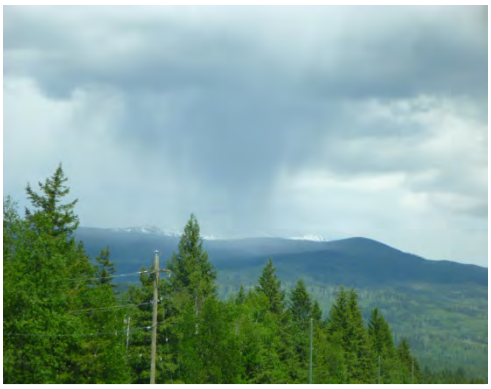
Appendix 13-C

Surface Water Quality Predictive Model

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT


WATER QUALITY PREDICTIONS

PREPARED FOR:

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VA101-458/14-3
Rev 0
October 17, 2014

Knight Piésold
CONSULTING
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ISO 9001 - FS 64925
ISO 14001 - EMS 550121
OHSAS 18001 - OHS 550122

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

WATER QUALITY PREDICTIONS
VA101-458/14-3

Rev	Description	Date	Approved
0	Issued in Final	October 17, 2014	

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EXECUTIVE SUMMARY

Knight Pièsold Ltd. (KP) completed a mass balance mixing model for the surface water regime in the vicinity of the Project. The water quality model was utilized throughout the preparation of the Application for an Environmental Assessment Certificate/Environmental Impact Statement (Application/EIS) to assist optimization of the mine design. This model combines three major inputs: 1) mine site and receiving environment surface and ground water hydrology data from the Life of Mine (LOM) watershed model, 2) geochemical source term data, and 3) baseline water quality data.

A total of 79 parameters were modeled, including: anions, nutrients, hardness, and total and dissolved metals. One expected case scenario, and three sensitivity cases were modelled to provide an indication of expected water quality concentrations within the mine site and the receiving environment. The Expected Case water quality model is assumed to provide the results that are most likely to occur. While the Expected Case model represents the concentrations that are the most likely, this model is inherently conservative. The Expected Case model does not account for any natural attenuation of loads, although this will very likely occur. Conservative seepage rates have been applied that reflect the upper bound of expected seepage.

The three sensitivity cases include: the Seepage Sensitivity Case, Upper Bound Case, and the 5th and 95th Percentile Precipitation Case. The Seepage Sensitivity Case examines the variability in predicted water quality as a result of altered seepage assumptions for upper Harper Creek and P-Creek. The Upper Bound Case utilizes the upper bound geochemistry source terms, which represent the upper limit of uncertainty within the inputs, and as a result of mine effects. The 5th and 95th Percentile Precipitation cases investigate the predicted variability as a result of variable climatic inputs, during key years in mine development.

Two different approaches were taken to compare results to appropriate guidelines, depending on whether the results were associated with a mine site modelling node or a receiving water environment modelling node. Mine site modelling node results were presented with respect to the following guidelines:

- *Metal Mining* Effluent Regulations (MMER) effluent discharge limits (Schedule 4 – Authorized Limits of Deleterious Substances, Column 2 – Maximum Authorized Monthly Mean Concentration)
- British Columbia Ministry of Environment (BC MOE) Water Quality Guidelines for the Protection of Wildlife (BCWQG-Wildlife)

Receiving environment modelling node results were compared against the federal and provincial guidelines for the protection of fresh water aquatic life:

- BC MOE Water Quality Guidelines for the Protection of Fresh Water Aquatic Life Maximum Acceptable Limits (BCWQG-Max)
- BC MOE Water Quality Guidelines for the Protection of Fresh Water Aquatic Life 30 Day Average Limits (BCWQG-30 D)
- Canadian Environmental Quality Guideline for the Protection of Aquatic Life (Freshwater) (CEQG)

A draft aquatic life guideline for dissolved cadmium was released in British Columbia (BC) in June 2014 (BC MOE, 2014). This guideline does not officially supersede the interim cadmium guideline; however it has been used for comparison against the modeled water quality results for the

receiving water nodes on the advice of BC MOE. It is acknowledged that this is a draft guideline and that it may change as a result of public comment.

The majority of mass load addition for all parameters is derived from ore processing. This load reports to the Tailing Management Facility (TMF) (regular ore), Open Pit (Low-Grade Ore (LGO)) and subsequently, T-Creek and Harper Creek downstream of T-Creek. The primary load addition in the TMF is derived from ore processing and tailings conveyed as slurry tailings into the TMF during the first phase of Operations (Operations I). The secondary source of loading to the TMF is water transferred from the Open Pit during Post-Closure. Maximum TMF concentrations for most parameter are achieved at the end of Operations I (Year 23.5) when regular ore processing is complete and LGO process tailings are then directed to the Open Pit. Certain parameters reach maximum predicted concentrations during Post-Closure as a result of load transfer from the Open Pit to the TMF, most notably cadmium. Selenium concentrations are predicted to be above the BCWQG-Wildlife during all phases on the model within the TMF and no other parameters are predicted above these guidelines or the MMER.

Open Pit water quality is influenced by LGO processing in the second phase of Operations (Operations II). Parameters increase in concentration through this phase to their maximum concentrations at the end of Operations II. Fluoride, mercury, molybdenum, and selenium are predicted to be above the BCWQG-Wildlife. Fluoride concentrations are predicted to drop below the guideline prior to closure, mercury and molybdenum are predicted to decrease below the wildlife guidelines in Post-Closure, and selenium is predicted to decrease over time, but remain above the wildlife guideline. No parameters are predicted to be above the MMER within the Open Pit.

There are no Project-related water chemistry influences to P-Creek in the Expected Case model. Total copper concentrations are above the BCWQG-30 D and CEQG as a result of background loading. Selenium is predicted to be above the BCWQG-30 D and CEQG in P-Creek in the Unrecovered Seepage Sensitivity Model during Operations and concentrations are predicted to decrease in Closure and Post-Closure to below the BCWQG-30 D but remain above the CEQG.

T-Creek water quality trends are similar to TMF trends in Closure and Post-Closure. Concentrations of most parameters[1] at T-Creek are at their maximum at Year 31 and decrease during the remainder of Closure and Post-Closure; with the exception of a few parameters which trend upwards as a result of transfer of water from the Open Pit to the TMF in Post-Closure. The following parameters are predicted to be above the provincial or federal aquatic life guidelines: fluoride, sulphate, aluminum, cadmium, copper, selenium, and zinc. Aluminum is the only parameter that is predicted to be above guidelines during Operations and then it is predicted to decrease to levels below the guideline in Closure and Post-Closure. The remaining parameter concentrations increase in T-Creek as a result of discharge from the TMF, affecting Closure and Post-Closure concentrations. Fluoride concentrations drop below the guidelines before the end of the Closure phase, and the remaining parameters remain above one or more guidelines for a longer duration.

Water quality parameter concentrations in Baker Creek and Jones Creek are not predicted to have concentrations above the federal and provincial guidelines for the protection of aquatic life as a result of mine loading. Iron, copper, chromium and aluminum are noted to be above guidelines during all mine phases within one or both creek as a result of baseline loading.

[1] With the exception of parameters affected by background loading.

Mine-related seepage and TMF discharge are predicted to result in changes to water quality in Harper Creek, particularly downstream of the confluence of Harper Creek with T-Creek. Selenium is the only parameter within Harper Creek that is predicted to be above the aquatic life guidelines during Operations in the Expected Case as a result of mine-loading; this change is directly attributed to unrecovered seepage from the Non-Potentially Acid Generating (Non-PAG) Waste Rock Stockpile and Potentially Acid Generating (PAG) LGO Stockpile. Dissolved aluminum and total copper are noted to be above guidelines during operation within Harper Creek during all mine phases, as a result of baseline loading. Selenium, cadmium, and copper concentrations are predicted to be above the aquatic life guidelines within Harper Creek, downstream of the confluence with T-Creek (HT) as a result of TMF discharge during Closure and Post-Closure. Selenium and copper concentrations are predicted to above the aquatic life guidelines at the base of Harper Creek (HB).

Expected Case selenium concentrations in Harper Creek are predicted to be above guidelines during Operations at mid Harper Creek (HM) and HT as a result of loading from the PAG LGO Stockpile. This loading source is removed through LGO processing in Operations II. Expected Case predicted selenium concentrations during Closure and Post-Closure at HT and HB are above the applicable guidelines on a seasonal basis. Unrecovered Seepage Sensitivity Case selenium concentrations for HP are predicted to be seasonally above the BCWQG-30 D and CEQG during Operations I and II, with lowest concentrations predicted for the months of April through July. Selenium concentrations at HP for this sensitivity analysis are predicted to decrease in Closure when the PAG LGO is processed, remaining below the BCWQG-30 D through Closure and Post-Closure and only seasonally above the CEQG through these phases.

Expected Case cadmium concentrations in Harper Creek are predicted to be below the most stringent guidelines (BCWQG-30 D Draft) for the duration of Operations. Concentrations increase during Closure, but are predicted to be below guidelines for the majority of this phase (seasonally above the guideline in October). Peak predicted concentrations during Post-Closure at HT and in HB (Year 50 through Year 52) are above guidelines for the majority of the year (maximum factor by which cadmium is above guidelines in Post-Closure is 2.4). Cadmium concentrations follow a decreasing trend after Year 50. All applicable guidelines for cadmium are hardness-dependent and baseline hardness decreases with distance downstream in the creek, resulting in lower guidelines downstream.

Expected Case copper concentrations are influenced by background concentrations. Higher background total copper concentrations are predicted to occur during freshet, when measured hardness is lower and guidelines are most protective. There is a slight increase predicted in low flow total copper concentrations during Closure and Post-Closure due to the influence of the TMF spillway discharge. TMF discharge has the greatest effect on predicted copper concentrations during the low flow months when there is the highest proportion of discharge compared to natural flows. Peak concentrations for copper are dominantly influenced by background loading sources though a small change in concentration is attributed to TMF discharge.

Sensitivity Analyses

Three sensitivity analyses were completed to determine the upper bound of predicted concentrations: Unrecovered Seepage Sensitivity Case, 5th and 95th Percentile Precipitation Case, and Upper Bound Case. Selenium and total copper are predicted to be above guidelines in all of the sensitivity analyses. Total copper results are influenced by background loading at many sites, but

are further influenced by mine loading at other sites. Cadmium concentrations are elevated within the 5th and 95th Percentile and Upper Bound sensitivity cases at various nodes within Harper Creek. The Upper Bound Case identified aluminum, cobalt, mercury, and zinc as parameters that were predicted to be above guidelines in Harper Creek, in addition to cadmium, copper, and selenium. Aluminum, cobalt, mercury, and zinc are not predicted to be above guidelines in Harper Creek in the Expected Case or other sensitivity analyses.

Selenium is the only parameter that is predicted to be above guidelines as a result of Project-related seepage in P-Creek and upper Harper Creek (HP) in the Unrecovered Seepage Sensitivity Case. Selenium is predicted to be above the BCWQG-30 D and CEQG at both model nodes in the Unrecovered Seepage Sensitivity Model during Operations and concentrations are predicted to decrease in Closure and Post-Closure to below the BCWQG-30 D but remain above the CEQG.

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ABBREVIATIONS

Project	the project
ARD	acid rock drainage
BC	British Columbia
BC MOE	British Columbia Ministry of Environment
BCWQG	British Columbia Ministry of Environment Water Quality Guidelines
BK1	Mid Baker Creek (BK1)
BK0	Baker Creek Above North Thompson River
CEQG	Canadian Environmental Quality Guidelines
DFO	Fisheries and Oceans Canada
EIS	environmental impact statement
HT	Harper Creek below T-Creek
HP	Harper Creek below P-Creek
HM	Mid Harper Creek
HB	Harper Creek Above Barrière River
J1	Jones Creek Above North Thompson River (J1)
KP	Knight Pièsold Ltd.
LGO	LGO
LOM	life of mine
PAG	potentially-acid generating
TMF	Tailings Management Facility
TPD	tonnes per day
Non-PAG	non potentially-acid generating
WMP	water management pond

1 – INTRODUCTION

1.1 PROJECT DESCRIPTION

The Harper Creek Project (the Project) is a large copper-gold-silver deposit located approximately 150 km northeast of Kamloops in south-central British Columbia (BC), as shown on Figure 1.1. The Project involves a conventional truck-shovel Open Pit mine and 70,000 tonnes per day (TPD) processing plant, which is designed to process the copper sulphide ore and produce marketable copper concentrate over a 28-year mine life. Road access to the project site will be over the existing Highway 5 from Kamloops to Vavenby, and then via upgraded existing secondary and forestry roads from Vavenby to the project site. The Canadian National rail line is located 24 km away and will connect the property to the Port of Vancouver, an approximate rail distance of 560 km. Power interconnection to the provincial grid is anticipated at a tie-in location near Vavenby.

1.2 SCOPE OF WORK

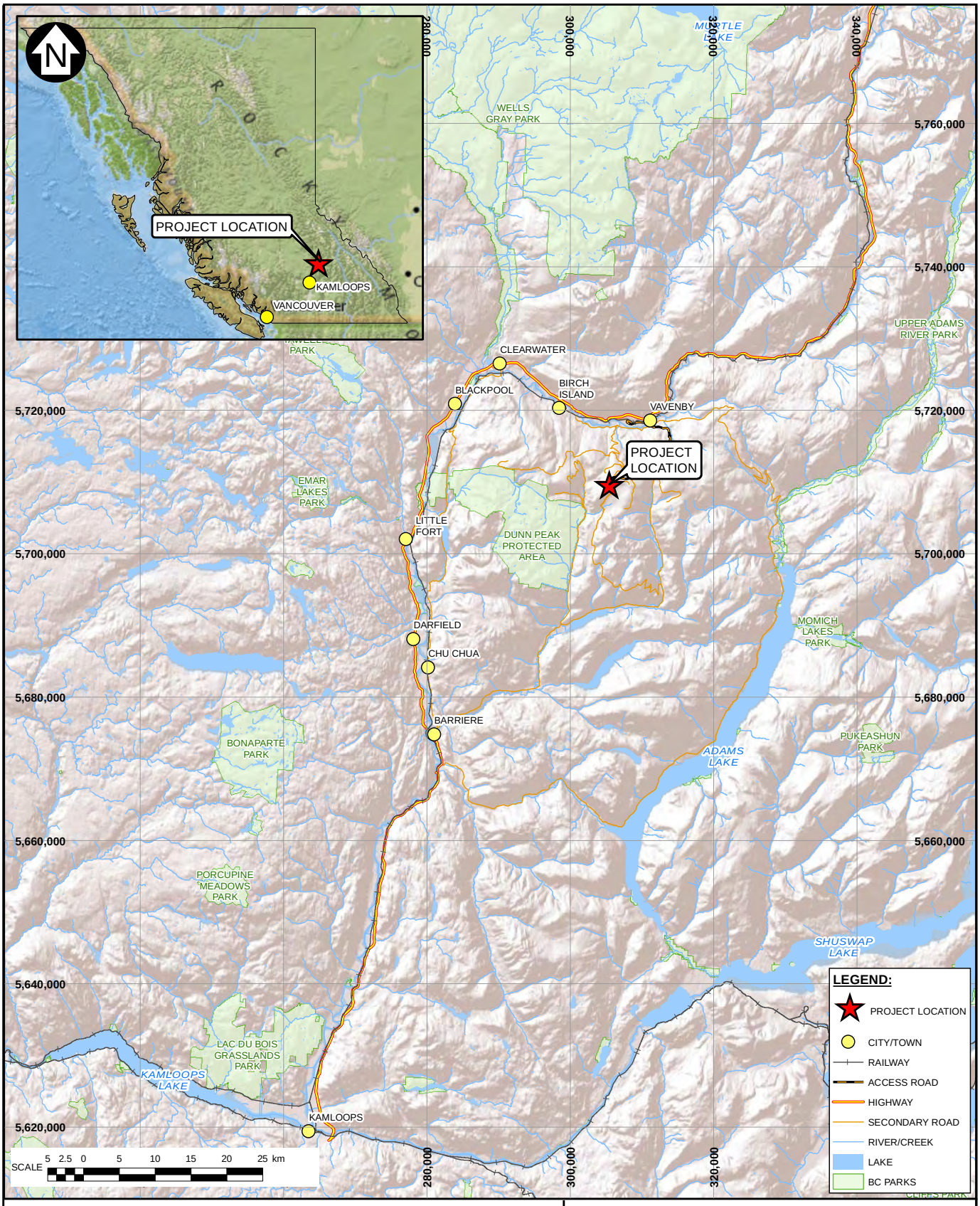
Knight Pièsold Ltd. (KP) completed a mass balance mixing model for the surface water regime ("the water quality model") in the vicinity of the Project. The model was utilized throughout the preparation of the Application for an Environmental Assessment Certificate/Environmental Impact Statement (Application/EIS) to assist optimization of the mine design. The water quality model was developed based on geochemical source terms for all major Project component inputs to provide downstream surface water quality predictions for the duration of Operations, Closure, and well into Post-Closure in all potentially affected watersheds. Predicted downstream surface water concentrations are provided for Harper Creek, Jones Creek and Baker Creek and compared to relevant provincial and federal water quality guidelines. The results were used as inputs to support effects assessments for relevant Valued Components in the Application/EIS.

The water quality predictions contained herein are based on the current project design and assumptions as described in Chapter 5 (Project Description) of the Application/EIS. The outcomes of the model should not be viewed as definitive numbers, but as a tool to provide indications of where future monitoring efforts should focus and what mitigation and adaptive management measures should be considered and implemented. The model results are based on Project design mitigation measures assumed in the model and will need to be verified by actual monitoring results throughout the operation of the mine.

1.3 REFERENCE REPORTS

The following KP subject matter reports were considered in the preparation of this report.

- Watershed Modelling Report – KP report, Ref No. VA011-458/14-1;
- Numerical Groundwater Modelling Report – KP report, Ref No. VA101-458/14-2;
- Harper Creek Project – Seepage and Stability Modelling – KP memo report, Ref No. VA14-00865; and
- Mine Waste and Water Management Design Report – KP report, Ref No. VA101-458/11-1.



NOTES:

1. BASE MAP: TRIM AND NTS MAPPING, ESRI ARCGIS ONLINE SHADED RELIEF.
2. COORDINATE GRID IS IN METRES. COORDINATE SYSTEM: NAD 1983 UTM ZONE 11N.
3. THIS FIGURE IS PRODUCED AT A NOMINAL SCALE OF 1:750,000 FOR 8.5x11 (LETTER) PAPER.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
0	17OCT'14	ISSUED WITH REPORT	CAC	CAC	TJP	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PROJECT LOCATION

Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF NO. 3

FIGURE 1.1

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2 – MINE DEVELOPMENT AND MINE WATER MANAGEMENT

2.1 GENERAL

The sequence of mine development, mine waste production and management, and associated mine water management is essential to the design of water management systems and the modelling of predicted water quantity and quality effects. The project design and water management plans were presented previously in the Mine Waste and Water Management Design Report (KP, 2014d). There were five stages of mine development that were considered:

- Construction (two pre-production years, referred to as Year -2 and Year -1)
- Operations I (active mining in the open pit, Year 1 through 23)
- Operations II (during low-grade ore (LGO) processing, from end of active mining through Year 28)
- Closure (during active closure and reclamation phase while Open Pit and Tailings Management Facility (TMF) are filling, from Year 29 through 35), and
- Post-Closure (steady-state long-term closure condition following active closure; commences upon Open Pit lake reaching elevation specified for design capacity, Year 36).

A water management plan indicating water movement strategies for each of the five stages of mine development are shown on Figures 2.1 to 2.5. A summary of the mine development sequence and mine water management plans are described in the following sections.

2.2 CONSTRUCTION

The Project begins with two years of construction prior to mine operation. The construction phase includes the following development activities:

- Collection channels and Water Management Ponds (WMPs) are constructed downstream of key development areas.
- Topsoil is stripped from the Open Pit and key areas of the TMF and stored in topsoil stockpiles.
- Overburden and Non-potentially-acid generating (Non-PAG) waste rock is stripped from the Open Pit and used in construction of mine facilities (e.g., roads, crusher pad, plant site grading, TMF embankments, or stored in the overburden or Non-PAG Waste Rock stockpiles).
- PAG waste rock is stripped from the Open Pit and placed in the TMF for long-term storage or used in construction of the upstream zone of the Main Embankment (upstream of core zone).
- Low-Grade Ore (LGO) encountered during pit pre-stripping is stored in one of three surface stockpiles, depending on geochemical classification and grade of the material.
- The cofferdam for the TMF Main Embankment is constructed to elevation (EL.) 1683 m, followed immediately by construction of the Stage 1 embankment to EL. 1720 m.
- Tailings distribution system to the Main Embankment is constructed, but inactive.
- Water reclaim system from the TMF to the process plant is constructed, but inactive.
- Diversion channels are constructed to route non-contact water to the downstream receiving environment.
- WMPs function as sediment control ponds with surface water discharge to receiving environment with water quality meeting federal and provincial discharge standards.
- Water management pump systems and pipelines are installed at all WMPs.

2.3 OPERATIONS I – ACTIVE MINING

The first operational phase includes the active mining and ore processing period and is approximately 23 years long. This period includes the following activities:

- Overburden and Non-PAG waste rock is stripped from the Open Pit and used in on-going construction of the TMF embankments or stored in the overburden or Non-PAG Waste Rock stockpiles.
- PAG waste rock is stripped from the Open Pit and placed in the TMF for long-term storage, or used in construction of the upstream zone of the Main Embankment (first five years only) and subsequently buried with Non-PAG waste and flooded.
- LGO encountered during mining is stored in one of three surface stockpiles, depending on geochemical classification and grade of the material. Stockpiled LGO is used periodically to supplement volume and grade of ore processing.
- Crushing and milling of ore underway at the crusher pad and process plant, respectively.
- Tailings from ore processing conveyed as slurry to TMF for long-term storage.
- Supernatant water from TMF is reclaimed and recycled for ore processing.
- Portion of supernatant water is separated, treated, and used as fresh water in the mill for reagent makeup, gland seals, and most purposes other than potable water.
- Diversion channels continue to route non-contact water to the downstream receiving environment and are adjusted as required due to the expanding mine site.
- Seepage and surface runoff from the Non-PAG Waste Rock stockpile, PAG LGO stockpile, and the Non-PAG LGO stockpile outside the TMF are collected in WMPs and pumped to the TMF for long-term storage and reuse.
- Surface runoff from the overburden stockpile is conveyed by collection ditch to the Open Pit until approximately Year 10, and then routed through a sediment control pond with surface water discharge to receiving environment if water quality meets federal and provincial discharge standards.
- Pit wall seepage and surface runoff from the Open Pit is conveyed to the TMF for long-term storage and reuse.

2.4 OPERATIONS II – LOW GRADE ORE PROCESSING

The second operational phase commences when active mining is complete in the Open Pit. This phase consists of LGO processing and includes the following activities:

- Crushing and milling of LGO underway at crusher pad and process plant, respectively.
- Tailings from LGO processing conveyed as slurry to the Open Pit for long-term storage.
- Water from TMF is reclaimed and reused in ore processing for first 18 months as the Open Pit begins to fill, and then water is reclaimed from the Open Pit for the remaining two and a half years.
- Open Pit water management system is partially decommissioned and removed. Pit inflows from seepage and surface runoff are allowed to accumulate in the pit.
- Seepage and surface runoff from the Non-PAG Waste Rock stockpile and PAG LGO stockpile are collected in WMPs and pumped to the TMF for long-term storage.
- TMF is allowed to fill with surface runoff and inflows from site water management systems, diluting concentrations of key parameters in the TMF pond.
- The closure spillway is constructed at southeastern end of the TMF, but remains inactive until TMF pond has filled.

2.5 CLOSURE

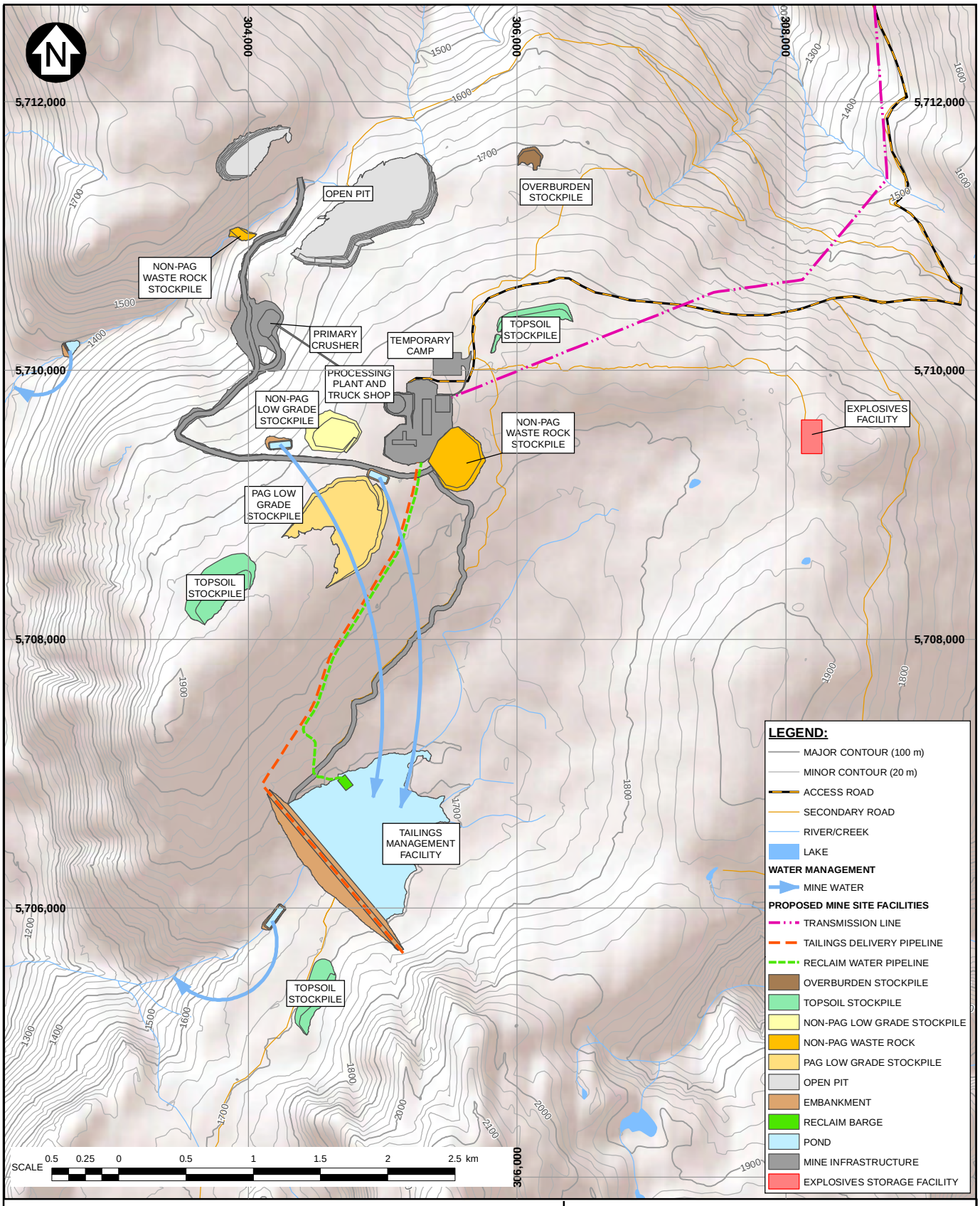
There is a period of time following completion of LGO processing where the mine site is being actively reclaimed and has not yet reached end land use objectives. The following activities are occurring during the closure phase:

- Final reclamation activities occur for plant site, tailings distribution, LGO stockpiles and associated WMPs and pipelines.
- Seepage and surface runoff from the Non-PAG Waste Rock stockpile are collected in the WMPs and pumped to the TMF for long-term storage.
- Pit inflows from seepage and surface runoff are allowed to accumulate in the pit diluting concentrations of key parameters in the pond.
- Open Pit water management system for closure is commissioned, but remains inactive.
- The TMF closure spillway becomes active and excess site water is discharged via the spillway to the downstream receiving environment.

2.6 POST-CLOSURE

The active closure period continues until the Open Pit pond reaches the final design elevation (EL. 1530 m) and the final arrangement of the mine site for closure has been reached. The following activities for mine water management will occur in perpetuity during the Post-Closure period:

- Excess pit inflows from seepage and surface runoff are pumped to the TMF for long-term storage and discharge management.
- Seepage and surface runoff from the Non-PAG Waste Rock stockpile is collected in the WMP and pumped to the TMF for long-term storage.
- The TMF closure spillway remains active and excess site water is discharged via the spillway to the downstream receiving environment.



NOTES:

1. BASE MAP: TRIM AND NTS MAPPING, ESRI ARCGIS ONLINE SHADED RELIEF.
2. COORDINATE GRID IS IN METRES. COORDINATE SYSTEM: NAD 1983 UTM ZONE 11N.
3. THIS FIGURE IS PRODUCED AT A NOMINAL SCALE OF 1:40,000 FOR 8.5x11 (LETTER) PAPER.

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HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

MINE WATER MANAGEMENT PLAN CONSTRUCTION

Knight Piésold CONSULTING

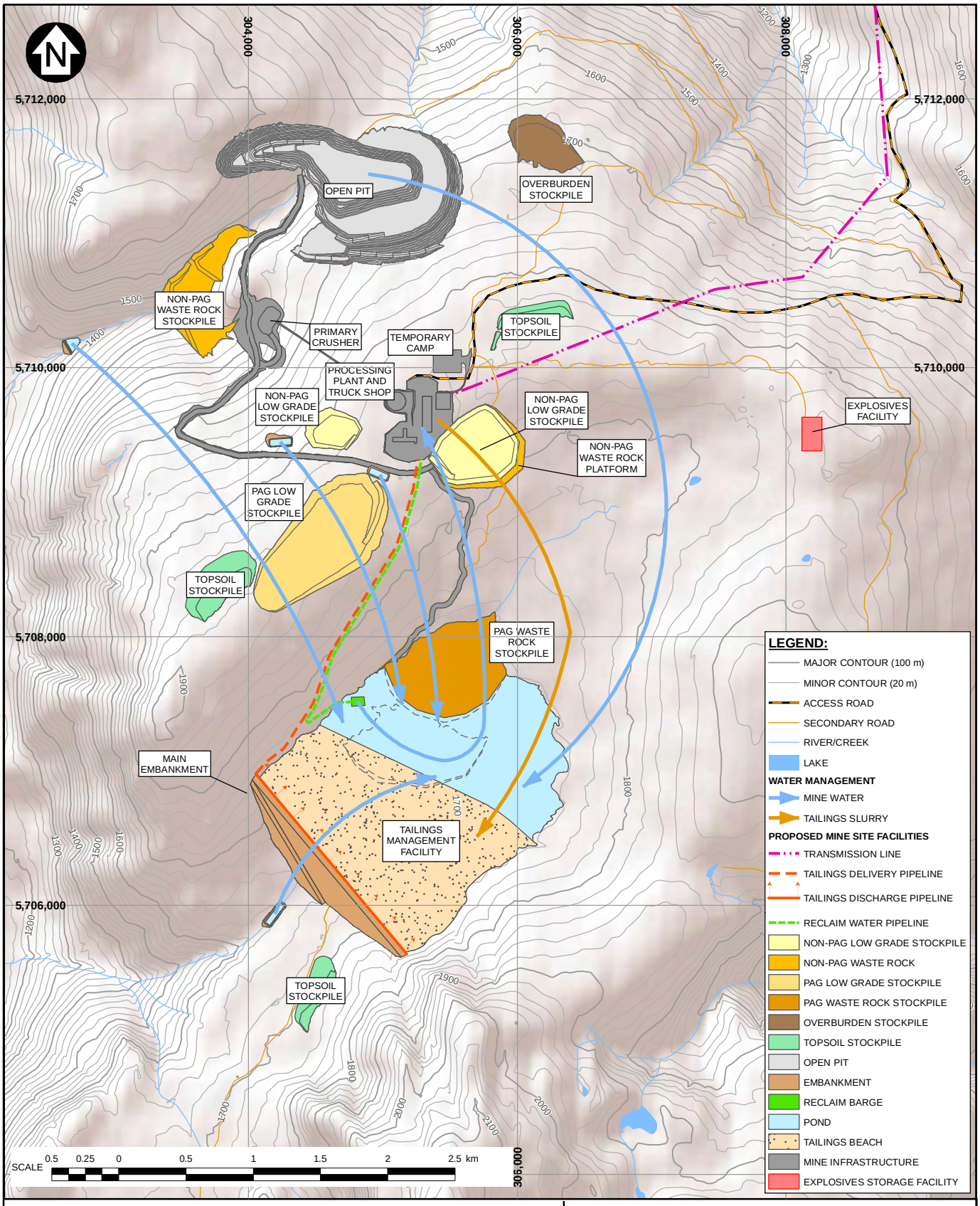
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FIGURE 2.1

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NOTES:

1. BASE MAP: TRIM AND NTS MAPPING, ESRI ARCGIS ONLINE SHADED RELIEF.
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HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

MINE WATER MANAGEMENT PLAN
OPERATIONS I

Knight Piésold CONSULTING

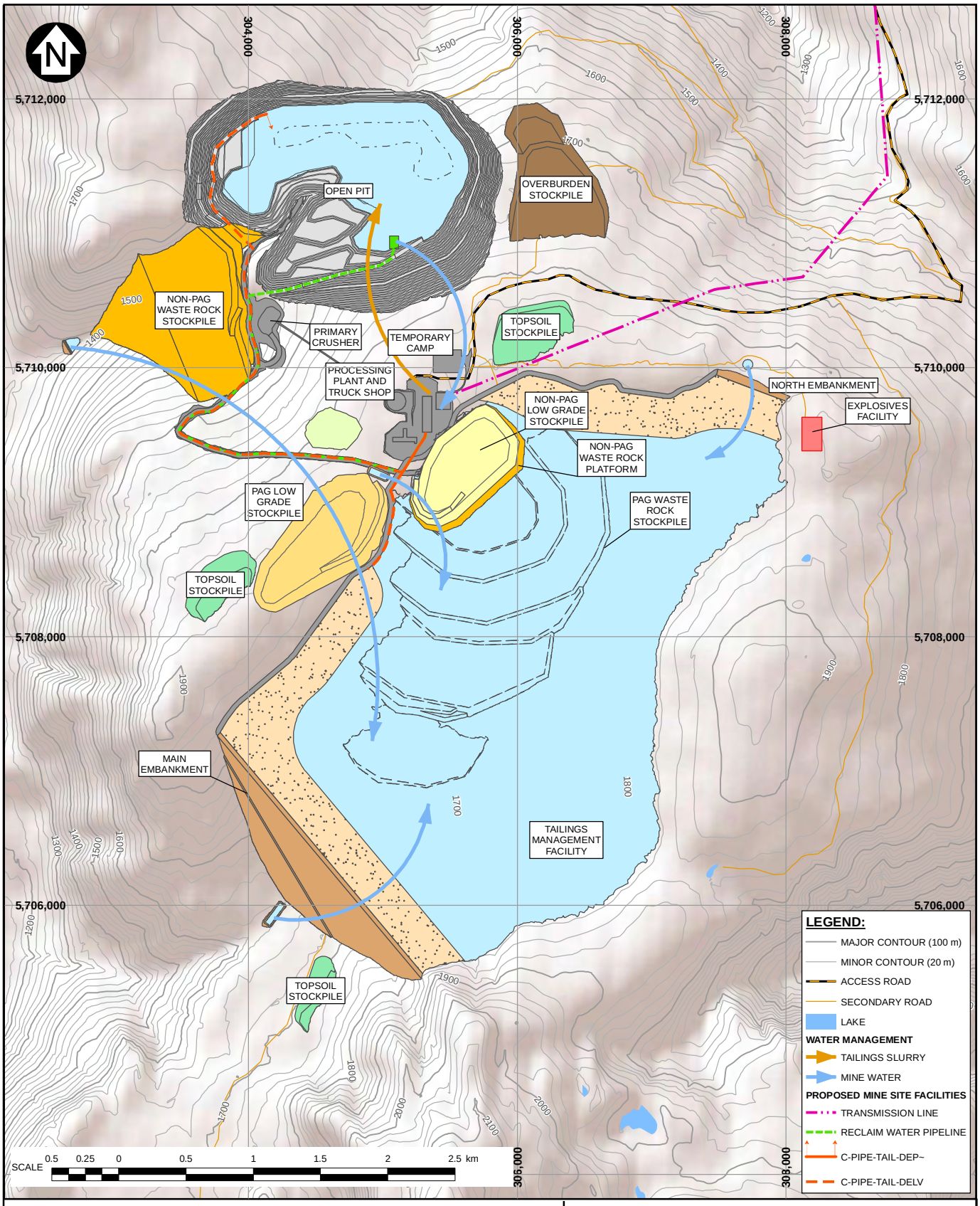
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FIGURE 2.2

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NOTES:

1. BASE MAP: TRIM AND NTS MAPPING, ESRI ARCGIS ONLINE SHADED RELIEF.
2. COORDINATE GRID IS IN METRES. COORDINATE SYSTEM: NAD 1983 UTM ZONE 11N.
3. THIS FIGURE IS PRODUCED AT A NOMINAL SCALE OF 1:40,000 FOR 8.5x11 (LETTER) PAPER.

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HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

MINE WATER MANAGEMENT PLAN
OPERATIONS II

Knight Piésold CONSULTING

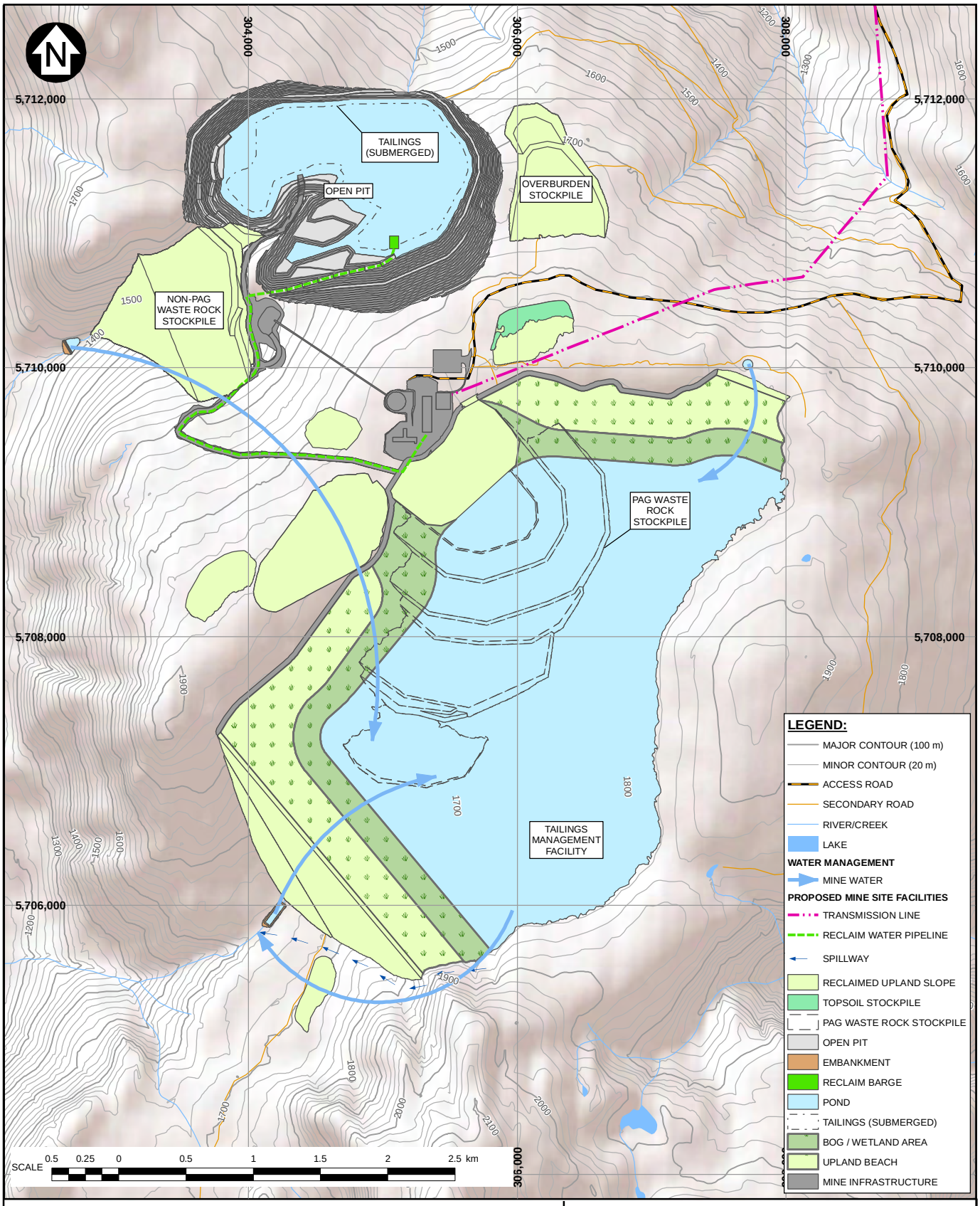
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FIGURE 2.3

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NOTES:

1. BASE MAP: TRIM AND NTS MAPPING, ESRI ARCGIS ONLINE SHADED RELIEF.
2. COORDINATE GRID IS IN METRES. COORDINATE SYSTEM: NAD 1983 UTM ZONE 11N.
3. THIS FIGURE IS PRODUCED AT A NOMINAL SCALE OF 1:40,000 FOR 8.5x11 (LETTER) PAPER.

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HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

MINE WATER MANAGEMENT PLAN CLOSURE

Knight Piésold CONSULTING

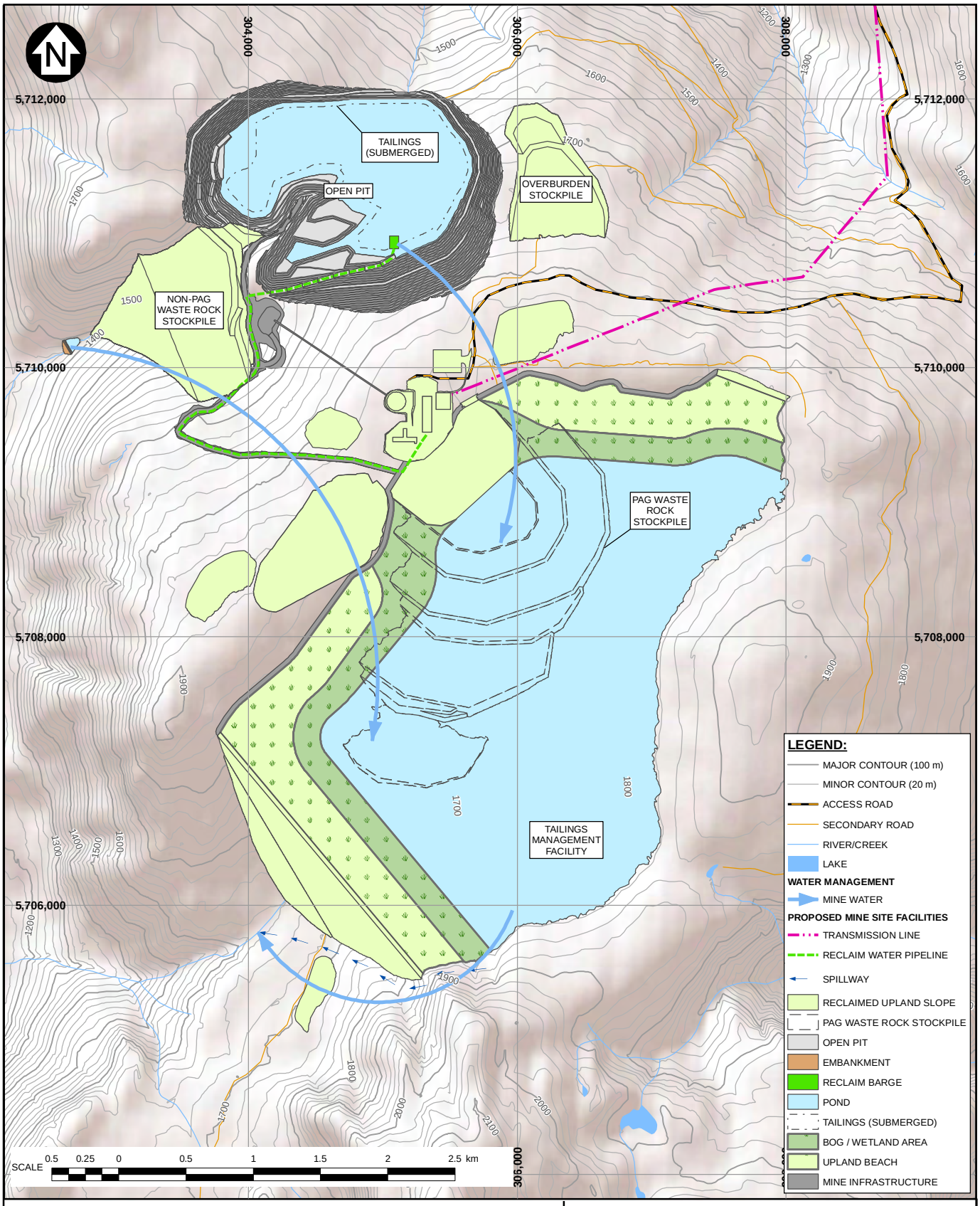
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FIGURE 2.4

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NOTES:

1. BASE MAP: TRIM AND NTS MAPPING, ESRI ARCGIS ONLINE SHADED RELIEF.
2. COORDINATE GRID IS IN METRES. COORDINATE SYSTEM: NAD 1983 UTM ZONE 11N.
3. THIS FIGURE IS PRODUCED AT A NOMINAL SCALE OF 1:40,000 FOR 8.5x11 (LETTER) PAPER.

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HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

MINE WATER MANAGEMENT PLAN POST CLOSURE

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VA101-458/14	3

FIGURE 2.5

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3 – METHODS

3.1 MODEL OVERVIEW

The water quality model combines three major inputs: 1) mine site and receiving environment surface water and groundwater hydrology data from the Life of Mine (LOM) watershed model, 2) baseline water quality data, and 3) geochemical source term data. The LOM watershed model also uses data for a variety of sources. The relationships between the various models that were integrated to create the water quality model are illustrated on Figure 3.1. Additional information for the three major input sources for the water quality model is listed below:

a) LOM Watershed Model:
   - Watershed Modelling Report – KP report, Ref No. VA011-458/14-1 (KP, 2014a).

b) Baseline Water Quality:
   - Appendix A1.
   - 2014 Harper Creek Baseline Water Quality Report prepared by ERM Rescan (ERM, 2014).

c) Geochemical source term data:
   - Appendix A2 and Appendix A3 (model input data).
   - *Metal Leaching and Acid Rock Drainage Characterization, Harper Creek Project Report* (SRK, 2014) – prepared by SRK (including details regarding development of conceptual geochemical model for each term).

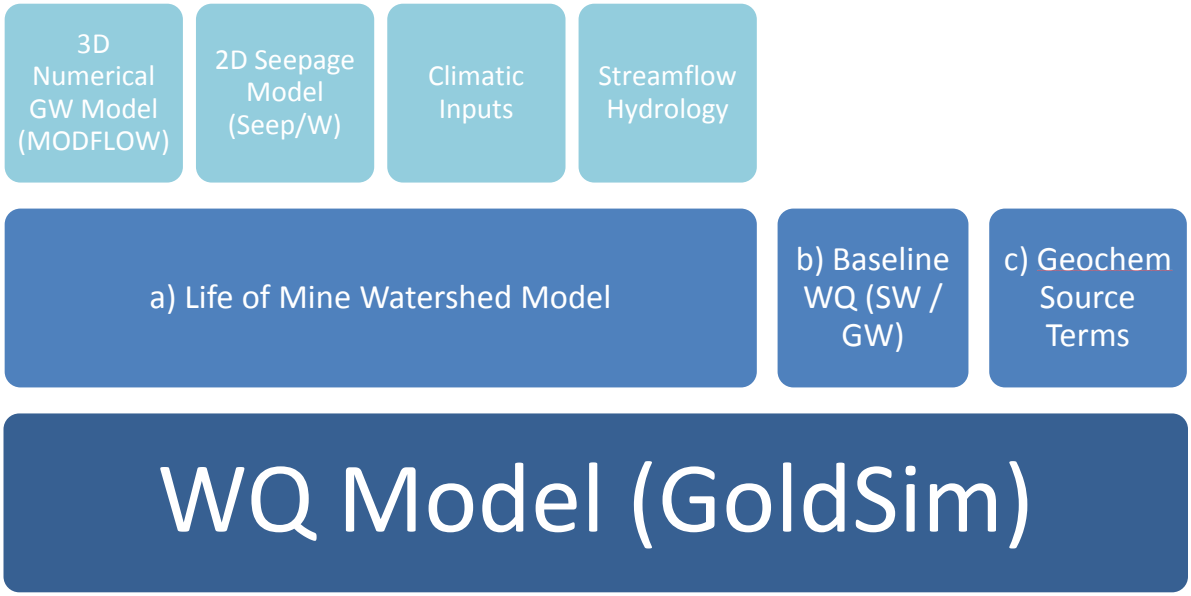


Figure 3.1 Summary of Input Data for Water Quality Model

3.2 MODELED SCENARIOS

Four scenarios were modeled to provide an indication of water quality concentrations within the mine site and the receiving environment. The Expected Case water quality model is assumed to provide the results that are most likely to occur. Three sensitivity analyses were completed: the Seepage Sensitivity Case, Upper Bound Case, and the 5th and 95th Percentile Precipitation Case. The Seepage Sensitivity Case examines the variability in predicted water quality as a result of altered

seepage assumptions. The Upper Bound Case utilizes the upper bound geochemistry source terms, which represent the upper limit of uncertainty within the inputs, and as a result of mine effects. The 5th and 95th Percentile Precipitation cases investigate the predicted variability as a result of variable climatic inputs, during key years in mine development.

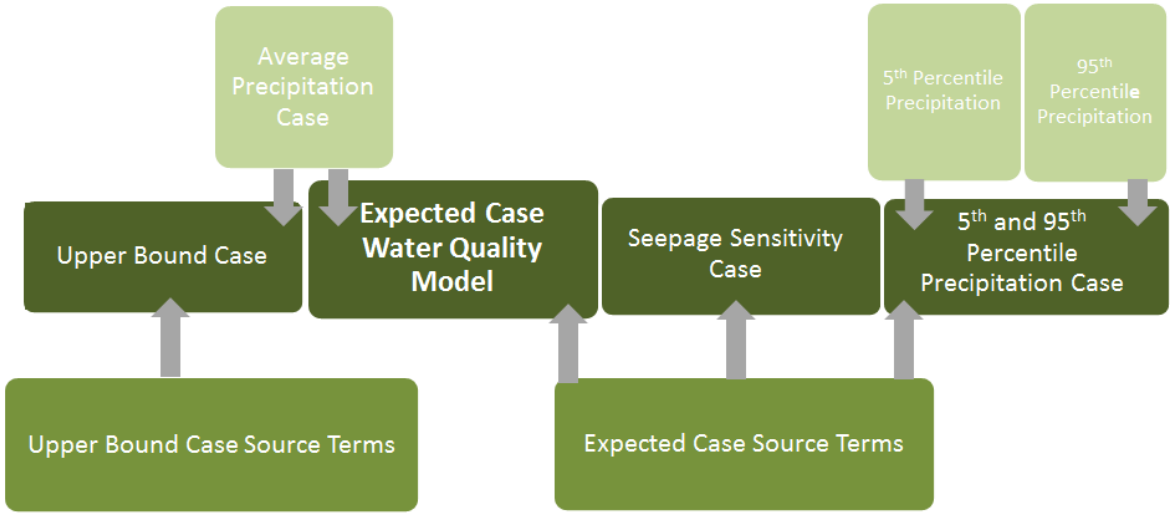


Figure 3.2 Summary of the Modeled Scenarios

3.2.1 Expected Case

The Expected Case water quality model presents water quality concentrations that are the most likely to occur. The Expected Case water quality model applies the Average Climate Inputs Case flows (Section 3.5.1) with the Expected Case geochemical source terms (Section 3.7).

3.2.2 Sensitivity Analyses

3.2.2.1 Unrecovered Seepage Sensitivity Case

The location of the discharge of unrecovered seepage from the mine facilities is a key aspect of the prediction of water quality for the project. Water quality predictions include a sensitivity analysis to determine an expected range of water chemistry in P-Creek and Upper Harper Creek based on sensitivity to discharge of unrecovered seepage from the Non-PAG Waste Rock Stockpile and PAG LGO Stockpile to these locations. This sensitivity analysis took into consideration the flow paths for unrecovered seepage that were modelled using the watershed model, SEEP/W, and MODFLOW. Consideration was given to the strengths of each groundwater modelling technique to form a reasonable upper bound scenario for expected case water quality in P-Creek and upper Harper Creek. A more detailed discussion of the unrecovered seepage is provided in Section 3.8.

3.2.2.2 5th and 95th Percentile Precipitation Cases

The third sensitivity analysis was completed to examine the effect on predicted parameter concentrations by altering climate inputs. Three iterations of 5th percentile dry flows were run through the historic climate record during key years to predict the effect of lower than average flows

on predicted concentrations, as described in Section 3.5.2. Three iterations of the 95th percentile wet flows were also run through the historic climate record during key years to predict the effect of higher than average flows on predicted concentrations. Maximum water quality concentrations recorded for all 5th percentile iterations and 95th percentile iterations were compared to guidelines for key parameters.

3.2.2.3 Upper Bound Case

The fourth sensitivity analysis was completed to examine the effect of altering geochemical source terms inputs. The Upper Bound Case water quality model was developed using the Average Climate Inputs Case flows (Section 3.5.1) with the Upper Bound Case geochemical source terms (Section 3.7). The Upper Bound Case geochemical source terms incorporate extreme inputs and provide the upper boundary condition for loading. There is a very low probability that actual mine-related loading will meet or exceed the conceptual Upper Bound Case source terms. In this case, all source terms have been assumed to equal their upper limit.

3.3 PARAMETERS MODELED

A total of 79 parameters were modeled, including: anions, nutrients, hardness, and total and dissolved metals. The anions modeled include: sulphate, chloride, fluoride, and phosphorus. The nutrients modeled include: orthophosphate, phosphorus, nitrate, nitrite, and ammonia. The total and dissolved metals modeled include: aluminum, antimony, arsenic, barium, beryllium, bismuth, boron, cadmium, calcium, chromium, cobalt, copper, iron, lead, lithium, magnesium, manganese, molybdenum, mercury, nickel, phosphorous (metal), potassium, selenium, silica, silver, sodium, strontium, sulphur, thallium, tin, titanium, uranium, vanadium, zinc, and zirconium.

3.4 CALCULATIONS

The GoldSim Contaminant Transport Module was used to calculate predicted concentrations of the modelled parameters within mine site ponds (e.g., TMF, Pit Lake and WMPs) and at select downstream water quality mixing nodes for all model scenarios except the unrecovered seepage sensitivity case, which was modeled in Excel. Two different calculations were used, depending on whether the node was a water quality mixing node for a pond or a river or creek. For WMPs that are to be decommissioned and act as both a pond and then a river or creek during different time periods, both equations were used.

At water quality mixing nodes within rivers or creeks, the mass balance method assumes that the incoming flows are thoroughly mixed a short distance downstream of the confluence. The generalized mass balance equation for mixing points on creeks and rivers is as follows:

$$C_{New} = \frac{C_A \times Q_A + C_B \times Q_B}{(Q_A + Q_B)}$$

Where
C_{New} = mixed concentration (mg/L)
C_A = concentration of stream A (mg/L)
Q_A = flow rate of stream A (m^3/s)
C_B = concentration of stream B (mg/L)
Q_B = flow rate of stream B (m^3/s)

At water quality mixing nodes within ponds, the GoldSim Contaminant Transport "Cell Pathway" was used to calculate the outgoing concentration of a pond. Since this model assumes that dissolved loads remain in solution and particulate loads remain suspended, the calculation pond calculated used for this pathway can be simplified as follow:

$$C_{New} = \frac{L_{STORED} + (C_{IN} \times Q_{IN}) - (C_{OUT} \times Q_{OUT})}{Volume}$$

Where
L_{STORED} = stored load (mg/mon)
C_{IN} = concentration of incoming flow (mg/L)
Q_{IN} = flow rate of incoming flow (m^3/s)
C_{OUT} = concentration of all outgoing flow (mg/L)
Q_{OUT} = flow rate of all outgoing flow (m^3/s)
Volume= volume in pond

3.5 LIFE OF MINE WATERSHED MODEL

The LOM watershed model was developed to simulate the effects of the proposed mine development and operation on the surface water and groundwater quantity and quality in the project area. The LOM watershed model includes the proposed infrastructure and operational water management practices for all phases of the Project as described in the Mine Waste and Water Management Design Report (KP, 2014d). The development of the LOM watershed model, including inputs, data sources and findings are described in detail in the Project Watershed Modelling Report (KP, 2014a). The model includes inputs from 3D numerical groundwater modelling (KP, 2014b) and seepage modelling (KP, 2014c). Water quality models that use flows derived from LOM watershed models have the ability to model and track contact and non-contact seepage waters in addition to surface flow. Additional discussion on the results of groundwater modelling and methodology of water quality predictions are provided in Section 3.5.

The Pre-Mine baseline watershed model integrates existing groundwater and surface water data with climatic inputs at a variety of elevation bands to create a baseline model of water flow at the existing site prior to project Construction. The Pre-Mine baseline watershed model was calibrated to available streamflow records. As stated in Section 5.3 of the KP Watershed Model Report KP Ref. VA101-458/14-1, the goodness of fit between the long-term synthetic and watershed model streamflows used in the Pre-Mine and baseline models were evaluated using the statistical Nash-Sutcliffe efficiency method (NSE) (Moriaisi et al, 2006). A summary of the calibration is included below (Table 3.1). This information is also provided in Table 5.2 of the Watershed Model Report KP Ref. VA101-458/14-1.

Table 3.1 Comparison of Baseline and Pre-Mine Watershed Model Calibration

CREEK	GAUGE	BASELINE MODEL NSE	PRE-MINE MODEL NSE
HARPER CREEK	WBS 08LB076	0.69	0.70
HARPER CREEK	HARPERUS	0.63	0.64
P-CREEK	OP	0.67	0.64
JONES CREEK	JONESUS	0.69	0.67
T-CREEK	TSFDS	0.67	0.66

NOTES:

1. THE PERFORMANCE RATING FOR NSE VALUES (MORIAISI ET AL, 2006) IS DEFINED AS: VERY GOOD: 0.75 < NSE < 1.00; GOOD: 0.65 < NSE < 0.75; SATISFACTORY: 0.50 < NSE < 0.65, AND UNSATISFACTORY: NSE < 0.50.

The watershed model was used to generate the water quality model flows for two conditions, the Expected Case and the 5th and 95th Percentile Precipitation cases. These cases are described in the sections that follow.

3.5.1 Expected Case

The Average Case LOM watershed model was run to simulate the effects of proposed mine infrastructure and water management practices on the Expected Case surface water quality. Average monthly temperature and precipitation inputs were applied to produce average monthly flows over the life of the project. In this scenario, all inputs are steady state and changes to flow are as a result of mine development.

The average temperature and precipitation inputs to the model, discretized by sub-catchment and elevation band, are included in Table 3. 1 and Table 3.2 in Section 3.4 of the *Watershed Modelling Report – KP report, Ref No. VA011-458/14-1* (KP, 2014a). The long-term precipitation record for the project area, was simulated from precipitation data from three on-site meteorology stations, on-site snow course station and the Vavenby regional meteorological station. The on-site meteorology station data record is 8 years and extends from 2007 to present. The on-site snow course station data record is two years and extends from 2012 to present. The Canadian Climate Normals Data from the Vavenby regional average precipitation and temperature record extends from 1971 to present.

3.5.2 5th and 95th Percentile Precipitation Cases

The 5th and 95th Percentile Precipitation Cases were used to assess the effect of variable climatic conditions on streamflow and resulting water quality. In order to assess the effect of variable climatic conditions on surface water quality, climatic variability was introduced into the LOM model during the following key phases of the Project development:

- Operations I (Years 21 and 22)
- Operations II (Years 27 and 28)
- Closure (Years 29 and 30), and
- Post-Closure (Years 50 and 51).

The above phases were selected to correspond with times when the concentrations of the parameters of concern within the average case water quality model reached their maximum during Operations I, Operations II, Closure and Post-Closure at key receiving environment nodes. Variable climatic conditions were not modeled during the construction phase due to the low predicted concentrations, when compared to subsequent phases. As mine activities affect water quality parameters differently, it was not possible to select key phases that include the maximum concentration for all water quality parameters.

Climatic variability was generated by inserting historical precipitation data from the calibrated baseline model into the climate record of the Average Case LOM model during the timeframes specified above. Six iterations of the LOM model were completed (three wet and three dry), each using monthly data from a different year approximating 5th or 95th percentile conditions. This approach was applied to better represent the range of resultant flows for the long-term wet and dry conditions at the site and reduces potential selection bias from using a single year of data. The 5th percentile annual precipitation is approximately 730 mm and the 95th percentile annual precipitation is approximately 1392 mm. The monthly and annual precipitation data used for each of the six cases (three 5th and three 95th percentile cases) are shown for an elevation of 1680 masl in Table 3.2. For additional information refer to Section 5.5.3 of the *Watershed Modelling Report – KP report, Ref No. VA011-458/14-1*.

Table 3.2 5th and 95th Percentile Precipitation Input Data by Case Number

Modelled Scenario	Case No.	Source Year for Climate Data	Precipitation from Long-Term Climate Record (mm)												
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
5th Percentile Cases (Approx 730 mm/yr)	Case 1	2002	28	42	67	28	97	57	41	65	92	45	125	64	750
	Case 2	1952	78	77	35	24	63	75	22	23	49	101	67	125	738
	Case 3	1913	119	49	64	0	53	59	42	23	75	85	81	80	730
95th Percentile Cases (Approx 1391 mm/yr)	Case 1	1982	138	77	30	43	89	180	93	74	10	219	180	259	1,391
	Case 2	1951	216	108	76	9	96	85	33	136	188	194	200	52	1,392
	Case 3	2001	413	242	68	14	41	48	4	9	76	173	148	134	1,371

NOTES:

1. THE PRECIPITATION DATA TABULATED ABOVE IS TAKEN FROM THE CALIBRATED BASELINE WATERSHED MODEL FOR AN ELEVATION OF 1680 (masl).

3.6 BASELINE WATER QUALITY

3.6.1 Surface Water Quality

Surface water quality data for samples collected from June 2007 through January 2014 were included as baseline inputs to the model (Figure 3.3; Appendix A1). The review of the baseline data revealed that there were elevated detection limits for many parameters during early sampling events.

Specifically, data from 2007, 2008 and 2011[2] were affected by elevated detection limits for certain parameters. Elevated detection limits were defined as detection limits that exceed the target minimum detection limits for baseline samples within the *MOE Water and Air Baseline Monitoring Guidance Document for Mine Proponent and Operators* (2012). Analysis of key parameters indicated that elevated historic detection limits did affect summary statistics, with the strongest effect to median values (Table 3.3).

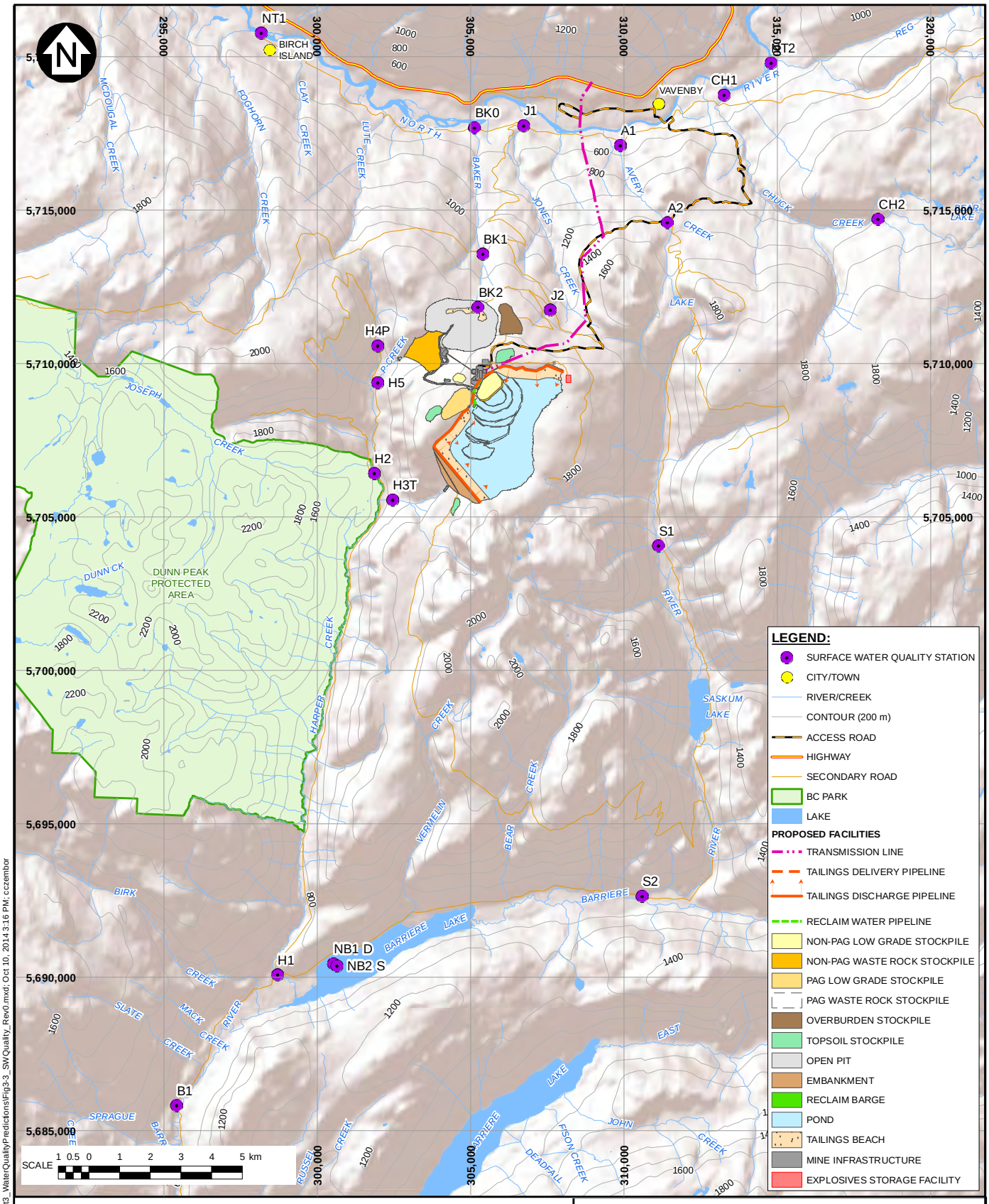
Elevated historic MDLs were removed from the database and monthly statistics were calculated after their removal, providing input concentrations that were not biased high due to high non-detect values. Monthly mean data were used as input to the water quality model. Values that were below the MDL and were not removed from the dataset were set equal to the MDL for inclusion in the mean value calculations. A screening logic was applied at all nodes to ensure that dissolved concentrations for model inputs never surpassed total concentrations. Where monthly values were not available, the values were determined through interpolation between preceding and following months to ensure that seasonality of data was maintained; a summary of the sites and months where interpolation was required is provided in Table 3.4. The baseline water quality inputs to the model are provided in Appendix A1.

Table 3.3 Summary Statistics for Data with Elevated Historic Detection Limits - Copper

	Mean	25th Percentile	75th Percentile
H1 data (all)	0.00089	0.0005	0.0017
H1 data (1/2 detection limit)	0.00075	0.0004	0.0017
H1 data (no elevated detection limit[2])	0.00087	0.0005	0.0017

NOTES:
1. FULL VALUE OF NON-ELEVATED DETECTION LIMIT USED TO CALCULATE STATISTICS.

[2] Data were collected prior to issuance of the 2012 MOE Water and Air Baseline Monitoring Guidance Document for Mine Proponents and Operators.



NOTES:

1. BASE MAP: TRIM AND NTS MAPPING, ESRI ARCGIS ONLINE SHADED RELIEF.
2. COORDINATE GRID IS IN METRES. COORDINATE SYSTEM: NAD 1983 UTM ZONE 11N.
3. THIS FIGURE IS PRODUCED AT A NOMINAL SCALE OF 1:175,000 FOR 8.5x11 (LETTER) PAPER.
4. CONTOUR INTERVAL IS 200 METRES. DATA SOURCE: NTS DATA.

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HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SURFACE WATER QUALITY MONITORING STATIONS

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REF NO. 3

FIGURE 3.3

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Table 3.4 Baseline Surface Water Data and Corresponding Modelling Node

Water Quality Modelling Node	Baseline Surface Water Data	Notes
TMF	H3T	December values for most parameters were interpolated; additional months were interpolated for both dissolved and total phosphorous (metal), sulphur and zirconium.
Open Pit	BK1	December values for all parameters were interpolated; additional months were interpolated for both dissolved and total phosphorous (metal), sulphur and zirconium. April values are interpolated for: total thallium, total tin, total titanium, total vanadium, total zinc, orthophosphate, ammonia and nitrite.
P-Creek	H4P	December values for all parameters were interpolated; additional months were interpolated for both dissolved and total phosphorous (metal), sulphur and zirconium.
T-Creek	H3T	December values for most parameters were interpolated; additional months were interpolated for both dissolved and total phosphorous (metal), sulphur and zirconium.
Harper Creek downstream of P-Creek (HP)	H4P	December values for all parameters were interpolated; additional months were interpolated for both dissolved and total phosphorous (metal), sulphur and zirconium.
Harper Creek downstream of T-Creek (HT)	H2 and H3T	Baseline data at HT was modelled based on the H2 and H3T inputs.
Mid Harper Creek (HM)	H2	December values for all parameters were interpolated; additional months were interpolated for both dissolved and total phosphorous (metal), sulphur and zirconium.
Lower Harper Creek (HB)	H1	December values for most parameters were interpolated; additional months were interpolated for both dissolved and total phosphorous (metal), sulphur and zirconium.
Mid Baker Creek (BK1)	BK1	December values for all parameters were interpolated; additional months were interpolated for both dissolved and total phosphorous (metal), sulphur and zirconium. April values are interpolated for: total thallium, total tin, total titanium, total vanadium, total zinc, orthophosphate, ammonia and nitrite.
Lower Baker Creek (BK0)	BK0	December values for most parameters were interpolated; additional months were interpolated for both dissolved and total phosphorous (metal), sulphur and zirconium.
Lower Jones Creek (J1)	J1	December, February and March values for most parameters were interpolated; additional months were interpolated for both dissolved and total phosphorous (metal), sulphur and zirconium.

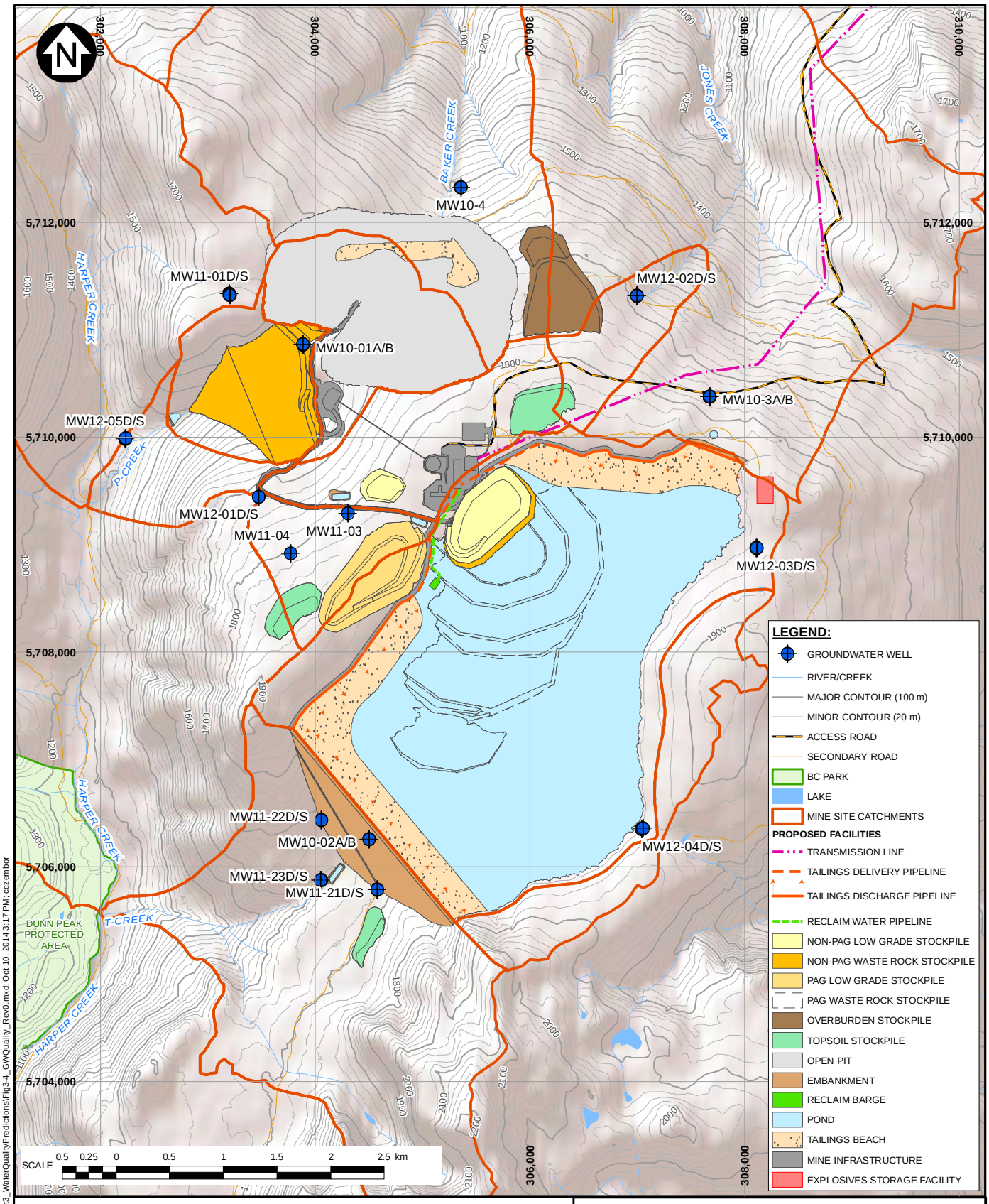
3.6.2 Groundwater Quality

Directly integrating groundwater quality into a mass-balance model can be problematic, as complex redox reactions that typically affect the available load of certain parameters at the groundwater-surface water interface are not mass conservative. The direct application of groundwater concentrations to local groundwater discharge in a modeled reach of a stream can result in high concentrations that do not reflect observed water quality conditions and can introduce error into the model. Mid to late winter surface water stream flow in the project area is dominantly supported by local groundwater discharge and the samples collected at the baseline water quality monitoring locations under these baseflow conditions have been used to represent groundwater inflows in this model. Trilinear piper diagrams were used to compare the major ion composition of the winter low-flow surface water samples to groundwater quality data collected from wells in the same catchments[3] (Appendix A1 on Figures A1.2 to A1.6); the results were favourable, supporting the assumptions for groundwater inflows.

Baseline groundwater quality samples collected from monitoring wells across the project area from September 2011 to January 2014 were analyzed for each modeled catchment to inform groundwater quality model inputs. The monitoring well locations are illustrated on Figure 3.4. All monitoring wells, except for MW12-05S/D, were drilled during 2010 or 2011 and have a sampling record that begins in September 2011. The groundwater monitoring well MW12-05S/D was drilled in 2012 and samples collected from April 2013 through January 2014 are analyzed in this report.

The major ion compositions were similar between the shallow monitoring well sample results and the winter low-flow surface water quality results for all of the mine site catchments except Baker Creek. The low-flow (i.e., January or February) surface water data was assumed appropriate to represent the concentration of surfacing groundwater within the water quality model within these catchments. Measured surface water quality differs from groundwater quality in the Baker Creek catchment in the proportions of Na-K and Ca. The monitoring well used for comparison in Baker Creek is MW11-04, which is located immediately north of the Open Pit and is situated at a much higher elevation than the baseline water quality sites in lower Baker Creek. It is assumed that the large geographic distance between MW10-4 provides an explanation for the differences in major ion composition and that regional groundwater system associated with the North Thompson River has a greater influence on baseflow in Baker Creek than groundwater in the immediate project area. For these reasons, it is assumed that low-flow surface water concentrations are an appropriate surrogate for surfacing groundwater within the Baker Creek catchment as well. Representative groundwater wells in each catchment, based on the results of the tri-linear piper plots, are summarized in Table 3.5.

[3] Numbers provided for the modeled catchments match those provided in Watershed Modelling Report – KP report, Ref No. VA011-458/14-1 (KP, 2014a).



NOTES:

1. BASE MAP: TRIM AND NTS MAPPING, ESRI ARCGIS ONLINE SHADED RELIEF.
2. COORDINATE GRID IS IN METRES. COORDINATE SYSTEM: NAD 1983 UTM ZONE 11N.
3. THIS FIGURE IS PRODUCED AT A NOMINAL SCALE OF 1:50,000 FOR 8.5x11 (LETTER) PAPER.
4. CONTOUR INTERVAL IS 20 METRES. DATA SOURCE: BC TRIM DATA.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	CAC	DDF	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

GROUNDWATER QUALITY MONITORING STATIONS

Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF NO. 3

FIGURE 3.4

REV 0

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Table 3.5 Baseline Groundwater and Surface Water Quality Data by Catchment

Catchment	Groundwater Wells	Representative Groundwater Wells	Surface Water Quality Sampling Sites	Applicable Modelling Nodes
P-Creek Catchment	MW11-03 MW10-01A/B MW12-05D/S	MW12-05S MW11-03 MW10-01B	H5	H5, Waste Rock WMP
T-Creek Catchment	MW11-22D/S MW10-02A/B MW11-21D/S MW11-23D/S	MW11-22S	H3T, H2	H3T, TMF, Main Embankment WMP
Baker Creek Catchment	MW10-4 (3 samples)	Assumed due to physical distance between MW10-04 and the creek monitoring sites accounts for difference in chemistry.	BK1, BK0	BK1, BK0
Jones Creek Catchment	MW10-3A	MW10-3A	J1	J1, North Embankment WMP
Open Pit	MW10-4 MW10-01A/B MW11-01D/S	NA	BK1	Open Pit

NOTES:

1. TRILINEAR PIPER PLOTS COMPARING GROUNDWATER AND SURFACE WATER CHEMISTRY FOR ABOVE ARE FOUND IN APPENDIX A1.

3.7 GEOCHEMICAL SOURCE TERMS

Information related to this section was obtained from the *Metal Leaching and Acid Rock Drainage Characterization – Harper Creek Projec*t report dated June 2014 and prepared by SRK Consulting. Geochemical source terms are “predicted concentrations for waters in contact with various types of geologically-sourced wastes and surfaces under the expected disposal conditions at the site. For example, the source term for a waste rock storage area is the concentration found in pore waters within the facilities” (SRK Consulting, 2014). Geochemical source terms are conceptual terms derived prior to the onset of mining. These terms are derived based on results from field and laboratory data from materials that are representative of ore, waste rock, locally sourced materials used for construction of various facilities, overburden, and soils at the site, in addition to data from other sites (analog data). These geochemical source terms are inputs to the site wide water quality model that is presented within this report (Table 3.6).

It is not possible to assign actual probabilities to geochemical source terms due to the limited understanding of the underlying probability distributions. In order to address uncertainty, two bounding cases, the “Expected Case” and the “Upper Bound Case” were used to provide an understanding of the range of variation predicted (Table 3.7 and Table 3.8, respectively). The Expected Case represents the set of geochemical source terms that are considered to be the most

likely outcome. The Upper Bound Case incorporates extreme inputs and provides the upper boundary condition for loading. There is a very low probability that actual mine-related loading will exceed the conceptual Upper Bound Case source terms.

Short-term geochemical loading concentrations are primarily driven by weathering mechanisms which create water soluble load. Geochemical loading concentrations are dependent on the kinetics of dissolution of source term parameters over the long-term. Uncertainty within the kinetics of dissolution is hypothesized to be primarily a function of pH, which controls solubility. It corresponds that uncertainty between the Expected Case and Upper Bound Case is a function of pH. With the exception of the acidified pit highwall term, all Expected Case source terms have solubility controls that assume pH > 8 or a P95 statistic equal to P50; Upper Bound Case terms have solubility controls that assume 7 < pH < 8 or a P95 statistics equal to P95.

All divided into three categories that are dependent on the method of waste placement potential sources of geochemical loading were identified and 28 source terms were developed for the mine plan (Table 3.6). These source terms were and storage: Fully-sub-aerial or unsaturated (indicating above-ground placement and storage), flushed following sub-aerial (indicating above-ground placement and flushing water during storage), and subaqueous (indicating permanent placement and storage under water). Source terms were assigned based on material type, solubility control, infiltration, temperature scaling factor, particle size scaling factor and contact scaling factor (SRK, 2014).

Table 3.6 Summary of Geochemical Source Terms

Term	Term Location	Material Type	Units	Solubility Control		
				Type	Expected Case - P95 Statistic	Upper Bound Case - P95 Statistic
Subaqueous Source Terms						
7.3	PAG Waste Rock Stockpile	Pit Rock	mg/L	Testwork	P50	P95
16	Cleaner tailings	Tailings	mg/L	Testwork	P50	P95
18	Rougher tailings	Tailings	mg/L	Testwork	P50	P95
Flushed Source Terms						
22	Ore to Process	Pit Rock	mg/tonne	Analog	pH>8	7<pH<8
23.1	LGO to process	Pit Rock	mg/L	Analog	pH>8	7<pH<8
7.2	PAG Waste Rock Stockpile	Pit Rock	mg/year	Analog	pH>8	7<pH<8
10.3	Flushed Pit Walls	Wall	mg/m^2	Analog	pH>8	7<pH<8
Subaerial Source Terms						
2	North Non-PAG Waste Rock Stockpile	Pit Rock	mg/L	Analog	pH>8	7<pH<8
3	Non-PAG LGO Stockpile Outside TMF	Pit Rock	mg/L	Analog	pH>8	7<pH<8
4	PAG LGO Stockpile	Pit Rock	mg/L	Analog	pH>8	7<pH<8
7.1	PAG Waste Rock Stockpile	Pit Rock	mg/L	Analog	pH>8	7<pH<8
9	East Overburden Stockpile	Overburden	mg/L	OP Overburden	P50	P95
10.1	Pit walls	Wall	mg/L	Analog	pH>8	7<pH<8
10.2	Acidified Highwall	Wall	mg/L	Analog	4<pH<5	4<pH<5
11.1	Tailings Dam	Pit Rock	mg/L	Analog	pH>8	7<pH<8
11.2	Tailings Dam	Quarry Rock	mg/L	Analog	pH>8	7<pH<8
11.3	Tailings Dam	TMF Overburden	mg/L	TMF Overburden	P50	P95
11.4	Tailings Dam	Pit Overburden	mg/L	OP Overburden	P50	P95

Term	Term Location	Material Type	Units	Solubility Control		
11.5	Tailings Dam	Tailings	mg/L	Analog	pH>8	7<pH<8
12.1	Seepage dams	TMF Overburden	mg/L	TMF Overburden	P50	P95
12.2	Seepage dams	Pit Overburden	mg/L	OP Overburden	P50	P95
12.3	Seepage dams	Local Overburden	mg/L	TMF Overburden	P50	P95
14	Haul Road and Crusher Pad	Pit Rock	mg/L	Analog	pH>8	7<pH<8
15	Live ore pad and Live ore	Pit Rock	mg/L	Analog	pH>8	7<pH<8
17.1	Rougher tailings	Tailings	mg/m2/year	None	-	-
17.2	Rougher tailings	Tailings	mg/L	Analog	pH>8	7<pH<8
19	Topsoil Stockpiles	Overburden	mg/L	TMF Overburden	P50	P95
20	Plant site	Pit Rock	mg/L	Analog	pH>8	7<pH<8
21	Quarry	Wall	mg/L	Analog	pH>8	7<pH<8
23.2	Process and Pond Constraints	-	-	Calculated	Process Pond pH	Process Pond pH
25	Non-PAG LGO Stockpile Inside TMF	Pit Rock	mg/L	Analog	pH>8	7<pH<8

NOTES:

1. FOR A COMPLETE LIST OF GEOCHEMICAL SOURCE TERM ASSUMPTIONS, REFER TO TABLE 14 AND 15 IN *METAL LEACHING AND ACID ROCK DRAINAGE CHARACTERIZATION, HARPER CREEK PROJECT REPORT* (PREPARED BY SRK).
2. REFER TO TABLE 16 FOR A DEFINITON OF P50 AND P95 IN *METAL LEACHING AND ACID ROCK DRAINAGE CHARACTERIZATION; HARPER CREEK PROJECT REPORT* (PREPARED BY SRK) FOR ASSUMPTIONS FOR EACH PARAMETER AND MATERIAL TYPE.

Knight Piésold CONSULTING

TABLE 3.7

HARPER CREEK MINING CORPORATION
HARPER CREEK PROJECT

GEOCHEMICAL SOURCE TERMS
EXPECTED CASE SUMMARY

Print Oct/17/14 12:29:49

Source Term Number	2	3	4	7.1	7.2	7.3	9	10.1	10.2	10.3	11.1	11.2	11.3	11.4	11.5	12.1	12.2	12.3	14	15	16	17.1	17.2	18	19	20	21	22	23.1	23.2	25
Source Term Title	North Non-PAG Waste Rock Stockpile	Non-PAG Low Grade Ore (Stockpile Outside TMF and temporary stockpile)	PAG Low Grade Ore Stockpile	Subaerial PAG Stockpile	Flusehd PAG Stockpile	Subaqueous PAG Stockpile	East Overburden Stockpile	Pit walls	Acidified Highwall	Flushed Pit Walls	Tailings Dam - Pit Rock	Tailings Dam - Quarry Rock	Tailings Dam - TMF Overburden	Tailings Dam - Pit Overburden	Tailings Dam - Tailings	Seepage dams - TMF Overburden	Seepage dams - Pit Overburden	Seepage dams - Local Overburden	Haul Road and Crusher Pad	Live ore pad and Live ore	Cleaner tailings	Subaerial Rougher tailings - Runoff from Beaches	Rougher tailings - subaerial	Rougher tailings - Subaqueous	Topsoil Stockpiles	Plant site	Quarry	Ore to Process	Low grade ore to process	Process and Pond Constraints	Non-PAG Low Grade Ore Stockpile Inside TMF
SO_4	2,992	2,622	2,992	870	547,835,306	16	101	227	331	46,064	2,992	41	26	29	0	1	1	0	460	2,992	13	2,311	0	200	26	68	2	1,450	105,951	2,992	2,992
Cl	41.6	41.6	41.6	31.9	20,117,197	0.7	3.7	8.3	4.4	1,692	41.6	1.5	1.1	1.1	0	0.03	0.030	0.0	16.9	41.6	0.9	5.2	0	3.2	12.8	2.5	0.1	26.1	1903	41.6	41.6
F	0.86	0.86	0.86	0.7	438,628	0.08	0.08	0.18	0.08	36.9	0.86	0.03	0.02	0.02	0	0.00066	0.00066	0.0002	0.37	0.86	0.07	0.26	0	0.10	0.35	0.05	0.00	0.73	53.1	0.86	0.86
Hardness	0	0	0	0	0	74.4	0	0	339.0	0	0	0	0	0	0	0	0	0.86	0	0	87.9	555.9	0	272.2	0	0	0	2,495	0	1,000,000	0
Al - D	0.034	0.034	0.034	0.034	241,903	0.017	0.034	0.034	0.402	20.3	0.034	0.034	0.034	0.034	0	0.001	0.001	0.00031	0.034	0.034	0.011	0.788	0	0.017	0.034	0.034	0.003	0.448	32.7	0.655	0.034
Sb - D	0.037	0.015	0.037	0.010	6,041	0.00044	0.001	0.002	0.004	0.508	0.037	0.00045	0.00032	0.00032	0	0.0000091	0.0000091	0.0000028	0.005	0.023	0.00043	0.0034	0	0.0011	0.0048	0.00075	0.000025	0.0085	0.62	0.037	0.032
As - D	0.025	0.011	0.025	0.016	10,021	0.003	0.002	0.004	0.006	0.843	0.025	0.00074	0.001	0.00053	0	0.000015	0.000015	0.0000046	0.008	0.016	0.00089	0.034	0	0.0018	0.008	0.001	0.000041	0.006	0.43	0.025	0.022
Ba - D	0.071	0.071	0.071	0.071	67,719	0.006	0.013	0.028	0.041	5.7	0.071	0.005	0.004	0.004	0	0.0001	0.0001	0.00003	0.057	0.071	0.009	0.394	0	0.011	0.054	0.008	0.00028	0.122	8.9	0.071	0.071
Be - D	0.00005	0.00005	0.00005	0.00005	357	0.00001	0.00005	0.00005	0.00022	0.03	0.00005	0.000027	0.000019	0.000019	0	0.00000054	0.00000054	0.00000017	0.00005	0.00005	0.00001	0.000077	0	0.00001	0.00005	0.000044	0.0000015	0.0006	0.044	0.00005	0.00005
Bi - D	0.00025	0.00025	0.00025	0.00025	180	0.000005	0.000033	0.000074	0.00011	0.015	0.00025	0.000013	0.00001	0.00001	0	0.00000027	0.00000027	0.00000008	0.00015	0.00025	0.000005	0.000038	0	0.000005	0.000071	0.000022	0.00000074	0.00025	0.018	1,000,000	0.00025
B - D	0.3	0.3	0.3	0.3	1,791,272	0.05	0.3	0.3	0.08	150.6	0.3	0.13	0.095	0.095	0	0.0027	0.0027	0.0008	0.3	0.3	0.05	0.38	0	0.05	0.3	0.22	0.0074	2.4	174.9	0.3	0.3
Cd - D	0.00047	0.00047	0.00047	0.00032	202	0.000029	0.000037	0.000083	0.00012	0.017	0.00047	0.000015	0.000011	0.000011	0	0.0000003	0.0000003	0.00000009	0.00017	0.00047	0	0.0011	0	0.000019	0.00016	0.000025	0.00000083	0.01	0.74	0.0093	0.00047
Ca - D	197.3	197.3	197.3	197.3	297,031,890	16.2	54.9	122.9	179.2	24,975	197.3	22.0	15.7	15.7	0	0.4	0.4	0.1	197.3	197.3	17.0	122.9	0	98.3	143.2	36.9	1.2	443.5	32400	197.3	197.3
Cr - D	0.0005	0.0005	0.0005	0.0005	3,568	0.0001	0.0005	0.0005	0.0026	0.3	0.0005	0.0003	0.0002	0.0002	0	0.0000066	0.0000066	0.0000002	0.0005	0.0005	0.0001	0.0013	0	0.0002	0.0005	0.0005	0.000018	0.0057	0.41	0.0005	0.0005
Co - D	0.013	0.11	0.11	0.002	1,503	0.00018	0.00028	0.00062	0.00091	0.126	0.11	0.00011	0.00008	0.00008	0	0.0000023	0.0000023	0.0000007	0.0013	0.11	0.00015	0.0028	0	0.00032	0.00083	0.00019	0.0000006	0.089	6.5	0.12	0.11
Cu - D	0.049	0.049	0.049	0.024	15,041	0.00071	0.0028	0.0062	0.0091	1.3	0.049	0.0011	0.0008	0.0008	0	0.000023	0.000023	0.000007	0.013	0.049	0.0024	0.014	0	0.0079	0.012	0.0019	0.00006	0.86	63	0.049	0.049
Fe - D	0.005	0.005	0.005	0.005	35,679	0.005	0.005	0.005	0.073	3	0.005	0.005	0.005	0.005	0	0.00018	0.00018	0.0000056	0.005	0.005	0.006	0.07	0	0.012	0.005	0.005	0.0005	0.15	9.3	0.005	0.005
Pb - D	0.00057	0.00057	0.00057	0.00057	1,029	0.000031	0.00019	0.00043	0.00062	0.087	0.00057	0.000076	0.000054	0.000054	0	0.0000015	0.0000015	0.0000005	0.00057	0.00057	0.000015	0.0016	0	0.000052	0.00057	0.00013	0.0000043	0.001	0.074	0.0028	0.00057
Li - D	0.061	0.045	0.061	0.029	18,535	0.0013	0.0034	0.0077	0.0077	1.6	0.061	0.0014	0.001	0.001	0	0.000028	0.000028	0.000009	0.016	0.061	0.0014	0.041	0	0.0028	0.015	0.0023	0.000077	0.025	1.8	1,000,000	0.061
Mg - D	195	195	195	195	243,526,769	7.8	16.7	100.8	146.9	20,477	195	18.0	12.9	12.9	0	0.37	0.37	0.11	195	195	8.6	105.5	0	14.6	16.3	30.2	1.0	336.9	24612	195	195
Mn - D	0.42	0.42	0.42	0.1	65,923	0.037	0.012	0.027	0.04	5.5	0.42	0.0049	0.0035	0.0035	0	0.000099	0.000099	0.000031	0.06	0.42	0.031	0.29	0	0.14	0.052	0.0082	0.00027	2.7	199.6	0.42	0.42
Mo - D	0.12	0.065	0.12	0.057	35,714	0.0016	0.0066	0.015	0.022	3	0.12	0.0026	0.0019	0.0019	0	0.000054	0.000054	0.0000017	0.03	0.097	0.019	0.081	0	0.077	0.0071	0.0044	0.00015	0.036	2.6	0.12	0.12
Ni - D	0.026	0.026	0.026	0.015	9,354	0.00051	0.0017	0.0039	0.0056	0.79	0.026	0.00069	0.0005	0.0005	0	0.000014	0.000014	0.0000043	0.0079	0.026	0.00048	0.0072	0	0.0022	0.0057	0.0012	0.000039	0.049	3.6	1.5	0.026
P - D	0	0	0	0	0	0.0045	0	0	0.014	0	0	0	0	0	0	0	0	0.00009	0	0	0.005	0.062	0	0.023	0	0	0	0.25	0	1,000,000	0
K - D	60.2	44.0	60.2	14.0	8,834,741	2.8	1.6	3.7	5.0	742.9	60.2	0.7	0.5	0.5	0	0.013	0.013	0.0041	7.4	60.2	0.9	13	0	2.9	7	1.1	0.0	24.3	1778	1,000,000	60.2
Se - D	0.16	0.087	0.28	0.028	17,701	0.00094	0.0033	0.0073	0.011	1.49	0.28	0.0041	0.0026	0.0029	0	0.000082	0.000082	0.000025	0.015	0.13	0.00092	0.027	0	0.0015	0.0026	0.0022	0.00023	0.048	3.5	0.28	0.18
Si - D	4.7	4.7	4.7	4.66	12,127,398	2.1	2.2	4.7	7.3	1,020	4.7	0.9	0.64	0.64	0	0.018	0.018	0.0056	4.7	4.7	2.1	5.2	0	2.5	4.7	1.5	0.05	16.3	1189	1,000,000	4.7
Ag - D	0.00019	0.00019	0.00019	0.00019	182	0.000005	0.000034	0.000075	0.00011	0.015	0.00019	0.000013	0.0000096	0.0000096	0	0.00000027	0.00000027	0.000000084	0.00015	0.00019	0.000015	0.000049	0	0.000074	0.000093	0.000023	0.00000075	0.00025	0.018	0.00019	0.00019
Na - D	17.2	4.4	14.7	3.1	1,929,699	1.4	0.36	0.8	1.2	162.3	37.9	0.14	0.1	0.1	0	0.0029	0.0029	0.0009	1.6	6.7	0.48	0.83	0	0.91	1.5	0.24	0.008	2.46	179.5	1,000,000	9.2
Sr - D	10.3	3.4	10.3	2.3	1,453,481	0.22	0.27	0.6	0.88	122.2	10.3	0.11	0.077	0.077	0	0.0022	0.0022	0.00067	1.2	5.1	0.24	3.7	0	0.27	0.48	0.18	0.006	1.9	136.6	1,000,000	7
S - D	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	5.4	97.3	0	79.8	0	0	0	534.3	0	1,000,000	0
Tl - D	0.00026	0.00026	0.00026	0.00023	147	0.0000095	0.000027	0.000061	0.000089	0.012	0.00026	0.000011	0.0000078	0.0000078	0	0.00000022	0.00000022	0.000000068	0.00012	0.00026	0.000002	0.00011	0	0.0000037	0.00011	0.000018	0.00000061	0.00043	0.031	0.00026	0.00026
Sn - D	0.0014	0.0014	0.0014	0.0014	9,940	0.00008	0.0014	0.0014	0.0004	0.84	0.0014	0.0014	0.0014	0.0014	0	0.000052	0.000052	0.000016	0.0014	0.0014	0.000075	0.01	0	0.00028	0.0014	0.0014	0.00014	0.038	2.6	1,000,000	0.0014
Ti - D	0.005	0.005	0.005	0.005	19,236	0.0005	0.0036	0.005	0.012	1.6	0.005	0.0014	0.001	0.001	0	0.000029	0.000029	0.0000089	0.005	0.005	0.0005	0.0056	0	0.0005	0.005	0.0024	0.00008	0.025	1.8	1,000,000	0.005
U - D	0.028	0.0078	0.026	0.005	3,112	0.00031	0.00058	0.0013	0.0019	0.26	0.037	0.00023	0.00016	0.00016	0	0.0000047	0.0000047	0.0000014	0.0026	0.012	0.00016	0.0029	0	0.0014	0.0025	0.00039	0.000013	0.0043	0.32	0.037	0.016
V - D	0.001	0.001	0.001	0.001	7,136	0.0002	0.001	0.001	0.0053	0.6	0.001	0.00065	0.00046	0.00046	0	0.000013	0.000013	0.000004	0.001	0.001	0.0002	0.0055	0	0.00027	0.001	0.001	0.00004	0.012	0.88	1,000,000	0.001
Zn - D	0.039	0.039	0.039	0.039	31,591	0.0019	0.0058	0.013	0.019	2.7	0.039	0.0023	0.0017	0.0017	0	0.000047	0.000047	0.000015	0.027	0.039	0.0008	0.04	0	0.0017	0.025	0.0039	0.00013	1.4	71.6	0.8	0.039
Zr - D	0	0	0	0	0	0.0001	0	0	0.00038	0	0	0	0	0	0	0	0	0.0000017	0	0	0.0001	0.00081	0	0.0001	0	0	0	0.0048	0	1,000,000	0
Hg - D	0	0	0	0	0	0.00001	0	0	0.000043	0	0	0	0	0	0	0	0	0.000000033	0	0	0.00001	0.000015	0	0.0000265	0	0	0	0.000096	0	1,000,000	0
H^+ Concentration	0.000032	0.000032	0.000032	0.000032	0	0.000032	0.000032	0.000032	0.000032	0.000032	0.000032	0.000032	0.000032	0.000032	0	0	0.000032	0.000032	0.000032	0.000032	0.000032	0.000032	0	0.000032	0.000032	0.000032	0.000032	0.000032	0.000032	0.000032	0.000032
Orthophosphate - dissolved	0	0	0	0	0	0	0	0	0.029	0	0	0	0	0	0	0	0	0.00019	0	0	0	0.13	0	0	0	0	0	0	0	0	0
N as NO_3	122.3	87.3	58.7	77.5	74,003,250	0	0	0	0	8,245	101.4	188.1	0	0	0	0	0	0	37.3	161.7	0	0	0	0	0	5.5	0	0	0	1,000,000	104.4
N as NH_3	15.5	11.0	7.4	9.8	9,356,733	0	0	0	0	1,042	12.8	23.8	0	0	0	0	0	0	4.7	20.4	0	0	0	0	0	0.7	0	0	0	1,000,000	13.2
N as NO_2	2.8	2.0	1.3	1.8	1,701,224	0	0	0	0	189.5	2.3	4.3	0	0	0	0	0	0	0.86	3.7	0	0	0	0	0	0.13	0	0	0	1,000,000	2.4

M:\1\2010045\B14\A\Report\3 - Water Quality Predictions\Rev 0\Tables\[Table 3.7.xlsx]Table 3.7

NOTES:

1. ALL UNITS IN mg/L EXCEPT SOURCE TERM 7.2 PAG STOCKPILE, WHICH IS IN mg/day.
2. THIS TABLE REPRESENTS MAXIMUM CONCENTRATIONS PROVIDED FOR EACH TERM. TIMING ASSUMPTIONS AND SCALING FACTORS WERE APPLIED TO THESE TERMS PRIOR TO INPUT INTO THE MODEL.
3. BLUE SHADING INDICATES SUBAQUEOUS SOURCE TERMS.
4. YELLOW SHADING INDICATES SOURCE TERMS ARE FLUSHED FOLLOWING SUB-AERIAL PLACEMENT.
5. ORGANCE SHADING INDICATES FULLY-SUBAERIAL SOURCE TERMS.

0	10OCT14	ISSUED WITH REPORT (VSS) #5513.3	NJP	EJA	KJB
REV	DATE	DESCRIPTION	PREPD	CHK'D	APP'D

Knight Piésold CONSULTING

TABLE 3.8

HARPER CREEK MINING CORPORATION
HARPER CREEK PROJECT

GEOCHEMICAL SOURCE TERMS
UPPER BOUND CASE

Print Oct/17/14 12:30:33

Source Term Num	2	3	4	7.1	7.2	7.3	9	10.1	10.2	10.3	11.1	11.2	11.3	11.4	11.5	12.1	12.2	12.3	14	15	16	17.1	17.2	18	19	20	21	22	23.1	23.2	25
Source Term Title	North Non-PAG Waste Rock Stockpile	Non-PAG Low Grade Ore Stockpile Outside TMF	PAG Low Grade Ore Stockpile	Subaerial PAG Stockpile	Flusehd PAG Stockpile	Subaqueous PAG Stockpile	East Overburden Stockpile	Pit walls	Acidified Highwall	Flushed Pit Walls	Tailings Dam - Pit Rock	Tailings Dam - Quarry Rock	Tailings Dam - TMF Overburden	Tailings Dam - Pit Overburden	Tailings Dam - Tailings	Seepage dams - TMF Overburden	Seepage dams - Pit Overburden	Seepage dams - Local Overburden	Haul Road and Crusher Pad	Live ore pad and Live ore	Cleaner tailings	Subaerial Rougher tailings - Runoff from Beaches	Rougher tailings - subaerial	Rougher tailings - Subaqueous	Topsoil Stockpiles	Plant site	Quarry	Ore to Process	Low grade ore to process	Process and Pond Constraints	Non-PAG Low Grade Ore Stockpile Inside TMF
SO_4	3,638	2,918	3,638	2,050	12,914,746,722	29	239	534	495	1,085,913	3,638	96	68	68	0	2	2	1	1,084	3,638	200	2,311	0	200	692	160	5	1,614	1,178,962	3,638	3,638
Cl	52.9	47.1	52.9	39.4	247,867,681	1.1	4.6	10.3	4.4	20,841	52.9	1.8	1.3	1.3	0	0.04	0.037	0.011	20.8	52.9	3.2	5.2	0	3.2	19.7	3.1	0.1	26.1	19,042	52.9	52.9
F	0.77	0.77	0.77	0.77	5,494,560	0.11	0.23	0.5	0.08	462.0	0.77	0.09	0.065	0.065	0	0.0018	0.0018	0.00057	0.77	0.77	0.1	0.26	0	0.1	0.77	0.15	0.01	0.87	636.7	0.77	0.77
Hardness	1,350	1,350	1,350	1,350	9,633,319,208	85	488.9	1094	339	810,000	1,350	195.9	140	140	0	4	4	1.2	1350	1,350	272.2	555.9	0	272.2	1157	328.3	10.9	2,509	1,833,121	1,350	1,350
Al - D	0.46	0.46	0.46	0.459	3,275,329	0.04	0.46	0.46	1.44	275.4	0.46	0.28	0.2	0.2	0	0.0056	0.0056	0.0017	0.46	0.46	0.017	0.79	0	0.017	0.46	0.46	0.016	0.69	503.8	0.65	0.46
Sb - D	0.14	0.022	0.073	0.026	161,820	0.0018	0.003	0.0067	0.0062	13.6	0.15	0.0012	0.00086	0.00086	0	0.000024	0.000024	0.0000075	0.014	0.033	0.0011	0.0034	0	0.0011	0.013	0.002	0.000067	0.012	8.9	0.2	0.046
As - D	0.028	0.011	0.028	0.028	201,372	0.02	0.028	0.028	0.062	16.9	0.028	0.012	0.0086	0.0086	0	0.00024	0.00024	0.000075	0.028	0.016	0.0018	0.034	0	0.0018	0.028	0.02	0.00067	0.006	4.4	0.028	0.023
Ba - D	0.21	0.21	0.21	0.21	1,466,405	0.053	0.21	0.21	0.054	123.3	0.21	0.14	0.099	0.099	0	0.0028	0.0028	0.00087	0.21	0.21	0.011	0.39	0	0.011	0.21	0.21	0.0077	0.13	91.6	0.21	0.21
Be - D	0.0032	0.0013	0.0042	0.00058	3,641	0.00001	0.000067	0.00015	0.00014	0.31	0.0035	0.000027	0.000019	0.000019	0	0.00000055	0.00000055	0.00000017	0.00031	0.0019	0.00001	0.000077	0	0.00001	0.00029	0.000045	0.0000015	0.00071	0.52	0.005	0.0027
Bi - D	0.0016	0.00046	0.0015	0.00029	1,823	0.0000013	0.000034	0.000075	0.00007	0.15	0.0017	0.000014	0.00001	0.00001	0	0.00000027	0.00000027	0.000000085	0.00015	0.0007	0.000005	0.000038	0	0.000005	0.000071	0.000023	0.00000075	0.00026	0.19	1,000,000	0.00096
B - D	0.3	0.3	0.3	0.3	2,140,738	0.05	0.3	0.3	0.084	180	0.3	0.13	0.096	0.096	0	0.0027	0.0027	0.00084	0.3	0.3	0.05	0.38	0	0.05	0.3	0.23	0.0075	2.4	557.1	0.3	0.3
Cd - D	0.00085	0.00085	0.00085	0.00085	6,065	0.000043	0.00085	0.00085	0.002	0.51	0.00085	0.00038	0.00027	0.00027	0	0.0000077	0.0000077	0.0000024	0.00085	0.00085	0.000019	0.0011	0	0.000019	0.00085	0.00064	0.000021	0.017	1.6	0.0093	0.00085
Ca - D	474.7	474.7	474.7	474.7	3,387,360,465	18.925	108.1	241.9	224	284,820	474.7	43.3	30.9	30.9	0	0.88	0.88	0.27	474.7	474.7	98.3	122.9	0	98.3	424.2	72.6	2.4	486.3	355,207	474.7	474.7
Cr - D	0.015	0.011	0.015	0.0097	61,247	0.00013	0.0011	0.0025	0.0023	5.1	0.015	0.00045	0.00032	0.00032	0	0.0000092	0.0000092	0.0000028	0.0051	0.015	0.0002	0.0013	0	0.0002	0.0049	0.00076	0.000025	0.0062	4.5	0.015	0.015
Co - D	0.12	0.29	0.76	0.021	133,509	0.00089	0.0025	0.0055	0.0051	11.2	0.13	0.00099	0.00071	0.00071	0	0.00002	0.00002	0.0000062	0.011	0.44	0.00032	0.0028	0	0.00032	0.011	0.0017	0.000055	0.16	117.2	0.76	0.6
Cu - D	0.57	2.7	4.5	0.1	645,158	0.0022	0.012	0.027	0.025	54.2	0.62	0.0048	0.0034	0.0034	0	0.000097	0.000097	0.00003	0.054	4	0.0079	0.014	0	0.0079	0.051	0.008	0.00027	1.5	1,071	4.5	4.5
Fe - D	0.28	0.28	0.28	0.276	1,969,479	0.048	0.062	0.14	0.13	165.6	0.28	0.025	0.018	0.018	0	0.0005	0.0005	0.00015	0.28	0.28	0.012	0.07	0	0.012	0.26	0.041	0.0014	0.17	123.1	0.28	0.28
Pb - D	0.003	0.0022	0.003	0.003	21,140	0.00014	0.0014	0.003	0.0029	1.8	0.003	0.00056	0.0004	0.0004	0	0.000011	0.000011	0.0000035	0.003	0.003	0.000052	0.0016	0	0.000052	0.003	0.00094	0.000031	0.0012	0.89	0.003	0.003
Li - D	0.071	0.047	0.071	0.071	503,787	0.0017	0.036	0.071	0.0077	42.4	0.071	0.015	0.01	0.01	0	0.00029	0.00029	0.000091	0.071	0.07	0.0028	0.041	0	0.0028	0.041	0.024	0.00081	0.026	18.8	1,000,000	0.071
Mg - D	1,279	662.4	1,279	797.1	5,020,660,652	11	92.8	207.7	192.3	422,153	1,279	37.2	23.4	26.6	0	0.75	0.75	0.23	421.5	993.7	14.6	105.5	0	14.6	23.4	62.3	2.1	366.4	267,663	1,279	1,279
Mn - D	12.1	6.4	21.1	2.2	13,577,151	0.099	0.25	0.56	0.52	1,142	13	0.1	0.072	0.072	0	0.002	0.002	0.00063	1.1	9.5	0.14	0.29	0	0.14	1.1	0.17	0.0056	3.5	2,567	86	13.2
Mo - D	0.07	0.07	0.07	0.07	496,651	0.0027	0.07	0.07	0.03	42	0.07	0.029	0.02	0.02	0	0.00058	0.000580	0.00018	0.07	0.07	0.077	0.081	0	0.077	0.07	0.048	0.0016	0.063	46.3	0.07	0.07
Ni - D	0.16	0.14	0.16	0.054	341,564	0.00069	0.0063	0.014	0.013	28.7	0.16	0.0025	0.0018	0.0018	0	0.000051	0.000051	0.000016	0.029	0.16	0.0022	0.0072	0	0.0022	0.02	0.0042	0.00014	0.077	55.9	1.5	0.16
P - D	0.3	0.3	0.3	0.3	2,140,738	0.023	0.054	0.12	0.014	180	0.3	0.022	0.016	0.016	0	0.00044	0.000440427	0.00014	0.25	0.3	0.023	0.062	0	0.023	0.23	0.036	0.0012	0.27	196.7	1,000,000	0.3
K - D	67.1	66.5	67.1	67.1	478,904,409	4.8	11.5	25.7	5	40,268	67.1	4.6	3.3	3.3	0	0.093	0.093	0.029	52.1	67.1	2.9	13	0	2.9	49	7.7	0.3	36.8	26,862	1,000,000	67.1
Se - D	0.49	0.11	0.37	0.2	1,262,297	0.0013	0.023	0.052	0.048	106.1	0.49	0.0096	0.0068	0.0068	0	0.00019	0.00019	0.00006	0.11	0.17	0.0015	0.027	0	0.0015	0.069	0.016	0.00053	0.062	45.3	0.49	0.23
Si - D	4.5	4.5	4.5	4.52	32,253,780	3.4	4.5	4.5	9.5	2,712	4.5	1.8	1.31	1.31	0	0.037	0.037	0.011	4.5	4.5	2.5	5.2	0	2.5	4.5	3.1	0.10	17.6	8,394	1,000,000	4.5
Ag - D	0.00049	0.00046	0.00049	0.00037	2,312	0.000005	0.000043	0.000096	0.00009	0.194	0.00049	0.000017	0.000012	0.000012	0	0.00000035	0.00000035	0.00000011	0.00019	0.00049	0.000074	0.000049	0	0.000074	0.00011	0.000029	0.00000096	0.00025	0.18	0.00049	0.00049
Na - D	35.3	4.5	15.1	6.3	39,650,433	3.3	0.73	1.6	1.5	3,334	37.9	0.29	0.2	0.2	0	0.0060	0.0060	0.0018	3.3	6.8	0.91	0.83	0	0.91	3.2	0.49	0.016	2.5	1,834	1,000,000	9.4
Sr - D	11.8	3.7	11.8	11.8	84,345,062	0.30	3.26	7.3	2.08	7,092	11.8	1.31	0.932	0.932	0	0.0265	0.0265	0.00817	11.8	5.5	0.27	3.7	0	0.27	1.1	2.2	0.073	2	1,493	1,000,000	7.7
S - D	518	518	518	518	3,696,340,259	10.8	85.5	191.5	0	310,800	518	34.3	24.5	24.5	0	0.7	0.7	0.2	388.5	518	79.8	97.3	0	79.8	257.2	57.4	1.9	588.6	429,996	1,000,000	518
Tl - D	0.00028	0.00028	0.00028	0.00028	1,998	0.000018	0.000096	0.00022	0.00014	0.17	0.00028	0.000039	0.000028	0.000028	0	0.00000078	0.00000078	0.00000024	0.00028	0.00028	0.0000037	0.00011	0	0.0000037	0.00028	0.000065	0.0000022	0.00051	0.37	0.00028	0.00028
Sn - D	0.3	0.11	0.3	0.077	488,088	0.0003	0.009	0.02	0.0004	41	0.3	0.0036	0.0026	0.0026	0	0.000073	0.000073	0.000023	0.041	0.17	0.00028	0.01	0	0.00028	0.0028	0.0061	0.0002	0.061	44.7	1,000,000	0.23
Ti - D	0.012	0.012	0.012	0.012	84,559	0.0005	0.0049	0.011	0.01	7.1	0.012	0.002	0.0014	0.0014	0	0.00004	0.000040	0.000012	0.012	0.012	0.0005	0.0056	0	0.0005	0.012	0.0033	0.00011	0.025	18.2	1,000,000	0.012
U - D	0.045	0.014	0.045	0.022	137,405	0.0016	0.0025	0.0057	0.0053	11.6	0.045	0.001	0.00073	0.00073	0	0.000021	0.000021	0.0000064	0.012	0.022	0.0014	0.0029	0	0.0014	0.0065	0.0017	0.0000057	0.008	5.8	0.045	0.03
V - D	0.0025	0.0025	0.0025	0.0025	17,839	0.00043	0.0025	0.0025	0.01	1.5	0.0025	0.0019	0.0014	0.0014	0	0.000039	0.000039	0.000012	0.0025	0.0025	0.00027	0.0055	0	0.00027	0.003	0.0025	0.00011	0.012	4.64	1,000,000	0.0025
Zn - D	0.054	0.054	0.054	0.054	385,333	0.0029	0.035	0.054	0.072	32.4	0.054	0.014	0.01	0.01	0	0.00028	0.00028	0.000087	0.054	0.054	0.0017	0.04	0	0.0017	0.054	0.023	0.00078	2.7	100.3	0.8	0.054
Zr - D	0.0005	0.0005	0.0005	0.0005	3,568	0.0001	0.0005	0.0005	0.00038	0.3	0.0005	0.00029	0.0002	0.0002	0	0.0000058	0.0000058	0.0000018	0.0005	0.0005	0.0001	0.00081	0	0.0001	0.0005	0.00048	0.000016	0.0048	0.93	1,000,000	0.0005
Hg - D	0.00065	0.00017	0.00058	0.00012	728	0.00002	0.000013	0.00003	0.000028	0.061	0.0007	0.0000054	0.0000039	0.0000039	0	0.00000011	0.00000011	0.000000034	0.000061	0.000260061	0.0000265	0.000015	0	0.0000265	0.000058	0.000009	0.0000003	0.000096	0.07	0.0012	0.00036
H^+ Concentration	0.000032	0.000032	0.000032	0.000032	0	0.000032	0.000032	0.000032	0.000032	0.000032	0.000032	0.000032	0.000032	0.000032	0	0.000032	0.000032	0.000032	0.000032	0.000032	0.000032	0.000032	0	0.000032	0.000032	0.000032	0.000032	0.000032	0.000032	0.000032	0.000032
Orthophosphate -	0.62	0.62	0.62	0.62	4,423,021	0	0.11	0.25	0.029	0	0.62	0.045	0.032	0.032	0	0.00091	0.00091	0.00028	0.51	0.62	0	0.13	0	0	0.48	0.075	0.0025	0	406.4	0	0.62
N as NO_3	122.3	87.3	58.7	77.5	74,003,250	0	0	0	0	8,245	101.4	188.1	0	0	0	0	0	0	37.3	161.7	0	0	0	0	0	5.5	0	0	0	1,000,000	104.4
N as NH_3	15.5	11.0	7.4	9.8	9,356,733	0	0	0	0	1,042	12.8	23.8	0	0	0	0	0	0	4.7	20.4	0	0	0	0	0	0.7	0	0	0	1,000,000	13.2
N as NO_2	2.8	2.0	1.3	1.8	1,701,224	0	0	0	0	189.5	2.3	4.3	0	0	0	0	0	0	0.86	3.7	0	0	0	0	0	0.13	0	0	0	1,000,000	2.4

M:\1\01\00458\14\A\Report\3 - Water Quality Predictions\Rev 0\Tables\[Table 3.8.xlsx]ReadMe_First

NOTES:

1. ALL UNITS IN mg/L EXCEPT SOURCE TERM 7.2 PAG STOCKPILE, WHICH IS IN mg/day.
2. THIS TABLE REPRESENTS MAXIMUM CONCENTRATIONS PROVIDED FOR EACH TERM. TIMING ASSUMPTIONS AND SCALING FACTORS WERE APPLIED TO THESE TERMS PRIOR TO INPUT INTO THE MODEL.
3. BLUE SHADING INDICATES SUBAQUEOUS SOURCE TERMS.
4. YELLOW SHADING INDICATES SOURCE TERMS ARE FLUSHED FOLLOWING SUB-AERIAL PLACEMENT.
5. ORGANCE SHADING INDICATES FULLY-SUBAERIAL SOURCE TERMS.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	13OCT14	ISSUED WITH REPORT VA101-458/14-3	MZP	EIA	KJE

3.8 SEEPAGE INTO STREAMFLOW

The design of the mine waste and water management facilities included mitigation measures to prevent and capture groundwater seepage from the mine facilities to the maximum practical extent (KP, 2014d). The vast majority of seepage will be collected by the mitigation measures. Still, some unrecovered seepage is expected. There are several pathways of unrecovered seepage that are important to the prediction of water quality for the project. These pathways include the following:

- Seepage towards T-Creek will result from infiltration of ponded water in the TMF directly through the embankment fill and the natural ground, and from expulsion of pore water as the tailings mass consolidates.
- Seepage towards P-Creek and Harper Creek will result from infiltration on the Non-PAG Waste Rock Stockpile and from seepage from the water management pond bypassing cut-off and collection measures.
- Seepage towards P-Creek and Harper Creek will result from infiltration on the PAG Low-Grade Ore Stockpile bypassing collection measures infiltrating through the underlying low-permeability foundation liner.

The location of the discharge of unrecovered seepage from the mine facilities is a key aspect of the prediction of water quality for the project. The potential for seepage and estimates of unrecovered seepage from key mine facilities was analyzed using three groundwater modelling techniques:

- Watershed Modelling: A month-to-month water balance modelling approach using a semi-distributed (or quasi-distributed) parameter model to evaluate surface water and groundwater flows in the Project area (KP, 2014a).
- SEEP/W: A two-dimensional (2D) finite element computer program (Geostudio, 2007) was used to determine the potential for seepage through the embankments and foundation materials of the TMF (KP, 2014b) and Non-PAG Waste Rock Stockpile water management pond (WMP).
- MODFLOW: A three-dimensional (3D) finite-difference flow model developed by the U.S. Geological Survey and HGL Software Systems (Hydrogeologic Inc., 1996) was used to develop a steady-state regional-scale numerical groundwater model to assess hydrogeological conditions and groundwater flow during baseline, mine operations and the post-closure period (KP, 2014c).

The predicted behavior of groundwater, including both non-contact groundwater and unrecovered seepage from the mine facilities, was inherent to the methodology used in the analysis and varied depending on the model.

The watershed model uses transmissivity, transmissive aquifer width, and a hydraulic gradient to calculate the amount of groundwater that passes a node in the model with any excess flow routed to surface water. The TMF and Non-PAG Waste Rock Stockpile WMP were represented in the watershed model as a facility with a low-permeability groundwater cut-off. To simulate a low-permeability cut-off, the hydraulic gradient was decreased so that no flow passed the node in the subsurface but instead flowed 100% as surface water. The surface water was collected and recycled to the TMF. An unrecovered seepage flow rate was then introduced to the groundwater flow zone immediately downstream of the node. The seepage flow rate was based on seepage estimates from 2D modelling with SEEP/W. This methodology conservatively assumed that there will be no non-contact groundwater bypassing the cut-off node, and the unrecovered seepage flow will be the only groundwater flow immediately downstream of the node. Non-Contact groundwater flow from down-gradient areas entered the groundwater balance downstream of the cut-off and saturated the transmissive aquifer. Once the transmissive aquifer was saturated in the model,

excess flow was routed to the surface water system. The groundwater recharge rates depended on the recharge characteristics, catchment area, and topography of the site (KP, 2014a).

The three-dimensional nature of the MODFLOW groundwater models allows for the evaluation of the efficiency of groundwater cut-off structures at the TMF Embankment and Non-PAG Waste Rock Pond. The MODFLOW model represents the groundwater system as a series of layers corresponding to the hydrostratigraphic units (i.e. overburden deposits, weathered bedrock and fractured bedrock) that convey groundwater in the Project area. These layers are stacked vertically to create a 'layer cake' aquifer system and were assigned a hydraulic conductivity corresponding to the geological material they represented. A groundwater cut-off was simulated by reducing the hydraulic conductivity of the model cells within the cut-off area to restrict groundwater flow through those cells. The cut-off structures for the TMF and Non-PAG Waste Rock Stockpile water management pond were specified in the top layer of the model only. Hydraulic conductivity in the underlying layers was unaffected by presence of the cut-off in the top layer. This model construction caused a greater amount of groundwater to surface upstream of the cut-off while also allowing groundwater, both seepage and non-contact, to bypass under the cut-off in the deeper model layers. The MODFLOW approach differs from the simplified analytical approach used in the watershed model, which did not allow any non-contact groundwater bypass through or under a cut-off.

Seepage flow rates were estimated in MODPATH to provide a comparison to unrecovered seepage estimates from SEEP/W analyses and watershed modelling. The seepage rates were estimated using average groundwater recharge applied at ground surface beneath mine facilities, and did not account for reduced infiltration due to foundation lining. The MODFLOW models were steady-state models constructed at the maximum extents of the mine facilities and calibrated to a specific set of low flow measurements. The models provide an improved understanding of potential groundwater flow pathways (KP, 2014c).

The unrecovered seepage rates and seepage directions using both groundwater modelling techniques are included in Table 3.9.

The unrecovered seepage rates and seepage directions predicted by MODPATH particle tracking agree reasonably well with predictions from the SEEP/W analyses and the LOM watershed model. The MODPATH estimates indicated that the flow rates included in the LOM watershed model are conservative.

Seepage into T-Creek was predicted to enter the streamflow upstream of the first water quality prediction location. This prediction was consistent in the watershed modeling, numerical groundwater model, and SEEP/W modeling. The consistency is primarily attributed to the difference in elevation and distance between the TMF and the T-Creek water quality node, and recharge characteristics, catchment area, and topography of the site. The site is located over 2000 m downstream with an elevation difference in excess of 450 m. The catchment area downstream of the TMF for recharge of the groundwater is approximately 8.4 km^2. These differences allow for the convergence of the predictions between the models. Similarly, seepage from the pit lake in closure towards Baker Creek from the open pit is predicted to enter streamflow prior to the first water quality node in that creek.

Table 3.9 Unrecovered Seepage Rates from Groundwater Modelling

FACILITY	SEEPAGE DIRECTION	WATERSHED MODEL SEEPAGE RATE (1)	MODPATH SEEPAGE RATE (2)
TMF	T-CREEK	2.5 L/s	1.5 L/s
NON-PAG WASTE ROCK STOCKPILE	P-CREEK	1 L/s (3)	0.1 L/s
PAG LOW-GRADE ORE STOCKPILE	P-CREEK	1 L/s	0.2 L/s
	UPPER HARPER CREEK		0.1 L/s
	LOWER HARPER CREEK		0.6 L/s

NOTES:

1. ADOPTED FROM TABLE 5.3 OF THE WATERSHED MODELLING REPORT (KP, 2014a).
2. ADOPTED FROM TABLE 6.2 OF THE NUMERICAL GROUNDWATER MODELLING REPORT (KP, 2014c).
3. UNRECOVERED SEEPAGE RATE WAS SELECTED TO REPRESENT A CONSERVATIVE SCENARIO WHERE THE WATER MANAGEMENT POND IS ALLOWED TO ACCUMULATE WATER AND IS MAINTAINED AT MAXIMUM CAPACITY. PREDICTED SEEPAGE RATES RANGED FROM 0.25 L/S TO 0.9 L/S DEPENDING ON POND FILL LEVEL. THE WATER MANAGEMENT SYSTEM IS DESIGNED TO REMOVE EXCESS WATER TO THE MINIMUM OPERATING LEVEL FOR PUMP SUBMERGENCE (KP, 2014d).

The particle tracking completed from the mine facilities indicates that there is a potential for unrecovered seepage to discharge to P-Creek and Harper Creek upstream of where the LOM watershed model predicts groundwater flow to discharge to streamflow. The seepage is from the Non-PAG Waste Rock Stockpile and PAG LGO Stockpile. This indicates that there is a potential for water chemistry impacts in the upstream reach of Harper Creek that were not captured by the LOM watershed model and expected case water quality predictions.

The location of unrecovered seepage discharge will vary over the life of the project, and may be impacted by both seasonal and annual trends. Judgment is needed to determine an expected range of water quality based on sensitivity to discharge location. Water quality predictions include a sensitivity analysis, further described below, to determine an expected range of water chemistry in P-Creek and upper Harper Creek based on sensitivity to discharge location. Consideration was given to the strengths of each groundwater modelling technique to form a reasonable upper bound scenario for expected case water quality in P-Creek and upper Harper Creek at HP. The sensitivity case flows adopted for the P-Creek analysis are shown in Table 3.10.

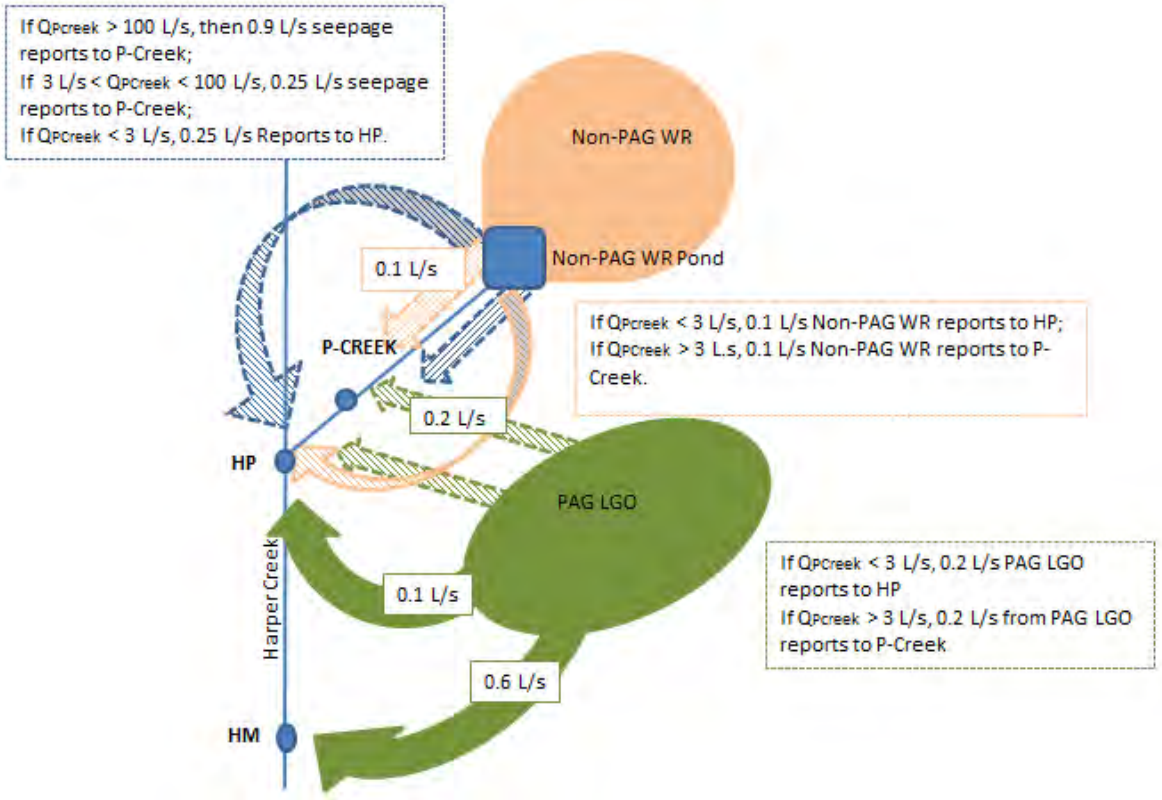
Table 3.10 Unrecovered Seepage Rates for P-Creek Sensitivity

FACILITY	SEEPAGE DIRECTION	WATER QUALITY NODE (1)	UNRECOVERED SEEPAGE RATE (L/S)
NON-PAG WASTE ROCK STOCKPILE	P-CREEK AND UPPER HARPER CREEK	P-CREEK, HP	0.1 L/s
NON-PAG WASTE ROCK STOCKPILE WMP	P-CREEK AND UPPER HARPER CREEK	P-CREEK, HP	0.25 – 0.9 L/s (2)
PAG LOW-GRADE ORE STOCKPILE	P-CREEK AND UPPER HARPER CREEK	P-CREEK, HP	0.2 L/s
	UPPER HARPER CREEK	HP	0.1 L/s
	LOWER HARPER CREEK	HM	0.6 L/s

NOTES:

1. WATER QUALITY NODE THAT SEEPAGE FLOW IS APPLIED AT IS DEPENDENT ON PREDICTED MEAN MONTHLY STREAMFLOW.
2. PREDICTED SEEPAGE RATES RANGED FROM 0.25 L/S TO 0.9 L/S DEPENDING ON POND FILL LEVEL.

The Unrecovered Seepage Sensitivity model integrated the seepage rates listed in Table 3.10, together with Expected Case geochemical source terms and the existing non-contact surface water and groundwater flows. Logic was integrated into the model to specify at which node seepage would report to, depending on whether flow conditions in P-Creek are low or high. Under low flow conditions in P-Creek, defined as anything less than 3 L/s, contact seepage is expected to flow subsurface, bypass the P-Creek water quality node and surface at the HP node. Under high flow conditions in P-Creek, high water conditions are assumed to occur within the Non-PAG WR Pond, and an elevated seepage rate of 0.9 L/s is assumed. Seepage rates from all facilities are based on the full footprint of each facility; loads generated in the earlier years of Operations were more conservative as a result of this assumption. The logic is illustrated in the schematic on Figure 3.5.



NOTES:

1. CONCEPTUAL SCHEMATIC ONLY, NOT INTENDED FOR DESIGN PURPOSES.
2. NON-PAG WR INDICATES THE NON-PAG WASTE ROCK STOCKPILE.
3. PAG LGO INDICATES THE POTENTIALLY ACID GENERATING LOW GRADE ORE.

Figure 3.5 Seepage Sensitivity Case – Seepage Schematic

3.9 ASSUMPTIONS

3.9.1 General Assumptions

- This is a mass balance mixing model that provides a conservative estimate of water quality, and, with the exception of solubility controls applied in the TMF, Open Pit and mill, does not account for natural attenuation of metals and other parameters due to natural geochemical and biological processes in soils and bedrock.
- Precipitation and evaporation are neutral inputs and outputs; the concentration of metals, dissolved anions and nutrients in precipitation and in evaporate is assumed to be zero.
- Mixing at each model node is instantaneous and complete. The effects of thermal stratification on surface water reservoirs were not modelled.
- There are no lag-times (delays) on contact water seepage flow paths.
- Within the mine site, only dissolved metals were modelled, which reflects the source terms.
- Dissolved loads remain in solution and particulate loads remain suspended.
- Catchment runoff water quality is assumed to contain the same parameter concentrations as the baseline surface water data for the nearest surface water quality node in that catchment.

3.9.2 Baseline Water Quality Data Assumptions

- Natural groundwater that comes to surface is considered to have the concentration of baseline low-flow surface water, as measured during January and/or February. Piper diagram comparisons of the low-flow surface water quality baseline data to nearby groundwater monitoring data were completed to support this assumption.
- Baseline data that were reported as non-detect with MDLs above the Ministry of Environment's target minimum detection limits for baseline sampling were removed (MOE, 2012).
- Parameter concentrations that were reported as non-detect were assumed to equal the method detection limit (MDL).
- Natural surface water source terms do not change over time, but show monthly variability through the calendar year based on the average monthly dataset.
- If surface water baseline sampling events were absent for certain months data were interpolated between adjacent months.

3.9.3 Geochemical Source Term Application Assumptions

- Total ore processing assumed to equal 2,129,166 tonnes per month from Year 2 through Year 23. Ore production is assumed to equal 1,916,250 tonnes per month during Year 1.
- The LGO to process source term (Term 23.1) increases annually due to sub-aerial exposure. A conservative assumption of a minimum of two years of loading has been applied in the development of this source term. Small amounts of LGO are planned to be processed early in the mine life that will be on surface for less than two years. Additional loading is carried in the model as a result of this assumption.
- Source terms that vary by year are applied at a constant value for each year and are not interpolated between years.
- Non-PAG LGO in P-Creek is assumed to provide loading for the first three years of Operations I.
- Loading from the PAG LGO Stockpile is assumed to cease upon removal of the stockpile for processing, at the end of model Year 27.

3.9.4 TMF Assumptions

- Precipitation on beaches: 70% of the precipitation that makes contact with the TMF beaches will run off, while 30% will infiltrate (Operations and Closure); based on the watershed model and water balance model.
- Displaced pore water concentrations are assumed to enter the TMF pond and are not expected to report directly out the base of the TMF. As a result, all TMF embankment and foundation seepage from the TMF is equal to the concentration of the TMF pond, which was considered a conservative assumption.
- A separate pore water load and water balance was completed for water lost to void space within the TMF during tailings deposition. New loads into the pore balance were based on the concentration of the overlying supernatant pond for a given time step. The pore water loads released during consolidation were assumed to equal the calculated concentration resulting from this load balance, unless the concentration was less than Term 18. If the concentration of a given parameter tracked in the pore water load balance was less than those specified in Term 18, the load released was calculated using this term instead.
- PAG LGO within the TMF is expected to remain sub-aerial.
- PAG waste rock is inundated within one year of placement and is never re-exposed. The PAG waste rock flushing term (Term 7.2) is applied once to every volume of waste rock inundated each year.

3.9.5 Open Pit Assumptions

- The Open Pit highwall is assumed to be composed of 65% PAG and 35% Non-PAG materials, as determined by the Open Pit geological pit shell model.
- The flushed Open Pit wall term (Term 10.3) is not applied to the model due to the rapid filling of the Open Pit with LGO process tailings (within 3 years). The source term was developed assuming long-term exposure of the pit walls with the Open Pit filling naturally, resulting in load build up due to oxidation. Rapid filling prevents extended weathering and as a result the term is not valid for application under the current mine plan.
- Acidic pit wall source terms (Term 10.2) are applied at the start of closure, as soon as the Open Pit starts to fill.
- Loading from LGO tailings pore water is expected to occur only during placement of the LGO tailings (from model Year 23 through Year 28).
- A large quantity of slurry water will be retained in the void (pore) space of the tailings deposit during discharge of LGO tailings to the pit. Open Pit pore water was handled in the same manner as the TMF pore water (refer to Section 3.9.4, above).

3.9.6 Solubility Limit Assumptions

- Solubility limits are applied to the TMF, Open Pit and Mill. These constraints are listed for Term 23.2 (Process and Pond Constraints) within Appendix A2 and Appendix A3.
- Within the mill, dissolved metal concentrations greater than the solubility limits are expected to precipitate and are deposited in solid form with the tailings solids in the TSF. Loads were assumed to be permanently removed from solution.
- Solubility limits were applied within the TMF to represent the threshold above which dissolved metals would precipitate and precipitated loads were assumed to remain in solid form and settle out of the water column.

3.10 LIMITATIONS AND CONSERVATISM

The water quality model is a tool that is used to indicate parameters that may be of concern during all phases of the mine life (Construction, Operations, Closure and Post-Closure). Due to the number of assumptions required to provide inputs to the model, including area assumptions, climate assumptions, and geochemical assumptions, results of the model are approximate and must be viewed as such.

It is not possible to assign actual probabilities to geochemical source terms due to the limited understanding of the underlying probability distributions. In order to address uncertainty, two bounding cases, the Expected Case and the Upper Bound Case were used to provide an understanding of the range of variation predicted. The Expected Case provides the concentrations that are the most likely, while it is extremely unlikely that concentrations will exceed the Upper Bound Case.

While the Expected Case model represents the concentrations that are the most likely, this model is inherently conservative. The Expected Case model does not account for any natural attenuation of loads, although this will very likely occur. Conservative seepage rates have been applied that reflect the upper bound of expected seepage and an additional sensitivity analysis was conducted in upper Harper Creek and P-Creek to address uncertainty in the flow pathways for unrecovered seepage.

The LGO to process source term (Term 23.1) increases annually due to sub-aerial exposure. A conservative assumption of a minimum of two years of weathering/oxidation has been applied in the

development of this source term. Small amounts of LGO are planned to be processed early in the mine life that will be on surface for less than two years. Additional loading is carried in the model as a result of this assumption. There is no seasonality in the source terms provided by SRK and loading is applied equally for all months of the year.

3.11 WATER QUALITY MODEL NODE LOCATIONS

3.11.1 Mine Site Water Quality Model Nodes

Mine Site Water Quality Model Nodes are defined as those nodes that occur within the Project footprint and buffer areas. These nodes include: TMF, Open Pit, P-Creek and T-Creek. It is recognized that P-Creek and T-Creek are existing natural watercourses. The aquatic life guidelines have been used for comparison of water quality at P-Creek and T-Creek nodes. Differentiation between “mine site” and “off mine-site” nodes was made purely on a geographic basis, and not intended to direct the effects assessment. The following water quality nodes occur within the boundaries of the mine site were modelled and presented within the report (Figure 3.5). A mine site water balance schematic indicating water flow within the site and locations of discharge is also provided on Figure 3.7.

- Tailings Management Facility (TMF): The TMF is located within the T-Creek drainage of the Harper Creek Valley and has been designed to minimize effects on local and regional groundwater and surface water resources throughout all phases of the Project. The TMF will be designed to minimize interaction with wildlife, but may be accessed as a source of drinking water. As a result, predicted results are compared to BCWQG-Wildlife. The TMF influences the receiving environment via seepage (embankment or foundation) or discharge from the spillway, which commences discharge at the start of closure. A description of the conceptual seepage pathways from the TMF follows. For further details and seepage quantities, refer to Section 3.8. describes TMF seepage exits the facility via the Main Embankment, the North Embankment, the West Saddle or the East Saddle, as either foundation or embankment seepage. The North Embankment, West Saddle and East Saddle predicted seepage volumes are very low. The uncaptured North Embankment seepage reports to Jones Creek. Uncaptured seepage from the Main Embankment reports to the receiving environment via T-Creek, and subsequently into Harper Creek at model node HT. Discharge from the TMF spillway occurs at the start of closure and reports to T-Creek and subsequently into Harper Creek at model node HT. Seepage from the West Saddle is tracked in the model and a nominal seepage volume is expected to report to HM. Seepage from the TMF will be primarily controlled by the design of the facility, which includes extensive tailings beaches that isolate supernatant pond away from the embankments, WMPs, toe drains, and seepage collection ditches. Seepage analyses were completed for cross sections of the Main Embankment, North Embankment, East Saddle and West Saddle.
- Open Pit: The Open Pit is located within the deposit area, upslope of the North Thompson River Valley. Pit wall seepage and surface runoff is collected and conveyed directly to the TMF for long-term storage and use during operations. At the end of Operations I (Year 24), the LGO process tailings (Operations II) will be deposited into the Open Pit, rapidly backfilling the majority of the Open Pit and subsequently reducing the pit wall area that will be exposed to long-term oxidation and metal leaching. Filling of the pit lake is completed by the end of Year 28. Reclaim water will be drawn from the Open Pit will for the last 4 years of Operations II (Years 25 through 28) and the LGO tailings will be remain subaqueous in Closure and Post-Closure. Seepage from the Open Pit reports to Baker Creek and no seepage pathways are expected to report to P-Creek. Seepage rates were estimated using the finite element computer program SEEP/W.

The maximum seepage rate form the pit lake was predicted to be 8 L/s. Additional details regarding the water balance for the Open Pit can be found in Section 5.4.1 of the *Watershed Modelling Report – KP report, Ref No. VA011-458/14-1*.

- P-Creek (creek down-gradient of the Open Pit): The P-Creek node is located at the base of P-Creek, just upstream of the confluence with Harper Creek, and down-gradient of the Non-PAG Waste Rock stockpile and the Open Pit. Under the Expected Case conditions, the watershed model predicts that the P-Creek node only receives background loading and is not expected to not receive any mine related loading. Mine related loading from the Non-PAG Waste Rock stockpile is expected to report further downstream on Harper Creek, at HM. The Seepage Sensitivity Case examines the resulting water quality that could arise if seepage from the PAG LGO and Non-PAG Waste Rock surfaces within P-Creek.
- T-Creek (creek down-gradient of the TMF): The T-Creek node is located at the base of T-Creek down-gradient of the TMF. T-Creek flows enter Harper Creek just upstream of the HT node. T-Creek receives loading from the TMF via embankment and foundation seepage. See Section 3.8 for further details on seepage.

3.11.2 Water Quality Nodes

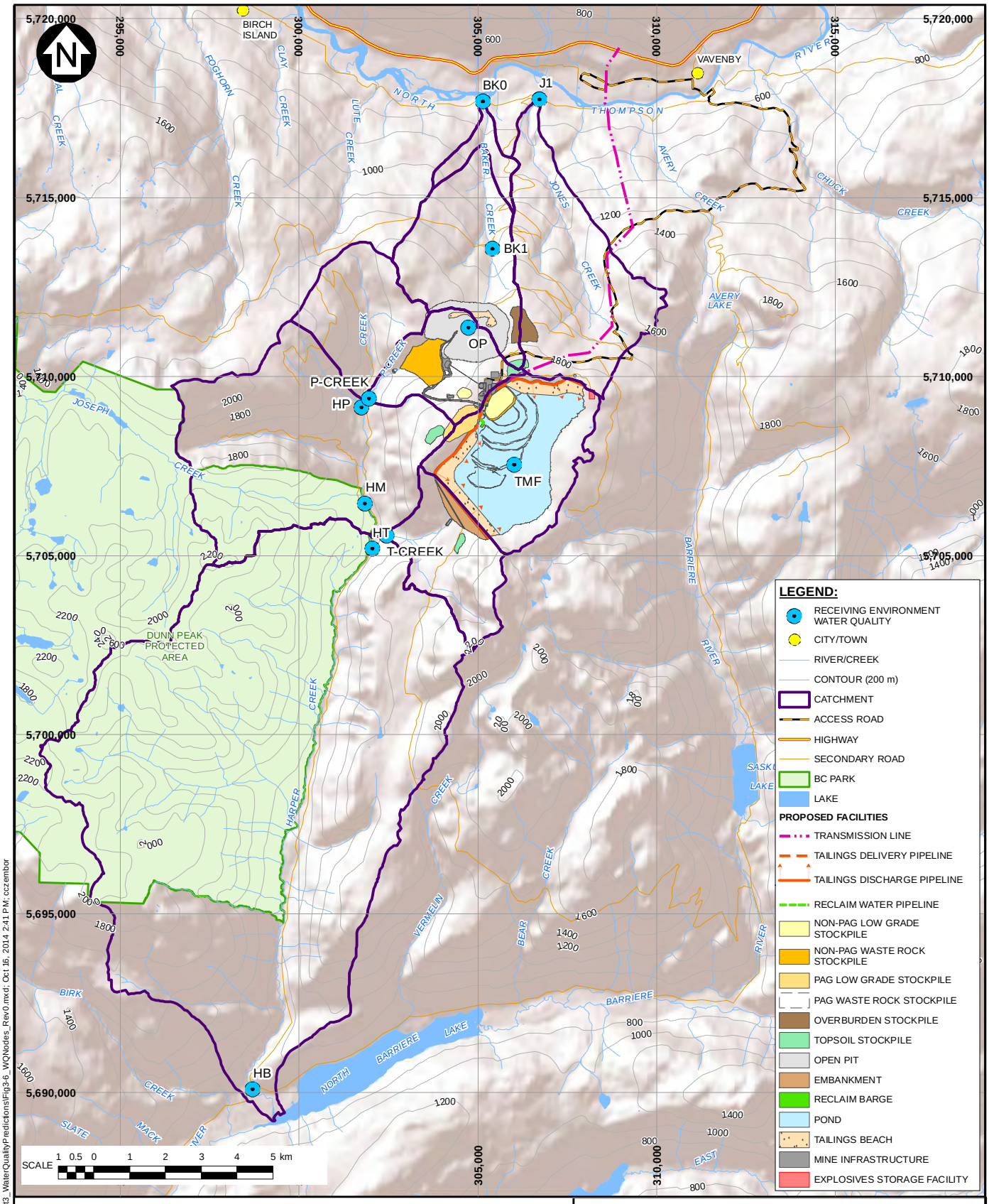
Key water quality nodes have been modelled to support a surface water quality effects assessment for the receiving environments of Harper Creek, Baker Creek, and Jones Creek (Figure 3.5). A mine site water balance schematic indicating locations of discharge is also provided on Figure 3.7.

- Harper Creek: There are four modelled nodes within Harper Creek that are described below from upstream to downstream.
  - Harper Creek below P-Creek (HP): Located within Harper Creek, immediately downstream of the confluence with P-Creek and upstream of HM. The HP node only receives background loading and is not expected to receive any mine related loading. Mine related loading from the Non-PAG Waste Rock stockpile is expected to report further downstream in Harper Creek, at HM.
  - Mid Harper Creek (HM): Located within Harper Creek, downstream of model node HP and immediately upstream of the confluence with T-Creek. Model node HM receives background loading from HP in addition to unrecovered seepage from the Non-PAG WMP, and uncaptured seepage from the temporary Non-PAG LGO stockpile located within the P-Creek catchment (processed by year 5) and the PAG LGO Stockpile.
  - Harper Creek below T-Creek (HT): Located in Harper Creek, immediately downstream of the confluence with T-Creek. Loading sources to HT include those from model nodes HM, upstream on Harper Creek, and T-Creek, located down-gradient of the TMF. Loading to T-Creek includes seepage from the TMF main embankment and the TMF spillway in closure. No additional loading sources report to HT.
  - Harper Creek above Barrière River (HB): Most downstream water quality node modelled on Harper Creek, immediately upstream of the confluence with Barrière River. All loading at HB is derived from model node HT, natural catchment runoff and groundwater inflows, with no additional mine related loading sources reporting to HB.
- Baker Creek: There are two modelled nodes within Baker Creek that are described below from upstream to downstream.
  - Mid Baker Creek (BK1): Located just downstream of the Open Pit, in the middle reaches of Baker Creek. This is the most upstream model node on Baker Creek, downstream of the Open Pit. The management strategy includes controlling the Pit Lake elevation below the

natural spill elevation. As a result, the only mine related loading source to this creek is through seepage from the Open Pit in Closure and Post-Closure. All seepage pathways from the Open Pit report to the BK1 node.

- Lower Baker Creek (BK0): Located within Baker Creek, down-gradient of BK1. The BK0 node receives no additional mine related loading source outside of loads that report to the BK1 node.

- Jones Creek: There is one modelled node presented for Jones Creek:
  - Lower Jones Creek (J1): Located in the middle reaches of Jones Creek. The J1 node receives mine related loading from the overburden stockpile and nominal embankment seepage from the North Embankment of the TMF. Further details on seepage quantities are provided in Section 3.8.



NOTES:

1. BASE MAP: TRIM AND NTS MAPPING, ESRI ARCGIS ONLINE SHADED RELIEF.
2. COORDINATE GRID IS IN METRES. COORDINATE SYSTEM: NAD 1983 UTM ZONE 11N.
3. THIS FIGURE IS PRODUCED AT A NOMINAL SCALE OF 1:150,000 FOR 8.5x11 (LETTER) PAPER.
4. CONTOUR INTERVAL IS 200 METRES. DATA SOURCE: NTS DATA.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	CAC	DDF	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

WATER QUALITY NODE LOCATIONS

Knight Piésold CONSULTING

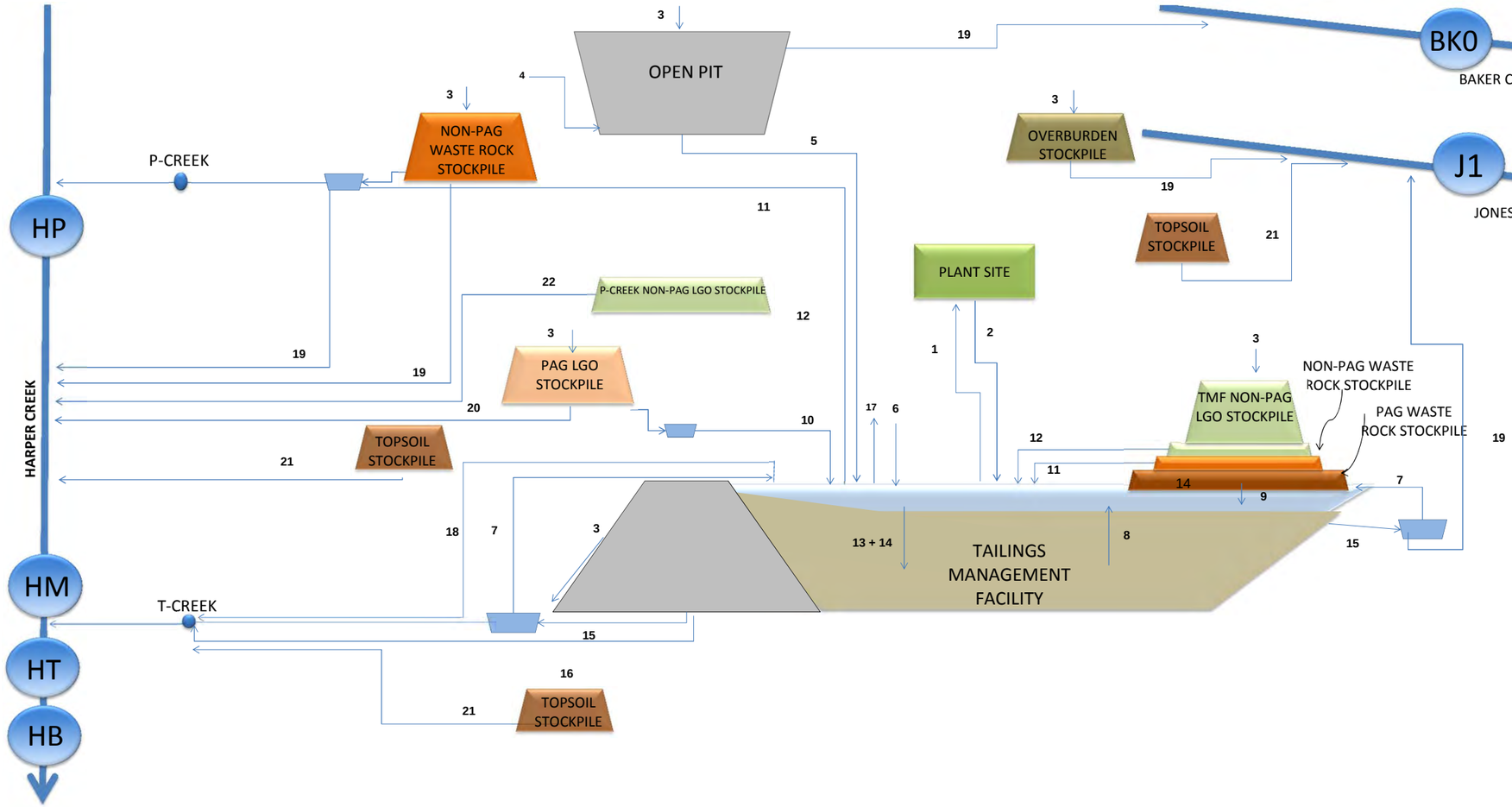
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FIGURE 3.6

REV 0

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Number	Description
	Plant Site Balance
1	TMF Reclaim
2	Water in Tailings Slurry
	Open Pit Balance
3	Direct Precip and Runoff
4	Groundwater Inflows
5	Dewatering to TMF
	Tailings Management Facility Balance
1	TMF Reclaim
2	Water in Tailings Slurry
3	Direct Precip and Runoff
5	Pit Dewatering to TMF / Excess Water to TMF (Closure)
6	Direct Precip and Runoff (pond, beach and undisturbed area)
7	Seepage Recycle (including TMF embankment runoff)
8	Tailings Consolidation Seepage
9	Exposed PAG waste rock in TMF
10	PAG LGO Stockpile runoff
11	Non-PAG Waste Rock stockpile runoff
12	Non-PAG LGO Stockpile runoff
13	Water trapped in tailings voids
14	Water trapped in PAG WR voids
15	Recoverable embankment seepage
16	Unrecoverable embankment seepage
17	TMF pond and beach evaporation
18	TMF overflow
19	Unrecoverable Seepage
20	Unrecoverable PAG LGO stockpile seepage (Operations I and II)
21	Runoff from Topsoil Stockpiles (Operations I and II)
22	Unrecoverable P-Creek Non-PAG LGO Seepage (first 5 years)

HARPER CREEK MINING CORP.		
HARPER CREEK PROJECT		
MINE SITE WATER BALANCE SCHEMATIC		
Knight Piésold CONSULTING	PA NO. VA101-458/14	REF. NO. 3
	FIGURE 3.7	REV 0

4 – MODEL OUTPUT SUMMARY

4.1 GENERAL

The purpose of this section of the report is provide an overview of how the model outputs are presented in this report, where they are provided, and the guidelines that were used to assess the data. Water quality predictions were modelled during construction, Operations I, Operations II through to Closure and Post-Closure, with monthly outputs over a 100 year period for all modelled facilities.

4.2 WATER QUALITY GUIDELINES

4.2.1 General

Two different approaches were taken to compare results to appropriate guidelines, depending on whether the results were associated with a mine site modelling node or a receiving water environment modelling node.

Mine site modelling node results were presented with respect to *Metal Mining Effluent Regulations* (MMER) effluent discharge limits (Schedule 4 – Authorized Limits of Deleterious Substances, Column 2 – Maximum Authorized Monthly Mean Concentration) and British Columbia Ministry of Environment (BC MOE) Water Quality Guidelines for the Protection of Wildlife (BCWQG-Wildlife). MMER authorized limits are available for the following modelled parameters: arsenic, copper, cyanide, lead, nickel, and zinc. Graphs are provided for all modelled parameters whether there are guidelines or not.

Receiving environment modelling node results were compared against the following guidelines (Table 4.1):

- BC MOE Water Quality Guidelines (Approved and Working) for the Protection of Fresh Water Aquatic Life (BCWQG-FAL)
  - Maximum Acceptable Limits (BCWQG-Max)
  - 30 Day Average Limits (BCWQG-30 D)
- Canadian Environmental Quality Guideline for the Water Quality Guidelines for the Protection of Aquatic Life (Freshwater) (CEQG)

A draft aquatic life guideline for dissolved cadmium was released in BC in June 2014 (BC MoE 2014). This guideline does not officially supersede the interim cadmium guideline; however, it has been used for comparison against the modelled water quality results for the receiving water nodes on the direction and advice of the MOE. It is acknowledged that this is a draft guideline and that is may change as a result of public comment.

Table 4.1 Water Quality Guideline Overview

	BCWQG-30 D[2]	BCWQG-MAX [3]	CEQG-PAL[4]	BCWQG-Wildlife
Physical Tests				
pH		6.5 to 9	6.5 to 9	
Dissolved Anions				
Chloride	150	600	640 (short term); 120 (long-term)	600
Fluoride		0.4 to 0.01(-51.73+92.57(Log(H))) [5]	0.12	1 (average); 1.5 (max)
Sulphate	128 to 429 [5]			
Nutrients				
Ammonia (Total)		0.681 to 28.7 [6,7]	0.017 to 192 [6,7]	
Nitrate (as N)	3	32.8	13	
Nitrite (as N)	0.02 to 0.2	0.06 to 0.6 [8]	0.06	
Metals				
Aluminum	0.05 to $e^{(1.6-3.327*[pH]+0.402*([pH]^{[(2)]}))}$ [6,9]	0.1 to $e^{(1.209-2.426*[pH]+0.286*[pH]^{[(2)]})}$ [6,9]	0.005 to 0.1 [6]	5
Antimony		0.02		
Arsenic		0.005	0.005	0.025
Barium	1	5		
Beryllium	0.0053			
Boron		1.2		5
Cadmium	0.00002 to $e^{(0.762*ln(H)-6.07)}$/1000 to 0.000172 [5,10]	0.00001 to $e^{(1.04*ln(H)-5.87)}$/1000 to 0.00164 [5,10]	0.00004 to $10^{(0.83*(log(H)-2.46)}$/1000 to 0.000373 [5]	
Chromium		0.001[11]	0.001	
Cobalt	0.004	0.11		
Copper	0.002 to (0.04*H)/1000 [5]	(0.094*H+2)/1000 [5]	0.002 to 0.004 [5]	0.3
Iron		0.35 [9]/1	0.3	
Lead	(3.31+$e^{1.273*ln(H)-4.704}$)/1000 [5]	0.003 to $e^{(1.273*ln(H)-1.460)}$/1000 [5]	0.001 to $e^{1.273*ln(H)-4.705}$/1000 [5]	0.1
Manganese	0.0044*H+0.605 [5]	(0.01102*H)+0.54 [5]		
Mercury	0.00002		0.000026	0.00002 (average)

	BCWQG-30 D[2]	BCWQG-MAX [3]	CEQG-PAL[4]	BCWQG-Wildlife
Molybdenum	1	2	0.073	0.05
Nickel		0.025 to 0.150 [5]	0.025 to 0.15 [5]	
Selenium	0.002		0.001	0.002
Silver	0.00005 to 0.0015 [5]	0.0001 to 0.003 [5]	0.0001	
Thallium		0.0003[11]	0.0008	
Uranium		0.3	0.015	
Vanadium		0.006		
Zinc	(7.5+0.75*(H-90))/1000 to 0.0075 [5]	(33+0.75*(H-90))/1000 to 0.033 [5]	0.03	

M:\1\01\00458\04\A\Report\11 - Water Quality Modelling\Appendices\Appendix C - Concentration Graphs\[Table Ci - Aquatic Life Guidelines.xlsx]Ci - AQUATIC LIFE GUIDELINES

NOTES:

1. UNITS ARE IN mg/L UNLESS OTHERWISE STATED.
2. BRITISH COLUMBIA WATER QUALITY GUIDELINES (APPROVED AND WORKING) - 30 DAY AVERAGE LIMITS (BCWQG-30 D) - FRESHWATER AQUATIC LIFE.
3. BRITISH COLUMBIA WATER QUALITY GUIDELINES (APPROVED AND WORKING) - MAXIMUM LIMITS (BCWQG-MAX) - FRESHWATER AQUATIC LIFE.
4. CANADIAN ENVIRONMENTAL QUALITY GUIDELINES - WATER QUALITY GUIDELINE FOR THE PROTECTION OF AQUATIC LIFE (CEQG-PAL) - FRESHWATER.
5. HARDNESS (H) DEPENDENT GUIDELINE LIMIT (DISSOLVED).
6. pH DEPENDENT GUIDELINE LIMIT (IN SITU VALUE PREFFERED).
7. TEMPERATURE DEPENDENT GUIDELINE LIMIT.
8. CHLORIDE (DISSOLVED) DEPENDENT GUIDELINE LIMIT.
9. THIS GUIDELINE APPLIES TO DISSOLVED CONCENTRATIONS ONLY.
10. DRAFT WATER QUALITY GUIDELINE RELEASED JUNE 2014 (BC MoE 2014).
11. THE FRESHWATER AQUATIC LIFE WATER QUALITY OBJECTIVE FOR ONTARIO USED DUE TO ABSENSE OF BC OBJECTIVE.

4.2.2 Hardness Dependent Guidelines

Guidelines for many parameters are calculated using hardness, measured in mg/L $CaCO_3$. Hardness is a key parameter that modifies the toxicity of certain metals (fluoride, sulphate, copper, cadmium, lead, manganese, nickel, silver, and zinc). Hardness dependent guidelines are only applied at receiving environment water modelling nodes.

Hardness dependent guidelines were calculated using the mean baseline hardness for the nearest representative baseline water quality site, and these guidelines were applied against the full predicted time-series chemistry for a given parameter. A more detailed seasonal assessment of specific parameters was conducted for key periods in each mine phase. For this assessment, the seasonal variability in the hardness dependent guidelines was determined by calculating monthly guideline values that were dependent upon the monthly mean baseline hardness concentrations.

4.3 MODEL OUTPUTS

4.3.1 Expected Case

4.3.1.1 Concentration Summary Statistics

Summary statistics were generated for the minimum, median, mean, maximum, standard deviation, coefficient of variation and 10^{th}, 25^{th}, 75^{th} and 90^{th} percentiles for the Expected Case data. Summary statistics are provided for each of the following major mine phases at key water quality nodes:

- Operations I (Year 1 through a portion of Year 23)
- Operations II (Years 24 through 28)
- Closure (Years 29 through 35)
- Post-Closure (Years 36 onwards)

4.3.1.2 Concentration Graphs

Concentration graphs are provided for each parameter with an associated guideline (see Section 4.2.1). Monthly concentrations for these parameters over the entire course of the model are plotted on these graphs. Delineation of the different phases of the mine life is provided for each graph, in addition to notes specifying major changes in water management, where appropriate. Depending on whether the parameter plotted is for a mine site or receiving environment node, different guidelines and limits are plotted on each respective graph (see Section 4.2.1).

4.3.1.3 Loading Charts

Loading charts are provided for key parameters at key areas of the model for the Expected Case results. Loading charts provide an indication of the proportion of loading from each contributing source. Loading charts track the contributing load measured in mg/month over the course of the model.

4.3.2 Sensitivity Analyses

4.3.2.1 Seepage Sensitivity Case

Concentration graphs are provided for each parameter with an associated guideline (see Section 4.2.1) at model nodes P-Creek and HP. Monthly concentrations for these parameters over the entire course of the model are plotted on these graphs. Delineation of the different phases of the mine life is provided for each graph, in addition to notes specifying major changes in water management, where appropriate.

4.3.2.2 5^{th} and 95^{th} Percentile Precipitation Cases

Concentration graphs are provided for cadmium, copper and selenium during the key snapshot years where the 5^{th} and 95^{th} percentile precipitation record has been applied. Maximum concentrations recorded of the three iterations of the 5^{th} percentile and three iterations of the 95^{th} percentile cases are plotted. Concentration graphs are provided for key receiving environment nodes: HT, HM and HB.

4.3.2.3 Upper Bound Case

Concentration graphs are provided for each parameter with an associated guideline (see Section 4.2.1) at each model node. Monthly concentrations for these parameters over the entire course of the model are plotted on these graphs. Delineation of the different phases of the mine life is provided for each graph, in addition to notes specifying major changes in water management, where appropriate. Depending on whether the parameter plotted is for a mine site or receiving environment node, different guidelines and limits are plotted on each respective graph (see Section 4.2.1).

4.3.3 Location of Results

Concentration summary statistics, concentrations graphs and loading charts are provided within associated appendices as outlined in Table 4.2.

Table 4.2 Location of Model Results

Node	Expected Case - Concentration Summary Statistics	Expected Case - Concentration Graphs	Expected Case - Loading Charts	Seepage Sensitivity Case – Concentration Graphs	Upper Bound Case – Concentration Graphs	5th and 95th Percentile Precipitation Cases – Concentration Graphs
Mine Site Model Node						
TMF	Appendix B1	Appendix C1	Appendix D1			Appendix G1
Open Pit	Appendix B2	Appendix C2	Appendix D2			Appendix G2
P-Creek	Appendix B3	Appendix C3	Appendix D3	Appendix E1		Appendix G3
T-Creek	Appendix B4	Appendix C4	Appendix D4			Appendix G4
Receiving Environment Model Node						
HP	Appendix B5	Appendix C5	Appendix D5	Appendix E2		Appendix G5
HM	Appendix B6	Appendix C6	Appendix D6		Appendix F1	Appendix G6
HT	Appendix B7	Appendix C7	Appendix D7		Appendix F2	Appendix G7
HB	Appendix B8	Appendix C8	Appendix D8		Appendix F3	Appendix G8
Mid Baker Creek (BK1)	Appendix B9	Appendix C9	Appendix D9			Appendix G9
Lower Baker Creek (BK0)	Appendix B10	Appendix C10	Appendix D10			Appendix G10
Jones Creek (J1)	Appendix B11	Appendix C11	Appendix D11			Appendix G11

5 – MINE SITE WATER QUALITY PREDICTIONS

5.1 TAILINGS MANAGEMENT FACILITY

5.1.1 Summary of Trends

Predicted parameter concentrations were low within the TMF during Construction when the upstream zone of the TMF embankment is placed. A steady increase for most parameters is predicted during Operations I as the TMF fills with surface runoff, inflows from site water management systems (Non-PAG Waste Rock stockpile, PAG LGO Stockpile, Open Pit), tailings, PAG Waste Rock (flushing and runoff), and Non-PAG LGO seepage. During this time, water is reclaimed from the TMF for use in the mill for the duration of Operations I. The majority of load addition for all parameters in Operations I is derived from ore processing and conveyed as slurry into the TMF. Maximum TMF concentrations for most parameters are achieved at the end of Operations I (Year 23.5) when regular ore processing is complete and LGO process tailings are then directed to the Open Pit.

Reclaim from the TMF continues for an additional 18 months into Operations II when LGO is processed and the tailings are deposited into the Open Pit, which results in load transfer from the TMF to the Open Pit. All parameters show a decreasing concentration trend within the TMF during Operations II due in part to the load transfer, but predominantly due to the influence of dilution from precipitation.

The TMF pond reaches the spillway elevation and discharge commences to T-Creek at the beginning of Closure (Year 31). All parameters show a decreasing trend through the Closure phase (Year 29 through Year 35). The Post-Closure phase begins at Year 36, at which time water begins to be transferred on a seasonal basis from the Open Pit and concentration trends for some parameters change as a result. Most parameters are only slightly affected by the introduction of Open Pit water to the TMF; however, aluminum, cadmium, mercury[4] and zinc[5] are predicted to increase to their maximum values as a result of the influence of the introduction of Open Pit water to the TMF. All parameters show negligible effects of the cessation of pumpback from the Main Embankment WMP, at Year 40.

Predicted concentrations for parameters that are most affected by the transfer of water from the Open Pit (cadmium, copper, zinc and mercury) increase in the TMF until the total load within the Open Pit equals the total load within the TMF and then the concentrations trend downwards. This time varies slightly depending on the parameter in question and is predicted to occur from Year 44 through Year 50.

No parameters are predicted to be above the MMER limits; however, the following parameter has predicted Expected Case concentrations above the BCWQG-Wildlife:

- Selenium: Predicted concentrations are greater than the guideline (0.002 mg/L) during all phases of the mine life, with the exception of construction. Maximum concentrations up to 0.015 mg/L are reached in early Operations II and long-term Post-Closure concentrations stabilize around 0.006 mg/L.

4 Predicted mercury concentrations reach their maximum during briefly during construction, but remain consistently elevated after the introduction of water from the Open Pit.
5 These parameters are not expected to elevate concentrations in the receiving environment above background levels.

5.1.2 Expected Case Concentrations - Key Parameters

Cadmium, copper and selenium were identified as key parameters of concern within the Harper Creek receiving environment. The predicted concentration[6] of these parameters including magnitude, trends, and sources of loading in the TMF is discussed here in more detail. The TMF is a mine site water quality prediction node, and therefore predicted concentrations were compared to the authorized limits of deleterious substances in Schedule 4 of the MMER and the BCWQG-Wildlife. Wildlife may access the TMF as a source of drinking water, which is the reason for including BCWQG-Wildlife. Additional graphical and tabular information for predicted Expected Case TMF concentrations for all modelled parameters are provided in Appendix B1 (summary statistics), Appendix C1 (graphical summary), and Appendix D1 (loading charts).

5.1.2.1 Selenium

Predicted selenium concentrations within the TMF follow the overall trend noted for the facility. Selenium concentrations are predicted to reach a maximum of approximately 0.0158 mg/L at the start of Operations II (LGO Processing) and decrease to an equilibrium value around 0.0066 mg/L in the long-term (Expected Case). Selenium concentrations are not notably influenced as a result of loading from the Open Pit during Post-Closure, since the load addition from the Open Pit (primarily from LGO slurry) does not exceed stored load in TMF (primarily as a result of slurry water addition throughout Operations I) at Year 35. Selenium is not a parameter that is currently listed in Schedule 4 of the MMER; however, the BCWQG-Wildlife for Se is 0.002 mg/L. After Year 3, predicted selenium concentrations in the TMF exceed this guideline for the duration of the model. Graphs of predicted concentration and loading for selenium are provided on Figure 5.1 (Expected Case).

The primary sources of selenium loading into the TMF in Operations I is the load released during ore processing (dominantly regular ore, but some LGO is processed in the first five years of Operations I). Additional loading to the TMF in Operations I comes from the dewatering of the Open Pit and water reclaimed from the Non-PAG Waste Rock and LGO Stockpile WMPs. All water requirements for the Mill are met through reclaim from the TMF and as a result loads are recirculated within this system for the duration of Operations I, with minimal load losses along seepage pathways and no loads lost due to solubility constraints in the Mill. The slurry loads provided on the time-series loading graphs on Figure 6.1 include the reclaim loads. At the start of Operations II LGO slurry reports to the Open Pit and additional slurry loading does not enter the TMF. Pump-back from the WMPs to the TMF continues through Operations II; however, concentrations are predicted to trend downwards in the absence of slurry loading.

The dominant selenium loading source to the TMF in Closure and Post-Closure is from the water pumped back to the TMF from the Non-PAG Waste Rock WMP. Loading from the Open Pit is tracked, but has no noticeable effects on predicted selenium concentrations.

5.1.2.2 Cadmium

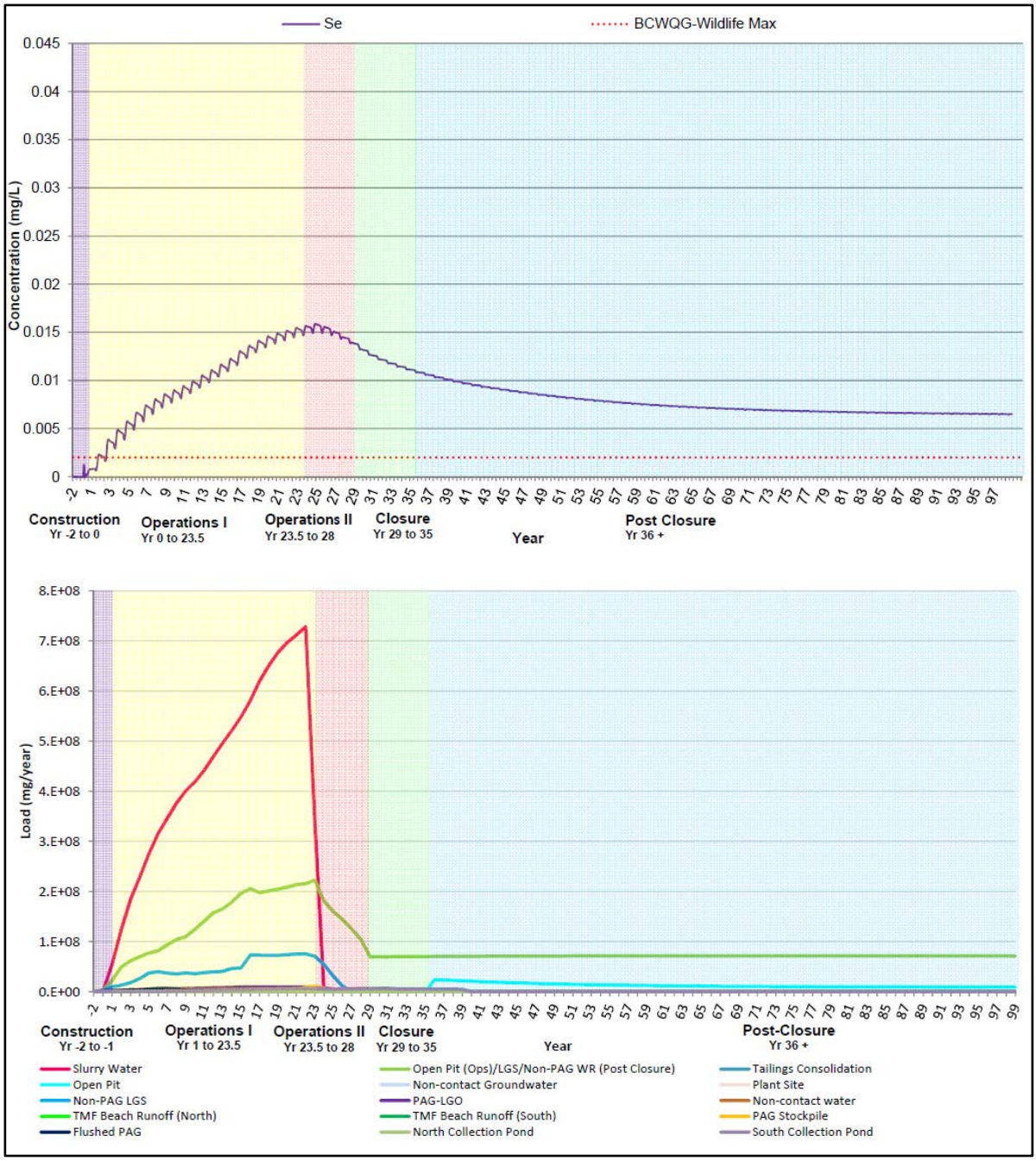
Predicted cadmium concentrations within the TMF follow the overall trend noted for the facility; however, cadmium concentrations in this facility are affected by water from the Open Pit that is

[6] For the purposes of this and following discussions, predicted concentrations are concentrations predicted with the Expected Case model.

pumped to the TMF on a seasonal basis beginning in Post-Closure (Year 36). Cadmium concentrations quickly increase during Operations I and reach a concentration above 0.00005 mg/L from Year 6 until the end of Operations I. Peak concentrations during Operations are predicted to occur in Year 20 and reach a maximum of approximately 0.000072 mg/L (Expected Case). A steady rise in concentration begins in response to loading from the Open Pit, which begins in Post-Closure (Year 36), and maximum predicted Expected Case cadmium concentrations (0.00011 mg/L) in the TMF occur in Post-Closure (Year 50). Cadmium concentrations begin to decrease after Year 50. Cadmium does not have a BCWQG-Wildlife and is not currently listed in Schedule 4 of the MMER. Concentration and loading graphs for cadmium in the TMF are provided on Figure 5.2.

Unlike selenium, maximum predicted cadmium concentrations occur during Post-Closure as a result of loading from the Open Pit. Ore processing (slurry water) remains the primary loader during Operations I (primary ore in addition to small amounts of LGO). Reclaim water requirements for the first 18 months of Operations II are met through withdrawal from the TMF, resulting in load transfer from the TMF to the Open Pit. No cadmium loads are lost due to solubility constraints within the mill. The load transfer process is then reversed in Post-Closure when excess water from the Open Pit is pumped to the TMF (Year 36). Water pumped from the Open Pit to the TMF is the primary source of load addition during Post-Closure. At the start of Post-Closure, predicted cadmium concentrations in the Open Pit are approximately 32 times higher than that of the TMF. Post-Closure Open Pit concentrations in the TMF continue to increase until approximately Year 50, when the contributing load from the Open Pit equals the load in the TMF due to the absence of major load addition and addition of non-contact water, after which concentrations exhibit a decreasing trend.

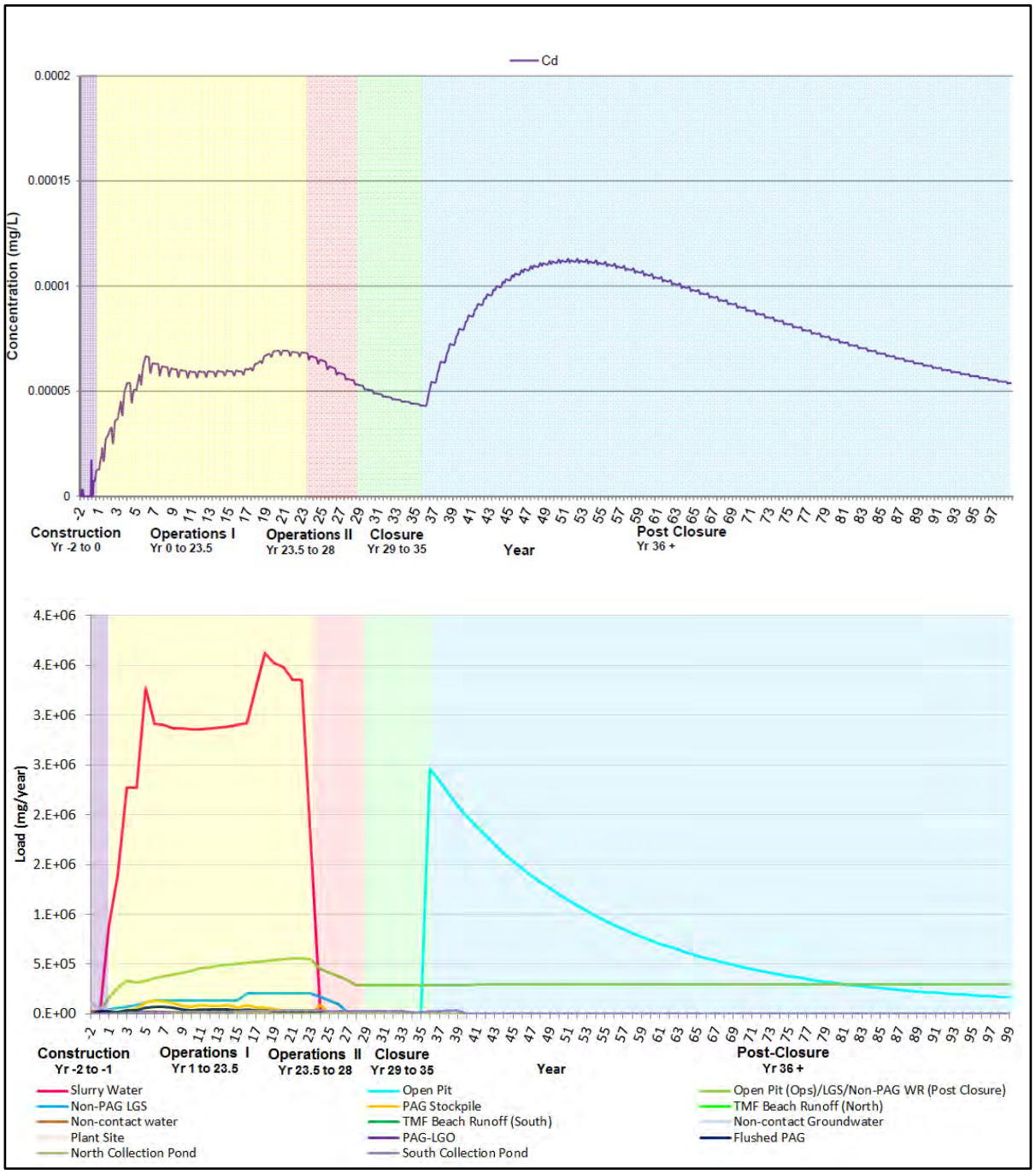
The secondary source of cadmium loading into the TMF during Operations I and II come from the dewatering of the Open Pit and water reclaimed from the Non-PAG Waste Rock and LGO Stockpile WMPs. The loading from the Non-PAG Waste Rock WMP is continuous through Closure and Post-Closure and becomes the dominant loading source for cadmium later in Post-Closure.



NOTES:

1. OPERATIONS II INDICATES LGO PROCESSING.
2. RECLAIM FROM THE TMF OCCURS FOR THE FIRST 18 MONTHS OF OPERATIONS II, AFTER WHICH ALL RECLAIM COMES FROM THE OPEN PIT.
3. THERE IS NO MMER DISCHARGE LIMIT FOR SELENIUM.

Figure 5.1 Selenium TMF Concentrations and Sources of Loading



NOTES:

1. OPERATIONS II INDICATES LGO PROCESSING.
2. RECLAIM FROM THE TMF OCCURS FOR THE FIRST 18 MONTHS OF OPERATIONS II, AFTER WHICH ALL RECLAIM COMES FROM THE OPEN PIT.
3. THERE IS NO MMER DISCHARGE LIMIT FOR CADMIUM.

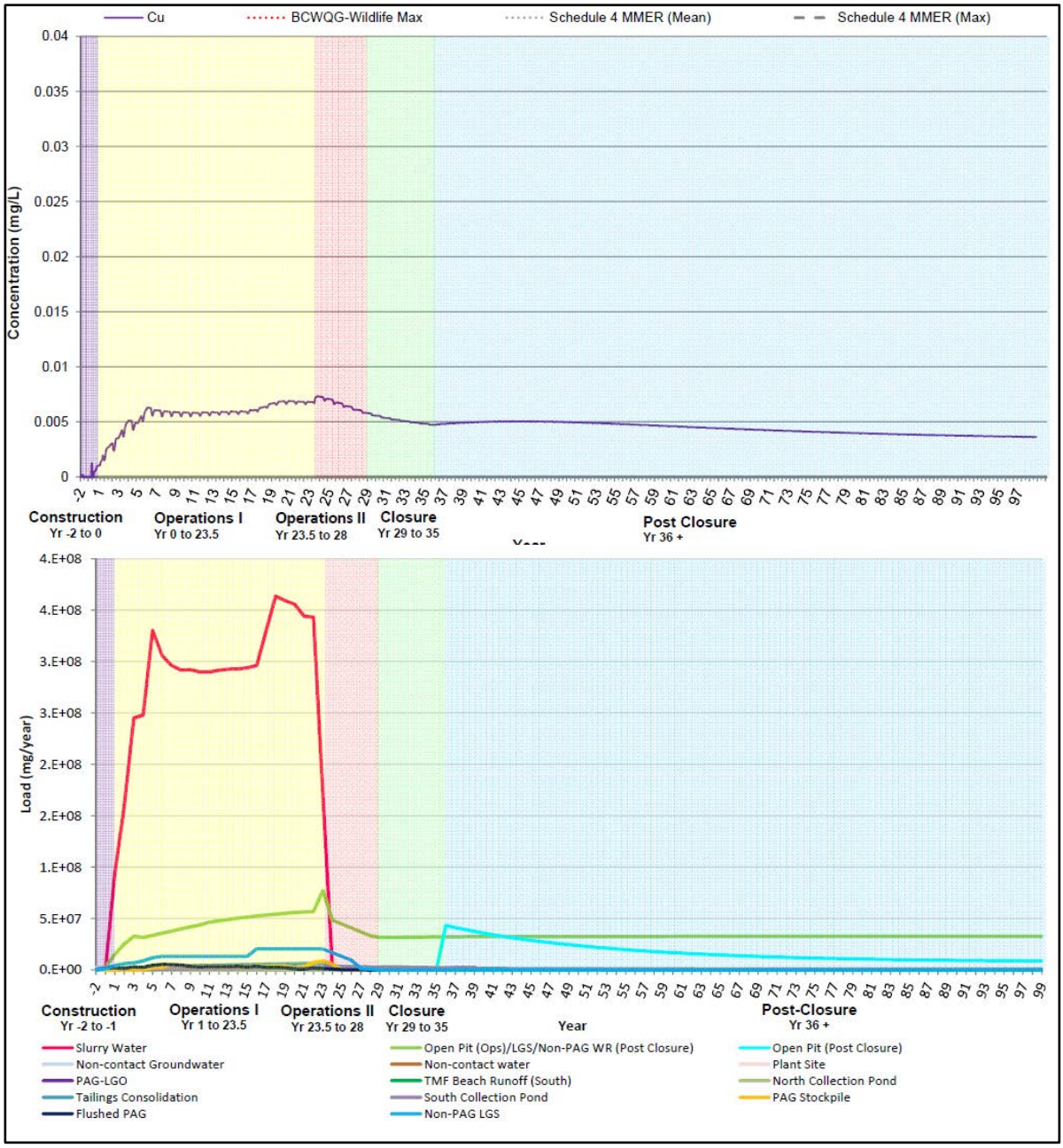
Figure 5.2 Cadmium TMF Concentrations and Sources of Loading

5.1.2.3 Copper

Predicted copper concentrations within the TMF follow the overall trend noted for the facility. Copper concentrations in the TMF quickly increase through early Operations I until Year 6, after which the rate of rise decreases. The maximum copper concentration is predicted to be 0.0073 mg/L and is expected to occur at the transition between Operations I and II. Copper concentrations decrease during Operations II and Closure and are predicted to increase in a similar manner as cadmium in Post-Closure (Year 36), when excess water is transferred from the Open Pit to the TMF. The change in concentrations is not as great for copper as it is for cadmium and peak Post-Closure concentrations are lower than those reached during Operations. The MMER Schedule 4 Maximum Authorized Monthly Mean Limit for copper is 0.30 mg/L, the MMER Schedule 4 Maximum Authorized Concentration in a grab sample is 0.6 mg/L. The BCWQG-Wildlife is equal to 0.3 mg/L. TMF concentrations are never predicted to be above any of these limits. Concentration and loading graphs for copper in the TMF are provided on Figure 5.3.

The primary source of copper loading into the TMF is the load released during ore processing. Primary ore processing slurry is directly deposited into the TMF in Operations I (some LGO is processed in the first five years of Operations I) and LGO process tailings are deposited into the Open Pit in Operations II. Reclaim water requirements for the first 18 months of Operations II are met through withdrawal from the TMF, resulting in load transfer from the TMF to the Open Pit. Unlike cadmium and selenium, copper loads are lost in the mill as a result of the solubility limits (0.36 mg/L). Solubility limits were defined by SRK Consulting. The load transfer process is then reversed in Post-Closure when excess water from the Open Pit is pumped to the TMF. The copper concentration in the Open Pit is predicted to be up to six times higher than that of the TMF at the beginning of Post-Closure (Year 36) and concentrations are predicted to increase slightly in the TMF as a result of the addition of this water source. Concentrations in the TMF are predicted to continue to increase for approximately eight years and then a decreasing trend is observed when the contributing load from the Open Pit is less the load in the TMF.

The secondary source of copper loading into the TMF in Operations I and II come from the dewatering of the Open Pit and water reclaimed from the Non-PAG Waste Rock and LGO Stockpile WMPs. The loading from the Non-PAG Waste Rock WMP is continuous through Closure and Post-Closure and is the dominant loading source for copper for most of the modelled Post-Closure phase.



NOTES:

1. OPERATIONS II INDICATES LGO PROCESSING.
2. RECLAIM FROM THE TMF OCCURS FOR THE FIRST 18 MONTHS OF OPERATIONS II, AFTER WHICH ALL RECLAIM COMES FROM THE OPEN PIT.
3. MMER DISCHARGE LIMITS FOR COPPER ARE 0.3 mg/L FOR MONTHLY MEAN CONCENTRATIONS OR 0.60 mg/L FOR A GRAB SAMPLE.

Figure 5.3 Copper TMF Concentrations and Sources of Loading

5.1.3 Sensitivity Analyses

The greatest variability in TMF predicted concentrations is expected to occur with alterations to the geochemical source terms. Variable climatic inputs have much less influence on mine site water quality predictions and as a result, the Upper Bound Case model results are discussed in detail for sensitivity analysis. A graphical summary of the predicted concentrations for all parameters under the Upper Bound Case conditions can be found in Appendix F1. Maximum concentrations predicted by the Upper Bound Case range from three to twenty times greater than the maximum concentrations predicted by the Expected Case.

5.1.3.1 Selenium

Predicted Upper Bound Case selenium concentrations are between three to four times greater than the Expected Case concentrations. Upper bound selenium concentrations are above the BCWQG-Wildlife (0.002 mg/L), but are less than one order of magnitude greater than the guideline. Maximum selenium concentrations with the Upper Bound Case are reached earlier when compared with the Expected Case (Year 19 when compared with Year 25). Compared with the Expected Case results, Upper Bound Case results show: 1) greater effects of ore processing during Operations I and 2) greater effects on concentrations from Open Pit load transfer to TMF during Post-Closure.

5.1.3.2 Cadmium

Predicted Upper Bound Case cadmium concentrations are between three to seven times greater than the Expected Case concentrations. No MMER criteria or BCWQG-Wildlife exist for cadmium. Maximum cadmium concentrations under the Upper Bound Case are reached during Operations I (Year 6), which differs from the Expected Case predictions (maximum concentrations occur in Year 55). Compared with the Expected Case results, the Upper Bound Case results show greater effects of ore processing during Operations I.

5.1.3.3 Copper

Predicted Upper Bound Case copper concentrations are between five to twenty times greater than the Expected Case concentrations. Upper Bound Case copper concentrations (maximum concentration of approximately 0.13 mg/L) are not expected to exceed MMER discharge limits or the BCWQG-Wildlife. The peak concentration for copper under the Upper Bound conditions occurs during Operations II, consistent with predictions for the Expected Case. The concentration trend for predicted Upper Bound copper concentrations is slightly altered when compared to the expected case: 1) the effects of ore processing during Operations I are pronounced in the Upper Bound case and 2) less pronounced effect from the load transfer from the Open Pit to TMF during Post-Closure when compared to the higher concentrations predicted in Operations.

5.1.3.4 Additional Parameters

Mercury is the only additional parameter that is predicted to be above the BCWQG-Wildlife (0.00002 mg/L) in the TMF in the Upper Bound Case. Maximum predicted concentrations are less than three times higher than the guideline and the concentration is still trending downwards at Year 100, but remains above this guideline for the majority of the duration of the model. The water transferred from the Open Pit to the TMF and pump-back from the Non-PAG Waste Rock WMP are

the primary sources of new loading in the TMF in Post-Closure. Concentrations drop in the Open Pit at a faster rate than they do in the TMF, and the long-term influence is dominantly the Non-PAG Waste Rock pump-back.

5.2 OPEN PIT

5.2.1 Summary of Trends

Overburden and waste rock are stripped from the Open Pit and stored in predetermined locations during Operations I (Figures 2.1 through 2.5). All pit groundwater inflows and surface runoff is conveyed from the Open Pit to the TMF for long-term storage and reuse during Operations I. No water or loads accumulate in the Open Pit during this time and seasonal fluctuations in concentrations are common. Water is allowed to accumulate in the Open Pit at the onset of Operations II. Slurry water, previously pumped to the TMF, is routed to the TMF once LGO processing commences. This timing corresponds to the start of Operations II. Most parameters increase in concentration during Operations II as a result of the load addition from the LGO slurry, while a minority of parameters show stable concentrations (arsenic, barium, boron, chromium, copper, iron, lead, manganese, molybdenum, mercury). Water from the Open Pit is also used as reclaim water for the last four years of Operations II (Years 25 through 28). The Open Pit continues to fill with surface runoff and water during Closure and Post-Closure, until it reaches its design specified elevation (volume) at the end of Year 35 and is pumped to the TMF. Concentrations of all parameters decline during the period of Open Pit filling and pumping, after the end of Operations II (LGO processing).

The following parameters have predicted Expected Case concentrations above the BCWQG-Wildlife:

- Fluoride: One predicted seasonal maximum concentration above the average guideline (1.0 mg/L) in Year 23 at the beginning of LGO processing.
- Mercury: Predicted concentrations are greater than the guideline during Operations II, Closure, and a portion of Post-Closure. The maximum concentration is slightly greater than four times higher than the guideline.
- Molybdenum: Predicted concentrations are greater than the guideline during Operations I and II, Closure, and a portion of Post-Closure. The peak concentration (occurring in one year) is approximately five times the guideline.
- Selenium: Predicted concentrations are greater than the guideline during construction and Operations I (seasonal maximums), Operations II, Closure, and Post-Closure (additional information provided below). The peak selenium concentration is 0.0185 mg/L.

5.2.2 Expected Case Concentrations - Key Parameters

Cadmium, copper and selenium were identified as key parameters within the receiving environment that are predicted to be affected by mining activities. As a result, the predicted magnitude, trends and sources of loading for predicted Open Pit concentrations under the Expected Case model are discussed here for these select parameters.

Additional graphical and tabular information for all modelled parameters within the Open Pit under Expected Case conditions are provided in Appendix B2 (summary statistics), Appendix C2 (graphical summary), and Appendix D2 (loading charts).

5.2.2.1 Selenium

Predicted Expected Case selenium concentrations reach seasonal maximums above the BCWQG-Wildlife (approximately 0.007 mg/L) during Operations I. Concentrations of predicted selenium rise once water begins accumulating within the Open Pit, at the start of Operations II, under the influence of loading from the LGO slurry water. Maximum selenium concentrations (0.0185 mg/L) are reached at the end of Operations II and decrease during Closure and Post-Closure phases. Selenium concentrations reach an equilibrium value of approximately 0.0046 mg/L at the end of the model life. Selenium concentrations remain above the BCWQG-Wildlife for the duration of Operations II, Closure and Post-Closure (Figure 5.4).

Seasonal trends within the Open Pit are not very pronounced and concentration trends are driven by major loading sources, similar to the TMF. The largest selenium loading term during Operations I is the Open Pit walls. During Operations II (LGO processing), the largest source of selenium loading is the LGO slurry from the mill, which enters the Open Pit from Year 23 through 28. Loading from this source is greater than the combination of all the other loads, and in excess of eight times any of the other individual loading sources. Loading is much reduced during Closure and Post-Closure when compared to Operation II, and is derived primarily from the Open Pit walls.

5.2.2.2 Cadmium

Predicted Expected Case cadmium concentrations follow a very similar trend to predicted selenium concentrations. Low concentrations are predicted during Operations when water is being pumped from the Open Pit and maximum concentrations are reached at the end of Operations II. During Operations I, cadmium concentrations are low and have seasonal maximum values below 0.0001 mg/L. A sharp increase in predicted cadmium concentration occurs once water begins accumulating within the Open Pit, and LGO slurry reports to the Open Pit (Operations II). Maximum cadmium concentrations (0.0021 mg/L) are reached at the end of Operations II and steadily decrease during the Closure and Post-Closure phases. Long-term cadmium concentrations fall below 0.00025 mg/L (Figure 5.5). No MMER criteria or BCWQG-Wildlife are applicable for cadmium.

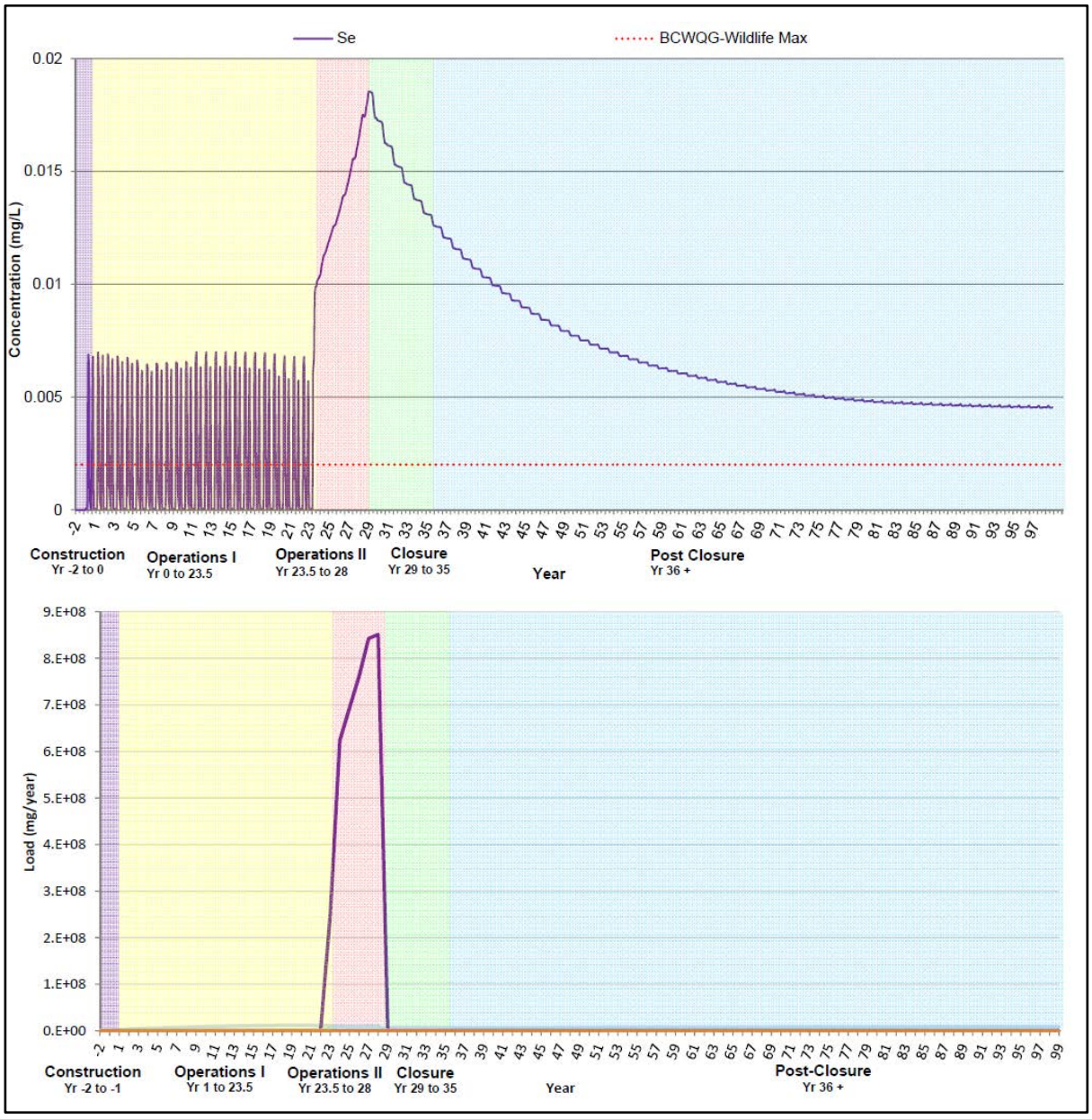
Seasonal trends within the Open Pit are not pronounced and concentration trends are driven by major loading sources. Cadmium has the same primary load drivers as observed for selenium. During Operations I, Closure and Post-Closure, the primary source of cadmium loading is derived from the Open Pit walls. During Operations II (LGO processing), the primary loading source is the slurry load.

5.2.2.3 Copper

Predicted Expected Case copper concentrations follow similar trends to those noted for selenium and cadmium, with one exception. Predicted Expected Case copper concentrations reach a maximum value early in Operations II, as a result of application of a solubility limit within the mill. Operations I concentrations have seasonal maximum concentrations of 0.0056 mg/L, and peak concentrations are reached at the start of Operations II (0.035 mg/L). Copper concentrations remain high for the duration of LGO processing as a result of uniform loading. At the onset of closure and as a result of the cessation of LGO processing, predicted copper concentrations decrease rapidly during Closure and Post-Closure. Long-term concentrations fall at or below 0.005 mg/L (Figure 5.6).

Predicted copper concentrations are below the applicable MMER discharge limits (0.30 mg/L mean, 0.60 mg/L max) and BCWQG-Wildlife (0.3 mg/L).

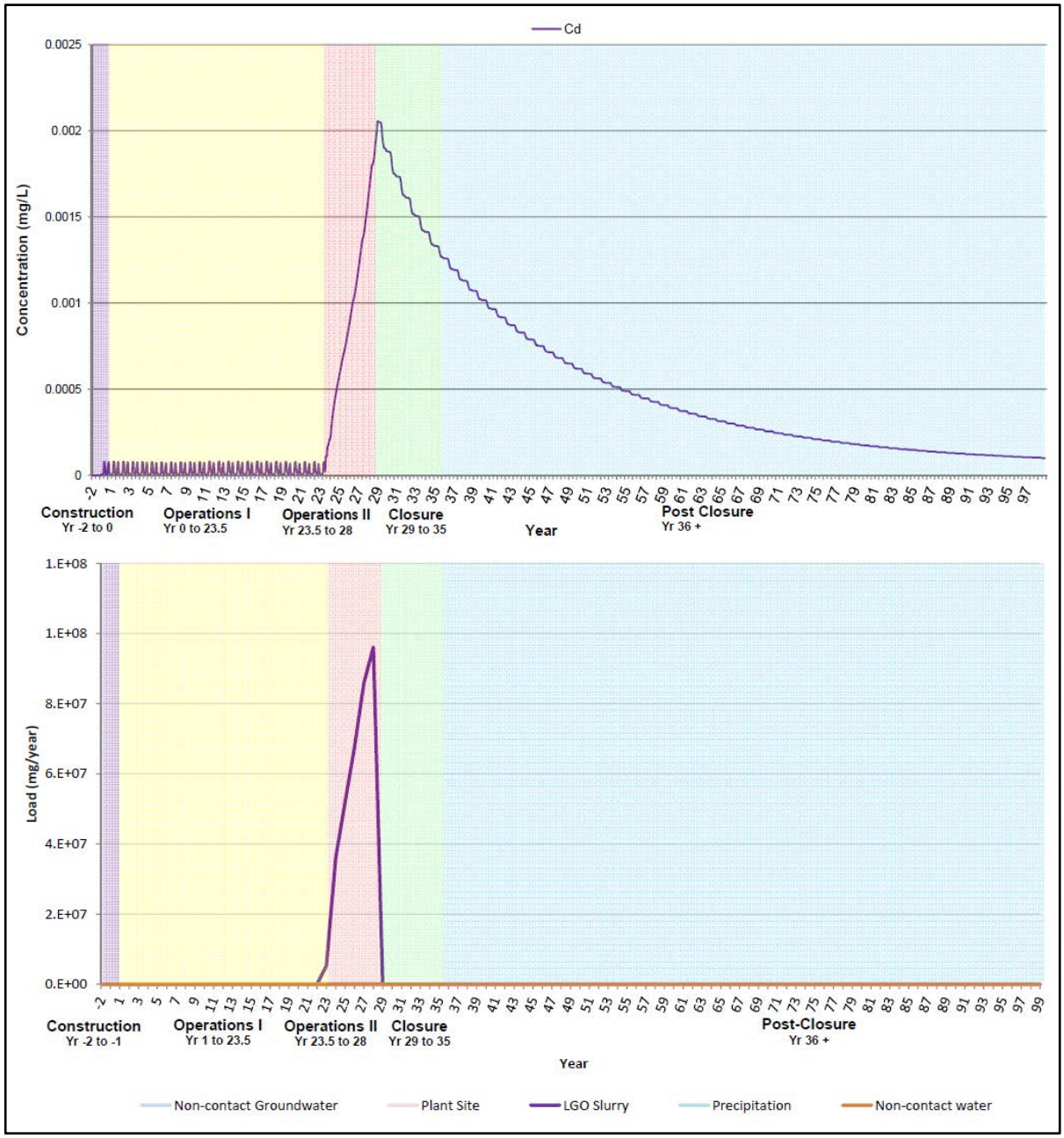
Seasonal trends for copper within the Open Pit are not pronounced and concentration trends are driven by the input of the major loading source: LGO slurry water. Compared to other parameters, load from the LGO processing slurry is by far the largest source of loading, even when compared to loading from the Open Pit walls.



NOTES:

1. OPERATIONS II INDICATES LGO PROCESSING.
2. LGO SLURRY WATER IS DISCHAREGED TO THE OPEN PIT FROM YEAR 23.5 THROUGH 28.
3. THERE IS NO MMER DISCHARGE LIMIT FOR SELENIUM.

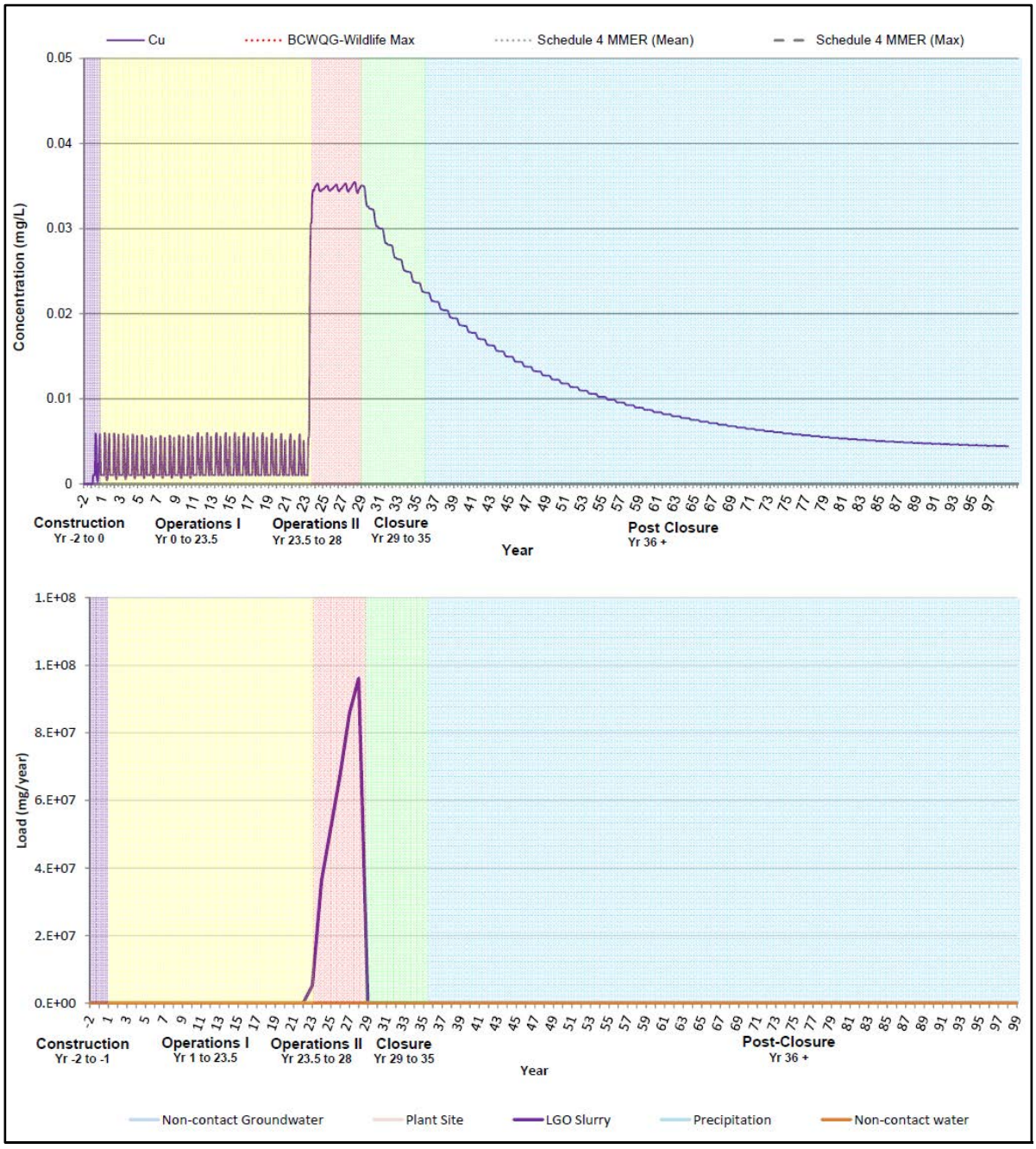
Figure 5.4 Selenium Open Pit Concentrations and Sources of Loading



NOTES:

1. OPERATIONS II INDICATES LGO PROCESSING.
2. LGO SLURRY WATER IS DISCHAREGED TO THE OPEN PIT FROM YEAR 23.5 THROUGH 28.
3. THERE IS NO MMER DISCHARGE LIMIT FOR CADMIUM.

Figure 5.5 Cadmium Open Pit Concentrations and Sources of Loading



NOTES:

1. OPERATIONS II INDICATES LGO PROCESSING.
2. LGO SLURRY WATER IS DISCHAREGED TO THE OPEN PIT FROM YEAR 23.5 THROUGH 28.
3. MMER DISCHARGE LIMITS FOR COPPER ARE 0.3 mg/L FOR MONTHLY MEAN CONCENTRATIONS OR 0.60 mg/L FOR A GRAB SAMPLE.

Figure 5.6 Copper Open Pit Concentrations and Sources of Loading

5.2.3 Sensitivity Analysis

The greatest variability in predicted concentrations within the mine site is expected to occur as a result of alterations to the geochemical source terms. Variable climatic inputs have much lower magnitude effects on mine site water quality predictions. As a result, the Upper Bound Case model is discussed for the sensitivity analysis. A graphical summary of the predicted concentrations for all parameters under the Upper Bound Case conditions can be found in Appendix F2. Maximum concentrations predicted by the Upper Bound Case are approximately two to eight times greater than the maximum concentrations predicted by the Expected Case.

5.2.3.1 Selenium

Predicted Upper Bound Case selenium maximum concentrations (0.15 mg/L) are approximately eight times greater than the Expected Case concentrations (0.0185 mg/L). Upper bound selenium concentrations are above the BCWQG-Wildlife (0.002 mg/L), but are less than two orders of magnitude greater than the guideline. Maximum selenium concentrations with the Upper Bound Case are reached at the same time as the Expected Case (end of Operations II).

5.2.3.2 Cadmium

Predicted Upper Bound Case cadmium concentrations (0.005 mg/L) are approximately 2.5 times the Expected Case concentrations (0.0021 mg/L). No MMER discharge criteria or BCWQG-Wildlife have been developed for cadmium. Maximum selenium concentrations with the Upper Bound Case are reached at the same time as the Expected Case (end of Operations II). Compared with the Expected Case results, Upper Bound Case results show very similar concentration trends.

5.2.3.3 Copper

Predicted Upper Bound Case copper concentrations are approximately double the Expected Case predictions during Operations I. Predicted Upper Bound case copper concentrations closely follow predictions for the Expected Case during Operations II, Closure and Post-Closure. Solubility limits applied to the mill (0.036 mg/L) restrict the maximum possible concentration for copper in both models. An elevated spike does occur within the Upper Bound Case model prior to the onset of Operations II. This is explained by a combination of the increased loading during Operations I combined with the small volume in the Open Pit as filling commences. Upper Bound Case copper concentrations (maximum concentration of 0.078 mg/L maximum) are not expected to exceed MMER discharge limits or the BCWQG-Wildlife.

5.2.3.4 Additional Parameters

The following additional parameters have predicted Upper Bound Case concentrations above the BCWQG-Wildlife:

- Arsenic: predicted concentrations are above the BCWQG-Wildlife Max seasonally during Operations I and consistently during Operations II, and the first few years of Closure. Maximum predicted Upper Bound arsenic concentrations 0.028 mg/L, which is slightly above the 0.025 mg/L guideline.
- Molybdenum: predicted concentrations are above the BCWQG-Wildlife Max seasonally during Operations I and consistently during Operations II, and the first 12 years of Closure. There is a large spike in Molybdenum concentrations during the filling of the Open Pit (0.68 mg/L). Outside

of this anomalous year, maximum molybdenum concentrations under Upper Bound conditions are predicted to be less than 0.1 mg/L.

- Mercury: predicted concentrations are above the BCWQG-Wildlife Max seasonally during Operations I and for the duration of Operations II and closure. Under Upper Bound conditions, the maximum predicted mercury concentration (outside of construction) is 0.00041 mg/L, approximately 4.5 times the maximum Expected Case concentrations (0.00009 mg/L).

5.3 P-CREEK

5.3.1 Summary of Trends

The P-Creek catchment is located down-gradient of the Non-PAG Waste Rock Stockpile and PAG LGO Stockpile. The location of unrecovered seepage discharge will vary over the life of the project, and may be impacted by both seasonal and annual trends. Judgment was used to determine an expected range of water quality based on sensitivity to discharge location. Water quality predictions included an Unrecovered Seepage Sensitivity analysis, previously described in Section 3.8, to determine an expected range of water chemistry in P-Creek based on sensitivity to discharge location. Consideration was given to the strengths of each groundwater modelling technique to form a reasonable range for expected case water quality in P-Creek.

The following parameters are predicted to potentially be above aquatic life guidelines:

- Total copper: peak baseline concentrations are above the BCWQG-30 D and CEQG.
- Selenium: peak concentrations have potential to seasonally be above BCWQG-30 D during operations, ranging up to 0.0061 mg/L.

5.3.2 Expected Case Concentrations - Key Parameters

Watershed modelling completed for the Project indicated that seepage pathways from the Non-PAG Waste Rock Stockpile, PAG LGO Stockpile and associated WMPs are not expected to report directly to P-Creek. Rather seepage flows were predicted to report further downstream in Harper Creek, in vicinity to HM. Open Pit seepage is expected to report north to Baker Creek and is not anticipated to affect water quality in the P-Creek catchment. As such, there are no predicted Project-related water chemistry influences to P-Creek in the Expected Case. Concentrations modelled at this node reflect loading attributed from non-contact, background sources.

Total copper is the only parameter expected to be above the BCWQG-30 D and CEQG. As discussed above, all concentrations within P-Creek reflect loading attributed to background levels.

5.3.3 Sensitivity Analysis

Since no mine-related loading reports to P-Creek in the watershed model, results from the Upper Bound Case equal those of the Expected Case and similarly results of the 5th and 95th Precipitation Case equal that of the Expected Case. Total copper is the only parameter expected to be above the BCWQG-30 D and CEQG. As discussed above, all concentrations within P-Creek reflect loading attributed to background levels.

Selenium is predicted to be above the aquatic life guideline in P-Creek in the Unrecovered Seepage Sensitivity Model. Most other parameters are noted to increase to varying degrees; selenium is the

only parameter that is predicted to be above guidelines as a result of the variation in the flow pathways modeled for this unrecovered seepage. Discussion of the key parameters follows.

5.3.3.1 Selenium

- Predicted selenium concentrations are expected to be above CEQG for the duration of the model. Predicted selenium concentrations show a clear increase during Operations I and II, as a result of loading from the PAG LGO Stockpile and concentrations decrease in Closure once the stockpile is processed. Peak concentrations are expected to be approximately 0.0061 mg/L. Predicted selenium concentrations are seasonally above the BCWQG-30 D for the majority of Operations I and II and below this guideline in Closure and Post-Closure.

5.3.3.2 Cadmium

- The Seepage Sensitivity Case predicts cadmium concentrations that are similar to the Expected Case, and not elevated above any guidelines.

5.3.3.3 Copper

- Peak concentrations are approximately 0.0038 mg/L and are predicted to be seasonally above the CEQG and BCWQG-30 D for the duration of the model, as a result of baseline loading.

5.4 T-CREEK

5.4.1 Summary of Trends

Concentrations within T-Creek show minor increases during Operations I and II from unrecovered seepage. Parameters with elevated background concentrations (ammonia, aluminum, beryllium, chromium, iron, lead, mercury, and thallium), show less influence. The TMF begins to discharge at the start of closure (Year 31); discharge water first enters T-Creek, and subsequently travels downstream to node HT. Concentrations of most parameters[7] are at their maximum at Year 31/32 and decrease during the remainder of Closure and Post-Closure; however, trends in T-Creek are the same as the TMF and some parameter concentrations trend upwards as a result of transfer of water from the Open Pit to the TMF in Post-Closure. Cadmium and zinc predicted concentrations increase to their maximum value as a result of from loading in the Open Pit. Mercury and aluminum were noted to reach their maximum concentration within the TMF as a result of the influx of Open Pit loading but show maximum concentrations in T-Creek during Operations I as a result of background loading. Other parameters show subtle influence as a result of the load influx from the Open Pit.

T-Creek flows in Closure range from 66% to 94% of TMF effluent under average climate conditions. These flows are summarized in Table 5.1.

[7] With the exception of parameters affected by background loading.

Table 5.1 Proportion of Closure Flow in T-Creek that is TMF Effluent

Month	TMF Spillway Discharge (L/s)	T-Creek Total Flow (L/s)	Proportion of Effluent to Total Flow
Jan	65	78	0.84
Feb	129	142	0.90
Mar	181	193	0.94
Apr	409	484	0.84
May	1,371	2,001	0.69
Jun	1,693	2,426	0.70
Jul	367	534	0.69
Aug	94	127	0.74
Sep	97	118	0.82
Oct	166	188	0.89
Nov	73	86	0.85
Dec	70	82	0.85

NOTES:
1. FLOWS EXTRACTED FROM H3T/AREA 5 NODE THE LIFE OF MINE WATERSHED MODEL AT YEAR 44 (KP, 2014a).

The following parameters have predicted Expected Case concentrations above provincial or federal aquatic life guidelines:

- Fluoride: Predicted concentrations are just above the CEQG during Years 31 and 32, but are below the BCWQG-Max.
- Sulphate: Predicted sulphate concentrations are above the BCWQG-30 D for the duration of Closure and Post-Closure.
- Aluminum: Predicted aluminum concentrations are seasonally above the BCWQG-30 D during Operations and early Closure and decrease to below the guideline in late Closure and remain below through Post-Closure.
- Cadmium: Total and dissolved cadmium are above relevant guidelines during various project phases and are discussed further below.
- Copper: Total and dissolved copper concentrations are predicted to be above the BCWQG-Max and CEQG during Post-Closure (additional information provided below).
- Selenium: Predicted concentrations are greater than BCWQG-30 D and CEQG during a portion of Closure, and throughout Post-Closure (additional information provided below).
- Zinc: Predicted zinc concentrations are above the BCWQG-30 D for the majority of Post-Closure.

5.4.2 Expected Case Concentrations - Key Parameters

5.4.2.1 Selenium

Predicted Expected Case selenium concentrations follow the overall trend described above. Peak selenium concentrations are predicted to rise to approximately 0.012 mg/L at Year 31. Predicted peak selenium concentrations in T-Creek are very similar to those observed in the TMF at that time (approximately 0.015 mg/L), due to the small amount of dilution available in T-Creek. Concentrations decrease after Year 31 and reach an equilibrium average concentration just under 0.005 mg/L in Post-Closure. Seasonal fluctuations are noted for selenium, with lower concentrations predicted during spring freshet. By far, the largest loading source in T-Creek is the TMF discharge

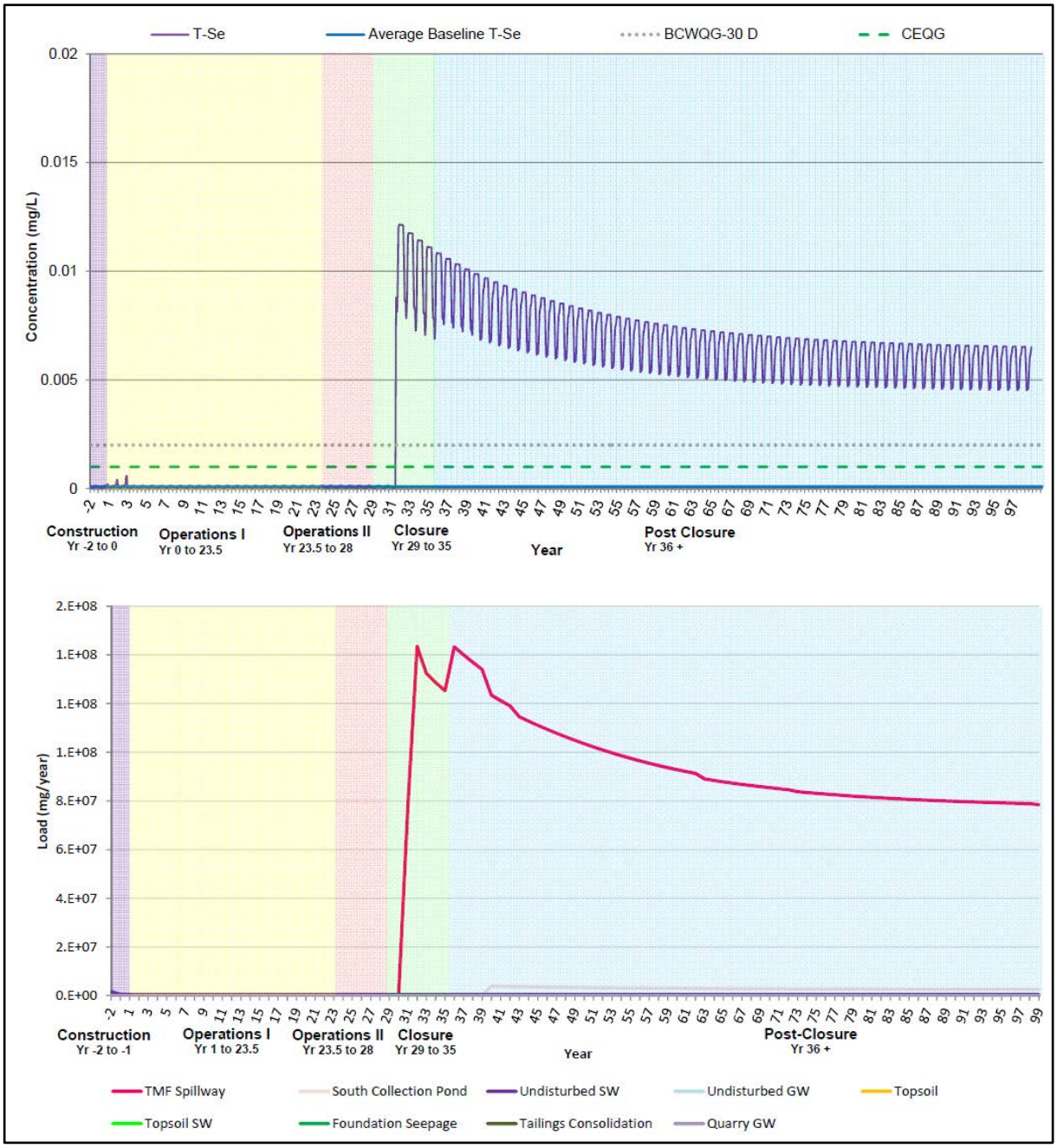
spillway loading. The load from this source dwarfs all other Project-related sources of loading (Figure 5.7). Predicted selenium concentrations are above the BCWQG-30 D and CEQG after Year 31 and for the duration of modelled time.

5.4.2.2 Cadmium

Predicted Expected Case cadmium concentrations show a slightly different trend when compared with selenium. Peak cadmium concentrations (approximately 0.00011 mg/L) are predicted to be reached at Year 52, not at Year 31 when the TMF spillway commences discharge. This corresponds to the time that maximum cadmium concentrations are predicted to occur in the TMF, as a result of load influx from the Open Pit. Cadmium concentrations are predicted to decrease to below 0.00006 mg/L in late Post-Closure (Figure 5.8). Predicted total cadmium concentrations are just above the CEQG seasonally during Construction, Operations and the first few years of Closure. After discharge of the TMF spillway, predicted total cadmium concentrations are expected to be above the CEQG for approximately half of the year. During Post-Closure, once water from the Open Pit increases the load in the TMF, predicted total cadmium concentrations are above CEQG for the duration of Post-Closure. Dissolved cadmium concentrations follow a similar trend; however, dissolved cadmium exceeds just the BCWQG-30 D (not the CEQG) seasonally during Construction, Operations and the first few years of Closure.

5.4.2.3 Copper

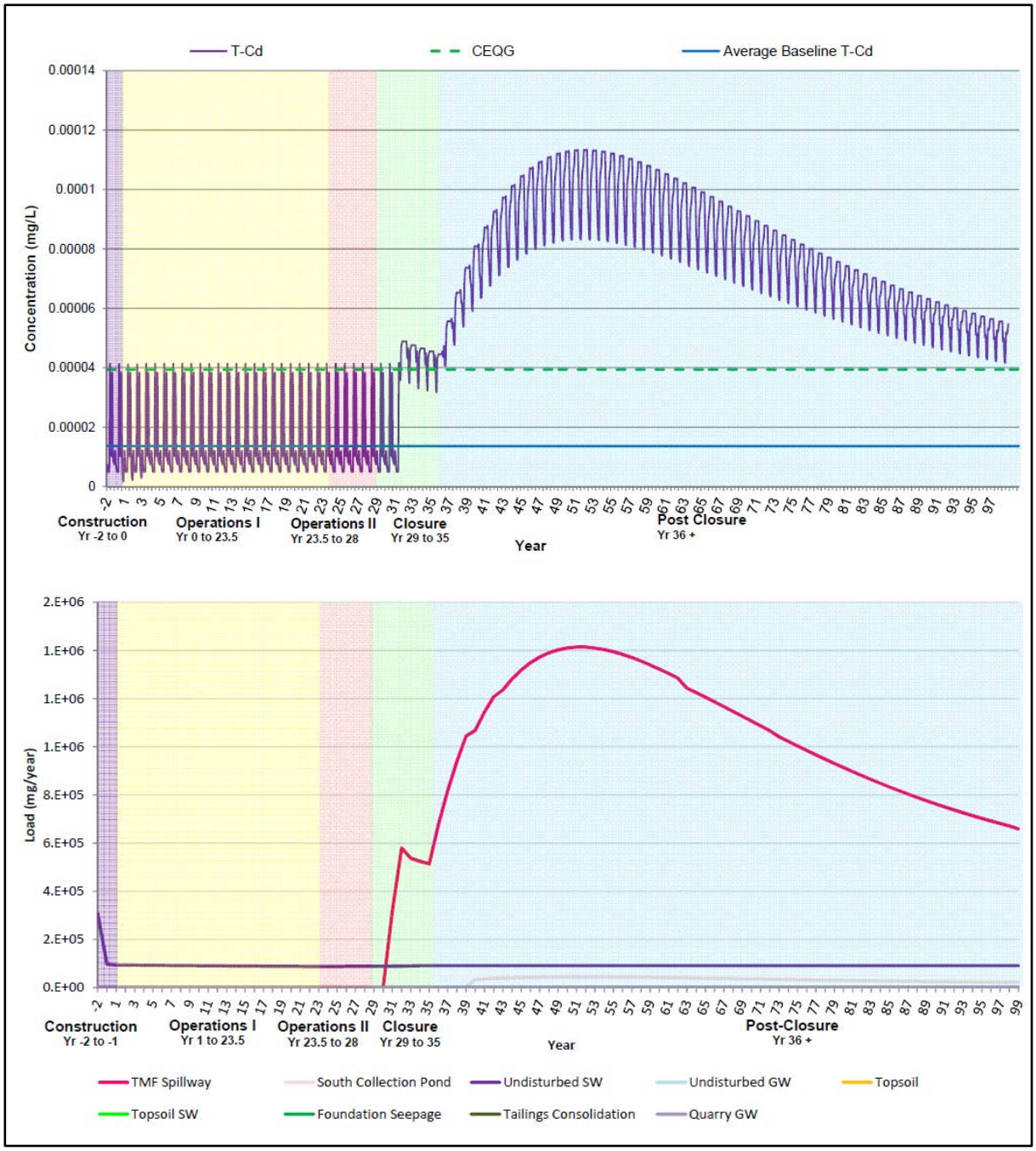
Peak Expected Case copper concentrations (approximately 0.0052 mg/L) are predicted to occur at Year 31, similar to selenium; however, Post-Closure copper concentrations show some effect from the transfer of water from the Open Pit to the TMF (similar to predicted cadmium concentrations). Expected Case total and dissolved copper are predicted to be above the BCWQG-Max for the majority of the year for a portion of Closure and the majority of Post-Closure. Expected Case copper concentrations are predicted to be below the BCWQG-Max at the end of model time. Predicted copper concentrations are below the applicable MMER discharge limits (0.30 mg/L mean, 0.60 mg/L max) and BCWQG-Wildlife (0.3 mg/L) (Figure 5.9).



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 31.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.
3. THE BCWQG-WIDLIFE MAX IS A FIXED VALUE.

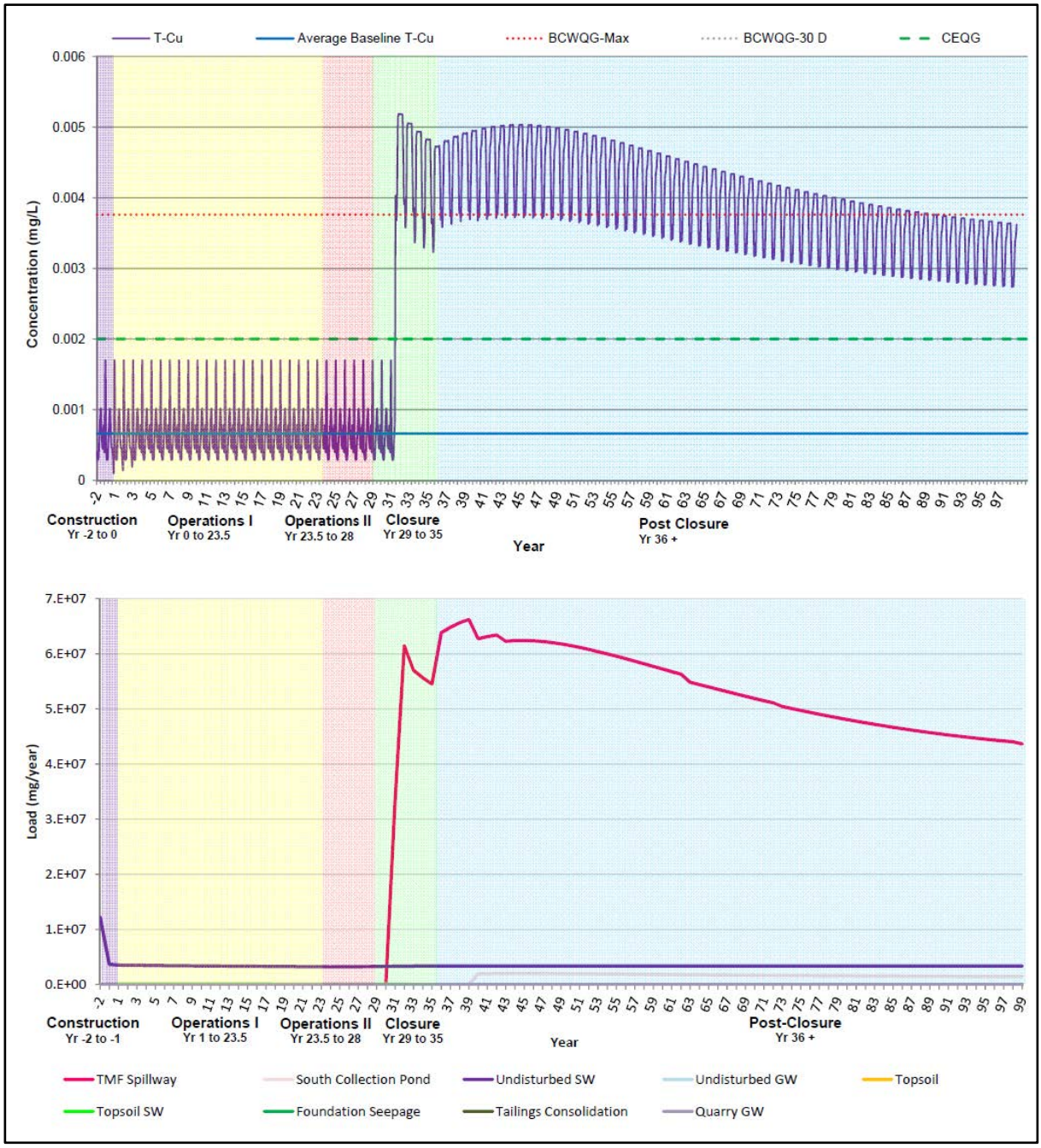
Figure 5.7 Selenium T-Creek Concentrations and Sources of Loading



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 31.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

Figure 5.8 Total Cadmium T-Creek Concentrations and Sources of Loading



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 31.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.
3. ALL GUIDELINES ARE FIXED VALUES.
4. BCWQG-WILDLIFE (0.3 mg/L), MMER MEAN (0.3 mg/L) AND MMER MAX (0.6 mg/L) ARE NOT SHOWN.

Figure 5.9 Total Copper T-Creek Concentrations and Sources of Loading

5.4.3 Sensitivity Analyses

The Upper Bound Case was deemed the most conservative sensitivity analysis to understand the upper bound limits for predicted T-Creek concentrations. Upper Bound Case results for T-Creek are provided in Appendix F4. Maximum concentrations predicted by the Upper Bound Case range from approximately three to twenty times greater than the maximum concentrations predicted by the Expected Case.

The parameters that are expected to be above provincial and federal aquatic life guidelines under Upper Bound Case conditions include:

- Aluminum: Predicted Upper Bound Case aluminum is expected to be seasonally above the BCWQG-30 D and below the CEQG / BCWQG-Max during Operations I and II. Predicted Upper Bound Case aluminum is expected to be continually above the BCWQG guideline for the duration of Closure and Post-Closure, and rises to be seasonally above the CEQG / BCWQG-Max for the last 20 years of the model.
- Cadmium: Total and dissolved cadmium are expected to be above aquatic life guidelines for the duration of Closure and Post-Closure, and are less elevated during Operations I and II (further discussion below).
- Cobalt: Predicted Upper Bound Case cobalt is expected to be above the BCWQG-30 D, but below the BCWQG-Max during the majority of Closure and duration of Post-Closure.
- Copper: Predicted Upper Bound Case total and dissolved copper are expected to be above BCWQG-Max and BCWQG-30 D for the majority of Closure and duration of Post-Closure (discussion below).
- Chromium: Upper Bound Case chromium is expected to be above BCWQG-Max and CEQG for the majority of Closure and duration of Post-Closure.
- Fluoride: Upper Bound Case fluoride is expected to be just above the CEQG, but below the BCWQG-30 D for a portion of Closure and Post-Closure.
- Mercury: Upper Bound Case mercury is expected to be above BCWQG-30 D and CEQG for the majority of Closure and duration of Post-Closure.
- Silver: Upper Bound Case silver is expected to be above BCWQG-30 D, but below BCWQG-Max / CEQG for the majority of Closure and a portion of Post-Closure.
- Manganese: Upper Bound Case manganese is expected to be above BCWQG-30 D and BCWQG-Max for the majority of Closure and a portion of Post-Closure.
- Selenium: Upper Bound Case selenium is expected to be above BCWQG-30 D and CEQG for the majority of Closure and duration of Post-Closure (discussed further below).
- Sulphate: Upper Bound Case sulphate is expected to be above BCWQG-30 D for the majority of Closure and duration of Post-Closure.
- Zinc: Upper Bound Case zinc is expected to be above BCWQG-30 D and below CEQG for the majority of Closure and duration of Post-Closure.

5.4.3.1 Selenium

Predicted Upper Bound Case selenium concentrations (0.035 mg/L) are between three to five times greater than the Expected Case concentrations (0.012 mg/L). Upper bound selenium concentrations are above the BCWQG-Wildlife (0.002 mg/L), but are less than two orders of magnitude greater than the guideline. Maximum selenium concentrations with the Upper Bound Case are reached during the same year as the Expected Case (Year 31). Compared with the Expected Case, Upper Bound Case results show greater effects from the Open Pit load transfer to TMF during Post-Closure.

5.4.3.2 Cadmium

Predicted maximum Upper Bound Case cadmium concentrations (0.00029 mg/L) are approximately three times greater than the Expected Case concentrations (approximately 0.00011 mg/L). No MMER criteria or BCWQG-Wildlife have been developed for cadmium. Maximum selenium concentrations with the Upper Bound Case are reached during the same year as the Expected Case (Year 52). Compared with the Expected Case results, the Upper Bound Case results show similar trends that are increased in magnitude.

5.4.3.3 Copper

Predicted maximum Upper Bound Case copper concentrations (0.095 mg/L) are approximately nineteen times greater than the Expected Case concentrations (0.0052 mg/L). Upper Bound Case copper concentrations are not expected to exceed MMER discharge limits or the BCWQG-Wildlife. The peak concentration for cadmium under the Upper Bound conditions is predicted to occur at Year 31, consistent with predictions for the Expected Case. The concentration trend for predicted Upper Bound cadmium concentrations is slightly altered when compared to the expected case in two ways:

1. The effects of ore processing during Operations I are pronounced in the Upper Bound case, and
2. Less effect from the load transfer from the Open Pit to TMF during Post-Closure.

6 – RECEIVING ENVIRONMENT WATER QUALITY PREDICTIONS

6.1 HARPER CREEK

6.1.1 General

The Harper Creek drainage is situated east of the proposed Project area, and is a key waterbody within the receiving environment. Four receiving environment water quality model nodes are located within Harper Creek (upstream to downstream): HP, HM, HT and HB. These sites are shown on Figure 3.1. Harper Creek runs North-South and the most northerly (upstream) node HP is located in Harper Creek below the confluence with P-Creek. Concentrations at this node are calculated based on background loading reported in P-Creek and background loading that reports upstream of HP, within the main stem of Harper Creek. The P-Creek catchment is located down-gradient of the Non-PAG Waste Rock Stockpile and PAG LGO Stockpile. The location of unrecovered seepage discharge from these facilities will vary over the life of the project, and may be impacted by both seasonal and annual trends. Judgment was used to determine an expected range of water quality based on sensitivity to discharge location. Water quality predictions included an Unrecovered Seepage Sensitivity analysis, previously described in Section 3.8, to determine an expected range of water chemistry at HP based on sensitivity to discharge location. Consideration was given to the strengths of each groundwater modelling technique to form a reasonable range for expected case water quality Harper Creek at HP.

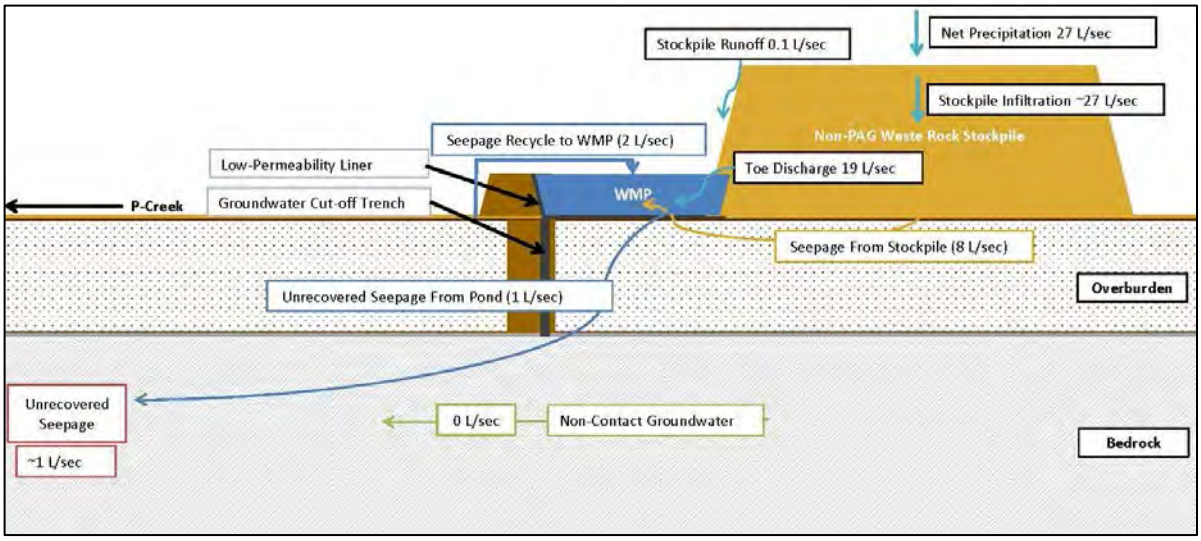
Harper Mid (HM) is the second most northerly model node located in Harper Creek. This model node is situated at a point in Harper Creek where all mine-related loading (unrecovered seepage losses) are expected to be intercepted from the PAG LGO Stockpile and the Non-PAG Waste Rock Stockpile, and associated WMPs. The majority of mine-related loading at HM is attributed to the Non-PAG Waste Rock and PAG LGO Stockpiles. A seepage pathway schematic for the Non-PAG Waste Rock Stockpile has been provided on Figure 6.1. Seepage from the Open Pit is not expected to report to Harper Creek (KP, 2014c). The PAG LGO Stockpile is processed by the end of Operations II. Loading at this node substantially decreases as the stockpile is milled, and LGO materials are removed from the surface at Closure.

Model node HT is located in Harper Creek, downstream of the confluence with T-Creek. Water quality predictions at this node are based on a culmination of background and mine-related loads that report to HM and T-Creek. Node HT is where all mine affected loads are predicted to surface on the western side of the project area. A seepage pathway schematic for the TMF is provided in Figure 6.2.

The most southerly node within Harper Creek is the model node HB[8]. This node is located just upstream of the confluence with the Barrière River at the outlet of North Barrière Lake. Water quality at this site includes all mine-related loads that are expected to report into this drainage and a substantial volume of natural runoff.

Baseline water hardness in Harper Creek decreases with distance downstream and T-Creek water hardness is similar to that of Lower Harper Creek. Baseline water hardness at each site has been used to calculate all hardness dependent water quality guidelines.

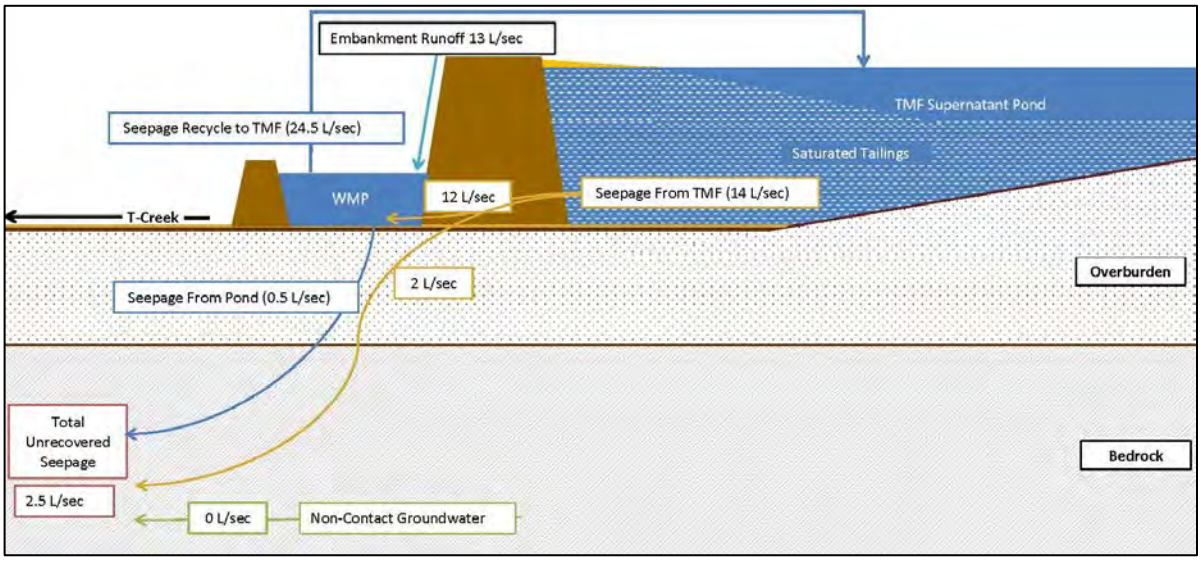
8 HB is referred to as both Harper Creek above Barrière River or Lower Harper Creek.



NOTES:

1. FIGURE ADOPTED FROM FIGURE 5.7 OF THE WATERSHED MODELLING REPORT (KP, 2014a).
2. FLOW RATES ARE PROVIDED FOR A SNAPSHOT YEAR DURING OPERATIONS I (YEAR 20). POST-CLOSURE FLOW RATES ARE SIMILAR TO ABOVE EXCEPT POST-CLOSURE SEEPAGE RATES FROM STOCKPILE ARE REDUCED BY 25% DUE TO COVER.

Figure 6.1 Non-PAG Waste Rock Stockpile Seepage Schematic



NOTES:

1. FIGURE ADOPTED FROM FIGURE 5.6 OF THE WATERSHED MODELLING REPORT (KP, 2014a).
2. SEEPAGE RECYCLE TO THE TMF CONTINUES UNTIL YEAR 40.
3. THE FLOW RATES SHOWN ABOVE ARE TAKEN FROM THE CLOSURE FLOW PERIOD WHEN THE WMP IS STILL BEING PUMPED BACK TO THE TMF.

Figure 6.2 TMF Seepage Schematic

6.1.2 Summary of Trends

The majority of loads from the Non-PAG Waste Rock Stockpile in the P-Creek Valley are captured in the WMP and are pumped back to the TMF. Upper Harper Creek (HP) is predicted to be unaffected by this facility in the Expected Case. All uncaptured seepage from the Non-PAG Waste Rock Stockpile and the PAG LGO Stockpile are expected to surface further down in Harper Creek, and are captured in the predictions for the Expected Case at model node HM. The location of unrecovered seepage discharge from these facilities will vary over the life of the project, and may be impacted by both seasonal and annual trends. Judgment was used to determine an expected range of water quality based on sensitivity to discharge location. Water quality predictions included an Unrecovered Seepage Sensitivity analysis, previously described in Section 3.8, to determine an expected range of water chemistry at HP based on sensitivity to discharge location.

All predicted changes in water quality at HM in Closure and Post-Closure are due to seepage losses from the Non-PAG Waste Rock Stockpile because the PAG LGO is processed during Operations II and seepage losses from this facility end at Closure. The only parameter predicted to be above the aquatic life guidelines at HM as a result of mine loadings is selenium. Predicted concentrations of selenium are only above guidelines towards the end of Operations I and II and they rapidly decrease at Closure when the LGO is processed.

Predicted parameter concentrations at model node HT are very similar to HM during Operations I and II, as the only new loads that affect water quality downstream of HM over these mine phases are due to unrecovered seepage from the TMF and runoff from the rock quarry. A marked increase in some parameter concentrations is noted at HT at Closure when the pond elevation in the TMF reaches the spillway and water from the TMF begins to discharge to T-Creek and then flows downstream into Harper Creek. Parameters that were predicted to increase in concentration in the TMF in Post-Closure when excess water from the Open Pit is seasonally transferred to the TMF also increase at HT; peak Post-Closure concentrations vary for these parameters but typically are predicted to occur between Years 44 and 50, after which concentrations trend downwards. The majority of the parameters were not predicted to increase at model node HT in Post-Closure and downward concentration trends were noted through Post-Closure.

The trends in predicted parameter concentrations in Lower Harper Creek (HB) were similar to HT, but concentrations were typically lower due to dilution from natural catchment runoff.

The following parameters have predicted Expected Case concentrations above either the provincial or federal aquatic life guidelines:

- Aluminum: Predicted dissolved aluminum is above the BCWQG-30 D, as a result of background loading. As a result, this parameter is not discussed futher.
- Copper: Predicted total and dissolved copper are expected to be above aquatic guidelines at every node within Harper Creek. Elevated total copper concentrations predicted at HP and HM are a result of background loading, while the remaining predicted concentrations are a result of mine loading (further discussion below).
- Cadmium: Dissolved cadmium is expected to be above aquatic life guidelines during Closure at HT and Post-Closure at HT and HB (further discussion below).
- Selenium: Predicted selenium concentrations are expected to be above aquatic guidelines at various phases within HB, HM and HT (further discussion below). Peak concentrations at HP have the potential to seasonally be above BCWQG-30 D and CEQG during operations based on the Unrecovered Seepage Sensitivity Case, ranging up to 0.006 mg/L.

6.1.3 Expected Case Concentrations - Key Parameters

Cadmium, copper and selenium are the only parameters that are predicted to be elevated above the aquatic life guidelines under Expected Case conditions as a result of loading from mine contact water sources within Harper Creek. Cadmium and copper were also noted to be elevated within the watershed in baseline water quality samples.

6.1.3.1 Selenium

Selenium is the only parameter that is predicted to be above guidelines at HM as a result of mine related loading. Predicted total and dissolved copper concentrations are above the BCWQG-Max and CEQG; however, this is a result of background loading. Selenium concentrations are low during baseline and during Construction; however, groundwater seepage primarily from the PAG LGO Stockpile results in predicted selenium concentrations that increase over the course of Operations I. Predicted selenium concentrations are above the BCWQG-30 D seasonally towards the end of Operations I and through Operations II. With load contributing from both primary and secondary PAG LGO Stockpile flow pathways, selenium concentrations reach their maximum concentration of 0.0028 mg/L during operations (Year 27), as shown in Table 6.1. After the processing of the PAG LGO is completed, no load addition from the LGO remains and concentrations decrease rapidly. Concentrations and loading graphs for selenium at model node HM are provided on Figure 6.3.

Predicted selenium concentrations at HT rise during Operations II to the same maximum concentration noted at HM (0.0028 mg/L), since there is minimal dilution modelled between the HM and HT nodes. Concentrations decrease slightly and then rise at Year 31 in response to discharge from the TMF, and rise again at Year 36, when more water is released from the TMF as a result of additional water from the Open Pit. Peak concentrations occur in Year 36 at a value of 0.0059 mg/L, after which average selenium concentrations generally decrease, but show large seasonal fluctuations. Concentrations are elevated slightly when water from the Open Pit is pumped to the TMF (Year 36). Selenium concentrations reach equilibrium near the end of the modelled timeframe, with average concentrations just above 0.002 mg/L and seasonal fluctuations between 0.0012 mg/L and 0.0036 mg/L. Noticeable annual seasonality is observed in the modelled concentrations for selenium with lower concentrations consistently during periods of higher flow conditions (freshet) as there are minimal additional background loads for this parameter. Concentrations and loading graphs for model node HT are provided on Figure 6.4.

At model node HB, concentrations are approximately 50% of concentrations measured at HT, as a result of additional non-contact surface and groundwater that surfaces in this portion of the catchment (peak concentration is 0.0032 mg/L). Selenium baseline concentrations were typically low to non-detect and the predominant loading at HB is as a result of upstream Project-related sources. Concentrations and loading graphs for model node HB are provided on Figure 6.5. Of note, there seems to be disproportional dilution of the October peak flows during Closure when compared to Post-Closure. After water from the Open Pit is routed to the TMF, there will be an increased volume of discharge via the TMF spillway during Post-Closure, which minimizes the amount of dilution between HT and HB.

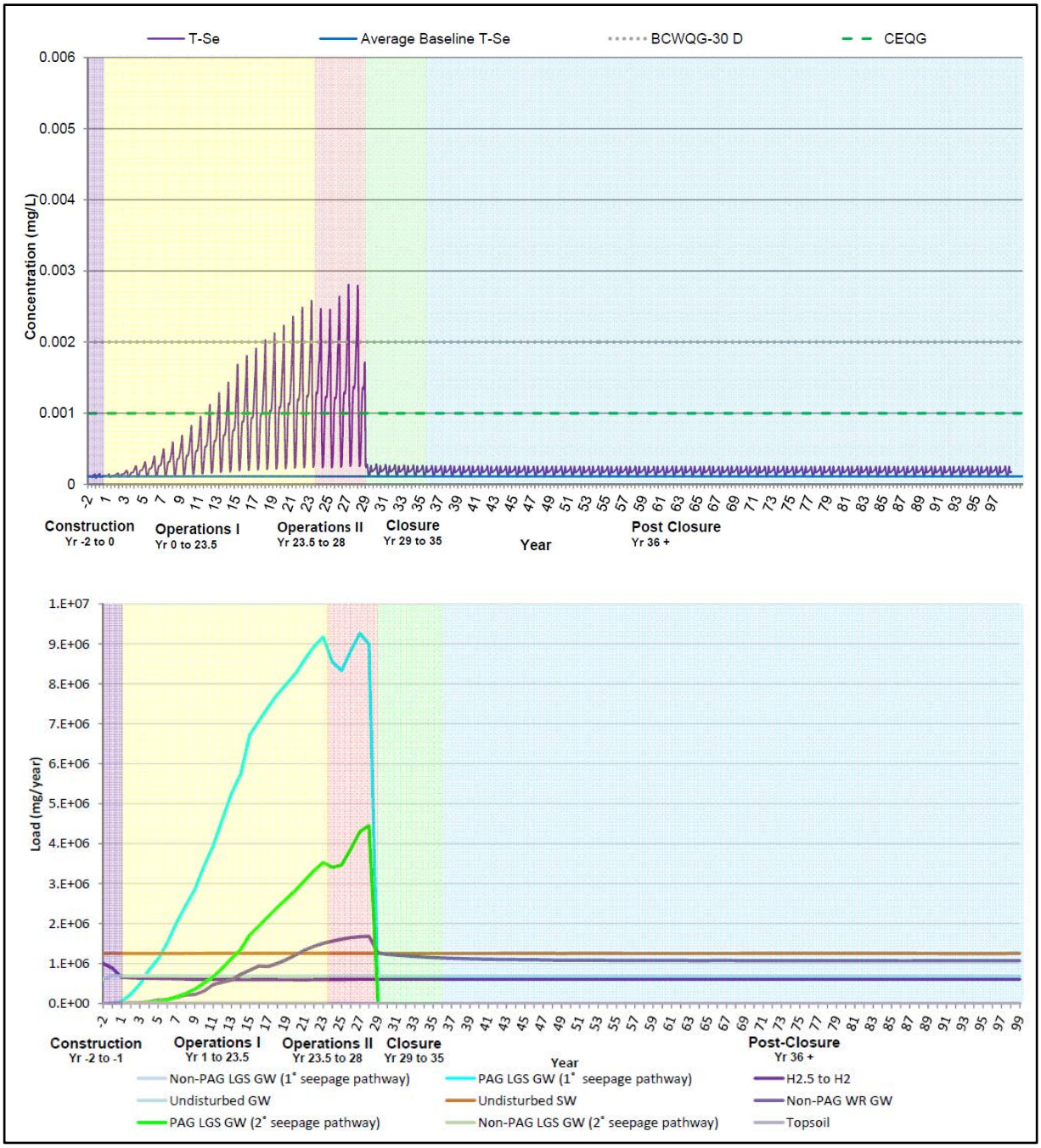
Seasonality in the predicted water quality for selenium are demonstrated on Figure 6.6. Background levels of selenium remain below applicable guidelines. Project-related loading sources tend to increase concentrations during lower-flow months (January, February, March and October) during Operations I and Operations II, and during Closure and Post-Closure, greater loading from TMF discharge elevates concentrations year round, but lower concentrations are still predicted to occur during spring freshet due to low background levels of selenium.

Table 6.1 Harper Creek Selenium Concentration Summary

Node	Operations I			Operations II			Guidelines	
	Minimum	Average	Maximum	Minimum	Average	Maximum	CEQG	BCWQG-30 D
H4P	0.00010	0.00015	0.00021	0.00010	0.00015	0.00021	0.0010	0.0020
HP	0.00010	0.00015	0.00021	0.00010	0.00015	0.00021	0.0010	0.0020
HM	0.00010	0.00062	0.0025	0.00024	0.00127	0.0028	0.0010	0.0020
HT	0.00010	0.00062	0.0025	0.00022	0.00125	0.0028	0.0010	0.0020
HB	0.00007	0.00026	0.0009	0.00014	0.00046	0.0010	0.0010	0.0020
Node	**Closure**			**Post-Closure**			**Guidelines**	
	Minimum	**Average**	**Maximum**	**Minimum**	**Average**	**Maximum**	**CEQG**	**BCWQG-30 D**
H4P	0.00010	0.00015	0.00021	0.00010	0.00015	0.00021	0.0010	0.0020
HP	0.00010	0.00015	0.00021	0.00010	0.00015	0.00021	0.0010	0.0020
HM	0.00011	0.00039	0.00275	0.00011	0.00018	0.00048	0.0010	0.0020
HT	0.0001	0.0019	0.0045	0.00114	0.00234	0.0059	0.0010	0.0020
HB	0.00008	0.00076	0.00203	0.00045	0.00098	0.0032	0.0010	0.0020

NOTES:

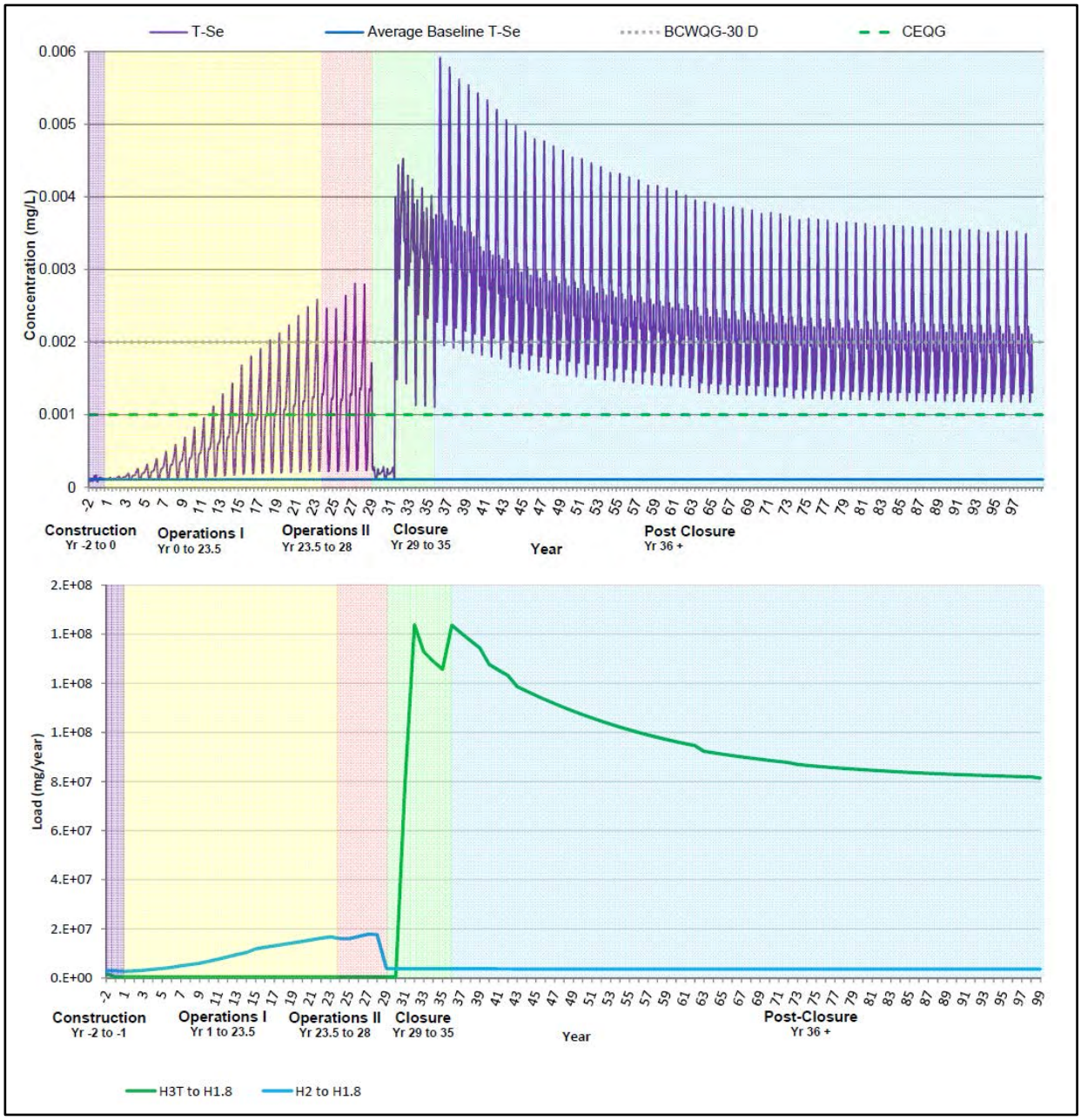
1. UNITS ARE mg/L.
2. RED HIGHLIGHTING INDICATES CONCENTRATIONS THAT ARE ABOVE THE BCWQG-30 D ONLY.
3. THE CEQG IS 0.001 mg/L; THE BCWQG-30 D IS 0.002 mg/L.
4. H4P NODE IS LOCATED ON HARPER CREEK, UPSTREAM OF THE CONFLUENCE WITH P-CREEK.
5. HP NODE IS LOCATED ON HARPER CREEK, DOWNSTREAM OF THE CONFLUENCE WITH P-CREEK.
6. HM NODE IS LOCATED WITHIN MID-HARPER CREEK, DOWNSTREAM OF P-CREEK AND SEEPAGE THAT REPORTS TO MID HARPER CREEK.
7. HT NODE IS LOCATED ON HARPER CREEK, DOWNSTREAM OF THE CONFLUENCE WITH T-CREEK.
8. HB NODE IS THE MOST DOWNSTREAM NODE ON HARPER CREEK.



NOTES:

1. OPERATIONS II INDICATES LGO PROCESSING.
2. SEEPAGE FROM THE LGO STOCKPILES CEASES ONCE THE STOCKPILES ARE REMOVED AT THE END OF OPERATIONS II.
3. HM NODE IS DOWNSTREAM OF HP AND UPSTREAM OF HT.

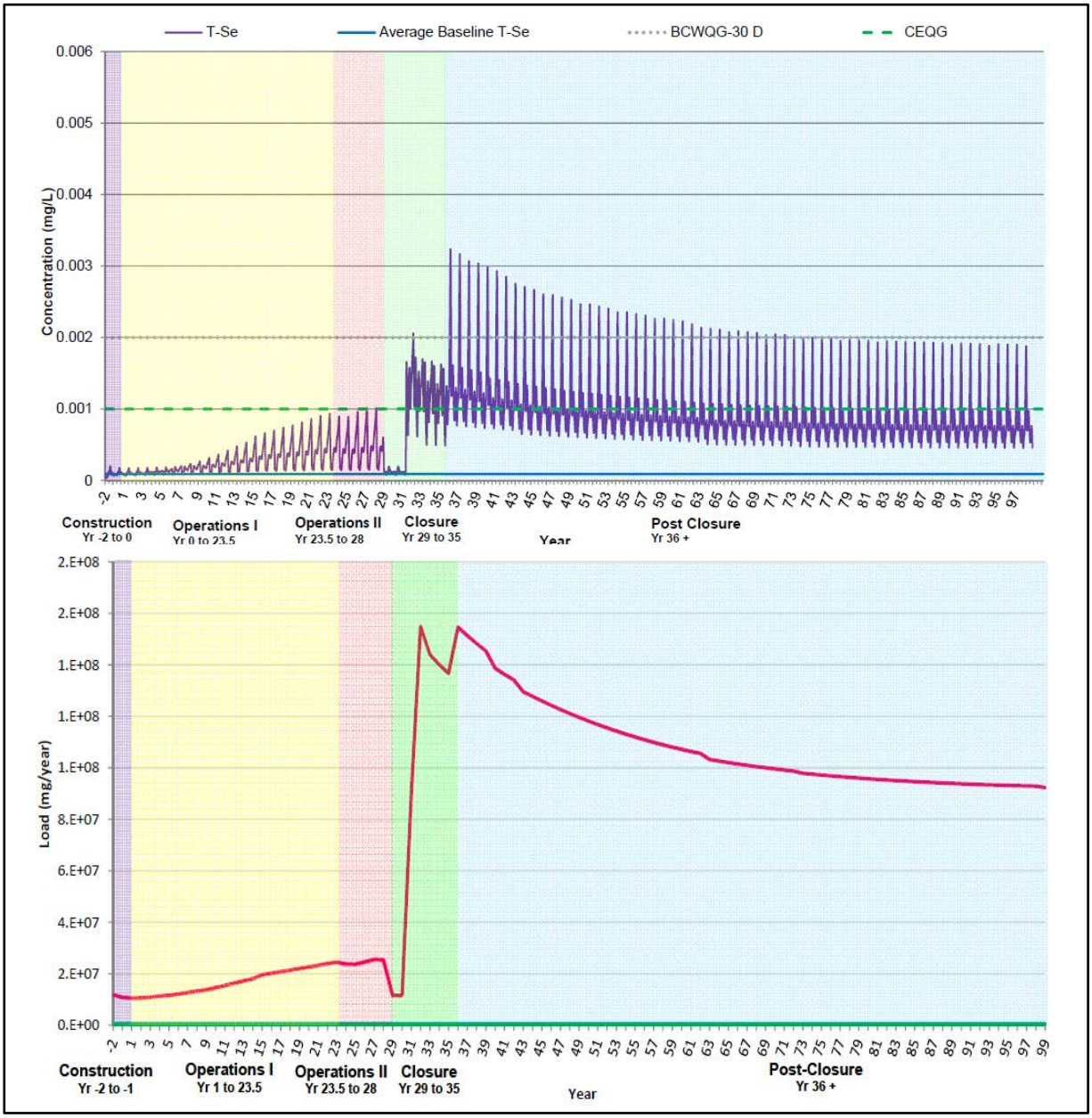
Figure 6.3 Selenium Concentrations and Loading Sources at Model Node HM



NOTES:

1. OPERATIONS II INDICATES LGO PROCESSING.
2. SEEPAGE FROM THE LGO STOCKPILES CEASES ONCE THE STOCKPILES ARE REMOVED AT THE END OF OPERATIONS II.
3. THE HT NODE IS DOWNSTREAM OF THE HM NODE.

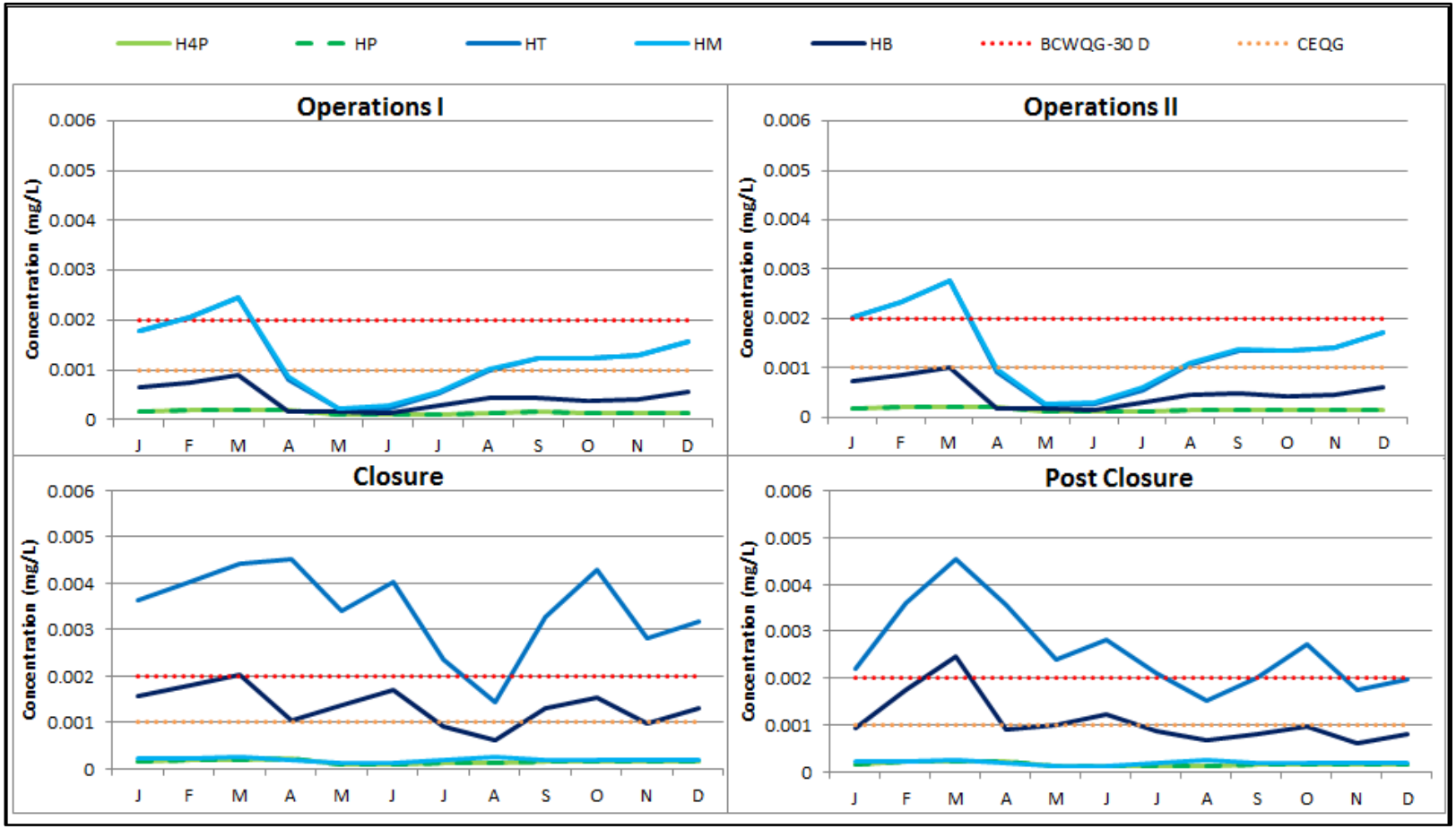
Figure 6.4 Selenium Concentrations and Loading Sources at Model Node HT



NOTES:

1. OPERATIONS II INDICATES LGO PROCESSING.
2. SEEPAGE FROM THE LGO STOCKPILES CEASES ONCE THE STOCKPILES ARE REMOVED AT THE END OF OPERATIONS II.
3. THE HB NODE IS THE MOST DOWNSTREAM NODE MODELLED ON HARPER CREEK.

Figure 6.5 Selenium Concentrations and Loading Sources at Model Node HB



NOTES:

1. SNAPSHOT YEAR PROVIDED FOR OPERATIONS I, OPERATIONS II, CLOSURE AND POST-CLOSURE ARE YEAR 22, 27, 29 AND 50, RESPECTIVELY.

Figure 6.6 Seasonal Snapshot - Selenium

6.1.3.2 Cadmium

The BCWQG-30 D (Draft) (MOE, 2014b) has been used as the primary guideline for comparison with the predicted cadmium results, which is for the dissolved fraction only. The predicted water quality for total and dissolved cadmium are very similar, though total cadmium baseline concentrations are higher during spring freshet, resulting in higher predicted total cadmium concentrations over this time frame compared to dissolved cadmium. Baseline water hardness in Harper Creek is higher in the upper watershed and decreases with distance downstream. Baseline water hardness was used to calculate the hardness dependent cadmium guidelines; model hardness was not used for this assessment. Summary statistics for dissolved cadmium by project phase are provided in Table 6.2.

Predicted cadmium concentrations are similar between model nodes in Operations I and II when concentrations at all nodes are affected by unrecovered seepage from the mine facilities and background sources. Concentrations are not predicted to be above the BCWQG-30 D (Draft) at any of the nodes during Operations. Cadmium concentrations decrease slightly at HM in Closure due to the removal of the PAG LGO Stockpile which is processed in Operations II, and are sustained at these lower levels through Post-Closure. Cadmium concentrations are predicted to increase at HT and HB in Closure when discharge from the TMF commences; however, predicted concentrations are not above the BCWQG-30 D. Predicted cadmium concentrations are expected to increase further during Post-Closure when water quality in the TMF is altered due to the transfer of water from the Open Pit. Cadmium concentrations trend upwards in Post-Closure at HT and HB until Year 52 when maximum concentrations are predicted (0.00063 mg/L at HT and 0.00039 mg/L at HB), after which concentrations trend downwards. Cadmium concentrations are predicted to be above the BCWQG-30 D (Draft) in Post-Closure phase at HT and HB but the guideline values when calculated using monthly average hardness at these locations are very similar to the predicted concentrations. At peak concentrations in Post-Closure the predicted concentrations are above the guideline half the year at both HT (February through July) and HB (February through March and May through July). Concentration trends at HB show the same pattern as HT; however, maximum concentrations are reduced as a result of non-contact surface water and groundwater inflows below HT. Concentration and loading time-series plots for model nodes HT and HB are provided on Figure 6.7and Figure 6.8, respectively.

Baseline water hardness is variable through the calendar year and to understand the magnitude by which the predicted cadmium concentrations are above the BCWQG-30 D (Draft) and the frequency that this is predicted to occur it is important to look at the monthly scale of the model. Seasonality in the predicted water quality for cadmium are demonstrated on Figure 6.9 for specific years during each phase of the model. Cadmium concentrations are only slightly higher at HB in August in Operations I and II, though the concentration range for all nodes varies by less than 0.00001 mg/L on an annual basis during these mine phases. Predicted cadmium concentrations increase slightly in Closure at model nodes downstream of T-Creek, due to influences of discharge from the TMF, though again, seasonality is not distinct and the range of concentrations on an annual basis is still small. The annual concentration range increases in Post-Closure but is typically restrained to 0.000025 mg/L between HB and HT.

Cadmium concentrations downstream of T-Creek are predicted to be higher under lower flow conditions however this seasonal trend is much more apparent as concentrations increase through

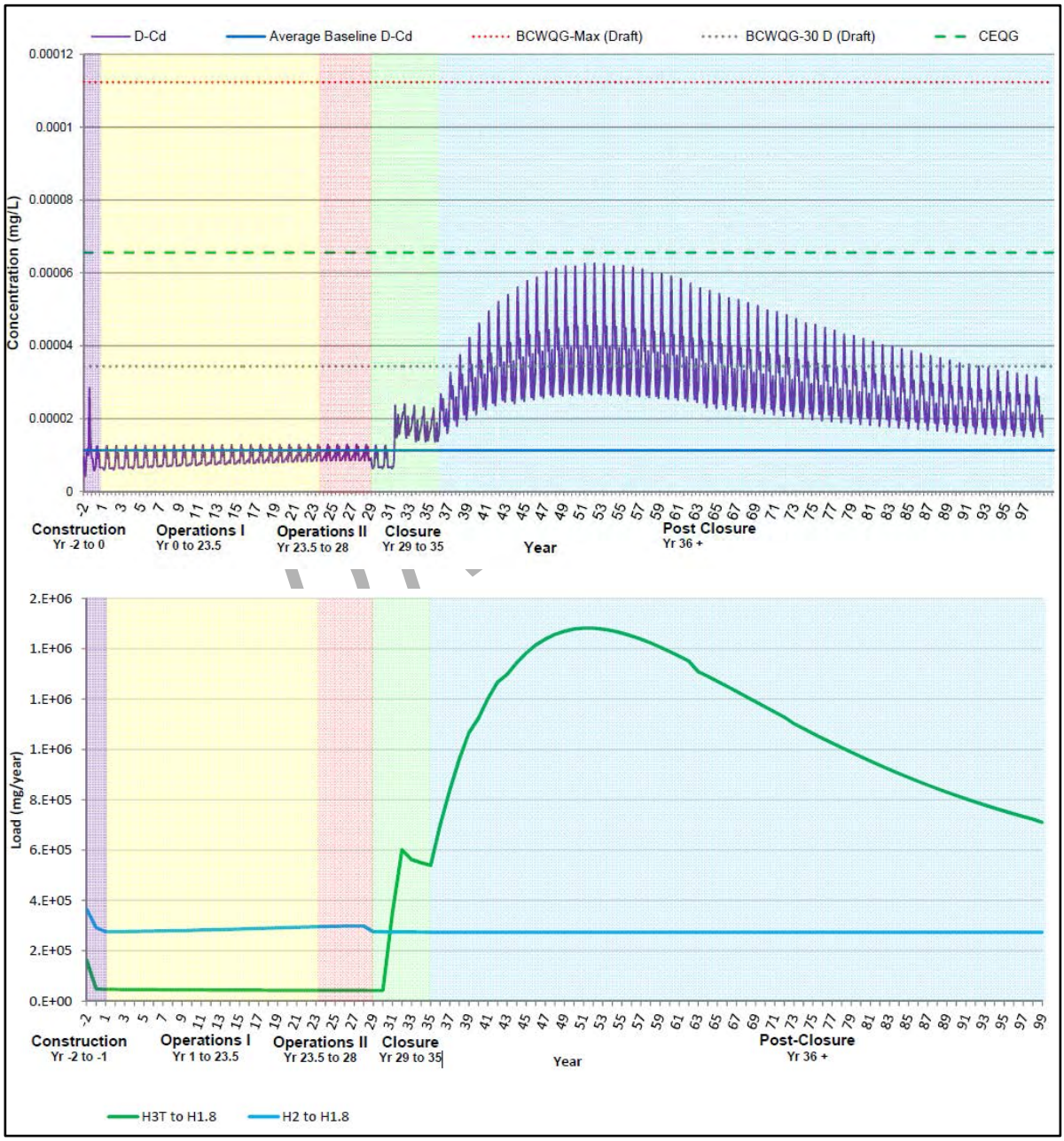
to Year 52 (Post-Closure). There is a connection between the predicted monthly cadmium concentrations in Post-Closure at HT and the proportion of flow in T-Creek that is comprised of effluent from the TMF (Table 5.1). The highest Post-Closure monthly concentrations are typically predicted to occur in February and March which coincides with the maximum proportion of TMF effluent in T-Creek (0.94 and 0.90, respectively) and the second highest peak is in October when the proportion of TMF effluent in T-Creek is 0.89 (3rd highest). Cadmium concentrations at HB are similarly distributed to HT but are lower due to dilution from background water sources. Baseline water hardness is relatively higher at both model nodes in March, but hardness is naturally lower in October. The factor by which cadmium concentrations are above guidelines at HT are greatest during October in Closure and Post-Closure due to the lower hardness, although highest concentrations are not predicted for this month. The seasonal variability in dissolved cadmium concentrations are provided for Closure and Post-Closure are on Figure 6.10. Post-Closure.

Table 6.2 Summary of Predicted Dissolved Cadmium Concentrations

Node	Operations I			Operations II			Guidelines			
	Minimum	Average	Max	Minimum	Average	Maximum	CEQG	BCWQG-30 D (Draft)	BCWQG-Max (Draft)	Baseline Hardness (mg/L CaCO3)
H4P	0.0000050	0.000009	0.000011	0.0000050	0.000009	0.000011	0.00012	0.000058	0.00023	68
HP	0.0000050	0.000009	0.000011	0.0000050	0.000009	0.000011	0.00012	0.000058	0.00023	68
HM	0.0000059	0.000009	0.000013	0.0000084	0.000010	0.000013	0.00007	0.000034	0.00011	35
HT	0.0000059	0.000009	0.000013	0.0000084	0.000010	0.000013	0.00007	0.000037	0.00012	38
HB	0.0000072	0.000011	0.000017	0.0000078	0.000011	0.000017	0.00004	0.000023	0.00006	20
Node	**Closure**			**Post-Closure**			**Guidelines**			
	Minimum	**Average**	**Max**	**Minimum**	**Average**	**Maximum**	**CEQG**	**BCWQG-30 D (Draft)**	**BCWQG-Max (Draft)**	**Baseline Hardness (mg/L CaCO3)**
H4P	0.0000050	0.000009	0.000011	0.0000050	0.000009	0.000011	0.00012	0.000058	0.00023	68
HP	0.0000050	0.000009	0.000011	0.0000050	0.000009	0.000011	0.00012	0.000058	0.00023	68
HM	0.0000063	0.000008	0.000013	0.0000063	0.000008	0.000013	0.00007	0.000034	0.00011	35
HT	0.0000063	0.000014	0.000024	0.0000136	0.000030	0.000063	0.00007	0.000037	0.00012	38
HB	0.0000073	0.000013	0.000018	0.0000098	0.000019	0.000039	0.00004	0.000023	0.00006	20

NOTES:

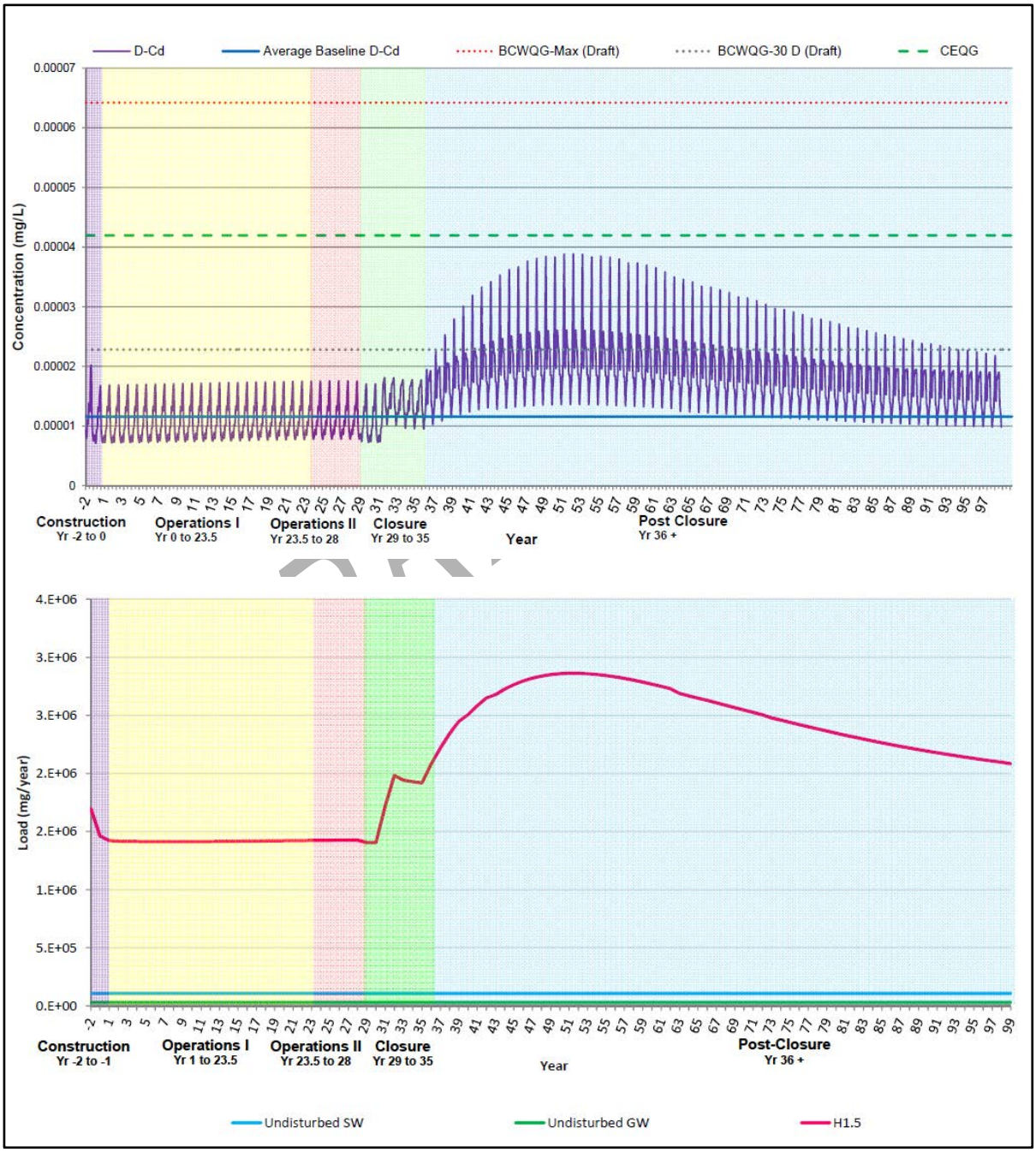
1. UNITS ARE mg/L.
2. RED HIGHLIGHTING INDICATES CONCENTRATIONS THAT EXCEED THE BCWQG-30 D (DRAFT).
3. GUIDELINES PRESENTED IN THE TABLE ARE CALCULATED BASED ON THE AVERAGE BASELINE HARDNESS AND DO NOT REPRESENT THE SEASONALITY OF THE DATA.



NOTES:

1. OPERATIONS II INDICATES LGO PROCESSING.
2. SEEPAGE FROM THE LGO STOCKPILES CEASES ONCE THE STOCKPILES ARE REMOVED AT THE END OF OPERATIONS II.
3. THE HT NODE IS DOWNSTREAM OF THE HM NODE.

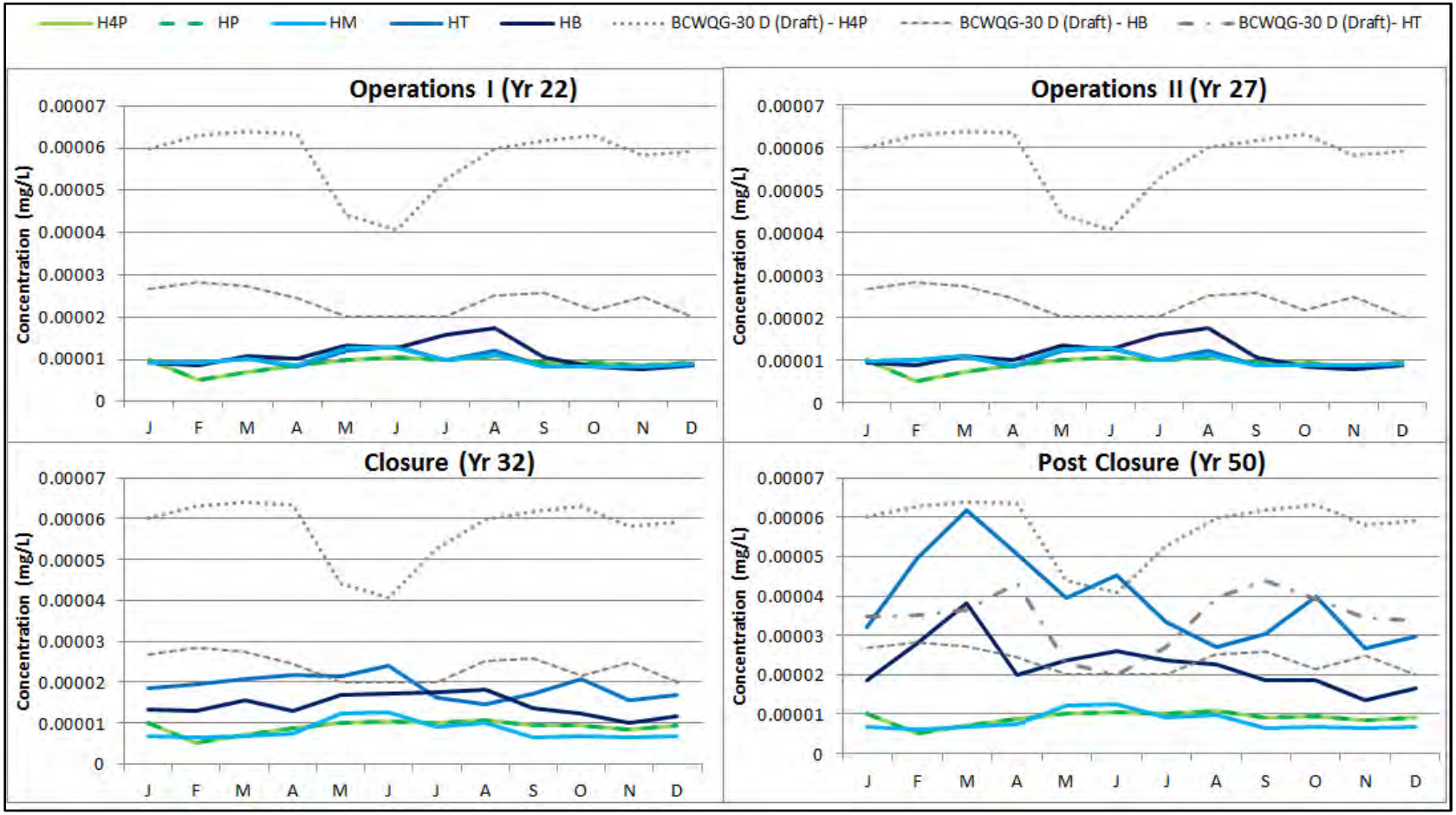
Figure 6.7 Dissolved Cadmium Concentrations and Loading Sources at HT



NOTES:

1. OPERATIONS II INDICATES LGO PROCESSING.
2. SEEPAGE FROM THE LGO STOCKPILES CEASES ONCE THE STOCKPILES ARE REMOVED AT THE END OF OPERATIONS II.
3. THE HB NODE IS THE MOST DOWNSTREAM NODE MODELLED ON HARPER CREEK.

Figure 6.8 Predicted Dissolved Cadmium Concentrations and Loading Sources at HB



NOTES:

1. SNAPSHOT YEAR PROVIDED FOR OPERATIONS I, OPERATIONS II, CLOSURE AND POST-CLOSURE ARE YEAR 22, 27, 29 AND 50, RESPECTIVELY.
2. HARDNESS DEPENDENT GUIDELINE PRESENTED ON THE GRAPH WERE CALCULATE USING THE MONTHLY AVERAGE HARDNESS FOR BASELINE SITE H4P AND FOR BASELINE SITE H1 (MODEL NODE HB); BASELINE HARDNESS IS NATURALLY LOWER IN LOWER HARPER CREEK COMPARED TO UPPER HARPER CREEK.

Figure 6.9 Seasonal Snapshot – Dissolved Cadmium

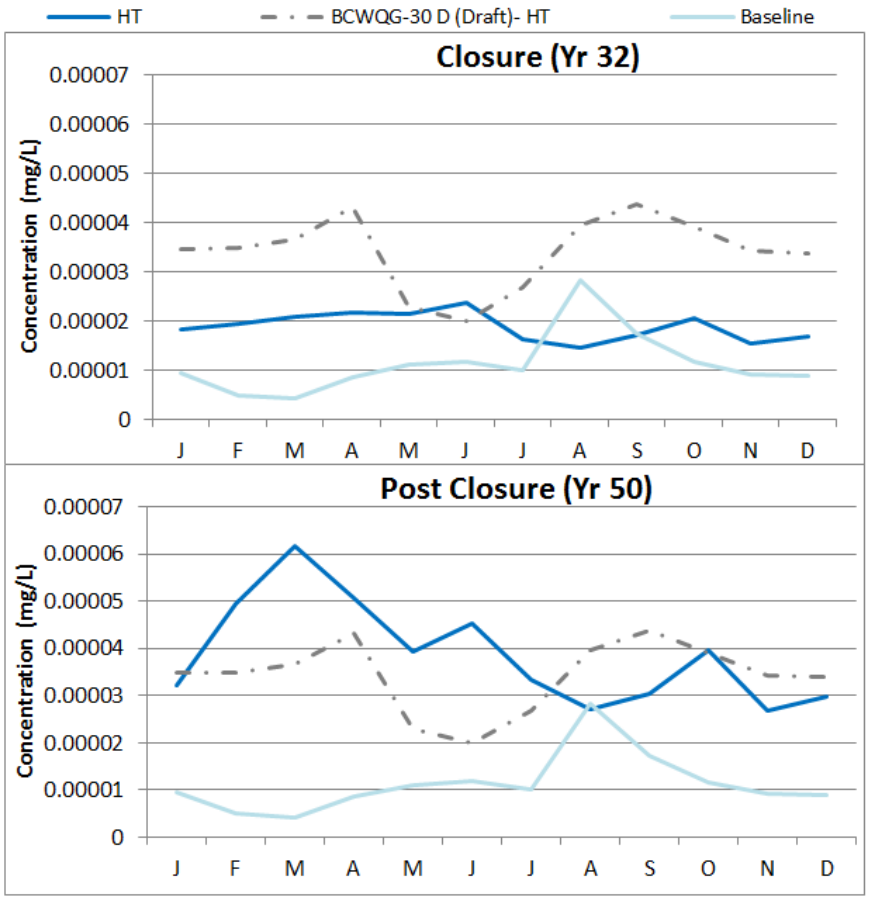


Figure 6.10 Seasonal Variability in Predicted Dissolved Cadmium Concentrations at HT

6.1.3.3 Copper

The BCWQG-30 D (MOE, 2014) and CEQG (CCME, 2014) were used as the primary guidelines for comparison with the predicted total copper results, as they are the most protective. Both of these guidelines are hardness-dependent. Baseline water hardness was used to calculate all guidelines for the purposes of this assessment. Water hardness is higher in the upper watershed and decreases with distance downstream. Summary statistics for baseline hardness, calculated guidelines and total predicted copper concentrations by project phase are provided in Table 6.3.

Predicted copper concentrations are similar between model nodes during Operations I and II, when concentrations at all nodes are affected by uncaptured seepage from the mine facilities and background sources. Maximum predicted copper concentrations are greater than the BCWQG-30 D and CEQG at all nodes during Operations. Copper is greatly influenced by seasonally higher background concentrations[9] in Harper Creek. These seasonally higher concentrations tend to be associated with freshet (May through July) and lower hardness. Note that an observed decrease of

[9] Baseline monthly average values at HP, HM and HT during June have measured surface water quality peaks of 0.0035 mg/L, 0.001 mg/L and 0.003 mg/L, respectively.

peak copper concentrations with distance downstream from the upper watershed occurs as result of different recorded freshet peaks at model nodes during baseline.

Loading at HT and HB during low-flow months shows a slight increase during Closure when discharge from the TMF commences. Once water from the Open Pit enters the TMF at Year 36, a further incremental loading increase occurs. Predicted copper concentrations at HT during Closure approach guidelines and are expected to be above the CEQG and BCWQG-30 D during freshet (May through July, consistent with background) and during October as a result of TMF spillway discharge. Predicted copper concentrations are not expected to be above the BCWQG-Max. Further down the watershed at HB, Closure concentrations are elevated compared to Operational concentrations but remain at or below applicable guidelines (December and June concentrations are just greater than guidelines). Freshet peaks as a result of baseline loading occur during Closure at HP, HM and HT. Note that the proportion of time predicted concentrations are expected to be above guidelines during project phases is overestimated in Figure 6.11. In this figure, seasonality is not considered when calculating the guideline.

Loading at HT and HB during low-flow months slightly increases during Post-Closure when compared to Closure. Similar effects from the TMF discharge and relocation of water from the Open Pit are noted during Closure as Post-Closure. Predicted concentrations at HT during Post-Closure are expected to report just above the CEQG and BCWQG-30 D during freshet and several low-flow months (March, April and October). The predicted concentrations at HT during low-flow months are not expected to be above the BCWQG-Max, however. HB concentrations during Post-Closure are reduced when compared to HT concentrations, as a result of non-contact surface water and groundwater inflows below HT. Predicted copper concentrations are not expected to be above any guidelines at model node HB. Concentration and loading time-series plots for model nodes HT and HB are provided on Figure 6.11and Figure 6.12, respectively.

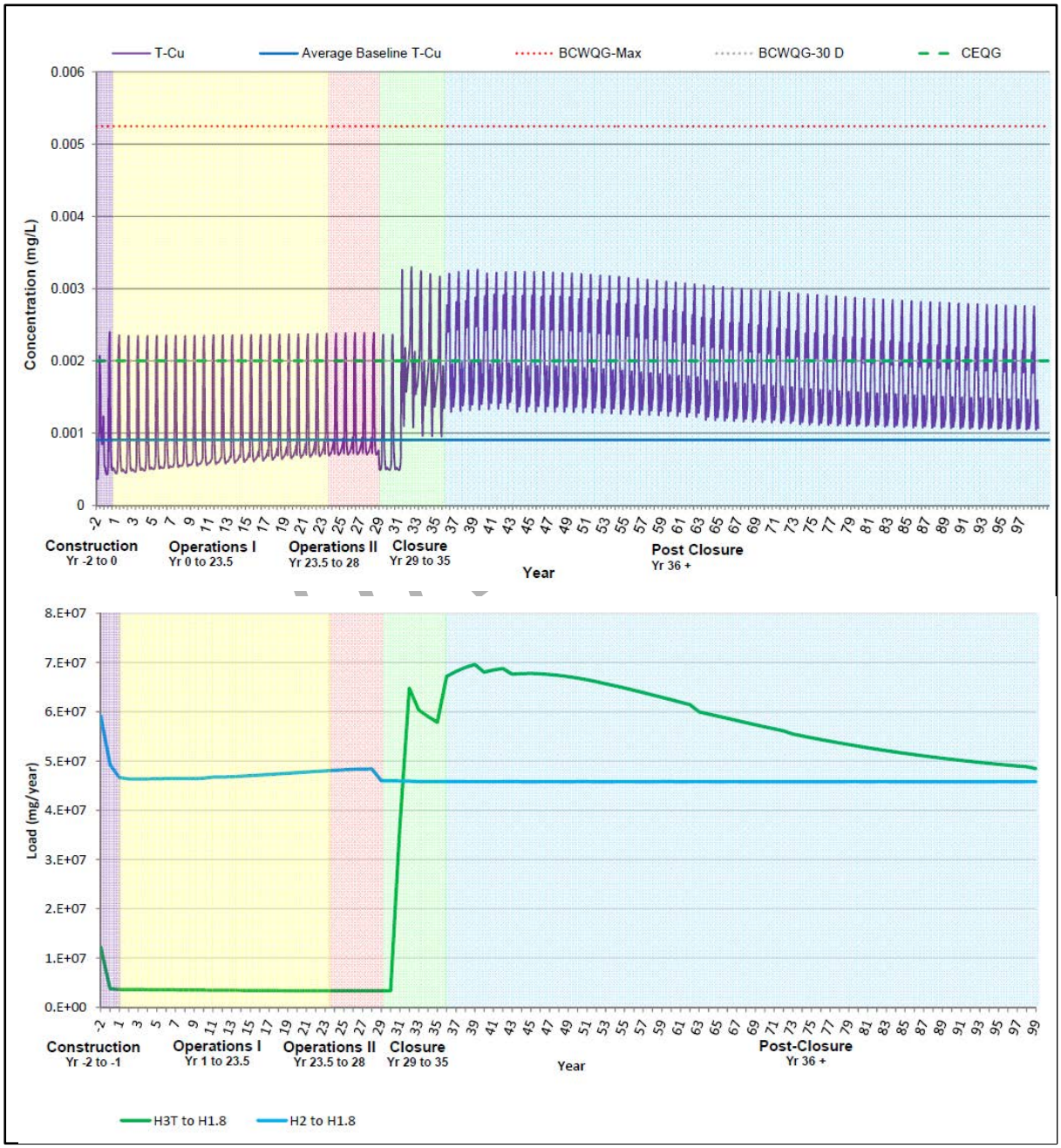
Baseline total copper concentrations show a distinct seasonal trend, with peak copper concentrations occuring during freshet. Under baseline conditions, freshet is also associated with the lowest hardness and the lowest guidelines. Predicted low-flow copper concentrations downstream of T-Creek during Closure and Post-Closure are slightly elevated as a result of TMF spillway discharge. Similar to cadmium, there is a connection between the predicted monthly low-flow copper concentrations during Post-Closure at HT and the proportion of flow in T-Creek that is comprised of effluent from the TMF (Table 5.1). The highest Post-Closure low-flow concentrations are predicted to occur in March and February, which coincides with the maximum proportion of TMF effluent in T-Creek (0.94 and 0.90, respectively) and the second highest peak is in October when the proportion of TMF effluent in T-Creek is 0.89 (3rd highest). Copper concentrations at HB are similarly distributed to HT but are lower due to dilution from background water sources. The seasonal variability for total copper concentrations are provided for Closure and Post-Closure are on Figure 6.13. As discussed above, seasonal trends in hardness vary with distance downstream from the upper watershed. The seasonality of the predicted copper concentrations and hardness dependent guidelines are shown on Figure 6.13. The seasonal trends at HT during Closure and Post-Closure are examined separately on Figure 6.14, to compare with site specific guidelines.

Table 6.3 Summary of Predicted Total Copper Concentrations

Node	Operations I			Operations II			Guidelines			
	Minimum	Average	Maximum	Minimum	Average	Maximum	CEQG	BCWQG-30 D	BCWQG-Max	Baseline Hardness (mg/L CaCO3)
H4P	0.00036	0.00097	0.0035	0.00036	0.0010	0.0035	0.0020	0.0027	0.0084	68
HP	0.00036	0.00097	0.0035	0.00036	0.0010	0.0035	0.0020	0.0027	0.0084	68
HM	0.00044	0.00098	0.0027	0.00069	0.0011	0.0027	0.0020	0.0020	0.0052	35
HT	0.00044	0.00093	0.0024	0.00069	0.0010	0.0024	0.0020	0.0020	0.0056	38
HB	0.00040	0.00088	0.0021	0.00051	0.0009	0.0021	0.0020	0.0020	0.0039	20
Node	**Closure**			**Post-Closure**			**Guidelines**			
	Minimum	**Average**	**Maximum**	**Minimum**	**Average**	**Maximum**	**CEQG**	**BCWQG-30 D**	**BCWQG-Max**	**Baseline Hardness (mg/L CaCO3)**
H4P	0.0004	0.0010	0.0035	0.00036	0.00097	0.0035	0.0020	0.0027	0.0084	68
HP	0.0004	0.0010	0.0035	0.00036	0.00097	0.0035	0.0020	0.0027	0.0084	68
HM	0.0005	0.0009	0.0027	0.00048	0.00090	0.0027	0.0020	0.0020	0.0052	35
HT	0.0005	0.0015	0.0033	0.00097	0.0019	0.0032	0.0020	0.0020	0.0056	38
HB	0.0004	0.0011	0.0024	0.00063	0.0013	0.0023	0.0020	0.0020	0.0039	20

NOTES:

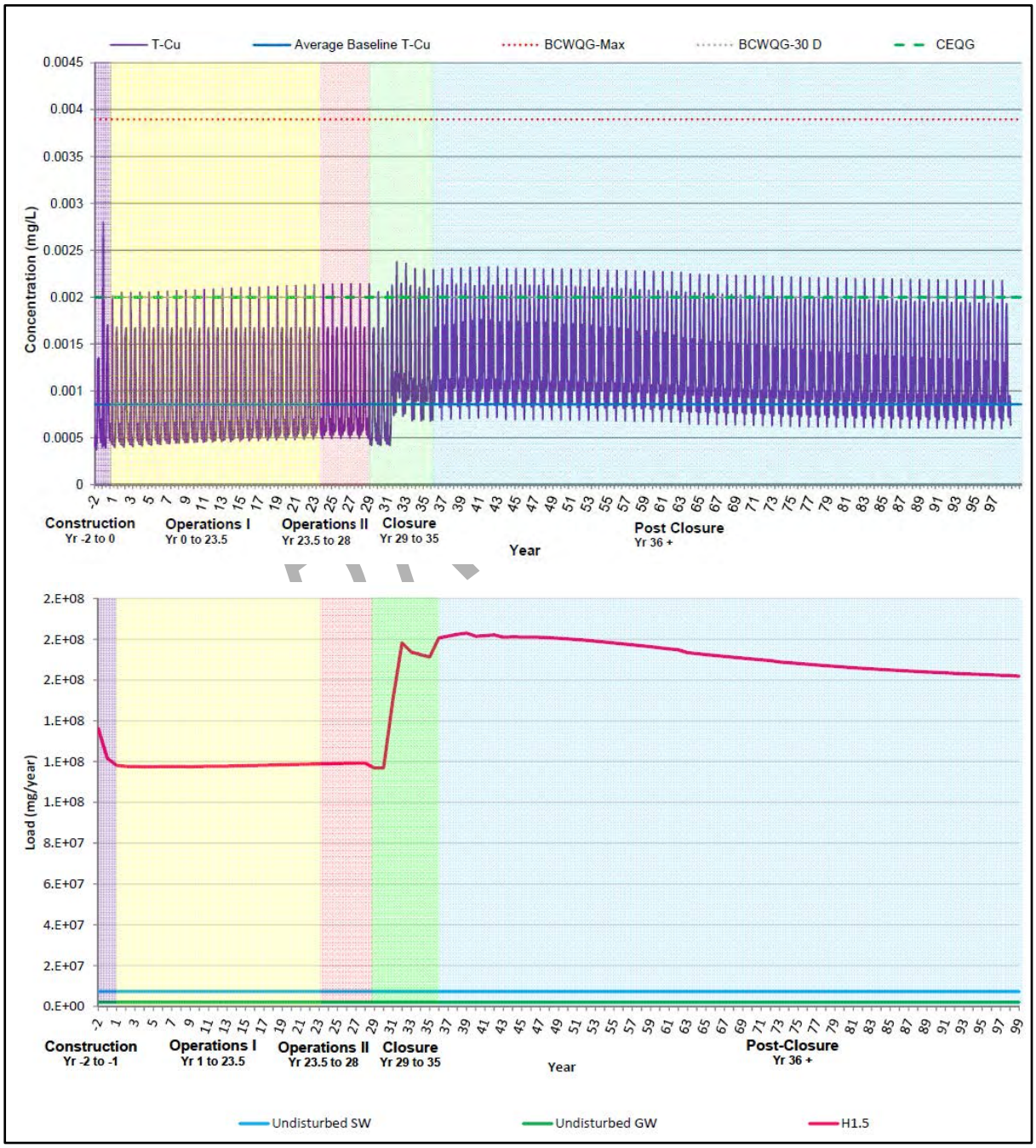
1. UNITS ARE mg/L.
2. RED HIGHLIGHTING INDICATES CONCENTRATIONS THAT EXCEED ONE OR MORE APPLICABLE GUIDELINES.
3. THE CEQG AND BCWQG-MAXS ARE 0.001 mg/L;THE BCWQG-AVG GUIDELINE IS 0.002 mg/L.



NOTES:

1. OPERATIONS II INDICATES LGO PROCESSING.
2. SEEPAGE FROM THE LGO STOCKPILES CEASES ONCE THE STOCKPILES ARE REMOVED AT THE END OF OPERATIONS II.
3. THE HT NODE IS DOWNSTREAM OF THE HM NODE.
4. ALL GUIDELINES ARE BASED ON AVERAGE BASELINE HARDNESS AND DO NOT REFLECT SEASONALITY.

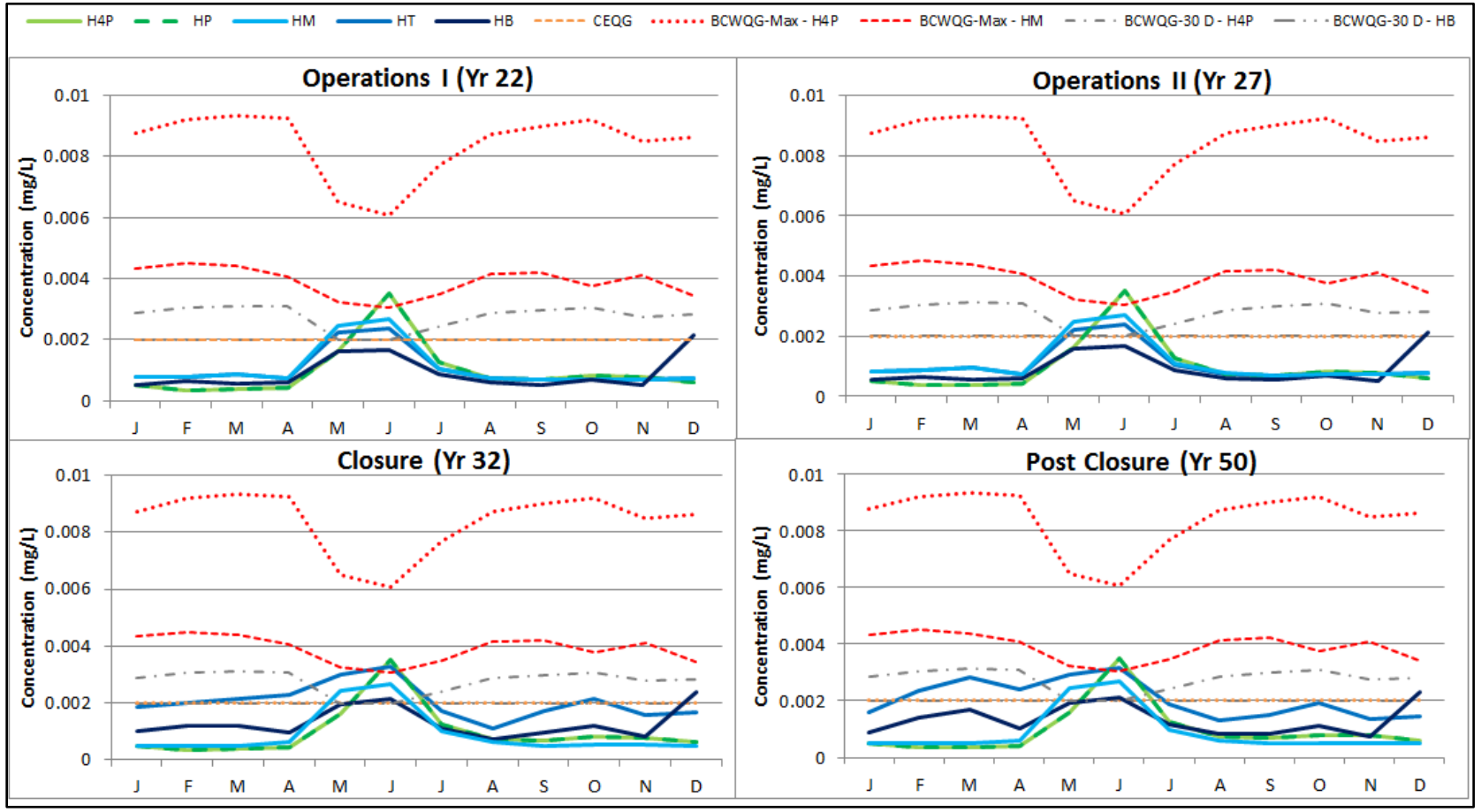
Figure 6.11 Predicted Copper Concentrations and Loading Sources at model node HT



NOTES:

1. OPERATIONS II INDICATES LGO PROCESSING.
2. SEEPAGE FROM THE LGO STOCKPILES CEASES ONCE THE STOCKPILES ARE REMOVED AT THE END OF OPERATIONS II.
3. THE HB NODE IS THE MOST DOWNSTREAM NODE MODELLED ON HARPER CREEK.

Figure 6.12 Predicted Copper Concentrations and Loading Sources at mode node HB



NOTES:

1. SNAPSHOT YEAR PROVIDED FOR OPERATIONS I, OPERATIONS II, CLOSURE AND POST-CLOSURE ARE YEAR 22, 27, 29 AND 50, RESPECTIVELY.

Figure 6.13 Seasonal Snapshot – Copper

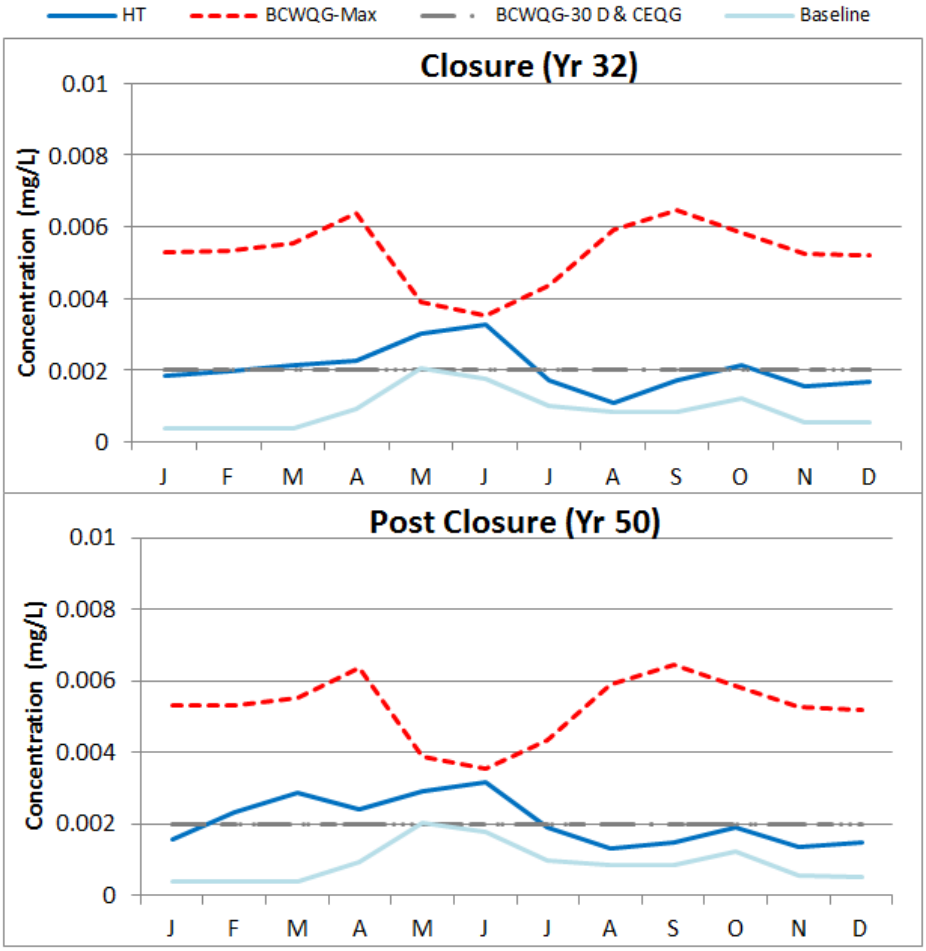


Figure 6.14 Seasonal Variability in Predicted Total Copper Concentrations at HT

6.1.4 Sensitivity Analysis

Three sensitivity analyses were completed within Harper Creek to determine the upper bound of predicted concentrations: Seepage Sensitivity Case, 5th and 95th Percentile Precipitation and Upper Bound cases. The Upper Bound Case is generally the most conservative sensitivity analysis. The Seepage Sensitivity Case results for Harper Creek are provided in Appendices E5, E6, E7 and E8. The 5th and 95th Percentile Precipitation case results are provided for HM, HT and HB in Appendices F1, F2 and F3. Upper Bound Case results for Harper Creek are provided in Appendices G5, G6, G7 and G8.

In addition to the key parameters discussed below, the following parameters also are above guidelines limits:

- Aluminum: Dissolved aluminum is predicted to be above BCWQG-30 D, but below CEQG and BCWQG-Max during all phases within HB under the 5th and 95th Percentile Precipitation Case and the Upper Bound Case. Elevated dissolved aluminum loading is a result of background concentrations. Elevated aluminum concentrations are also noted under the Upper Bound Case at HT, as a result of mine loading.

- Cadmium: Total and dissolved Upper Bound Case cadmium is expected to be above aquatic life guidelines during Closure and Post-Closure at HB and HT (discussed further below).
- Copper: Total copper is predicted to be above aquatic life guidelines at ever node within Harper Creek, during every mine phase under the P-Creek Sensitivity Case, the 5th and 95th Percentile Precipitation Case and the Upper Bound Case. This is as a result of both baseline loading and mine loading and is discussed further below.
- Cobalt: Predicted Upper Bound Case cobalt is expected to be above aquatic life guidelines during Closure and Post-Closure at HB and HT under the Upper Bound Case (discussed further below).
- Mercury: Predicted Upper Bound Case mercury is expected to be above aquatic life guidelines during Closure and Post-Closure at HT.
- Selenium: Predicted selenium concentrations are expected to be above aquatic guidelines under all of the sensitivity cases (discussed further below).
- Zinc: Predicted zinc concentrations are expected to go above the BCWQG-30 D at HT for just two years during Post-Closure in the Upper Bound Case and the 5th Percentile Case.

6.1.4.1 Selenium

- HP: The Unrecovered Seepage Sensitivity Case maximum selenium concentrations are similar to those predicted in P-Creek. Unrecovered Seepage Sensitivity Case concentrations are predicted to be seasonally above the BCWQG-30 D and CEQG with a peak concentration of 0.006 mg/L during Operations I and II, and the lowest concentrations predicted for the months of April through July. Selenium concentrations are predicted to decrease in Closure when the PAG LGO is processed, remaining below the BCWQG-30 D through Closure and Post-Closure and only seasonally above the CEQG through these phases.
- HM: Predicted maximum Upper Bound Case selenium concentrations (0.0041 mg/L) are 1.5 times greater than the Expected Case concentrations (0.0028 mg/L). Predictions for selenium under the maximum 5th and 95th percentile flow conditions indicate 5th percentile flows may increase predicted concentrations to 0.0046 mg/L (Year 27), while 95th percentile predictions are slightly below the Expected case (0.0027 mg/L). Seepage reporting from the Non-PAG Waste Rock Stockpile and LGO Stockpile would be altered depending on the amount of recharge to the stockpile (which is a function of precipitation). Upper Bound selenium concentrations and the 95th Percentile Precipitation cases are predicted to have seasonal peaks above the CEQG and BCWQG-30 D for the duration of Operations II and a portion of Operations I. During Closure and Post-Closure predicted Upper Bound Case selenium is not expected to be above any applicable guidelines.
- HT: Predicted maximum Upper Bound Case selenium concentrations (0.019 mg/L) are approximately three times the Expected Case concentrations (0.0059 mg/L). Maximum selenium concentrations predicted under 95th Percentile Precipitation is 0.01 mg/L, as a result of increased TMF discharge (year 28). With the exception of this year, the maximum values predicted by the 5th and 95th Percentile Precipitation cases are below 0.006 mg/L. Upper bound selenium concentrations are predicted to have seasonal peaks above the CEQG and BCWQG-30 D for a portion of Operations I and the duration of Operations II. During Closure and Post-Closure, predicted Upper Bound Case selenium concentrations remain elevated above both guidelines. It is worth noting that elevated concentrations in the Upper Bound Case in Closure and Post-Closure are first observed in the TMP and Open Pit concentrations.
- HB: Predicted maximum Upper Bound Case selenium concentrations (0.011 mg/L) are approximately three times than the Expected Case concentrations (0.0032 mg/L). Maximum selenium concentrations predicted under 95th Percentile Precipitation is 0.0067 mg/L, as a result of increased TMF discharge (Closure). Upper bound selenium concentrations are predicted to

have seasonal peaks above the CEQG and BCWQG-30 D for a portion of Operations I and the duration of Operations II. During Closure and Post-Closure, predicted Upper Bound Case selenium concentrations remain elevated above both guidelines.

6.1.4.2 Cadmium

- HM: Predicted Upper Bound Case dissolved cadmium concentrations are only slightly elevated when compared to the Expected Case values, and are not above guidelines. Predicted cadmium concentrations under the 5th and 95th Percentile Precipitation are not expected to be above a maximum of 0.000022 mg/L and are not expected to be above guidelines.
- HP: The Seepage Sensitivity Case predicts cadmium concentrations that are only slightly elevated when compared to the Expected Case, and not elevated above any guidelines.
- HT: Predicted maximum Upper Bound Case dissolved cadmium concentrations (0.00016 mg/L) are approximately three times greater than the Expected Case concentrations (0.000061 mg/L). Upper Bound Case cadmium concentrations at HT are predicted to be above the BCWQG-30 D for the duration of Post-Closure. Seasonal maximum concentrations are predicted to be above the CEQG and BCWQG-Max (draft) for portions of Post-Closure. Predicted cadmium concentrations under the 5th and 95th Percentile Precipitation cases are expected to reach a maximum of 0.000076 mg/L during Post-Closure, and surpass applicable guidelines.
- HB: Predicted maximum Upper Bound Case dissolved cadmium concentrations (0.000091 mg/L) are approximately three times greater than the Expected Case concentrations (0.000039 mg/L). Maximum cadmium concentrations predicted under 95th Percentile Precipitation is 0.000047 mg/L (year 51). Upper Bound Case cadmium concentrations at HB are predicted to be seasonally above the BCWQG-30 D for the majority of Post-Closure. Seasonal maximum concentrations are predicted to be above the CEQG and BCWQG-Max (draft) for portions of Post-Closure.

6.1.4.3 Copper

- HM: Upper Bound Case copper concentrations are predicted to have seasonal maximums of approximately 0.041 mg/L at HM. Predicted Upper Bound Case copper concentrations at HM are greater than the CEQG and BCWQG-30 D for the duration of Operations I and Operations II and are seasonally greater than the CEQG and BCWQG-30 D during Closure and Post-Closure. These concentrations only are above the BCWQG-Max on a seasonal basis during Operations I and Operations II. Predictions for copper under the 5th and 95th Percentile Precipitation cases do not predict copper concentrations above 0.004 mg/L, well below the maximum predicted by the Expected Case.
- HP: The Seepage Sensitivity Case predicts copper concentrations that are similar to predictions for the Expected Case, and are elevated above the CEQG and BCWQG-30 D.
- HT: Upper Bound Case copper concentrations are predicted to have seasonal maximums of approximately 0.043 mg/L (compared to 0.0032 mg/L under the Expected Case). Upper Bound Case copper concentrations are up to 14 times greater than expected case concentrations. Predicted Upper Bound Case copper concentrations at HT are greater than the CEQG and BCWQG-30 D from Year 9 onwards. Predicted Upper Bound Case copper concentrations are greater than the BCWQG-Max during Operations I, Operations II (seasonal exceedance) and Closure and Post-Closure (continual exceedance). Predicted copper concentrations under the 5th and 95th Percentile Precipitation cases are expected to reach a maximum of 0.0032 mg/L during Post-Closure, and are above the CEQG and BCWQG-30 D.
- HB: Upper Bound Case copper concentrations are predicted to have seasonal maximums of approximately 0.023 mg/L (compared to 0.0023 mg/L under the Expected Case). Maximum copper concentrations predicted under 95th Percentile Precipitation is 0.0033 mg/L (Closure).

Upper Bound Case copper concentrations are up to an order of magnitude greater than expected case concentrations. Predicted Upper Bound Case copper concentrations at HB are greater than the CEQG from Year 9 onwards. Predicted Upper Bound Case copper concentrations are greater than the BCWQG-Max during the majority of Operations I, Operations II (seasonally above guideline) and Closure and Post-Closure (continually above guideline until Year 45, seasonally above guideline Year 50+).

6.1.4.4 Other Parameters

The following parameters are expected to be above applicable guidelines under the Upper Bound Case conditions and not for the Expected Case conditions.

- Aluminum: Predicted Upper Bound Aluminum concentrations are expected to seasonally surpass the BCWQG-30 D for the duration of Post-Closure at HT and HB.
- Cobalt: Predicted Upper Bound Cobalt concentrations are expected to be above the CEQG and BCWQG-30 D seasonally for the duration of Operations II and a portion of Operations I at HM. Predicted Upper Bound Cobalt concentrations are expected to be above the BCWQG-30 D seasonally for a portion of Operations I, Operations II, Closure and Post-Closure at HT. Seasonal maximum concentrations for Upper Bound cobalt are predicted to be above the BCWQG-30 D for a portion of Post-Closure at node HB.
- Sulphate: Predicted Upper Bound Sulphate concentrations are expected to seasonally surpass the BCWQG-30 D during portions of Post-Closure at HT.
- Mercury: Predicted Upper Bound Mercury concentrations are expected to be above the BCWQG-30 D and CEQG for a portion of Closure and Post-Closure at HT.
- Zinc: Predicted Upper Bound Zinc concentrations are expected to be above the BCWQG-30 D for a portion Post-Closure at HT.

6.2 BAKER CREEK

6.2.1 General

The Baker Creek drainage is located northeast of the proposed Open Pit. Loading within Baker Creek is derived from non-contact surface water, non-contact groundwater, runoff from toposoil stockpiles and seepage from the Open Pit. In contrast to the previous design, a spillway from the Open Pit does not discharge into the receiving environment in Baker Creek. As a result, minimal contact water from the Open Pit enters Baker Creek. Seepage flows begin to report to the downstream receiving environment in Baker Creek once the Open Pit starts to fill with water (mid-way through Year 23). During operations, the pit is maintained in a fully dewatered conditions and thus there is assumed to be no seepage from the Open Pit during Operations I. Conceptually, excavation of the Open Pit caused water table draw down surrounding the pit and drives inflow from Baker Creek and P-Creek watersheds.

Baker Creek shows minimal effects from seepage derived from the Open Pit. Groundwater modelling completed indicates that all seepage reports to the Mid Baker Creek modelling node (BK1), and subsequently the Lower Baker Creek modelling node. Seepage loads from the Open Pit ranges from 3 mg/mon to 293 mg/mon and occurs during months with higher precipitation (May through October). Although Baker Creek has a small catchment, contact water makes up 0% to 11% of the flow reporting to Baker Creek. All Open Pit seepage is expected to report high in the Baker Creek catchment.

6.2.2 Expected Case Concentrations – Key Parameters

The only parameters that are above guideline limits are copper, chromium, and iron. The two modelled nodes in Baker Creek were examined (BK0 and BK1). Seasonal peaks predicted for these parameters are similar at the two nodes, and driven by background concentrations. Of note: predicted total copper is above guidelines in the BK1 node, and below guidelines in the BK0 node. The difference in hardness between the two sites, however, means there is a difference in the calculated average hardness guidelines. Mid Baker Creek (BK1) has hardness equal to 101 mg/L and Lower Baker Creek (BK0) has hardness equal to 144 mg/L.

Expected Case total copper concentrations for Mid Baker Creek (BK1) are predicted to have seasonal maximums of 0.0028 mg/L, just above the calculated CEQG, but below the BCWQG-30 D. Baseline concentrations at BK0 are 0.0028 mg/L during June. Expected Case total copper concentrations for Lower Baker Creek (BK0) are also 0.0027 mg/L, but these and report below CEQG and BCWQG-30 D due to different hardness at the two sites. Baseline concentrations at BK0 are 0.0027 mg/L during June. Copper concentration reported are a result of background loading.

Expected Case chromium concentrations are predicted to have seasonal peaks of 0.0011 mg/ at BK1 and BK0. Peak concentrations occur during one of the high flow months and are a result of background loading. Background chromium concentrations have peak values of 0.0016 mg/L and 0.001 mg/L at BK1 and BK0, respectively. Seasonal peaks at BK1 are slightly above the CEQG and BCWQG-Max (0.001 mg/L) are seasonal peaks at BK0 meet the CEQG and BCWQG-Max.

Expected Case total iron concentrations are predicted have maximum peaks equal to 0.78 mg/L and at BK1 and BK0. These peaks are above the CEQG but below the BCWQG-Max. Peak concentrations occur during one of the high flow months and are a result of background loading. Background iron concentrations have peak values of 0.76 mg/L and 1.22 mg/L at BK1 and BK0, respectively. Seasonal peaks for measured baseline concentrations and predicted concentrations at both nodes in Baker Creek are above the CEQG (0.5 mg/L).

6.2.3 Sensitivity Analyses

The Upper Bound Case was deemed the most conservative sensitivity analysis to understand the upper bound limits for predicted Baker Creek concentrations. Upper Bound Case results for Baker Creek are provided in Appendix F9 and F10.

The following Upper Bound Case parameters are expected to be above aquatic life guidelines, as a result of background loading:

- Chromium: Predicted Upper Bound Case chromium is expected to be above guidelines at both BK0 and BK1 for all mine phases, as a result of background loading.
- Copper: Predicted Upper Bound Case copper is expected to be above guidelines at BK1 for all mine phases, as a result of background loading.
- Iron: Predicted Upper Bound Case iron is expected to be above guidelines at both BK0 and BK1 for all mine phases, as a result of background loading.

6.3 JONES CREEK

6.3.1 General

The Jones Creek catchment is located northeast of the proposed overburden stockpile and the TMF. Project-related influences on water quality within Jones Creek include: loading from the overburden stockpile and unrecovered seepage from the North Embankment WMP. Background concentrations of chromium, iron and mercury are elevated as a result of natural loading sources.

6.3.2 Expected Case Concentrations – Key Parameters

The only parameters that are above guideline limits include chromium and iron. These parameters show influence from background loading.

Expected Case chromium concentrations are predicted to range from below 0.0002 mg/L to seasonal peaks just above 0.0012 mg/L during a high flow month (June). Baseline concentrations at J1 during pre-mining conditions have maximum concentrations that occur in April at 0.0025 mg/L. This elevated high flow concentration is driving the predictions for chromium. As a result of elevated existing chromium levels on site, background and predicted concentrations for chromium exceed the BCWQG-Max and CEQG.

Expected Case total iron concentrations are predicted to range between less than 0.2 mg/L to just above 0.8 mg/L. Predicted iron concentrations are elevated during May and June, which correspond to high flow months. Baseline concentrations at J1 during pre-mining conditions show maximum iron concentrations occur during May and June, 0.78 mg/L at 0.93 mg/L, respectively. As a result of elevated existing iron levels on site, background and predicted concentrations are above the CEQG, but report below BCWQG-Max.

6.3.3 Sensitivity Analyses

The Upper Bound Case was deemed the most conservative sensitivity analysis to understand the upper bound limits for predicted Jones Creek concentrations. Upper Bound Case results for Jones Creek are provided in Appendix F11. Maximum concentrations predicted by the Upper Bound Case range from approximately three to twenty times greater than the maximum concentrations predicted by the Expected Case.

6.3.3.1 Chromium and Iron

Predicted Upper Bound Case chromium and iron concentrations are very similar to those predicted in the Expected Case. Peak values for these parameters remain the same, since background loading is the driver for these concentrations, not mine-related loading.

6.3.3.2 Selenium

Peak Upper Bound Case selenium concentrations are predicted to be five times greater than the Expected Case concentrations. Upper bound selenium concentrations are above the CEQG (0.001 mg/L)[10] for two years during the start of closure (Year 31 through 32). Outside of these years, predicted Upper Bound Case concentrations remain below applicable guidelines.

[10] Predicted Upper Bound Case selenium concentrations remain below the BCWQG-30 D.

7 – CONCLUSIONS

The majority of mass load addition for all parameters is derived from ore processing. This load reports to the Tailing Management Facility (TMF) (regular ore), Open Pit (Low-Grade Ore (LGO)) and subsequently, T-Creek and Harper Creek downstream of T-Creek. The primary load addition in the TMF is derived from ore processing and tailings conveyed as slurry tailings into the TMF during the first phase of Operations (Operations I). The secondary source of loading to the TMF is water transferred from the Open Pit during Post-Closure. Maximum TMF concentrations for most parameter are achieved at the end of Operations I (Year 23.5) when regular ore processing is complete and LGO process tailings are then directed to the Open Pit. Certain parameters reach maximum predicted concentrations during Post-Closure as a result of load transfer from the Open Pit to the TMF, most notably cadmium. Selenium concentrations are predicted to be above the BCWQG-Wildlife during all phases on the model within the TMF and no other parameters are predicted above these guidelines or the MMER.

Open Pit water quality is influenced by LGO processing in the second phase of Operations (Operations II). Parameters increase in concentration through this phase to their maximum concentrations at the end of Operations II. Fluoride, mercury, molybdenum, and selenium are predicted to be above the BCWQG-Wildlife. Fluoride concentrations are predicted to drop below the guideline prior to closure, mercury and molybdenum are predicted to decrease below the wildlife guidelines in Post-Closure, and selenium is predicted to decrease over time, but remain above the wildlife guideline. No parameters are predicted to be above the MMER within the Open Pit.

There are no Project-related water chemistry influences to P-Creek in the Expected Case model. Total copper concentrations are above the BCWQG-30 D and CEQG as a result of background loading. Selenium is predicted to be above the BCWQG-30 D and CEQG in P-Creek in the Unrecovered Seepage Sensitivity Model during Operations and concentrations are predicted to decrease in Closure and Post-Closure to below the BCWQG-30 D but remain above the CEQG. Most other parameters are noted to increase to varying degrees and copper remains elevated due to baseline influences.

T-Creek water quality trends are similar to TMF trends in Closure and Post-Closure. Concentrations of most parameters[11] at T-Creek are at their maximum at Year 31 and decrease during the remainder of Closure and Post-Closure; with the exception of a few parameters which trend upwards as a result of transfer of water from the Open Pit to the TMF in Post-Closure. The following parameters are predicted to be above the provincial or federal aquatic life guidelines: fluoride, sulphate, aluminum, cadmium, copper, selenium, and zinc. Aluminum is the only parameter that is predicted to be above guidelines during Operations and then it is predicted to decrease to levels below the guideline in Closure and Post-Closure. The remaining parameter concentrations increase in T-Creek as a result of discharge from the TMF, affecting Closure and Post-Closure concentrations. Fluoride concentrations drop below the guidelines before the end of the Closure phase, and the remaining parameters remain above one or more guidelines for a longer duration.

Water quality parameter concentrations in Baker Creek and Jones Creek are not predicted to have concentrations above the federal and provincial guidelines for the protection of aquatic life as a result

[11] With the exception of parameters affected by background loading.

of mine loading. Iron, copper, chromium and aluminum are noted to be above guidelines during all mine phases within one or both creek as a result of baseline loading.

Mine-related seepage and TMF discharge are predicted to result in changes to water quality in Harper Creek, particularly downstream of the confluence of Harper Creek with T-Creek. Selenium is the only parameter within Harper Creek that is predicted to be above the aquatic life guidelines during Operations in the Expected Case as a result of mine-loading; this change is directly attributed to uncaptured seepage from the Non-Potentially Acid Generating (Non-PAG) LGO. Dissolved aluminum and total copper are noted to be above guidelines during operation within Harper Creek during all mine phases, as a result of baseline loading. Selenium, cadmium, and copper concentrations are predicted to be above the aquatic life guidelines within Harper Creek, downstream of the confluence with T-Creek (HT) as a result of TMF discharge during Closure and Post-Closure. Selenium and copper concentrations are predicted to above the aquatic life guidelines at the base of Harper Creek (HB).

Expected Case selenium concentrations in Harper Creek are predicted to be above guidelines during Operations at mid Harper Creek (HM) and HT as a result of loading from the PAG LGO Stockpile. This loading source is removed through LGO processing in Operations II. Expected Case predicted selenium concentrations during Closure and Post-Closure at HT and HB are above the applicable guidelines on a seasonal basis. Unrecovered Seepage Sensitivity Case selenium concentrations for HP are predicted to be seasonally above the BCWQG-30 D and CEQG during Operations I and II, with lowest concentrations predicted for the months of April through July. Selenium concentrations at HP for this sensitivity analysis are predicted to decrease in Closure when the PAG LGO is processed, remaining below the BCWQG-30 D through Closure and Post-Closure and only seasonally above the CEQG through these phases.

Expected Case cadmium concentrations in Harper Creek are predicted to be below the most stringent guidelines (BCWQG-30 D Draft) for the duration of Operations. Concentrations increase during Closure, but are predicted to be below guidelines for the majority of this phase (seasonally above the guideline in October). Peak predicted concentrations during Post-Closure at HT and HB (Year 50 through Year 52) are above guidelines for the majority of the year (maximum factor by which cadmium is above guidelines in Post-Closure is 2.4). Cadmium concentrations follow a decreasing trend after Year 50. All applicable guidelines for cadmium are hardness-dependent and baseline hardness decreases with distance downstream in the creek, resulting in lower guidelines downstream.

Expected Case copper concentrations are influenced by background concentrations. Higher background total copper concentrations are predicted to occur during freshet, when measured hardness is lower and guidelines are most protective. There is a slight increase predicted in low flow total copper concentrations during Closure and Post-Closure due to the influence of the TMF spillway discharge. TMF discharge has the greatest effect on predicted copper concentrations during the low flow months when there is the highest proportion of discharge compared to natural flows. Peak concentrations for copper are dominantly influenced by background loading sources though a small change in concentration is attributed to TMF discharge.

7.1 SENSITIVITY ANALYSES

Three sensitivity analyses were completed to determine the upper bound of predicted concentrations: Unrecovered Seepage Sensitivity Case, 5th and 95th Percentile Precipitation Case, and Upper Bound Case. Selenium and total copper are predicted to be above guidelines in all of the sensitivity analyses. Total copper results are influenced by background loading at many sites, but are further influenced by mine loading at other sites. Cadmium concentrations are elevated within the 5th and 95th Percentile and Upper Bound sensitivity cases at various nodes within Harper Creek. The Upper Bound Case identified aluminum, cobalt, mercury, and zinc as parameters that were predicted to be above guidelines in Harper Creek, in addition to cadmium, copper, and selenium. Aluminum, cobalt, mercury, and zinc are not predicted to be above guidelines in Harper Creek in the Expected Case or other sensitivity analyses.

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9 – CERTIFICATION

This report was prepared, reviewed and approved by the undersigned.

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APPENDIX A

MODEL INPUTS

Appendix A1 Baseline Water Quality
Appendix A2 Expected Case Geochemical Source Terms
Appendix A3 Upper Bound Case Geochemical Source Terms

APPENDIX A1

BASELINE WATER QUALITY

(Pages A1-1 to A1-16)

APPENDIX A1 - SOURCE TERMS
HARPER CREEK PROJECT
TABLE 1 - Site HT (SW)

Parameter	January 01/01/2013	February 01/02/2013	March 01/03/2013	April 01/04/2013	May 01/05/2013	June 01/06/2013	July 01/07/2013	August 01/08/2013	September 01/09/2013	October 01/10/2013	November 01/11/2013	December 01/12/2013
Sulphate (Dissolved)	7.45	7.52	10.87	8.34	3.01	2.98	4.15	7.88	9.68	7.52	7.05	7.17
Acidity to pH 4.5 (as Ca(	0	0	0	0	0	0	0	0	0	0	0	0
Acidity to pH 8.3 (as Ca(	0	0	0	0	0	0	0	0	0	0	0	0
Alkalinity (Total as CaC(	31.18	36.17	34.21	45.64	17.65	14.41	22.44	45.93	43.08	38.22	33.71	31.32
Chloride (Dissolved)	0.42	0.74	0.43	0.62	0.44	0.69	0.50	0.48	0.79	0.71	0.47	0.43
Fluoride (Dissolved)	0.0295	0.0392	0.0356	0.0433	0.0226	0.0195	0.0261	0.0431	0.0442	0.0442	0.0329	0.0311
Hardness as CaCO3 (Di	35.0	35.3	37.5	46.6	20.2	16.2	25.0	41.6	47.4	40.9	34.6	33.9
Aluminum (Dissolved)	0.0059	0.0062	0.0064	0.0199	0.0471	0.0404	0.0229	0.0155	0.0159	0.0217	0.0098	0.0083
Antimony (Dissolved)	0.00005	0.00002	0.00002	0.00002	0.00010	0.00009	0.00011	0.00016	0.00018	0.00013	0.00006	0.00005
Arsenic (Dissolved)	0.00038	0.00038	0.00034	0.00048	0.00032	0.00017	0.00060	0.00103	0.00063	0.00080	0.00040	0.00038
Barium (Dissolved)	0.0084	0.0087	0.0091	0.0118	0.0053	0.0044	0.0066	0.0109	0.0128	0.0104	0.0083	0.0081
Beryllium (Dissolved)	0.00005	0.00001	0.00001	0.00001	0.00010	0.00009	0.00011	0.00016	0.00010	0.00007	0.00005	0.00005
Bismuth (Dissolved)	0.00021	0.00000	0.00000	0.00001	0.00042	0.00043	0.00045	0.00048	0.00053	0.00037	0.00024	0.00022
Boron (Dissolved)	0.02535	0.04203	0.04258	0.06198	0.00885	0.00859	0.00972	0.01192	0.01314	0.02483	0.02807	0.02569
Cadmium (Dissolved)	0.000009	0.000005	0.000004	0.000009	0.000011	0.000012	0.000010	0.000028	0.000017	0.000012	0.000009	0.000009
Calcium (Dissolved)	11.07	10.97	11.79	14.87	6.48	5.27	8.22	13.25	15.24	13.14	10.80	10.62
Chromium (Dissolved)	0.00008	0.00008	0.00009	0.00012	0.00010	0.00009	0.00009	0.00016	0.00018	0.00016	0.00009	0.00009
Cobalt (Dissolved)	0.00005	0.00001	0.00001	0.00003	0.00010	0.00009	0.00011	0.00016	0.00009	0.00013	0.00005	0.00005
Copper (Dissolved)	0.00035	0.00031	0.00033	0.00069	0.00147	0.00116	0.00072	0.00078	0.00071	0.00079	0.00044	0.00047
Iron (Dissolved)	0.0075	0.0034	0.0034	0.0203	0.0212	0.0145	0.0130	0.0157	0.0119	0.0158	0.0078	0.0073
Lead (Dissolved)	0.000025	0.000005	0.000004	0.000012	0.000055	0.000073	0.000068	0.000119	0.000200	0.000121	0.000026	0.000024
Lithium (Dissolved)	0.000560	0.000735	0.000586	0.000620	0.000479	0.000440	0.000551	0.000858	0.000812	0.000917	0.000468	0.000497
Magnesium (Dissolved)	1.79	1.93	1.93	2.27	0.98	0.75	1.14	1.88	2.26	2.00	1.68	1.71
Manganese (Dissolved)	0.000415	0.000460	0.000396	0.000972	0.000651	0.000726	0.000630	0.000723	0.000867	0.000851	0.000675	0.000515
Molybdenum (Dissolved	0.000647	0.000692	0.000686	0.000641	0.000308	0.000407	0.001103	0.001278	0.001429	0.001122	0.000692	0.000693
Nickel (Dissolved)	0.000248	0.000041	0.000058	0.000095	0.000421	0.000429	0.000447	0.000574	0.000477	0.000395	0.000265	0.000247
Phosphorus (Metal) Diss	0.25	0.25	0.25	0.36	0.25	0.26	0.26	0.25	0.39	0.26	0.28	0.26
Potassium (Dissolved)	0.90	1.05	0.99	1.25	0.47	0.40	0.63	1.12	1.39	1.22	0.87	0.87
Selenium (Dissolved)	0.00008	0.00007	0.00008	0.00012	0.00010	0.00009	0.00011	0.00016	0.00009	0.00017	0.00008	0.00008
Silicon (Dissolved)	3.154	3.102	3.305	4.861	2.683	2.453	3.064	4.263	4.778	4.770	3.288	3.108
Silver (Dissolved)	0.000006	0.000004	0.000004	0.000006	0.000012	0.000009	0.000023	0.000028	0.000031	0.000023	0.000007	0.000006
Sodium (Dissolved)	1.435412	1.626993	1.607630	1.922437	0.661557	0.575408	0.873728	1.484652	1.889289	1.683883	1.313532	1.335547
Strontium (Dissolved)	0.040120	0.043603	0.043374	0.055329	0.022268	0.017757	0.025949	0.047139	0.058049	0.050249	0.040233	0.039087
Sulphur (Dissolved)	0.01	8.41	8.52	12.40	8.85	8.59	9.72	11.92	13.14	12.41	9.36	4.29
Thallium (Dissolved)	0.000005	0.000002	0.000002	0.000002	0.000010	0.000009	0.000011	0.000016	0.000016	0.000013	0.000006	0.000005
Tin (Dissolved)	0.000127	0.000168	0.000170	0.000253	0.000096	0.000086	0.000110	0.000159	0.000092	0.000151	0.000073	0.000098
Titanium (Dissolved)	0.004436	0.000420	0.000426	0.000620	0.008210	0.008588	0.008490	0.008085	0.008850	0.006517	0.004912	0.004496
Uranium (Dissolved)	0.000270	0.000307	0.000312	0.000379	0.000211	0.000209	0.000272	0.000369	0.000404	0.000379	0.000270	0.000318
Vanadium (Dissolved)	0.000507	0.000168	0.000170	0.000248	0.000829	0.000859	0.000849	0.000904	0.000898	0.000729	0.000561	0.000514
Zinc (Dissolved)	0.0006	0.0003	0.0003	0.0009	0.0021	0.0017	0.0021	0.0030	0.0021	0.0018	0.0006	0.0006
Zirconium (Dissolved)	0.000085	0.000084	0.000085	0.000124	0.000923	0.001234	0.001668	0.002384	0.000700	0.001303	0.000094	0.000086
Mercury (Dissolved)	0.000008	0.000008	0.000009	0.000012	0.000009	0.000009	0.000010	0.000012	0.000018	0.000016	0.000009	0.000009
Aluminum (Total)	0.0081	0.0069	0.0064	0.0432	0.1061	0.1317	0.0326	0.0287	0.0281	0.0356	0.0134	0.0114
Antimony (Total)	0.00005	0.00002	0.00002	0.00002	0.00010	0.00009	0.00011	0.00016	0.00018	0.00013	0.00006	0.00005
Arsenic (Total)	0.00038	0.00038	0.00034	0.00050	0.00039	0.00029	0.00061	0.00103	0.00063	0.00081	0.00044	0.00039
Barium (Total)	0.0085	0.0094	0.0091	0.0120	0.0057	0.0054	0.0066	0.0111	0.0129	0.0110	0.0085	0.0082
Beryllium (Total)	0.00005	0.00001	0.00001	0.00001	0.00010	0.00009	0.00011	0.00016	0.00012	0.00007	0.00005	0.00005
Bismuth (Total)	0.00021	0.00000	0.00000	0.00001	0.00042	0.00043	0.00045	0.00048	0.00053	0.00037	0.00024	0.00022
Boron (Total)	0.02535	0.04203	0.04258	0.06198	0.00885	0.00859	0.00972	0.01192	0.01314	0.02483	0.02807	0.02569
Cadmium (Total)	0.000009	0.000007	0.000007	0.000014	0.000022	0.000013	0.000017	0.000028	0.000017	0.000012	0.000009	0.000009
Calcium (Total)	11.23	11.84	12.20	14.87	6.60	5.39	8.22	13.25	15.34	13.14	11.34	10.95
Chromium (Total)	0.00008	0.00008	0.00009	0.00012	0.00018	0.00017	0.00012	0.00016	0.00024	0.00016	0.00009	0.00009
Cobalt (Total)	0.00005	0.00001	0.00001	0.00003	0.00010	0.00011	0.00011	0.00016	0.00011	0.00014	0.00005	0.00005
Copper (Total)	0.00037	0.00037	0.00038	0.00094	0.00205	0.00176	0.00099	0.00085	0.00086	0.00123	0.00055	0.00053
Iron (Total)	0.0080	0.0058	0.0050	0.0589	0.1274	0.1338	0.0323	0.0220	0.0321	0.0258	0.0135	0.0116
Lead (Total)	0.000030	0.000005	0.000004	0.000021	0.000105	0.000295	0.000068	0.000119	0.000200	0.000126	0.000027	0.000073
Lithium (Total)	0.000599	0.000735	0.000586	0.000620	0.000479	0.000443	0.000577	0.000879	0.000897	0.000942	0.000509	0.000537
Magnesium (Total)	1.79	2.00	1.97	2.30	1.01	0.80	1.14	1.90	2.28	2.02	1.85	1.79
Manganese (Total)	0.000575	0.000629	0.000425	0.002687	0.006145	0.006707	0.001582	0.001796	0.002795	0.002571	0.001083	0.000791
Molybdenum (Total)	0.000695	0.000724	0.000694	0.000652	0.000341	0.000425	0.001203	0.001340	0.001443	0.001130	0.000768	0.000751
Nickel (Total)	0.000248	0.000073	0.000058	0.000139	0.000421	0.000429	0.000460	0.000574	0.000489	0.000413	0.000273	0.000249
Phosphorus (Metal) Tota	0.25	0.25	0.25	0.36	0.25	0.26	0.26	0.25	0.39	0.26	0.28	0.26
Potassium (Total)	0.91	1.05	1.01	1.25	0.47	0.42	0.63	1.14	1.39	1.22	0.94	0.90
Selenium (Total)	0.00009	0.00009	0.00009	0.00012	0.00010	0.00009	0.00011	0.00016	0.00013	0.00017	0.00008	0.00009
Silicon (Total)	3.229	3.322	3.451	4.861	2.799	2.637	3.070	4.263	4.796	4.770	3.691	3.327
Silver (Total)	0.000009	0.000004	0.000004	0.000006	0.000013	0.000009	0.000023	0.000028	0.000031	0.000024	0.000007	0.000008
Sodium (Total)	1.435412	1.685834	1.631730	1.975314	0.669836	0.584678	0.880648	1.561540	1.905529	1.685499	1.413045	1.374854
Strontium (Total)	0.041832	0.043844	0.043454	0.056675	0.022720	0.017879	0.026251	0.049067	0.059186	0.050249	0.041561	0.040571
Sulphur (Total)	8.45	8.41	8.52	12.40	8.85	8.59	9.72	11.92	13.14	12.41	9.36	8.56
Thallium (Total)	0.000005	0.000002	0.000002	0.000002	0.000010	0.000009	0.000011	0.000016	0.000016	0.000013	0.000006	0.000005
Tin (Total)	0.000127	0.000168	0.000175	0.000330	0.000158	0.000086	0.000110	0.000159	0.000097	0.000184	0.000074	0.000098
Titanium (Total)	0.004436	0.000420	0.000426	0.000620	0.008225	0.010687	0.008529	0.008363	0.009496	0.006629	0.004912	0.004496
Uranium (Total)	0.000286	0.000327	0.000312	0.000388	0.000318	0.000267	0.000312	0.000403	0.000429	0.000389	0.000295	0.000337
Vanadium (Total)	0.000507	0.000168	0.000170	0.000248	0.000829	0.000882	0.000857	0.000904	0.001018	0.000729	0.000561	0.000514
Zinc (Total)	0.0015	0.0003	0.0003	0.0034	0.0027	0.0030	0.0033	0.0031	0.0034	0.0080	0.0015	0.0014
Zirconium (Total)	0.000085	0.000084	0.000085	0.000124	0.000923	0.001234	0.001668	0.002384	0.002629	0.001303	0.000094	0.000086
Mercury (Total)	0.000008	0.000008	0.000009	0.000012	0.000009	0.000009	0.000010	0.000012	0.000018	0.000016	0.000009	0.000009
H+ Calcluated based on	0	0	0	0	0	0	0	0	0	0	0	0
Orthophosphate (Dissolv	0.0025	0.0042	0.0043	0.0062	0.0009	0.0009	0.0010	0.0023	0.0021	0.0023	0.0028	0.0026
Nitrate (as N)	0.161	0.166	0.163	0.248	0.177	0.091	0.041	0.086	0.128	0.124	0.139	0.145
Ammonia (Total)	0.017	0.018	0.010	0.018	0.011	0.009	0.027	0.975	0.025	0.014	0.020	0.018
Nitrite (as N)	0.003	0.004	0.004	0.006	0.001	0.001	0.001	0.002	0.001	0.003	0.003	0.003

APPENDIX A1 - SOURCE TERMS
HARPER CREEK PROJECT
TABLE 2 - Site BK0 (SW)

Parameter	January 01/01/2013	February 01/02/2013	March 01/03/2013	April 01/04/2013	May 01/05/2013	June 01/06/2013	July 01/07/2013	August 01/08/2013	September 01/09/2013	October 01/10/2013	November 01/11/2013	December 01/12/2013
Sulphate (Dissolved)	17.73	20.70	19.35	15.43	7.24	6.02	11.13	13.18	15.08	14.28	17.65	9.84
Acidity to pH 4.5 (as Ca(	0	0	0	0	0	0	0	0	0	0	0	0
Acidity to pH 8.3 (as Ca(	0	0	0	0	0	0	0	0	0	0	0	0
Alkalinity (Total as CaC(	143.00	146.00	146.00	145.33	89.81	78.23	108.20	136.00	140.20	140.00	142.50	117.00
Chloride (Dissolved)	0.50	0.80	0.50	0.65	0.55	0.50	0.63	0.48	0.70	0.58	0.50	0.50
Fluoride (Dissolved)	0.0427	0.0530	0.0450	0.0487	0.0336	0.0291	0.0362	0.0432	0.0466	0.0454	0.0470	0.0340
Hardness as CaCO3 (Di	155.7	163.0	157.5	158.0	96.8	82.7	121.5	149.2	151.0	153.5	176.0	123.0
Aluminum (Dissolved)	0.0016	0.0029	0.0057	0.0042	0.0091	0.0106	0.0058	0.0041	0.0035	0.0023	0.0013	0.0014
Antimony (Dissolved)	0.00006	0.00002	0.00002	0.00002	0.00013	0.00010	0.00013	0.00013	0.00013	0.00011	0.00006	0.00006
Arsenic (Dissolved)	0.00016	0.00015	0.00018	0.00020	0.00152	0.00019	0.00287	0.00147	0.00017	0.00079	0.00017	0.00017
Barium (Dissolved)	0.0151	0.0156	0.0149	0.0141	0.0096	0.0079	0.0131	0.0155	0.0162	0.0150	0.0141	0.0146
Beryllium (Dissolved)	0.00006	0.00001	0.00001	0.00001	0.00013	0.00010	0.00013	0.00013	0.00007	0.00006	0.00006	0.00006
Bismuth (Dissolved)	0.00025	0.00001	0.00001	0.00001	0.00043	0.00050	0.00040	0.00040	0.00040	0.00030	0.00025	0.00025
Boron (Dissolved)	0.03000	0.05000	0.05000	0.05000	0.01000	0.01000	0.01000	0.01000	0.01000	0.02000	0.03000	0.03000
Cadmium (Dissolved)	0.000008	0.000005	0.000005	0.000010	0.000014	0.000011	0.000009	0.000011	0.000008	0.000008	0.000008	0.000008
Calcium (Dissolved)	47.47	48.60	47.40	48.90	30.89	26.99	37.75	45.08	47.15	45.58	48.75	38.80
Chromium (Dissolved)	0.00010	0.00010	0.00010	0.00230	0.00038	0.00010	0.00013	0.00013	0.00013	0.00013	0.00010	0.00010
Cobalt (Dissolved)	0.00005	0.00001	0.00001	0.00001	0.00013	0.00010	0.00013	0.00013	0.00007	0.00010	0.00005	0.00005
Copper (Dissolved)	0.00057	0.00018	0.00014	0.00026	0.00066	0.00070	0.00045	0.00033	0.00032	0.00025	0.00021	0.00039
Iron (Dissolved)	0.0065	0.0010	0.0010	0.0088	0.0218	0.0108	0.0100	0.0100	0.0077	0.0078	0.0055	0.0060
Lead (Dissolved)	0.000028	0.000023	0.000005	0.000008	0.000088	0.000050	0.000100	0.000100	0.000039	0.000076	0.000029	0.000028
Lithium (Dissolved)	0.000850	0.000900	0.000800	0.000700	0.000633	0.000540	0.000667	0.000847	0.000763	0.000825	0.000805	0.000828
Magnesium (Dissolved)	9.02	10.10	9.52	8.80	4.61	3.71	6.64	7.38	8.36	8.28	8.50	6.36
Manganese (Dissolved)	0.000090	0.000110	0.000615	0.000293	0.000435	0.000243	0.000489	0.000196	0.000154	0.000558	0.000355	0.000223
Molybdenum (Dissolved	0.000339	0.000360	0.000320	0.000364	0.000240	0.000218	0.000307	0.000315	0.000339	0.000328	0.000318	0.000329
Nickel (Dissolved)	0.000280	0.000070	0.000060	0.000124	0.000600	0.000500	0.000600	0.000867	0.000367	0.000543	0.000285	0.000283
Phosphorus (Metal) Diss	0.30	0.28	0.27	0.25	0.23	0.30	0.21	0.21	0.30	0.21	0.30	0.30
Potassium (Dissolved)	0.76	0.79	0.77	0.73	0.50	0.40	0.59	0.68	0.75	0.73	0.69	0.72
Selenium (Dissolved)	0.00027	0.00030	0.00032	0.00030	0.00016	0.00010	0.00036	0.00023	0.00018	0.00029	0.00021	0.00024
Silicon (Dissolved)	4.010	3.770	3.900	4.170	3.473	3.330	4.105	4.400	4.362	4.363	3.750	3.880
Silver (Dissolved)	0.000008	0.000005	0.000005	0.000005	0.000020	0.000010	0.000023	0.000023	0.000023	0.000019	0.000008	0.000008
Sodium (Dissolved)	2.000000	2.220000	2.150000	2.000000	1.063429	0.852600	1.307500	1.527500	1.790000	1.785000	1.845000	1.922500
Strontium (Dissolved)	0.236000	0.225000	0.222000	0.209500	0.131286	0.099660	0.160750	0.203000	0.218200	0.215000	0.212000	0.224000
Sulphur (Dissolved)	0.01	10.00	10.00	8.00	3.00	3.33	3.67	4.00	5.00	10.00	10.00	5.01
Thallium (Dissolved)	0.000006	0.000002	0.000002	0.000002	0.000013	0.000010	0.000013	0.000013	0.000013	0.000011	0.000006	0.000006
Tin (Dissolved)	0.000150	0.000200	0.000200	0.000200	0.000125	0.000100	0.000133	0.000133	0.000070	0.000115	0.000060	0.000105
Titanium (Dissolved)	0.005250	0.000500	0.000500	0.000500	0.007725	0.010000	0.007000	0.006900	0.006733	0.005250	0.005250	0.005250
Uranium (Dissolved)	0.000900	0.001070	0.000945	0.000890	0.000327	0.000203	0.000471	0.000643	0.000737	0.000720	0.000836	0.000520
Vanadium (Dissolved)	0.000600	0.000200	0.000200	0.000200	0.000780	0.001000	0.000760	0.000740	0.000683	0.000563	0.000600	0.000600
Zinc (Dissolved)	0.0006	0.0002	0.0004	0.0014	0.0018	0.0010	0.0033	0.0033	0.0009	0.0009	0.0007	0.0006
Zirconium (Dissolved)	0.000100	0.000100	0.000100	0.000100	0.002000	0.002000	0.002000	0.002000	0.000100	0.001050	0.000100	0.000100
Mercury (Dissolved)	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000013	0.000013	0.000010	0.000010
Aluminum (Total)	0.0047	0.0029	0.0076	0.0059	0.1646	0.4129	0.0192	0.0079	0.0067	0.0078	0.0035	0.0041
Antimony (Total)	0.00006	0.00002	0.00002	0.00002	0.00013	0.00010	0.00013	0.00013	0.00013	0.00011	0.00006	0.00006
Arsenic (Total)	0.00016	0.00017	0.00018	0.00020	0.00155	0.00124	0.00287	0.00186	0.00017	0.00079	0.00020	0.00018
Barium (Total)	0.0154	0.0157	0.0154	0.0147	0.0109	0.0149	0.0131	0.0155	0.0162	0.0150	0.0150	0.0152
Beryllium (Total)	0.00006	0.00001	0.00001	0.00001	0.00013	0.00010	0.00013	0.00013	0.00008	0.00006	0.00006	0.00006
Bismuth (Total)	0.00025	0.00001	0.00001	0.00001	0.00043	0.00050	0.00040	0.00040	0.00040	0.00030	0.00025	0.00025
Boron (Total)	0.03000	0.05000	0.05000	0.05000	0.01000	0.01000	0.01000	0.01000	0.01000	0.02000	0.03000	0.03000
Cadmium (Total)	0.000008	0.000005	0.000005	0.000010	0.000017	0.000024	0.000009	0.000012	0.000009	0.000008	0.000008	0.000008
Calcium (Total)	47.47	51.60	48.15	50.30	33.06	27.50	37.75	45.08	47.15	45.58	51.10	41.50
Chromium (Total)	0.00010	0.00010	0.00010	0.00230	0.00067	0.00167	0.00015	0.00021	0.00013	0.00015	0.00010	0.00010
Cobalt (Total)	0.00006	0.00001	0.00001	0.00001	0.00034	0.00101	0.00013	0.00013	0.00007	0.00010	0.00006	0.00006
Copper (Total)	0.00057	0.00018	0.00014	0.00040	0.00127	0.00270	0.00103	0.00043	0.00076	0.00065	0.00035	0.00039
Iron (Total)	0.0085	0.0020	0.0010	0.0088	0.3584	1.2250	0.0328	0.0140	0.0092	0.0080	0.0060	0.0073
Lead (Total)	0.000031	0.000023	0.000005	0.000020	0.000459	0.001621	0.000100	0.000100	0.000039	0.000078	0.000029	0.000030
Lithium (Total)	0.000895	0.000900	0.000900	0.000810	0.000633	0.000657	0.000667	0.000847	0.000763	0.000935	0.000805	0.000828
Magnesium (Total)	9.05	10.10	9.59	8.96	5.01	3.90	6.64	7.60	8.36	8.28	9.45	6.72
Manganese (Total)	0.000421	0.000150	0.000615	0.000379	0.012181	0.036869	0.001754	0.000370	0.000592	0.000943	0.000479	0.000450
Molybdenum (Total)	0.000362	0.000360	0.000330	0.000364	0.000260	0.000234	0.000308	0.000345	0.000355	0.000334	0.000334	0.000348
Nickel (Total)	0.000295	0.000070	0.000060	0.000124	0.001068	0.003073	0.000633	0.000867	0.000367	0.000550	0.000290	0.000293
Phosphorus (Metal) Tota	0.30	0.28	0.27	0.25	0.23	0.30	0.21	0.21	0.30	0.21	0.30	0.30
Potassium (Total)	0.76	0.79	0.78	0.75	0.53	0.48	0.59	0.68	0.75	0.73	0.77	0.77
Selenium (Total)	0.00027	0.00031	0.00032	0.00030	0.00017	0.00015	0.00036	0.00023	0.00020	0.00029	0.00021	0.00024
Silicon (Total)	4.025	4.070	4.060	4.235	3.860	4.082	4.105	4.400	4.362	4.363	4.255	4.140
Silver (Total)	0.000009	0.000005	0.000005	0.000005	0.000048	0.000016	0.000023	0.000023	0.000023	0.000019	0.000008	0.000008
Sodium (Total)	2.035000	2.220000	2.190000	2.000000	1.133286	0.861000	1.307500	1.582500	1.790000	1.785000	2.020000	2.027500
Strontium (Total)	0.236000	0.229000	0.227000	0.216500	0.147857	0.101880	0.160750	0.207500	0.218200	0.215000	0.222000	0.227250
Sulphur (Total)	10.00	10.00	10.00	8.00	5.00	4.00	3.67	5.00	5.00	10.00	10.00	10.00
Thallium (Total)	0.000006	0.000002	0.000002	0.000002	0.000013	0.000010	0.000013	0.000013	0.000013	0.000011	0.000006	0.000006
Tin (Total)	0.000150	0.000200	0.000200	0.000230	0.000125	0.000100	0.000133	0.000133	0.000080	0.000115	0.000070	0.000110
Titanium (Total)	0.005250	0.000500	0.000500	0.000500	0.010140	0.012000	0.009667	0.006900	0.006733	0.005300	0.005250	0.005250
Uranium (Total)	0.000933	0.001090	0.000945	0.000890	0.000387	0.000233	0.000474	0.000647	0.000743	0.000726	0.000875	0.000520
Vanadium (Total)	0.000600	0.000200	0.000200	0.000200	0.000924	0.001133	0.000867	0.000740	0.000683	0.000563	0.000600	0.000600
Zinc (Total)	0.0017	0.0002	0.0004	0.0014	0.0028	0.0058	0.0033	0.0033	0.0021	0.0024	0.0016	0.0017
Zirconium (Total)	0.000100	0.000100	0.000100	0.000100	0.002000	0.002000	0.002000	0.002000	0.002000	0.001050	0.000100	0.000100
Mercury (Total)	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000013	0.000013	0.000010	0.000010
H+ Calcluated based on	0	0	0	0	0	0	0	0	0	0	0	0
Orthophosphate (Dissolv	0.0030	0.0050	0.0050	0.0050	0.0010	0.0010	0.0010	0.0013	0.0033	0.0021	0.0030	0.0030
Nitrate (as N)	0.046	0.053	0.021	0.020	0.009	0.005	0.006	0.020	0.012	0.022	0.027	0.017
Ammonia (Total)	0.017	0.023	0.005	0.006	0.013	0.009	0.015	0.010	0.015	0.012	0.068	0.053
Nitrite (as N)	0.003	0.005	0.005	0.005	0.001	0.001	0.001	0.001	0.001	0.002	0.003	0.003

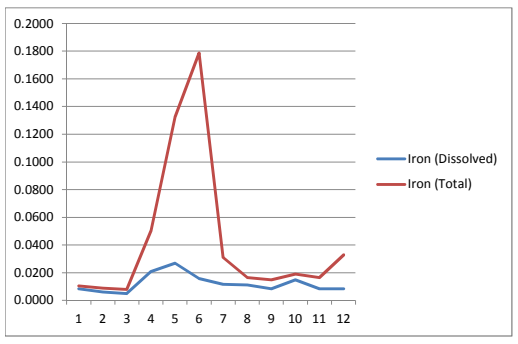
Flagged, but not altered.

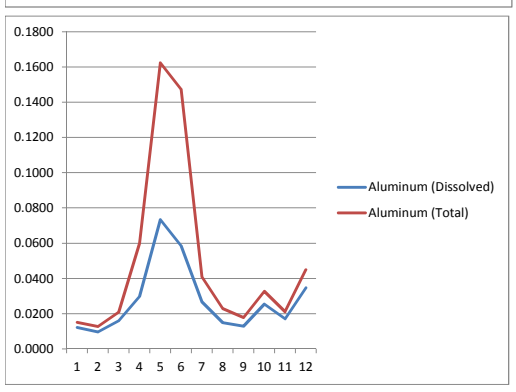
APPENDIX A1 - SOURCE TERMS
HARPER CREEK PROJECT
TABLE 3 - Site BK1 (SW)

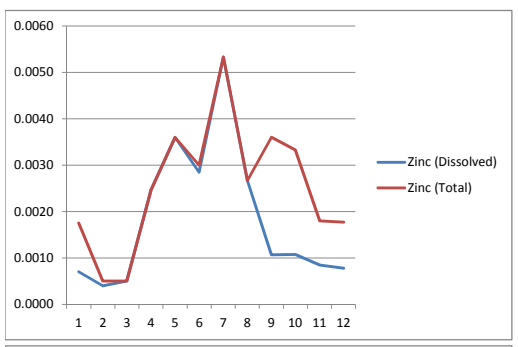
Parameter	January 01/01/2013	February 01/02/2013	March 01/03/2013	April 01/04/2013	May 01/05/2013	June 01/06/2013	July 01/07/2013	August 01/08/2013	September 01/09/2013	October 01/10/2013	November 01/11/2013	December 01/12/2013
Sulphate (Dissolv	8.39	8.76	9.69	8.08	4.69	4.30	5.41	7.00	7.64	7.53	8.67	8.53
Acidity to pH 4.5 (	0	0	0	0	0	0	0	0	0	0	0	0
Acidity to pH 8.3 (	0	0	0	0	0	0	0	0	0	0	0	0
Alkalinity (Total as	101.05	111.00	112.00	106.50	64.87	48.28	78.40	110.08	107.40	96.13	107.00	104.03
Chloride (Dissolve	0.50	0.80	0.50	0.50	0.55	0.50	0.60	0.53	0.60	0.50	0.50	0.50
Fluoride (Dissolve	0.0277	0.0390	0.0325	0.0350	0.0257	0.0250	0.0250	0.0326	0.0294	0.0278	0.0290	0.0283
Hardness as CaC	107.9	117.0	118.0	114.0	66.1	54.1	86.0	111.1	114.3	107.5	114.0	111.0
Aluminum (Dissol	0.0027	0.0033	0.0061	0.0037	0.0135	0.0235	0.0098	0.0053	0.0050	0.0046	0.0021	0.0024
Antimony (Dissolv	0.00006	0.00002	0.00002	0.00002	0.00010	0.00010	0.00010	0.00013	0.00013	0.00007	0.00010	0.00008
Arsenic (Dissolvec	0.00017	0.00014	0.00015	0.00016	0.00019	0.00018	0.00019	0.00129	0.00017	0.00019	0.00017	0.00017
Barium (Dissolvec	0.0089	0.0096	0.0094	0.0091	0.0060	0.0055	0.0079	0.0096	0.0102	0.0089	0.0082	0.0085
Beryllium (Dissolv	0.00006	0.00001	0.00001	0.00001	0.00010	0.00010	0.00010	0.00013	0.00007	0.00007	0.00010	0.00008
Bismuth (Dissolve	0.00025	0.00001	0.00001	0.00001	0.00050	0.00050	0.00050	0.00040	0.00040	0.00034	0.00050	0.00038
Boron (Dissolved)	0.03000	0.05000	0.05000	0.05000	0.01000	0.01000	0.01000	0.01000	0.01000	0.02333	0.01000	0.02000
Cadmium (Dissolv	0.000008	0.000005	0.000005	0.000005	0.000010	0.000010	0.000010	0.000013	0.000009	0.000008	0.000010	0.000009
Calcium (Dissolve	34.70	37.00	37.55	36.85	21.45	17.43	28.05	34.72	37.05	34.88	37.00	35.85
Chromium (Dissol	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00013	0.00013	0.00010	0.00010	0.00010
Cobalt (Dissolved)	0.00006	0.00001	0.00001	0.00001	0.00010	0.00010	0.00010	0.00013	0.00007	0.00007	0.00010	0.00008
Copper (Dissolvec	0.00020	0.00022	0.00016	0.00027	0.00095	0.00129	0.00061	0.00040	0.00033	0.00037	0.00024	0.00022
Iron (Dissolved)	0.0055	0.0010	0.0010	0.0010	0.0138	0.0142	0.0107	0.0083	0.0062	0.0073	0.0100	0.0078
Lead (Dissolved)	0.000029	0.000005	0.000005	0.000005	0.000050	0.000050	0.000050	0.000100	0.000182	0.000041	0.000050	0.000040
Lithium (Dissolvec	0.000500	0.000500	0.000500	0.000500	0.000500	0.000500	0.000500	0.001000	0.000367	0.000500	0.000500	0.000500
Magnesium (Disso	5.18	5.94	5.78	5.34	3.04	2.58	3.87	4.92	5.34	4.93	5.16	5.17
Manganese (Disso	0.000060	0.000050	0.000245	0.000050	0.000396	0.000627	0.000712	0.000167	0.000079	0.000103	0.000050	0.000055
Molybdenum (Dis	0.000294	0.000320	0.000300	0.000271	0.000125	0.000114	0.000174	0.000258	0.000272	0.000257	0.000239	0.000267
Nickel (Dissolved)	0.000295	0.000100	0.000080	0.000104	0.000500	0.000500	0.000500	0.000767	0.000370	0.000377	0.000500	0.000398
Phosphorus (Meta	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.21	0.30	0.30	0.30	0.30
Potassium (Dissol	0.55	0.70	0.61	0.59	0.40	0.33	0.46	0.55	0.59	0.56	0.51	0.53
Selenium (Dissolv	0.00011	0.00012	0.00012	0.00011	0.00010	0.00010	0.00010	0.00017	0.00007	0.00009	0.00010	0.00011
Silicon (Dissolved	3.005	3.000	3.130	3.000	2.862	2.826	3.270	3.418	3.370	3.213	2.980	2.993
Silver (Dissolved)	0.000008	0.000005	0.000005	0.000005	0.000010	0.000010	0.000010	0.000023	0.000023	0.000008	0.000010	0.000009
Sodium (Dissolvec	1.135000	1.280000	1.310000	1.140000	0.732667	0.587400	0.764000	0.901000	1.018000	1.076667	1.020000	1.077500
Strontium (Dissolv	0.154000	0.161000	0.161000	0.161000	0.092917	0.069520	0.104500	0.153250	0.169000	0.154000	0.142000	0.148000
Sulphur (Dissolve	0.01	10.00	10.00	10.00	8.60	7.20	5.80	4.40	3.00	10.00	10.00	10.00
Thallium (Dissolve	0.000006	0.000002	0.000002	0.000002	0.000010	0.000010	0.000010	0.000013	0.000013	0.000007	0.000010	0.000008
Tin (Dissolved)	0.000150	0.000200	0.000200	0.000200	0.000100	0.000100	0.000100	0.000133	0.000070	0.000090	0.000100	0.000125
Titanium (Dissolve	0.005250	0.000500	0.000500	0.000500	0.010000	0.010000	0.010000	0.006800	0.006733	0.006833	0.010000	0.007625
Uranium (Dissolve	0.000241	0.000289	0.000262	0.000230	0.000092	0.000042	0.000098	0.000172	0.000215	0.000198	0.000185	0.000213
Vanadium (Dissol	0.000600	0.000200	0.000200	0.000200	0.001000	0.001000	0.001000	0.000749	0.000683	0.000733	0.001000	0.000800
Zinc (Dissolved)	0.0006	0.0001	0.0004	0.0001	0.0017	0.0010	0.0010	0.0027	0.0010	0.0008	0.0010	0.0008
Zirconium (Dissol	0.000100	0.000100	0.000100	0.000100	0.000575	0.001050	0.001525	0.002000	0.000100	0.000100	0.000100	0.000100
Mercury (Dissolve	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000013	0.000010	0.000010	0.000010
Aluminum (Total)	0.0042	0.0034	0.0075	0.0046	0.2589	0.3188	0.0157	0.0116	0.0073	0.0059	0.0059	0.0050
Antimony (Total)	0.00006	0.00002	0.00002	0.00002	0.00010	0.00010	0.00010	0.00013	0.00013	0.00008	0.00010	0.00008
Arsenic (Total)	0.00018	0.00019	0.00015	0.00016	0.00056	0.00071	0.00022	0.00143	0.00017	0.00019	0.00019	0.00019
Barium (Total)	0.0089	0.0096	0.0094	0.0094	0.0083	0.0084	0.0081	0.0096	0.0102	0.0092	0.0085	0.0087
Beryllium (Total)	0.00006	0.00001	0.00001	0.00001	0.00010	0.00010	0.00010	0.00013	0.00008	0.00007	0.00010	0.00008
Bismuth (Total)	0.00025	0.00001	0.00001	0.00001	0.00050	0.00050	0.00050	0.00040	0.00040	0.00034	0.00050	0.00038
Boron (Total)	0.03000	0.05000	0.05000	0.05000	0.01000	0.01000	0.01000	0.01000	0.01000	0.02333	0.01000	0.02000
Cadmium (Total)	0.000008	0.000005	0.000005	0.000005	0.000025	0.000017	0.000010	0.000013	0.000016	0.000008	0.000010	0.000009
Calcium (Total)	34.70	37.90	37.55	38.75	23.02	17.43	28.43	34.72	37.05	34.88	37.00	35.85
Chromium (Total)	0.00012	0.00010	0.00010	0.00015	0.00102	0.00096	0.00015	0.00022	0.00017	0.00015	0.00015	0.00013
Cobalt (Total)	0.00006	0.00001	0.00001	0.00001	0.00038	0.00058	0.00010	0.00013	0.00007	0.00007	0.00010	0.00008
Copper (Total)	0.00096	0.00024	0.00016	0.00027	0.00199	0.00285	0.00094	0.00054	0.00042	0.00058	0.00050	0.00073
Iron (Total)	0.0070	0.0020	0.0010	0.0034	0.5487	0.7626	0.0217	0.0103	0.0083	0.0073	0.0100	0.0085
Lead (Total)	0.000031	0.000007	0.000012	0.000007	0.000618	0.001152	0.000050	0.000100	0.000182	0.000041	0.000050	0.000041
Lithium (Total)	0.000500	0.000500	0.000500	0.000500	0.000500	0.000523	0.000500	0.001000	0.000367	0.000500	0.000500	0.000500
Magnesium (Total	5.18	6.09	5.85	5.42	3.27	2.67	3.93	5.03	5.35	4.93	5.46	5.32
Manganese (Total	0.000170	0.000080	0.000290	0.000228	0.014102	0.026003	0.001022	0.000963	0.000353	0.000214	0.000264	0.000217
Molybdenum (Tot	0.000307	0.000320	0.000300	0.000347	0.000144	0.000127	0.000188	0.000258	0.000286	0.000267	0.000274	0.000291
Nickel (Total)	0.000350	0.000100	0.000090	0.000104	0.001344	0.001768	0.000500	0.000767	0.000373	0.000377	0.000500	0.000425
Phosphorus (Meta	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.21	0.30	0.30	0.30	0.30
Potassium (Total)	0.55	0.70	0.61	0.62	0.45	0.38	0.46	0.55	0.59	0.56	0.53	0.54
Selenium (Total)	0.00011	0.00012	0.00014	0.00011	0.00012	0.00010	0.00010	0.00017	0.00010	0.00009	0.00010	0.00011
Silicon (Total)	3.005	3.020	3.130	3.290	3.207	3.246	3.270	3.418	3.370	3.213	3.000	2.993
Silver (Total)	0.000009	0.000005	0.000005	0.000005	0.000010	0.000014	0.000010	0.000023	0.000023	0.000008	0.000010	0.000010
Sodium (Total)	1.135000	1.310000	1.310000	1.140000	0.767667	0.587400	0.782667	0.922750	1.018000	1.076667	1.060000	1.092500
Strontium (Total)	0.161000	0.163000	0.161000	0.161000	0.103200	0.069520	0.104500	0.156000	0.169000	0.154000	0.154000	0.157500
Sulphur (Total)	10.00	10.00	10.00	10.00	8.60	7.20	5.80	7.20	8.60	10.00	10.00	10.00
Thallium (Total)	0.000006	0.000002	0.000002	0.000006	0.000010	0.000010	0.000010	0.000013	0.000013	0.000007	0.000010	0.000008
Tin (Total)	0.000150	0.000200	0.000200	0.000200	0.000100	0.000100	0.000195	0.000133	0.000070	0.000107	0.000100	0.000125
Titanium (Total)	0.005250	0.000500	0.000500	0.006875	0.013250	0.011200	0.010000	0.006900	0.006733	0.006833	0.010000	0.007625
Uranium (Total)	0.000254	0.000289	0.000262	0.000230	0.000162	0.000072	0.000100	0.000198	0.000220	0.000209	0.000201	0.000228
Vanadium (Total)	0.000600	0.000200	0.000200	0.000600	0.001000	0.001200	0.001000	0.000749	0.000683	0.000733	0.001000	0.000800
Zinc (Total)	0.0016	0.0001	0.0004	0.0021	0.0040	0.0046	0.0031	0.0027	0.0020	0.0020	0.0030	0.0023
Zirconium (Total)	0.000100	0.000100	0.000100	0.000480	0.000860	0.001240	0.001620	0.002000	0.002000	0.000100	0.000100	0.000100
Mercury (Total)	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000013	0.000010	0.000010	0.000010
pH (In Situ) pH	0	0	0	0	0	0	0	0	0	0	0	0
Orthophosphate (I	0.0025	0.0050	0.0050	0.0043	0.0035	0.0010	0.0010	0.0011	0.0010	0.0021	0.0010	0.0018
Nitrate (as N)	0.085	0.109	0.089	0.062	0.024	0.005	0.006	0.033	0.053	0.031	0.069	0.077
Ammonia (Total)	0.012	0.021	0.012	0.015	0.017	0.009	0.012	0.076	0.027	0.011	0.005	0.009
Nitrite (as N)	0.003	0.005	0.005	0.003	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.002

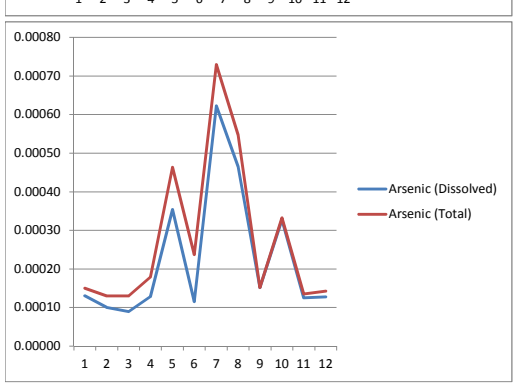
APPENDIX A1 - SOURCE TERMS
HARPER CREEK PROJECT
TABLE 4 - Site H1 (SW)

Parameter	January 01/01/2013	February 01/02/2013	March 01/03/2013	April 01/04/2013	May 01/05/2013	June 01/06/2013	July 01/07/2013	August 01/08/2013	September 01/09/2013	October 01/10/2013	November 01/11/2013	December 01/12/2013
Sulphate (Dissolved)	3.50	3.46	4.61	2.91	1.44	1.67	2.05	3.20	3.75	2.28	2.89	3.01
Acidity to pH 4.5 (as Ca	0	0	0	0	0	0	0	0	0	0	0	0
Acidity to pH 8.3 (as Ca	0	0	0	0	0	0	0	0	0	0	0	0
Alkalinity (Total as CaC(	25.35	30.60	26.90	23.83	11.61	10.47	14.74	30.16	26.02	20.38	24.60	19.70
Chloride (Dissolved)	0.50	0.60	0.50	0.50	0.55	0.50	0.50	0.40	0.73	0.57	0.50	0.50
Fluoride (Dissolved)	0.0427	0.0550	0.0510	0.0450	0.0305	0.0230	0.0294	0.0456	0.0464	0.0394	0.0440	0.0350
Hardness as CaCO3 (D	25.0	26.7	25.5	22.0	13.2	11.1	15.6	22.9	23.6	18.8	22.4	15.2
Aluminum (Dissolved)	0.0122	0.0097	0.0160	0.0298	0.0733	0.0585	0.0266	0.0149	0.0129	0.0254	0.0172	0.0347
Antimony (Dissolved)	0.00006	0.00002	0.00002	0.00002	0.00013	0.00010	0.00013	0.00013	0.00013	0.00011	0.00006	0.00006
Arsenic (Dissolved)	0.00013	0.00010	0.00009	0.00013	0.00035	0.00012	0.00062	0.00047	0.00015	0.00033	0.00013	0.00013
Barium (Dissolved)	0.0064	0.0072	0.0069	0.0059	0.0042	0.0034	0.0048	0.0066	0.0072	0.0055	0.0057	0.0060
Beryllium (Dissolved)	0.00006	0.00001	0.00001	0.00001	0.00013	0.00010	0.00013	0.00013	0.00007	0.00006	0.00006	0.00006
Bismuth (Dissolved)	0.00025	0.00001	0.00001	0.00001	0.00043	0.00050	0.00040	0.00040	0.00040	0.00030	0.00025	0.00025
Boron (Dissolved)	0.03000	0.05000	0.05000	0.05000	0.01000	0.01000	0.01000	0.01000	0.01000	0.02000	0.03000	0.03000
Cadmium (Dissolved)	0.000009	0.000008	0.000011	0.000010	0.000014	0.000013	0.000018	0.000020	0.000012	0.000008	0.000008	0.000008
Calcium (Dissolved)	8.02	8.54	8.16	7.07	4.20	3.61	5.24	7.33	7.74	6.07	6.85	4.89
Chromium (Dissolved)	0.00010	0.00010	0.00010	0.00010	0.00013	0.00010	0.00013	0.00013	0.00018	0.00013	0.00010	0.00010
Cobalt (Dissolved)	0.00005	0.00001	0.00001	0.00002	0.00013	0.00010	0.00013	0.00013	0.00007	0.00010	0.00006	0.00005
Copper (Dissolved)	0.00024	0.00024	0.00022	0.00051	0.00080	0.00108	0.00081	0.00036	0.00040	0.00030	0.00035	0.00029
Iron (Dissolved)	0.0085	0.0060	0.0050	0.0208	0.0269	0.0158	0.0118	0.0113	0.0084	0.0150	0.0085	0.0085
Lead (Dissolved)	0.000040	0.000016	0.000015	0.000027	0.000088	0.000209	0.000167	0.000100	0.000042	0.000086	0.000033	0.000036
Lithium (Dissolved)	0.001550	0.001700	0.001600	0.001240	0.000700	0.000603	0.000877	0.001353	0.001547	0.001188	0.001515	0.001533
Magnesium (Dissolved)	1.20	1.31	1.25	1.05	0.62	0.52	0.70	1.03	1.11	0.87	0.99	0.73
Manganese (Dissolved)	0.000149	0.000170	0.000130	0.000529	0.001123	0.000650	0.000428	0.000438	0.000396	0.000456	0.000355	0.000360
Molybdenum (Dissolved	0.002093	0.002280	0.002260	0.001883	0.001011	0.001282	0.001832	0.002108	0.002178	0.001816	0.002250	0.001300
Nickel (Dissolved)	0.000275	0.000030	0.000040	0.000070	0.000425	0.000500	0.000433	0.000400	0.000353	0.000318	0.000280	0.000278
Phosphorus (Metal) Dis	0.30	0.28	0.27	0.25	0.23	0.30	0.21	0.21	0.30	0.21	0.30	0.30
Potassium (Dissolved)	0.81	0.93	0.88	0.84	0.45	0.35	0.48	0.75	0.85	0.69	0.72	0.76
Selenium (Dissolved)	0.00007	0.00004	0.00004	0.00005	0.00013	0.00010	0.00020	0.00013	0.00007	0.00011	0.00007	0.00007
Silicon (Dissolved)	4.455	4.600	4.470	4.760	3.244	2.658	3.108	3.980	4.188	3.898	4.100	4.278
Silver (Dissolved)	0.000008	0.000005	0.000005	0.000005	0.000020	0.000010	0.000023	0.000023	0.000023	0.000019	0.000008	0.000008
Sodium (Dissolved)	1.855000	2.130000	2.080000	1.870000	0.935750	0.716250	0.999250	1.497500	1.736000	1.415000	1.725000	1.790000
Strontium (Dissolved)	0.044300	0.050400	0.049500	0.042800	0.022775	0.017675	0.025525	0.040700	0.046540	0.036725	0.041300	0.042800
Sulphur (Dissolved)	0.01	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	5.01
Thallium (Dissolved)	0.000006	0.000002	0.000002	0.000002	0.000013	0.000010	0.000013	0.000013	0.000013	0.000011	0.000006	0.000006
Tin (Dissolved)	0.000150	0.000200	0.000200	0.000210	0.000125	0.000100	0.000133	0.000133	0.000070	0.000128	0.000060	0.000105
Titanium (Dissolved)	0.005250	0.000500	0.000500	0.000500	0.007825	0.010000	0.006867	0.006733	0.006733	0.005250	0.005250	0.005250
Uranium (Dissolved)	0.001330	0.001930	0.001670	0.001360	0.001033	0.000819	0.000823	0.001046	0.001094	0.001039	0.001185	0.000980
Vanadium (Dissolved)	0.000600	0.000200	0.000200	0.000200	0.000815	0.001000	0.000833	0.000727	0.000683	0.000613	0.000650	0.000625
Zinc (Dissolved)	0.0007	0.0004	0.0005	0.0025	0.0036	0.0029	0.0053	0.0027	0.0011	0.0011	0.0009	0.0008
Zirconium (Dissolved)	0.000100	0.000100	0.000100	0.000100	0.002000	0.002000	0.002000	0.002000	0.000100	0.001050	0.000100	0.000100
Mercury (Dissolved)	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000013	0.000013	0.000010	0.000010
Aluminum (Total)	0.0151	0.0128	0.0209	0.0600	0.1623	0.1473	0.0408	0.0230	0.0178	0.0326	0.0212	0.0448
Antimony (Total)	0.00006	0.00002	0.00002	0.00002	0.00013	0.00010	0.00013	0.00013	0.00013	0.00011	0.00006	0.00006
Arsenic (Total)	0.00015	0.00013	0.00013	0.00018	0.00046	0.00024	0.00073	0.00055	0.00015	0.00033	0.00014	0.00014
Barium (Total)	0.0064	0.0072	0.0069	0.0067	0.0050	0.0047	0.0048	0.0066	0.0072	0.0055	0.0060	0.0062
Beryllium (Total)	0.00006	0.00001	0.00001	0.00001	0.00013	0.00010	0.00013	0.00013	0.00009	0.00006	0.00006	0.00006
Bismuth (Total)	0.00025	0.00001	0.00001	0.00001	0.00043	0.00050	0.00040	0.00040	0.00040	0.00030	0.00025	0.00025
Boron (Total)	0.03000	0.05000	0.05000	0.05000	0.01000	0.01000	0.01000	0.01000	0.01000	0.02000	0.03000	0.03000
Cadmium (Total)	0.000011	0.000008	0.000012	0.000014	0.000018	0.000013	0.000018	0.000020	0.000012	0.000009	0.000008	0.000009
Calcium (Total)	8.10	8.56	8.35	7.07	4.44	3.76	5.24	7.33	7.74	6.07	7.13	6.69
Chromium (Total)	0.00010	0.00010	0.00010	0.00010	0.00019	0.00018	0.00017	0.00014	0.00018	0.00014	0.00010	0.00010
Cobalt (Total)	0.00005	0.00001	0.00001	0.00002	0.00013	0.00010	0.00013	0.00013	0.00007	0.00010	0.00006	0.00005
Copper (Total)	0.00041	0.00053	0.00037	0.00057	0.00133	0.00135	0.00081	0.00053	0.00046	0.00070	0.00043	0.00280
Iron (Total)	0.0105	0.0090	0.0080	0.0505	0.1324	0.1788	0.0310	0.0165	0.0148	0.0190	0.0165	0.0330
Lead (Total)	0.000040	0.000024	0.000022	0.000065	0.000176	0.000209	0.000167	0.000100	0.000050	0.000086	0.000047	0.000040
Lithium (Total)	0.001590	0.001800	0.001600	0.001360	0.000735	0.000710	0.000913	0.001413	0.001547	0.001225	0.001515	0.001533
Magnesium (Total)	1.20	1.36	1.25	1.07	0.67	0.55	0.71	1.03	1.12	0.88	1.06	1.00
Manganese (Total)	0.000410	0.000430	0.000440	0.001933	0.005894	0.005618	0.001282	0.001035	0.000850	0.000803	0.000654	0.000690
Molybdenum (Total)	0.002093	0.002360	0.002260	0.001993	0.001171	0.001288	0.002088	0.002166	0.002178	0.001816	0.002275	0.001400
Nickel (Total)	0.000275	0.000400	0.000040	0.000078	0.000668	0.000500	0.000433	0.000400	0.000353	0.000318	0.000280	0.000278
Phosphorus (Metal) Tot	0.30	0.28	0.27	0.25	0.23	0.30	0.21	0.21	0.30	0.21	0.30	0.30
Potassium (Total)	0.82	0.96	0.88	0.84	0.48	0.37	0.48	0.75	0.85	0.69	0.80	0.81
Selenium (Total)	0.00007	0.00004	0.00004	0.00006	0.00013	0.00010	0.00020	0.00013	0.00008	0.00011	0.00007	0.00007
Silicon (Total)	4.465	4.630	4.710	4.760	3.513	2.968	3.108	3.988	4.188	3.898	4.555	4.510
Silver (Total)	0.000015	0.000005	0.000005	0.000005	0.000023	0.000010	0.000023	0.000023	0.000023	0.000019	0.000008	0.000011
Sodium (Total)	1.865000	2.240000	2.080000	1.895000	0.935750	0.740500	1.000750	1.522500	1.736000	1.435000	1.790000	1.827500
Strontium (Total)	0.044300	0.050400	0.049500	0.044100	0.023688	0.018500	0.025975	0.040950	0.046540	0.036725	0.041900	0.043025
Sulphur (Total)	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
Thallium (Total)	0.000006	0.000002	0.000002	0.000002	0.000013	0.000010	0.000013	0.000013	0.000013	0.000011	0.000006	0.000006
Tin (Total)	0.000150	0.000200	0.000200	0.000210	0.000125	0.000100	0.000133	0.000133	0.000077	0.000128	0.000090	0.000120
Titanium (Total)	0.005250	0.000500	0.000500	0.001290	0.008400	0.010000	0.009333	0.006967	0.006867	0.005300	0.005250	0.005250
Uranium (Total)	0.001367	0.001940	0.001670	0.001643	0.001453	0.001041	0.000946	0.001148	0.001127	0.001095	0.001285	0.001070
Vanadium (Total)	0.000600	0.000200	0.000200	0.000200	0.000815	0.001000	0.000833	0.000727	0.000733	0.000613	0.000650	0.000625
Zinc (Total)	0.0018	0.0005	0.0005	0.0025	0.0036	0.0030	0.0053	0.0027	0.0036	0.0033	0.0018	0.0018
Zirconium (Total)	0.000100	0.000100	0.000100	0.000100	0.002000	0.002000	0.002000	0.002000	0.002000	0.001050	0.000100	0.000100
Mercury (Total)	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000013	0.000013	0.000010	0.000010
H+ Calcluated based on	0	0	0	0	0	0	0	0	0	0	0	0
Orthophosphate (Dissol	0.0030	0.0050	0.0050	0.0050	0.0010	0.0010	0.0010	0.0017	0.0030	0.0020	0.0030	0.0030
Nitrate (as N)	0.119	0.115	0.107	0.127	0.141	0.032	0.015	0.029	0.032	0.036	0.083	0.079
Ammonia (Total)	0.019	0.024	0.023	0.008	0.014	0.012	0.014	0.108	0.016	0.008	0.044	0.032
Nitrite (as N)	0.003	0.005	0.005	0.005	0.001	0.001	0.001	0.001	0.001	0.002	0.003	0.003



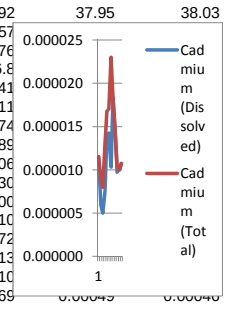






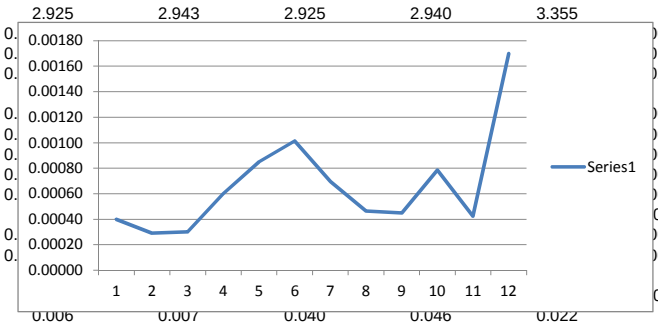
APPENDIX A1 - SOURCE TERMS
HARPER CREEK PROJECT
TABLE 5 - Site H2 (SW)

Parameter	January 01/01/2013	February 01/02/2013	March 01/03/2013	April 01/04/2013	May 01/05/2013	June 01/06/2013	July 01/07/2013	August 01/08/2013	September 01/09/2013	October 01/10/2013	November 01/11/2013	December 01/12/2013
Sulphate (Dissolved)	9.33	9.44	13.30	8.35	4.58	5.15	6.36	8.39	8.94	7.20	8.31	8.82
Acidity to pH 4.5 (as CaCO3)	0	0	0	0	0	0	0	0	0	0	0	0
Acidity to pH 8.3 (as CaCO3)	0	0	0	0	0	0	0	0	0	0	0	0
Alkalinity (Total as CaCO3)	38.10	44.10	41.20	41.25	24.14	21.15	27.94	44.78	36.86	33.92	37.95	38.03
Chloride (Dissolved)	0.50	0.90	0.50	0.50	0.50	1.02	0.50	0.40	0.60	0.57		
Fluoride (Dissolved)	0.0360	0.0480	0.0430	0.0390	0.0282	0.0263	0.0314	0.0394	0.0376	0.0376		
Hardness as CaCO3 (Dissolved)	43.0	43.3	45.3	42.7	27.6	24.5	32.6	40.6	40.7	36.8		
Aluminum (Dissolved)	0.0063	0.0067	0.0070	0.0125	0.0400	0.0324	0.0171	0.0110	0.0105	0.0141		
Antimony (Dissolved)	0.00006	0.00002	0.00002	0.00002	0.00010	0.00010	0.00010	0.00013	0.00013	0.00011		
Arsenic (Dissolved)	0.00048	0.00048	0.00042	0.00047	0.00026	0.00026	0.00049	0.00101	0.00059	0.00074		
Barium (Dissolved)	0.0102	0.0106	0.0109	0.0103	0.0061	0.0055	0.0072	0.0098	0.0103	0.0089		
Beryllium (Dissolved)	0.00006	0.00001	0.00001	0.00001	0.00010	0.00010	0.00010	0.00013	0.00007	0.00006		
Bismuth (Dissolved)	0.00025	0.00001	0.00001	0.00001	0.00050	0.00050	0.00050	0.00040	0.00040	0.00030		
Boron (Dissolved)	0.03000	0.05000	0.05000	0.05000	0.01000	0.01000	0.01000	0.01000	0.01000	0.02000		
Cadmium (Dissolved)	0.000012	0.000006	0.000005	0.000008	0.000014	0.000014	0.000010	0.000018	0.000014	0.000010		
Calcium (Dissolved)	13.55	13.40	14.20	13.50	8.72	7.80	10.39	12.78	12.92	11.72		
Chromium (Dissolved)	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00013	0.00013	0.00013		
Cobalt (Dissolved)	0.00006	0.00001	0.00001	0.00002	0.00010	0.00010	0.00010	0.00013	0.00007	0.00010		
Copper (Dissolved)	0.00043	0.00038	0.00040	0.00055	0.00219	0.00188	0.00090	0.00073	0.00059	0.00069		
Iron (Dissolved)	0.0090	0.0040	0.0040	0.0154	0.0194	0.0125	0.0123	0.0148	0.0092	0.0118	0.0080	0.0085
Lead (Dissolved)	0.000029	0.000005	0.000005	0.000009	0.000050	0.000050	0.000050	0.000100	0.000135	0.000102	0.000028	0.000028
Lithium (Dissolved)	0.000675	0.000900	0.000700	0.000500	0.000500	0.000520	0.000500	0.000740	0.000603	0.000705	0.000500	0.000588
Magnesium (Dissolved)	2.22	2.40	2.35	2.15	1.42	1.22	1.62	1.94	2.02	1.85	1.95	2.09
Manganese (Dissolved)	0.000523	0.000580	0.000490	0.000906	0.000602	0.000734	0.000929	0.000701	0.000806	0.000775	0.000698	0.000610
Molybdenum (Dissolved)	0.000771	0.000830	0.000810	0.000547	0.000385	0.000488	0.001097	0.001070	0.001081	0.000956	0.000748	0.000760
Nickel (Dissolved)	0.000295	0.000050	0.000070	0.000082	0.000500	0.000500	0.000500	0.000500	0.000363	0.000318	0.000285	0.000290
Phosphorus (Metal) Dissolved	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.21	0.30	0.21	0.30	0.30
Potassium (Dissolved)	1.11	1.29	1.20	1.13	0.58	0.55	0.78	1.09	1.20	1.09	1.00	1.05
Selenium (Dissolved)	0.00010	0.00008	0.00010	0.00012	0.00010	0.00010	0.00010	0.00013	0.00007	0.00014	0.00009	0.00009
Silicon (Dissolved)	3.745	3.680	3.890	3.945	3.112	3.000	3.300	3.820	3.840	3.965	3.555	3.650
Silver (Dissolved)	0.000008	0.000005	0.000005	0.000005	0.000010	0.000010	0.000023	0.000023	0.000023	0.000019	0.000008	0.000008
Sodium (Dissolved)	1.740000	1.980000	1.920000	1.690000	0.798200	0.732750	0.983333	1.360000	1.544000	1.460000	1.465000	1.602500
Strontium (Dissolved)	0.049400	0.053800	0.052500	0.051300	0.030420	0.026800	0.033467	0.046225	0.050100	0.045800	0.045950	0.047675
Sulphur (Dissolved)	0.01	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	5.01
Thallium (Dissolved)	0.000006	0.000002	0.000002	0.000002	0.000010	0.000010	0.000010	0.000013	0.000013	0.000011	0.000006	0.000006
Tin (Dissolved)	0.000150	0.000200	0.000200	0.000200	0.000100	0.000100	0.000100	0.000133	0.000070	0.000120	0.000080	0.000115
Titanium (Dissolved)	0.005250	0.000500	0.000500	0.000500	0.010000	0.010000	0.010000	0.006800	0.006733	0.005250	0.005250	0.005250
Uranium (Dissolved)	0.000329	0.000376	0.000376	0.000344	0.000254	0.000258	0.000305	0.000354	0.000341	0.000331	0.000303	0.000316
Vanadium (Dissolved)	0.000600	0.000200	0.000200	0.000200	0.001000	0.001000	0.001000	0.000769	0.000683	0.000588	0.000600	0.000600
Zinc (Dissolved)	0.0007	0.0004	0.0004	0.0005	0.0020	0.0019	0.0010	0.0027	0.0017	0.0016	0.0007	0.0007
Zirconium (Dissolved)	0.000100	0.000100	0.000100	0.000100	0.000575	0.001050	0.001525	0.002000	0.000100	0.001050	0.000100	0.000100
Mercury (Dissolved)	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000013	0.000013	0.000010	0.000010
Aluminum (Total)	0.0089	0.0076	0.0070	0.0349	0.1105	0.1101	0.0276	0.0192	0.0195	0.0261	0.0127	0.0108
Antimony (Total)	0.00006	0.00002	0.00002	0.00002	0.00010	0.00010	0.00010	0.00013	0.00013	0.00011	0.00006	0.00006
Arsenic (Total)	0.00048	0.00048	0.00042	0.00048	0.00038	0.00045	0.00051	0.00101	0.00059	0.00074	0.00052	0.00049
Barium (Total)	0.0102	0.0114	0.0109	0.0104	0.0066	0.0062	0.0072	0.0098	0.0104	0.0095	0.0094	0.0098
Beryllium (Total)	0.00006	0.00001	0.00001	0.00001	0.00010	0.00010	0.00010	0.00013	0.00009	0.00006	0.00006	0.00006
Bismuth (Total)	0.00025	0.00001	0.00001	0.00001	0.00050	0.00050	0.00050	0.00040	0.00040	0.00030	0.00025	0.00025
Boron (Total)	0.03000	0.05000	0.05000	0.05000	0.01000	0.01000	0.01000	0.01000	0.01000	0.02000	0.03000	0.03000
Cadmium (Total)	0.000012	0.000009	0.000008	0.000013	0.000017	0.000017	0.000023	0.000018	0.000014	0.000010	0.000010	0.000011
Calcium (Total)	13.75	14.50	14.70	13.50	8.88	7.94	10.39	12.78	13.02	11.72	12.85	13.30
Chromium (Total)	0.00010	0.00010	0.00010	0.00010	0.00020	0.00020	0.00011	0.00014	0.00019	0.00013	0.00010	0.00010
Cobalt (Total)	0.00006	0.00002	0.00001	0.00002	0.00010	0.00011	0.00010	0.00013	0.00008	0.00012	0.00006	0.00006
Copper (Total)	0.00045	0.00045	0.00045	0.00081	0.00303	0.00276	0.00123	0.00080	0.00071	0.00104	0.00062	0.00053
Iron (Total)	0.0095	0.0070	0.0060	0.0553	0.1642	0.1330	0.0390	0.0195	0.0262	0.0203	0.0145	0.0120
Lead (Total)	0.000037	0.000006	0.000005	0.000018	0.000126	0.000185	0.000050	0.000100	0.000135	0.000102	0.000029	0.000033
Lithium (Total)	0.000725	0.000900	0.000700	0.000500	0.000500	0.000520	0.000545	0.000763	0.000687	0.000730	0.000550	0.000638
Magnesium (Total)	2.23	2.48	2.40	2.18	1.46	1.28	1.62	1.95	2.04	1.88	2.15	2.19
Manganese (Total)	0.000707	0.000790	0.000520	0.002660	0.007620	0.005692	0.001798	0.001465	0.002148	0.002414	0.001190	0.000948
Molybdenum (Total)	0.000829	0.000870	0.000820	0.000547	0.000424	0.000520	0.001180	0.001114	0.001087	0.000956	0.000839	0.000834
Nickel (Total)	0.000295	0.000090	0.000070	0.000128	0.000500	0.000500	0.000500	0.000500	0.000373	0.000335	0.000295	0.000293
Phosphorus (Metal) Total	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.21	0.30	0.21	0.30	0.30
Potassium (Total)	1.12	1.29	1.22	1.13	0.58	0.56	0.78	1.09	1.20	1.09	1.07	1.10
Selenium (Total)	0.00012	0.00011	0.00011	0.00012	0.00010	0.00010	0.00010	0.00013	0.00010	0.00014	0.00009	0.00010
Silicon (Total)	3.840	3.960	4.060	3.945	3.232	3.170	3.300	3.820	3.858	3.965	3.980	3.910
Silver (Total)	0.000011	0.000005	0.000005	0.000005	0.000010	0.000010	0.000023	0.000023	0.000023	0.000019	0.000008	0.000009
Sodium (Total)	1.740000	2.050000	1.950000	1.745000	0.805200	0.743000	0.983333	1.407500	1.560000	1.460000	1.575000	1.650000
Strontium (Total)	0.051500	0.054100	0.052600	0.052700	0.031140	0.026900	0.033567	0.048450	0.051220	0.045800	0.047450	0.049475
Sulphur (Total)	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
Thallium (Total)	0.000006	0.000002	0.000002	0.000002	0.000010	0.000010	0.000010	0.000013	0.000013	0.000011	0.000006	0.000006
Tin (Total)	0.000150	0.000200	0.000200	0.000280	0.000100	0.000100	0.000100	0.000133	0.000073	0.000120	0.000080	0.000115
Titanium (Total)	0.005250	0.000500	0.000500	0.000500	0.010000	0.010000	0.010000	0.007033	0.007133	0.005350	0.005250	0.005250
Uranium (Total)	0.000349	0.000401	0.000376	0.000350	0.000418	0.000321	0.000348	0.000388	0.000360	0.000341	0.000330	0.000339
Vanadium (Total)	0.000600	0.000200	0.000200	0.000200	0.001000	0.001000	0.001000	0.000769	0.000767	0.000588	0.000600	0.000600
Zinc (Total)	0.0018	0.0004	0.0004	0.0031	0.0031	0.0034	0.0030	0.0027	0.0027	0.0074	0.0017	0.0017
Zirconium (Total)	0.000100	0.000100	0.000100	0.000100	0.000575	0.001050	0.001525	0.002000	0.002000	0.001050	0.000100	0.000100
Mercury (Total)	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000013	0.000013	0.000010	0.000010
H+ Calcluated based on A143	0	0	0	0	0	0	0	0	0	0	0	0
Orthophosphate (Dissolved)	0.0030	0.0050	0.0050	0.0050	0.0010	0.0010	0.0010	0.0020	0.0010	0.0018	0.0030	0.0030
Nitrate (as N)	0.198	0.205	0.197	0.245	0.295	0.174	0.066	0.084	0.112	0.119	0.163	0.180
Ammonia (Total)	0.019	0.021	0.012	0.015	0.010	0.010	0.036	0.832	0.016	0.011	0.014	0.016
Nitrite (as N)	0.003	0.005	0.005	0.005	0.001	0.002	0.001	0.001	0.001	0.002	0.003	0.003



APPENDIX A1 - SOURCE TERMS
HARPER CREEK PROJECT
TABLE 6 - Site H3T (SW)

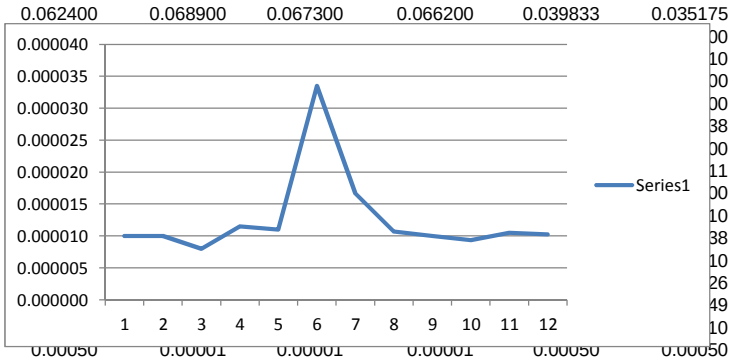
Parameter	January 01/01/2013	February 01/02/2013	March 01/03/2013	April 01/04/2013	May 01/05/2013	June 01/06/2013	July 01/07/2013	August 01/08/2013	September 01/09/2013	October 01/10/2013	November 01/11/2013	December 01/12/2013
Sulphate (Dissolved)	2.07	1.83	3.84	1.14	0.99	1.03	1.13	1.87	2.02	1.50	1.66	3.03
Acidity to pH 4.5 (as CaCO3)	0	0	0	0	0	0	0	0	0	0	0	0
Acidity to pH 8.3 (as CaCO3)	0	0	0	0	0	0	0	0	0	0	0	0
Alkalinity (Total as CaCO3)	21.10	27.70	23.10	21.50	11.38	10.42	15.80	21.88	18.93	18.30	21.30	19.20
Chloride (Dissolved)	0.50	0.60	0.50	0.50	0.50	0.50	0.53	0.40	0.60	0.56	0.50	0.50
Fluoride (Dissolved)	0.0200	0.0280	0.0220	0.0210	0.0200	0.0175	0.0200	0.0275	0.0200	0.0275	0.0210	0.0340
Hardness as CaCO3 (Dissolved)	21.2	23.7	23.3	20.0	13.0	10.8	15.5	19.7	20.5	17.8	18.9	20.3
Aluminum (Dissolved)	0.0174	0.0168	0.0158	0.0286	0.0803	0.0684	0.0331	0.0186	0.0175	0.0310	0.0252	0.0374
Antimony (Dissolved)	0.00006	0.00002	0.00002	0.00002	0.00013	0.00010	0.00013	0.00013	0.00013	0.00011	0.00006	0.00006
Arsenic (Dissolved)	0.00009	0.00006	0.00007	0.00010	0.00055	0.00010	0.00080	0.00047	0.00010	0.00028	0.00010	0.00009
Barium (Dissolved)	0.0070	0.0075	0.0073	0.0068	0.0056	0.0046	0.0062	0.0072	0.0078	0.0062	0.0063	0.0067
Beryllium (Dissolved)	0.00006	0.00001	0.00001	0.00001	0.00013	0.00010	0.00013	0.00013	0.00007	0.00006	0.00006	0.00006
Bismuth (Dissolved)	0.00025	0.00001	0.00001	0.00001	0.00043	0.00050	0.00040	0.00040	0.00040	0.00030	0.00025	0.00025
Boron (Dissolved)	0.03000	0.05000	0.05000	0.05000	0.01000	0.01000	0.01000	0.01000	0.01000	0.02000	0.03000	0.03000
Cadmium (Dissolved)	0.000008	0.000005	0.000005	0.000005	0.000009	0.000013	0.000011	0.000038	0.000010	0.000008	0.000008	0.000008
Calcium (Dissolved)	7.23	8.08	7.91	6.78	4.44	3.71	5.55	6.68	7.10	6.06	6.16	6.50
Chromium (Dissolved)	0.00010	0.00010	0.00010	0.00010	0.00013	0.00010	0.00007	0.00013	0.00013	0.00013	0.00010	0.00010
Cobalt (Dissolved)	0.00006	0.00001	0.00001	0.00002	0.00013	0.00010	0.00013	0.00013	0.00007	0.00011	0.00005	0.00006
Copper (Dissolved)	0.00030	0.00027	0.00028	0.00060	0.00059	0.00059	0.00049	0.00045	0.00037	0.00044	0.00038	0.00170
Iron (Dissolved)	0.0075	0.0040	0.0030	0.0197	0.0333	0.0233	0.0150	0.0090	0.0085	0.0165	0.0105	0.0090
Lead (Dissolved)	0.000030	0.000011	0.000005	0.000014	0.000088	0.000137	0.000100	0.000100	0.000209	0.000080	0.000031	0.000030
Lithium (Dissolved)	0.000500	0.000500	0.000500	0.000500	0.000625	0.000500	0.000667	0.000667	0.000667	0.000875	0.000500	0.000500
Magnesium (Dissolved)	0.76	0.84	0.85	0.74	0.45	0.37	0.51	0.62	0.69	0.64	0.62	0.99
Manganese (Dissolved)	0.000070	0.000080	0.000050	0.000362	0.001007	0.001008	0.000228	0.000356	0.000165	0.000330	0.000905	0.000500
Molybdenum (Dissolved)	0.000692	0.000720	0.000740	0.000414	0.000273	0.000452	0.001191	0.001078	0.001108	0.000698	0.000678	0.001400
Nickel (Dissolved)	0.000275	0.000040	0.000030	0.000057	0.000425	0.000500	0.000400	0.000433	0.000360	0.000323	0.000270	0.000273
Phosphorus (Metal) Dissolved	0.30	0.28	0.27	0.25	0.23	0.30	0.21	0.21	0.30	0.21	0.30	0.30
Potassium (Dissolved)	0.54	0.60	0.59	0.60	0.41	0.35	0.43	0.55	0.60	0.53	0.46	0.50
Selenium (Dissolved)	0.00007	0.00004	0.00004	0.00004	0.00013	0.00010	0.00013	0.00013	0.00007	0.00011	0.00007	0.00007
Silicon (Dissolved)	3.570	3.840	3.730	3.840	2.867	2.648	2.928	2.925	2.940	3.355	3.200	3.385
Silver (Dissolved)	0.000008	0.000005	0.000005	0.000005	0.000020	0.000010	0.000023	0.000023	0.000023	0.000019	0.000008	0.000008
Sodium (Dissolved)	1.155000	1.300000	1.350000	1.070000	0.644000	0.578667	0.771750	0.940250	1.076000	0.943000	0.936500	1.045750
Strontium (Dissolved)	0.022200	0.024300	0.024800	0.021600	0.014417	0.011767	0.016550	0.021750	0.024040	0.019225	0.020450	0.021325
Sulphur (Dissolved)	0.01	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	5.01
Thallium (Dissolved)	0.000006	0.000002	0.000002	0.000002	0.000013	0.000010	0.000013	0.000013	0.000007	0.000011	0.000006	0.000006
Tin (Dissolved)	0.000150	0.000200	0.000200	0.000220	0.000125	0.000100	0.000133	0.000133	0.000070	0.000128	0.000065	0.000108
Titanium (Dissolved)	0.005250	0.000500	0.000500	0.000500	0.007800	0.010000	0.006833	0.006733	0.006733	0.005250	0.005250	0.005250
Uranium (Dissolved)	0.000195	0.000204	0.000199	0.000174	0.000208	0.000222	0.000241	0.000192	0.000194	0.000204	0.000186	0.001040
Vanadium (Dissolved)	0.000600	0.000200	0.000200	0.000200	0.000808	0.001000	0.000683	0.000731	0.000683	0.000588	0.000600	0.000600
Zinc (Dissolved)	0.0007	0.0003	0.0002	0.0016	0.0031	0.0021	0.0040	0.0020	0.0014	0.0009	0.0006	0.0007
Zirconium (Dissolved)	0.000100	0.000100	0.000100	0.000100	0.002000	0.002000	0.002000	0.002000	0.002000	0.001050	0.000100	0.000100
Mercury (Dissolved)	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000013	0.000013	0.000010	0.000010
Aluminum (Total)	0.0190	0.0169	0.0162	0.0347	0.1392	0.2162	0.0424	0.0371	0.0276	0.0392	0.0274	0.0434
Antimony (Total)	0.00006	0.00002	0.00002	0.00002	0.00013	0.00010	0.00013	0.00013	0.00013	0.00011	0.00006	0.00006
Arsenic (Total)	0.00009	0.00010	0.00009	0.00012	0.00055	0.00017	0.00080	0.00047	0.00011	0.00030	0.00010	0.00009
Barium (Total)	0.0072	0.0076	0.0074	0.0070	0.0060	0.0063	0.0062	0.0079	0.0078	0.0064	0.0068	0.0070
Beryllium (Total)	0.00006	0.00001	0.00001	0.00001	0.00013	0.00010	0.00013	0.00013	0.00010	0.00006	0.00006	0.00006
Bismuth (Total)	0.00025	0.00001	0.00001	0.00001	0.00043	0.00050	0.00040	0.00040	0.00040	0.00030	0.00025	0.00025
Boron (Total)	0.03000	0.05000	0.05000	0.05000	0.01000	0.01000	0.01000	0.01000	0.01000	0.02000	0.03000	0.03000
Cadmium (Total)	0.000008	0.000005	0.000005	0.000005	0.000041	0.000014	0.000011	0.000038	0.000010	0.000008	0.000008	0.000012
Calcium (Total)	7.23	8.08	8.05	6.78	4.57	3.87	5.55	6.68	7.10	6.06	6.54	6.70
Chromium (Total)	0.00010	0.00010	0.00010	0.00010	0.00019	0.00021	0.00014	0.00013	0.00015	0.00013	0.00010	0.00010
Cobalt (Total)	0.00006	0.00001	0.00001	0.00002	0.00013	0.00016	0.00013	0.00013	0.00008	0.00011	0.00005	0.00006
Copper (Total)	0.00040	0.00029	0.00030	0.00060	0.00085	0.00102	0.00070	0.00047	0.00045	0.00079	0.00043	0.00170
Iron (Total)	0.0090	0.0050	0.0040	0.0206	0.1025	0.1890	0.0245	0.0158	0.0184	0.0228	0.0135	0.0320
Lead (Total)	0.000030	0.000011	0.000006	0.000014	0.000103	0.000574	0.000100	0.000100	0.000209	0.000097	0.000031	0.000720
Lithium (Total)	0.000500	0.000500	0.000500	0.000500	0.000625	0.000510	0.000667	0.000667	0.000667	0.000875	0.000500	0.000500
Magnesium (Total)	0.76	0.87	0.85	0.74	0.47	0.43	0.51	0.63	0.70	0.64	0.69	1.01
Manganese (Total)	0.000343	0.000160	0.000140	0.000465	0.005562	0.010890	0.001370	0.001617	0.002053	0.000704	0.000905	0.000630
Molybdenum (Total)	0.000740	0.000730	0.000740	0.000452	0.000306	0.000457	0.001321	0.001150	0.001138	0.000727	0.000683	0.001400
Nickel (Total)	0.000275	0.000040	0.000030	0.000057	0.000425	0.000500	0.000433	0.000433	0.000367	0.000323	0.000270	0.000273
Phosphorus (Metal) Total	0.30	0.28	0.27	0.25	0.23	0.30	0.21	0.21	0.30	0.21	0.30	0.30
Potassium (Total)	0.54	0.61	0.59	0.60	0.42	0.37	0.43	0.60	0.60	0.53	0.51	0.52
Selenium (Total)	0.00007	0.00004	0.00004	0.00004	0.00013	0.00010	0.00013	0.00013	0.00011	0.00011	0.00007	0.00007
Silicon (Total)	3.570	3.840	3.930	3.840	3.020	2.925	2.943	2.925	2.940	3.355	3.680	3.590
Silver (Total)	0.000012	0.000005	0.000005	0.000005	0.000025	0.					000008	0.000010
Sodium (Total)	1.155000	1.370000	1.350000	1.070000	0.658167	0.					015000	1.072500
Strontium (Total)	0.023250	0.024400	0.024800	0.021600	0.014500	0.					021250	0.022250
Sulphur (Total)	10.00	10.00	10.00	10.00	10.00						10.00	10.00
Thallium (Total)	0.000006	0.000002	0.000002	0.000002	0.000013	0.					000006	0.000006
Tin (Total)	0.000150	0.000200	0.000300	0.000220	0.000338	0.					000070	0.000110
Titanium (Total)	0.005250	0.000500	0.000500	0.000500	0.007850	0.					005250	0.005250
Uranium (Total)	0.000204	0.000209	0.000199	0.000187	0.000241	0.					000206	0.001040
Vanadium (Total)	0.000600	0.000200	0.000200	0.000200	0.000808	0.					000600	0.000600
Zinc (Total)	0.0017	0.0003	0.0003	0.0016	0.0031						0.0016	0.0016
Zirconium (Total)	0.000100	0.000100	0.000100	0.000100	0.002000	0.					000100	0.000100
Mercury (Total)	0.000010	0.000010	0.000010	0.000010	0.000010	0.					000010	0.000010
H+ Calcluated based on A142	0	0	0	0	0						0	0
Orthophosphate (Dissolved)	0.0030	0.0050	0.0050	0.0050	0.0010						0.0030	0.0030
Nitrate (as N)	0.088	0.098	0.102	0.046	0.007	0.006	0.007	0.040	0.046	0.022	0.044	0.044
Ammonia (Total)	0.027	0.020	0.014	0.012	0.017	0.011	0.014	0.779	0.028	0.010	0.083	0.083
Nitrite (as N)	0.003	0.005	0.005	0.005	0.001	0.001	0.001	0.001	0.001	0.002	0.003	0.003

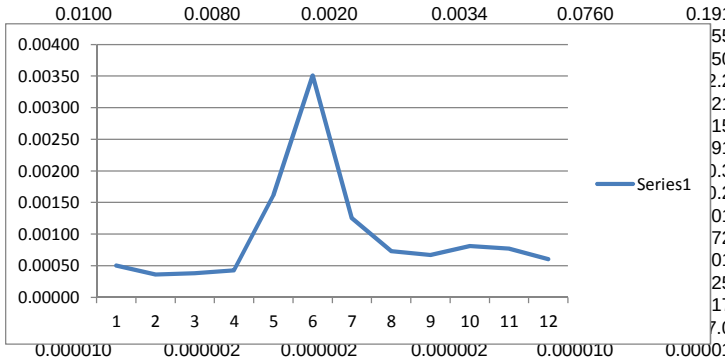


Aluminum (Dissolved)	0.01760	0.01680	0.01580	0.02860	0.08030	0.06838	0.03683	0.01943	0.01907	0.03945	0.02410	0.03740
Aluminum (Total)	0.01910	0.01690	0.01620	0.03470	0.14200	0.15000	0.03100	0.02800	0.02000	0.05005	0.02280	0.04340
Fluoride (Dissolved)	0.02000	0.02800	0.02200	0.02100	0.01400	0.01000	0.01500	0.01833	0.02000	0.02250	0.02200	0.03400
hg	0.0000075	0.000005	0.000005	0.000005	0.0000075	0.000005	0.00001	0.000015	0.00001	0.0000075	0.000005	0.00001
	0.00001											

APPENDIX A1 - SOURCE TERMS
HARPER CREEK PROJECT
TABLE 7 - Site H4P (SW)

Parameter	January 01/01/2013	February 01/02/2013	March 01/03/2013	April 01/04/2013	May 01/05/2013	June 01/06/2013	July 01/07/2013	August 01/08/2013	September 01/09/2013	October 01/10/2013	November 01/11/2013	December 01/12/2013
Sulphate (Dissolved)	11.80	13.50	15.80	11.50	5.67	5.13	7.96	10.15	13.03	12.03	11.49	11.64
Acidity to pH 4.5 (as CaCO3)	0	0	0	0	0	0	0	0	0	0	0	0
Acidity to pH 8.3 (as CaCO3)	0	0	0	0	0	0	0	0	0	0	0	0
Alkalinity (Total as CaCO3)	61.70	68.40	66.80	65.10	40.60	39.38	54.63	62.08	66.48	66.95	66.25	63.98
Chloride (Dissolved)	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.53	0.57	0.50	0.50
Fluoride (Dissolved)	0.0300	0.0420	0.0100	0.0370	0.0213	0.0212	0.0258	0.0355	0.0340	0.0353	0.0335	0.0318
Hardness as CaCO3 (Dissolved)	71.8	76.4	77.9	77.0	47.8	43.1	60.6	71.5	74.4	76.8	69.0	70.4
Aluminum (Dissolved)	0.0025	0.0033	0.0035	0.0038	0.0159	0.0178	0.0087	0.0052	0.0051	0.0038	0.0046	0.0036
Antimony (Dissolved)	0.00010	0.00002	0.00002	0.00002	0.00010	0.00010	0.00010	0.00010	0.00010	0.00007	0.00006	0.00008
Arsenic (Dissolved)	0.00018	0.00017	0.00013	0.00019	0.00023	0.00023	0.00024	0.00102	0.00024	0.00058	0.00019	0.00019
Barium (Dissolved)	0.0055	0.0062	0.0061	0.0060	0.0043	0.0041	0.0054	0.0061	0.0066	0.0060	0.0058	0.0056
Beryllium (Dissolved)	0.00010	0.00001	0.00001	0.00001	0.00010	0.00010	0.00010	0.00010	0.00010	0.00007	0.00006	0.00008
Bismuth (Dissolved)	0.00050	0.00001	0.00001	0.00001	0.00050	0.00050	0.00050	0.00050	0.00050	0.00034	0.00025	0.00038
Boron (Dissolved)	0.01000	0.05000	0.05000	0.05000	0.01000	0.01000	0.01000	0.01000	0.01000	0.02333	0.03000	0.02000
Cadmium (Dissolved)	0.000010	0.000005	0.000007	0.000009	0.000010	0.000011	0.000010	0.000011	0.000009	0.000009	0.000009	0.000009
Calcium (Dissolved)	21.20	22.00	22.60	22.60	14.93	13.70	18.93	20.70	22.50	21.65	20.55	20.88
Chromium (Dissolved)	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010
Cobalt (Dissolved)	0.00010	0.00001	0.00001	0.00001	0.00010	0.00010	0.00010	0.00010	0.00007	0.00007	0.00006	0.00008
Copper (Dissolved)	0.00044	0.00036	0.00038	0.00043	0.00110	0.00142	0.00082	0.00067	0.00062	0.00053	0.00077	0.00061
Iron (Dissolved)	0.0100	0.0080	0.0010	0.0034	0.0167	0.0100	0.0100	0.0100	0.0077	0.0080	0.0060	0.0080
Lead (Dissolved)	0.000050	0.000005	0.000005	0.000020	0.000050	0.000050	0.000253	0.000133	0.000042	0.000037	0.000030	0.000040
Lithium (Dissolved)	0.000500	0.000500	0.000500	0.000500	0.000500	0.000500	0.000500	0.000500	0.000500	0.000500	0.000500	0.000500
Magnesium (Dissolved)	4.57	5.20	5.22	4.99	2.55	2.17	3.26	3.97	4.56	4.24	4.22	4.39
Manganese (Dissolved)	0.000124	0.000200	0.000140	0.000261	0.000219	0.000305	0.000260	0.000376	0.000300	0.000309	0.000352	0.000238
Molybdenum (Dissolved)	0.000170	0.000190	0.000190	0.000184	0.000129	0.000133	0.000156	0.000189	0.000196	0.000199	0.000216	0.000193
Nickel (Dissolved)	0.000500	0.000060	0.000060	0.000080	0.000500	0.000500	0.000500	0.000533	0.000367	0.000320	0.000355	0.000428
Phosphorus (Metal) Dissolved	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.21	0.30	0.30
Potassium (Dissolved)	0.28	0.33	0.32	0.30	0.20	0.19	0.25	0.28	0.31	0.29	0.30	0.29
Selenium (Dissolved)	0.00016	0.00020	0.00020	0.00021	0.00010	0.00010	0.00011	0.00013	0.00015	0.00014	0.00014	0.00015
Silicon (Dissolved)	2.880	2.880	2.910	3.070	2.703	2.615	3.093	3.270	3.400	3.318	2.900	2.890
Silver (Dissolved)	0.000010	0.000005	0.000005	0.000005	0.000010	0.000010	0.000010	0.000010	0.000010	0.000008	0.000008	0.000009
Sodium (Dissolved)	1.070000	1.290000	1.280000	1.150000	0.579667	0.570750	0.785667	0.893500	1.026000	0.999500	1.015000	1.042500
Strontium (Dissolved)	0.062400	0.068900	0.067300	0.066200	0.039833	0.035175	0.050467	0.062350	0.068520	0.064300	0.061650	0.062025
Sulphur (Dissolved)						00	5.50	4.00	4.50	10.00	10.00	10.00
Thallium (Dissolved)						10	0.000010	0.000010	0.000010	0.000007	0.000006	0.000008
Tin (Dissolved)						00	0.000100	0.000100	0.000100	0.000110	0.000075	0.000088
Titanium (Dissolved)						00	0.010000	0.006733	0.010000	0.005200	0.005250	0.007625
Uranium (Dissolved)						38	0.000081	0.000111	0.000115	0.000119	0.000123	0.000121
Vanadium (Dissolved)						00	0.001000	0.000709	0.001000	0.000733	0.000600	0.000800
Zinc (Dissolved)						11	0.0010	0.0030	0.0010	0.0014	0.0013	0.0012
Zirconium (Dissolved)						00	0.000100	0.000100	0.000100	0.000100	0.000100	0.000100
Mercury (Dissolved)						10	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010
Aluminum (Total)						38	0.0138	0.0126	0.0088	0.0080	0.0053	0.0047
Antimony (Total)						10	0.00010	0.00010	0.00010	0.00007	0.00006	0.00008
Arsenic (Total)						26	0.00029	0.00103	0.00024	0.00058	0.00023	0.00022
Barium (Total)						49	0.0055	0.0061	0.0066	0.0062	0.0059	0.0057
Beryllium (Total)						10	0.00010	0.00010	0.00010	0.00007	0.00006	0.00008
Bismuth (Total)	0.00050	0.00001	0.00001	0.00001	0.00050	0.00050	0.00050	0.00050	0.00050	0.00034	0.00025	0.00038
Boron (Total)	0.01000	0.05000	0.05000	0.05000	0.01000	0.01000	0.01000	0.01000	0.01000	0.02333	0.03000	0.02000
Cadmium (Total)	0.000010	0.000010	0.000008	0.000012	0.000011	0.000034	0.000017	0.000011	0.000010	0.000009	0.000011	0.000010
Calcium (Total)	21.20	23.40	23.70	22.60	15.10	13.82	19.15	20.70	22.50	21.65	21.20	20.90
Chromium (Total)	0.00010	0.00010	0.00010	0.00010	0.00018	0.00027	0.00011	0.00010	0.00010	0.00014	0.00010	0.00010
Cobalt (Total)	0.00010	0.00001	0.00001	0.00001	0.00010	0.00024	0.00010	0.00010	0.00007	0.00007	0.00006	0.00008
Copper (Total)	0.00050	0.00036	0.00038	0.00043	0.00161	0.00351	0.00125	0.00073	0.00067	0.00081	0.00077	0.00061
Iron (Total)	0.0100	0.0080	0.0020	0.0034	0.0760	0.1914	0.0160	0.0100	0.0110	0.0090	0.0070	0.0085
Lead (Total)						558	0.000253	0.000133	0.000042	0.000041	0.000034	0.000042
Lithium (Total)						500	0.000500	0.000500	0.000500	0.000875	0.000500	0.000500
Magnesium (Total)						2.21	3.26	4.17	4.56	4.29	4.77	4.67
Manganese (Total)						212	0.000680	0.000616	0.000602	0.000587	0.000538	0.000436
Molybdenum (Total)						157	0.000178	0.000201	0.000211	0.000201	0.000216	0.000204
Nickel (Total)						913	0.000500	0.000533	0.000370	0.000370	0.000355	0.000428
Phosphorus (Metal) Total						0.30	0.30	0.30	0.30	0.30	0.30	0.30
Potassium (Total)						0.20	0.25	0.28	0.31	0.29	0.31	0.30
Selenium (Total)						010	0.00012	0.00013	0.00015	0.00015	0.00015	0.00015
Silicon (Total)						725	3.110	3.280	3.400	3.335	3.175	3.018
Silver (Total)						012	0.000010	0.000010	0.000010	0.000013	0.000008	0.000012
Sodium (Total)						250	0.796000	0.904500	1.026000	1.036500	1.065000	1.077500
Strontium (Total)						175	0.052933	0.063700	0.068520	0.065325	0.064950	0.064525
Sulphur (Total)						7.00	5.50	4.00	4.50	10.00	10.00	10.00
Thallium (Total)	0.000010	0.000002	0.000002	0.000002	0.000010	0.000010	0.000010	0.000010	0.000010	0.000007	0.000006	0.000008
Tin (Total)	0.000100	0.000200	0.000300	0.000200	0.000100	0.000100	0.000100	0.000100	0.000100	0.000110	0.000075	0.000088
Titanium (Total)	0.010000	0.000500	0.000500	0.000500	0.010000	0.011333	0.010000	0.006833	0.010000	0.005225	0.005250	0.007625
Uranium (Total)	0.000128	0.000187	0.000178	0.000159	0.000054	0.000057	0.000087	0.000111	0.000126	0.000119	0.000128	0.000128
Vanadium (Total)	0.001000	0.000200	0.000200	0.000200	0.001000	0.001000	0.001000	0.001000	0.001000	0.000733	0.000600	0.000800
Zinc (Total)	0.0030	0.0004	0.0010	0.0010	0.0030	0.0040	0.0030	0.0030	0.0022	0.0024	0.0019	0.0024
Zirconium (Total)	0.000100	0.000100	0.000100	0.000100	0.000200	0.000300	0.000400	0.000500	0.000600	0.001050	0.000100	0.000100
Mercury (Total)	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010
H+ Calcluated based on A134	0	0	0	0	0	0	0	0	0	0	0	0
Orthophosphate (Dissolved)	0.0010	0.0050	0.0050	0.0050	0.0010	0.0010	0.0010	0.0017	0.0187	0.0023	0.0030	0.0020
Nitrate (as N)	0.306	0.301	0.297	0.402	0.544	0.140	0.101	0.131	0.173	0.173	0.225	0.265
Ammonia (Total)	0.005	0.051	0.009	0.007	0.005	0.007	0.010	1.305	0.056	0.009	0.008	0.006
Nitrite (as N)	0.001	0.005	0.005	0.005	0.001	0.001	0.001	0.001	0.001	0.002	0.003	0.002





APPENDIX A1 - SOURCE TERMS
HARPER CREEK PROJECT
TABLE 8 - Site H5 (SW)

	January	February	March	April	May	June	July	August	September	October	November	December
Parameter	01/01/2013	01/02/2013	01/03/2013	01/04/2013	01/05/2013	01/06/2013	01/07/2013	01/08/2013	01/09/2013	01/10/2013	01/11/2013	01/12/2013
Sulphate (Dis	13.70	13.80	15.90	13.25	6.87	6.22	8.61	11.50	12.48	11.77	11.80	12.75
Acidity to pH	0	0	0	0	0	0	0	0	0	0	0	0
Acidity to pH	0	0	0	0	0	0	0	0	0	0	0	0
Alkalinity (Tot	35.50	43.70	39.80	43.75	24.58	20.43	30.03	38.10	41.83	36.90	35.20	35.35
Chloride (Diss	0.50	0.80	0.50	0.50	0.50	0.50	0.53	0.50	0.50	0.50	0.50	0.50
Fluoride (Diss	0.0290	0.0430	0.0380	0.0340	0.0298	0.0233	0.0297	0.0320	0.0348	0.0360	0.0325	0.0308
Hardness as	47.1	50.2	52.6	53.3	30.8	25.2	37.9	49.6	51.3	47.9	43.5	45.3
Aluminum (Di	0.0046	0.0048	0.0048	0.0044	0.0315	0.0385	0.0180	0.0098	0.0073	0.0072	0.0059	0.0052
Antimony (Dis	0.00010	0.00002	0.00002	0.00002	0.00010	0.00010	0.00010	0.00010	0.00010	0.00007	0.00006	0.00008
Arsenic (Diss	0.00012	0.00011	0.00013	0.00012	0.00012	0.00013	0.00013	0.00015	0.00014	0.00013	0.00014	0.00013
Barium (Disso	0.0087	0.0100	0.0101	0.0100	0.0062	0.0052	0.0080	0.0102	0.0107	0.0091	0.0080	0.0084
Beryllium (Dis	0.00010	0.00001	0.00001	0.00001	0.00010	0.00010	0.00010	0.00010	0.00010	0.00007	0.00006	0.00008
Bismuth (Diss	0.00050	0.00001	0.00001	0.00001	0.00050	0.00050	0.00050	0.00050	0.00050	0.00034	0.00025	0.00038
Boron (Dissol	0.01000	0.05000	0.05000	0.05000	0.01000	0.01000	0.01000	0.01000	0.01000	0.02333	0.03000	0.02000
Cadmium (Di	0.000019	0.000026	0.000022	0.000027	0.000030	0.000029	0.000027	0.000028	0.000030	0.000022	0.000021	0.000020
Calcium (Diss	14.70	15.30	16.10	16.55	9.39	7.75	11.75	15.63	15.93	14.87	13.20	13.95
Chromium (D	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010
Cobalt (Disso	0.00010	0.00001	0.00001	0.00001	0.00010	0.00010	0.00010	0.00010	0.00010	0.00007	0.00006	0.00008
Copper (Diss	0.00209	0.00185	0.00167	0.00172	0.00781	0.00808	0.00514	0.00308	0.00265	0.00292	0.00222	0.00215
Iron (Dissolve	0.0100	0.0010	0.0010	0.0016	0.0178	0.0140	0.0117	0.0100	0.0100	0.0080	0.0055	0.0078
Lead (Dissolv	0.000050	0.000009	0.000006	0.000006	0.000050	0.000050	0.000050	0.000050	0.000050	0.000042	0.000029	0.000039
Lithium (Disso	0.000500	0.000500	0.000500	0.000500	0.000500	0.000500	0.000500	0.000500	0.000500	0.000500	0.000500	0.000500
Magnesium (	2.55	2.92	3.02	2.89	1.79	1.41	2.08	2.58	2.80	2.63	2.36	2.46
Manganese (	0.000050	0.000050	0.000050	0.000111	0.000688	0.000804	0.000086	0.000135	0.000115	0.000202	0.000080	0.000065
Molybdenum	0.000148	0.000170	0.000180	0.000150	0.000071	0.000071	0.000098	0.000138	0.000161	0.000135	0.000136	0.000142
Nickel (Disso	0.000500	0.000180	0.000190	0.000203	0.000520	0.000510	0.000500	0.000500	0.000500	0.000423	0.000360	0.000430
Phosphorus (	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Potassium (D	0.55	0.65	0.66	0.65	0.37	0.34	0.48	0.61	0.67	0.59	0.50	0.52
Selenium (Dis	0.00022	0.00021	0.00023	0.00024	0.00017	0.00012	0.00012	0.00012	0.00015	0.00014	0.00018	0.00020
Silicon (Dissc	2.850	2.660	2.880	2.995	2.836	2.695	3.237	3.520	3.320	3.230	2.680	2.765
Silver (Dissol	0.000010	0.000005	0.000005	0.000005	0.000010	0.000010	0.000010	0.000010	0.000010	0.000008	0.000008	0.000009
Sodium (Diss	1.060000	1.270000	1.320000	1.170000	0.567800	0.501250	0.726000	0.951667	1.097500	0.987000	0.935500	0.997750
Strontium (Di	0.040100	0.046300	0.045800	0.046650	0.028420	0.023125	0.032867	0.045133	0.048375	0.042600	0.038900	0.039500
Sulphur (Diss	10.00	10.00	10.00	8.00	3.00	3.33	3.67	4.00	4.00	10.00	10.00	10.00
Thallium (Dis	0.000010	0.000002	0.000002	0.000002	0.000010	0.000010	0.000010	0.000010	0.000010	0.000007	0.000006	0.000008
Tin (Dissolve	0.000100	0.000200	0.000200	0.000200	0.000100	0.000100	0.000100	0.000100	0.000100	0.000097	0.000060	0.000080
Titanium (Dis	0.010000	0.000500	0.000500	0.000500	0.010000	0.010000	0.010000	0.010000	0.010000	0.006833	0.005250	0.007625
Uranium (Dis	0.000034	0.000058	0.000058	0.000061	0.000018	0.000019	0.000020	0.000033	0.000041	0.000035	0.000036	0.000035
Vanadium (D	0.001000	0.000200	0.000200	0.000200	0.001000	0.001000	0.001000	0.001000	0.001000	0.000733	0.000600	0.000800
Zinc (Dissolve	0.0015	0.0014	0.0014	0.0018	0.0043	0.0040	0.0020	0.0014	0.0020	0.0018	0.0016	0.0015
Zirconium (Di	0.000100	0.000100	0.000100	0.000100	0.000100	0.000100	0.000100	0.000100	0.000100	0.000100	0.000100	0.000100
Mercury (Diss	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010
Aluminum (To	0.0055	0.0193	0.0090	0.0330	0.2291	0.2348	0.0481	0.0192	0.0121	0.0138	0.0072	0.0063
Antimony (To	0.00010	0.00002	0.00002	0.00002	0.00010	0.00010	0.00010	0.00010	0.00010	0.00007	0.00006	0.00008
Arsenic (Tota	0.00014	0.00016	0.00013	0.00017	0.00034	0.00043	0.00023	0.00017	0.00014	0.00015	0.00015	0.00014
Barium (Total	0.0087	0.0103	0.0101	0.0109	0.0077	0.0066	0.0084	0.0102	0.0107	0.0094	0.0084	0.0085
Beryllium (To	0.00010	0.00001	0.00001	0.00001	0.00010	0.00010	0.00010	0.00010	0.00010	0.00007	0.00006	0.00008
Bismuth (Tota	0.00050	0.00001	0.00001	0.00001	0.00050	0.00050	0.00050	0.00050	0.00050	0.00034	0.00025	0.00038
Boron (Total)	0.01000	0.05000	0.05000	0.05000	0.01000	0.01000	0.01000	0.01000	0.01000	0.02333	0.03000	0.02000
Cadmium (To	0.000022	0.000031	0.000023	0.000027	0.000061	0.000046	0.000042	0.000028	0.000030	0.000023	0.000021	0.000021
Calcium (Tota	14.70	16.80	16.90	16.55	9.48	7.80	11.89	15.63	15.93	14.87	13.85	14.23
Chromium (T	0.00010	0.00010	0.00010	0.00010	0.00039	0.00037	0.00014	0.00010	0.00010	0.00012	0.00010	0.00010
Cobalt (Total)	0.00010	0.00004	0.00001	0.00001	0.00018	0.00021	0.00012	0.00010	0.00010	0.00008	0.00006	0.00008
Copper (Tota	0.00221	0.00235	0.00202	0.00279	0.01089	0.01245	0.00607	0.00345	0.00277	0.00352	0.00241	0.00231
Iron (Total)	0.0100	0.0290	0.0070	0.0509	0.2946	0.3933	0.0743	0.0110	0.0100	0.0147	0.0060	0.0080
Lead (Total)	0.000050	0.000074	0.000026	0.000010	0.000271	0.000383	0.000095	0.000050	0.000050	0.000056	0.000029	0.000039
Lithium (Tota	0.000500	0.000500	0.000500	0.000500	0.000500	0.000500	0.000500	0.000500	0.000500	0.000500	0.000500	0.000500
Magnesium (	2.63	3.02	3.03	2.91	1.88	1.51	2.13	2.60	2.80	2.63	2.55	2.59
Manganese (	0.000098	0.001350	0.000540	0.001669	0.006926	0.010418	0.003013	0.000343	0.000387	0.000726	0.000124	0.000111
Molybdenum	0.000173	0.000190	0.000180	0.000164	0.000087	0.000093	0.000111	0.000145	0.000172	0.000151	0.000138	0.000156
Nickel (Total)	0.000500	0.000210	0.000190	0.000212	0.000820	0.000973	0.000500	0.000500	0.000500	0.000613	0.000360	0.000430
Phosphorus (	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Potassium (T	0.56	0.68	0.66	0.66	0.42	0.37	0.48	0.61	0.67	0.59	0.54	0.55
Selenium (To	0.00022	0.00021	0.00023	0.00029	0.00017	0.00012	0.00016	0.00013	0.00015	0.00014	0.00018	0.00020
Silicon (Total)	2.890	3.000	3.050	2.995	3.114	2.923	3.237	3.520	3.320	3.230	3.005	2.948
Silver (Total)	0.000016	0.000005	0.000005	0.000005	0.000012	0.000011	0.000010	0.000010	0.000010	0.000011	0.000008	0.000012
Sodium (Tota	1.090000	1.320000	1.330000	1.240000	1.007800	0.526500	0.728667	0.953000	1.097500	0.999667	0.991000	1.040500
Strontium (To	0.042200	0.046300	0.046100	0.049550	0.029180	0.023775	0.033567	0.045133	0.048375	0.042833	0.040850	0.041525
Sulphur (Tota	10.00	10.00	10.00	8.00	3.00	3.33	3.67	4.00	4.50	10.00	10.00	10.00
Thallium (Tot	0.000010	0.000002	0.000002	0.000002	0.000010	0.000010	0.000010	0.000010	0.000010	0.000007	0.000006	0.000008
Tin (Total)	0.000100	0.000200	0.000200	0.000200	0.000100	0.000100	0.000100	0.000100	0.000100	0.000097	0.000075	0.000088
Titanium (Tot	0.010000	0.000500	0.000500	0.000500	0.011333	0.010000	0.010000	0.010000	0.010000	0.006833	0.005250	0.007625
Uranium (Tot	0.000037	0.000068	0.000062	0.000061	0.000029	0.000035	0.000025	0.000034	0.000044	0.000036	0.000040	0.000038
Vanadium (To	0.001000	0.000200	0.000200	0.000200	0.001000	0.001000	0.001000	0.001000	0.001000	0.000733	0.000600	0.000800
Zinc (Total)	0.0030	0.0019	0.0015	0.0020	0.0073	0.0073	0.0037	0.0030	0.0033	0.0026	0.0023	0.0026
Zirconium (To	0.000100	0.000100	0.000100	0.000100	0.000100	0.000100	0.000100	0.000100	0.000100	0.000100	0.000100	0.000100
Mercury (Tota	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010
H+ Calcluate	0	0	0	0	0	0	0	0	0	0	0	0
Orthophospha	0.0010	0.0050	0.0050	0.0050	0.0010	0.0010	0.0010	0.0011	0.0189	0.0023	0.0030	0.0020
Nitrate (as N)	0.120	0.154	0.160	0.183	0.101	0.034	0.028	0.061	0.085	0.036	0.090	0.105
Ammonia (To	0.005	0.017	0.010	0.006	0.010	0.012	0.007	0.008	0.025	0.008	0.013	0.009
Nitrate+Nitrite	0.001	0.005	0.005	0.005	0.001	0.001	0.001	0.001	0.001	0.002	0.003	0.002

APPENDIX A1 - SOURCE TERMS
HARPER CREEK PROJECT
TABLE 9 - Site J1 (SW)

	January	February	March	April	May	June	July	August	September	October	November	December
Parameter	01/01/2013	01/02/2013	01/03/2013	01/04/2013	01/05/2013	01/06/2013	01/07/2013	01/08/2013	01/09/2013	01/10/2013	01/11/2013	01/12/2013
Sulphate (Dissolved)	23.23	23.12	23.00	16.75	6.88	6.95	12.61	20.96	21.77	18.25	22.85	12.20
Acidity to pH 4.5 (as CaCO3)	0	0	0	0	0	0	0	0	0	0	0	0
Acidity to pH 8.3 (as CaCO3)	0	0	0	0	0	0	0	0	0	0	0	0
Alkalinity (Total as CaCO3)	116.00	121.50	127.00	122.50	57.36	48.39	96.58	125.00	128.00	103.38	128.50	77.30
Chloride (Dissolved)	0.50	0.50	0.50	0.50	0.70	0.50	0.50	0.53	0.67	0.50	0.65	0.58
Fluoride (Dissolved)	0.0397	0.0393	0.0390	0.0445	0.0280	0.0259	0.0362	0.0405	0.0483	0.0410	0.0450	0.0310
Hardness as CaCO3 (Dissolved)	142.3	144.2	146.0	141.0	61.8	55.6	112.2	148.4	148.0	127.5	151.0	83.6
Aluminum (Dissolved)	0.0032	0.0041	0.0050	0.0054	0.0214	0.0193	0.0097	0.0063	0.0072	0.0049	0.0039	0.0050
Antimony (Dissolved)	0.00006	0.00005	0.00003	0.00002	0.00013	0.00010	0.00013	0.00010	0.00010	0.00007	0.00006	0.00006
Arsenic (Dissolved)	0.00016	0.00018	0.00019	0.00021	0.00095	0.00011	0.00237	0.00134	0.00021	0.00017	0.00017	0.00016
Barium (Dissolved)	0.0124	0.0123	0.0123	0.0123	0.0067	0.0056	0.0115	0.0145	0.0148	0.0127	0.0119	0.0121
Beryllium (Dissolved)	0.00006	0.00004	0.00003	0.00001	0.00013	0.00010	0.00013	0.00010	0.00010	0.00007	0.00006	0.00006
Bismuth (Dissolved)	0.00025	0.00017	0.00009	0.00001	0.00043	0.00050	0.00040	0.00050	0.00050	0.00034	0.00025	0.00025
Boron (Dissolved)	0.03000	0.03667	0.04333	0.05000	0.01000	0.01000	0.01000	0.01000	0.01000	0.02333	0.03000	0.03000
Cadmium (Dissolved)	0.000008	0.000007	0.000007	0.000007	0.000011	0.000015	0.000009	0.000013	0.000010	0.000008	0.000008	0.000008
Calcium (Dissolved)	34.73	35.12	35.50	36.05	17.40	15.13	30.88	36.48	38.50	32.55	34.80	21.40
Chromium (Dissolved)	0.00010	0.00090	0.00170	0.00250	0.00013	0.00010	0.00013	0.00010	0.00010	0.00115	0.00010	0.00010
Cobalt (Dissolved)	0.00005	0.00004	0.00003	0.00001	0.00013	0.00010	0.00013	0.00010	0.00006	0.00007	0.00006	0.00005
Copper (Dissolved)	0.00018	0.00019	0.00021	0.00022	0.00080	0.00083	0.00077	0.00035	0.00030	0.00023	0.00024	0.00021
Iron (Dissolved)	0.0070	0.0052	0.0033	0.0015	0.0266	0.0122	0.0100	0.0100	0.0070	0.0070	0.0055	0.0063
Lead (Dissolved)	0.000028	0.000021	0.000014	0.000008	0.000088	0.000050	0.000133	0.000050	0.000051	0.000036	0.000032	0.000030
Lithium (Dissolved)	0.000920	0.000940	0.000960	0.000980	0.000665	0.000507	0.000803	0.001130	0.000935	0.000917	0.001025	0.000973
Magnesium (Dissolved)	13.43	13.67	13.90	12.40	4.46	4.34	8.45	12.42	13.75	11.19	12.65	7.31
Manganese (Dissolved)	0.000257	0.000293	0.000330	0.000344	0.000957	0.000534	0.000156	0.000212	0.000194	0.000744	0.001010	0.000633
Molybdenum (Dissolved)	0.000251	0.000250	0.000250	0.000249	0.000082	0.000066	0.000167	0.000218	0.000267	0.000219	0.000238	0.000244
Nickel (Dissolved)	0.000305	0.000247	0.000188	0.000130	0.000500	0.000500	0.000533	0.000733	0.000330	0.000370	0.000300	0.000303
Phosphorus (Metal) Dissolved	0.30	0.28	0.27	0.25	0.23	0.30	0.21	0.30	0.30	0.30	0.30	0.30
Potassium (Dissolved)	0.57	0.58	0.59	0.61	0.32	0.25	0.46	0.58	0.64	0.61	0.60	0.58
Selenium (Dissolved)	0.00040	0.00040	0.00040	0.00041	0.00016	0.00010	0.00038	0.00030	0.00027	0.00024	0.00030	0.00035
Silicon (Dissolved)	3.085	3.167	3.248	3.330	2.879	2.722	3.525	3.643	3.578	3.430	2.960	3.023
Silver (Dissolved)	0.000008	0.000007	0.000006	0.000005	0.000020	0.000010	0.000023	0.000010	0.000010	0.000008	0.000008	0.000008
Sodium (Dissolved)	1.840000	1.763333	1.686667	1.610000	0.649571	0.550600	1.072500	1.462500	1.722500	1.520000	1.590000	1.715000
Strontium (Dissolved)	0.191000	0.190667	0.190333	0.190000	0.075643	0.056700	0.127250	0.191500	0.206750	0.182667	0.183000	0.187000
Sulphur (Dissolved)	0.01	3.34	6.67	10.00	8.00	6.00	4.00	6.00	8.00	10.00	10.00	5.01
Thallium (Dissolved)	0.000006	0.000005	0.000003	0.000002	0.000013	0.000010	0.000013	0.000010	0.000010	0.000007	0.000006	0.000006
Tin (Dissolved)	0.000150	0.000167	0.000183	0.000200	0.000125	0.000100	0.000133	0.000100	0.000070	0.000090	0.000055	0.000103
Titanium (Dissolved)	0.005250	0.003667	0.002083	0.000500	0.007700	0.010000	0.006833	0.007000	0.005250	0.006833	0.005250	0.005250
Uranium (Dissolved)	0.001107	0.001103	0.001100	0.001050	0.000228	0.000163	0.000490	0.000960	0.001063	0.000775	0.000994	0.000400
Vanadium (Dissolved)	0.000600	0.000467	0.000333	0.000200	0.000813	0.001000	0.000683	0.000738	0.001000	0.000733	0.000600	0.000600
Zinc (Dissolved)	0.0007	0.0008	0.0008	0.0009	0.0028	0.0010	0.0037	0.0033	0.0010	0.0007	0.0010	0.0008
Zirconium (Dissolved)	0.000100	0.000100	0.000100	0.000100	0.002000	0.002000	0.002000	0.001050	0.000100	0.000100	0.000100	0.000100
Mercury (Dissolved)	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010
Aluminum (Total)	0.0040	0.0051	0.0061	0.0056	0.3531	0.3221	0.0326	0.0094	0.0088	0.0063	0.0047	0.0052
Antimony (Total)	0.00006	0.00005	0.00003	0.00002	0.00013	0.00010	0.00013	0.00010	0.00010	0.00007	0.00006	0.00006
Arsenic (Total)	0.00016	0.00018	0.00019	0.00021	0.00128	0.00077	0.00237	0.00146	0.00022	0.00017	0.00017	0.00016
Barium (Total)	0.0124	0.0124	0.0124	0.0124	0.0095	0.0097	0.0115	0.0145	0.0148	0.0133	0.0125	0.0124
Beryllium (Total)	0.00006	0.00004	0.00003	0.00001	0.00013	0.00010	0.00013	0.00010	0.00010	0.00007	0.00006	0.00006
Bismuth (Total)	0.00025	0.00017	0.00009	0.00001	0.00043	0.00050	0.00040	0.00050	0.00050	0.00034	0.00025	0.00025
Boron (Total)	0.03000	0.03667	0.04333	0.05000	0.01000	0.01000	0.01000	0.01000	0.01000	0.02333	0.03000	0.03000
Cadmium (Total)	0.000008	0.000007	0.000007	0.000007	0.000021	0.000015	0.000009	0.000013	0.000015	0.000008	0.000008	0.000008
Calcium (Total)	34.73	35.12	35.50	37.40	17.65	15.21	30.88	36.48	38.50	32.90	37.40	22.80
Chromium (Total)	0.00010	0.00090	0.00170	0.00250	0.00095	0.00140	0.00016	0.00010	0.00010	0.00115	0.00010	0.00010
Cobalt (Total)	0.00005	0.00004	0.00003	0.00002	0.00050	0.00064	0.00013	0.00010	0.00006	0.00007	0.00006	0.00006
Copper (Total)	0.00030	0.00029	0.00028	0.00027	0.00203	0.00207	0.00077	0.00050	0.00033	0.00059	0.00037	0.00033
Iron (Total)	0.0070	0.0055	0.0039	0.0024	0.7849	0.9292	0.0393	0.0103	0.0093	0.0070	0.0065	0.0068
Lead (Total)	0.000032	0.000025	0.000018	0.000011	0.001414	0.001149	0.000133	0.000050	0.000051	0.000037	0.000032	0.000031
Lithium (Total)	0.001040	0.001020	0.001000	0.000980	0.000665	0.000623	0.000850	0.001130	0.000935	0.000983	0.001045	0.001043
Magnesium (Total)	13.43	13.67	13.90	12.40	4.88	4.50	8.56	12.72	13.75	11.19	13.95	7.75
Manganese (Total)	0.000259	0.000469	0.000680	0.000432	0.026325	0.025962	0.001249	0.000273	0.000524	0.000935	0.001040	0.000633
Molybdenum (Total)	0.000258	0.000252	0.000250	0.000249	0.000100	0.000091	0.000180	0.000233	0.000285	0.000244	0.000238	0.000244
Nickel (Total)	0.000305	0.000247	0.000188	0.000130	0.001389	0.001748	0.000600	0.000733	0.000330	0.000370	0.000300	0.000303
Phosphorus (Metal) Total	0.30	0.28	0.27	0.25	0.23	0.30	0.22	0.30	0.30	0.30	0.30	0.30
Potassium (Total)	0.57	0.59	0.61	0.64	0.37	0.33	0.46	0.58	0.64	0.62	0.65	0.60
Selenium (Total)	0.00040	0.00040	0.00040	0.00041	0.00017	0.00012	0.00038	0.00030	0.00028	0.00024	0.00031	0.00035
Silicon (Total)	3.085	3.213	3.377	3.540	3.274	3.284	3.525	3.665	3.598	3.430	3.465	3.258
Silver (Total)	0.000009	0.000007	0.000006	0.000005	0.000020	0.000011	0.000023	0.000010	0.000010	0.000010	0.000008	0.000008
Sodium (Total)	1.840000	1.763333	1.686667	1.610000	0.705571	0.567000	1.072500	1.512500	1.722500	1.543333	1.730000	1.785000
Strontium (Total)	0.198500	0.195667	0.192833	0.190000	0.082443	0.056720	0.127250	0.195750	0.206750	0.186667	0.193500	0.196000
Sulphur (Total)	10.00	10.00	10.00	10.00	8.00	6.00	4.00	7.00	8.00	10.00	10.00	10.00
Thallium (Total)	0.000006	0.000005	0.000003	0.000002	0.000013	0.000010	0.000013	0.000010	0.000010	0.000007	0.000006	0.000006
Tin (Total)	0.000150	0.000167	0.000183	0.000200	0.000125	0.000100	0.000133	0.000100	0.000070	0.000090	0.000070	0.000110
Titanium (Total)	0.005250	0.003667	0.002083	0.000500	0.010250	0.016000	0.006867	0.007000	0.010000	0.006833	0.005250	0.005250
Uranium (Total)	0.001117	0.001103	0.001100	0.001050	0.000285	0.000194	0.000520	0.000983	0.001063	0.000780	0.001049	0.000400
Vanadium (Total)	0.000600	0.000467	0.000333	0.000200	0.001006	0.001100	0.000683	0.000738	0.001000	0.000733	0.000600	0.000600
Zinc (Total)	0.0018	0.0015	0.0012	0.0010	0.0039	0.0050	0.0037	0.0033	0.0016	0.0020	0.0017	0.0017
Zirconium (Total)	0.000100	0.000100	0.000100	0.000100	0.002000	0.002000	0.002000	0.001367	0.000733	0.000100	0.000100	0.000100
Mercury (Total)	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000023
H+ Calcluated based on A134	0	0	0	0	0	0	0	0	0	0	0	0
Orthophosphate (Dissolved)	0.0030	0.0021	0.0012	0.0031	0.0025	0.0010	0.0011	0.0014	0.0055	0.0045	0.0030	0.0030
Nitrate (as N)	0.067	0.052	0.038	0.032	0.041	0.006	0.008	0.013	0.022	0.009	0.017	0.019
Ammonia (Total)	0.016	0.012	0.009	0.005	0.011	0.007	0.013	0.011	0.018	0.009	0.014	0.067
Nitrate+Nitrite (Dissolved)	0.003	0.004	0.004	0.005	0.001	0.001	0.001	0.001	0.001	0.002	0.003	0.003

APPENDIX A1 - SOURCE TERMS
HARPER CREEK PROJECT
TABLE 10 - Site BK0 (GW)

Parameter	January 01/01/2013	February 01/02/2013	March 01/03/2013	April 01/04/2013	May 01/05/2013	June 01/06/2013	July 01/07/2013	August 01/08/2013	September 01/09/2013	October 01/10/2013	November 01/11/2013	December 01/12/2013
Sulphate (Dis	20.70000	20.70000	20.70000	20.70000	20.70000	20.70000	20.70000	20.70000	20.70000	20.70000	20.70000	20.70000
Acidity to pH	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Acidity to pH	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Alkalinity (Tot	146.00000	146.00000	146.00000	146.00000	146.00000	146.00000	146.00000	146.00000	146.00000	146.00000	146.00000	146.00000
Chloride (Dis	0.80000	0.80000	0.80000	0.80000	0.80000	0.80000	0.80000	0.80000	0.80000	0.80000	0.80000	0.80000
Fluoride (Diss	0.05300	0.05300	0.05300	0.05300	0.05300	0.05300	0.05300	0.05300	0.05300	0.05300	0.05300	0.05300
Hardness as	163.00000	163.00000	163.00000	163.00000	163.00000	163.00000	163.00000	163.00000	163.00000	163.00000	163.00000	163.00000
Aluminum (Di	0.00290	0.00290	0.00290	0.00290	0.00290	0.00290	0.00290	0.00290	0.00290	0.00290	0.00290	0.00290
Antimony (Dis	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002
Arsenic (Diss	0.00015	0.00015	0.00015	0.00015	0.00015	0.00015	0.00015	0.00015	0.00015	0.00015	0.00015	0.00015
Barium (Disso	0.01560	0.01560	0.01560	0.01560	0.01560	0.01560	0.01560	0.01560	0.01560	0.01560	0.01560	0.01560
Beryllium (Dis	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010
Bismuth (Diss	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050
Boron (Dissol	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000
Cadmium (Di	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Calcium (Diss	48.60000	48.60000	48.60000	48.60000	48.60000	48.60000	48.60000	48.60000	48.60000	48.60000	48.60000	48.60000
Chromium (D	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010
Cobalt (Disso	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Copper (Diss	0.00018	0.00018	0.00018	0.00018	0.00018	0.00018	0.00018	0.00018	0.00018	0.00018	0.00018	0.00018
Iron (Dissolve	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100
Lead (Dissolv	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002
Lithium (Disso	0.00090	0.00090	0.00090	0.00090	0.00090	0.00090	0.00090	0.00090	0.00090	0.00090	0.00090	0.00090
Magnesium (I	10.10000	10.10000	10.10000	10.10000	10.10000	10.10000	10.10000	10.10000	10.10000	10.10000	10.10000	10.10000
Manganese (	0.00011	0.00011	0.00011	0.00011	0.00011	0.00011	0.00011	0.00011	0.00011	0.00011	0.00011	0.00011
Molybdenum	0.00036	0.00036	0.00036	0.00036	0.00036	0.00036	0.00036	0.00036	0.00036	0.00036	0.00036	0.00036
Nickel (Disso	0.00007	0.00007	0.00007	0.00007	0.00007	0.00007	0.00007	0.00007	0.00007	0.00007	0.00007	0.00007
Phosphorus (	0.28313	0.28313	0.28313	0.28313	0.28313	0.28313	0.28313	0.28313	0.28313	0.28313	0.28313	0.28313
Potassium (D	0.79000	0.79000	0.79000	0.79000	0.79000	0.79000	0.79000	0.79000	0.79000	0.79000	0.79000	0.79000
Selenium (Dis	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Silicon (Dissc	3.77000	3.77000	3.77000	3.77000	3.77000	3.77000	3.77000	3.77000	3.77000	3.77000	3.77000	3.77000
Silver (Dissol	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Sodium (Diss	2.22000	2.22000	2.22000	2.22000	2.22000	2.22000	2.22000	2.22000	2.22000	2.22000	2.22000	2.22000
Strontium (Di	0.22500	0.22500	0.22500	0.22500	0.22500	0.22500	0.22500	0.22500	0.22500	0.22500	0.22500	0.22500
Sulphur (Diss	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000
Thallium (Dis	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Tin (Dissolve	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020
Titanium (Dis	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050
Uranium (Diss	0.00107	0.00107	0.00107	0.00107	0.00107	0.00107	0.00107	0.00107	0.00107	0.00107	0.00107	0.00107
Vanadium (D	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020
Zinc (Dissolve	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020
Zirconium (Di	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010
Mercury (Diss	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Aluminum (To	0.00290	0.00290	0.00290	0.00290	0.00290	0.00290	0.00290	0.00290	0.00290	0.00290	0.00290	0.00290
Antimony (To	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002
Arsenic (Tota	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017
Barium (Total	0.01570	0.01570	0.01570	0.01570	0.01570	0.01570	0.01570	0.01570	0.01570	0.01570	0.01570	0.01570
Beryllium (To	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Bismuth (Tota	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Boron (Total)	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000
Cadmium (To	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Calcium (Tota	51.60000	51.60000	51.60000	51.60000	51.60000	51.60000	51.60000	51.60000	51.60000	51.60000	51.60000	51.60000
Chromium (T	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010
Cobalt (Total)	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Copper (Tota	0.00018	0.00018	0.00018	0.00018	0.00018	0.00018	0.00018	0.00018	0.00018	0.00018	0.00018	0.00018
Iron (Total)	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200
Lead (Total)	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002
Lithium (Tota	0.00090	0.00090	0.00090	0.00090	0.00090	0.00090	0.00090	0.00090	0.00090	0.00090	0.00090	0.00090
Magnesium (T	10.10000	10.10000	10.10000	10.10000	10.10000	10.10000	10.10000	10.10000	10.10000	10.10000	10.10000	10.10000
Manganese (	0.00015	0.00015	0.00015	0.00015	0.00015	0.00015	0.00015	0.00015	0.00015	0.00015	0.00015	0.00015
Molybdenum	0.00036	0.00036	0.00036	0.00036	0.00036	0.00036	0.00036	0.00036	0.00036	0.00036	0.00036	0.00036
Nickel (Total)	0.00007	0.00007	0.00007	0.00007	0.00007	0.00007	0.00007	0.00007	0.00007	0.00007	0.00007	0.00007
Phosphorus (	0.28313	0.28313	0.28313	0.28313	0.28313	0.28313	0.28313	0.28313	0.28313	0.28313	0.28313	0.28313
Potassium (T	0.79000	0.79000	0.79000	0.79000	0.79000	0.79000	0.79000	0.79000	0.79000	0.79000	0.79000	0.79000
Selenium (To	0.00031	0.00031	0.00031	0.00031	0.00031	0.00031	0.00031	0.00031	0.00031	0.00031	0.00031	0.00031
Silicon (Total)	4.07000	4.07000	4.07000	4.07000	4.07000	4.07000	4.07000	4.07000	4.07000	4.07000	4.07000	4.07000
Silver (Total)	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Sodium (Tota	2.22000	2.22000	2.22000	2.22000	2.22000	2.22000	2.22000	2.22000	2.22000	2.22000	2.22000	2.22000
Strontium (To	0.22900	0.22900	0.22900	0.22900	0.22900	0.22900	0.22900	0.22900	0.22900	0.22900	0.22900	0.22900
Sulphur (Tota	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000
Thallium (Tot	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Tin (Total)	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020
Titanium (Tot	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050
Uranium (Tot	0.00109	0.00109	0.00109	0.00109	0.00109	0.00109	0.00109	0.00109	0.00109	0.00109	0.00109	0.00109
Vanadium (To	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020
Zinc (Total)	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020
Zirconium (To	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010
Mercury (Tota	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
H+ Calcluate	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Orthophospha	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500
Nitrate (as N)	0.05300	0.05300	0.05300	0.05300	0.05300	0.05300	0.05300	0.05300	0.05300	0.05300	0.05300	0.05300
Ammonia (To	0.02300	0.02300	0.02300	0.02300	0.02300	0.02300	0.02300	0.02300	0.02300	0.02300	0.02300	0.02300
Nitrite (as N)	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500

APPENDIX A1 - SOURCE TERMS
HARPER CREEK PROJECT
TABLE 11 - Site BK1 (GW)

	January	February	March	April	May	June	July	August	September	October	November	December
Parameter	01/01/2013	01/02/2013	01/03/2013	01/04/2013	01/05/2013	01/06/2013	01/07/2013	01/08/2013	01/09/2013	01/10/2013	01/11/2013	01/12/2013
Sulphate (Dissolve	8.76000	8.76000	8.76000	8.76000	8.76000	8.76000	8.76000	8.76000	8.76000	8.76000	8.76000	8.76000
Acidity to pH 4.5 (	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Acidity to pH 8.3 (	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Alkalinity (Total as	111.00000	111.00000	111.00000	111.00000	111.00000	111.00000	111.00000	111.00000	111.00000	111.00000	111.00000	111.00000
Chloride (Dissolve	0.80000	0.80000	0.80000	0.80000	0.80000	0.80000	0.80000	0.80000	0.80000	0.80000	0.80000	0.80000
Fluoride (Dissolve	0.03900	0.03900	0.03900	0.03900	0.03900	0.03900	0.03900	0.03900	0.03900	0.03900	0.03900	0.03900
Hardness as CaC	117.00000	117.00000	117.00000	117.00000	117.00000	117.00000	117.00000	117.00000	117.00000	117.00000	117.00000	117.00000
Aluminum (Dissol	0.00330	0.00330	0.00330	0.00330	0.00330	0.00330	0.00330	0.00330	0.00330	0.00330	0.00330	0.00330
Antimony (Dissolv	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002
Arsenic (Dissolvec	0.00014	0.00014	0.00014	0.00014	0.00014	0.00014	0.00014	0.00014	0.00014	0.00014	0.00014	0.00014
Barium (Dissolvec	0.00964	0.00964	0.00964	0.00964	0.00964	0.00964	0.00964	0.00964	0.00964	0.00964	0.00964	0.00964
Beryllium (Dissolv	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Bismuth (Dissolve	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Boron (Dissolved)	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000
Cadmium (Dissolv	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Calcium (Dissolve	37.00000	37.00000	37.00000	37.00000	37.00000	37.00000	37.00000	37.00000	37.00000	37.00000	37.00000	37.00000
Chromium (Dissol	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010
Cobalt (Dissolved)	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Copper (Dissolvec	0.00022	0.00022	0.00022	0.00022	0.00022	0.00022	0.00022	0.00022	0.00022	0.00022	0.00022	0.00022
Iron (Dissolved)	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100
Lead (Dissolved)	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Lithium (Dissolvec	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050
Magnesium (Disso	5.94000	5.94000	5.94000	5.94000	5.94000	5.94000	5.94000	5.94000	5.94000	5.94000	5.94000	5.94000
Manganese (Disso	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005
Molybdenum (Diss	0.00032	0.00032	0.00032	0.00032	0.00032	0.00032	0.00032	0.00032	0.00032	0.00032	0.00032	0.00032
Nickel (Dissolved)	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010
Phosphorus (Meta	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000
Potassium (Dissol	0.70000	0.70000	0.70000	0.70000	0.70000	0.70000	0.70000	0.70000	0.70000	0.70000	0.70000	0.70000
Selenium (Dissolv	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012
Silicon (Dissolved	3.00000	3.00000	3.00000	3.00000	3.00000	3.00000	3.00000	3.00000	3.00000	3.00000	3.00000	3.00000
Silver (Dissolved)	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Sodium (Dissolvec	1.28000	1.28000	1.28000	1.28000	1.28000	1.28000	1.28000	1.28000	1.28000	1.28000	1.28000	1.28000
Strontium (Dissolv	0.16100	0.16100	0.16100	0.16100	0.16100	0.16100	0.16100	0.16100	0.16100	0.16100	0.16100	0.16100
Sulphur (Dissolve	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000
Thallium (Dissolve	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Tin (Dissolved)	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020
Titanium (Dissolve	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050
Uranium (Dissolve	0.00029	0.00029	0.00029	0.00029	0.00029	0.00029	0.00029	0.00029	0.00029	0.00029	0.00029	0.00029
Vanadium (Dissol	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020
Zinc (Dissolved)	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010
Zirconium (Dissol	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010
Mercury (Dissolve	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Aluminum (Total)	0.00340	0.00340	0.00340	0.00340	0.00340	0.00340	0.00340	0.00340	0.00340	0.00340	0.00340	0.00340
Antimony (Total)	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002
Arsenic (Total)	0.00019	0.00019	0.00019	0.00019	0.00019	0.00019	0.00019	0.00019	0.00019	0.00019	0.00019	0.00019
Barium (Total)	0.00964	0.00964	0.00964	0.00964	0.00964	0.00964	0.00964	0.00964	0.00964	0.00964	0.00964	0.00964
Beryllium (Total)	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Bismuth (Total)	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Boron (Total)	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000
Cadmium (Total)	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Calcium (Total)	37.90000	37.90000	37.90000	37.90000	37.90000	37.90000	37.90000	37.90000	37.90000	37.90000	37.90000	37.90000
Chromium (Total)	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010
Cobalt (Total)	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Copper (Total)	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024
Iron (Total)	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200	0.00200
Lead (Total)	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Lithium (Total)	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050
Magnesium (Total	6.09000	6.09000	6.09000	6.09000	6.09000	6.09000	6.09000	6.09000	6.09000	6.09000	6.09000	6.09000
Manganese (Total	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008
Molybdenum (Tota	0.00032	0.00032	0.00032	0.00032	0.00032	0.00032	0.00032	0.00032	0.00032	0.00032	0.00032	0.00032
Nickel (Total)	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010
Phosphorus (Meta	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000
Potassium (Total)	0.70000	0.70000	0.70000	0.70000	0.70000	0.70000	0.70000	0.70000	0.70000	0.70000	0.70000	0.70000
Selenium (Total)	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012
Silicon (Total)	3.02000	3.02000	3.02000	3.02000	3.02000	3.02000	3.02000	3.02000	3.02000	3.02000	3.02000	3.02000
Silver (Total)	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Sodium (Total)	1.31000	1.31000	1.31000	1.31000	1.31000	1.31000	1.31000	1.31000	1.31000	1.31000	1.31000	1.31000
Strontium (Total)	0.16300	0.16300	0.16300	0.16300	0.16300	0.16300	0.16300	0.16300	0.16300	0.16300	0.16300	0.16300
Sulphur (Total)	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000
Thallium (Total)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Tin (Total)	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020
Titanium (Total)	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050
Uranium (Total)	0.00029	0.00029	0.00029	0.00029	0.00029	0.00029	0.00029	0.00029	0.00029	0.00029	0.00029	0.00029
Vanadium (Total)	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020
Zinc (Total)	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010
Zirconium (Total)	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010
Mercury (Total)	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
pH (In Situ) pH	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Orthophosphate (I	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500
Nitrate (as N)	0.10900	0.10900	0.10900	0.10900	0.10900	0.10900	0.10900	0.10900	0.10900	0.10900	0.10900	0.10900
Ammonia (Total)	0.02100	0.02100	0.02100	0.02100	0.02100	0.02100	0.02100	0.02100	0.02100	0.02100	0.02100	0.02100
Nitrite (as N)	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500

APPENDIX A1 - SOURCE TERMS
HARPER CREEK PROJECT
TABLE 12 - Site H2 (GW)

	January	February	March	April	May	June	July	August	September	October	November	December
Parameter	01/01/2013	01/02/2013	01/03/2013	01/04/2013	01/05/2013	01/06/2013	01/07/2013	01/08/2013	01/09/2013	01/10/2013	01/11/2013	01/12/2013
Sulphate (Dis	9.44000	9.44000	9.44000	9.44000	9.44000	9.44000	9.44000	9.44000	9.44000	9.44000	9.44000	9.44000
Acidity to pH	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Acidity to pH	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Alkalinity (Tot	44.10000	44.10000	44.10000	44.10000	44.10000	44.10000	44.10000	44.10000	44.10000	44.10000	44.10000	44.10000
Chloride (Diss	0.90000	0.90000	0.90000	0.90000	0.90000	0.90000	0.90000	0.90000	0.90000	0.90000	0.90000	0.90000
Fluoride (Diss	0.04800	0.04800	0.04800	0.04800	0.04800	0.04800	0.04800	0.04800	0.04800	0.04800	0.04800	0.04800
Hardness as	43.30000	43.30000	43.30000	43.30000	43.30000	43.30000	43.30000	43.30000	43.30000	43.30000	43.30000	43.30000
Aluminum (Di	0.00670	0.00670	0.00670	0.00670	0.00670	0.00670	0.00670	0.00670	0.00670	0.00670	0.00670	0.00670
Antimony (Dis	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002
Arsenic (Diss	0.00048	0.00048	0.00048	0.00048	0.00048	0.00048	0.00048	0.00048	0.00048	0.00048	0.00048	0.00048
Barium (Disso	0.01060	0.01060	0.01060	0.01060	0.01060	0.01060	0.01060	0.01060	0.01060	0.01060	0.01060	0.01060
Beryllium (Dis	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Bismuth (Diss	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Boron (Dissol	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000
Cadmium (Di	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Calcium (Diss	13.40000	13.40000	13.40000	13.40000	13.40000	13.40000	13.40000	13.40000	13.40000	13.40000	13.40000	13.40000
Chromium (D	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010
Cobalt (Disso	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Copper (Diss	0.00038	0.00038	0.00038	0.00038	0.00038	0.00038	0.00038	0.00038	0.00038	0.00038	0.00038	0.00038
Iron (Dissolve	0.00400	0.00400	0.00400	0.00400	0.00400	0.00400	0.00400	0.00400	0.00400	0.00400	0.00400	0.00400
Lead (Dissolv	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Lithium (Disso	0.00090	0.00090	0.00090	0.00090	0.00090	0.00090	0.00090	0.00090	0.00090	0.00090	0.00090	0.00090
Magnesium (I	2.40000	2.40000	2.40000	2.40000	2.40000	2.40000	2.40000	2.40000	2.40000	2.40000	2.40000	2.40000
Manganese (	0.00058	0.00058	0.00058	0.00058	0.00058	0.00058	0.00058	0.00058	0.00058	0.00058	0.00058	0.00058
Molybdenum	0.00083	0.00083	0.00083	0.00083	0.00083	0.00083	0.00083	0.00083	0.00083	0.00083	0.00083	0.00083
Nickel (Disso	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005
Phosphorus (	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000
Potassium (D	1.29000	1.29000	1.29000	1.29000	1.29000	1.29000	1.29000	1.29000	1.29000	1.29000	1.29000	1.29000
Selenium (Dis	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008
Silicon (Dissc	3.68000	3.68000	3.68000	3.68000	3.68000	3.68000	3.68000	3.68000	3.68000	3.68000	3.68000	3.68000
Silver (Dissol	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Sodium (Diss	1.98000	1.98000	1.98000	1.98000	1.98000	1.98000	1.98000	1.98000	1.98000	1.98000	1.98000	1.98000
Strontium (Di	0.05380	0.05380	0.05380	0.05380	0.05380	0.05380	0.05380	0.05380	0.05380	0.05380	0.05380	0.05380
Sulphur (Diss	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000
Thallium (Dis	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Tin (Dissolve	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020
Titanium (Dis	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050
Uranium (Dis	0.00038	0.00038	0.00038	0.00038	0.00038	0.00038	0.00038	0.00038	0.00038	0.00038	0.00038	0.00038
Vanadium (D	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020
Zinc (Dissolve	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040
Zirconium (Di	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010
Mercury (Diss	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Aluminum (To	0.00760	0.00760	0.00760	0.00760	0.00760	0.00760	0.00760	0.00760	0.00760	0.00760	0.00760	0.00760
Antimony (To	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002
Arsenic (Tota	0.00048	0.00048	0.00048	0.00048	0.00048	0.00048	0.00048	0.00048	0.00048	0.00048	0.00048	0.00048
Barium (Total	0.01140	0.01140	0.01140	0.01140	0.01140	0.01140	0.01140	0.01140	0.01140	0.01140	0.01140	0.01140
Beryllium (To	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Bismuth (Tota	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Boron (Total)	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000
Cadmium (To	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Calcium (Tota	14.50000	14.50000	14.50000	14.50000	14.50000	14.50000	14.50000	14.50000	14.50000	14.50000	14.50000	14.50000
Chromium (T	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010
Cobalt (Total)	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002
Copper (Tota	0.00045	0.00045	0.00045	0.00045	0.00045	0.00045	0.00045	0.00045	0.00045	0.00045	0.00045	0.00045
Iron (Total)	0.00700	0.00700	0.00700	0.00700	0.00700	0.00700	0.00700	0.00700	0.00700	0.00700	0.00700	0.00700
Lead (Total)	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Lithium (Tota	0.00090	0.00090	0.00090	0.00090	0.00090	0.00090	0.00090	0.00090	0.00090	0.00090	0.00090	0.00090
Magnesium (T	2.48000	2.48000	2.48000	2.48000	2.48000	2.48000	2.48000	2.48000	2.48000	2.48000	2.48000	2.48000
Manganese (	0.00079	0.00079	0.00079	0.00079	0.00079	0.00079	0.00079	0.00079	0.00079	0.00079	0.00079	0.00079
Molybdenum	0.00087	0.00087	0.00087	0.00087	0.00087	0.00087	0.00087	0.00087	0.00087	0.00087	0.00087	0.00087
Nickel (Total)	0.00009	0.00009	0.00009	0.00009	0.00009	0.00009	0.00009	0.00009	0.00009	0.00009	0.00009	0.00009
Phosphorus (	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000
Potassium (T	1.29000	1.29000	1.29000	1.29000	1.29000	1.29000	1.29000	1.29000	1.29000	1.29000	1.29000	1.29000
Selenium (To	0.00011	0.00011	0.00011	0.00011	0.00011	0.00011	0.00011	0.00011	0.00011	0.00011	0.00011	0.00011
Silicon (Total)	3.96000	3.96000	3.96000	3.96000	3.96000	3.96000	3.96000	3.96000	3.96000	3.96000	3.96000	3.96000
Silver (Total)	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Sodium (Tota	2.05000	2.05000	2.05000	2.05000	2.05000	2.05000	2.05000	2.05000	2.05000	2.05000	2.05000	2.05000
Strontium (To	0.05410	0.05410	0.05410	0.05410	0.05410	0.05410	0.05410	0.05410	0.05410	0.05410	0.05410	0.05410
Sulphur (Tota	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000
Thallium (Tot	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Tin (Total)	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020
Titanium (Tot	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050
Uranium (Tot	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040
Vanadium (To	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020
Zinc (Total)	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040
Zirconium (To	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010
Mercury (Tota	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
H+ Calcluate	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Orthophosph	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500
Nitrate (as N)	0.20500	0.20500	0.20500	0.20500	0.20500	0.20500	0.20500	0.20500	0.20500	0.20500	0.20500	0.20500
Ammonia (To	0.02100	0.02100	0.02100	0.02100	0.02100	0.02100	0.02100	0.02100	0.02100	0.02100	0.02100	0.02100
Nitrite (as N)	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500

APPENDIX A1 - SOURCE TERMS
HARPER CREEK PROJECT
TABLE 13 - Site H3T (GW)

Parameter	January 01/01/2013	February 01/02/2013	March 01/03/2013	April 01/04/2013	May 01/05/2013	June 01/06/2013	July 01/07/2013	August 01/08/2013	September 01/09/2013	October 01/10/2013	November 01/11/2013	December 01/12/2013
Sulphate (Dis	1.83000	1.83000	1.83000	1.83000	1.83000	1.83000	1.83000	1.83000	1.83000	1.83000	1.83000	1.83000
Acidity to pH	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Acidity to pH	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Alkalinity (Tot	27.70000	27.70000	27.70000	27.70000	27.70000	27.70000	27.70000	27.70000	27.70000	27.70000	27.70000	27.70000
Chloride (Dis	0.60000	0.60000	0.60000	0.60000	0.60000	0.60000	0.60000	0.60000	0.60000	0.60000	0.60000	0.60000
Fluoride (Dis	0.02800	0.02800	0.02800	0.02800	0.02800	0.02800	0.02800	0.02800	0.02800	0.02800	0.02800	0.02800
Hardness as	23.70000	23.70000	23.70000	23.70000	23.70000	23.70000	23.70000	23.70000	23.70000	23.70000	23.70000	23.70000
Aluminum (D	0.01680	0.01680	0.01680	0.01680	0.01680	0.01680	0.01680	0.01680	0.01680	0.01680	0.01680	0.01680
Antimony (Dis	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002
Arsenic (Diss	0.00006	0.00006	0.00006	0.00006	0.00006	0.00006	0.00006	0.00006	0.00006	0.00006	0.00006	0.00006
Barium (Disso	0.00746	0.00746	0.00746	0.00746	0.00746	0.00746	0.00746	0.00746	0.00746	0.00746	0.00746	0.00746
Beryllium (Dis	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Bismuth (Diss	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Boron (Dissol	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000
Cadmium (Di	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Calcium (Diss	8.08000	8.08000	8.08000	8.08000	8.08000	8.08000	8.08000	8.08000	8.08000	8.08000	8.08000	8.08000
Chromium (D	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010
Cobalt (Disso	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Copper (Diss	0.00027	0.00027	0.00027	0.00027	0.00027	0.00027	0.00027	0.00027	0.00027	0.00027	0.00027	0.00027
Iron (Dissolve	0.00400	0.00400	0.00400	0.00400	0.00400	0.00400	0.00400	0.00400	0.00400	0.00400	0.00400	0.00400
Lead (Dissolv	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Lithium (Disso	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050
Magnesium (I	0.84000	0.84000	0.84000	0.84000	0.84000	0.84000	0.84000	0.84000	0.84000	0.84000	0.84000	0.84000
Manganese (	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008
Molybdenum	0.00072	0.00072	0.00072	0.00072	0.00072	0.00072	0.00072	0.00072	0.00072	0.00072	0.00072	0.00072
Nickel (Disso	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004
Phosphorus (	0.28313	0.28313	0.28313	0.28313	0.28313	0.28313	0.28313	0.28313	0.28313	0.28313	0.28313	0.28313
Potassium (D	0.60000	0.60000	0.60000	0.60000	0.60000	0.60000	0.60000	0.60000	0.60000	0.60000	0.60000	0.60000
Selenium (Dis	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004
Silicon (Dissc	3.84000	3.84000	3.84000	3.84000	3.84000	3.84000	3.84000	3.84000	3.84000	3.84000	3.84000	3.84000
Silver (Dissol	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Sodium (Diss	1.30000	1.30000	1.30000	1.30000	1.30000	1.30000	1.30000	1.30000	1.30000	1.30000	1.30000	1.30000
Strontium (Di	0.02430	0.02430	0.02430	0.02430	0.02430	0.02430	0.02430	0.02430	0.02430	0.02430	0.02430	0.02430
Sulphur (Diss	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000
Thallium (Dis	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Tin (Dissolve	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020
Titanium (Dis	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050
Uranium (Dis	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020
Vanadium (D	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020
Zinc (Dissolv	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Zirconium (Di	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010
Mercury (Diss	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Aluminum (T	0.01690	0.01690	0.01690	0.01690	0.01690	0.01690	0.01690	0.01690	0.01690	0.01690	0.01690	0.01690
Antimony (To	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002
Arsenic (Tota	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010
Barium (Total	0.00755	0.00755	0.00755	0.00755	0.00755	0.00755	0.00755	0.00755	0.00755	0.00755	0.00755	0.00755
Beryllium (To	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Bismuth (Tota	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Boron (Total)	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000
Cadmium (To	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Calcium (Tota	8.08000	8.08000	8.08000	8.08000	8.08000	8.08000	8.08000	8.08000	8.08000	8.08000	8.08000	8.08000
Chromium (T	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010
Cobalt (Total)	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Copper (Tota	0.00029	0.00029	0.00029	0.00029	0.00029	0.00029	0.00029	0.00029	0.00029	0.00029	0.00029	0.00029
Iron (Total)	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500
Lead (Total)	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Lithium (Tota	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050
Magnesium (	0.87000	0.87000	0.87000	0.87000	0.87000	0.87000	0.87000	0.87000	0.87000	0.87000	0.87000	0.87000
Manganese (	0.00016	0.00016	0.00016	0.00016	0.00016	0.00016	0.00016	0.00016	0.00016	0.00016	0.00016	0.00016
Molybdenum	0.00073	0.00073	0.00073	0.00073	0.00073	0.00073	0.00073	0.00073	0.00073	0.00073	0.00073	0.00073
Nickel (Total)	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004
Phosphorus (	0.28313	0.28313	0.28313	0.28313	0.28313	0.28313	0.28313	0.28313	0.28313	0.28313	0.28313	0.28313
Potassium (T	0.61000	0.61000	0.61000	0.61000	0.61000	0.61000	0.61000	0.61000	0.61000	0.61000	0.61000	0.61000
Selenium (To	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004
Silicon (Total)	3.84000	3.84000	3.84000	3.84000	3.84000	3.84000	3.84000	3.84000	3.84000	3.84000	3.84000	3.84000
Silver (Total)	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Sodium (Tota	1.37000	1.37000	1.37000	1.37000	1.37000	1.37000	1.37000	1.37000	1.37000	1.37000	1.37000	1.37000
Strontium (To	0.02440	0.02440	0.02440	0.02440	0.02440	0.02440	0.02440	0.02440	0.02440	0.02440	0.02440	0.02440
Sulphur (Tota	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000
Thallium (Tot	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Tin (Total)	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020
Titanium (Tot	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050
Uranium (Tot	0.00021	0.00021	0.00021	0.00021	0.00021	0.00021	0.00021	0.00021	0.00021	0.00021	0.00021	0.00021
Vanadium (To	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020
Zinc (Total)	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
Zirconium (To	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010
Mercury (Tota	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
H+ Calcluate	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Orthophospha	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500
Nitrate (as N)	0.09800	0.09800	0.09800	0.09800	0.09800	0.09800	0.09800	0.09800	0.09800	0.09800	0.09800	0.09800
Ammonia (To	0.02000	0.02000	0.02000	0.02000	0.02000	0.02000	0.02000	0.02000	0.02000	0.02000	0.02000	0.02000
Nitrite (as N)	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500

APPENDIX A1 - SOURCE TERMS
HARPER CREEK PROJECT
TABLE 14 - Site H4P (GW)

	January	February	March	April	May	June	July	August	September	October	November	December
Parameter	01/01/2013	01/02/2013	01/03/2013	01/04/2013	01/05/2013	01/06/2013	01/07/2013	01/08/2013	01/09/2013	01/10/2013	01/11/2013	01/12/2013
Sulphate (Dis	13.50000	13.50000	13.50000	13.50000	13.50000	13.50000	13.50000	13.50000	13.50000	13.50000	13.50000	13.50000
Acidity to pH	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Acidity to pH	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Alkalinity (Tot	68.40000	68.40000	68.40000	68.40000	68.40000	68.40000	68.40000	68.40000	68.40000	68.40000	68.40000	68.40000
Chloride (Dis	0.50000	0.50000	0.50000	0.50000	0.50000	0.50000	0.50000	0.50000	0.50000	0.50000	0.50000	0.50000
Fluoride (Diss	0.04200	0.04200	0.04200	0.04200	0.04200	0.04200	0.04200	0.04200	0.04200	0.04200	0.04200	0.04200
Hardness as	76.40000	76.40000	76.40000	76.40000	76.40000	76.40000	76.40000	76.40000	76.40000	76.40000	76.40000	76.40000
Aluminum (Di	0.00330	0.00330	0.00330	0.00330	0.00330	0.00330	0.00330	0.00330	0.00330	0.00330	0.00330	0.00330
Antimony (Dis	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002
Arsenic (Diss	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017
Barium (Disso	0.00624	0.00624	0.00624	0.00624	0.00624	0.00624	0.00624	0.00624	0.00624	0.00624	0.00624	0.00624
Beryllium (Dis	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Bismuth (Diss	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Boron (Dissol	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000
Cadmium (Di	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Calcium (Diss	22.00000	22.00000	22.00000	22.00000	22.00000	22.00000	22.00000	22.00000	22.00000	22.00000	22.00000	22.00000
Chromium (D	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010
Cobalt (Disso	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Copper (Diss	0.00036	0.00036	0.00036	0.00036	0.00036	0.00036	0.00036	0.00036	0.00036	0.00036	0.00036	0.00036
Iron (Dissolve	0.00800	0.00800	0.00800	0.00800	0.00800	0.00800	0.00800	0.00800	0.00800	0.00800	0.00800	0.00800
Lead (Dissolv	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Lithium (Disso	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050
Magnesium (I	5.20000	5.20000	5.20000	5.20000	5.20000	5.20000	5.20000	5.20000	5.20000	5.20000	5.20000	5.20000
Manganese (	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020
Molybdenum	0.00019	0.00019	0.00019	0.00019	0.00019	0.00019	0.00019	0.00019	0.00019	0.00019	0.00019	0.00019
Nickel (Disso	0.00006	0.00006	0.00006	0.00006	0.00006	0.00006	0.00006	0.00006	0.00006	0.00006	0.00006	0.00006
Phosphorus (	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000
Potassium (D	0.33000	0.33000	0.33000	0.33000	0.33000	0.33000	0.33000	0.33000	0.33000	0.33000	0.33000	0.33000
Selenium (Dis	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020
Silicon (Dissc	2.88000	2.88000	2.88000	2.88000	2.88000	2.88000	2.88000	2.88000	2.88000	2.88000	2.88000	2.88000
Silver (Dissol	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Sodium (Diss	1.29000	1.29000	1.29000	1.29000	1.29000	1.29000	1.29000	1.29000	1.29000	1.29000	1.29000	1.29000
Strontium (Di	0.06890	0.06890	0.06890	0.06890	0.06890	0.06890	0.06890	0.06890	0.06890	0.06890	0.06890	0.06890
Sulphur (Diss	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000
Thallium (Dis	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Tin (Dissolve	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020
Titanium (Dis	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050
Uranium (Dis	0.00018	0.00018	0.00018	0.00018	0.00018	0.00018	0.00018	0.00018	0.00018	0.00018	0.00018	0.00018
Vanadium (D	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020
Zinc (Dissolve	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040
Zirconium (Di	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010
Mercury (Diss	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Aluminum (To	0.00340	0.00340	0.00340	0.00340	0.00340	0.00340	0.00340	0.00340	0.00340	0.00340	0.00340	0.00340
Antimony (To	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002
Arsenic (Tota	0.00018	0.00018	0.00018	0.00018	0.00018	0.00018	0.00018	0.00018	0.00018	0.00018	0.00018	0.00018
Barium (Total	0.00624	0.00624	0.00624	0.00624	0.00624	0.00624	0.00624	0.00624	0.00624	0.00624	0.00624	0.00624
Beryllium (To	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Bismuth (Tota	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Boron (Total)	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000
Cadmium (To	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Calcium (Tota	23.40000	23.40000	23.40000	23.40000	23.40000	23.40000	23.40000	23.40000	23.40000	23.40000	23.40000	23.40000
Chromium (T	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010
Cobalt (Total)	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Copper (Tota	0.00036	0.00036	0.00036	0.00036	0.00036	0.00036	0.00036	0.00036	0.00036	0.00036	0.00036	0.00036
Iron (Total)	0.00800	0.00800	0.00800	0.00800	0.00800	0.00800	0.00800	0.00800	0.00800	0.00800	0.00800	0.00800
Lead (Total)	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Lithium (Tota	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050
Magnesium (T	5.20000	5.20000	5.20000	5.20000	5.20000	5.20000	5.20000	5.20000	5.20000	5.20000	5.20000	5.20000
Manganese (	0.00028	0.00028	0.00028	0.00028	0.00028	0.00028	0.00028	0.00028	0.00028	0.00028	0.00028	0.00028
Molybdenum	0.00019	0.00019	0.00019	0.00019	0.00019	0.00019	0.00019	0.00019	0.00019	0.00019	0.00019	0.00019
Nickel (Total)	0.00006	0.00006	0.00006	0.00006	0.00006	0.00006	0.00006	0.00006	0.00006	0.00006	0.00006	0.00006
Phosphorus (	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000
Potassium (T	0.33000	0.33000	0.33000	0.33000	0.33000	0.33000	0.33000	0.33000	0.33000	0.33000	0.33000	0.33000
Selenium (To	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020
Silicon (Total	3.04000	3.04000	3.04000	3.04000	3.04000	3.04000	3.04000	3.04000	3.04000	3.04000	3.04000	3.04000
Silver (Total)	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Sodium (Tota	1.30000	1.30000	1.30000	1.30000	1.30000	1.30000	1.30000	1.30000	1.30000	1.30000	1.30000	1.30000
Strontium (To	0.06960	0.06960	0.06960	0.06960	0.06960	0.06960	0.06960	0.06960	0.06960	0.06960	0.06960	0.06960
Sulphur (Tota	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000
Thallium (Tot	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Tin (Total)	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020
Titanium (Tot	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050
Uranium (Tot	0.00019	0.00019	0.00019	0.00019	0.00019	0.00019	0.00019	0.00019	0.00019	0.00019	0.00019	0.00019
Vanadium (To	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020
Zinc (Total)	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040
Zirconium (To	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010
Mercury (Tota	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
H+ Calcluate	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Orthophospha	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500
Nitrate (as N)	0.30100	0.30100	0.30100	0.30100	0.30100	0.30100	0.30100	0.30100	0.30100	0.30100	0.30100	0.30100
Ammonia (To	0.05100	0.05100	0.05100	0.05100	0.05100	0.05100	0.05100	0.05100	0.05100	0.05100	0.05100	0.05100
Nitrite (as N)	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500

APPENDIX A1 - SOURCE TERMS
HARPER CREEK PROJECT
TABLE 15 - Site H5 (GW)

	January	February	March	April	May	June	July	August	September	October	November	December
Parameter	01/01/2013	01/02/2013	01/03/2013	01/04/2013	01/05/2013	01/06/2013	01/07/2013	01/08/2013	01/09/2013	01/10/2013	01/11/2013	01/12/2013
Sulphate (Dis	13.80000	13.80000	13.80000	13.80000	13.80000	13.80000	13.80000	13.80000	13.80000	13.80000	13.80000	13.80000
Acidity to pH	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Acidity to pH	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Alkalinity (Tot	43.70000	43.70000	43.70000	43.70000	43.70000	43.70000	43.70000	43.70000	43.70000	43.70000	43.70000	43.70000
Chloride (Diss	0.80000	0.80000	0.80000	0.80000	0.80000	0.80000	0.80000	0.80000	0.80000	0.80000	0.80000	0.80000
Fluoride (Diss	0.04300	0.04300	0.04300	0.04300	0.04300	0.04300	0.04300	0.04300	0.04300	0.04300	0.04300	0.04300
Hardness as	50.20000	50.20000	50.20000	50.20000	50.20000	50.20000	50.20000	50.20000	50.20000	50.20000	50.20000	50.20000
Aluminum (Di	0.00480	0.00480	0.00480	0.00480	0.00480	0.00480	0.00480	0.00480	0.00480	0.00480	0.00480	0.00480
Antimony (Dis	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002
Arsenic (Diss	0.00011	0.00011	0.00011	0.00011	0.00011	0.00011	0.00011	0.00011	0.00011	0.00011	0.00011	0.00011
Barium (Disso	0.00997	0.00997	0.00997	0.00997	0.00997	0.00997	0.00997	0.00997	0.00997	0.00997	0.00997	0.00997
Beryllium (Dis	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Bismuth (Diss	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Boron (Dissol	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000
Cadmium (Di	0.00003	0.00003	0.00003	0.00003	0.00003	0.00003	0.00003	0.00003	0.00003	0.00003	0.00003	0.00003
Calcium (Diss	15.30000	15.30000	15.30000	15.30000	15.30000	15.30000	15.30000	15.30000	15.30000	15.30000	15.30000	15.30000
Chromium (D	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010
Cobalt (Disso	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Copper (Diss	0.00185	0.00185	0.00185	0.00185	0.00185	0.00185	0.00185	0.00185	0.00185	0.00185	0.00185	0.00185
Iron (Dissolve	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100
Lead (Dissolv	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Lithium (Disso	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050
Magnesium (I	2.92000	2.92000	2.92000	2.92000	2.92000	2.92000	2.92000	2.92000	2.92000	2.92000	2.92000	2.92000
Manganese (	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005
Molybdenum	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017
Nickel (Disso	0.00018	0.00018	0.00018	0.00018	0.00018	0.00018	0.00018	0.00018	0.00018	0.00018	0.00018	0.00018
Phosphorus (	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000
Potassium (D	0.65000	0.65000	0.65000	0.65000	0.65000	0.65000	0.65000	0.65000	0.65000	0.65000	0.65000	0.65000
Selenium (Dis	0.00021	0.00021	0.00021	0.00021	0.00021	0.00021	0.00021	0.00021	0.00021	0.00021	0.00021	0.00021
Silicon (Disso	2.66000	2.66000	2.66000	2.66000	2.66000	2.66000	2.66000	2.66000	2.66000	2.66000	2.66000	2.66000
Silver (Dissol	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Sodium (Diss	1.27000	1.27000	1.27000	1.27000	1.27000	1.27000	1.27000	1.27000	1.27000	1.27000	1.27000	1.27000
Strontium (Di	0.04630	0.04630	0.04630	0.04630	0.04630	0.04630	0.04630	0.04630	0.04630	0.04630	0.04630	0.04630
Sulphur (Diss	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000
Thallium (Dis	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Tin (Dissolve	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020
Titanium (Dis	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050
Uranium (Dis	0.00006	0.00006	0.00006	0.00006	0.00006	0.00006	0.00006	0.00006	0.00006	0.00006	0.00006	0.00006
Vanadium (D	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020
Zinc (Dissolve	0.00140	0.00140	0.00140	0.00140	0.00140	0.00140	0.00140	0.00140	0.00140	0.00140	0.00140	0.00140
Zirconium (Di	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010
Mercury (Diss	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Aluminum (To	0.01930	0.01930	0.01930	0.01930	0.01930	0.01930	0.01930	0.01930	0.01930	0.01930	0.01930	0.01930
Antimony (To	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002
Arsenic (Tota	0.00016	0.00016	0.00016	0.00016	0.00016	0.00016	0.00016	0.00016	0.00016	0.00016	0.00016	0.00016
Barium (Total	0.01030	0.01030	0.01030	0.01030	0.01030	0.01030	0.01030	0.01030	0.01030	0.01030	0.01030	0.01030
Beryllium (To	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Bismuth (Tota	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Boron (Total)	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000	0.05000
Cadmium (To	0.00003	0.00003	0.00003	0.00003	0.00003	0.00003	0.00003	0.00003	0.00003	0.00003	0.00003	0.00003
Calcium (Tota	16.80000	16.80000	16.80000	16.80000	16.80000	16.80000	16.80000	16.80000	16.80000	16.80000	16.80000	16.80000
Chromium (T	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010
Cobalt (Total)	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004
Copper (Tota	0.00235	0.00235	0.00235	0.00235	0.00235	0.00235	0.00235	0.00235	0.00235	0.00235	0.00235	0.00235
Iron (Total)	0.02900	0.02900	0.02900	0.02900	0.02900	0.02900	0.02900	0.02900	0.02900	0.02900	0.02900	0.02900
Lead (Total)	0.00007	0.00007	0.00007	0.00007	0.00007	0.00007	0.00007	0.00007	0.00007	0.00007	0.00007	0.00007
Lithium (Tota	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050
Magnesium (T	3.02000	3.02000	3.02000	3.02000	3.02000	3.02000	3.02000	3.02000	3.02000	3.02000	3.02000	3.02000
Manganese (	0.00135	0.00135	0.00135	0.00135	0.00135	0.00135	0.00135	0.00135	0.00135	0.00135	0.00135	0.00135
Molybdenum	0.00019	0.00019	0.00019	0.00019	0.00019	0.00019	0.00019	0.00019	0.00019	0.00019	0.00019	0.00019
Nickel (Total)	0.00021	0.00021	0.00021	0.00021	0.00021	0.00021	0.00021	0.00021	0.00021	0.00021	0.00021	0.00021
Phosphorus (	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000	0.30000
Potassium (T	0.68000	0.68000	0.68000	0.68000	0.68000	0.68000	0.68000	0.68000	0.68000	0.68000	0.68000	0.68000
Selenium (To	0.00021	0.00021	0.00021	0.00021	0.00021	0.00021	0.00021	0.00021	0.00021	0.00021	0.00021	0.00021
Silicon (Total)	3.00000	3.00000	3.00000	3.00000	3.00000	3.00000	3.00000	3.00000	3.00000	3.00000	3.00000	3.00000
Silver (Total)	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Sodium (Tota	1.32000	1.32000	1.32000	1.32000	1.32000	1.32000	1.32000	1.32000	1.32000	1.32000	1.32000	1.32000
Strontium (To	0.04630	0.04630	0.04630	0.04630	0.04630	0.04630	0.04630	0.04630	0.04630	0.04630	0.04630	0.04630
Sulphur (Tota	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000
Thallium (Tot	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Tin (Total)	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020
Titanium (Tot	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050
Uranium (Tot	0.00007	0.00007	0.00007	0.00007	0.00007	0.00007	0.00007	0.00007	0.00007	0.00007	0.00007	0.00007
Vanadium (To	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020
Zinc (Total)	0.00190	0.00190	0.00190	0.00190	0.00190	0.00190	0.00190	0.00190	0.00190	0.00190	0.00190	0.00190
Zirconium (To	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010
Mercury (Tota	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
H+ Calcluate	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Orthophospha	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500
Nitrate (as N)	0.15400	0.15400	0.15400	0.15400	0.15400	0.15400	0.15400	0.15400	0.15400	0.15400	0.15400	0.15400
Ammonia (To	0.01700	0.01700	0.01700	0.01700	0.01700	0.01700	0.01700	0.01700	0.01700	0.01700	0.01700	0.01700
Nitrate+Nitrite	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500

APPENDIX A1 - SOURCE TERMS
HARPER CREEK PROJECT
TABLE 16 - Site J1 (GW)

	January	February	March	April	May	June	July	August	September	October	November	December
Parameter	01/01/2013	01/02/2013	01/03/2013	01/04/2013	01/05/2013	01/06/2013	01/07/2013	01/08/2013	01/09/2013	01/10/2013	01/11/2013	01/12/2013
Sulphate (Dis	23.11667	23.11667	23.11667	23.11667	23.11667	23.11667	23.11667	23.11667	23.11667	23.11667	23.11667	23.11667
Acidity to pH	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Acidity to pH	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Alkalinity (Tot	121.50000	121.50000	121.50000	121.50000	121.50000	121.50000	121.50000	121.50000	121.50000	121.50000	121.50000	121.50000
Chloride (Diss	0.50000	0.50000	0.50000	0.50000	0.50000	0.50000	0.50000	0.50000	0.50000	0.50000	0.50000	0.50000
Fluoride (Diss	0.03933	0.03933	0.03933	0.03933	0.03933	0.03933	0.03933	0.03933	0.03933	0.03933	0.03933	0.03933
Hardness as	144.16667	144.16667	144.16667	144.16667	144.16667	144.16667	144.16667	144.16667	144.16667	144.16667	144.16667	144.16667
Aluminum (Di	0.00410	0.00410	0.00410	0.00410	0.00410	0.00410	0.00410	0.00410	0.00410	0.00410	0.00410	0.00410
Antimony (Dis	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005
Arsenic (Diss	0.00018	0.00018	0.00018	0.00018	0.00018	0.00018	0.00018	0.00018	0.00018	0.00018	0.00018	0.00018
Barium (Disso	0.01233	0.01233	0.01233	0.01233	0.01233	0.01233	0.01233	0.01233	0.01233	0.01233	0.01233	0.01233
Beryllium (Dis	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004
Bismuth (Diss	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017
Boron (Dissol	0.03667	0.03667	0.03667	0.03667	0.03667	0.03667	0.03667	0.03667	0.03667	0.03667	0.03667	0.03667
Cadmium (Di	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Calcium (Diss	35.11667	35.11667	35.11667	35.11667	35.11667	35.11667	35.11667	35.11667	35.11667	35.11667	35.11667	35.11667
Chromium (D	0.00090	0.00090	0.00090	0.00090	0.00090	0.00090	0.00090	0.00090	0.00090	0.00090	0.00090	0.00090
Cobalt (Disso	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004
Copper (Diss	0.00019	0.00019	0.00019	0.00019	0.00019	0.00019	0.00019	0.00019	0.00019	0.00019	0.00019	0.00019
Iron (Dissolve	0.00517	0.00517	0.00517	0.00517	0.00517	0.00517	0.00517	0.00517	0.00517	0.00517	0.00517	0.00517
Lead (Dissolv	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002
Lithium (Disso	0.00094	0.00094	0.00094	0.00094	0.00094	0.00094	0.00094	0.00094	0.00094	0.00094	0.00094	0.00094
Magnesium (	13.66667	13.66667	13.66667	13.66667	13.66667	13.66667	13.66667	13.66667	13.66667	13.66667	13.66667	13.66667
Manganese (	0.00029	0.00029	0.00029	0.00029	0.00029	0.00029	0.00029	0.00029	0.00029	0.00029	0.00029	0.00029
Molybdenum	0.00025	0.00025	0.00025	0.00025	0.00025	0.00025	0.00025	0.00025	0.00025	0.00025	0.00025	0.00025
Nickel (Disso	0.00025	0.00025	0.00025	0.00025	0.00025	0.00025	0.00025	0.00025	0.00025	0.00025	0.00025	0.00025
Phosphorus (	0.28313	0.28313	0.28313	0.28313	0.28313	0.28313	0.28313	0.28313	0.28313	0.28313	0.28313	0.28313
Potassium (D	0.58000	0.58000	0.58000	0.58000	0.58000	0.58000	0.58000	0.58000	0.58000	0.58000	0.58000	0.58000
Selenium (Dis	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040
Silicon (Disso	3.16667	3.16667	3.16667	3.16667	3.16667	3.16667	3.16667	3.16667	3.16667	3.16667	3.16667	3.16667
Silver (Dissol	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Sodium (Diss	1.76333	1.76333	1.76333	1.76333	1.76333	1.76333	1.76333	1.76333	1.76333	1.76333	1.76333	1.76333
Strontium (Di	0.19067	0.19067	0.19067	0.19067	0.19067	0.19067	0.19067	0.19067	0.19067	0.19067	0.19067	0.19067
Sulphur (Diss	3.34000	3.34000	3.34000	3.34000	3.34000	3.34000	3.34000	3.34000	3.34000	3.34000	3.34000	3.34000
Thallium (Dis	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Tin (Dissolve	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017
Titanium (Dis	0.00367	0.00367	0.00367	0.00367	0.00367	0.00367	0.00367	0.00367	0.00367	0.00367	0.00367	0.00367
Uranium (Dis	0.00110	0.00110	0.00110	0.00110	0.00110	0.00110	0.00110	0.00110	0.00110	0.00110	0.00110	0.00110
Vanadium (D	0.00047	0.00047	0.00047	0.00047	0.00047	0.00047	0.00047	0.00047	0.00047	0.00047	0.00047	0.00047
Zinc (Dissolve	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077
Zirconium (Di	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010
Mercury (Diss	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Aluminum (To	0.00507	0.00507	0.00507	0.00507	0.00507	0.00507	0.00507	0.00507	0.00507	0.00507	0.00507	0.00507
Antimony (To	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005
Arsenic (Tota	0.00018	0.00018	0.00018	0.00018	0.00018	0.00018	0.00018	0.00018	0.00018	0.00018	0.00018	0.00018
Barium (Total	0.01240	0.01240	0.01240	0.01240	0.01240	0.01240	0.01240	0.01240	0.01240	0.01240	0.01240	0.01240
Beryllium (To	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004
Bismuth (Tota	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017
Boron (Total)	0.03667	0.03667	0.03667	0.03667	0.03667	0.03667	0.03667	0.03667	0.03667	0.03667	0.03667	0.03667
Cadmium (To	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Calcium (Tota	35.11667	35.11667	35.11667	35.11667	35.11667	35.11667	35.11667	35.11667	35.11667	35.11667	35.11667	35.11667
Chromium (T	0.00090	0.00090	0.00090	0.00090	0.00090	0.00090	0.00090	0.00090	0.00090	0.00090	0.00090	0.00090
Cobalt (Total)	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004
Copper (Tota	0.00029	0.00029	0.00029	0.00029	0.00029	0.00029	0.00029	0.00029	0.00029	0.00029	0.00029	0.00029
Iron (Total)	0.00547	0.00547	0.00547	0.00547	0.00547	0.00547	0.00547	0.00547	0.00547	0.00547	0.00547	0.00547
Lead (Total)	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002
Lithium (Tota	0.00102	0.00102	0.00102	0.00102	0.00102	0.00102	0.00102	0.00102	0.00102	0.00102	0.00102	0.00102
Magnesium (	13.66667	13.66667	13.66667	13.66667	13.66667	13.66667	13.66667	13.66667	13.66667	13.66667	13.66667	13.66667
Manganese (	0.00047	0.00047	0.00047	0.00047	0.00047	0.00047	0.00047	0.00047	0.00047	0.00047	0.00047	0.00047
Molybdenum	0.00025	0.00025	0.00025	0.00025	0.00025	0.00025	0.00025	0.00025	0.00025	0.00025	0.00025	0.00025
Nickel (Total)	0.00025	0.00025	0.00025	0.00025	0.00025	0.00025	0.00025	0.00025	0.00025	0.00025	0.00025	0.00025
Phosphorus (	0.28313	0.28313	0.28313	0.28313	0.28313	0.28313	0.28313	0.28313	0.28313	0.28313	0.28313	0.28313
Potassium (T	0.58567	0.58567	0.58567	0.58567	0.58567	0.58567	0.58567	0.58567	0.58567	0.58567	0.58567	0.58567
Selenium (To	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040
Silicon (Total)	3.21333	3.21333	3.21333	3.21333	3.21333	3.21333	3.21333	3.21333	3.21333	3.21333	3.21333	3.21333
Silver (Total)	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Sodium (Tota	1.76333	1.76333	1.76333	1.76333	1.76333	1.76333	1.76333	1.76333	1.76333	1.76333	1.76333	1.76333
Strontium (To	0.19567	0.19567	0.19567	0.19567	0.19567	0.19567	0.19567	0.19567	0.19567	0.19567	0.19567	0.19567
Sulphur (Tota	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000
Thallium (Tot	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Tin (Total)	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017
Titanium (Tot	0.00367	0.00367	0.00367	0.00367	0.00367	0.00367	0.00367	0.00367	0.00367	0.00367	0.00367	0.00367
Uranium (Tot	0.00110	0.00110	0.00110	0.00110	0.00110	0.00110	0.00110	0.00110	0.00110	0.00110	0.00110	0.00110
Vanadium (To	0.00047	0.00047	0.00047	0.00047	0.00047	0.00047	0.00047	0.00047	0.00047	0.00047	0.00047	0.00047
Zinc (Total)	0.00149	0.00149	0.00149	0.00149	0.00149	0.00149	0.00149	0.00149	0.00149	0.00149	0.00149	0.00149
Zirconium (To	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010
Mercury (Tota	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
H+ Calcluate	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Orthophospha	0.00210	0.00210	0.00210	0.00210	0.00210	0.00210	0.00210	0.00210	0.00210	0.00210	0.00210	0.00210
Nitrate (as N)	0.05240	0.05240	0.05240	0.05240	0.05240	0.05240	0.05240	0.05240	0.05240	0.05240	0.05240	0.05240
Ammonia (To	0.01207	0.01207	0.01207	0.01207	0.01207	0.01207	0.01207	0.01207	0.01207	0.01207	0.01207	0.01207
Nitrate+Nitrite	0.00367	0.00367	0.00367	0.00367	0.00367	0.00367	0.00367	0.00367	0.00367	0.00367	0.00367	0.00367

APPENDIX A2

EXPECTED CASE GEOCHEMICAL SOURCE TERMS

(Pages A2-1 to A2-47)

APPENDIX A2 - EXPECTED CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 2 Out

Parameter	Unit	Year -2 (Coffer	Year -1 (Stag	Year 1 (Stag	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	End
Year		01/01/2013	01/01/2014	01/01/2015	01/01/2016	01/01/2017	01/01/2018	01/01/2019	01/01/2020	01/01/2021	01/01/2022	01/01/2023	01/01/2024	01/01/2025	01/01/2026	01/01/2027	01/01/2028	01/01/2029	01/01/2030	01/01/2031	01/01/2032	01/01/2033	01/01/2034	01/01/2035	01/01/2036	01/01/2037	01/01/2038	01/01/2039	01/01/2040	01/01/2041	01/01/2042	01/01/2043	01/01/2044	01/01/2045	01/01/2046	01/01/2047	31/12/2113
Physical Tests																																					
Acidity to pH 4.5 (as CaCO3)	mg/L	0.00E+00	0.00E+00	0.00E+00

APPENDIX A2 - EXPECTED CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 3 Out

Parameter	Unit	Year -2 (Coffer	Year -1 (Stag	Year 1 (Stag	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	End
Year		01/01/2013	01/01/2014	01/01/2015	01/01/2016	01/01/2017	01/01/2018	01/01/2019	01/01/2020	01/01/2021	01/01/2022	01/01/2023	01/01/2024	01/01/2025	01/01/2026	01/01/2027	01/01/2028	01/01/2029	01/01/2030	01/01/2031	01/01/2032	01/01/2033	01/01/2034	01/01/2035	01/01/2036	01/01/2037	01/01/2038	01/01/2039	01/01/2040	01/01/2041	01/01/2042	01/01/2043	01/01/2044	01/01/2045	01/01/2046	01/01/2047	31/12/2113
Physical Tests																																					
Acidity to pH 4.5 (as CaCO3)	mg/L	0.00E+00	0.00E+00	0.00E+00

APPENDIX A2 - EXPECTED CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 4 Out

Parameter	Unit	Year -2 (Coffer	Year -1 (Stag	Year 1 (Stag	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	End
Year		01/01/2013	01/01/2014	01/01/2015	01/01/2016	01/01/2017	01/01/2018	01/01/2019	01/01/2020	01/01/2021	01/01/2022	01/01/2023	01/01/2024	01/01/2025	01/01/2026	01/01/2027	01/01/2028	01/01/2029	01/01/2030	01/01/2031	01/01/2032	01/01/2033	01/01/2034	01/01/2035	01/01/2036	01/01/2037	01/01/2038	01/01/2039	01/01/2040	01/01/2041	01/01/2042	01/01/2043	01/01/2044	01/01/2045	01/01/2046	01/01/2047	31/12/2113
Physical Tests																																					
Acidity to pH 4.5 (as CaCO3)	mg/L	0.00E+00	0.00E+00	0.00E+00

APPENDIX A2 - EXPECTED CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 7.1 Out

Parameter	Unit	Year -2 (Coffer	Year -1 (Stag	Year 1 (Stag	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	End
Year		01/01/2013	01/01/2014	01/01/2015	01/01/2016	01/01/2017	01/01/2018	01/01/2019	01/01/2020	01/01/2021	01/01/2022	01/01/2023	01/01/2024	01/01/2025	01/01/2026	01/01/2027	01/01/2028	01/01/2029	01/01/2030	01/01/2031	01/01/2032	01/01/2033	01/01/2034	01/01/2035	01/01/2036	01/01/2037	01/01/2038	01/01/2039	01/01/2040	01/01/2041	01/01/2042	01/01/2043	01/01/2044	01/01/2045	01/01/2046	01/01/2047	31/12/2113
Physical Tests																																					
Acidity to pH 4.5 (as CaCO3)	mg/L	0.00E+00	0.00E+00	0.00E+00

Parameter	Unit	All
Physical Tests		01/01/2013
Acidity to pH 4.5 (as CaCO3)	mg/L	5.00E-01
Acidity to pH 8.3 (as CaCO3)	mg/L	5.00E-01
Alkalinity (Total as CaCO3)	mg/L	6.39E+01
Hardness as CaCO3 (Dissolved)	mg/L	7.44E+01
H+ Concentration	mg/L	3.18E-05
Dissolved Anions		
Sulphate (Dissolved)	mg/L	7.00E-01
Chloride (Dissolved)	mg/L	8.00E-02
Fluoride (Dissolved)	mg/L	1.61E+01
Nutrients		
Nitrate (Dissolved)	mg/L	0.00E+00
Ammonia (Dissolved)	mg/L	0.00E+00
Nitrite (Dissolved)	mg/L	0.00E+00
Orthophosphate (Dissolved)	mg/L	9.30E-03
Dissolved Metals		
Al (Dissolved)	mg/L	1.73E-02
Sb (Dissolved)	mg/L	4.40E-04
As (Dissolved)	mg/L	3.28E-03
Ba (Dissolved)	mg/L	6.31E-03
Be (Dissolved)	mg/L	1.00E-05
Bi (Dissolved)	mg/L	5.00E-06
B (Dissolved)	mg/L	5.00E-02
Cd (Dissolved)	mg/L	2.90E-05
Ca (Dissolved)	mg/L	1.62E+01
Cr (Dissolved)	mg/L	1.00E-04
Co (Dissolved)	mg/L	1.79E-04
Cu (Dissolved)	mg/L	7.05E-04
Fe (Dissolved)	mg/L	5.00E-03
Pb (Dissolved)	mg/L	3.05E-05
Li (Dissolved)	mg/L	1.30E-03
Mg (Dissolved)	mg/L	7.81E+00
Mn (Dissolved)	mg/L	3.75E-02
Mo (Dissolved)	mg/L	1.63E-03
Ni (Dissolved)	mg/L	5.10E-04
P (Dissolved)	mg/L	4.50E-03
K (Dissolved)	mg/L	2.77E+00
Se (Dissolved)	mg/L	9.40E-04
Si (Dissolved)	mg/L	2.10E+00
Ag (Dissolved)	mg/L	5.00E-06
Na (Dissolved)	mg/L	1.41E+00
Sr (Dissolved)	mg/L	2.18E-01
S (Dissolved)	mg/L	5.95E+00
Tl (Dissolved)	mg/L	9.50E-06
Sn (Dissolved)	mg/L	8.00E-05
Ti (Dissolved)	mg/L	5.00E-04
U (Dissolved)	mg/L	3.13E-04
V (Dissolved)	mg/L	2.00E-04
Zn (Dissolved)	mg/L	1.90E-03
Zr (Dissolved)	mg/L	1.00E-04
Hg (Dissolved)	mg/L	1.00E-05

APPENDIX A2 - EXPECTED CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 7.2 Out

Parameter	Unit	Year -2 (Coffer	Year -1 (Stag	Year 1 (Stag	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	End
Year		01/01/2013	01/01/2014	01/01/2015	01/01/2016	01/01/2017	01/01/2018	01/01/2019	01/01/2020	01/01/2021	01/01/2022	01/01/2023	01/01/2024	01/01/2025	01/01/2026	01/01/2027	01/01/2028	01/01/2029	01/01/2030	01/01/2031	01/01/2032	01/01/2033	01/01/2034	01/01/2035	01/01/2036	01/01/2037	01/01/2038	########	########	########	########	########	########	########	########	########	########
Physical Tests																																					
Acidity to pH 4.5 (as CaCO3)	mg/year	0.00E+00	0.00E+00	0.00E+00

APPENDIX A2 - EXPECTED CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 9 Out

Parameter	Unit	Year -2 (Coffer	Year -1 (Stag	Year 1 (Stag	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	End
Year		01/01/2013	01/01/2014	01/01/2015	01/01/2016	01/01/2017	01/01/2018	01/01/2019	01/01/2020	01/01/2021	01/01/2022	01/01/2023	01/01/2024	01/01/2025	01/01/2026	01/01/2027	01/01/2028	01/01/2029	01/01/2030	01/01/2031	01/01/2032	01/01/2033	01/01/2034	01/01/2035	01/01/2036	01/01/2037	01/01/2038	01/01/2039	01/01/2040	01/01/2041	01/01/2042	01/01/2043	01/01/2044	01/01/2045	01/01/2046	01/01/2047	31/12/2113
Physical Tests																																					
Acidity to pH 4.5 (as CaCO3)	mg/L	0.00E+00	0.00E+00	0.00E+00

APPENDIX A2 - EXPECTED CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 10.1 N Out

Term applies to freshly created area of pit as a one time leaching event

N as NO3	0.008244717 kg N/m2	8244.717 mg/m2
N as NH3	0.001042435 kg N/m2	1042.435 mg/m3
N as NO2	0.000189534 kg N/m2	189.5337 mg/m4

NOTE: THIS HAS BEEN ADDED TO THE FLUSHED PIT WALL TERM (TERM 10.3), SINCE IT IS A ONE TIME EVENT.

APPENDIX A2 - EXPECTED CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 10.1 Out

Parameter	Unit	Year -2 (Coffer	Year -1 (Stag	Year 1 (Stag	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	End
Year		01/01/2013	01/01/2014	01/01/2015	01/01/2016	01/01/2017	01/01/2018	01/01/2019	01/01/2020	01/01/2021	01/01/2022	01/01/2023	01/01/2024	01/01/2025	01/01/2026	01/01/2027	01/01/2028	01/01/2029	01/01/2030	01/01/2031	01/01/2032	01/01/2033	01/01/2034	01/01/2035	01/01/2036	01/01/2037	01/01/2038	01/01/2039	01/01/2040	01/01/2041	01/01/2042	01/01/2043	01/01/2044	01/01/2045	01/01/2046	01/01/2047	31/12/2113
Physical Tests																																					
Acidity to pH 4.5 (as CaCO3)	mg/L	0.00E+00	0.00E+00	0.00E+00

APPENDIX A2 - EXPECTED CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 10.2 Out

Parameter	Unit	Year -2 (Coffer	Year -1 (Stage 1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Year		01/01/2013	01/01/2036	01/01/2037	01/01/2038	01/01/2039	01/01/2040	01/01/2041	01/01/2042	01/01/2043	01/01/2044	01/01/2045	01/01/2046	01/01/2047	01/01/2048	01/01/2049	01/01/2050	01/01/2051	01/01/2052	01/01/2053	01/01/2054	01/01/2055	01/01/2056	01/01/2057	01/01/2058	01/01/2059	01/01/2060
Physical Tests																											
Acidity to pH 4.5 (as CaCO3)	mg/L	0.00E+00	0.00E+00	6.88E+00	6.88E+00	6.88E+00	7.25E+00	7.62E+00	8.01E+00	8.01E+00	8.38E+00	8.38E+00	8.74E+00	8.74E+00	8.74E+00	8.74E+00	8.74E+00	8.74E+00	8.73E+00	8.73E+00	9.11E+00	9.11E+00	9.11E+00	9.11E+00	9.11E+00	9.11E+00	9.11E+00
Acidity to pH 8.3 (as CaCO3)	mg/L	0.00E+00	0.00E+00	7.02E+00	7.02E+00	7.02E+00	7.40E+00	7.78E+00	8.18E+00	8.18E+00	8.55E+00	8.55E+00	8.92E+00	8.92E+00	8.92E+00	8.92E+00	8.92E+00	8.92E+00	8.92E+00	8.92E+00	9.30E+00	9.30E+00	9.30E+00	9.30E+00	9.30E+00	9.30E+00	9.30E+00
Alkalinity (Total as CaCO3)	mg/L	0.00E+00	0.00E+00	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01
Hardness as CaCO3 (Dissolved)	mg/L	0.00E+00	0.00E+00	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02
H+ Concentration	mg/L	0.00E+00	0.00E+00	0.00E+00	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05
Dissolved Anions																											
Sulphate (Dissolved)	mg/L	0.00E+00	0.00E+00	2.10E+02	2.10E+02	2.10E+02	2.22E+02	2.33E+02	2.45E+02	2.45E+02	2.56E+02	2.56E+02	2.67E+02	2.67E+02	2.67E+02	2.67E+02	2.67E+02	2.67E+02	2.67E+02	2.67E+02	2.79E+02	2.79E+02	2.79E+02	2.79E+02	2.79E+02	2.79E+02	2.78E+02
Chloride (Dissolved)	mg/L	0.00E+00	0.00E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00
Fluoride (Dissolved)	mg/L	0.00E+00	0.00E+00	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02
Nutrients																											
Nitrate (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.71E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrite (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Orthophosphate (Dissolved)	mg/L	0.00E+00	0.00E+00	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02
Dissolved Metals																											
Al (Dissolved)	mg/L	0.00E+00	0.00E+00	2.56E-01	2.56E-01	2.56E-01	2.70E-01	2.83E-01	2.98E-01	2.98E-01	3.12E-01	3.12E-01	3.25E-01	3.25E-01	3.25E-01	3.25E-01	3.25E-01	3.25E-01	3.25E-01	3.25E-01	3.39E-01	3.39E-01	3.39E-01	3.39E-01	3.39E-01	3.39E-01	3.39E-01
Sb (Dissolved)	mg/L	0.00E+00	0.00E+00	2.32E-03	2.32E-03	2.32E-03	2.44E-03	2.57E-03	2.70E-03	2.70E-03	2.82E-03	2.82E-03	2.95E-03	2.95E-03	2.95E-03	2.95E-03	2.95E-03	2.95E-03	2.95E-03	2.95E-03	3.07E-03	3.07E-03	3.07E-03	3.07E-03	3.07E-03	3.07E-03	3.07E-03
As (Dissolved)	mg/L	0.00E+00	0.00E+00	3.85E-03	3.85E-03	3.85E-03	4.05E-03	4.26E-03	4.48E-03	4.48E-03	4.69E-03	4.69E-03	4.89E-03	4.89E-03	4.89E-03	4.89E-03	4.89E-03	4.89E-03	4.89E-03	4.89E-03	5.10E-03	5.10E-03	5.10E-03	5.10E-03	5.10E-03	5.09E-03	5.09E-03
Ba (Dissolved)	mg/L	0.00E+00	0.00E+00	2.60E-02	2.60E-02	2.60E-02	2.74E-02	2.88E-02	3.03E-02	3.03E-02	3.17E-02	3.17E-02	3.30E-02	3.30E-02	3.30E-02	3.30E-02	3.30E-02	3.30E-02	3.30E-02	3.30E-02	3.44E-02	3.44E-02	3.44E-02	3.44E-02	3.44E-02	3.44E-02	3.44E-02
Be (Dissolved)	mg/L	0.00E+00	0.00E+00	1.38E-04	1.38E-04	1.38E-04	1.45E-04	1.52E-04	1.60E-04	1.60E-04	1.68E-04	1.68E-04	1.75E-04	1.75E-04	1.75E-04	1.75E-04	1.75E-04	1.75E-04	1.75E-04	1.75E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04
Bi (Dissolved)	mg/L	0.00E+00	0.00E+00	6.91E-05	6.91E-05	6.91E-05	7.28E-05	7.65E-05	8.05E-05	8.05E-05	8.42E-05	8.42E-05	8.78E-05	8.78E-05	8.78E-05	8.78E-05	8.78E-05	8.78E-05	8.78E-05	8.78E-05	9.15E-05	9.15E-05	9.15E-05	9.15E-05	9.15E-05	9.15E-05	9.15E-05
B (Dissolved)	mg/L	0.00E+00	0.00E+00	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02
Cd (Dissolved)	mg/L	0.00E+00	0.00E+00	7.74E-05	7.74E-05	7.74E-05	8.16E-05	8.57E-05	9.02E-05	9.02E-05	9.43E-05	9.43E-05	9.83E-05	9.83E-05	9.83E-05	9.83E-05	9.83E-05	9.83E-05	9.83E-05	9.83E-05	1.03E-04	1.03E-04	1.03E-04	1.02E-04	1.02E-04	1.02E-04	1.02E-04
Ca (Dissolved)	mg/L	0.00E+00	0.00E+00	1.14E+02	1.14E+02	1.14E+02	1.20E+02	1.26E+02	1.33E+02	1.33E+02	1.39E+02	1.39E+02	1.45E+02	1.45E+02	1.45E+02	1.45E+02	1.45E+02	1.45E+02	1.45E+02	1.45E+02	1.51E+02	1.51E+02	1.51E+02	1.51E+02	1.51E+02	1.51E+02	1.51E+02
Cr (Dissolved)	mg/L	0.00E+00	0.00E+00	1.67E-03	1.67E-03	1.67E-03	1.76E-03	1.85E-03	1.95E-03	1.95E-03	2.04E-03	2.04E-03	2.13E-03	2.13E-03	2.13E-03	2.13E-03	2.13E-03	2.13E-03	2.13E-03	2.13E-03	2.22E-03	2.22E-03	2.22E-03	2.22E-03	2.22E-03	2.22E-03	2.22E-03
Co (Dissolved)	mg/L	0.00E+00	0.00E+00	5.77E-04	5.77E-04	5.77E-04	6.08E-04	6.39E-04	6.72E-04	6.72E-04	7.03E-04	7.03E-04	7.33E-04	7.33E-04	7.33E-04	7.33E-04	7.33E-04	7.33E-04	7.33E-04	7.33E-04	7.65E-04	7.64E-04	7.64E-04	7.64E-04	7.64E-04	7.64E-04	7.64E-04
Cu (Dissolved)	mg/L	0.00E+00	0.00E+00	5.77E-03	5.77E-03	5.77E-03	6.09E-03	6.40E-03	6.73E-03	6.73E-03	7.03E-03	7.03E-03	7.34E-03	7.34E-03	7.34E-03	7.34E-03	7.34E-03	7.33E-03	7.33E-03	7.33E-03	7.65E-03	7.65E-03	7.65E-03	7.65E-03	7.65E-03	7.65E-03	7.65E-03
Fe (Dissolved)	mg/L	0.00E+00	0.00E+00	4.63E-02	4.63E-02	4.63E-02	4.88E-02	5.13E-02	5.39E-02	5.39E-02	5.64E-02	5.64E-02	5.88E-02	5.88E-02	5.88E-02	5.88E-02	5.88E-02	5.88E-02	5.88E-02	5.88E-02	6.13E-02	6.13E-02	6.13E-02	6.13E-02	6.13E-02	6.13E-02	6.13E-02
Pb (Dissolved)	mg/L	0.00E+00	0.00E+00	3.95E-04	3.95E-04	3.95E-04	4.16E-04	4.38E-04	4.60E-04	4.60E-04	4.81E-04	4.81E-04	5.02E-04	5.02E-04	5.02E-04	5.02E-04	5.02E-04	5.02E-04	5.02E-04	5.02E-04	5.23E-04	5.23E-04	5.23E-04	5.23E-04	5.23E-04	5.23E-04	5.23E-04
Li (Dissolved)	mg/L	0.00E+00	0.00E+00	7.12E-03	7.12E-03	7.12E-03	7.50E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03
Mg (Dissolved)	mg/L	0.00E+00	0.00E+00	9.35E+01	9.35E+01	9.35E+01	9.85E+01	1.04E+02	1.09E+02	1.09E+02	1.14E+02	1.14E+02	1.19E+02	1.19E+02	1.19E+02	1.19E+02	1.19E+02	1.19E+02	1.19E+02	1.19E+02	1.24E+02	1.24E+02	1.24E+02	1.24E+02	1.24E+02	1.24E+02	1.24E+02
Mn (Dissolved)	mg/L	0.00E+00	0.00E+00	2.53E-02	2.53E-02	2.53E-02	2.67E-02	2.80E-02	2.95E-02	2.95E-02	3.08E-02	3.08E-02	3.22E-02	3.22E-02	3.22E-02	3.22E-02	3.21E-02	3.21E-02	3.21E-02	3.21E-02	3.35E-02	3.35E-02	3.35E-02	3.35E-02	3.35E-02	3.35E-02	3.35E-02
Mo (Dissolved)	mg/L	0.00E+00	0.00E+00	1.37E-02	1.37E-02	1.37E-02	1.44E-02	1.52E-02	1.60E-02	1.60E-02	1.67E-02	1.67E-02	1.74E-02	1.74E-02	1.74E-02	1.74E-02	1.74E-02	1.74E-02	1.74E-02	1.74E-02	1.82E-02	1.82E-02	1.82E-02	1.82E-02	1.82E-02	1.82E-02	1.82E-02
Ni (Dissolved)	mg/L	0.00E+00	0.00E+00	3.59E-03	3.59E-03	3.59E-03	3.78E-03	3.98E-03	4.18E-03	4.18E-03	4.37E-03	4.37E-03	4.56E-03	4.56E-03	4.56E-03	4.56E-03	4.56E-03	4.56E-03	4.56E-03	4.56E-03	4.76E-03	4.76E-03	4.76E-03	4.76E-03	4.76E-03	4.76E-03	4.75E-03
P (Dissolved)	mg/L	0.00E+00	0.00E+00	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02
K (Dissolved)	mg/L	0.00E+00	0.00E+00	3.39E+00	3.39E+00	3.39E+00	3.57E+00	3.76E+00	3.95E+00	3.95E+00	4.13E+00	4.13E+00	4.31E+00	4.31E+00	4.31E+00	4.31E+00	4.31E+00	4.31E+00	4.31E+00	4.31E+00	4.49E+00	4.49E+00	4.49E+00	4.49E+00	4.49E+00	4.49E+00	4.49E+00
Si (Dissolved)	mg/L	0.00E+00	0.00E+00	4.66E+00	4.66E+00	4.66E+00	4.91E+00	5.16E+00	5.42E+00	5.42E+00	5.67E+00	5.67E+00	5.92E+00	5.92E+00	5.92E+00	5.91E+00	5.91E+00	5.91E+00	5.91E+00	5.91E+00	6.17E+00	6.17E+00	6.17E+00	6.17E+00	6.17E+00	6.17E+00	6.16E+00
Ag (Dissolved)	mg/L	0.00E+00	0.00E+00	6.98E-05	6.98E-05	6.98E-05	7.35E-05	7.73E-05	8.13E-05	8.13E-05	8.50E-05	8.50E-05	8.86E-05	8.86E-05	8.86E-05	8.86E-05	8.86E-05	8.86E-05	8.86E-05	8.86E-05	9.24E-05	9.24E-05	9.24E-05	9.24E-05	9.24E-05	9.24E-05	9.24E-05
Na (Dissolved)	mg/L	0.00E+00	0.00E+00	7.41E-01	7.41E-01	7.41E-01	7.81E-01	8.21E-01	8.63E-01	8.63E-01	9.02E-01	9.02E-01	9.41E-01	9.41E-01	9.41E-01	9.41E-01	9.41E-01	9.41E-01	9.41E-01	9.41E-01	9.81E-01	9.81E-01	9.81E-01	9.81E-01	9.81E-01	9.81E-01	9.81E-01
Sr (Dissolved)	mg/L	0.00E+00	0.00E+00	5.58E-01	5.58E-01	5.58E-01	5.88E-01	6.18E-01	6.50E-01	6.50E-01	6.80E-01	6.80E-01	7.09E-01	7.09E-01	7.09E-01	7.09E-01	7.09E-01	7.09E-01	7.09E-01	7.09E-01	7.39E-01	7.39E-01	7.39E-01	7.39E-01	7.39E-01	7.39E-01	7.39E-01
S (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tl (Dissolved)	mg/L	0.00E+00	0.00E+00	5.66E-05	5.66E-05	5.66E-05	5.96E-05	6.27E-05	6.59E-05	6.59E-05	6.89E-05	6.89E-05	7.19E-05	7.19E-05	7.19E-05	7.19E-05	7.19E-05	7.18E-05	7.18E-05	7.18E-05	7.49E-05	7.49E-05	7.49E-05	7.49E-05	7.49E-05	7.49E-05	7.49E-05
Sn (Dissolved)	mg/L	0.00E+00	0.00E+00	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04
Ti (Dissolved)	mg/L	0.00E+00	0.00E+00	7.38E-03	7.38E-03	7.38E-03	7.78E-03	8.18E-03	8.60E-03	8.60E-03	9.00E-03	8.99E-03	9.38E-03	9.38E-03	9.38E-03	9.38E-03	9.38E-03	9.38E-03	9.38E-03	9.38E-03	9.78E-03	9.78E-03	9.78E-03	9.78E-03	9.78E-03	9.78E-03	9.78E-03
U (Dissolved)	mg/L	0.00E+00	0.00E+00	1.19E-03	1.19E-03	1.19E-03	1.26E-03	1.32E-03	1.39E-03	1.39E-03	1.46E-03	1.46E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.58E-03	1.58E-03	1.58E-03	1.58E-03	1.58E-03	1.58E-03	1.58E-03
V (Dissolved)	mg/L	0.00E+00	0.00E+00	3.35E-03	3.35E-03	3.35E-03	3.53E-03	3.71E-03	3.91E-03	3.91E-03	4.08E-03	4.08E-03	4.26E-03	4.26E-03	4.26E-03	4.26E-03	4.26E-03	4.26E-03	4.26E-03	4.26E-03	4.44E-03	4.44E-03	4.44E-03	4.44E-03	4.44E-03	4.44E-03	4.44E-03
Zn (Dissolved)	mg/L	0.00E+00	0.00E+00	1.21E-02	1.21E-02	1.21E-02	1.28E-02	1.34E-02	1.41E-02	1.41E-02	1.48E-02	1.48E-02	1.54E-02	1.54E-02	1.54E-02	1.54E-02	1.54E-02	1.54E-02	1.54E-02	1.54E-02	1.61E-02	1.61E-02	1.61E-02	1.61E-02	1.61E-02	1.61E-02	1.61E-02
Zr (Dissolved)	mg/L	0.00E+00	0.00E+00	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04
Hg - (Dissolved)	mg/L	0.00E+00	0.00E+00	2.75E-05	2.75E-05	2.75E-05	2.90E-05	3.05E-05	3.20E-05	3.20E-05	3.35E-05	3.35E-05	3.50E-05	3.49E-05	3.49E-05	3.49E-05	3.49E-05	3.49E-05	3.49E-05	3.49E-05	3.64E-05	3.64E-05	3.64E-05	3.64E-05	3.64E-05	3.64E-05	3.64E-05
Se (Dissolved)	mg/L	0.00E+00	0.00E+00	6.80E-03	6.80E-03	6.80E-03	7.16E-03	7.53E-03	7.92E-03	7.92E-03	8.28E-03	8.28E-03	8.63E-03	8.63E-03	8.63E-03	8.63E-03	8.63E-03	8.63E-03	8.63E-03	8.63E-03	9.00E-03	9.00E-03	9.00E-03	9.00E-03	9.00E-03	9.00E-03	9.00E-03

APPENDIX A2 - EXPECTED CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 10.2 Out

Parameter	Unit	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51
Year		01/01/2061	01/01/2062	01/01/2063	01/01/2064	01/01/2065	01/01/2066	01/01/2067	01/01/2068	01/01/2069	01/01/2070	01/01/2071	01/01/2072	01/01/2073	01/01/2074	01/01/2075	01/01/2076	01/01/2077	01/01/2078	01/01/2079	01/01/2080	01/01/2081	01/01/2082	01/01/2083	01/01/2084	01/01/2085	01/01/2086	01/01/2087
Physical Tests																												
Acidity to pH 4.5 (as CaCO3)	mg/L	9.45E+00	9.45E+00	9.78E+00	9.78E+00	1.01E+01	1.08E+01	1.08E+01	1.08E+01	1.08E+01	1.08E+01	1.08E+01	1.11E+01	1.11E+01	1.11E+01	1.15E+01	1.15E+01	1.15E+01	1.15E+01	1.15E+01	1.15E+01	1.15E+01	1.15E+01	1.18E+01	1.18E+01	1.18E+01	1.18E+01	1.18E+01
Acidity to pH 8.3 (as CaCO3)	mg/L	9.64E+00	9.64E+00	9.99E+00	9.99E+00	1.03E+01	1.10E+01	1.10E+01	1.10E+01	1.10E+01	1.10E+01	1.10E+01	1.14E+01	1.14E+01	1.14E+01	1.17E+01	1.17E+01	1.17E+01	1.17E+01	1.17E+01	1.17E+01	1.17E+01	1.17E+01	1.20E+01	1.20E+01	1.20E+01	1.20E+01	1.20E+01
Alkalinity (Total as CaCO3)	mg/L	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01
Hardness as CaCO3 (Dissolved)	mg/L	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02
H+ Concentration	mg/L	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	2.00E+00	3.00E+00	4.00E+00	5.00E+00	6.00E+00	7.00E+00	8.00E+00	9.00E+00	1.00E+01	1.10E+01	1.20E+01	1.30E+01	1.40E+01	1.50E+01	1.60E+01
Dissolved Anions																												
Sulphate (Dissolved)	mg/L	2.89E+02	2.89E+02	2.99E+02	2.99E+02	3.09E+02	3.31E+02	3.30E+02	3.30E+02	3.30E+02	3.30E+02	3.30E+02	3.40E+02	3.40E+02	3.40E+02	3.51E+02	3.51E+02	3.51E+02	3.51E+02	3.51E+02	3.50E+02	3.50E+02	3.50E+02	3.60E+02	3.60E+02	3.60E+02	3.60E+02	3.60E+02
Chloride (Dissolved)	mg/L	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00
Fluoride (Dissolved)	mg/L	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02
Nutrients																												
Nitrate (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrite (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Orthophosphate (Dissolved)	mg/L	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02
Dissolved Metals																												
Al (Dissolved)	mg/L	3.52E-01	3.51E-01	3.64E-01	3.64E-01	3.76E-01	4.02E-01	4.02E-01	4.02E-01	4.02E-01	4.02E-01	4.02E-01	4.14E-01	4.14E-01	4.14E-01	4.27E-01	4.27E-01	4.27E-01	4.27E-01	4.26E-01	4.26E-01	4.26E-01	4.26E-01	4.38E-01	4.38E-01	4.38E-01	4.38E-01	4.38E-01
Sb (Dissolved)	mg/L	3.19E-03	3.19E-03	3.30E-03	3.30E-03	3.41E-03	3.64E-03	3.64E-03	3.64E-03	3.64E-03	3.64E-03	3.64E-03	3.75E-03	3.75E-03	3.75E-03	3.87E-03	3.87E-03	3.87E-03	3.87E-03	3.87E-03	3.86E-03	3.86E-03	3.86E-03	3.97E-03	3.97E-03	3.97E-03	3.97E-03	3.97E-03
As (Dissolved)	mg/L	5.28E-03	5.28E-03	5.47E-03	5.47E-03	5.66E-03	6.05E-03	6.05E-03	6.05E-03	6.04E-03	6.04E-03	6.04E-03	6.22E-03	6.22E-03	6.22E-03	6.42E-03	6.41E-03	6.41E-03	6.41E-03	6.41E-03	6.41E-03	6.41E-03	6.41E-03	6.58E-03	6.58E-03	6.58E-03	6.58E-03	6.58E-03
Ba (Dissolved)	mg/L	3.57E-02	3.57E-02	3.70E-02	3.70E-02	3.82E-02	4.09E-02	4.09E-02	4.08E-02	4.08E-02	4.08E-02	4.08E-02	4.21E-02	4.21E-02	4.21E-02	4.33E-02	4.33E-02	4.33E-02	4.33E-02	4.33E-02	4.33E-02	4.33E-02	4.33E-02	4.33E-02	4.45E-02	4.45E-02	4.45E-02	4.45E-02	4.45E-02
Be (Dissolved)	mg/L	1.89E-04	1.89E-04	1.96E-04	1.96E-04	2.02E-04	2.16E-04	2.16E-04	2.16E-04	2.16E-04	2.16E-04	2.16E-04	2.23E-04	2.22E-04	2.22E-04	2.29E-04	2.29E-04	2.29E-04	2.29E-04	2.29E-04	2.29E-04	2.29E-04	2.29E-04	2.29E-04	2.35E-04	2.35E-04	2.35E-04	2.35E-04	2.35E-04
Bi (Dissolved)	mg/L	9.49E-05	9.49E-05	9.83E-05	9.83E-05	1.02E-04	1.09E-04	1.09E-04	1.09E-04	1.09E-04	1.09E-04	1.09E-04	1.12E-04	1.12E-04	1.12E-04	1.15E-04	1.15E-04	1.15E-04	1.15E-04	1.15E-04	1.15E-04	1.15E-04	1.15E-04	1.15E-04	1.18E-04	1.18E-04	1.18E-04	1.18E-04	1.18E-04
B (Dissolved)	mg/L	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02
Cd (Dissolved)	mg/L	1.06E-04	1.06E-04	1.10E-04	1.10E-04	1.14E-04	1.22E-04	1.22E-04	1.22E-04	1.22E-04	1.22E-04	1.22E-04	1.25E-04	1.25E-04	1.25E-04	1.29E-04	1.29E-04	1.29E-04	1.29E-04	1.29E-04	1.29E-04	1.29E-04	1.29E-04	1.32E-04	1.32E-04	1.32E-04	1.32E-04	1.32E-04
Ca (Dissolved)	mg/L	1.57E+02	1.57E+02	1.62E+02	1.62E+02	1.68E+02	1.79E+02	1.79E+02	1.79E+02	1.79E+02	1.79E+02	1.79E+02	1.84E+02	1.84E+02	1.84E+02	1.90E+02	1.90E+02	1.90E+02	1.90E+02	1.90E+02	1.90E+02	1.90E+02	1.90E+02	1.95E+02	1.95E+02	1.95E+02	1.95E+02	1.95E+02
Cr (Dissolved)	mg/L	2.30E-03	2.30E-03	2.38E-03	2.38E-03	2.46E-03	2.63E-03	2.63E-03	2.63E-03	2.63E-03	2.63E-03	2.63E-03	2.71E-03	2.71E-03	2.71E-03	2.79E-03	2.79E-03	2.79E-03	2.79E-03	2.79E-03	2.79E-03	2.79E-03	2.79E-03	2.86E-03	2.86E-03	2.86E-03	2.86E-03	2.86E-03
Co (Dissolved)	mg/L	7.93E-04	7.93E-04	8.21E-04	8.21E-04	8.49E-04	9.07E-04	9.07E-04	9.07E-04	9.07E-04	9.07E-04	9.07E-04	9.34E-04	9.34E-04	9.34E-04	9.62E-04	9.62E-04	9.62E-04	9.62E-04	9.62E-04	9.62E-04	9.62E-04	9.62E-04	9.87E-04	9.87E-04	9.87E-04	9.87E-04	9.87E-04
Cu (Dissolved)	mg/L	7.93E-03	7.93E-03	8.21E-03	8.21E-03	8.49E-03	9.08E-03	9.07E-03	9.07E-03	9.07E-03	9.07E-03	9.07E-03	9.34E-03	9.34E-03	9.34E-03	9.63E-03	9.63E-03	9.63E-03	9.63E-03	9.62E-03	9.62E-03	9.62E-03	9.62E-03	9.88E-03	9.88E-03	9.88E-03	9.88E-03	9.87E-03
Fe (Dissolved)	mg/L	6.36E-02	6.36E-02	6.58E-02	6.58E-02	6.81E-02	7.27E-02	7.27E-02	7.27E-02	7.27E-02	7.27E-02	7.27E-02	7.49E-02	7.49E-02	7.49E-02	7.72E-02	7.72E-02	7.72E-02	7.71E-02	7.71E-02	7.71E-02	7.71E-02	7.71E-02	7.92E-02	7.92E-02	7.92E-02	7.92E-02	7.91E-02
Pb (Dissolved)	mg/L	5.43E-04	5.43E-04	5.62E-04	5.62E-04	5.81E-04	6.21E-04	6.21E-04	6.21E-04	6.21E-04	6.21E-04	6.21E-04	6.39E-04	6.39E-04	6.39E-04	6.59E-04	6.59E-04	6.59E-04	6.59E-04	6.59E-04	6.58E-04	6.58E-04	6.58E-04	6.76E-04	6.76E-04	6.76E-04	6.76E-04	6.76E-04
Li (Dissolved)	mg/L	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03
Mg (Dissolved)	mg/L	1.28E+02	1.28E+02	1.33E+02	1.33E+02	1.38E+02	1.47E+02	1.47E+02	1.47E+02	1.47E+02	1.47E+02	1.47E+02	1.51E+02	1.51E+02	1.51E+02	1.56E+02	1.56E+02	1.56E+02	1.56E+02	1.56E+02	1.56E+02	1.56E+02	1.56E+02	1.60E+02	1.60E+02	1.60E+02	1.60E+02	1.60E+02
Mn (Dissolved)	mg/L	3.48E-02	3.48E-02	3.60E-02	3.60E-02	3.72E-02	3.98E-02	3.98E-02	3.98E-02	3.98E-02	3.98E-02	3.98E-02	4.09E-02	4.09E-02	4.09E-02	4.22E-02	4.22E-02	4.22E-02	4.22E-02	4.22E-02	4.22E-02	4.22E-02	4.22E-02	4.33E-02	4.33E-02	4.33E-02	4.33E-02	4.33E-02
Mo (Dissolved)	mg/L	1.88E-02	1.88E-02	1.95E-02	1.95E-02	2.02E-02	2.15E-02	2.15E-02	2.15E-02	2.15E-02	2.15E-02	2.15E-02	2.22E-02	2.22E-02	2.22E-02	2.29E-02	2.29E-02	2.29E-02	2.29E-02	2.29E-02	2.28E-02	2.28E-02	2.28E-02	2.35E-02	2.35E-02	2.35E-02	2.34E-02	2.34E-02
Ni (Dissolved)	mg/L	4.93E-03	4.93E-03	5.11E-03	5.11E-03	5.28E-03	5.64E-03	5.64E-03	5.64E-03	5.64E-03	5.64E-03	5.64E-03	5.81E-03	5.81E-03	5.81E-03	5.99E-03	5.99E-03	5.99E-03	5.99E-03	5.99E-03	5.98E-03	5.98E-03	5.98E-03	6.14E-03	6.14E-03	6.14E-03	6.14E-03	6.14E-03
P (Dissolved)	mg/L	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02
K (Dissolved)	mg/L	4.66E+00	4.66E+00	4.82E+00	4.82E+00	4.99E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00
Se (Dissolved)	mg/L	9.33E-03	9.33E-03	9.67E-03	9.67E-03	1.00E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.10E-02	1.10E-02	1.10E-02	1.13E-02	1.13E-02	1.13E-02	1.13E-02	1.13E-02	1.13E-02	1.13E-02	1.13E-02	1.16E-02	1.16E-02	1.16E-02	1.16E-02	1.16E-02
Si (Dissolved)	mg/L	6.40E+00	6.39E+00	6.62E+00	6.62E+00	6.85E+00	7.32E+00	7.32E+00	7.32E+00	7.31E+00	7.31E+00	7.31E+00	7.53E+00	7.53E+00	7.53E+00	7.76E+00	7.76E+00	7.76E+00	7.76E+00	7.76E+00	7.76E+00	7.76E+00	7.76E+00	7.97E+00	7.96E+00	7.96E+00	7.96E+00	7.96E+00
Ag (Dissolved)	mg/L	9.58E-05	9.58E-05	9.92E-05	9.92E-05	1.03E-04	1.10E-04	1.10E-04	1.10E-04	1.10E-04	1.10E-04	1.10E-04	1.13E-04	1.13E-04	1.13E-04	1.16E-04	1.16E-04	1.16E-04	1.16E-04	1.16E-04	1.16E-04	1.16E-04	1.16E-04	1.19E-04	1.19E-04	1.19E-04	1.19E-04	1.19E-04
Na (Dissolved)	mg/L	1.02E+00	1.02E+00	1.05E+00	1.05E+00	1.09E+00	1.16E+00	1.16E+00	1.16E+00	1.16E+00	1.16E+00	1.16E+00	1.20E+00	1.20E+00	1.20E+00	1.24E+00	1.24E+00	1.23E+00	1.23E+00	1.23E+00	1.23E+00	1.23E+00	1.23E+00	1.27E+00	1.27E+00	1.27E+00	1.27E+00	1.27E+00
Sr (Dissolved)	mg/L	7.66E-01	7.66E-01	7.94E-01	7.94E-01	8.21E-01	8.77E-01	8.77E-01	8.77E-01	8.77E-01	8.77E-01	8.76E-01	9.03E-01	9.03E-01	9.03E-01	9.30E-01	9.30E-01	9.30E-01	9.30E-01	9.30E-01	9.30E-01	9.30E-01	9.30E-01	9.55E-01	9.55E-01	9.54E-01	9.54E-01	9.54E-01
S (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tl (Dissolved)	mg/L	7.77E-05	7.77E-05	8.05E-05	8.05E-05	8.32E-05	8.89E-05	8.89E-05	8.89E-05	8.89E-05	8.89E-05	8.88E-05	9.15E-05	9.15E-05	9.15E-05	9.43E-05	9.43E-05	9.43E-05	9.43E-05	9.43E-05	9.43E-05	9.43E-05	9.42E-05	9.68E-05	9.68E-05	9.68E-05	9.67E-05	9.67E-05
Sn (Dissolved)	mg/L	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04
Ti (Dissolved)	mg/L	1.01E-02	1.01E-02	1.05E-02	1.05E-02	1.09E-02	1.16E-02	1.16E-02	1.16E-02	1.16E-02	1.16E-02	1.16E-02	1.19E-02	1.19E-02	1.19E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02
U (Dissolved)	mg/L	1.64E-03	1.64E-03	1.70E-03	1.70E-03	1.76E-03	1.88E-03	1.88E-03	1.88E-03	1.88E-03	1.88E-03	1.88E-03	1.93E-03	1.93E-03	1.93E-03	1.99E-03	1.99E-03	1.99E-03	1.99E-03	1.99E-03	1.99E-03	1.99E-03	1.99E-03	2.04E-03	2.04E-03	2.04E-03	2.04E-03	2.04E-03
V (Dissolved)	mg/L	4.60E-03	4.60E-03	4.77E-03	4.77E-03	4.93E-03	5.27E-03	5.27E-03	5.27E-03	5.27E-03	5.27E-03	5.27E-03	5.42E-03	5.42E-03	5.42E-03	5.59E-03	5.59E-03	5.59E-03	5.59E-03	5.59E-03	5.59E-03	5.59E-03	5.58E-03	5.73E-03	5.73E-03	5.73E-03	5.73E-03	5.73E-03
Zn (Dissolved)	mg/L	1.67E-02	1.67E-02	1.73E-02	1.73E-02	1.78E-02	1.91E-02	1.91E-02	1.91E-02	1.91E-02	1.91E-02	1.91E-02	1.96E-02	1.96E-02	1.96E-02	2.02E-02	2.02E-02	2.02E-02	2.02E-02	2.02E-02	2.02E-02	2.02E-02	2.02E-02	2.07E-02	2.07E-02	2.07E-02	2.07E-02	2.07E-02
Zr (Dissolved)	mg/L	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04
Hg - (Dissolved)	mg/L	3.78E-05	3.78E-05	3.91E-05	3.91E-05	4.05E-05	4.32E-05	4.32E-05	4.32E-05	4.32E-05	4.32E-05	4.32E-05	4.45E-05	4.45E-05	4.45E-05	4.59E-05	4.59E-05	4.59E-05	4.59E-05	4.58E-05	4.58E-05	4.58E-05	4.58E-05	4.71E-05	4.71E-05	4.71E-05	4.70E-05	4.70E-05

APPENDIX A2 - EXPECTED CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 10.2 Out

Parameter	Unit	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77
Year		01/01/2088	01/01/2089	01/01/2090	01/01/2091	01/01/2092	01/01/2093	01/01/2094	01/01/2095	01/01/2096	01/01/2097	01/01/2098	01/01/2099	01/01/2100	01/01/2101	01/01/2102	01/01/2103	01/01/2104	01/01/2105	01/01/2106	01/01/2107	01/01/2108	01/01/2109	01/01/2110	01/01/2111	01/01/2112	31/12/2113
Physical Tests																											
Acidity to pH 4.5 (as CaCO3)	mg/L	1.18E+01	1.18E+01	1.21E+01	1.21E+01	1.21E+01	1.21E+01	1.23E+01	1.23E+01	1.29E+01	1.29E+01	1.29E+01	1.29E+01	1.29E+01	1.29E+01	1.29E+01	1.29E+01	1.29E+01	1.32E+01	1.32E+01	1.32E+01	1.32E+01	1.32E+01	1.32E+01	1.38E+01	1.38E+01	1.40E+01
Acidity to pH 8.3 (as CaCO3)	mg/L	1.20E+01	1.20E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.26E+01	1.26E+01	1.32E+01	1.32E+01	1.32E+01	1.32E+01	1.32E+01	1.32E+01	1.32E+01	1.32E+01	1.32E+01	1.35E+01	1.35E+01	1.35E+01	1.35E+01	1.35E+01	1.35E+01	1.40E+01	1.40E+01	1.43E+01
Alkalinity (Total as CaCO3)	mg/L	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01
Hardness as CaCO3 (Dissolved)	mg/L	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02
H+ Concentration	mg/L	1.70E+01	1.80E+01	1.90E+01	2.00E+01	2.10E+01	2.20E+01	2.30E+01	2.40E+01	2.50E+01	2.60E+01	2.70E+01	2.80E+01	2.90E+01	3.00E+01	3.10E+01	3.20E+01	3.30E+01	3.40E+01	3.50E+01	3.60E+01	3.70E+01	3.80E+01	3.90E+01	4.00E+01	4.10E+01	4.20E+01
Dissolved Anions																											
Sulphate (Dissolved)	mg/L	3.60E+02	3.60E+02	3.69E+02	3.69E+02	3.69E+02	3.69E+02	3.78E+02	3.77E+02	3.96E+02	3.96E+02	3.96E+02	3.96E+02	3.96E+02	3.96E+02	3.96E+02	3.95E+02	3.95E+02	4.04E+02	4.04E+02	4.04E+02	4.04E+02	4.04E+02	4.04E+02	4.21E+02	4.21E+02	4.29E+02
Chloride (Dissolved)	mg/L	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00
Fluoride (Dissolved)	mg/L	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02
Nutrients																											
Nitrate (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrite (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Orthophosphate (Dissolved)	mg/L	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02
Dissolved Metals																											
Al (Dissolved)	mg/L	4.38E-01	4.38E-01	4.49E-01	4.49E-01	4.48E-01	4.48E-01	4.59E-01	4.59E-01	4.82E-01	4.82E-01	4.82E-01	4.81E-01	4.81E-01	4.81E-01	4.81E-01	4.81E-01	4.81E-01	4.91E-01	4.91E-01	4.91E-01	4.91E-01	4.91E-01	4.91E-01	5.12E-01	5.12E-01	5.22E-01
Sb (Dissolved)	mg/L	3.97E-03	3.97E-03	4.07E-03	4.07E-03	4.06E-03	4.06E-03	4.16E-03	4.16E-03	4.37E-03	4.36E-03	4.36E-03	4.36E-03	4.36E-03	4.36E-03	4.36E-03	4.36E-03	4.36E-03	4.45E-03	4.45E-03	4.45E-03	4.45E-03	4.45E-03	4.45E-03	4.64E-03	4.64E-03	4.73E-03
As (Dissolved)	mg/L	6.58E-03	6.58E-03	6.74E-03	6.74E-03	6.74E-03	6.74E-03	6.91E-03	6.90E-03	7.24E-03	7.24E-03	7.24E-03	7.24E-03	7.24E-03	7.24E-03	7.24E-03	7.23E-03	7.23E-03	7.39E-03	7.39E-03	7.39E-03	7.39E-03	7.38E-03	7.38E-03	7.70E-03	7.69E-03	7.84E-03
Ba (Dissolved)	mg/L	4.45E-02	4.44E-02	4.56E-02	4.56E-02	4.56E-02	4.56E-02	4.67E-02	4.67E-02	4.89E-02	4.89E-02	4.89E-02	4.89E-02	4.89E-02	4.89E-02	4.89E-02	4.89E-02	4.89E-02	4.99E-02	4.99E-02	4.99E-02	4.99E-02	4.99E-02	4.99E-02	5.20E-02	5.20E-02	5.30E-02
Be (Dissolved)	mg/L	2.35E-04	2.35E-04	2.41E-04	2.41E-04	2.41E-04	2.41E-04	2.47E-04	2.47E-04	2.59E-04	2.59E-04	2.59E-04	2.59E-04	2.59E-04	2.59E-04	2.59E-04	2.59E-04	2.59E-04	2.64E-04	2.64E-04	2.64E-04	2.64E-04	2.64E-04	2.64E-04	2.75E-04	2.75E-04	2.80E-04
Bi (Dissolved)	mg/L	1.18E-04	1.18E-04	1.21E-04	1.21E-04	1.21E-04	1.21E-04	1.24E-04	1.24E-04	1.30E-04	1.30E-04	1.30E-04	1.30E-04	1.30E-04	1.30E-04	1.30E-04	1.30E-04	1.30E-04	1.33E-04	1.33E-04	1.33E-04	1.33E-04	1.33E-04	1.33E-04	1.38E-04	1.38E-04	1.41E-04
B (Dissolved)	mg/L	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02
Cd (Dissolved)	mg/L	1.32E-04	1.32E-04	1.36E-04	1.36E-04	1.36E-04	1.36E-04	1.39E-04	1.39E-04	1.46E-04	1.46E-04	1.46E-04	1.46E-04	1.46E-04	1.46E-04	1.46E-04	1.46E-04	1.46E-04	1.49E-04	1.49E-04	1.49E-04	1.49E-04	1.49E-04	1.49E-04	1.55E-04	1.55E-04	1.58E-04
Ca (Dissolved)	mg/L	1.95E+02	1.95E+02	2.00E+02	2.00E+02	2.00E+02	2.00E+02	2.05E+02	2.05E+02	2.15E+02	2.15E+02	2.15E+02	2.15E+02	2.15E+02	2.14E+02	2.14E+02	2.14E+02	2.14E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.28E+02	2.28E+02	2.32E+02
Cr (Dissolved)	mg/L	2.86E-03	2.86E-03	2.93E-03	2.93E-03	2.93E-03	2.93E-03	3.00E-03	3.00E-03	3.15E-03	3.15E-03	3.15E-03	3.15E-03	3.15E-03	3.15E-03	3.15E-03	3.15E-03	3.15E-03	3.21E-03	3.21E-03	3.21E-03	3.21E-03	3.21E-03	3.21E-03	3.35E-03	3.35E-03	3.41E-03
Co (Dissolved)	mg/L	9.87E-04	9.87E-04	1.01E-03	1.01E-03	1.01E-03	1.01E-03	1.04E-03	1.04E-03	1.09E-03	1.09E-03	1.09E-03	1.09E-03	1.09E-03	1.09E-03	1.09E-03	1.09E-03	1.09E-03	1.11E-03	1.11E-03	1.11E-03	1.11E-03	1.11E-03	1.11E-03	1.15E-03	1.15E-03	1.18E-03
Cu (Dissolved)	mg/L	9.87E-03	9.87E-03	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.04E-02	1.04E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.11E-02	1.11E-02	1.11E-02	1.11E-02	1.11E-02	1.11E-02	1.16E-02	1.15E-02	1.18E-02
Fe (Dissolved)	mg/L	7.91E-02	7.91E-02	8.11E-02	8.11E-02	8.11E-02	8.11E-02	8.31E-02	8.31E-02	8.71E-02	8.71E-02	8.71E-02	8.71E-02	8.71E-02	8.70E-02	8.70E-02	8.70E-02	8.70E-02	8.89E-02	8.89E-02	8.89E-02	8.88E-02	8.88E-02	8.88E-02	9.26E-02	9.26E-02	9.43E-02
Pb (Dissolved)	mg/L	6.76E-04	6.76E-04	6.93E-04	6.93E-04	6.92E-04	6.92E-04	7.09E-04	7.09E-04	7.44E-04	7.44E-04	7.43E-04	7.43E-04	7.43E-04	7.43E-04	7.43E-04	7.43E-04	7.43E-04	7.59E-04	7.59E-04	7.59E-04	7.59E-04	7.58E-04	7.58E-04	7.90E-04	7.90E-04	8.05E-04
Li (Dissolved)	mg/L	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03
Mg (Dissolved)	mg/L	1.60E+02	1.60E+02	1.64E+02	1.64E+02	1.64E+02	1.64E+02	1.68E+02	1.68E+02	1.76E+02	1.76E+02	1.76E+02	1.76E+02	1.76E+02	1.76E+02	1.76E+02	1.76E+02	1.76E+02	1.80E+02	1.80E+02	1.80E+02	1.79E+02	1.79E+02	1.79E+02	1.87E+02	1.87E+02	1.91E+02
Mn (Dissolved)	mg/L	4.33E-02	4.33E-02	4.44E-02	4.44E-02	4.44E-02	4.44E-02	4.54E-02	4.54E-02	4.76E-02	4.76E-02	4.76E-02	4.76E-02	4.76E-02	4.76E-02	4.76E-02	4.76E-02	4.76E-02	4.86E-02	4.86E-02	4.86E-02	4.86E-02	4.86E-02	4.86E-02	5.06E-02	5.06E-02	5.16E-02
Mo (Dissolved)	mg/L	2.34E-02	2.34E-02	2.40E-02	2.40E-02	2.40E-02	2.40E-02	2.46E-02	2.46E-02	2.58E-02	2.58E-02	2.58E-02	2.58E-02	2.58E-02	2.58E-02	2.58E-02	2.58E-02	2.58E-02	2.63E-02	2.63E-02	2.63E-02	2.63E-02	2.63E-02	2.63E-02	2.74E-02	2.74E-02	2.79E-02
Ni (Dissolved)	mg/L	6.14E-03	6.14E-03	6.30E-03	6.29E-03	6.29E-03	6.29E-03	6.45E-03	6.44E-03	6.76E-03	6.76E-03	6.76E-03	6.76E-03	6.76E-03	6.75E-03	6.75E-03	6.75E-03	6.75E-03	6.90E-03	6.90E-03	6.89E-03	6.89E-03	6.89E-03	6.89E-03	7.18E-03	7.18E-03	7.32E-03
P (Dissolved)	mg/L	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02
K (Dissolved)	mg/L	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00
Se (Dissolved)	mg/L	1.16E-02	1.16E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.22E-02	1.22E-02	1.28E-02	1.28E-02	1.28E-02	1.28E-02	1.28E-02	1.28E-02	1.28E-02	1.28E-02	1.28E-02	1.31E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.36E-02	1.36E-02	1.39E-02
Si (Dissolved)	mg/L	7.96E+00	7.96E+00	8.16E+00	8.16E+00	8.16E+00	8.16E+00	8.36E+00	8.36E+00	8.76E+00	8.76E+00	8.76E+00	8.76E+00	8.76E+00	8.76E+00	8.76E+00	8.75E+00	8.75E+00	8.94E+00	8.94E+00	8.94E+00	8.94E+00	8.94E+00	8.94E+00	9.31E+00	9.31E+00	9.49E+00
Ag (Dissolved)	mg/L	1.19E-04	1.19E-04	1.22E-04	1.22E-04	1.22E-04	1.22E-04	1.25E-04	1.25E-04	1.31E-04	1.31E-04	1.31E-04	1.31E-04	1.31E-04	1.31E-04	1.31E-04	1.31E-04	1.31E-04	1.34E-04	1.34E-04	1.34E-04	1.34E-04	1.34E-04	1.34E-04	1.40E-04	1.40E-04	1.42E-04
Na (Dissolved)	mg/L	1.27E+00	1.27E+00	1.30E+00	1.30E+00	1.30E+00	1.30E+00	1.33E+00	1.33E+00	1.39E+00	1.39E+00	1.39E+00	1.39E+00	1.39E+00	1.39E+00	1.39E+00	1.39E+00	1.39E+00	1.42E+00	1.42E+00	1.42E+00	1.42E+00	1.42E+00	1.42E+00	1.48E+00	1.48E+00	1.51E+00
Sr (Dissolved)	mg/L	9.54E-01	9.54E-01	9.78E-01	9.78E-01	9.78E-01	9.78E-01	1.00E+00	1.00E+00	1.05E+00	1.05E+00	1.05E+00	1.05E+00	1.05E+00	1.05E+00	1.05E+00	1.05E+00	1.05E+00	1.07E+00	1.07E+00	1.07E+00	1.07E+00	1.07E+00	1.07E+00	1.12E+00	1.12E+00	1.14E+00
S (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tl (Dissolved)	mg/L	9.67E-05	9.67E-05	9.92E-05	9.91E-05	9.91E-05	9.91E-05	1.02E-04	1.02E-04	1.06E-04	1.06E-04	1.06E-04	1.06E-04	1.06E-04	1.06E-04	1.06E-04	1.06E-04	1.06E-04	1.09E-04	1.09E-04	1.09E-04	1.09E-04	1.09E-04	1.09E-04	1.13E-04	1.13E-04	1.15E-04
Sn (Dissolved)	mg/L	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04
Ti (Dissolved)	mg/L	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02
U (Dissolved)	mg/L	2.04E-03	2.04E-03	2.09E-03	2.09E-03	2.09E-03	2.09E-03	2.14E-03	2.14E-03	2.25E-03	2.25E-03	2.25E-03	2.25E-03	2.25E-03	2.25E-03	2.25E-03	2.25E-03	2.25E-03	2.29E-03	2.29E-03	2.29E-03	2.29E-03	2.29E-03	2.29E-03	2.39E-03	2.39E-03	2.44E-03
V (Dissolved)	mg/L	5.73E-03	5.73E-03	5.88E-03	5.88E-03	5.87E-03	5.87E-03	6.02E-03	6.02E-03	6.31E-03	6.31E-03	6.31E-03	6.31E-03	6.31E-03	6.30E-03	6.30E-03	6.30E-03	6.30E-03	6.44E-03	6.44E-03	6.44E-03	6.43E-03	6.43E-03	6.43E-03	6.70E-03	6.70E-03	6.83E-03
Zn (Dissolved)	mg/L	2.07E-02	2.07E-02	2.13E-02	2.13E-02	2.13E-02	2.13E-02	2.18E-02	2.18E-02	2.28E-02	2.28E-02	2.28E-02	2.28E-02	2.28E-02	2.28E-02	2.28E-02	2.28E-02	2.28E-02	2.33E-02	2.33E-02	2.33E-02	2.33E-02	2.33E-02	2.33E-02	2.43E-02	2.43E-02	2.47E-02
Zr (Dissolved)	mg/L	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04
Hg - (Dissolved)	mg/L	4.70E-05	4.70E-05	4.82E-05	4.82E-05	4.82E-05	4.82E-05	4.94E-05	4.94E-05	5.18E-05	5.18E-05	5.18E-05	5.18E-05	5.17E-05	5.17E-05	5.17E-05	5.17E-05	5.17E-05	5.28E-05	5.28E-05	5.28E-05	5.28E-05	5.28E-05	5.28E-05	5.50E-05	5.50E-05	5.61E-05

APPENDIX A2 - EXPECTED CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 10.2 Out

Parameter	Unit	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104
Year		01/01/2114	01/01/2115	01/01/2116	01/01/2117	01/01/2118	01/01/2119	01/01/2120	01/01/2121	01/01/2122	01/01/2123	01/01/2124	01/01/2125	01/01/2126	01/01/2127	01/01/2128	01/01/2129	01/01/2130	01/01/2131	01/01/2132	01/01/2133	01/01/2134	01/01/2135	01/01/2114	01/01/2115	09/03/2047	10/03/2047	11/03/2047
Physical Tests																												
Acidity to pH 4.5 (as CaCO3)	mg/L	1.40E+01	1.40E+01	1.40E+01	1.40E+01	1.40E+01	1.40E+01	1.40E+01	1.43E+01	1.50E+01	1.50E+01	1.50E+01	1.53E+01	1.53E+01	1.53E+01	1.53E+01	1.53E+01	1.55E+01	1.55E+01	1.55E+01	1.55E+01	1.55E+01	1.55E+01	1.55E+01	1.55E+01	1.55E+01	1.55E+01	1.55E+01
Acidity to pH 8.3 (as CaCO3)	mg/L	1.43E+01	1.43E+01	1.43E+01	1.43E+01	1.43E+01	1.43E+01	1.43E+01	1.46E+01	1.54E+01	1.53E+01	1.53E+01	1.56E+01	1.56E+01	1.56E+01	1.56E+01	1.56E+01	1.59E+01	1.59E+01	1.59E+01	1.58E+01	1.58E+01	1.58E+01	1.58E+01	1.58E+01	1.58E+01	1.58E+01	1.58E+01
Alkalinity (Total as CaCO3)	mg/L	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01
Hardness as CaCO3 (Dissolved)	mg/L	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02
H+ Concentration	mg/L	4.30E+01	4.40E+01	4.50E+01	4.60E+01	4.70E+01	4.80E+01	4.90E+01	5.00E+01	5.10E+01	5.20E+01	5.30E+01	5.40E+01	5.50E+01	5.60E+01	5.70E+01	5.80E+01	5.90E+01	6.00E+01	6.10E+01	6.20E+01	6.30E+01	6.40E+01					
Dissolved Anions																												
Sulphate (Dissolved)	mg/L	4.29E+02	4.29E+02	4.29E+02	4.28E+02	4.28E+02	4.28E+02	4.28E+02	4.36E+02	4.60E+02	4.60E+02	4.60E+02	4.68E+02	4.68E+02	4.68E+02	4.68E+02	4.68E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.74E+02	4.74E+02	4.74E+02	4.74E+02
Chloride (Dissolved)	mg/L	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00
Fluoride (Dissolved)	mg/L	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02
Nutrients																												
Nitrate (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrite (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Orthophosphate (Dissolved)	mg/L	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02					
Dissolved Metals																												
Al (Dissolved)	mg/L	5.22E-01	5.21E-01	5.21E-01	5.21E-01	5.21E-01	5.21E-01	5.21E-01	5.31E-01	5.60E-01	5.59E-01	5.59E-01	5.69E-01	5.69E-01	5.69E-01	5.69E-01	5.69E-01	5.78E-01	5.78E-01	5.78E-01	5.78E-01	5.78E-01	5.77E-01	5.77E-01	5.77E-01	5.77E-01	5.77E-01	5.77E-01
Sb (Dissolved)	mg/L	4.73E-03	4.73E-03	4.73E-03	4.72E-03	4.72E-03	4.72E-03	4.72E-03	4.81E-03	5.07E-03	5.07E-03	5.07E-03	5.16E-03	5.16E-03	5.16E-03	5.16E-03	5.16E-03	5.24E-03	5.24E-03	5.24E-03	5.24E-03	5.23E-03	5.23E-03	5.23E-03	5.23E-03	5.23E-03	5.23E-03	5.23E-03
As (Dissolved)	mg/L	7.84E-03	7.84E-03	7.84E-03	7.84E-03	7.84E-03	7.84E-03	7.83E-03	7.98E-03	8.41E-03	8.41E-03	8.41E-03	8.56E-03	8.56E-03	8.56E-03	8.56E-03	8.55E-03	8.69E-03	8.69E-03	8.69E-03	8.68E-03	8.68E-03	8.68E-03	8.68E-03	8.68E-03	8.68E-03	8.68E-03	8.68E-03
Ba (Dissolved)	mg/L	5.30E-02	5.30E-02	5.30E-02	5.30E-02	5.30E-02	5.30E-02	5.29E-02	5.39E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02
Be (Dissolved)	mg/L	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.85E-04	3.01E-04	3.01E-04	3.01E-04	3.06E-04	3.06E-04	3.06E-04	3.06E-04	3.06E-04	3.11E-04	3.11E-04	3.11E-04	3.10E-04	3.10E-04	3.10E-04	3.10E-04	3.10E-04	3.10E-04	3.10E-04	3.10E-04
Bi (Dissolved)	mg/L	1.41E-04	1.41E-04	1.41E-04	1.41E-04	1.41E-04	1.41E-04	1.41E-04	1.43E-04	1.51E-04	1.51E-04	1.51E-04	1.54E-04	1.54E-04	1.54E-04	1.54E-04	1.54E-04	1.56E-04	1.56E-04	1.56E-04	1.56E-04	1.56E-04	1.56E-04	1.56E-04	1.56E-04	1.56E-04	1.56E-04	1.56E-04
B (Dissolved)	mg/L	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02
Cd (Dissolved)	mg/L	1.58E-04	1.58E-04	1.58E-04	1.58E-04	1.58E-04	1.58E-04	1.58E-04	1.60E-04	1.69E-04	1.69E-04	1.69E-04	1.72E-04	1.72E-04	1.72E-04	1.72E-04	1.72E-04	1.75E-04	1.75E-04	1.75E-04	1.75E-04	1.75E-04	1.75E-04	1.75E-04	1.75E-04	1.75E-04	1.75E-04	1.75E-04
Ca (Dissolved)	mg/L	2.32E+02	2.32E+02	2.32E+02	2.32E+02	2.32E+02	2.32E+02	2.32E+02	2.36E+02	2.49E+02	2.49E+02	2.49E+02	2.54E+02	2.54E+02	2.54E+02	2.54E+02	2.54E+02	2.58E+02	2.57E+02	2.57E+02	2.57E+02	2.57E+02	2.57E+02	2.57E+02	2.57E+02	2.57E+02	2.57E+02	2.57E+02
Cr (Dissolved)	mg/L	3.41E-03	3.41E-03	3.41E-03	3.41E-03	3.41E-03	3.41E-03	3.41E-03	3.47E-03	3.66E-03	3.66E-03	3.66E-03	3.72E-03	3.72E-03	3.72E-03	3.72E-03	3.72E-03	3.78E-03	3.78E-03	3.78E-03	3.78E-03	3.78E-03	3.78E-03	3.78E-03	3.77E-03	3.77E-03	3.77E-03	3.77E-03
Co (Dissolved)	mg/L	1.18E-03	1.18E-03	1.18E-03	1.18E-03	1.18E-03	1.18E-03	1.18E-03	1.20E-03	1.26E-03	1.26E-03	1.26E-03	1.28E-03	1.28E-03	1.28E-03	1.28E-03	1.28E-03	1.30E-03	1.30E-03	1.30E-03	1.30E-03	1.30E-03	1.30E-03	1.30E-03	1.30E-03	1.30E-03	1.30E-03	1.30E-03
Cu (Dissolved)	mg/L	1.18E-02	1.18E-02	1.18E-02	1.18E-02	1.18E-02	1.18E-02	1.18E-02	1.20E-02	1.26E-02	1.26E-02	1.26E-02	1.28E-02	1.28E-02	1.28E-02	1.28E-02	1.28E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02
Fe (Dissolved)	mg/L	9.43E-02	9.43E-02	9.43E-02	9.43E-02	9.43E-02	9.43E-02	9.42E-02	9.60E-02	1.01E-01	1.01E-01	1.01E-01	1.03E-01	1.03E-01	1.03E-01	1.03E-01	1.03E-01	1.05E-01	1.05E-01	1.04E-01	1.04E-01	1.04E-01	1.04E-01	1.04E-01	1.04E-01	1.04E-01	1.04E-01	1.04E-01
Pb (Dissolved)	mg/L	8.05E-04	8.05E-04	8.05E-04	8.05E-04	8.05E-04	8.05E-04	8.05E-04	8.19E-04	8.64E-04	8.64E-04	8.64E-04	8.79E-04	8.79E-04	8.79E-04	8.79E-04	8.78E-04	8.92E-04	8.92E-04	8.92E-04	8.92E-04	8.92E-04	8.92E-04	8.91E-04	8.91E-04	8.91E-04	8.91E-04	8.91E-04
Li (Dissolved)	mg/L	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03
Mg (Dissolved)	mg/L	1.91E+02	1.91E+02	1.90E+02	1.90E+02	1.90E+02	1.90E+02	1.90E+02	1.94E+02	2.04E+02	2.04E+02	2.04E+02	2.08E+02	2.08E+02	2.08E+02	2.08E+02	2.08E+02	2.11E+02	2.11E+02	2.11E+02	2.11E+02	2.11E+02	2.11E+02	2.11E+02	2.11E+02	2.11E+02	2.11E+02	2.11E+02
Mn (Dissolved)	mg/L	5.16E-02	5.16E-02	5.16E-02	5.16E-02	5.16E-02	5.15E-02	5.15E-02	5.25E-02	5.53E-02	5.53E-02	5.53E-02	5.63E-02	5.63E-02	5.63E-02	5.63E-02	5.63E-02	5.72E-02	5.71E-02	5.71E-02	5.71E-02	5.71E-02	5.71E-02	5.71E-02	5.71E-02	5.71E-02	5.71E-02	5.71E-02
Mo (Dissolved)	mg/L	2.79E-02	2.79E-02	2.79E-02	2.79E-02	2.79E-02	2.79E-02	2.79E-02	2.84E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02
Ni (Dissolved)	mg/L	7.32E-03	7.32E-03	7.32E-03	7.32E-03	7.32E-03	7.31E-03	7.31E-03	7.45E-03	7.85E-03	7.85E-03	7.85E-03	7.99E-03	7.99E-03	7.99E-03	7.99E-03	7.98E-03	8.11E-03	8.11E-03	8.11E-03	8.11E-03	8.10E-03	8.10E-03	8.10E-03	8.10E-03	8.10E-03	8.10E-03	8.10E-03
P (Dissolved)	mg/L	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02
K (Dissolved)	mg/L	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00
Si (Dissolved)	mg/L	9.49E+00	9.49E+00	9.49E+00	9.49E+00	9.48E+00	9.48E+00	9.48E+00	9.65E+00	1.02E+01	1.02E+01	1.02E+01	1.04E+01	1.04E+01	1.04E+01	1.04E+01	1.04E+01	1.05E+01	1.05E+01	1.05E+01	1.05E+01	1.05E+01	1.05E+01	1.05E+01	1.05E+01	1.05E+01	1.05E+01	1.05E+01
Ag (Dissolved)	mg/L	1.42E-04	1.42E-04	1.42E-04	1.42E-04	1.42E-04	1.42E-04	1.42E-04	1.45E-04	1.53E-04	1.53E-04	1.52E-04	1.55E-04	1.55E-04	1.55E-04	1.55E-04	1.55E-04	1.58E-04	1.58E-04	1.57E-04	1.57E-04	1.57E-04	1.57E-04	1.57E-04	1.57E-04	1.57E-04	1.57E-04	1.57E-04
Na (Dissolved)	mg/L	1.51E+00	1.51E+00	1.51E+00	1.51E+00	1.51E+00	1.51E+00	1.51E+00	1.54E+00	1.62E+00	1.62E+00	1.62E+00	1.65E+00	1.65E+00	1.65E+00	1.65E+00	1.65E+00	1.67E+00	1.67E+00	1.67E+00	1.67E+00	1.67E+00	1.67E+00	1.67E+00	1.67E+00	1.67E+00	1.67E+00	1.67E+00
Sr (Dissolved)	mg/L	1.14E+00	1.14E+00	1.14E+00	1.14E+00	1.14E+00	1.14E+00	1.14E+00	1.16E+00	1.22E+00	1.22E+00	1.22E+00	1.24E+00	1.24E+00	1.24E+00	1.24E+00	1.24E+00	1.26E+00	1.26E+00	1.26E+00	1.26E+00	1.26E+00	1.26E+00	1.26E+00	1.26E+00	1.26E+00	1.26E+00	1.26E+00
S (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tl (Dissolved)	mg/L	1.15E-04	1.15E-04	1.15E-04	1.15E-04	1.15E-04	1.15E-04	1.15E-04	1.17E-04	1.24E-04	1.24E-04	1.24E-04	1.26E-04	1.26E-04	1.26E-04	1.26E-04	1.26E-04	1.28E-04	1.28E-04	1.28E-04	1.28E-04	1.28E-04	1.28E-04	1.28E-04	1.28E-04	1.28E-04	1.28E-04	1.28E-04
Sn (Dissolved)	mg/L	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04
Ti (Dissolved)	mg/L	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02
U (Dissolved)	mg/L	2.44E-03	2.44E-03	2.43E-03	2.43E-03	2.43E-03	2.43E-03	2.43E-03	2.48E-03	2.61E-03	2.61E-03	2.61E-03	2.66E-03	2.66E-03	2.66E-03	2.66E-03	2.66E-03	2.70E-03	2.70E-03	2.70E-03	2.70E-03	2.70E-03	2.70E-03	2.70E-03	2.70E-03	2.70E-03	2.69E-03	2.69E-03
V (Dissolved)	mg/L	6.83E-03	6.83E-03	6.83E-03	6.83E-03	6.83E-03	6.83E-03	6.83E-03	6.95E-03	7.33E-03	7.33E-03	7.33E-03	7.46E-03	7.46E-03	7.45E-03	7.45E-03	7.45E-03	7.57E-03	7.57E-03	7.57E-03	7.57E-03	7.57E-03	7.56E-03	7.56E-03	7.56E-03	7.56E-03	7.56E-03	7.56E-03
Zn (Dissolved)	mg/L	2.47E-02	2.47E-02	2.47E-02	2.47E-02	2.47E-02	2.47E-02	2.47E-02	2.51E-02	2.65E-02	2.65E-02	2.65E-02	2.70E-02	2.70E-02	2.70E-02	2.70E-02	2.70E-02	2.74E-02	2.74E-02	2.74E-02	2.74E-02	2.74E-02	2.74E-02	2.74E-02	2.74E-02	2.74E-02	2.74E-02	2.73E-02
Zr (Dissolved)	mg/L	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04
Hg - (Dissolved)	mg/L	5.61E-05	5.61E-05	5.60E-05	5.60E-05	5.60E-05	5.60E-05	5.60E-05	5.70E-05	6.01E-05	6.01E-05	6.01E-05	6.12E-05	6.12E-05	6.12E-05	6.12E-05	6.12E-05	6.21E-05	6.21E-05	6.21E-05	6.21E-05	6.21E-05	6.21E-05	6.21E-05	6.21E-05	6.20E-05	6.20E-05	6.20E-05

APPENDIX A2 - EXPECTED CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 10.2 Out

Parameter	Unit	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131
Year		12/03/2047	13/03/2047	14/03/2047	15/03/2047	16/03/2047	17/03/2047	18/03/2047	19/03/2047	20/03/2047	21/03/2047	22/03/2047	23/03/2047	24/03/2047	25/03/2047	26/03/2047	27/03/2047	28/03/2047	29/03/2047	30/03/2047	31/03/2047	01/04/2047	02/04/2047	03/04/2047	04/04/2047	05/04/2047	06/04/2047	07/04/2047
Physical Tests																												
Acidity to pH 4.5 (as CaCO3)	mg/L	1.55E+01	1.55E+01	1.55E+01	1.57E+01	1.57E+01	1.57E+01	1.57E+01	1.57E+01	1.57E+01	1.57E+01	1.59E+01	1.59E+01	1.59E+01	1.59E+01	1.59E+01	1.59E+01	1.59E+01	1.59E+01	1.59E+01	1.59E+01	1.59E+01	1.61E+01	1.61E+01	1.61E+01	1.61E+01	1.61E+01	1.61E+01
Acidity to pH 8.3 (as CaCO3)	mg/L	1.58E+01	1.58E+01	1.58E+01	1.60E+01	1.60E+01	1.60E+01	1.60E+01	1.60E+01	1.60E+01	1.60E+01	1.63E+01	1.62E+01	1.62E+01	1.62E+01	1.62E+01	1.62E+01	1.62E+01	1.62E+01	1.62E+01	1.62E+01	1.62E+01	1.64E+01	1.64E+01	1.64E+01	1.64E+01	1.64E+01	1.64E+01
Alkalinity (Total as CaCO3)	mg/L	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01
Hardness as CaCO3 (Dissolved)	mg/L	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02
H+ Concentration	mg/L																											
Dissolved Anions																												
Sulphate (Dissolved)	mg/L	4.74E+02	4.74E+02	4.74E+02	4.81E+02	4.81E+02	4.81E+02	4.81E+02	4.80E+02	4.80E+02	4.80E+02	4.87E+02	4.87E+02	4.87E+02	4.87E+02	4.87E+02	4.86E+02	4.86E+02	4.86E+02	4.86E+02	4.86E+02	4.86E+02	4.93E+02	4.92E+02	4.92E+02	4.92E+02	4.92E+02	4.92E+02
Chloride (Dissolved)	mg/L	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00
Fluoride (Dissolved)	mg/L	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02
Nutrients																												
Nitrate (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrite (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Orthophosphate (Dissolved)	mg/L																											
Dissolved Metals																												
Al (Dissolved)	mg/L	5.77E-01	5.77E-01	5.77E-01	5.85E-01	5.85E-01	5.85E-01	5.85E-01	5.85E-01	5.85E-01	5.84E-01	5.92E-01	5.92E-01	5.92E-01	5.92E-01	5.92E-01	5.92E-01	5.92E-01	5.92E-01	5.92E-01	5.91E-01	5.91E-01	5.99E-01	5.99E-01	5.99E-01	5.99E-01	5.99E-01	5.99E-01
Sb (Dissolved)	mg/L	5.23E-03	5.23E-03	5.23E-03	5.30E-03	5.30E-03	5.30E-03	5.30E-03	5.30E-03	5.30E-03	5.30E-03	5.37E-03	5.37E-03	5.37E-03	5.37E-03	5.36E-03	5.36E-03	5.36E-03	5.36E-03	5.36E-03	5.36E-03	5.36E-03	5.43E-03	5.43E-03	5.43E-03	5.43E-03	5.43E-03	5.43E-03
As (Dissolved)	mg/L	8.67E-03	8.67E-03	8.67E-03	8.79E-03	8.79E-03	8.79E-03	8.79E-03	8.79E-03	8.79E-03	8.79E-03	8.91E-03	8.90E-03	8.90E-03	8.90E-03	8.90E-03	8.90E-03	8.90E-03	8.90E-03	8.89E-03	8.89E-03	8.89E-03	9.01E-03	9.01E-03	9.01E-03	9.00E-03	9.00E-03	9.00E-03
Ba (Dissolved)	mg/L	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02
Be (Dissolved)	mg/L	3.10E-04	3.10E-04	3.10E-04	3.14E-04	3.14E-04	3.14E-04	3.14E-04	3.14E-04	3.14E-04	3.14E-04	3.18E-04	3.18E-04	3.18E-04	3.18E-04	3.18E-04	3.18E-04	3.18E-04	3.18E-04	3.18E-04	3.18E-04	3.18E-04	3.22E-04	3.22E-04	3.22E-04	3.22E-04	3.22E-04	3.22E-04
Bi (Dissolved)	mg/L	1.56E-04	1.56E-04	1.56E-04	1.58E-04	1.58E-04	1.58E-04	1.58E-04	1.58E-04	1.58E-04	1.58E-04	1.60E-04	1.60E-04	1.60E-04	1.60E-04	1.60E-04	1.60E-04	1.60E-04	1.60E-04	1.60E-04	1.60E-04	1.60E-04	1.62E-04	1.62E-04	1.62E-04	1.62E-04	1.62E-04	1.62E-04
B (Dissolved)	mg/L	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02
Cd (Dissolved)	mg/L	1.74E-04	1.74E-04	1.74E-04	1.77E-04	1.77E-04	1.77E-04	1.77E-04	1.77E-04	1.77E-04	1.77E-04	1.79E-04	1.79E-04	1.79E-04	1.79E-04	1.79E-04	1.79E-04	1.79E-04	1.79E-04	1.79E-04	1.79E-04	1.79E-04	1.81E-04	1.81E-04	1.81E-04	1.81E-04	1.81E-04	1.81E-04
Ca (Dissolved)	mg/L	2.57E+02	2.57E+02	2.57E+02	2.61E+02	2.61E+02	2.61E+02	2.61E+02	2.61E+02	2.60E+02	2.60E+02	2.64E+02	2.64E+02	2.64E+02	2.64E+02	2.64E+02	2.64E+02	2.64E+02	2.64E+02	2.64E+02	2.64E+02	2.64E+02	2.67E+02	2.67E+02	2.67E+02	2.67E+02	2.67E+02	2.67E+02
Cr (Dissolved)	mg/L	3.77E-03	3.77E-03	3.77E-03	3.82E-03	3.82E-03	3.82E-03	3.82E-03	3.82E-03	3.82E-03	3.82E-03	3.87E-03	3.87E-03	3.87E-03	3.87E-03	3.87E-03	3.87E-03	3.87E-03	3.87E-03	3.87E-03	3.87E-03	3.87E-03	3.92E-03	3.92E-03	3.92E-03	3.92E-03	3.92E-03	3.91E-03
Co (Dissolved)	mg/L	1.30E-03	1.30E-03	1.30E-03	1.32E-03	1.32E-03	1.32E-03	1.32E-03	1.32E-03	1.32E-03	1.32E-03	1.34E-03	1.34E-03	1.34E-03	1.34E-03	1.33E-03	1.33E-03	1.33E-03	1.33E-03	1.33E-03	1.33E-03	1.33E-03	1.35E-03	1.35E-03	1.35E-03	1.35E-03	1.35E-03	1.35E-03
Cu (Dissolved)	mg/L	1.30E-02	1.30E-02	1.30E-02	1.32E-02	1.32E-02	1.32E-02	1.32E-02	1.32E-02	1.32E-02	1.32E-02	1.34E-02	1.34E-02	1.34E-02	1.34E-02	1.34E-02	1.34E-02	1.34E-02	1.34E-02	1.33E-02	1.33E-02	1.33E-02	1.35E-02	1.35E-02	1.35E-02	1.35E-02	1.35E-02	1.35E-02
Fe (Dissolved)	mg/L	1.04E-01	1.04E-01	1.04E-01	1.06E-01	1.06E-01	1.06E-01	1.06E-01	1.06E-01	1.06E-01	1.06E-01	1.07E-01	1.07E-01	1.07E-01	1.07E-01	1.07E-01	1.07E-01	1.07E-01	1.07E-01	1.07E-01	1.07E-01	1.07E-01	1.08E-01	1.08E-01	1.08E-01	1.08E-01	1.08E-01	1.08E-01
Pb (Dissolved)	mg/L	8.91E-04	8.91E-04	8.91E-04	9.03E-04	9.03E-04	9.03E-04	9.03E-04	9.03E-04	9.03E-04	9.02E-04	9.15E-04	9.14E-04	9.14E-04	9.14E-04	9.14E-04	9.14E-04	9.14E-04	9.14E-04	9.13E-04	9.13E-04	9.13E-04	9.25E-04	9.25E-04	9.25E-04	9.25E-04	9.25E-04	9.25E-04
Li (Dissolved)	mg/L	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03
Mg (Dissolved)	mg/L	2.11E+02	2.11E+02	2.11E+02	2.14E+02	2.14E+02	2.14E+02	2.14E+02	2.14E+02	2.14E+02	2.14E+02	2.16E+02	2.16E+02	2.16E+02	2.16E+02	2.16E+02	2.16E+02	2.16E+02	2.16E+02	2.16E+02	2.16E+02	2.16E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02
Mn (Dissolved)	mg/L	5.71E-02	5.71E-02	5.70E-02	5.79E-02	5.78E-02	5.78E-02	5.78E-02	5.78E-02	5.78E-02	5.78E-02	5.86E-02	5.86E-02	5.86E-02	5.86E-02	5.85E-02	5.85E-02	5.85E-02	5.85E-02	5.85E-02	5.85E-02	5.85E-02	5.93E-02	5.93E-02	5.92E-02	5.92E-02	5.92E-02	5.92E-02
Mo (Dissolved)	mg/L	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02
Ni (Dissolved)	mg/L	8.10E-03	8.09E-03	8.09E-03	8.21E-03	8.21E-03	8.21E-03	8.21E-03	8.20E-03	8.20E-03	8.20E-03	8.31E-03	8.31E-03	8.31E-03	8.31E-03	8.31E-03	8.31E-03	8.30E-03	8.30E-03	8.30E-03	8.30E-03	8.30E-03	8.41E-03	8.41E-03	8.41E-03	8.41E-03	8.40E-03	8.40E-03
P (Dissolved)	mg/L	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02
K (Dissolved)	mg/L	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00
Si (Dissolved)	mg/L	1.05E+01	1.05E+01	1.05E+01	1.06E+01	1.06E+01	1.06E+01	1.06E+01	1.06E+01	1.06E+01	1.06E+01	1.08E+01	1.08E+01	1.08E+01	1.08E+01	1.08E+01	1.08E+01	1.08E+01	1.08E+01	1.08E+01	1.08E+01	1.08E+01	1.09E+01	1.09E+01	1.09E+01	1.09E+01	1.09E+01	1.09E+01
Ag (Dissolved)	mg/L	1.57E-04	1.57E-04	1.57E-04	1.59E-04	1.59E-04	1.59E-04	1.59E-04	1.59E-04	1.59E-04	1.59E-04	1.61E-04	1.61E-04	1.61E-04	1.61E-04	1.61E-04	1.61E-04	1.61E-04	1.61E-04	1.61E-04	1.61E-04	1.61E-04	1.63E-04	1.63E-04	1.63E-04	1.63E-04	1.63E-04	1.63E-04
Na (Dissolved)	mg/L	1.67E+00	1.67E+00	1.67E+00	1.69E+00	1.69E+00	1.69E+00	1.69E+00	1.69E+00	1.69E+00	1.69E+00	1.71E+00	1.71E+00	1.71E+00	1.71E+00	1.71E+00	1.71E+00	1.71E+00	1.71E+00	1.71E+00	1.71E+00	1.71E+00	1.73E+00	1.73E+00	1.73E+00	1.73E+00	1.73E+00	1.73E+00
Sr (Dissolved)	mg/L	1.26E+00	1.26E+00	1.26E+00	1.28E+00	1.28E+00	1.28E+00	1.28E+00	1.27E+00	1.27E+00	1.27E+00	1.29E+00	1.29E+00	1.29E+00	1.29E+00	1.29E+00	1.29E+00	1.29E+00	1.29E+00	1.29E+00	1.29E+00	1.29E+00	1.31E+00	1.31E+00	1.31E+00	1.31E+00	1.31E+00	1.31E+00
S (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tl (Dissolved)	mg/L	1.28E-04	1.28E-04	1.27E-04	1.29E-04	1.29E-04	1.29E-04	1.29E-04	1.29E-04	1.29E-04	1.29E-04	1.31E-04	1.31E-04	1.31E-04	1.31E-04	1.31E-04	1.31E-04	1.31E-04	1.31E-04	1.31E-04	1.31E-04	1.31E-04	1.32E-04	1.32E-04	1.32E-04	1.32E-04	1.32E-04	1.32E-04
Sn (Dissolved)	mg/L	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04
Ti (Dissolved)	mg/L	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02
U (Dissolved)	mg/L	2.69E-03	2.69E-03	2.69E-03	2.73E-03	2.73E-03	2.73E-03	2.73E-03	2.73E-03	2.73E-03	2.73E-03	2.77E-03	2.77E-03	2.76E-03	2.76E-03	2.76E-03	2.76E-03	2.76E-03	2.76E-03	2.76E-03	2.76E-03	2.76E-03	2.80E-03	2.80E-03	2.80E-03	2.80E-03	2.80E-03	2.80E-03
V (Dissolved)	mg/L	7.56E-03	7.56E-03	7.55E-03	7.66E-03	7.66E-03	7.66E-03	7.66E-03	7.66E-03	7.66E-03	7.66E-03	7.76E-03	7.76E-03	7.76E-03	7.76E-03	7.75E-03	7.75E-03	7.75E-03	7.75E-03	7.75E-03	7.75E-03	7.75E-03	7.85E-03	7.85E-03	7.85E-03	7.85E-03	7.84E-03	7.84E-03
Zn (Dissolved)	mg/L	2.73E-02	2.73E-02	2.73E-02	2.77E-02	2.77E-02	2.77E-02	2.77E-02	2.77E-02	2.77E-02	2.77E-02	2.81E-02	2.81E-02	2.81E-02	2.81E-02	2.81E-02	2.81E-02	2.80E-02	2.80E-02	2.80E-02	2.80E-02	2.80E-02	2.84E-02	2.84E-02	2.84E-02	2.84E-02	2.84E-02	2.84E-02
Zr (Dissolved)	mg/L	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04
Hg - (Dissolved)	mg/L	6.20E-05	6.20E-05	6.20E-05	6.29E-05	6.29E-05	6.29E-05	6.29E-05	6.28E-05	6.28E-05	6.28E-05	6.37E-05	6.37E-05	6.36E-05	6.36E-05	6.36E-05	6.36E-05	6.36E-05	6.36E-05	6.36E-05	6.36E-05	6.36E-05	6.44E-05	6.44E-05	6.44E-05	6.44E-05	6.44E-05	6.44E-05

APPENDIX A2 - EXPECTED CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 10.2 Out

Parameter	Unit	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157
Year		08/04/2047	09/04/2047	10/04/2047	11/04/2047	12/04/2047	13/04/2047	14/04/2047	15/04/2047	16/04/2047	17/04/2047	18/04/2047	19/04/2047	20/04/2047	21/04/2047	22/04/2047	23/04/2047	24/04/2047	25/04/2047	26/04/2047	27/04/2047	28/04/2047	29/04/2047	30/04/2047	01/05/2047	02/05/2047	03/05/2047
Physical Tests																											
Acidity to pH 4.5 (as CaCO3)	mg/L	1.63E+01	1.63E+01	1.65E+01	1.65E+01	1.65E+01	1.65E+01	1.66E+01	1.66E+01	1.68E+01	1.68E+01	1.68E+01	1.68E+01	1.68E+01	1.68E+01	1.68E+01	1.70E+01	1.70E+01	1.71E+01	1.71E+01	1.71E+01	1.73E+01	1.73E+01	1.73E+01	1.73E+01	1.73E+01	1.73E+01
Acidity to pH 8.3 (as CaCO3)	mg/L	1.66E+01	1.66E+01	1.68E+01	1.68E+01	1.68E+01	1.68E+01	1.70E+01	1.70E+01	1.72E+01	1.72E+01	1.72E+01	1.72E+01	1.72E+01	1.72E+01	1.72E+01	1.73E+01	1.73E+01	1.75E+01	1.75E+01	1.75E+01	1.77E+01	1.77E+01	1.77E+01	1.77E+01	1.76E+01	1.76E+01
Alkalinity (Total as CaCO3)	mg/L	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01
Hardness as CaCO3 (Dissolved)	mg/L	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02
H+ Concentration	mg/L																										
Dissolved Anions																											
Sulphate (Dissolved)	mg/L	4.98E+02	4.98E+02	5.03E+02	5.03E+02	5.03E+02	5.03E+02	5.09E+02	5.09E+02	5.14E+02	5.14E+02	5.14E+02	5.14E+02	5.14E+02	5.14E+02	5.14E+02	5.19E+02	5.19E+02	5.24E+02	5.24E+02	5.24E+02	5.29E+02	5.29E+02	5.29E+02	5.29E+02	5.29E+02	5.29E+02
Chloride (Dissolved)	mg/L	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00
Fluoride (Dissolved)	mg/L	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02
Nutrients																											
Nitrate (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrite (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Orthophosphate (Dissolved)	mg/L																										
Dissolved Metals																											
Al (Dissolved)	mg/L	6.06E-01	6.06E-01	6.13E-01	6.12E-01	6.12E-01	6.12E-01	6.19E-01	6.19E-01	6.26E-01	6.26E-01	6.26E-01	6.26E-01	6.25E-01	6.25E-01	6.25E-01	6.31E-01	6.31E-01	6.37E-01	6.37E-01	6.37E-01	6.44E-01	6.44E-01	6.43E-01	6.43E-01	6.43E-01	6.43E-01
Sb (Dissolved)	mg/L	5.49E-03	5.49E-03	5.55E-03	5.55E-03	5.55E-03	5.55E-03	5.61E-03	5.61E-03	5.67E-03	5.67E-03	5.67E-03	5.67E-03	5.67E-03	5.67E-03	5.67E-03	5.72E-03	5.72E-03	5.78E-03	5.78E-03	5.78E-03	5.83E-03	5.83E-03	5.83E-03	5.83E-03	5.83E-03	5.83E-03
As (Dissolved)	mg/L	9.11E-03	9.11E-03	9.21E-03	9.21E-03	9.21E-03	9.20E-03	9.31E-03	9.31E-03	9.41E-03	9.41E-03	9.41E-03	9.40E-03	9.40E-03	9.40E-03	9.40E-03	9.49E-03	9.49E-03	9.58E-03	9.58E-03	9.58E-03	9.68E-03	9.68E-03	9.67E-03	9.67E-03	9.67E-03	9.67E-03
Ba (Dissolved)	mg/L	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02
Be (Dissolved)	mg/L	3.26E-04	3.26E-04	3.29E-04	3.29E-04	3.29E-04	3.29E-04	3.33E-04	3.33E-04	3.36E-04	3.36E-04	3.36E-04	3.36E-04	3.36E-04	3.36E-04	3.36E-04	3.39E-04	3.39E-04	3.43E-04	3.43E-04	3.43E-04	3.46E-04	3.46E-04	3.46E-04	3.46E-04	3.46E-04	3.46E-04
Bi (Dissolved)	mg/L	1.64E-04	1.64E-04	1.65E-04	1.65E-04	1.65E-04	1.65E-04	1.67E-04	1.67E-04	1.69E-04	1.69E-04	1.69E-04	1.69E-04	1.69E-04	1.69E-04	1.69E-04	1.70E-04	1.70E-04	1.72E-04	1.72E-04	1.72E-04	1.74E-04	1.74E-04	1.74E-04	1.74E-04	1.74E-04	1.74E-04
B (Dissolved)	mg/L	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02
Cd (Dissolved)	mg/L	1.83E-04	1.83E-04	1.85E-04	1.85E-04	1.85E-04	1.85E-04	1.87E-04	1.87E-04	1.89E-04	1.89E-04	1.89E-04	1.89E-04	1.89E-04	1.89E-04	1.89E-04	1.91E-04	1.91E-04	1.93E-04	1.93E-04	1.93E-04	1.95E-04	1.95E-04	1.95E-04	1.95E-04	1.95E-04	1.94E-04
Ca (Dissolved)	mg/L	2.70E+02	2.70E+02	2.73E+02	2.73E+02	2.73E+02	2.73E+02	2.76E+02	2.76E+02	2.79E+02	2.79E+02	2.79E+02	2.79E+02	2.79E+02	2.79E+02	2.79E+02	2.81E+02	2.81E+02	2.84E+02	2.84E+02	2.84E+02	2.87E+02	2.87E+02	2.87E+02	2.87E+02	2.87E+02	2.87E+02
Cr (Dissolved)	mg/L	3.96E-03	3.96E-03	4.01E-03	4.00E-03	4.00E-03	4.00E-03	4.05E-03	4.05E-03	4.09E-03	4.09E-03	4.09E-03	4.09E-03	4.09E-03	4.09E-03	4.09E-03	4.13E-03	4.13E-03	4.17E-03	4.17E-03	4.17E-03	4.21E-03	4.21E-03	4.21E-03	4.21E-03	4.21E-03	4.20E-03
Co (Dissolved)	mg/L	1.37E-03	1.37E-03	1.38E-03	1.38E-03	1.38E-03	1.38E-03	1.40E-03	1.40E-03	1.41E-03	1.41E-03	1.41E-03	1.41E-03	1.41E-03	1.41E-03	1.41E-03	1.42E-03	1.42E-03	1.44E-03	1.44E-03	1.44E-03	1.45E-03	1.45E-03	1.45E-03	1.45E-03	1.45E-03	1.45E-03
Cu (Dissolved)	mg/L	1.37E-02	1.37E-02	1.38E-02	1.38E-02	1.38E-02	1.38E-02	1.40E-02	1.40E-02	1.41E-02	1.41E-02	1.41E-02	1.41E-02	1.41E-02	1.41E-02	1.41E-02	1.42E-02	1.42E-02	1.44E-02	1.44E-02	1.44E-02	1.45E-02	1.45E-02	1.45E-02	1.45E-02	1.45E-02	1.45E-02
Fe (Dissolved)	mg/L	1.10E-01	1.10E-01	1.11E-01	1.11E-01	1.11E-01	1.11E-01	1.12E-01	1.12E-01	1.13E-01	1.13E-01	1.13E-01	1.13E-01	1.13E-01	1.13E-01	1.13E-01	1.14E-01	1.14E-01	1.15E-01	1.15E-01	1.15E-01	1.16E-01	1.16E-01	1.16E-01	1.16E-01	1.16E-01	1.16E-01
Pb (Dissolved)	mg/L	9.35E-04	9.35E-04	9.46E-04	9.46E-04	9.45E-04	9.45E-04	9.56E-04	9.56E-04	9.66E-04	9.66E-04	9.66E-04	9.66E-04	9.66E-04	9.66E-04	9.65E-04	9.75E-04	9.75E-04	9.84E-04	9.84E-04	9.84E-04	9.94E-04	9.94E-04	9.94E-04	9.93E-04	9.93E-04	9.93E-04
Li (Dissolved)	mg/L	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03
Mg (Dissolved)	mg/L	2.21E+02	2.21E+02	2.24E+02	2.24E+02	2.24E+02	2.24E+02	2.26E+02	2.26E+02	2.29E+02	2.29E+02	2.29E+02	2.29E+02	2.29E+02	2.28E+02	2.28E+02	2.31E+02	2.31E+02	2.33E+02	2.33E+02	2.33E+02	2.35E+02	2.35E+02	2.35E+02	2.35E+02	2.35E+02	2.35E+02
Mn (Dissolved)	mg/L	5.99E-02	5.99E-02	6.06E-02	6.06E-02	6.06E-02	6.06E-02	6.13E-02	6.13E-02	6.19E-02	6.19E-02	6.19E-02	6.19E-02	6.19E-02	6.18E-02	6.18E-02	6.25E-02	6.24E-02	6.30E-02	6.30E-02	6.30E-02	6.37E-02	6.36E-02	6.36E-02	6.36E-02	6.36E-02	6.36E-02
Mo (Dissolved)	mg/L	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02
Ni (Dissolved)	mg/L	8.50E-03	8.50E-03	8.60E-03	8.59E-03	8.59E-03	8.59E-03	8.69E-03	8.69E-03	8.78E-03	8.78E-03	8.78E-03	8.78E-03	8.78E-03	8.78E-03	8.77E-03	8.86E-03	8.86E-03	8.95E-03	8.94E-03	8.94E-03	9.03E-03	9.03E-03	9.03E-03	9.03E-03	9.03E-03	9.02E-03
P (Dissolved)	mg/L	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02
K (Dissolved)	mg/L	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00
Se (Dissolved)	mg/L	1.61E-02	1.61E-02	1.63E-02	1.63E-02	1.63E-02	1.63E-02	1.64E-02	1.64E-02	1.66E-02	1.66E-02	1.66E-02	1.66E-02	1.66E-02	1.66E-02	1.66E-02	1.68E-02	1.68E-02	1.69E-02	1.69E-02	1.69E-02	1.71E-02	1.71E-02	1.71E-02	1.71E-02	1.71E-02	1.71E-02
Si (Dissolved)	mg/L	1.10E+01	1.10E+01	1.11E+01	1.11E+01	1.11E+01	1.11E+01	1.13E+01	1.13E+01	1.14E+01	1.14E+01	1.14E+01	1.14E+01	1.14E+01	1.14E+01	1.14E+01	1.15E+01	1.15E+01	1.16E+01	1.16E+01	1.16E+01	1.17E+01	1.17E+01	1.17E+01	1.17E+01	1.17E+01	1.17E+01
Ag (Dissolved)	mg/L	1.65E-04	1.65E-04	1.67E-04	1.67E-04	1.67E-04	1.67E-04	1.69E-04	1.69E-04	1.71E-04	1.71E-04	1.71E-04	1.71E-04	1.70E-04	1.70E-04	1.70E-04	1.72E-04	1.72E-04	1.74E-04	1.74E-04	1.74E-04	1.75E-04	1.75E-04	1.75E-04	1.75E-04	1.75E-04	1.75E-04
Na (Dissolved)	mg/L	1.75E+00	1.75E+00	1.77E+00	1.77E+00	1.77E+00	1.77E+00	1.79E+00	1.79E+00	1.81E+00	1.81E+00	1.81E+00	1.81E+00	1.81E+00	1.81E+00	1.81E+00	1.83E+00	1.83E+00	1.85E+00	1.85E+00	1.84E+00	1.86E+00	1.86E+00	1.86E+00	1.86E+00	1.86E+00	1.86E+00
Sr (Dissolved)	mg/L	1.32E+00	1.32E+00	1.34E+00	1.34E+00	1.34E+00	1.34E+00	1.35E+00	1.35E+00	1.36E+00	1.36E+00	1.36E+00	1.36E+00	1.36E+00	1.36E+00	1.36E+00	1.38E+00	1.38E+00	1.39E+00	1.39E+00	1.39E+00	1.40E+00	1.40E+00	1.40E+00	1.40E+00	1.40E+00	1.40E+00
S (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tl (Dissolved)	mg/L	1.34E-04	1.34E-04	1.35E-04	1.35E-04	1.35E-04	1.35E-04	1.37E-04	1.37E-04	1.38E-04	1.38E-04	1.38E-04	1.38E-04	1.38E-04	1.38E-04	1.38E-04	1.40E-04	1.40E-04	1.41E-04	1.41E-04	1.41E-04	1.42E-04	1.42E-04	1.42E-04	1.42E-04	1.42E-04	1.42E-04
Sn (Dissolved)	mg/L	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04
Ti (Dissolved)	mg/L	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02
U (Dissolved)	mg/L	2.83E-03	2.83E-03	2.86E-03	2.86E-03	2.86E-03	2.86E-03	2.89E-03	2.89E-03	2.92E-03	2.92E-03	2.92E-03	2.92E-03	2.92E-03	2.92E-03	2.92E-03	2.95E-03	2.95E-03	2.98E-03	2.98E-03	2.98E-03	3.01E-03	3.01E-03	3.00E-03	3.00E-03	3.00E-03	3.00E-03
V (Dissolved)	mg/L	7.93E-03	7.93E-03	8.02E-03	8.02E-03	8.02E-03	8.02E-03	8.11E-03	8.11E-03	8.20E-03	8.20E-03	8.20E-03	8.20E-03	8.19E-03	8.19E-03	8.19E-03	8.27E-03	8.27E-03	8.35E-03	8.35E-03	8.35E-03	8.43E-03	8.43E-03	8.43E-03	8.43E-03	8.43E-03	8.42E-03
Zn (Dissolved)	mg/L	2.87E-02	2.87E-02	2.90E-02	2.90E-02	2.90E-02	2.90E-02	2.94E-02	2.94E-02	2.97E-02	2.97E-02	2.97E-02	2.96E-02	2.96E-02	2.96E-02	2.96E-02	2.99E-02	2.99E-02	3.02E-02	3.02E-02	3.02E-02	3.05E-02	3.05E-02	3.05E-02	3.05E-02	3.05E-02	3.05E-02
Zr (Dissolved)	mg/L	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04
Hg - (Dissolved)	mg/L	6.51E-05	6.51E-05	6.58E-05	6.58E-05	6.58E-05	6.58E-05	6.66E-05	6.66E-05	6.73E-05	6.73E-05	6.73E-05	6.72E-05	6.72E-05	6.72E-05	6.72E-05	6.79E-05	6.79E-05	6.85E-05	6.85E-05	6.85E-05	6.92E-05	6.92E-05	6.92E-05	6.92E-05	6.91E-05	6.91E-05

APPENDIX A2 - EXPECTED CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 10.2 Out

Parameter	Unit	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184
Year		04/05/2047	05/05/2047	06/05/2047	07/05/2047	08/05/2047	09/05/2047	10/05/2047	11/05/2047	12/05/2047	13/05/2047	14/05/2047	15/05/2047	16/05/2047	17/05/2047	18/05/2047	19/05/2047	20/05/2047										
Physical Tests																												
Acidity to pH 4.5 (as CaCO3)	mg/L	1.73E+01	1.74E+01	1.74E+01	1.74E+01	1.76E+01	1.76E+01	1.76E+01	1.76E+01	1.76E+01	1.77E+01	1.77E+01	1.77E+01	1.77E+01	1.77E+01	1.77E+01	1.77E+01	1.77E+01	1.77E+01	1.77E+01	1.77E+01	1.78E+01	1.78E+01	1.78E+01	1.79E+01	1.80E+01	1.80E+01	1.80E+01
Acidity to pH 8.3 (as CaCO3)	mg/L	1.76E+01	1.78E+01	1.78E+01	1.78E+01	1.79E+01	1.79E+01	1.79E+01	1.79E+01	1.79E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.80E+01	1.82E+01	1.82E+01	1.82E+01	1.83E+01	1.84E+01	1.84E+01	1.84E+01
Alkalinity (Total as CaCO3)	mg/L	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01
Hardness as CaCO3 (Dissolved)	mg/L	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02
H+ Concentration	mg/L																											
Dissolved Anions																												
Sulphate (Dissolved)	mg/L	5.28E+02	5.33E+02	5.33E+02	5.33E+02	5.37E+02	5.37E+02	5.37E+02	5.37E+02	5.37E+02	5.42E+02	5.42E+02	5.41E+02	5.41E+02	5.41E+02	5.41E+02	5.41E+02	5.41E+02	5.41E+02	5.41E+02	5.41E+02	5.44E+02	5.44E+02	5.44E+02	5.48E+02	5.52E+02	5.52E+02	5.51E+02
Chloride (Dissolved)	mg/L	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00
Fluoride (Dissolved)	mg/L	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02
Nutrients																												
Nitrate (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrite (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Orthophosphate (Dissolved)	mg/L																											
Dissolved Metals																												
Al (Dissolved)	mg/L	6.43E-01	6.49E-01	6.49E-01	6.48E-01	6.54E-01	6.54E-01	6.54E-01	6.54E-01	6.53E-01	6.59E-01	6.59E-01	6.59E-01	6.59E-01	6.59E-01	6.58E-01	6.58E-01	6.58E-01	6.58E-01	6.58E-01	6.58E-01	6.63E-01	6.62E-01	6.62E-01	6.67E-01	6.71E-01	6.71E-01	6.71E-01
Sb (Dissolved)	mg/L	5.83E-03	5.88E-03	5.88E-03	5.88E-03	5.93E-03	5.92E-03	5.92E-03	5.92E-03	5.92E-03	5.97E-03	5.97E-03	5.97E-03	5.97E-03	5.97E-03	5.97E-03	5.97E-03	5.97E-03	5.96E-03	5.96E-03	5.96E-03	6.00E-03	6.00E-03	6.00E-03	6.04E-03	6.08E-03	6.08E-03	6.08E-03
As (Dissolved)	mg/L	9.67E-03	9.75E-03	9.75E-03	9.75E-03	9.83E-03	9.83E-03	9.83E-03	9.83E-03	9.82E-03	9.91E-03	9.91E-03	9.90E-03	9.90E-03	9.90E-03	9.90E-03	9.90E-03	9.90E-03	9.89E-03	9.89E-03	9.89E-03	9.96E-03	9.96E-03	9.96E-03	1.00E-02	1.01E-02	1.01E-02	1.01E-02
Ba (Dissolved)	mg/L	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02
Be (Dissolved)	mg/L	3.46E-04	3.49E-04	3.49E-04	3.48E-04	3.51E-04	3.51E-04	3.51E-04	3.51E-04	3.51E-04	3.54E-04	3.54E-04	3.54E-04	3.54E-04	3.54E-04	3.54E-04	3.54E-04	3.54E-04	3.54E-04	3.54E-04	3.54E-04	3.56E-04	3.56E-04	3.56E-04	3.58E-04	3.61E-04	3.61E-04	3.61E-04
Bi (Dissolved)	mg/L	1.74E-04	1.75E-04	1.75E-04	1.75E-04	1.77E-04	1.77E-04	1.76E-04	1.76E-04	1.76E-04	1.78E-04	1.78E-04	1.78E-04	1.78E-04	1.78E-04	1.78E-04	1.78E-04	1.78E-04	1.78E-04	1.78E-04	1.78E-04	1.79E-04	1.79E-04	1.79E-04	1.80E-04	1.81E-04	1.81E-04	1.81E-04
B (Dissolved)	mg/L	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02
Cd (Dissolved)	mg/L	1.94E-04	1.96E-04	1.96E-04	1.96E-04	1.98E-04	1.98E-04	1.98E-04	1.98E-04	1.98E-04	1.99E-04	1.99E-04	1.99E-04	1.99E-04	1.99E-04	1.99E-04	1.99E-04	1.99E-04	1.99E-04	1.99E-04	1.99E-04	2.00E-04	2.00E-04	2.00E-04	2.02E-04	2.03E-04	2.03E-04	2.03E-04
Ca (Dissolved)	mg/L	2.87E+02	2.89E+02	2.89E+02	2.89E+02	2.91E+02	2.91E+02	2.91E+02	2.91E+02	2.91E+02	2.94E+02	2.94E+02	2.94E+02	2.94E+02	2.93E+02	2.93E+02	2.93E+02	2.93E+02	2.93E+02	2.93E+02	2.93E+02	2.95E+02	2.95E+02	2.95E+02	2.97E+02	2.99E+02	2.99E+02	2.99E+02
Cr (Dissolved)	mg/L	4.20E-03	4.24E-03	4.24E-03	4.24E-03	4.28E-03	4.27E-03	4.27E-03	4.27E-03	4.27E-03	4.31E-03	4.31E-03	4.31E-03	4.31E-03	4.31E-03	4.30E-03	4.30E-03	4.30E-03	4.30E-03	4.30E-03	4.30E-03	4.33E-03	4.33E-03	4.33E-03	4.36E-03	4.39E-03	4.39E-03	4.39E-03
Co (Dissolved)	mg/L	1.45E-03	1.46E-03	1.46E-03	1.46E-03	1.47E-03	1.47E-03	1.47E-03	1.47E-03	1.47E-03	1.49E-03	1.49E-03	1.49E-03	1.49E-03	1.49E-03	1.48E-03	1.48E-03	1.48E-03	1.48E-03	1.48E-03	1.48E-03	1.49E-03	1.49E-03	1.49E-03	1.50E-03	1.51E-03	1.51E-03	1.51E-03
Cu (Dissolved)	mg/L	1.45E-02	1.46E-02	1.46E-02	1.46E-02	1.48E-02	1.48E-02	1.47E-02	1.47E-02	1.47E-02	1.49E-02	1.49E-02	1.49E-02	1.49E-02	1.49E-02	1.49E-02	1.49E-02	1.49E-02	1.48E-02	1.48E-02	1.48E-02	1.49E-02	1.49E-02	1.49E-02	1.50E-02	1.51E-02	1.51E-02	1.51E-02
Fe (Dissolved)	mg/L	1.16E-01	1.17E-01	1.17E-01	1.17E-01	1.18E-01	1.18E-01	1.18E-01	1.18E-01	1.18E-01	1.19E-01	1.19E-01	1.19E-01	1.19E-01	1.19E-01	1.19E-01	1.19E-01	1.19E-01	1.19E-01	1.19E-01	1.19E-01	1.20E-01	1.20E-01	1.20E-01	1.21E-01	1.21E-01	1.21E-01	1.21E-01
Pb (Dissolved)	mg/L	9.93E-04	1.00E-03	1.00E-03	1.00E-03	1.01E-03	1.01E-03	1.01E-03	1.01E-03	1.01E-03	1.02E-03	1.02E-03	1.02E-03	1.02E-03	1.02E-03	1.02E-03	1.02E-03	1.02E-03	1.02E-03	1.02E-03	1.02E-03	1.02E-03	1.02E-03	1.02E-03	1.03E-03	1.04E-03	1.04E-03	1.04E-03
Li (Dissolved)	mg/L	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03
Mg (Dissolved)	mg/L	2.35E+02	2.37E+02	2.37E+02	2.37E+02	2.39E+02	2.39E+02	2.39E+02	2.39E+02	2.39E+02	2.41E+02	2.41E+02	2.41E+02	2.41E+02	2.41E+02	2.41E+02	2.41E+02	2.40E+02	2.40E+02	2.40E+02	2.40E+02	2.42E+02	2.42E+02	2.42E+02	2.44E+02	2.45E+02	2.45E+02	2.45E+02
Mn (Dissolved)	mg/L	6.36E-02	6.41E-02	6.41E-02	6.41E-02	6.47E-02	6.47E-02	6.46E-02	6.46E-02	6.46E-02	6.52E-02	6.52E-02	6.52E-02	6.51E-02	6.51E-02	6.51E-02	6.51E-02	6.51E-02	6.51E-02	6.51E-02	6.51E-02	6.55E-02	6.55E-02	6.55E-02	6.59E-02	6.64E-02	6.64E-02	6.64E-02
Mo (Dissolved)	mg/L	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02
Ni (Dissolved)	mg/L	9.02E-03	9.10E-03	9.10E-03	9.10E-03	9.18E-03	9.17E-03	9.17E-03	9.17E-03	9.17E-03	9.25E-03	9.25E-03	9.24E-03	9.24E-03	9.24E-03	9.24E-03	9.24E-03	9.24E-03	9.23E-03	9.23E-03	9.23E-03	9.30E-03	9.30E-03	9.29E-03	9.36E-03	9.42E-03	9.42E-03	9.42E-03
P (Dissolved)	mg/L	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02
K (Dissolved)	mg/L	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00
Se (Dissolved)	mg/L	1.71E-02	1.72E-02	1.72E-02	1.72E-02	1.74E-02	1.74E-02	1.74E-02	1.74E-02	1.74E-02	1.75E-02	1.75E-02	1.75E-02	1.75E-02	1.75E-02	1.75E-02	1.75E-02	1.75E-02	1.75E-02	1.75E-02	1.75E-02	1.76E-02	1.76E-02	1.76E-02	1.77E-02	1.78E-02	1.78E-02	1.78E-02
Si (Dissolved)	mg/L	1.17E+01	1.18E+01	1.18E+01	1.18E+01	1.19E+01	1.19E+01	1.19E+01	1.19E+01	1.19E+01	1.20E+01	1.20E+01	1.20E+01	1.20E+01	1.20E+01	1.20E+01	1.20E+01	1.20E+01	1.20E+01	1.20E+01	1.20E+01	1.21E+01	1.21E+01	1.20E+01	1.21E+01	1.22E+01	1.22E+01	1.22E+01
Ag (Dissolved)	mg/L	1.75E-04	1.77E-04	1.77E-04	1.77E-04	1.78E-04	1.78E-04	1.78E-04	1.78E-04	1.78E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.79E-04	1.79E-04	1.79E-04	1.79E-04	1.79E-04	1.79E-04	1.81E-04	1.81E-04	1.81E-04	1.82E-04	1.83E-04	1.83E-04	1.83E-04
Na (Dissolved)	mg/L	1.86E+00	1.88E+00	1.88E+00	1.88E+00	1.89E+00	1.89E+00	1.89E+00	1.89E+00	1.89E+00	1.91E+00	1.91E+00	1.91E+00	1.91E+00	1.91E+00	1.91E+00	1.91E+00	1.91E+00	1.91E+00	1.90E+00	1.90E+00	1.92E+00	1.92E+00	1.92E+00	1.93E+00	1.94E+00	1.94E+00	1.94E+00
Sr (Dissolved)	mg/L	1.40E+00	1.41E+00	1.41E+00	1.41E+00	1.43E+00	1.43E+00	1.43E+00	1.43E+00	1.42E+00	1.44E+00	1.44E+00	1.44E+00	1.44E+00	1.44E+00	1.44E+00	1.44E+00	1.44E+00	1.43E+00	1.43E+00	1.43E+00	1.44E+00	1.44E+00	1.44E+00	1.45E+00	1.46E+00	1.46E+00	1.46E+00
S (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tl (Dissolved)	mg/L	1.42E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04
Sn (Dissolved)	mg/L	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04
Ti (Dissolved)	mg/L	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02
U (Dissolved)	mg/L	3.00E-03	3.03E-03	3.03E-03	3.03E-03	3.05E-03	3.05E-03	3.05E-03	3.05E-03	3.05E-03	3.08E-03	3.08E-03	3.08E-03	3.08E-03	3.07E-03	3.07E-03	3.07E-03	3.07E-03	3.07E-03	3.07E-03	3.07E-03	3.09E-03	3.09E-03	3.09E-03	3.11E-03	3.13E-03	3.13E-03	3.13E-03
V (Dissolved)	mg/L	8.42E-03	8.50E-03	8.49E-03	8.49E-03	8.57E-03	8.56E-03	8.56E-03	8.56E-03	8.56E-03	8.63E-03	8.63E-03	8.63E-03	8.63E-03	8.63E-03	8.62E-03	8.62E-03	8.62E-03	8.62E-03	8.62E-03	8.62E-03	8.68E-03	8.68E-03	8.68E-03	8.73E-03	8.79E-03	8.79E-03	8.79E-03
Zn (Dissolved)	mg/L	3.05E-02	3.07E-02	3.07E-02	3.07E-02	3.10E-02	3.10E-02	3.10E-02	3.10E-02	3.10E-02	3.12E-02	3.12E-02	3.12E-02	3.12E-02	3.12E-02	3.12E-02	3.12E-02	3.12E-02	3.12E-02	3.12E-02	3.12E-02	3.14E-02	3.14E-02	3.14E-02	3.16E-02	3.18E-02	3.18E-02	3.18E-02
Zr (Dissolved)	mg/L	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04
Hg - (Dissolved)	mg/L	6.91E-05	6.97E-05	6.97E-05	6.97E-05	7.03E-05	7.03E-05	7.03E-05	7.02E-05	7.02E-05	7.08E-05	7.08E-05	7.08E-05	7.08E-05	7.08E-05	7.08E-05	7.08E-05	7.08E-05	7.07E-05	7.07E-05	7.07E-05	7.12E-05	7.12E-05	7.12E-05	7.17E-05	7.21E-05	7.21E-05	7.21E-05

APPENDIX A2 - EXPECTED CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 10.2 Out

Parameter	Unit	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211
Year																												
Physical Tests																												
Acidity to pH 4.5 (as CaCO3)	mg/L	1.80E+01	1.80E+01	1.80E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.82E+01	1.81E+01
Acidity to pH 8.3 (as CaCO3)	mg/L	1.84E+01	1.84E+01	1.84E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.84E+01	1.85E+01	1.85E+01
Alkalinity (Total as CaCO3)	mg/L	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01
Hardness as CaCO3 (Dissolved)	mg/L	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02
H+ Concentration	mg/L																											
Dissolved Anions																												
Sulphate (Dissolved)	mg/L	5.51E+02	5.51E+02	5.51E+02	5.55E+02	5.55E+02	5.55E+02	5.54E+02	5.54E+02	5.54E+02	5.54E+02	5.54E+02	5.54E+02	5.54E+02	5.54E+02	5.54E+02	5.54E+02	5.53E+02	5.53E+02	5.53E+02	5.53E+02	5.53E+02	5.53E+02	5.53E+02	5.53E+02	5.53E+02	5.53E+02	5.55E+02	5.55E+02
Chloride (Dissolved)	mg/L	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00
Fluoride (Dissolved)	mg/L	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02
Nutrients																												
Nitrate (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrite (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Orthophosphate (Dissolved)	mg/L																											
Dissolved Metals																												
Al (Dissolved)	mg/L	6.71E-01	6.71E-01	6.71E-01	6.75E-01	6.75E-01	6.75E-01	6.75E-01	6.75E-01	6.74E-01	6.74E-01	6.74E-01	6.74E-01	6.74E-01	6.74E-01	6.74E-01	6.74E-01	6.73E-01	6.73E-01	6.73E-01	6.73E-01	6.73E-01	6.73E-01	6.73E-01	6.73E-01	6.72E-01	6.75E-01	6.75E-01
Sb (Dissolved)	mg/L	6.08E-03	6.08E-03	6.08E-03	6.12E-03	6.12E-03	6.12E-03	6.11E-03	6.11E-03	6.11E-03	6.11E-03	6.11E-03	6.11E-03	6.11E-03	6.11E-03	6.11E-03	6.10E-03	6.10E-03	6.10E-03	6.10E-03	6.10E-03	6.10E-03	6.10E-03	6.10E-03	6.10E-03	6.09E-03	6.12E-03	6.12E-03
As (Dissolved)	mg/L	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.02E-02	1.02E-02
Ba (Dissolved)	mg/L	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02
Be (Dissolved)	mg/L	3.61E-04	3.60E-04	3.60E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.62E-04	3.62E-04	3.62E-04	3.62E-04	3.62E-04	3.62E-04	3.62E-04	3.62E-04	3.62E-04	3.62E-04	3.62E-04	3.62E-04	3.62E-04	3.62E-04	3.62E-04	3.62E-04	3.61E-04	3.61E-04	3.63E-04	3.63E-04
Bi (Dissolved)	mg/L	1.81E-04	1.81E-04	1.81E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04
B (Dissolved)	mg/L	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02
Cd (Dissolved)	mg/L	2.03E-04	2.03E-04	2.03E-04	2.04E-04	2.04E-04	2.04E-04	2.04E-04	2.04E-04	2.04E-04	2.04E-04	2.04E-04	2.04E-04	2.04E-04	2.04E-04	2.04E-04	2.04E-04	2.04E-04	2.04E-04	2.04E-04	2.04E-04	2.04E-04	2.04E-04	2.03E-04	2.03E-04	2.03E-04	2.03E-04	2.04E-04	2.04E-04
Ca (Dissolved)	mg/L	2.99E+02	2.99E+02	2.99E+02	3.01E+02	3.01E+02	3.01E+02	3.01E+02	3.01E+02	3.01E+02	3.00E+02	3.00E+02	3.00E+02	3.00E+02	3.00E+02	3.00E+02	3.00E+02	3.00E+02	3.00E+02	3.00E+02	3.00E+02	3.00E+02	3.00E+02	3.00E+02	3.00E+02	3.00E+02	3.01E+02	3.01E+02
Cr (Dissolved)	mg/L	4.39E-03	4.39E-03	4.38E-03	4.41E-03	4.41E-03	4.41E-03	4.41E-03	4.41E-03	4.41E-03	4.41E-03	4.41E-03	4.41E-03	4.41E-03	4.41E-03	4.41E-03	4.40E-03	4.40E-03	4.40E-03	4.40E-03	4.40E-03	4.40E-03	4.40E-03	4.40E-03	4.40E-03	4.40E-03	4.42E-03	4.42E-03
Co (Dissolved)	mg/L	1.51E-03	1.51E-03	1.51E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03
Cu (Dissolved)	mg/L	1.51E-02	1.51E-02	1.51E-02	1.52E-02	1.52E-02	1.52E-02	1.52E-02	1.52E-02	1.52E-02	1.52E-02	1.52E-02	1.52E-02	1.52E-02	1.52E-02	1.52E-02	1.52E-02	1.52E-02	1.52E-02	1.52E-02	1.52E-02	1.52E-02	1.52E-02	1.52E-02	1.52E-02	1.52E-02	1.52E-02	1.52E-02
Fe (Dissolved)	mg/L	1.21E-01	1.21E-01	1.21E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01
Pb (Dissolved)	mg/L	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03
Li (Dissolved)	mg/L	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03
Mg (Dissolved)	mg/L	2.45E+02	2.45E+02	2.45E+02	2.47E+02	2.47E+02	2.47E+02	2.46E+02	2.46E+02	2.46E+02	2.46E+02	2.46E+02	2.46E+02	2.46E+02	2.46E+02	2.46E+02	2.46E+02	2.46E+02	2.46E+02	2.46E+02	2.46E+02	2.46E+02	2.46E+02	2.46E+02	2.46E+02	2.46E+02	2.47E+02	2.47E+02
Mn (Dissolved)	mg/L	6.63E-02	6.63E-02	6.63E-02	6.68E-02	6.67E-02	6.67E-02	6.67E-02	6.67E-02	6.67E-02	6.67E-02	6.67E-02	6.67E-02	6.66E-02	6.66E-02	6.66E-02	6.66E-02	6.66E-02	6.66E-02	6.66E-02	6.66E-02	6.66E-02	6.66E-02	6.65E-02	6.65E-02	6.65E-02	6.68E-02	6.68E-02
Mo (Dissolved)	mg/L	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02
Ni (Dissolved)	mg/L	9.41E-03	9.41E-03	9.41E-03	9.47E-03	9.47E-03	9.47E-03	9.47E-03	9.47E-03	9.46E-03	9.46E-03	9.46E-03	9.46E-03	9.46E-03	9.46E-03	9.45E-03	9.45E-03	9.45E-03	9.45E-03	9.45E-03	9.45E-03	9.44E-03	9.44E-03	9.44E-03	9.44E-03	9.44E-03	9.48E-03	9.48E-03
P (Dissolved)	mg/L	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02
K (Dissolved)	mg/L	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00
Se (Dissolved)	mg/L	1.78E-02	1.78E-02	1.78E-02	1.79E-02	1.79E-02	1.79E-02	1.79E-02	1.79E-02	1.79E-02	1.79E-02	1.79E-02	1.79E-02	1.79E-02	1.79E-02	1.79E-02	1.79E-02	1.79E-02	1.79E-02	1.79E-02	1.79E-02	1.79E-02	1.79E-02	1.79E-02	1.79E-02	1.79E-02	1.79E-02	1.79E-02
Si (Dissolved)	mg/L	1.22E+01	1.22E+01	1.22E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.22E+01	1.22E+01	1.22E+01	1.22E+01	1.22E+01	1.22E+01	1.22E+01	1.23E+01	1.23E+01
Ag (Dissolved)	mg/L	1.83E-04	1.83E-04	1.83E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.83E-04	1.83E-04	1.83E-04	1.83E-04	1.83E-04	1.83E-04	1.84E-04	1.84E-04
Na (Dissolved)	mg/L	1.94E+00	1.94E+00	1.94E+00	1.95E+00	1.95E+00	1.95E+00	1.95E+00	1.95E+00	1.95E+00	1.95E+00	1.95E+00	1.95E+00	1.95E+00	1.95E+00	1.95E+00	1.95E+00	1.95E+00	1.95E+00	1.95E+00	1.95E+00	1.95E+00	1.95E+00	1.95E+00	1.95E+00	1.95E+00	1.96E+00	1.96E+00
Sr (Dissolved)	mg/L	1.46E+00	1.46E+00	1.46E+00	1.47E+00	1.47E+00	1.47E+00	1.47E+00	1.47E+00	1.47E+00	1.47E+00	1.47E+00	1.47E+00	1.47E+00	1.47E+00	1.47E+00	1.47E+00	1.47E+00	1.47E+00	1.47E+00	1.47E+00	1.47E+00	1.47E+00	1.47E+00	1.47E+00	1.47E+00	1.47E+00	1.47E+00
S (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tl (Dissolved)	mg/L	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04
Sn (Dissolved)	mg/L	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04
Ti (Dissolved)	mg/L	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02
U (Dissolved)	mg/L	3.13E-03	3.13E-03	3.13E-03	3.15E-03	3.15E-03	3.15E-03	3.15E-03	3.15E-03	3.15E-03	3.15E-03	3.15E-03	3.15E-03	3.15E-03	3.15E-03	3.15E-03	3.15E-03	3.14E-03	3.14E-03	3.14E-03	3.14E-03	3.14E-03	3.14E-03	3.14E-03	3.14E-03	3.14E-03	3.15E-03	3.15E-03
V (Dissolved)	mg/L	8.79E-03	8.79E-03	8.78E-03	8.84E-03	8.84E-03	8.84E-03	8.84E-03	8.84E-03	8.83E-03	8.83E-03	8.83E-03	8.83E-03	8.83E-03	8.83E-03	8.82E-03	8.82E-03	8.82E-03	8.82E-03	8.82E-03	8.82E-03	8.82E-03	8.81E-03	8.81E-03	8.81E-03	8.81E-03	8.85E-03	8.85E-03
Zn (Dissolved)	mg/L	3.18E-02	3.18E-02	3.18E-02	3.20E-02	3.20E-02	3.20E-02	3.20E-02	3.20E-02	3.20E-02	3.20E-02	3.20E-02	3.19E-02	3.19E-02	3.19E-02	3.19E-02	3.19E-02	3.19E-02	3.19E-02	3.19E-02	3.19E-02	3.19E-02	3.19E-02	3.19E-02	3.19E-02	3.19E-02	3.20E-02	3.20E-02
Zr (Dissolved)	mg/L	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04
Hg - (Dissolved)	mg/L	7.21E-05	7.21E-05	7.21E-05	7.26E-05	7.25E-05	7.25E-05	7.25E-05	7.25E-05	7.25E-05	7.25E-05	7.25E-05	7.25E-05	7.24E-05	7.24E-05	7.24E-05	7.24E-05	7.24E-05	7.24E-05	7.24E-05	7.23E-05	7.23E-05	7.23E-05	7.23E-05	7.23E-05	7.23E-05	7.26E-05	7.26E-05

APPENDIX A2 - EXPECTED CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 10.2 Out

Parameter	Unit	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237
Year																											
Physical Tests																											
Acidity to pH 4.5 (as CaCO3)	mg/L	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.82E+01	1.82E+01	1.82E+01	1.82E+01	1.82E+01	1.82E+01	1.82E+01	1.82E+01	1.83E+01	1.83E+01	1.83E+01	1.83E+01	1.83E+01	1.83E+01	1.83E+01	1.83E+01	1.83E+01	1.84E+01	1.85E+01
Acidity to pH 8.3 (as CaCO3)	mg/L	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.86E+01	1.86E+01	1.86E+01	1.86E+01	1.86E+01	1.86E+01	1.86E+01	1.86E+01	1.87E+01	1.87E+01	1.87E+01	1.87E+01	1.87E+01	1.87E+01	1.87E+01	1.87E+01	1.87E+01	1.88E+01	1.89E+01
Alkalinity (Total as CaCO3)	mg/L	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01
Hardness as CaCO3 (Dissolved)	mg/L	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02
H+ Concentration	mg/L																										
Dissolved Anions																											
Sulphate (Dissolved)	mg/L	5.55E+02	5.55E+02	5.55E+02	5.55E+02	5.55E+02	5.54E+02	5.54E+02	5.56E+02	5.56E+02	5.56E+02	5.56E+02	5.56E+02	5.56E+02	5.56E+02	5.56E+02	5.60E+02	5.59E+02	5.59E+02	5.59E+02	5.61E+02	5.61E+02	5.61E+02	5.61E+02	5.60E+02	5.62E+02	5.65E+02
Chloride (Dissolved)	mg/L	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00
Fluoride (Dissolved)	mg/L	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02
Nutrients																											
Nitrate (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrite (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Orthophosphate (Dissolved)	mg/L																										
Dissolved Metals																											
Al (Dissolved)	mg/L	6.75E-01	6.75E-01	6.75E-01	6.75E-01	6.75E-01	6.75E-01	6.75E-01	6.77E-01	6.77E-01	6.77E-01	6.77E-01	6.77E-01	6.76E-01	6.76E-01	6.76E-01	6.81E-01	6.81E-01	6.81E-01	6.80E-01	6.82E-01	6.82E-01	6.82E-01	6.82E-01	6.82E-01	6.84E-01	6.87E-01
Sb (Dissolved)	mg/L	6.12E-03	6.12E-03	6.12E-03	6.12E-03	6.12E-03	6.11E-03	6.11E-03	6.14E-03	6.14E-03	6.13E-03	6.13E-03	6.13E-03	6.13E-03	6.13E-03	6.13E-03	6.17E-03	6.17E-03	6.17E-03	6.17E-03	6.19E-03	6.18E-03	6.18E-03	6.18E-03	6.18E-03	6.20E-03	6.23E-03
As (Dissolved)	mg/L	1.02E-02	1.02E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.02E-02	1.02E-02	1.02E-02	1.02E-02	1.02E-02	1.02E-02	1.02E-02	1.02E-02	1.02E-02	1.02E-02	1.02E-02	1.02E-02	1.03E-02	1.03E-02	1.03E-02	1.03E-02	1.03E-02	1.03E-02	1.03E-02
Ba (Dissolved)	mg/L	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02
Be (Dissolved)	mg/L	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.64E-04	3.64E-04	3.64E-04	3.64E-04	3.64E-04	3.64E-04	3.64E-04	3.63E-04	3.66E-04	3.66E-04	3.66E-04	3.66E-04	3.67E-04	3.67E-04	3.67E-04	3.67E-04	3.67E-04	3.67E-04	3.69E-04
Bi (Dissolved)	mg/L	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.83E-04	1.83E-04	1.83E-04	1.83E-04	1.83E-04	1.83E-04	1.83E-04	1.83E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.85E-04	1.86E-04
B (Dissolved)	mg/L	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02
Cd (Dissolved)	mg/L	2.04E-04	2.04E-04	2.04E-04	2.04E-04	2.04E-04	2.04E-04	2.04E-04	2.05E-04	2.05E-04	2.05E-04	2.05E-04	2.05E-04	2.05E-04	2.05E-04	2.05E-04	2.06E-04	2.06E-04	2.06E-04	2.06E-04	2.06E-04	2.06E-04	2.06E-04	2.06E-04	2.06E-04	2.07E-04	2.08E-04
Ca (Dissolved)	mg/L	3.01E+02	3.01E+02	3.01E+02	3.01E+02	3.01E+02	3.01E+02	3.01E+02	3.02E+02	3.02E+02	3.02E+02	3.02E+02	3.02E+02	3.01E+02	3.01E+02	3.01E+02	3.03E+02	3.03E+02	3.03E+02	3.03E+02	3.04E+02	3.04E+02	3.04E+02	3.04E+02	3.04E+02	3.05E+02	3.06E+02
Cr (Dissolved)	mg/L	4.42E-03	4.41E-03	4.41E-03	4.41E-03	4.41E-03	4.41E-03	4.41E-03	4.43E-03	4.43E-03	4.43E-03	4.42E-03	4.42E-03	4.42E-03	4.42E-03	4.42E-03	4.45E-03	4.45E-03	4.45E-03	4.45E-03	4.46E-03	4.46E-03	4.46E-03	4.46E-03	4.46E-03	4.47E-03	4.49E-03
Co (Dissolved)	mg/L	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.53E-03	1.53E-03	1.53E-03	1.53E-03	1.53E-03	1.53E-03	1.53E-03	1.53E-03	1.54E-03	1.54E-03	1.53E-03	1.53E-03	1.54E-03	1.54E-03	1.54E-03	1.54E-03	1.54E-03	1.54E-03	1.55E-03
Cu (Dissolved)	mg/L	1.52E-02	1.52E-02	1.52E-02	1.52E-02	1.52E-02	1.52E-02	1.52E-02	1.53E-02	1.53E-02	1.53E-02	1.53E-02	1.53E-02	1.53E-02	1.53E-02	1.53E-02	1.54E-02	1.54E-02	1.54E-02	1.54E-02	1.54E-02	1.54E-02	1.54E-02	1.54E-02	1.54E-02	1.54E-02	1.55E-02
Fe (Dissolved)	mg/L	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.24E-01	1.24E-01
Pb (Dissolved)	mg/L	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.05E-03	1.05E-03	1.05E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.05E-03	1.05E-03	1.05E-03	1.05E-03	1.05E-03	1.05E-03	1.05E-03	1.05E-03	1.05E-03	1.06E-03	1.06E-03
Li (Dissolved)	mg/L	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03
Mg (Dissolved)	mg/L	2.47E+02	2.47E+02	2.47E+02	2.47E+02	2.47E+02	2.46E+02	2.46E+02	2.47E+02	2.47E+02	2.47E+02	2.47E+02	2.47E+02	2.47E+02	2.47E+02	2.47E+02	2.49E+02	2.49E+02	2.49E+02	2.49E+02	2.49E+02	2.49E+02	2.49E+02	2.49E+02	2.49E+02	2.50E+02	2.51E+02
Mn (Dissolved)	mg/L	6.68E-02	6.68E-02	6.68E-02	6.67E-02	6.67E-02	6.67E-02	6.67E-02	6.70E-02	6.70E-02	6.69E-02	6.69E-02	6.69E-02	6.69E-02	6.69E-02	6.69E-02	6.73E-02	6.73E-02	6.73E-02	6.73E-02	6.75E-02	6.75E-02	6.75E-02	6.75E-02	6.74E-02	6.76E-02	6.80E-02
Mo (Dissolved)	mg/L	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02
Ni (Dissolved)	mg/L	9.48E-03	9.47E-03	9.47E-03	9.47E-03	9.47E-03	9.47E-03	9.47E-03	9.50E-03	9.50E-03	9.50E-03	9.50E-03	9.49E-03	9.49E-03	9.49E-03	9.49E-03	9.55E-03	9.55E-03	9.55E-03	9.55E-03	9.58E-03	9.58E-03	9.57E-03	9.57E-03	9.57E-03	9.59E-03	9.65E-03
P (Dissolved)	mg/L	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02
K (Dissolved)	mg/L	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00
Si (Dissolved)	mg/L	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01
Ag (Dissolved)	mg/L	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.85E-04	1.85E-04	1.85E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.86E-04	1.86E-04	1.86E-04	1.85E-04	1.86E-04	1.86E-04	1.86E-04	1.86E-04	1.86E-04	1.86E-04	1.87E-04
Na (Dissolved)	mg/L	1.95E+00	1.95E+00	1.95E+00	1.95E+00	1.95E+00	1.95E+00	1.95E+00	1.96E+00	1.96E+00	1.96E+00	1.96E+00	1.96E+00	1.96E+00	1.96E+00	1.96E+00	1.97E+00	1.97E+00	1.97E+00	1.97E+00	1.98E+00	1.98E+00	1.98E+00	1.97E+00	1.97E+00	1.98E+00	1.99E+00
Sr (Dissolved)	mg/L	1.47E+00	1.47E+00	1.47E+00	1.47E+00	1.47E+00	1.47E+00	1.47E+00	1.48E+00	1.48E+00	1.48E+00	1.48E+00	1.48E+00	1.48E+00	1.47E+00	1.47E+00	1.48E+00	1.48E+00	1.48E+00	1.48E+00	1.49E+00	1.49E+00	1.49E+00	1.49E+00	1.49E+00	1.49E+00	1.50E+00
S (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tl (Dissolved)	mg/L	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04
Sn (Dissolved)	mg/L	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04
Ti (Dissolved)	mg/L	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02
U (Dissolved)	mg/L	3.15E-03	3.15E-03	3.15E-03	3.15E-03	3.15E-03	3.15E-03	3.15E-03	3.16E-03	3.16E-03	3.16E-03	3.16E-03	3.16E-03	3.16E-03	3.16E-03	3.16E-03	3.18E-03	3.18E-03	3.18E-03	3.18E-03	3.19E-03	3.19E-03	3.19E-03	3.19E-03	3.18E-03	3.19E-03	3.21E-03
V (Dissolved)	mg/L	8.85E-03	8.84E-03	8.84E-03	8.84E-03	8.84E-03	8.84E-03	8.84E-03	8.87E-03	8.87E-03	8.87E-03	8.86E-03	8.86E-03	8.86E-03	8.86E-03	8.86E-03	8.92E-03	8.92E-03	8.92E-03	8.91E-03	8.94E-03	8.94E-03	8.94E-03	8.93E-03	8.93E-03	8.96E-03	9.00E-03
Zn (Dissolved)	mg/L	3.20E-02	3.20E-02	3.20E-02	3.20E-02	3.20E-02	3.20E-02	3.20E-02	3.21E-02	3.21E-02	3.21E-02	3.21E-02	3.21E-02	3.21E-02	3.21E-02	3.20E-02	3.23E-02	3.23E-02	3.23E-02	3.23E-02	3.23E-02	3.23E-02	3.23E-02	3.23E-02	3.23E-02	3.24E-02	3.26E-02
Zr (Dissolved)	mg/L	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04
Hg - (Dissolved)	mg/L	7.26E-05	7.26E-05	7.26E-05	7.25E-05	7.25E-05	7.25E-05	7.25E-05	7.28E-05	7.28E-05	7.28E-05	7.27E-05	7.27E-05	7.27E-05	7.27E-05	7.27E-05	7.32E-05	7.32E-05	7.32E-05	7.31E-05	7.34E-05	7.33E-05	7.33E-05	7.33E-05	7.33E-05	7.35E-05	7.39E-05

APPENDIX A2 - EXPECTED CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 10.2 Out

Parameter	Unit	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263
Year																											
Physical Tests																											
Acidity to pH 4.5 (as CaCO3)	mg/L	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.86E+01	1.86E+01	1.86E+01	1.86E+01	1.86E+01	1.86E+01	1.86E+01
Acidity to pH 8.3 (as CaCO3)	mg/L	1.89E+01	1.89E+01	1.88E+01	1.88E+01	1.88E+01	1.88E+01	1.88E+01	1.88E+01	1.88E+01	1.88E+01	1.89E+01	1.89E+01	1.88E+01	1.88E+01	1.89E+01	1.89E+01	1.89E+01	1.89E+01	1.89E+01	1.90E+01	1.90E+01	1.90E+01	1.90E+01	1.90E+01	1.90E+01	1.90E+01
Alkalinity (Total as CaCO3)	mg/L	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01
Hardness as CaCO3 (Dissolved)	mg/L	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02
H+ Concentration	mg/L																										
Dissolved Anions																											
Sulphate (Dissolved)	mg/L	5.65E+02	5.65E+02	5.65E+02	5.65E+02	5.64E+02	5.64E+02	5.64E+02	5.64E+02	5.64E+02	5.64E+02	5.65E+02	5.65E+02	5.65E+02	5.65E+02	5.65E+02	5.66E+02	5.66E+02	5.66E+02	5.67E+02	5.68E+02	5.68E+02	5.68E+02	5.69E+02	5.69E+02	5.69E+02	5.69E+02
Chloride (Dissolved)	mg/L	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00
Fluoride (Dissolved)	mg/L	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02
Nutrients																											
Nitrate (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrite (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Orthophosphate (Dissolved)	mg/L																										
Dissolved Metals																											
Al (Dissolved)	mg/L	6.87E-01	6.87E-01	6.87E-01	6.87E-01	6.87E-01	6.87E-01	6.86E-01	6.86E-01	6.86E-01	6.86E-01	6.87E-01	6.87E-01	6.87E-01	6.87E-01	6.88E-01	6.89E-01	6.89E-01	6.89E-01	6.89E-01	6.91E-01	6.92E-01	6.91E-01	6.92E-01	6.93E-01	6.92E-01	6.92E-01
Sb (Dissolved)	mg/L	6.23E-03	6.23E-03	6.23E-03	6.23E-03	6.22E-03	6.22E-03	6.22E-03	6.22E-03	6.22E-03	6.22E-03	6.23E-03	6.23E-03	6.23E-03	6.23E-03	6.23E-03	6.24E-03	6.24E-03	6.24E-03	6.25E-03	6.26E-03	6.27E-03	6.27E-03	6.27E-03	6.28E-03	6.28E-03	6.27E-03
As (Dissolved)	mg/L	1.03E-02	1.03E-02	1.03E-02	1.03E-02	1.03E-02	1.03E-02	1.03E-02	1.03E-02	1.03E-02	1.03E-02	1.03E-02	1.03E-02	1.03E-02	1.03E-02	1.03E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02
Ba (Dissolved)	mg/L	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02
Be (Dissolved)	mg/L	3.69E-04	3.69E-04	3.69E-04	3.69E-04	3.69E-04	3.69E-04	3.69E-04	3.69E-04	3.69E-04	3.69E-04	3.69E-04	3.69E-04	3.69E-04	3.69E-04	3.70E-04	3.70E-04	3.70E-04	3.70E-04	3.70E-04	3.71E-04	3.72E-04	3.72E-04	3.72E-04	3.72E-04	3.72E-04	3.72E-04
Bi (Dissolved)	mg/L	1.86E-04	1.86E-04	1.85E-04	1.85E-04	1.85E-04	1.85E-04	1.85E-04	1.85E-04	1.85E-04	1.85E-04	1.86E-04	1.86E-04	1.85E-04	1.85E-04	1.86E-04	1.86E-04	1.86E-04	1.86E-04	1.86E-04	1.87E-04	1.87E-04	1.87E-04	1.87E-04	1.87E-04	1.87E-04	1.87E-04
B (Dissolved)	mg/L	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02
Cd (Dissolved)	mg/L	2.08E-04	2.08E-04	2.08E-04	2.08E-04	2.08E-04	2.08E-04	2.08E-04	2.08E-04	2.08E-04	2.07E-04	2.08E-04	2.08E-04	2.08E-04	2.08E-04	2.08E-04	2.08E-04	2.08E-04	2.08E-04	2.08E-04	2.09E-04	2.09E-04	2.09E-04	2.09E-04	2.09E-04	2.09E-04	2.09E-04
Ca (Dissolved)	mg/L	3.06E+02	3.06E+02	3.06E+02	3.06E+02	3.06E+02	3.06E+02	3.06E+02	3.06E+02	3.06E+02	3.06E+02	3.06E+02	3.06E+02	3.06E+02	3.06E+02	3.07E+02	3.07E+02	3.07E+02	3.07E+02	3.07E+02	3.08E+02	3.08E+02	3.08E+02	3.08E+02	3.09E+02	3.09E+02	3.09E+02
Cr (Dissolved)	mg/L	4.49E-03	4.49E-03	4.49E-03	4.49E-03	4.49E-03	4.49E-03	4.49E-03	4.49E-03	4.49E-03	4.49E-03	4.49E-03	4.49E-03	4.49E-03	4.49E-03	4.50E-03	4.50E-03	4.50E-03	4.50E-03	4.51E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.53E-03	4.53E-03	4.53E-03
Co (Dissolved)	mg/L	1.55E-03	1.55E-03	1.55E-03	1.55E-03	1.55E-03	1.55E-03	1.55E-03	1.55E-03	1.55E-03	1.55E-03	1.55E-03	1.55E-03	1.55E-03	1.55E-03	1.55E-03	1.55E-03	1.55E-03	1.55E-03	1.55E-03	1.56E-03	1.56E-03	1.56E-03	1.56E-03	1.56E-03	1.56E-03	1.56E-03
Cu (Dissolved)	mg/L	1.55E-02	1.55E-02	1.55E-02	1.55E-02	1.55E-02	1.55E-02	1.55E-02	1.55E-02	1.55E-02	1.55E-02	1.55E-02	1.55E-02	1.55E-02	1.55E-02	1.55E-02	1.55E-02	1.55E-02	1.55E-02	1.56E-02	1.56E-02	1.56E-02	1.56E-02	1.56E-02	1.56E-02	1.56E-02	1.56E-02
Fe (Dissolved)	mg/L	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.25E-01	1.25E-01	1.25E-01	1.25E-01	1.25E-01	1.25E-01	1.25E-01	1.25E-01	1.25E-01	1.25E-01	1.25E-01
Pb (Dissolved)	mg/L	1.06E-03	1.06E-03	1.06E-03	1.06E-03	1.06E-03	1.06E-03	1.06E-03	1.06E-03	1.06E-03	1.06E-03	1.06E-03	1.06E-03	1.06E-03	1.06E-03	1.06E-03	1.06E-03	1.06E-03	1.06E-03	1.06E-03	1.07E-03	1.07E-03	1.07E-03	1.07E-03	1.07E-03	1.07E-03	1.07E-03
Li (Dissolved)	mg/L	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03
Mg (Dissolved)	mg/L	2.51E+02	2.51E+02	2.51E+02	2.51E+02	2.51E+02	2.51E+02	2.51E+02	2.51E+02	2.51E+02	2.51E+02	2.51E+02	2.51E+02	2.51E+02	2.51E+02	2.51E+02	2.52E+02	2.52E+02	2.52E+02	2.52E+02	2.52E+02	2.53E+02	2.53E+02	2.53E+02	2.53E+02	2.53E+02	2.53E+02
Mn (Dissolved)	mg/L	6.80E-02	6.80E-02	6.79E-02	6.79E-02	6.79E-02	6.79E-02	6.79E-02	6.79E-02	6.79E-02	6.79E-02	6.80E-02	6.80E-02	6.79E-02	6.79E-02	6.80E-02	6.81E-02	6.81E-02	6.81E-02	6.82E-02	6.83E-02	6.84E-02	6.84E-02	6.84E-02	6.85E-02	6.85E-02	6.85E-02
Mo (Dissolved)	mg/L	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02
Ni (Dissolved)	mg/L	9.64E-03	9.64E-03	9.64E-03	9.64E-03	9.64E-03	9.64E-03	9.63E-03	9.63E-03	9.63E-03	9.63E-03	9.64E-03	9.64E-03	9.64E-03	9.64E-03	9.65E-03	9.67E-03	9.66E-03	9.66E-03	9.67E-03	9.70E-03	9.70E-03	9.70E-03	9.71E-03	9.72E-03	9.72E-03	9.72E-03
P (Dissolved)	mg/L	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02
K (Dissolved)	mg/L	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00
Si (Dissolved)	mg/L	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01
Ag (Dissolved)	mg/L	1.87E-04	1.87E-04	1.87E-04	1.87E-04	1.87E-04	1.87E-04	1.87E-04	1.87E-04	1.87E-04	1.87E-04	1.87E-04	1.87E-04	1.87E-04	1.87E-04	1.88E-04	1.88E-04	1.88E-04	1.88E-04	1.88E-04	1.88E-04	1.89E-04	1.88E-04	1.89E-04	1.89E-04	1.89E-04	1.89E-04
Na (Dissolved)	mg/L	1.99E+00	1.99E+00	1.99E+00	1.99E+00	1.99E+00	1.99E+00	1.99E+00	1.99E+00	1.99E+00	1.99E+00	1.99E+00	1.99E+00	1.99E+00	1.99E+00	1.99E+00	1.99E+00	1.99E+00	1.99E+00	2.00E+00	2.00E+00	2.00E+00	2.00E+00	2.00E+00	2.00E+00	2.00E+00	2.00E+00
Sr (Dissolved)	mg/L	1.50E+00	1.50E+00	1.50E+00	1.50E+00	1.50E+00	1.50E+00	1.50E+00	1.50E+00	1.50E+00	1.50E+00	1.50E+00	1.50E+00	1.50E+00	1.50E+00	1.50E+00	1.50E+00	1.50E+00	1.50E+00	1.50E+00	1.51E+00	1.51E+00	1.51E+00	1.51E+00	1.51E+00	1.51E+00	1.51E+00
S (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tl (Dissolved)	mg/L	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04
Sn (Dissolved)	mg/L	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04
Ti (Dissolved)	mg/L	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02
U (Dissolved)	mg/L	3.21E-03	3.21E-03	3.21E-03	3.21E-03	3.21E-03	3.21E-03	3.21E-03	3.20E-03	3.20E-03	3.20E-03	3.21E-03	3.21E-03	3.21E-03	3.21E-03	3.21E-03	3.22E-03	3.22E-03	3.22E-03	3.22E-03	3.23E-03	3.23E-03	3.23E-03	3.23E-03	3.23E-03	3.23E-03	3.23E-03
V (Dissolved)	mg/L	9.00E-03	9.00E-03	9.00E-03	9.00E-03	9.00E-03	8.99E-03	8.99E-03	8.99E-03	8.99E-03	8.99E-03	9.00E-03	9.00E-03	9.00E-03	9.00E-03	9.01E-03	9.02E-03	9.02E-03	9.02E-03	9.03E-03	9.05E-03	9.06E-03	9.06E-03	9.06E-03	9.07E-03	9.07E-03	9.07E-03
Zn (Dissolved)	mg/L	3.26E-02	3.26E-02	3.26E-02	3.26E-02	3.25E-02	3.25E-02	3.25E-02	3.25E-02	3.25E-02	3.25E-02	3.26E-02	3.26E-02	3.26E-02	3.26E-02	3.26E-02	3.26E-02	3.26E-02	3.26E-02	3.27E-02	3.27E-02	3.28E-02	3.28E-02	3.28E-02	3.28E-02	3.28E-02	3.28E-02
Zr (Dissolved)	mg/L	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04
Hg - (Dissolved)	mg/L	7.39E-05	7.39E-05	7.38E-05	7.38E-05	7.38E-05	7.38E-05	7.38E-05	7.38E-05	7.38E-05	7.38E-05	7.39E-05	7.39E-05	7.38E-05	7.38E-05	7.39E-05	7.40E-05	7.40E-05	7.40E-05	7.41E-05	7.43E-05	7.43E-05	7.43E-05	7.44E-05	7.44E-05	7.44E-05	7.44E-05

APPENDIX A2 - EXPECTED CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 10.2 Out

Parameter	Unit	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290
Year																												
Physical Tests																												
Acidity to pH 4.5 (as CaCO3)	mg/L	1.86E+01	1.86E+01	1.86E+01	1.86E+01	1.86E+01	1.86E+01	1.86E+01	1.86E+01	1.86E+01	1.86E+01	1.86E+01	1.86E+01	1.86E+01	1.86E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01
Acidity to pH 8.3 (as CaCO3)	mg/L	1.90E+01	1.90E+01	1.90E+01	1.90E+01	1.90E+01	1.90E+01	1.90E+01	1.90E+01	1.90E+01	1.90E+01	1.90E+01	1.89E+01	1.89E+01	1.89E+01	1.89E+01	1.89E+01	1.89E+01	1.89E+01	1.89E+01	1.89E+01	1.89E+01	1.89E+01	1.89E+01	1.89E+01	1.89E+01	1.89E+01	1.89E+01
Alkalinity (Total as CaCO3)	mg/L	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01
Hardness as CaCO3 (Dissolved)	mg/L	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02
H+ Concentration	mg/L																											
Dissolved Anions																												
Sulphate (Dissolved)	mg/L	5.69E+02	5.69E+02	5.69E+02	5.69E+02	5.68E+02	5.68E+02	5.68E+02	5.68E+02	5.68E+02	5.68E+02	5.68E+02	5.68E+02	5.68E+02	5.67E+02	5.67E+02	5.67E+02	5.67E+02	5.67E+02	5.67E+02	5.66E+02	5.66E+02	5.66E+02	5.66E+02	5.65E+02	5.65E+02	5.65E+02	5.65E+02
Chloride (Dissolved)	mg/L	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00
Fluoride (Dissolved)	mg/L	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02
Nutrients																												
Nitrate (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrite (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Orthophosphate (Dissolved)	mg/L																											
Dissolved Metals																												
Al (Dissolved)	mg/L	6.92E-01	6.92E-01	6.92E-01	6.92E-01	6.92E-01	6.91E-01	6.91E-01	6.91E-01	6.91E-01	6.91E-01	6.91E-01	6.91E-01	6.91E-01	6.90E-01	6.90E-01	6.90E-01	6.90E-01	6.90E-01	6.89E-01	6.89E-01	6.89E-01	6.89E-01	6.88E-01	6.87E-01	6.87E-01	6.87E-01	6.87E-01
Sb (Dissolved)	mg/L	6.27E-03	6.27E-03	6.27E-03	6.27E-03	6.27E-03	6.27E-03	6.27E-03	6.26E-03	6.26E-03	6.26E-03	6.26E-03	6.26E-03	6.26E-03	6.26E-03	6.26E-03	6.25E-03	6.25E-03	6.25E-03	6.25E-03	6.25E-03	6.25E-03	6.24E-03	6.24E-03	6.24E-03	6.23E-03	6.23E-03	6.23E-03
As (Dissolved)	mg/L	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.03E-02	1.03E-02	1.03E-02	1.03E-02
Ba (Dissolved)	mg/L	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02
Be (Dissolved)	mg/L	3.72E-04	3.72E-04	3.72E-04	3.72E-04	3.72E-04	3.72E-04	3.72E-04	3.72E-04	3.71E-04	3.71E-04	3.71E-04	3.71E-04	3.71E-04	3.71E-04	3.71E-04	3.71E-04	3.71E-04	3.71E-04	3.71E-04	3.70E-04	3.70E-04	3.70E-04	3.70E-04	3.70E-04	3.69E-04	3.69E-04	3.69E-04
Bi (Dissolved)	mg/L	1.87E-04	1.87E-04	1.87E-04	1.87E-04	1.87E-04	1.87E-04	1.87E-04	1.87E-04	1.87E-04	1.87E-04	1.87E-04	1.86E-04	1.86E-04	1.86E-04	1.86E-04	1.86E-04	1.86E-04	1.86E-04	1.86E-04	1.86E-04	1.86E-04	1.86E-04	1.86E-04	1.86E-04	1.86E-04	1.86E-04	1.86E-04
B (Dissolved)	mg/L	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02
Cd (Dissolved)	mg/L	2.09E-04	2.09E-04	2.09E-04	2.09E-04	2.09E-04	2.09E-04	2.09E-04	2.09E-04	2.09E-04	2.09E-04	2.09E-04	2.09E-04	2.09E-04	2.09E-04	2.09E-04	2.09E-04	2.09E-04	2.09E-04	2.08E-04	2.08E-04	2.08E-04	2.08E-04	2.08E-04	2.08E-04	2.08E-04	2.08E-04	2.08E-04
Ca (Dissolved)	mg/L	3.08E+02	3.08E+02	3.08E+02	3.08E+02	3.08E+02	3.08E+02	3.08E+02	3.08E+02	3.08E+02	3.08E+02	3.08E+02	3.08E+02	3.08E+02	3.08E+02	3.08E+02	3.08E+02	3.07E+02	3.07E+02	3.07E+02	3.07E+02	3.07E+02	3.07E+02	3.07E+02	3.06E+02	3.06E+02	3.06E+02	3.06E+02
Cr (Dissolved)	mg/L	4.53E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.52E-03	4.51E-03	4.51E-03	4.51E-03	4.51E-03	4.51E-03	4.51E-03	4.51E-03	4.51E-03	4.51E-03	4.50E-03	4.50E-03	4.50E-03	4.49E-03	4.49E-03	4.49E-03
Co (Dissolved)	mg/L	1.56E-03	1.56E-03	1.56E-03	1.56E-03	1.56E-03	1.56E-03	1.56E-03	1.56E-03	1.56E-03	1.56E-03	1.56E-03	1.56E-03	1.56E-03	1.56E-03	1.56E-03	1.56E-03	1.56E-03	1.56E-03	1.55E-03	1.55E-03	1.55E-03	1.55E-03	1.55E-03	1.55E-03	1.55E-03	1.55E-03	1.55E-03
Cu (Dissolved)	mg/L	1.56E-02	1.56E-02	1.56E-02	1.56E-02	1.56E-02	1.56E-02	1.56E-02	1.56E-02	1.56E-02	1.56E-02	1.56E-02	1.56E-02	1.56E-02	1.56E-02	1.56E-02	1.56E-02	1.56E-02	1.56E-02	1.56E-02	1.56E-02	1.55E-02	1.55E-02	1.55E-02	1.55E-02	1.55E-02	1.55E-02	1.55E-02
Fe (Dissolved)	mg/L	1.25E-01	1.25E-01	1.25E-01	1.25E-01	1.25E-01	1.25E-01	1.25E-01	1.25E-01	1.25E-01	1.25E-01	1.25E-01	1.25E-01	1.25E-01	1.25E-01	1.25E-01	1.25E-01	1.25E-01	1.25E-01	1.25E-01	1.25E-01	1.25E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01
Pb (Dissolved)	mg/L	1.07E-03	1.07E-03	1.07E-03	1.07E-03	1.07E-03	1.07E-03	1.07E-03	1.07E-03	1.07E-03	1.07E-03	1.07E-03	1.07E-03	1.07E-03	1.07E-03	1.07E-03	1.07E-03	1.07E-03	1.07E-03	1.06E-03	1.06E-03	1.06E-03	1.06E-03	1.06E-03	1.06E-03	1.06E-03	1.06E-03	1.06E-03
Li (Dissolved)	mg/L	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03
Mg (Dissolved)	mg/L	2.53E+02	2.53E+02	2.53E+02	2.53E+02	2.53E+02	2.53E+02	2.53E+02	2.53E+02	2.52E+02	2.52E+02	2.52E+02	2.52E+02	2.52E+02	2.52E+02	2.52E+02	2.52E+02	2.52E+02	2.52E+02	2.52E+02	2.52E+02	2.52E+02	2.52E+02	2.52E+02	2.51E+02	2.51E+02	2.51E+02	2.51E+02
Mn (Dissolved)	mg/L	6.85E-02	6.84E-02	6.84E-02	6.84E-02	6.84E-02	6.84E-02	6.84E-02	6.84E-02	6.83E-02	6.83E-02	6.83E-02	6.83E-02	6.83E-02	6.83E-02	6.83E-02	6.83E-02	6.82E-02	6.82E-02	6.82E-02	6.82E-02	6.82E-02	6.81E-02	6.81E-02	6.81E-02	6.80E-02	6.80E-02	6.80E-02
Mo (Dissolved)	mg/L	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02
Ni (Dissolved)	mg/L	9.71E-03	9.71E-03	9.71E-03	9.71E-03	9.71E-03	9.70E-03	9.70E-03	9.70E-03	9.70E-03	9.70E-03	9.69E-03	9.69E-03	9.69E-03	9.69E-03	9.69E-03	9.68E-03	9.68E-03	9.68E-03	9.67E-03	9.67E-03	9.67E-03	9.67E-03	9.66E-03	9.65E-03	9.65E-03	9.64E-03	9.64E-03
P (Dissolved)	mg/L	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02
K (Dissolved)	mg/L	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00
Si (Dissolved)	mg/L	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01
Ag (Dissolved)	mg/L	1.89E-04	1.89E-04	1.89E-04	1.89E-04	1.89E-04	1.88E-04	1.88E-04	1.88E-04	1.88E-04	1.88E-04	1.88E-04	1.88E-04	1.88E-04	1.88E-04	1.88E-04	1.88E-04	1.88E-04	1.88E-04	1.88E-04	1.88E-04	1.88E-04	1.88E-04	1.88E-04	1.87E-04	1.87E-04	1.87E-04	1.87E-04
Na (Dissolved)	mg/L	2.00E+00	2.00E+00	2.00E+00	2.00E+00	2.00E+00	2.00E+00	2.00E+00	2.00E+00	2.00E+00	2.00E+00	2.00E+00	2.00E+00	2.00E+00	2.00E+00	2.00E+00	2.00E+00	2.00E+00	2.00E+00	2.00E+00	2.00E+00	2.00E+00	1.99E+00	1.99E+00	1.99E+00	1.99E+00	1.99E+00	1.99E+00
Sr (Dissolved)	mg/L	1.51E+00	1.51E+00	1.51E+00	1.51E+00	1.51E+00	1.51E+00	1.51E+00	1.51E+00	1.51E+00	1.51E+00	1.51E+00	1.51E+00	1.51E+00	1.51E+00	1.51E+00	1.50E+00	1.50E+00	1.50E+00	1.50E+00	1.50E+00	1.50E+00	1.50E+00	1.50E+00	1.50E+00	1.50E+00	1.50E+00	1.50E+00
S (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tl (Dissolved)	mg/L	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04
Sn (Dissolved)	mg/L	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04
Ti (Dissolved)	mg/L	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02
U (Dissolved)	mg/L	3.23E-03	3.23E-03	3.23E-03	3.23E-03	3.23E-03	3.23E-03	3.23E-03	3.23E-03	3.23E-03	3.23E-03	3.23E-03	3.23E-03	3.22E-03	3.22E-03	3.22E-03	3.22E-03	3.22E-03	3.22E-03	3.22E-03	3.22E-03	3.22E-03	3.22E-03	3.21E-03	3.21E-03	3.21E-03	3.21E-03	3.21E-03
V (Dissolved)	mg/L	9.07E-03	9.06E-03	9.06E-03	9.06E-03	9.06E-03	9.06E-03	9.06E-03	9.05E-03	9.05E-03	9.05E-03	9.05E-03	9.05E-03	9.05E-03	9.04E-03	9.04E-03	9.04E-03	9.04E-03	9.04E-03	9.03E-03	9.03E-03	9.03E-03	9.03E-03	9.02E-03	9.02E-03	9.01E-03	9.00E-03	9.00E-03	9.00E-03
Zn (Dissolved)	mg/L	3.28E-02	3.28E-02	3.28E-02	3.28E-02	3.28E-02	3.28E-02	3.28E-02	3.28E-02	3.28E-02	3.27E-02	3.27E-02	3.27E-02	3.27E-02	3.27E-02	3.27E-02	3.27E-02	3.27E-02	3.27E-02	3.27E-02	3.27E-02	3.27E-02	3.27E-02	3.26E-02	3.26E-02	3.26E-02	3.26E-02	3.26E-02
Zr (Dissolved)	mg/L	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04
Hg - (Dissolved)	mg/L	7.44E-05	7.44E-05	7.44E-05	7.44E-05	7.43E-05	7.43E-05	7.43E-05	7.43E-05	7.43E-05	7.43E-05	7.43E-05	7.42E-05	7.42E-05	7.42E-05	7.42E-05	7.42E-05	7.42E-05	7.42E-05	7.41E-05	7.41E-05	7.41E-05	7.41E-05	7.40E-05	7.39E-05	7.39E-05	7.39E-05	7.39E-05

APPENDIX A2 - EXPECTED CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 10.2 Out

Parameter	Unit	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316
Year																											
Physical Tests																											
Acidity to pH 4.5 (as CaCO3)	mg/L	1.85E+01	1.85E+01	1.85E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.83E+01	1.83E+01	1.83E+01	1.83E+01	1.83E+01	1.83E+01	1.83E+01	1.83E+01	1.83E+01	1.83E+01	1.83E+01	1.83E+01
Acidity to pH 8.3 (as CaCO3)	mg/L	1.88E+01	1.88E+01	1.88E+01	1.88E+01	1.88E+01	1.88E+01	1.88E+01	1.88E+01	1.88E+01	1.88E+01	1.88E+01	1.88E+01	1.88E+01	1.88E+01	1.87E+01	1.87E+01	1.87E+01	1.87E+01	1.87E+01	1.87E+01	1.87E+01	1.87E+01	1.87E+01	1.87E+01	1.87E+01	1.87E+01
Alkalinity (Total as CaCO3)	mg/L	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01
Hardness as CaCO3 (Dissolved)	mg/L	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02
H+ Concentration	mg/L																										
Dissolved Anions																											
Sulphate (Dissolved)	mg/L	5.65E+02	5.64E+02	5.64E+02	5.64E+02	5.64E+02	5.64E+02	5.63E+02	5.63E+02	5.63E+02	5.63E+02	5.62E+02	5.62E+02	5.62E+02	5.62E+02	5.61E+02	5.61E+02	5.61E+02	5.60E+02	5.60E+02	5.60E+02	5.60E+02	5.60E+02	5.60E+02	5.60E+02	5.60E+02	5.60E+02
Chloride (Dissolved)	mg/L	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00
Fluoride (Dissolved)	mg/L	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02
Nutrients																											
Nitrate (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrite (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Orthophosphate (Dissolved)	mg/L																										
Dissolved Metals																											
Al (Dissolved)	mg/L	6.87E-01	6.87E-01	6.87E-01	6.87E-01	6.86E-01	6.86E-01	6.85E-01	6.85E-01	6.85E-01	6.85E-01	6.84E-01	6.84E-01	6.84E-01	6.84E-01	6.82E-01	6.82E-01	6.82E-01	6.82E-01	6.82E-01	6.82E-01	6.82E-01	6.81E-01	6.81E-01	6.81E-01	6.81E-01	6.81E-01
Sb (Dissolved)	mg/L	6.23E-03	6.22E-03	6.22E-03	6.22E-03	6.22E-03	6.22E-03	6.21E-03	6.21E-03	6.21E-03	6.20E-03	6.20E-03	6.20E-03	6.20E-03	6.20E-03	6.18E-03	6.18E-03	6.18E-03	6.18E-03	6.18E-03	6.18E-03	6.18E-03	6.18E-03	6.18E-03	6.17E-03	6.17E-03	6.17E-03
As (Dissolved)	mg/L	1.03E-02	1.03E-02	1.03E-02	1.03E-02	1.03E-02	1.03E-02	1.03E-02	1.03E-02	1.03E-02	1.03E-02	1.03E-02	1.03E-02	1.03E-02	1.03E-02	1.03E-02	1.03E-02	1.03E-02	1.03E-02	1.03E-02	1.02E-02	1.02E-02	1.02E-02	1.02E-02	1.02E-02	1.02E-02	1.02E-02
Ba (Dissolved)	mg/L	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02
Be (Dissolved)	mg/L	3.69E-04	3.69E-04	3.69E-04	3.69E-04	3.69E-04	3.69E-04	3.68E-04	3.68E-04	3.68E-04	3.68E-04	3.68E-04	3.68E-04	3.68E-04	3.68E-04	3.67E-04	3.67E-04	3.67E-04	3.67E-04	3.66E-04	3.66E-04	3.66E-04	3.66E-04	3.66E-04	3.66E-04	3.66E-04	3.66E-04
Bi (Dissolved)	mg/L	1.85E-04	1.85E-04	1.85E-04	1.85E-04	1.85E-04	1.85E-04	1.85E-04	1.85E-04	1.85E-04	1.85E-04	1.85E-04	1.85E-04	1.85E-04	1.85E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04
B (Dissolved)	mg/L	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02
Cd (Dissolved)	mg/L	2.08E-04	2.08E-04	2.08E-04	2.08E-04	2.08E-04	2.08E-04	2.07E-04	2.07E-04	2.07E-04	2.07E-04	2.07E-04	2.07E-04	2.07E-04	2.07E-04	2.06E-04	2.06E-04	2.06E-04	2.06E-04	2.06E-04	2.06E-04	2.06E-04	2.06E-04	2.06E-04	2.06E-04	2.06E-04	2.06E-04
Ca (Dissolved)	mg/L	3.06E+02	3.06E+02	3.06E+02	3.06E+02	3.06E+02	3.06E+02	3.05E+02	3.05E+02	3.05E+02	3.05E+02	3.05E+02	3.05E+02	3.05E+02	3.05E+02	3.04E+02	3.04E+02	3.04E+02	3.04E+02	3.04E+02	3.04E+02	3.04E+02	3.04E+02	3.04E+02	3.04E+02	3.03E+02	3.03E+02
Cr (Dissolved)	mg/L	4.49E-03	4.49E-03	4.49E-03	4.49E-03	4.49E-03	4.49E-03	4.48E-03	4.48E-03	4.48E-03	4.48E-03	4.47E-03	4.47E-03	4.47E-03	4.47E-03	4.46E-03	4.46E-03	4.46E-03	4.46E-03	4.46E-03	4.46E-03	4.46E-03	4.46E-03	4.46E-03	4.45E-03	4.45E-03	4.45E-03
Co (Dissolved)	mg/L	1.55E-03	1.55E-03	1.55E-03	1.55E-03	1.55E-03	1.55E-03	1.54E-03	1.54E-03	1.54E-03	1.54E-03	1.54E-03	1.54E-03	1.54E-03	1.54E-03	1.54E-03	1.54E-03	1.54E-03	1.54E-03	1.54E-03	1.54E-03	1.54E-03	1.54E-03	1.54E-03	1.54E-03	1.54E-03	1.54E-03
Cu (Dissolved)	mg/L	1.55E-02	1.55E-02	1.55E-02	1.55E-02	1.55E-02	1.55E-02	1.55E-02	1.55E-02	1.54E-02	1.54E-02	1.54E-02	1.54E-02	1.54E-02	1.54E-02	1.54E-02	1.54E-02	1.54E-02	1.54E-02	1.54E-02	1.54E-02	1.54E-02	1.54E-02	1.54E-02	1.54E-02	1.54E-02	1.54E-02
Fe (Dissolved)	mg/L	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01
Pb (Dissolved)	mg/L	1.06E-03	1.06E-03	1.06E-03	1.06E-03	1.06E-03	1.06E-03	1.06E-03	1.06E-03	1.06E-03	1.06E-03	1.06E-03	1.06E-03	1.06E-03	1.06E-03	1.05E-03	1.05E-03	1.05E-03	1.05E-03	1.05E-03	1.05E-03	1.05E-03	1.05E-03	1.05E-03	1.05E-03	1.05E-03	1.05E-03
Li (Dissolved)	mg/L	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03
Mg (Dissolved)	mg/L	2.51E+02	2.51E+02	2.51E+02	2.51E+02	2.51E+02	2.51E+02	2.50E+02	2.50E+02	2.50E+02	2.50E+02	2.50E+02	2.50E+02	2.50E+02	2.50E+02	2.49E+02	2.49E+02	2.49E+02	2.49E+02	2.49E+02	2.49E+02	2.49E+02	2.49E+02	2.49E+02	2.49E+02	2.49E+02	2.49E+02
Mn (Dissolved)	mg/L	6.79E-02	6.79E-02	6.79E-02	6.79E-02	6.79E-02	6.79E-02	6.77E-02	6.77E-02	6.77E-02	6.77E-02	6.77E-02	6.77E-02	6.77E-02	6.76E-02	6.75E-02	6.75E-02	6.75E-02	6.74E-02	6.74E-02	6.74E-02	6.74E-02	6.74E-02	6.74E-02	6.74E-02	6.73E-02	6.73E-02
Mo (Dissolved)	mg/L	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02
Ni (Dissolved)	mg/L	9.64E-03	9.64E-03	9.64E-03	9.63E-03	9.63E-03	9.63E-03	9.61E-03	9.61E-03	9.61E-03	9.61E-03	9.60E-03	9.60E-03	9.60E-03	9.60E-03	9.58E-03	9.57E-03	9.57E-03	9.57E-03	9.57E-03	9.57E-03	9.56E-03	9.56E-03	9.56E-03	9.56E-03	9.56E-03	9.55E-03
P (Dissolved)	mg/L	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02
K (Dissolved)	mg/L	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00
Si (Dissolved)	mg/L	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01
Ag (Dissolved)	mg/L	1.87E-04	1.87E-04	1.87E-04	1.87E-04	1.87E-04	1.87E-04	1.87E-04	1.87E-04	1.87E-04	1.87E-04	1.87E-04	1.87E-04	1.86E-04	1.86E-04	1.86E-04	1.86E-04	1.86E-04	1.86E-04	1.86E-04	1.86E-04	1.86E-04	1.86E-04	1.86E-04	1.86E-04	1.86E-04	1.86E-04
Na (Dissolved)	mg/L	1.99E+00	1.99E+00	1.99E+00	1.99E+00	1.99E+00	1.99E+00	1.98E+00	1.98E+00	1.98E+00	1.98E+00	1.98E+00	1.98E+00	1.98E+00	1.98E+00	1.98E+00	1.97E+00	1.97E+00	1.97E+00	1.97E+00	1.97E+00	1.97E+00	1.97E+00	1.97E+00	1.97E+00	1.97E+00	1.97E+00
Sr (Dissolved)	mg/L	1.50E+00	1.50E+00	1.50E+00	1.50E+00	1.50E+00	1.50E+00	1.49E+00	1.49E+00	1.49E+00	1.49E+00	1.49E+00	1.49E+00	1.49E+00	1.49E+00	1.49E+00	1.49E+00	1.49E+00	1.49E+00	1.49E+00	1.49E+00	1.49E+00	1.49E+00	1.49E+00	1.49E+00	1.48E+00	1.48E+00
S (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tl (Dissolved)	mg/L	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04
Sn (Dissolved)	mg/L	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04
Ti (Dissolved)	mg/L	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02
U (Dissolved)	mg/L	3.21E-03	3.21E-03	3.21E-03	3.21E-03	3.21E-03	3.20E-03	3.20E-03	3.20E-03	3.20E-03	3.20E-03	3.20E-03	3.20E-03	3.19E-03	3.19E-03	3.19E-03	3.19E-03	3.18E-03	3.18E-03	3.18E-03	3.18E-03	3.18E-03	3.18E-03	3.18E-03	3.18E-03	3.18E-03	3.18E-03
V (Dissolved)	mg/L	9.00E-03	9.00E-03	8.99E-03	8.99E-03	8.99E-03	8.99E-03	8.97E-03	8.97E-03	8.97E-03	8.97E-03	8.96E-03	8.96E-03	8.96E-03	8.96E-03	8.94E-03	8.94E-03	8.93E-03	8.93E-03	8.93E-03	8.93E-03	8.93E-03	8.93E-03	8.93E-03	8.92E-03	8.92E-03	8.92E-03
Zn (Dissolved)	mg/L	3.26E-02	3.26E-02	3.25E-02	3.25E-02	3.25E-02	3.25E-02	3.25E-02	3.25E-02	3.24E-02	3.24E-02	3.24E-02	3.24E-02	3.24E-02	3.24E-02	3.23E-02	3.23E-02	3.23E-02	3.23E-02	3.23E-02	3.23E-02	3.23E-02	3.23E-02	3.23E-02	3.23E-02	3.23E-02	3.23E-02
Zr (Dissolved)	mg/L	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04
Hg - (Dissolved)	mg/L	7.38E-05	7.38E-05	7.38E-05	7.38E-05	7.38E-05	7.38E-05	7.36E-05	7.36E-05	7.36E-05	7.36E-05	7.36E-05	7.36E-05	7.35E-05	7.35E-05	7.33E-05	7.33E-05	7.33E-05	7.33E-05	7.33E-05	7.33E-05	7.33E-05	7.32E-05	7.32E-05	7.32E-05	7.32E-05	7.32E-05

APPENDIX A2 - EXPECTED CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 10.2 Out

Parameter	Unit	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342
Year																											
Physical Tests																											
Acidity to pH 4.5 (as CaCO3)	mg/L	1.83E+01	1.83E+01	1.83E+01	1.83E+01	1.83E+01	1.83E+01	1.83E+01	1.83E+01	1.82E+01	1.82E+01	1.82E+01	1.82E+01	1.82E+01	1.82E+01	1.82E+01	1.82E+01	1.82E+01	1.82E+01	1.82E+01	1.82E+01	1.82E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01
Acidity to pH 8.3 (as CaCO3)	mg/L	1.87E+01	1.87E+01	1.87E+01	1.87E+01	1.87E+01	1.87E+01	1.87E+01	1.86E+01	1.86E+01	1.86E+01	1.86E+01	1.86E+01	1.86E+01	1.86E+01	1.86E+01	1.86E+01	1.86E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01
Alkalinity (Total as CaCO3)	mg/L	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01
Hardness as CaCO3 (Dissolved)	mg/L	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02
H+ Concentration	mg/L																										
Dissolved Anions																											
Sulphate (Dissolved)	mg/L	5.59E+02	5.59E+02	5.59E+02	5.59E+02	5.59E+02	5.59E+02	5.59E+02	5.59E+02	5.57E+02	5.56E+02	5.56E+02	5.56E+02	5.56E+02	5.56E+02	5.56E+02	5.56E+02	5.56E+02	5.56E+02	5.56E+02	5.55E+02	5.55E+02	5.55E+02	5.55E+02	5.55E+02	5.55E+02	5.55E+02	5.55E+02
Chloride (Dissolved)	mg/L	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00
Fluoride (Dissolved)	mg/L	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02
Nutrients																											
Nitrate (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrite (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Orthophosphate (Dissolved)	mg/L																										
Dissolved Metals																											
Al (Dissolved)	mg/L	6.81E-01	6.81E-01	6.80E-01	6.80E-01	6.80E-01	6.80E-01	6.80E-01	6.80E-01	6.77E-01	6.77E-01	6.77E-01	6.77E-01	6.77E-01	6.76E-01	6.76E-01	6.76E-01	6.76E-01	6.76E-01	6.76E-01	6.76E-01	6.75E-01	6.75E-01	6.75E-01	6.75E-01	6.75E-01	6.75E-01
Sb (Dissolved)	mg/L	6.17E-03	6.17E-03	6.17E-03	6.17E-03	6.16E-03	6.16E-03	6.16E-03	6.16E-03	6.14E-03	6.14E-03	6.13E-03	6.13E-03	6.13E-03	6.13E-03	6.13E-03	6.13E-03	6.13E-03	6.13E-03	6.13E-03	6.12E-03	6.12E-03	6.12E-03	6.12E-03	6.12E-03	6.12E-03	6.12E-03
As (Dissolved)	mg/L	1.02E-02	1.02E-02	1.02E-02	1.02E-02	1.02E-02	1.02E-02	1.02E-02	1.02E-02	1.02E-02	1.02E-02	1.02E-02	1.02E-02	1.02E-02	1.02E-02	1.02E-02	1.02E-02	1.02E-02	1.02E-02	1.02E-02	1.02E-02	1.02E-02	1.02E-02	1.02E-02	1.02E-02	1.01E-02	1.01E-02	1.01E-02
Ba (Dissolved)	mg/L	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02
Be (Dissolved)	mg/L	3.66E-04	3.66E-04	3.66E-04	3.66E-04	3.66E-04	3.65E-04	3.65E-04	3.65E-04	3.64E-04	3.64E-04	3.64E-04	3.64E-04	3.64E-04	3.64E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04	3.63E-04
Bi (Dissolved)	mg/L	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.83E-04	1.83E-04	1.83E-04	1.83E-04	1.83E-04	1.83E-04	1.83E-04	1.83E-04	1.83E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04
B (Dissolved)	mg/L	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02
Cd (Dissolved)	mg/L	2.06E-04	2.06E-04	2.06E-04	2.06E-04	2.06E-04	2.06E-04	2.06E-04	2.06E-04	2.05E-04	2.05E-04	2.05E-04	2.05E-04	2.05E-04	2.05E-04	2.05E-04	2.04E-04	2.04E-04	2.04E-04	2.04E-04	2.04E-04	2.04E-04	2.04E-04	2.04E-04	2.04E-04	2.04E-04	2.04E-04
Ca (Dissolved)	mg/L	3.03E+02	3.03E+02	3.03E+02	3.03E+02	3.03E+02	3.03E+02	3.03E+02	3.03E+02	3.02E+02	3.02E+02	3.02E+02	3.02E+02	3.01E+02	3.01E+02	3.01E+02	3.01E+02	3.01E+02	3.01E+02	3.01E+02	3.01E+02	3.01E+02	3.01E+02	3.01E+02	3.01E+02	3.01E+02	3.01E+02
Cr (Dissolved)	mg/L	4.45E-03	4.45E-03	4.45E-03	4.45E-03	4.45E-03	4.45E-03	4.45E-03	4.44E-03	4.43E-03	4.43E-03	4.43E-03	4.42E-03	4.42E-03	4.42E-03	4.42E-03	4.42E-03	4.42E-03	4.42E-03	4.42E-03	4.42E-03	4.42E-03	4.42E-03	4.42E-03	4.41E-03	4.41E-03	4.41E-03
Co (Dissolved)	mg/L	1.54E-03	1.53E-03	1.53E-03	1.53E-03	1.53E-03	1.53E-03	1.53E-03	1.53E-03	1.53E-03	1.53E-03	1.53E-03	1.53E-03	1.53E-03	1.53E-03	1.53E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03
Cu (Dissolved)	mg/L	1.54E-02	1.54E-02	1.54E-02	1.54E-02	1.53E-02	1.53E-02	1.53E-02	1.53E-02	1.53E-02	1.53E-02	1.53E-02	1.53E-02	1.53E-02	1.53E-02	1.53E-02	1.53E-02	1.53E-02	1.53E-02	1.52E-02	1.52E-02	1.52E-02	1.52E-02	1.52E-02	1.52E-02	1.52E-02	1.52E-02
Fe (Dissolved)	mg/L	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01
Pb (Dissolved)	mg/L	1.05E-03	1.05E-03	1.05E-03	1.05E-03	1.05E-03	1.05E-03	1.05E-03	1.05E-03	1.05E-03	1.05E-03	1.05E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03
Li (Dissolved)	mg/L	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03
Mg (Dissolved)	mg/L	2.49E+02	2.49E+02	2.49E+02	2.49E+02	2.48E+02	2.48E+02	2.48E+02	2.48E+02	2.47E+02	2.47E+02	2.47E+02	2.47E+02	2.47E+02	2.47E+02	2.47E+02	2.47E+02	2.47E+02	2.47E+02	2.47E+02	2.47E+02	2.47E+02	2.47E+02	2.47E+02	2.47E+02	2.47E+02	2.47E+02
Mn (Dissolved)	mg/L	6.73E-02	6.73E-02	6.73E-02	6.73E-02	6.73E-02	6.73E-02	6.72E-02	6.72E-02	6.70E-02	6.70E-02	6.69E-02	6.69E-02	6.69E-02	6.69E-02	6.69E-02	6.69E-02	6.69E-02	6.68E-02	6.68E-02	6.68E-02	6.68E-02	6.68E-02	6.68E-02	6.68E-02	6.68E-02	6.67E-02
Mo (Dissolved)	mg/L	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02
Ni (Dissolved)	mg/L	9.55E-03	9.55E-03	9.55E-03	9.55E-03	9.54E-03	9.54E-03	9.54E-03	9.54E-03	9.50E-03	9.50E-03	9.50E-03	9.50E-03	9.49E-03	9.49E-03	9.49E-03	9.49E-03	9.49E-03	9.48E-03	9.48E-03	9.48E-03	9.48E-03	9.48E-03	9.48E-03	9.47E-03	9.47E-03	9.47E-03
P (Dissolved)	mg/L	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02
K (Dissolved)	mg/L	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00
Si (Dissolved)	mg/L	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01
Ag (Dissolved)	mg/L	1.86E-04	1.86E-04	1.85E-04	1.85E-04	1.85E-04	1.85E-04	1.85E-04	1.85E-04	1.85E-04	1.85E-04	1.85E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04
Na (Dissolved)	mg/L	1.97E+00	1.97E+00	1.97E+00	1.97E+00	1.97E+00	1.97E+00	1.97E+00	1.97E+00	1.96E+00	1.96E+00	1.96E+00	1.96E+00	1.96E+00	1.96E+00	1.96E+00	1.96E+00	1.96E+00	1.96E+00	1.96E+00	1.96E+00	1.96E+00	1.96E+00	1.96E+00	1.95E+00	1.95E+00	1.95E+00	1.95E+00
Sr (Dissolved)	mg/L	1.48E+00	1.48E+00	1.48E+00	1.48E+00	1.48E+00	1.48E+00	1.48E+00	1.48E+00	1.48E+00	1.48E+00	1.48E+00	1.48E+00	1.48E+00	1.48E+00	1.47E+00	1.47E+00	1.47E+00	1.47E+00	1.47E+00	1.47E+00	1.47E+00	1.47E+00	1.47E+00	1.47E+00	1.47E+00	1.47E+00
S (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tl (Dissolved)	mg/L	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04
Sn (Dissolved)	mg/L	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04
Ti (Dissolved)	mg/L	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02
U (Dissolved)	mg/L	3.18E-03	3.18E-03	3.18E-03	3.18E-03	3.18E-03	3.18E-03	3.17E-03	3.17E-03	3.16E-03	3.16E-03	3.16E-03	3.16E-03	3.16E-03	3.16E-03	3.16E-03	3.16E-03	3.16E-03	3.16E-03	3.16E-03	3.15E-03	3.15E-03	3.15E-03	3.15E-03	3.15E-03	3.15E-03	3.15E-03
V (Dissolved)	mg/L	8.92E-03	8.91E-03	8.91E-03	8.91E-03	8.91E-03	8.91E-03	8.91E-03	8.90E-03	8.87E-03	8.87E-03	8.87E-03	8.86E-03	8.86E-03	8.86E-03	8.86E-03	8.86E-03	8.86E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.84E-03	8.84E-03	8.84E-03
Zn (Dissolved)	mg/L	3.23E-02	3.23E-02	3.22E-02	3.22E-02	3.22E-02	3.22E-02	3.22E-02	3.22E-02	3.21E-02	3.21E-02	3.21E-02	3.21E-02	3.21E-02	3.21E-02	3.21E-02	3.20E-02	3.20E-02	3.20E-02	3.20E-02	3.20E-02	3.20E-02	3.20E-02	3.20E-02	3.20E-02	3.20E-02	3.20E-02
Zr (Dissolved)	mg/L	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04
Hg - (Dissolved)	mg/L	7.32E-05	7.32E-05	7.31E-05	7.31E-05	7.31E-05	7.31E-05	7.31E-05	7.31E-05	7.28E-05	7.28E-05	7.28E-05	7.27E-05	7.27E-05	7.27E-05	7.27E-05	7.27E-05	7.27E-05	7.27E-05	7.26E-05	7.26E-05	7.26E-05	7.26E-05	7.26E-05	7.26E-05	7.26E-05	7.25E-05

APPENDIX A2 - EXPECTED CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 10.2 Out

Parameter	Unit	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369
Year																												
Physical Tests																												
Acidity to pH 4.5 (as CaCO3)	mg/L	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.80E+01	1.80E+01	1.80E+01	1.80E+01	1.80E+01
Acidity to pH 8.3 (as CaCO3)	mg/L	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01
Alkalinity (Total as CaCO3)	mg/L	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01
Hardness as CaCO3 (Dissolved)	mg/L	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02
H+ Concentration	mg/L																											
Dissolved Anions																												
Sulphate (Dissolved)	mg/L	5.54E+02	5.54E+02	5.54E+02	5.54E+02	5.54E+02	5.54E+02	5.54E+02	5.54E+02	5.54E+02	5.53E+02	5.53E+02	5.53E+02	5.53E+02	5.53E+02	5.53E+02	5.53E+02	5.53E+02	5.53E+02	5.53E+02	5.52E+02	5.52E+02	5.52E+02	5.52E+02	5.52E+02	5.52E+02	5.52E+02	5.52E+02	5.52E+02
Chloride (Dissolved)	mg/L	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00
Fluoride (Dissolved)	mg/L	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02
Nutrients																												
Nitrate (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrite (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Orthophosphate (Dissolved)	mg/L																											
Dissolved Metals																												
Al (Dissolved)	mg/L	6.75E-01	6.75E-01	6.74E-01	6.74E-01	6.74E-01	6.74E-01	6.74E-01	6.74E-01	6.74E-01	6.73E-01	6.73E-01	6.73E-01	6.73E-01	6.73E-01	6.73E-01	6.73E-01	6.72E-01	6.72E-01	6.72E-01	6.72E-01	6.72E-01	6.72E-01	6.72E-01	6.72E-01	6.71E-01	6.71E-01	6.71E-01
Sb (Dissolved)	mg/L	6.11E-03	6.11E-03	6.11E-03	6.11E-03	6.11E-03	6.11E-03	6.11E-03	6.11E-03	6.10E-03	6.10E-03	6.10E-03	6.10E-03	6.10E-03	6.10E-03	6.10E-03	6.10E-03	6.09E-03	6.09E-03	6.09E-03	6.09E-03	6.09E-03	6.09E-03	6.09E-03	6.09E-03	6.08E-03	6.08E-03	6.08E-03
As (Dissolved)	mg/L	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02
Ba (Dissolved)	mg/L	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02
Be (Dissolved)	mg/L	3.63E-04	3.63E-04	3.62E-04	3.62E-04	3.62E-04	3.62E-04	3.62E-04	3.62E-04	3.62E-04	3.62E-04	3.62E-04	3.62E-04	3.62E-04	3.62E-04	3.62E-04	3.62E-04	3.61E-04	3.61E-04	3.61E-04	3.61E-04	3.61E-04	3.61E-04	3.61E-04	3.61E-04	3.61E-04	3.61E-04	3.61E-04
Bi (Dissolved)	mg/L	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.81E-04	1.81E-04	1.81E-04	1.81E-04	1.81E-04	1.81E-04	1.81E-04	1.81E-04	1.81E-04
B (Dissolved)	mg/L	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02
Cd (Dissolved)	mg/L	2.04E-04	2.04E-04	2.04E-04	2.04E-04	2.04E-04	2.04E-04	2.04E-04	2.04E-04	2.04E-04	2.04E-04	2.04E-04	2.04E-04	2.04E-04	2.03E-04	2.03E-04	2.03E-04	2.03E-04	2.03E-04	2.03E-04	2.03E-04	2.03E-04	2.03E-04	2.03E-04	2.03E-04	2.03E-04	2.03E-04	2.03E-04
Ca (Dissolved)	mg/L	3.01E+02	3.01E+02	3.01E+02	3.00E+02	3.00E+02	3.00E+02	3.00E+02	3.00E+02	3.00E+02	3.00E+02	3.00E+02	3.00E+02	3.00E+02	3.00E+02	3.00E+02	3.00E+02	3.00E+02	3.00E+02	3.00E+02	2.99E+02	2.99E+02	2.99E+02	2.99E+02	2.99E+02	2.99E+02	2.99E+02	2.99E+02
Cr (Dissolved)	mg/L	4.41E-03	4.41E-03	4.41E-03	4.41E-03	4.41E-03	4.41E-03	4.41E-03	4.40E-03	4.40E-03	4.40E-03	4.40E-03	4.40E-03	4.40E-03	4.40E-03	4.40E-03	4.40E-03	4.40E-03	4.40E-03	4.40E-03	4.39E-03	4.39E-03	4.39E-03	4.39E-03	4.39E-03	4.39E-03	4.39E-03	4.39E-03
Co (Dissolved)	mg/L	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.52E-03	1.51E-03	1.51E-03	1.51E-03	1.51E-03
Cu (Dissolved)	mg/L	1.52E-02	1.52E-02	1.52E-02	1.52E-02	1.52E-02	1.52E-02	1.52E-02	1.52E-02	1.52E-02	1.52E-02	1.52E-02	1.52E-02	1.52E-02	1.52E-02	1.52E-02	1.52E-02	1.52E-02	1.52E-02	1.52E-02	1.52E-02	1.52E-02	1.52E-02	1.52E-02	1.52E-02	1.51E-02	1.51E-02	1.51E-02
Fe (Dissolved)	mg/L	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.21E-01	1.21E-01	1.21E-01	1.21E-01	1.21E-01	1.21E-01
Pb (Dissolved)	mg/L	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03
Li (Dissolved)	mg/L	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03
Mg (Dissolved)	mg/L	2.46E+02	2.46E+02	2.46E+02	2.46E+02	2.46E+02	2.46E+02	2.46E+02	2.46E+02	2.46E+02	2.46E+02	2.46E+02	2.46E+02	2.46E+02	2.46E+02	2.46E+02	2.46E+02	2.46E+02	2.46E+02	2.46E+02	2.46E+02	2.45E+02	2.45E+02	2.45E+02	2.45E+02	2.45E+02	2.45E+02	2.45E+02
Mn (Dissolved)	mg/L	6.67E-02	6.67E-02	6.67E-02	6.67E-02	6.67E-02	6.67E-02	6.66E-02	6.66E-02	6.66E-02	6.66E-02	6.66E-02	6.66E-02	6.66E-02	6.66E-02	6.65E-02	6.65E-02	6.65E-02	6.65E-02	6.65E-02	6.65E-02	6.65E-02	6.64E-02	6.64E-02	6.64E-02	6.64E-02	6.64E-02	6.64E-02
Mo (Dissolved)	mg/L	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02
Ni (Dissolved)	mg/L	9.47E-03	9.47E-03	9.46E-03	9.46E-03	9.46E-03	9.46E-03	9.46E-03	9.45E-03	9.45E-03	9.45E-03	9.45E-03	9.45E-03	9.44E-03	9.44E-03	9.44E-03	9.44E-03	9.44E-03	9.43E-03	9.43E-03	9.43E-03	9.43E-03	9.43E-03	9.43E-03	9.42E-03	9.42E-03	9.42E-03	9.42E-03
P (Dissolved)	mg/L	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02
K (Dissolved)	mg/L	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00
Se (Dissolved)	mg/L	1.79E-02	1.79E-02	1.79E-02	1.79E-02	1.79E-02	1.79E-02	1.79E-02	1.79E-02	1.79E-02	1.79E-02	1.79E-02	1.79E-02	1.79E-02	1.79E-02	1.79E-02	1.79E-02	1.79E-02	1.79E-02	1.79E-02	1.78E-02	1.78E-02	1.78E-02	1.78E-02	1.78E-02	1.78E-02	1.78E-02	1.78E-02
Si (Dissolved)	mg/L	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.22E+01	1.22E+01	1.22E+01	1.22E+01	1.22E+01	1.22E+01	1.22E+01	1.22E+01	1.22E+01	1.22E+01	1.22E+01	1.22E+01	1.22E+01	1.22E+01	1.22E+01	1.22E+01	1.22E+01
Ag (Dissolved)	mg/L	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.84E-04	1.83E-04	1.83E-04	1.83E-04	1.83E-04	1.83E-04	1.83E-04	1.83E-04	1.83E-04	1.83E-04	1.83E-04	1.83E-04	1.83E-04	1.83E-04	1.83E-04	1.83E-04	1.83E-04
Na (Dissolved)	mg/L	1.95E+00	1.95E+00	1.95E+00	1.95E+00	1.95E+00	1.95E+00	1.95E+00	1.95E+00	1.95E+00	1.95E+00	1.95E+00	1.95E+00	1.95E+00	1.95E+00	1.95E+00	1.95E+00	1.95E+00	1.95E+00	1.95E+00	1.95E+00	1.95E+00	1.94E+00	1.94E+00	1.94E+00	1.94E+00	1.94E+00	1.94E+00
Sr (Dissolved)	mg/L	1.47E+00	1.47E+00	1.47E+00	1.47E+00	1.47E+00	1.47E+00	1.47E+00	1.47E+00	1.47E+00	1.47E+00	1.47E+00	1.47E+00	1.47E+00	1.47E+00	1.47E+00	1.47E+00	1.47E+00	1.47E+00	1.47E+00	1.47E+00	1.47E+00	1.46E+00	1.46E+00	1.46E+00	1.46E+00	1.46E+00	1.46E+00
S (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tl (Dissolved)	mg/L	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04
Sn (Dissolved)	mg/L	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04
Ti (Dissolved)	mg/L	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02
U (Dissolved)	mg/L	3.15E-03	3.15E-03	3.15E-03	3.15E-03	3.15E-03	3.15E-03	3.15E-03	3.15E-03	3.15E-03	3.14E-03	3.14E-03	3.14E-03	3.14E-03	3.14E-03	3.14E-03	3.14E-03	3.14E-03	3.14E-03	3.14E-03	3.14E-03	3.14E-03	3.14E-03	3.14E-03	3.14E-03	3.13E-03	3.13E-03	3.13E-03
V (Dissolved)	mg/L	8.84E-03	8.84E-03	8.83E-03	8.83E-03	8.83E-03	8.83E-03	8.83E-03	8.82E-03	8.82E-03	8.82E-03	8.82E-03	8.82E-03	8.82E-03	8.81E-03	8.81E-03	8.81E-03	8.81E-03	8.81E-03	8.81E-03	8.80E-03	8.80E-03	8.80E-03	8.80E-03	8.80E-03	8.79E-03	8.79E-03	8.79E-03
Zn (Dissolved)	mg/L	3.20E-02	3.20E-02	3.20E-02	3.20E-02	3.19E-02	3.19E-02	3.19E-02	3.19E-02	3.19E-02	3.19E-02	3.19E-02	3.19E-02	3.19E-02	3.19E-02	3.19E-02	3.19E-02	3.19E-02	3.19E-02	3.19E-02	3.19E-02	3.18E-02	3.18E-02	3.18E-02	3.18E-02	3.18E-02	3.18E-02	3.18E-02
Zr (Dissolved)	mg/L	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04
Hg - (Dissolved)	mg/L	7.25E-05	7.25E-05	7.25E-05	7.25E-05	7.25E-05	7.24E-05	7.24E-05	7.24E-05	7.24E-05	7.24E-05	7.24E-05	7.24E-05	7.23E-05	7.23E-05	7.23E-05	7.23E-05	7.23E-05	7.23E-05	7.23E-05	7.22E-05	7.22E-05	7.22E-05	7.22E-05	7.22E-05	7.22E-05	7.22E-05	7.21E-05

APPENDIX A2 - EXPECTED CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 10.2 Out

Parameter	Unit	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395
Year																											
Physical Tests																											
Acidity to pH 4.5 (as CaCO3)	mg/L	1.80E+01	1.80E+01	1.80E+01	1.80E+01	1.80E+01	1.80E+01	1.80E+01	1.80E+01	1.80E+01	1.80E+01	1.80E+01	1.80E+01	1.80E+01	1.80E+01	1.80E+01	1.80E+01	1.80E+01	1.80E+01	1.80E+01	1.80E+01	1.80E+01	1.80E+01	1.80E+01	1.79E+01	1.79E+01	1.79E+01
Acidity to pH 8.3 (as CaCO3)	mg/L	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.83E+01	1.83E+01	1.83E+01	1.83E+01	1.83E+01	1.83E+01	1.83E+01	1.83E+01	1.83E+01
Alkalinity (Total as CaCO3)	mg/L	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01
Hardness as CaCO3 (Dissolved)	mg/L	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02
H+ Concentration	mg/L																										
Dissolved Anions																											
Sulphate (Dissolved)	mg/L	5.51E+02	5.51E+02	5.51E+02	5.51E+02	5.51E+02	5.51E+02	5.51E+02	5.51E+02	5.51E+02	5.50E+02	5.50E+02	5.50E+02	5.50E+02	5.50E+02	5.50E+02	5.50E+02	5.50E+02	5.50E+02	5.50E+02	5.49E+02	5.49E+02	5.49E+02	5.49E+02	5.49E+02	5.49E+02	5.49E+02	5.49E+02
Chloride (Dissolved)	mg/L	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00
Fluoride (Dissolved)	mg/L	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02
Nutrients																											
Nitrate (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrite (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Orthophosphate (Dissolved)	mg/L																										
Dissolved Metals																											
Al (Dissolved)	mg/L	6.71E-01	6.71E-01	6.71E-01	6.71E-01	6.70E-01	6.70E-01	6.70E-01	6.70E-01	6.70E-01	6.70E-01	6.70E-01	6.69E-01	6.69E-01	6.69E-01	6.69E-01	6.69E-01	6.69E-01	6.69E-01	6.69E-01	6.68E-01	6.68E-01	6.68E-01	6.68E-01	6.68E-01	6.68E-01	6.68E-01
Sb (Dissolved)	mg/L	6.08E-03	6.08E-03	6.08E-03	6.08E-03	6.08E-03	6.07E-03	6.07E-03	6.07E-03	6.07E-03	6.07E-03	6.07E-03	6.07E-03	6.07E-03	6.06E-03	6.06E-03	6.06E-03	6.06E-03	6.06E-03	6.06E-03	6.06E-03	6.06E-03	6.06E-03	6.05E-03	6.05E-03	6.05E-03	6.05E-03
As (Dissolved)	mg/L	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02
Ba (Dissolved)	mg/L	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02
Be (Dissolved)	mg/L	3.61E-04	3.61E-04	3.60E-04	3.60E-04	3.60E-04	3.60E-04	3.60E-04	3.60E-04	3.60E-04	3.60E-04	3.60E-04	3.60E-04	3.60E-04	3.60E-04	3.60E-04	3.60E-04	3.59E-04	3.59E-04	3.59E-04	3.59E-04	3.59E-04	3.59E-04	3.59E-04	3.59E-04	3.59E-04	3.59E-04
Bi (Dissolved)	mg/L	1.81E-04	1.81E-04	1.81E-04	1.81E-04	1.81E-04	1.81E-04	1.81E-04	1.81E-04	1.81E-04	1.81E-04	1.81E-04	1.81E-04	1.81E-04	1.81E-04	1.81E-04	1.81E-04	1.81E-04	1.81E-04	1.81E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04
B (Dissolved)	mg/L	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02
Cd (Dissolved)	mg/L	2.03E-04	2.03E-04	2.03E-04	2.03E-04	2.03E-04	2.03E-04	2.03E-04	2.03E-04	2.03E-04	2.03E-04	2.03E-04	2.02E-04	2.02E-04	2.02E-04	2.02E-04	2.02E-04	2.02E-04	2.02E-04	2.02E-04	2.02E-04	2.02E-04	2.02E-04	2.02E-04	2.02E-04	2.02E-04	2.02E-04
Ca (Dissolved)	mg/L	2.99E+02	2.99E+02	2.99E+02	2.99E+02	2.99E+02	2.99E+02	2.99E+02	2.99E+02	2.99E+02	2.98E+02	2.98E+02	2.98E+02	2.98E+02	2.98E+02	2.98E+02	2.98E+02	2.98E+02	2.98E+02	2.98E+02	2.98E+02	2.98E+02	2.98E+02	2.98E+02	2.98E+02	2.98E+02	2.97E+02
Cr (Dissolved)	mg/L	4.39E-03	4.39E-03	4.39E-03	4.38E-03	4.38E-03	4.38E-03	4.38E-03	4.38E-03	4.38E-03	4.38E-03	4.38E-03	4.38E-03	4.38E-03	4.38E-03	4.37E-03	4.37E-03	4.37E-03	4.37E-03	4.37E-03	4.37E-03	4.37E-03	4.37E-03	4.37E-03	4.37E-03	4.37E-03	4.36E-03
Co (Dissolved)	mg/L	1.51E-03	1.51E-03	1.51E-03	1.51E-03	1.51E-03	1.51E-03	1.51E-03	1.51E-03	1.51E-03	1.51E-03	1.51E-03	1.51E-03	1.51E-03	1.51E-03	1.51E-03	1.51E-03	1.51E-03	1.51E-03	1.51E-03	1.51E-03	1.51E-03	1.51E-03	1.51E-03	1.51E-03	1.51E-03	1.51E-03
Cu (Dissolved)	mg/L	1.51E-02	1.51E-02	1.51E-02	1.51E-02	1.51E-02	1.51E-02	1.51E-02	1.51E-02	1.51E-02	1.51E-02	1.51E-02	1.51E-02	1.51E-02	1.51E-02	1.51E-02	1.51E-02	1.51E-02	1.51E-02	1.51E-02	1.51E-02	1.51E-02	1.51E-02	1.51E-02	1.51E-02	1.51E-02	1.51E-02
Fe (Dissolved)	mg/L	1.21E-01	1.21E-01	1.21E-01	1.21E-01	1.21E-01	1.21E-01	1.21E-01	1.21E-01	1.21E-01	1.21E-01	1.21E-01	1.21E-01	1.21E-01	1.21E-01	1.21E-01	1.21E-01	1.21E-01	1.21E-01	1.21E-01	1.21E-01	1.21E-01	1.21E-01	1.21E-01	1.21E-01	1.21E-01	1.21E-01
Pb (Dissolved)	mg/L	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03	1.03E-03	1.03E-03	1.03E-03	1.03E-03	1.03E-03	1.03E-03	1.03E-03	1.03E-03	1.03E-03	1.03E-03	1.03E-03	1.03E-03	1.03E-03	1.03E-03	1.03E-03	1.03E-03	1.03E-03	1.03E-03	1.03E-03	1.03E-03	1.03E-03
Li (Dissolved)	mg/L	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03
Mg (Dissolved)	mg/L	2.45E+02	2.45E+02	2.45E+02	2.45E+02	2.45E+02	2.45E+02	2.45E+02	2.45E+02	2.45E+02	2.45E+02	2.45E+02	2.45E+02	2.45E+02	2.44E+02	2.44E+02	2.44E+02	2.44E+02	2.44E+02	2.44E+02	2.44E+02	2.44E+02	2.44E+02	2.44E+02	2.44E+02	2.44E+02	2.44E+02
Mn (Dissolved)	mg/L	6.64E-02	6.63E-02	6.63E-02	6.63E-02	6.63E-02	6.63E-02	6.63E-02	6.63E-02	6.63E-02	6.62E-02	6.62E-02	6.62E-02	6.62E-02	6.62E-02	6.62E-02	6.62E-02	6.61E-02	6.61E-02	6.61E-02	6.61E-02	6.61E-02	6.61E-02	6.61E-02	6.60E-02	6.60E-02	6.60E-02
Mo (Dissolved)	mg/L	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02
Ni (Dissolved)	mg/L	9.42E-03	9.41E-03	9.41E-03	9.41E-03	9.41E-03	9.41E-03	9.40E-03	9.40E-03	9.40E-03	9.40E-03	9.40E-03	9.39E-03	9.39E-03	9.39E-03	9.39E-03	9.39E-03	9.39E-03	9.38E-03	9.38E-03	9.38E-03	9.38E-03	9.38E-03	9.37E-03	9.37E-03	9.37E-03	9.37E-03
P (Dissolved)	mg/L	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02
K (Dissolved)	mg/L	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00
Se (Dissolved)	mg/L	1.78E-02	1.78E-02	1.78E-02	1.78E-02	1.78E-02	1.78E-02	1.78E-02	1.78E-02	1.78E-02	1.78E-02	1.78E-02	1.78E-02	1.78E-02	1.78E-02	1.78E-02	1.78E-02	1.78E-02	1.78E-02	1.78E-02	1.77E-02	1.77E-02	1.77E-02	1.77E-02	1.77E-02	1.77E-02	1.77E-02
Si (Dissolved)	mg/L	1.22E+01	1.22E+01	1.22E+01	1.22E+01	1.22E+01	1.22E+01	1.22E+01	1.22E+01	1.22E+01	1.22E+01	1.22E+01	1.22E+01	1.22E+01	1.22E+01	1.22E+01	1.22E+01	1.22E+01	1.22E+01	1.22E+01	1.22E+01	1.22E+01	1.22E+01	1.22E+01	1.22E+01	1.21E+01	1.21E+01
Ag (Dissolved)	mg/L	1.83E-04	1.83E-04	1.83E-04	1.83E-04	1.83E-04	1.83E-04	1.83E-04	1.83E-04	1.83E-04	1.83E-04	1.83E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04
Na (Dissolved)	mg/L	1.94E+00	1.94E+00	1.94E+00	1.94E+00	1.94E+00	1.94E+00	1.94E+00	1.94E+00	1.94E+00	1.94E+00	1.94E+00	1.94E+00	1.94E+00	1.94E+00	1.94E+00	1.94E+00	1.94E+00	1.94E+00	1.94E+00	1.93E+00	1.93E+00	1.93E+00	1.93E+00	1.93E+00	1.93E+00	1.93E+00
Sr (Dissolved)	mg/L	1.46E+00	1.46E+00	1.46E+00	1.46E+00	1.46E+00	1.46E+00	1.46E+00	1.46E+00	1.46E+00	1.46E+00	1.46E+00	1.46E+00	1.46E+00	1.46E+00	1.46E+00	1.46E+00	1.46E+00	1.46E+00	1.46E+00	1.46E+00	1.46E+00	1.46E+00	1.46E+00	1.46E+00	1.46E+00	1.46E+00
S (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tl (Dissolved)	mg/L	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04
Sn (Dissolved)	mg/L	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04
Ti (Dissolved)	mg/L	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02
U (Dissolved)	mg/L	3.13E-03	3.13E-03	3.13E-03	3.13E-03	3.13E-03	3.13E-03	3.13E-03	3.13E-03	3.13E-03	3.13E-03	3.13E-03	3.13E-03	3.13E-03	3.12E-03	3.12E-03	3.12E-03	3.12E-03	3.12E-03	3.12E-03	3.12E-03	3.12E-03	3.12E-03	3.12E-03	3.12E-03	3.12E-03	3.12E-03
V (Dissolved)	mg/L	8.79E-03	8.79E-03	8.79E-03	8.78E-03	8.78E-03	8.78E-03	8.78E-03	8.78E-03	8.77E-03	8.77E-03	8.77E-03	8.77E-03	8.77E-03	8.77E-03	8.76E-03	8.76E-03	8.76E-03	8.76E-03	8.76E-03	8.76E-03	8.75E-03	8.75E-03	8.75E-03	8.75E-03	8.75E-03	8.74E-03
Zn (Dissolved)	mg/L	3.18E-02	3.18E-02	3.18E-02	3.18E-02	3.18E-02	3.18E-02	3.18E-02	3.18E-02	3.17E-02	3.17E-02	3.17E-02	3.17E-02	3.17E-02	3.17E-02	3.17E-02	3.17E-02	3.17E-02	3.17E-02	3.17E-02	3.17E-02	3.17E-02	3.17E-02	3.17E-02	3.17E-02	3.16E-02	3.16E-02
Zr (Dissolved)	mg/L	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04
Hg - (Dissolved)	mg/L	7.21E-05	7.21E-05	7.21E-05	7.21E-05	7.21E-05	7.21E-05	7.20E-05	7.20E-05	7.20E-05	7.20E-05	7.20E-05	7.20E-05	7.19E-05	7.19E-05	7.19E-05	7.19E-05	7.19E-05	7.19E-05	7.19E-05	7.18E-05	7.18E-05	7.18E-05	7.18E-05	7.18E-05	7.18E-05	7.18E-05

APPENDIX A2 - EXPECTED CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 10.2 Out

Parameter	Unit	396	397	398	399	400	401
Year							
Physical Tests							
Acidity to pH 4.5 (as CaCO3)	mg/L	1.79E+01	1.79E+01	1.79E+01	1.79E+01	1.79E+01	1.79E+01
Acidity to pH 8.3 (as CaCO3)	mg/L	1.83E+01	1.83E+01	1.83E+01	1.83E+01	1.83E+01	1.83E+01
Alkalinity (Total as CaCO3)	mg/L	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01
Hardness as CaCO3 (Dissolved)	mg/L	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02
H+ Concentration	mg/L						
Dissolved Anions							
Sulphate (Dissolved)	mg/L	5.49E+02	5.48E+02	5.48E+02	5.48E+02	5.48E+02	5.48E+02
Chloride (Dissolved)	mg/L	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00
Fluoride (Dissolved)	mg/L	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02
Nutrients							
Nitrate (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrite (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Orthophosphate (Dissolved)	mg/L						
Dissolved Metals							
Al (Dissolved)	mg/L	6.67E-01	6.67E-01	6.67E-01	6.67E-01	6.67E-01	6.67E-01
Sb (Dissolved)	mg/L	6.05E-03	6.05E-03	6.05E-03	6.05E-03	6.04E-03	6.04E-03
As (Dissolved)	mg/L	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02
Ba (Dissolved)	mg/L	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02
Be (Dissolved)	mg/L	3.59E-04	3.59E-04	3.59E-04	3.58E-04	3.58E-04	3.58E-04
Bi (Dissolved)	mg/L	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04
B (Dissolved)	mg/L	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02
Cd (Dissolved)	mg/L	2.02E-04	2.02E-04	2.02E-04	2.02E-04	2.02E-04	2.02E-04
Ca (Dissolved)	mg/L	2.97E+02	2.97E+02	2.97E+02	2.97E+02	2.97E+02	2.97E+02
Cr (Dissolved)	mg/L	4.36E-03	4.36E-03	4.36E-03	4.36E-03	4.36E-03	4.36E-03
Co (Dissolved)	mg/L	1.51E-03	1.50E-03	1.50E-03	1.50E-03	1.50E-03	1.50E-03
Cu (Dissolved)	mg/L	1.51E-02	1.51E-02	1.51E-02	1.51E-02	1.50E-02	1.50E-02
Fe (Dissolved)	mg/L	1.21E-01	1.21E-01	1.21E-01	1.21E-01	1.21E-01	1.21E-01
Pb (Dissolved)	mg/L	1.03E-03	1.03E-03	1.03E-03	1.03E-03	1.03E-03	1.03E-03
Li (Dissolved)	mg/L	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03
Mg (Dissolved)	mg/L	2.44E+02	2.44E+02	2.44E+02	2.44E+02	2.44E+02	2.44E+02
Mn (Dissolved)	mg/L	6.60E-02	6.60E-02	6.60E-02	6.60E-02	6.60E-02	6.59E-02
Mo (Dissolved)	mg/L	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02
Ni (Dissolved)	mg/L	9.37E-03	9.36E-03	9.36E-03	9.36E-03	9.36E-03	9.36E-03
P (Dissolved)	mg/L	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02
K (Dissolved)	mg/L	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00
Se (Dissolved)	mg/L	1.77E-02	1.77E-02	1.77E-02	1.77E-02	1.77E-02	1.77E-02
Si (Dissolved)	mg/L	1.21E+01	1.21E+01	1.21E+01	1.21E+01	1.21E+01	1.21E+01
Ag (Dissolved)	mg/L	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04
Na (Dissolved)	mg/L	1.93E+00	1.93E+00	1.93E+00	1.93E+00	1.93E+00	1.93E+00
Sr (Dissolved)	mg/L	1.46E+00	1.46E+00	1.45E+00	1.45E+00	1.45E+00	1.45E+00
S (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tl (Dissolved)	mg/L	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04
Sn (Dissolved)	mg/L	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04
Ti (Dissolved)	mg/L	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02
U (Dissolved)	mg/L	3.12E-03	3.12E-03	3.12E-03	3.11E-03	3.11E-03	3.11E-03
V (Dissolved)	mg/L	8.74E-03	8.74E-03	8.74E-03	8.74E-03	8.74E-03	8.73E-03
Zn (Dissolved)	mg/L	3.16E-02	3.16E-02	3.16E-02	3.16E-02	3.16E-02	3.16E-02
Zr (Dissolved)	mg/L	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04
Hg - (Dissolved)	mg/L	7.17E-05	7.17E-05	7.17E-05	7.17E-05	7.17E-05	7.17E-05

Parameter	Unit	All
Physical Tests		01/01/2013
Acidity to pH 4.5 (as CaCO3)	mg/m2	0.00E+00
Acidity to pH 8.3 (as CaCO3)	mg/m2	0.00E+00
Alkalinity (Total as CaCO3)	mg/m2	1.01E+05
Hardness as CaCO3 (Dissolved)	mg/m2	0.00E+00
H+ Concentration	mg/m2	3.18E-05
Dissolved Anions		
Sulphate (Dissolved)	mg/m2	1.69E+03
Chloride (Dissolved)	mg/m2	3.69E+01
Fluoride (Dissolved)	mg/m2	4.61E+04
Nutrients		
Nitrate (Dissolved)	mg/m2	8.24E+03
Ammonia (Dissolved)	mg/m2	1.04E+03
Nitrite (Dissolved)	mg/m2	1.90E+02
Orthophosphate (Dissolved)	mg/m2	0.00E+00
Dissolved Metals		
Al (Dissolved)	mg/m2	2.03E+01
Sb (Dissolved)	mg/m2	5.08E-01
As (Dissolved)	mg/m2	8.43E-01
Ba (Dissolved)	mg/m2	5.69E+00
Be (Dissolved)	mg/m2	3.00E-02
Bi (Dissolved)	mg/m2	1.51E-02
B (Dissolved)	mg/m2	1.51E+02
Cd (Dissolved)	mg/m2	1.69E-02
Ca (Dissolved)	mg/m2	2.50E+04
Cr (Dissolved)	mg/m2	3.00E-01
Co (Dissolved)	mg/m2	1.26E-01
Cu (Dissolved)	mg/m2	1.26E+00
Fe (Dissolved)	mg/m2	3.00E+00
Pb (Dissolved)	mg/m2	8.65E-02
Li (Dissolved)	mg/m2	1.56E+00
Mg (Dissolved)	mg/m2	2.05E+04
Mn (Dissolved)	mg/m2	5.54E+00
Mo (Dissolved)	mg/m2	3.00E+00
Ni (Dissolved)	mg/m2	7.87E-01
P (Dissolved)	mg/m2	0.00E+00
K (Dissolved)	mg/m2	7.43E+02
Se (Dissolved)	mg/m2	1.49E+00
Si (Dissolved)	mg/m2	1.02E+03
Ag (Dissolved)	mg/m2	1.53E-02
Na (Dissolved)	mg/m2	1.62E+02
Sr (Dissolved)	mg/m2	1.22E+02
S (Dissolved)	mg/m2	0.00E+00
Tl (Dissolved)	mg/m2	1.24E-02
Sn (Dissolved)	mg/m2	8.36E-01
Ti (Dissolved)	mg/m2	1.62E+00
U (Dissolved)	mg/m2	2.62E-01
V (Dissolved)	mg/m2	6.00E-01
Zn (Dissolved)	mg/m2	2.66E+00
Zr (Dissolved)	mg/m2	0.00E+00
Hg (Dissolved)	mg/m2	0.00E+00

APPENDIX A2 - EXPECTED CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 11.1 Out

Parameter	Unit	Year -2 (Coffer	Year -1 (Stag	Year 1 (Stag	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	End
Year		01/01/2013	01/01/2014	01/01/2015	01/01/2016	01/01/2017	01/01/2018	01/01/2019	01/01/2020	01/01/2021	01/01/2022	01/01/2023	01/01/2024	01/01/2025	01/01/2026	01/01/2027	01/01/2028	01/01/2029	01/01/2030	01/01/2031	01/01/2032	01/01/2033	01/01/2034	01/01/2035	01/01/2036	01/01/2037	01/01/2038	01/01/2039	01/01/2040	01/01/2041	01/01/2042	01/01/2043	01/01/2044	01/01/2045	01/01/2046	01/01/2047	31/12/2113
Physical Tests																																					
Acidity to pH 4.5 (as CaCO3)	mg/L	0.00E+00	0.00E+00	0.00E+00

APPENDIX A2 - EXPECTED CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 11.2 Out

Parameter	Unit	Year -2 (Cofferd	Year -1 (Stag	Year 1 (Stag	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	End
Year		01/01/2013	01/01/2014	01/01/2015	01/01/2016	01/01/2017	01/01/2018	01/01/2019	01/01/2020	01/01/2021	01/01/2022	01/01/2023	01/01/2024	01/01/2025	01/01/2026	01/01/2027	01/01/2028	01/01/2029	01/01/2030	01/01/2031	01/01/2032	01/01/2033	01/01/2034	01/01/2035	01/01/2036	01/01/2037	01/01/2038	01/01/2039	01/01/2040	01/01/2041	01/01/2042	01/01/2043	01/01/2044	01/01/2045	01/01/2046	01/01/2047	31/12/2113
Physical Tests																																					
Acidity to pH 4.5 (as CaCO3)	mg/L	0.00E+00	0.00E+00	0.00E+00

APPENDIX A2 - EXPECTED CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 11.3 Out

Parameter	Unit	Year -2 (Cofferd	Year -1 (Stag	Year 1 (Stag	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	End
Year		01/01/2013	01/01/2014	01/01/2015	01/01/2016	01/01/2017	01/01/2018	01/01/2019	01/01/2020	01/01/2021	01/01/2022	01/01/2023	01/01/2024	01/01/2025	01/01/2026	01/01/2027	01/01/2028	01/01/2029	01/01/2030	01/01/2031	01/01/2032	01/01/2033	01/01/2034	01/01/2035	01/01/2036	01/01/2037	01/01/2038	01/01/2039	01/01/2040	01/01/2041	01/01/2042	01/01/2043	01/01/2044	01/01/2045	01/01/2046	01/01/2047	31/12/2113
Physical Tests																																					
Acidity to pH 4.5 (as CaCO3)	mg/L	0.00E+00	0.00E+00	0.00E+00

APPENDIX A2 - EXPECTED CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 11.4 Out

Parameter	Unit	Year -2 (Cofferc	Year -1 (Stag	Year 1 (Stag	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	End
Year		01/01/2013	01/01/2014	01/01/2015	01/01/2016	01/01/2017	01/01/2018	01/01/2019	01/01/2020	01/01/2021	01/01/2022	01/01/2023	01/01/2024	01/01/2025	01/01/2026	01/01/2027	01/01/2028	01/01/2029	01/01/2030	01/01/2031	01/01/2032	01/01/2033	01/01/2034	01/01/2035	01/01/2036	01/01/2037	01/01/2038	01/01/2039	01/01/2040	01/01/2041	01/01/2042	01/01/2043	01/01/2044	01/01/2045	01/01/2046	01/01/2047	31/12/2113
Physical Tests																																					
Acidity to pH 4.5 (as CaCO3)	mg/L	0.00E+00	0.00E+00	0.00E+00

APPENDIX A2 - EXPECTED CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 11.5 Out

Parameter	Unit	Year -2 (Coffer	Year -1 (Stag	Year 1 (Stag	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	End
Year		01/01/2013	01/01/2014	01/01/2015	01/01/2016	01/01/2017	01/01/2018	01/01/2019	01/01/2020	01/01/2021	01/01/2022	01/01/2023	01/01/2024	01/01/2025	01/01/2026	01/01/2027	01/01/2028	01/01/2029	01/01/2030	01/01/2031	01/01/2032	01/01/2033	01/01/2034	01/01/2035	01/01/2036	01/01/2037	01/01/2038	01/01/2039	01/01/2040	01/01/2041	01/01/2042	01/01/2043	01/01/2044	01/01/2045	01/01/2046	01/01/2047	31/12/2113
Physical Tests																																					
Acidity to pH 4.5 (as CaCO3)	mg/L	0.00E+00	0.00E+00	0.00E+00

APPENDIX A2 - EXPECTED CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 12.1 Out

Parameter	Unit	Year -2 (Coffer	Year -1 (Stag	Year 1 (Stag	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	End
Year		01/01/2013	01/01/2014	01/01/2015	01/01/2016	01/01/2017	01/01/2018	01/01/2019	01/01/2020	01/01/2021	01/01/2022	01/01/2023	01/01/2024	01/01/2025	01/01/2026	01/01/2027	01/01/2028	01/01/2029	01/01/2030	01/01/2031	01/01/2032	01/01/2033	01/01/2034	01/01/2035	01/01/2036	01/01/2037	01/01/2038	01/01/2039	01/01/2040	01/01/2041	01/01/2042	01/01/2043	01/01/2044	01/01/2045	01/01/2046	01/01/2047	31/12/2113
Physical Tests																																					
Acidity to pH 4.5 (as CaCO3)	mg/L	0.00E+00	0.00E+00	0.00E+00

APPENDIX A2 - EXPECTED CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 12.2 Out

Parameter	Unit	Year -2 (Coffer	Year -1 (Stag	Year 1 (Stag	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	End
Year		01/01/2013	01/01/2014	01/01/2015	01/01/2016	01/01/2017	01/01/2018	01/01/2019	01/01/2020	01/01/2021	01/01/2022	01/01/2023	01/01/2024	01/01/2025	01/01/2026	01/01/2027	01/01/2028	01/01/2029	01/01/2030	01/01/2031	01/01/2032	01/01/2033	01/01/2034	01/01/2035	01/01/2036	01/01/2037	01/01/2038	01/01/2039	01/01/2040	01/01/2041	01/01/2042	01/01/2043	01/01/2044	01/01/2045	01/01/2046	01/01/2047	31/12/2113
Physical Tests																																					
Acidity to pH 4.5 (as CaCO3)	mg/L	0.00E+00	0.00E+00	0.00E+00

APPENDIX A2 - EXPECTED CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 12.3 Out

Parameter	Unit	Year -2 (Coffer	Year -1 (Stag	Year 1 (Stag	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	End
Year		01/01/2013	01/01/2014	01/01/2015	01/01/2016	01/01/2017	01/01/2018	01/01/2019	01/01/2020	01/01/2021	01/01/2022	01/01/2023	01/01/2024	01/01/2025	01/01/2026	01/01/2027	01/01/2028	01/01/2029	01/01/2030	01/01/2031	01/01/2032	01/01/2033	01/01/2034	01/01/2035	01/01/2036	01/01/2037	01/01/2038	01/01/2039	01/01/2040	01/01/2041	01/01/2042	01/01/2043	01/01/2044	01/01/2045	01/01/2046	01/01/2047	31/12/2113
Physical Tests																																					
Acidity to pH 4.5 (as CaCO3)	mg/L	0.00E+00	8.31E-03	8.31E-03	8.31E-03

APPENDIX A2 - EXPECTED CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 14 Out

Parameter	Unit	Year -2 (Cofferd	Year -1 (Stag	Year 1 (Stag	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	End
Year		01/01/2013	01/01/2014	01/01/2015	01/01/2016	01/01/2017	01/01/2018	01/01/2019	01/01/2020	01/01/2021	01/01/2022	01/01/2023	01/01/2024	01/01/2025	01/01/2026	01/01/2027	01/01/2028	01/01/2029	01/01/2030	01/01/2031	01/01/2032	01/01/2033	01/01/2034	01/01/2035	01/01/2036	01/01/2037	01/01/2038	01/01/2039	01/01/2040	01/01/2041	01/01/2042	01/01/2043	01/01/2044	01/01/2045	01/01/2046	01/01/2047	31/12/2113
Physical Tests																																					
Acidity to pH 4.5 (as CaCO3)	mg/L	0.00E+00	0.00E+00	0.00E+00

APPENDIX A2 - EXPECTED CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 15 Out

Parameter	Unit	Year -2 (Cofferd	Year -1 (Stag	Year 1 (Stag	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	End
Year		01/01/2013	01/01/2014	01/01/2015	01/01/2016	01/01/2017	01/01/2018	01/01/2019	01/01/2020	01/01/2021	01/01/2022	01/01/2023	01/01/2024	01/01/2025	01/01/2026	01/01/2027	01/01/2028	01/01/2029	01/01/2030	01/01/2031	01/01/2032	01/01/2033	01/01/2034	01/01/2035	01/01/2036	01/01/2037	01/01/2038	01/01/2039	01/01/2040	01/01/2041	01/01/2042	01/01/2043	01/01/2044	01/01/2045	01/01/2046	01/01/2047	31/12/2113
Physical Tests																																					
Acidity to pH 4.5 (as CaCO3)	mg/L	0.00E+00	0.00E+00	0.00E+00

APPENDIX A2 - EXPECTED CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 16 Out

Parameter	Unit	All
Physical Tests		01/01/2013
Acidity to pH 4.5 (as CaCO3)	mg/L	5.00E-01
Acidity to pH 8.3 (as CaCO3)	mg/L	5.00E-01
Alkalinity (Total as CaCO3)	mg/L	6.57E+01
Hardness as CaCO3 (Dissolved)	mg/L	8.79E+01
H+ Concentration	mg/L	3.18E-05
Dissolved Anions		
Sulphate (Dissolved)	mg/L	9.00E-01
Chloride (Dissolved)	mg/L	7.00E-02
Fluoride (Dissolved)	mg/L	1.33E+01
Nutrients		
Nitrate (Dissolved)	mg/L	0.00E+00
Ammonia (Dissolved)	mg/L	0.00E+00
Nitrite (Dissolved)	mg/L	0.00E+00
Orthophosphate (Dissolved)	mg/L	1.03E-02
Dissolved Metals		
Al (Dissolved)	mg/L	1.11E-02
Sb (Dissolved)	mg/L	4.30E-04
As (Dissolved)	mg/L	8.90E-04
Ba (Dissolved)	mg/L	8.66E-03
Be (Dissolved)	mg/L	1.00E-05
Bi (Dissolved)	mg/L	5.00E-06
B (Dissolved)	mg/L	5.00E-02
Cd (Dissolved)	mg/L	0.00E+00
Ca (Dissolved)	mg/L	1.70E+01
Cr (Dissolved)	mg/L	1.00E-04
Co (Dissolved)	mg/L	1.49E-04
Cu (Dissolved)	mg/L	2.44E-03
Fe (Dissolved)	mg/L	6.00E-03
Pb (Dissolved)	mg/L	1.50E-05
Li (Dissolved)	mg/L	1.40E-03
Mg (Dissolved)	mg/L	8.58E+00
Mn (Dissolved)	mg/L	3.15E-02
Mo (Dissolved)	mg/L	1.92E-02
Ni (Dissolved)	mg/L	4.80E-04
P (Dissolved)	mg/L	5.00E-03
K (Dissolved)	mg/L	9.20E-01
Se (Dissolved)	mg/L	9.15E-04
Si (Dissolved)	mg/L	2.05E+00
Ag (Dissolved)	mg/L	1.50E-05
Na (Dissolved)	mg/L	4.80E-01
Sr (Dissolved)	mg/L	2.43E-01
S (Dissolved)	mg/L	5.40E+00
Tl (Dissolved)	mg/L	2.00E-06
Sn (Dissolved)	mg/L	7.50E-05
Ti (Dissolved)	mg/L	5.00E-04
U (Dissolved)	mg/L	1.59E-04
V (Dissolved)	mg/L	2.00E-04
Zn (Dissolved)	mg/L	8.00E-04
Zr (Dissolved)	mg/L	1.00E-04
Hg (Dissolved)	mg/L	1.00E-05

APPENDIX A2 - EXPECTED CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 17.1 Out

Parameter	Unit	Year -2 (Constr	Year -1 (Stag	Year 1 (Stag	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	End
Year		01/01/2013	01/01/2014	01/01/2015	01/01/2016	01/01/2017	01/01/2018	01/01/2019	01/01/2020	01/01/2021	01/01/2022	01/01/2023	01/01/2024	01/01/2025	01/01/2026	01/01/2027	01/01/2028	01/01/2029	01/01/2030	01/01/2031	01/01/2032	01/01/2033	01/01/2034	01/01/2035	01/01/2036	01/01/2037	01/01/2038	01/01/2039	01/01/2040	01/01/2041	01/01/2042	01/01/2043	01/01/2044	01/01/2045	01/01/2046	01/01/2047	31/12/2113
Physical Tests																																					
Acidity to pH 4.5 (as CaCO3)	mg/m2/year	3.83E+00	3.83E+00	3.83E+00

APPENDIX A2 - EXPECTED CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 17.2 Out

Parameter	Unit	Year -2 (Coffer	Year -1 (Stag	Year 1 (Stag	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	End
Physical Tests		01/01/2013	01/01/2014	01/01/2015	01/01/2016	01/01/2017	01/01/2018	01/01/2019	01/01/2020	01/01/2021	01/01/2022	01/01/2023	01/01/2024	01/01/2025	01/01/2026	01/01/2027	01/01/2028	01/01/2029	01/01/2030	01/01/2031	01/01/2032	01/01/2033	01/01/2034	01/01/2035	01/01/2036	01/01/2037	01/01/2038	01/01/2039	01/01/2040	01/01/2041	01/01/2042	01/01/2043	01/01/2044	01/01/2045	01/01/2046	01/01/2047	31/12/2113
Acidity to pH 4.5 (as CaCO3)	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acidity to pH 8.3 (as CaCO3)	mg/L	0.00E+00	0.00E+00	0.00E+00

Parameter	Unit	All
Physical Tests		01/01/2013
Acidity to pH 4.5 (as CaCO3)	mg/L	5.00E-01
Acidity to pH 8.3 (as CaCO3)	mg/L	1.03E+00
Alkalinity (Total as CaCO3)	mg/L	9.20E+01
Hardness as CaCO3 (Dissolved)	mg/L	2.72E+02
H+ Concentration	mg/L	3.18E-05
Dissolved Anions		
Sulphate (Dissolved)	mg/L	3.17E+00
Chloride (Dissolved)	mg/L	1.00E-01
Fluoride (Dissolved)	mg/L	2.00E+02
Nutrients		
Nitrate (Dissolved)	mg/L	0.00E+00
Ammonia (Dissolved)	mg/L	0.00E+00
Nitrite (Dissolved)	mg/L	0.00E+00
Orthophosphate (Dissolved)	mg/L	4.66E-02
Dissolved Metals		
Al (Dissolved)	mg/L	1.66E-02
Sb (Dissolved)	mg/L	1.12E-03
As (Dissolved)	mg/L	1.78E-03
Ba (Dissolved)	mg/L	1.06E-02
Be (Dissolved)	mg/L	1.00E-05
Bi (Dissolved)	mg/L	5.00E-06
B (Dissolved)	mg/L	5.00E-02
Cd (Dissolved)	mg/L	1.86E-05
Ca (Dissolved)	mg/L	9.83E+01
Cr (Dissolved)	mg/L	2.00E-04
Co (Dissolved)	mg/L	3.21E-04
Cu (Dissolved)	mg/L	7.90E-03
Fe (Dissolved)	mg/L	1.17E-02
Pb (Dissolved)	mg/L	5.17E-05
Li (Dissolved)	mg/L	2.77E-03
Mg (Dissolved)	mg/L	1.46E+01
Mn (Dissolved)	mg/L	1.38E-01
Mo (Dissolved)	mg/L	7.69E-02
Ni (Dissolved)	mg/L	2.22E-03
P (Dissolved)	mg/L	2.26E-02
K (Dissolved)	mg/L	2.92E+00
Se (Dissolved)	mg/L	1.55E-03
Si (Dissolved)	mg/L	2.47E+00
Ag (Dissolved)	mg/L	7.40E-05
Na (Dissolved)	mg/L	9.07E-01
Sr (Dissolved)	mg/L	2.67E-01
S (Dissolved)	mg/L	7.98E+01
Tl (Dissolved)	mg/L	3.65E-06
Sn (Dissolved)	mg/L	2.79E-04
Ti (Dissolved)	mg/L	5.00E-04
U (Dissolved)	mg/L	1.43E-03
V (Dissolved)	mg/L	2.65E-04
Zn (Dissolved)	mg/L	1.67E-03
Zr (Dissolved)	mg/L	1.00E-04
Hg (Dissolved)	mg/L	2.65E-05

APPENDIX A2 - EXPECTED CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 19 Out

Parameter	Unit	Year -2 (Coffer	Year -1 (Stag	Year 1 (Stag	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	End
Year		01/01/2013	01/01/2014	01/01/2015	01/01/2016	01/01/2017	01/01/2018	01/01/2019	01/01/2020	01/01/2021	01/01/2022	01/01/2023	01/01/2024	01/01/2025	01/01/2026	01/01/2027	01/01/2028	01/01/2029	01/01/2030	01/01/2031	01/01/2032	01/01/2033	01/01/2034	01/01/2035	01/01/2036	01/01/2037	01/01/2038	01/01/2039	01/01/2040	01/01/2041	01/01/2042	01/01/2043	01/01/2044	01/01/2045	01/01/2046	01/01/2047	31/12/2113
Physical Tests																																					
Acidity to pH 4.5 (as CaCO3)	mg/L	0.00E+00	0.00E+00	0.00E+00

APPENDIX A2 - EXPECTED CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 20 Out

Parameter	Unit	Year -2 (Cofferd	Year -1 (Stag	Year 1 (Stag	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	End
Year		01/01/2013	01/01/2014	01/01/2015	01/01/2016	01/01/2017	01/01/2018	01/01/2019	01/01/2020	01/01/2021	01/01/2022	01/01/2023	01/01/2024	01/01/2025	01/01/2026	01/01/2027	01/01/2028	01/01/2029	01/01/2030	01/01/2031	01/01/2032	01/01/2033	01/01/2034	01/01/2035	01/01/2036	01/01/2037	01/01/2038	01/01/2039	01/01/2040	01/01/2041	01/01/2042	01/01/2043	01/01/2044	01/01/2045	01/01/2046	01/01/2047	31/12/2113
Physical Tests																																					
Acidity to pH 4.5 (as CaCO3)	mg/L	0.00E+00	0.00E+00	0.00E+00

APPENDIX A2 - EXPECTED CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 21 Out

Parameter	Unit	Year -2 (Coffer	Year -1 (Stag	Year 1 (Stag	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	End
Year		01/01/2013	01/01/2014	01/01/2015	01/01/2016	01/01/2017	01/01/2018	01/01/2019	01/01/2020	01/01/2021	01/01/2022	01/01/2023	01/01/2024	01/01/2025	01/01/2026	01/01/2027	01/01/2028	01/01/2029	01/01/2030	01/01/2031	01/01/2032	01/01/2033	01/01/2034	01/01/2035	01/01/2036	01/01/2037	01/01/2038	01/01/2039	01/01/2040	01/01/2041	01/01/2042	01/01/2043	01/01/2044	01/01/2045	01/01/2046	01/01/2047	31/12/2113
Physical Tests																																					
Acidity to pH 4.5 (as CaCO3)	mg/L	0.00E+00	0.00E+00	0.00E+00

APPENDIX A2 - EXPECTED CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 22 Out

Parameter	Unit	All
Physical Tests		01/01/2013
Acidity to pH 4.5 (as CaCO3)	mg/tonne	2.39E+01
Acidity to pH 8.3 (as CaCO3)	mg/tonne	2.46E+01
Alkalinity (Total as CaCO3)	mg/tonne	1.06E+03
Hardness as CaCO3 (Dissolved)	mg/tonne	2.49E+03
H+ Concentration	mg/tonne	3.18E-05
Dissolved Anions		
Sulphate (Dissolved)	mg/tonne	2.61E+01
Chloride (Dissolved)	mg/tonne	7.27E-01
Fluoride (Dissolved)	mg/tonne	1.45E+03
Nutrients		
Nitrate (Dissolved)	mg/tonne	0.00E+00
Ammonia (Dissolved)	mg/tonne	0.00E+00
Nitrite (Dissolved)	mg/tonne	0.00E+00
Orthophosphate (Dissolved)	mg/tonne	5.25E-01
Dissolved Metals		
Al (Dissolved)	mg/tonne	4.48E-01
Sb (Dissolved)	mg/tonne	8.49E-03
As (Dissolved)	mg/tonne	5.90E-03
Ba (Dissolved)	mg/tonne	1.22E-01
Be (Dissolved)	mg/tonne	5.99E-04
Bi (Dissolved)	mg/tonne	2.48E-04
B (Dissolved)	mg/tonne	2.39E+00
Cd (Dissolved)	mg/tonne	1.02E-02
Ca (Dissolved)	mg/tonne	4.44E+02
Cr (Dissolved)	mg/tonne	5.68E-03
Co (Dissolved)	mg/tonne	8.86E-02
Cu (Dissolved)	mg/tonne	8.62E-01
Fe (Dissolved)	mg/tonne	1.50E-01
Pb (Dissolved)	mg/tonne	1.01E-03
Li (Dissolved)	mg/tonne	2.51E-02
Mg (Dissolved)	mg/tonne	3.37E+02
Mn (Dissolved)	mg/tonne	2.73E+00
Mo (Dissolved)	mg/tonne	3.58E-02
Ni (Dissolved)	mg/tonne	4.89E-02
P (Dissolved)	mg/tonne	2.54E-01
K (Dissolved)	mg/tonne	2.43E+01
Se (Dissolved)	mg/tonne	4.80E-02
Si (Dissolved)	mg/tonne	1.63E+01
Ag (Dissolved)	mg/tonne	2.46E-04
Na (Dissolved)	mg/tonne	2.46E+00
Sr (Dissolved)	mg/tonne	1.87E+00
S (Dissolved)	mg/tonne	5.34E+02
Tl (Dissolved)	mg/tonne	4.26E-04
Sn (Dissolved)	mg/tonne	3.77E-02
Ti (Dissolved)	mg/tonne	2.49E-02
U (Dissolved)	mg/tonne	4.32E-03
V (Dissolved)	mg/tonne	1.21E-02
Zn (Dissolved)	mg/tonne	1.44E+00
Zr (Dissolved)	mg/tonne	4.79E-03
Hg (Dissolved)	mg/tonne	9.58E-05

APPENDIX A2 - EXPECTED CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 23 Out

Parameter	Unit	Year -2 (Cofferd	Year -1 (Stag	Year 1 (Stag	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	End
Year		01/01/2013	01/01/2014	01/01/2015	01/01/2016	01/01/2017	01/01/2018	01/01/2019	01/01/2020	01/01/2021	01/01/2022	01/01/2023	01/01/2024	01/01/2025	01/01/2026	01/01/2027	01/01/2028	01/01/2029	01/01/2030	01/01/2031	01/01/2032	01/01/2033	01/01/2034	01/01/2035	01/01/2036	01/01/2037	01/01/2038	01/01/2039	01/01/2040	01/01/2041	01/01/2042	01/01/2043	01/01/2044	01/01/2045	01/01/2046	01/01/2047	31/12/2113
Physical Tests																																					
Acidity to pH 4.5 (as CaCO3)	mg/t	0.00E+00	0.00E+00	0.00E+00

APPENDIX A2 - EXPECTED CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 23.2 Out

Parameter	Unit	All					
Physical Tests			01/01/2013	01/01/2013	01/01/2013	01/01/2013	01/01/2013
Acidity to pH 4.5 (as CaCO3)	mg/L		1.00E+06	1.00E+06	1.00E+06	1.00E+06	1.00E+06
Acidity to pH 8.3 (as CaCO3)	mg/L		1.00E+06	1.00E+06	1.00E+06	1.00E+06	1.00E+06
Alkalinity (Total as CaCO3)	mg/L		1.86E+02	1.86E+02	1.00E+06	1.00E+06	1.00E+06
Hardness as CaCO3 (Dissolved)	mg/L		1.00E+06	1.00E+06	1.00E+06	1.00E+06	1.00E+06
H+ Concentration	mg/L		3.18E-05	3.18E-05	1.00E+06	1.00E+06	1.00E+06
Dissolved Anions							
Sulphate (Dissolved)	mg/L		4.16E+01	4.16E+01	1.00E+06	1.00E+06	1.00E+06
Chloride (Dissolved)	mg/L		8.63E-01	8.63E-01	1.00E+06	1.00E+06	1.00E+06
Fluoride (Dissolved)	mg/L		1.50E+03	2.99E+03	1.00E+06	1.00E+06	1.00E+06
Nutrients							
Nitrate (Dissolved)	mg/L		1.00E+06	1.00E+06	1.00E+06	1.00E+06	1.00E+06
Ammonia (Dissolved)	mg/L		1.00E+06	1.00E+06	1.00E+06	1.00E+06	1.00E+06
Nitrite (Dissolved)	mg/L		1.00E+06	1.00E+06	1.00E+06	1.00E+06	1.00E+06
Orthophosphate (Dissolved)	mg/L		2.07E+06	2.07E+06	1.00E+06	1.00E+06	1.00E+06
Dissolved Metals							
Al (Dissolved)	mg/L		6.55E-01	3.39E-02	1.00E+06	1.00E+06	1.00E+06
Sb (Dissolved)	mg/L		3.71E-02	3.71E-02	1.00E+06	1.00E+06	1.00E+06
As (Dissolved)	mg/L		2.46E-02	2.46E-02	1.00E+06	1.00E+06	1.00E+06
Ba (Dissolved)	mg/L		7.11E-02	7.11E-02	1.00E+06	1.00E+06	1.00E+06
Be (Dissolved)	mg/L		5.00E-05	5.00E-05	1.00E+06	1.00E+06	1.00E+06
Bi (Dissolved)	mg/L		1.00E+06	1.00E+06	1.00E+06	1.00E+06	1.00E+06
B (Dissolved)	mg/L		3.00E-01	3.00E-01	1.00E+06	1.00E+06	1.00E+06
Cd (Dissolved)	mg/L		9.33E-03	4.66E-04	1.00E+06	1.00E+06	1.00E+06
Ca (Dissolved)	mg/L		1.97E+02	1.97E+02	1.00E+06	1.00E+06	1.00E+06
Cr (Dissolved)	mg/L		5.00E-04	5.00E-04	1.00E+06	1.00E+06	1.00E+06
Co (Dissolved)	mg/L		1.21E-01	1.09E-01	1.00E+06	1.00E+06	1.00E+06
Cu (Dissolved)	mg/L		3.58E-02	4.91E-02	1.00E+06	1.00E+06	1.00E+06
Fe (Dissolved)	mg/L		4.38E-05	5.00E-03	1.00E+06	1.00E+06	1.00E+06
Pb (Dissolved)	mg/L		2.85E-03	5.75E-04	1.00E+06	1.00E+06	1.00E+06
Li (Dissolved)	mg/L		1.00E+06	1.00E+06	1.00E+06	1.00E+06	1.00E+06
Mg (Dissolved)	mg/L		1.95E+02	1.95E+02	1.00E+06	1.00E+06	1.00E+06
Mn (Dissolved)	mg/L		4.24E-01	4.24E-01	1.00E+06	1.00E+06	1.00E+06
Mo (Dissolved)	mg/L		1.20E-01	1.20E-01	1.00E+06	1.00E+06	1.00E+06
Ni (Dissolved)	mg/L		1.54E+00	2.59E-02	1.00E+06	1.00E+06	1.00E+06
P (Dissolved)	mg/L		1.00E+06	1.00E+06	1.00E+06	1.00E+06	1.00E+06
K (Dissolved)	mg/L		1.00E+06	1.00E+06	1.00E+06	1.00E+06	1.00E+06
Se (Dissolved)	mg/L		2.77E-01	2.77E-01	1.00E+06	1.00E+06	1.00E+06
Si (Dissolved)	mg/L		1.00E+06	1.00E+06	1.00E+06	1.00E+06	1.00E+06
Ag (Dissolved)	mg/L		1.86E-04	1.86E-04	1.00E+06	1.00E+06	1.00E+06
Na (Dissolved)	mg/L		1.00E+06	1.00E+06	1.00E+06	1.00E+06	1.00E+06
Sr (Dissolved)	mg/L		1.00E+06	1.00E+06	1.00E+06	1.00E+06	1.00E+06
S (Dissolved)	mg/L		1.00E+06	1.00E+06	1.00E+06	1.00E+06	1.00E+06
Tl (Dissolved)	mg/L		2.59E-04	2.59E-04	1.00E+06	1.00E+06	1.00E+06
Sn (Dissolved)	mg/L		1.00E+06	1.00E+06	1.00E+06	1.00E+06	1.00E+06
Ti (Dissolved)	mg/L		1.00E+06	1.00E+06	1.00E+06	1.00E+06	1.00E+06
U (Dissolved)	mg/L		3.71E-02	3.71E-02	1.00E+06	1.00E+06	1.00E+06
V (Dissolved)	mg/L		1.00E+06	1.00E+06	1.00E+06	1.00E+06	1.00E+06
Zn (Dissolved)	mg/L		8.04E-01	3.85E-02	1.00E+06	1.00E+06	1.00E+06
Zr (Dissolved)	mg/L		1.00E+06	1.00E+06	1.00E+06	1.00E+06	1.00E+06
Hg (Dissolved)	mg/L		1.00E+06	1.00E+06	1.00E+06	1.00E+06	1.00E+06

APPENDIX A2 - EXPECTED CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 25 Out

Parameter	Unit	Year -2 (Cofferdan	Year -1 (Stage	Year 1 (Stage 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	End
Year		01/01/2013	01/01/2014	01/01/2015	01/01/2016	01/01/2017	01/01/2018	01/01/2019	01/01/2020	01/01/2021	01/01/2022	01/01/2023	01/01/2024	01/01/2025	01/01/2026	01/01/2027	01/01/2028	01/01/2029	01/01/2030	01/01/2031	01/01/2032	01/01/2033	01/01/2034	01/01/2035	01/01/2036	01/01/2037	01/01/2038	01/01/2039	01/01/2040	01/01/2041	01/01/2042	01/01/2043	01/01/2044	01/01/2045	01/01/2046	01/01/2047	31/12/2113
Physical Tests																																					
Acidity to pH 4.5 (as CaCO3)	mg/L	0.00E+00	0.00E+00	0.00E+00

APPENDIX A3

UPPER BOUND CASE GEOCHEMICAL SOURCE TERMS

(Pages A3-1 to A3-50)

Knight Piésold CONSULTING

TABLE A3.1

HARPER CREEK MINING CORPORATION
HARPER CREEK PROJECT

GEOCHEMICAL SOURCE TERMS
WORST CASE (WC)

Parameter	2 North Non-PAG Stockpile	3 Non-PAG Low Grade Ore Stockpile Outside TMF	4 PAG Low Grade Ore Stockpile	7.1 PAG Stockpile	7.2 PAG Stockpile	7.3 PAG Stockpile	9 East Overburden Stockpile	10.1 Pit walls	10.2 Acidified Highwall	10.3 Flushed Pit Walls
SO_4	0	0	0	0	0	0	0	0	0	0
Cl	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0
F	0.00	0.00	0.00	0.00	0	0.00	0.00	0.0	0.00	0.0
Hardness	0	0	0	0	0	0	0.0	0	0	0
Al - D	0.00	0.00	0.00	0.000	0	0.00	0.00	0.00	0.00	0.0
Sb - D	0.00	0.000	0.000	0.000	0	0.0000	0.000	0.0000	0.0000	0.0
As - D	0.000	0.000	0.000	0.000	0	0.00	0.000	0.000	0.000	0.0
Ba - D	0.00	0.00	0.00	0.00	0	0.000	0.00	0.00	0.000	0.0
Be - D	0.0000	0.0000	0.0000	0.00000	0	0	0.000000	0.00000	0.00000	0.00
Bi - D	0.0000	0.00000	0.0000	0.00000	0	0.0000000	0.000000	0.000000	0.00000	0.00
B - D	0	0	0	0	0	0	0	0	0.000	0
Cd - D	0.00000	0.00000	0.00000	0.00000	0	0.000000	0	0	0.000	0.00
Ca - D	0	0	0	0	0	0	0.0	0.0	0	0
Cr - D	0	0.000	0	0.0000	0	0.00000	0.0000	0.0000	0.0000	0.0
Co - D	0.00	0.00	0.00	0.000	0	0.00000	0.0000	0.0000	0.0000	0.0
Cu - D	0.00	0.0	0.0	0.0	0	0.0000	0.000	0.000	0.000	0.0
Fe - D	0.00	0.00	0.00	0	0	0.000	0.000	0.00	0.00	0
Pb - D	0.000	0.0000	0.000	0.000	0	0.00000	0.0000	0.000	0.0000	0.0
Li - D	0.000	0.000	0.000	0.000	0	0.0000	0.000	0.000	0	0.0
Mg - D	0	0.0	0	0.0	0	0	0.0	0.0	0.0	0
Mn - D	0.0	0.0	0.0	0.0	0	0.000	0.00	0.00	0.00	0
Mo - D	0.00	0.00	0.00	0.00	0	0.0000	0.00	0.00	0.00	0
Ni - D	0.00	0.00	0.00	0.000	0	0	0.0000	0.000	0.000	0.0
P - D	0	0	0	0	0	0.000	0.000	0.00	0	0
K - D	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0	0
Se - D	0.00	0.00	0.00	0.0	0	0.0000	0.000	0.000	0.000	0.0
Si - D	0.0	0.0	0.0	0	0	0.0	0.0	0.0	0.0	0
Ag - D	0.00000	0.00000	0.00000	0.00000	0	0	0.000000	0.000000	0.00000	0.000
Na - D	0.0	0.0	0.0	0.0	0	0.0	0.00	0.0	0.0	0
Sr - D	0.0	0.0	0.0	0.0	0	0.00	0.00	0.0	0.00	0
S - D	0	0	0	0	0	0.0	0.0	0.0	0	0
Tl - D	0.00000	0.00000	0.00000	0.00000	0	0.000000	0.000000	0.00000	0.00000	0.00
Sn - D	0	0.00	0	0.000	0	0	0.000	0.00	0.0000	0
Ti - D	0.000	0.000	0.000	0.000	0	0	0.0000	0.000	0.00	0.0
U - D	0.000	0.000	0.000	0.000	0	0.0000	0.0000	0.0000	0.0000	0.0
V - D	0	0	0	0	0	0.00000	0	0	0.00	0
Zn - D	0	0	0	0	0	0	0.000	0	0.000	0
Zr - D	0	0	0	0	0	0.0000	0	0	0.00000	0
Hg - D	0.00000	0.00000	0.00000	0.00000	0	0	0.000000	0.00000	0.000000	0.000
H^+ Concentration	0.000032	0.000032	0.000032	0.000032	0	0.000032	0.000032	0.000032	0.000032	0.000032
Orthophosphate	0.00	0.00	0.00	0.00	0	0	0.00	0.00	0.000	0
N as NO_3	0.0	0.0	0.0	0.0	0	0	0	0	0	0
N as NH_3	0.0	0.0	0.0	0.0	0	0	0	0	0	0
N as NO_2	0.0	0.0	0.0	0.0	0	0	0	0	0	0.0

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NOTES:

1. ALL UNITS IN mg/L EXCEPT SOURCE TERM 7.2 PAG STOCKPILE, WHICH IS IN mg/day.
2. THIS TABLE REPRESENTS MAXIMUM CONCENTRATIONS PROVIDED FOR EACH TERM. TIMING ASSUMPTIONS AND SCALING FACTORS WERE APPLIED TO THESE TERMS PRIOR TO INPUT INTO THE MODEL.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	03JUL'14	ISSUED WITH REPORT VA101-	MZP	EJA	JEM

Knight Piésold CONSULTING

TABLE A3.2

HARPER CREEK MINING CORPORATION
HARPER CREEK PROJECT

GEOCHEMICAL SOURCE TERMS
WORST CASE (WC)

Parameter	11.1 Tailings Dam	11.2 Tailings Dam	11.3 Tailings Dam	11.4 Tailings Dam	11.5 Tailings Dam	12.1 Seepage dams	12.2 Seepage dams	12.3 Seepage dams	14 Haul Road and Crusher Pad	15 Live ore pad and Live ore	16 Cleaner tailings
SO_4	0	0	0	0	0	0	0	0	0	0	0
Cl	0.0	0.0	0.0	0.0	0	0.00	0.000	0.000	0.0	0.0	0.0
F	0.00	0.00	0.000	0.000	0	0.0000	0.0000	0.00000	0.00	0.00	0.0
Hardness	0	0.0	0	0	0	0	0	0.0	0	0	0.0
Al - D	0.00	0.00	0.0	0.0	0	0.0000	0.0000	0.0000	0.00	0.00	0.000
Sb - D	0.00	0.0000	0.00000	0.00000	0	0.000000	0.000000	0.0000000	0.000	0.000	0.0000
As - D	0.000	0.000	0.0000	0.0000	0	0.00000	0.00000	0.000000	0.000	0.000	0.0000
Ba - D	0.00	0.00	0.000	0.000	0	0.0000	0.0000	0.00000	0.00	0.00	0.000
Be - D	0.0000	0.000000	0.000000	0.000000	0	0.00000000	0.00000000	0.00000000	0.00000	0.0000	0
Bi - D	0.0000	0.000000	0.00000	0.00000	0	0.00000000	0.00000000	0.000000000	0.00000	0.0000	0
B - D	0	0.00	0.000	0.000	0	0.0000	0.0000	0.00000	0	0	0
Cd - D	0.00000	0.00000	0.00000	0.00000	0	0.0000000	0.0000000	0.0000000	0.00000	0.00000	0.000000
Ca - D	0.0	0.0	0.0	0.0	0	0.00	0.00	0.00	0.0	0.0	0.0
Cr - D	0	0.00000	0.00000	0.00000	0	0.0000000	0.0000000	0.0000000	0.0000	0	0
Co - D	0.00	0.00000	0.00000	0.00000	0	0.00000	0.00000	0.0000000	0.000	0.00	0.00000
Cu - D	0.00	0.0000	0.0000	0.0000	0	0.000000	0.000000	0.00000	0.000	0	0.0000
Fe - D	0.00	0.000	0.000	0.000	0	0.0000	0.0000	0.00000	0.00	0.00	0.000
Pb - D	0.000	0.00000	0.0000	0.0000	0	0.000000	0.000000	0.0000000	0.000	0.000	0.000000
Li - D	0.000	0.000	0.00	0.00	0	0.00000	0.00000	0.000000	0.000	0.00	0.0000
Mg - D	0	0.0	0.0	0.0	0	0.00	0.00	0.00	0.0	0.0	0.0
Mn - D	0	0.0	0.000	0.000	0	0.000	0.000	0.00000	0.0	0.0	0.00
Mo - D	0.00	0.000	0.00	0.00	0	0.00000	0.000000	0.00000	0.00	0.00	0.000
Ni - D	0.00	0.0000	0.0000	0.0000	0	0.000000	0.000000	0.000000	0.000	0.00	0.0000
P - D	0	0.000	0.000	0.000	0	0.00000	0	0.00000	0.00	0	0.000
K - D	0.0	0.0	0.0	0.0	0	0.000	0.000	0.000	0.0	0.0	0.0
Se - D	0.00	0.0000	0.0000	0.0000	0	0.00000	0.00000	0.00000	0.00	0.00	0.0000
Si - D	0.0	0.0	0.00	0.00	0	0.000	0.000	0.000	0.0	0.0	0.0
Ag - D	0.00000	0.000000	0.000000	0.000000	0	0.00000000	0.00000000	0.00000000	0.00000	0.00000	0.000000
Na - D	0.0	0.00	0.0	0.0	0	0.0000	0.0000	0.0000	0.0	0.0	0.00
Sr - D	0.0	0.00	0.000	0.000	0	0.0000	0.0000	0.00000	0.0	0.0	0.00
S - D	0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0	0.0
Tl - D	0.00000	0.000000	0.000000	0.000000	0	0.00000000	0.00000000	0.00000000	0.00000	0.00000	0.0000000
Sn - D	0	0.0000	0.0000	0.0000	0	0.000000	0.000000	0.000000	0.000	0.00	0.00000
Ti - D	0.000	0.000	0.0000	0.0000	0	0.00000	0.000000	0.000000	0.000	0.000	0
U - D	0.000	0.000	0.00000	0.00000	0	0.000000	0.000000	0.0000000	0.000	0.000	0.0000
V - D	0	0.0000	0.0000	0.0000	0	0.000000	0.000000	0.000000	0	0	0.00000
Zn - D	0	0.000	0.00	0.00	0	0.00000	0.00000	0.000000	0	0	0.0000
Zr - D	0	0.00000	0.0000	0.0000	0	0.0000000	0.0000000	0.0000000	0	0	0
Hg - D	0.0000	0.0000000	0.0000000	0.0000000	0	0.00000000	0.00000000	0.000000000	0.000000	0	0
H^+ Concentration	0.000032	0.000032	0.000032	0.000032	0	0.000032	0.000032	0.000032	0.000032	0.000032	0.000032
Orthophosphate	0.00	0.000	0.000	0.000	0	0.00000	0.00000	0.00000	0.00	0.00	0
N as NO_3	0.0	0.0	0	0	0	0	0	0	0.0	0.0	0
N as NH_3	0.0	0.0	0	0	0	0	0	0	0.0	0.0	0
N as NO_2	0.0	0.0	0	0	0	0	0	0	0.00	0.0	0

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NOTES:

1. ALL UNITS IN mg/L EXCEPT SOURCE TERM 7.2 PAG STOCKPILE, WHICH IS IN mg/day.
2. THIS TABLE REPRESENTS MAXIMUM CONCENTRATIONS PROVIDED FOR EACH TERM. TIMING ASSUMPTIONS AND SCALING FACTORS WERE APPLIED TO THESE TERMS PRIOR TO INPUT INTO THE MODEL.

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TABLE A3.3

HARPER CREEK MINING CORPORATION
HARPER CREEK PROJECT

GEOCHEMICAL SOURCE TERMS
WORST CASE (WC)

Parameter	17.1 Rougher tailings	17.2 Rougher tailings	18 Rougher tailings	19 Topsoil Stockpiles	20 Plant site	21 Quarry	22 Ore to Process	23.1 Low grade ore to process	23.2 Process and Pond Constraints	25 Non-PAG Low Grade Ore Stockpile Inside TMF
SO_4	0	0	0	0	0	0	0	0	0	0
Cl	0.0	0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0
F	0.00	0	0.0	0.00	0.00	0.00	0.00	0.0	0.00	0.00
Hardness	0.0	0	0.0	0	0.0	0.0	0	0	0	0
Al - D	0.00	0	0.000	0.00	0.00	0.000	0.00	0.0	0.00	0.00
Sb - D	0.0000	0	0.0000	0.000	0.000	0.000000	0.000	0.0	0.0	0.000
As - D	0.000	0	0.0000	0.000	0.00	0.00000	0.000	0.0	0.000	0.000
Ba - D	0.00	0	0.000	0.00	0.00	0.0000	0.00	0.0	0.00	0.00
Be - D	0.000000	0	0	0.00000	0.000000	0.0000000	0.00000	0.00	0	0.0000
Bi - D	0.000000	0	0	0.000000	0.000000	0.00000000	0.00000	0.00	0	0.00000
B - D	0.00	0	0	0	0.00	0.0000	0.0	0.0	0.0	0.0
Cd - D	0.0000	0	0.000000	0.00000	0.00000	0.000000	0.000	0.0	0.0000	0.00000
Ca - D	0.0	0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0
Cr - D	0.0000	0	0	0.0000	0.00000	0.000000	0.0000	0.0	0	0
Co - D	0.0000	0	0.00000	0.000	0.0000	0.000000	0.00	0.0	0.00	0.0
Cu - D	0.000	0	0.0000	0.000	0.000	0.00000	0.0	0	0.0	0.0
Fe - D	0.00	0	0.000	0.00	0.000	0.0000	0.00	0.0	0.00	0.00
Pb - D	0.0000	0	0.000000	0.000	0.00000	0.000000	0.0000	0.00	0.000	0.000
Li - D	0.000	0	0.0000	0.000	0.000	0.00000	0.000	0.0	0	0.000
Mg - D	0.0	0	0.0	0.0	0.0	0.0	0.0	0	0	0
Mn - D	0.00	0	0.00	0.0	0.00	0.0000	0.0	0	0	0.0
Mo - D	0.000	0	0.000	0.00	0.000	0.0000	0.000	0.0	0.00	0.00
Ni - D	0.0000	0	0.0000	0.00	0.0000	0.00000	0.000	0.0	0.0	0.00
P - D	0.000	0	0.000	0.00	0.000	0.0000	0.00	0.0	0	0
K - D	0	0	0.0	0	0.0	0.0	0.0	0	0	0.0
Se - D	0.000	0	0.0000	0.000	0.000	0.00000	0.000	0.0	0.00	0.00
Si - D	0.0	0	0.0	0.0	0.0	0.00	0.0	0	0	0.0
Ag - D	0.000000	0	0	0.00000	0.000000	0.00000000	0.00000	0.00	0.00000	0.00000
Na - D	0.00	0	0.00	0.0	0.00	0.000	0.0	0	0	0.0
Sr - D	0.0	0	0.00	0.0	0.0	0.000	0	0	0	0.0
S - D	0.0	0	0.0	0.0	0.0	0.0	0.0	0	0	0
Tl - D	0.00000	0	0.0000000	0.00000	0.000000	0.0000000	0.00000	0.00	0.00000	0.00000
Sn - D	0.00	0	0.00000	0.0000	0.0000	0.0000	0.000	0.0	0	0.00
Ti - D	0.0000	0	0	0.000	0.0000	0.00000	0.000	0.0	0	0.000
U - D	0.0000	0	0.0000	0.0000	0.0000	0.000000	0.000	0.0	0.000	0.00
V - D	0.0000	0	0.00000	0.000	0	0.00000	0.000	0.00	0	0
Zn - D	0.00	0	0.0000	0	0.000	0.00000	0.0	0.0	0.0	0.000
Zr - D	0.00000	0	0	0	0.00000	0.000000	0.0000	0.00	0	0.0000
Hg - D	0.000000	0	0	0.000000	0.000000	0.0000000	0.000000	0.00	0.0000	0.00000
H^+ Concentration	0.000032	0	0.000032	0.000032	0.000032	0.000032	0.000032	0.000032	0.000032	0.000032
Orthophosphate	0.00	0	0	0.00	0.000	0.0000	0	0.0	0	0.00
N as NO_3	0	0	0	0	0.0	0	0	0	0	0.0
N as NH_3	0	0	0	0	0.0	0	0	0	0	0.0
N as NO_2	0	0	0	0	0.00	0	0	0	0	0.0

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NOTES:

1. ALL UNITS IN mg/L EXCEPT SOURCE TERM 7.2 PAG STOCKPILE, WHICH IS IN mg/day.
2. THIS TABLE REPRESENTS MAXIMUM CONCENTRATIONS PROVIDED FOR EACH TERM. TIMING ASSUMPTIONS AND SCALING FACTORS WERE APPLIED TO THESE TERMS PRIOR TO INPUT INTO THE MODEL.

APPENDIX A3 - UPPER CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 7.2 Out

Parameter	Unit	Year -2 (Coffer	Year -1 (Stage	Year 1 (Stag	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	End
Year		01/01/2013	01/01/2014	01/01/2015	01/01/2016	01/01/2017	01/01/2018	01/01/2019	01/01/2020	01/01/2021	01/01/2022	01/01/2023	01/01/2024	01/01/2025	01/01/2026	01/01/2027	01/01/2028	01/01/2029	01/01/2030	01/01/2031	01/01/2032	01/01/2033	01/01/2034	01/01/2035	01/01/2036	01/01/2037	01/01/2038	01/01/2039	01/01/2040	01/01/2041	01/01/2042	01/01/2043	01/01/2044	01/01/2045	01/01/2046	01/01/2047	31/12/2113
Physical Tests																																					
Acidity to pH 4.5 (as C	mg/year	0	0	2.23E+10	2.68E+10	1.70E+10	3.48E+10	2.92E+10	5.49E+10	6.64E+10	6.28E+10	5.43E+10	3.86E+10	3.41E+10	4.00E+10	3.78E+10	3.69E+10	4.06E+10	3.47E+10	4.40E+10	2.88E+10	2.94E+10	2.53E+10	1.14E+10	1.13E+10	2.19E+10	1.31E+10	9.21E+09	0	0	0	0	0	0	0	0	0
Acidity to pH 8.3 (as C	mg/year	0	0	2.71E+10	3.27E+10	2.07E+10	4.24E+10	3.55E+10	6.68E+10	8.09E+10	7.64E+10	6.61E+10	4.70E+10	4.15E+10	4.87E+10	4.61E+10	4.49E+10	4.95E+10	4.22E+10	5.35E+10	3.51E+10	3.57E+10	3.07E+10	1.39E+10	1.38E+10	2.67E+10	1.60E+10	1.12E+10	0	0	0	0	0	0	0	0	0
Alkalinity (Total as Ca	mg/year	0	0	1.91E+11	2.30E+11	1.46E+11	2.99E+11	2.50E+11	4.71E+11	5.70E+11	5.38E+11	4.66E+11	3.31E+11	2.93E+11	3.43E+11	3.25E+11	3.16E+11	3.49E+11	2.97E+11	3.77E+11	2.47E+11	2.52E+11	2.17E+11	9.82E+10	9.72E+10	1.88E+11	1.13E+11	7.90E+10	0	0	0	0	0	0	0	0	0
Hardness as CaCO3 (	mg/year	0	0	1.18E+12	1.42E+12	9.00E+11	1.84E+12	1.54E+12	2.90E+12	3.52E+12	3.32E+12	2.87E+12	2.04E+12	1.81E+12	2.12E+12	2.00E+12	1.95E+12	2.15E+12	1.83E+12	2.33E+12	1.53E+12	1.55E+12	1.34E+12	6.06E+11	6.00E+11	1.16E+12	6.95E+11	4.87E+11	0	0	0	0	0	0	0	0	0
H+ Concentration	mg/year	0	0	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	0	0	0	0	0	0	0	0	0
Dissolved Anions																																					
Sulphate (Dissolved)	mg/year	0	0	1.58E+12	1.90E+12	1.21E+12	2.47E+12	2.07E+12	3.89E+12	4.71E+12	4.45E+12	3.85E+12	2.74E+12	2.42E+12	2.84E+12	2.68E+12	2.62E+12	2.88E+12	2.46E+12	3.12E+12	2.04E+12	2.08E+12	1.79E+12	8.12E+11	8.04E+11	1.55E+12	9.31E+11	6.53E+11	0	0	0	0	0	0	0	0	0
Chloride (Dissolved)	mg/year	0	0	3.03E+10	3.65E+10	2.32E+10	4.74E+10	3.97E+10	7.47E+10	9.05E+10	8.55E+10	7.40E+10	5.25E+10	4.64E+10	5.45E+10	5.15E+10	5.02E+10	5.54E+10	4.72E+10	5.99E+10	3.92E+10	4.00E+10	3.44E+10	1.56E+10	1.54E+10	2.98E+10	1.79E+10	1.25E+10	0	0	0	0	0	0	0	0	0
Fluoride (Dissolved)	mg/year	0	0	6.72E+08	8.10E+08	5.13E+08	1.05E+09	8.80E+08	1.66E+09	2.01E+09	1.89E+09	1.64E+09	1.16E+09	1.03E+09	1.21E+09	1.14E+09	1.11E+09	1.23E+09	1.05E+09	1.33E+09	8.70E+08	8.86E+08	7.62E+08	3.45E+08	3.42E+08	6.61E+08	3.96E+08	2.78E+08	0	0	0	0	0	0	0	0	0
Nutrients																																					
Nitrate (Dissolved)	mg/year	0	0	9.05E+09	1.09E+10	6.92E+09	1.42E+10	1.19E+10	2.23E+10	2.70E+10	2.55E+10	2.21E+10	1.57E+10	1.39E+10	1.63E+10	1.54E+10	1.50E+10	1.65E+10	1.41E+10	1.79E+10	1.17E+10	1.19E+10	1.03E+10	4.65E+09	4.61E+09	8.91E+09	5.34E+09	3.74E+09	0	0	0	0	0	0	0	0	0
Ammonia (Dissolved)	mg/year	0	0	1.14E+09	1.38E+09	8.74E+08	1.79E+09	1.50E+09	2.82E+09	3.42E+09	3.23E+09	2.79E+09	1.98E+09	1.75E+09	2.06E+09	1.95E+09	1.90E+09	2.09E+09	1.78E+09	2.26E+09	1.48E+09	1.51E+09	1.30E+09	5.88E+08	5.82E+08	1.13E+09	6.75E+08	4.73E+08	0	0	0	0	0	0	0	0	0
Nitrite (Dissolved)	mg/year	0	0	2.08E+08	2.51E+08	1.59E+08	3.26E+08	2.73E+08	5.13E+08	6.21E+08	5.86E+08	5.08E+08	3.60E+08	3.19E+08	3.74E+08	3.54E+08	3.45E+08	3.80E+08	3.24E+08	4.11E+08	2.69E+08	2.74E+08	2.36E+08	1.07E+08	1.06E+08	2.05E+08	1.23E+08	8.60E+07	0	0	0	0	0	0	0	0	0
Orthophosphate (Diss	mg/year	0	0	5.41E+08	6.52E+08	4.13E+08	8.46E+08	7.09E+08	1.33E+09	1.61E+09	1.52E+09	1.32E+09	9.37E+08	8.29E+08	9.73E+08	9.20E+08	8.96E+08	9.88E+08	8.42E+08	1.07E+09	7.00E+08	7.13E+08	6.14E+08	2.78E+08	2.75E+08	5.32E+08	3.19E+08	2.24E+08	0	0	0	0	0	0	0	0	0
Dissolved Metals																																					
Al (Dissolved)	mg/year	0	0	4.01E+08	4.83E+08	3.06E+08	6.27E+08	5.25E+08	9.88E+08	1.20E+09	1.13E+09	9.77E+08	6.94E+08	6.14E+08	7.20E+08	6.81E+08	6.64E+08	7.31E+08	6.24E+08	7.91E+08	5.19E+08	5.28E+08	4.54E+08	2.06E+08	2.04E+08	3.94E+08	2.36E+08	1.66E+08	0	0	0	0	0	0	0	0	0
Sb (Dissolved)	mg/year	0	0	1.98E+07	2.38E+07	1.51E+07	3.10E+07	2.59E+07	4.88E+07	5.91E+07	5.58E+07	4.83E+07	3.43E+07	3.03E+07	3.56E+07	3.36E+07	3.28E+07	3.61E+07	3.08E+07	3.91E+07	2.56E+07	2.61E+07	2.25E+07	1.02E+07	1.01E+07	1.95E+07	1.17E+07	8.18E+06	0	0	0	0	0	0	0	0	0
As (Dissolved)	mg/year	0	0	2.46E+07	2.97E+07	1.88E+07	3.85E+07	3.23E+07	6.07E+07	7.35E+07	6.94E+07	6.01E+07	4.27E+07	3.77E+07	4.43E+07	4.19E+07	4.08E+07	4.50E+07	3.83E+07	4.87E+07	3.19E+07	3.25E+07	2.79E+07	1.27E+07	1.25E+07	2.42E+07	1.45E+07	1.02E+07	0	0	0	0	0	0	0	0	0
Ba (Dissolved)	mg/year	0	0	1.79E+08	2.16E+08	1.37E+08	2.81E+08	2.35E+08	4.42E+08	5.35E+08	5.06E+08	4.38E+08	3.11E+08	2.75E+08	3.23E+08	3.05E+08	2.97E+08	3.27E+08	2.79E+08	3.54E+08	2.32E+08	2.36E+08	2.03E+08	9.22E+07	9.13E+07	1.76E+08	1.06E+08	7.42E+07	0	0	0	0	0	0	0	0	0
Be (Dissolved)	mg/year	0	0	4.45E+05	5.37E+05	3.40E+05	6.97E+05	5.83E+05	1.10E+06	1.33E+06	1.26E+06	1.09E+06	7.71E+05	6.82E+05	8.01E+05	7.57E+05	7.37E+05	8.13E+05	6.93E+05	8.80E+05	5.76E+05	5.87E+05	5.05E+05	2.29E+05	2.27E+05	4.38E+05	2.63E+05	1.84E+05	0	0	0	0	0	0	0	0	0
Bi (Dissolved)	mg/year	0	0	2.23E+05	2.69E+05	1.70E+05	3.49E+05	2.92E+05	5.50E+05	6.65E+05	6.28E+05	5.44E+05	3.86E+05	3.42E+05	4.01E+05	3.79E+05	3.69E+05	4.07E+05	3.47E+05	4.40E+05	2.89E+05	2.94E+05	2.53E+05	1.15E+05	1.13E+05	2.19E+05	1.31E+05	9.22E+04	0	0	0	0	0	0	0	0	0
B (Dissolved)	mg/year	0	0	2.62E+08	3.16E+08	2.00E+08	4.10E+08	3.43E+08	6.45E+08	7.81E+08	7.38E+08	6.39E+08	4.54E+08	4.01E+08	4.71E+08	4.45E+08	4.34E+08	4.78E+08	4.08E+08	5.17E+08	3.39E+08	3.45E+08	2.97E+08	1.35E+08	1.33E+08	2.58E+08	1.54E+08	1.08E+08	0	0	0	0	0	0	0	0	0
Cd (Dissolved)	mg/year	0	0	7.42E+05	8.94E+05	5.67E+05	1.16E+06	9.72E+05	1.83E+06	2.21E+06	2.09E+06	1.81E+06	1.29E+06	1.14E+06	1.33E+06	1.26E+06	1.23E+06	1.35E+06	1.16E+06	1.47E+06	9.60E+05	9.78E+05	8.42E+05	3.81E+05	3.78E+05	7.30E+05	4.37E+05	3.07E+05	0	0	0	0	0	0	0	0	0
Ca (Dissolved)	mg/year	0	0	4.14E+11	4.99E+11	3.17E+11	6.48E+11	5.43E+11	1.02E+12	1.24E+12	1.17E+12	1.01E+12	7.18E+11	6.35E+11	7.45E+11	7.04E+11	6.86E+11	7.56E+11	6.45E+11	8.18E+11	5.36E+11	5.46E+11	4.70E+11	2.13E+11	2.11E+11	4.08E+11	2.44E+11	1.71E+11	0	0	0	0	0	0	0	0	0
Cr (Dissolved)	mg/year	0	0	7.49E+06	9.03E+06	5.72E+06	1.17E+07	9.81E+06	1.85E+07	2.24E+07	2.11E+07	1.83E+07	1.30E+07	1.15E+07	1.34E+07	1.27E+07	1.24E+07	1.37E+07	1.17E+07	1.48E+07	9.70E+06	9.88E+06	8.50E+06	3.85E+06	3.81E+06	7.37E+06	4.42E+06	3.10E+06	0	0	0	0	0	0	0	0	0
Co (Dissolved)	mg/year	0	0	1.63E+07	1.97E+07	1.25E+07	2.55E+07	2.14E+07	4.03E+07	4.87E+07	4.60E+07	3.98E+07	2.83E+07	2.50E+07	2.94E+07	2.78E+07	2.70E+07	2.98E+07	2.54E+07	3.23E+07	2.11E+07	2.15E+07	1.85E+07	8.39E+06	8.31E+06	1.61E+07	9.63E+06	6.75E+06	0	0	0	0	0	0	0	0	0
Cu (Dissolved)	mg/year	0	0	7.89E+07	9.51E+07	6.03E+07	1.23E+08	1.03E+08	1.95E+08	2.35E+08	2.22E+08	1.92E+08	1.37E+08	1.21E+08	1.42E+08	1.34E+08	1.31E+08	1.44E+08	1.23E+08	1.56E+08	1.02E+08	1.04E+08	8.95E+07	4.06E+07	4.02E+07	7.77E+07	4.65E+07	3.26E+07	0	0	0	0	0	0	0	0	0
Fe (Dissolved)	mg/year	0	0	2.41E+08	2.90E+08	1.84E+08	3.77E+08	3.16E+08	5.94E+08	7.19E+08	6.79E+08	5.88E+08	4.17E+08	3.69E+08	4.33E+08	4.09E+08	3.99E+08	4.40E+08	3.75E+08	4.76E+08	3.12E+08	3.18E+08	2.73E+08	1.24E+08	1.23E+08	2.37E+08	1.42E+08	9.96E+07	0	0	0	0	0	0	0	0	0
Pb (Dissolved)	mg/year	0	0	2.59E+06	3.12E+06	1.98E+06	4.05E+06	3.39E+06	6.37E+06	7.72E+06	7.29E+06	6.31E+06	4.48E+06	3.96E+06	4.65E+06	4.39E+06	4.28E+06	4.72E+06	4.03E+06	5.11E+06	3.35E+06	3.41E+06	2.93E+06	1.33E+06	1.32E+06	2.54E+06	1.52E+06	1.07E+06	0	0	0	0	0	0	0	0	0
Li (Dissolved)	mg/year	0	0	6.16E+07	7.42E+07	4.71E+07	9.64E+07	8.07E+07	1.52E+08	1.84E+08	1.74E+08	1.50E+08	1.07E+08	9.44E+07	1.11E+08	1.05E+08	1.02E+08	1.13E+08	9.59E+07	1.22E+08	7.98E+07	8.12E+07	6.99E+07	3.17E+07	3.14E+07	6.06E+07	3.63E+07	2.55E+07	0	0	0	0	0	0	0	0	0
Mg (Dissolved)	mg/year	0	0	6.14E+11	7.40E+11	4.69E+11	9.61E+11	8.04E+11	1.51E+12	1.83E+12	1.73E+12	1.50E+12	1.06E+12	9.41E+11	1.10E+12	1.04E+12	1.02E+12	1.12E+12	9.56E+11	1.21E+12	7.95E+11	8.10E+11	6.97E+11	3.16E+11	3.13E+11	6.04E+11	3.62E+11	2.54E+11	0	0	0	0	0	0	0	0	0
Mn (Dissolved)	mg/year	0	0	1.66E+09	2.00E+09	1.27E+09	2.60E+09	2.18E+09	4.09E+09	4.96E+09	4.68E+09	4.05E+09	2.88E+09	2.54E+09	2.99E+09	2.82E+09	2.75E+09	3.03E+09	2.59E+09	3.28E+09	2.15E+09	2.19E+09	1.88E+09	8.54E+08	8.45E+08	1.63E+09	9.79E+08	6.87E+08	0	0	0	0	0	0	0	0	0
Mo (Dissolved)	mg/year	0	0	6.07E+07	7.32E+07	4.64E+07	9.50E+07	7.96E+07	1.50E+08	1.81E+08	1.71E+08	1.48E+08	1.05E+08	9.31E+07	1.09E+08	1.03E+08	1.01E+08	1.11E+08	9.46E+07	1.20E+08	7.86E+07	8.01E+07	6.89E+07	3.12E+07	3.09E+07	5.98E+07	3.58E+07	2.51E+07	0	0	0	0	0	0	0	0	0
Ni (Dissolved)	mg/year	0	0	4.18E+07	5.03E+07	3.19E+07	6.54E+07	5.47E+07	1.03E+08	1.25E+08	1.18E+08	1.02E+08	7.24E+07	6.40E+07	7.51E+07	7.10E+07	6.92E+07	7.63E+07	6.50E+07	8.25E+07	5.41E+07	5.51E+07	4.74E+07	2.15E+07	2.13E+07	4.11E+07	2.46E+07	1.73E+07	0	0	0	0	0	0	0	0	0
P (Dissolved)	mg/year	0	0	2.62E+08	3.16E+08	2.00E+08	4.10E+08	3.43E+08	6.45E+08	7.81E+08	7.38E+08	6.39E+08	4.54E+08	4.01E+08	4.71E+08	4.45E+08	4.34E+08	4.78E+08	4.08E+08	5.17E+08	3.39E+08	3.45E+08	2.97E+08	1.35E+08	1.33E+08	2.58E+08	1.54E+08	1.08E+08	0	0	0	0	0	0	0	0	0
K (Dissolved)	mg/year	0	0	5.86E+10	7.06E+10	4.48E+10	9.16E+10	7.67E+10	1.44E+11	1.75E+11	1.65E+11	1.43E+11	1.01E+11	8.97E+10	1.05E+11	9.96E+10	9.70E+10	1.07E+11	9.12E+10	1.16E+11	7.58E+10	7.72E+10	6.65E+10	3.01E+10	2.98E+10	5.76E+10	3.45E+10	2.42E+10	0	0	0	0	0	0	0	0	0
Se (Dissolved)	mg/year	0	0	1.54E+08	1.86E+08	1.18E+08	2.42E+08	2.02E+08	3.81E+08	4.61E+08	4.35E+08	3.77E+08	2.67E+08	2.37E+08	2.78E+08	2.62E+08	2.56E+08	2.82E+08	2.40E+08	3.05E+08	2.00E+08	2.04E+08	1.75E+08	7.94E+07	7.86E+07	1.52E+08	9.10E+07	6.38E+07	0	0	0	0	0	0	0	0	0
Si (Dissolved)	mg/year	0	0	3.94E+09	4.75E+09	3.01E+09	6.17E+09	5.17E+09	9.73E+09	1.18E+10	1.11E+10	9.62E+09	6.83E+09	6.04E+09	7.09E+09	6.71E+09	6.53E+09	7.20E+09	6.14E+09	7.79E+09	5.11E+09	5.20E+09	4.48E+09	2.03E+09	2.01E+09	3.88E+09	2.33E+09	1.63E+09	0	0	0	0	0	0	0	0	0
Ag (Dissolved)	mg/year	0	0	2.83E+05	3.41E+05	2.16E+05	4.42E+05	3.70E+05	6.97E+05	8.44E+05	7.97E+05	6.90E+05	4.90E+05	4.33E+05	5.09E+05	4.81E+05	4.68E+05	5.16E+05	4.40E+05	5.59E+05	3.66E+05	3.73E+05	3.21E+05	1.45E+05	1.44E+05	2.78E+05	1.67E+05	1.17E+05	0	0	0	0	0	0	0	0	0
Na (Dissolved)	mg/year	0	0	4.85E+09	5.84E+09	3.71E+09	7.59E+09	6.35E+09	1.20E+10	1.45E+10	1.37E+10	1.18E+10	8.40E+09	7.43E+09	8.72E+09	8.24E+09	8.03E+09	8.85E+09	7.55E+09	9.58E+09	6.28E+09	6.39E+09	5.50E+09	2.49E+09	2.47E+09	4.77E+09	2.86E+09	2.01E+09	0	0	0	0	0	0	0	0	0
Sr (Dissolved)	mg/year	0	0	1.03E+10	1.24E+10	7.88E+09	1.61E+10	1.35E+10	2.54E+10	3.08E+10	2.91E+10	2.52E+10	1.79E+10	1.58E+10	1.86E+10	1.75E+10	1.71E+10	1.88E+10	1.61E+10	2.04E+10	1.34E+10	1.36E+10	1.17E+10	5.30E+09	5.25E+09	1.02E+10	6.08E+09	4.27E+09	0	0	0	0	0	0	0	0	0
S (Dissolved)	mg/year	0	0	4.52E+11	5.45E+11	3.45E+11	7.07E+11	5.92E+11	1.11E+12	1.35E+12	1.27E+12	1.10E+12	7.83E+11	6.93E+11	8.13E+11	7.68E+11	7.49E+11	8.25E+11	7.04E+11	8.93E+11	5.85E+11	5.96E+11	5.13E+11	2.32E+11	2.30E+11	4.45E+11	2.67E+11	1.87E+11	0	0	0	0	0	0	0	0	0
Tl (Dissolved)	mg/year	0	0	2.44E+05	2.94E+05	1.87E+05	3.82E+05	3.20E+05	6.02E+05	7.29E+05	6.89E+05	5.96E+05	4.23E+05	3.74E+05	4.39E+05	4.15E+05	4.05E+05	4.46E+05	3.80E+05	4.83E+05	3.16E+05	3.22E+05	2.77E+05	1.26E+05	1.24E+05	2.40E+05	1.44E+05	1.01E+05	0	0	0	0	0	0	0	0	0
Sn (Dissolved)	mg/year	0	0	5.97E+07	7.19E+07	4.56E+07	9.34E+07	7.82E+07	1.47E+08	1.78E+08	1.68E+08	1.46E+08	1.03E+08	9.15E+07	1.07E+08	1.01E+08	9.89E+07	1.09E+08	9.29E+07	1.18E+08	7.73E+07	7.87E+07	6.77E+07	3.07E+07	3.04E+07	5.87E+07	3.52E+07	2.47E+07	0	0	0	0	0	0	0	0	0
Tl (Dissolved)	mg/year	0	0	1.03E+07	1.25E+07	7.90E+06	1.62E+07	1.35E+07	2.55E+07	3.09E+07	2.92E+07	2.52E+07	1.79E+07	1.58E+07	1.86E+07	1.76E+07	1.71E+07	1.89E+07	1.61E+07	2.04E+07	1.34E+07	1.36E+07	1.17E+07	5.32E+06	5.26E+06	1.02E+07	6.10E+06	4.28E+06	0	0	0	0	0	0	0	0	0
U (Dissolved)	mg/year	0	0	1.68E+07	2.03E+07	1.28E+07	2.63E+07	2.20E+07	4.14E+07	5.02E+07	4.74E+07	4.10E+07	2.91E+07	2.57E+07	3.02E+07	2.86E+07	2.78E+07	3.07E+07	2.62E+07	3.32E+07	2.18E+07	2.22E+07	1.91E+07	8.64E+06	8.55E+06	1.65E+07	9.91E+06	6.95E+06	0	0	0	0	0	0	0	0	0
V (Dissolved)	mg/year	0	0	2.18E+06	2.63E+06	1.67E+06	3.41E+06	2.86E+06	5.38E+06	6.51E+06	6.15E+06	5.32E+06	3.78E+06	3.34E+06	3.92E+06	3.71E+06	3.61E+06	3.98E+06	3.40E+06	4.31E+06	2.82E+06	2.88E+06	2.48E+06	1.12E+06	1.11E+06	2.15E+06	1.29E+06	9.02E+05	0	0	0	0	0	0	0	0	0
Zn (Dissolved)	mg/year	0	0	4.71E+07	5.68E+07	3.60E+07	7.37E+07	6.17E+07	1.16E+08	1.41E+08	1.33E+08	1.15E+08	8.17E+07	7.22E+07	8.48E+07	8.01E+07	7.81E+07	8.60E+07	7.34E+07	9.31E+07	6.10E+07	6.21E+07	5.35E+07	2.42E+07	2.40E+07	4.64E+07	2.78E+07	1.95E+07	0	0	0	0	0	0	0	0	0
Zr (Dissolved)	mg/year	0	0	4.36E+05	5.26E+05	3.33E+05	6.83E+05	5.72E+05	1.08E+06	1.30E+06	1.23E+06	1.06E+06	7.56E+05	6.69E+05	7.85E+05	7.42E+05	7.23E+05	7.97E+05	6.79E+05	8.62E+05	5.65E+05	5.75E+05	4.95E+05	2.24E+05	2.22E+05	4.29E+05	2.57E+05	1.80E+05	0	0	0	0	0	0	0	0	0
Hg (Dissolved)	mg/year	0	0	8.90E+04	1.07E+05	6.80E+04	1.39E+05	1.17E+05	2.20E+05	2.66E+05	2.51E+05	2.17E+05	1.54E+05	1.36E+05	1.60E+05	1.51E+05	1.47E+05	1.63E+05	1.39E+05	1.76E+05	1.15E+05	1.17E+05	1.01E+05	4.58E+04	4.53E+04	8.76E+04	5.25E+04	3.68E+04	0	0	0	0	0	0	0	0	0

APPENDIX A3 - UPPER CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 2 Out

Parameter	Unit	Year -2 (Coffer	Year -1 (Stage	Year 1 (Stag	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	End
Year		01/01/2013	01/01/2014	01/01/2015	01/01/2016	01/01/2017	01/01/2018	01/01/2019	01/01/2020	01/01/2021	01/01/2022	01/01/2023	01/01/2024	01/01/2025	01/01/2026	01/01/2027	01/01/2028	01/01/2029	01/01/2030	01/01/2031	01/01/2032	01/01/2033	01/01/2034	01/01/2035	01/01/2036	01/01/2037	01/01/2038	01/01/2039	01/01/2040	01/01/2041	01/01/2042	01/01/2043	01/01/2044	01/01/2045	01/01/2046	01/01/2047	31/12/2113
Physical Tests																																					
Acidity to pH 4.5 (as C	mg/L	0.00E+00	1.27E+01	1.61E+01	2.08E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	
Acidity to pH 8.3 (as C	mg/L	0.00E+00	1.54E+01	1.96E+01	2.53E+01	7.42E+01	7.91E+01	1.11E+02	8.75E+01	9.10E+01	1.06E+02	1.03E+02	1.19E+02	1.39E+02	1.58E+02	1.55E+02	1.75E+02	1.82E+02	1.97E+02	1.72E+02	1.75E+02	1.79E+02	1.83E+02	1.88E+02	1.88E+02	1.88E+02	1.86E+02	1.86E+02	1.86E+02	1.86E+02	1.86E+02	1.36E+02	1.36E+02	1.36E+02	1.36E+02	1.36E+02	1.36E+02
Alkalinity (Total as CaC	mg/L	0.00E+00	2.19E+02	2.19E+02	2.19E+02

APPENDIX A3 - UPPER CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 3 Out

Parameter	Unit	Year -2 (Coffe	Year -1 (Stage	Year 1 (Stag	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	End
Year		01/01/2013	01/01/2014	01/01/2015	01/01/2016	01/01/2017	01/01/2018	01/01/2019	01/01/2020	01/01/2021	01/01/2022	01/01/2023	01/01/2024	01/01/2025	01/01/2026	01/01/2027	01/01/2028	01/01/2029	01/01/2030	01/01/2031	01/01/2032	01/01/2033	01/01/2034	01/01/2035	01/01/2036	01/01/2037	01/01/2038	01/01/2039	01/01/2040	01/01/2041	01/01/2042	01/01/2043	01/01/2044	01/01/2045	01/01/2046	01/01/2047	31/12/2113
Physical Tests																																					
Acidity to pH 4.5 (as C	mg/L	0.00E+00	3.51E+01	3.95E+01	3.95E+01	3.16E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acidity to pH 8.3 (as C	mg/L	0.00E+00	3.69E+01	4.55E+01	4.55E+01	3.32E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Alkalinity (Total as Ca	mg/L	0.00E+00	2.19E+02	2.19E+02	2.19E+02	2.19E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hardness as CaCO3 (	mg/L	0.00E+00	1.35E+03	1.35E+03	1.35E+03	1.35E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H+ Concentration	mg/L	0.00E+00	3.18E-05	3.18E-05	3.18E-05	3.18E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dissolved Anions																																					
Sulphate (Dissolved)	mg/L	0.00E+00	2.36E+03	2.92E+03	2.92E+03	2.13E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chloride (Dissolved)	mg/L	0.00E+00	3.82E+01	4.71E+01	4.71E+01	3.44E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluoride (Dissolved)	mg/L	0.00E+00	7.70E-01	7.70E-01	7.70E-01	7.70E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nutrients																																					
Nitrate (Dissolved)	mg/L	0.00E+00	8.73E+01	2.04E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

APPENDIX A3 - UPPER CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 4 Out

Parameter	Unit	Year -2 (Coffer	Year -1 (Stage	Year 1 (Stag	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	End
Year		01/01/2013	01/01/2014	01/01/2015	01/01/2016	01/01/2017	01/01/2018	01/01/2019	01/01/2020	01/01/2021	01/01/2022	01/01/2023	01/01/2024	01/01/2025	01/01/2026	01/01/2027	01/01/2028	01/01/2029	01/01/2030	01/01/2031	01/01/2032	01/01/2033	01/01/2034	01/01/2035	01/01/2036	01/01/2037	01/01/2038	01/01/2039	01/01/2040	01/01/2041	01/01/2042	01/01/2043	01/01/2044	01/01/2045	01/01/2046	01/01/2047	31/12/2113
Physical Tests																																					
Acidity to pH 4.5 (as C	mg/L	0.00E+00	2.04E+01	3.63E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acidity to pH 8.3 (as C	mg/L	0.00E+00	2.14E+01	3.81E+01	5.69E+01	6.12E+01	7.06E+01	6.98E+01	7.68E+01	8.71E+01	9.20E+01	9.59E+01	1.05E+02	1.11E+02	1.19E+02	1.27E+02	1.31E+02	1.47E+02	1.47E+02	1.46E+02	1.45E+02	1.44E+02	1.44E+02	1.45E+02	1.46E+02	1.48E+02	1.32E+02	1.28E+02	1.35E+02	1.51E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Alkalinity (Total as Ca	mg/L	0.00E+00	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hardness as CaCO3 (	mg/L	0.00E+00	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H+ Concentration	mg/L	0.00E+00	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dissolved Anions																																					
Sulphate (Dissolved)	mg/L	0.00E+00	1.37E+03	2.44E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chloride (Dissolved)	mg/L	0.00E+00	2.22E+01	3.94E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluoride (Dissolved)	mg/L	0.00E+00	7.41E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nutrients																																					
Nitrate (Dissolved)	mg	0.00E+00	5.07E+01	5.27E+01	5.87E+01	2.88E+01	2.21E+01	0.00E+00	1.64E+01	2.44E+01	1.17E+01	9.27E+00	2.04E+01	1.44E+01	2.08E+01	1.87E+01	7.97E+00	3.94E+01	6.24E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.47E+00	3.30E+00	4.51E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia (Dissolved)	mg	0.00E+00	6.41E+00	6.67E+00	7.42E+00	3.64E+00	2.80E+00	0.00E+00	2.07E+00	3.08E+00	1.48E+00	1.17E+00	2.57E+00	1.82E+00	2.63E+00	2.36E+00	1.01E+00	4.98E+00	7.88E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.12E-01	4.18E-01	5.70E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrite (Dissolved)	mg	0.00E+00	1.17E+00	1.21E+00	1.35E+00	6.62E-01	5.08E-01	0.00E+00	3.77E-01	5.60E-01	2.69E-01	2.13E-01	4.68E-01	3.31E-01	4.78E-01	4.29E-01	1.83E-01	9.05E-01	1.43E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.67E-02	7.59E-02	1.04E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Orthophosphate (Diss	mg/L	0.00E+00	4.73E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dissolved Metals																																					
Al (Dissolved)	mg/L	0.00E+00	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sb (Dissolved)	mg/L	0.00E+00	1.03E-02	1.84E-02	2.74E-02	2.95E-02	3.40E-02	3.37E-02	3.70E-02	4.19E-02	4.43E-02	4.62E-02	5.04E-02	5.33E-02	5.75E-02	6.13E-02	6.29E-02	7.09E-02	7.10E-02	7.05E-02	6.97E-02	6.94E-02	6.92E-02	6.97E-02	7.03E-02	7.13E-02	6.37E-02	6.15E-02	6.52E-02	7.28E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
As (Dissolved)	mg/L	0.00E+00	5.11E-03	9.09E-03	1.36E-02	1.46E-02	1.68E-02	1.67E-02	1.83E-02	2.08E-02	2.20E-02	2.29E-02	2.49E-02	2.64E-02	2.85E-02	3.04E-02	3.12E-02	3.52E-02	3.52E-02	3.50E-02	3.46E-02	3.44E-02	3.43E-02	3.46E-02	3.49E-02	3.54E-02	3.16E-02	3.05E-02	3.24E-02	3.61E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ba (Dissolved)	mg/L	0.00E+00	1.07E-01	1.90E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Be (Dissolved)	mg/L	0.00E+00	6.02E-04	1.07E-03	1.60E-03	1.72E-03	1.98E-03	1.96E-03	2.16E-03	2.45E-03	2.59E-03	2.70E-03	2.94E-03	3.11E-03	3.36E-03	3.58E-03	3.67E-03	4.14E-03	4.14E-03	4.11E-03	4.07E-03	4.05E-03	4.04E-03	4.06E-03	4.10E-03	4.16E-03	3.72E-03	3.59E-03	3.80E-03	4.25E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bi (Dissolved)	mg/L	0.00E+00	2.18E-04	3.88E-04	5.79E-04	6.23E-04	7.18E-04	7.11E-04	7.81E-04	8.86E-04	9.36E-04	9.76E-04	1.06E-03	1.13E-03	1.22E-03	1.30E-03	1.33E-03	1.50E-03	1.50E-03	1.49E-03	1.47E-03	1.47E-03	1.46E-03	1.47E-03	1.49E-03	1.51E-03	1.35E-03	1.30E-03	1.38E-03	1.54E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
B (Dissolved)	mg/L	0.00E+00	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cd (Dissolved)	mg/L	0.00E+00	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ca (Dissolved)	mg/L	0.00E+00	4.13E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cr (Dissolved)	mg/L	0.00E+00	5.23E-03	9.32E-03	1.39E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co (Dissolved)	mg/L	0.00E+00	1.36E-01	2.43E-01	3.62E-01	3.90E-01	4.50E-01	4.45E-01	4.89E-01	5.55E-01	5.86E-01	6.11E-01	6.66E-01	7.05E-01	7.61E-01	7.65E-01	7.65E-01	7.65E-01	7.65E-01	7.65E-01	7.65E-01	7.65E-01	7.65E-01	7.65E-01	7.65E-01	7.65E-01	7.65E-01	7.65E-01	7.65E-01	7.65E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cu (Dissolved)	mg/L	0.00E+00	1.25E+00	2.22E+00	3.31E+00	3.57E+00	4.11E+00	4.07E+00	4.45E+00	4.45E+00	4.45E+00	4.45E+00	4.45E+00	4.45E+00	4.45E+00	4.45E+00	4.45E+00	4.45E+00	4.45E+00	4.45E+00	4.45E+00	4.45E+00	4.45E+00	4.45E+00	4.45E+00	4.45E+00	4.45E+00	4.45E+00	4.45E+00	4.45E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe (Dissolved)	mg/L	0.00E+00	1.43E-01	2.55E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pb (Dissolved)	mg/L	0.00E+00	1.03E-03	1.84E-03	2.75E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Li (Dissolved)	mg/L	0.00E+00	2.19E-02	3.90E-02	5.81E-02	6.26E-02	7.06E-02	7.06E-02	7.06E-02	7.06E-02	7.06E-02	7.06E-02	7.06E-02	7.06E-02	7.06E-02	7.06E-02	7.06E-02	7.06E-02	7.06E-02	7.06E-02	7.06E-02	7.06E-02	7.06E-02	7.06E-02	7.06E-02	7.06E-02	7.06E-02	7.06E-02	7.06E-02	7.06E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mg (Dissolved)	mg/L	0.00E+00	3.11E+02	5.55E+02	8.27E+02	8.91E+02	1.03E+03	1.02E+03	1.12E+03	1.27E+03	1.28E+03	1.28E+03	1.28E+03	1.28E+03	1.28E+03	1.28E+03	1.28E+03	1.28E+03	1.28E+03	1.28E+03	1.28E+03	1.28E+03	1.28E+03	1.28E+03	1.28E+03	1.28E+03	1.28E+03	1.28E+03	1.28E+03	1.28E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mn (Dissolved)	mg/L	0.00E+00	2.99E+00	5.32E+00	7.98E+00	8.54E+00	9.85E+00	9.75E+00	1.07E+01	1.21E+01	1.28E+01	1.34E+01	1.46E+01	1.54E+01	1.67E+01	1.78E+01	1.82E+01	2.05E+01	2.05E+01	2.04E+01	2.02E+01	2.01E+01	2.00E+01	2.02E+01	2.04E+01	2.06E+01	1.84E+01	1.78E+01	1.89E+01	2.11E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mo (Dissolved)	mg/L	0.00E+00	5.39E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ni (Dissolved)	mg/L	0.00E+00	6.50E-02	1.16E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
P (Dissolved)	mg/L	0.00E+00	2.29E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
K (Dissolved)	mg/L	0.00E+00	3.13E+01	5.57E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Se (Dissolved)	mg/L	0.00E+00	5.27E-02	9.39E-02	1.40E-01	1.51E-01	1.74E-01	1.72E-01	1.89E-01	2.14E-01	2.27E-01	2.36E-01	2.57E-01	2.72E-01	2.94E-01	3.13E-01	3.22E-01	3.63E-01	3.63E-01	3.60E-01	3.56E-01	3.55E-01	3.54E-01	3.56E-01	3.60E-01	3.64E-01	3.26E-01	3.14E-01	3.33E-01	3.72E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Si (Dissolved)	mg/L	0.00E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ag (Dissolved)	mg/L	0.00E+00	2.14E-04	3.82E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Na (Dissolved)	mg/L	0.00E+00	2.13E+00	3.80E+00	5.67E+00	6.11E+00	7.04E+00	6.96E+00	7.65E+00	8.68E+00	9.17E+00	9.56E+00	1.04E+01	1.10E+01	1.19E+01	1.27E+01	1.30E+01	1.47E+01	1.47E+01	1.46E+01	1.44E+01	1.44E+01	1.43E+01	1.44E+01	1.46E+01	1.47E+01	1.32E+01	1.27E+01	1.35E+01	1.51E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sr (Dissolved)	mg/L	0.00E+00	1.74E+00	3.09E+00	4.61E+00	4.97E+00	5.73E+00	5.67E+00	6.23E+00	7.07E+00	7.47E+00	7.78E+00	8.48E+00	8.97E+00	9.69E+00	1.03E+01	1.06E+01	1.18E+01	1.18E+01	1.18E+01	1.17E+01	1.17E+01	1.17E+01	1.17E+01	1.18E+01	1.18E+01	1.07E+01	1.04E+01	1.10E+01	1.18E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
S (Dissolved)	mg/L	0.00E+00	5.00E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tl (Dissolved)	mg/L	0.00E+00	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sn (Dissolved)	mg/L	0.00E+00	5.21E-02	9.27E-02	1.38E-01	1.49E-01	1.72E-01	1.70E-01	1.87E-01	2.12E-01	2.24E-01	2.33E-01	2.54E-01	2.69E-01	2.90E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ti (Dissolved)	mg/L	0.00E+00	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
U (Dissolved)	mg/L	0.00E+00	6.81E-03	1.21E-02	1.81E-02	1.95E-02	2.24E-02	2.22E-02	2.44E-02	2.77E-02	2.93E-02	3.05E-02	3.32E-02	3.52E-02	3.80E-02	4.05E-02	4.15E-02	4.50E-02	4.50E-02	4.50E-02	4.50E-02	4.50E-02	4.50E-02	4.50E-02	4.50E-02	4.50E-02	4.20E-02	4.06E-02	4.30E-02	4.50E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
V (Dissolved)	mg/L	0.00E+00	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zn (Dissolved)	mg/L	0.00E+00	5.40E-02	5.40E-02	5.40E

APPENDIX A3 - UPPER CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 7.1 Out

Parameter	Unit	Year -2 (Coffer	Year -1 (Stage	Year 1 (Stag	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	End
Year		01/01/2013	01/01/2014	01/01/2015	01/01/2016	01/01/2017	01/01/2018	01/01/2019	01/01/2020	01/01/2021	01/01/2022	01/01/2023	01/01/2024	01/01/2025	01/01/2026	01/01/2027	01/01/2028	01/01/2029	01/01/2030	01/01/2031	01/01/2032	01/01/2033	01/01/2034	01/01/2035	01/01/2036	01/01/2037	01/01/2038	01/01/2039	01/01/2040	01/01/2041	01/01/2042	01/01/2043	01/01/2044	01/01/2045	01/01/2046	01/01/2047	31/12/2113
Physical Tests																																					
Acidity to pH 4.5 (as C	mg/L	0.00E+00	2.89E+01	2.32E+01	2.21E+01	2.26E+01	1.55E+01	2.47E+01	2.74E+01	2.38E+01	1.91E+01	1.27E+01	1.05E+01	1.13E+01	9.86E+00	8.92E+00	9.18E+00	7.34E+00	9.94E+00	6.99E+00	7.68E+00	7.17E+00	3.55E+00	4.69E+00	1.36E+01	1.63E+01	1.14E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acidity to pH 8.3 (as C	mg/L	0.00E+00	3.52E+01	2.83E+01	2.69E+01	2.75E+01	1.89E+01	3.01E+01	3.33E+01	2.90E+01	2.33E+01	1.54E+01	1.28E+01	1.37E+01	1.20E+01	1.09E+01	1.12E+01	8.93E+00	1.21E+01	8.51E+00	9.35E+00	8.73E+00	4.33E+00	5.71E+00	1.66E+01	1.98E+01	1.39E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Alkalinity (Total as Ca	mg/L	0.00E+00	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hardness as CaCO3 (	mg/L	0.00E+00	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.30E+03	1.33E+03	1.07E+03	1.35E+03	1.02E+03	1.12E+03	1.04E+03	5.16E+02	6.82E+02	1.35E+03	1.35E+03	1.35E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H+ Concentration	mg/L	0.00E+00	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dissolved Anions																																					
Sulphate (Dissolved)	mg/L	0.00E+00	2.05E+03	1.65E+03	1.57E+03	1.60E+03	1.10E+03	1.75E+03	1.94E+03	1.69E+03	1.36E+03	8.99E+02	7.45E+02	8.01E+02	6.99E+02	6.33E+02	6.51E+02	5.21E+02	7.06E+02	4.96E+02	5.45E+02	5.09E+02	2.52E+02	3.33E+02	9.66E+02	1.16E+03	8.11E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chloride (Dissolved)	mg/L	0.00E+00	3.94E+01	3.16E+01	3.01E+01	3.08E+01	2.11E+01	3.36E+01	3.73E+01	3.24E+01	2.61E+01	1.73E+01	1.43E+01	1.54E+01	1.34E+01	1.21E+01	1.25E+01	9.99E+00	1.35E+01	9.52E+00	1.05E+01	9.77E+00	4.84E+00	6.39E+00	1.85E+01	2.22E+01	1.56E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluoride (Dissolved)	mg/L	0.00E+00	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.03E-01	7.57E-01	6.60E-01	5.98E-01	6.15E-01	4.92E-01	6.66E-01	4.68E-01	5.15E-01	4.81E-01	2.38E-01	3.14E-01	7.70E-01	7.70E-01	7.66E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nutrients																																					
Nitrate (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	7.75E+01	4.67E+01	2.43E+01	4.21E+01	3.22E+01	5.59E+01	6.28E+01	5.53E+01	4.48E+01	2.92E+01	2.38E+01	2.60E+01	2.29E+01	2.09E+01	2.47E+01	2.26E+01	3.09E+01	2.20E+01	2.45E+01	2.81E+01	1.91E+01	3.78E+01	7.30E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	9.80E+00	5.91E+00	3.07E+00	5.32E+00	4.08E+00	7.07E+00	7.94E+00	6.99E+00	5.67E+00	3.69E+00	3.01E+00	3.29E+00	2.90E+00	2.65E+00	3.12E+00	2.85E+00	3.90E+00	2.78E+00	3.09E+00	3.55E+00	2.41E+00	4.78E+00	9.23E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrite (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	1.78E+00	1.07E+00	5.58E-01	9.67E-01	7.41E-01	1.29E+00	1.44E+00	1.27E+00	1.03E+00	6.71E-01	5.48E-01	5.97E-01	5.27E-01	4.82E-01	5.67E-01	5.19E-01	7.10E-01	5.05E-01	5.62E-01	6.45E-01	4.38E-01	8.68E-01	1.68E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Orthophosphate (Diss	mg/L	0.00E+00	6.20E-01	6.20E-01	6.20E-01	6.20E-01	5.16E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	4.21E-01	3.49E-01	3.76E-01	3.28E-01	2.97E-01	3.05E-01	2.44E-01	3.31E-01	2.33E-01	2.55E-01	2.39E-01	1.18E-01	1.56E-01	4.53E-01	5.42E-01	3.80E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dissolved Metals																																					
Al (Dissolved)	mg/L	0.00E+00	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sb (Dissolved)	mg/L	0.00E+00	2.57E-02	2.06E-02	1.96E-02	2.01E-02	1.38E-02	2.20E-02	2.43E-02	2.12E-02	1.70E-02	1.13E-02	9.33E-03	1.00E-02	8.76E-03	7.93E-03	8.16E-03	6.52E-03	8.84E-03	6.21E-03	6.83E-03	6.38E-03	3.16E-03	4.17E-03	1.21E-02	1.45E-02	1.02E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
As (Dissolved)	mg/L	0.00E+00	2.82E-02	2.82E-02	2.82E-02	2.82E-02	2.82E-02	2.82E-02	2.82E-02	2.82E-02	2.82E-02	2.82E-02	2.82E-02	2.82E-02	2.82E-02	2.82E-02	2.82E-02	2.82E-02	2.82E-02	2.82E-02	2.82E-02	2.82E-02	2.82E-02	2.82E-02	2.82E-02	2.82E-02	2.82E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ba (Dissolved)	mg/L	0.00E+00	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Be (Dissolved)	mg/L	0.00E+00	5.78E-04	4.64E-04	4.42E-04	4.52E-04	3.10E-04	4.94E-04	5.47E-04	4.77E-04	3.83E-04	2.53E-04	2.10E-04	2.26E-04	1.97E-04	1.78E-04	1.84E-04	1.47E-04	1.99E-04	1.40E-04	1.54E-04	1.43E-04	7.11E-05	9.39E-05	2.72E-04	3.26E-04	2.29E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bi (Dissolved)	mg/L	0.00E+00	2.89E-04	2.32E-04	2.21E-04	2.26E-04	1.55E-04	2.47E-04	2.74E-04	2.39E-04	1.92E-04	1.27E-04	1.05E-04	1.13E-04	9.87E-05	8.93E-05	9.19E-05	7.35E-05	9.96E-05	7.00E-05	7.69E-05	7.18E-05	3.56E-05	4.70E-05	1.36E-04	1.63E-04	1.15E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
B (Dissolved)	mg/L	0.00E+00	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cd (Dissolved)	mg/L	0.00E+00	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ca (Dissolved)	mg/L	0.00E+00	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.07E+02	3.37E+02	3.63E+02	3.17E+02	2.86E+02	2.95E+02	2.36E+02	3.19E+02	2.25E+02	2.47E+02	2.30E+02	1.14E+02	1.51E+02	4.37E+02	4.75E+02	3.67E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cr (Dissolved)	mg/L	0.00E+00	9.72E-03	7.81E-03	7.43E-03	7.61E-03	5.22E-03	8.31E-03	9.21E-03	8.02E-03	6.44E-03	4.26E-03	3.53E-03	3.80E-03	3.32E-03	3.05E-03	3.09E-03	2.47E-03	3.35E-03	2.35E-03	2.58E-03	2.41E-03	1.20E-03	1.58E-03	4.58E-03	5.49E-03	3.85E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co (Dissolved)	mg/L	0.00E+00	2.12E-02	1.70E-02	1.62E-02	1.66E-02	1.14E-02	1.81E-02	2.01E-02	1.75E-02	1.40E-02	9.29E-03	7.70E-03	8.28E-03	7.23E-03	6.54E-03	6.73E-03	5.38E-03	7.29E-03	5.13E-03	5.63E-03	5.26E-03	2.61E-03	3.44E-03	9.98E-03	1.20E-02	8.39E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cu (Dissolved)	mg/L	0.00E+00	1.02E-01	8.23E-02	7.83E-02	8.01E-02	5.49E-02	8.75E-02	9.70E-02	8.45E-02	6.78E-02	4.49E-02	3.72E-02	4.00E-02	3.49E-02	3.16E-02	3.25E-02	2.60E-02	3.52E-02	2.48E-02	2.72E-02	2.54E-02	1.26E-02	1.66E-02	4.82E-02	5.78E-02	4.05E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe (Dissolved)	mg/L	0.00E+00	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.32E-01	1.92E-01	2.07E-01	1.80E-01	1.63E-01	1.68E-01	1.34E-01	1.82E-01	1.28E-01	1.40E-01	1.31E-01	6.50E-02	8.58E-02	2.49E-01	2.76E-01	2.09E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pb (Dissolved)	mg/L	0.00E+00	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.90E-03	2.96E-03	2.96E-03	1.48E-03	1.95E-03	2.96E-03	2.96E-03	2.96E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Li (Dissolved)	mg/L	0.00E+00	7.06E-02	7.06E-02	7.06E-02	7.06E-02	7.06E-02	7.06E-02	7.06E-02	7.06E-02	7.06E-02	7.06E-02	7.06E-02	7.06E-02	7.06E-02	7.06E-02	7.06E-02	7.06E-02	7.06E-02	7.06E-02	7.06E-02	7.06E-02	3.82E-02	5.05E-02	7.06E-02	7.06E-02	7.06E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mg (Dissolved)	mg/L	0.00E+00	7.97E+02	6.40E+02	6.09E+02	6.24E+02	4.28E+02	6.81E+02	7.55E+02	6.57E+02	5.28E+02	3.49E+02	2.89E+02	3.12E+02	2.72E+02	2.46E+02	2.53E+02	2.02E+02	2.74E+02	1.93E+02	2.12E+02	1.98E+02	9.80E+01	1.29E+02	3.75E+02	4.50E+02	3.15E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mn (Dissolved)	mg/L	0.00E+00	2.16E+00	1.73E+00	1.65E+00	1.69E+00	1.16E+00	1.84E+00	2.04E+00	1.78E+00	1.43E+00	9.45E-01	7.83E-01	8.42E-01	7.35E-01	6.65E-01	6.85E-01	5.47E-01	7.42E-01	5.21E-01	5.73E-01	5.35E-01	2.65E-01	3.50E-01	1.02E+00	1.22E+00	8.53E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mo (Dissolved)	mg/L	0.00E+00	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ni (Dissolved)	mg/L	0.00E+00	5.42E-02	4.36E-02	4.14E-02	4.24E-02	2.91E-02	4.63E-02	5.13E-02	4.47E-02	3.59E-02	2.38E-02	1.97E-02	2.12E-02	1.85E-02	1.67E-02	1.72E-02	1.38E-02	1.87E-02	1.31E-02	1.44E-02	1.35E-02	6.67E-03	8.81E-03	2.55E-02	3.06E-02	2.15E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
P (Dissolved)	mg/L	0.00E+00	3.00E-01	3.00E-01	3.00E-01	3.00E-01	2.50E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	2.04E-01	1.69E-01	1.82E-01	1.59E-01	1.44E-01	1.48E-01	1.18E-01	1.60E-01	1.13E-01	1.24E-01	1.15E-01	5.72E-02	7.55E-02	2.19E-01	2.62E-01	1.84E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
K (Dissolved)	mg/L	0.00E+00	6.71E-01	6.71E-01	6.71E-01	6.71E-01	5.28E-01	6.71E-01	6.71E-01	6.71E-01	6.52E-01	4.32E-01	3.58E-01	3.85E-01	3.36E-01	3.04E-01	3.13E-01	2.50E-01	3.39E-01	2.38E-01	2.62E-01	2.44E-01	1.21E-01	1.60E-01	4.64E-01	5.56E-01	3.90E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Se (Dissolved)	mg/L	0.00E+00	2.00E-01	1.61E-01	1.53E-01	1.57E-01	1.07E-01	1.71E-01	1.90E-01	1.65E-01	1.33E-01	8.79E-02	7.28E-02	7.83E-02	6.84E-02	6.19E-02	6.36E-02	5.09E-02	6.90E-02	4.85E-02	5.33E-02	4.98E-02	2.46E-02	3.25E-02	9.44E-02	1.13E-01	7.93E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Si (Dissolved)	mg/L	0.00E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ag (Dissolved)	mg/L	0.00E+00	3.67E-04	2.95E-04	2.81E-04	2.87E-04	1.97E-04	3.14E-04	3.48E-04	3.03E-04	2.43E-04	1.61E-04	1.33E-04	1.43E-04	1.25E-04	1.13E-04	1.17E-04	9.32E-05	1.26E-04	8.88E-05	9.76E-05	9.11E-05	4.51E-05	5.96E-05	1.73E-04	2.07E-04	1.45E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Na (Dissolved)	mg/L	0.00E+00	6.29E+00	5.06E+00	4.81E+00	4.92E+00	3.38E+00	5.38E+00	5.96E+00	5.19E+00	4.17E+00	2.76E+00	2.29E+00	2.46E+00	2.15E+00	1.94E+00	2.00E+00	1.60E+00	2.17E+00	1.52E+00	1.67E+00	1.56E+00	7.74E-01	1.02E+00	2.96E+00	3.55E+00	2.49E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sr (Dissolved)	mg/L	0.00E+00	1.18E+01	1.18E+01	1.18E+01	1.18E+01	1.18E+01	1.18E+01	1.18E+01	1.18E+01	1.18E+01	1.18E+01	1.02E+01	1.09E+01	9.54E+00	8.63E+00	8.88E+00	7.10E+00	9.62E+00	6.77E+00	7.43E+00	6.94E+00	3.44E+00	4.54E+00	1.18E+01	1.18E+01	1.11E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
S (Dissolved)	mg/L	0.00E+00	5.18E+02	5.18E+02	5.18E+02	5.18E+02	3.94E+02	5.18E+02	5.18E+02	5.18E+02	4.86E+02	3.22E+02	2.67E+02	2.87E+02	2.51E+02	2.27E+02	2.33E+02	1.87E+02	2.53E+02	1.78E+02	1.95E+02	1.82E+02	9.04E+01	1.19E+02	3.46E+02	4.15E+02	2.91E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tl (Dissolved)	mg/L	0.00E+00	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.55E-04	2.62E-04	2.10E-04	2.80E-04	2.00E-04	2.20E-04	2.05E-04	1.02E-04	1.34E-04	2.80E-04	2.80E-04	2.80E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sn (Dissolved)	mg/L	0.00E+00	7.75E-02	6.23E-02	5.92E-02	6.06E-02	4.16E-02	6.62E-02	7.34E-02	6.39E-02	5.13E-02	3.40E-02	2.81E-02	3.03E-02	2.64E-02	2.39E-02	2.46E-02	1.97E-02	2.67E-02	1.87E-02	2.06E-02	1.92E-02	9.53E-03	1.26E-02	3.65E-02	4.37E-02	3.07E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ti (Dissolved)	mg/L	0.00E+00	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.08E-02	1.19E-02	1.03E-02	1.13E-02	1.05E-02	5.22E-03	6.89E-03	1.19E-02	1.19E-02	1.19E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
U (Dissolved)	mg/L	0.00E+00	2.18E-02	1.75E-02	1.67E-02	1.71E-02	1.17E-02	1.86E-02	2.07E-02	1.80E-02	1.44E-02	9.56E-03	7.92E-03	8.53E-03	7.44E-03	6.73E-03	6.93E-03	5.54E-03	7.51E-03	5.28E-03	5.80E-03	5.42E-03	2.68E-03	3.54E-03	1.03E-02	1.23E-02	8.63E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
V (Dissolved)	mg/L	0.00E+00	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zn (Dissolved)	mg/L	0.00E+00	5.40E-02	5.40E-

APPENDIX A3 - UPPER CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 7.3 Out

Parameter	Unit	All 01/01/2013
Physical Tests		
Acidity to pH 4.5 (as CaCO	mg/L	5.00E-01
Acidity to pH 8.3 (as CaCO	mg/L	8.25E-01
Alkalinity (Total as CaCO3)	mg/L	7.25E+01
Hardness as CaCO3 (Dissc	mg/L	8.50E+01
H+ Concentration	mg/L	3.18E-05
Dissolved Anions		
Sulphate (Dissolved)	mg/L	2.88E+01
Chloride (Dissolved)	mg/L	1.10E+00
Fluoride (Dissolved)	mg/L	1.13E-01
Nutrient		
Nitrate (Dissolved)	mg/L	0.00E+00
Ammonia (Dissolved)	mg/L	0.00E+00
Nitrite (Dissolved)	mg/L	0.00E+00
Orthophosphate (Dissolved	mg/L	4.80E-02
Dissolved Metals		
Al (Dissolved)	mg/L	4.02E-02
Sb (Dissolved)	mg/L	1.79E-03
As (Dissolved)	mg/L	1.98E-02
Ba (Dissolved)	mg/L	5.26E-02
Be (Dissolved)	mg/L	1.00E-05
Bi (Dissolved)	mg/L	1.25E-06
B (Dissolved)	mg/L	5.00E-02
Cd (Dissolved)	mg/L	4.25E-05
Ca (Dissolved)	mg/L	1.89E+01
Cr (Dissolved)	mg/L	1.25E-04
Co (Dissolved)	mg/L	8.86E-04
Cu (Dissolved)	mg/L	2.24E-03
Fe (Dissolved)	mg/L	4.75E-02
Pb (Dissolved)	mg/L	1.41E-04
Li (Dissolved)	mg/L	1.73E-03
Mg (Dissolved)	mg/L	1.10E+01
Mn (Dissolved)	mg/L	9.89E-02
Mo (Dissolved)	mg/L	2.65E-03
Ni (Dissolved)	mg/L	6.90E-04
P (Dissolved)	mg/L	2.33E-02
K (Dissolved)	mg/L	4.84E+00
Se (Dissolved)	mg/L	1.31E-03
Si (Dissolved)	mg/L	3.35E+00
Ag (Dissolved)	mg/L	5.00E-06
Na (Dissolved)	mg/L	3.26E+00
Sr (Dissolved)	mg/L	3.01E-01
S (Dissolved)	mg/L	1.08E+01
Tl (Dissolved)	mg/L	1.75E-05
Sn (Dissolved)	mg/L	3.00E-04
Ti (Dissolved)	mg/L	5.00E-04
U (Dissolved)	mg/L	1.57E-03
V (Dissolved)	mg/L	4.25E-04
Zn (Dissolved)	mg/L	2.90E-03
Zr (Dissolved)	mg/L	1.00E-04
Hg (Dissolved)	mg/L	2.00E-05

APPENDIX A3 - UPPER CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 9 Out

Parameter	Unit	Year -2 (Coffer	Year -1 (Stage	Year 1 (Stag	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	End
Year		01/01/2013	01/01/2014	01/01/2015	01/01/2016	01/01/2017	01/01/2018	01/01/2019	01/01/2020	01/01/2021	01/01/2022	01/01/2023	01/01/2024	01/01/2025	01/01/2026	01/01/2027	01/01/2028	01/01/2029	01/01/2030	01/01/2031	01/01/2032	01/01/2033	01/01/2034	01/01/2035	01/01/2036	01/01/2037	01/01/2038	01/01/2039	01/01/2040	01/01/2041	01/01/2042	01/01/2043	01/01/2044	01/01/2045	01/01/2046	01/01/2047	31/12/2113
Physical Tests																																					
Acidity to pH 4.5 (as C	mg/L	0.00E+00	0.00E+00	0.00E+00

APPENDIX A3 - UPPER CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 10.1 Out

Parameter	Unit	Year -2 (Coffer	Year -1 (Stage	Year 1 (Stag	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	End
Year		01/01/2013	01/01/2014	01/01/2015	01/01/2016	01/01/2017	01/01/2018	01/01/2019	01/01/2020	01/01/2021	01/01/2022	01/01/2023	01/01/2024	01/01/2025	01/01/2026	01/01/2027	01/01/2028	01/01/2029	01/01/2030	01/01/2031	01/01/2032	01/01/2033	01/01/2034	01/01/2035	01/01/2036	01/01/2037	01/01/2038	01/01/2039	01/01/2040	01/01/2041	01/01/2042	01/01/2043	01/01/2044	01/01/2045	01/01/2046	01/01/2047	31/12/2113
Physical Tests																																					
Acidity to pH 4.5 (as C	mg/L	7.53E+00	7.53E+00	7.53E+00

APPENDIX A3 - UPPER CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 10.2 Out

Parameter	Unit	Year -2 (Coffer	Year -1 (Stage 1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Year		01/01/2013	01/01/2036	01/01/2037	01/01/2038	01/01/2039	01/01/2040	01/01/2041	01/01/2042	01/01/2043	01/01/2044	01/01/2045	01/01/2046	01/01/2047	01/01/2048	01/01/2049	01/01/2050	01/01/2051	01/01/2052	01/01/2053	01/01/2054	01/01/2055	01/01/2056	01/01/2057	01/01/2058	01/01/2059	01/01/2060
Physical Tests																											
Acidity to pH 4.5 (as C	mg/L	0.00E+00	0.00E+00	3.17E+00	3.17E+00	3.17E+00	3.52E+00	3.88E+00	4.27E+00	4.26E+00	4.62E+00	4.62E+00	4.97E+00	4.97E+00	4.97E+00	4.97E+00	4.96E+00	4.96E+00	4.96E+00	4.96E+00	5.33E+00	5.32E+00	5.32E+00	5.32E+00	5.32E+00	5.32E+00	5.32E+00
Acidity to pH 8.3 (as C	mg/L	0.00E+00	0.00E+00	3.85E+00	3.85E+00	3.85E+00	4.29E+00	4.73E+00	5.19E+00	5.19E+00	5.62E+00	5.62E+00	6.05E+00	6.05E+00	6.04E+00	6.04E+00	6.04E+00	6.04E+00	6.04E+00	6.04E+00	6.48E+00	6.48E+00	6.48E+00	6.48E+00	6.48E+00	6.48E+00	6.47E+00
Alkalinity (Total as Ca	mg/L	0.00E+00	0.00E+00	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01
Hardness as CaCO3 (	mg/L	0.00E+00	0.00E+00	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02
H+ Concentration	mg/L	0.00E+00	0.00E+00	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05
Dissolved Anions																											
Sulphate (Dissolved)	mg/L	0.00E+00	0.00E+00	2.25E+02	2.25E+02	2.25E+02	2.50E+02	2.76E+02	3.03E+02	3.03E+02	3.28E+02	3.28E+02	3.52E+02	3.52E+02	3.52E+02	3.52E+02	3.52E+02	3.52E+02	3.52E+02	3.52E+02	3.78E+02	3.78E+02	3.78E+02	3.78E+02	3.78E+02	3.77E+02	3.77E+02
Chloride (Dissolved)	mg/L	0.00E+00	0.00E+00	4.31E+00	4.31E+00	4.31E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00
Fluoride (Dissolved)	mg/L	0.00E+00	0.00E+00	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02
Nutrients																											
Nitrate (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrite (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Orthophosphate (Diss	mg/L	0.00E+00	0.00E+00	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02
Dissolved Metals																											
Al (Dissolved)	mg/L	0.00E+00	0.00E+00	6.52E-01	6.52E-01	6.52E-01	7.26E-01	8.00E-01	8.78E-01	8.78E-01	9.51E-01	9.51E-01	1.02E+00	1.02E+00	1.02E+00	1.02E+00	1.02E+00	1.02E+00	1.02E+00	1.02E+00	1.10E+00	1.10E+00	1.10E+00	1.10E+00	1.10E+00	1.10E+00	1.10E+00
Sb (Dissolved)	mg/L	0.00E+00	0.00E+00	2.81E-03	2.81E-03	2.81E-03	3.13E-03	3.45E-03	3.79E-03	3.79E-03	4.11E-03	4.10E-03	4.42E-03	4.42E-03	4.41E-03	4.41E-03	4.41E-03	4.41E-03	4.41E-03	4.41E-03	4.73E-03	4.73E-03	4.73E-03	4.73E-03	4.73E-03	4.73E-03	4.73E-03
As (Dissolved)	mg/L	0.00E+00	0.00E+00	2.82E-02	2.82E-02	2.82E-02	3.14E-02	3.45E-02	3.79E-02	3.79E-02	4.11E-02	4.11E-02	4.42E-02	4.42E-02	4.42E-02	4.42E-02	4.42E-02	4.42E-02	4.41E-02	4.41E-02	4.74E-02	4.74E-02	4.74E-02	4.74E-02	4.73E-02	4.73E-02	4.73E-02
Ba (Dissolved)	mg/L	0.00E+00	0.00E+00	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02
Be (Dissolved)	mg/L	0.00E+00	0.00E+00	6.33E-05	6.33E-05	6.33E-05	7.05E-05	7.77E-05	8.53E-05	8.53E-05	9.24E-05	9.23E-05	9.94E-05	9.93E-05	9.93E-05	9.93E-05	9.93E-05	9.93E-05	9.92E-05	9.92E-05	1.07E-04	1.06E-04	1.06E-04	1.06E-04	1.06E-04	1.06E-04	1.06E-04
Bi (Dissolved)	mg/L	0.00E+00	0.00E+00	3.17E-05	3.17E-05	3.17E-05	3.53E-05	3.89E-05	4.27E-05	4.27E-05	4.62E-05	4.62E-05	4.97E-05	4.97E-05	4.97E-05	4.97E-05	4.97E-05	4.97E-05	4.97E-05	4.97E-05	5.33E-05	5.33E-05	5.33E-05	5.33E-05	5.33E-05	5.33E-05	5.33E-05
B (Dissolved)	mg/L	0.00E+00	0.00E+00	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02
Cd (Dissolved)	mg/L	0.00E+00	0.00E+00	8.94E-04	8.94E-04	8.94E-04	9.95E-04	1.10E-03	1.20E-03	1.20E-03	1.30E-03	1.30E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	1.50E-03	1.50E-03	1.50E-03	1.50E-03	1.50E-03	1.50E-03	1.50E-03
Ca (Dissolved)	mg/L	0.00E+00	0.00E+00	1.02E+02	1.02E+02	1.02E+02	1.13E+02	1.25E+02	1.37E+02	1.37E+02	1.48E+02	1.48E+02	1.60E+02	1.60E+02	1.59E+02	1.59E+02	1.59E+02	1.59E+02	1.59E+02	1.59E+02	1.71E+02	1.71E+02	1.71E+02	1.71E+02	1.71E+02	1.71E+02	1.71E+02
Cr (Dissolved)	mg/L	0.00E+00	0.00E+00	1.07E-03	1.07E-03	1.07E-03	1.19E-03	1.31E-03	1.44E-03	1.43E-03	1.55E-03	1.55E-03	1.67E-03	1.67E-03	1.67E-03	1.67E-03	1.67E-03	1.67E-03	1.67E-03	1.67E-03	1.79E-03	1.79E-03	1.79E-03	1.79E-03	1.79E-03	1.79E-03	1.79E-03
Co (Dissolved)	mg/L	0.00E+00	0.00E+00	2.32E-03	2.32E-03	2.32E-03	2.59E-03	2.85E-03	3.13E-03	3.13E-03	3.39E-03	3.39E-03	3.64E-03	3.64E-03	3.64E-03	3.64E-03	3.64E-03	3.64E-03	3.64E-03	3.64E-03	3.91E-03	3.91E-03	3.90E-03	3.90E-03	3.90E-03	3.90E-03	3.90E-03
Cu (Dissolved)	mg/L	0.00E+00	0.00E+00	1.12E-02	1.12E-02	1.12E-02	1.25E-02	1.38E-02	1.51E-02	1.51E-02	1.64E-02	1.64E-02	1.76E-02	1.76E-02	1.76E-02	1.76E-02	1.76E-02	1.76E-02	1.76E-02	1.76E-02	1.89E-02	1.89E-02	1.89E-02	1.89E-02	1.89E-02	1.89E-02	1.89E-02
Fe (Dissolved)	mg/L	0.00E+00	0.00E+00	5.79E-02	5.79E-02	5.79E-02	6.44E-02	7.10E-02	7.80E-02	7.80E-02	8.44E-02	8.44E-02	9.08E-02	9.08E-02	9.08E-02	9.08E-02	9.08E-02	9.07E-02	9.07E-02	9.07E-02	9.74E-02	9.74E-02	9.73E-02	9.73E-02	9.73E-02	9.73E-02	9.73E-02
Pb (Dissolved)	mg/L	0.00E+00	0.00E+00	1.31E-03	1.31E-03	1.31E-03	1.46E-03	1.61E-03	1.77E-03	1.77E-03	1.92E-03	1.92E-03	2.06E-03	2.06E-03	2.06E-03	2.06E-03	2.06E-03	2.06E-03	2.06E-03	2.06E-03	2.21E-03	2.21E-03	2.21E-03	2.21E-03	2.21E-03	2.21E-03	2.21E-03
Li (Dissolved)	mg/L	0.00E+00	0.00E+00	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03
Mg (Dissolved)	mg/L	0.00E+00	0.00E+00	8.73E+01	8.73E+01	8.73E+01	9.72E+01	1.07E+02	1.18E+02	1.18E+02	1.27E+02	1.27E+02	1.37E+02	1.37E+02	1.37E+02	1.37E+02	1.37E+02	1.37E+02	1.37E+02	1.37E+02	1.47E+02	1.47E+02	1.47E+02	1.47E+02	1.47E+02	1.47E+02	1.47E+02
Mn (Dissolved)	mg/L	0.00E+00	0.00E+00	2.36E-01	2.36E-01	2.36E-01	2.63E-01	2.90E-01	3.18E-01	3.18E-01	3.44E-01	3.44E-01	3.71E-01	3.70E-01	3.70E-01	3.70E-01	3.70E-01	3.70E-01	3.70E-01	3.70E-01	3.97E-01	3.97E-01	3.97E-01	3.97E-01	3.97E-01	3.97E-01	3.97E-01
Mo (Dissolved)	mg/L	0.00E+00	0.00E+00	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02
Ni (Dissolved)	mg/L	0.00E+00	0.00E+00	5.94E-03	5.94E-03	5.94E-03	6.61E-03	7.29E-03	8.00E-03	8.00E-03	8.67E-03	8.66E-03	9.32E-03	9.32E-03	9.32E-03	9.32E-03	9.31E-03	9.31E-03	9.31E-03	9.31E-03	9.99E-03	9.99E-03	9.99E-03	9.99E-03	9.99E-03	9.98E-03	9.98E-03
P (Dissolved)	mg/L	0.00E+00	0.00E+00	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02
K (Dissolved)	mg/L	0.00E+00	0.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00
Se (Dissolved)	mg/L	0.00E+00	0.00E+00	2.20E-02	2.20E-02	2.20E-02	2.44E-02	2.69E-02	2.96E-02	2.96E-02	3.20E-02	3.20E-02	3.45E-02	3.44E-02	3.44E-02	3.44E-02	3.44E-02	3.44E-02	3.44E-02	3.44E-02	3.69E-02	3.69E-02	3.69E-02	3.69E-02	3.69E-02	3.69E-02	3.69E-02
Si (Dissolved)	mg/L	0.00E+00	0.00E+00	4.29E+00	4.29E+00	4.29E+00	4.78E+00	5.26E+00	5.78E+00	5.78E+00	6.26E+00	6.26E+00	6.74E+00	6.73E+00	6.73E+00	6.73E+00	6.73E+00	6.73E+00	6.73E+00	6.73E+00	7.22E+00	7.22E+00	7.22E+00	7.22E+00	7.21E+00	7.21E+00	7.21E+00
Sr (Dissolved)	mg/L	0.00E+00	0.00E+00	6.90E-01	6.90E-01	6.90E-01	7.68E-01	8.46E-01	9.29E-01	9.29E-01	1.01E+00	1.01E+00	1.08E+00	1.08E+00	1.08E+00	1.08E+00	1.08E+00	1.08E+00	1.08E+00	1.08E+00	1.16E+00	1.16E+00	1.16E+00	1.16E+00	1.16E+00	1.16E+00	1.16E+00
S (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tl (Dissolved)	mg/L	0.00E+00	0.00E+00	9.05E-05	9.05E-05	9.05E-05	1.01E-04	1.11E-04	1.22E-04	1.22E-04	1.32E-04	1.32E-04	1.42E-04	1.42E-04	1.42E-04	1.42E-04	1.42E-04	1.42E-04	1.42E-04	1.42E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04
Sn (Dissolved)	mg/L	0.00E+00	0.00E+00	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04
Ti (Dissolved)	mg/L	0.00E+00	0.00E+00	4.65E-03	4.65E-03	4.65E-03	5.18E-03	5.70E-03	6.26E-03	6.26E-03	6.78E-03	6.78E-03	7.29E-03	7.29E-03	7.29E-03	7.29E-03	7.29E-03	7.29E-03	7.29E-03	7.28E-03	7.82E-03	7.82E-03	7.82E-03	7.82E-03	7.81E-03	7.81E-03	7.81E-03
U (Dissolved)	mg/L	0.00E+00	0.00E+00	2.39E-03	2.39E-03	2.39E-03	2.66E-03	2.93E-03	3.22E-03	3.22E-03	3.49E-03	3.49E-03	3.75E-03	3.75E-03	3.75E-03	3.75E-03	3.75E-03	3.75E-03	3.75E-03	3.75E-03	4.02E-03	4.02E-03	4.02E-03	4.02E-03	4.02E-03	4.02E-03	4.02E-03
V (Dissolved)	mg/L	0.00E+00	0.00E+00	4.54E-03	4.54E-03	4.54E-03	5.05E-03	5.57E-03	6.12E-03	6.12E-03	6.62E-03	6.62E-03	7.12E-03	7.12E-03	7.12E-03	7.12E-03	7.12E-03	7.12E-03	7.12E-03	7.11E-03	7.64E-03	7.64E-03	7.63E-03	7.63E-03	7.63E-03	7.63E-03	7.63E-03
Zn (Dissolved)	mg/L	0.00E+00	0.00E+00	3.27E-02	3.27E-02	3.27E-02	3.64E-02	4.02E-02	4.41E-02	4.41E-02	4.78E-02	4.77E-02	5.14E-02	5.14E-02	5.14E-02	5.13E-02	5.13E-02	5.13E-02	5.13E-02	5.13E-02	5.51E-02	5.51E-02	5.50E-02	5.50E-02	5.50E-02	5.50E-02	5.50E-02
Zr (Dissolved)	mg/L	0.00E+00	0.00E+00	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04
Hg (Dissolved)	mg/L	0.00E+00	0.00E+00	1.27E-05	1.27E-05	1.27E-05	1.41E-05	1.55E-05	1.71E-05	1.71E-05	1.85E-05	1.85E-05	1.99E-05	1.99E-05	1.99E-05	1.99E-05	1.99E-05	1.99E-05	1.98E-05	1.98E-05	2.13E-05	2.13E-05	2.13E-05	2.13E-05	2.13E-05	2.13E-05	2.13E-05

APPENDIX A3 - UPPER CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 10.2 Out

Parameter	Unit	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Year		01/01/2061	01/01/2062	01/01/2063	01/01/2064	01/01/2065	01/01/2066	01/01/2067	01/01/2068	01/01/2069	01/01/2070	01/01/2071	01/01/2072	01/01/2073	01/01/2074	01/01/2075	01/01/2076	01/01/2077	01/01/2078	01/01/2079	01/01/2080	01/01/2081	01/01/2082	01/01/2083	01/01/2084	01/01/2085	01/01/2086
Physical Tests																											
Acidity to pH 4.5 (as C	mg/L	5.65E+00	5.65E+00	5.98E+00	5.98E+00	6.30E+00	6.97E+00	6.97E+00	6.97E+00	6.97E+00	6.97E+00	6.96E+00	6.96E+00	7.28E+00	7.28E+00	7.61E+00	7.61E+00	7.61E+00	7.60E+00	7.60E+00	7.60E+00	7.60E+00	7.59E+00	7.90E+00	7.89E+00	7.89E+00	7.89E+00
Acidity to pH 8.3 (as C	mg/L	6.88E+00	6.88E+00	7.27E+00	7.27E+00	7.67E+00	8.49E+00	8.49E+00	8.48E+00	8.48E+00	8.48E+00	8.48E+00	8.48E+00	8.86E+00	8.86E+00	9.26E+00	9.26E+00	9.26E+00	9.26E+00	9.25E+00	9.25E+00	9.25E+00	9.24E+00	9.61E+00	9.61E+00	9.61E+00	9.60E+00
Alkalinity (Total as Ca(	mg/L	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01
Hardness as CaCO3 (	mg/L	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02
H+ Concentration	mg/L	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05
Dissolved Anions																											
Sulphate (Dissolved)	mg/L	4.01E+02	4.01E+02	4.24E+02	4.24E+02	4.47E+02	4.95E+02	4.95E+02	4.95E+02	4.94E+02	4.94E+02	4.94E+02	4.94E+02	5.16E+02	5.16E+02	5.40E+02	5.40E+02	5.40E+02	5.39E+02	5.39E+02	5.39E+02	5.39E+02	5.39E+02	5.60E+02	5.60E+02	5.60E+02	5.60E+02
Chloride (Dissolved)	mg/L	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00
Fluoride (Dissolved)	mg/L	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02
Nutrients																											
Nitrate (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrite (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Orthophosphate (Diss	mg/L	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02
Dissolved Metals																											
Al (Dissolved)	mg/L	1.16E+00	1.16E+00	1.23E+00	1.23E+00	1.30E+00	1.44E+00	1.44E+00	1.44E+00	1.43E+00	1.43E+00	1.43E+00	1.43E+00	1.50E+00	1.50E+00	1.57E+00	1.57E+00	1.57E+00	1.57E+00	1.57E+00	1.56E+00	1.56E+00	1.56E+00	1.63E+00	1.63E+00	1.62E+00	1.62E+00
Sb (Dissolved)	mg/L	5.02E-03	5.02E-03	5.31E-03	5.31E-03	5.60E-03	6.20E-03	6.20E-03	6.20E-03	6.19E-03	6.19E-03	6.19E-03	6.19E-03	6.47E-03	6.47E-03	6.77E-03	6.76E-03	6.76E-03	6.76E-03	6.76E-03	6.76E-03	6.75E-03	6.75E-03	7.02E-03	7.02E-03	7.02E-03	7.01E-03
As (Dissolved)	mg/L	5.03E-02	5.03E-02	5.32E-02	5.32E-02	5.61E-02	6.20E-02	6.20E-02	6.20E-02	6.20E-02	6.20E-02	6.20E-02	6.20E-02	6.48E-02	6.47E-02	6.77E-02	6.77E-02	6.77E-02	6.76E-02	6.76E-02	6.76E-02	6.76E-02	6.76E-02	7.02E-02	7.02E-02	7.02E-02	7.02E-02
Ba (Dissolved)	mg/L	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02
Be (Dissolved)	mg/L	1.13E-04	1.13E-04	1.20E-04	1.20E-04	1.26E-04	1.39E-04	1.39E-04	1.39E-04	1.39E-04	1.39E-04	1.39E-04	1.39E-04	1.46E-04	1.46E-04	1.52E-04	1.52E-04	1.52E-04	1.52E-04	1.52E-04	1.52E-04	1.52E-04	1.52E-04	1.58E-04	1.58E-04	1.58E-04	1.58E-04
Bi (Dissolved)	mg/L	5.66E-05	5.66E-05	5.98E-05	5.98E-05	6.31E-05	6.98E-05	6.98E-05	6.98E-05	6.98E-05	6.98E-05	6.97E-05	6.97E-05	7.29E-05	7.29E-05	7.62E-05	7.62E-05	7.62E-05	7.61E-05	7.61E-05	7.61E-05	7.61E-05	7.61E-05	7.91E-05	7.90E-05	7.90E-05	7.90E-05
B (Dissolved)	mg/L	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02
Cd (Dissolved)	mg/L	1.60E-03	1.59E-03	1.69E-03	1.69E-03	1.78E-03	1.97E-03	1.97E-03	1.97E-03	1.97E-03	1.97E-03	1.97E-03	1.97E-03	2.05E-03	2.05E-03	2.15E-03	2.15E-03	2.15E-03	2.15E-03	2.15E-03	2.15E-03	2.14E-03	2.14E-03	2.23E-03	2.23E-03	2.23E-03	2.23E-03
Ca (Dissolved)	mg/L	1.81E+02	1.81E+02	1.92E+02	1.92E+02	2.02E+02	2.24E+02	2.24E+02	2.24E+02	2.24E+02	2.24E+02	2.24E+02	2.24E+02	2.34E+02	2.34E+02	2.44E+02	2.44E+02	2.44E+02	2.44E+02	2.44E+02	2.44E+02	2.44E+02	2.44E+02	2.54E+02	2.54E+02	2.53E+02	2.53E+02
Cr (Dissolved)	mg/L	1.90E-03	1.90E-03	2.01E-03	2.01E-03	2.12E-03	2.35E-03	2.35E-03	2.35E-03	2.34E-03	2.34E-03	2.34E-03	2.34E-03	2.45E-03	2.45E-03	2.56E-03	2.56E-03	2.56E-03	2.56E-03	2.56E-03	2.56E-03	2.56E-03	2.56E-03	2.66E-03	2.66E-03	2.66E-03	2.65E-03
Co (Dissolved)	mg/L	4.14E-03	4.14E-03	4.38E-03	4.38E-03	4.62E-03	5.11E-03	5.11E-03	5.11E-03	5.11E-03	5.11E-03	5.11E-03	5.11E-03	5.34E-03	5.34E-03	5.58E-03	5.58E-03	5.58E-03	5.58E-03	5.58E-03	5.58E-03	5.57E-03	5.57E-03	5.79E-03	5.79E-03	5.79E-03	5.79E-03
Cu (Dissolved)	mg/L	2.00E-02	2.00E-02	2.12E-02	2.12E-02	2.23E-02	2.47E-02	2.47E-02	2.47E-02	2.47E-02	2.47E-02	2.47E-02	2.47E-02	2.58E-02	2.58E-02	2.70E-02	2.70E-02	2.70E-02	2.69E-02	2.69E-02	2.69E-02	2.69E-02	2.69E-02	2.80E-02	2.80E-02	2.80E-02	2.80E-02
Fe (Dissolved)	mg/L	1.03E-01	1.03E-01	1.09E-01	1.09E-01	1.15E-01	1.28E-01	1.27E-01	1.27E-01	1.27E-01	1.27E-01	1.27E-01	1.27E-01	1.33E-01	1.33E-01	1.39E-01	1.39E-01	1.39E-01	1.39E-01	1.39E-01	1.39E-01	1.39E-01	1.39E-01	1.44E-01	1.44E-01	1.44E-01	1.44E-01
Pb (Dissolved)	mg/L	2.35E-03	2.35E-03	2.48E-03	2.48E-03	2.62E-03	2.90E-03	2.89E-03	2.89E-03	2.89E-03	2.89E-03	2.89E-03	2.89E-03	3.02E-03	3.02E-03	3.16E-03	3.16E-03	3.16E-03	3.16E-03	3.16E-03	3.16E-03	3.15E-03	3.15E-03	3.28E-03	3.28E-03	3.28E-03	3.28E-03
Li (Dissolved)	mg/L	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03
Mg (Dissolved)	mg/L	1.56E+02	1.56E+02	1.65E+02	1.65E+02	1.74E+02	1.92E+02	1.92E+02	1.92E+02	1.92E+02	1.92E+02	1.92E+02	1.92E+02	2.01E+02	2.01E+02	2.10E+02	2.10E+02	2.10E+02	2.10E+02	2.10E+02	2.10E+02	2.10E+02	2.09E+02	2.18E+02	2.18E+02	2.18E+02	2.18E+02
Mn (Dissolved)	mg/L	4.21E-01	4.21E-01	4.46E-01	4.46E-01	4.70E-01	5.20E-01	5.20E-01	5.20E-01	5.20E-01	5.20E-01	5.19E-01	5.19E-01	5.43E-01	5.43E-01	5.68E-01	5.67E-01	5.67E-01	5.67E-01	5.67E-01	5.67E-01	5.67E-01	5.66E-01	5.89E-01	5.89E-01	5.89E-01	5.88E-01
Mo (Dissolved)	mg/L	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02
Ni (Dissolved)	mg/L	1.06E-02	1.06E-02	1.12E-02	1.12E-02	1.18E-02	1.31E-02	1.31E-02	1.31E-02	1.31E-02	1.31E-02	1.31E-02	1.31E-02	1.37E-02	1.37E-02	1.43E-02	1.43E-02	1.43E-02	1.43E-02	1.43E-02	1.43E-02	1.43E-02	1.43E-02	1.48E-02	1.48E-02	1.48E-02	1.48E-02
P (Dissolved)	mg/L	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02
K (Dissolved)	mg/L	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00
Se (Dissolved)	mg/L	3.92E-02	3.92E-02	4.14E-02	4.14E-02	4.37E-02	4.84E-02	4.83E-02	4.83E-02	4.83E-02	4.83E-02	4.83E-02	4.83E-02	5.05E-02	5.05E-02	5.28E-02	5.28E-02	5.27E-02	5.27E-02	5.27E-02	5.27E-02	5.27E-02	5.27E-02	5.48E-02	5.47E-02	5.47E-02	5.47E-02
Si (Dissolved)	mg/L	7.66E+00	7.66E+00	8.10E+00	8.10E+00	8.54E+00	9.45E+00	9.45E+00	9.45E+00	9.45E+00	9.44E+00	9.44E+00	9.44E+00	9.87E+00	9.86E+00	1.03E+01	1.03E+01	1.03E+01	1.03E+01	1.03E+01	1.03E+01	1.03E+01	1.03E+01	1.07E+01	1.07E+01	1.07E+01	1.07E+01
Na (Dissolved)	mg/L	1.23E+00	1.23E+00	1.30E+00	1.30E+00	1.37E+00	1.52E+00	1.52E+00	1.52E+00	1.52E+00	1.52E+00	1.52E+00	1.52E+00	1.59E+00	1.58E+00	1.66E+00	1.66E+00	1.66E+00	1.66E+00	1.66E+00	1.66E+00	1.65E+00	1.65E+00	1.72E+00	1.72E+00	1.72E+00	1.72E+00
Sr (Dissolved)	mg/L	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00
S (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tl (Dissolved)	mg/L	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04
Sn (Dissolved)	mg/L	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04
Ti (Dissolved)	mg/L	8.30E-03	8.29E-03	8.78E-03	8.77E-03	9.25E-03	1.02E-02	1.02E-02	1.02E-02	1.02E-02	1.02E-02	1.02E-02	1.02E-02	1.07E-02	1.07E-02	1.12E-02	1.12E-02	1.12E-02	1.12E-02	1.12E-02	1.12E-02	1.12E-02	1.12E-02	1.16E-02	1.16E-02	1.16E-02	1.16E-02
U (Dissolved)	mg/L	4.26E-03	4.26E-03	4.51E-03	4.51E-03	4.76E-03	5.26E-03	5.26E-03	5.26E-03	5.26E-03	5.26E-03	5.26E-03	5.26E-03	5.49E-03	5.49E-03	5.74E-03	5.74E-03	5.74E-03	5.74E-03	5.74E-03	5.74E-03	5.73E-03	5.73E-03	5.96E-03	5.96E-03	5.96E-03	5.95E-03
V (Dissolved)	mg/L	8.10E-03	8.10E-03	8.57E-03	8.57E-03	9.04E-03	1.00E-02	1.00E-02	1.00E-02	9.99E-03	9.99E-03	9.99E-03	9.99E-03	1.04E-02	1.04E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.13E-02	1.13E-02	1.13E-02	1.13E-02
Zn (Dissolved)	mg/L	5.84E-02	5.84E-02	6.18E-02	6.18E-02	6.52E-02	7.21E-02	7.21E-02	7.21E-02	7.21E-02	7.20E-02	7.20E-02	7.20E-02	7.53E-02	7.52E-02	7.87E-02	7.87E-02	7.86E-02	7.86E-02	7.86E-02	7.86E-02	7.86E-02	7.85E-02	8.16E-02	8.16E-02	8.16E-02	8.16E-02
Zr (Dissolved)	mg/L	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04
Hg (Dissolved)	mg/L	2.26E-05	2.26E-05	2.39E-05	2.39E-05	2.52E-05	2.79E-05	2.79E-05	2.79E-05	2.79E-05	2.79E-05	2.79E-05	2.79E-05	2.91E-05	2.91E-05	3.04E-05	3.04E-05	3.04E-05	3.04E-05	3.04E-05	3.04E-05	3.04E-05	3.04E-05	3.16E-05	3.16E-05	3.16E-05	3.16E-05
Ag (Dissolved)	mg/L	7.18E-05	7.18E-05	7.59E-05	7.59E-05	8.00E-05	8.86E-05	8.86E-05	8.85E-05	8.85E-05	8.85E-05	8.85E-05	8.85E-05	9.24E-05	9.24E-05	9.67E-05	9.66E-05	9.66E-05	9.66E-05	9.66E-05	9.65E-05	9.65E-05	9.65E-05	1.00E-04	1.00E-04	1.00E-04	1.00E-04

APPENDIX A3 - UPPER CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 10.2 Out

Parameter	Unit	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76
Year		01/01/2087	01/01/2088	01/01/2089	01/01/2090	01/01/2091	01/01/2092	01/01/2093	01/01/2094	01/01/2095	01/01/2096	01/01/2097	01/01/2098	01/01/2099	01/01/2100	01/01/2101	01/01/2102	01/01/2103	01/01/2104	01/01/2105	01/01/2106	01/01/2107	01/01/2108	01/01/2109	01/01/2110	01/01/2111	01/01/2112
Physical Tests																											
Acidity to pH 4.5 (as C	mg/L	7.89E+00	7.88E+00	7.88E+00	8.17E+00	8.17E+00	8.17E+00	8.17E+00	8.45E+00	8.45E+00	9.04E+00	9.04E+00	9.04E+00	9.03E+00	9.03E+00	9.03E+00	9.03E+00	9.02E+00	9.02E+00	9.29E+00	9.29E+00	9.29E+00	9.28E+00	9.28E+00	9.28E+00	9.83E+00	9.83E+00
Acidity to pH 8.3 (as C	mg/L	9.60E+00	9.60E+00	9.59E+00	9.95E+00	9.95E+00	9.94E+00	9.94E+00	1.03E+01	1.03E+01	1.10E+01	1.10E+01	1.10E+01	1.10E+01	1.10E+01	1.10E+01	1.10E+01	1.10E+01	1.10E+01	1.13E+01	1.13E+01	1.13E+01	1.13E+01	1.13E+01	1.13E+01	1.20E+01	1.20E+01
Alkalinity (Total as Ca(	mg/L	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01
Hardness as CaCO3 (	mg/L	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02
H+ Concentration	mg/L	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05
Dissolved Anions																											
Sulphate (Dissolved)	mg/L	5.60E+02	5.59E+02	5.59E+02	5.80E+02	5.80E+02	5.80E+02	5.79E+02	6.00E+02	6.00E+02	6.42E+02	6.41E+02	6.41E+02	6.41E+02	6.41E+02	6.41E+02	6.40E+02	6.40E+02	6.40E+02	6.59E+02	6.59E+02	6.59E+02	6.59E+02	6.58E+02	6.58E+02	6.97E+02	6.97E+02
Chloride (Dissolved)	mg/L	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00
Fluoride (Dissolved)	mg/L	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02
Nutrients																											
Nitrate (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrite (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Orthophosphate (Diss	mg/L	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02	2.89E-02
Dissolved Metals																											
Al (Dissolved)	mg/L	1.62E+00	1.62E+00	1.62E+00	1.68E+00	1.68E+00	1.68E+00	1.68E+00	1.74E+00	1.74E+00	1.86E+00	1.86E+00	1.86E+00	1.86E+00	1.86E+00	1.86E+00	1.86E+00	1.86E+00	1.86E+00	1.91E+00	1.91E+00	1.91E+00	1.91E+00	1.91E+00	1.91E+00	2.02E+00	2.02E+00
Sb (Dissolved)	mg/L	7.01E-03	7.01E-03	7.01E-03	7.27E-03	7.26E-03	7.26E-03	7.26E-03	7.52E-03	7.51E-03	8.04E-03	8.04E-03	8.03E-03	8.03E-03	8.03E-03	8.03E-03	8.02E-03	8.02E-03	8.02E-03	8.26E-03	8.26E-03	8.26E-03	8.25E-03	8.25E-03	8.25E-03	8.74E-03	8.74E-03
As (Dissolved)	mg/L	7.02E-02	7.01E-02	7.01E-02	7.27E-02	7.27E-02	7.27E-02	7.27E-02	7.52E-02	7.52E-02	8.04E-02	8.04E-02	8.04E-02	8.04E-02	8.03E-02	8.03E-02	8.03E-02	8.03E-02	8.02E-02	8.27E-02	8.26E-02	8.26E-02	8.26E-02	8.26E-02	8.25E-02	8.74E-02	8.74E-02
Ba (Dissolved)	mg/L	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02
Be (Dissolved)	mg/L	1.58E-04	1.58E-04	1.58E-04	1.63E-04	1.63E-04	1.63E-04	1.63E-04	1.69E-04	1.69E-04	1.81E-04	1.81E-04	1.81E-04	1.81E-04	1.81E-04	1.81E-04	1.81E-04	1.80E-04	1.80E-04	1.86E-04	1.86E-04	1.86E-04	1.86E-04	1.86E-04	1.86E-04	1.97E-04	1.97E-04
Bi (Dissolved)	mg/L	7.90E-05	7.89E-05	7.89E-05	8.19E-05	8.18E-05	8.18E-05	8.18E-05	8.47E-05	8.46E-05	9.05E-05	9.05E-05	9.05E-05	9.05E-05	9.04E-05	9.04E-05	9.04E-05	9.03E-05	9.03E-05	9.30E-05	9.30E-05	9.30E-05	9.30E-05	9.29E-05	9.29E-05	9.84E-05	9.84E-05
B (Dissolved)	mg/L	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02
Cd (Dissolved)	mg/L	2.23E-03	2.23E-03	2.23E-03	2.31E-03	2.31E-03	2.31E-03	2.31E-03	2.39E-03	2.39E-03	2.55E-03	2.55E-03	2.55E-03	2.55E-03	2.55E-03	2.55E-03	2.55E-03	2.55E-03	2.55E-03	2.62E-03	2.62E-03	2.62E-03	2.62E-03	2.62E-03	2.62E-03	2.77E-03	2.77E-03
Ca (Dissolved)	mg/L	2.53E+02	2.53E+02	2.53E+02	2.63E+02	2.62E+02	2.62E+02	2.62E+02	2.72E+02	2.71E+02	2.90E+02	2.90E+02	2.90E+02	2.90E+02	2.90E+02	2.90E+02	2.90E+02	2.90E+02	2.90E+02	2.98E+02	2.98E+02	2.98E+02	2.98E+02	2.98E+02	2.98E+02	3.16E+02	3.16E+02
Cr (Dissolved)	mg/L	2.65E-03	2.65E-03	2.65E-03	2.75E-03	2.75E-03	2.75E-03	2.75E-03	2.84E-03	2.84E-03	3.04E-03	3.04E-03	3.04E-03	3.04E-03	3.04E-03	3.04E-03	3.04E-03	3.04E-03	3.03E-03	3.13E-03	3.13E-03	3.12E-03	3.12E-03	3.12E-03	3.12E-03	3.31E-03	3.31E-03
Co (Dissolved)	mg/L	5.78E-03	5.78E-03	5.78E-03	6.00E-03	5.99E-03	5.99E-03	5.99E-03	6.20E-03	6.20E-03	6.63E-03	6.63E-03	6.63E-03	6.63E-03	6.62E-03	6.62E-03	6.62E-03	6.62E-03	6.62E-03	6.82E-03	6.81E-03	6.81E-03	6.81E-03	6.81E-03	6.80E-03	7.21E-03	7.21E-03
Cu (Dissolved)	mg/L	2.80E-02	2.79E-02	2.79E-02	2.90E-02	2.90E-02	2.90E-02	2.89E-02	3.00E-02	3.00E-02	3.20E-02	3.20E-02	3.20E-02	3.20E-02	3.20E-02	3.20E-02	3.20E-02	3.20E-02	3.20E-02	3.29E-02	3.29E-02	3.29E-02	3.29E-02	3.29E-02	3.29E-02	3.48E-02	3.48E-02
Fe (Dissolved)	mg/L	1.44E-01	1.44E-01	1.44E-01	1.49E-01	1.49E-01	1.49E-01	1.49E-01	1.55E-01	1.55E-01	1.65E-01	1.65E-01	1.65E-01	1.65E-01	1.65E-01	1.65E-01	1.65E-01	1.65E-01	1.65E-01	1.70E-01	1.70E-01	1.70E-01	1.70E-01	1.70E-01	1.70E-01	1.80E-01	1.80E-01
Pb (Dissolved)	mg/L	3.27E-03	3.27E-03	3.27E-03	3.39E-03	3.39E-03	3.39E-03	3.39E-03	3.51E-03	3.51E-03	3.75E-03	3.75E-03	3.75E-03	3.75E-03	3.75E-03	3.75E-03	3.75E-03	3.75E-03	3.74E-03	3.86E-03	3.86E-03	3.86E-03	3.85E-03	3.85E-03	3.85E-03	4.08E-03	4.08E-03
Li (Dissolved)	mg/L	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03
Mg (Dissolved)	mg/L	2.18E+02	2.17E+02	2.17E+02	2.25E+02	2.25E+02	2.25E+02	2.25E+02	2.33E+02	2.33E+02	2.49E+02	2.49E+02	2.49E+02	2.49E+02	2.49E+02	2.49E+02	2.49E+02	2.49E+02	2.49E+02	2.56E+02	2.56E+02	2.56E+02	2.56E+02	2.56E+02	2.56E+02	2.71E+02	2.71E+02
Mn (Dissolved)	mg/L	5.88E-01	5.88E-01	5.88E-01	6.10E-01	6.10E-01	6.09E-01	6.09E-01	6.31E-01	6.30E-01	6.74E-01	6.74E-01	6.74E-01	6.74E-01	6.74E-01	6.73E-01	6.73E-01	6.73E-01	6.73E-01	6.93E-01	6.93E-01	6.93E-01	6.92E-01	6.92E-01	6.92E-01	7.33E-01	7.33E-01
Mo (Dissolved)	mg/L	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02
Ni (Dissolved)	mg/L	1.48E-02	1.48E-02	1.48E-02	1.53E-02	1.53E-02	1.53E-02	1.53E-02	1.59E-02	1.59E-02	1.70E-02	1.70E-02	1.70E-02	1.70E-02	1.69E-02	1.69E-02	1.69E-02	1.69E-02	1.69E-02	1.74E-02	1.74E-02	1.74E-02	1.74E-02	1.74E-02	1.74E-02	1.84E-02	1.84E-02
P (Dissolved)	mg/L	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02
K (Dissolved)	mg/L	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00
Se (Dissolved)	mg/L	5.47E-02	5.47E-02	5.47E-02	5.67E-02	5.67E-02	5.67E-02	5.66E-02	5.86E-02	5.86E-02	6.27E-02	6.27E-02	6.27E-02	6.26E-02	6.26E-02	6.26E-02	6.26E-02	6.26E-02	6.25E-02	6.44E-02	6.44E-02	6.44E-02	6.44E-02	6.44E-02	6.43E-02	6.82E-02	6.81E-02
Si (Dissolved)	mg/L	1.07E+01	1.07E+01	1.07E+01	1.11E+01	1.11E+01	1.11E+01	1.11E+01	1.15E+01	1.15E+01	1.23E+01	1.23E+01	1.23E+01	1.22E+01	1.22E+01	1.22E+01	1.22E+01	1.22E+01	1.22E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01
Na (Dissolved)	mg/L	1.72E+00	1.72E+00	1.72E+00	1.78E+00	1.78E+00	1.78E+00	1.78E+00	1.84E+00	1.84E+00	1.97E+00	1.97E+00	1.97E+00	1.97E+00	1.97E+00	1.97E+00	1.97E+00	1.97E+00	1.96E+00	2.02E+00	2.02E+00	2.02E+00	2.02E+00	2.02E+00	2.02E+00	2.14E+00	2.14E+00
Sr (Dissolved)	mg/L	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00
S (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tl (Dissolved)	mg/L	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04
Sn (Dissolved)	mg/L	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04
Ti (Dissolved)	mg/L	1.16E-02	1.16E-02	1.16E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02
U (Dissolved)	mg/L	5.95E-03	5.95E-03	5.95E-03	6.17E-03	6.17E-03	6.17E-03	6.16E-03	6.38E-03	6.38E-03	6.83E-03	6.82E-03	6.82E-03	6.82E-03	6.82E-03	6.82E-03	6.81E-03	6.81E-03	6.81E-03	7.01E-03	7.01E-03	7.01E-03	7.01E-03	7.01E-03	7.00E-03	7.42E-03	7.42E-03
V (Dissolved)	mg/L	1.13E-02	1.13E-02	1.13E-02	1.17E-02	1.17E-02	1.17E-02	1.17E-02	1.21E-02	1.21E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.29E-02	1.29E-02	1.29E-02	1.29E-02	1.33E-02	1.33E-02	1.33E-02	1.33E-02	1.33E-02	1.33E-02	1.41E-02	1.41E-02
Zn (Dissolved)	mg/L	8.16E-02	8.15E-02	8.15E-02	8.45E-02	8.45E-02	8.45E-02	8.44E-02	8.74E-02	8.74E-02	9.35E-02	9.35E-02	9.34E-02	9.34E-02	9.34E-02	9.34E-02	9.33E-02	9.33E-02	9.33E-02	9.61E-02	9.61E-02	9.60E-02	9.60E-02	9.60E-02	9.59E-02	1.02E-01	1.02E-01
Zr (Dissolved)	mg/L	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	[illegible]							3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04
Hg (Dissolved)	mg/L	3.15E-05	3.15E-05	3.15E-05	3.27E-05	3.27E-05	3.27E-05	3.27E-05	3.38E-05	3.38E-05	3.62E-05	3.62E-05	3.								3.72E-05	3.71E-05	3.71E-05	3.71E-05	3.71E-05	3.93E-05	3.93E-05

APPENDIX A3 - UPPER CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 10.2 Out

Parameter	Unit	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101
Year		31/12/2113																								
Physical Tests																										
Acidity to pH 4.5 (as C	mg/L	1.01E+01	1.01E+01	1.01E+01	1.01E+01	1.01E+01	1.01E+01	1.01E+01	1.01E+01	1.03E+01	1.11E+01	1.11E+01	1.11E+01	1.13E+01	1.13E+01	1.13E+01	1.13E+01	1.13E+01	1.16E+01	1.16E+01	1.16E+01	1.16E+01	1.16E+01	1.16E+01	1.16E+01	1.15E+01
Acidity to pH 8.3 (as C	mg/L	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.26E+01	1.35E+01	1.35E+01	1.35E+01	1.38E+01	1.38E+01	1.38E+01	1.38E+01	1.38E+01	1.41E+01	1.41E+01	1.41E+01	1.41E+01	1.41E+01	1.41E+01	1.41E+01	1.41E+01
Alkalinity (Total as Ca	mg/L	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01
Hardness as CaCO3 (	mg/L	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02
H+ Concentration	mg/L	3.18E-05																								
Dissolved Anions																										
Sulphate (Dissolved)	mg/L	7.16E+02	7.15E+02	7.15E+02	7.15E+02	7.15E+02	7.15E+02	7.14E+02	7.14E+02	7.32E+02	7.87E+02	7.87E+02	7.86E+02	8.05E+02	8.05E+02	8.05E+02	8.04E+02	8.04E+02	8.21E+02	8.21E+02	8.21E+02	8.20E+02	8.20E+02	8.20E+02	8.19E+02	8.19E+02
Chloride (Dissolved)	mg/L	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00
Fluoride (Dissolved)	mg/L	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02
Nutrients																										
Nitrate (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrite (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Orthophosphate (Diss	mg/L	2.89E-02																								
Dissolved Metals																										
Al (Dissolved)	mg/L	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.07E+00	2.07E+00	2.07E+00	2.07E+00	2.12E+00	2.28E+00	2.28E+00	2.28E+00	2.34E+00	2.34E+00	2.34E+00	2.33E+00	2.33E+00	2.38E+00	2.38E+00	2.38E+00	2.38E+00	2.38E+00	2.38E+00	2.38E+00	2.38E+00
Sb (Dissolved)	mg/L	8.97E-03	8.96E-03	8.96E-03	8.96E-03	8.96E-03	8.95E-03	8.95E-03	8.95E-03	9.17E-03	9.86E-03	9.86E-03	9.85E-03	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.03E-02	1.03E-02	1.03E-02	1.03E-02	1.03E-02	1.03E-02	1.03E-02	1.03E-02
As (Dissolved)	mg/L	8.98E-02	8.97E-02	8.97E-02	8.97E-02	8.96E-02	8.96E-02	8.96E-02	8.95E-02	9.18E-02	9.87E-02	9.87E-02	9.86E-02	1.01E-01	1.01E-01	1.01E-01	1.01E-01	1.01E-01	1.03E-01	1.03E-01	1.03E-01	1.03E-01	1.03E-01	1.03E-01	1.03E-01	1.03E-01
Ba (Dissolved)	mg/L	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02
Be (Dissolved)	mg/L	2.02E-04	2.02E-04	2.02E-04	2.02E-04	2.01E-04	2.01E-04	2.01E-04	2.01E-04	2.06E-04	2.22E-04	2.22E-04	2.22E-04	2.27E-04	2.27E-04	2.27E-04	2.27E-04	2.27E-04	2.31E-04	2.31E-04	2.31E-04	2.31E-04	2.31E-04	2.31E-04	2.31E-04	2.31E-04
Bi (Dissolved)	mg/L	1.01E-04	1.01E-04	1.01E-04	1.01E-04	1.01E-04	1.01E-04	1.01E-04	1.01E-04	1.03E-04	1.11E-04	1.11E-04	1.11E-04	1.14E-04	1.14E-04	1.14E-04	1.14E-04	1.13E-04	1.16E-04	1.16E-04	1.16E-04	1.16E-04	1.16E-04	1.16E-04	1.16E-04	1.16E-04
B (Dissolved)	mg/L	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02
Cd (Dissolved)	mg/L	2.85E-03	2.85E-03	2.85E-03	2.85E-03	2.84E-03	2.84E-03	2.84E-03	2.84E-03	2.91E-03	3.13E-03	3.13E-03	3.13E-03	3.20E-03	3.20E-03	3.20E-03	3.20E-03	3.20E-03	3.27E-03	3.27E-03	3.27E-03	3.26E-03	3.26E-03	3.26E-03	3.26E-03	3.26E-03
Ca (Dissolved)	mg/L	3.24E+02	3.24E+02	3.24E+02	3.24E+02	3.24E+02	3.23E+02	3.23E+02	3.23E+02	3.31E+02	3.56E+02	3.56E+02	3.56E+02	3.65E+02	3.64E+02	3.64E+02	3.64E+02	3.64E+02	3.72E+02	3.72E+02	3.71E+02	3.71E+02	3.71E+02	3.71E+02	3.71E+02	3.71E+02
Cr (Dissolved)	mg/L	3.39E-03	3.39E-03	3.39E-03	3.39E-03	3.39E-03	3.39E-03	3.39E-03	3.39E-03	3.47E-03	3.73E-03	3.73E-03	3.73E-03	3.82E-03	3.82E-03	3.82E-03	3.81E-03	3.81E-03	3.89E-03	3.89E-03	3.89E-03	3.89E-03	3.89E-03	3.89E-03	3.89E-03	3.88E-03
Co (Dissolved)	mg/L	7.40E-03	7.40E-03	7.39E-03	7.39E-03	7.39E-03	7.39E-03	7.38E-03	7.38E-03	7.57E-03	8.14E-03	8.13E-03	8.13E-03	8.32E-03	8.32E-03	8.32E-03	8.32E-03	8.31E-03	8.49E-03	8.49E-03	8.48E-03	8.48E-03	8.48E-03	8.47E-03	8.47E-03	8.47E-03
Cu (Dissolved)	mg/L	3.58E-02	3.57E-02	3.57E-02	3.57E-02	3.57E-02	3.57E-02	3.57E-02	3.57E-02	3.66E-02	3.93E-02	3.93E-02	3.93E-02	4.02E-02	4.02E-02	4.02E-02	4.02E-02	4.02E-02	4.10E-02	4.10E-02	4.10E-02	4.10E-02	4.10E-02	4.10E-02	4.09E-02	4.09E-02
Fe (Dissolved)	mg/L	1.84E-01	1.84E-01	1.84E-01	1.84E-01	1.84E-01	1.84E-01	1.84E-01	1.84E-01	1.89E-01	2.03E-01	2.03E-01	2.03E-01	2.08E-01	2.07E-01	2.07E-01	2.07E-01	2.07E-01	2.12E-01	2.12E-01	2.11E-01	2.11E-01	2.11E-01	2.11E-01	2.11E-01	2.11E-01
Pb (Dissolved)	mg/L	4.19E-03	4.19E-03	4.19E-03	4.18E-03	4.18E-03	4.18E-03	4.18E-03	4.18E-03	4.28E-03	4.61E-03	4.60E-03	4.60E-03	4.71E-03	4.71E-03	4.71E-03	4.71E-03	4.71E-03	4.81E-03	4.80E-03	4.80E-03	4.80E-03	4.80E-03	4.80E-03	4.80E-03	4.79E-03
Li (Dissolved)	mg/L	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03
Mg (Dissolved)	mg/L	2.78E+02	2.78E+02	2.78E+02	2.78E+02	2.78E+02	2.78E+02	2.78E+02	2.78E+02	2.85E+02	3.06E+02	3.06E+02	3.06E+02	3.13E+02	3.13E+02	3.13E+02	3.13E+02	3.13E+02	3.19E+02	3.19E+02	3.19E+02	3.19E+02	3.19E+02	3.19E+02	3.19E+02	3.18E+02
Mn (Dissolved)	mg/L	7.52E-01	7.52E-01	7.52E-01	7.52E-01	7.51E-01	7.51E-01	7.51E-01	7.51E-01	7.70E-01	8.27E-01	8.27E-01	8.27E-01	8.47E-01	8.46E-01	8.46E-01	8.46E-01	8.45E-01	8.63E-01	8.63E-01	8.63E-01	8.62E-01	8.62E-01	8.62E-01	8.61E-01	8.61E-01
Mo (Dissolved)	mg/L	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02
Ni (Dissolved)	mg/L	1.89E-02	1.89E-02	1.89E-02	1.89E-02	1.89E-02	1.89E-02	1.89E-02	1.89E-02	1.94E-02	2.08E-02	2.08E-02	2.08E-02	2.13E-02	2.13E-02	2.13E-02	2.13E-02	2.13E-02	2.17E-02	2.17E-02	2.17E-02	2.17E-02	2.17E-02	2.17E-02	2.17E-02	2.17E-02
P (Dissolved)	mg/L	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02
K (Dissolved)	mg/L	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00
Se (Dissolved)	mg/L	7.00E-02	6.99E-02	6.99E-02	6.99E-02	6.99E-02	6.98E-02	6.98E-02	6.98E-02	7.15E-02	7.69E-02	7.69E-02	7.69E-02	7.87E-02	7.87E-02	7.87E-02	7.86E-02	7.86E-02	8.03E-02	8.02E-02	8.02E-02	8.02E-02	8.02E-02	8.02E-02	8.01E-02	8.01E-02
Si (Dissolved)	mg/L	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01
Na (Dissolved)	mg/L	2.20E+00	2.20E+00	2.20E+00	2.20E+00	2.19E+00	2.19E+00	2.19E+00	2.19E+00	2.25E+00	2.42E+00	2.42E+00	2.41E+00	2.47E+00	2.47E+00	2.47E+00	2.47E+00	2.47E+00	2.52E+00	2.52E+00	2.52E+00	2.52E+00	2.52E+00	2.52E+00	2.52E+00	2.52E+00
Sr (Dissolved)	mg/L	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00
S (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tl (Dissolved)	mg/L	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04
Sn (Dissolved)	mg/L	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04
Ti (Dissolved)	mg/L	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02
U (Dissolved)	mg/L	7.61E-03	7.61E-03	7.61E-03	7.61E-03	7.60E-03	7.60E-03	7.60E-03	7.60E-03	7.79E-03	8.37E-03	8.37E-03	8.37E-03	8.57E-03	8.56E-03	8.56E-03	8.56E-03	8.56E-03	8.74E-03	8.73E-03	8.73E-03	8.73E-03	8.73E-03	8.72E-03	8.72E-03	8.72E-03
V (Dissolved)	mg/L	1.45E-02	1.45E-02	1.45E-02	1.45E-02	1.44E-02	1.44E-02	1.44E-02	1.44E-02	1.48E-02	1.59E-02	1.59E-02	1.59E-02	1.63E-02	1.63E-02	1.63E-02	1.63E-02	1.63E-02	1.66E-02	1.66E-02	1.66E-02	1.66E-02	1.66E-02	1.66E-02	1.66E-02	1.66E-02
Zn (Dissolved)	mg/L	1.04E-01	1.04E-01	1.04E-01	1.04E-01	1.04E-01	1.04E-01	1.04E-01	1.04E-01	1.07E-01	1.15E-01	1.15E-01	1.15E-01	1.17E-01	1.17E-01	1.17E-01	1.17E-01	1.17E-01	1.20E-01	1.20E-01	1.20E-01	1.20E-01	1.20E-01	1.19E-01	1.19E-01	1.19E-01
Zr (Dissolved)	mg/L	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04
Hg (Dissolved)	mg/L	4.04E-05	4.03E-05	4.03E-05	4.03E-05	4.03E-05	4.03E-05	4.03E-05	4.03E-05	4.13E-05	4.44E-05	4.44E-05	4.43E-05	4.54E-05	4.54E-05	4.54E-05	4.54E-05	4.53E-05	4.63E-05	4.63E-05	4.63E-05	4.62E-05	4.62E-05	4.62E-05	4.62E-05	4.62E-05

APPENDIX A3 - UPPER CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 10.2 Out

Parameter	Unit	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
Year																											
Physical Tests																											
Acidity to pH 4.5 (as C	mg/L	1.15E+01	1.15E+01	1.15E+01	1.15E+01	1.15E+01	1.15E+01	1.17E+01	1.17E+01	1.17E+01	1.17E+01	1.17E+01	1.17E+01	1.17E+01	1.19E+01	1.19E+01	1.19E+01	1.19E+01	1.19E+01	1.19E+01	1.19E+01	1.19E+01	1.19E+01	1.19E+01	1.19E+01	1.21E+01	1.21E+01
Acidity to pH 8.3 (as C	mg/L	1.40E+01	1.40E+01	1.40E+01	1.40E+01	1.40E+01	1.40E+01	1.43E+01	1.43E+01	1.43E+01	1.43E+01	1.43E+01	1.43E+01	1.43E+01	1.45E+01	1.45E+01	1.45E+01	1.45E+01	1.45E+01	1.45E+01	1.45E+01	1.45E+01	1.45E+01	1.45E+01	1.45E+01	1.47E+01	1.47E+01
Alkalinity (Total as Ca	mg/L	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01
Hardness as CaCO3 (	mg/L	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02
H+ Concentration	mg/L																										
Dissolved Anions																											
Sulphate (Dissolved)	mg/L	8.19E+02	8.19E+02	8.18E+02	8.18E+02	8.18E+02	8.17E+02	8.33E+02	8.33E+02	8.33E+02	8.32E+02	8.32E+02	8.32E+02	8.32E+02	8.47E+02	8.46E+02	8.46E+02	8.46E+02	8.46E+02	8.45E+02	8.45E+02	8.45E+02	8.44E+02	8.44E+02	8.44E+02	8.59E+02	8.59E+02
Chloride (Dissolved)	mg/L	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00
Fluoride (Dissolved)	mg/L	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02
Nutrients																											
Nitrate (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrite (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Orthophosphate (Diss	mg/L																										
Dissolved Metals																											
Al (Dissolved)	mg/L	2.38E+00	2.38E+00	2.38E+00	2.37E+00	2.37E+00	2.37E+00	2.42E+00	2.42E+00	2.42E+00	2.42E+00	2.42E+00	2.41E+00	2.41E+00	2.46E+00	2.46E+00	2.46E+00	2.45E+00	2.45E+00	2.45E+00	2.45E+00	2.45E+00	2.45E+00	2.45E+00	2.45E+00	2.49E+00	2.49E+00
Sb (Dissolved)	mg/L	1.03E-02	1.03E-02	1.03E-02	1.02E-02	1.02E-02	1.02E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.06E-02	1.06E-02	1.06E-02	1.06E-02	1.06E-02	1.06E-02	1.06E-02	1.06E-02	1.06E-02	1.06E-02	1.06E-02	1.08E-02	1.08E-02
As (Dissolved)	mg/L	1.03E-01	1.03E-01	1.03E-01	1.03E-01	1.03E-01	1.03E-01	1.04E-01	1.04E-01	1.04E-01	1.04E-01	1.04E-01	1.04E-01	1.04E-01	1.06E-01	1.06E-01	1.06E-01	1.06E-01	1.06E-01	1.06E-01	1.06E-01	1.06E-01	1.06E-01	1.06E-01	1.06E-01	1.08E-01	1.08E-01
Ba (Dissolved)	mg/L	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02
Be (Dissolved)	mg/L	2.31E-04	2.31E-04	2.31E-04	2.31E-04	2.31E-04	2.30E-04	2.35E-04	2.35E-04	2.35E-04	2.35E-04	2.35E-04	2.34E-04	2.34E-04	2.39E-04	2.39E-04	2.39E-04	2.38E-04	2.38E-04	2.38E-04	2.38E-04	2.38E-04	2.38E-04	2.38E-04	2.38E-04	2.42E-04	2.42E-04
Bi (Dissolved)	mg/L	1.16E-04	1.16E-04	1.15E-04	1.15E-04	1.15E-04	1.15E-04	1.18E-04	1.18E-04	1.18E-04	1.17E-04	1.17E-04	1.17E-04	1.17E-04	1.19E-04	1.19E-04	1.19E-04	1.19E-04	1.19E-04	1.19E-04	1.19E-04	1.19E-04	1.19E-04	1.19E-04	1.19E-04	1.21E-04	1.21E-04
B (Dissolved)	mg/L	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02
Cd (Dissolved)	mg/L	3.26E-03	3.26E-03	3.26E-03	3.25E-03	3.25E-03	3.25E-03	3.32E-03	3.31E-03	3.31E-03	3.31E-03	3.31E-03	3.31E-03	3.31E-03	3.37E-03	3.37E-03	3.37E-03	3.37E-03	3.36E-03	3.36E-03	3.36E-03	3.36E-03	3.36E-03	3.36E-03	3.36E-03	3.42E-03	3.42E-03
Ca (Dissolved)	mg/L	3.71E+02	3.71E+02	3.70E+02	3.70E+02	3.70E+02	3.70E+02	3.77E+02	3.77E+02	3.77E+02	3.77E+02	3.77E+02	3.77E+02	3.76E+02	3.83E+02	3.83E+02	3.83E+02	3.83E+02	3.83E+02	3.83E+02	3.82E+02	3.82E+02	3.82E+02	3.82E+02	3.82E+02	3.89E+02	3.89E+02
Cr (Dissolved)	mg/L	3.88E-03	3.88E-03	3.88E-03	3.88E-03	3.88E-03	3.88E-03	3.95E-03	3.95E-03	3.95E-03	3.95E-03	3.95E-03	3.94E-03	3.94E-03	4.02E-03	4.01E-03	4.01E-03	4.01E-03	4.01E-03	4.01E-03	4.01E-03	4.01E-03	4.01E-03	4.00E-03	4.00E-03	4.07E-03	4.07E-03
Co (Dissolved)	mg/L	8.47E-03	8.46E-03	8.46E-03	8.46E-03	8.45E-03	8.45E-03	8.61E-03	8.61E-03	8.61E-03	8.60E-03	8.60E-03	8.60E-03	8.60E-03	8.75E-03	8.75E-03	8.75E-03	8.74E-03	8.74E-03	8.74E-03	8.73E-03	8.73E-03	8.73E-03	8.73E-03	8.72E-03	8.88E-03	8.88E-03
Cu (Dissolved)	mg/L	4.09E-02	4.09E-02	4.09E-02	4.09E-02	4.09E-02	4.08E-02	4.16E-02	4.16E-02	4.16E-02	4.16E-02	4.16E-02	4.16E-02	4.15E-02	4.23E-02	4.23E-02	4.23E-02	4.23E-02	4.22E-02	4.22E-02	4.22E-02	4.22E-02	4.22E-02	4.22E-02	4.21E-02	4.29E-02	4.29E-02
Fe (Dissolved)	mg/L	2.11E-01	2.11E-01	2.11E-01	2.11E-01	2.11E-01	2.11E-01	2.15E-01	2.15E-01	2.15E-01	2.15E-01	2.14E-01	2.14E-01	2.14E-01	2.18E-01	2.18E-01	2.18E-01	2.18E-01	2.18E-01	2.18E-01	2.18E-01	2.18E-01	2.18E-01	2.18E-01	2.17E-01	2.17E-01	2.21E-01	2.21E-01
Pb (Dissolved)	mg/L	4.79E-03	4.79E-03	4.79E-03	4.79E-03	4.79E-03	4.78E-03	4.88E-03	4.87E-03	4.87E-03	4.87E-03	4.87E-03	4.87E-03	4.87E-03	4.95E-03	4.95E-03	4.95E-03	4.95E-03	4.95E-03	4.95E-03	4.94E-03	4.94E-03	4.94E-03	4.94E-03	4.94E-03	5.03E-03	5.03E-03
Li (Dissolved)	mg/L	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03
Mg (Dissolved)	mg/L	3.18E+02	3.18E+02	3.18E+02	3.18E+02	3.18E+02	3.18E+02	3.24E+02	3.24E+02	3.24E+02	3.24E+02	3.23E+02	3.23E+02	3.23E+02	3.29E+02	3.29E+02	3.29E+02	3.29E+02	3.29E+02	3.29E+02	3.28E+02	3.28E+02	3.28E+02	3.28E+02	3.28E+02	3.34E+02	3.34E+02
Mn (Dissolved)	mg/L	8.61E-01	8.61E-01	8.60E-01	8.60E-01	8.60E-01	8.59E-01	8.76E-01	8.76E-01	8.75E-01	8.75E-01	8.75E-01	8.74E-01	8.74E-01	8.90E-01	8.90E-01	8.89E-01	8.89E-01	8.89E-01	8.89E-01	8.88E-01	8.88E-01	8.88E-01	8.88E-01	8.87E-01	8.87E-01	9.03E-01	9.03E-01
Mo (Dissolved)	mg/L	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02
Ni (Dissolved)	mg/L	2.17E-02	2.17E-02	2.16E-02	2.16E-02	2.16E-02	2.16E-02	2.20E-02	2.20E-02	2.20E-02	2.20E-02	2.20E-02	2.20E-02	2.20E-02	2.24E-02	2.24E-02	2.24E-02	2.24E-02	2.24E-02	2.24E-02	2.23E-02	2.23E-02	2.23E-02	2.23E-02	2.23E-02	2.27E-02	2.27E-02
P (Dissolved)	mg/L	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02
K (Dissolved)	mg/L	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00
Se (Dissolved)	mg/L	8.00E-02	8.00E-02	8.00E-02	8.00E-02	7.99E-02	7.99E-02	8.14E-02	8.14E-02	8.14E-02	8.14E-02	8.13E-02	8.13E-02	8.13E-02	8.28E-02	8.27E-02	8.27E-02	8.27E-02	8.26E-02	8.26E-02	8.26E-02	8.26E-02	8.25E-02	8.25E-02	8.25E-02	8.40E-02	8.39E-02
Si (Dissolved)	mg/L	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01
Na (Dissolved)	mg/L	2.51E+00	2.51E+00	2.51E+00	2.51E+00	2.51E+00	2.51E+00	2.56E+00	2.56E+00	2.56E+00	2.56E+00	2.55E+00	2.55E+00	2.55E+00	2.60E+00	2.60E+00	2.60E+00	2.60E+00	2.60E+00	2.59E+00	2.59E+00	2.59E+00	2.59E+00	2.59E+00	2.59E+00	2.64E+00	2.64E+00
Sr (Dissolved)	mg/L	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00
S (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tl (Dissolved)	mg/L	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04
Sn (Dissolved)	mg/L	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04
Ti (Dissolved)	mg/L	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02
U (Dissolved)	mg/L	8.71E-03	8.71E-03	8.71E-03	8.70E-03	8.70E-03	8.70E-03	8.87E-03	8.86E-03	8.86E-03	8.86E-03	8.85E-03	8.85E-03	8.85E-03	9.01E-03	9.01E-03	9.00E-03	9.00E-03	9.00E-03	8.99E-03	8.99E-03	8.99E-03	8.98E-03	8.98E-03	8.98E-03	9.14E-03	9.14E-03
V (Dissolved)	mg/L	1.66E-02	1.65E-02	1.65E-02	1.65E-02	1.65E-02	1.65E-02	1.68E-02	1.68E-02	1.68E-02	1.68E-02	1.68E-02	1.68E-02	1.68E-02	1.71E-02	1.71E-02	1.71E-02	1.71E-02	1.71E-02	1.71E-02	1.71E-02	1.71E-02	1.71E-02	1.71E-02	1.71E-02	1.74E-02	1.74E-02
Zn (Dissolved)	mg/L	1.19E-01	1.19E-01	1.19E-01	1.19E-01	1.19E-01	1.19E-01	1.21E-01	1.21E-01	1.21E-01	1.21E-01	1.21E-01	1.21E-01	1.21E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.25E-01	1.25E-01
Zr (Dissolved)	mg/L	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04
Hg (Dissolved)	mg/L	4.62E-05	4.62E-05	4.61E-05	4.61E-05	4.61E-05	4.61E-05	4.70E-05	4.70E-05	4.69E-05	4.69E-05	4.69E-05	4.69E-05	4.69E-05	4.77E-05	4.77E-05	4.77E-05	4.77E-05	4.77E-05	4.77E-05	4.76E-05	4.76E-05	4.76E-05	4.76E-05	4.76E-05	4.84E-05	4.84E-05

APPENDIX A3 - UPPER CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 10.2 Out

Parameter	Unit	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153
Year																											
Physical Tests																											
Acidity to pH 4.5 (as C	mg/L	1.21E+01	1.21E+01	1.21E+01	1.21E+01	1.23E+01	1.23E+01	1.25E+01	1.25E+01	1.25E+01	1.25E+01	1.27E+01	1.26E+01	1.28E+01	1.28E+01	1.28E+01	1.28E+01	1.28E+01	1.28E+01	1.28E+01	1.30E+01	1.30E+01	1.31E+01	1.31E+01	1.31E+01	1.33E+01	1.33E+01
Acidity to pH 8.3 (as C	mg/L	1.47E+01	1.47E+01	1.47E+01	1.47E+01	1.49E+01	1.49E+01	1.52E+01	1.52E+01	1.52E+01	1.52E+01	1.54E+01	1.54E+01	1.56E+01	1.56E+01	1.56E+01	1.56E+01	1.56E+01	1.56E+01	1.56E+01	1.58E+01	1.58E+01	1.60E+01	1.60E+01	1.60E+01	1.62E+01	1.62E+01
Alkalinity (Total as Ca(	mg/L	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01
Hardness as CaCO3 (	mg/L	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02
H+ Concentration	mg/L																										
Dissolved Anions																											
Sulphate (Dissolved)	mg/L	8.58E+02	8.58E+02	8.58E+02	8.57E+02	8.71E+02	8.71E+02	8.84E+02	8.84E+02	8.84E+02	8.83E+02	8.98E+02	8.97E+02	9.10E+02	9.10E+02	9.10E+02	9.09E+02	9.09E+02	9.09E+02	9.08E+02	9.21E+02	9.20E+02	9.33E+02	9.32E+02	9.32E+02	9.45E+02	9.44E+02
Chloride (Dissolved)	mg/L	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00
Fluoride (Dissolved)	mg/L	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02
Nutrients																											
Nitrate (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrite (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Orthophosphate (Diss	mg/L																										
Dissolved Metals																											
Al (Dissolved)	mg/L	2.49E+00	2.49E+00	2.49E+00	2.49E+00	2.53E+00	2.53E+00	2.57E+00	2.57E+00	2.57E+00	2.56E+00	2.61E+00	2.60E+00	2.64E+00	2.64E+00	2.64E+00	2.64E+00	2.64E+00	2.64E+00	2.64E+00	2.67E+00	2.67E+00	2.71E+00	2.71E+00	2.70E+00	2.74E+00	2.74E+00
Sb (Dissolved)	mg/L	1.08E-02	1.08E-02	1.07E-02	1.07E-02	1.09E-02	1.09E-02	1.11E-02	1.11E-02	1.11E-02	1.11E-02	1.12E-02	1.12E-02	1.14E-02	1.14E-02	1.14E-02	1.14E-02	1.14E-02	1.14E-02	1.14E-02	1.15E-02	1.15E-02	1.17E-02	1.17E-02	1.17E-02	1.18E-02	1.18E-02
As (Dissolved)	mg/L	1.08E-01	1.08E-01	1.08E-01	1.08E-01	1.09E-01	1.09E-01	1.11E-01	1.11E-01	1.11E-01	1.11E-01	1.13E-01	1.13E-01	1.14E-01	1.14E-01	1.14E-01	1.14E-01	1.14E-01	1.14E-01	1.14E-01	1.15E-01	1.15E-01	1.17E-01	1.17E-01	1.17E-01	1.18E-01	1.18E-01
Ba (Dissolved)	mg/L	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02
Be (Dissolved)	mg/L	2.42E-04	2.42E-04	2.42E-04	2.42E-04	2.46E-04	2.46E-04	2.49E-04	2.49E-04	2.49E-04	2.49E-04	2.53E-04	2.53E-04	2.57E-04	2.57E-04	2.56E-04	2.56E-04	2.56E-04	2.56E-04	2.56E-04	2.60E-04	2.59E-04	2.63E-04	2.63E-04	2.63E-04	2.66E-04	2.66E-04
Bi (Dissolved)	mg/L	1.21E-04	1.21E-04	1.21E-04	1.21E-04	1.23E-04	1.23E-04	1.25E-04	1.25E-04	1.25E-04	1.25E-04	1.27E-04	1.27E-04	1.28E-04	1.28E-04	1.28E-04	1.28E-04	1.28E-04	1.28E-04	1.28E-04	1.30E-04	1.30E-04	1.32E-04	1.32E-04	1.32E-04	1.33E-04	1.33E-04
B (Dissolved)	mg/L	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02
Cd (Dissolved)	mg/L	3.42E-03	3.41E-03	3.41E-03	3.41E-03	3.47E-03	3.47E-03	3.52E-03	3.52E-03	3.52E-03	3.52E-03	3.57E-03	3.57E-03	3.62E-03	3.62E-03	3.62E-03	3.62E-03	3.62E-03	3.62E-03	3.61E-03	3.66E-03	3.66E-03	3.71E-03	3.71E-03	3.71E-03	3.76E-03	3.76E-03
Ca (Dissolved)	mg/L	3.89E+02	3.88E+02	3.88E+02	3.88E+02	3.94E+02	3.94E+02	4.00E+02	4.00E+02	4.00E+02	4.00E+02	4.06E+02	4.06E+02	4.12E+02	4.12E+02	4.12E+02	4.12E+02	4.11E+02	4.11E+02	4.11E+02	4.17E+02	4.17E+02	4.22E+02	4.22E+02	4.22E+02	4.28E+02	4.28E+02
Cr (Dissolved)	mg/L	4.07E-03	4.07E-03	4.07E-03	4.07E-03	4.13E-03	4.13E-03	4.19E-03	4.19E-03	4.19E-03	4.19E-03	4.26E-03	4.26E-03	4.32E-03	4.32E-03	4.32E-03	4.31E-03	4.31E-03	4.31E-03	4.31E-03	4.37E-03	4.36E-03	4.42E-03	4.42E-03	4.42E-03	4.48E-03	4.48E-03
Co (Dissolved)	mg/L	8.87E-03	8.87E-03	8.87E-03	8.86E-03	9.01E-03	9.00E-03	9.14E-03	9.14E-03	9.14E-03	9.13E-03	9.28E-03	9.28E-03	9.41E-03	9.41E-03	9.40E-03	9.40E-03	9.40E-03	9.39E-03	9.39E-03	9.52E-03	9.51E-03	9.64E-03	9.64E-03	9.63E-03	9.77E-03	9.76E-03
Cu (Dissolved)	mg/L	4.29E-02	4.29E-02	4.29E-02	4.28E-02	4.35E-02	4.35E-02	4.42E-02	4.42E-02	4.42E-02	4.41E-02	4.48E-02	4.48E-02	4.55E-02	4.55E-02	4.54E-02	4.54E-02	4.54E-02	4.54E-02	4.54E-02	4.60E-02	4.60E-02	4.66E-02	4.66E-02	4.66E-02	4.72E-02	4.72E-02
Fe (Dissolved)	mg/L	2.21E-01	2.21E-01	2.21E-01	2.21E-01	2.25E-01	2.24E-01	2.28E-01	2.28E-01	2.28E-01	2.28E-01	2.31E-01	2.31E-01	2.35E-01	2.35E-01	2.34E-01	2.34E-01	2.34E-01	2.34E-01	2.34E-01	2.37E-01	2.37E-01	2.40E-01	2.40E-01	2.40E-01	2.43E-01	2.43E-01
Pb (Dissolved)	mg/L	5.02E-03	5.02E-03	5.02E-03	5.02E-03	5.10E-03	5.10E-03	5.18E-03	5.17E-03	5.17E-03	5.17E-03	5.25E-03	5.25E-03	5.33E-03	5.33E-03	5.32E-03	5.32E-03	5.32E-03	5.32E-03	5.32E-03	5.39E-03	5.39E-03	5.46E-03	5.46E-03	5.45E-03	5.53E-03	5.53E-03
Li (Dissolved)	mg/L	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03
Mg (Dissolved)	mg/L	3.34E+02	3.34E+02	3.33E+02	3.33E+02	3.39E+02	3.39E+02	3.44E+02	3.44E+02	3.44E+02	3.43E+02	3.49E+02	3.49E+02	3.54E+02	3.54E+02	3.54E+02	3.53E+02	3.53E+02	3.53E+02	3.53E+02	3.58E+02	3.58E+02	3.63E+02	3.62E+02	3.62E+02	3.67E+02	3.67E+02
Mn (Dissolved)	mg/L	9.02E-01	9.02E-01	9.02E-01	9.01E-01	9.16E-01	9.16E-01	9.30E-01	9.29E-01	9.29E-01	9.29E-01	9.44E-01	9.43E-01	9.57E-01	9.57E-01	9.56E-01	9.56E-01	9.56E-01	9.55E-01	9.55E-01	9.68E-01	9.68E-01	9.81E-01	9.80E-01	9.80E-01	9.93E-01	9.93E-01
Mo (Dissolved)	mg/L	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02
Ni (Dissolved)	mg/L	2.27E-02	2.27E-02	2.27E-02	2.27E-02	2.30E-02	2.30E-02	2.34E-02	2.34E-02	2.34E-02	2.34E-02	2.37E-02	2.37E-02	2.41E-02	2.41E-02	2.41E-02	2.40E-02	2.40E-02	2.40E-02	2.40E-02	2.44E-02	2.43E-02	2.47E-02	2.47E-02	2.46E-02	2.50E-02	2.50E-02
P (Dissolved)	mg/L	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02
K (Dissolved)	mg/L	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00
Se (Dissolved)	mg/L	8.39E-02	8.39E-02	8.38E-02	8.38E-02	8.52E-02	8.51E-02	8.64E-02	8.64E-02	8.64E-02	8.64E-02	8.77E-02	8.77E-02	8.90E-02	8.89E-02	8.89E-02	8.89E-02	8.88E-02	8.88E-02	8.88E-02	9.00E-02	9.00E-02	9.12E-02	9.11E-02	9.11E-02	9.23E-02	9.23E-02
Si (Dissolved)	mg/L	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01
Na (Dissolved)	mg/L	2.64E+00	2.63E+00	2.63E+00	2.63E+00	2.67E+00	2.67E+00	2.72E+00	2.71E+00	2.71E+00	2.71E+00	2.76E+00	2.75E+00	2.79E+00	2.79E+00	2.79E+00	2.79E+00	2.79E+00	2.79E+00	2.79E+00	2.83E+00	2.83E+00	2.86E+00	2.86E+00	2.86E+00	2.90E+00	2.90E+00
Sr (Dissolved)	mg/L	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00
S (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tl (Dissolved)	mg/L	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04
Sn (Dissolved)	mg/L	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04
Ti (Dissolved)	mg/L	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02
U (Dissolved)	mg/L	9.13E-03	9.13E-03	9.13E-03	9.12E-03	9.27E-03	9.27E-03	9.41E-03	9.41E-03	9.40E-03	9.40E-03	9.55E-03	9.55E-03	9.69E-03	9.68E-03	9.68E-03	9.67E-03	9.67E-03	9.67E-03	9.66E-03	9.80E-03	9.79E-03	9.92E-03	9.92E-03	9.92E-03	1.01E-02	1.00E-02
V (Dissolved)	mg/L	1.74E-02	1.73E-02	1.73E-02	1.73E-02	1.76E-02	1.76E-02	1.79E-02	1.79E-02	1.79E-02	1.79E-02	1.81E-02	1.81E-02	1.84E-02	1.84E-02	1.84E-02	1.84E-02	1.84E-02	1.84E-02	1.84E-02	1.86E-02	1.86E-02	1.89E-02	1.88E-02	1.88E-02	1.91E-02	1.91E-02
Zn (Dissolved)	mg/L	1.25E-01	1.25E-01	1.25E-01	1.25E-01	1.27E-01	1.27E-01	1.29E-01	1.29E-01	1.29E-01	1.29E-01	1.31E-01	1.31E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.32E-01	1.32E-01	1.32E-01	1.34E-01	1.34E-01	1.36E-01	1.36E-01	1.36E-01	1.38E-01	1.38E-01
Zr (Dissolved)	mg/L	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04
Hg (Dissolved)	mg/L	4.84E-05	4.84E-05	4.84E-05	4.83E-05	4.91E-05	4.91E-05	4.99E-05	4.98E-05	4.98E-05	4.98E-05	5.06E-05	5.06E-05	5.13E-05	5.13E-05	5.13E-05	5.13E-05	5.12E-05	5.12E-05	5.12E-05	5.19E-05	5.19E-05	5.26E-05	5.26E-05	5.25E-05	5.33E-05	5.32E-05
Ag (Dissolved)	mg/L	1.54E-04	1.54E-04	1.54E-04	1.54E-04	1.56E-04	1.56E-04	1.58E-04	1.58E-04	1.58E-04	1.58E-04	1.61E-04	1.61E-04	1.63E-04	1.63E-04	1.63E-04	1.63E-04	1.63E-04	1.63E-04	1.63E-04	1.65E-04	1.65E-04	1.67E-04	1.67E-04	1.67E-04	1.69E-04	1.69E-04

APPENDIX A3 - UPPER CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 10.2 Out

Parameter	Unit	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179
Year																											
Physical Tests																											
Acidity to pH 4.5 (as C	mg/L	1.33E+01	1.33E+01	1.33E+01	1.33E+01	1.33E+01	1.34E+01	1.34E+01	1.34E+01	1.36E+01	1.36E+01	1.36E+01	1.36E+01	1.36E+01	1.37E+01	1.37E+01	1.37E+01	1.37E+01	1.37E+01	1.37E+01	1.37E+01	1.37E+01	1.37E+01	1.37E+01	1.37E+01	1.38E+01	1.38E+01
Acidity to pH 8.3 (as C	mg/L	1.62E+01	1.62E+01	1.62E+01	1.62E+01	1.62E+01	1.64E+01	1.64E+01	1.64E+01	1.65E+01	1.65E+01	1.65E+01	1.65E+01	1.65E+01	1.67E+01	1.67E+01	1.67E+01	1.67E+01	1.67E+01	1.67E+01	1.67E+01	1.67E+01	1.67E+01	1.67E+01	1.67E+01	1.68E+01	1.68E+01
Alkalinity (Total as Ca	mg/L	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01
Hardness as CaCO3 (	mg/L	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02
H+ Concentration	mg/L																										
Dissolved Anions																											
Sulphate (Dissolved)	mg/L	9.44E+02	9.44E+02	9.43E+02	9.43E+02	9.43E+02	9.54E+02	9.54E+02	9.53E+02	9.65E+02	9.64E+02	9.64E+02	9.64E+02	9.63E+02	9.75E+02	9.74E+02	9.74E+02	9.74E+02	9.73E+02	9.73E+02	9.72E+02	9.72E+02	9.72E+02	9.71E+02	9.71E+02	9.81E+02	9.80E+02
Chloride (Dissolved)	mg/L	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00
Fluoride (Dissolved)	mg/L	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02
Nutrients																											
Nitrate (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrite (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Orthophosphate (Diss	mg/L																										
Dissolved Metals																											
Al (Dissolved)	mg/L	2.74E+00	2.74E+00	2.74E+00	2.74E+00	2.74E+00	2.77E+00	2.77E+00	2.77E+00	2.80E+00	2.80E+00	2.80E+00	2.80E+00	2.80E+00	2.83E+00	2.83E+00	2.83E+00	2.83E+00	2.82E+00	2.82E+00	2.82E+00	2.82E+00	2.82E+00	2.82E+00	2.82E+00	2.85E+00	2.85E+00
Sb (Dissolved)	mg/L	1.18E-02	1.18E-02	1.18E-02	1.18E-02	1.18E-02	1.20E-02	1.20E-02	1.19E-02	1.21E-02	1.21E-02	1.21E-02	1.21E-02	1.21E-02	1.22E-02	1.22E-02	1.22E-02	1.22E-02	1.22E-02	1.22E-02	1.22E-02	1.22E-02	1.22E-02	1.22E-02	1.22E-02	1.23E-02	1.23E-02
As (Dissolved)	mg/L	1.18E-01	1.18E-01	1.18E-01	1.18E-01	1.18E-01	1.20E-01	1.20E-01	1.20E-01	1.21E-01	1.21E-01	1.21E-01	1.21E-01	1.21E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.23E-01	1.23E-01
Ba (Dissolved)	mg/L	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02
Be (Dissolved)	mg/L	2.66E-04	2.66E-04	2.66E-04	2.66E-04	2.66E-04	2.69E-04	2.69E-04	2.69E-04	2.72E-04	2.72E-04	2.72E-04	2.72E-04	2.72E-04	2.75E-04	2.75E-04	2.75E-04	2.74E-04	2.74E-04	2.74E-04	2.74E-04	2.74E-04	2.74E-04	2.74E-04	2.74E-04	2.76E-04	2.76E-04
Bi (Dissolved)	mg/L	1.33E-04	1.33E-04	1.33E-04	1.33E-04	1.33E-04	1.35E-04	1.35E-04	1.35E-04	1.36E-04	1.36E-04	1.36E-04	1.36E-04	1.36E-04	1.38E-04	1.38E-04	1.37E-04	1.37E-04	1.37E-04	1.37E-04	1.37E-04	1.37E-04	1.37E-04	1.37E-04	1.37E-04	1.38E-04	1.38E-04
B (Dissolved)	mg/L	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02
Cd (Dissolved)	mg/L	3.76E-03	3.76E-03	3.75E-03	3.75E-03	3.75E-03	3.80E-03	3.80E-03	3.79E-03	3.84E-03	3.84E-03	3.84E-03	3.83E-03	3.83E-03	3.88E-03	3.88E-03	3.88E-03	3.87E-03	3.87E-03	3.87E-03	3.87E-03	3.87E-03	3.87E-03	3.87E-03	3.86E-03	3.90E-03	3.90E-03
Ca (Dissolved)	mg/L	4.27E+02	4.27E+02	4.27E+02	4.27E+02	4.27E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02
Cr (Dissolved)	mg/L	4.48E-03	4.48E-03	4.47E-03	4.47E-03	4.47E-03	4.52E-03	4.52E-03	4.52E-03	4.57E-03	4.57E-03	4.57E-03	4.57E-03	4.57E-03	4.62E-03	4.62E-03	4.62E-03	4.62E-03	4.62E-03	4.61E-03	4.61E-03	4.61E-03	4.61E-03	4.61E-03	4.61E-03	4.60E-03	4.65E-03	4.65E-03
Co (Dissolved)	mg/L	9.76E-03	9.76E-03	9.75E-03	9.75E-03	9.75E-03	9.86E-03	9.86E-03	9.86E-03	9.97E-03	9.97E-03	9.96E-03	9.96E-03	9.96E-03	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.01E-02	1.01E-02
Cu (Dissolved)	mg/L	4.72E-02	4.71E-02	4.71E-02	4.71E-02	4.71E-02	4.77E-02	4.76E-02	4.76E-02	4.82E-02	4.82E-02	4.82E-02	4.81E-02	4.81E-02	4.87E-02	4.87E-02	4.87E-02	4.86E-02	4.86E-02	4.86E-02	4.86E-02	4.86E-02	4.85E-02	4.85E-02	4.85E-02	4.90E-02	4.90E-02
Fe (Dissolved)	mg/L	2.43E-01	2.43E-01	2.43E-01	2.43E-01	2.43E-01	2.46E-01	2.46E-01	2.46E-01	2.49E-01	2.48E-01	2.48E-01	2.48E-01	2.48E-01	2.51E-01	2.51E-01	2.51E-01	2.51E-01	2.51E-01	2.51E-01	2.51E-01	2.51E-01	2.50E-01	2.50E-01	2.50E-01	2.53E-01	2.53E-01
Pb (Dissolved)	mg/L	5.53E-03	5.52E-03	5.52E-03	5.52E-03	5.52E-03	5.58E-03	5.58E-03	5.58E-03	5.64E-03	5.64E-03	5.64E-03	5.64E-03	5.64E-03	5.70E-03	5.70E-03	5.70E-03	5.70E-03	5.70E-03	5.69E-03	5.69E-03	5.69E-03	5.69E-03	5.68E-03	5.68E-03	5.74E-03	5.74E-03
Li (Dissolved)	mg/L	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03
Mg (Dissolved)	mg/L	3.67E+02	3.67E+02	3.67E+02	3.67E+02	3.66E+02	3.71E+02	3.71E+02	3.71E+02	3.75E+02	3.75E+02	3.75E+02	3.75E+02	3.74E+02	3.79E+02	3.79E+02	3.79E+02	3.78E+02	3.78E+02	3.78E+02	3.78E+02	3.78E+02	3.78E+02	3.78E+02	3.77E+02	3.81E+02	3.81E+02
Mn (Dissolved)	mg/L	9.93E-01	9.92E-01	9.92E-01	9.91E-01	9.91E-01	1.00E+00	1.00E+00	1.00E+00	1.01E+00	1.01E+00	1.01E+00	1.01E+00	1.01E+00	1.02E+00	1.02E+00	1.02E+00	1.02E+00	1.02E+00	1.02E+00	1.02E+00	1.02E+00	1.02E+00	1.02E+00	1.02E+00	1.03E+00	1.03E+00
Mo (Dissolved)	mg/L	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02
Ni (Dissolved)	mg/L	2.50E-02	2.50E-02	2.50E-02	2.49E-02	2.49E-02	2.52E-02	2.52E-02	2.52E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.58E-02	2.58E-02	2.58E-02	2.57E-02	2.57E-02	2.57E-02	2.57E-02	2.57E-02	2.57E-02	2.57E-02	2.57E-02	2.59E-02	2.59E-02
P (Dissolved)	mg/L	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02
K (Dissolved)	mg/L	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00
Se (Dissolved)	mg/L	9.23E-02	9.22E-02	9.22E-02	9.22E-02	9.21E-02	9.33E-02	9.32E-02	9.32E-02	9.43E-02	9.42E-02	9.42E-02	9.42E-02	9.41E-02	9.53E-02	9.52E-02	9.52E-02	9.52E-02	9.51E-02	9.51E-02	9.51E-02	9.50E-02	9.50E-02	9.49E-02	9.49E-02	9.59E-02	9.58E-02
Si (Dissolved)	mg/L	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01
Sr (Dissolved)	mg/L	2.90E+00	2.90E+00	2.90E+00	2.90E+00	2.89E+00	2.93E+00	2.93E+00	2.93E+00	2.96E+00	2.96E+00	2.96E+00	2.96E+00	2.96E+00	2.99E+00	2.99E+00	2.99E+00	2.99E+00	2.99E+00	2.99E+00	2.99E+00	2.98E+00	2.98E+00	2.98E+00	2.98E+00	3.01E+00	3.01E+00
S (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tl (Dissolved)	mg/L	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04
Sn (Dissolved)	mg/L	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04
Ti (Dissolved)	mg/L	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02
U (Dissolved)	mg/L	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.02E-02	1.01E-02	1.01E-02	1.03E-02	1.03E-02	1.03E-02	1.03E-02	1.02E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.03E-02	1.03E-02	1.03E-02	1.03E-02	1.03E-02	1.04E-02	1.04E-02
V (Dissolved)	mg/L	1.91E-02	1.91E-02	1.91E-02	1.91E-02	1.91E-02	1.93E-02	1.93E-02	1.93E-02	1.95E-02	1.95E-02	1.95E-02	1.95E-02	1.95E-02	1.97E-02	1.97E-02	1.97E-02	1.97E-02	1.97E-02	1.97E-02	1.97E-02	1.96E-02	1.96E-02	1.96E-02	1.96E-02	1.98E-02	1.98E-02
Zn (Dissolved)	mg/L	1.38E-01	1.38E-01	1.37E-01	1.37E-01	1.37E-01	1.39E-01	1.39E-01	1.39E-01	1.41E-01	1.41E-01	1.40E-01	1.40E-01	1.40E-01	1.42E-01	1.42E-01	1.42E-01	1.42E-01	1.42E-01	1.42E-01	1.42E-01	1.42E-01	1.42E-01	1.42E-01	1.42E-01	1.43E-01	1.43E-01
Zr (Dissolved)	mg/L	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04
Hg (Dissolved)	mg/L	5.32E-05	5.32E-05	5.32E-05	5.32E-05	5.32E-05	5.38E-05	5.38E-05	5.38E-05	5.44E-05	5.44E-05	5.43E-05	5.43E-05	5.43E-05	5.50E-05	5.49E-05	5.49E-05	5.49E-05	5.49E-05	5.48E-05	5.48E-05	5.48E-05	5.48E-05	5.48E-05	5.47E-05	5.53E-05	5.53E-05

APPENDIX A3 - UPPER CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 10.2 Out

Parameter	Unit	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205
Year																											
Physical Tests																											
Acidity to pH 4.5 (as C	mg/L	1.38E+01	1.39E+01	1.41E+01	1.41E+01	1.41E+01	1.41E+01	1.41E+01	1.41E+01	1.42E+01	1.42E+01	1.42E+01	1.42E+01	1.42E+01	1.42E+01	1.42E+01	1.42E+01	1.41E+01	1.41E+01	1.41E+01	1.41E+01	1.41E+01	1.41E+01	1.41E+01	1.41E+01	1.41E+01	1.41E+01
Acidity to pH 8.3 (as C	mg/L	1.68E+01	1.70E+01	1.71E+01	1.71E+01	1.71E+01	1.71E+01	1.71E+01	1.71E+01	1.73E+01	1.73E+01	1.73E+01	1.73E+01	1.72E+01	1.72E+01	1.72E+01	1.72E+01	1.72E+01	1.72E+01	1.72E+01	1.72E+01	1.72E+01	1.72E+01	1.72E+01	1.72E+01	1.72E+01	1.72E+01
Alkalinity (Total as Cal	mg/L	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01
Hardness as CaCO3 (	mg/L	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02
H+ Concentration	mg/L																										
Dissolved Anions																											
Sulphate (Dissolved)	mg/L	9.80E+02	9.90E+02	9.99E+02	9.99E+02	9.98E+02	9.98E+02	9.98E+02	9.97E+02	1.01E+03	1.01E+03	1.01E+03	1.01E+03	1.01E+03	1.00E+03	1.00E+03	1.00E+03	1.00E+03	1.00E+03	1.00E+03	1.00E+03	1.00E+03	1.00E+03	1.00E+03	1.00E+03	1.00E+03	1.00E+03
Chloride (Dissolved)	mg/L	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00
Fluoride (Dissolved)	mg/L	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02
Nutrients																											
Nitrate (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrite (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Orthophosphate (Diss	mg/L																										
Dissolved Metals																											
Al (Dissolved)	mg/L	2.84E+00	2.87E+00	2.90E+00	2.90E+00	2.90E+00	2.90E+00	2.90E+00	2.89E+00	2.92E+00	2.92E+00	2.92E+00	2.92E+00	2.92E+00	2.92E+00	2.92E+00	2.91E+00	2.91E+00	2.91E+00	2.91E+00	2.91E+00	2.91E+00	2.91E+00	2.91E+00	2.91E+00	2.90E+00	2.90E+00
Sb (Dissolved)	mg/L	1.23E-02	1.24E-02	1.25E-02	1.25E-02	1.25E-02	1.25E-02	1.25E-02	1.25E-02	1.26E-02	1.26E-02	1.26E-02	1.26E-02	1.26E-02	1.26E-02	1.26E-02	1.26E-02	1.26E-02	1.26E-02	1.26E-02	1.26E-02	1.26E-02	1.26E-02	1.25E-02	1.25E-02	1.25E-02	1.25E-02
As (Dissolved)	mg/L	1.23E-01	1.24E-01	1.25E-01	1.25E-01	1.25E-01	1.25E-01	1.25E-01	1.25E-01	1.26E-01	1.26E-01	1.26E-01	1.26E-01	1.26E-01	1.26E-01	1.26E-01	1.26E-01	1.26E-01	1.26E-01	1.26E-01	1.26E-01	1.26E-01	1.26E-01	1.26E-01	1.26E-01	1.25E-01	1.25E-01
Ba (Dissolved)	mg/L	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02
Be (Dissolved)	mg/L	2.76E-04	2.79E-04	2.82E-04	2.82E-04	2.81E-04	2.81E-04	2.81E-04	2.81E-04	2.84E-04	2.84E-04	2.84E-04	2.83E-04	2.83E-04	2.83E-04	2.83E-04	2.83E-04	2.83E-04	2.83E-04	2.83E-04	2.83E-04	2.83E-04	2.82E-04	2.82E-04	2.82E-04	2.82E-04	2.82E-04
Bi (Dissolved)	mg/L	1.38E-04	1.40E-04	1.41E-04	1.41E-04	1.41E-04	1.41E-04	1.41E-04	1.41E-04	1.42E-04	1.42E-04	1.42E-04	1.42E-04	1.42E-04	1.42E-04	1.42E-04	1.42E-04	1.42E-04	1.42E-04	1.42E-04	1.42E-04	1.41E-04	1.41E-04	1.41E-04	1.41E-04	1.41E-04	1.41E-04
B (Dissolved)	mg/L	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02
Cd (Dissolved)	mg/L	3.90E-03	3.94E-03	3.98E-03	3.97E-03	3.97E-03	3.97E-03	3.97E-03	3.97E-03	4.01E-03	4.00E-03	4.00E-03	4.00E-03	4.00E-03	4.00E-03	4.00E-03	4.00E-03	3.99E-03	3.99E-03	3.99E-03	3.99E-03	3.99E-03	3.99E-03	3.99E-03	3.98E-03	3.98E-03	3.98E-03
Ca (Dissolved)	mg/L	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02
Cr (Dissolved)	mg/L	4.65E-03	4.69E-03	4.74E-03	4.74E-03	4.73E-03	4.73E-03	4.73E-03	4.73E-03	4.77E-03	4.77E-03	4.77E-03	4.77E-03	4.77E-03	4.77E-03	4.76E-03	4.76E-03	4.76E-03	4.76E-03	4.76E-03	4.75E-03	4.75E-03	4.75E-03	4.75E-03	4.75E-03	4.75E-03	4.74E-03
Co (Dissolved)	mg/L	1.01E-02	1.02E-02	1.03E-02	1.03E-02	1.03E-02	1.03E-02	1.03E-02	1.03E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.03E-02	1.03E-02	1.03E-02
Cu (Dissolved)	mg/L	4.90E-02	4.94E-02	4.99E-02	4.99E-02	4.99E-02	4.99E-02	4.98E-02	4.98E-02	5.03E-02	5.03E-02	5.03E-02	5.02E-02	5.02E-02	5.02E-02	5.02E-02	5.02E-02	5.01E-02	5.01E-02	5.01E-02	5.01E-02	5.01E-02	5.00E-02	5.00E-02	5.00E-02	5.00E-02	5.00E-02
Fe (Dissolved)	mg/L	2.53E-01	2.55E-01	2.57E-01	2.57E-01	2.57E-01	2.57E-01	2.57E-01	2.57E-01	2.59E-01	2.59E-01	2.59E-01	2.59E-01	2.59E-01	2.59E-01	2.59E-01	2.59E-01	2.59E-01	2.59E-01	2.58E-01	2.58E-01	2.58E-01	2.58E-01	2.58E-01	2.58E-01	2.58E-01	2.58E-01
Pb (Dissolved)	mg/L	5.74E-03	5.79E-03	5.85E-03	5.84E-03	5.84E-03	5.84E-03	5.84E-03	5.84E-03	5.89E-03	5.89E-03	5.89E-03	5.89E-03	5.88E-03	5.88E-03	5.88E-03	5.88E-03	5.87E-03	5.87E-03	5.87E-03	5.87E-03	5.87E-03	5.86E-03	5.86E-03	5.86E-03	5.86E-03	5.85E-03
Li (Dissolved)	mg/L	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03
Mg (Dissolved)	mg/L	3.81E+02	3.85E+02	3.88E+02	3.88E+02	3.88E+02	3.88E+02	3.88E+02	3.88E+02	3.91E+02	3.91E+02	3.91E+02	3.91E+02	3.91E+02	3.91E+02	3.91E+02	3.90E+02	3.90E+02	3.90E+02	3.90E+02	3.90E+02	3.90E+02	3.89E+02	3.89E+02	3.89E+02	3.89E+02	3.89E+02
Mn (Dissolved)	mg/L	1.03E+00	1.04E+00	1.05E+00	1.05E+00	1.05E+00	1.05E+00	1.05E+00	1.05E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.05E+00	1.05E+00	1.05E+00	1.05E+00	1.05E+00	1.05E+00	1.05E+00	1.05E+00	1.05E+00
Mo (Dissolved)	mg/L	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02
Ni (Dissolved)	mg/L	2.59E-02	2.62E-02	2.64E-02	2.64E-02	2.64E-02	2.64E-02	2.64E-02	2.64E-02	2.66E-02	2.66E-02	2.66E-02	2.66E-02	2.66E-02	2.66E-02	2.66E-02	2.66E-02	2.65E-02	2.65E-02	2.65E-02	2.65E-02	2.65E-02	2.65E-02	2.65E-02	2.65E-02	2.65E-02	2.65E-02
P (Dissolved)	mg/L	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02
K (Dissolved)	mg/L	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00
Se (Dissolved)	mg/L	9.58E-02	9.67E-02	9.77E-02	9.76E-02	9.76E-02	9.75E-02	9.75E-02	9.75E-02	9.84E-02	9.84E-02	9.83E-02	9.83E-02	9.83E-02	9.82E-02	9.82E-02	9.81E-02	9.81E-02	9.81E-02	9.80E-02	9.80E-02	9.80E-02	9.79E-02	9.79E-02	9.78E-02	9.78E-02	9.78E-02
Si (Dissolved)	mg/L	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01
Na (Dissolved)	mg/L	3.01E+00	3.04E+00	3.07E+00	3.07E+00	3.07E+00	3.06E+00	3.06E+00	3.06E+00	3.09E+00	3.09E+00	3.09E+00	3.09E+00	3.09E+00	3.09E+00	3.08E+00	3.08E+00	3.08E+00	3.08E+00	3.08E+00	3.08E+00	3.08E+00	3.08E+00	3.07E+00	3.07E+00	3.07E+00	3.07E+00
Sr (Dissolved)	mg/L	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00
S (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tl (Dissolved)	mg/L	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04
Sn (Dissolved)	mg/L	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04
Ti (Dissolved)	mg/L	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02
U (Dissolved)	mg/L	1.04E-02	1.05E-02	1.06E-02	1.06E-02	1.06E-02	1.06E-02	1.06E-02	1.06E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.06E-02	1.06E-02
V (Dissolved)	mg/L	1.98E-02	2.00E-02	2.02E-02	2.02E-02	2.02E-02	2.02E-02	2.02E-02	2.02E-02	2.04E-02	2.03E-02	2.03E-02	2.03E-02	2.03E-02	2.03E-02	2.03E-02	2.03E-02	2.03E-02	2.03E-02	2.03E-02	2.03E-02	2.03E-02	2.02E-02	2.02E-02	2.02E-02	2.02E-02	2.02E-02
Zn (Dissolved)	mg/L	1.43E-01	1.44E-01	1.46E-01	1.46E-01	1.46E-01	1.45E-01	1.45E-01	1.45E-01	1.47E-01	1.47E-01	1.47E-01	1.47E-01	1.47E-01	1.46E-01	1.46E-01	1.46E-01	1.46E-01	1.46E-01	1.46E-01	1.46E-01	1.46E-01	1.46E-01	1.46E-01	1.46E-01	1.46E-01	1.46E-01
Zr (Dissolved)	mg/L	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04
Hg (Dissolved)	mg/L	5.53E-05	5.58E-05	5.63E-05	5.63E-05	5.63E-05	5.63E-05	5.62E-05	5.62E-05	5.68E-05	5.67E-05	5.67E-05	5.67E-05	5.67E-05	5.67E-05	5.66E-05	5.66E-05	5.66E-05	5.66E-05	5.65E-05	5.65E-05	5.65E-05	5.65E-05	5.65E-05	5.64E-05	5.64E-05	5.64E-05

APPENDIX A3 - UPPER CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 10.2 Out

Parameter	Unit	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231
Year																											
Physical Tests																											
Acidity to pH 4.5 (as C	mg/L	1.41E+01	1.41E+01	1.41E+01	1.41E+01	1.42E+01	1.42E+01	1.42E+01	1.42E+01	1.42E+01	1.42E+01	1.41E+01	1.41E+01	1.41E+01	1.42E+01	1.42E+01	1.42E+01	1.42E+01	1.42E+01	1.42E+01	1.42E+01	1.42E+01	1.44E+01	1.44E+01	1.44E+01	1.43E+01	1.44E+01
Acidity to pH 8.3 (as C	mg/L	1.72E+01	1.71E+01	1.71E+01	1.71E+01	1.73E+01	1.73E+01	1.72E+01	1.72E+01	1.72E+01	1.72E+01	1.72E+01	1.72E+01	1.72E+01	1.73E+01	1.73E+01	1.73E+01	1.73E+01	1.73E+01	1.73E+01	1.73E+01	1.73E+01	1.73E+01	1.75E+01	1.75E+01	1.75E+01	1.76E+01
Alkalinity (Total as Ca	mg/L	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01
Hardness as CaCO3 (	mg/L	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02
H+ Concentration	mg/L																										
Dissolved Anions																											
Sulphate (Dissolved)	mg/L	1.00E+03	1.00E+03	9.99E+02	9.99E+02	1.01E+03	1.01E+03	1.01E+03	1.00E+03	1.00E+03	1.00E+03	1.00E+03	1.00E+03	1.00E+03	1.01E+03	1.01E+03	1.01E+03	1.01E+03	1.01E+03	1.01E+03	1.01E+03	1.01E+03	1.02E+03	1.02E+03	1.02E+03	1.02E+03	1.02E+03
Chloride (Dissolved)	mg/L	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00
Fluoride (Dissolved)	mg/L	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02
Nutrients																											
Nitrate (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrite (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Orthophosphate (Diss	mg/L																										
Dissolved Metals																											
Al (Dissolved)	mg/L	2.90E+00	2.90E+00	2.90E+00	2.90E+00	2.92E+00	2.92E+00	2.92E+00	2.92E+00	2.92E+00	2.91E+00	2.91E+00	2.91E+00	2.91E+00	2.93E+00	2.93E+00	2.93E+00	2.93E+00	2.93E+00	2.92E+00	2.92E+00	2.92E+00	2.96E+00	2.96E+00	2.96E+00	2.95E+00	2.97E+00
Sb (Dissolved)	mg/L	1.25E-02	1.25E-02	1.25E-02	1.25E-02	1.26E-02	1.26E-02	1.26E-02	1.26E-02	1.26E-02	1.26E-02	1.26E-02	1.26E-02	1.26E-02	1.26E-02	1.26E-02	1.26E-02	1.26E-02	1.26E-02	1.26E-02	1.26E-02	1.26E-02	1.28E-02	1.28E-02	1.28E-02	1.28E-02	1.28E-02
As (Dissolved)	mg/L	1.25E-01	1.25E-01	1.25E-01	1.25E-01	1.26E-01	1.26E-01	1.26E-01	1.26E-01	1.26E-01	1.26E-01	1.26E-01	1.26E-01	1.27E-01	1.27E-01	1.26E-01	1.26E-01	1.26E-01	1.26E-01	1.26E-01	1.26E-01	1.26E-01	1.28E-01	1.28E-01	1.28E-01	1.28E-01	1.28E-01
Ba (Dissolved)	mg/L	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02
Be (Dissolved)	mg/L	2.82E-04	2.82E-04	2.82E-04	2.82E-04	2.84E-04	2.83E-04	2.83E-04	2.83E-04	2.83E-04	2.83E-04	2.83E-04	2.83E-04	2.83E-04	2.85E-04	2.84E-04	2.84E-04	2.84E-04	2.84E-04	2.84E-04	2.84E-04	2.84E-04	2.87E-04	2.87E-04	2.87E-04	2.87E-04	2.88E-04
Bi (Dissolved)	mg/L	1.41E-04	1.41E-04	1.41E-04	1.41E-04	1.42E-04	1.42E-04	1.42E-04	1.42E-04	1.42E-04	1.42E-04	1.42E-04	1.42E-04	1.42E-04	1.42E-04	1.42E-04	1.42E-04	1.42E-04	1.42E-04	1.42E-04	1.42E-04	1.42E-04	1.44E-04	1.44E-04	1.44E-04	1.44E-04	1.44E-04
B (Dissolved)	mg/L	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02
Cd (Dissolved)	mg/L	3.98E-03	3.98E-03	3.98E-03	3.97E-03	4.00E-03	4.00E-03	4.00E-03	4.00E-03	4.00E-03	4.00E-03	3.99E-03	3.99E-03	3.99E-03	4.02E-03	4.01E-03	4.01E-03	4.01E-03	4.01E-03	4.01E-03	4.01E-03	4.01E-03	4.01E-03	4.05E-03	4.05E-03	4.05E-03	4.07E-03
Ca (Dissolved)	mg/L	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02
Cr (Dissolved)	mg/L	4.74E-03	4.74E-03	4.74E-03	4.74E-03	4.77E-03	4.77E-03	4.77E-03	4.77E-03	4.76E-03	4.76E-03	4.76E-03	4.76E-03	4.76E-03	4.79E-03	4.78E-03	4.78E-03	4.78E-03	4.78E-03	4.78E-03	4.78E-03	4.78E-03	4.77E-03	4.83E-03	4.83E-03	4.83E-03	4.85E-03
Co (Dissolved)	mg/L	1.03E-02	1.03E-02	1.03E-02	1.03E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.05E-02	1.05E-02	1.05E-02	1.06E-02
Cu (Dissolved)	mg/L	5.00E-02	4.99E-02	4.99E-02	4.99E-02	5.03E-02	5.02E-02	5.02E-02	5.02E-02	5.02E-02	5.02E-02	5.01E-02	5.01E-02	5.01E-02	5.04E-02	5.04E-02	5.04E-02	5.04E-02	5.03E-02	5.03E-02	5.03E-02	5.03E-02	5.02E-02	5.09E-02	5.09E-02	5.09E-02	5.11E-02
Fe (Dissolved)	mg/L	2.58E-01	2.58E-01	2.57E-01	2.57E-01	2.59E-01	2.59E-01	2.59E-01	2.59E-01	2.59E-01	2.59E-01	2.59E-01	2.59E-01	2.58E-01	2.60E-01	2.60E-01	2.60E-01	2.60E-01	2.60E-01	2.60E-01	2.60E-01	2.59E-01	2.63E-01	2.63E-01	2.62E-01	2.62E-01	2.64E-01
Pb (Dissolved)	mg/L	5.85E-03	5.85E-03	5.85E-03	5.85E-03	5.89E-03	5.88E-03	5.88E-03	5.88E-03	5.88E-03	5.88E-03	5.87E-03	5.87E-03	5.87E-03	5.91E-03	5.90E-03	5.90E-03	5.90E-03	5.90E-03	5.90E-03	5.89E-03	5.89E-03	5.96E-03	5.96E-03	5.96E-03	5.96E-03	5.99E-03
Li (Dissolved)	mg/L	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03
Mg (Dissolved)	mg/L	3.89E+02	3.89E+02	3.88E+02	3.88E+02	3.91E+02	3.91E+02	3.91E+02	3.91E+02	3.90E+02	3.90E+02	3.90E+02	3.90E+02	3.90E+02	3.92E+02	3.92E+02	3.92E+02	3.92E+02	3.92E+02	3.92E+02	3.91E+02	3.91E+02	3.96E+02	3.96E+02	3.96E+02	3.96E+02	3.98E+02
Mn (Dissolved)	mg/L	1.05E+00	1.05E+00	1.05E+00	1.05E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.05E+00	1.05E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.07E+00	1.07E+00	1.07E+00	1.07E+00	1.08E+00
Mo (Dissolved)	mg/L	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02
Ni (Dissolved)	mg/L	2.64E-02	2.64E-02	2.64E-02	2.64E-02	2.66E-02	2.66E-02	2.66E-02	2.66E-02	2.66E-02	2.66E-02	2.65E-02	2.65E-02	2.65E-02	2.67E-02	2.67E-02	2.67E-02	2.67E-02	2.67E-02	2.66E-02	2.66E-02	2.66E-02	2.70E-02	2.69E-02	2.69E-02	2.69E-02	2.71E-02
P (Dissolved)	mg/L	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02
K (Dissolved)	mg/L	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00
Se (Dissolved)	mg/L	9.77E-02	9.77E-02	9.77E-02	9.76E-02	9.83E-02	9.83E-02	9.83E-02	9.82E-02	9.82E-02	9.81E-02	9.81E-02	9.81E-02	9.80E-02	9.87E-02	9.86E-02	9.86E-02	9.85E-02	9.85E-02	9.85E-02	9.84E-02	9.84E-02	9.96E-02	9.96E-02	9.95E-02	9.95E-02	1.00E-01
Si (Dissolved)	mg/L	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01
Na (Dissolved)	mg/L	3.07E+00	3.07E+00	3.07E+00	3.07E+00	3.09E+00	3.09E+00	3.09E+00	3.09E+00	3.08E+00	3.08E+00	3.08E+00	3.08E+00	3.08E+00	3.10E+00	3.10E+00	3.10E+00	3.10E+00	3.09E+00	3.09E+00	3.09E+00	3.09E+00	3.13E+00	3.13E+00	3.13E+00	3.13E+00	3.14E+00
Sr (Dissolved)	mg/L	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00
S (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tl (Dissolved)	mg/L	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04
Sn (Dissolved)	mg/L	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04
Ti (Dissolved)	mg/L	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02
U (Dissolved)	mg/L	1.06E-02	1.06E-02	1.06E-02	1.06E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.08E-02	1.08E-02	1.08E-02	1.08E-02	1.09E-02
V (Dissolved)	mg/L	2.02E-02	2.02E-02	2.02E-02	2.02E-02	2.03E-02	2.03E-02	2.03E-02	2.03E-02	2.03E-02	2.03E-02	2.03E-02	2.03E-02	2.03E-02	2.04E-02	2.04E-02	2.04E-02	2.04E-02	2.04E-02	2.04E-02	2.04E-02	2.03E-02	2.06E-02	2.06E-02	2.06E-02	2.06E-02	2.07E-02
Zn (Dissolved)	mg/L	1.46E-01	1.46E-01	1.46E-01	1.46E-01	1.47E-01	1.47E-01	1.47E-01	1.46E-01	1.46E-01	1.46E-01	1.46E-01	1.46E-01	1.46E-01	1.47E-01	1.47E-01	1.47E-01	1.47E-01	1.47E-01	1.47E-01	1.47E-01	1.47E-01	1.49E-01	1.48E-01	1.48E-01	1.48E-01	1.49E-01
Zr (Dissolved)	mg/L	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04
Hg (Dissolved)	mg/L	5.64E-05	5.64E-05	5.63E-05	5.63E-05	5.67E-05	5.67E-05	5.67E-05	5.67E-05	5.66E-05	5.66E-05	5.66E-05	5.66E-05	5.65E-05	5.69E-05	5.69E-05	5.69E-05	5.68E-05	5.68E-05	5.68E-05	5.68E-05	5.68E-05	5.75E-05	5.74E-05	5.74E-05	5.74E-05	5.77E-05

APPENDIX A3 - UPPER CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 10.2 Out

Parameter	Unit	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257
Year																											
Physical Tests																											
Acidity to pH 4.5 (as C	mg/L	1.44E+01	1.44E+01	1.44E+01	1.44E+01	1.45E+01	1.46E+01	1.46E+01	1.46E+01	1.46E+01	1.46E+01	1.46E+01	1.46E+01	1.46E+01	1.46E+01	1.46E+01	1.46E+01	1.46E+01	1.46E+01	1.46E+01	1.46E+01	1.47E+01	1.47E+01	1.47E+01	1.47E+01	1.48E+01	1.49E+01
Acidity to pH 8.3 (as C	mg/L	1.76E+01	1.75E+01	1.75E+01	1.75E+01	1.76E+01	1.78E+01	1.78E+01	1.78E+01	1.78E+01	1.78E+01	1.78E+01	1.78E+01	1.78E+01	1.77E+01	1.77E+01	1.77E+01	1.78E+01	1.78E+01	1.78E+01	1.78E+01	1.78E+01	1.79E+01	1.79E+01	1.79E+01	1.79E+01	1.80E+01	1.81E+01
Alkalinity (Total as Ca(	mg/L	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01
Hardness as CaCO3 (	mg/L	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02
H+ Concentration	mg/L																										
Dissolved Anions																											
Sulphate (Dissolved)	mg/L	1.02E+03	1.02E+03	1.02E+03	1.02E+03	1.03E+03	1.04E+03	1.04E+03	1.04E+03	1.04E+03	1.04E+03	1.04E+03	1.04E+03	1.03E+03	1.03E+03	1.03E+03	1.03E+03	1.04E+03	1.04E+03	1.04E+03	1.04E+03	1.04E+03	1.04E+03	1.04E+03	1.04E+03	1.05E+03	1.05E+03
Chloride (Dissolved)	mg/L	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00
Fluoride (Dissolved)	mg/L	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02
Nutrients																											
Nitrate (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrite (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Orthophosphate (Diss	mg/L																										
Dissolved Metals																											
Al (Dissolved)	mg/L	2.97E+00	2.97E+00	2.97E+00	2.97E+00	2.98E+00	3.01E+00	3.01E+00	3.01E+00	3.01E+00	3.01E+00	3.01E+00	3.00E+00	3.00E+00	3.00E+00	3.00E+00	3.00E+00	3.01E+00	3.01E+00	3.01E+00	3.01E+00	3.02E+00	3.03E+00	3.03E+00	3.03E+00	3.04E+00	3.06E+00
Sb (Dissolved)	mg/L	1.28E-02	1.28E-02	1.28E-02	1.28E-02	1.29E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.31E-02	1.31E-02	1.31E-02	1.31E-02	1.32E-02
As (Dissolved)	mg/L	1.28E-01	1.28E-01	1.28E-01	1.28E-01	1.29E-01	1.30E-01	1.30E-01	1.30E-01	1.30E-01	1.30E-01	1.30E-01	1.30E-01	1.30E-01	1.30E-01	1.30E-01	1.30E-01	1.30E-01	1.30E-01	1.30E-01	1.30E-01	1.31E-01	1.31E-01	1.31E-01	1.31E-01	1.31E-01	1.32E-01
Ba (Dissolved)	mg/L	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02
Be (Dissolved)	mg/L	2.88E-04	2.88E-04	2.88E-04	2.88E-04	2.89E-04	2.93E-04	2.92E-04	2.92E-04	2.92E-04	2.92E-04	2.92E-04	2.92E-04	2.92E-04	2.92E-04	2.92E-04	2.92E-04	2.91E-04	2.93E-04	2.92E-04	2.92E-04	2.92E-04	2.93E-04	2.94E-04	2.94E-04	2.94E-04	2.95E-04	2.97E-04
Bi (Dissolved)	mg/L	1.44E-04	1.44E-04	1.44E-04	1.44E-04	1.45E-04	1.46E-04	1.46E-04	1.46E-04	1.46E-04	1.46E-04	1.46E-04	1.46E-04	1.46E-04	1.46E-04	1.46E-04	1.46E-04	1.46E-04	1.46E-04	1.46E-04	1.46E-04	1.46E-04	1.47E-04	1.47E-04	1.47E-04	1.47E-04	1.48E-04	1.49E-04
B (Dissolved)	mg/L	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02
Cd (Dissolved)	mg/L	4.07E-03	4.07E-03	4.07E-03	4.07E-03	4.09E-03	4.13E-03	4.13E-03	4.13E-03	4.12E-03	4.12E-03	4.12E-03	4.12E-03	4.12E-03	4.12E-03	4.12E-03	4.11E-03	4.11E-03	4.13E-03	4.13E-03	4.13E-03	4.12E-03	4.14E-03	4.16E-03	4.15E-03	4.15E-03	4.17E-03	4.20E-03
Ca (Dissolved)	mg/L	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02
Cr (Dissolved)	mg/L	4.85E-03	4.85E-03	4.85E-03	4.85E-03	4.87E-03	4.92E-03	4.92E-03	4.92E-03	4.92E-03	4.91E-03	4.91E-03	4.91E-03	4.91E-03	4.91E-03	4.90E-03	4.90E-03	4.92E-03	4.92E-03	4.92E-03	4.92E-03	4.94E-03	4.95E-03	4.95E-03	4.95E-03	4.97E-03	5.00E-03
Co (Dissolved)	mg/L	1.06E-02	1.06E-02	1.06E-02	1.06E-02	1.06E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.08E-02	1.08E-02	1.08E-02	1.08E-02	1.08E-02	1.09E-02
Cu (Dissolved)	mg/L	5.11E-02	5.11E-02	5.11E-02	5.10E-02	5.13E-02	5.18E-02	5.18E-02	5.18E-02	5.18E-02	5.18E-02	5.17E-02	5.17E-02	5.17E-02	5.17E-02	5.17E-02	5.16E-02	5.18E-02	5.18E-02	5.18E-02	5.18E-02	5.20E-02	5.22E-02	5.22E-02	5.21E-02	5.23E-02	5.27E-02
Fe (Dissolved)	mg/L	2.64E-01	2.64E-01	2.63E-01	2.63E-01	2.65E-01	2.67E-01	2.67E-01	2.67E-01	2.67E-01	2.67E-01	2.67E-01	2.67E-01	2.67E-01	2.67E-01	2.67E-01	2.66E-01	2.66E-01	2.67E-01	2.67E-01	2.67E-01	2.67E-01	2.68E-01	2.69E-01	2.69E-01	2.69E-01	2.70E-01	2.72E-01
Pb (Dissolved)	mg/L	5.99E-03	5.98E-03	5.98E-03	5.98E-03	6.01E-03	6.07E-03	6.07E-03	6.07E-03	6.07E-03	6.06E-03	6.06E-03	6.06E-03	6.06E-03	6.05E-03	6.05E-03	6.05E-03	6.05E-03	6.07E-03	6.07E-03	6.07E-03	6.07E-03	6.09E-03	6.11E-03	6.11E-03	6.11E-03	6.13E-03	6.17E-03
Li (Dissolved)	mg/L	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03
Mg (Dissolved)	mg/L	3.98E+02	3.98E+02	3.97E+02	3.97E+02	3.99E+02	4.03E+02	4.03E+02	4.03E+02	4.03E+02	4.03E+02	4.03E+02	4.02E+02	4.02E+02	4.02E+02	4.02E+02	4.02E+02	4.03E+02	4.03E+02	4.03E+02	4.03E+02	4.05E+02	4.06E+02	4.06E+02	4.06E+02	4.07E+02	4.10E+02
Mn (Dissolved)	mg/L	1.08E+00	1.08E+00	1.07E+00	1.07E+00	1.08E+00	1.09E+00	1.09E+00	1.09E+00	1.09E+00	1.09E+00	1.09E+00	1.09E+00	1.09E+00	1.09E+00	1.09E+00	1.09E+00	1.09E+00	1.09E+00	1.09E+00	1.09E+00	1.09E+00	1.09E+00	1.10E+00	1.10E+00	1.10E+00	1.10E+00	1.11E+00
Mo (Dissolved)	mg/L	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02
Ni (Dissolved)	mg/L	2.71E-02	2.70E-02	2.70E-02	2.70E-02	2.72E-02	2.74E-02	2.74E-02	2.74E-02	2.74E-02	2.74E-02	2.74E-02	2.74E-02	2.74E-02	2.74E-02	2.73E-02	2.73E-02	2.74E-02	2.74E-02	2.74E-02	2.74E-02	2.74E-02	2.75E-02	2.76E-02	2.76E-02	2.76E-02	2.77E-02	2.79E-02
P (Dissolved)	mg/L	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02
K (Dissolved)	mg/L	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00
Se (Dissolved)	mg/L	1.00E-01	9.99E-02	9.99E-02	9.99E-02	1.00E-01	1.01E-01	1.01E-01	1.01E-01	1.01E-01	1.01E-01	1.01E-01	1.01E-01	1.01E-01	1.01E-01	1.01E-01	1.01E-01	1.01E-01	1.01E-01	1.01E-01	1.01E-01	1.01E-01	1.02E-01	1.02E-01	1.02E-01	1.02E-01	1.02E-01	1.03E-01
Si (Dissolved)	mg/L	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01
Na (Dissolved)	mg/L	3.14E+00	3.14E+00	3.14E+00	3.14E+00	3.15E+00	3.19E+00	3.18E+00	3.18E+00	3.18E+00	3.18E+00	3.18E+00	3.18E+00	3.18E+00	3.18E+00	3.17E+00	3.17E+00	3.19E+00	3.19E+00	3.18E+00	3.18E+00	3.20E+00	3.21E+00	3.21E+00	3.20E+00	3.22E+00	3.24E+00
Sr (Dissolved)	mg/L	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00
S (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tl (Dissolved)	mg/L	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04
Sn (Dissolved)	mg/L	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04
Ti (Dissolved)	mg/L	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02
U (Dissolved)	mg/L	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.10E-02	1.10E-02	1.10E-02	1.10E-02	1.10E-02	1.10E-02	1.10E-02	1.10E-02	1.10E-02	1.10E-02	1.10E-02	1.10E-02	1.10E-02	1.10E-02	1.10E-02	1.10E-02	1.11E-02	1.11E-02	1.11E-02	1.11E-02	1.11E-02	1.12E-02
V (Dissolved)	mg/L	2.07E-02	2.07E-02	2.07E-02	2.07E-02	2.08E-02	2.10E-02	2.10E-02	2.10E-02	2.10E-02	2.09E-02	2.09E-02	2.09E-02	2.09E-02	2.09E-02	2.09E-02	2.09E-02	2.10E-02	2.10E-02	2.10E-02	2.10E-02	2.10E-02	2.11E-02	2.11E-02	2.11E-02	2.12E-02	2.13E-02
Zn (Dissolved)	mg/L	1.49E-01	1.49E-01	1.49E-01	1.49E-01	1.50E-01	1.51E-01	1.51E-01	1.51E-01	1.51E-01	1.51E-01	1.51E-01	1.51E-01	1.51E-01	1.51E-01	1.51E-01	1.51E-01	1.51E-01	1.51E-01	1.51E-01	1.51E-01	1.51E-01	1.52E-01	1.52E-01	1.52E-01	1.52E-01	1.53E-01	1.54E-01
Zr (Dissolved)	mg/L	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04
Hg (Dissolved)	mg/L	5.77E-05	5.77E-05	5.76E-05	5.76E-05	5.79E-05	5.85E-05	5.85E-05	5.85E-05	5.84E-05	5.84E-05	5.84E-05	5.84E-05	5.83E-05	5.83E-05	5.83E-05	5.83E-05	5.85E-05	5.85E-05	5.85E-05	5.84E-05	5.87E-05	5.89E-05	5.89E-05	5.88E-05	5.90E-05	5.95E-05

APPENDIX A3 - UPPER CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 10.2 Out

Parameter	Unit	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283
Year																											
Physical Tests																											
Acidity to pH 4.5 (as C	mg/L	1.49E+01	1.49E+01	1.50E+01	1.50E+01	1.50E+01	1.50E+01	1.50E+01	1.50E+01	1.50E+01	1.50E+01	1.50E+01	1.50E+01	1.50E+01	1.49E+01	1.49E+01	1.49E+01	1.49E+01	1.49E+01	1.49E+01	1.49E+01	1.49E+01	1.49E+01	1.49E+01	1.49E+01	1.49E+01	1.49E+01
Acidity to pH 8.3 (as C	mg/L	1.82E+01	1.81E+01	1.82E+01	1.83E+01	1.83E+01	1.82E+01	1.82E+01	1.82E+01	1.82E+01	1.82E+01	1.82E+01	1.82E+01	1.82E+01	1.82E+01	1.82E+01	1.82E+01	1.82E+01	1.82E+01	1.82E+01	1.82E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01
Alkalinity (Total as Ca	mg/L	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01
Hardness as CaCO3 (	mg/L	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02
H+ Concentration	mg/L																										
Dissolved Anions																											
Sulphate (Dissolved)	mg/L	1.06E+03	1.06E+03	1.06E+03	1.06E+03	1.06E+03	1.06E+03	1.06E+03	1.06E+03	1.06E+03	1.06E+03	1.06E+03	1.06E+03	1.06E+03	1.06E+03	1.06E+03	1.06E+03	1.06E+03	1.06E+03	1.06E+03	1.06E+03	1.06E+03	1.06E+03	1.06E+03	1.06E+03	1.06E+03	1.06E+03
Chloride (Dissolved)	mg/L	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00
Fluoride (Dissolved)	mg/L	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02
Nutrients																											
Nitrate (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrite (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Orthophosphate (Diss	mg/L																										
Dissolved Metals																											
Al (Dissolved)	mg/L	3.07E+00	3.07E+00	3.08E+00	3.09E+00	3.09E+00	3.09E+00	3.09E+00	3.08E+00	3.08E+00	3.08E+00	3.08E+00	3.08E+00	3.08E+00	3.08E+00	3.08E+00	3.07E+00	3.07E+00	3.07E+00	3.07E+00	3.07E+00	3.07E+00	3.07E+00	3.07E+00	3.06E+00	3.07E+00	3.07E+00
Sb (Dissolved)	mg/L	1.33E-02	1.33E-02	1.33E-02	1.33E-02	1.33E-02	1.33E-02	1.33E-02	1.33E-02	1.33E-02	1.33E-02	1.33E-02	1.33E-02	1.33E-02	1.33E-02	1.33E-02	1.33E-02	1.33E-02	1.33E-02	1.33E-02	1.33E-02	1.32E-02	1.32E-02	1.32E-02	1.32E-02	1.32E-02	1.32E-02
As (Dissolved)	mg/L	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.32E-01	1.32E-01	1.33E-01	1.33E-01
Ba (Dissolved)	mg/L	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02
Be (Dissolved)	mg/L	2.98E-04	2.98E-04	2.99E-04	3.00E-04	3.00E-04	3.00E-04	3.00E-04	3.00E-04	2.99E-04	2.99E-04	2.99E-04	2.99E-04	2.99E-04	2.99E-04	2.99E-04	2.98E-04	2.98E-04	2.98E-04	2.98E-04	2.98E-04	2.98E-04	2.98E-04	2.98E-04	2.98E-04	2.98E-04	2.98E-04
Bi (Dissolved)	mg/L	1.49E-04	1.49E-04	1.50E-04	1.50E-04	1.50E-04	1.50E-04	1.50E-04	1.50E-04	1.50E-04	1.50E-04	1.50E-04	1.50E-04	1.50E-04	1.50E-04	1.50E-04	1.49E-04	1.49E-04	1.49E-04	1.49E-04	1.49E-04	1.49E-04	1.49E-04	1.49E-04	1.49E-04	1.49E-04	1.49E-04
B (Dissolved)	mg/L	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02
Cd (Dissolved)	mg/L	4.21E-03	4.21E-03	4.22E-03	4.24E-03	4.23E-03	4.23E-03	4.23E-03	4.23E-03	4.23E-03	4.22E-03	4.22E-03	4.22E-03	4.22E-03	4.22E-03	4.22E-03	4.21E-03	4.21E-03	4.21E-03	4.21E-03	4.21E-03	4.21E-03	4.21E-03	4.20E-03	4.20E-03	4.20E-03	4.21E-03	4.21E-03
Ca (Dissolved)	mg/L	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02
Cr (Dissolved)	mg/L	5.02E-03	5.02E-03	5.03E-03	5.05E-03	5.05E-03	5.04E-03	5.04E-03	5.04E-03	5.04E-03	5.04E-03	5.03E-03	5.03E-03	5.03E-03	5.03E-03	5.03E-03	5.02E-03	5.02E-03	5.02E-03	5.02E-03	5.02E-03	5.01E-03	5.01E-03	5.01E-03	5.01E-03	5.01E-03	5.01E-03
Co (Dissolved)	mg/L	1.09E-02	1.09E-02	1.10E-02	1.10E-02	1.10E-02	1.10E-02	1.10E-02	1.10E-02	1.10E-02	1.10E-02	1.10E-02	1.10E-02	1.10E-02	1.10E-02	1.10E-02	1.10E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02
Cu (Dissolved)	mg/L	5.29E-02	5.28E-02	5.30E-02	5.32E-02	5.31E-02	5.31E-02	5.31E-02	5.31E-02	5.31E-02	5.30E-02	5.30E-02	5.30E-02	5.30E-02	5.30E-02	5.29E-02	5.29E-02	5.29E-02	5.29E-02	5.29E-02	5.28E-02	5.28E-02	5.28E-02	5.28E-02	5.27E-02	5.28E-02	5.28E-02
Fe (Dissolved)	mg/L	2.73E-01	2.73E-01	2.73E-01	2.74E-01	2.74E-01	2.74E-01	2.74E-01	2.74E-01	2.74E-01	2.74E-01	2.74E-01	2.73E-01	2.73E-01	2.73E-01	2.73E-01	2.73E-01	2.73E-01	2.73E-01	2.73E-01	2.73E-01	2.72E-01	2.72E-01	2.72E-01	2.72E-01	2.72E-01	2.72E-01
Pb (Dissolved)	mg/L	6.19E-03	6.19E-03	6.21E-03	6.23E-03	6.23E-03	6.22E-03	6.22E-03	6.22E-03	6.22E-03	6.21E-03	6.21E-03	6.21E-03	6.21E-03	6.20E-03	6.20E-03	6.20E-03	6.20E-03	6.19E-03	6.19E-03	6.19E-03	6.19E-03	6.18E-03	6.18E-03	6.18E-03	6.19E-03	6.19E-03
Li (Dissolved)	mg/L	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03
Mg (Dissolved)	mg/L	4.11E+02	4.11E+02	4.12E+02	4.14E+02	4.14E+02	4.13E+02	4.13E+02	4.13E+02	4.13E+02	4.13E+02	4.13E+02	4.12E+02	4.12E+02	4.12E+02	4.12E+02	4.12E+02	4.12E+02	4.11E+02	4.11E+02	4.11E+02	4.11E+02	4.11E+02	4.11E+02	4.10E+02	4.11E+02	4.11E+02
Mn (Dissolved)	mg/L	1.11E+00	1.11E+00	1.12E+00	1.12E+00	1.12E+00	1.12E+00	1.12E+00	1.12E+00	1.12E+00	1.12E+00	1.12E+00	1.12E+00	1.11E+00	1.11E+00	1.11E+00	1.11E+00	1.11E+00	1.11E+00	1.11E+00	1.11E+00	1.11E+00	1.11E+00	1.11E+00	1.11E+00	1.11E+00	1.11E+00
Mo (Dissolved)	mg/L	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02
Ni (Dissolved)	mg/L	2.80E-02	2.80E-02	2.81E-02	2.81E-02	2.81E-02	2.81E-02	2.81E-02	2.81E-02	2.81E-02	2.81E-02	2.81E-02	2.81E-02	2.80E-02	2.80E-02	2.80E-02	2.80E-02	2.80E-02	2.80E-02	2.80E-02	2.80E-02	2.80E-02	2.79E-02	2.79E-02	2.79E-02	2.80E-02	2.80E-02
P (Dissolved)	mg/L	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02
K (Dissolved)	mg/L	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00
Se (Dissolved)	mg/L	1.03E-01	1.03E-01	1.04E-01	1.04E-01	1.04E-01	1.04E-01	1.04E-01	1.04E-01	1.04E-01	1.04E-01	1.04E-01	1.04E-01	1.04E-01	1.04E-01	1.04E-01	1.04E-01	1.03E-01	1.03E-01	1.03E-01	1.03E-01	1.03E-01	1.03E-01	1.03E-01	1.03E-01	1.03E-01	1.03E-01
Si (Dissolved)	mg/L	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01
Na (Dissolved)	mg/L	3.25E+00	3.25E+00	3.26E+00	3.27E+00	3.27E+00	3.27E+00	3.26E+00	3.26E+00	3.26E+00	3.26E+00	3.26E+00	3.26E+00	3.26E+00	3.25E+00	3.25E+00	3.25E+00	3.25E+00	3.25E+00	3.25E+00	3.25E+00	3.24E+00	3.24E+00	3.24E+00	3.25E+00	3.24E+00
Sr (Dissolved)	mg/L	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00
S (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tl (Dissolved)	mg/L	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04
Sn (Dissolved)	mg/L	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04
Ti (Dissolved)	mg/L	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02
U (Dissolved)	mg/L	1.13E-02	1.13E-02	1.13E-02	1.13E-02	1.13E-02	1.13E-02	1.13E-02	1.13E-02	1.13E-02	1.13E-02	1.13E-02	1.13E-02	1.13E-02	1.13E-02	1.13E-02	1.13E-02	1.13E-02	1.13E-02	1.13E-02	1.13E-02	1.12E-02	1.12E-02	1.12E-02	1.12E-02	1.12E-02	1.12E-02
V (Dissolved)	mg/L	2.14E-02	2.14E-02	2.14E-02	2.15E-02	2.15E-02	2.15E-02	2.15E-02	2.15E-02	2.15E-02	2.15E-02	2.15E-02	2.14E-02	2.14E-02	2.14E-02	2.14E-02	2.14E-02	2.14E-02	2.14E-02	2.14E-02	2.14E-02	2.14E-02	2.14E-02	2.13E-02	2.13E-02	2.14E-02	2.14E-02
Zn (Dissolved)	mg/L	1.54E-01	1.54E-01	1.55E-01	1.55E-01	1.55E-01	1.55E-01	1.55E-01	1.55E-01	1.55E-01	1.55E-01	1.55E-01	1.55E-01	1.55E-01	1.55E-01	1.54E-01	1.54E-01	1.54E-01	1.54E-01	1.54E-01	1.54E-01	1.54E-01	1.54E-01	1.54E-01	1.54E-01	1.54E-01	1.54E-01
Zr (Dissolved)	mg/L	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04
Hg (Dissolved)	mg/L	5.97E-05	5.96E-05	5.98E-05	6.00E-05	6.00E-05	6.00E-05	5.99E-05	5.99E-05	5.99E-05	5.99E-05	5.98E-05	5.98E-05	5.98E-05	5.98E-05	5.97E-05	5.97E-05	5.97E-05	5.97E-05	5.96E-05	5.96E-05	5.96E-05	5.96E-05	5.96E-05	5.95E-05	5.96E-05	5.96E-05

APPENDIX A3 - UPPER CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 10.2 Out

Parameter	Unit	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309
Year																											
Physical Tests																											
Acidity to pH 4.5 (as C	mg/L	1.49E+01	1.49E+01	1.49E+01	1.49E+01	1.49E+01	1.49E+01	1.49E+01	1.49E+01	1.49E+01	1.49E+01	1.49E+01	1.49E+01	1.49E+01	1.49E+01	1.49E+01	1.49E+01	1.49E+01	1.48E+01	1.48E+01	1.48E+01	1.48E+01	1.48E+01	1.48E+01	1.48E+01	1.48E+01	1.48E+01
Acidity to pH 8.3 (as C	mg/L	1.81E+01	1.81E+01	1.81E+01	1.82E+01	1.82E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.81E+01	1.80E+01	1.80E+01	1.80E+01	1.80E+01	1.80E+01	1.80E+01
Alkalinity (Total as Ca	mg/L	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01
Hardness as CaCO3 (	mg/L	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02
H+ Concentration	mg/L																										
Dissolved Anions																											
Sulphate (Dissolved)	mg/L	1.06E+03	1.06E+03	1.06E+03	1.06E+03	1.06E+03	1.06E+03	1.06E+03	1.06E+03	1.06E+03	1.06E+03	1.06E+03	1.06E+03	1.05E+03	1.06E+03	1.05E+03	1.05E+03	1.05E+03	1.05E+03	1.05E+03	1.05E+03	1.05E+03	1.05E+03	1.05E+03	1.05E+03	1.05E+03	1.05E+03
Chloride (Dissolved)	mg/L	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00
Fluoride (Dissolved)	mg/L	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02
Nutrients																											
Nitrate (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrite (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Orthophosphate (Diss	mg/L																										
Dissolved Metals																											
Al (Dissolved)	mg/L	3.07E+00	3.07E+00	3.07E+00	3.07E+00	3.07E+00	3.07E+00	3.07E+00	3.07E+00	3.07E+00	3.06E+00	3.06E+00	3.06E+00	3.06E+00	3.06E+00	3.06E+00	3.06E+00	3.06E+00	3.06E+00	3.06E+00	3.06E+00	3.05E+00	3.05E+00	3.05E+00	3.05E+00	3.05E+00	3.05E+00	3.05E+00
Sb (Dissolved)	mg/L	1.32E-02	1.32E-02	1.32E-02	1.33E-02	1.33E-02	1.33E-02	1.32E-02	1.32E-02	1.32E-02	1.32E-02	1.32E-02	1.32E-02	1.32E-02	1.32E-02	1.32E-02	1.32E-02	1.32E-02	1.32E-02	1.32E-02	1.32E-02	1.32E-02	1.32E-02	1.32E-02	1.32E-02	1.32E-02	1.32E-02
As (Dissolved)	mg/L	1.32E-01	1.32E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.32E-01	1.32E-01	1.32E-01	1.32E-01	1.32E-01	1.32E-01	1.32E-01	1.32E-01	1.32E-01	1.32E-01	1.32E-01	1.32E-01	1.32E-01	1.32E-01	1.32E-01	1.32E-01	1.32E-01	1.32E-01
Ba (Dissolved)	mg/L	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02
Be (Dissolved)	mg/L	2.98E-04	2.98E-04	2.98E-04	2.98E-04	2.98E-04	2.98E-04	2.98E-04	2.98E-04	2.98E-04	2.98E-04	2.98E-04	2.97E-04	2.97E-04	2.97E-04	2.97E-04	2.97E-04	2.97E-04	2.97E-04	2.97E-04	2.97E-04	2.97E-04	2.97E-04	2.96E-04	2.96E-04	2.96E-04	2.96E-04
Bi (Dissolved)	mg/L	1.49E-04	1.49E-04	1.49E-04	1.49E-04	1.49E-04	1.49E-04	1.49E-04	1.49E-04	1.49E-04	1.49E-04	1.49E-04	1.49E-04	1.49E-04	1.49E-04	1.49E-04	1.49E-04	1.49E-04	1.49E-04	1.49E-04	1.49E-04	1.48E-04	1.48E-04	1.48E-04	1.48E-04	1.48E-04	1.48E-04
B (Dissolved)	mg/L	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02
Cd (Dissolved)	mg/L	4.20E-03	4.20E-03	4.21E-03	4.21E-03	4.21E-03	4.21E-03	4.21E-03	4.20E-03	4.20E-03	4.20E-03	4.20E-03	4.20E-03	4.20E-03	4.20E-03	4.20E-03	4.19E-03	4.19E-03	4.19E-03	4.19E-03	4.19E-03	4.19E-03	4.19E-03	4.19E-03	4.18E-03	4.18E-03	4.18E-03
Ca (Dissolved)	mg/L	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02
Cr (Dissolved)	mg/L	5.01E-03	5.01E-03	5.01E-03	5.02E-03	5.02E-03	5.02E-03	5.01E-03	5.01E-03	5.01E-03	5.01E-03	5.01E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	4.99E-03	4.99E-03	4.99E-03	4.99E-03	4.99E-03	4.98E-03	4.98E-03
Co (Dissolved)	mg/L	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02
Cu (Dissolved)	mg/L	5.28E-02	5.28E-02	5.28E-02	5.29E-02	5.29E-02	5.28E-02	5.28E-02	5.28E-02	5.28E-02	5.27E-02	5.27E-02	5.27E-02	5.27E-02	5.27E-02	5.27E-02	5.27E-02	5.26E-02	5.26E-02	5.26E-02	5.26E-02	5.26E-02	5.26E-02	5.25E-02	5.25E-02	5.25E-02	5.25E-02
Fe (Dissolved)	mg/L	2.72E-01	2.72E-01	2.72E-01	2.73E-01	2.73E-01	2.73E-01	2.72E-01	2.72E-01	2.72E-01	2.72E-01	2.72E-01	2.72E-01	2.72E-01	2.72E-01	2.72E-01	2.72E-01	2.72E-01	2.71E-01	2.71E-01	2.71E-01	2.71E-01	2.71E-01	2.71E-01	2.71E-01	2.71E-01	2.71E-01
Pb (Dissolved)	mg/L	6.18E-03	6.18E-03	6.19E-03	6.19E-03	6.19E-03	6.19E-03	6.19E-03	6.18E-03	6.18E-03	6.18E-03	6.18E-03	6.17E-03	6.17E-03	6.17E-03	6.17E-03	6.17E-03	6.17E-03	6.16E-03	6.16E-03	6.16E-03	6.16E-03	6.16E-03	6.16E-03	6.15E-03	6.15E-03	6.15E-03
Li (Dissolved)	mg/L	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03
Mg (Dissolved)	mg/L	4.11E+02	4.11E+02	4.11E+02	4.11E+02	4.11E+02	4.11E+02	4.11E+02	4.11E+02	4.11E+02	4.10E+02	4.10E+02	4.10E+02	4.10E+02	4.10E+02	4.10E+02	4.10E+02	4.10E+02	4.09E+02	4.09E+02	4.09E+02	4.09E+02	4.09E+02	4.09E+02	4.08E+02	4.08E+02	4.08E+02
Mn (Dissolved)	mg/L	1.11E+00	1.11E+00	1.11E+00	1.11E+00	1.11E+00	1.11E+00	1.11E+00	1.11E+00	1.11E+00	1.11E+00	1.11E+00	1.11E+00	1.11E+00	1.11E+00	1.11E+00	1.11E+00	1.11E+00	1.11E+00	1.11E+00	1.11E+00	1.11E+00	1.11E+00	1.11E+00	1.11E+00	1.10E+00	1.10E+00	1.10E+00
Mo (Dissolved)	mg/L	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02
Ni (Dissolved)	mg/L	2.79E-02	2.79E-02	2.80E-02	2.80E-02	2.80E-02	2.80E-02	2.80E-02	2.79E-02	2.79E-02	2.79E-02	2.79E-02	2.79E-02	2.79E-02	2.79E-02	2.79E-02	2.79E-02	2.79E-02	2.79E-02	2.78E-02	2.78E-02	2.78E-02	2.78E-02	2.78E-02	2.78E-02	2.78E-02	2.78E-02
P (Dissolved)	mg/L	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02
K (Dissolved)	mg/L	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00
Se (Dissolved)	mg/L	1.03E-01	1.03E-01	1.03E-01	1.03E-01	1.03E-01	1.03E-01	1.03E-01	1.03E-01	1.03E-01	1.03E-01	1.03E-01	1.03E-01	1.03E-01	1.03E-01	1.03E-01	1.03E-01	1.03E-01	1.03E-01	1.03E-01	1.03E-01	1.03E-01	1.03E-01	1.03E-01	1.03E-01	1.03E-01	1.03E-01
Si (Dissolved)	mg/L	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01
Na (Dissolved)	mg/L	3.24E+00	3.24E+00	3.25E+00	3.25E+00	3.25E+00	3.25E+00	3.25E+00	3.24E+00	3.24E+00	3.24E+00	3.24E+00	3.24E+00	3.24E+00	3.24E+00	3.24E+00	3.24E+00	3.24E+00	3.23E+00	3.23E+00	3.23E+00	3.23E+00	3.23E+00	3.23E+00	3.23E+00	3.23E+00	3.22E+00
Sr (Dissolved)	mg/L	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00
S (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tl (Dissolved)	mg/L	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04
Sn (Dissolved)	mg/L	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04
Ti (Dissolved)	mg/L	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02
U (Dissolved)	mg/L	1.12E-02	1.12E-02	1.12E-02	1.13E-02	1.13E-02	1.13E-02	1.12E-02	1.12E-02	1.12E-02	1.12E-02	1.12E-02	1.12E-02	1.12E-02	1.12E-02	1.12E-02	1.12E-02	1.12E-02	1.12E-02	1.12E-02	1.12E-02	1.12E-02	1.12E-02	1.12E-02	1.12E-02	1.12E-02	1.12E-02
V (Dissolved)	mg/L	2.14E-02	2.13E-02	2.14E-02	2.14E-02	2.14E-02	2.14E-02	2.14E-02	2.14E-02	2.14E-02	2.13E-02	2.13E-02	2.13E-02	2.13E-02	2.13E-02	2.13E-02	2.13E-02	2.13E-02	2.13E-02	2.13E-02	2.13E-02	2.13E-02	2.13E-02	2.13E-02	2.13E-02	2.12E-02	2.12E-02	2.12E-02
Zn (Dissolved)	mg/L	1.54E-01	1.54E-01	1.54E-01	1.54E-01	1.54E-01	1.54E-01	1.54E-01	1.54E-01	1.54E-01	1.54E-01	1.54E-01	1.54E-01	1.54E-01	1.54E-01	1.54E-01	1.54E-01	1.54E-01	1.54E-01	1.54E-01	1.53E-01	1.53E-01	1.53E-01	1.53E-01	1.53E-01	1.53E-01	1.53E-01
Zr (Dissolved)	mg/L	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04
Hg (Dissolved)	mg/L	5.96E-05	5.95E-05	5.96E-05	5.97E-05	5.97E-05	5.96E-05	5.96E-05	5.96E-05	5.96E-05	5.95E-05	5.95E-05	5.95E-05	5.95E-05	5.95E-05	5.95E-05	5.94E-05	5.94E-05	5.94E-05	5.94E-05	5.93E-05	5.93E-05	5.93E-05	5.93E-05	5.93E-05	5.92E-05	5.92E-05

APPENDIX A3 - UPPER CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 10.2 Out

Parameter	Unit	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335
Year																											
Physical Tests																											
Acidity to pH 4.5 (as C	mg/L	1.48E+01	1.48E+01	1.48E+01	1.48E+01	1.48E+01	1.48E+01	1.48E+01	1.48E+01	1.47E+01	1.47E+01	1.47E+01	1.47E+01	1.47E+01	1.47E+01	1.47E+01	1.47E+01	1.47E+01	1.47E+01	1.47E+01	1.47E+01	1.47E+01	1.47E+01	1.46E+01	1.46E+01	1.46E+01	1.46E+01
Acidity to pH 8.3 (as C	mg/L	1.80E+01	1.80E+01	1.80E+01	1.80E+01	1.80E+01	1.80E+01	1.80E+01	1.80E+01	1.80E+01	1.79E+01	1.79E+01	1.79E+01	1.79E+01	1.79E+01	1.79E+01	1.79E+01	1.79E+01	1.79E+01	1.79E+01	1.78E+01	1.78E+01	1.78E+01	1.78E+01	1.78E+01	1.78E+01	1.78E+01
Alkalinity (Total as Ca	mg/L	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01
Hardness as CaCO3 (	mg/L	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02
H+ Concentration	mg/L																										
Dissolved Anions																											
Sulphate (Dissolved)	mg/L	1.05E+03	1.05E+03	1.05E+03	1.05E+03	1.05E+03	1.05E+03	1.05E+03	1.05E+03	1.05E+03	1.05E+03	1.05E+03	1.05E+03	1.04E+03	1.04E+03	1.04E+03	1.04E+03	1.04E+03	1.04E+03	1.04E+03	1.04E+03	1.04E+03	1.04E+03	1.04E+03	1.04E+03	1.04E+03	1.04E+03
Chloride (Dissolved)	mg/L	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00
Fluoride (Dissolved)	mg/L	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02
Nutrients																											
Nitrate (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrite (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Orthophosphate (Diss	mg/L																										
Dissolved Metals																											
Al (Dissolved)	mg/L	3.05E+00	3.05E+00	3.04E+00	3.04E+00	3.04E+00	3.04E+00	3.04E+00	3.04E+00	3.04E+00	3.04E+00	3.03E+00	3.03E+00	3.03E+00	3.03E+00	3.03E+00	3.02E+00	3.02E+00	3.02E+00	3.02E+00	3.02E+00	3.02E+00	3.02E+00	3.02E+00	3.01E+00	3.01E+00	3.01E+00
Sb (Dissolved)	mg/L	1.32E-02	1.31E-02	1.31E-02	1.31E-02	1.31E-02	1.31E-02	1.31E-02	1.31E-02	1.31E-02	1.31E-02	1.31E-02	1.31E-02	1.31E-02	1.31E-02	1.31E-02	1.31E-02	1.31E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02
As (Dissolved)	mg/L	1.32E-01	1.32E-01	1.32E-01	1.31E-01	1.31E-01	1.31E-01	1.31E-01	1.31E-01	1.31E-01	1.31E-01	1.31E-01	1.31E-01	1.31E-01	1.31E-01	1.31E-01	1.31E-01	1.31E-01	1.31E-01	1.31E-01	1.30E-01	1.30E-01	1.30E-01	1.30E-01	1.30E-01	1.30E-01	1.30E-01
Ba (Dissolved)	mg/L	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02
Be (Dissolved)	mg/L	2.96E-04	2.96E-04	2.96E-04	2.96E-04	2.95E-04	2.95E-04	2.95E-04	2.95E-04	2.95E-04	2.95E-04	2.95E-04	2.95E-04	2.94E-04	2.94E-04	2.94E-04	2.94E-04	2.94E-04	2.93E-04	2.93E-04	2.93E-04	2.93E-04	2.93E-04	2.93E-04	2.93E-04	2.93E-04	2.93E-04
Bi (Dissolved)	mg/L	1.48E-04	1.48E-04	1.48E-04	1.48E-04	1.48E-04	1.48E-04	1.48E-04	1.48E-04	1.48E-04	1.48E-04	1.48E-04	1.47E-04	1.47E-04	1.47E-04	1.47E-04	1.47E-04	1.47E-04	1.47E-04	1.47E-04	1.47E-04	1.47E-04	1.47E-04	1.47E-04	1.47E-04	1.47E-04	1.46E-04
B (Dissolved)	mg/L	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02
Cd (Dissolved)	mg/L	4.18E-03	4.17E-03	4.17E-03	4.17E-03	4.17E-03	4.17E-03	4.17E-03	4.16E-03	4.16E-03	4.16E-03	4.16E-03	4.16E-03	4.16E-03	4.15E-03	4.15E-03	4.15E-03	4.14E-03	4.14E-03	4.14E-03	4.14E-03	4.14E-03	4.14E-03	4.14E-03	4.13E-03	4.13E-03	4.13E-03
Ca (Dissolved)	mg/L	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02
Cr (Dissolved)	mg/L	4.98E-03	4.98E-03	4.97E-03	4.97E-03	4.97E-03	4.97E-03	4.97E-03	4.96E-03	4.96E-03	4.96E-03	4.96E-03	4.96E-03	4.95E-03	4.95E-03	4.95E-03	4.94E-03	4.94E-03	4.94E-03	4.94E-03	4.93E-03	4.93E-03	4.93E-03	4.93E-03	4.93E-03	4.92E-03	4.92E-03
Co (Dissolved)	mg/L	1.09E-02	1.08E-02	1.08E-02	1.08E-02	1.08E-02	1.08E-02	1.08E-02	1.08E-02	1.08E-02	1.08E-02	1.08E-02	1.08E-02	1.08E-02	1.08E-02	1.08E-02	1.08E-02	1.08E-02	1.08E-02	1.08E-02	1.08E-02	1.08E-02	1.08E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02
Cu (Dissolved)	mg/L	5.24E-02	5.24E-02	5.24E-02	5.24E-02	5.24E-02	5.23E-02	5.23E-02	5.23E-02	5.23E-02	5.22E-02	5.22E-02	5.22E-02	5.22E-02	5.22E-02	5.21E-02	5.21E-02	5.20E-02	5.20E-02	5.20E-02	5.20E-02	5.19E-02	5.19E-02	5.19E-02	5.19E-02	5.19E-02	5.18E-02
Fe (Dissolved)	mg/L	2.71E-01	2.70E-01	2.70E-01	2.70E-01	2.70E-01	2.70E-01	2.70E-01	2.70E-01	2.70E-01	2.70E-01	2.69E-01	2.69E-01	2.69E-01	2.69E-01	2.69E-01	2.69E-01	2.68E-01	2.68E-01	2.68E-01	2.68E-01	2.68E-01	2.68E-01	2.68E-01	2.68E-01	2.68E-01	2.67E-01
Pb (Dissolved)	mg/L	6.14E-03	6.14E-03	6.14E-03	6.14E-03	6.13E-03	6.13E-03	6.13E-03	6.13E-03	6.12E-03	6.12E-03	6.12E-03	6.12E-03	6.11E-03	6.11E-03	6.11E-03	6.10E-03	6.10E-03	6.09E-03	6.09E-03	6.09E-03	6.09E-03	6.08E-03	6.08E-03	6.08E-03	6.08E-03	6.07E-03
Li (Dissolved)	mg/L	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03
Mg (Dissolved)	mg/L	4.08E+02	4.08E+02	4.08E+02	4.08E+02	4.07E+02	4.07E+02	4.07E+02	4.07E+02	4.07E+02	4.07E+02	4.06E+02	4.06E+02	4.06E+02	4.06E+02	4.06E+02	4.05E+02	4.05E+02	4.05E+02	4.05E+02	4.04E+02	4.04E+02	4.04E+02	4.04E+02	4.04E+02	4.04E+02	4.03E+02
Mn (Dissolved)	mg/L	1.10E+00	1.10E+00	1.10E+00	1.10E+00	1.10E+00	1.10E+00	1.10E+00	1.10E+00	1.10E+00	1.10E+00	1.10E+00	1.10E+00	1.10E+00	1.10E+00	1.10E+00	1.10E+00	1.10E+00	1.09E+00	1.09E+00	1.09E+00	1.09E+00	1.09E+00	1.09E+00	1.09E+00	1.09E+00	1.09E+00
Mo (Dissolved)	mg/L	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02
Ni (Dissolved)	mg/L	2.78E-02	2.78E-02	2.77E-02	2.77E-02	2.77E-02	2.77E-02	2.77E-02	2.77E-02	2.77E-02	2.77E-02	2.76E-02	2.76E-02	2.76E-02	2.76E-02	2.76E-02	2.76E-02	2.75E-02	2.75E-02	2.75E-02	2.75E-02	2.75E-02	2.75E-02	2.75E-02	2.75E-02	2.75E-02	2.74E-02
P (Dissolved)	mg/L	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02
K (Dissolved)	mg/L	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00
Se (Dissolved)	mg/L	1.03E-01	1.03E-01	1.03E-01	1.02E-01	1.02E-01	1.02E-01	1.02E-01	1.02E-01	1.02E-01	1.02E-01	1.02E-01	1.02E-01	1.02E-01	1.02E-01	1.02E-01	1.02E-01	1.02E-01	1.02E-01	1.02E-01	1.02E-01	1.02E-01	1.02E-01	1.02E-01	1.02E-01	1.01E-01	1.01E-01
Si (Dissolved)	mg/L	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01
Na (Dissolved)	mg/L	3.22E+00	3.22E+00	3.22E+00	3.22E+00	3.22E+00	3.22E+00	3.21E+00	3.21E+00	3.21E+00	3.21E+00	3.21E+00	3.21E+00	3.21E+00	3.21E+00	3.20E+00	3.20E+00	3.20E+00	3.20E+00	3.20E+00	3.19E+00	3.19E+00	3.19E+00	3.19E+00	3.19E+00	3.19E+00	3.19E+00
Sr (Dissolved)	mg/L	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00
S (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tl (Dissolved)	mg/L	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04
Sn (Dissolved)	mg/L	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04
Ti (Dissolved)	mg/L	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02
U (Dissolved)	mg/L	1.12E-02	1.12E-02	1.12E-02	1.12E-02	1.11E-02	1.11E-02	1.11E-02	1.11E-02	1.11E-02	1.11E-02	1.11E-02	1.11E-02	1.11E-02	1.11E-02	1.11E-02	1.11E-02	1.11E-02	1.11E-02	1.11E-02	1.11E-02	1.11E-02	1.11E-02	1.11E-02	1.11E-02	1.10E-02	1.10E-02
V (Dissolved)	mg/L	2.12E-02	2.12E-02	2.12E-02	2.12E-02	2.12E-02	2.12E-02	2.12E-02	2.12E-02	2.11E-02	2.11E-02	2.11E-02	2.11E-02	2.11E-02	2.11E-02	2.11E-02	2.11E-02	2.11E-02	2.10E-02	2.10E-02	2.10E-02	2.10E-02	2.10E-02	2.10E-02	2.10E-02	2.10E-02	2.10E-02
Zn (Dissolved)	mg/L	1.53E-01	1.53E-01	1.53E-01	1.53E-01	1.53E-01	1.53E-01	1.53E-01	1.53E-01	1.52E-01	1.52E-01	1.52E-01	1.52E-01	1.52E-01	1.52E-01	1.52E-01	1.52E-01	1.52E-01	1.52E-01	1.52E-01	1.52E-01	1.52E-01	1.52E-01	1.51E-01	1.51E-01	1.51E-01	1.51E-01
Zr (Dissolved)	mg/L	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04
Hg (Dissolved)	mg/L	5.92E-05	5.92E-05	5.91E-05	5.91E-05	5.91E-05	5.91E-05	5.90E-05	5.90E-05	5.90E-05	5.90E-05	5.89E-05	5.89E-05	5.89E-05	5.89E-05	5.88E-05	5.87E-05	5.87E-05	5.87E-05	5.87E-05	5.87E-05	5.86E-05	5.86E-05	5.86E-05	5.86E-05	5.85E-05	5.85E-05
Ag (Dissolved)	mg/L	1.88E-04	1.88E-04	1.88E-04	1.88E-04	1.88E-04	1.88E-04	1.87E-04	1.87E-04	1.87E-04	1.87E-04	1.87E-04	1.87E-04	1.87E-04	1.87E-04	1.87E-04	1.87E-04	1.86E-04	1.86E-04	1.86E-04	1.86E-04	1.86E-04	1.86E-04	1.86E-04	1.86E-04	1.86E-04	1.86E-04

APPENDIX A3 - UPPER CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 10.2 Out

Parameter	Unit	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361
Year																											
Physical Tests																											
Acidity to pH 4.5 (as C	mg/L	1.46E+01	1.46E+01	1.46E+01	1.46E+01	1.46E+01	1.46E+01	1.46E+01	1.46E+01	1.46E+01	1.46E+01	1.46E+01	1.46E+01	1.45E+01	1.45E+01	1.45E+01	1.45E+01	1.45E+01	1.45E+01	1.45E+01	1.45E+01	1.45E+01	1.45E+01	1.45E+01	1.45E+01	1.45E+01	1.45E+01
Acidity to pH 8.3 (as C	mg/L	1.78E+01	1.78E+01	1.78E+01	1.78E+01	1.78E+01	1.78E+01	1.78E+01	1.77E+01	1.77E+01	1.77E+01	1.77E+01	1.77E+01	1.77E+01	1.77E+01	1.77E+01	1.77E+01	1.77E+01	1.77E+01	1.77E+01	1.77E+01	1.77E+01	1.77E+01	1.76E+01	1.76E+01	1.76E+01	1.76E+01
Alkalinity (Total as Ca	mg/L	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01
Hardness as CaCO3 (	mg/L	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02
H+ Concentration	mg/L																										
Dissolved Anions																											
Sulphate (Dissolved)	mg/L	1.04E+03	1.04E+03	1.04E+03	1.04E+03	1.04E+03	1.04E+03	1.03E+03	1.03E+03	1.03E+03	1.03E+03	1.03E+03	1.03E+03	1.03E+03	1.03E+03	1.03E+03	1.03E+03	1.03E+03	1.03E+03	1.03E+03	1.03E+03	1.03E+03	1.03E+03	1.03E+03	1.03E+03	1.03E+03	1.03E+03
Chloride (Dissolved)	mg/L	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00
Fluoride (Dissolved)	mg/L	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02
Nutrients																											
Nitrate (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrite (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Orthophosphate (Diss	mg/L																										
Dissolved Metals																											
Al (Dissolved)	mg/L	3.01E+00	3.01E+00	3.01E+00	3.01E+00	3.01E+00	3.00E+00	3.00E+00	3.00E+00	3.00E+00	3.00E+00	3.00E+00	3.00E+00	3.00E+00	2.99E+00	2.99E+00	2.99E+00	2.99E+00	2.99E+00	2.99E+00	2.99E+00	2.99E+00	2.99E+00	2.98E+00	2.98E+00	2.98E+00	2.98E+00
Sb (Dissolved)	mg/L	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.29E-02	1.29E-02	1.29E-02	1.29E-02	1.29E-02	1.29E-02	1.29E-02	1.29E-02	1.29E-02	1.29E-02	1.29E-02	1.29E-02	1.29E-02	1.29E-02	1.29E-02	1.29E-02
As (Dissolved)	mg/L	1.30E-01	1.30E-01	1.30E-01	1.30E-01	1.30E-01	1.30E-01	1.30E-01	1.30E-01	1.30E-01	1.30E-01	1.30E-01	1.30E-01	1.29E-01	1.29E-01	1.29E-01	1.29E-01	1.29E-01	1.29E-01	1.29E-01	1.29E-01	1.29E-01	1.29E-01	1.29E-01	1.29E-01	1.29E-01	1.29E-01
Ba (Dissolved)	mg/L	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02
Be (Dissolved)	mg/L	2.92E-04	2.92E-04	2.92E-04	2.92E-04	2.92E-04	2.92E-04	2.92E-04	2.92E-04	2.91E-04	2.91E-04	2.91E-04	2.91E-04	2.91E-04	2.91E-04	2.91E-04	2.91E-04	2.91E-04	2.91E-04	2.90E-04	2.90E-04	2.90E-04	2.90E-04	2.90E-04	2.90E-04	2.90E-04	2.89E-04
Bi (Dissolved)	mg/L	1.46E-04	1.46E-04	1.46E-04	1.46E-04	1.46E-04	1.46E-04	1.46E-04	1.46E-04	1.46E-04	1.46E-04	1.46E-04	1.46E-04	1.46E-04	1.46E-04	1.46E-04	1.46E-04	1.45E-04	1.45E-04	1.45E-04	1.45E-04	1.45E-04	1.45E-04	1.45E-04	1.45E-04	1.45E-04	1.45E-04
B (Dissolved)	mg/L	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02
Cd (Dissolved)	mg/L	4.13E-03	4.13E-03	4.12E-03	4.12E-03	4.12E-03	4.12E-03	4.12E-03	4.12E-03	4.11E-03	4.11E-03	4.11E-03	4.11E-03	4.11E-03	4.11E-03	4.10E-03	4.10E-03	4.10E-03	4.10E-03	4.10E-03	4.10E-03	4.10E-03	4.09E-03	4.09E-03	4.09E-03	4.09E-03	4.09E-03
Ca (Dissolved)	mg/L	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02
Cr (Dissolved)	mg/L	4.92E-03	4.92E-03	4.92E-03	4.91E-03	4.91E-03	4.91E-03	4.91E-03	4.91E-03	4.90E-03	4.90E-03	4.90E-03	4.90E-03	4.90E-03	4.89E-03	4.89E-03	4.89E-03	4.89E-03	4.89E-03	4.88E-03	4.88E-03	4.88E-03	4.88E-03	4.88E-03	4.87E-03	4.87E-03	4.87E-03
Co (Dissolved)	mg/L	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.06E-02	1.06E-02	1.06E-02	1.06E-02	1.06E-02	1.06E-02	1.06E-02	1.06E-02
Cu (Dissolved)	mg/L	5.18E-02	5.18E-02	5.18E-02	5.18E-02	5.17E-02	5.17E-02	5.17E-02	5.17E-02	5.17E-02	5.16E-02	5.16E-02	5.16E-02	5.16E-02	5.15E-02	5.15E-02	5.15E-02	5.15E-02	5.15E-02	5.14E-02	5.14E-02	5.14E-02	5.14E-02	5.14E-02	5.13E-02	5.13E-02	5.13E-02
Fe (Dissolved)	mg/L	2.67E-01	2.67E-01	2.67E-01	2.67E-01	2.67E-01	2.67E-01	2.67E-01	2.67E-01	2.66E-01	2.66E-01	2.66E-01	2.66E-01	2.66E-01	2.66E-01	2.66E-01	2.66E-01	2.66E-01	2.66E-01	2.65E-01	2.65E-01	2.65E-01	2.65E-01	2.65E-01	2.65E-01	2.65E-01	2.65E-01
Pb (Dissolved)	mg/L	6.07E-03	6.07E-03	6.07E-03	6.06E-03	6.06E-03	6.06E-03	6.06E-03	6.05E-03	6.05E-03	6.05E-03	6.05E-03	6.04E-03	6.04E-03	6.04E-03	6.04E-03	6.03E-03	6.03E-03	6.03E-03	6.03E-03	6.03E-03	6.02E-03	6.02E-03	6.02E-03	6.02E-03	6.01E-03	6.01E-03	6.01E-03
Li (Dissolved)	mg/L	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03
Mg (Dissolved)	mg/L	4.03E+02	4.03E+02	4.03E+02	4.03E+02	4.03E+02	4.02E+02	4.02E+02	4.02E+02	4.02E+02	4.02E+02	4.02E+02	4.01E+02	4.01E+02	4.01E+02	4.01E+02	4.01E+02	4.01E+02	4.00E+02	4.00E+02	4.00E+02	4.00E+02	4.00E+02	4.00E+02	4.00E+02	3.99E+02	3.99E+02
Mn (Dissolved)	mg/L	1.09E+00	1.09E+00	1.09E+00	1.09E+00	1.09E+00	1.09E+00	1.09E+00	1.09E+00	1.09E+00	1.09E+00	1.09E+00	1.09E+00	1.09E+00	1.08E+00	1.08E+00	1.08E+00	1.08E+00	1.08E+00	1.08E+00	1.08E+00	1.08E+00	1.08E+00	1.08E+00	1.08E+00	1.08E+00	1.08E+00
Mo (Dissolved)	mg/L	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02
Ni (Dissolved)	mg/L	2.74E-02	2.74E-02	2.74E-02	2.74E-02	2.74E-02	2.74E-02	2.74E-02	2.74E-02	2.73E-02	2.73E-02	2.73E-02	2.73E-02	2.73E-02	2.73E-02	2.73E-02	2.73E-02	2.73E-02	2.72E-02	2.72E-02	2.72E-02	2.72E-02	2.72E-02	2.72E-02	2.72E-02	2.72E-02	2.72E-02
P (Dissolved)	mg/L	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02
K (Dissolved)	mg/L	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00
Se (Dissolved)	mg/L	1.01E-01	1.01E-01	1.01E-01	1.01E-01	1.01E-01	1.01E-01	1.01E-01	1.01E-01	1.01E-01	1.01E-01	1.01E-01	1.01E-01	1.01E-01	1.01E-01	1.01E-01	1.01E-01	1.01E-01	1.01E-01	1.01E-01	1.01E-01	1.01E-01	1.01E-01	1.00E-01	1.00E-01	1.00E-01	1.00E-01
Si (Dissolved)	mg/L	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01
Sr (Dissolved)	mg/L	3.18E+00	3.18E+00	3.18E+00	3.18E+00	3.18E+00	3.18E+00	3.18E+00	3.18E+00	3.17E+00	3.17E+00	3.17E+00	3.17E+00	3.17E+00	3.17E+00	3.17E+00	3.17E+00	3.16E+00	3.16E+00	3.16E+00	3.16E+00	3.16E+00	3.16E+00	3.16E+00	3.16E+00	3.15E+00	3.15E+00
S (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tl (Dissolved)	mg/L	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04
Sn (Dissolved)	mg/L	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04
Ti (Dissolved)	mg/L	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02
U (Dissolved)	mg/L	1.10E-02	1.10E-02	1.10E-02	1.10E-02	1.10E-02	1.10E-02	1.10E-02	1.10E-02	1.10E-02	1.10E-02	1.10E-02	1.10E-02	1.10E-02	1.10E-02	1.10E-02	1.10E-02	1.10E-02	1.10E-02	1.10E-02	1.10E-02	1.10E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02
V (Dissolved)	mg/L	2.10E-02	2.10E-02	2.10E-02	2.09E-02	2.09E-02	2.09E-02	2.09E-02	2.09E-02	2.09E-02	2.09E-02	2.09E-02	2.09E-02	2.09E-02	2.09E-02	2.08E-02	2.08E-02	2.08E-02	2.08E-02	2.08E-02	2.08E-02	2.08E-02	2.08E-02	2.08E-02	2.08E-02	2.08E-02	2.08E-02
Zn (Dissolved)	mg/L	1.51E-01	1.51E-01	1.51E-01	1.51E-01	1.51E-01	1.51E-01	1.51E-01	1.51E-01	1.51E-01	1.51E-01	1.51E-01	1.51E-01	1.50E-01	1.50E-01	1.50E-01	1.50E-01	1.50E-01	1.50E-01	1.50E-01	1.50E-01	1.50E-01	1.50E-01	1.50E-01	1.50E-01	1.50E-01	1.50E-01
Zr (Dissolved)	mg/L	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04
Hg (Dissolved)	mg/L	5.85E-05	5.85E-05	5.84E-05	5.84E-05	5.84E-05	5.84E-05	5.83E-05	5.83E-05	5.83E-05	5.83E-05	5.82E-05	5.82E-05	5.82E-05	5.82E-05	5.82E-05	5.81E-05	5.81E-05	5.81E-05	5.81E-05	5.80E-05	5.80E-05	5.80E-05	5.80E-05	5.79E-05	5.79E-05	5.79E-05

APPENDIX A3 - UPPER CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 10.2 Out

Parameter	Unit	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387
Year																											
Physical Tests																											
Acidity to pH 4.5 (as C	mg/L	1.45E+01	1.45E+01	1.45E+01	1.44E+01	1.44E+01	1.44E+01	1.44E+01	1.44E+01	1.44E+01	1.44E+01	1.44E+01	1.44E+01	1.44E+01	1.44E+01	1.44E+01	1.44E+01	1.44E+01	1.44E+01	1.44E+01	1.44E+01	1.43E+01	1.43E+01	1.43E+01	1.43E+01	1.43E+01	1.43E+01
Acidity to pH 8.3 (as C	mg/L	1.76E+01	1.76E+01	1.76E+01	1.76E+01	1.76E+01	1.76E+01	1.76E+01	1.76E+01	1.76E+01	1.75E+01	1.75E+01	1.75E+01	1.75E+01	1.75E+01	1.75E+01	1.75E+01	1.75E+01	1.75E+01	1.75E+01	1.75E+01	1.75E+01	1.75E+01	1.75E+01	1.74E+01	1.74E+01	1.74E+01
Alkalinity (Total as Ca	mg/L	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01
Hardness as CaCO3 (	mg/L	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02
H+ Concentration	mg/L																										
Dissolved Anions																											
Sulphate (Dissolved)	mg/L	1.03E+03	1.03E+03	1.03E+03	1.03E+03	1.02E+03	1.02E+03	1.02E+03	1.02E+03	1.02E+03	1.02E+03	1.02E+03	1.02E+03	1.02E+03	1.02E+03	1.02E+03	1.02E+03	1.02E+03	1.02E+03	1.02E+03	1.02E+03	1.02E+03	1.02E+03	1.02E+03	1.02E+03	1.02E+03	1.02E+03
Chloride (Dissolved)	mg/L	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00
Fluoride (Dissolved)	mg/L	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02
Nutrients																											
Nitrate (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrite (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Orthophosphate (Diss	mg/L																										
Dissolved Metals																											
Al (Dissolved)	mg/L	2.98E+00	2.98E+00	2.98E+00	2.98E+00	2.97E+00	2.97E+00	2.97E+00	2.97E+00	2.97E+00	2.97E+00	2.97E+00	2.97E+00	2.96E+00	2.96E+00	2.96E+00	2.96E+00	2.96E+00	2.96E+00	2.96E+00	2.96E+00	2.95E+00	2.95E+00	2.95E+00	2.95E+00	2.95E+00	2.95E+00
Sb (Dissolved)	mg/L	1.29E-02	1.29E-02	1.29E-02	1.28E-02	1.28E-02	1.28E-02	1.28E-02	1.28E-02	1.28E-02	1.28E-02	1.28E-02	1.28E-02	1.28E-02	1.28E-02	1.28E-02	1.28E-02	1.28E-02	1.28E-02	1.28E-02	1.28E-02	1.28E-02	1.28E-02	1.27E-02	1.27E-02	1.27E-02	1.27E-02
As (Dissolved)	mg/L	1.29E-01	1.29E-01	1.29E-01	1.29E-01	1.29E-01	1.28E-01	1.28E-01	1.28E-01	1.28E-01	1.28E-01	1.28E-01	1.28E-01	1.28E-01	1.28E-01	1.28E-01	1.28E-01	1.28E-01	1.28E-01	1.28E-01	1.28E-01	1.28E-01	1.28E-01	1.28E-01	1.28E-01	1.27E-01	1.27E-01
Ba (Dissolved)	mg/L	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02
Be (Dissolved)	mg/L	2.89E-04	2.89E-04	2.89E-04	2.89E-04	2.89E-04	2.89E-04	2.89E-04	2.89E-04	2.88E-04	2.88E-04	2.88E-04	2.88E-04	2.88E-04	2.88E-04	2.88E-04	2.88E-04	2.87E-04	2.87E-04	2.87E-04	2.87E-04	2.87E-04	2.87E-04	2.87E-04	2.87E-04	2.87E-04	2.86E-04
Bi (Dissolved)	mg/L	1.45E-04	1.45E-04	1.45E-04	1.45E-04	1.45E-04	1.45E-04	1.45E-04	1.44E-04	1.44E-04	1.44E-04	1.44E-04	1.44E-04	1.44E-04	1.44E-04	1.44E-04	1.44E-04	1.44E-04	1.44E-04	1.44E-04	1.44E-04	1.44E-04	1.44E-04	1.44E-04	1.44E-04	1.43E-04	1.43E-04
B (Dissolved)	mg/L	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02
Cd (Dissolved)	mg/L	4.08E-03	4.08E-03	4.08E-03	4.08E-03	4.08E-03	4.08E-03	4.07E-03	4.07E-03	4.07E-03	4.07E-03	4.07E-03	4.07E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.06E-03	4.05E-03	4.05E-03	4.05E-03	4.05E-03	4.05E-03	4.04E-03	4.04E-03
Ca (Dissolved)	mg/L	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02
Cr (Dissolved)	mg/L	4.87E-03	4.87E-03	4.86E-03	4.86E-03	4.86E-03	4.86E-03	4.86E-03	4.85E-03	4.85E-03	4.85E-03	4.85E-03	4.85E-03	4.84E-03	4.84E-03	4.84E-03	4.84E-03	4.84E-03	4.84E-03	4.83E-03	4.83E-03	4.83E-03	4.83E-03	4.83E-03	4.82E-03	4.82E-03	4.82E-03
Co (Dissolved)	mg/L	1.06E-02	1.06E-02	1.06E-02	1.06E-02	1.06E-02	1.06E-02	1.06E-02	1.06E-02	1.06E-02	1.06E-02	1.06E-02	1.06E-02	1.06E-02	1.06E-02	1.06E-02	1.06E-02	1.05E-02	1.05E-02	1.05E-02	1.05E-02	1.05E-02	1.05E-02	1.05E-02	1.05E-02	1.05E-02	1.05E-02
Cu (Dissolved)	mg/L	5.13E-02	5.13E-02	5.12E-02	5.12E-02	5.12E-02	5.12E-02	5.12E-02	5.11E-02	5.11E-02	5.11E-02	5.11E-02	5.10E-02	5.10E-02	5.10E-02	5.10E-02	5.10E-02	5.10E-02	5.09E-02	5.09E-02	5.09E-02	5.09E-02	5.08E-02	5.08E-02	5.08E-02	5.08E-02	5.08E-02
Fe (Dissolved)	mg/L	2.65E-01	2.64E-01	2.64E-01	2.64E-01	2.64E-01	2.64E-01	2.64E-01	2.64E-01	2.64E-01	2.64E-01	2.63E-01	2.63E-01	2.63E-01	2.63E-01	2.63E-01	2.63E-01	2.63E-01	2.63E-01	2.63E-01	2.62E-01	2.62E-01	2.62E-01	2.62E-01	2.62E-01	2.62E-01	2.62E-01
Pb (Dissolved)	mg/L	6.01E-03	6.00E-03	6.00E-03	6.00E-03	6.00E-03	5.99E-03	5.99E-03	5.99E-03	5.99E-03	5.98E-03	5.98E-03	5.98E-03	5.98E-03	5.98E-03	5.97E-03	5.97E-03	5.97E-03	5.97E-03	5.96E-03	5.96E-03	5.96E-03	5.96E-03	5.95E-03	5.95E-03	5.95E-03	5.95E-03
Li (Dissolved)	mg/L	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03
Mg (Dissolved)	mg/L	3.99E+02	3.99E+02	3.99E+02	3.99E+02	3.98E+02	3.98E+02	3.98E+02	3.98E+02	3.98E+02	3.98E+02	3.97E+02	3.97E+02	3.97E+02	3.97E+02	3.97E+02	3.97E+02	3.96E+02	3.96E+02	3.96E+02	3.96E+02	3.96E+02	3.96E+02	3.95E+02	3.95E+02	3.95E+02	3.95E+02
Mn (Dissolved)	mg/L	1.08E+00	1.08E+00	1.08E+00	1.08E+00	1.08E+00	1.08E+00	1.08E+00	1.08E+00	1.08E+00	1.08E+00	1.07E+00	1.07E+00	1.07E+00	1.07E+00	1.07E+00	1.07E+00	1.07E+00	1.07E+00	1.07E+00	1.07E+00	1.07E+00	1.07E+00	1.07E+00	1.07E+00	1.07E+00	1.07E+00
Mo (Dissolved)	mg/L	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02
Ni (Dissolved)	mg/L	2.71E-02	2.71E-02	2.71E-02	2.71E-02	2.71E-02	2.71E-02	2.71E-02	2.71E-02	2.71E-02	2.70E-02	2.70E-02	2.70E-02	2.70E-02	2.70E-02	2.70E-02	2.70E-02	2.70E-02	2.70E-02	2.69E-02	2.69E-02	2.69E-02	2.69E-02	2.69E-02	2.69E-02	2.69E-02	2.69E-02
P (Dissolved)	mg/L	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02
K (Dissolved)	mg/L	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00
Se (Dissolved)	mg/L	1.00E-01	1.00E-01	1.00E-01	1.00E-01	1.00E-01	1.00E-01	1.00E-01	1.00E-01	1.00E-01	1.00E-01	9.99E-02	9.99E-02	9.98E-02	9.98E-02	9.98E-02	9.97E-02	9.97E-02	9.96E-02	9.96E-02	9.96E-02	9.95E-02	9.95E-02	9.94E-02	9.94E-02	9.93E-02	9.93E-02
Si (Dissolved)	mg/L	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01
Sr (Dissolved)	mg/L	3.15E+00	3.15E+00	3.15E+00	3.15E+00	3.15E+00	3.14E+00	3.14E+00	3.14E+00	3.14E+00	3.14E+00	3.14E+00	3.14E+00	3.14E+00	3.13E+00	3.13E+00	3.13E+00	3.13E+00	3.13E+00	3.13E+00	3.13E+00	3.13E+00	3.12E+00	3.12E+00	3.12E+00	3.12E+00	3.12E+00
S (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tl (Dissolved)	mg/L	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04
Sn (Dissolved)	mg/L	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04
Ti (Dissolved)	mg/L	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02
U (Dissolved)	mg/L	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.09E-02	1.08E-02	1.08E-02	1.08E-02	1.08E-02	1.08E-02	1.08E-02	1.08E-02	1.08E-02	1.08E-02	1.08E-02
V (Dissolved)	mg/L	2.07E-02	2.07E-02	2.07E-02	2.07E-02	2.07E-02	2.07E-02	2.07E-02	2.07E-02	2.07E-02	2.07E-02	2.07E-02	2.07E-02	2.06E-02	2.06E-02	2.06E-02	2.06E-02	2.06E-02	2.06E-02	2.06E-02	2.06E-02	2.06E-02	2.06E-02	2.06E-02	2.06E-02	2.05E-02	2.05E-02
Zn (Dissolved)	mg/L	1.50E-01	1.50E-01	1.49E-01	1.49E-01	1.49E-01	1.49E-01	1.49E-01	1.49E-01	1.49E-01	1.49E-01	1.49E-01	1.49E-01	1.49E-01	1.49E-01	1.49E-01	1.49E-01	1.49E-01	1.49E-01	1.49E-01	1.48E-01	1.48E-01	1.48E-01	1.48E-01	1.48E-01	1.48E-01	1.48E-01
Zr (Dissolved)	mg/L	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04
Hg (Dissolved)	mg/L	5.79E-05	5.78E-05	5.78E-05	5.78E-05	5.78E-05	5.78E-05	5.77E-05	5.77E-05	5.77E-05	5.77E-05	5.76E-05	5.76E-05	5.76E-05	5.76E-05	5.75E-05	5.75E-05	5.75E-05	5.75E-05	5.74E-05	5.74E-05	5.74E-05	5.74E-05	5.74E-05	5.73E-05	5.73E-05	5.73E-05

APPENDIX A3 - UPPER CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 10.2 Out

Parameter	Unit	388	389	390	391	392	393	394	395	396	397	398	399	400	401
Year															
Physical Tests															
Acidity to pH 4.5 (as C	mg/L	1.43E+01	1.43E+01	1.43E+01	1.43E+01	1.43E+01	1.43E+01	1.43E+01	1.43E+01	1.43E+01	1.43E+01	1.43E+01	1.43E+01	1.42E+01	1.42E+01
Acidity to pH 8.3 (as C	mg/L	1.74E+01	1.74E+01	1.74E+01	1.74E+01	1.74E+01	1.74E+01	1.74E+01	1.74E+01	1.74E+01	1.74E+01	1.74E+01	1.73E+01	1.73E+01	1.73E+01
Alkalinity (Total as Ca(	mg/L	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01	5.70E+01
Hardness as CaCO3 (	mg/L	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02	3.39E+02
H+ Concentration	mg/L														
Dissolved Anions															
Sulphate (Dissolved)	mg/L	1.02E+03	1.02E+03	1.01E+03	1.01E+03	1.01E+03	1.01E+03	1.01E+03	1.01E+03	1.01E+03	1.01E+03	1.01E+03	1.01E+03	1.01E+03	1.01E+03
Chloride (Dissolved)	mg/L	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00	4.40E+00
Fluoride (Dissolved)	mg/L	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02	7.90E-02
Nutrients															
Nitrate (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrite (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Orthophosphate (Diss	mg/L														
Dissolved Metals															
Al (Dissolved)	mg/L	2.95E+00	2.95E+00	2.95E+00	2.94E+00	2.94E+00	2.94E+00	2.94E+00	2.94E+00	2.94E+00	2.94E+00	2.94E+00	2.93E+00	2.93E+00	2.93E+00
Sb (Dissolved)	mg/L	1.27E-02	1.27E-02	1.27E-02	1.27E-02	1.27E-02	1.27E-02	1.27E-02	1.27E-02	1.27E-02	1.27E-02	1.27E-02	1.27E-02	1.27E-02	1.27E-02
As (Dissolved)	mg/L	1.27E-01	1.27E-01	1.27E-01	1.27E-01	1.27E-01	1.27E-01	1.27E-01	1.27E-01	1.27E-01	1.27E-01	1.27E-01	1.27E-01	1.27E-01	1.27E-01
Ba (Dissolved)	mg/L	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02	5.41E-02
Be (Dissolved)	mg/L	2.86E-04	2.86E-04	2.86E-04	2.86E-04	2.86E-04	2.86E-04	2.86E-04	2.85E-04	2.85E-04	2.85E-04	2.85E-04	2.85E-04	2.85E-04	2.85E-04
Bi (Dissolved)	mg/L	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04
B (Dissolved)	mg/L	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02	8.35E-02
Cd (Dissolved)	mg/L	4.04E-03	4.04E-03	4.04E-03	4.04E-03	4.03E-03	4.03E-03	4.03E-03	4.03E-03	4.03E-03	4.03E-03	4.02E-03	4.02E-03	4.02E-03	4.02E-03
Ca (Dissolved)	mg/L	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02	4.31E+02
Cr (Dissolved)	mg/L	4.82E-03	4.81E-03	4.81E-03	4.81E-03	4.81E-03	4.81E-03	4.80E-03	4.80E-03	4.80E-03	4.80E-03	4.80E-03	4.80E-03	4.79E-03	4.79E-03
Co (Dissolved)	mg/L	1.05E-02	1.05E-02	1.05E-02	1.05E-02	1.05E-02	1.05E-02	1.05E-02	1.05E-02	1.05E-02	1.05E-02	1.05E-02	1.05E-02	1.04E-02	1.04E-02
Cu (Dissolved)	mg/L	5.07E-02	5.07E-02	5.07E-02	5.07E-02	5.07E-02	5.06E-02	5.06E-02	5.06E-02	5.06E-02	5.06E-02	5.05E-02	5.05E-02	5.05E-02	5.05E-02
Fe (Dissolved)	mg/L	2.62E-01	2.62E-01	2.62E-01	2.61E-01	2.61E-01	2.61E-01	2.61E-01	2.61E-01	2.61E-01	2.61E-01	2.61E-01	2.61E-01	2.60E-01	2.60E-01
Pb (Dissolved)	mg/L	5.94E-03	5.94E-03	5.94E-03	5.94E-03	5.93E-03	5.93E-03	5.93E-03	5.93E-03	5.92E-03	5.92E-03	5.92E-03	5.92E-03	5.91E-03	5.91E-03
Li (Dissolved)	mg/L	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03	7.70E-03
Mg (Dissolved)	mg/L	3.95E+02	3.95E+02	3.95E+02	3.94E+02	3.94E+02	3.94E+02	3.94E+02	3.94E+02	3.94E+02	3.93E+02	3.93E+02	3.93E+02	3.93E+02	3.93E+02
Mn (Dissolved)	mg/L	1.07E+00	1.07E+00	1.07E+00	1.07E+00	1.07E+00	1.07E+00	1.07E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00
Mo (Dissolved)	mg/L	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02
Ni (Dissolved)	mg/L	2.69E-02	2.69E-02	2.68E-02	2.68E-02	2.68E-02	2.68E-02	2.68E-02	2.68E-02	2.68E-02	2.68E-02	2.68E-02	2.67E-02	2.67E-02	2.67E-02
P (Dissolved)	mg/L	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02	1.40E-02
K (Dissolved)	mg/L	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00	5.00E+00
Se (Dissolved)	mg/L	9.93E-02	9.92E-02	9.92E-02	9.91E-02	9.91E-02	9.91E-02	9.90E-02	9.90E-02	9.89E-02	9.89E-02	9.89E-02	9.88E-02	9.88E-02	9.87E-02
Si (Dissolved)	mg/L	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01
Ag (Dissolved)	mg/L	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.82E-04	1.81E-04	1.81E-04	1.81E-04	1.81E-04	1.81E-04	1.81E-04	1.81E-04	1.81E-04	1.81E-04
Na (Dissolved)	mg/L	3.12E+00	3.12E+00	3.12E+00	3.11E+00	3.11E+00	3.11E+00	3.11E+00	3.11E+00	3.11E+00	3.11E+00	3.11E+00	3.10E+00	3.10E+00	3.10E+00
Sr (Dissolved)	mg/L	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00	2.08E+00
S (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tl (Dissolved)	mg/L	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04	1.43E-04
Sn (Dissolved)	mg/L	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04	4.05E-04
Ti (Dissolved)	mg/L	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02	1.20E-02
U (Dissolved)	mg/L	1.08E-02	1.08E-02	1.08E-02	1.08E-02	1.08E-02	1.08E-02	1.08E-02	1.08E-02	1.08E-02	1.08E-02	1.08E-02	1.08E-02	1.08E-02	1.07E-02
V (Dissolved)	mg/L	2.05E-02	2.05E-02	2.05E-02	2.05E-02	2.05E-02	2.05E-02	2.05E-02	2.05E-02	2.05E-02	2.05E-02	2.04E-02	2.04E-02	2.04E-02	2.04E-02
Zn (Dissolved)	mg/L	1.48E-01	1.48E-01	1.48E-01	1.48E-01	1.48E-01	1.48E-01	1.48E-01	1.48E-01	1.48E-01	1.47E-01	1.47E-01	1.47E-01	1.47E-01	1.47E-01
Zr (Dissolved)	mg/L	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04	3.76E-04
Hg (Dissolved)	mg/L	5.73E-05	5.72E-05	5.72E-05	5.72E-05	5.72E-05	5.71E-05	5.71E-05	5.71E-05	5.71E-05	5.71E-05	5.70E-05	5.70E-05	5.70E-05	5.70E-05

TABLE Term 10.1 N Out

Term applies to freshly created area of pit as a one time leaching event

N as NO3	0.008244717	kg N/m2	8244.717	mg/m2
N as NH3	0.001042435	kg N/m2	1042.435	mg/m3
N as NO2	0.000189534	kg N/m2	189.5337	mg/m4

NOTE: THIS HAS BEEN ADDED TO THE FLUSHED PIT WALL TERM (TERM 10.3), SINCE IT IS A ONE TIME EVENT.

APPENDIX A3 - UPPER CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 10.3 Out

Parameter	Unit	All 01/01/2013
Physical Tests		
Acidity to pH 4.5 (as CaCO	mg/m2	1.53E+04
Acidity to pH 8.3 (as CaCO	mg/m2	1.86E+04
Alkalinity (Total as CaCO3)	mg/m2	1.31E+05
Hardness as CaCO3 (Dissc	mg/m2	8.10E+05
H+ Concentration	mg/m2	3.18E-05
Dissolved Anions		
Sulphate (Dissolved)	mg/m2	1.09E+06
Chloride (Dissolved)	mg/m2	2.08E+04
Fluoride (Dissolved)	mg/m2	4.62E+02
Nutrient		
Nitrate (Dissolved)	mg/m2	8.24E+03
Ammonia (Dissolved)	mg/m2	1.04E+03
Nitrite (Dissolved)	mg/m2	1.90E+02
Orthophosphate (Dissolved	mg/m2	3.72E+02
Dissolved Metals		
Al (Dissolved)	mg/m2	2.75E+02
Sb (Dissolved)	mg/m2	1.36E+01
As (Dissolved)	mg/m2	1.69E+01
Ba (Dissolved)	mg/m2	1.23E+02
Be (Dissolved)	mg/m2	3.06E-01
Bi (Dissolved)	mg/m2	1.53E-01
B (Dissolved)	mg/m2	1.80E+02
Cd (Dissolved)	mg/m2	5.10E-01
Ca (Dissolved)	mg/m2	2.85E+05
Cr (Dissolved)	mg/m2	5.15E+00
Co (Dissolved)	mg/m2	1.12E+01
Cu (Dissolved)	mg/m2	5.42E+01
Fe (Dissolved)	mg/m2	1.66E+02
Pb (Dissolved)	mg/m2	1.78E+00
Li (Dissolved)	mg/m2	4.24E+01
Mg (Dissolved)	mg/m2	4.22E+05
Mn (Dissolved)	mg/m2	1.14E+03
Mo (Dissolved)	mg/m2	4.18E+01
Ni (Dissolved)	mg/m2	2.87E+01
P (Dissolved)	mg/m2	1.80E+02
K (Dissolved)	mg/m2	4.03E+04
Se (Dissolved)	mg/m2	1.06E+02
Si (Dissolved)	mg/m2	2.71E+03
Ag (Dissolved)	mg/m2	1.94E-01
Na (Dissolved)	mg/m2	3.33E+03
Sr (Dissolved)	mg/m2	7.09E+03
S (Dissolved)	mg/m2	3.11E+05
Tl (Dissolved)	mg/m2	1.68E-01
Sn (Dissolved)	mg/m2	4.10E+01
Ti (Dissolved)	mg/m2	7.11E+00
U (Dissolved)	mg/m2	1.16E+01
V (Dissolved)	mg/m2	1.50E+00
Zn (Dissolved)	mg/m2	3.24E+01
Zr (Dissolved)	mg/m2	3.00E-01
Hg (Dissolved)	mg/m2	6.12E-02

APPENDIX A3 - UPPER CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 11.1 Out

Parameter	Unit	Year -2 (Coffer	Year -1 (Stage	Year 1 (Stag	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	End
Year		01/01/2013	01/01/2014	01/01/2015	01/01/2016	01/01/2017	01/01/2018	01/01/2019	01/01/2020	01/01/2021	01/01/2022	01/01/2023	01/01/2024	01/01/2025	01/01/2026	01/01/2027	01/01/2028	01/01/2029	01/01/2030	01/01/2031	01/01/2032	01/01/2033	01/01/2034	01/01/2035	01/01/2036	01/01/2037	01/01/2038	01/01/2039	01/01/2040	01/01/2041	01/01/2042	01/01/2043	01/01/2044	01/01/2045	01/01/2046	01/01/2047	31/12/2113
Physical Tests																																					
Acidity to pH 4.5 (as C	mg/L	0.00E+00	3.95E+01	3.95E+01	3.95E+01

APPENDIX A3 - UPPER CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 11.2 Out

Parameter	Unit	Year -2 (Cof	Year -1 (Stage	Year 1 (Stage 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	End	
Year		01/01/2013	01/01/2014	01/01/2015	01/01/2016	01/01/2017	01/01/2018	01/01/2019	01/01/2020	01/01/2021	01/01/2022	01/01/2023	01/01/2024	01/01/2025	01/01/2026	01/01/2027	01/01/2028	01/01/2029	01/01/2030	01/01/2031	01/01/2032	01/01/2033	01/01/2034	01/01/2035	01/01/2036	01/01/2037	01/01/2038	01/01/2039	01/01/2040	01/01/2041	01/01/2042	01/01/2043	01/01/2044	01/01/2045	01/01/2046	01/01/2047	31/12/2113	
Physical Tests																																						
Acidity to pH 4.5 (as C	mg/L	0.00E+00	4.63E-01	6.02E-01	7.12E-01	6.76E-01	7.53E-01	8.32E-01	9.13E-01	9.84E-01	1.07E+00	1.13E+00	1.03E+00	1.09E+00	1.13E+00	1.18E+00	1.23E+00	1.20E+00	1.25E+00	1.29E+00	1.31E+00	1.35E+00	1.09E+00	1.12E+00	1.12E+00	1.12E+00	1.12E+00	1.12E+00	1.12E+00	1.12E+00	1.12E+00	1.12E+00	1.12E+00	1.12E+00	1.12E+00	0.00E+00	0.00E+00	0.00E+00
Acidity to pH 8.3 (as C	mg/L	0.00E+00	5.63E-01	7.33E-01	8.67E-01	8.22E-01	9.17E-01	1.01E+00	1.11E+00	1.20E+00	1.30E+00	1.38E+00	1.26E+00	1.33E+00	1.38E+00	1.44E+00	1.49E+00	1.46E+00	1.52E+00	1.57E+00	1.60E+00	1.64E+00	1.33E+00	1.36E+00	1.36E+00	1.36E+00	1.36E+00	1.36E+00	1.36E+00	1.36E+00	1.36E+00	1.36E+00	1.36E+00	1.36E+00	1.36E+00	0.00E+00	0.00E+00	0.00E+00
Alkalinity (Total as Ca	mg/L	0.00E+00	5.32E+01	6.92E+01	8.19E+01	7.77E+01	8.66E+01	9.57E+01	1.05E+02	1.13E+02	1.23E+02	1.30E+02	1.19E+02	1.25E+02	1.31E+02	1.36E+02	1.41E+02	1.38E+02	1.43E+02	1.49E+02	1.51E+02	1.55E+02	1.25E+02	1.29E+02	1.29E+02	1.29E+02	1.29E+02	1.29E+02	1.29E+02	1.29E+02	1.29E+02	1.29E+02	1.29E+02	1.29E+02	1.29E+02	0.00E+00	0.00E+00	0.00E+00
Hardness as CaCO3 (	mg/L	0.00E+00	6.72E+01	8.75E+01	1.03E+02	9.81E+01	1.09E+02	1.21E+02	1.33E+02	1.43E+02	1.55E+02	1.64E+02	1.50E+02	1.58E+02	1.65E+02	1.72E+02	1.78E+02	1.74E+02	1.81E+02	1.88E+02	1.91E+02	1.96E+02	1.58E+02	1.62E+02	1.62E+02	1.62E+02	1.62E+02	1.62E+02	1.62E+02	1.62E+02	1.62E+02	1.62E+02	1.62E+02	1.62E+02	1.62E+02	0.00E+00	0.00E+00	0.00E+00
H+ Concentration	mg/L	3.18E-05	3.18E-05	3.18E-05

APPENDIX A3 - UPPER CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 11.3 Out

Parameter	Unit	Year -2 (Coffer	Year -1 (Stage	Year 1 (Stag	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	End
Year		01/01/2013	01/01/2014	01/01/2015	01/01/2016	01/01/2017	01/01/2018	01/01/2019	01/01/2020	01/01/2021	01/01/2022	01/01/2023	01/01/2024	01/01/2025	01/01/2026	01/01/2027	01/01/2028	01/01/2029	01/01/2030	01/01/2031	01/01/2032	01/01/2033	01/01/2034	01/01/2035	01/01/2036	01/01/2037	01/01/2038	01/01/2039	01/01/2040	01/01/2041	01/01/2042	01/01/2043	01/01/2044	01/01/2045	01/01/2046	01/01/2047	31/12/2113
Physical Tests																																					
Acidity to pH 4.5 (as C	mg/L	0.00E+00	3.31E-01	4.30E-01	5.09E-01	4.83E-01	5.38E-01	5.94E-01	6.52E-01	7.03E-01	7.64E-01	8.08E-01	7.39E-01	7.79E-01	8.10E-01	8.43E-01	8.76E-01	8.57E-01	8.90E-01	9.22E-01	9.39E-01	9.63E-01	7.78E-01	7.98E-01	7.98E-01	7.98E-01	7.98E-01	7.98E-01	7.98E-01	7.98E-01	7.98E-01	7.98E-01	7.98E-01	7.98E-01	0.00E+00	0.00E+00	0.00E+00
Acidity to pH 8.3 (as C	mg/L	0.00E+00	4.02E-01	5.23E-01	6.19E-01	5.87E-01	6.55E-01	7.23E-01	7.93E-01	8.55E-01	9.29E-01	9.83E-01	8.99E-01	9.48E-01	9.87E-01	1.03E+00	1.07E+00	1.04E+00	1.08E+00	1.12E+00	1.14E+00	1.17E+00	9.47E-01	9.72E-01	9.72E-01	9.72E-01	9.72E-01	9.72E-01	9.72E-01	9.72E-01	9.72E-01	9.72E-01	9.72E-01	9.72E-01	0.00E+00	0.00E+00	0.00E+00
Alkalinity (Total as Ca	mg/L	0.00E+00	3.80E+01	4.94E+01	5.85E+01	5.55E+01	6.19E+01	6.83E+01	7.50E+01	8.08E+01	8.78E+01	9.29E+01	8.50E+01	8.95E+01	9.32E+01	9.70E+01	1.01E+02	9.85E+01	1.02E+02	1.06E+02	1.08E+02	1.11E+02	8.95E+01	9.18E+01	9.18E+01	9.18E+01	9.18E+01	9.18E+01	9.18E+01	9.18E+01	9.18E+01	9.18E+01	9.18E+01	9.18E+01	0.00E+00	0.00E+00	0.00E+00
Hardness as CaCO3 (	mg/L	4.80E+01	6.25E+01	7.39E+01	7.01E+01	7.81E+01	8.63E+01	9.47E+01	1.02E+02	1.11E+02	1.17E+02	1.07E+02	1.13E+02	1.18E+02	1.23E+02	1.27E+02	1.24E+02	1.29E+02	1.34E+02	1.36E+02	1.40E+02	1.13E+02	1.16E+02	1.16E+02	1.16E+02	1.16E+02	1.16E+02	1.16E+02	1.16E+02	1.16E+02	1.16E+02	1.16E+02	1.16E+02	1.16E+02	0.00E+00	0.00E+00	0.00E+00
H+ Concentration	mg/L	0.00E+00	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	0.00E+00	0.00E+00	0.00E+00
Dissolved Anions																																					
Sulphate (Dissolved)	mg/L	0.00E+00	2.35E+01	3.05E+01	3.61E+01	3.42E+01	3.82E+01	4.22E+01	4.62E+01	4.99E+01	5.42E+01	5.73E+01	5.24E+01	5.52E+01	5.75E+01	5.98E+01	6.22E+01	6.08E+01	6.31E+01	6.54E+01	6.66E+01	6.83E+01	5.52E+01	5.66E+01	5.66E+01	5.66E+01	5.66E+01	5.66E+01	5.66E+01	5.66E+01	5.66E+01	5.66E+01	5.66E+01	5.66E+01	0.00E+00	0.00E+00	0.00E+00
Chloride (Dissolved)	mg/L	0.00E+00	4.50E-01	5.85E-01	6.93E-01	6.57E-01	7.32E-01	8.09E-01	8.88E-01	9.57E-01	1.04E+00	1.10E+00	1.01E+00	1.06E+00	1.10E+00	1.15E+00	1.19E+00	1.17E+00	1.21E+00	1.26E+00	1.28E+00	1.31E+00	1.06E+00	1.09E+00	1.09E+00	1.09E+00	1.09E+00	1.09E+00	1.09E+00	1.09E+00	1.09E+00	1.09E+00	1.09E+00	1.09E+00	0.00E+00	0.00E+00	0.00E+00
Fluoride (Dissolved)	mg/L	0.00E+00	2.21E-02	2.88E-02	3.41E-02	3.23E-02	3.60E-02	3.98E-02	4.37E-02	4.71E-02	5.12E-02	5.41E-02	4.95E-02	5.22E-02	5.43E-02	5.65E-02	5.87E-02	5.74E-02	5.96E-02	6.18E-02	6.29E-02	6.45E-02	5.21E-02	5.35E-02	5.35E-02	5.35E-02	5.35E-02	5.35E-02	5.35E-02	5.35E-02	5.35E-02	5.35E-02	5.35E-02	5.35E-02	0.00E+00	0.00E+00	0.00E+00
Nutrients																																					
Nitrate (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00

APPENDIX A3 - UPPER CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 11.4 Out

Parameter	Unit	Year -2 (Coffer	Year -1 (Stage	Year 1 (Stag	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	End
Year		01/01/2013	01/01/2014	01/01/2015	01/01/2016	01/01/2017	01/01/2018	01/01/2019	01/01/2020	01/01/2021	01/01/2022	01/01/2023	01/01/2024	01/01/2025	01/01/2026	01/01/2027	01/01/2028	01/01/2029	01/01/2030	01/01/2031	01/01/2032	01/01/2033	01/01/2034	01/01/2035	01/01/2036	01/01/2037	01/01/2038	01/01/2039	01/01/2040	01/01/2041	01/01/2042	01/01/2043	01/01/2044	01/01/2045	01/01/2046	01/01/2047	31/12/2113
Physical Tests																																					
Acidity to pH 4.5 (as C	mg/L	0.00E+00	0.00E+00	0.00E+00

APPENDIX A3 - UPPER CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 11.5 Out

Parameter	Unit	Year -2 (Coffe	Year -1 (Stage	Year 1 (Stag	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	End
Year		01/01/2013	01/01/2014	01/01/2015	01/01/2016	01/01/2017	01/01/2018	01/01/2019	01/01/2020	01/01/2021	01/01/2022	01/01/2023	01/01/2024	01/01/2025	01/01/2026	01/01/2027	01/01/2028	01/01/2029	01/01/2030	01/01/2031	01/01/2032	01/01/2033	01/01/2034	01/01/2035	01/01/2036	01/01/2037	01/01/2038	01/01/2039	01/01/2040	01/01/2041	01/01/2042	01/01/2043	01/01/2044	01/01/2045	01/01/2046	01/01/2047	31/12/2113
Physical Tests																																					
Acidity to pH 4.5 (as C	mg/L	0.00E+00	0.00E+00	0.00E+00

APPENDIX A3 - UPPER CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 12.1 Out

Parameter	Unit	Year -2 (Coffer	Year -1 (Stage	Year 1 (Stag	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	End
Year		01/01/2013	01/01/2014	01/01/2015	01/01/2016	01/01/2017	01/01/2018	01/01/2019	01/01/2020	01/01/2021	01/01/2022	01/01/2023	01/01/2024	01/01/2025	01/01/2026	01/01/2027	01/01/2028	01/01/2029	01/01/2030	01/01/2031	01/01/2032	01/01/2033	01/01/2034	01/01/2035	01/01/2036	01/01/2037	01/01/2038	01/01/2039	01/01/2040	01/01/2041	01/01/2042	01/01/2043	01/01/2044	01/01/2045	01/01/2046	01/01/2047	31/12/2113
Physical Tests																																					
Acidity to pH 4.5 (as C	mg/L	0.00E+00	2.74E-02	2.74E-02	2.74E-02

APPENDIX A3 - UPPER CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 12.2 Out

Parameter	Unit	Year -2 (Coffer	Year -1 (Stage	Year 1 (Stag	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	End
Year		01/01/2013	01/01/2014	01/01/2015	01/01/2016	01/01/2017	01/01/2018	01/01/2019	01/01/2020	01/01/2021	01/01/2022	01/01/2023	01/01/2024	01/01/2025	01/01/2026	01/01/2027	01/01/2028	01/01/2029	01/01/2030	01/01/2031	01/01/2032	01/01/2033	01/01/2034	01/01/2035	01/01/2036	01/01/2037	01/01/2038	01/01/2039	01/01/2040	01/01/2041	01/01/2042	01/01/2043	01/01/2044	01/01/2045	01/01/2046	01/01/2047	31/12/2113
Physical Tests																																					
Acidity to pH 4.5 (as C	mg/L	0.00E+00	0.00E+00	0.00E+00

APPENDIX A3 - UPPER CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 12.3 Out

Parameter	Unit	Year -2 (Coffer	Year -1 (Stage	Year 1 (Stag	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	End
Year		01/01/2013	01/01/2014	01/01/2015	01/01/2016	01/01/2017	01/01/2018	01/01/2019	01/01/2020	01/01/2021	01/01/2022	01/01/2023	01/01/2024	01/01/2025	01/01/2026	01/01/2027	01/01/2028	01/01/2029	01/01/2030	01/01/2031	01/01/2032	01/01/2033	01/01/2034	01/01/2035	01/01/2036	01/01/2037	01/01/2038	01/01/2039	01/01/2040	01/01/2041	01/01/2042	01/01/2043	01/01/2044	01/01/2045	01/01/2046	01/01/2047	31/12/2113
Physical Tests																																					
Acidity to pH 4.5 (as C	mg/L	0.00E+00	8.44E-03	8.44E-03	8.44E-03

APPENDIX A3 - UPPER CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 14 Out

Parameter	Unit	Year -2 (Coffer	Year -1 (Stage	Year 1 (Stag	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	End
Year		01/01/2013	01/01/2014	01/01/2015	01/01/2016	01/01/2017	01/01/2018	01/01/2019	01/01/2020	01/01/2021	01/01/2022	01/01/2023	01/01/2024	01/01/2025	01/01/2026	01/01/2027	01/01/2028	01/01/2029	01/01/2030	01/01/2031	01/01/2032	01/01/2033	01/01/2034	01/01/2035	01/01/2036	01/01/2037	01/01/2038	01/01/2039	01/01/2040	01/01/2041	01/01/2042	01/01/2043	01/01/2044	01/01/2045	01/01/2046	01/01/2047	31/12/2113
Physical Tests																																					
Acidity to pH 4.5 (as C	mg/L	0.00E+00	1.53E+01	1.53E+01	1.53E+01	1.53E+01	1.53E+01	1.53E+01	1.53E+01	1.53E+01	1.53E+01	1.53E+01	1.53E+01	1.53E+01	1.53E+01	1.53E+01	1.53E+01	1.53E+01	1.53E+01	1.53E+01	1.53E+01	1.53E+01	1.53E+01	1.53E+01	1.53E+01	1.53E+01	1.53E+01	1.53E+01	1.53E+01	1.53E+01	1.53E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acidity to pH 8.3 (as C	mg/L	0.00E+00	1.86E+01	1.86E+01	1.86E+01	1.86E+01	1.86E+01	1.86E+01	1.86E+01	1.86E+01	1.86E+01	1.86E+01	1.86E+01	1.86E+01	1.86E+01	1.86E+01	1.86E+01	1.86E+01	1.86E+01	1.86E+01	1.86E+01	1.86E+01	1.86E+01	1.86E+01	1.86E+01	1.86E+01	1.86E+01	1.86E+01	1.86E+01	1.86E+01	1.86E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Alkalinity (Total as Ca	mg/L	0.00E+00	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hardness as CaCO3 (	mg/L	0.00E+00	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H+ Concentration	mg/L	0.00E+00	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dissolved Anions																																					
Sulphate (Dissolved)	mg/L	0.00E+00	1.08E+03	1.08E+03	1.08E+03	1.08E+03	1.08E+03	1.08E+03	1.08E+03	1.08E+03	1.08E+03	1.08E+03	1.08E+03	1.08E+03	1.08E+03	1.08E+03	1.08E+03	1.08E+03	1.08E+03	1.08E+03	1.08E+03	1.08E+03	1.08E+03	1.08E+03	1.08E+03	1.08E+03	1.08E+03	1.08E+03	1.08E+03	1.08E+03	1.08E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chloride (Dissolved)	mg/L	0.00E+00	2.08E+01	2.08E+01	2.08E+01	2.08E+01	2.08E+01	2.08E+01	2.08E+01	2.08E+01	2.08E+01	2.08E+01	2.08E+01	2.08E+01	2.08E+01	2.08E+01	2.08E+01	2.08E+01	2.08E+01	2.08E+01	2.08E+01	2.08E+01	2.08E+01	2.08E+01	2.08E+01	2.08E+01	2.08E+01	2.08E+01	2.08E+01	2.08E+01	2.08E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluoride (Dissolved)	mg/L	0.00E+00	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nutrients																																					
Nitrate (Dissolved)	mg/L	0.00E+00	3.73E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

APPENDIX A3 - UPPER CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 15 Out

Parameter	Unit	Year -2 (Coffer	Year -1 (Stage	Year 1 (Stag	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	End
Year		01/01/2013	01/01/2014	01/01/2015	01/01/2016	01/01/2017	01/01/2018	01/01/2019	01/01/2020	01/01/2021	01/01/2022	01/01/2023	01/01/2024	01/01/2025	01/01/2026	01/01/2027	01/01/2028	01/01/2029	01/01/2030	01/01/2031	01/01/2032	01/01/2033	01/01/2034	01/01/2035	01/01/2036	01/01/2037	01/01/2038	01/01/2039	01/01/2040	01/01/2041	01/01/2042	01/01/2043	01/01/2044	01/01/2045	01/01/2046	01/01/2047	31/12/2113
Physical Tests																																					
Acidity to pH 4.5 (as C	mg/L	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acidity to pH 8.3 (as C	mg/L	6.83E+01	6.83E+01	6.83E+01	6.83E+01	6.83E+01	6.83E+01	6.83E+01	6.83E+01	6.83E+01	6.83E+01	6.83E+01	6.83E+01	6.83E+01	6.83E+01	6.83E+01	6.83E+01	6.83E+01	6.83E+01	6.83E+01	6.83E+01	6.83E+01	6.83E+01	6.83E+01	6.83E+01	6.83E+01	6.83E+01	6.83E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Alkalinity (Total as Ca	mg/L	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hardness as CaCO3 (	mg/L	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H+ Concentration	mg/L	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dissolved Anions																																					
Sulphate (Dissolved)	mg/L	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chloride (Dissolved)	mg/L	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluoride (Dissolved)	mg/L	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nutrients																																					
Nitrate (Dissolved)	mg/L	1.62E+02	1.62E+02	1.62E+02	1.62E+02	1.62E+02	1.62E+02	1.62E+02	1.62E+02	1.62E+02	1.62E+02	1.62E+02	1.62E+02	1.62E+02	1.62E+02	1.62E+02	1.62E+02	1.62E+02	1.62E+02	1.62E+02	1.62E+02	1.62E+02	1.62E+02	1.62E+02	1.62E+02	1.62E+02	1.62E+02	1.62E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia (Dissolved)	mg/L	2.04E+01	2.04E+01	2.04E+01	2.04E+01	2.04E+01	2.04E+01	2.04E+01	2.04E+01	2.04E+01	2.04E+01	2.04E+01	2.04E+01	2.04E+01	2.04E+01	2.04E+01	2.04E+01	2.04E+01	2.04E+01	2.04E+01	2.04E+01	2.04E+01	2.04E+01	2.04E+01	2.04E+01	2.04E+01	2.04E+01	2.04E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrite (Dissolved)	mg/L	3.72E+00	3.72E+00	3.72E+00	3.72E+00	3.72E+00	3.72E+00	3.72E+00	3.72E+00	3.72E+00	3.72E+00	3.72E+00	3.72E+00	3.72E+00	3.72E+00	3.72E+00	3.72E+00	3.72E+00	3.72E+00	3.72E+00	3.72E+00	3.72E+00	3.72E+00	3.72E+00	3.72E+00	3.72E+00	3.72E+00	3.72E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Orthophosphate (Diss	mg/L	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dissolved Metals																																					
Al (Dissolved)	mg/L	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sb (Dissolved)	mg/L	3.29E-02	3.29E-02	3.29E-02	3.29E-02	3.29E-02	3.29E-02	3.29E-02	3.29E-02	3.29E-02	3.29E-02	3.29E-02	3.29E-02	3.29E-02	3.29E-02	3.29E-02	3.29E-02	3.29E-02	3.29E-02	3.29E-02	3.29E-02	3.29E-02	3.29E-02	3.29E-02	3.29E-02	3.29E-02	3.29E-02	3.29E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
As (Dissolved)	mg/L	1.63E-02	1.63E-02	1.63E-02	1.63E-02	1.63E-02	1.63E-02	1.63E-02	1.63E-02	1.63E-02	1.63E-02	1.63E-02	1.63E-02	1.63E-02	1.63E-02	1.63E-02	1.63E-02	1.63E-02	1.63E-02	1.63E-02	1.63E-02	1.63E-02	1.63E-02	1.63E-02	1.63E-02	1.63E-02	1.63E-02	1.63E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ba (Dissolved)	mg/L	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Be (Dissolved)	mg/L	1.92E-03	1.92E-03	1.92E-03	1.92E-03	1.92E-03	1.92E-03	1.92E-03	1.92E-03	1.92E-03	1.92E-03	1.92E-03	1.92E-03	1.92E-03	1.92E-03	1.92E-03	1.92E-03	1.92E-03	1.92E-03	1.92E-03	1.92E-03	1.92E-03	1.92E-03	1.92E-03	1.92E-03	1.92E-03	1.92E-03	1.92E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bi (Dissolved)	mg/L	6.95E-04	6.95E-04	6.95E-04	6.95E-04	6.95E-04	6.95E-04	6.95E-04	6.95E-04	6.95E-04	6.95E-04	6.95E-04	6.95E-04	6.95E-04	6.95E-04	6.95E-04	6.95E-04	6.95E-04	6.95E-04	6.95E-04	6.95E-04	6.95E-04	6.95E-04	6.95E-04	6.95E-04	6.95E-04	6.95E-04	6.95E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
B (Dissolved)	mg/L	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cd (Dissolved)	mg/L	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ca (Dissolved)	mg/L	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cr (Dissolved)	mg/L	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co (Dissolved)	mg/L	4.35E-01	4.35E-01	4.35E-01	4.35E-01	4.35E-01	4.35E-01	4.35E-01	4.35E-01	4.35E-01	4.35E-01	4.35E-01	4.35E-01	4.35E-01	4.35E-01	4.35E-01	4.35E-01	4.35E-01	4.35E-01	4.35E-01	4.35E-01	4.35E-01	4.35E-01	4.35E-01	4.35E-01	4.35E-01	4.35E-01	4.35E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cu (Dissolved)	mg/L	3.98E+00	3.98E+00	3.98E+00	3.98E+00	3.98E+00	3.98E+00	3.98E+00	3.98E+00	3.98E+00	3.98E+00	3.98E+00	3.98E+00	3.98E+00	3.98E+00	3.98E+00	3.98E+00	3.98E+00	3.98E+00	3.98E+00	3.98E+00	3.98E+00	3.98E+00	3.98E+00	3.98E+00	3.98E+00	3.98E+00	3.98E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe (Dissolved)	mg/L	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pb (Dissolved)	mg/L	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Li (Dissolved)	mg/L	6.98E-02	6.98E-02	6.98E-02	6.98E-02	6.98E-02	6.98E-02	6.98E-02	6.98E-02	6.98E-02	6.98E-02	6.98E-02	6.98E-02	6.98E-02	6.98E-02	6.98E-02	6.98E-02	6.98E-02	6.98E-02	6.98E-02	6.98E-02	6.98E-02	6.98E-02	6.98E-02	6.98E-02	6.98E-02	6.98E-02	6.98E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mg (Dissolved)	mg/L	9.94E+02	9.94E+02	9.94E+02	9.94E+02	9.94E+02	9.94E+02	9.94E+02	9.94E+02	9.94E+02	9.94E+02	9.94E+02	9.94E+02	9.94E+02	9.94E+02	9.94E+02	9.94E+02	9.94E+02	9.94E+02	9.94E+02	9.94E+02	9.94E+02	9.94E+02	9.94E+02	9.94E+02	9.94E+02	9.94E+02	9.94E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mn (Dissolved)	mg/L	9.53E+00	9.53E+00	9.53E+00	9.53E+00	9.53E+00	9.53E+00	9.53E+00	9.53E+00	9.53E+00	9.53E+00	9.53E+00	9.53E+00	9.53E+00	9.53E+00	9.53E+00	9.53E+00	9.53E+00	9.53E+00	9.53E+00	9.53E+00	9.53E+00	9.53E+00	9.53E+00	9.53E+00	9.53E+00	9.53E+00	9.53E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mo (Dissolved)	mg/L	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ni (Dissolved)	mg/L	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
P (Dissolved)	mg/L	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
K (Dissolved)	mg/L	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Se (Dissolved)	mg/L	1.68E-01	1.68E-01	1.68E-01	1.68E-01	1.68E-01	1.68E-01	1.68E-01	1.68E-01	1.68E-01	1.68E-01	1.68E-01	1.68E-01	1.68E-01	1.68E-01	1.68E-01	1.68E-01	1.68E-01	1.68E-01	1.68E-01	1.68E-01	1.68E-01	1.68E-01	1.68E-01	1.68E-01	1.68E-01	1.68E-01	1.68E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Si (Dissolved)	mg/L	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ag (Dissolved)	mg/L	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Na (Dissolved)	mg/L	6.81E+00	6.81E+00	6.81E+00	6.81E+00	6.81E+00	6.81E+00	6.81E+00	6.81E+00	6.81E+00	6.81E+00	6.81E+00	6.81E+00	6.81E+00	6.81E+00	6.81E+00	6.81E+00	6.81E+00	6.81E+00	6.81E+00	6.81E+00	6.81E+00	6.81E+00	6.81E+00	6.81E+00	6.81E+00	6.81E+00	6.81E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sr (Dissolved)	mg/L	5.54E+00	5.54E+00	5.54E+00	5.54E+00	5.54E+00	5.54E+00	5.54E+00	5.54E+00	5.54E+00	5.54E+00	5.54E+00	5.54E+00	5.54E+00	5.54E+00	5.54E+00	5.54E+00	5.54E+00	5.54E+00	5.54E+00	5.54E+00	5.54E+00	5.54E+00	5.54E+00	5.54E+00	5.54E+00	5.54E+00	5.54E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
S (Dissolved)	mg/L	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tl (Dissolved)	mg/L	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sn (Dissolved)	mg/L	1.66E-01	1.66E-01	1.66E-01	1.66E-01	1.66E-01	1.66E-01	1.66E-01	1.66E-01	1.66E-01	1.66E-01	1.66E-01	1.66E-01	1.66E-01	1.66E-01	1.66E-01	1.66E-01	1.66E-01	1.66E-01	1.66E-01	1.66E-01	1.66E-01	1.66E-01	1.66E-01	1.66E-01	1.66E-01	1.66E-01	1.66E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
U (Dissolved)	mg/L	2.17E-02	2.17E-02	2.17E-02	2.17E-02	2.17E-02	2.17E-02	2.17E-02	2.17E-02	2.17E-02	2.17E-02	2.17E-02	2.17E-02	2.17E-02	2.17E-02	2.17E-02	2.17E-02	2.17E-02	2.17E-02	2.17E-02	2.17E-02	2.17E-02	2.17E-02	2.17E-02	2.17E-02	2.17E-02	2.17E-02	2.17E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
V (Dissolved)	mg/L	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zn (Dissolved)	mg/L	5.40E-02	5.40E-02	5.40E-02	5.40E-02	5.40E-02	5.40E-02	5.40E-02	5.40E-02	5.40E-02	5.40E-02	5.40E-02	5.40E-02	5.40E-02	5.40E-02	5.40E-02	5.40E-02	5.40E-02	5.40E-02	5.40E-02	5.40E-02	5.40E-02	5.40E-02	5.40E-02	5.40E-02	5.40E-02	5.40E-02	5.40E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zr (Dissolved)	mg/L	5.00E-04	5.00E-04	5.00E-04

APPENDIX A3 - UPPER CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 16 Out

Parameter	Unit	All 01/01/2013
Physical Tests		
Acidity to pH 4.5 (as CaCO:	mg/L	5.00E-01
Acidity to pH 8.3 (as CaCO:	mg/L	1.03E+00
Alkalinity (Total as CaCO3)	mg/L	9.20E+01
Hardness as CaCO3 (Dissc	mg/L	2.72E+02
H+ Concentration	mg/L	3.18E-05
Dissolved Anions		
Sulphate (Dissolved)	mg/L	2.00E+02
Chloride (Dissolved)	mg/L	3.17E+00
Fluoride (Dissolved)	mg/L	1.00E-01
Nutrient		
Nitrate (Dissolved)	mg/L	0.00E+00
Ammonia (Dissolved)	mg/L	0.00E+00
Nitrite (Dissolved)	mg/L	0.00E+00
Orthophosphate (Dissolved	mg/L	4.66E-02
Dissolved Metals		
Al (Dissolved)	mg/L	1.66E-02
Sb (Dissolved)	mg/L	1.12E-03
As (Dissolved)	mg/L	1.78E-03
Ba (Dissolved)	mg/L	1.06E-02
Be (Dissolved)	mg/L	1.00E-05
Bi (Dissolved)	mg/L	5.00E-06
B (Dissolved)	mg/L	5.00E-02
Cd (Dissolved)	mg/L	1.86E-05
Ca (Dissolved)	mg/L	9.83E+01
Cr (Dissolved)	mg/L	2.00E-04
Co (Dissolved)	mg/L	3.21E-04
Cu (Dissolved)	mg/L	7.90E-03
Fe (Dissolved)	mg/L	1.17E-02
Pb (Dissolved)	mg/L	5.17E-05
Li (Dissolved)	mg/L	2.77E-03
Mg (Dissolved)	mg/L	1.46E+01
Mn (Dissolved)	mg/L	1.38E-01
Mo (Dissolved)	mg/L	7.69E-02
Ni (Dissolved)	mg/L	2.22E-03
P (Dissolved)	mg/L	2.26E-02
K (Dissolved)	mg/L	2.92E+00
Se (Dissolved)	mg/L	1.55E-03
Si (Dissolved)	mg/L	2.47E+00
Ag (Dissolved)	mg/L	7.40E-05
Na (Dissolved)	mg/L	9.07E-01
Sr (Dissolved)	mg/L	2.67E-01
S (Dissolved)	mg/L	7.98E+01
Tl (Dissolved)	mg/L	3.65E-06
Sn (Dissolved)	mg/L	2.79E-04
Ti (Dissolved)	mg/L	5.00E-04
U (Dissolved)	mg/L	1.43E-03
V (Dissolved)	mg/L	2.65E-04
Zn (Dissolved)	mg/L	1.67E-03
Zr (Dissolved)	mg/L	1.00E-04
Hg (Dissolved)	mg/L	2.65E-05

APPENDIX A3 - UPPER CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 17.1 Out

Parameter	Unit	Year -2 (Coffe	Year -1 (Stage	Year 1 (Stag	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	End
Year		01/01/2013	01/01/2014	01/01/2015	01/01/2016	01/01/2017	01/01/2018	01/01/2019	01/01/2020	01/01/2021	01/01/2022	01/01/2023	01/01/2024	01/01/2025	01/01/2026	01/01/2027	01/01/2028	01/01/2029	01/01/2030	01/01/2031	01/01/2032	01/01/2033	01/01/2034	01/01/2035	01/01/2036	01/01/2037	01/01/2038	01/01/2039	01/01/2040	01/01/2041	01/01/2042	01/01/2043	01/01/2044	01/01/2045	01/01/2046	01/01/2047	31/12/2113
Physical Tests																																					
Acidity to pH 4.5 (as C	mg/m2/year	3.83E+00	3.83E+00	3.83E+00

APPENDIX A3 - UPPER CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 17.2 Out

Parameter	Unit	Year -2 (Coffe	Year -1 (Stage	Year 1 (Stag	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	End
Year		01/01/2013	01/01/2014	01/01/2015	01/01/2016	01/01/2017	01/01/2018	01/01/2019	01/01/2020	01/01/2021	01/01/2022	01/01/2023	01/01/2024	01/01/2025	01/01/2026	01/01/2027	01/01/2028	01/01/2029	01/01/2030	01/01/2031	01/01/2032	01/01/2033	01/01/2034	01/01/2035	01/01/2036	01/01/2037	01/01/2038	01/01/2039	01/01/2040	01/01/2041	01/01/2042	01/01/2043	01/01/2044	01/01/2045	01/01/2046	01/01/2047	31/12/2113
Physical Tests																																					
Acidity to pH 4.5 (as C	mg/L	0.00E+00	0.00E+00	0.00E+00

APPENDIX A3 - UPPER CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 18 Out

Parameter	Unit	All 01/01/2013			
Physical Tests					
Acidity to pH 4.5 (as CaCO:	mg/L	5.00E-01	0	0	0
Acidity to pH 8.3 (as CaCO:	mg/L	1.03E+00	0	0	0
Alkalinity (Total as CaCO3)	mg/L	9.20E+01	0	0	0
Hardness as CaCO3 (Dissc	mg/L	2.72E+02	0	0	0
H+ Concentration	mg/L	3.18E-05	0	0	0
Dissolved Anions					
Sulphate (Dissolved)	mg/L	2.00E+02	0	0	0
Chloride (Dissolved)	mg/L	3.17E+00	0	0	0
Fluoride (Dissolved)	mg/L	1.00E-01	0	0	0
Nutrient					
Nitrate (Dissolved)	mg/L	0.00E+00	0	0	0
Ammonia (Dissolved)	mg/L	0.00E+00	0	0	0
Nitrite (Dissolved)	mg/L	0.00E+00	0	0	0
Orthophosphate (Dissolved	mg/L	4.66E-02	0	0	0
Dissolved Metals					
Al (Dissolved)	mg/L	1.66E-02	0	0	0
Sb (Dissolved)	mg/L	1.12E-03	0	0	0
As (Dissolved)	mg/L	1.78E-03	0	0	0
Ba (Dissolved)	mg/L	1.06E-02	0	0	0
Be (Dissolved)	mg/L	1.00E-05	0	0	0
Bi (Dissolved)	mg/L	5.00E-06	0	0	0
B (Dissolved)	mg/L	5.00E-02	0	0	0
Cd (Dissolved)	mg/L	1.86E-05	0	0	0
Ca (Dissolved)	mg/L	9.83E+01	0	0	0
Cr (Dissolved)	mg/L	2.00E-04	0	0	0
Co (Dissolved)	mg/L	3.21E-04	0	0	0
Cu (Dissolved)	mg/L	7.90E-03	0	0	0
Fe (Dissolved)	mg/L	1.17E-02	0	0	0
Pb (Dissolved)	mg/L	5.17E-05	0	0	0
Li (Dissolved)	mg/L	2.77E-03	0	0	0
Mg (Dissolved)	mg/L	1.46E+01	0	0	0
Mn (Dissolved)	mg/L	1.38E-01	0	0	0
Mo (Dissolved)	mg/L	7.69E-02	0	0	0
Ni (Dissolved)	mg/L	2.22E-03	0	0	0
P (Dissolved)	mg/L	2.26E-02	0	0	0
K (Dissolved)	mg/L	2.92E+00	0	0	0
Se (Dissolved)	mg/L	1.55E-03	0	0	0
Si (Dissolved)	mg/L	2.47E+00	0	0	0
Ag (Dissolved)	mg/L	7.40E-05	0	0	0
Na (Dissolved)	mg/L	9.07E-01	0	0	0
Sr (Dissolved)	mg/L	2.67E-01	0	0	0
S (Dissolved)	mg/L	7.98E+01	0	0	0
Tl (Dissolved)	mg/L	3.65E-06	0	0	0
Sn (Dissolved)	mg/L	2.79E-04	0	0	0
Ti (Dissolved)	mg/L	5.00E-04	0	0	0
U (Dissolved)	mg/L	1.43E-03	0	0	0
V (Dissolved)	mg/L	2.65E-04	0	0	0
Zn (Dissolved)	mg/L	1.67E-03	0	0	0
Zr (Dissolved)	mg/L	1.00E-04	0	0	0
Hg (Dissolved)	mg/L	2.65E-05	0	0	0

APPENDIX A3 - UPPER CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 19 Out

Parameter	Unit	Year -2 (Coffer	Year -1 (Stage	Year 1 (Stag	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	End
Year		01/01/2013	01/01/2014	01/01/2015	01/01/2016	01/01/2017	01/01/2018	01/01/2019	01/01/2020	01/01/2021	01/01/2022	01/01/2023	01/01/2024	01/01/2025	01/01/2026	01/01/2027	01/01/2028	01/01/2029	01/01/2030	01/01/2031	01/01/2032	01/01/2033	01/01/2034	01/01/2035	01/01/2036	01/01/2037	01/01/2038	01/01/2039	01/01/2040	01/01/2041	01/01/2042	01/01/2043	01/01/2044	01/01/2045	01/01/2046	01/01/2047	31/12/2113
Physical Tests																																					
Acidity to pH 4.5 (as C	mg/L	0.00E+00	7.13E-02	1.43E-01	2.14E-01	2.85E-01	3.57E-01	4.28E-01	4.99E-01	5.71E-01	6.42E-01	7.13E-01	5.59E-01	6.09E-01	6.60E-01	7.11E-01	7.62E-01	8.12E-01	8.63E-01	9.14E-01	9.65E-01	1.02E+00	1.07E+00	1.12E+00	1.17E+00	1.22E+00	1.40E+00	1.63E+00	1.91E+00	2.28E+00	2.79E+00	3.54E+00	4.77E+00	7.12E+00	7.12E+00	0.00E+00	0.00E+00
Acidity to pH 8.3 (as C	mg/L	0.00E+00	8.68E-02	1.74E-01	2.60E-01	3.47E-01	4.34E-01	5.21E-01	6.08E-01	6.95E-01	7.81E-01	8.68E-01	6.80E-01	7.42E-01	8.03E-01	8.65E-01	9.27E-01	9.89E-01	1.05E+00	1.11E+00	1.17E+00	1.24E+00	1.30E+00	1.36E+00	1.42E+00	1.48E+00	1.71E+00	1.99E+00	2.33E+00	2.78E+00	3.40E+00	4.31E+00	5.81E+00	8.78E+00	1.76E+01	0.00E+00	0.00E+00
Alkalinity (Total as Ca	mg/L	0.00E+00	8.20E+00	1.64E+01	2.46E+01	3.28E+01	4.10E+01	4.92E+01	5.74E+01	6.56E+01	7.38E+01	8.20E+01	6.42E+01	7.01E+01	7.59E+01	8.18E+01	8.76E+01	9.34E+01	9.93E+01	1.05E+02	1.11E+02	1.17E+02	1.23E+02	1.28E+02	1.34E+02	1.40E+02	1.62E+02	1.88E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	0.00E+00	0.00E+00
Hardness as CaCO3 (	mg/L	0.00E+00	1.04E+01	2.07E+01	3.11E+01	4.15E+01	5.18E+01	6.22E+01	7.25E+01	8.29E+01	9.33E+01	1.04E+02	8.11E+01	8.85E+01	9.59E+01	1.03E+02	1.11E+02	1.18E+02	1.25E+02	1.33E+02	1.40E+02	1.48E+02	1.55E+02	1.62E+02	1.70E+02	1.77E+02	2.04E+02	2.37E+02	2.78E+02	3.32E+02	4.06E+02	5.15E+02	6.93E+02	1.05E+03	1.16E+03	0.00E+00	0.00E+00
H+ Concentration	mg/L	0.00E+00	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	0.00E+00	0.00E+00
Dissolved Anions																																					
Sulphate (Dissolved)	mg/L	0.00E+00	5.06E+00	1.01E+01	1.52E+01	2.02E+01	2.53E+01	3.04E+01	3.54E+01	4.05E+01	4.55E+01	5.06E+01	3.96E+01	4.32E+01	4.68E+01	5.04E+01	5.40E+01	5.76E+01	6.12E+01	6.48E+01	6.84E+01	7.20E+01	7.57E+01	7.93E+01	8.29E+01	8.65E+01	9.97E+01	1.16E+02	1.36E+02	1.62E+02	1.98E+02	2.51E+02	3.39E+02	5.12E+02	6.92E+02	0.00E+00	0.00E+00
Chloride (Dissolved)	mg/L	0.00E+00	9.71E-02	1.94E-01	2.91E-01	3.88E-01	4.86E-01	5.83E-01	6.80E-01	7.77E-01	8.74E-01	9.71E-01	7.61E-01	8.30E-01	8.99E-01	9.68E-01	1.04E+00	1.11E+00	1.18E+00	1.24E+00	1.31E+00	1.38E+00	1.45E+00	1.52E+00	1.59E+00	1.66E+00	1.91E+00	2.22E+00	2.61E+00	3.11E+00	3.80E+00	4.82E+00	6.50E+00	9.82E+00	1.97E+01	0.00E+00	0.00E+00
Fluoride (Dissolved)	mg/L	0.00E+00	4.78E-03	9.56E-03	1.43E-02	1.91E-02	2.39E-02	2.87E-02	3.34E-02	3.82E-02	4.30E-02	4.78E-02	3.74E-02	4.08E-02	4.42E-02	4.76E-02	5.10E-02	5.44E-02	5.78E-02	6.12E-02	6.46E-02	6.80E-02	7.14E-02	7.48E-02	7.82E-02	8.16E-02	9.41E-02	1.09E-01	1.28E-01	1.53E-01	1.87E-01	2.37E-01	3.20E-01	4.83E-01	7.70E-01	0.00E+00	0.00E+00
Nutrients																																					
Nitrate (Dissolved)	mg/L	0.00E+00	0.00E+00	0.00E+00

APPENDIX A3 - UPPER CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 20 Out

Parameter	Unit	Year -2 (Coffer	Year -1 (Stage	Year 1 (Stag	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	End
Year		01/01/2013	01/01/2014	01/01/2015	01/01/2016	01/01/2017	01/01/2018	01/01/2019	01/01/2020	01/01/2021	01/01/2022	01/01/2023	01/01/2024	01/01/2025	01/01/2026	01/01/2027	01/01/2028	01/01/2029	01/01/2030	01/01/2031	01/01/2032	01/01/2033	01/01/2034	01/01/2035	01/01/2036	01/01/2037	01/01/2038	01/01/2039	01/01/2040	01/01/2041	01/01/2042	01/01/2043	01/01/2044	01/01/2045	01/01/2046	01/01/2047	31/12/2113
Physical Tests																																					
Acidity to pH 4.5 (as C	mg/L	0.00E+00	2.26E+00	2.26E+00	2.26E+00	2.26E+00	2.26E+00	2.26E+00	2.26E+00	2.26E+00	2.26E+00	2.26E+00	2.26E+00	2.26E+00	2.26E+00	2.26E+00	2.26E+00	2.26E+00	2.26E+00	2.26E+00	2.26E+00	2.26E+00	2.26E+00	2.26E+00	2.26E+00	2.26E+00	2.26E+00	2.26E+00	2.26E+00	2.26E+00	2.26E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acidity to pH 8.3 (as C	mg/L	0.00E+00	2.75E+00	2.75E+00	2.75E+00	2.75E+00	2.75E+00	2.75E+00	2.75E+00	2.75E+00	2.75E+00	2.75E+00	2.75E+00	2.75E+00	2.75E+00	2.75E+00	2.75E+00	2.75E+00	2.75E+00	2.75E+00	2.75E+00	2.75E+00	2.75E+00	2.75E+00	2.75E+00	2.75E+00	2.75E+00	2.75E+00	2.75E+00	2.75E+00	2.75E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Alkalinity (Total as Ca	mg/L	0.00E+00	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hardness as CaCO3 (	mg/L	0.00E+00	3.28E+02	3.28E+02	3.28E+02	3.28E+02	3.28E+02	3.28E+02	3.28E+02	3.28E+02	3.28E+02	3.28E+02	3.28E+02	3.28E+02	3.28E+02	3.28E+02	3.28E+02	3.28E+02	3.28E+02	3.28E+02	3.28E+02	3.28E+02	3.28E+02	3.28E+02	3.28E+02	3.28E+02	3.28E+02	3.28E+02	3.28E+02	3.28E+02	3.28E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H+ Concentration	mg/L	0.00E+00	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dissolved Anions																																					
Sulphate (Dissolved)	mg/L	0.00E+00	1.60E+02	1.60E+02	1.60E+02	1.60E+02	1.60E+02	1.60E+02	1.60E+02	1.60E+02	1.60E+02	1.60E+02	1.60E+02	1.60E+02	1.60E+02	1.60E+02	1.60E+02	1.60E+02	1.60E+02	1.60E+02	1.60E+02	1.60E+02	1.60E+02	1.60E+02	1.60E+02	1.60E+02	1.60E+02	1.60E+02	1.60E+02	1.60E+02	1.60E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chloride (Dissolved)	mg/L	0.00E+00	3.08E+00	3.08E+00	3.08E+00	3.08E+00	3.08E+00	3.08E+00	3.08E+00	3.08E+00	3.08E+00	3.08E+00	3.08E+00	3.08E+00	3.08E+00	3.08E+00	3.08E+00	3.08E+00	3.08E+00	3.08E+00	3.08E+00	3.08E+00	3.08E+00	3.08E+00	3.08E+00	3.08E+00	3.08E+00	3.08E+00	3.08E+00	3.08E+00	3.08E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluoride (Dissolved)	mg/L	0.00E+00	1.51E-01	1.51E-01	1.51E-01	1.51E-01	1.51E-01	1.51E-01	1.51E-01	1.51E-01	1.51E-01	1.51E-01	1.51E-01	1.51E-01	1.51E-01	1.51E-01	1.51E-01	1.51E-01	1.51E-01	1.51E-01	1.51E-01	1.51E-01	1.51E-01	1.51E-01	1.51E-01	1.51E-01	1.51E-01	1.51E-01	1.51E-01	1.51E-01	1.51E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nutrients																																					
Nitrate (Dissolved)	mg/L	0.00E+00	5.51E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00

APPENDIX A3 - UPPER CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 21 Out

Parameter	Unit	Year -2 (Coffer	Year -1 (Stage	Year 1 (Stag	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	End
Year		01/01/2013	01/01/2014	01/01/2015	01/01/2016	01/01/2017	01/01/2018	01/01/2019	01/01/2020	01/01/2021	01/01/2022	01/01/2023	01/01/2024	01/01/2025	01/01/2026	01/01/2027	01/01/2028	01/01/2029	01/01/2030	01/01/2031	01/01/2032	01/01/2033	01/01/2034	01/01/2035	01/01/2036	01/01/2037	01/01/2038	01/01/2039	01/01/2040	01/01/2041	01/01/2042	01/01/2043	01/01/2044	01/01/2045	01/01/2046	01/01/2047	31/12/2113
Physical Tests																																					
Acidity to pH 4.5 (as C	mg/L	7.53E-02	7.53E-02	7.53E-02

APPENDIX A3 - UPPER CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 22 Out

Parameter	Unit	All 01/01/2013
Physical Tests		
Acidity to pH 4.5 (as CaCO	mg/tonne	2.40E+01
Acidity to pH 8.3 (as CaCO	mg/tonne	2.52E+01
Alkalinity (Total as CaCO3)	mg/tonne	1.25E+03
Hardness as CaCO3 (Dissc	mg/tonne	2.51E+03
H+ Concentration	mg/tonne	3.18E-05
Dissolved Anions		
Sulphate (Dissolved)	mg/tonne	1.61E+03
Chloride (Dissolved)	mg/tonne	2.61E+01
Fluoride (Dissolved)	mg/tonne	8.72E-01
Nutrient		
Nitrate (Dissolved)	mg/tonne	0.00E+00
Ammonia (Dissolved)	mg/tonne	0.00E+00
Nitrite (Dissolved)	mg/tonne	0.00E+00
Orthophosphate (Dissolved	mg/tonne	5.56E-01
Dissolved Metals		
Al (Dissolved)	mg/tonne	6.90E-01
Sb (Dissolved)	mg/tonne	1.21E-02
As (Dissolved)	mg/tonne	6.01E-03
Ba (Dissolved)	mg/tonne	1.25E-01
Be (Dissolved)	mg/tonne	7.08E-04
Bi (Dissolved)	mg/tonne	2.56E-04
B (Dissolved)	mg/tonne	2.40E+00
Cd (Dissolved)	mg/tonne	1.71E-02
Ca (Dissolved)	mg/tonne	4.86E+02
Cr (Dissolved)	mg/tonne	6.16E-03
Co (Dissolved)	mg/tonne	1.60E-01
Cu (Dissolved)	mg/tonne	1.47E+00
Fe (Dissolved)	mg/tonne	1.69E-01
Pb (Dissolved)	mg/tonne	1.22E-03
Li (Dissolved)	mg/tonne	2.57E-02
Mg (Dissolved)	mg/tonne	3.66E+02
Mn (Dissolved)	mg/tonne	3.51E+00
Mo (Dissolved)	mg/tonne	6.34E-02
Ni (Dissolved)	mg/tonne	7.65E-02
P (Dissolved)	mg/tonne	2.69E-01
K (Dissolved)	mg/tonne	3.68E+01
Se (Dissolved)	mg/tonne	6.20E-02
Si (Dissolved)	mg/tonne	1.76E+01
Ag (Dissolved)	mg/tonne	2.52E-04
Na (Dissolved)	mg/tonne	2.51E+00
Sr (Dissolved)	mg/tonne	2.04E+00
S (Dissolved)	mg/tonne	5.89E+02
Tl (Dissolved)	mg/tonne	5.10E-04
Sn (Dissolved)	mg/tonne	6.12E-02
Ti (Dissolved)	mg/tonne	2.50E-02
U (Dissolved)	mg/tonne	8.01E-03
V (Dissolved)	mg/tonne	1.23E-02
Zn (Dissolved)	mg/tonne	2.66E+00
Zr (Dissolved)	mg/tonne	4.79E-03
Hg (Dissolved)	mg/tonne	9.59E-05

APPENDIX A3 - UPPER CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 23.2 Out

Parameter	Unit	All					
			01/01/2013	01/01/2013	01/01/2013	01/01/2013	01/01/2013
Physical Tests							
Acidity to pH 4.5 (as CaCO	mg/L		1.00E+06	1.00E+06	0	0	0
Acidity to pH 8.3 (as CaCO	mg/L		1.00E+06	1.00E+06	0	0	0
Alkalinity (Total as CaCO3)	mg/L		2.19E+02	2.19E+02	0	0	0
Hardness as CaCO3 (Dissc	mg/L		1.35E+03	1.35E+03	0	0	0
H+ Concentration	mg/L		3.18E-05	3.18E-05	0	0	0
Dissolved Anions							
Sulphate (Dissolved)	mg/L		1.50E+03	3.64E+03	0	0	0
Chloride (Dissolved)	mg/L		5.29E+01	5.29E+01	0	0	0
Fluoride (Dissolved)	mg/L		7.70E-01	7.70E-01	0	0	0
Nutrient							
Nitrate (Dissolved)	mg/L		1.00E+06	1.00E+06	0	0	0
Ammonia (Dissolved)	mg/L		1.00E+06	1.00E+06	0	0	0
Nitrite (Dissolved)	mg/L		1.00E+06	1.00E+06	0	0	0
Orthophosphate (Dissolved	mg/L		2.07E+06	2.07E+06	0	0	0
Dissolved Metals							
Al (Dissolved)	mg/L		6.55E-01	4.59E-01	0	0	0
Sb (Dissolved)	mg/L		2.00E-01	2.00E-01	0	0	0
As (Dissolved)	mg/L		2.82E-02	2.82E-02	0	0	0
Ba (Dissolved)	mg/L		2.06E-01	2.06E-01	0	0	0
Be (Dissolved)	mg/L		5.00E-03	5.00E-03	0	0	0
Bi (Dissolved)	mg/L		1.00E+06	1.00E+06	0	0	0
B (Dissolved)	mg/L		3.00E-01	3.00E-01	0	0	0
Cd (Dissolved)	mg/L		9.33E-03	8.50E-04	0	0	0
Ca (Dissolved)	mg/L		4.75E+02	4.75E+02	0	0	0
Cr (Dissolved)	mg/L		1.50E-02	1.50E-02	0	0	0
Co (Dissolved)	mg/L		1.21E-01	7.65E-01	0	0	0
Cu (Dissolved)	mg/L		3.58E-02	4.45E+00	0	0	0
Fe (Dissolved)	mg/L		4.38E-05	2.76E-01	0	0	0
Pb (Dissolved)	mg/L		2.85E-03	2.96E-03	0	0	0
Li (Dissolved)	mg/L		1.00E+06	1.00E+06	0	0	0
Mg (Dissolved)	mg/L		1.28E+03	1.28E+03	0	0	0
Mn (Dissolved)	mg/L		8.60E+01	8.60E+01	0	0	0
Mo (Dissolved)	mg/L		6.96E-02	6.96E-02	0	0	0
Ni (Dissolved)	mg/L		1.54E+00	1.57E-01	0	0	0
P (Dissolved)	mg/L		1.00E+06	1.00E+06	0	0	0
K (Dissolved)	mg/L		1.00E+06	1.00E+06	0	0	0
Se (Dissolved)	mg/L		4.94E-01	4.94E-01	0	0	0
Si (Dissolved)	mg/L		1.00E+06	1.00E+06	0	0	0
Ag (Dissolved)	mg/L		4.85E-04	4.85E-04	0	0	0
Na (Dissolved)	mg/L		1.00E+06	1.00E+06	0	0	0
Sr (Dissolved)	mg/L		1.00E+06	1.00E+06	0	0	0
S (Dissolved)	mg/L		1.00E+06	1.00E+06	0	0	0
Tl (Dissolved)	mg/L		2.80E-04	2.80E-04	0	0	0
Sn (Dissolved)	mg/L		1.00E+06	1.00E+06	0	0	0
Ti (Dissolved)	mg/L		1.00E+06	1.00E+06	0	0	0
U (Dissolved)	mg/L		4.50E-02	4.50E-02	0	0	0
V (Dissolved)	mg/L		1.00E+06	1.00E+06	0	0	0
Zn (Dissolved)	mg/L		8.04E-01	5.40E-02	0	0	0
Zr (Dissolved)	mg/L		1.00E+06	1.00E+06	0	0	0
Hg (Dissolved)	mg/L		1.16E-03	1.16E-03	0	0	0

APPENDIX A3 - UPPER CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 25 Out

Parameter	Unit	Year -2 (Coffer	Year -1 (Stage	Year 1 (Stag	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	End
Year		01/01/2013	01/01/2014	01/01/2015	01/01/2016	01/01/2017	01/01/2018	01/01/2019	01/01/2020	01/01/2021	01/01/2022	01/01/2023	01/01/2024	01/01/2025	01/01/2026	01/01/2027	01/01/2028	01/01/2029	01/01/2030	01/01/2031	01/01/2032	01/01/2033	01/01/2034	01/01/2035	01/01/2036	01/01/2037	01/01/2038	01/01/2039	01/01/2040	01/01/2041	01/01/2042	01/01/2043	01/01/2044	01/01/2045	01/01/2046	01/01/2047	31/12/2113
Physical Tests																																					
Acidity to pH 4.5 (as C	mg/L	0.00E+00	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	3.95E+01	2.82E+01	3.43E-01	5.26E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acidity to pH 8.3 (as C	mg/L	0.00E+00	4.41E+01	6.03E+01	5.50E+01	6.73E+01	7.64E+01	8.18E+01	7.74E+01	7.20E+01	6.89E+01	7.28E+01	6.97E+01	7.37E+01	7.69E+01	7.87E+01	9.01E+01	9.23E+01	9.20E+01	9.14E+01	9.12E+01	9.10E+01	9.30E+01	9.43E+01	9.45E+01	8.92E+01	8.31E+01	6.02E+01	2.96E+01	3.60E-01	5.53E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Alkalinity (Total as Ca	mg/L	0.00E+00	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	2.19E+02	1.79E+01	2.75E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hardness as CaCO3 (	mg/L	0.00E+00	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	1.35E+03	5.51E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H+ Concentration	mg/L	0.00E+00	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.59E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dissolved Anions																																					
Sulphate (Dissolved)	mg/L	0.00E+00	2.83E+03	3.64E+03	3.53E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	3.64E+03	1.90E+03	2.31E+01	3.54E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chloride (Dissolved)	mg/L	0.00E+00	4.56E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	5.29E+01	3.06E+01	3.73E-01	5.72E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluoride (Dissolved)	mg/L	0.00E+00	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	7.70E-01	1.25E-02	1.91E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nutrients																																					
Nitrate (Dissolved)	mg/L	0.00E+00	1.04E+02	6.23E+01	4.45E+01	4.04E+01	2.16E+01	1.27E+01	8.96E+00	3.62E+00	6.98E+00	2.17E+01	4.81E+00	9.57E+00	7.56E+00	4.24E+00	2.69E+01	5.26E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.59E+00	3.21E+00	3.55E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia (Dissolved)	mg/L	0.00E+00	1.32E+01	7.88E+00	5.63E+00	5.11E+00	2.74E+00	1.61E+00	1.13E+00	4.57E-01	8.83E-01	2.75E+00	6.09E-01	1.21E+00	9.56E-01	5.37E-01	3.41E+00	6.65E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.80E-01	4.06E-01	4.49E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrite (Dissolved)	mg/L	0.00E+00	2.40E+00	1.43E+00	1.02E+00	9.29E-01	4.98E-01	2.92E-01	2.06E-01	8.32E-02	1.60E-01	5.00E-01	1.11E-01	2.20E-01	1.74E-01	9.76E-02	6.19E-01	1.21E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.05E-01	7.37E-02	8.16E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Orthophosphate (Diss	mg/L	0.00E+00	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	6.20E-01	7.96E-03	1.22E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dissolved Metals																																					
Al (Dissolved)	mg/L	0.00E+00	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	9.86E-03	1.51E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sb (Dissolved)	mg/L	0.00E+00	2.12E-02	2.91E-02	2.65E-02	3.24E-02	3.68E-02	3.94E-02	3.73E-02	3.47E-02	3.32E-02	3.51E-02	3.36E-02	3.55E-02	3.71E-02	3.79E-02	4.34E-02	4.45E-02	4.43E-02	4.41E-02	4.39E-02	4.39E-02	4.48E-02	4.55E-02	4.55E-02	4.30E-02	4.00E-02	2.90E-02	1.43E-02	1.74E-04	2.66E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
As (Dissolved)	mg/L	0.00E+00	1.05E-02	1.44E-02	1.31E-02	1.60E-02	1.82E-02	1.95E-02	1.85E-02	1.72E-02	1.64E-02	1.74E-02	1.66E-02	1.76E-02	1.84E-02	1.88E-02	2.15E-02	2.20E-02	2.19E-02	2.18E-02	2.18E-02	2.17E-02	2.22E-02	2.25E-02	2.25E-02	2.13E-02	1.98E-02	1.44E-02	7.06E-03	8.59E-05	1.32E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ba (Dissolved)	mg/L	0.00E+00	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	2.06E-01	1.47E-01	1.79E-03	2.75E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Be (Dissolved)	mg/L	1.24E-03	1.70E-03	1.55E-03	1.89E-03	2.15E-03	2.30E-03	2.18E-03	2.02E-03	1.94E-03	2.05E-03	1.96E-03	2.07E-03	2.16E-03	2.21E-03	2.53E-03	2.60E-03	2.59E-03	2.57E-03	2.56E-03	2.56E-03	2.61E-03	2.65E-03	2.66E-03	2.51E-03	2.34E-03	2.34E-03	1.69E-03	8.31E-04	1.01E-05	1.55E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bi (Dissolved)	mg/L	0.00E+00	4.49E-04	6.14E-04	5.60E-04	6.85E-04	7.78E-04	8.32E-04	7.88E-04	7.32E-04	7.02E-04	7.41E-04	7.09E-04	7.51E-04	7.83E-04	8.01E-04	9.17E-04	9.40E-04	9.36E-04	9.31E-04	9.28E-04	9.27E-04	9.46E-04	9.60E-04	9.62E-04	9.08E-04	8.46E-04	6.13E-04	3.01E-04	3.67E-06	5.63E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
B (Dissolved)	mg/L	0.00E+00	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.43E-02	5.26E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cd (Dissolved)	mg/L	0.00E+00	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	8.50E-04	2.44E-04	3.75E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ca (Dissolved)	mg/L	0.00E+00	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	4.75E+02	6.95E+00	1.07E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cr (Dissolved)	mg/L	0.00E+00	1.08E-02	1.47E-02	1.34E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.47E-02	7.23E-03	8.80E-05	1.35E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co (Dissolved)	mg/L	0.00E+00	2.81E-01	3.84E-01	3.51E-01	4.29E-01	4.87E-01	5.21E-01	4.93E-01	4.58E-01	4.39E-01	4.64E-01	4.44E-01	4.70E-01	4.90E-01	5.02E-01	5.74E-01	5.88E-01	5.86E-01	5.83E-01	5.81E-01	5.80E-01	5.92E-01	6.01E-01	6.02E-01	5.68E-01	5.29E-01	3.84E-01	1.88E-01	2.29E-03	3.52E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cu (Dissolved)	mg/L	0.00E+00	2.57E+00	3.51E+00	3.20E+00	3.92E+00	4.45E+00	4.45E+00	4.45E+00	4.19E+00	4.01E+00	4.24E+00	4.06E+00	4.29E+00	4.45E+00	4.45E+00	4.45E+00	4.45E+00	4.45E+00	4.45E+00	4.45E+00	4.45E+00	4.45E+00	4.45E+00	4.45E+00	4.45E+00	4.45E+00	3.51E+00	1.72E+00	2.10E-02	3.22E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe (Dissolved)	mg/L	0.00E+00	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	2.76E-01	1.98E-01	2.41E-03	3.70E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pb (Dissolved)	mg/L	0.00E+00	2.13E-03	2.91E-03	2.66E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03	2.91E-03	1.43E-03	1.74E-05	2.67E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Li (Dissolved)	mg/L	0.00E+00	4.51E-02	6.17E-02	5.62E-02	6.88E-02	7.06E-02	7.06E-02	7.06E-02	7.06E-02	7.05E-02	7.06E-02	7.06E-02	7.06E-02	7.06E-02	7.06E-02	7.06E-02	7.06E-02	7.06E-02	7.06E-02	7.06E-02	7.06E-02	7.06E-02	7.06E-02	7.06E-02	7.06E-02	7.06E-02	7.06E-02	6.16E-02	3.02E-02	3.68E-04	5.65E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mg (Dissolved)	mg/L	0.00E+00	6.41E+02	8.78E+02	8.00E+02	9.79E+02	1.11E+03	1.19E+03	1.13E+03	1.05E+03	1.00E+03	1.06E+03	1.01E+03	1.07E+03	1.12E+03	1.15E+03	1.28E+03	1.28E+03	1.28E+03	1.28E+03	1.28E+03	1.28E+03	1.28E+03	1.28E+03	1.28E+03	1.28E+03	1.21E+03	8.76E+02	4.30E+02	5.24E+00	8.04E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mn (Dissolved)	mg/L	0.00E+00	6.15E+00	8.42E+00	7.68E+00	9.38E+00	1.07E+01	1.14E+01	1.08E+01	1.00E+01	9.62E+00	1.02E+01	9.72E+00	1.03E+01	1.07E+01	1.10E+01	1.26E+01	1.29E+01	1.28E+01	1.28E+01	1.27E+01	1.27E+01	1.30E+01	1.32E+01	1.32E+01	1.24E+01	1.16E+01	8.41E+00	4.13E+00	5.02E-02	7.71E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mo (Dissolved)	mg/L	0.00E+00	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	6.96E-02	9.07E-04	1.39E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ni (Dissolved)	mg/L	0.00E+00	1.34E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	8.99E-02	1.09E-03	1.68E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
P (Dissolved)	mg/L	0.00E+00	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.00E-01	3.85E-03	5.91E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
K (Dissolved)	mg/L	0.00E+00	6.44E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	6.71E+01	4.32E+01	5.26E-01	8.07E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Se (Dissolved)	mg/L	0.00E+00	1.09E-01	1.49E-01	1.35E-01	1.66E-01	1.88E-01	2.01E-01	1.91E-01	1.77E-01	1.70E-01	1.79E-01	1.72E-01	1.82E-01	1.89E-01	1.94E-01	2.22E-01	2.27E-01	2.27E-01	2.25E-01	2.25E-01	2.24E-01	2.29E-01	2.32E-01	2.33E-01	2.20E-01	2.05E-01	1.48E-01	7.28E-02	8.87E-04	1.36E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Si (Dissolved)	mg/L	0.00E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	4.52E+00	2.51E-01	3.85E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ag (Dissolved)	mg/L	0.00E+00	4.42E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	4.85E-04	2.96E-04	3.61E-06	5.54E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Na (Dissolved)	mg/L	0.00E+00	4.40E+00	6.02E+00	5.49E+00	6.71E+00	7.62E+00	8.15E+00	7.72E+00	7.17E+00	6.87E+00	7.26E+00	6.95E+00	7.35E+00	7.67E+00	7.85E+00	8.98E+00	9.21E+00	9.17E+00	9.12E+00	9.09E+00	9.08E+00	9.27E+00	9.41E+00	9.42E+00	8.89E+00	8.28E+00	6.01E+00	2.95E+00	3.59E-02	5.51E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sr (Dissolved)	mg/L	0.00E+00	3.58E+00	4.90E+00	4.46E+00	5.46E+00	6.20E+00	6.64E+00	6.28E+00	5.84E+00	5.59E+00	5.91E+00	5.66E+00	5.98E+00	6.24E+00	6.39E+00	7.31E+00	7.49E+00	7.47E+00	7.43E+00	7.40E+00	7.39E+00	7.55E+00	7.66E+00	7.67E+00	7.24E+00	6.74E+00	4.89E+00	2.40E+00	2.92E-02	4.49E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
S (Dissolved)	mg/L	0.00E+00	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	5.18E+02	8.42E+00	1.29E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tl (Dissolved)	mg/L	0.00E+00	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	2.80E-04	7.29E-06	1.12E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sn (Dissolved)	mg/L	0.00E+00	1.07E-01	1.47E-01	1.34E-01	1.64E-01	1.86E-01	1.99E-01	1.88E-01	1.75E-01	1.68E-01	1.77E-01	1.69E-01	1.79E-01	1.87E-01	1.91E-01	2.19E-01	2.25E-01	2.24E-01	2.22E-01	2.22E-01	2.21E-01	2.26E-01	2.29E-01	2.30E-01	2.17E-01	2.02E-01	1.46E-01	7.19E-02	8.76E-04	1.34E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ti (Dissolved)	mg/L	0.00E+00	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	3.57E-04	5.48E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
U (Dissolved)	mg/L	0.00E+00	1.40E-02	1.92E-02	1.75E-02	2.14E-02	2.43E-02	2.60E-02	2.46E-02	2.29E-02	2.19E-02	2.32E-02	2.22E-02	2.34E-02	2.45E-02	2.50E-02	2.87E-02	2.94E-02	2.93E-02	2.91E-02	2.90E-02	2.89E-02	2.96E-02	3.00E-02	3.00E-02	2.84E-02	2.64E-02	1.92E-02	9.41E-03	1.15E-04	1.76E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
V (Dissolved)	mg/L	0.00E+00	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	2.50E-03	1.76E-04	2.71E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zn (Dissolved)	mg/L	0.00E+00	5.40E-02	5.40E-02

APPENDIX A3 - UPPER CASE GEOCHEMICAL SOURCE TERMS
HARPER CREEK PROJECT
TABLE Term 23 Out

Parameter	Unit		Year -2 (Coffer	Year -1 (Stage	Year 1 (Stag	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	End
Year			01/01/2013	01/01/2014	01/01/2015	01/01/2016	01/01/2017	01/01/2018	01/01/2019	01/01/2020	01/01/2021	01/01/2022	01/01/2023	01/01/2024	01/01/2025	01/01/2026	01/01/2027	01/01/2028	01/01/2029	01/01/2030	01/01/2031	01/01/2032	01/01/2033	01/01/2034	01/01/2035	01/01/2036	01/01/2037	01/01/2038	01/01/2039	01/01/2040	01/01/2041	01/01/2042	01/01/2043	01/01/2044	01/01/2045	01/01/2046	01/01/2047	31/12/2113
Physical Tests																																						
Acidity to pH 4.5 (as C	mg/t		0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.88E+03	2.50E+03	3.13E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+04	1.06E+04	1.13E+04	1.19E+04	1.25E+04	0.00E+00	0.00E+00	1.44E+04	1.50E+04	1.56E+04	1.63E+04	1.69E+04	1.75E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acidity to pH 8.3 (as C	mg/t		0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.97E+03	2.63E+03	3.29E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.05E+04	1.12E+04	1.18E+04	1.25E+04	1.31E+04	0.00E+00	0.00E+00	1.51E+04	1.58E+04	1.64E+04	1.71E+04	1.77E+04	1.84E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Alkalinity (Total as Ca	mg/t		0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.80E+04	1.31E+05	1.63E+05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.06E+05	4.06E+05	4.06E+05	4.06E+05	4.06E+05	0.00E+00	0.00E+00	4.06E+05	4.06E+05	4.06E+05	4.06E+05	4.06E+05	4.06E+05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hardness as CaCO3 (	mg/t		0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.96E+05	2.62E+05	3.27E+05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.05E+06	1.11E+06	1.18E+06	1.24E+06	1.31E+06	0.00E+00	0.00E+00	1.51E+06	1.57E+06	1.64E+06	1.70E+06	1.77E+06	1.83E+06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H+ Concentration	mg/t		0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.18E-05	3.18E-05	3.18E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	0.00E+00	0.00E+00	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	3.18E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dissolved Anions																																						
Sulphate (Dissolved)	mg/t		0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.26E+05	1.68E+05	2.11E+05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.74E+05	7.16E+05	7.58E+05	8.00E+05	8.42E+05	0.00E+00	0.00E+00	9.68E+05	1.01E+06	1.05E+06	1.09E+06	1.14E+06	1.18E+06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chloride (Dissolved)	mg/t		0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.04E+03	2.72E+03	3.40E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.09E+04	1.16E+04	1.22E+04	1.29E+04	1.36E+04	0.00E+00	0.00E+00	1.56E+04	1.63E+04	1.70E+04	1.77E+04	1.84E+04	1.90E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluoride (Dissolved)	mg/t		0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.82E+01	9.10E+01	1.14E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.64E+02	3.87E+02	4.09E+02	4.32E+02	4.55E+02	0.00E+00	0.00E+00	5.23E+02	5.46E+02	5.68E+02	5.91E+02	6.14E+02	6.37E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nutrients																																						
Nitrate (Dissolved)		0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

APPENDIX B

EXPECTED CASE CONCENTRATION SUMMARY STATISTICS

Appendix B1 Tailings Management Facility (TMF)
Appendix B2 Open Pit (OP)
Appendix B3 P-Creek
Appendix B4 T-Creek
Appendix B5 Harper Creek Below P-Creek (HP)
Appendix B6 Mid Harper Creek (HM)
Appendix B7 Harper Creek Below T-Creek (HT)
Appendix B8 Harper Creek Above Barrière River (HB)
Appendix B9 Mid Baker Creek (BK1)
Appendix B10 Baker Creek Above North Thompson River (BK0)
Appendix B11 Jones Creek Above North Thompson River (J1)

APPENDIX B1

TAILINGS MANAGEMENT FACILITY (TMF)

(Pages B1-1 to B1-4)

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TABLE B1.1

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

SUMMARY STATISTICS - TMF
OPERATIONS PHASE I

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		Operations Phase I (Years 0 through 23.5) - Regular Ore Processing									
Parameter	Unit	Minimum	10th Percentile	25th Percentile	Median	Mean	75th Percentile	90th Percentile	Maximum	Standard Deviation	Coefficient of Variation
Hardness, Dissolved Anions and Nutrients											
Model Hardness	mg/L CaCO3	23.3	35.3	39.4	43.2	41.7	45.2	46.0	47.1	4.6	0.1
Baseline Hardness	mg/L CaCO3	24.48	27.64	33.62	40.70	38.12	43.00	43.30	45.30	6.35	0.17
SO4	mg/L	22.00	108.22	166.70	215.21	197.80	244.81	260.90	269.21	60.81	0.31
Cl	mg/L	1.00	2.23	3.17	3.95	3.64	4.32	4.50	4.59	0.90	0.25
F	mg/L	0.043	0.093	0.127	0.157	0.145	0.174	0.177	0.178	0.034	0.23
Hardness	mg/L	23.3	35.3	39.4	43.2	41.7	45.2	46.0	47.1	4.6	0.11
Orthophosphate	mg/L	0.0023	0.0024	0.0025	0.0026	0.0027	0.0027	0.0030	0.0045	0.0003	0.12
N as NO3	mg/L	1.125	2.332	2.577	2.918	2.838	3.240	3.303	3.387	0.451	0.16
Dissolved Metals											
Al - D	mg/L	0.021	0.022	0.022	0.023	0.023	0.024	0.024	0.024	0.001	0.04
Cd - D	mg/L	0.0000128	0.0000402	0.0000576	0.0000595	0.0000576	0.0000640	0.0000684	0.0000693	0.0000116	0.20
Fe - D	mg/L	0.0007	0.0028	0.0041	0.0050	0.0044	0.0050	0.0050	0.0050	0.0010	0.22
Total Metals											
Al - T	mg/L	0.032	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.000	0.01
Sb - T	mg/L	0.00019	0.00074	0.00144	0.00222	0.00204	0.00274	0.00298	0.00310	0.00082	0.40
As - T	mg/L	0.00039	0.00104	0.00176	0.00250	0.00227	0.00291	0.00304	0.00309	0.00075	0.33
Ba - T	mg/L	0.0086	0.0115	0.0138	0.0157	0.0149	0.0165	0.0167	0.0169	0.0021	0.14
Be - T	mg/L	0.000024	0.000026	0.000030	0.000031	0.000030	0.000032	0.000032	0.000032	0.000002	0.07
Bi - T	mg/L	0.000059	0.000079	0.000087	0.000093	0.000090	0.000096	0.000097	0.000098	0.000007	0.08
B - T	mg/L	0.048	0.059	0.076	0.085	0.080	0.087	0.088	0.090	0.011	0.14
Cd - T	mg/L	0.0000136	0.000042	0.000060	0.000062	0.000060	0.000067	0.000071	0.000072	0.000012	0.20
Ca - T	mg/L	12.7	19.9	27.4	33.9	31.4	36.9	37.7	38.1	6.8	0.22
Cr - T	mg/L	0.00014	0.00019	0.00024	0.00027	0.00026	0.00029	0.00029	0.00030	0.00004	0.16
Co - T	mg/L	0.000572	0.003708	0.004737	0.005194	0.004872	0.005417	0.005784	0.005941	0.001049	0.22
Cu - T	mg/L	0.00102	0.00379	0.00563	0.00588	0.00563	0.00628	0.00680	0.00687	0.00120	0.21
Fe - T	mg/L	0.0010	0.0050	0.0050	0.0050	0.0049	0.0050	0.0050	0.0050	0.0005	0.11
Pb - T	mg/L	0.000055	0.000088	0.000112	0.000134	0.000127	0.000147	0.000149	0.000151	0.000023	0.18
Li - T	mg/L	0.00126	0.00391	0.00600	0.00775	0.00711	0.00877	0.00906	0.00914	0.00202	0.28
Mg - T	mg/L	5.90	13.13	20.34	26.84	24.44	30.03	30.89	31.37	6.82	0.28
Mn - T	mg/L	0.00643	0.02451	0.03702	0.04223	0.04030	0.04863	0.05212	0.05285	0.01071	0.27
Hg - T	mg/L	0.0000038	0.0000040	0.0000042	0.0000045	0.0000047	0.0000049	0.0000056	0.0000095	0.0000009	0.18
Mo - T	mg/L	0.00141	0.00366	0.00682	0.00950	0.00863	0.01096	0.01174	0.01212	0.00294	0.34
Ni - T	mg/L	0.00043	0.00126	0.0019	0.0023	0.0022	0.0026	0.0027	0.0028	0.00058	0.27
P - T	mg/L	0.088	0.095	0.102	0.114	0.119	0.128	0.150	0.266	0.027	0.23
K - T	mg/L	0.88	2.45	3.64	4.54	4.26	5.22	5.54	5.70	1.20	0.28
Se - T	mg/L	0.000647	0.003658	0.006656	0.009760	0.009518	0.013162	0.014634	0.015470	0.004047	0.43
Si - T	mg/L	3.02	3.16	3.27	3.38	3.35	3.44	3.48	3.84	0.14	0.04
Ag - T	mg/L	0.0000080	0.0000135	0.0000189	0.0000240	0.000022	0.000026	0.000027	0.000028	0.000005	0.23
Na - T	mg/L	1.34	1.66	1.93	2.22	2.17	2.51	2.56	2.57	0.34	0.16
Sr - T	mg/L	0.066	0.200	0.367	0.563	0.541	0.747	0.816	0.849	0.225	0.42
S - T	mg/L	6.86	7.08	7.20	7.39	7.40	7.50	7.61	10.05	0.40	0.05
Tl - T	mg/L	0.000006	0.000014	0.000020	0.000025	0.000023	0.000028	0.000029	0.000029	0.000006	0.25
Sn - T	mg/L	0.00026	0.00034	0.00048	0.00049	0.00046	0.00050	0.00051	0.00052	0.00006	0.14
Ti - T	mg/L	0.0019	0.0022	0.0024	0.0026	0.0025	0.0027	0.0027	0.0027	0.0002	0.08
U - T	mg/L	0.00029	0.00058	0.00092	0.00133	0.00131	0.00177	0.00194	0.00203	0.00050	0.38
V - T	mg/L	0.00032	0.00035	0.00042	0.00045	0.00043	0.00045	0.00046	0.00046	0.00004	0.09
Zn - T	mg/L	0.0015	0.0053	0.0073	0.0075	0.0073	0.0081	0.0085	0.0087	0.0014	0.19
Zr - T	mg/L	0.00021	0.00022	0.00022	0.00022	0.00023	0.00023	0.00024	0.00033	0.00002	0.07

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NOTES:

1. UNITS ARE IN mg/L UNLESS OTHERWISE STATED.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT VA101-458/14-3	EJA	JEM	KJB

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TABLE B1.2

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

SUMMARY STATISTICS - TMF
OPERATIONS PHASE II

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		Operations Phase II (Years 23.5 through 28) - LGO Processing to Open Pit									
Parameter	Unit	Minimum	10th Percentile	25th Percentile	Median	Mean	75th Percentile	90th Percentile	Maximum	Standard Deviation	Coefficient of Variation
Hardness, Dissolved Anions and Nutrients											
Model Hardness	mg/L CaCO3	44.51	46.67	48.06	56.22	56.39	63.06	69.47	70.91	8.45	0.15
Baseline Hardness	mg/L CaCO3	24.48	27.64	36.75	40.64	38.16	42.65	43.30	45.30	6.11	0.16
SO4	mg/L	243.25	247.94	253.60	263.09	262.15	270.35	272.70	275.31	9.50	0.04
Cl	mg/L	4.15	4.25	4.34	4.63	4.56	4.79	4.82	4.84	0.22	0.05
F	mg/L	0.144	0.150	0.154	0.172	0.171	0.186	0.195	0.197	0.017	0.10
Hardness	mg/L	44.5	46.7	48.1	56.2	56.4	63.1	69.5	70.9	8.5	0.15
Orthophosphate	mg/L	0.0033	0.0034	0.0035	0.0041	0.0041	0.0045	0.0050	0.0051	0.0006	0.14
N as NO3	mg/L	1.582	1.684	1.759	2.146	2.078	2.363	2.451	2.547	0.304	0.15
Dissolved Metals											
Al - D	mg/L	0.020	0.020	0.021	0.022	0.022	0.023	0.024	0.024	0.001	0.05
Cd - D	mg/L	0.0000529	0.0000543	0.0000558	0.0000607	0.0000602	0.0000643	0.0000660	0.0000667	0.0000044	0.07
Fe - D	mg/L	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0000	0.00
Total Metals											
Al - T	mg/L	0.031	0.031	0.032	0.034	0.033	0.034	0.034	0.034	0.001	0.03
Sb - T	mg/L	0.0029	0.0029	0.0030	0.0031	0.0031	0.0032	0.0032	0.0032	0.00011	0.04
As - T	mg/L	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.00023	0.08
Ba - T	mg/L	0.014	0.015	0.015	0.017	0.016	0.018	0.018	0.018	0.0013	0.08
Be - T	mg/L	0.000026	0.000026	0.000027	0.000029	0.000028	0.000030	0.000031	0.000032	0.000002	0.07
Bi - T	mg/L	0.00008	0.00008	0.00009	0.00009	0.00009	0.00010	0.00010	0.00010	0.000005	0.06
B - T	mg/L	0.07	0.07	0.07	0.08	0.08	0.09	0.09	0.09	0.008	0.10
Cd - T	mg/L	0.00005	0.00006	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00000	0.08
Ca - T	mg/L	32.8	33.9	34.8	38.7	38.2	41.4	42.6	42.8	3.3	0.09
Cr - T	mg/L	0.00020	0.00021	0.00021	0.00024	0.00024	0.00027	0.00029	0.00029	0.00003	0.12
Co - T	mg/L	0.005	0.005	0.005	0.006	0.005	0.006	0.006	0.006	0.000361	0.07
Cu - T	mg/L	0.00579	0.00596	0.00611	0.00665	0.00659	0.00705	0.00725	0.00732	0.00048	0.07
Fe - T	mg/L	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0000	0.00
Pb - T	mg/L	0.000122	0.000124	0.000128	0.000141	0.000140	0.000151	0.000156	0.000157	0.000012	0.08
Li - T	mg/L	0.00747	0.00772	0.00793	0.00880	0.00871	0.00942	0.00978	0.00989	0.00077	0.09
Mg - T	mg/L	26.26	27.17	27.91	31.03	30.63	33.30	34.12	34.35	2.66	0.09
Mn - T	mg/L	0.04879	0.05021	0.05142	0.05596	0.05545	0.05915	0.06100	0.06152	0.00401	0.07
Hg - T	mg/L	0.0000049	0.0000051	0.0000052	0.0000057	0.0000057	0.0000061	0.0000064	0.0000065	0.0000005	0.09
Mo - T	mg/L	0.01298	0.01332	0.01363	0.01481	0.01462	0.01559	0.01591	0.01602	0.00098	0.07
Ni - T	mg/L	0.002493	0.002552	0.002613	0.002783	0.002749	0.002886	0.002915	0.002933	0.000139	0.05
P - T	mg/L	0.083	0.084	0.085	0.087	0.087	0.088	0.090	0.091	0.002	0.02
K - T	mg/L	5.26	5.36	5.48	5.69	5.68	5.88	5.93	5.97	0.22	0.04
Se - T	mg/L	0.014	0.014	0.014	0.015	0.015	0.016	0.016	0.016	0.001	0.04
Si - T	mg/L	2.92	2.98	3.03	3.28	3.26	3.44	3.58	3.59	0.22	0.07
Ag - T	mg/L	0.00003	0.00003	0.00003	0.00003	0.00003	0.00003	0.00003	0.00003	0.0000020	0.07
Na - T	mg/L	2.22	2.27	2.32	2.51	2.49	2.65	2.75	2.77	0.18	0.07
Sr - T	mg/L	0.809	0.824	0.841	0.882	0.873	0.906	0.915	0.919	0.035	0.04
S - T	mg/L	6.23	6.44	6.58	7.40	7.41	8.06	8.70	8.83	0.83	0.11
Tl - T	mg/L	0.000026	0.000026	0.000027	0.000029	0.000028	0.000030	0.000030	0.000030	0.000001	0.05
Sn - T	mg/L	0.00037	0.00038	0.00039	0.00044	0.00043	0.00047	0.00049	0.00050	0.00004	0.10
Ti - T	mg/L	0.0023	0.0023	0.0024	0.0026	0.0026	0.0027	0.0028	0.0028	0.0002	0.07
U - T	mg/L	0.0019	0.0019	0.0020	0.0020	0.0020	0.0021	0.0021	0.0021	0.00006	0.03
V - T	mg/L	0.0004	0.0004	0.0004	0.0004	0.0004	0.0005	0.0005	0.0005	0.00004	0.09
Zn - T	mg/L	0.0062	0.0064	0.0066	0.0074	0.0073	0.0080	0.0084	0.0085	0.0007	0.10
Zr - T	mg/L	0.00022	0.00023	0.00023	0.00023	0.00023	0.00023	0.00024	0.00024	0.00000	0.02

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NOTES:

1. UNITS ARE IN mg/L UNLESS OTHERWISE STATED.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT VA101-458/14-3	EJA	JEM	KJB

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TABLE B1.3

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

SUMMARY STATISTICS - TMF
CLOSURE

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		Closure (Years 29 through 35)									
Parameter	Unit	Minimum	10th Percentile	25th Percentile	Median	Mean	75th Percentile	90th Percentile	Maximum	Standard Deviation	Coefficient of Variation
Hardness, Dissolved Anions and Nutrients											
Model Hardness	mg/L CaCO3	31.7	33.0	34.5	36.6	37.2	39.7	42.1	44.5	3.7	0.1
Baseline Hardness	mg/L CaCO3	24.48	27.64	35.71	40.67	38.12	42.74	43.30	45.30	6.33	0.17
SO4	mg/L	211.25	214.01	216.97	221.07	223.68	229.24	236.05	242.99	8.78	0.04
Cl	mg/L	3.51	3.57	3.64	3.72	3.77	3.88	4.01	4.15	0.18	0.05
F	mg/L	0.113	0.116	0.119	0.124	0.126	0.132	0.138	0.144	0.009	0.07
Hardness	mg/L	31.7	33.0	34.5	36.6	37.2	39.7	42.1	44.5	3.7	0.10
Orthophosphate	mg/L	0.0024	0.0025	0.0026	0.0027	0.0028	0.0030	0.0031	0.0033	0.0003	0.09
N as NO3	mg/L	0.995	1.052	1.117	1.217	1.245	1.361	1.469	1.579	0.167	0.13
Dissolved Metals											
Al - D	mg/L	0.018	0.018	0.018	0.019	0.019	0.019	0.020	0.020	0.001	0.04
Cd - D	mg/L	0.0000430	0.0000439	0.0000449	0.0000463	0.0000470	0.0000488	0.0000508	0.0000528	0.0000028	0.06
Fe - D	mg/L	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0000	0.00
Total Metals											
Al - T	mg/L	0.028	0.028	0.028	0.029	0.029	0.030	0.030	0.031	0.001	0.03
Sb - T	mg/L	0.00254	0.00257	0.00260	0.00264	0.00267	0.00272	0.00280	0.00287	0.00009	0.03
As - T	mg/L	0.00222	0.00227	0.00231	0.00238	0.00241	0.00250	0.00260	0.00269	0.00013	0.05
Ba - T	mg/L	0.0116	0.0118	0.0122	0.0126	0.0127	0.0133	0.0138	0.0143	0.0008	0.06
Be - T	mg/L	0.000023	0.000023	0.000023	0.000024	0.000024	0.000024	0.000025	0.000026	0.000001	0.03
Bi - T	mg/L	0.000077	0.000077	0.000078	0.000079	0.000079	0.000080	0.000082	0.000083	0.000002	0.02
B - T	mg/L	0.054	0.056	0.057	0.060	0.061	0.064	0.067	0.070	0.005	0.07
Cd - T	mg/L	0.00004	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00000	0.06
Ca - T	mg/L	25.9	26.5	27.3	28.3	28.8	30.1	31.4	32.8	2.0	0.07
Cr - T	mg/L	0.00015	0.00016	0.00016	0.00017	0.00017	0.00018	0.00019	0.00020	0.00001	0.08
Co - T	mg/L	0.00313	0.00328	0.0035	0.0037	0.0038	0.0041	0.0044	0.0047	0.0005	0.12
Cu - T	mg/L	0.00472	0.00482	0.00493	0.00508	0.00515	0.00536	0.00557	0.00579	0.00030	0.06
Fe - T	mg/L	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0000	0.00
Pb - T	mg/L	0.00010	0.00010	0.00011	0.00011	0.00011	0.00011	0.00012	0.00012	0.000006	0.05
Li - T	mg/L	0.00596	0.00610	0.00625	0.00648	0.00657	0.00686	0.00716	0.00746	0.00043	0.06
Mg - T	mg/L	20.64	21.16	21.75	22.62	22.96	24.05	25.13	26.23	1.59	0.07
Mn - T	mg/L	0.03956	0.04044	0.04140	0.04275	0.04334	0.04507	0.04686	0.04875	0.00260	0.06
Hg - T	mg/L	0.000004	0.000004	0.000004	0.000004	0.000004	0.000005	0.000005	0.000005	0.000000	0.05
Mo - T	mg/L	0.011	0.011	0.011	0.012	0.012	0.012	0.013	0.013	0.001	0.05
Ni - T	mg/L	0.0021	0.0021	0.0022	0.0022	0.0023	0.0023	0.0024	0.0025	0.0001	0.05
P - T	mg/L	0.077	0.078	0.079	0.080	0.080	0.081	0.083	0.084	0.002	0.02
K - T	mg/L	4.44	4.52	4.60	4.71	4.77	4.92	5.08	5.25	0.23	0.05
Se - T	mg/L	0.0108	0.0111	0.0114	0.0119	0.0120	0.0126	0.0132	0.0138	0.0009	0.07
Si - T	mg/L	2.43	2.49	2.54	2.62	2.65	2.74	2.83	2.92	0.14	0.05
Ag - T	mg/L	0.000021	0.000021	0.000022	0.000023	0.000023	0.000024	0.000025	0.000026	0.000001	0.06
Na - T	mg/L	1.79	1.83	1.88	1.94	1.97	2.05	2.13	2.22	0.12	0.06
Sr - T	mg/L	0.690	0.701	0.713	0.729	0.738	0.759	0.784	0.810	0.033	0.05
S - T	mg/L	4.92	5.06	5.21	5.41	5.49	5.74	5.98	6.23	0.37	0.07
Tl - T	mg/L	0.000022	0.000022	0.000023	0.000023	0.000023	0.000024	0.000025	0.000026	0.000001	0.05
Sn - T	mg/L	0.00028	0.00029	0.00030	0.00032	0.00032	0.00034	0.00035	0.00037	0.00002	0.08
Ti - T	mg/L	0.0020	0.0021	0.0021	0.0021	0.0021	0.0022	0.0022	0.0023	0.0001	0.03
U - T	mg/L	0.00161	0.00164	0.00167	0.00171	0.00173	0.00179	0.00185	0.00192	0.00009	0.05
V - T	mg/L	0.00031	0.00032	0.00033	0.00034	0.00034	0.00035	0.00037	0.00038	0.00002	0.06
Zn - T	mg/L	0.0048	0.0050	0.0051	0.0053	0.0054	0.0057	0.0059	0.0062	0.0004	0.07
Zr - T	mg/L	0.00022	0.00022	0.00023	0.00023	0.00023	0.00023	0.00023	0.00023	0.00000	0.01

M:\1\01\00458\14\A\Report\3 - Water Quality Predictions\Rev 0\Appendices\Appendix C - Expected Case Concentration Graphs\[APPENDIX C1 HC_019 TMF (EC).xlsx]Appendix B

NOTES:

1. UNITS ARE IN mg/L UNLESS OTHERWISE STATED.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT VA101-458/14-3	EJA	JEM	KJB

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TABLE B1.4

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

SUMMARY STATISTICS - TMF
CLOSURE AND POST-CLOSURE

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		Post-Closure (Years 36 +)									
Parameter	Unit	Minimum	10th Percentile	25th Percentile	Median	Mean	75th Percentile	90th Percentile	Maximum	Standard Deviation	Coefficient of Variation
Hardness, Dissolved Anions and Nutrients											
Model Hardness	mg/L CaCO3	30.2	32.5	36.4	44.1	43.7	51.4	54.0	55.2	7.9	0.2
Baseline Hardness	mg/L CaCO3	24.48	27.64	34.67	40.64	38.12	42.83	43.30	45.30	6.30	0.17
SO4	mg/L	179.78	181.66	183.29	188.00	191.02	198.02	205.21	212.16	8.98	0.05
Cl	mg/L	2.86	2.92	2.99	3.17	3.20	3.43	3.53	3.55	0.23	0.07
F	mg/L	0.074	0.077	0.083	0.096	0.097	0.113	0.117	0.118	0.015	0.15
Hardness	mg/L	30.2	32.5	36.4	44.1	43.7	51.4	54.0	55.2	7.9	0.18
Orthophosphate	mg/L	0.0024	0.0028	0.0032	0.0039	0.0039	0.0046	0.0049	0.0050	0.0007	0.19
N as NO3	mg/L	0.040	0.047	0.066	0.137	0.245	0.346	0.653	0.994	0.241	0.98
Dissolved Metals											
Al - D	mg/L	0.018	0.023	0.027	0.029	0.028	0.030	0.030	0.031	0.003	0.11
Cd - D	mg/L	0.0000430	0.0000580	0.0000670	0.0000858	0.0000851	0.0001038	0.0001105	0.0001129	0.0000194	0.23
Fe - D	mg/L	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0000	0.00
Total Metals											
Al - T	mg/L	0.028	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.001	0.03
Sb - T	mg/L	0.00220	0.00223	0.00225	0.00231	0.00234	0.00242	0.00249	0.00255	0.00010	0.04
As - T	mg/L	0.00186	0.00190	0.00195	0.00209	0.00210	0.00226	0.00231	0.00233	0.00016	0.07
Ba - T	mg/L	0.0094	0.0096	0.0099	0.0107	0.0108	0.0117	0.0120	0.0121	0.0009	0.08
Be - T	mg/L	0.000023	0.000023	0.000024	0.000025	0.000025	0.000026	0.000027	0.000027	0.000001	0.05
Bi - T	mg/L	0.000074	0.000075	0.000076	0.000078	0.000078	0.000080	0.000081	0.000082	0.000002	0.03
B - T	mg/L	0.036	0.037	0.038	0.043	0.044	0.050	0.053	0.055	0.006	0.14
Cd - T	mg/L	0.00004	0.00006	0.00007	0.00009	0.00009	0.00011	0.00011	0.00011	0.00002	0.23
Ca - T	mg/L	24.6	24.9	25.4	26.6	26.6	27.8	28.3	28.6	1.3	0.05
Cr - T	mg/L	0.00015	0.00015	0.00015	0.00016	0.00017	0.00017	0.00018	0.00019	0.00001	0.07
Co - T	mg/L	0.00078	0.00085	0.0010	0.0014	0.0016	0.0021	0.0027	0.0031	0.0007	0.43
Cu - T	mg/L	0.00360	0.00371	0.00390	0.00434	0.00436	0.00486	0.00500	0.00505	0.00049	0.11
Fe - T	mg/L	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0000	0.00
Pb - T	mg/L	0.00010	0.00011	0.00011	0.00011	0.00011	0.00011	0.00011	0.00011	0.000002	0.02
Li - T	mg/L	0.00433	0.00446	0.00468	0.00519	0.00525	0.00588	0.00607	0.00612	0.00060	0.11
Mg - T	mg/L	20.30	20.61	21.03	22.04	22.07	23.13	23.59	23.83	1.10	0.05
Mn - T	mg/L	0.02888	0.03022	0.03275	0.03843	0.03812	0.04362	0.04542	0.04602	0.00566	0.15
Hg - T	mg/L	0.000004	0.000005	0.000005	0.000006	0.000006	0.000006	0.000007	0.000007	0.000001	0.11
Mo - T	mg/L	0.009	0.009	0.010	0.011	0.011	0.013	0.013	0.013	0.001	0.12
Ni - T	mg/L	0.0019	0.0019	0.0020	0.0021	0.0021	0.0023	0.0023	0.0024	0.0002	0.07
P - T	mg/L	0.068	0.069	0.069	0.071	0.072	0.074	0.076	0.078	0.003	0.04
K - T	mg/L	3.44	3.50	3.58	3.79	3.86	4.12	4.33	4.47	0.31	0.08
Se - T	mg/L	0.0065	0.0066	0.0067	0.0071	0.0076	0.0082	0.0095	0.0108	0.0011	0.15
Si - T	mg/L	2.11	2.18	2.29	2.53	2.52	2.75	2.83	2.87	0.24	0.10
Ag - T	mg/L	0.000020	0.000020	0.000021	0.000022	0.000022	0.000024	0.000024	0.000025	0.000001	0.06
Na - T	mg/L	1.24	1.28	1.34	1.48	1.51	1.70	1.78	1.81	0.19	0.12
Sr - T	mg/L	0.551	0.561	0.574	0.610	0.618	0.664	0.688	0.695	0.047	0.08
S - T	mg/L	3.15	3.37	3.77	4.67	4.62	5.50	5.76	5.86	0.89	0.19
Tl - T	mg/L	0.000021	0.000021	0.000022	0.000022	0.000022	0.000023	0.000023	0.000023	0.000001	0.03
Sn - T	mg/L	0.00025	0.00027	0.00031	0.00039	0.00039	0.00048	0.00050	0.00052	0.00009	0.22
Ti - T	mg/L	0.0021	0.0023	0.0023	0.0024	0.0024	0.0024	0.0024	0.0025	0.0001	0.03
U - T	mg/L	0.00121	0.00123	0.00124	0.00129	0.00133	0.00140	0.00150	0.00161	0.00010	0.08
V - T	mg/L	0.00031	0.00042	0.00046	0.00046	0.00046	0.00048	0.00048	0.00048	0.00003	0.07
Zn - T	mg/L	0.0048	0.0063	0.0073	0.0093	0.0092	0.0112	0.0120	0.0122	0.0021	0.23
Zr - T	mg/L	0.00023	0.00025	0.00026	0.00026	0.00026	0.00027	0.00027	0.00027	0.00001	0.03

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NOTES:

1. UNITS ARE IN mg/L UNLESS OTHERWISE STATED.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT VA101-458/14-3	EJA	JEM	KJB

APPENDIX B2

OPEN PIT (OP)

(Pages B2-1 to B2-4)

Knight Piésold CONSULTING

TABLE B2.1

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

SUMMARY STATISTICS - OPEN PIT
OPERATIONS PHASE I

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		Operations Phase I (Years 0 through 23.5) - Regular Ore Processing									
Parameter	Unit	Minimum	10th Percentile	25th Percentile	Median	Mean	75th Percentile	90th Percentile	Maximum	Standard Deviation	Coefficient of Variation
Hardness, Dissolved Anions and Nutrients											
Model Hardness	mg/L CaCO3	5.9	20.7	42.0	233.0	159.5	233.0	233.0	949.5	103.4	0.6
Baseline Hardness	mg/L CaCO3	24.48	27.64	33.62	40.70	38.12	43.00	43.30	45.30	6.35	0.17
SO4	mg/L	23.27	79.90	79.90	79.90	117.09	193.59	211.03	226.28	58.32	0.50
Cl	mg/L	0.42	0.80	0.80	0.80	2.88	6.63	7.52	10.23	2.87	1.00
F	mg/L	0.075	0.204	0.250	0.620	0.470	0.620	0.620	1.137	0.188	0.40
Hardness	mg/L	5.9	20.7	42.0	233.0	159.5	233.0	233.0	949.5	103.4	0.65
Orthophosphate	mg/L	0.0001	0.0002	0.0005	0.0025	0.0020	0.0025	0.0025	0.0920	0.0056	2.77
N as NO3	mg/L	0.000	0.001	0.002	0.010	0.007	0.010	0.010	0.010	0.004	0.58
Dissolved Metals											
Al - D	mg/L	0.004	0.004	0.004	0.004	0.013	0.027	0.031	0.106	0.013	0.96
Cd - D	mg/L	0.0000040	0.0000070	0.0000070	0.0000070	0.0000279	0.0000627	0.0000751	0.0000796	0.0000287	1.03
Fe - D	mg/L	0.0117	0.0289	0.0553	0.2870	0.1948	0.2870	0.2870	0.2870	0.1109	0.57
Total Metals											
Al - T	mg/L	0.016	0.034	0.037	0.053	0.046	0.053	0.053	0.146	0.011	0.24
Sb - T	mg/L	0.00022	0.00070	0.00070	0.00070	0.00118	0.00209	0.00231	0.00483	0.00073	0.62
As - T	mg/L	0.00096	0.00393	0.00439	0.00580	0.00508	0.00580	0.00580	0.01320	0.00120	0.24
Ba - T	mg/L	0.0060	0.0263	0.0288	0.0336	0.0307	0.0336	0.0336	0.1078	0.0074	0.24
Be - T	mg/L	0.000013	0.000047	0.000050	0.000050	0.000048	0.000050	0.000050	0.000137	0.000009	0.19
Bi - T	mg/L	0.000030	0.000083	0.000102	0.000250	0.000189	0.000250	0.000250	0.000257	0.000074	0.39
B - T	mg/L	0.014	0.014	0.014	0.014	0.096	0.236	0.270	0.510	0.110	1.15
Cd - T	mg/L	0.0000077	0.000025	0.000025	0.000025	0.000040	0.000068	0.000077	0.000081	0.000023	0.57
Ca - T	mg/L	10.6	33.4	33.4	33.4	57.1	102.7	113.4	199.9	35.6	0.62
Cr - T	mg/L	0.00019	0.00051	0.00057	0.00100	0.00082	0.00100	0.00100	0.00177	0.00024	0.29
Co - T	mg/L	0.000133	0.000584	0.000641	0.000750	0.000682	0.000750	0.000750	0.002021	0.000153	0.22
Cu - T	mg/L	0.00040	0.00102	0.00102	0.00102	0.00249	0.00505	0.00567	0.02337	0.00235	0.94
Fe - T	mg/L	0.0144	0.0379	0.0746	0.3940	0.2667	0.3940	0.3940	0.3940	0.1529	0.57
Pb - T	mg/L	0.000069	0.000273	0.000273	0.000273	0.000302	0.000379	0.000410	0.000436	0.000077	0.26
Li - T	mg/L	0.00339	0.00877	0.01095	0.02880	0.02154	0.02880	0.02880	0.03654	0.00883	0.41
Mg - T	mg/L	9.71	32.40	32.40	32.40	50.04	85.35	93.48	121.56	27.08	0.54
Mn - T	mg/L	0.00882	0.02922	0.03301	0.06630	0.05318	0.06630	0.06630	0.33202	0.02428	0.46
Hg - T	mg/L	0.0000001	0.0000004	0.0000009	0.0000050	0.0000037	0.0000050	0.0000050	0.0000911	0.0000057	1.54
Mo - T	mg/L	0.00060	0.00067	0.00067	0.00067	0.00517	0.01160	0.01327	0.17102	0.01143	2.21
Ni - T	mg/L	0.00042	0.00149	0.0015	0.0015	0.0021	0.0033	0.0036	0.0062	0.00098	0.47
P - T	mg/L	0.004	0.013	0.027	0.150	0.101	0.150	0.150	0.162	0.059	0.58
K - T	mg/L	0.63	2.69	2.69	2.69	2.85	3.29	3.55	10.91	0.78	0.27
Se - T	mg/L	0.000050	0.000050	0.000050	0.000050	0.002096	0.005684	0.006549	0.009555	0.002761	1.32
Si - T	mg/L	0.87	4.07	4.07	4.07	4.10	4.34	4.60	22.05	1.32	0.32
Ag - T	mg/L	0.0000034	0.0000050	0.0000050	0.0000050	0.000025	0.000059	0.000068	0.000150	0.000027	1.11
Na - T	mg/L	0.81	1.40	2.02	8.15	5.72	8.15	8.15	10.78	2.95	0.52
Sr - T	mg/L	0.108	0.497	0.497	0.497	0.509	0.548	0.590	2.636	0.161	0.32
S - T	mg/L	0.71	2.48	5.05	28.00	19.01	28.00	28.00	69.13	11.40	0.60
Tl - T	mg/L	0.000003	0.000005	0.000005	0.000005	0.000020	0.000046	0.000055	0.000058	0.000021	1.04
Sn - T	mg/L	0.00014	0.00014	0.00014	0.00014	0.00053	0.00109	0.00127	0.00133	0.00047	0.90
Ti - T	mg/L	0.0011	0.0047	0.0050	0.0050	0.0048	0.0050	0.0050	0.0094	0.0008	0.18
U - T	mg/L	0.00024	0.00115	0.00115	0.00115	0.00114	0.00121	0.00127	0.00256	0.00022	0.20
V - T	mg/L	0.00021	0.00050	0.00050	0.00050	0.00063	0.00088	0.00095	0.00235	0.00023	0.36
Zn - T	mg/L	0.0016	0.0058	0.0058	0.0058	0.0076	0.0114	0.0123	0.0143	0.0030	0.40
Zr - T	mg/L	0.00001	0.00002	0.00004	0.00020	0.00014	0.00020	0.00020	0.00103	0.00010	0.69

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NOTES:

1. UNITS ARE IN mg/L UNLESS OTHERWISE STATED.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT VA101-458/14-3	EJA	JEM	KJB

Knight Piésold CONSULTING

TABLE B2.2

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

SUMMARY STATISTICS - OPEN PIT
OPERATIONS PHASE II

Print Oct/16/14 11:03:36

		Operations Phase II (Years 23.5 through 28) - LGO Processing to Open Pit									
Parameter	Unit	Minimum	10th Percentile	25th Percentile	Median	Mean	75th Percentile	90th Percentile	Maximum	Standard Deviation	Coefficient of Variation
Hardness, Dissolved Anions and Nutrients											
Model Hardness	mg/L CaCO3	816.56	837.50	853.48	890.11	885.12	911.12	940.49	950.13	37.62	0.04
Baseline Hardness	mg/L CaCO3	24.48	27.64	36.75	40.64	38.16	42.65	43.30	45.30	6.11	0.16
SO4	mg/L	236.40	257.83	299.20	354.78	358.92	414.54	468.34	500.94	75.06	0.21
Cl	mg/L	10.36	10.75	11.39	12.36	12.40	13.30	14.22	14.78	1.25	0.10
F	mg/L	0.830	0.840	0.844	0.849	0.851	0.857	0.865	0.872	0.010	0.01
Hardness	mg/L	816.6	837.5	853.5	890.1	885.1	911.1	940.5	950.1	37.6	0.04
Orthophosphate	mg/L	0.0801	0.0819	0.0835	0.0865	0.0861	0.0883	0.0911	0.0920	0.0033	0.04
N as NO3	mg/L	0.006	0.007	0.007	0.007	0.007	0.008	0.008	0.008	0.000	0.06
Dissolved Metals											
Al - D	mg/L	0.110	0.116	0.127	0.143	0.144	0.159	0.175	0.185	0.021	0.15
Cd - D	mg/L	0.0001090	0.0002552	0.0005648	0.0009663	0.0010050	0.0014301	0.0018031	0.0020551	0.0005552	0.55
Fe - D	mg/L	0.0032	0.0033	0.0036	0.0044	0.0046	0.0055	0.0064	0.0069	0.0012	0.25
Total Metals											
Al - T	mg/L	0.149	0.154	0.164	0.179	0.180	0.194	0.207	0.217	0.019	0.11
Sb - T	mg/L	0.0049	0.0050	0.0051	0.0054	0.0054	0.0057	0.0059	0.0061	0.00034	0.06
As - T	mg/L	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.00017	0.01
Ba - T	mg/L	0.069	0.070	0.070	0.071	0.071	0.071	0.072	0.072	0.0007	0.01
Be - T	mg/L	0.000050	0.000051	0.000051	0.000051	0.000051	0.000052	0.000052	0.000052	0.000000	0.01
Bi - T	mg/L	0.00026	0.00026	0.00026	0.00026	0.00026	0.00026	0.00027	0.00027	0.000003	0.01
B - T	mg/L	0.30	0.30	0.30	0.30	0.30	0.30	0.31	0.31	0.002	0.01
Cd - T	mg/L	0.00012	0.00027	0.0006	0.0010	0.0010	0.0014	0.0018	0.0021	0.00055	0.54
Ca - T	mg/L	191.1	193.0	193.9	194.9	194.9	196.1	197.0	197.5	1.5	0.01
Cr - T	mg/L	0.00051	0.00051	0.00052	0.00052	0.00052	0.00052	0.00053	0.00053	0.00001	0.01
Co - T	mg/L	0.003	0.004	0.007	0.010	0.010	0.014	0.017	0.019	0.004754	0.46
Cu - T	mg/L	0.03058	0.03438	0.03452	0.03470	0.03465	0.03503	0.03520	0.03546	0.00078	0.02
Fe - T	mg/L	0.0038	0.0040	0.0044	0.0056	0.0058	0.0071	0.0083	0.0089	0.0016	0.27
Pb - T	mg/L	0.000440	0.000456	0.000481	0.000516	0.000516	0.000550	0.000581	0.000601	0.000045	0.09
Li - T	mg/L	0.03554	0.03591	0.03613	0.03637	0.03637	0.03663	0.03676	0.03710	0.00034	0.01
Mg - T	mg/L	123.37	128.38	136.79	149.14	149.64	161.11	172.86	179.95	15.95	0.11
Mn - T	mg/L	0.35391	0.38678	0.40139	0.40767	0.40366	0.41132	0.41542	0.41973	0.01376	0.03
Hg - T	mg/L	0.0000792	0.0000810	0.0000826	0.0000856	0.0000852	0.0000875	0.0000902	0.0000911	0.0000033	0.04
Mo - T	mg/L	0.11624	0.11731	0.11780	0.11847	0.11875	0.11965	0.12061	0.12162	0.00131	0.01
Ni - T	mg/L	0.006543	0.007241	0.008605	0.010474	0.010615	0.012479	0.014270	0.015387	0.002514	0.24
P - T	mg/L	0.134	0.138	0.141	0.150	0.149	0.155	0.160	0.162	0.008	0.06
K - T	mg/L	11.05	11.37	11.83	12.62	12.65	13.40	14.08	14.57	0.99	0.08
Se - T	mg/L	0.010	0.011	0.012	0.014	0.014	0.016	0.017	0.019	0.002	0.18
Si - T	mg/L	21.97	22.07	22.15	22.30	22.33	22.47	22.66	22.98	0.24	0.01
Ag - T	mg/L	0.00015	0.00015	0.00016	0.00017	0.00017	0.00017	0.00018	0.00018	0.0000093	0.06
Na - T	mg/L	9.50	9.73	9.91	10.26	10.20	10.46	10.73	10.82	0.37	0.04
Sr - T	mg/L	2.624	2.634	2.644	2.659	2.664	2.679	2.699	2.737	0.026	0.01
S - T	mg/L	58.91	60.53	61.65	64.65	64.21	66.27	68.46	69.18	2.92	0.05
Tl - T	mg/L	0.000037	0.000044	0.000057	0.000074	0.000075	0.000093	0.000109	0.000119	0.000023	0.31
Sn - T	mg/L	0.00137	0.00191	0.00305	0.00453	0.00465	0.00620	0.00753	0.00838	0.00201	0.43
Ti - T	mg/L	0.0095	0.0098	0.0104	0.0112	0.0113	0.0120	0.0128	0.0133	0.0011	0.09
U - T	mg/L	0.0026	0.0026	0.0027	0.0028	0.0028	0.0030	0.0031	0.0031	0.00016	0.06
V - T	mg/L	0.0024	0.0026	0.0029	0.0034	0.0034	0.0038	0.0042	0.0045	0.00059	0.17
Zn - T	mg/L	0.0243	0.0412	0.0756	0.1184	0.1202	0.1644	0.2005	0.2238	0.0570	0.47
Zr - T	mg/L	0.00089	0.00091	0.00093	0.00097	0.00096	0.00099	0.00102	0.00103	0.00004	0.04

M:\1\01\00458\14\A\Report\3 - Water Quality Predictions\Rev 0\Appendices\Appendix C - Expected Case Concentration Graphs\[APPENDIX C2 HC_019 OP (EC).xlsx]Appendix B

NOTES:

1. UNITS ARE IN mg/L UNLESS OTHERWISE STATED.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT VA101-458/14-3	EJA	JEM	KJB

Knight Piésold CONSULTING

TABLE B2.3

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

SUMMARY STATISTICS - OPEN PIT
CLOSURE

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		Closure (Years 29 through 35)									
Parameter	Unit	Minimum	10th Percentile	25th Percentile	Median	Mean	75th Percentile	90th Percentile	Maximum	Standard Deviation	Coefficient of Variation
Hardness, Dissolved Anions and Nutrients											
Model Hardness	mg/L CaCO3	547.9	573.2	601.9	649.4	663.5	718.2	769.8	824.0	79.8	0.1
Baseline Hardness	mg/L CaCO3	24.48	27.64	35.71	40.67	38.12	42.74	43.30	45.30	6.33	0.17
SO4	mg/L	347.03	360.85	376.81	404.04	411.28	441.38	470.38	501.01	44.45	0.11
Cl	mg/L	9.95	10.39	10.89	11.74	11.98	12.94	13.85	14.80	1.40	0.12
F	mg/L	0.564	0.591	0.621	0.669	0.685	0.741	0.794	0.851	0.083	0.12
Hardness	mg/L	547.9	573.2	601.9	649.4	663.5	718.2	769.8	824.0	79.8	0.12
Orthophosphate	mg/L	0.0526	0.0551	0.0581	0.0630	0.0644	0.0701	0.0754	0.0810	0.0082	0.13
N as NO3	mg/L	0.004	0.005	0.005	0.005	0.005	0.006	0.006	0.006	0.001	0.12
Dissolved Metals											
Al - D	mg/L	0.147	0.151	0.155	0.162	0.163	0.170	0.177	0.185	0.011	0.07
Cd - D	mg/L	0.0012595	0.0013296	0.0014113	0.0015460	0.0015893	0.0017490	0.0018990	0.0020530	0.0002293	0.14
Fe - D	mg/L	0.0037	0.0067	0.0105	0.0155	0.0144	0.0189	0.0205	0.0214	0.0051	0.35
Total Metals											
Al - T	mg/L	0.169	0.173	0.178	0.187	0.189	0.198	0.207	0.217	0.014	0.07
Sb - T	mg/L	0.00418	0.00435	0.00455	0.00489	0.00498	0.00536	0.00572	0.00610	0.00055	0.11
As - T	mg/L	0.00877	0.00914	0.00956	0.01026	0.01046	0.01125	0.01200	0.01280	0.00116	0.11
Ba - T	mg/L	0.0497	0.0517	0.0539	0.0576	0.0587	0.0628	0.0668	0.0710	0.0062	0.10
Be - T	mg/L	0.000052	0.000052	0.000053	0.000053	0.000053	0.000054	0.000054	0.000055	0.000001	0.02
Bi - T	mg/L	0.000186	0.000193	0.000202	0.000216	0.000220	0.000236	0.000250	0.000267	0.000023	0.11
B - T	mg/L	0.213	0.221	0.231	0.247	0.251	0.270	0.287	0.305	0.027	0.11
Cd - T	mg/L	0.00127	0.00134	0.00142	0.00156	0.00160	0.00176	0.00191	0.00206	0.00023	0.14
Ca - T	mg/L	142.0	146.8	152.4	162.1	164.4	174.7	184.8	195.6	15.5	0.09
Cr - T	mg/L	0.00052	0.00054	0.00055	0.00057	0.00057	0.00059	0.00060	0.00061	0.00003	0.04
Co - T	mg/L	0.01192	0.01259	0.0134	0.0146	0.0150	0.0165	0.0180	0.0194	0.0022	0.14
Cu - T	mg/L	0.02247	0.02358	0.02488	0.02705	0.02770	0.03022	0.03259	0.03505	0.00364	0.13
Fe - T	mg/L	0.0044	0.0083	0.0130	0.0193	0.0179	0.0236	0.0256	0.0266	0.0064	0.36
Pb - T	mg/L	0.00045	0.00047	0.00048	0.00051	0.00051	0.00054	0.00057	0.00060	0.000043	0.08
Li - T	mg/L	0.02444	0.02554	0.02677	0.02874	0.02935	0.03165	0.03380	0.03612	0.00338	0.12
Mg - T	mg/L	128.40	133.07	138.45	147.73	150.02	160.03	169.75	180.13	14.93	0.10
Mn - T	mg/L	0.26037	0.27425	0.29021	0.31636	0.32474	0.35570	0.38477	0.41486	0.04466	0.14
Hg - T	mg/L	0.000053	0.000055	0.000058	0.000063	0.000064	0.000069	0.000075	0.000080	0.000008	0.12
Mo - T	mg/L	0.076	0.079	0.084	0.091	0.094	0.102	0.111	0.119	0.013	0.13
Ni - T	mg/L	0.0101	0.0106	0.0111	0.0120	0.0123	0.0133	0.0143	0.0154	0.0015	0.12
P - T	mg/L	0.089	0.094	0.098	0.106	0.108	0.117	0.125	0.134	0.013	0.12
K - T	mg/L	9.63	10.08	10.59	11.45	11.70	12.68	13.62	14.59	1.43	0.12
Se - T	mg/L	0.0125	0.0131	0.0137	0.0148	0.0150	0.0162	0.0174	0.0185	0.0017	0.12
Si - T	mg/L	14.94	15.65	16.46	17.81	18.22	19.78	21.26	22.81	2.28	0.12
Ag - T	mg/L	0.000125	0.000130	0.000136	0.000146	0.000149	0.000160	0.000171	0.000183	0.000017	0.11
Na - T	mg/L	6.32	6.63	6.97	7.51	7.69	8.33	8.93	9.58	0.94	0.12
Sr - T	mg/L	1.781	1.865	1.962	2.122	2.170	2.356	2.531	2.715	0.270	0.12
S - T	mg/L	37.42	39.44	41.71	45.36	46.58	50.96	55.05	59.34	6.34	0.14
Tl - T	mg/L	0.000083	0.000086	0.000090	0.000097	0.000098	0.000105	0.000112	0.000119	0.000010	0.11
Sn - T	mg/L	0.00520	0.00548	0.00581	0.00635	0.00652	0.00716	0.00776	0.00837	0.00092	0.14
Ti - T	mg/L	0.0095	0.0099	0.0103	0.0109	0.0111	0.0118	0.0125	0.0133	0.0011	0.10
U - T	mg/L	0.00219	0.00228	0.00238	0.00255	0.00259	0.00278	0.00296	0.00315	0.00028	0.11
V - T	mg/L	0.00325	0.00337	0.00350	0.00373	0.00378	0.00403	0.00427	0.00453	0.00037	0.10
Zn - T	mg/L	0.1381	0.1457	0.1545	0.1690	0.1736	0.1908	0.2070	0.2236	0.0247	0.14
Zr - T	mg/L	0.00059	0.00062	0.00065	0.00071	0.00072	0.00078	0.00084	0.00090	0.00009	0.12

M:\1\01\00458\14\A\Report\3 - Water Quality Predictions\Rev 0\Appendices\Appendix C - Expected Case Concentration Graphs\[APPENDIX C2 HC_019 OP (EC).xlsx]Appendix B

NOTES:

1. UNITS ARE IN mg/L UNLESS OTHERWISE STATED.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT VA101-458/14-3	EJA	JEM	KJB

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TABLE B2.4

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

SUMMARY STATISTICS - OPEN PIT
CLOSURE AND POST-CLOSURE

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		Post-Closure (Years 36 +)									
Parameter	Unit	Minimum	10th Percentile	25th Percentile	Median	Mean	75th Percentile	90th Percentile	Maximum	Standard Deviation	Coefficient of Variation
Hardness, Dissolved Anions and Nutrients											
Model Hardness	mg/L CaCO3	116.4	124.1	139.8	189.5	231.6	294.3	424.1	547.8	114.1	0.5
Baseline Hardness	mg/L CaCO3	24.48	27.64	34.67	40.64	38.12	42.83	43.30	45.30	6.30	0.17
SO4	mg/L	141.17	142.63	145.67	164.19	187.27	210.93	278.88	346.91	53.49	0.29
Cl	mg/L	2.65	2.78	3.04	3.87	4.58	5.61	7.80	9.95	1.92	0.42
F	mg/L	0.092	0.100	0.118	0.172	0.220	0.290	0.433	0.564	0.126	0.57
Hardness	mg/L	116.4	124.1	139.8	189.5	231.6	294.3	424.1	547.8	114.1	0.49
Orthophosphate	mg/L	0.0095	0.0103	0.0118	0.0167	0.0209	0.0271	0.0400	0.0525	0.0113	0.54
N as NO3	mg/L	0.001	0.001	0.001	0.001	0.002	0.002	0.003	0.004	0.001	0.63
Dissolved Metals											
Al - D	mg/L	0.114	0.114	0.115	0.118	0.120	0.123	0.130	0.147	0.007	0.06
Cd - D	mg/L	0.0000999	0.0001166	0.0001570	0.0002831	0.0004006	0.0005645	0.0009137	0.0012590	0.0003048	0.76
Fe - D	mg/L	0.0215	0.0266	0.0282	0.0301	0.0298	0.0318	0.0329	0.0338	0.0026	0.09
Total Metals											
Al - T	mg/L	0.120	0.120	0.121	0.124	0.128	0.128	0.147	0.169	0.011	0.09
Sb - T	mg/L	0.00157	0.00159	0.00163	0.00188	0.00217	0.00248	0.00333	0.00418	0.00068	0.31
As - T	mg/L	0.00286	0.00293	0.00306	0.00366	0.00429	0.00505	0.00695	0.00877	0.00156	0.36
Ba - T	mg/L	0.0187	0.0190	0.0196	0.0227	0.0261	0.0299	0.0401	0.0497	0.0082	0.31
Be - T	mg/L	0.000054	0.000055	0.000056	0.000062	0.000062	0.000067	0.000070	0.000073	0.000006	0.09
Bi - T	mg/L	0.000058	0.000060	0.000063	0.000077	0.000090	0.000107	0.000148	0.000186	0.000034	0.38
B - T	mg/L	0.070	0.073	0.078	0.094	0.108	0.128	0.171	0.212	0.037	0.35
Cd - T	mg/L	0.00010	0.00012	0.00016	0.00029	0.00040	0.00057	0.00092	0.00127	0.00031	0.76
Ca - T	mg/L	73.9	74.3	74.7	79.5	87.8	94.6	118.0	141.9	17.5	0.20
Cr - T	mg/L	0.00060	0.00063	0.00066	0.00075	0.00074	0.00081	0.00085	0.00089	0.00008	0.11
Co - T	mg/L	0.00088	0.00104	0.0014	0.0026	0.0038	0.0053	0.0086	0.0119	0.0029	0.77
Cu - T	mg/L	0.00440	0.00464	0.00517	0.00709	0.00893	0.01137	0.01694	0.02246	0.00474	0.53
Fe - T	mg/L	0.0267	0.0328	0.0340	0.0351	0.0349	0.0364	0.0374	0.0383	0.0021	0.06
Pb - T	mg/L	0.00026	0.00026	0.00026	0.00027	0.00030	0.00031	0.00038	0.00045	0.000049	0.17
Li - T	mg/L	0.00509	0.00543	0.00615	0.00839	0.01032	0.01319	0.01907	0.02445	0.00517	0.50
Mg - T	mg/L	61.42	61.76	62.45	67.69	75.58	82.69	105.40	128.36	17.32	0.23
Mn - T	mg/L	0.02879	0.03215	0.04016	0.06559	0.08909	0.12207	0.19221	0.26029	0.06110	0.69
Hg - T	mg/L	0.000015	0.000015	0.000016	0.000020	0.000024	0.000028	0.000041	0.000053	0.000010	0.42
Mo - T	mg/L	0.011	0.012	0.014	0.021	0.028	0.037	0.056	0.075	0.017	0.61
Ni - T	mg/L	0.0026	0.0027	0.0029	0.0037	0.0044	0.0054	0.0078	0.0101	0.0020	0.44
P - T	mg/L	0.013	0.014	0.017	0.026	0.034	0.046	0.069	0.090	0.021	0.60
K - T	mg/L	2.23	2.36	2.62	3.45	4.17	5.20	7.44	9.63	1.94	0.47
Se - T	mg/L	0.0045	0.0046	0.0047	0.0055	0.0064	0.0073	0.0099	0.0125	0.0021	0.33
Si - T	mg/L	3.49	3.64	3.95	5.17	6.34	7.88	11.45	14.93	3.01	0.47
Ag - T	mg/L	0.000046	0.000047	0.000048	0.000056	0.000064	0.000074	0.000099	0.000124	0.000020	0.32
Na - T	mg/L	1.03	1.11	1.29	1.88	2.43	3.20	4.84	6.33	1.42	0.58
Sr - T	mg/L	0.424	0.441	0.479	0.623	0.762	0.944	1.367	1.781	0.357	0.47
S - T	mg/L	2.73	3.28	4.58	8.49	12.01	17.15	27.60	37.42	9.23	0.77
Tl - T	mg/L	0.000037	0.000037	0.000038	0.000041	0.000047	0.000052	0.000067	0.000083	0.000012	0.26
Sn - T	mg/L	0.00051	0.00059	0.00076	0.00128	0.00174	0.00241	0.00382	0.00520	0.00123	0.71
Ti - T	mg/L	0.0042	0.0043	0.0044	0.0050	0.0055	0.0061	0.0078	0.0095	0.0014	0.25
U - T	mg/L	0.00084	0.00085	0.00088	0.00100	0.00115	0.00132	0.00176	0.00219	0.00035	0.31
V - T	mg/L	0.00174	0.00176	0.00177	0.00184	0.00203	0.00216	0.00269	0.00325	0.00038	0.19
Zn - T	mg/L	0.0133	0.0151	0.0193	0.0329	0.0455	0.0631	0.1008	0.1380	0.0328	0.72
Zr - T	mg/L	0.00013	0.00013	0.00015	0.00021	0.00025	0.00032	0.00046	0.00059	0.00012	0.49

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NOTES:

1. UNITS ARE IN mg/L UNLESS OTHERWISE STATED.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT VA101-458/14-3	EJA	JEM	KJB

APPENDIX B3

P-CREEK

(Pages B3-1 to B3-4)

Knight Piésold CONSULTING

TABLE B3.1

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

SUMMARY STATISTICS - P-CREEK
OPERATIONS PHASE I

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		Operations Phase I (Years 0 through 23.5) - Regular Ore Processing									
Parameter	Unit	Minimum	10th Percentile	25th Percentile	Median	Mean	75th Percentile	90th Percentile	Maximum	Standard Deviation	Coefficient of Variation
Hardness, Dissolved Anions and Nutrients											
Model Hardness	mg/L CaCO3	43.1	47.8	62.7	71.8	68.0	76.7	77.0	77.9	11.2	0.2
Baseline Hardness	mg/L CaCO3	24.48	27.64	33.62	40.70	38.12	43.00	43.30	45.30	6.35	0.17
SO4	mg/L	5.13	5.67	8.51	11.57	10.80	12.78	13.50	15.80	3.03	0.28
Cl	mg/L	0.50	0.50	0.50	0.50	0.51	0.50	0.53	0.57	0.02	0.04
F	mg/L	0.010	0.021	0.021	0.032	0.030	0.035	0.037	0.042	0.009	0.29
Hardness	mg/L	43.1	47.8	62.7	71.8	68.0	76.7	77.0	77.9	11.2	0.16
Orthophosphate	mg/L	0.0010	0.0010	0.0010	0.0022	0.0039	0.0050	0.0050	0.0187	0.0047	1.21
N as NO3	mg/L	0.101	0.131	0.173	0.265	0.256	0.306	0.402	0.544	0.123	0.48
Dissolved Metals											
Al - D	mg/L	0.003	0.003	0.004	0.004	0.007	0.008	0.016	0.018	0.005	0.76
Cd - D	mg/L	0.0000050	0.0000070	0.0000086	0.0000093	0.0000090	0.0000100	0.0000105	0.0000107	0.0000016	0.17
Fe - D	mg/L	0.0010	0.0034	0.0064	0.0080	0.0082	0.0100	0.0100	0.0167	0.0037	0.46
Total Metals											
Al - T	mg/L	0.003	0.004	0.004	0.005	0.023	0.013	0.086	0.114	0.036	1.58
Sb - T	mg/L	0.00002	0.00002	0.00002	0.00009	0.00007	0.00010	0.00010	0.00010	0.00003	0.46
As - T	mg/L	0.00018	0.00019	0.00021	0.00023	0.00050	0.00035	0.00103	0.00226	0.00059	1.17
Ba - T	mg/L	0.0049	0.0049	0.0055	0.0060	0.0058	0.0062	0.0063	0.0066	0.0005	0.09
Be - T	mg/L	0.000010	0.000010	0.000010	0.000089	0.000069	0.000100	0.000100	0.000100	0.000037	0.54
Bi - T	mg/L	0.000005	0.000005	0.000005	0.000438	0.000330	0.000500	0.000500	0.000500	0.000206	0.62
B - T	mg/L	0.010	0.010	0.010	0.015	0.024	0.050	0.050	0.050	0.017	0.70
Cd - T	mg/L	0.0000080	0.000009	0.000010	0.000010	0.000013	0.000011	0.000017	0.000034	0.000007	0.53
Ca - T	mg/L	13.8	15.1	19.5	21.2	20.5	22.6	23.4	23.7	3.0	0.15
Cr - T	mg/L	0.00010	0.00010	0.00010	0.00010	0.00012	0.00013	0.00018	0.00027	0.00005	0.39
Co - T	mg/L	0.000009	0.000010	0.000011	0.000076	0.000080	0.000100	0.000100	0.000243	0.000061	0.77
Cu - T	mg/L	0.00036	0.00038	0.00043	0.00067	0.00097	0.00114	0.00161	0.00351	0.00085	0.88
Fe - T	mg/L	0.0020	0.0034	0.0073	0.0095	0.0298	0.0148	0.0760	0.1914	0.0530	1.78
Pb - T	mg/L	0.000005	0.000010	0.000020	0.000042	0.000110	0.000125	0.000253	0.000558	0.000153	1.39
Li - T	mg/L	0.00050	0.00050	0.00050	0.00050	0.00053	0.00050	0.00050	0.00088	0.00010	0.19
Mg - T	mg/L	2.21	2.60	3.49	4.57	4.23	4.99	5.20	5.44	0.98	0.23
Mn - T	mg/L	0.00028	0.00030	0.00033	0.00054	0.00138	0.00066	0.00331	0.00821	0.00224	1.63
Hg - T	mg/L	0.0000100	0.0000100	0.0000100	0.0000100	0.0000100	0.0000100	0.0000100	0.0000100	0.0000000	0.00
Mo - T	mg/L	0.00014	0.00016	0.00018	0.00019	0.00019	0.00020	0.00021	0.00022	0.00002	0.11
Ni - T	mg/L	0.00006	0.00007	0.0001	0.0004	0.0004	0.0005	0.0005	0.0009	0.00023	0.60
P - T	mg/L	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.000	0.00
K - T	mg/L	0.20	0.22	0.25	0.30	0.28	0.31	0.33	0.33	0.04	0.15
Se - T	mg/L	0.000103	0.000103	0.000121	0.000148	0.000152	0.000200	0.000200	0.000211	0.000035	0.23
Si - T	mg/L	2.73	2.74	2.88	3.07	3.07	3.18	3.34	3.40	0.21	0.07
Ag - T	mg/L	0.0000050	0.0000050	0.0000050	0.0000100	0.000010	0.000012	0.000013	0.000017	0.000004	0.36
Na - T	mg/L	0.60	0.62	0.82	1.07	1.00	1.15	1.30	1.34	0.23	0.23
Sr - T	mg/L	0.035	0.041	0.056	0.065	0.060	0.068	0.069	0.070	0.011	0.18
S - T	mg/L	4.00	4.50	7.00	10.00	8.31	10.00	10.00	10.00	2.28	0.27
Tl - T	mg/L	0.000002	0.000002	0.000002	0.000009	0.000007	0.000010	0.000010	0.000010	0.000003	0.46
Sn - T	mg/L	0.00008	0.00009	0.00010	0.00010	0.00013	0.00020	0.00020	0.00030	0.00006	0.49
Ti - T	mg/L	0.0005	0.0005	0.0005	0.0072	0.0065	0.0100	0.0100	0.0113	0.0040	0.61
U - T	mg/L	0.00005	0.00006	0.00009	0.00013	0.00012	0.00016	0.00018	0.00019	0.00004	0.33
V - T	mg/L	0.00020	0.00020	0.00020	0.00090	0.00072	0.00100	0.00100	0.00100	0.00033	0.46
Zn - T	mg/L	0.0004	0.0010	0.0010	0.0024	0.0023	0.0030	0.0030	0.0040	0.0010	0.45
Zr - T	mg/L	0.00010	0.00010	0.00010	0.00010	0.00030	0.00040	0.00060	0.00105	0.00028	0.93

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NOTES:

1. UNITS ARE IN mg/L UNLESS OTHERWISE STATED.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT VA101-458/14-3	EJA	JEM	KJB

Knight Piésold CONSULTING

TABLE B3.2

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

SUMMARY STATISTICS - P-CREEK
OPERATIONS PHASE II

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		Operations Phase II (Years 23.5 through 28) - LGO Processing to Open Pit									
Parameter	Unit	Minimum	10th Percentile	25th Percentile	Median	Mean	75th Percentile	90th Percentile	Maximum	Standard Deviation	Coefficient of Variation
Hardness, Dissolved Anions and Nutrients											
Model Hardness	mg/L CaCO3	43.14	47.83	69.00	71.50	68.28	76.40	77.00	77.90	10.81	0.16
Baseline Hardness	mg/L CaCO3	24.48	27.64	36.75	40.64	38.16	42.65	43.30	45.30	6.11	0.16
SO4	mg/L	5.13	5.67	10.15	11.57	10.83	12.03	13.50	15.80	2.93	0.27
Cl	mg/L	0.50	0.50	0.50	0.50	0.51	0.50	0.53	0.57	0.02	0.04
F	mg/L	0.010	0.021	0.026	0.034	0.030	0.035	0.037	0.042	0.008	0.27
Hardness	mg/L	43.1	47.8	69.0	71.5	68.3	76.4	77.0	77.9	10.8	0.16
Orthophosphate	mg/L	0.0010	0.0010	0.0010	0.0022	0.0040	0.0050	0.0050	0.0187	0.0049	1.24
N as NO3	mg/L	0.101	0.131	0.148	0.225	0.248	0.301	0.402	0.544	0.121	0.49
Dissolved Metals											
Al - D	mg/L	0.003	0.003	0.004	0.005	0.006	0.005	0.016	0.018	0.005	0.75
Cd - D	mg/L	0.0000050	0.0000070	0.0000087	0.0000093	0.0000091	0.0000100	0.0000105	0.0000107	0.0000015	0.17
Fe - D	mg/L	0.0010	0.0034	0.0077	0.0080	0.0082	0.0100	0.0100	0.0167	0.0036	0.44
Total Metals											
Al - T	mg/L	0.003	0.004	0.004	0.008	0.021	0.013	0.086	0.114	0.034	1.62
Sb - T	mg/L	0.0000	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00003	0.44
As - T	mg/L	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.002	0.00057	1.15
Ba - T	mg/L	0.005	0.005	0.006	0.006	0.006	0.006	0.006	0.007	0.0005	0.09
Be - T	mg/L	0.000010	0.000010	0.000055	0.000089	0.000071	0.000100	0.000100	0.000100	0.000036	0.51
Bi - T	mg/L	0.00001	0.00001	0.00025	0.00044	0.00034	0.00050	0.00050	0.00050	0.000199	0.59
B - T	mg/L	0.01	0.01	0.01	0.02	0.02	0.03	0.05	0.05	0.016	0.70
Cd - T	mg/L	0.00001	0.00001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.00001	0.51
Ca - T	mg/L	13.8	15.1	20.7	21.2	20.5	22.5	23.4	23.7	2.9	0.14
Cr - T	mg/L	0.00010	0.00010	0.00010	0.00010	0.00012	0.00011	0.00018	0.00027	0.00005	0.38
Co - T	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000058	0.73
Cu - T	mg/L	0.00036	0.00038	0.00050	0.00073	0.00095	0.00081	0.00161	0.00351	0.00081	0.85
Fe - T	mg/L	0.0020	0.0034	0.0080	0.0095	0.0276	0.0110	0.0760	0.1914	0.0506	1.83
Pb - T	mg/L	0.000005	0.000010	0.000034	0.000042	0.000108	0.000131	0.000253	0.000558	0.000147	1.37
Li - T	mg/L	0.00050	0.00050	0.00050	0.00050	0.00053	0.00050	0.00050	0.00088	0.00011	0.20
Mg - T	mg/L	2.21	2.60	4.17	4.56	4.23	4.77	5.20	5.44	0.95	0.22
Mn - T	mg/L	0.00028	0.00030	0.00041	0.00059	0.00129	0.00062	0.00331	0.00821	0.00214	1.66
Hg - T	mg/L	0.0000100	0.0000100	0.0000100	0.0000100	0.0000100	0.0000100	0.0000100	0.0000100	0.0000000	0.00
Mo - T	mg/L	0.00014	0.00016	0.00019	0.00020	0.00019	0.00021	0.00021	0.00022	0.00002	0.11
Ni - T	mg/L	0.000060	0.000070	0.000355	0.000399	0.000393	0.000500	0.000533	0.000913	0.000223	0.57
P - T	mg/L	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.000	0.00
K - T	mg/L	0.20	0.22	0.28	0.30	0.28	0.31	0.33	0.33	0.04	0.14
Se - T	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.23
Si - T	mg/L	2.73	2.74	3.02	3.09	3.09	3.28	3.34	3.40	0.21	0.07
Ag - T	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00002	0.0000034	0.35
Na - T	mg/L	0.60	0.62	0.90	1.04	1.00	1.09	1.30	1.34	0.22	0.22
Sr - T	mg/L	0.035	0.041	0.064	0.065	0.061	0.067	0.069	0.070	0.011	0.17
S - T	mg/L	4.00	4.50	5.50	10.00	8.20	10.00	10.00	10.00	2.36	0.29
Tl - T	mg/L	0.000002	0.000002	0.000006	0.000009	0.000007	0.000010	0.000010	0.000010	0.000003	0.44
Sn - T	mg/L	0.00008	0.00009	0.00010	0.00010	0.00013	0.00011	0.00020	0.00030	0.00006	0.49
Ti - T	mg/L	0.0005	0.0005	0.0052	0.0072	0.0066	0.0100	0.0100	0.0113	0.0038	0.58
U - T	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.00004	0.32
V - T	mg/L	0.0002	0.0002	0.0006	0.0009	0.0007	0.0010	0.0010	0.0010	0.00032	0.44
Zn - T	mg/L	0.0004	0.0010	0.0019	0.0024	0.0023	0.0030	0.0030	0.0040	0.0010	0.43
Zr - T	mg/L	0.00010	0.00010	0.00010	0.00020	0.00032	0.00050	0.00060	0.00105	0.00029	0.92

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NOTES:

1. UNITS ARE IN mg/L UNLESS OTHERWISE STATED.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT VA101-458/14-3	EJA	JEM	KJB

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TABLE B3.3

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

SUMMARY STATISTICS - P-CREEK
CLOSURE

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		Closure (Years 29 through 35)									
Parameter	Unit	Minimum	10th Percentile	25th Percentile	Median	Mean	75th Percentile	90th Percentile	Maximum	Standard Deviation	Coefficient of Variation
Hardness, Dissolved Anions and Nutrients											
Model Hardness	mg/L CaCO3	43.1	47.8	66.9	71.7	68.1	76.5	77.0	77.9	11.2	0.2
Baseline Hardness	mg/L CaCO3	24.48	27.64	35.71	40.67	38.12	42.74	43.30	45.30	6.33	0.17
SO4	mg/L	5.13	5.67	9.60	11.57	10.81	12.28	13.50	15.80	3.02	0.28
Cl	mg/L	0.50	0.50	0.50	0.50	0.51	0.50	0.53	0.57	0.02	0.04
F	mg/L	0.010	0.021	0.025	0.033	0.030	0.035	0.037	0.042	0.008	0.28
Hardness	mg/L	43.1	47.8	66.9	71.7	68.1	76.5	77.0	77.9	11.2	0.16
Orthophosphate	mg/L	0.0010	0.0010	0.0010	0.0022	0.0039	0.0050	0.0050	0.0187	0.0047	1.22
N as NO3	mg/L	0.101	0.131	0.164	0.245	0.255	0.302	0.402	0.544	0.123	0.48
Dissolved Metals											
Al - D	mg/L	0.003	0.003	0.004	0.004	0.006	0.006	0.016	0.018	0.005	0.76
Cd - D	mg/L	0.0000050	0.0000070	0.0000087	0.0000093	0.0000090	0.0000100	0.0000105	0.0000107	0.0000016	0.17
Fe - D	mg/L	0.0010	0.0034	0.0073	0.0080	0.0082	0.0100	0.0100	0.0167	0.0037	0.45
Total Metals											
Al - T	mg/L	0.003	0.004	0.004	0.007	0.022	0.013	0.086	0.114	0.036	1.59
Sb - T	mg/L	0.00002	0.00002	0.00005	0.00009	0.00007	0.00010	0.00010	0.00010	0.00003	0.46
As - T	mg/L	0.00018	0.00019	0.00021	0.00023	0.00050	0.00040	0.00103	0.00226	0.00058	1.17
Ba - T	mg/L	0.0049	0.0049	0.0055	0.0060	0.0058	0.0062	0.0063	0.0066	0.0005	0.09
Be - T	mg/L	0.000010	0.000010	0.000044	0.000089	0.000069	0.000100	0.000100	0.000100	0.000037	0.54
Bi - T	mg/L	0.000005	0.000005	0.000191	0.000438	0.000332	0.000500	0.000500	0.000500	0.000205	0.62
B - T	mg/L	0.010	0.010	0.010	0.015	0.024	0.035	0.050	0.050	0.017	0.70
Cd - T	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00002	0.00003	0.00001	0.53
Ca - T	mg/L	13.8	15.1	20.3	21.2	20.5	22.5	23.4	23.7	3.0	0.15
Cr - T	mg/L	0.00010	0.00010	0.00010	0.00010	0.00012	0.00012	0.00018	0.00027	0.00005	0.39
Co - T	mg/L	0.00001	0.00001	0.0000	0.0001	0.0001	0.0001	0.0001	0.0002	0.0001	0.76
Cu - T	mg/L	0.00036	0.00038	0.00048	0.00070	0.00097	0.00092	0.00161	0.00351	0.00085	0.88
Fe - T	mg/L	0.0020	0.0034	0.0078	0.0095	0.0294	0.0123	0.0760	0.1914	0.0527	1.79
Pb - T	mg/L	0.00001	0.00001	0.00003	0.00004	0.00011	0.00013	0.00025	0.00056	0.000152	1.39
Li - T	mg/L	0.00050	0.00050	0.00050	0.00050	0.00053	0.00050	0.00050	0.00088	0.00010	0.20
Mg - T	mg/L	2.21	2.60	3.94	4.57	4.23	4.82	5.20	5.44	0.98	0.23
Mn - T	mg/L	0.00028	0.00030	0.00039	0.00056	0.00136	0.00063	0.00331	0.00821	0.00223	1.64
Hg - T	mg/L	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000000	0.00
Mo - T	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.11
Ni - T	mg/L	0.0001	0.0001	0.0003	0.0004	0.0004	0.0005	0.0005	0.0009	0.0002	0.60
P - T	mg/L	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.000	0.00
K - T	mg/L	0.20	0.22	0.27	0.30	0.28	0.31	0.33	0.33	0.04	0.15
Se - T	mg/L	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0000	0.23
Si - T	mg/L	2.73	2.74	2.98	3.08	3.07	3.20	3.34	3.40	0.21	0.07
Ag - T	mg/L	0.000005	0.000005	0.000007	0.000010	0.000010	0.000012	0.000013	0.000017	0.000004	0.36
Na - T	mg/L	0.60	0.62	0.88	1.05	1.00	1.11	1.30	1.34	0.23	0.23
Sr - T	mg/L	0.035	0.041	0.061	0.065	0.060	0.067	0.069	0.070	0.011	0.18
S - T	mg/L	4.00	4.50	6.63	10.00	8.29	10.00	10.00	10.00	2.30	0.28
Tl - T	mg/L	0.000002	0.000002	0.000005	0.000009	0.000007	0.000010	0.000010	0.000010	0.000003	0.46
Sn - T	mg/L	0.00008	0.00009	0.00010	0.00010	0.00013	0.00013	0.00020	0.00030	0.00006	0.49
Ti - T	mg/L	0.0005	0.0005	0.0040	0.0072	0.0065	0.0100	0.0100	0.0113	0.0039	0.61
U - T	mg/L	0.00005	0.00006	0.00011	0.00013	0.00012	0.00014	0.00018	0.00019	0.00004	0.33
V - T	mg/L	0.00020	0.00020	0.00050	0.00090	0.00073	0.00100	0.00100	0.00100	0.00033	0.46
Zn - T	mg/L	0.0004	0.0010	0.0016	0.0024	0.0023	0.0030	0.0030	0.0040	0.0010	0.45
Zr - T	mg/L	0.00010	0.00010	0.00010	0.00015	0.00030	0.00043	0.00060	0.00105	0.00028	0.93

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NOTES:

1. UNITS ARE IN mg/L UNLESS OTHERWISE STATED.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT VA101-458/14-3	EJA	JEM	KJB

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TABLE B3.4

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

SUMMARY STATISTICS - P-CREEK
CLOSURE AND POST-CLOSURE

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		Post-Closure (Years 36 +)									
Parameter	Unit	Minimum	10th Percentile	25th Percentile	Median	Mean	75th Percentile	90th Percentile	Maximum	Standard Deviation	Coefficient of Variation
Hardness, Dissolved Anions and Nutrients											
Model Hardness	mg/L CaCO3	43.1	47.8	64.8	71.8	68.1	76.6	77.0	77.9	11.1	0.2
Baseline Hardness	mg/L CaCO3	24.48	27.64	34.67	40.64	38.12	42.83	43.30	45.30	6.30	0.17
SO4	mg/L	5.13	5.67	9.06	11.50	10.81	12.53	13.50	15.80	3.01	0.28
Cl	mg/L	0.50	0.50	0.50	0.50	0.51	0.50	0.53	0.57	0.02	0.04
F	mg/L	0.010	0.021	0.024	0.034	0.030	0.035	0.037	0.042	0.008	0.28
Hardness	mg/L	43.1	47.8	64.8	71.8	68.1	76.6	77.0	77.9	11.1	0.16
Orthophosphate	mg/L	0.0010	0.0010	0.0010	0.0023	0.0039	0.0050	0.0050	0.0187	0.0047	1.21
N as NO3	mg/L	0.101	0.131	0.156	0.225	0.255	0.304	0.402	0.544	0.122	0.48
Dissolved Metals											
Al - D	mg/L	0.003	0.003	0.004	0.005	0.006	0.007	0.016	0.018	0.005	0.75
Cd - D	mg/L	0.0000050	0.0000070	0.0000086	0.0000093	0.0000090	0.0000100	0.0000105	0.0000107	0.0000015	0.17
Fe - D	mg/L	0.0010	0.0034	0.0068	0.0080	0.0082	0.0100	0.0100	0.0167	0.0037	0.45
Total Metals											
Al - T	mg/L	0.003	0.004	0.004	0.008	0.022	0.013	0.086	0.114	0.035	1.58
Sb - T	mg/L	0.00002	0.00002	0.00004	0.00010	0.00007	0.00010	0.00010	0.00010	0.00003	0.45
As - T	mg/L	0.00018	0.00019	0.00021	0.00024	0.00050	0.00046	0.00103	0.00226	0.00058	1.17
Ba - T	mg/L	0.0049	0.0049	0.0055	0.0061	0.0058	0.0062	0.0063	0.0066	0.0005	0.09
Be - T	mg/L	0.000010	0.000010	0.000033	0.000100	0.000069	0.000100	0.000100	0.000100	0.000037	0.53
Bi - T	mg/L	0.000005	0.000005	0.000129	0.000500	0.000332	0.000500	0.000500	0.000500	0.000204	0.62
B - T	mg/L	0.010	0.010	0.010	0.010	0.024	0.040	0.050	0.050	0.016	0.70
Cd - T	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00002	0.00003	0.00001	0.52
Ca - T	mg/L	13.8	15.1	19.9	21.2	20.5	22.6	23.4	23.7	3.0	0.14
Cr - T	mg/L	0.00010	0.00010	0.00010	0.00010	0.00012	0.00013	0.00018	0.00027	0.00005	0.39
Co - T	mg/L	0.00001	0.00001	0.0000	0.0001	0.0001	0.0001	0.0001	0.0002	0.0001	0.76
Cu - T	mg/L	0.00036	0.00038	0.00046	0.00073	0.00097	0.00103	0.00161	0.00351	0.00084	0.87
Fe - T	mg/L	0.0020	0.0034	0.0075	0.0100	0.0294	0.0135	0.0760	0.1914	0.0524	1.78
Pb - T	mg/L	0.00001	0.00001	0.00003	0.00004	0.00011	0.00013	0.00025	0.00056	0.000151	1.38
Li - T	mg/L	0.00050	0.00050	0.00050	0.00050	0.00053	0.00050	0.00050	0.00088	0.00010	0.20
Mg - T	mg/L	2.21	2.60	3.72	4.56	4.23	4.88	5.20	5.44	0.97	0.23
Mn - T	mg/L	0.00028	0.00030	0.00037	0.00059	0.00136	0.00065	0.00331	0.00821	0.00221	1.63
Hg - T	mg/L	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000000	0.00
Mo - T	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.11
Ni - T	mg/L	0.0001	0.0001	0.0002	0.0004	0.0004	0.0005	0.0005	0.0009	0.0002	0.59
P - T	mg/L	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.000	0.00
K - T	mg/L	0.20	0.22	0.26	0.29	0.28	0.31	0.33	0.33	0.04	0.14
Se - T	mg/L	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0000	0.23
Si - T	mg/L	2.73	2.74	2.95	3.09	3.07	3.23	3.34	3.40	0.21	0.07
Ag - T	mg/L	0.000005	0.000005	0.000006	0.000010	0.000010	0.000012	0.000013	0.000017	0.000003	0.36
Na - T	mg/L	0.60	0.62	0.85	1.04	1.00	1.12	1.30	1.34	0.23	0.23
Sr - T	mg/L	0.035	0.041	0.058	0.065	0.060	0.067	0.069	0.070	0.011	0.18
S - T	mg/L	4.00	4.50	6.25	10.00	8.29	10.00	10.00	10.00	2.29	0.28
Tl - T	mg/L	0.000002	0.000002	0.000004	0.000010	0.000007	0.000010	0.000010	0.000010	0.000003	0.45
Sn - T	mg/L	0.00008	0.00009	0.00010	0.00010	0.00013	0.00016	0.00020	0.00030	0.00006	0.49
Ti - T	mg/L	0.0005	0.0005	0.0029	0.0068	0.0065	0.0100	0.0100	0.0113	0.0039	0.61
U - T	mg/L	0.00005	0.00006	0.00010	0.00013	0.00012	0.00014	0.00018	0.00019	0.00004	0.33
V - T	mg/L	0.00020	0.00020	0.00040	0.00100	0.00073	0.00100	0.00100	0.00100	0.00033	0.45
Zn - T	mg/L	0.0004	0.0010	0.0014	0.0024	0.0023	0.0030	0.0030	0.0040	0.0010	0.45
Zr - T	mg/L	0.00010	0.00010	0.00010	0.00020	0.00030	0.00045	0.00060	0.00105	0.00028	0.93

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NOTES:

1. UNITS ARE IN mg/L UNLESS OTHERWISE STATED.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT VA101-458/14-3	EJA	JEM	KJB

APPENDIX B4

T-CREEK

(Pages B4-1 to B4-4)

Knight Piésold CONSULTING

TABLE B4.1

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

SUMMARY STATISTICS - T-CREEK
OPERATIONS PHASE I

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		Operations Phase I (Years 0 through 23.5) - Regular Ore Processing									
Parameter	Unit	Minimum	10th Percentile	25th Percentile	Median	Mean	75th Percentile	90th Percentile	Maximum	Standard Deviation	Coefficient of Variation
Hardness, Dissolved Anions and Nutrients											
Model Hardness	mg/L CaCO3	2.3	12.7	15.5	19.8	18.5	21.2	23.3	23.7	4.2	0.2
Baseline Hardness	mg/L CaCO3	24.48	27.64	33.62	40.70	38.12	43.00	43.30	45.30	6.35	0.17
SO4	mg/L	0.99	1.03	1.14	1.83	1.89	2.07	3.08	5.86	0.90	0.47
Cl	mg/L	0.20	0.50	0.50	0.50	0.51	0.53	0.60	0.60	0.06	0.12
F	mg/L	0.006	0.020	0.020	0.021	0.023	0.028	0.028	0.034	0.005	0.22
Hardness	mg/L	2.3	12.7	15.5	19.8	18.5	21.2	23.3	23.7	4.2	0.23
Orthophosphate	mg/L	0.0004	0.0010	0.0010	0.0030	0.0028	0.0049	0.0050	0.0050	0.0015	0.54
N as NO3	mg/L	0.005	0.007	0.007	0.044	0.046	0.088	0.098	0.102	0.033	0.73
Dissolved Metals											
Al - D	mg/L	0.008	0.017	0.017	0.025	0.032	0.036	0.068	0.080	0.020	0.63
Cd - D	mg/L	0.0000023	0.0000050	0.0000050	0.0000075	0.0000104	0.0000095	0.0000130	0.0000383	0.0000087	0.84
Fe - D	mg/L	0.0021	0.0040	0.0075	0.0090	0.0132	0.0195	0.0233	0.0333	0.0086	0.65
Total Metals											
Al - T	mg/L	0.008	0.017	0.019	0.035	0.055	0.043	0.139	0.216	0.059	1.07
Sb - T	mg/L	0.00002	0.00002	0.00002	0.00006	0.00008	0.00013	0.00013	0.00013	0.00004	0.56
As - T	mg/L	0.00008	0.00009	0.00009	0.00012	0.00025	0.00030	0.00055	0.00080	0.00022	0.91
Ba - T	mg/L	0.0013	0.0062	0.0063	0.0070	0.0069	0.0074	0.0078	0.0079	0.0009	0.13
Be - T	mg/L	0.000009	0.000010	0.000010	0.000055	0.000069	0.000100	0.000133	0.000133	0.000046	0.66
Bi - T	mg/L	0.000005	0.000005	0.000005	0.000253	0.000262	0.000400	0.000425	0.000500	0.000172	0.66
B - T	mg/L	0.010	0.010	0.010	0.021	0.026	0.050	0.050	0.050	0.016	0.62
Cd - T	mg/L	0.0000023	0.000005	0.000005	0.000008	0.000014	0.000013	0.000038	0.000041	0.000012	0.90
Ca - T	mg/L	2.8	4.5	5.6	6.7	6.4	7.2	8.1	8.1	1.3	0.20
Cr - T	mg/L	0.00004	0.00010	0.00010	0.00010	0.00013	0.00015	0.00019	0.00021	0.00004	0.30
Co - T	mg/L	0.000012	0.000012	0.000018	0.000057	0.000077	0.000125	0.000133	0.000160	0.000050	0.65
Cu - T	mg/L	0.00016	0.00030	0.00040	0.00047	0.00066	0.00083	0.00102	0.00170	0.00038	0.58
Fe - T	mg/L	0.0025	0.0050	0.0090	0.0184	0.0382	0.0301	0.1025	0.1890	0.0525	1.37
Pb - T	mg/L	0.000006	0.000011	0.000014	0.000097	0.000165	0.000103	0.000574	0.000720	0.000224	1.36
Li - T	mg/L	0.00019	0.00050	0.00050	0.00050	0.00058	0.00067	0.00067	0.00088	0.00012	0.20
Mg - T	mg/L	0.43	0.47	0.56	0.70	0.71	0.85	0.87	2.60	0.24	0.33
Mn - T	mg/L	0.00014	0.00016	0.00034	0.00070	0.00209	0.00194	0.00556	0.01089	0.00305	1.46
Hg - T	mg/L	0.0000012	0.0000100	0.0000100	0.0000100	0.0000103	0.0000100	0.0000125	0.0000133	0.0000015	0.14
Mo - T	mg/L	0.00031	0.00045	0.00046	0.00073	0.00081	0.00114	0.00132	0.00140	0.00034	0.42
Ni - T	mg/L	0.00003	0.00004	0.0001	0.0003	0.0003	0.0004	0.0004	0.0005	0.00016	0.57
P - T	mg/L	0.036	0.210	0.215	0.266	0.260	0.300	0.300	0.300	0.045	0.17
K - T	mg/L	0.12	0.42	0.43	0.54	0.52	0.60	0.60	0.61	0.09	0.17
Se - T	mg/L	0.000040	0.000040	0.000045	0.000100	0.000092	0.000125	0.000133	0.000574	0.000057	0.62
Si - T	mg/L	0.54	2.93	2.94	3.36	3.34	3.79	3.84	3.93	0.50	0.15
Ag - T	mg/L	0.0000022	0.0000050	0.0000050	0.0000100	0.000014	0.000023	0.000023	0.000025	0.000008	0.57
Na - T	mg/L	0.14	0.65	0.79	1.06	1.00	1.16	1.35	1.37	0.25	0.25
Sr - T	mg/L	0.012	0.015	0.017	0.022	0.020	0.024	0.024	0.025	0.004	0.19
S - T	mg/L	1.21	10.00	10.00	10.00	9.88	10.00	10.00	10.00	0.98	0.10
Tl - T	mg/L	0.000002	0.000002	0.000002	0.000006	0.000007	0.000011	0.000013	0.000013	0.000004	0.56
Sn - T	mg/L	0.00007	0.00008	0.00011	0.00015	0.00018	0.00026	0.00030	0.00037	0.00009	0.49
Ti - T	mg/L	0.0005	0.0005	0.0005	0.0053	0.0056	0.0074	0.0079	0.0160	0.0042	0.74
U - T	mg/L	0.00005	0.00020	0.00020	0.00021	0.00029	0.00024	0.00030	0.00104	0.00023	0.80
V - T	mg/L	0.00013	0.00020	0.00020	0.00060	0.00058	0.00078	0.00081	0.00107	0.00027	0.46
Zn - T	mg/L	0.0003	0.0003	0.0016	0.0017	0.0021	0.0030	0.0036	0.0040	0.0011	0.55
Zr - T	mg/L	0.00001	0.00010	0.00010	0.00010	0.00096	0.00200	0.00200	0.00200	0.00091	0.95

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NOTES:

1. UNITS ARE IN mg/L UNLESS OTHERWISE STATED.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT VA101-458/14-3	EJA	JEM	KJB

Knight Piésold CONSULTING

TABLE B4.2

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

SUMMARY STATISTICS - T-CREEK
OPERATIONS PHASE II

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		Operations Phase II (Years 23.5 through 28) - LGO Processing to Open Pit									
Parameter	Unit	Minimum	10th Percentile	25th Percentile	Median	Mean	75th Percentile	90th Percentile	Maximum	Standard Deviation	Coefficient of Variation
Hardness, Dissolved Anions and Nutrients											
Model Hardness	mg/L CaCO3	10.78	13.00	17.77	19.68	18.72	20.50	23.30	23.70	3.62	0.19
Baseline Hardness	mg/L CaCO3	24.48	27.64	36.75	40.64	38.16	42.65	43.30	45.30	6.11	0.16
SO4	mg/L	0.99	1.03	1.14	1.75	1.84	2.02	3.03	3.84	0.81	0.44
Cl	mg/L	0.40	0.50	0.50	0.50	0.52	0.56	0.60	0.60	0.05	0.10
F	mg/L	0.018	0.020	0.020	0.021	0.023	0.028	0.028	0.034	0.005	0.20
Hardness	mg/L	10.8	13.0	17.8	19.7	18.7	20.5	23.3	23.7	3.6	0.19
Orthophosphate	mg/L	0.0010	0.0010	0.0017	0.0030	0.0028	0.0037	0.0050	0.0050	0.0015	0.52
N as NO3	mg/L	0.006	0.007	0.022	0.044	0.045	0.046	0.098	0.102	0.032	0.71
Dissolved Metals											
Al - D	mg/L	0.016	0.017	0.017	0.027	0.032	0.033	0.068	0.080	0.019	0.61
Cd - D	mg/L	0.0000050	0.0000050	0.0000075	0.0000078	0.0000108	0.0000103	0.0000130	0.0000383	0.0000091	0.84
Fe - D	mg/L	0.0030	0.0040	0.0085	0.0098	0.0131	0.0165	0.0233	0.0333	0.0082	0.62
Total Metals											
Al - T	mg/L	0.016	0.017	0.027	0.037	0.053	0.042	0.139	0.216	0.056	1.05
Sb - T	mg/L	0.0000	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00004	0.53
As - T	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.00023	0.91
Ba - T	mg/L	0.006	0.006	0.006	0.007	0.007	0.008	0.008	0.008	0.0006	0.09
Be - T	mg/L	0.000010	0.000010	0.000055	0.000058	0.000072	0.000119	0.000133	0.000133	0.000045	0.62
Bi - T	mg/L	0.00001	0.00001	0.00025	0.00030	0.00027	0.00040	0.00043	0.00050	0.000164	0.60
B - T	mg/L	0.01	0.01	0.01	0.02	0.03	0.03	0.05	0.05	0.016	0.63
Cd - T	mg/L	0.00001	0.00001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.00001	0.88
Ca - T	mg/L	3.9	4.6	6.1	6.7	6.4	7.1	8.1	8.1	1.2	0.18
Cr - T	mg/L	0.00010	0.00010	0.00010	0.00013	0.00013	0.00014	0.00019	0.00021	0.00004	0.28
Co - T	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000049	0.61
Cu - T	mg/L	0.00029	0.00030	0.00043	0.00053	0.00067	0.00079	0.00102	0.00170	0.00039	0.58
Fe - T	mg/L	0.0040	0.0050	0.0135	0.0195	0.0365	0.0245	0.1025	0.1890	0.0501	1.37
Pb - T	mg/L	0.000006	0.000011	0.000030	0.000100	0.000170	0.000182	0.000574	0.000720	0.000227	1.33
Li - T	mg/L	0.00050	0.00050	0.00050	0.00051	0.00059	0.00067	0.00067	0.00088	0.00012	0.20
Mg - T	mg/L	0.43	0.47	0.63	0.69	0.69	0.76	0.87	1.01	0.16	0.24
Mn - T	mg/L	0.00014	0.00016	0.00047	0.00091	0.00199	0.00162	0.00556	0.01089	0.00291	1.46
Hg - T	mg/L	0.0000100	0.0000100	0.0000100	0.0000100	0.0000105	0.0000100	0.0000125	0.0000133	0.0000011	0.11
Mo - T	mg/L	0.00031	0.00045	0.00068	0.00074	0.00084	0.00115	0.00132	0.00140	0.00034	0.41
Ni - T	mg/L	0.000030	0.000040	0.000270	0.000323	0.000291	0.000431	0.000433	0.000500	0.000153	0.53
P - T	mg/L	0.210	0.210	0.210	0.275	0.263	0.300	0.300	0.300	0.039	0.15
K - T	mg/L	0.37	0.42	0.51	0.53	0.53	0.60	0.60	0.61	0.08	0.14
Se - T	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.39
Si - T	mg/L	2.93	2.93	2.94	3.36	3.37	3.68	3.84	3.93	0.39	0.12
Ag - T	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00002	0.00002	0.00003	0.0000078	0.55
Na - T	mg/L	0.59	0.66	0.95	1.05	1.01	1.08	1.35	1.37	0.22	0.22
Sr - T	mg/L	0.012	0.015	0.019	0.022	0.021	0.023	0.024	0.025	0.004	0.18
S - T	mg/L	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	0.00	0.00
Tl - T	mg/L	0.000002	0.000002	0.000006	0.000007	0.000008	0.000012	0.000013	0.000013	0.000004	0.53
Sn - T	mg/L	0.00007	0.00008	0.00010	0.00013	0.00017	0.00022	0.00030	0.00034	0.00008	0.50
Ti - T	mg/L	0.0005	0.0005	0.0053	0.0053	0.0057	0.0070	0.0079	0.0160	0.0039	0.69
U - T	mg/L	0.0002	0.0002	0.0002	0.0002	0.0003	0.0003	0.0003	0.0010	0.00024	0.81
V - T	mg/L	0.0002	0.0002	0.0006	0.0006	0.0006	0.0007	0.0008	0.0011	0.00025	0.42
Zn - T	mg/L	0.0003	0.0003	0.0016	0.0023	0.0021	0.0029	0.0036	0.0040	0.0011	0.52
Zr - T	mg/L	0.00010	0.00010	0.00010	0.00105	0.00099	0.00200	0.00200	0.00200	0.00091	0.92

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NOTES:

1. UNITS ARE IN mg/L UNLESS OTHERWISE STATED.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT VA101-458/14-3	EJA	JEM	KJB

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TABLE B4.3

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

SUMMARY STATISTICS - T-CREEK
CLOSURE

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		Closure (Years 29 through 35)									
Parameter	Unit	Minimum	10th Percentile	25th Percentile	Median	Mean	75th Percentile	90th Percentile	Maximum	Standard Deviation	Coefficient of Variation
Hardness, Dissolved Anions and Nutrients											
Model Hardness	mg/L CaCO3	10.8	18.1	21.2	29.9	28.0	34.4	36.1	37.8	7.5	0.3
Baseline Hardness	mg/L CaCO3	24.48	27.64	35.71	40.67	38.12	42.74	43.30	45.30	6.33	0.17
SO4	mg/L	0.99	1.14	2.06	155.86	127.07	214.55	220.26	224.12	94.88	0.75
Cl	mg/L	0.40	0.50	0.53	2.76	2.33	3.58	3.70	3.78	1.38	0.59
F	mg/L	0.018	0.020	0.028	0.092	0.079	0.116	0.123	0.127	0.043	0.54
Hardness	mg/L	10.8	18.1	21.2	29.9	28.0	34.4	36.1	37.8	7.5	0.27
Orthophosphate	mg/L	0.0010	0.0017	0.0022	0.0026	0.0027	0.0029	0.0046	0.0050	0.0010	0.37
N as NO3	mg/L	0.006	0.028	0.088	0.844	0.680	1.105	1.190	1.269	0.483	0.71
Dissolved Metals											
Al - D	mg/L	0.016	0.017	0.018	0.019	0.025	0.029	0.036	0.080	0.014	0.56
Cd - D	mg/L	0.0000050	0.0000058	0.0000095	0.0000383	0.0000308	0.0000444	0.0000460	0.0000472	0.0000165	0.54
Fe - D	mg/L	0.0030	0.0061	0.0063	0.0071	0.0097	0.0106	0.0165	0.0333	0.0063	0.64
Total Metals											
Al - T	mg/L	0.016	0.021	0.028	0.029	0.042	0.037	0.081	0.216	0.037	0.87
Sb - T	mg/L	0.00002	0.00003	0.00013	0.00189	0.00155	0.00257	0.00263	0.00267	0.00111	0.72
As - T	mg/L	0.00009	0.00010	0.00030	0.00181	0.00147	0.00227	0.00237	0.00243	0.00093	0.63
Ba - T	mg/L	0.0060	0.0065	0.0074	0.0108	0.0100	0.0121	0.0125	0.0128	0.0024	0.24
Be - T	mg/L	0.000010	0.000013	0.000023	0.000025	0.000045	0.000055	0.000099	0.000133	0.000033	0.75
Bi - T	mg/L	0.000005	0.000024	0.000078	0.000085	0.000160	0.000198	0.000400	0.000500	0.000128	0.80
B - T	mg/L	0.010	0.010	0.039	0.050	0.044	0.057	0.059	0.062	0.017	0.37
Cd - T	mg/L	0.00001	0.00001	0.00001	0.00004	0.00003	0.00005	0.00005	0.00005	0.00002	0.50
Ca - T	mg/L	3.9	6.2	7.2	21.2	18.6	26.7	28.1	29.0	9.3	0.50
Cr - T	mg/L	0.00010	0.00010	0.00014	0.00016	0.00015	0.00017	0.00018	0.00021	0.00003	0.19
Co - T	mg/L	0.00001	0.00003	0.0001	0.0026	0.0021	0.0034	0.0037	0.0039	0.0015	0.73
Cu - T	mg/L	0.00029	0.00041	0.00079	0.00383	0.00315	0.00483	0.00505	0.00519	0.00192	0.61
Fe - T	mg/L	0.0040	0.0104	0.0143	0.0147	0.0264	0.0206	0.0631	0.1890	0.0327	1.24
Pb - T	mg/L	0.00001	0.00002	0.00010	0.00010	0.00013	0.00011	0.00023	0.00072	0.000129	1.02
Li - T	mg/L	0.00050	0.00050	0.00066	0.00469	0.00390	0.00612	0.00642	0.00662	0.00252	0.65
Mg - T	mg/L	0.43	0.64	0.83	15.92	13.00	21.25	22.42	23.14	9.34	0.72
Mn - T	mg/L	0.00014	0.00038	0.00162	0.03241	0.02516	0.04055	0.04246	0.04360	0.01762	0.70
Hg - T	mg/L	0.000004	0.000004	0.000004	0.000006	0.000007	0.000010	0.000010	0.000013	0.000003	0.40
Mo - T	mg/L	0.000	0.001	0.001	0.008	0.007	0.011	0.011	0.012	0.005	0.67
Ni - T	mg/L	0.0000	0.0001	0.0004	0.0017	0.0014	0.0021	0.0022	0.0023	0.0009	0.61
P - T	mg/L	0.078	0.079	0.080	0.123	0.155	0.233	0.300	0.300	0.084	0.54
K - T	mg/L	0.37	0.51	0.60	3.42	2.90	4.53	4.69	4.79	1.80	0.62
Se - T	mg/L	0.0000	0.0000	0.0001	0.0083	0.0067	0.0111	0.0118	0.0121	0.0050	0.75
Si - T	mg/L	2.45	2.50	2.60	2.68	2.90	2.96	3.79	3.93	0.46	0.16
Ag - T	mg/L	0.000005	0.000006	0.000019	0.000022	0.000019	0.000023	0.000023	0.000025	0.000006	0.33
Na - T	mg/L	0.59	0.97	1.16	1.58	1.51	1.86	1.92	1.98	0.40	0.27
Sr - T	mg/L	0.012	0.020	0.024	0.516	0.424	0.703	0.726	0.740	0.306	0.72
S - T	mg/L	4.93	5.08	5.37	6.57	7.26	10.00	10.00	10.00	2.08	0.29
Tl - T	mg/L	0.000002	0.000003	0.000011	0.000020	0.000016	0.000022	0.000023	0.000024	0.000007	0.45
Sn - T	mg/L	0.00007	0.00013	0.00023	0.00028	0.00026	0.00031	0.00033	0.00034	0.00008	0.30
Ti - T	mg/L	0.0005	0.0009	0.0021	0.0022	0.0037	0.0053	0.0070	0.0160	0.0028	0.77
U - T	mg/L	0.00019	0.00020	0.00024	0.00128	0.00109	0.00164	0.00170	0.00174	0.00063	0.58
V - T	mg/L	0.00020	0.00023	0.00032	0.00034	0.00044	0.00054	0.00072	0.00107	0.00019	0.43
Zn - T	mg/L	0.0003	0.0016	0.0029	0.0047	0.0039	0.0050	0.0053	0.0055	0.0016	0.41
Zr - T	mg/L	0.00010	0.00010	0.00023	0.00023	0.00058	0.00075	0.00200	0.00200	0.00061	1.06

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NOTES:

1. UNITS ARE IN mg/L UNLESS OTHERWISE STATED.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT VA101-458/14-3	EJA	JEM	KJB

Knight Piésold CONSULTING

TABLE B4.4

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

SUMMARY STATISTICS - T-CREEK
CLOSURE AND POST-CLOSURE

Print Oct/16/14 11:05:29

		Post-Closure (Years 36 +)									
Parameter	Unit	Minimum	10th Percentile	25th Percentile	Median	Mean	75th Percentile	90th Percentile	Maximum	Standard Deviation	Coefficient of Variation
Hardness, Dissolved Anions and Nutrients											
Model Hardness	mg/L CaCO3	24.4	30.2	33.6	40.0	40.3	47.4	51.9	54.6	8.0	0.2
Baseline Hardness	mg/L CaCO3	24.48	27.64	34.67	40.64	38.12	42.83	43.30	45.30	6.30	0.17
SO4	mg/L	124.99	129.77	150.19	178.82	170.39	188.23	200.03	211.97	24.93	0.15
Cl	mg/L	2.13	2.30	2.59	2.94	2.90	3.20	3.47	3.54	0.40	0.14
F	mg/L	0.057	0.067	0.076	0.086	0.088	0.102	0.114	0.117	0.017	0.19
Hardness	mg/L	24.4	30.2	33.6	40.0	40.3	47.4	51.9	54.6	8.0	0.20
Orthophosphate	mg/L	0.0022	0.0027	0.0030	0.0036	0.0036	0.0043	0.0047	0.0049	0.0008	0.21
N as NO3	mg/L	0.030	0.043	0.059	0.122	0.221	0.306	0.576	0.994	0.221	1.00
Dissolved Metals											
Al - D	mg/L	0.018	0.024	0.027	0.029	0.029	0.030	0.039	0.044	0.005	0.18
Cd - D	mg/L	0.0000374	0.0000525	0.0000609	0.0000764	0.0000771	0.0000945	0.0001054	0.0001119	0.0000196	0.25
Fe - D	mg/L	0.0061	0.0068	0.0075	0.0082	0.0088	0.0093	0.0122	0.0153	0.0022	0.25
Total Metals											
Al - T	mg/L	0.028	0.034	0.037	0.039	0.044	0.040	0.066	0.087	0.015	0.34
Sb - T	mg/L	0.00156	0.00162	0.00186	0.00219	0.00209	0.00230	0.00244	0.00255	0.00029	0.14
As - T	mg/L	0.00135	0.00157	0.00174	0.00192	0.00192	0.00211	0.00227	0.00232	0.00025	0.13
Ba - T	mg/L	0.0082	0.0090	0.0095	0.0101	0.0102	0.0111	0.0118	0.0120	0.0010	0.10
Be - T	mg/L	0.000021	0.000023	0.000024	0.000026	0.000033	0.000044	0.000053	0.000058	0.000012	0.36
Bi - T	mg/L	0.000065	0.000073	0.000077	0.000080	0.000107	0.000152	0.000173	0.000191	0.000044	0.41
B - T	mg/L	0.028	0.031	0.036	0.039	0.041	0.046	0.051	0.054	0.007	0.17
Cd - T	mg/L	0.00004	0.00005	0.00006	0.00008	0.00008	0.00010	0.00011	0.00011	0.00002	0.24
Ca - T	mg/L	18.4	19.6	21.6	24.9	24.2	26.5	27.8	28.5	2.9	0.12
Cr - T	mg/L	0.00014	0.00015	0.00015	0.00016	0.00016	0.00017	0.00018	0.00019	0.00001	0.07
Co - T	mg/L	0.00058	0.00076	0.0009	0.0013	0.0014	0.0019	0.0025	0.0031	0.0007	0.45
Cu - T	mg/L	0.00274	0.00310	0.00354	0.00387	0.00396	0.00445	0.00487	0.00503	0.00062	0.16
Fe - T	mg/L	0.0146	0.0162	0.0178	0.0189	0.0240	0.0198	0.0420	0.0649	0.0136	0.57
Pb - T	mg/L	0.00009	0.00010	0.00011	0.00011	0.00012	0.00011	0.00011	0.00023	0.000035	0.30
Li - T	mg/L	0.00318	0.00364	0.00420	0.00463	0.00474	0.00535	0.00595	0.00610	0.00080	0.17
Mg - T	mg/L	14.30	15.31	16.91	20.54	19.72	21.98	23.13	23.70	2.81	0.14
Mn - T	mg/L	0.02081	0.02572	0.02961	0.03342	0.03442	0.03998	0.04370	0.04580	0.00655	0.19
Hg - T	mg/L	0.000004	0.000005	0.000006	0.000006	0.000006	0.000007	0.000007	0.000008	0.000001	0.12
Mo - T	mg/L	0.006	0.008	0.009	0.010	0.010	0.012	0.013	0.013	0.002	0.18
Ni - T	mg/L	0.0014	0.0016	0.0017	0.0020	0.0019	0.0022	0.0023	0.0023	0.0003	0.13
P - T	mg/L	0.065	0.069	0.071	0.076	0.087	0.104	0.116	0.137	0.021	0.24
K - T	mg/L	2.51	2.69	3.10	3.53	3.48	3.83	4.18	4.46	0.51	0.15
Se - T	mg/L	0.0045	0.0048	0.0058	0.0066	0.0068	0.0075	0.0088	0.0108	0.0014	0.21
Si - T	mg/L	2.03	2.20	2.34	2.55	2.53	2.73	2.82	2.87	0.23	0.09
Ag - T	mg/L	0.000017	0.000019	0.000021	0.000022	0.000022	0.000023	0.000024	0.000024	0.000002	0.08
Na - T	mg/L	1.03	1.18	1.27	1.39	1.42	1.58	1.73	1.80	0.20	0.14
Sr - T	mg/L	0.386	0.418	0.485	0.564	0.553	0.617	0.672	0.693	0.086	0.16
S - T	mg/L	3.04	3.52	4.22	5.23	5.06	5.78	6.43	6.99	1.02	0.20
Tl - T	mg/L	0.000017	0.000019	0.000020	0.000021	0.000021	0.000022	0.000023	0.000023	0.000002	0.08
Sn - T	mg/L	0.00020	0.00026	0.00029	0.00037	0.00037	0.00044	0.00048	0.00051	0.00008	0.23
Ti - T	mg/L	0.0019	0.0022	0.0023	0.0024	0.0029	0.0033	0.0038	0.0060	0.0011	0.36
U - T	mg/L	0.00091	0.00096	0.00109	0.00123	0.00121	0.00131	0.00143	0.00161	0.00017	0.14
V - T	mg/L	0.00031	0.00042	0.00045	0.00047	0.00048	0.00052	0.00055	0.00062	0.00006	0.12
Zn - T	mg/L	0.0047	0.0059	0.0067	0.0085	0.0085	0.0102	0.0115	0.0121	0.0020	0.24
Zr - T	mg/L	0.00022	0.00024	0.00026	0.00027	0.00040	0.00064	0.00074	0.00077	0.00021	0.52

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NOTES:

1. UNITS ARE IN mg/L UNLESS OTHERWISE STATED.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT VA101-458/14-3	EJA	JEM	KJB

APPENDIX B5

HARPER CREEK BELOW P-CREEK (HP)

(Pages B5-1 to B5-4)

Knight Piésold CONSULTING

TABLE B5.1

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

SUMMARY STATISTICS - HARPER CREEK BELOW P-CREEK (HP)
OPERATIONS PHASE I

Print Oct/10/14 14:30:47

		Operations Phase I (Years 0 through 23.5) - Regular Ore Processing									
Parameter	Unit	Minimum	10th Percentile	25th Percentile	Median	Mean	75th Percentile	90th Percentile	Maximum	Standard Deviation	Coefficient of Variation
Hardness, Dissolved Anions and Nutrients											
Model Hardness	mg/L CaCO3	43.1	47.8	62.7	71.8	68.0	76.7	77.0	77.9	11.2	0.2
Baseline Hardness	mg/L CaCO3	24.48	27.64	33.62	40.70	38.12	43.00	43.30	45.30	6.35	0.17
SO4	mg/L	5.13	5.67	8.51	11.57	10.80	12.78	13.50	15.80	3.03	0.28
Cl	mg/L	0.50	0.50	0.50	0.50	0.51	0.50	0.53	0.57	0.02	0.04
F	mg/L	0.010	0.021	0.021	0.032	0.030	0.035	0.037	0.042	0.009	0.29
Hardness	mg/L	43.1	47.8	62.7	71.8	68.0	76.7	77.0	77.9	11.2	0.16
Orthophosphate	mg/L	0.0010	0.0010	0.0010	0.0022	0.0039	0.0050	0.0050	0.0187	0.0047	1.21
N as NO3	mg/L	0.101	0.131	0.173	0.265	0.256	0.306	0.402	0.544	0.123	0.48
Dissolved Metals											
Al - D	mg/L	0.003	0.003	0.004	0.004	0.007	0.008	0.016	0.018	0.005	0.76
Cd - D	mg/L	0.0000050	0.0000070	0.0000086	0.0000093	0.0000090	0.0000100	0.0000105	0.0000107	0.0000016	0.17
Fe - D	mg/L	0.0010	0.0034	0.0064	0.0080	0.0082	0.0100	0.0100	0.0167	0.0037	0.46
Total Metals											
Al - T	mg/L	0.003	0.004	0.004	0.005	0.023	0.013	0.086	0.114	0.036	1.58
Sb - T	mg/L	0.00002	0.00002	0.00002	0.00009	0.00007	0.00010	0.00010	0.00010	0.00003	0.46
As - T	mg/L	0.00018	0.00019	0.00021	0.00023	0.00050	0.00035	0.00103	0.00226	0.00059	1.17
Ba - T	mg/L	0.0049	0.0049	0.0055	0.0060	0.0058	0.0062	0.0063	0.0066	0.0005	0.09
Be - T	mg/L	0.000010	0.000010	0.000010	0.000089	0.000069	0.000100	0.000100	0.000100	0.000037	0.54
Bi - T	mg/L	0.000005	0.000005	0.000005	0.000438	0.000330	0.000500	0.000500	0.000500	0.000206	0.62
B - T	mg/L	0.010	0.010	0.010	0.015	0.024	0.050	0.050	0.050	0.017	0.70
Cd - T	mg/L	0.0000080	0.000009	0.000010	0.000010	0.000013	0.000011	0.000017	0.000034	0.000007	0.53
Ca - T	mg/L	13.8	15.1	19.5	21.2	20.5	22.6	23.4	23.7	3.0	0.15
Cr - T	mg/L	0.00010	0.00010	0.00010	0.00010	0.00012	0.00013	0.00018	0.00027	0.00005	0.39
Co - T	mg/L	0.000009	0.000010	0.000011	0.000076	0.000080	0.000100	0.000100	0.000243	0.000061	0.77
Cu - T	mg/L	0.00036	0.00038	0.00043	0.00067	0.00097	0.00114	0.00161	0.00351	0.00085	0.88
Fe - T	mg/L	0.0020	0.0034	0.0073	0.0095	0.0298	0.0148	0.0760	0.1914	0.0530	1.78
Pb - T	mg/L	0.000005	0.000010	0.000020	0.000042	0.000110	0.000125	0.000253	0.000558	0.000153	1.39
Li - T	mg/L	0.00050	0.00050	0.00050	0.00050	0.00053	0.00050	0.00050	0.00088	0.00010	0.19
Mg - T	mg/L	2.21	2.60	3.49	4.57	4.23	4.99	5.20	5.44	0.98	0.23
Mn - T	mg/L	0.00028	0.00030	0.00033	0.00054	0.00138	0.00066	0.00331	0.00821	0.00224	1.63
Hg - T	mg/L	0.0000100	0.0000100	0.0000100	0.0000100	0.0000100	0.0000100	0.0000100	0.0000100	0.0000000	0.00
Mo - T	mg/L	0.00014	0.00016	0.00018	0.00019	0.00019	0.00020	0.00021	0.00022	0.00002	0.11
Ni - T	mg/L	0.00006	0.00007	0.0001	0.0004	0.0004	0.0005	0.0005	0.0009	0.00023	0.60
P - T	mg/L	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.000	0.00
K - T	mg/L	0.20	0.22	0.25	0.30	0.28	0.31	0.33	0.33	0.04	0.15
Se - T	mg/L	0.000103	0.000103	0.000121	0.000148	0.000152	0.000200	0.000200	0.000211	0.000035	0.23
Si - T	mg/L	2.73	2.74	2.88	3.07	3.07	3.18	3.34	3.40	0.21	0.07
Ag - T	mg/L	0.0000050	0.0000050	0.0000050	0.0000100	0.000010	0.000012	0.000013	0.000017	0.000004	0.36
Na - T	mg/L	0.60	0.62	0.82	1.07	1.00	1.15	1.30	1.34	0.23	0.23
Sr - T	mg/L	0.035	0.041	0.056	0.065	0.060	0.068	0.069	0.070	0.011	0.18
S - T	mg/L	4.00	4.50	7.00	10.00	8.31	10.00	10.00	10.00	2.28	0.27
Tl - T	mg/L	0.000002	0.000002	0.000002	0.000009	0.000007	0.000010	0.000010	0.000010	0.000003	0.46
Sn - T	mg/L	0.00008	0.00009	0.00010	0.00010	0.00013	0.00020	0.00020	0.00030	0.00006	0.49
Ti - T	mg/L	0.0005	0.0005	0.0005	0.0072	0.0065	0.0100	0.0100	0.0113	0.0040	0.61
U - T	mg/L	0.00005	0.00006	0.00009	0.00013	0.00012	0.00016	0.00018	0.00019	0.00004	0.33
V - T	mg/L	0.00020	0.00020	0.00020	0.00090	0.00072	0.00100	0.00100	0.00100	0.00033	0.46
Zn - T	mg/L	0.0004	0.0010	0.0010	0.0024	0.0023	0.0030	0.0030	0.0040	0.0010	0.45
Zr - T	mg/L	0.00010	0.00010	0.00010	0.00010	0.00030	0.00040	0.00060	0.00105	0.00028	0.93

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NOTES:

1. UNITS ARE IN mg/L UNLESS OTHERWISE STATED.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT VA101-458/14-3	EJA	JEM	KJB

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TABLE B5.2

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

SUMMARY STATISTICS - HARPER CREEK BELOW P-CREEK (HP)
OPERATIONS PHASE II

Print Oct/10/14 14:30:47

		Operations Phase II (Years 23.5 through 28) - LGO Processing to Open Pit									
Parameter	Unit	Minimum	10th Percentile	25th Percentile	Median	Mean	75th Percentile	90th Percentile	Maximum	Standard Deviation	Coefficient of Variation
Hardness, Dissolved Anions and Nutrients											
Model Hardness	mg/L CaCO3	43.14	47.83	69.00	71.50	68.28	76.40	77.00	77.90	10.81	0.16
Baseline Hardness	mg/L CaCO3	24.48	27.64	36.75	40.64	38.16	42.65	43.30	45.30	6.11	0.16
SO4	mg/L	5.13	5.67	10.15	11.57	10.83	12.03	13.50	15.80	2.93	0.27
Cl	mg/L	0.50	0.50	0.50	0.50	0.51	0.50	0.53	0.57	0.02	0.04
F	mg/L	0.010	0.021	0.026	0.034	0.030	0.035	0.037	0.042	0.008	0.27
Hardness	mg/L	43.1	47.8	69.0	71.5	68.3	76.4	77.0	77.9	10.8	0.16
Orthophosphate	mg/L	0.0010	0.0010	0.0010	0.0022	0.0040	0.0050	0.0050	0.0187	0.0049	1.24
N as NO3	mg/L	0.101	0.131	0.148	0.225	0.248	0.301	0.402	0.544	0.121	0.49
Dissolved Metals											
Al - D	mg/L	0.003	0.003	0.004	0.005	0.006	0.005	0.016	0.018	0.005	0.75
Cd - D	mg/L	0.0000050	0.0000070	0.0000087	0.0000093	0.0000091	0.0000100	0.0000105	0.0000107	0.0000015	0.17
Fe - D	mg/L	0.0010	0.0034	0.0077	0.0080	0.0082	0.0100	0.0100	0.0167	0.0036	0.44
Total Metals											
Al - T	mg/L	0.003	0.004	0.004	0.008	0.021	0.013	0.086	0.114	0.034	1.62
Sb - T	mg/L	0.0000	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00003	0.44
As - T	mg/L	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.002	0.00057	1.15
Ba - T	mg/L	0.005	0.005	0.006	0.006	0.006	0.006	0.006	0.007	0.0005	0.09
Be - T	mg/L	0.000010	0.000010	0.000055	0.000089	0.000071	0.000100	0.000100	0.000100	0.000036	0.51
Bi - T	mg/L	0.00001	0.00001	0.00025	0.00044	0.00034	0.00050	0.00050	0.00050	0.000199	0.59
B - T	mg/L	0.01	0.01	0.01	0.02	0.02	0.03	0.05	0.05	0.016	0.70
Cd - T	mg/L	0.00001	0.00001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.00001	0.51
Ca - T	mg/L	13.8	15.1	20.7	21.2	20.5	22.5	23.4	23.7	2.9	0.14
Cr - T	mg/L	0.00010	0.00010	0.00010	0.00010	0.00012	0.00011	0.00018	0.00027	0.00005	0.38
Co - T	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000058	0.73
Cu - T	mg/L	0.00036	0.00038	0.00050	0.00073	0.00095	0.00081	0.00161	0.00351	0.00081	0.85
Fe - T	mg/L	0.0020	0.0034	0.0080	0.0095	0.0276	0.0110	0.0760	0.1914	0.0506	1.83
Pb - T	mg/L	0.000005	0.000010	0.000034	0.000042	0.000108	0.000131	0.000253	0.000558	0.000147	1.37
Li - T	mg/L	0.00050	0.00050	0.00050	0.00050	0.00053	0.00050	0.00050	0.00088	0.00011	0.20
Mg - T	mg/L	2.21	2.60	4.17	4.56	4.23	4.77	5.20	5.44	0.95	0.22
Mn - T	mg/L	0.00028	0.00030	0.00041	0.00059	0.00129	0.00062	0.00331	0.00821	0.00214	1.66
Hg - T	mg/L	0.0000100	0.0000100	0.0000100	0.0000100	0.0000100	0.0000100	0.0000100	0.0000100	0.0000000	0.00
Mo - T	mg/L	0.00014	0.00016	0.00019	0.00020	0.00019	0.00021	0.00021	0.00022	0.00002	0.11
Ni - T	mg/L	0.000060	0.000070	0.000355	0.000399	0.000393	0.000500	0.000533	0.000913	0.000223	0.57
P - T	mg/L	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.000	0.00
K - T	mg/L	0.20	0.22	0.28	0.30	0.28	0.31	0.33	0.33	0.04	0.14
Se - T	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.23
Si - T	mg/L	2.73	2.74	3.02	3.09	3.09	3.28	3.34	3.40	0.21	0.07
Ag - T	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00002	0.0000034	0.35
Na - T	mg/L	0.60	0.62	0.90	1.04	1.00	1.09	1.30	1.34	0.22	0.22
Sr - T	mg/L	0.035	0.041	0.064	0.065	0.061	0.067	0.069	0.070	0.011	0.17
S - T	mg/L	4.00	4.50	5.50	10.00	8.20	10.00	10.00	10.00	2.36	0.29
Tl - T	mg/L	0.000002	0.000002	0.000006	0.000009	0.000007	0.000010	0.000010	0.000010	0.000003	0.44
Sn - T	mg/L	0.00008	0.00009	0.00010	0.00010	0.00013	0.00011	0.00020	0.00030	0.00006	0.49
Ti - T	mg/L	0.0005	0.0005	0.0052	0.0072	0.0066	0.0100	0.0100	0.0113	0.0038	0.58
U - T	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.00004	0.32
V - T	mg/L	0.0002	0.0002	0.0006	0.0009	0.0007	0.0010	0.0010	0.0010	0.00032	0.44
Zn - T	mg/L	0.0004	0.0010	0.0019	0.0024	0.0023	0.0030	0.0030	0.0040	0.0010	0.43
Zr - T	mg/L	0.00010	0.00010	0.00010	0.00020	0.00032	0.00050	0.00060	0.00105	0.00029	0.92

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NOTES:

1. UNITS ARE IN mg/L UNLESS OTHERWISE STATED.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT VA101-458/14-3	EJA	JEM	KJB

Knight Piésold CONSULTING

TABLE B5.3

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

SUMMARY STATISTICS - HARPER CREEK BELOW P-CREEK (HP)
CLOSURE

Print Oct/10/14 14:30:47

		Closure (Years 29 through 35)									
Parameter	Unit	Minimum	10th Percentile	25th Percentile	Median	Mean	75th Percentile	90th Percentile	Maximum	Standard Deviation	Coefficient of Variation
Hardness, Dissolved Anions and Nutrients											
Model Hardness	mg/L CaCO3	43.1	47.8	66.9	71.7	68.1	76.5	77.0	77.9	11.2	0.2
Baseline Hardness	mg/L CaCO3	24.48	27.64	35.71	40.67	38.12	42.74	43.30	45.30	6.33	0.17
SO4	mg/L	5.13	5.67	9.60	11.57	10.81	12.28	13.50	15.80	3.02	0.28
Cl	mg/L	0.50	0.50	0.50	0.50	0.51	0.50	0.53	0.57	0.02	0.04
F	mg/L	0.010	0.021	0.025	0.033	0.030	0.035	0.037	0.042	0.008	0.28
Hardness	mg/L	43.1	47.8	66.9	71.7	68.1	76.5	77.0	77.9	11.2	0.16
Orthophosphate	mg/L	0.0010	0.0010	0.0010	0.0022	0.0039	0.0050	0.0050	0.0187	0.0047	1.22
N as NO3	mg/L	0.101	0.131	0.164	0.245	0.255	0.302	0.402	0.544	0.123	0.48
Dissolved Metals											
Al - D	mg/L	0.003	0.003	0.004	0.004	0.006	0.006	0.016	0.018	0.005	0.76
Cd - D	mg/L	0.0000050	0.0000070	0.0000087	0.0000093	0.0000090	0.0000100	0.0000105	0.0000107	0.0000016	0.17
Fe - D	mg/L	0.0010	0.0034	0.0073	0.0080	0.0082	0.0100	0.0100	0.0167	0.0037	0.45
Total Metals											
Al - T	mg/L	0.003	0.004	0.004	0.007	0.022	0.013	0.086	0.114	0.036	1.59
Sb - T	mg/L	0.00002	0.00002	0.00005	0.00009	0.00007	0.00010	0.00010	0.00010	0.00003	0.46
As - T	mg/L	0.00018	0.00019	0.00021	0.00023	0.00050	0.00040	0.00103	0.00226	0.00058	1.17
Ba - T	mg/L	0.0049	0.0049	0.0055	0.0060	0.0058	0.0062	0.0063	0.0066	0.0005	0.09
Be - T	mg/L	0.000010	0.000010	0.000044	0.000089	0.000069	0.000100	0.000100	0.000100	0.000037	0.54
Bi - T	mg/L	0.000005	0.000005	0.000191	0.000438	0.000332	0.000500	0.000500	0.000500	0.000205	0.62
B - T	mg/L	0.010	0.010	0.010	0.015	0.024	0.035	0.050	0.050	0.017	0.70
Cd - T	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00002	0.00003	0.00001	0.53
Ca - T	mg/L	13.8	15.1	20.3	21.2	20.5	22.5	23.4	23.7	3.0	0.15
Cr - T	mg/L	0.00010	0.00010	0.00010	0.00010	0.00012	0.00012	0.00018	0.00027	0.00005	0.39
Co - T	mg/L	0.00001	0.00001	0.0000	0.0001	0.0001	0.0001	0.0001	0.0002	0.0001	0.76
Cu - T	mg/L	0.00036	0.00038	0.00048	0.00070	0.00097	0.00092	0.00161	0.00351	0.00085	0.88
Fe - T	mg/L	0.0020	0.0034	0.0078	0.0095	0.0294	0.0123	0.0760	0.1914	0.0527	1.79
Pb - T	mg/L	0.00001	0.00001	0.00003	0.00004	0.00011	0.00013	0.00025	0.00056	0.000152	1.39
Li - T	mg/L	0.00050	0.00050	0.00050	0.00050	0.00053	0.00050	0.00050	0.00088	0.00010	0.20
Mg - T	mg/L	2.21	2.60	3.94	4.57	4.23	4.82	5.20	5.44	0.98	0.23
Mn - T	mg/L	0.00028	0.00030	0.00039	0.00056	0.00136	0.00063	0.00331	0.00821	0.00223	1.64
Hg - T	mg/L	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000000	0.00
Mo - T	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.11
Ni - T	mg/L	0.0001	0.0001	0.0003	0.0004	0.0004	0.0005	0.0005	0.0009	0.0002	0.60
P - T	mg/L	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.000	0.00
K - T	mg/L	0.20	0.22	0.27	0.30	0.28	0.31	0.33	0.33	0.04	0.15
Se - T	mg/L	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0000	0.23
Si - T	mg/L	2.73	2.74	2.98	3.08	3.07	3.20	3.34	3.40	0.21	0.07
Ag - T	mg/L	0.000005	0.000005	0.000007	0.000010	0.000010	0.000012	0.000013	0.000017	0.000004	0.36
Na - T	mg/L	0.60	0.62	0.88	1.05	1.00	1.11	1.30	1.34	0.23	0.23
Sr - T	mg/L	0.035	0.041	0.061	0.065	0.060	0.067	0.069	0.070	0.011	0.18
S - T	mg/L	4.00	4.50	6.63	10.00	8.29	10.00	10.00	10.00	2.30	0.28
Tl - T	mg/L	0.000002	0.000002	0.000005	0.000009	0.000007	0.000010	0.000010	0.000010	0.000003	0.46
Sn - T	mg/L	0.00008	0.00009	0.00010	0.00010	0.00013	0.00013	0.00020	0.00030	0.00006	0.49
Ti - T	mg/L	0.0005	0.0005	0.0040	0.0072	0.0065	0.0100	0.0100	0.0113	0.0039	0.61
U - T	mg/L	0.00005	0.00006	0.00011	0.00013	0.00012	0.00014	0.00018	0.00019	0.00004	0.33
V - T	mg/L	0.00020	0.00020	0.00050	0.00090	0.00073	0.00100	0.00100	0.00100	0.00033	0.46
Zn - T	mg/L	0.0004	0.0010	0.0016	0.0024	0.0023	0.0030	0.0030	0.0040	0.0010	0.45
Zr - T	mg/L	0.00010	0.00010	0.00010	0.00015	0.00030	0.00043	0.00060	0.00105	0.00028	0.93

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NOTES:

1. UNITS ARE IN mg/L UNLESS OTHERWISE STATED.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT VA101-458/14-3	EJA	JEM	KJB

Knight Piésold CONSULTING

TABLE B5.4

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

SUMMARY STATISTICS - HARPER CREEK BELOW P-CREEK (HP)
CLOSURE AND POST-CLOSURE

Print Oct/10/14 14:30:47

		Post-Closure (Years 36 +)									
Parameter	Unit	Minimum	10th Percentile	25th Percentile	Median	Mean	75th Percentile	90th Percentile	Maximum	Standard Deviation	Coefficient of Variation
Hardness, Dissolved Anions and Nutrients											
Model Hardness	mg/L CaCO3	43.1	47.8	64.8	71.8	68.1	76.6	77.0	77.9	11.1	0.2
Baseline Hardness	mg/L CaCO3	24.48	27.64	34.67	40.64	38.12	42.83	43.30	45.30	6.30	0.17
SO4	mg/L	5.13	5.67	9.06	11.50	10.81	12.53	13.50	15.80	3.01	0.28
Cl	mg/L	0.50	0.50	0.50	0.50	0.51	0.50	0.53	0.57	0.02	0.04
F	mg/L	0.010	0.021	0.024	0.034	0.030	0.035	0.037	0.042	0.008	0.28
Hardness	mg/L	43.1	47.8	64.8	71.8	68.1	76.6	77.0	77.9	11.1	0.16
Orthophosphate	mg/L	0.0010	0.0010	0.0010	0.0023	0.0039	0.0050	0.0050	0.0187	0.0047	1.21
N as NO3	mg/L	0.101	0.131	0.156	0.225	0.255	0.304	0.402	0.544	0.122	0.48
Dissolved Metals											
Al - D	mg/L	0.003	0.003	0.004	0.005	0.006	0.007	0.016	0.018	0.005	0.75
Cd - D	mg/L	0.0000050	0.0000070	0.0000086	0.0000093	0.0000090	0.0000100	0.0000105	0.0000107	0.0000015	0.17
Fe - D	mg/L	0.0010	0.0034	0.0068	0.0080	0.0082	0.0100	0.0100	0.0167	0.0037	0.45
Total Metals											
Al - T	mg/L	0.003	0.004	0.004	0.008	0.022	0.013	0.086	0.114	0.035	1.58
Sb - T	mg/L	0.00002	0.00002	0.00004	0.00010	0.00007	0.00010	0.00010	0.00010	0.00003	0.45
As - T	mg/L	0.00018	0.00019	0.00021	0.00024	0.00050	0.00046	0.00103	0.00226	0.00058	1.17
Ba - T	mg/L	0.0049	0.0049	0.0055	0.0061	0.0058	0.0062	0.0063	0.0066	0.0005	0.09
Be - T	mg/L	0.000010	0.000010	0.000033	0.000100	0.000069	0.000100	0.000100	0.000100	0.000037	0.53
Bi - T	mg/L	0.000005	0.000005	0.000129	0.000500	0.000332	0.000500	0.000500	0.000500	0.000204	0.62
B - T	mg/L	0.010	0.010	0.010	0.010	0.024	0.040	0.050	0.050	0.016	0.70
Cd - T	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00002	0.00003	0.00001	0.52
Ca - T	mg/L	13.8	15.1	19.9	21.2	20.5	22.6	23.4	23.7	3.0	0.14
Cr - T	mg/L	0.00010	0.00010	0.00010	0.00010	0.00012	0.00013	0.00018	0.00027	0.00005	0.39
Co - T	mg/L	0.00001	0.00001	0.0000	0.0001	0.0001	0.0001	0.0001	0.0002	0.0001	0.76
Cu - T	mg/L	0.00036	0.00038	0.00046	0.00073	0.00097	0.00103	0.00161	0.00351	0.00084	0.87
Fe - T	mg/L	0.0020	0.0034	0.0075	0.0100	0.0294	0.0135	0.0760	0.1914	0.0524	1.78
Pb - T	mg/L	0.00001	0.00001	0.00003	0.00004	0.00011	0.00013	0.00025	0.00056	0.000151	1.38
Li - T	mg/L	0.00050	0.00050	0.00050	0.00050	0.00053	0.00050	0.00050	0.00088	0.00010	0.20
Mg - T	mg/L	2.21	2.60	3.72	4.56	4.23	4.88	5.20	5.44	0.97	0.23
Mn - T	mg/L	0.00028	0.00030	0.00037	0.00059	0.00136	0.00065	0.00331	0.00821	0.00221	1.63
Hg - T	mg/L	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000000	0.00
Mo - T	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.11
Ni - T	mg/L	0.0001	0.0001	0.0002	0.0004	0.0004	0.0005	0.0005	0.0009	0.0002	0.59
P - T	mg/L	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.000	0.00
K - T	mg/L	0.20	0.22	0.26	0.29	0.28	0.31	0.33	0.33	0.04	0.14
Se - T	mg/L	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0000	0.23
Si - T	mg/L	2.73	2.74	2.95	3.09	3.07	3.23	3.34	3.40	0.21	0.07
Ag - T	mg/L	0.000005	0.000005	0.000006	0.000010	0.000010	0.000012	0.000013	0.000017	0.000003	0.36
Na - T	mg/L	0.60	0.62	0.85	1.04	1.00	1.12	1.30	1.34	0.23	0.23
Sr - T	mg/L	0.035	0.041	0.058	0.065	0.060	0.067	0.069	0.070	0.011	0.18
S - T	mg/L	4.00	4.50	6.25	10.00	8.29	10.00	10.00	10.00	2.29	0.28
Tl - T	mg/L	0.000002	0.000002	0.000004	0.000010	0.000007	0.000010	0.000010	0.000010	0.000003	0.45
Sn - T	mg/L	0.00008	0.00009	0.00010	0.00010	0.00013	0.00016	0.00020	0.00030	0.00006	0.49
Ti - T	mg/L	0.0005	0.0005	0.0029	0.0068	0.0065	0.0100	0.0100	0.0113	0.0039	0.61
U - T	mg/L	0.00005	0.00006	0.00010	0.00013	0.00012	0.00014	0.00018	0.00019	0.00004	0.33
V - T	mg/L	0.00020	0.00020	0.00040	0.00100	0.00073	0.00100	0.00100	0.00100	0.00033	0.45
Zn - T	mg/L	0.0004	0.0010	0.0014	0.0024	0.0023	0.0030	0.0030	0.0040	0.0010	0.45
Zr - T	mg/L	0.00010	0.00010	0.00010	0.00020	0.00030	0.00045	0.00060	0.00105	0.00028	0.93

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NOTES:

1. UNITS ARE IN mg/L UNLESS OTHERWISE STATED.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT VA101-458/14-3	EJA	JEM	KJB

APPENDIX B6

MID HARPER CREEK

(Pages B6-1 to B6-4)

Knight Piésold CONSULTING

TABLE B6.1

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

SUMMARY STATISTICS - MID HARPER CREEK (HM)
OPERATIONS PHASE I

Print Oct/16/14 11:06:11

		Operations Phase I (Years 0 through 23.5) - Regular Ore Processing									
Parameter	Unit	Minimum	10th Percentile	25th Percentile	Median	Mean	75th Percentile	90th Percentile	Maximum	Standard Deviation	Coefficient of Variation
Hardness, Dissolved Anions and Nutrients											
Model Hardness	mg/L CaCO3	30.6	34.3	41.4	46.1	43.8	46.5	47.2	51.6	5.7	0.1
Baseline Hardness	mg/L CaCO3	24.48	27.64	33.62	40.70	38.12	43.00	43.30	45.30	6.35	0.17
SO4	mg/L	5.29	6.56	10.25	14.28	15.26	19.52	24.66	37.81	6.91	0.45
Cl	mg/L	0.53	0.64	0.74	0.90	0.87	0.99	1.06	1.24	0.16	0.19
F	mg/L	0.028	0.028	0.039	0.047	0.043	0.049	0.050	0.054	0.008	0.18
Hardness	mg/L	30.6	34.3	41.4	46.1	43.8	46.5	47.2	51.6	5.7	0.13
Orthophosphate	mg/L	0.0013	0.0015	0.0027	0.0047	0.0041	0.0050	0.0050	0.0063	0.0015	0.36
N as NO3	mg/L	0.117	0.172	0.205	0.227	0.235	0.265	0.343	0.434	0.060	0.26
Dissolved Metals											
Al - D	mg/L	0.006	0.006	0.006	0.007	0.011	0.011	0.026	0.031	0.008	0.74
Cd - D	mg/L	0.0000059	0.0000067	0.0000073	0.0000083	0.0000088	0.0000097	0.0000125	0.0000128	0.0000020	0.23
Fe - D	mg/L	0.0037	0.0043	0.0044	0.0046	0.0070	0.0091	0.0110	0.0174	0.0039	0.56
Total Metals											
Al - T	mg/L	0.007	0.007	0.007	0.008	0.025	0.019	0.096	0.099	0.033	1.33
Sb - T	mg/L	0.00002	0.00004	0.00007	0.00011	0.00012	0.00015	0.00021	0.00037	0.00007	0.56
As - T	mg/L	0.00038	0.00042	0.00047	0.00052	0.00055	0.00058	0.00074	0.00088	0.00012	0.23
Ba - T	mg/L	0.0065	0.0066	0.0088	0.0108	0.0099	0.0110	0.0111	0.0114	0.0017	0.17
Be - T	mg/L	0.000010	0.000010	0.000010	0.000018	0.000035	0.000064	0.000090	0.000093	0.000031	0.87
Bi - T	mg/L	0.000005	0.000005	0.000007	0.000050	0.000137	0.000286	0.000442	0.000461	0.000167	1.22
B - T	mg/L	0.013	0.015	0.027	0.047	0.040	0.050	0.051	0.052	0.014	0.35
Cd - T	mg/L	0.0000089	0.000009	0.000010	0.000011	0.000012	0.000014	0.000018	0.000020	0.000003	0.26
Ca - T	mg/L	10.0	11.1	13.7	15.6	14.7	16.0	16.4	17.1	2.1	0.14
Cr - T	mg/L	0.00010	0.00010	0.00010	0.00010	0.00012	0.00011	0.00019	0.00020	0.00003	0.29
Co - T	mg/L	0.000019	0.000077	0.000128	0.000191	0.000254	0.000347	0.000512	0.000909	0.000182	0.72
Cu - T	mg/L	0.00044	0.00051	0.00058	0.00067	0.00098	0.00095	0.00246	0.00268	0.00073	0.74
Fe - T	mg/L	0.0065	0.0070	0.0071	0.0074	0.0313	0.0267	0.1279	0.1321	0.0449	1.44
Pb - T	mg/L	0.000006	0.000009	0.000011	0.000012	0.000047	0.000058	0.000116	0.000252	0.000068	1.45
Li - T	mg/L	0.00053	0.00057	0.00072	0.00093	0.00090	0.00106	0.00115	0.00142	0.00022	0.24
Mg - T	mg/L	1.64	1.88	2.52	3.04	2.93	3.37	3.67	4.56	0.67	0.23
Mn - T	mg/L	0.00076	0.00106	0.00152	0.00209	0.00265	0.00302	0.00587	0.00615	0.00165	0.62
Hg - T	mg/L	0.0000099	0.0000099	0.0000100	0.0000100	0.0000100	0.0000100	0.0000100	0.0000100	0.0000000	0.00
Mo - T	mg/L	0.00038	0.00049	0.00081	0.00100	0.00099	0.00120	0.00139	0.00191	0.00033	0.34
Ni - T	mg/L	0.00009	0.00013	0.0002	0.0002	0.0003	0.0004	0.0005	0.0006	0.00013	0.51
P - T	mg/L	0.277	0.297	0.298	0.299	0.297	0.300	0.300	0.300	0.006	0.02
K - T	mg/L	0.53	0.57	0.99	1.24	1.16	1.37	1.48	1.74	0.31	0.27
Se - T	mg/L	0.000102	0.000135	0.000201	0.000433	0.000624	0.000936	0.001410	0.002538	0.000538	0.86
Si - T	mg/L	3.14	3.16	3.56	3.86	3.71	3.87	3.89	3.91	0.27	0.07
Ag - T	mg/L	0.0000050	0.0000053	0.0000058	0.0000064	0.000008	0.000010	0.000010	0.000016	0.000003	0.37
Na - T	mg/L	0.85	0.86	1.43	1.95	1.70	1.98	2.01	2.09	0.42	0.25
Sr - T	mg/L	0.032	0.038	0.056	0.066	0.071	0.088	0.105	0.150	0.026	0.36
S - T	mg/L	9.28	9.36	9.42	9.93	9.74	9.97	9.98	10.00	0.27	0.03
Tl - T	mg/L	0.000002	0.000002	0.000003	0.000004	0.000005	0.000007	0.000009	0.000009	0.000003	0.52
Sn - T	mg/L	0.00011	0.00011	0.00015	0.00019	0.00018	0.00020	0.00022	0.00024	0.00004	0.22
Ti - T	mg/L	0.0005	0.0005	0.0005	0.0013	0.0030	0.0058	0.0092	0.0092	0.0033	1.09
U - T	mg/L	0.00027	0.00032	0.00035	0.00039	0.00040	0.00045	0.00050	0.00061	0.00007	0.18
V - T	mg/L	0.00020	0.00020	0.00021	0.00027	0.00041	0.00065	0.00091	0.00094	0.00027	0.65
Zn - T	mg/L	0.0004	0.0006	0.0007	0.0008	0.0013	0.0020	0.0029	0.0032	0.0009	0.68
Zr - T	mg/L	0.00010	0.00010	0.00010	0.00010	0.00030	0.00044	0.00078	0.00089	0.00028	0.92

M:\1\01\00458\14\A\Report\3 - Water Quality Predictions\Rev 0\Appendices\Appendix C - Expected Case Concentration Graphs\[APPENDIX C6 HC_019 HM (EC).xlsx]Appendix B

NOTES:

1. UNITS ARE IN mg/L UNLESS OTHERWISE STATED.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT VA101-458/14-3	EJA	JEM	KJB

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TABLE B6.2

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

SUMMARY STATISTICS - MID HARPER CREEK (HM)
OPERATIONS PHASE II

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		Operations Phase II (Years 23.5 through 28) - LGO Processing to Open Pit									
Parameter	Unit	Minimum	10th Percentile	25th Percentile	Median	Mean	75th Percentile	90th Percentile	Maximum	Standard Deviation	Coefficient of Variation
Hardness, Dissolved Anions and Nutrients											
Model Hardness	mg/L CaCO3	30.61	34.32	45.17	45.92	43.86	46.25	47.00	51.32	5.44	0.12
Baseline Hardness	mg/L CaCO3	24.48	27.64	36.75	40.64	38.16	42.65	43.30	45.30	6.11	0.16
SO4	mg/L	7.00	7.99	18.72	23.80	22.89	27.92	35.16	40.55	9.29	0.41
Cl	mg/L	0.56	0.72	0.91	1.05	0.98	1.11	1.20	1.27	0.20	0.20
F	mg/L	0.028	0.028	0.044	0.050	0.046	0.051	0.052	0.054	0.009	0.19
Hardness	mg/L	30.6	34.3	45.2	45.9	43.9	46.3	47.0	51.3	5.4	0.12
Orthophosphate	mg/L	0.0013	0.0015	0.0039	0.0047	0.0041	0.0049	0.0050	0.0063	0.0015	0.36
N as NO3	mg/L	0.117	0.168	0.186	0.210	0.210	0.214	0.271	0.355	0.055	0.26
Dissolved Metals											
Al - D	mg/L	0.006	0.007	0.007	0.007	0.011	0.009	0.026	0.031	0.008	0.73
Cd - D	mg/L	0.0000084	0.0000086	0.0000086	0.0000097	0.0000099	0.0000108	0.0000126	0.0000128	0.0000014	0.15
Fe - D	mg/L	0.0037	0.0043	0.0044	0.0045	0.0069	0.0088	0.0110	0.0174	0.0038	0.56
Total Metals											
Al - T	mg/L	0.007	0.007	0.007	0.008	0.023	0.019	0.096	0.099	0.032	1.36
Sb - T	mg/L	0.0001	0.0001	0.0002	0.0002	0.0002	0.0003	0.0003	0.0004	0.00008	0.37
As - T	mg/L	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.00012	0.19
Ba - T	mg/L	0.007	0.007	0.010	0.011	0.010	0.011	0.011	0.011	0.0017	0.17
Be - T	mg/L	0.000010	0.000010	0.000016	0.000018	0.000035	0.000048	0.000089	0.000093	0.000030	0.86
Bi - T	mg/L	0.00001	0.00001	0.00004	0.00005	0.00013	0.00015	0.00044	0.00046	0.000162	1.20
B - T	mg/L	0.01	0.01	0.04	0.05	0.04	0.05	0.05	0.05	0.014	0.34
Cd - T	mg/L	0.00001	0.00001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.00000	0.20
Ca - T	mg/L	10.1	11.1	15.4	16.2	15.2	16.5	16.9	17.3	2.2	0.14
Cr - T	mg/L	0.00010	0.00010	0.00010	0.00010	0.00012	0.00011	0.00019	0.00020	0.00003	0.28
Co - T	mg/L	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.000238	0.49
Cu - T	mg/L	0.00069	0.00071	0.00073	0.00077	0.00107	0.00094	0.00247	0.00269	0.00065	0.60
Fe - T	mg/L	0.0065	0.0070	0.0071	0.0074	0.0290	0.0251	0.1277	0.1310	0.0432	1.49
Pb - T	mg/L	0.000010	0.000012	0.000013	0.000013	0.000046	0.000044	0.000116	0.000246	0.000065	1.41
Li - T	mg/L	0.00057	0.00061	0.00081	0.00115	0.00106	0.00123	0.00137	0.00147	0.00027	0.26
Mg - T	mg/L	1.77	1.97	3.29	3.60	3.43	3.88	4.39	4.74	0.84	0.25
Mn - T	mg/L	0.00217	0.00264	0.00276	0.00288	0.00363	0.00433	0.00600	0.00616	0.00127	0.35
Hg - T	mg/L	0.0000099	0.0000099	0.0000099	0.0000100	0.0000099	0.0000100	0.0000100	0.0000100	0.0000000	0.00
Mo - T	mg/L	0.00045	0.00058	0.00119	0.00136	0.00130	0.00153	0.00181	0.00202	0.00042	0.32
Ni - T	mg/L	0.000184	0.000238	0.000246	0.000307	0.000327	0.000352	0.000483	0.000562	0.000102	0.31
P - T	mg/L	0.277	0.296	0.297	0.298	0.296	0.299	0.300	0.300	0.006	0.02
K - T	mg/L	0.58	0.62	1.16	1.45	1.32	1.55	1.69	1.79	0.37	0.28
Se - T	mg/L	0.000	0.000	0.001	0.001	0.001	0.002	0.002	0.003	0.001	0.53
Si - T	mg/L	3.16	3.17	3.73	3.86	3.72	3.87	3.89	3.91	0.26	0.07
Ag - T	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00002	0.0000028	0.34
Na - T	mg/L	0.86	0.87	1.73	1.98	1.75	2.02	2.07	2.11	0.43	0.24
Sr - T	mg/L	0.039	0.041	0.087	0.102	0.098	0.117	0.141	0.160	0.033	0.34
S - T	mg/L	9.34	9.35	9.39	9.89	9.70	9.93	9.94	9.96	0.26	0.03
Tl - T	mg/L	0.000003	0.000004	0.000004	0.000004	0.000005	0.000007	0.000009	0.000010	0.000002	0.40
Sn - T	mg/L	0.00011	0.00011	0.00018	0.00019	0.00018	0.00020	0.00022	0.00024	0.00004	0.21
Ti - T	mg/L	0.0005	0.0005	0.0011	0.0014	0.0029	0.0027	0.0092	0.0092	0.0032	1.07
U - T	mg/L	0.0003	0.0003	0.0004	0.0005	0.0005	0.0005	0.0006	0.0006	0.00009	0.20
V - T	mg/L	0.0002	0.0002	0.0003	0.0003	0.0004	0.0004	0.0009	0.0009	0.00026	0.64
Zn - T	mg/L	0.0007	0.0008	0.0008	0.0008	0.0014	0.0018	0.0029	0.0032	0.0008	0.59
Zr - T	mg/L	0.00010	0.00010	0.00010	0.00016	0.00031	0.00055	0.00078	0.00089	0.00028	0.92

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NOTES:

1. UNITS ARE IN mg/L UNLESS OTHERWISE STATED.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT VA101-458/14-3	EJA	JEM	KJB

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TABLE B6.3

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

SUMMARY STATISTICS - MID HARPER CREEK (HM)
CLOSURE

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		Closure (Years 29 through 35)									
Parameter	Unit	Minimum	10th Percentile	25th Percentile	Median	Mean	75th Percentile	90th Percentile	Maximum	Standard Deviation	Coefficient of Variation
Hardness, Dissolved Anions and Nutrients											
Model Hardness	mg/L CaCO3	30.7	34.4	44.0	46.0	43.8	46.3	47.0	51.3	5.6	0.1
Baseline Hardness	mg/L CaCO3	24.48	27.64	35.71	40.67	38.12	42.74	43.30	45.30	6.33	0.17
SO4	mg/L	5.52	6.30	10.39	11.56	10.94	12.56	13.15	14.49	2.52	0.23
Cl	mg/L	0.54	0.64	0.76	0.88	0.81	0.89	0.90	0.91	0.12	0.15
F	mg/L	0.028	0.028	0.040	0.046	0.042	0.047	0.047	0.048	0.007	0.17
Hardness	mg/L	30.7	34.4	44.0	46.0	43.8	46.3	47.0	51.3	5.6	0.13
Orthophosphate	mg/L	0.0013	0.0015	0.0035	0.0047	0.0041	0.0049	0.0050	0.0063	0.0015	0.36
N as NO3	mg/L	0.117	0.168	0.192	0.208	0.211	0.213	0.271	0.356	0.056	0.26
Dissolved Metals											
Al - D	mg/L	0.006	0.006	0.006	0.007	0.011	0.009	0.026	0.031	0.008	0.75
Cd - D	mg/L	0.0000063	0.0000066	0.0000066	0.0000068	0.0000081	0.0000093	0.0000123	0.0000126	0.0000022	0.27
Fe - D	mg/L	0.0037	0.0042	0.0044	0.0045	0.0070	0.0089	0.0110	0.0174	0.0039	0.57
Total Metals											
Al - T	mg/L	0.007	0.007	0.007	0.008	0.025	0.019	0.096	0.099	0.033	1.34
Sb - T	mg/L	0.00003	0.00005	0.00005	0.00006	0.00007	0.00010	0.00010	0.00010	0.00002	0.34
As - T	mg/L	0.00038	0.00042	0.00047	0.00047	0.00051	0.00049	0.00069	0.00085	0.00013	0.24
Ba - T	mg/L	0.0065	0.0065	0.0094	0.0107	0.0098	0.0108	0.0109	0.0109	0.0016	0.17
Be - T	mg/L	0.000010	0.000010	0.000014	0.000018	0.000035	0.000053	0.000089	0.000093	0.000031	0.88
Bi - T	mg/L	0.000005	0.000005	0.000028	0.000049	0.000136	0.000194	0.000442	0.000460	0.000166	1.22
B - T	mg/L	0.013	0.015	0.033	0.046	0.039	0.048	0.050	0.050	0.013	0.34
Cd - T	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00002	0.00002	0.00000	0.30
Ca - T	mg/L	10.0	11.0	14.5	15.3	14.4	15.4	15.5	16.1	1.9	0.13
Cr - T	mg/L	0.00010	0.00010	0.00010	0.00010	0.00012	0.00011	0.00019	0.00020	0.00003	0.30
Co - T	mg/L	0.00002	0.00002	0.0000	0.0000	0.0000	0.0001	0.0001	0.0001	0.0000	0.72
Cu - T	mg/L	0.00048	0.00050	0.00050	0.00052	0.00091	0.00072	0.00244	0.00267	0.00075	0.83
Fe - T	mg/L	0.0064	0.0070	0.0071	0.0073	0.0308	0.0254	0.1275	0.1311	0.0448	1.45
Pb - T	mg/L	0.00001	0.00001	0.00001	0.00001	0.00005	0.00005	0.00012	0.00025	0.000068	1.50
Li - T	mg/L	0.00054	0.00057	0.00069	0.00090	0.00081	0.00091	0.00093	0.00094	0.00014	0.18
Mg - T	mg/L	1.67	1.87	2.64	2.82	2.64	2.90	3.03	3.06	0.44	0.17
Mn - T	mg/L	0.00099	0.00101	0.00105	0.00122	0.00200	0.00160	0.00576	0.00593	0.00174	0.87
Hg - T	mg/L	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000000	0.00
Mo - T	mg/L	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.24
Ni - T	mg/L	0.0001	0.0001	0.0001	0.0001	0.0002	0.0003	0.0005	0.0005	0.0001	0.65
P - T	mg/L	0.278	0.296	0.297	0.298	0.297	0.299	0.300	0.300	0.006	0.02
K - T	mg/L	0.54	0.58	0.97	1.20	1.07	1.22	1.24	1.26	0.25	0.23
Se - T	mg/L	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0003	0.0003	0.0000	0.24
Si - T	mg/L	3.15	3.16	3.66	3.84	3.69	3.85	3.87	3.89	0.26	0.07
Ag - T	mg/L	0.000005	0.000005	0.000005	0.000006	0.000007	0.000010	0.000010	0.000015	0.000003	0.41
Na - T	mg/L	0.85	0.87	1.60	1.93	1.68	1.95	1.97	1.97	0.41	0.24
Sr - T	mg/L	0.034	0.036	0.057	0.061	0.057	0.064	0.065	0.068	0.011	0.19
S - T	mg/L	9.33	9.34	9.40	9.89	9.71	9.94	9.95	9.96	0.27	0.03
Tl - T	mg/L	0.000002	0.000002	0.000003	0.000003	0.000004	0.000006	0.000009	0.000009	0.000003	0.61
Sn - T	mg/L	0.00011	0.00011	0.00016	0.00019	0.00018	0.00019	0.00021	0.00023	0.00004	0.21
Ti - T	mg/L	0.0005	0.0005	0.0009	0.0013	0.0030	0.0037	0.0092	0.0092	0.0033	1.09
U - T	mg/L	0.00028	0.00032	0.00034	0.00038	0.00036	0.00039	0.00040	0.00040	0.00004	0.10
V - T	mg/L	0.00020	0.00020	0.00024	0.00027	0.00041	0.00049	0.00091	0.00094	0.00027	0.66
Zn - T	mg/L	0.0004	0.0005	0.0006	0.0007	0.0013	0.0018	0.0028	0.0032	0.0009	0.73
Zr - T	mg/L	0.00010	0.00010	0.00010	0.00013	0.00030	0.00047	0.00077	0.00088	0.00028	0.93

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NOTES:

1. UNITS ARE IN mg/L UNLESS OTHERWISE STATED.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT VA101-458/14-3	EJA	JEM	KJB

Knight Piésold CONSULTING

TABLE B6.4

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

SUMMARY STATISTICS - MID HARPER CREEK (HM)
CLOSURE AND POST-CLOSURE

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		Post-Closure (Years 36 +)									
Parameter	Unit	Minimum	10th Percentile	25th Percentile	Median	Mean	75th Percentile	90th Percentile	Maximum	Standard Deviation	Coefficient of Variation
Hardness, Dissolved Anions and Nutrients											
Model Hardness	mg/L CaCO3	30.8	34.4	42.8	46.1	43.9	46.6	47.2	51.5	5.6	0.1
Baseline Hardness	mg/L CaCO3	24.48	27.64	34.67	40.64	38.12	42.83	43.30	45.30	6.30	0.17
SO4	mg/L	5.50	6.28	10.11	11.36	10.71	12.28	12.92	13.91	2.38	0.22
Cl	mg/L	0.54	0.64	0.73	0.88	0.81	0.89	0.90	0.91	0.12	0.15
F	mg/L	0.028	0.028	0.039	0.046	0.042	0.047	0.047	0.048	0.007	0.17
Hardness	mg/L	30.8	34.4	42.8	46.1	43.9	46.6	47.2	51.5	5.6	0.13
Orthophosphate	mg/L	0.0013	0.0015	0.0032	0.0047	0.0041	0.0050	0.0050	0.0063	0.0015	0.36
N as NO3	mg/L	0.118	0.168	0.185	0.207	0.212	0.214	0.272	0.356	0.056	0.26
Dissolved Metals											
Al - D	mg/L	0.006	0.006	0.006	0.007	0.011	0.010	0.026	0.031	0.008	0.75
Cd - D	mg/L	0.0000063	0.0000066	0.0000066	0.0000068	0.0000081	0.0000095	0.0000123	0.0000126	0.0000022	0.27
Fe - D	mg/L	0.0037	0.0042	0.0044	0.0046	0.0070	0.0090	0.0110	0.0174	0.0039	0.56
Total Metals											
Al - T	mg/L	0.007	0.007	0.007	0.008	0.025	0.019	0.096	0.099	0.033	1.34
Sb - T	mg/L	0.00003	0.00005	0.00005	0.00006	0.00007	0.00010	0.00010	0.00010	0.00002	0.37
As - T	mg/L	0.00038	0.00042	0.00046	0.00047	0.00051	0.00049	0.00069	0.00086	0.00013	0.24
Ba - T	mg/L	0.0065	0.0065	0.0091	0.0107	0.0098	0.0108	0.0109	0.0110	0.0016	0.17
Be - T	mg/L	0.000010	0.000010	0.000013	0.000019	0.000035	0.000059	0.000089	0.000093	0.000030	0.87
Bi - T	mg/L	0.000005	0.000005	0.000021	0.000054	0.000136	0.000240	0.000442	0.000460	0.000166	1.22
B - T	mg/L	0.013	0.015	0.030	0.046	0.039	0.049	0.050	0.050	0.013	0.34
Cd - T	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00002	0.00002	0.00000	0.30
Ca - T	mg/L	10.0	11.0	14.0	15.3	14.4	15.5	15.6	16.2	1.9	0.13
Cr - T	mg/L	0.00010	0.00010	0.00010	0.00010	0.00012	0.00011	0.00019	0.00020	0.00003	0.29
Co - T	mg/L	0.00002	0.00002	0.0000	0.0000	0.0000	0.0001	0.0001	0.0001	0.0000	0.73
Cu - T	mg/L	0.00048	0.00049	0.00050	0.00052	0.00090	0.00081	0.00244	0.00267	0.00075	0.83
Fe - T	mg/L	0.0064	0.0070	0.0071	0.0074	0.0309	0.0259	0.1275	0.1311	0.0446	1.44
Pb - T	mg/L	0.00001	0.00001	0.00001	0.00001	0.00005	0.00005	0.00012	0.00025	0.000068	1.49
Li - T	mg/L	0.00054	0.00057	0.00067	0.00089	0.00081	0.00090	0.00093	0.00093	0.00014	0.18
Mg - T	mg/L	1.67	1.87	2.52	2.79	2.64	2.89	3.00	3.05	0.43	0.16
Mn - T	mg/L	0.00097	0.00097	0.00101	0.00122	0.00197	0.00161	0.00576	0.00593	0.00175	0.89
Hg - T	mg/L	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000000	0.00
Mo - T	mg/L	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.24
Ni - T	mg/L	0.0001	0.0001	0.0001	0.0001	0.0002	0.0003	0.0005	0.0005	0.0001	0.66
P - T	mg/L	0.278	0.297	0.299	0.299	0.297	0.300	0.300	0.300	0.006	0.02
K - T	mg/L	0.54	0.58	0.95	1.20	1.06	1.22	1.23	1.25	0.25	0.23
Se - T	mg/L	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	0.0000	0.22
Si - T	mg/L	3.16	3.16	3.61	3.85	3.71	3.86	3.89	3.91	0.27	0.07
Ag - T	mg/L	0.000005	0.000005	0.000005	0.000006	0.000007	0.000010	0.000010	0.000015	0.000003	0.40
Na - T	mg/L	0.85	0.87	1.51	1.93	1.68	1.95	1.98	1.99	0.41	0.24
Sr - T	mg/L	0.034	0.036	0.055	0.060	0.056	0.063	0.065	0.067	0.010	0.18
S - T	mg/L	9.33	9.35	9.40	9.95	9.74	9.97	9.98	9.99	0.28	0.03
Tl - T	mg/L	0.000002	0.000002	0.000002	0.000003	0.000004	0.000007	0.000009	0.000009	0.000003	0.61
Sn - T	mg/L	0.00011	0.00011	0.00016	0.00019	0.00018	0.00019	0.00021	0.00023	0.00004	0.21
Ti - T	mg/L	0.0005	0.0005	0.0008	0.0014	0.0030	0.0047	0.0092	0.0092	0.0032	1.09
U - T	mg/L	0.00028	0.00032	0.00033	0.00038	0.00036	0.00039	0.00039	0.00040	0.00004	0.10
V - T	mg/L	0.00020	0.00020	0.00023	0.00028	0.00041	0.00057	0.00091	0.00094	0.00027	0.65
Zn - T	mg/L	0.0004	0.0005	0.0006	0.0007	0.0013	0.0019	0.0028	0.0032	0.0009	0.73
Zr - T	mg/L	0.00010	0.00010	0.00010	0.00015	0.00030	0.00051	0.00077	0.00088	0.00028	0.92

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NOTES:

1. UNITS ARE IN mg/L UNLESS OTHERWISE STATED.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT VA101-458/14-3	EJA	JEM	KJB

APPENDIX B7

HARPER CREEK BELOW T-CREEK (HT)

(Pages B7-1 to B7-4)

Knight Piésold CONSULTING

TABLE B7.1

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

SUMMARY STATISTICS - HARPER CREEK BELOW T-CREEK (HT)
OPERATIONS PHASE I

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		Operations Phase I (Years 0 through 23.5) - Regular Ore Processing									
Parameter	Unit	Minimum	10th Percentile	25th Percentile	Median	Mean	75th Percentile	90th Percentile	Maximum	Standard Deviation	Coefficient of Variation
Hardness, Dissolved Anions and Nutrients											
Model Hardness	mg/L CaCO3	26.7	30.9	38.9	46.0	42.6	46.5	47.1	49.0	6.9	0.2
Baseline Hardness	mg/L CaCO3	24.48	27.64	33.62	40.70	38.12	43.00	43.30	45.30	6.35	0.17
SO4	mg/L	4.62	5.65	9.92	13.87	14.85	19.39	24.66	37.81	7.20	0.48
Cl	mg/L	0.53	0.62	0.73	0.88	0.86	0.99	1.06	1.24	0.17	0.20
F	mg/L	0.026	0.027	0.037	0.047	0.043	0.049	0.050	0.054	0.009	0.20
Hardness	mg/L	26.7	30.9	38.9	46.0	42.6	46.5	47.1	49.0	6.9	0.16
Orthophosphate	mg/L	0.0013	0.0014	0.0026	0.0047	0.0040	0.0050	0.0050	0.0063	0.0015	0.38
N as NO3	mg/L	0.102	0.139	0.204	0.227	0.224	0.256	0.301	0.434	0.057	0.25
Dissolved Metals											
Al - D	mg/L	0.006	0.006	0.006	0.007	0.013	0.014	0.035	0.039	0.011	0.87
Cd - D	mg/L	0.0000059	0.0000067	0.0000073	0.0000082	0.0000089	0.0000104	0.0000120	0.0000129	0.0000020	0.23
Fe - D	mg/L	0.0037	0.0043	0.0044	0.0046	0.0076	0.0098	0.0134	0.0200	0.0048	0.63
Total Metals											
Al - T	mg/L	0.007	0.007	0.007	0.008	0.028	0.021	0.103	0.122	0.039	1.39
Sb - T	mg/L	0.00002	0.00004	0.00008	0.00011	0.00012	0.00015	0.00021	0.00037	0.00007	0.56
As - T	mg/L	0.00038	0.00042	0.00046	0.00053	0.00054	0.00058	0.00071	0.00074	0.00010	0.18
Ba - T	mg/L	0.0064	0.0065	0.0086	0.0108	0.0098	0.0110	0.0111	0.0114	0.0017	0.18
Be - T	mg/L	0.000010	0.000010	0.000010	0.000018	0.000037	0.000070	0.000092	0.000098	0.000033	0.89
Bi - T	mg/L	0.000005	0.000005	0.000007	0.000051	0.000139	0.000295	0.000454	0.000455	0.000168	1.21
B - T	mg/L	0.013	0.014	0.026	0.047	0.039	0.050	0.051	0.052	0.014	0.36
Cd - T	mg/L	0.0000089	0.000009	0.000010	0.000011	0.000013	0.000016	0.000019	0.000019	0.000003	0.27
Ca - T	mg/L	8.8	10.0	12.9	15.5	14.3	15.8	16.1	17.1	2.5	0.17
Cr - T	mg/L	0.00010	0.00010	0.00010	0.00010	0.00012	0.00011	0.00019	0.00020	0.00004	0.29
Co - T	mg/L	0.000019	0.000081	0.000126	0.000189	0.000253	0.000346	0.000512	0.000909	0.000182	0.72
Cu - T	mg/L	0.00044	0.00051	0.00058	0.00066	0.00093	0.00092	0.00221	0.00236	0.00062	0.67
Fe - T	mg/L	0.0065	0.0070	0.0071	0.0074	0.0319	0.0262	0.1239	0.1432	0.0465	1.46
Pb - T	mg/L	0.000006	0.000009	0.000011	0.000013	0.000053	0.000062	0.000114	0.000315	0.000084	1.60
Li - T	mg/L	0.00055	0.00057	0.00070	0.00093	0.00090	0.00105	0.00115	0.00142	0.00022	0.24
Mg - T	mg/L	1.40	1.66	2.33	2.97	2.84	3.32	3.67	4.56	0.75	0.26
Mn - T	mg/L	0.00076	0.00108	0.00148	0.00205	0.00271	0.00302	0.00602	0.00690	0.00182	0.67
Hg - T	mg/L	0.0000099	0.0000099	0.0000100	0.0000100	0.0000100	0.0000100	0.0000100	0.0000100	0.0000000	0.00
Mo - T	mg/L	0.00037	0.00049	0.00080	0.00102	0.00099	0.00120	0.00139	0.00191	0.00034	0.34
Ni - T	mg/L	0.00009	0.00013	0.0002	0.0002	0.0003	0.0004	0.0005	0.0005	0.00013	0.50
P - T	mg/L	0.275	0.288	0.295	0.298	0.295	0.299	0.300	0.300	0.007	0.02
K - T	mg/L	0.51	0.54	0.94	1.24	1.14	1.37	1.48	1.74	0.33	0.29
Se - T	mg/L	0.000102	0.000132	0.000194	0.000415	0.000615	0.000925	0.001410	0.002538	0.000539	0.88
Si - T	mg/L	3.10	3.13	3.51	3.85	3.69	3.87	3.88	3.90	0.28	0.08
Ag - T	mg/L	0.0000050	0.0000053	0.0000058	0.0000064	0.000008	0.000010	0.000012	0.000017	0.000003	0.41
Na - T	mg/L	0.80	0.82	1.37	1.94	1.68	1.98	2.01	2.09	0.44	0.26
Sr - T	mg/L	0.028	0.033	0.054	0.065	0.069	0.086	0.105	0.150	0.027	0.39
S - T	mg/L	9.39	9.43	9.47	9.93	9.76	9.97	9.98	10.00	0.24	0.02
Tl - T	mg/L	0.000002	0.000002	0.000003	0.000004	0.000005	0.000008	0.000009	0.000010	0.000003	0.55
Sn - T	mg/L	0.00011	0.00013	0.00015	0.00019	0.00018	0.00020	0.00022	0.00024	0.00003	0.19
Ti - T	mg/L	0.0005	0.0005	0.0005	0.0014	0.0031	0.0058	0.0090	0.0106	0.0035	1.11
U - T	mg/L	0.00027	0.00030	0.00034	0.00039	0.00040	0.00045	0.00050	0.00061	0.00007	0.18
V - T	mg/L	0.00020	0.00020	0.00021	0.00027	0.00041	0.00065	0.00092	0.00094	0.00027	0.65
Zn - T	mg/L	0.0004	0.0006	0.0007	0.0008	0.0014	0.0022	0.0029	0.0033	0.0009	0.69
Zr - T	mg/L	0.00010	0.00010	0.00010	0.00010	0.00036	0.00066	0.00102	0.00104	0.00036	0.99

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NOTES:

1. UNITS ARE IN mg/L UNLESS OTHERWISE STATED.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT VA101-458/14-3	EJA	JEM	KJB

Knight Piésold CONSULTING

TABLE B7.2

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

SUMMARY STATISTICS - HARPER CREEK BELOW T-CREEK (HT)
OPERATIONS PHASE II

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		Operations Phase II (Years 23.5 through 28) - LGO Processing to Open Pit									
Parameter	Unit	Minimum	10th Percentile	25th Percentile	Median	Mean	75th Percentile	90th Percentile	Maximum	Standard Deviation	Coefficient of Variation
Hardness, Dissolved Anions and Nutrients											
Model Hardness	mg/L CaCO3	26.84	31.02	44.23	45.85	42.77	46.25	46.91	48.76	6.54	0.15
Baseline Hardness	mg/L CaCO3	24.48	27.64	36.75	40.64	38.16	42.65	43.30	45.30	6.11	0.16
SO4	mg/L	6.07	6.67	17.27	23.76	22.39	27.92	35.16	40.55	9.77	0.44
Cl	mg/L	0.55	0.70	0.84	1.05	0.97	1.11	1.20	1.27	0.21	0.21
F	mg/L	0.026	0.027	0.042	0.050	0.045	0.051	0.052	0.054	0.009	0.20
Hardness	mg/L	26.8	31.0	44.2	45.8	42.8	46.3	46.9	48.8	6.5	0.15
Orthophosphate	mg/L	0.0013	0.0014	0.0038	0.0046	0.0041	0.0049	0.0050	0.0063	0.0015	0.37
N as NO3	mg/L	0.105	0.139	0.182	0.210	0.201	0.214	0.253	0.302	0.048	0.24
Dissolved Metals											
Al - D	mg/L	0.006	0.007	0.007	0.007	0.012	0.010	0.034	0.038	0.011	0.86
Cd - D	mg/L	0.0000084	0.0000085	0.0000086	0.0000097	0.0000100	0.0000108	0.0000123	0.0000129	0.0000015	0.15
Fe - D	mg/L	0.0037	0.0043	0.0044	0.0045	0.0074	0.0097	0.0133	0.0199	0.0046	0.63
Total Metals											
Al - T	mg/L	0.007	0.007	0.007	0.008	0.026	0.020	0.102	0.121	0.037	1.42
Sb - T	mg/L	0.0001	0.0001	0.0001	0.0002	0.0002	0.0003	0.0003	0.0004	0.00008	0.38
As - T	mg/L	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.00009	0.16
Ba - T	mg/L	0.006	0.007	0.010	0.011	0.010	0.011	0.011	0.011	0.0018	0.17
Be - T	mg/L	0.000010	0.000010	0.000016	0.000019	0.000036	0.000052	0.000091	0.000098	0.000032	0.88
Bi - T	mg/L	0.00001	0.00001	0.00004	0.00005	0.00014	0.00016	0.00045	0.00045	0.000163	1.19
B - T	mg/L	0.01	0.01	0.04	0.05	0.04	0.05	0.05	0.05	0.014	0.35
Cd - T	mg/L	0.00001	0.00001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.00000	0.20
Ca - T	mg/L	8.9	10.1	15.1	16.1	14.9	16.3	16.9	17.3	2.6	0.17
Cr - T	mg/L	0.00010	0.00010	0.00010	0.00010	0.00012	0.00011	0.00019	0.00020	0.00003	0.28
Co - T	mg/L	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.000242	0.51
Cu - T	mg/L	0.00069	0.00071	0.00073	0.00076	0.00103	0.00094	0.00222	0.00237	0.00055	0.54
Fe - T	mg/L	0.0065	0.0070	0.0071	0.0074	0.0296	0.0250	0.1238	0.1420	0.0446	1.51
Pb - T	mg/L	0.000010	0.000012	0.000013	0.000014	0.000051	0.000046	0.000114	0.000308	0.000080	1.56
Li - T	mg/L	0.00058	0.00059	0.00079	0.00114	0.00105	0.00123	0.00137	0.00147	0.00028	0.26
Mg - T	mg/L	1.51	1.74	3.19	3.58	3.34	3.88	4.39	4.74	0.93	0.28
Mn - T	mg/L	0.00208	0.00260	0.00267	0.00288	0.00367	0.00433	0.00607	0.00693	0.00143	0.39
Hg - T	mg/L	0.0000099	0.0000099	0.0000099	0.0000100	0.0000099	0.0000100	0.0000100	0.0000100	0.0000000	0.00
Mo - T	mg/L	0.00043	0.00055	0.00120	0.00135	0.00130	0.00153	0.00181	0.00202	0.00043	0.33
Ni - T	mg/L	0.000173	0.000239	0.000246	0.000307	0.000326	0.000352	0.000474	0.000551	0.000101	0.31
P - T	mg/L	0.275	0.289	0.291	0.297	0.294	0.298	0.298	0.300	0.007	0.02
K - T	mg/L	0.55	0.57	1.11	1.45	1.30	1.55	1.69	1.79	0.38	0.30
Se - T	mg/L	0.000	0.000	0.001	0.001	0.001	0.002	0.002	0.003	0.001	0.55
Si - T	mg/L	3.12	3.14	3.74	3.86	3.71	3.87	3.89	3.90	0.28	0.07
Ag - T	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00002	0.0000032	0.37
Na - T	mg/L	0.82	0.83	1.67	1.98	1.73	2.02	2.07	2.11	0.44	0.26
Sr - T	mg/L	0.034	0.037	0.081	0.102	0.096	0.117	0.141	0.160	0.035	0.37
S - T	mg/L	9.36	9.41	9.44	9.89	9.73	9.93	9.94	9.96	0.24	0.02
Tl - T	mg/L	0.000003	0.000004	0.000004	0.000004	0.000006	0.000007	0.000009	0.000010	0.000002	0.42
Sn - T	mg/L	0.00011	0.00014	0.00018	0.00019	0.00018	0.00020	0.00022	0.00024	0.00003	0.19
Ti - T	mg/L	0.0005	0.0005	0.0011	0.0014	0.0030	0.0029	0.0090	0.0105	0.0033	1.10
U - T	mg/L	0.0003	0.0003	0.0004	0.0005	0.0005	0.0005	0.0006	0.0006	0.00009	0.21
V - T	mg/L	0.0002	0.0002	0.0003	0.0003	0.0004	0.0004	0.0009	0.0009	0.00026	0.64
Zn - T	mg/L	0.0007	0.0008	0.0008	0.0008	0.0014	0.0018	0.0029	0.0033	0.0009	0.61
Zr - T	mg/L	0.00010	0.00010	0.00010	0.00017	0.00036	0.00064	0.00101	0.00101	0.00035	0.98

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NOTES:

1. UNITS ARE IN mg/L UNLESS OTHERWISE STATED.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT VA101-458/14-3	EJA	JEM	KJB

Knight Piésold CONSULTING

TABLE B7.3

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

SUMMARY STATISTICS - HARPER CREEK BELOW T-CREEK (HT)
CLOSURE

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		Closure (Years 29 through 35)									
Parameter	Unit	Minimum	10th Percentile	25th Percentile	Median	Mean	75th Percentile	90th Percentile	Maximum	Standard Deviation	Coefficient of Variation
Hardness, Dissolved Anions and Nutrients											
Model Hardness	mg/L CaCO3	27.0	31.1	40.7	43.3	41.4	44.5	46.3	48.8	5.6	0.1
Baseline Hardness	mg/L CaCO3	24.48	27.64	35.71	40.67	38.12	42.74	43.30	45.30	6.33	0.17
SO4	mg/L	4.85	9.94	12.69	55.00	45.75	70.18	80.02	87.71	28.53	0.62
Cl	mg/L	0.53	0.78	0.89	1.40	1.28	1.66	1.76	1.91	0.41	0.32
F	mg/L	0.026	0.040	0.047	0.054	0.055	0.066	0.069	0.075	0.012	0.23
Hardness	mg/L	27.0	31.1	40.7	43.3	41.4	44.5	46.3	48.8	5.6	0.14
Orthophosphate	mg/L	0.0013	0.0017	0.0034	0.0042	0.0038	0.0046	0.0050	0.0063	0.0013	0.33
N as NO3	mg/L	0.105	0.200	0.214	0.389	0.361	0.484	0.538	0.619	0.140	0.39
Dissolved Metals											
Al - D	mg/L	0.006	0.006	0.009	0.010	0.013	0.014	0.032	0.038	0.009	0.68
Cd - D	mg/L	0.0000063	0.0000067	0.0000093	0.0000154	0.0000145	0.0000185	0.0000210	0.0000239	0.0000054	0.37
Fe - D	mg/L	0.0037	0.0044	0.0046	0.0050	0.0073	0.0092	0.0127	0.0199	0.0040	0.55
Total Metals											
Al - T	mg/L	0.007	0.007	0.012	0.014	0.027	0.023	0.091	0.121	0.031	1.16
Sb - T	mg/L	0.00003	0.00005	0.00010	0.00060	0.00050	0.00079	0.00092	0.00099	0.00035	0.70
As - T	mg/L	0.00039	0.00047	0.00050	0.00087	0.00081	0.00099	0.00113	0.00128	0.00026	0.32
Ba - T	mg/L	0.0064	0.0082	0.0094	0.0108	0.0102	0.0111	0.0113	0.0115	0.0014	0.14
Be - T	mg/L	0.000010	0.000011	0.000015	0.000019	0.000034	0.000055	0.000077	0.000098	0.000027	0.79
Bi - T	mg/L	0.000005	0.000011	0.000035	0.000056	0.000128	0.000191	0.000348	0.000455	0.000140	1.09
B - T	mg/L	0.013	0.025	0.034	0.048	0.042	0.050	0.052	0.054	0.012	0.28
Cd - T	mg/L	0.00001	0.00001	0.00001	0.00002	0.00002	0.00002	0.00003	0.00003	0.00001	0.32
Ca - T	mg/L	8.9	14.5	15.2	15.5	16.3	18.6	19.3	20.3	2.6	0.16
Cr - T	mg/L	0.00010	0.00010	0.00011	0.00012	0.00013	0.00012	0.00019	0.00020	0.00003	0.24
Co - T	mg/L	0.00002	0.00003	0.0001	0.0008	0.0006	0.0011	0.0012	0.0014	0.0005	0.76
Cu - T	mg/L	0.00049	0.00050	0.00062	0.00162	0.00155	0.00202	0.00274	0.00327	0.00080	0.52
Fe - T	mg/L	0.0064	0.0071	0.0086	0.0093	0.0280	0.0230	0.0999	0.1421	0.0378	1.35
Pb - T	mg/L	0.00001	0.00001	0.00003	0.00004	0.00006	0.00006	0.00011	0.00031	0.000068	1.14
Li - T	mg/L	0.00055	0.00070	0.00091	0.00200	0.00174	0.00240	0.00261	0.00295	0.00077	0.44
Mg - T	mg/L	1.43	2.72	2.88	6.77	5.86	8.13	9.10	10.22	2.71	0.46
Mn - T	mg/L	0.00102	0.00112	0.00157	0.00967	0.00876	0.01367	0.01603	0.01876	0.00581	0.66
Hg - T	mg/L	0.000008	0.000008	0.000008	0.000009	0.000009	0.000010	0.000010	0.000010	0.000001	0.09
Mo - T	mg/L	0.000	0.001	0.001	0.003	0.003	0.004	0.004	0.005	0.001	0.55
Ni - T	mg/L	0.0001	0.0001	0.0003	0.0006	0.0006	0.0008	0.0009	0.0011	0.0003	0.53
P - T	mg/L	0.217	0.225	0.232	0.249	0.258	0.295	0.298	0.300	0.029	0.11
K - T	mg/L	0.53	0.96	1.23	1.67	1.66	2.12	2.29	2.49	0.53	0.32
Se - T	mg/L	0.0001	0.0002	0.0002	0.0025	0.0021	0.0034	0.0040	0.0045	0.0016	0.74
Si - T	mg/L	2.90	3.04	3.33	3.52	3.49	3.73	3.84	3.88	0.28	0.08
Ag - T	mg/L	0.000005	0.000005	0.000009	0.000010	0.000010	0.000012	0.000015	0.000018	0.000003	0.33
Na - T	mg/L	0.81	1.14	1.58	1.91	1.70	1.94	1.96	1.97	0.35	0.21
Sr - T	mg/L	0.030	0.057	0.064	0.198	0.168	0.246	0.278	0.305	0.091	0.54
S - T	mg/L	7.99	8.32	8.41	8.79	8.97	9.51	9.92	9.96	0.62	0.07
Tl - T	mg/L	0.000002	0.000002	0.000006	0.000008	0.000008	0.000010	0.000013	0.000014	0.000003	0.44
Sn - T	mg/L	0.00011	0.00016	0.00018	0.00020	0.00020	0.00022	0.00024	0.00027	0.00003	0.16
Ti - T	mg/L	0.0005	0.0006	0.0011	0.0015	0.0029	0.0036	0.0077	0.0105	0.0028	0.97
U - T	mg/L	0.00028	0.00034	0.00039	0.00065	0.00058	0.00074	0.00080	0.00087	0.00018	0.31
V - T	mg/L	0.00020	0.00021	0.00025	0.00028	0.00040	0.00048	0.00075	0.00094	0.00022	0.56
Zn - T	mg/L	0.0004	0.0006	0.0015	0.0018	0.0020	0.0028	0.0034	0.0040	0.0010	0.50
Zr - T	mg/L	0.00010	0.00010	0.00013	0.00016	0.00034	0.00060	0.00083	0.00101	0.00030	0.88

M:\1\01\00458\14\A\Report\3 - Water Quality Predictions\Rev 0\Appendices\Appendix C - Expected Case Concentration Graphs\[APPENDIX C7 HC_019 HT (EC).xlsx]Appendix B

NOTES:

1. UNITS ARE IN mg/L UNLESS OTHERWISE STATED.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT VA101-458/14-3	EJA	JEM	KJB

Knight Piésold CONSULTING

TABLE B7.4

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

SUMMARY STATISTICS - HARPER CREEK BELOW T-CREEK (HT)
CLOSURE AND POST-CLOSURE

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		Post-Closure (Years 36 +)									
Parameter	Unit	Minimum	10th Percentile	25th Percentile	Median	Mean	75th Percentile	90th Percentile	Maximum	Standard Deviation	Coefficient of Variation
Hardness, Dissolved Anions and Nutrients											
Model Hardness	mg/L CaCO3	27.8	34.4	40.4	44.1	42.8	46.6	48.1	50.8	5.3	0.1
Baseline Hardness	mg/L CaCO3	24.48	27.64	34.67	40.64	38.12	42.83	43.30	45.30	6.30	0.17
SO4	mg/L	37.51	42.33	48.73	56.34	63.16	79.07	91.64	120.11	19.55	0.31
Cl	mg/L	1.09	1.19	1.30	1.44	1.50	1.67	1.94	2.32	0.28	0.19
F	mg/L	0.040	0.046	0.052	0.056	0.058	0.062	0.070	0.084	0.009	0.16
Hardness	mg/L	27.8	34.4	40.4	44.1	42.8	46.6	48.1	50.8	5.3	0.12
Orthophosphate	mg/L	0.0017	0.0022	0.0032	0.0043	0.0040	0.0046	0.0049	0.0059	0.0011	0.28
N as NO3	mg/L	0.089	0.130	0.161	0.188	0.214	0.247	0.333	0.630	0.086	0.40
Dissolved Metals											
Al - D	mg/L	0.009	0.011	0.011	0.014	0.017	0.018	0.032	0.036	0.008	0.47
Cd - D	mg/L	0.0000149	0.0000191	0.0000232	0.0000286	0.0000307	0.0000367	0.0000453	0.0000626	0.0000101	0.33
Fe - D	mg/L	0.0046	0.0050	0.0052	0.0058	0.0075	0.0091	0.0115	0.0166	0.0033	0.44
Total Metals											
Al - T	mg/L	0.012	0.013	0.015	0.018	0.030	0.026	0.084	0.093	0.026	0.88
Sb - T	mg/L	0.00042	0.00046	0.00054	0.00068	0.00073	0.00092	0.00106	0.00140	0.00024	0.33
As - T	mg/L	0.00071	0.00078	0.00084	0.00092	0.00097	0.00110	0.00123	0.00146	0.00018	0.18
Ba - T	mg/L	0.0072	0.0078	0.0092	0.0105	0.0100	0.0108	0.0111	0.0115	0.0012	0.12
Be - T	mg/L	0.000015	0.000016	0.000018	0.000020	0.000034	0.000056	0.000069	0.000077	0.000023	0.67
Bi - T	mg/L	0.000033	0.000036	0.000044	0.000060	0.000123	0.000211	0.000324	0.000346	0.000116	0.94
B - T	mg/L	0.019	0.023	0.033	0.045	0.040	0.047	0.049	0.052	0.010	0.25
Cd - T	mg/L	0.00002	0.00002	0.00003	0.00003	0.00003	0.00004	0.00005	0.00006	0.00001	0.30
Ca - T	mg/L	14.0	14.8	16.1	17.6	17.7	19.2	20.6	22.4	2.1	0.12
Cr - T	mg/L	0.00011	0.00011	0.00012	0.00012	0.00013	0.00013	0.00018	0.00019	0.00002	0.19
Co - T	mg/L	0.00016	0.00022	0.0003	0.0004	0.0005	0.0006	0.0009	0.0017	0.0003	0.55
Cu - T	mg/L	0.00106	0.00117	0.00132	0.00172	0.00187	0.00236	0.00286	0.00323	0.00062	0.33
Fe - T	mg/L	0.0085	0.0093	0.0099	0.0117	0.0270	0.0232	0.0936	0.1000	0.0314	1.16
Pb - T	mg/L	0.00003	0.00003	0.00003	0.00005	0.00007	0.00007	0.00011	0.00024	0.000056	0.83
Li - T	mg/L	0.00141	0.00160	0.00171	0.00197	0.00211	0.00237	0.00289	0.00371	0.00051	0.24
Mg - T	mg/L	5.32	6.08	6.75	7.44	8.25	9.65	11.44	13.99	2.14	0.26
Mn - T	mg/L	0.00553	0.00717	0.00863	0.01170	0.01259	0.01604	0.01921	0.02489	0.00462	0.37
Hg - T	mg/L	0.000007	0.000008	0.000008	0.000009	0.000009	0.000009	0.000009	0.000009	0.000000	0.06
Mo - T	mg/L	0.002	0.003	0.003	0.004	0.004	0.005	0.006	0.007	0.001	0.30
Ni - T	mg/L	0.0004	0.0005	0.0006	0.0008	0.0008	0.0010	0.0011	0.0013	0.0002	0.28
P - T	mg/L	0.178	0.199	0.214	0.228	0.228	0.247	0.253	0.259	0.023	0.10
K - T	mg/L	1.32	1.50	1.61	1.76	1.87	2.05	2.43	2.97	0.35	0.19
Se - T	mg/L	0.0012	0.0014	0.0017	0.0021	0.0024	0.0028	0.0036	0.0059	0.0009	0.38
Si - T	mg/L	2.75	2.95	3.14	3.36	3.33	3.57	3.62	3.66	0.26	0.08
Ag - T	mg/L	0.000008	0.000009	0.000010	0.000012	0.000012	0.000014	0.000015	0.000018	0.000003	0.21
Na - T	mg/L	0.93	1.03	1.42	1.75	1.61	1.84	1.88	1.91	0.31	0.19
Sr - T	mg/L	0.136	0.158	0.173	0.201	0.220	0.261	0.320	0.403	0.063	0.28
S - T	mg/L	6.46	7.37	7.85	8.25	8.20	8.66	8.90	9.16	0.58	0.07
Tl - T	mg/L	0.000006	0.000007	0.000007	0.000010	0.000010	0.000012	0.000013	0.000014	0.000002	0.25
Sn - T	mg/L	0.00015	0.00019	0.00021	0.00023	0.00024	0.00026	0.00031	0.00037	0.00004	0.19
Ti - T	mg/L	0.0012	0.0013	0.0014	0.0016	0.0029	0.0042	0.0071	0.0077	0.0023	0.80
U - T	mg/L	0.00051	0.00054	0.00056	0.00060	0.00064	0.00069	0.00083	0.00105	0.00011	0.17
V - T	mg/L	0.00025	0.00029	0.00031	0.00032	0.00043	0.00053	0.00077	0.00079	0.00018	0.43
Zn - T	mg/L	0.0015	0.0020	0.0026	0.0034	0.0036	0.0045	0.0054	0.0067	0.0013	0.35
Zr - T	mg/L	0.00013	0.00013	0.00016	0.00019	0.00034	0.00056	0.00075	0.00085	0.00025	0.75

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NOTES:

1. UNITS ARE IN mg/L UNLESS OTHERWISE STATED.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT VA101-458/14-3	EJA	JEM	KJB

APPENDIX B8

HARPER CREEK ABOVE BARRIÈRE RIVER (HB)

(Pages B8-1 to B8-4)

Knight Piésold CONSULTING

TABLE B8.1

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

SUMMARY STATISTICS - HARPER CREEK ABOVE BARRIÉRE RIVER (HB)
OPERATIONS PHASE I

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		Operations Phase I (Years 0 through 23.5) - Regular Ore Processing									
Parameter	Unit	Minimum	10th Percentile	25th Percentile	Median	Mean	75th Percentile	90th Percentile	Maximum	Standard Deviation	Coefficient of Variation
Hardness, Dissolved Anions and Nutrients											
Model Hardness	mg/L CaCO3	16.1	18.6	22.7	27.6	26.9	32.1	33.0	33.8	5.5	0.2
Baseline Hardness	mg/L CaCO3	24.48	27.64	33.62	40.70	38.12	43.00	43.30	45.30	6.35	0.17
SO4	mg/L	2.44	2.81	4.30	6.23	6.59	8.36	10.76	16.32	3.03	0.46
Cl	mg/L	0.51	0.53	0.55	0.63	0.63	0.68	0.77	0.83	0.09	0.14
F	mg/L	0.024	0.029	0.033	0.044	0.041	0.046	0.051	0.055	0.009	0.21
Hardness	mg/L	16.1	18.6	22.7	27.6	26.9	32.1	33.0	33.8	5.5	0.20
Orthophosphate	mg/L	0.0011	0.0011	0.0016	0.0035	0.0032	0.0050	0.0050	0.0050	0.0014	0.45
N as NO3	mg/L	0.041	0.066	0.081	0.126	0.121	0.155	0.180	0.223	0.045	0.37
Dissolved Metals											
Al - D	mg/L	0.009	0.010	0.011	0.017	0.023	0.027	0.051	0.063	0.016	0.70
Cd - D	mg/L	0.0000072	0.0000077	0.0000082	0.0000100	0.0000107	0.0000126	0.0000158	0.0000173	0.0000030	0.28
Fe - D	mg/L	0.0045	0.0054	0.0072	0.0086	0.0110	0.0150	0.0191	0.0247	0.0059	0.53
Total Metals											
Al - T	mg/L	0.011	0.012	0.015	0.023	0.044	0.054	0.139	0.144	0.046	1.04
Sb - T	mg/L	0.00002	0.00003	0.00007	0.00010	0.00009	0.00012	0.00013	0.00015	0.00004	0.38
As - T	mg/L	0.00021	0.00022	0.00025	0.00029	0.00036	0.00040	0.00061	0.00068	0.00014	0.39
Ba - T	mg/L	0.0053	0.0055	0.0061	0.0075	0.0072	0.0082	0.0085	0.0086	0.0011	0.16
Be - T	mg/L	0.000010	0.000010	0.000012	0.000044	0.000059	0.000097	0.000117	0.000117	0.000039	0.66
Bi - T	mg/L	0.000005	0.000005	0.000006	0.000194	0.000226	0.000366	0.000434	0.000485	0.000159	0.70
B - T	mg/L	0.011	0.011	0.015	0.035	0.030	0.050	0.050	0.051	0.015	0.49
Cd - T	mg/L	0.0000080	0.000009	0.000009	0.000011	0.000013	0.000014	0.000018	0.000018	0.000004	0.28
Ca - T	mg/L	5.4	6.2	7.6	9.5	9.0	10.5	11.1	11.5	1.8	0.21
Cr - T	mg/L	0.00010	0.00010	0.00010	0.00010	0.00013	0.00015	0.00019	0.00019	0.00003	0.26
Co - T	mg/L	0.000013	0.000052	0.000097	0.000125	0.000130	0.000159	0.000204	0.000328	0.000059	0.45
Cu - T	mg/L	0.00040	0.00046	0.00050	0.00059	0.00088	0.00141	0.00167	0.00213	0.00055	0.62
Fe - T	mg/L	0.0075	0.0083	0.0094	0.0152	0.0404	0.0467	0.1298	0.1672	0.0508	1.26
Pb - T	mg/L	0.000017	0.000018	0.000031	0.000048	0.000076	0.000124	0.000157	0.000244	0.000066	0.87
Li - T	mg/L	0.00066	0.00068	0.00094	0.00130	0.00120	0.00139	0.00148	0.00163	0.00029	0.24
Mg - T	mg/L	0.82	0.98	1.21	1.62	1.55	1.83	2.09	2.42	0.41	0.27
Mn - T	mg/L	0.00053	0.00080	0.00099	0.00129	0.00202	0.00187	0.00593	0.00602	0.00182	0.90
Hg - T	mg/L	0.0000100	0.0000100	0.0000100	0.0000100	0.0000103	0.0000100	0.0000119	0.0000123	0.0000008	0.08
Mo - T	mg/L	0.00092	0.00103	0.00146	0.00178	0.00164	0.00187	0.00197	0.00214	0.00035	0.21
Ni - T	mg/L	0.00006	0.00009	0.0002	0.0003	0.0003	0.0004	0.0005	0.0006	0.00015	0.47
P - T	mg/L	0.232	0.232	0.250	0.283	0.273	0.300	0.300	0.300	0.028	0.10
K - T	mg/L	0.42	0.50	0.66	0.93	0.86	1.01	1.08	1.20	0.22	0.26
Se - T	mg/L	0.000069	0.000102	0.000128	0.000185	0.000256	0.000345	0.000521	0.000921	0.000177	0.69
Si - T	mg/L	3.01	3.20	3.52	4.25	3.99	4.36	4.42	4.60	0.50	0.13
Ag - T	mg/L	0.0000050	0.0000051	0.0000056	0.0000100	0.000012	0.000018	0.000019	0.000021	0.000006	0.48
Na - T	mg/L	0.76	0.90	1.20	1.83	1.62	1.89	2.08	2.18	0.44	0.27
Sr - T	mg/L	0.022	0.026	0.037	0.049	0.048	0.057	0.066	0.085	0.015	0.31
S - T	mg/L	9.79	9.82	9.84	9.97	9.92	9.99	10.00	10.00	0.08	0.01
Tl - T	mg/L	0.000002	0.000002	0.000003	0.000005	0.000007	0.000010	0.000012	0.000012	0.000004	0.52
Sn - T	mg/L	0.00010	0.00011	0.00013	0.00014	0.00015	0.00020	0.00021	0.00021	0.00004	0.24
Ti - T	mg/L	0.0005	0.0005	0.0012	0.0041	0.0047	0.0078	0.0086	0.0102	0.0031	0.65
U - T	mg/L	0.00076	0.00080	0.00088	0.00103	0.00104	0.00122	0.00144	0.00146	0.00022	0.21
V - T	mg/L	0.00020	0.00020	0.00020	0.00053	0.00054	0.00076	0.00085	0.00098	0.00025	0.46
Zn - T	mg/L	0.0005	0.0005	0.0014	0.0023	0.0022	0.0030	0.0034	0.0045	0.0011	0.52
Zr - T	mg/L	0.00010	0.00010	0.00010	0.00010	0.00078	0.00157	0.00169	0.00172	0.00072	0.92

M:\1\01\00458\14\A\Report\3 - Water Quality Predictions\Rev 0\Appendices\Appendix C - Expected Case Concentration Graphs\[APPENDIX C8 HC_019 HB (EC).xlsx]Appendix B

NOTES:

1. UNITS ARE IN mg/L UNLESS OTHERWISE STATED.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT VA101-458/14-3	EJA	JEM	KJB

Knight Piésold CONSULTING

TABLE B8.2

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

SUMMARY STATISTICS - HARPER CREEK ABOVE BARRIÉRE RIVER (HB)
OPERATIONS PHASE II

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		Operations Phase II (Years 23.5 through 28) - LGO Processing to Open Pit									
Parameter	Unit	Minimum	10th Percentile	25th Percentile	Median	Mean	75th Percentile	90th Percentile	Maximum	Standard Deviation	Coefficient of Variation
Hardness, Dissolved Anions and Nutrients											
Model Hardness	mg/L CaCO3	16.08	18.67	25.09	27.52	26.85	30.60	32.83	33.61	5.29	0.20
Baseline Hardness	mg/L CaCO3	24.48	27.64	36.75	40.64	38.16	42.65	43.30	45.30	6.11	0.16
SO4	mg/L	2.86	3.25	5.12	8.99	8.93	11.08	14.66	17.29	4.16	0.47
Cl	mg/L	0.54	0.55	0.57	0.67	0.67	0.72	0.81	0.83	0.10	0.15
F	mg/L	0.024	0.029	0.040	0.045	0.042	0.046	0.051	0.055	0.009	0.21
Hardness	mg/L	16.1	18.7	25.1	27.5	26.9	30.6	32.8	33.6	5.3	0.20
Orthophosphate	mg/L	0.0011	0.0011	0.0024	0.0035	0.0032	0.0040	0.0050	0.0050	0.0014	0.44
N as NO3	mg/L	0.041	0.066	0.077	0.116	0.111	0.146	0.151	0.190	0.043	0.38
Dissolved Metals											
Al - D	mg/L	0.009	0.010	0.013	0.018	0.023	0.026	0.051	0.063	0.016	0.69
Cd - D	mg/L	0.0000078	0.0000083	0.0000086	0.0000103	0.0000111	0.0000131	0.0000158	0.0000173	0.0000030	0.27
Fe - D	mg/L	0.0045	0.0054	0.0072	0.0086	0.0108	0.0124	0.0191	0.0247	0.0056	0.52
Total Metals											
Al - T	mg/L	0.011	0.012	0.016	0.023	0.042	0.035	0.139	0.144	0.044	1.05
Sb - T	mg/L	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.00003	0.25
As - T	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.00014	0.37
Ba - T	mg/L	0.005	0.005	0.007	0.008	0.007	0.008	0.008	0.009	0.0011	0.15
Be - T	mg/L	0.000010	0.000010	0.000043	0.000048	0.000060	0.000103	0.000117	0.000117	0.000039	0.64
Bi - T	mg/L	0.00001	0.00001	0.00019	0.00024	0.00023	0.00032	0.00043	0.00049	0.000153	0.66
B - T	mg/L	0.01	0.01	0.02	0.03	0.03	0.04	0.05	0.05	0.014	0.48
Cd - T	mg/L	0.00001	0.00001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.00000	0.27
Ca - T	mg/L	5.4	6.2	8.4	9.7	9.2	10.4	11.5	11.5	1.9	0.20
Cr - T	mg/L	0.00010	0.00010	0.00010	0.00013	0.00013	0.00015	0.00019	0.00019	0.00003	0.25
Co - T	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000074	0.37
Cu - T	mg/L	0.00051	0.00053	0.00055	0.00062	0.00091	0.00087	0.00167	0.00214	0.00054	0.59
Fe - T	mg/L	0.0075	0.0083	0.0125	0.0153	0.0380	0.0293	0.1298	0.1671	0.0487	1.28
Pb - T	mg/L	0.000018	0.000019	0.000031	0.000048	0.000076	0.000081	0.000157	0.000240	0.000064	0.85
Li - T	mg/L	0.00067	0.00069	0.00121	0.00135	0.00125	0.00143	0.00155	0.00165	0.00031	0.25
Mg - T	mg/L	0.85	1.00	1.42	1.79	1.70	1.93	2.43	2.48	0.49	0.29
Mn - T	mg/L	0.00123	0.00127	0.00147	0.00157	0.00226	0.00204	0.00595	0.00603	0.00161	0.71
Hg - T	mg/L	0.0000100	0.0000100	0.0000100	0.0000100	0.0000104	0.0000100	0.0000119	0.0000123	0.0000008	0.08
Mo - T	mg/L	0.00094	0.00106	0.00169	0.00186	0.00175	0.00195	0.00216	0.00217	0.00037	0.21
Ni - T	mg/L	0.000093	0.000149	0.000277	0.000308	0.000333	0.000381	0.000516	0.000608	0.000132	0.40
P - T	mg/L	0.232	0.232	0.233	0.282	0.272	0.299	0.299	0.300	0.029	0.11
K - T	mg/L	0.43	0.51	0.87	0.97	0.90	1.05	1.20	1.22	0.24	0.27
Se - T	mg/L	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.000	0.52
Si - T	mg/L	3.02	3.20	3.89	4.10	3.98	4.36	4.42	4.60	0.49	0.12
Ag - T	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00002	0.00002	0.00002	0.0000058	0.46
Na - T	mg/L	0.77	0.90	1.57	1.82	1.63	1.89	2.09	2.18	0.44	0.27
Sr - T	mg/L	0.023	0.028	0.050	0.059	0.057	0.067	0.083	0.088	0.019	0.33
S - T	mg/L	9.78	9.82	9.83	9.96	9.91	9.98	9.99	9.99	0.08	0.01
Tl - T	mg/L	0.000002	0.000003	0.000005	0.000009	0.000007	0.000011	0.000012	0.000012	0.000004	0.47
Sn - T	mg/L	0.00010	0.00011	0.00012	0.00014	0.00015	0.00017	0.00021	0.00021	0.00004	0.24
Ti - T	mg/L	0.0005	0.0005	0.0040	0.0043	0.0048	0.0055	0.0086	0.0102	0.0030	0.62
U - T	mg/L	0.0008	0.0008	0.0009	0.0009	0.0010	0.0011	0.0014	0.0015	0.00022	0.21
V - T	mg/L	0.0002	0.0002	0.0005	0.0005	0.0005	0.0006	0.0008	0.0010	0.00024	0.43
Zn - T	mg/L	0.0006	0.0006	0.0015	0.0023	0.0022	0.0027	0.0034	0.0045	0.0011	0.49
Zr - T	mg/L	0.00010	0.00010	0.00010	0.00084	0.00080	0.00153	0.00169	0.00172	0.00072	0.90

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NOTES:

1. UNITS ARE IN mg/L UNLESS OTHERWISE STATED.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT VA101-458/14-3	EJA	JEM	KJB

Knight Piésold CONSULTING

TABLE B8.3

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

SUMMARY STATISTICS - HARPER CREEK ABOVE BARRIÉRE RIVER (HB)
CLOSURE

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		Closure (Years 29 through 35)									
Parameter	Unit	Minimum	10th Percentile	25th Percentile	Median	Mean	75th Percentile	90th Percentile	Maximum	Standard Deviation	Coefficient of Variation
Hardness, Dissolved Anions and Nutrients											
Model Hardness	mg/L CaCO3	16.1	19.0	24.5	28.1	27.4	31.5	33.2	34.2	5.1	0.2
Baseline Hardness	mg/L CaCO3	24.48	27.64	35.71	40.67	38.12	42.74	43.30	45.30	6.33	0.17
SO4	mg/L	2.49	3.99	6.58	19.41	18.46	28.11	32.08	42.38	11.18	0.61
Cl	mg/L	0.52	0.54	0.63	0.78	0.80	0.98	1.05	1.14	0.19	0.23
F	mg/L	0.024	0.036	0.039	0.047	0.046	0.051	0.055	0.063	0.009	0.19
Hardness	mg/L	16.1	19.0	24.5	28.1	27.4	31.5	33.2	34.2	5.1	0.18
Orthophosphate	mg/L	0.0011	0.0013	0.0022	0.0034	0.0031	0.0042	0.0049	0.0050	0.0013	0.42
N as NO3	mg/L	0.041	0.084	0.121	0.179	0.178	0.223	0.275	0.322	0.069	0.39
Dissolved Metals											
Al - D	mg/L	0.009	0.010	0.012	0.017	0.023	0.026	0.050	0.063	0.015	0.67
Cd - D	mg/L	0.0000073	0.0000080	0.0000100	0.0000125	0.0000127	0.0000158	0.0000173	0.0000181	0.0000033	0.26
Fe - D	mg/L	0.0045	0.0054	0.0071	0.0085	0.0106	0.0127	0.0191	0.0247	0.0055	0.52
Total Metals											
Al - T	mg/L	0.011	0.013	0.016	0.023	0.042	0.039	0.130	0.144	0.042	1.00
Sb - T	mg/L	0.00002	0.00004	0.00011	0.00025	0.00023	0.00036	0.00039	0.00046	0.00013	0.57
As - T	mg/L	0.00021	0.00025	0.00037	0.00047	0.00047	0.00062	0.00066	0.00078	0.00016	0.34
Ba - T	mg/L	0.0053	0.0061	0.0067	0.0077	0.0075	0.0083	0.0088	0.0091	0.0010	0.14
Be - T	mg/L	0.000010	0.000012	0.000034	0.000044	0.000057	0.000098	0.000111	0.000117	0.000037	0.65
Bi - T	mg/L	0.000005	0.000007	0.000134	0.000206	0.000218	0.000328	0.000430	0.000485	0.000148	0.68
B - T	mg/L	0.011	0.016	0.019	0.033	0.032	0.041	0.051	0.052	0.014	0.43
Cd - T	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00002	0.00002	0.00002	0.00000	0.25
Ca - T	mg/L	5.4	8.2	8.4	10.4	10.1	11.0	12.7	13.8	1.9	0.19
Cr - T	mg/L	0.00010	0.00010	0.00010	0.00012	0.00013	0.00015	0.00019	0.00019	0.00003	0.24
Co - T	mg/L	0.00001	0.00003	0.0001	0.0003	0.0003	0.0004	0.0005	0.0006	0.0002	0.66
Cu - T	mg/L	0.00042	0.00047	0.00069	0.00094	0.00111	0.00130	0.00209	0.00237	0.00058	0.52
Fe - T	mg/L	0.0074	0.0084	0.0119	0.0151	0.0381	0.0330	0.1297	0.1672	0.0465	1.22
Pb - T	mg/L	0.00002	0.00003	0.00004	0.00005	0.00008	0.00010	0.00016	0.00024	0.000061	0.79
Li - T	mg/L	0.00066	0.00115	0.00126	0.00143	0.00149	0.00176	0.00196	0.00221	0.00036	0.24
Mg - T	mg/L	0.83	1.34	1.77	2.85	2.74	3.63	4.16	5.26	1.11	0.41
Mn - T	mg/L	0.00065	0.00076	0.00175	0.00438	0.00428	0.00584	0.00886	0.01099	0.00284	0.66
Hg - T	mg/L	0.000009	0.000009	0.000009	0.000010	0.000010	0.000010	0.000011	0.000012	0.000001	0.08
Mo - T	mg/L	0.001	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.001	0.25
Ni - T	mg/L	0.0001	0.0002	0.0003	0.0004	0.0004	0.0005	0.0007	0.0008	0.0002	0.41
P - T	mg/L	0.214	0.224	0.232	0.263	0.260	0.280	0.299	0.300	0.027	0.10
K - T	mg/L	0.43	0.81	0.91	1.01	1.06	1.26	1.40	1.61	0.27	0.25
Se - T	mg/L	0.0001	0.0001	0.0001	0.0009	0.0008	0.0013	0.0016	0.0020	0.0006	0.71
Si - T	mg/L	2.94	3.16	3.65	4.07	3.90	4.24	4.40	4.60	0.47	0.12
Ag - T	mg/L	0.000005	0.000005	0.000008	0.000012	0.000013	0.000018	0.000020	0.000021	0.000006	0.43
Na - T	mg/L	0.76	0.92	1.45	1.82	1.63	1.88	2.04	2.14	0.41	0.25
Sr - T	mg/L	0.022	0.044	0.051	0.092	0.086	0.115	0.131	0.165	0.036	0.42
S - T	mg/L	9.18	9.34	9.43	9.61	9.63	9.85	9.97	9.99	0.25	0.03
Tl - T	mg/L	0.000002	0.000003	0.000005	0.000008	0.000008	0.000011	0.000012	0.000013	0.000004	0.44
Sn - T	mg/L	0.00010	0.00013	0.00013	0.00015	0.00016	0.00019	0.00022	0.00022	0.00003	0.21
Ti - T	mg/L	0.0005	0.0007	0.0031	0.0040	0.0045	0.0061	0.0086	0.0102	0.0028	0.63
U - T	mg/L	0.00077	0.00084	0.00092	0.00102	0.00107	0.00118	0.00143	0.00146	0.00021	0.19
V - T	mg/L	0.00020	0.00020	0.00041	0.00053	0.00053	0.00066	0.00085	0.00098	0.00023	0.43
Zn - T	mg/L	0.0005	0.0011	0.0016	0.0023	0.0024	0.0030	0.0036	0.0045	0.0011	0.45
Zr - T	mg/L	0.00010	0.00010	0.00011	0.00044	0.00075	0.00149	0.00161	0.00172	0.00068	0.90

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NOTES:

1. UNITS ARE IN mg/L UNLESS OTHERWISE STATED.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT VA101-458/14-3	EJA	JEM	KJB

Knight Piésold CONSULTING

TABLE B8.4

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

SUMMARY STATISTICS - HARPER CREEK ABOVE BARRIÉRE RIVER (HB)
CLOSURE AND POST-CLOSURE

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		Post-Closure (Years 36 +)									
Parameter	Unit	Minimum	10th Percentile	25th Percentile	Median	Mean	75th Percentile	90th Percentile	Maximum	Standard Deviation	Coefficient of Variation
Hardness, Dissolved Anions and Nutrients											
Model Hardness	mg/L CaCO3	18.0	21.0	25.0	29.0	28.7	32.4	35.1	39.1	5.1	0.2
Baseline Hardness	mg/L CaCO3	24.48	27.64	34.67	40.64	38.12	42.83	43.30	45.30	6.30	0.17
SO4	mg/L	14.99	16.88	19.42	22.18	26.46	27.07	45.19	66.95	12.04	0.46
Cl	mg/L	0.66	0.73	0.78	0.86	0.91	0.96	1.25	1.49	0.19	0.21
F	mg/L	0.031	0.035	0.040	0.048	0.047	0.051	0.060	0.069	0.009	0.19
Hardness	mg/L	18.0	21.0	25.0	29.0	28.7	32.4	35.1	39.1	5.1	0.18
Orthophosphate	mg/L	0.0013	0.0015	0.0020	0.0035	0.0032	0.0042	0.0049	0.0050	0.0012	0.38
N as NO3	mg/L	0.040	0.070	0.084	0.124	0.129	0.155	0.192	0.389	0.053	0.42
Dissolved Metals											
Al - D	mg/L	0.010	0.012	0.013	0.018	0.024	0.026	0.048	0.059	0.014	0.60
Cd - D	mg/L	0.0000098	0.0000129	0.0000150	0.0000186	0.0000191	0.0000221	0.0000256	0.0000387	0.0000055	0.29
Fe - D	mg/L	0.0050	0.0057	0.0072	0.0096	0.0106	0.0128	0.0180	0.0229	0.0051	0.48
Total Metals											
Al - T	mg/L	0.014	0.016	0.017	0.023	0.043	0.043	0.125	0.132	0.040	0.93
Sb - T	mg/L	0.00018	0.00022	0.00025	0.00030	0.00034	0.00039	0.00051	0.00076	0.00013	0.39
As - T	mg/L	0.00032	0.00037	0.00041	0.00057	0.00055	0.00067	0.00077	0.00085	0.00015	0.27
Ba - T	mg/L	0.0058	0.0060	0.0067	0.0076	0.0076	0.0084	0.0089	0.0093	0.0010	0.14
Be - T	mg/L	0.000013	0.000013	0.000028	0.000045	0.000056	0.000093	0.000107	0.000110	0.000035	0.62
Bi - T	mg/L	0.000012	0.000019	0.000101	0.000220	0.000214	0.000330	0.000395	0.000427	0.000138	0.64
B - T	mg/L	0.013	0.015	0.019	0.030	0.031	0.042	0.049	0.051	0.013	0.41
Cd - T	mg/L	0.00001	0.00001	0.00002	0.00002	0.00002	0.00002	0.00003	0.00004	0.00001	0.28
Ca - T	mg/L	8.0	8.4	9.5	10.6	10.9	11.8	14.4	15.9	2.1	0.19
Cr - T	mg/L	0.00010	0.00010	0.00011	0.00013	0.00013	0.00015	0.00018	0.00019	0.00003	0.22
Co - T	mg/L	0.00009	0.00012	0.0002	0.0002	0.0002	0.0003	0.0004	0.0009	0.0001	0.53
Cu - T	mg/L	0.00063	0.00073	0.00083	0.00109	0.00126	0.00175	0.00210	0.00232	0.00052	0.41
Fe - T	mg/L	0.0095	0.0103	0.0118	0.0147	0.0374	0.0359	0.1175	0.1462	0.0436	1.17
Pb - T	mg/L	0.00003	0.00004	0.00004	0.00006	0.00008	0.00011	0.00015	0.00022	0.000057	0.71
Li - T	mg/L	0.00106	0.00119	0.00141	0.00159	0.00163	0.00172	0.00227	0.00274	0.00038	0.23
Mg - T	mg/L	2.60	2.73	3.01	3.38	3.81	3.69	6.17	8.09	1.38	0.36
Mn - T	mg/L	0.00232	0.00314	0.00368	0.00478	0.00597	0.00880	0.01017	0.01356	0.00293	0.49
Hg - T	mg/L	0.000008	0.000009	0.000009	0.000010	0.000010	0.000010	0.000011	0.000012	0.000001	0.08
Mo - T	mg/L	0.002	0.002	0.002	0.003	0.003	0.003	0.004	0.005	0.001	0.26
Ni - T	mg/L	0.0003	0.0003	0.0004	0.0005	0.0005	0.0007	0.0007	0.0008	0.0002	0.29
P - T	mg/L	0.214	0.219	0.222	0.238	0.249	0.279	0.282	0.287	0.027	0.11
K - T	mg/L	0.81	0.85	1.02	1.13	1.17	1.22	1.68	2.01	0.28	0.24
Se - T	mg/L	0.0005	0.0006	0.0007	0.0008	0.0010	0.0011	0.0018	0.0032	0.0005	0.50
Si - T	mg/L	2.88	3.12	3.51	3.94	3.81	4.11	4.27	4.41	0.44	0.11
Ag - T	mg/L	0.000006	0.000008	0.000009	0.000012	0.000014	0.000019	0.000020	0.000022	0.000005	0.36
Na - T	mg/L	0.82	0.94	1.33	1.79	1.59	1.85	1.96	2.07	0.38	0.24
Sr - T	mg/L	0.073	0.078	0.086	0.097	0.109	0.109	0.178	0.241	0.039	0.36
S - T	mg/L	8.12	8.80	9.19	9.40	9.30	9.50	9.61	9.73	0.33	0.04
Tl - T	mg/L	0.000004	0.000006	0.000006	0.000010	0.000009	0.000011	0.000013	0.000013	0.000003	0.33
Sn - T	mg/L	0.00012	0.00013	0.00015	0.00016	0.00018	0.00020	0.00024	0.00029	0.00004	0.24
Ti - T	mg/L	0.0008	0.0010	0.0025	0.0040	0.0045	0.0066	0.0081	0.0090	0.0026	0.58
U - T	mg/L	0.00080	0.00085	0.00090	0.00105	0.00106	0.00119	0.00140	0.00146	0.00020	0.19
V - T	mg/L	0.00021	0.00025	0.00038	0.00053	0.00054	0.00069	0.00080	0.00091	0.00021	0.39
Zn - T	mg/L	0.0014	0.0019	0.0022	0.0030	0.0030	0.0036	0.0043	0.0051	0.0009	0.30
Zr - T	mg/L	0.00011	0.00011	0.00012	0.00078	0.00074	0.00145	0.00148	0.00160	0.00064	0.87

M:\1\01\00458\14\A\Report\3 - Water Quality Predictions\Rev 0\Appendices\Appendix C - Expected Case Concentration Graphs\[APPENDIX C8 HC_019 HB (EC).xlsx]Appendix B

NOTES:

1. UNITS ARE IN mg/L UNLESS OTHERWISE STATED.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT VA101-458/14-3	EJA	JEM	KJB

APPENDIX B9

MID BAKER CREEK (BK1)

(Pages B9-1 to B9-4)

Knight Piésold CONSULTING

TABLE B9.1

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

SUMMARY STATISTICS - MID BAKER CREEK (BK1)
OPERATIONS PHASE I

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		Operations Phase I (Years 0 through 23.5) - Regular Ore Processing									
Parameter	Unit	Minimum	10th Percentile	25th Percentile	Median	Mean	75th Percentile	90th Percentile	Maximum	Standard Deviation	Coefficient of Variation
Hardness, Dissolved Anions and Nutrients											
Model Hardness	mg/L CaCO3	54.7	66.1	92.1	111.0	101.9	114.2	117.0	118.0	20.4	0.2
Baseline Hardness	mg/L CaCO3	24.48	27.64	33.62	40.70	38.12	43.00	43.30	45.30	6.35	0.17
SO4	mg/L	4.34	4.69	5.95	8.08	7.44	8.64	8.76	9.69	1.64	0.22
Cl	mg/L	0.50	0.50	0.50	0.52	0.56	0.56	0.65	0.80	0.09	0.15
F	mg/L	0.025	0.025	0.026	0.029	0.030	0.033	0.035	0.039	0.004	0.14
Hardness	mg/L	54.7	66.1	92.1	111.0	101.9	114.2	117.0	118.0	20.4	0.20
Orthophosphate	mg/L	0.0010	0.0011	0.0013	0.0022	0.0026	0.0043	0.0050	0.0050	0.0014	0.56
N as NO3	mg/L	0.006	0.010	0.027	0.062	0.056	0.085	0.089	0.109	0.031	0.56
Dissolved Metals											
Al - D	mg/L	0.002	0.002	0.003	0.004	0.007	0.009	0.014	0.023	0.006	0.88
Cd - D	mg/L	0.0000050	0.0000050	0.0000050	0.0000085	0.0000083	0.0000099	0.0000100	0.0000122	0.0000022	0.26
Fe - D	mg/L	0.0010	0.0010	0.0010	0.0070	0.0070	0.0101	0.0138	0.0141	0.0044	0.63
Total Metals											
Al - T	mg/L	0.003	0.004	0.005	0.006	0.055	0.014	0.259	0.315	0.106	1.95
Sb - T	mg/L	0.00002	0.00002	0.00002	0.00008	0.00007	0.00010	0.00012	0.00013	0.00004	0.48
As - T	mg/L	0.00015	0.00016	0.00018	0.00019	0.00035	0.00048	0.00070	0.00130	0.00033	0.94
Ba - T	mg/L	0.0081	0.0083	0.0085	0.0090	0.0090	0.0094	0.0096	0.0102	0.0006	0.07
Be - T	mg/L	0.000010	0.000010	0.000010	0.000078	0.000067	0.000098	0.000100	0.000121	0.000037	0.56
Bi - T	mg/L	0.000005	0.000005	0.000005	0.000353	0.000298	0.000482	0.000495	0.000500	0.000188	0.63
B - T	mg/L	0.010	0.010	0.011	0.020	0.025	0.050	0.050	0.050	0.016	0.62
Cd - T	mg/L	0.0000050	0.000005	0.000005	0.000009	0.000011	0.000012	0.000017	0.000025	0.000006	0.53
Ca - T	mg/L	17.6	23.0	30.2	35.5	33.2	37.6	37.9	38.8	6.4	0.19
Cr - T	mg/L	0.00010	0.00010	0.00012	0.00015	0.00028	0.00019	0.00095	0.00102	0.00032	1.13
Co - T	mg/L	0.000008	0.000011	0.000014	0.000069	0.000131	0.000110	0.000378	0.000574	0.000165	1.26
Cu - T	mg/L	0.00016	0.00024	0.00027	0.00052	0.00084	0.00096	0.00199	0.00282	0.00077	0.92
Fe - T	mg/L	0.0010	0.0020	0.0034	0.0080	0.1172	0.0180	0.5487	0.7546	0.2461	2.10
Pb - T	mg/L	0.000007	0.000007	0.000012	0.000041	0.000189	0.000113	0.000618	0.001140	0.000333	1.77
Li - T	mg/L	0.00037	0.00050	0.00050	0.00050	0.00053	0.00050	0.00052	0.00095	0.00013	0.24
Mg - T	mg/L	2.71	3.27	4.25	5.25	4.91	5.49	5.85	6.09	1.00	0.20
Mn - T	mg/L	0.00008	0.00017	0.00021	0.00026	0.00369	0.00096	0.01410	0.02573	0.00775	2.10
Hg - T	mg/L	0.0000098	0.0000100	0.0000100	0.0000100	0.0000102	0.0000100	0.0000100	0.0000132	0.0000008	0.08
Mo - T	mg/L	0.00013	0.00014	0.00021	0.00029	0.00026	0.00031	0.00032	0.00035	0.00007	0.26
Ni - T	mg/L	0.00009	0.00010	0.0001	0.0004	0.0005	0.0006	0.0013	0.0018	0.00049	0.91
P - T	mg/L	0.217	0.297	0.300	0.300	0.293	0.300	0.300	0.300	0.022	0.07
K - T	mg/L	0.38	0.45	0.48	0.55	0.55	0.61	0.62	0.70	0.08	0.15
Se - T	mg/L	0.000091	0.000101	0.000103	0.000110	0.000115	0.000122	0.000140	0.000171	0.000019	0.16
Si - T	mg/L	2.99	3.00	3.02	3.20	3.17	3.26	3.34	3.38	0.13	0.04
Ag - T	mg/L	0.0000050	0.0000050	0.0000050	0.0000095	0.000010	0.000010	0.000021	0.000022	0.000005	0.50
Na - T	mg/L	0.59	0.77	0.84	1.09	1.03	1.14	1.31	1.31	0.21	0.20
Sr - T	mg/L	0.071	0.103	0.118	0.158	0.143	0.161	0.163	0.169	0.030	0.21
S - T	mg/L	5.90	7.23	8.58	10.00	9.01	10.00	10.00	10.00	1.35	0.15
Tl - T	mg/L	0.000002	0.000002	0.000006	0.000008	0.000008	0.000010	0.000012	0.000013	0.000003	0.41
Sn - T	mg/L	0.00008	0.00010	0.00010	0.00014	0.00014	0.00020	0.00020	0.00020	0.00004	0.30
Ti - T	mg/L	0.0005	0.0005	0.0053	0.0067	0.0069	0.0097	0.0111	0.0133	0.0037	0.54
U - T	mg/L	0.00007	0.00011	0.00017	0.00022	0.00021	0.00025	0.00026	0.00029	0.00006	0.29
V - T	mg/L	0.00020	0.00020	0.00060	0.00069	0.00071	0.00097	0.00100	0.00119	0.00029	0.41
Zn - T	mg/L	0.0001	0.0004	0.0016	0.0021	0.0022	0.0029	0.0040	0.0045	0.0012	0.56
Zr - T	mg/L	0.00010	0.00010	0.00010	0.00029	0.00068	0.00123	0.00176	0.00190	0.00067	0.99

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NOTES:

1. UNITS ARE IN mg/L UNLESS OTHERWISE STATED.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT VA101-458/14-3	EJA	JEM	KJB

Knight Piésold CONSULTING

TABLE B9.2

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

SUMMARY STATISTICS - MID BAKER CREEK (BK1)
OPERATIONS PHASE II

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		Operations Phase II (Years 23.5 through 28) - LGO Processing to Open Pit									
Parameter	Unit	Minimum	10th Percentile	25th Percentile	Median	Mean	75th Percentile	90th Percentile	Maximum	Standard Deviation	Coefficient of Variation
Hardness, Dissolved Anions and Nutrients											
Model Hardness	mg/L CaCO3	54.83	66.05	107.92	111.35	102.60	114.25	117.00	118.00	19.75	0.19
Baseline Hardness	mg/L CaCO3	24.48	27.64	36.75	40.64	38.16	42.65	43.30	45.30	6.11	0.16
SO4	mg/L	4.35	4.69	7.20	7.97	7.48	8.53	8.76	9.69	1.60	0.21
Cl	mg/L	0.50	0.50	0.50	0.52	0.56	0.60	0.62	0.80	0.08	0.15
F	mg/L	0.025	0.026	0.028	0.029	0.030	0.033	0.035	0.039	0.004	0.13
Hardness	mg/L	54.8	66.1	107.9	111.4	102.6	114.3	117.0	118.0	19.8	0.19
Orthophosphate	mg/L	0.0010	0.0011	0.0012	0.0018	0.0025	0.0035	0.0050	0.0050	0.0014	0.58
N as NO3	mg/L	0.006	0.010	0.035	0.059	0.055	0.077	0.089	0.109	0.031	0.56
Dissolved Metals											
Al - D	mg/L	0.002	0.002	0.003	0.005	0.007	0.006	0.014	0.023	0.006	0.87
Cd - D	mg/L	0.0000050	0.0000050	0.0000082	0.0000092	0.0000086	0.0000100	0.0000101	0.0000129	0.0000023	0.26
Fe - D	mg/L	0.0010	0.0010	0.0055	0.0075	0.0071	0.0097	0.0138	0.0141	0.0042	0.59
Total Metals											
Al - T	mg/L	0.003	0.004	0.005	0.006	0.050	0.011	0.259	0.315	0.102	2.06
Sb - T	mg/L	0.0000	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00004	0.47
As - T	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.00034	0.97
Ba - T	mg/L	0.008	0.008	0.009	0.009	0.009	0.010	0.010	0.010	0.0006	0.07
Be - T	mg/L	0.000010	0.000010	0.000055	0.000078	0.000070	0.000097	0.000100	0.000121	0.000037	0.53
Bi - T	mg/L	0.00001	0.00001	0.00025	0.00036	0.00031	0.00048	0.00049	0.00050	0.000183	0.59
B - T	mg/L	0.01	0.01	0.01	0.01	0.02	0.03	0.05	0.05	0.015	0.64
Cd - T	mg/L	0.00001	0.00001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.00001	0.50
Ca - T	mg/L	17.7	23.0	34.7	35.5	33.4	37.2	37.9	38.8	6.2	0.19
Cr - T	mg/L	0.00010	0.00010	0.00013	0.00015	0.00027	0.00017	0.00095	0.00102	0.00031	1.13
Co - T	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000157	1.23
Cu - T	mg/L	0.00016	0.00024	0.00041	0.00054	0.00082	0.00092	0.00199	0.00282	0.00073	0.90
Fe - T	mg/L	0.0010	0.0020	0.0070	0.0085	0.1055	0.0097	0.5487	0.7543	0.2360	2.24
Pb - T	mg/L	0.000007	0.000007	0.000031	0.000048	0.000177	0.000090	0.000618	0.001139	0.000319	1.80
Li - T	mg/L	0.00037	0.00050	0.00050	0.00050	0.00053	0.00051	0.00052	0.00096	0.00014	0.26
Mg - T	mg/L	2.71	3.27	4.99	5.27	4.93	5.49	5.85	6.09	0.97	0.20
Mn - T	mg/L	0.00008	0.00017	0.00022	0.00030	0.00337	0.00102	0.01410	0.02573	0.00741	2.20
Hg - T	mg/L	0.0000100	0.0000100	0.0000100	0.0000100	0.0000103	0.0000100	0.0000100	0.0000131	0.0000009	0.09
Mo - T	mg/L	0.00013	0.00014	0.00027	0.00029	0.00027	0.00031	0.00034	0.00035	0.00007	0.25
Ni - T	mg/L	0.000090	0.000100	0.000350	0.000425	0.000539	0.000488	0.001344	0.001750	0.000469	0.87
P - T	mg/L	0.219	0.300	0.300	0.300	0.293	0.300	0.300	0.300	0.023	0.08
K - T	mg/L	0.38	0.45	0.53	0.56	0.55	0.61	0.62	0.70	0.08	0.14
Se - T	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.17
Si - T	mg/L	2.99	3.00	3.01	3.21	3.18	3.28	3.35	3.38	0.14	0.04
Ag - T	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00002	0.00002	0.0000056	0.51
Na - T	mg/L	0.60	0.77	0.96	1.07	1.03	1.14	1.31	1.31	0.20	0.19
Sr - T	mg/L	0.071	0.103	0.154	0.158	0.144	0.161	0.163	0.170	0.030	0.21
S - T	mg/L	5.94	7.23	7.80	10.00	8.98	10.00	10.01	10.01	1.38	0.15
Tl - T	mg/L	0.000002	0.000002	0.000006	0.000010	0.000008	0.000010	0.000012	0.000013	0.000003	0.40
Sn - T	mg/L	0.00008	0.00010	0.00010	0.00013	0.00014	0.00020	0.00020	0.00020	0.00004	0.31
Ti - T	mg/L	0.0005	0.0005	0.0061	0.0067	0.0070	0.0097	0.0111	0.0133	0.0035	0.50
U - T	mg/L	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0003	0.0003	0.00006	0.29
V - T	mg/L	0.0002	0.0002	0.0006	0.0007	0.0007	0.0010	0.0010	0.0012	0.00028	0.39
Zn - T	mg/L	0.0001	0.0004	0.0019	0.0023	0.0023	0.0029	0.0040	0.0045	0.0012	0.52
Zr - T	mg/L	0.00010	0.00010	0.00010	0.00029	0.00072	0.00157	0.00180	0.00189	0.00071	0.99

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NOTES:

1. UNITS ARE IN mg/L UNLESS OTHERWISE STATED.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT VA101-458/14-3	EJA	JEM	KJB

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TABLE B9.3

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

SUMMARY STATISTICS - MID BAKER CREEK (BK1)
CLOSURE

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		Closure (Years 29 through 35)									
Parameter	Unit	Minimum	10th Percentile	25th Percentile	Median	Mean	75th Percentile	90th Percentile	Maximum	Standard Deviation	Coefficient of Variation
Hardness, Dissolved Anions and Nutrients											
Model Hardness	mg/L CaCO3	54.9	66.1	102.7	111.5	102.1	114.4	117.0	118.0	20.4	0.2
Baseline Hardness	mg/L CaCO3	24.48	27.64	35.71	40.67	38.12	42.74	43.30	45.30	6.33	0.17
SO4	mg/L	4.37	4.69	6.93	8.05	7.49	8.58	8.76	9.69	1.64	0.22
Cl	mg/L	0.50	0.50	0.50	0.52	0.56	0.57	0.63	0.80	0.09	0.15
F	mg/L	0.025	0.026	0.027	0.029	0.030	0.033	0.035	0.039	0.004	0.14
Hardness	mg/L	54.9	66.1	102.7	111.5	102.1	114.4	117.0	118.0	20.4	0.20
Orthophosphate	mg/L	0.0010	0.0012	0.0014	0.0020	0.0026	0.0037	0.0050	0.0050	0.0014	0.56
N as NO3	mg/L	0.006	0.010	0.033	0.061	0.056	0.079	0.089	0.109	0.031	0.56
Dissolved Metals											
Al - D	mg/L	0.002	0.002	0.003	0.005	0.007	0.007	0.014	0.023	0.006	0.88
Cd - D	mg/L	0.0000050	0.0000050	0.0000075	0.0000092	0.0000086	0.0000100	0.0000101	0.0000130	0.0000024	0.27
Fe - D	mg/L	0.0010	0.0010	0.0044	0.0072	0.0070	0.0098	0.0138	0.0141	0.0044	0.62
Total Metals											
Al - T	mg/L	0.003	0.004	0.005	0.006	0.054	0.012	0.259	0.315	0.106	1.97
Sb - T	mg/L	0.00002	0.00002	0.00005	0.00009	0.00008	0.00010	0.00012	0.00012	0.00004	0.48
As - T	mg/L	0.00015	0.00016	0.00018	0.00019	0.00035	0.00031	0.00070	0.00129	0.00033	0.95
Ba - T	mg/L	0.0082	0.0083	0.0085	0.0091	0.0090	0.0095	0.0096	0.0102	0.0006	0.07
Be - T	mg/L	0.000010	0.000010	0.000044	0.000076	0.000068	0.000097	0.000100	0.000120	0.000037	0.55
Bi - T	mg/L	0.000005	0.000005	0.000191	0.000355	0.000302	0.000480	0.000494	0.000500	0.000188	0.62
B - T	mg/L	0.010	0.010	0.012	0.018	0.025	0.035	0.050	0.050	0.016	0.63
Cd - T	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00002	0.00003	0.00001	0.52
Ca - T	mg/L	17.7	23.0	33.2	35.5	33.2	37.3	37.9	38.8	6.4	0.19
Cr - T	mg/L	0.00010	0.00010	0.00013	0.00015	0.00028	0.00017	0.00095	0.00102	0.00032	1.13
Co - T	mg/L	0.00001	0.00001	0.0000	0.0001	0.0001	0.0001	0.0004	0.0006	0.0002	1.24
Cu - T	mg/L	0.00016	0.00024	0.00037	0.00054	0.00084	0.00093	0.00199	0.00282	0.00076	0.91
Fe - T	mg/L	0.0010	0.0020	0.0061	0.0081	0.1149	0.0125	0.5487	0.7540	0.2450	2.13
Pb - T	mg/L	0.00001	0.00001	0.00003	0.00004	0.00019	0.00011	0.00062	0.00114	0.000332	1.78
Li - T	mg/L	0.00040	0.00050	0.00050	0.00050	0.00053	0.00051	0.00052	0.00096	0.00013	0.25
Mg - T	mg/L	2.72	3.27	4.78	5.27	4.93	5.52	5.85	6.09	1.00	0.20
Mn - T	mg/L	0.00008	0.00017	0.00023	0.00030	0.00366	0.00103	0.01410	0.02573	0.00770	2.10
Hg - T	mg/L	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000013	0.000001	0.08
Mo - T	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.25
Ni - T	mg/L	0.0001	0.0001	0.0003	0.0004	0.0005	0.0005	0.0013	0.0017	0.0005	0.90
P - T	mg/L	0.220	0.300	0.300	0.300	0.293	0.300	0.300	0.300	0.022	0.08
K - T	mg/L	0.38	0.45	0.52	0.56	0.55	0.61	0.62	0.70	0.08	0.15
Se - T	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0000	0.17
Si - T	mg/L	2.99	3.00	3.02	3.21	3.17	3.27	3.34	3.38	0.13	0.04
Ag - T	mg/L	0.000005	0.000005	0.000007	0.000010	0.000011	0.000011	0.000021	0.000021	0.000005	0.50
Na - T	mg/L	0.60	0.77	0.93	1.08	1.03	1.14	1.31	1.31	0.21	0.20
Sr - T	mg/L	0.071	0.103	0.143	0.158	0.143	0.161	0.163	0.170	0.030	0.21
S - T	mg/L	5.95	7.23	8.33	10.00	9.01	10.00	10.01	10.01	1.36	0.15
Tl - T	mg/L	0.000002	0.000002	0.000006	0.000009	0.000008	0.000010	0.000012	0.000012	0.000003	0.42
Sn - T	mg/L	0.00009	0.00010	0.00010	0.00013	0.00014	0.00020	0.00020	0.00020	0.00004	0.30
Ti - T	mg/L	0.0005	0.0005	0.0057	0.0067	0.0069	0.0096	0.0111	0.0133	0.0037	0.53
U - T	mg/L	0.00007	0.00011	0.00019	0.00022	0.00021	0.00024	0.00026	0.00029	0.00006	0.29
V - T	mg/L	0.00020	0.00020	0.00060	0.00070	0.00071	0.00097	0.00100	0.00119	0.00029	0.41
Zn - T	mg/L	0.0001	0.0004	0.0018	0.0022	0.0023	0.0029	0.0040	0.0045	0.0012	0.55
Zr - T	mg/L	0.00010	0.00010	0.00010	0.00029	0.00069	0.00131	0.00177	0.00179	0.00068	0.99

M:\1\01\00458\14\A\Report\3 - Water Quality Predictions\Rev 0\Appendices\Appendix C - Expected Case Concentration Graphs\[APPENDIX C9 HC_019 BK1 (EC).xlsx]Appendix B

NOTES:

1. UNITS ARE IN mg/L UNLESS OTHERWISE STATED.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT VA101-458/14-3	EJA	JEM	KJB

Knight Piésold CONSULTING

TABLE B9.4

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

SUMMARY STATISTICS - MID BAKER CREEK (BK1)
CLOSURE AND POST-CLOSURE

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		Post-Closure (Years 36 +)									
Parameter	Unit	Minimum	10th Percentile	25th Percentile	Median	Mean	75th Percentile	90th Percentile	Maximum	Standard Deviation	Coefficient of Variation
Hardness, Dissolved Anions and Nutrients											
Model Hardness	mg/L CaCO3	54.8	66.1	97.5	111.8	102.0	114.4	117.0	118.0	20.3	0.2
Baseline Hardness	mg/L CaCO3	24.48	27.64	34.67	40.64	38.12	42.83	43.30	45.30	6.30	0.17
SO4	mg/L	4.35	4.69	6.39	8.00	7.45	8.60	8.76	9.69	1.63	0.22
Cl	mg/L	0.50	0.50	0.50	0.52	0.56	0.58	0.63	0.80	0.08	0.15
F	mg/L	0.025	0.025	0.027	0.029	0.030	0.033	0.035	0.039	0.004	0.14
Hardness	mg/L	54.8	66.1	97.5	111.8	102.0	114.4	117.0	118.0	20.3	0.20
Orthophosphate	mg/L	0.0010	0.0011	0.0013	0.0022	0.0026	0.0039	0.0050	0.0050	0.0014	0.56
N as NO3	mg/L	0.006	0.010	0.030	0.061	0.056	0.081	0.089	0.109	0.031	0.56
Dissolved Metals											
Al - D	mg/L	0.002	0.002	0.003	0.005	0.007	0.008	0.014	0.023	0.006	0.87
Cd - D	mg/L	0.0000050	0.0000050	0.0000066	0.0000090	0.0000084	0.0000099	0.0000100	0.0000127	0.0000022	0.26
Fe - D	mg/L	0.0010	0.0010	0.0032	0.0070	0.0070	0.0100	0.0138	0.0141	0.0044	0.62
Total Metals											
Al - T	mg/L	0.003	0.004	0.005	0.007	0.054	0.013	0.259	0.315	0.105	1.96
Sb - T	mg/L	0.00002	0.00002	0.00004	0.00010	0.00008	0.00010	0.00012	0.00012	0.00004	0.48
As - T	mg/L	0.00015	0.00016	0.00018	0.00019	0.00035	0.00039	0.00070	0.00129	0.00033	0.94
Ba - T	mg/L	0.0082	0.0083	0.0085	0.0093	0.0090	0.0095	0.0096	0.0102	0.0006	0.07
Be - T	mg/L	0.000010	0.000010	0.000033	0.000076	0.000068	0.000098	0.000100	0.000120	0.000037	0.55
Bi - T	mg/L	0.000005	0.000005	0.000129	0.000356	0.000302	0.000481	0.000494	0.000500	0.000187	0.62
B - T	mg/L	0.010	0.010	0.012	0.016	0.025	0.040	0.050	0.050	0.016	0.63
Cd - T	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00002	0.00003	0.00001	0.52
Ca - T	mg/L	17.7	23.0	31.7	35.1	33.2	37.4	37.9	38.8	6.4	0.19
Cr - T	mg/L	0.00010	0.00010	0.00012	0.00015	0.00028	0.00018	0.00095	0.00102	0.00032	1.12
Co - T	mg/L	0.00001	0.00001	0.0000	0.0001	0.0001	0.0001	0.0004	0.0006	0.0002	1.25
Cu - T	mg/L	0.00016	0.00024	0.00033	0.00051	0.00084	0.00094	0.00199	0.00282	0.00076	0.91
Fe - T	mg/L	0.0010	0.0020	0.0052	0.0077	0.1151	0.0153	0.5487	0.7542	0.2438	2.12
Pb - T	mg/L	0.00001	0.00001	0.00002	0.00005	0.00019	0.00012	0.00062	0.00114	0.000330	1.76
Li - T	mg/L	0.00038	0.00050	0.00050	0.00050	0.00053	0.00050	0.00052	0.00095	0.00013	0.25
Mg - T	mg/L	2.71	3.27	4.51	5.21	4.91	5.49	5.85	6.09	0.99	0.20
Mn - T	mg/L	0.00008	0.00017	0.00022	0.00029	0.00363	0.00099	0.01410	0.02572	0.00767	2.11
Hg - T	mg/L	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000013	0.000001	0.08
Mo - T	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.25
Ni - T	mg/L	0.0001	0.0001	0.0002	0.0004	0.0005	0.0006	0.0013	0.0017	0.0005	0.90
P - T	mg/L	0.220	0.300	0.300	0.300	0.293	0.300	0.300	0.300	0.022	0.08
K - T	mg/L	0.38	0.45	0.50	0.56	0.55	0.61	0.62	0.70	0.08	0.15
Se - T	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0000	0.16
Si - T	mg/L	2.99	3.00	3.02	3.21	3.17	3.28	3.33	3.38	0.13	0.04
Ag - T	mg/L	0.000005	0.000005	0.000007	0.000010	0.000011	0.000012	0.000021	0.000022	0.000005	0.50
Na - T	mg/L	0.60	0.77	0.88	1.07	1.03	1.14	1.31	1.31	0.21	0.20
Sr - T	mg/L	0.071	0.103	0.131	0.158	0.143	0.161	0.163	0.169	0.030	0.21
S - T	mg/L	5.95	7.23	8.07	10.00	9.00	10.00	10.00	10.01	1.35	0.15
Tl - T	mg/L	0.000002	0.000002	0.000006	0.000010	0.000008	0.000010	0.000012	0.000012	0.000003	0.41
Sn - T	mg/L	0.00008	0.00010	0.00010	0.00014	0.00014	0.00020	0.00020	0.00020	0.00004	0.30
Ti - T	mg/L	0.0005	0.0005	0.0056	0.0065	0.0069	0.0096	0.0111	0.0133	0.0036	0.53
U - T	mg/L	0.00007	0.00011	0.00018	0.00021	0.00020	0.00024	0.00026	0.00029	0.00006	0.29
V - T	mg/L	0.00020	0.00020	0.00060	0.00069	0.00071	0.00097	0.00100	0.00119	0.00029	0.41
Zn - T	mg/L	0.0001	0.0004	0.0017	0.0021	0.0022	0.0029	0.0040	0.0045	0.0012	0.55
Zr - T	mg/L	0.00010	0.00010	0.00010	0.00048	0.00069	0.00140	0.00179	0.00181	0.00068	0.99

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NOTES:

1. UNITS ARE IN mg/L UNLESS OTHERWISE STATED.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT VA101-458/14-3	EJA	JEM	KJB

APPENDIX B10

BAKER CREEK ABOVE NORTH THOMPSON RIVER (BK0)

(Pages B10-1 to B10-4)

Knight Piésold CONSULTING

TABLE B10.1

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

SUMMARY STATISTICS - LOWER BAKER CREEK (BK0)
OPERATIONS PHASE I

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		Operations Phase I (Years 0 through 23.5) - Regular Ore Processing									
Parameter	Unit	Minimum	10th Percentile	25th Percentile	Median	Mean	75th Percentile	90th Percentile	Maximum	Standard Deviation	Coefficient of Variation
Hardness, Dissolved Anions and Nutrients											
Model Hardness	mg/L CaCO3	55.4	67.1	93.3	117.1	111.3	127.8	141.5	158.7	27.9	0.3
Baseline Hardness	mg/L CaCO3	24.48	27.64	33.62	40.70	38.12	43.00	43.30	45.30	6.35	0.17
SO4	mg/L	4.40	4.78	6.16	9.11	9.56	11.03	15.79	19.59	4.12	0.43
Cl	mg/L	0.50	0.50	0.53	0.56	0.58	0.61	0.67	0.80	0.08	0.14
F	mg/L	0.025	0.026	0.027	0.033	0.034	0.039	0.045	0.052	0.006	0.19
Hardness	mg/L	55.4	67.1	93.3	117.1	111.3	127.8	141.5	158.7	27.9	0.25
Orthophosphate	mg/L	0.0010	0.0011	0.0016	0.0024	0.0028	0.0045	0.0050	0.0050	0.0014	0.51
N as NO3	mg/L	0.006	0.010	0.024	0.044	0.047	0.070	0.073	0.109	0.028	0.61
Dissolved Metals											
Al - D	mg/L	0.002	0.002	0.003	0.004	0.007	0.008	0.013	0.023	0.006	0.88
Cd - D	mg/L	0.0000050	0.0000050	0.0000070	0.0000082	0.0000082	0.0000099	0.0000101	0.0000120	0.0000020	0.25
Fe - D	mg/L	0.0010	0.0010	0.0039	0.0066	0.0069	0.0099	0.0140	0.0141	0.0042	0.62
Total Metals											
Al - T	mg/L	0.003	0.004	0.005	0.006	0.054	0.014	0.256	0.316	0.106	1.95
Sb - T	mg/L	0.00002	0.00002	0.00002	0.00007	0.00007	0.00010	0.00011	0.00012	0.00004	0.50
As - T	mg/L	0.00017	0.00018	0.00018	0.00019	0.00035	0.00050	0.00071	0.00128	0.00032	0.91
Ba - T	mg/L	0.0082	0.0084	0.0086	0.0097	0.0103	0.0113	0.0130	0.0154	0.0020	0.19
Be - T	mg/L	0.000010	0.000010	0.000010	0.000065	0.000063	0.000098	0.000101	0.000119	0.000038	0.60
Bi - T	mg/L	0.000005	0.000005	0.000005	0.000309	0.000276	0.000469	0.000494	0.000497	0.000188	0.68
B - T	mg/L	0.010	0.010	0.012	0.025	0.027	0.050	0.050	0.050	0.016	0.58
Cd - T	mg/L	0.0000050	0.000005	0.000007	0.000008	0.000011	0.000012	0.000017	0.000025	0.000006	0.52
Ca - T	mg/L	17.8	23.3	30.5	37.9	35.8	40.8	45.0	50.3	8.4	0.23
Cr - T	mg/L	0.00010	0.00010	0.00011	0.00015	0.00035	0.00095	0.00101	0.00102	0.00038	1.06
Co - T	mg/L	0.000009	0.000011	0.000014	0.000066	0.000127	0.000106	0.000376	0.000579	0.000167	1.32
Cu - T	mg/L	0.00014	0.00023	0.00032	0.00050	0.00080	0.00085	0.00197	0.00281	0.00077	0.96
Fe - T	mg/L	0.0010	0.0020	0.0053	0.0072	0.1168	0.0178	0.5424	0.7598	0.2462	2.11
Pb - T	mg/L	0.000005	0.000007	0.000020	0.000039	0.000186	0.000099	0.000613	0.001144	0.000334	1.79
Li - T	mg/L	0.00043	0.00050	0.00050	0.00053	0.00061	0.00064	0.00090	0.00095	0.00015	0.25
Mg - T	mg/L	2.74	3.33	4.35	5.88	5.75	6.83	8.18	9.73	1.82	0.32
Mn - T	mg/L	0.00008	0.00016	0.00020	0.00029	0.00371	0.00095	0.01403	0.02584	0.00774	2.08
Hg - T	mg/L	0.0000098	0.0000100	0.0000100	0.0000100	0.0000102	0.0000100	0.0000100	0.0000128	0.0000007	0.07
Mo - T	mg/L	0.00013	0.00015	0.00021	0.00030	0.00027	0.00033	0.00034	0.00036	0.00007	0.26
Ni - T	mg/L	0.00006	0.00009	0.0001	0.0004	0.0005	0.0006	0.0013	0.0018	0.00050	0.97
P - T	mg/L	0.220	0.267	0.281	0.298	0.287	0.299	0.300	0.300	0.022	0.08
K - T	mg/L	0.39	0.45	0.49	0.58	0.59	0.67	0.73	0.78	0.11	0.19
Se - T	mg/L	0.000099	0.000103	0.000110	0.000126	0.000153	0.000182	0.000231	0.000319	0.000061	0.40
Si - T	mg/L	3.02	3.05	3.23	3.27	3.37	3.43	3.67	4.06	0.28	0.08
Ag - T	mg/L	0.0000050	0.0000050	0.0000050	0.0000087	0.000010	0.000011	0.000020	0.000021	0.000005	0.49
Na - T	mg/L	0.60	0.78	0.86	1.16	1.23	1.48	1.80	2.19	0.42	0.34
Sr - T	mg/L	0.071	0.105	0.120	0.163	0.156	0.183	0.202	0.227	0.042	0.27
S - T	mg/L	5.92	7.19	8.49	9.57	8.95	10.00	10.00	10.00	1.32	0.15
Tl - T	mg/L	0.000002	0.000002	0.000004	0.000007	0.000007	0.000010	0.000011	0.000012	0.000003	0.46
Sn - T	mg/L	0.00009	0.00010	0.00011	0.00014	0.00015	0.00020	0.00020	0.00021	0.00004	0.28
Ti - T	mg/L	0.0005	0.0005	0.0036	0.0061	0.0062	0.0094	0.0111	0.0131	0.0038	0.61
U - T	mg/L	0.00008	0.00011	0.00019	0.00029	0.00036	0.00049	0.00076	0.00102	0.00024	0.68
V - T	mg/L	0.00020	0.00020	0.00044	0.00067	0.00066	0.00095	0.00100	0.00119	0.00030	0.46
Zn - T	mg/L	0.0001	0.0004	0.0011	0.0019	0.0021	0.0029	0.0040	0.0045	0.0013	0.61
Zr - T	mg/L	0.00010	0.00010	0.00010	0.00021	0.00065	0.00124	0.00165	0.00178	0.00065	1.00

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NOTES:

1. UNITS ARE IN mg/L UNLESS OTHERWISE STATED.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	3OCT'14	ISSUED WITH REPORT VA101-458/14-3	EJA	JEM	KJB

Knight Piésold CONSULTING

TABLE B10.2

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

SUMMARY STATISTICS - LOWER BAKER CREEK (BK0)
OPERATIONS PHASE II

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		Operations Phase II (Years 23.5 through 28) - LGO Processing to Open Pit									
Parameter	Unit	Minimum	10th Percentile	25th Percentile	Median	Mean	75th Percentile	90th Percentile	Maximum	Standard Deviation	Coefficient of Variation
Hardness, Dissolved Anions and Nutrients											
Model Hardness	mg/L CaCO3	55.42	67.08	109.86	116.63	110.57	120.87	131.82	157.19	26.09	0.24
Baseline Hardness	mg/L CaCO3	24.48	27.64	36.75	40.64	38.16	42.65	43.30	45.30	6.11	0.16
SO4	mg/L	4.40	4.78	7.49	8.92	9.30	11.00	13.43	19.28	3.79	0.41
Cl	mg/L	0.50	0.50	0.53	0.56	0.58	0.61	0.65	0.80	0.08	0.13
F	mg/L	0.025	0.026	0.029	0.033	0.033	0.038	0.041	0.045	0.006	0.18
Hardness	mg/L	55.4	67.1	109.9	116.6	110.6	120.9	131.8	157.2	26.1	0.24
Orthophosphate	mg/L	0.0011	0.0012	0.0014	0.0023	0.0027	0.0036	0.0050	0.0050	0.0014	0.53
N as NO3	mg/L	0.006	0.010	0.024	0.043	0.047	0.070	0.073	0.109	0.029	0.61
Dissolved Metals											
Al - D	mg/L	0.002	0.002	0.003	0.005	0.007	0.006	0.013	0.023	0.006	0.86
Cd - D	mg/L	0.0000050	0.0000050	0.0000075	0.0000091	0.0000087	0.0000100	0.0000102	0.0000129	0.0000021	0.24
Fe - D	mg/L	0.0010	0.0010	0.0042	0.0068	0.0070	0.0093	0.0140	0.0141	0.0040	0.58
Total Metals											
Al - T	mg/L	0.003	0.004	0.005	0.006	0.049	0.011	0.256	0.316	0.102	2.06
Sb - T	mg/L	0.0000	0.0000	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001	0.00004	0.47
As - T	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.00034	0.93
Ba - T	mg/L	0.008	0.008	0.009	0.010	0.010	0.011	0.012	0.015	0.0018	0.18
Be - T	mg/L	0.000010	0.000010	0.000038	0.000068	0.000066	0.000097	0.000101	0.000119	0.000037	0.56
Bi - T	mg/L	0.00001	0.00001	0.00016	0.00032	0.00029	0.00046	0.00049	0.00050	0.000182	0.62
B - T	mg/L	0.01	0.01	0.01	0.02	0.03	0.04	0.05	0.05	0.015	0.59
Cd - T	mg/L	0.00001	0.00001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.00001	0.48
Ca - T	mg/L	17.9	23.4	35.4	37.8	35.6	38.9	43.4	48.1	7.8	0.22
Cr - T	mg/L	0.00010	0.00010	0.00013	0.00015	0.00033	0.00020	0.00101	0.00102	0.00036	1.09
Co - T	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000159	1.25
Cu - T	mg/L	0.00014	0.00024	0.00039	0.00053	0.00079	0.00071	0.00197	0.00281	0.00073	0.93
Fe - T	mg/L	0.0010	0.0020	0.0056	0.0073	0.1052	0.0094	0.5423	0.7595	0.2362	2.25
Pb - T	mg/L	0.000005	0.000007	0.000028	0.000047	0.000174	0.000089	0.000613	0.001144	0.000320	1.83
Li - T	mg/L	0.00043	0.00050	0.00050	0.00053	0.00061	0.00063	0.00090	0.00096	0.00016	0.26
Mg - T	mg/L	2.74	3.33	5.17	5.75	5.66	6.28	7.20	9.56	1.68	0.30
Mn - T	mg/L	0.00008	0.00021	0.00030	0.00055	0.00346	0.00102	0.01403	0.02584	0.00739	2.14
Hg - T	mg/L	0.0000100	0.0000100	0.0000100	0.0000100	0.0000103	0.0000100	0.0000101	0.0000128	0.0000008	0.08
Mo - T	mg/L	0.00013	0.00015	0.00027	0.00032	0.00030	0.00035	0.00038	0.00050	0.00009	0.29
Ni - T	mg/L	0.000060	0.000100	0.000253	0.000363	0.000519	0.000487	0.001335	0.001765	0.000479	0.92
P - T	mg/L	0.220	0.267	0.293	0.298	0.287	0.299	0.300	0.300	0.023	0.08
K - T	mg/L	0.39	0.45	0.54	0.58	0.58	0.66	0.70	0.78	0.10	0.18
Se - T	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.39
Si - T	mg/L	3.02	3.05	3.21	3.26	3.35	3.43	3.67	4.05	0.26	0.08
Ag - T	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00002	0.00002	0.0000053	0.50
Na - T	mg/L	0.60	0.78	0.99	1.13	1.19	1.31	1.55	2.18	0.39	0.33
Sr - T	mg/L	0.071	0.105	0.157	0.160	0.156	0.177	0.189	0.226	0.039	0.25
S - T	mg/L	5.94	7.19	7.81	9.60	8.93	10.01	10.03	10.08	1.36	0.15
Tl - T	mg/L	0.000002	0.000002	0.000005	0.000009	0.000008	0.000010	0.000011	0.000012	0.000003	0.44
Sn - T	mg/L	0.00009	0.00010	0.00011	0.00014	0.00015	0.00020	0.00020	0.00021	0.00004	0.29
Ti - T	mg/L	0.0005	0.0005	0.0043	0.0063	0.0064	0.0093	0.0111	0.0131	0.0036	0.57
U - T	mg/L	0.0001	0.0001	0.0002	0.0002	0.0003	0.0004	0.0006	0.0009	0.00022	0.67
V - T	mg/L	0.0002	0.0002	0.0005	0.0007	0.0007	0.0009	0.0010	0.0012	0.00029	0.43
Zn - T	mg/L	0.0001	0.0004	0.0017	0.0019	0.0022	0.0028	0.0040	0.0045	0.0012	0.56
Zr - T	mg/L	0.00010	0.00010	0.00010	0.00021	0.00069	0.00156	0.00169	0.00177	0.00069	1.00

M:\1\01\00458\14\A\Report\3 - Water Quality Predictions\Rev 0\Appendices\Appendix C - Expected Case Concentration Graphs\[APPENDIX C10 HC_019 BK0 (EC).xlsx]Appendix B

NOTES:

1. UNITS ARE IN mg/L UNLESS OTHERWISE STATED.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	3OCT'14	ISSUED WITH REPORT VA101-458/14-3	EJA	JEM	KJB

Knight Piésold CONSULTING

TABLE B10.3

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

SUMMARY STATISTICS - LOWER BAKER CREEK (BK0)
CLOSURE

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		Closure (Years 29 through 35)									
Parameter	Unit	Minimum	10th Percentile	25th Percentile	Median	Mean	75th Percentile	90th Percentile	Maximum	Standard Deviation	Coefficient of Variation
Hardness, Dissolved Anions and Nutrients											
Model Hardness	mg/L CaCO3	55.5	67.1	104.6	116.9	110.8	123.4	131.8	157.2	27.2	0.2
Baseline Hardness	mg/L CaCO3	24.48	27.64	35.71	40.67	38.12	42.74	43.30	45.30	6.33	0.17
SO4	mg/L	4.43	4.79	7.23	9.07	9.50	11.05	14.00	19.28	3.98	0.42
Cl	mg/L	0.50	0.50	0.53	0.56	0.58	0.62	0.66	0.80	0.08	0.14
F	mg/L	0.025	0.026	0.029	0.034	0.034	0.039	0.041	0.045	0.006	0.18
Hardness	mg/L	55.5	67.1	104.6	116.9	110.8	123.4	131.8	157.2	27.2	0.25
Orthophosphate	mg/L	0.0011	0.0012	0.0016	0.0024	0.0028	0.0039	0.0050	0.0050	0.0014	0.51
N as NO3	mg/L	0.006	0.010	0.023	0.044	0.047	0.070	0.072	0.109	0.029	0.62
Dissolved Metals											
Al - D	mg/L	0.002	0.003	0.003	0.005	0.007	0.007	0.013	0.023	0.006	0.86
Cd - D	mg/L	0.0000050	0.0000050	0.0000082	0.0000096	0.0000090	0.0000101	0.0000102	0.0000130	0.0000022	0.24
Fe - D	mg/L	0.0010	0.0010	0.0040	0.0066	0.0069	0.0095	0.0140	0.0141	0.0042	0.61
Total Metals											
Al - T	mg/L	0.003	0.004	0.005	0.006	0.053	0.012	0.256	0.316	0.105	1.97
Sb - T	mg/L	0.00002	0.00002	0.00004	0.00008	0.00007	0.00010	0.00011	0.00012	0.00004	0.49
As - T	mg/L	0.00018	0.00018	0.00019	0.00019	0.00036	0.00032	0.00071	0.00127	0.00033	0.91
Ba - T	mg/L	0.0082	0.0084	0.0088	0.0097	0.0102	0.0110	0.0117	0.0154	0.0019	0.19
Be - T	mg/L	0.000010	0.000010	0.000030	0.000066	0.000064	0.000097	0.000101	0.000117	0.000038	0.59
Bi - T	mg/L	0.000005	0.000005	0.000116	0.000308	0.000281	0.000463	0.000493	0.000497	0.000187	0.67
B - T	mg/L	0.010	0.011	0.013	0.023	0.027	0.041	0.050	0.050	0.016	0.58
Cd - T	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00002	0.00002	0.00001	0.48
Ca - T	mg/L	17.9	23.4	33.9	37.8	35.7	39.6	43.4	48.1	8.2	0.23
Cr - T	mg/L	0.00010	0.00010	0.00012	0.00015	0.00035	0.00039	0.00101	0.00102	0.00037	1.07
Co - T	mg/L	0.00001	0.00001	0.0000	0.0001	0.0001	0.0001	0.0004	0.0006	0.0002	1.24
Cu - T	mg/L	0.00014	0.00024	0.00038	0.00053	0.00081	0.00076	0.00197	0.00281	0.00076	0.94
Fe - T	mg/L	0.0010	0.0020	0.0054	0.0072	0.1146	0.0122	0.5422	0.7589	0.2452	2.14
Pb - T	mg/L	0.00001	0.00001	0.00002	0.00004	0.00018	0.00010	0.00061	0.00114	0.000332	1.80
Li - T	mg/L	0.00047	0.00050	0.00051	0.00053	0.00061	0.00064	0.00090	0.00096	0.00016	0.25
Mg - T	mg/L	2.75	3.33	4.95	5.93	5.73	6.45	7.39	9.56	1.77	0.31
Mn - T	mg/L	0.00008	0.00029	0.00035	0.00061	0.00378	0.00103	0.01403	0.02583	0.00766	2.03
Hg - T	mg/L	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000013	0.000001	0.07
Mo - T	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.32
Ni - T	mg/L	0.0001	0.0001	0.0002	0.0004	0.0005	0.0005	0.0013	0.0018	0.0005	0.95
P - T	mg/L	0.221	0.267	0.290	0.298	0.288	0.299	0.300	0.300	0.022	0.08
K - T	mg/L	0.39	0.45	0.53	0.59	0.59	0.67	0.70	0.78	0.11	0.18
Se - T	mg/L	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0003	0.0001	0.39
Si - T	mg/L	3.02	3.06	3.22	3.26	3.36	3.44	3.67	4.05	0.27	0.08
Ag - T	mg/L	0.000005	0.000005	0.000007	0.000009	0.000010	0.000012	0.000019	0.000021	0.000005	0.49
Na - T	mg/L	0.60	0.78	0.95	1.16	1.21	1.36	1.58	2.18	0.41	0.33
Sr - T	mg/L	0.071	0.105	0.145	0.162	0.156	0.179	0.192	0.226	0.041	0.26
S - T	mg/L	5.96	7.20	8.26	9.60	8.96	10.01	10.03	10.08	1.33	0.15
Tl - T	mg/L	0.000002	0.000002	0.000004	0.000008	0.000007	0.000010	0.000011	0.000012	0.000003	0.45
Sn - T	mg/L	0.00010	0.00010	0.00011	0.00014	0.00015	0.00020	0.00020	0.00021	0.00004	0.28
Ti - T	mg/L	0.0005	0.0005	0.0041	0.0062	0.0063	0.0093	0.0111	0.0131	0.0038	0.60
U - T	mg/L	0.00008	0.00011	0.00022	0.00027	0.00034	0.00042	0.00059	0.00094	0.00023	0.67
V - T	mg/L	0.00020	0.00020	0.00044	0.00068	0.00067	0.00094	0.00100	0.00119	0.00030	0.45
Zn - T	mg/L	0.0001	0.0004	0.0016	0.0020	0.0022	0.0029	0.0040	0.0045	0.0012	0.57
Zr - T	mg/L	0.00010	0.00010	0.00010	0.00021	0.00066	0.00132	0.00159	0.00175	0.00066	1.00

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NOTES:

1. UNITS ARE IN mg/L UNLESS OTHERWISE STATED.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	3OCT'14	ISSUED WITH REPORT VA101-458/14-3	EJA	JEM	KJB

Knight Piésold CONSULTING

TABLE B10.4

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

SUMMARY STATISTICS - LOWER BAKER CREEK (BK0)
CLOSURE AND POST-CLOSURE

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		Post-Closure (Years 36 +)									
Parameter	Unit	Minimum	10th Percentile	25th Percentile	Median	Mean	75th Percentile	90th Percentile	Maximum	Standard Deviation	Coefficient of Variation
Hardness, Dissolved Anions and Nutrients											
Model Hardness	mg/L CaCO3	55.4	67.1	98.8	116.6	110.5	124.8	131.8	157.2	27.0	0.2
Baseline Hardness	mg/L CaCO3	24.48	27.64	34.67	40.64	38.12	42.83	43.30	45.30	6.30	0.17
SO4	mg/L	4.40	4.78	6.59	8.78	9.35	11.05	13.79	19.27	3.92	0.42
Cl	mg/L	0.50	0.50	0.53	0.56	0.58	0.61	0.65	0.80	0.08	0.14
F	mg/L	0.025	0.026	0.028	0.033	0.033	0.039	0.041	0.045	0.006	0.18
Hardness	mg/L	55.4	67.1	98.8	116.6	110.5	124.8	131.8	157.2	27.0	0.24
Orthophosphate	mg/L	0.0011	0.0012	0.0015	0.0023	0.0028	0.0041	0.0050	0.0050	0.0014	0.51
N as NO3	mg/L	0.006	0.010	0.023	0.042	0.047	0.070	0.073	0.109	0.029	0.62
Dissolved Metals											
Al - D	mg/L	0.002	0.002	0.003	0.005	0.007	0.008	0.013	0.023	0.006	0.87
Cd - D	mg/L	0.0000050	0.0000050	0.0000070	0.0000084	0.0000084	0.0000099	0.0000101	0.0000126	0.0000020	0.24
Fe - D	mg/L	0.0010	0.0010	0.0040	0.0067	0.0069	0.0098	0.0140	0.0141	0.0042	0.60
Total Metals											
Al - T	mg/L	0.003	0.004	0.005	0.006	0.053	0.013	0.256	0.316	0.105	1.96
Sb - T	mg/L	0.00002	0.00002	0.00003	0.00009	0.00007	0.00010	0.00011	0.00012	0.00004	0.49
As - T	mg/L	0.00017	0.00018	0.00018	0.00019	0.00036	0.00041	0.00071	0.00127	0.00033	0.91
Ba - T	mg/L	0.0082	0.0084	0.0087	0.0097	0.0102	0.0111	0.0117	0.0154	0.0019	0.19
Be - T	mg/L	0.000010	0.000010	0.000023	0.000066	0.000064	0.000098	0.000101	0.000118	0.000037	0.58
Bi - T	mg/L	0.000005	0.000005	0.000078	0.000310	0.000282	0.000469	0.000494	0.000497	0.000186	0.66
B - T	mg/L	0.010	0.011	0.012	0.020	0.027	0.044	0.050	0.050	0.016	0.59
Cd - T	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00002	0.00002	0.00001	0.51
Ca - T	mg/L	17.9	23.3	32.2	37.8	35.6	40.0	43.4	48.1	8.1	0.23
Cr - T	mg/L	0.00010	0.00010	0.00012	0.00015	0.00035	0.00058	0.00101	0.00102	0.00037	1.06
Co - T	mg/L	0.00001	0.00001	0.0000	0.0001	0.0001	0.0001	0.0004	0.0006	0.0002	1.29
Cu - T	mg/L	0.00014	0.00024	0.00035	0.00051	0.00080	0.00080	0.00197	0.00281	0.00076	0.95
Fe - T	mg/L	0.0010	0.0020	0.0054	0.0071	0.1148	0.0151	0.5424	0.7591	0.2440	2.13
Pb - T	mg/L	0.00001	0.00001	0.00002	0.00005	0.00018	0.00012	0.00061	0.00114	0.000331	1.79
Li - T	mg/L	0.00044	0.00050	0.00050	0.00053	0.00060	0.00064	0.00090	0.00095	0.00015	0.26
Mg - T	mg/L	2.74	3.33	4.62	5.75	5.68	6.57	7.33	9.56	1.74	0.31
Mn - T	mg/L	0.00008	0.00016	0.00024	0.00032	0.00368	0.00099	0.01403	0.02582	0.00767	2.08
Hg - T	mg/L	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000013	0.000001	0.07
Mo - T	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.27
Ni - T	mg/L	0.0001	0.0001	0.0002	0.0004	0.0005	0.0006	0.0013	0.0018	0.0005	0.95
P - T	mg/L	0.221	0.267	0.286	0.298	0.288	0.299	0.300	0.300	0.022	0.08
K - T	mg/L	0.39	0.45	0.51	0.58	0.58	0.67	0.70	0.78	0.11	0.18
Se - T	mg/L	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0003	0.0001	0.39
Si - T	mg/L	3.02	3.05	3.23	3.27	3.35	3.42	3.67	4.05	0.27	0.08
Ag - T	mg/L	0.000005	0.000005	0.000006	0.000010	0.000010	0.000012	0.000020	0.000021	0.000005	0.49
Na - T	mg/L	0.60	0.78	0.90	1.13	1.21	1.40	1.58	2.18	0.40	0.33
Sr - T	mg/L	0.071	0.105	0.132	0.160	0.155	0.180	0.190	0.226	0.040	0.26
S - T	mg/L	5.95	7.19	8.04	9.19	8.94	10.00	10.00	10.05	1.32	0.15
Tl - T	mg/L	0.000002	0.000002	0.000004	0.000009	0.000007	0.000010	0.000011	0.000012	0.000003	0.45
Sn - T	mg/L	0.00010	0.00010	0.00011	0.00014	0.00015	0.00020	0.00020	0.00021	0.00004	0.29
Ti - T	mg/L	0.0005	0.0005	0.0039	0.0061	0.0063	0.0094	0.0111	0.0131	0.0038	0.60
U - T	mg/L	0.00008	0.00011	0.00020	0.00025	0.00034	0.00044	0.00060	0.00094	0.00023	0.67
V - T	mg/L	0.00020	0.00020	0.00044	0.00068	0.00067	0.00095	0.00100	0.00119	0.00030	0.45
Zn - T	mg/L	0.0001	0.0004	0.0014	0.0019	0.0021	0.0029	0.0040	0.0045	0.0013	0.59
Zr - T	mg/L	0.00010	0.00010	0.00010	0.00033	0.00066	0.00139	0.00162	0.00176	0.00066	1.00

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NOTES:

1. UNITS ARE IN mg/L UNLESS OTHERWISE STATED.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	3OCT'14	ISSUED WITH REPORT VA101-458/14-3	EJA	JEM	KJB

APPENDIX B11

JONES CREEK ABOVE NORTH THOMPSON RIVER (J1)

(Pages B11-1 to B11-4)

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TABLE B11.1

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

SUMMARY STATISTICS - JONES CREEK (J1)
OPERATIONS PHASE I

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		Operations Phase I (Years 0 through 23.5) - Regular Ore Processing									
Parameter	Unit	Minimum	10th Percentile	25th Percentile	Median	Mean	75th Percentile	90th Percentile	Maximum	Standard Deviation	Coefficient of Variation
Hardness, Dissolved Anions and Nutrients											
Model Hardness	mg/L CaCO3	17.5	21.3	28.9	49.6	54.9	68.8	86.7	123.3	30.5	0.6
Baseline Hardness	mg/L CaCO3	24.48	27.64	33.62	40.70	38.12	43.00	43.30	45.30	6.35	0.17
SO4	mg/L	5.12	5.71	6.32	7.01	8.84	11.06	13.85	15.09	3.20	0.36
Cl	mg/L	0.50	0.51	0.52	0.54	0.55	0.55	0.60	0.69	0.05	0.09
F	mg/L	0.020	0.021	0.022	0.025	0.027	0.030	0.033	0.041	0.006	0.21
Hardness	mg/L	17.5	21.3	28.9	49.6	54.9	68.8	86.7	123.3	30.5	0.56
Orthophosphate	mg/L	0.0010	0.0010	0.0011	0.0014	0.0017	0.0022	0.0027	0.0028	0.0006	0.37
N as NO3	mg/L	0.007	0.011	0.021	0.026	0.024	0.028	0.032	0.039	0.008	0.35
Dissolved Metals											
Al - D	mg/L	0.007	0.009	0.011	0.013	0.013	0.014	0.022	0.023	0.004	0.34
Cd - D	mg/L	0.0000075	0.0000091	0.0000095	0.0000103	0.0000106	0.0000108	0.0000118	0.0000174	0.0000021	0.20
Fe - D	mg/L	0.0036	0.0109	0.0122	0.0148	0.0140	0.0161	0.0166	0.0258	0.0048	0.34
Total Metals											
Al - T	mg/L	0.007	0.011	0.014	0.016	0.063	0.026	0.285	0.321	0.107	1.68
Sb - T	mg/L	0.00003	0.00008	0.00009	0.00010	0.00009	0.00010	0.00012	0.00013	0.00002	0.24
As - T	mg/L	0.00013	0.00013	0.00014	0.00015	0.00044	0.00068	0.00116	0.00169	0.00048	1.10
Ba - T	mg/L	0.0043	0.0046	0.0052	0.0082	0.0073	0.0087	0.0094	0.0113	0.0021	0.29
Be - T	mg/L	0.000022	0.000077	0.000085	0.000095	0.000088	0.000099	0.000103	0.000122	0.000023	0.26
Bi - T	mg/L	0.000073	0.000374	0.000420	0.000451	0.000420	0.000487	0.000492	0.000500	0.000112	0.27
B - T	mg/L	0.010	0.010	0.010	0.011	0.015	0.015	0.020	0.044	0.009	0.61
Cd - T	mg/L	0.0000064	0.000010	0.000012	0.000014	0.000014	0.000015	0.000016	0.000021	0.000003	0.25
Ca - T	mg/L	4.5	5.3	7.4	13.5	14.3	17.4	23.0	32.7	8.1	0.56
Cr - T	mg/L	0.00011	0.00014	0.00015	0.00016	0.00030	0.00017	0.00087	0.00123	0.00034	1.12
Co - T	mg/L	0.000033	0.000095	0.000117	0.000120	0.000176	0.000129	0.000462	0.000563	0.000151	0.86
Cu - T	mg/L	0.00036	0.00064	0.00073	0.00083	0.00095	0.00089	0.00188	0.00193	0.00045	0.48
Fe - T	mg/L	0.0107	0.0341	0.0366	0.0532	0.1631	0.0594	0.7103	0.8127	0.2649	1.62
Pb - T	mg/L	0.000035	0.000108	0.000117	0.000162	0.000303	0.000179	0.001010	0.001291	0.000381	1.26
Li - T	mg/L	0.00050	0.00052	0.00055	0.00061	0.00065	0.00074	0.00077	0.00091	0.00012	0.19
Mg - T	mg/L	1.72	2.09	2.75	4.14	4.85	6.01	7.74	10.79	2.57	0.53
Mn - T	mg/L	0.00042	0.00042	0.00044	0.00046	0.00433	0.00100	0.02254	0.02382	0.00835	1.93
Hg - T	mg/L	0.0000094	0.0000097	0.0000098	0.0000099	0.0000100	0.0000100	0.0000100	0.0000122	0.0000006	0.06
Mo - T	mg/L	0.00005	0.00007	0.00008	0.00012	0.00012	0.00014	0.00018	0.00022	0.00004	0.37
Ni - T	mg/L	0.00022	0.00055	0.0007	0.0008	0.0008	0.0008	0.0013	0.0016	0.00034	0.42
P - T	mg/L	0.226	0.238	0.263	0.293	0.281	0.297	0.299	0.300	0.024	0.09
K - T	mg/L	0.20	0.21	0.24	0.31	0.32	0.37	0.42	0.57	0.10	0.31
Se - T	mg/L	0.000102	0.000112	0.000124	0.000144	0.000167	0.000170	0.000241	0.000326	0.000060	0.36
Si - T	mg/L	2.55	2.60	2.68	3.00	2.93	3.12	3.28	3.41	0.26	0.09
Ag - T	mg/L	0.0000057	0.0000087	0.0000096	0.0000099	0.000011	0.000011	0.000019	0.000020	0.000004	0.34
Na - T	mg/L	0.46	0.50	0.54	0.67	0.77	0.90	1.09	1.44	0.28	0.36
Sr - T	mg/L	0.018	0.024	0.037	0.051	0.069	0.095	0.104	0.165	0.041	0.59
S - T	mg/L	4.43	4.63	6.41	9.78	8.51	9.93	9.97	10.00	2.14	0.25
Tl - T	mg/L	0.000003	0.000008	0.000009	0.000010	0.000009	0.000010	0.000012	0.000012	0.000002	0.24
Sn - T	mg/L	0.00009	0.00009	0.00010	0.00011	0.00012	0.00013	0.00015	0.00019	0.00003	0.22
Ti - T	mg/L	0.0018	0.0073	0.0085	0.0091	0.0088	0.0098	0.0102	0.0151	0.0028	0.32
U - T	mg/L	0.00004	0.00007	0.00010	0.00017	0.00029	0.00039	0.00053	0.00086	0.00023	0.79
V - T	mg/L	0.00031	0.00074	0.00084	0.00092	0.00087	0.00098	0.00101	0.00108	0.00019	0.22
Zn - T	mg/L	0.0013	0.0025	0.0031	0.0032	0.0031	0.0034	0.0039	0.0048	0.0008	0.24
Zr - T	mg/L	0.00010	0.00010	0.00010	0.00010	0.00047	0.00102	0.00140	0.00150	0.00053	1.14

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NOTES:

1. UNITS ARE IN mg/L UNLESS OTHERWISE STATED.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT VA101-458/14-3	EJA	JEM	KJB

Knight Piésold CONSULTING

TABLE B11.2

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

SUMMARY STATISTICS - JONES CREEK (J1)
OPERATIONS PHASE II

Print Oct/10/14 14:58:09

		Operations Phase II (Years 23.5 through 28) - LGO Processing to Open Pit									
Parameter	Unit	Minimum	10th Percentile	25th Percentile	Median	Mean	75th Percentile	90th Percentile	Maximum	Standard Deviation	Coefficient of Variation
Hardness, Dissolved Anions and Nutrients											
Model Hardness	mg/L CaCO3	17.47	21.13	30.48	55.25	55.13	78.68	83.69	123.08	29.88	0.54
Baseline Hardness	mg/L CaCO3	24.48	27.64	36.75	40.64	38.16	42.65	43.30	45.30	6.11	0.16
SO4	mg/L	5.34	5.83	6.65	7.16	9.00	11.18	13.84	15.08	3.15	0.35
Cl	mg/L	0.50	0.51	0.53	0.54	0.55	0.56	0.60	0.68	0.05	0.08
F	mg/L	0.020	0.021	0.022	0.027	0.027	0.031	0.032	0.041	0.006	0.21
Hardness	mg/L	17.5	21.1	30.5	55.2	55.1	78.7	83.7	123.1	29.9	0.54
Orthophosphate	mg/L	0.0010	0.0010	0.0011	0.0014	0.0017	0.0021	0.0027	0.0028	0.0006	0.37
N as NO3	mg/L	0.007	0.011	0.020	0.025	0.023	0.028	0.031	0.038	0.008	0.34
Dissolved Metals											
Al - D	mg/L	0.007	0.009	0.010	0.013	0.013	0.014	0.022	0.022	0.004	0.33
Cd - D	mg/L	0.0000075	0.0000091	0.0000093	0.0000100	0.0000104	0.0000104	0.0000118	0.0000167	0.0000020	0.19
Fe - D	mg/L	0.0037	0.0109	0.0114	0.0134	0.0138	0.0152	0.0162	0.0253	0.0046	0.33
Total Metals											
Al - T	mg/L	0.007	0.011	0.013	0.015	0.057	0.016	0.274	0.315	0.101	1.76
Sb - T	mg/L	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00002	0.23
As - T	mg/L	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.002	0.00049	1.10
Ba - T	mg/L	0.004	0.005	0.005	0.008	0.007	0.009	0.009	0.011	0.0021	0.28
Be - T	mg/L	0.000023	0.000077	0.000080	0.000091	0.000087	0.000097	0.000102	0.000120	0.000022	0.25
Bi - T	mg/L	0.00007	0.00037	0.00041	0.00044	0.00042	0.00048	0.00049	0.00049	0.000105	0.25
B - T	mg/L	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.04	0.009	0.58
Cd - T	mg/L	0.00001	0.00001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.00000	0.24
Ca - T	mg/L	4.5	5.4	7.7	15.9	14.4	19.6	22.4	32.6	7.9	0.55
Cr - T	mg/L	0.00011	0.00014	0.00014	0.00016	0.00028	0.00017	0.00085	0.00119	0.00032	1.13
Co - T	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000143	0.85
Cu - T	mg/L	0.00036	0.00064	0.00073	0.00081	0.00092	0.00088	0.00187	0.00189	0.00043	0.47
Fe - T	mg/L	0.0108	0.0338	0.0364	0.0514	0.1480	0.0579	0.6933	0.7836	0.2509	1.70
Pb - T	mg/L	0.000036	0.000107	0.000112	0.000156	0.000281	0.000175	0.000971	0.001263	0.000361	1.29
Li - T	mg/L	0.00050	0.00052	0.00055	0.00061	0.00065	0.00074	0.00077	0.00091	0.00012	0.18
Mg - T	mg/L	1.84	2.15	2.98	4.53	4.92	6.48	7.72	10.78	2.50	0.51
Mn - T	mg/L	0.00042	0.00044	0.00045	0.00047	0.00389	0.00074	0.02170	0.02333	0.00791	2.03
Hg - T	mg/L	0.0000094	0.0000096	0.0000097	0.0000099	0.0000100	0.0000099	0.0000100	0.0000120	0.0000006	0.06
Mo - T	mg/L	0.00008	0.00008	0.00010	0.00012	0.00012	0.00014	0.00018	0.00022	0.00004	0.32
Ni - T	mg/L	0.000218	0.000552	0.000628	0.000733	0.000784	0.000783	0.001310	0.001581	0.000320	0.41
P - T	mg/L	0.225	0.232	0.284	0.289	0.279	0.294	0.296	0.297	0.024	0.09
K - T	mg/L	0.20	0.21	0.24	0.34	0.33	0.38	0.42	0.57	0.10	0.30
Se - T	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.34
Si - T	mg/L	2.54	2.57	2.67	2.98	2.90	3.07	3.18	3.40	0.26	0.09
Ag - T	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00002	0.00002	0.0000037	0.34
Na - T	mg/L	0.46	0.50	0.58	0.67	0.77	0.92	1.08	1.43	0.27	0.35
Sr - T	mg/L	0.018	0.024	0.038	0.074	0.070	0.095	0.104	0.165	0.040	0.57
S - T	mg/L	4.44	4.63	8.73	9.66	8.47	9.86	9.89	9.95	2.09	0.25
Tl - T	mg/L	0.000003	0.000008	0.000009	0.000010	0.000009	0.000010	0.000012	0.000012	0.000002	0.23
Sn - T	mg/L	0.00009	0.00010	0.00011	0.00012	0.00012	0.00013	0.00015	0.00019	0.00002	0.20
Ti - T	mg/L	0.0018	0.0073	0.0078	0.0088	0.0087	0.0096	0.0100	0.0146	0.0026	0.30
U - T	mg/L	0.0000	0.0001	0.0001	0.0003	0.0003	0.0004	0.0005	0.0009	0.00022	0.77
V - T	mg/L	0.0003	0.0007	0.0008	0.0009	0.0009	0.0010	0.0010	0.0011	0.00018	0.21
Zn - T	mg/L	0.0013	0.0025	0.0028	0.0031	0.0031	0.0033	0.0038	0.0046	0.0007	0.23
Zr - T	mg/L	0.00010	0.00010	0.00010	0.00010	0.00046	0.00078	0.00135	0.00145	0.00052	1.14

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NOTES:

1. UNITS ARE IN mg/L UNLESS OTHERWISE STATED.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT VA101-458/14-3	EJA	JEM	KJB

Knight Piésold CONSULTING

TABLE B11.3

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

SUMMARY STATISTICS - JONES CREEK (J1)
CLOSURE

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		Closure (Years 29 through 35)									
Parameter	Unit	Minimum	10th Percentile	25th Percentile	Median	Mean	75th Percentile	90th Percentile	Maximum	Standard Deviation	Coefficient of Variation
Hardness, Dissolved Anions and Nutrients											
Model Hardness	mg/L CaCO3	17.5	21.4	30.0	52.2	55.3	72.7	85.8	123.0	30.5	0.6
Baseline Hardness	mg/L CaCO3	24.48	27.64	35.71	40.67	38.12	42.74	43.30	45.30	6.33	0.17
SO4	mg/L	5.74	6.58	7.02	8.47	9.64	11.63	14.66	15.58	3.01	0.31
Cl	mg/L	0.50	0.51	0.53	0.56	0.57	0.60	0.64	0.71	0.05	0.09
F	mg/L	0.021	0.021	0.023	0.026	0.028	0.031	0.033	0.041	0.006	0.20
Hardness	mg/L	17.5	21.4	30.0	52.2	55.3	72.7	85.8	123.0	30.5	0.55
Orthophosphate	mg/L	0.0010	0.0011	0.0011	0.0014	0.0017	0.0021	0.0027	0.0028	0.0006	0.37
N as NO3	mg/L	0.007	0.011	0.022	0.028	0.026	0.034	0.037	0.039	0.009	0.35
Dissolved Metals											
Al - D	mg/L	0.007	0.009	0.011	0.013	0.014	0.014	0.023	0.024	0.005	0.35
Cd - D	mg/L	0.0000075	0.0000093	0.0000095	0.0000105	0.0000108	0.0000112	0.0000120	0.0000180	0.0000024	0.22
Fe - D	mg/L	0.0037	0.0110	0.0119	0.0143	0.0140	0.0154	0.0163	0.0258	0.0048	0.34
Total Metals											
Al - T	mg/L	0.008	0.011	0.014	0.016	0.063	0.020	0.282	0.319	0.107	1.70
Sb - T	mg/L	0.00003	0.00008	0.00010	0.00011	0.00010	0.00012	0.00013	0.00015	0.00003	0.24
As - T	mg/L	0.00014	0.00014	0.00015	0.00017	0.00045	0.00068	0.00115	0.00167	0.00048	1.07
Ba - T	mg/L	0.0044	0.0046	0.0055	0.0083	0.0074	0.0088	0.0093	0.0113	0.0021	0.28
Be - T	mg/L	0.000023	0.000077	0.000084	0.000094	0.000088	0.000098	0.000103	0.000122	0.000023	0.26
Bi - T	mg/L	0.000074	0.000372	0.000419	0.000446	0.000420	0.000484	0.000489	0.000499	0.000110	0.26
B - T	mg/L	0.010	0.010	0.011	0.013	0.016	0.017	0.021	0.045	0.009	0.57
Cd - T	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00002	0.00002	0.00002	0.00000	0.25
Ca - T	mg/L	4.6	5.5	7.8	14.9	14.6	18.6	22.9	32.8	8.0	0.55
Cr - T	mg/L	0.00011	0.00014	0.00015	0.00016	0.00030	0.00017	0.00086	0.00121	0.00034	1.12
Co - T	mg/L	0.00003	0.00010	0.0001	0.0001	0.0002	0.0001	0.0005	0.0006	0.0001	0.81
Cu - T	mg/L	0.00036	0.00064	0.00076	0.00084	0.00096	0.00092	0.00192	0.00193	0.00045	0.47
Fe - T	mg/L	0.0111	0.0332	0.0360	0.0519	0.1605	0.0584	0.7028	0.7987	0.2649	1.65
Pb - T	mg/L	0.00004	0.00011	0.00011	0.00016	0.00030	0.00018	0.00099	0.00128	0.000380	1.27
Li - T	mg/L	0.00051	0.00055	0.00059	0.00062	0.00067	0.00076	0.00079	0.00093	0.00011	0.17
Mg - T	mg/L	1.84	2.28	3.03	4.36	4.98	6.29	7.91	10.82	2.52	0.51
Mn - T	mg/L	0.00044	0.00050	0.00057	0.00075	0.00440	0.00110	0.02220	0.02361	0.00830	1.89
Hg - T	mg/L	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000012	0.000001	0.06
Mo - T	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.30
Ni - T	mg/L	0.0002	0.0006	0.0007	0.0008	0.0008	0.0008	0.0013	0.0016	0.0003	0.42
P - T	mg/L	0.233	0.239	0.279	0.292	0.281	0.296	0.297	0.300	0.022	0.08
K - T	mg/L	0.21	0.23	0.27	0.33	0.34	0.39	0.43	0.58	0.10	0.28
Se - T	mg/L	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0003	0.0003	0.0001	0.27
Si - T	mg/L	2.55	2.59	2.69	3.00	2.94	3.15	3.27	3.40	0.27	0.09
Ag - T	mg/L	0.000006	0.000009	0.000010	0.000010	0.000011	0.000011	0.000019	0.000020	0.000004	0.34
Na - T	mg/L	0.46	0.51	0.57	0.68	0.78	0.91	1.10	1.43	0.27	0.35
Sr - T	mg/L	0.020	0.027	0.041	0.064	0.072	0.097	0.107	0.166	0.040	0.55
S - T	mg/L	4.57	4.84	7.96	9.72	8.51	9.88	9.93	9.97	2.05	0.24
Tl - T	mg/L	0.000003	0.000008	0.000009	0.000010	0.000009	0.000010	0.000012	0.000013	0.000002	0.24
Sn - T	mg/L	0.00008	0.00009	0.00010	0.00011	0.00012	0.00014	0.00015	0.00019	0.00003	0.22
Ti - T	mg/L	0.0018	0.0075	0.0082	0.0090	0.0088	0.0097	0.0102	0.0150	0.0028	0.32
U - T	mg/L	0.00004	0.00008	0.00014	0.00021	0.00030	0.00039	0.00054	0.00086	0.00023	0.76
V - T	mg/L	0.00031	0.00076	0.00082	0.00092	0.00087	0.00098	0.00100	0.00108	0.00019	0.22
Zn - T	mg/L	0.0013	0.0025	0.0030	0.0032	0.0032	0.0035	0.0039	0.0048	0.0008	0.24
Zr - T	mg/L	0.00010	0.00010	0.00010	0.00010	0.00047	0.00089	0.00137	0.00148	0.00053	1.14

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NOTES:

1. UNITS ARE IN mg/L UNLESS OTHERWISE STATED.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT VA101-458/14-3	EJA	JEM	KJB

Knight Piésold CONSULTING

TABLE B11.4

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

SUMMARY STATISTICS - JONES CREEK (J1)
CLOSURE AND POST-CLOSURE

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		Post-Closure (Years 36 +)									
Parameter	Unit	Minimum	10th Percentile	25th Percentile	Median	Mean	75th Percentile	90th Percentile	Maximum	Standard Deviation	Coefficient of Variation
Hardness, Dissolved Anions and Nutrients											
Model Hardness	mg/L CaCO3	18.0	22.0	31.0	56.3	55.8	76.7	85.9	123.2	30.3	0.5
Baseline Hardness	mg/L CaCO3	24.48	27.64	34.67	40.64	38.12	42.83	43.30	45.30	6.30	0.17
SO4	mg/L	6.25	6.42	6.57	7.82	9.26	11.52	14.27	15.21	3.06	0.33
Cl	mg/L	0.50	0.51	0.52	0.56	0.56	0.57	0.60	0.69	0.05	0.09
F	mg/L	0.021	0.022	0.023	0.027	0.027	0.031	0.033	0.041	0.006	0.21
Hardness	mg/L	18.0	22.0	31.0	56.3	55.8	76.7	85.9	123.2	30.3	0.54
Orthophosphate	mg/L	0.0010	0.0011	0.0012	0.0014	0.0017	0.0022	0.0027	0.0028	0.0006	0.36
N as NO3	mg/L	0.007	0.011	0.021	0.027	0.025	0.030	0.033	0.039	0.009	0.35
Dissolved Metals											
Al - D	mg/L	0.007	0.009	0.010	0.013	0.014	0.014	0.023	0.024	0.005	0.36
Cd - D	mg/L	0.0000075	0.0000094	0.0000095	0.0000107	0.0000109	0.0000112	0.0000121	0.0000180	0.0000024	0.22
Fe - D	mg/L	0.0037	0.0111	0.0117	0.0139	0.0141	0.0157	0.0166	0.0258	0.0048	0.34
Total Metals											
Al - T	mg/L	0.008	0.011	0.013	0.016	0.063	0.024	0.282	0.319	0.107	1.69
Sb - T	mg/L	0.00003	0.00008	0.00010	0.00011	0.00010	0.00011	0.00012	0.00013	0.00002	0.23
As - T	mg/L	0.00014	0.00014	0.00014	0.00015	0.00045	0.00068	0.00115	0.00167	0.00048	1.08
Ba - T	mg/L	0.0044	0.0047	0.0054	0.0084	0.0074	0.0089	0.0093	0.0112	0.0021	0.28
Be - T	mg/L	0.000023	0.000077	0.000083	0.000096	0.000089	0.000099	0.000104	0.000122	0.000023	0.26
Bi - T	mg/L	0.000075	0.000375	0.000424	0.000453	0.000425	0.000488	0.000495	0.000500	0.000112	0.26
B - T	mg/L	0.010	0.010	0.010	0.010	0.015	0.015	0.020	0.044	0.009	0.63
Cd - T	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00002	0.00002	0.00002	0.00000	0.25
Ca - T	mg/L	4.6	5.5	7.7	16.0	14.5	19.2	22.8	32.6	8.0	0.55
Cr - T	mg/L	0.00011	0.00014	0.00014	0.00016	0.00030	0.00017	0.00086	0.00121	0.00034	1.12
Co - T	mg/L	0.00003	0.00010	0.0001	0.0001	0.0002	0.0001	0.0005	0.0006	0.0001	0.83
Cu - T	mg/L	0.00037	0.00064	0.00076	0.00084	0.00096	0.00092	0.00192	0.00192	0.00045	0.47
Fe - T	mg/L	0.0113	0.0335	0.0360	0.0528	0.1619	0.0595	0.7034	0.7989	0.2649	1.64
Pb - T	mg/L	0.00004	0.00011	0.00011	0.00016	0.00030	0.00018	0.00099	0.00128	0.000380	1.26
Li - T	mg/L	0.00053	0.00054	0.00057	0.00061	0.00066	0.00075	0.00078	0.00092	0.00011	0.17
Mg - T	mg/L	1.84	2.17	3.03	4.48	4.89	6.35	7.83	10.78	2.55	0.52
Mn - T	mg/L	0.00047	0.00050	0.00055	0.00066	0.00438	0.00096	0.02220	0.02362	0.00830	1.90
Hg - T	mg/L	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000012	0.000001	0.06
Mo - T	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.25
Ni - T	mg/L	0.0002	0.0006	0.0007	0.0008	0.0008	0.0008	0.0013	0.0016	0.0003	0.42
P - T	mg/L	0.239	0.240	0.272	0.298	0.284	0.299	0.300	0.300	0.023	0.08
K - T	mg/L	0.22	0.23	0.26	0.35	0.34	0.39	0.43	0.58	0.10	0.29
Se - T	mg/L	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0003	0.0001	0.30
Si - T	mg/L	2.58	2.63	2.71	3.03	2.96	3.17	3.28	3.41	0.26	0.09
Ag - T	mg/L	0.000006	0.000009	0.000010	0.000010	0.000011	0.000011	0.000019	0.000020	0.000004	0.34
Na - T	mg/L	0.47	0.52	0.57	0.67	0.78	0.93	1.10	1.44	0.27	0.35
Sr - T	mg/L	0.022	0.026	0.040	0.075	0.071	0.097	0.106	0.166	0.040	0.56
S - T	mg/L	4.69	4.99	7.20	9.95	8.62	9.98	9.99	10.00	2.07	0.24
Tl - T	mg/L	0.000003	0.000008	0.000009	0.000010	0.000009	0.000010	0.000012	0.000012	0.000002	0.24
Sn - T	mg/L	0.00009	0.00009	0.00010	0.00010	0.00011	0.00012	0.00012	0.00019	0.00003	0.23
Ti - T	mg/L	0.0018	0.0076	0.0081	0.0091	0.0089	0.0099	0.0102	0.0150	0.0028	0.32
U - T	mg/L	0.00005	0.00008	0.00015	0.00026	0.00029	0.00040	0.00054	0.00086	0.00023	0.77
V - T	mg/L	0.00031	0.00077	0.00082	0.00093	0.00087	0.00099	0.00101	0.00108	0.00019	0.22
Zn - T	mg/L	0.0013	0.0025	0.0029	0.0032	0.0032	0.0035	0.0039	0.0047	0.0008	0.24
Zr - T	mg/L	0.00010	0.00010	0.00010	0.00011	0.00047	0.00097	0.00137	0.00148	0.00053	1.13

M:\1\01\00458\14\A\Report\3 - Water Quality Predictions\Rev 0\Appendices\Appendix C - Expected Case Concentration Graphs\[APPENDIX C11 HC_019 J1 (EC).xlsx]Appendix B

NOTES:

1. UNITS ARE IN mg/L UNLESS OTHERWISE STATED.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT VA101-458/14-3	EJA	JEM	KJB

APPENDIX C

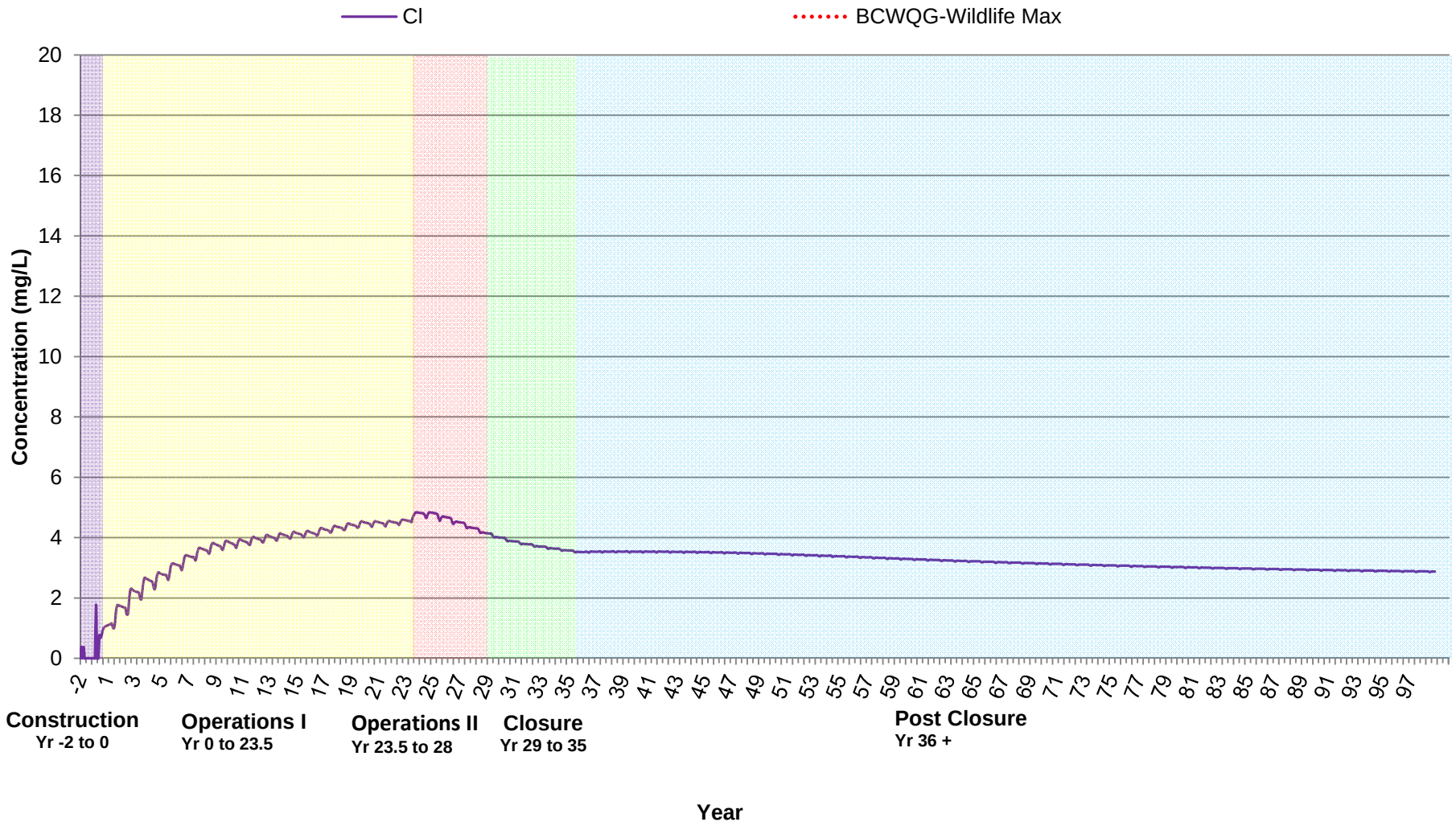
EXPECTED CASE CONCENTRATION GRAPHS

Appendix C1 Tailings Management Facility (TMF)
Appendix C2 Open Pit (OP)
Appendix C3 P-Creek
Appendix C4 T-Creek
Appendix C5 Harper Creek Below P-Creek (HP)
Appendix C6 Mid Harper Creek (HM)
Appendix C7 Harper Creek Below T-Creek (HT)
Appendix C8 Harper Creek Above Barrière River (HB)
Appendix C9 Mid Baker Creek (BK1)
Appendix C10 Baker Creek Above North Thompson River (BK0)
Appendix C11 Jones Creek Above North Thompson River (J1)

APPENDIX C1

TAILINGS MANAGEMENT FACILITY (TMF)

(Pages C1-1 to C1-27)



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.
3. ALL GUIDELINES ARE FIXED VALUES.
4. THE BCWQG-WILDLIFE MAX GUIDELINE (600 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE CHLORIDE CONCENTRATIONS - TMF

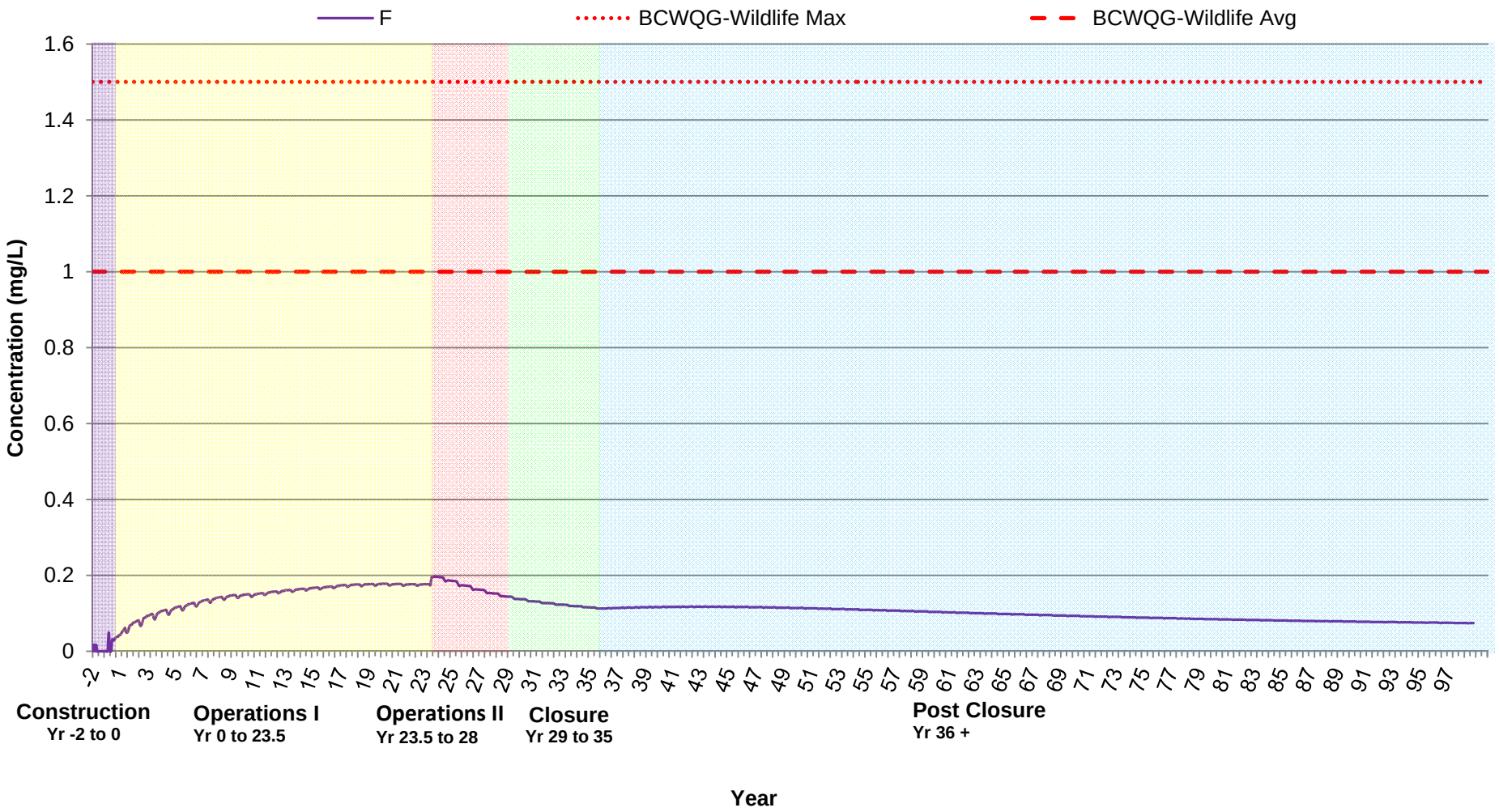
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C1.Cl

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.
3. ALL GUIDELINES ARE FIXED VALUES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE FLUORIDE CONCENTRATIONS - TMF

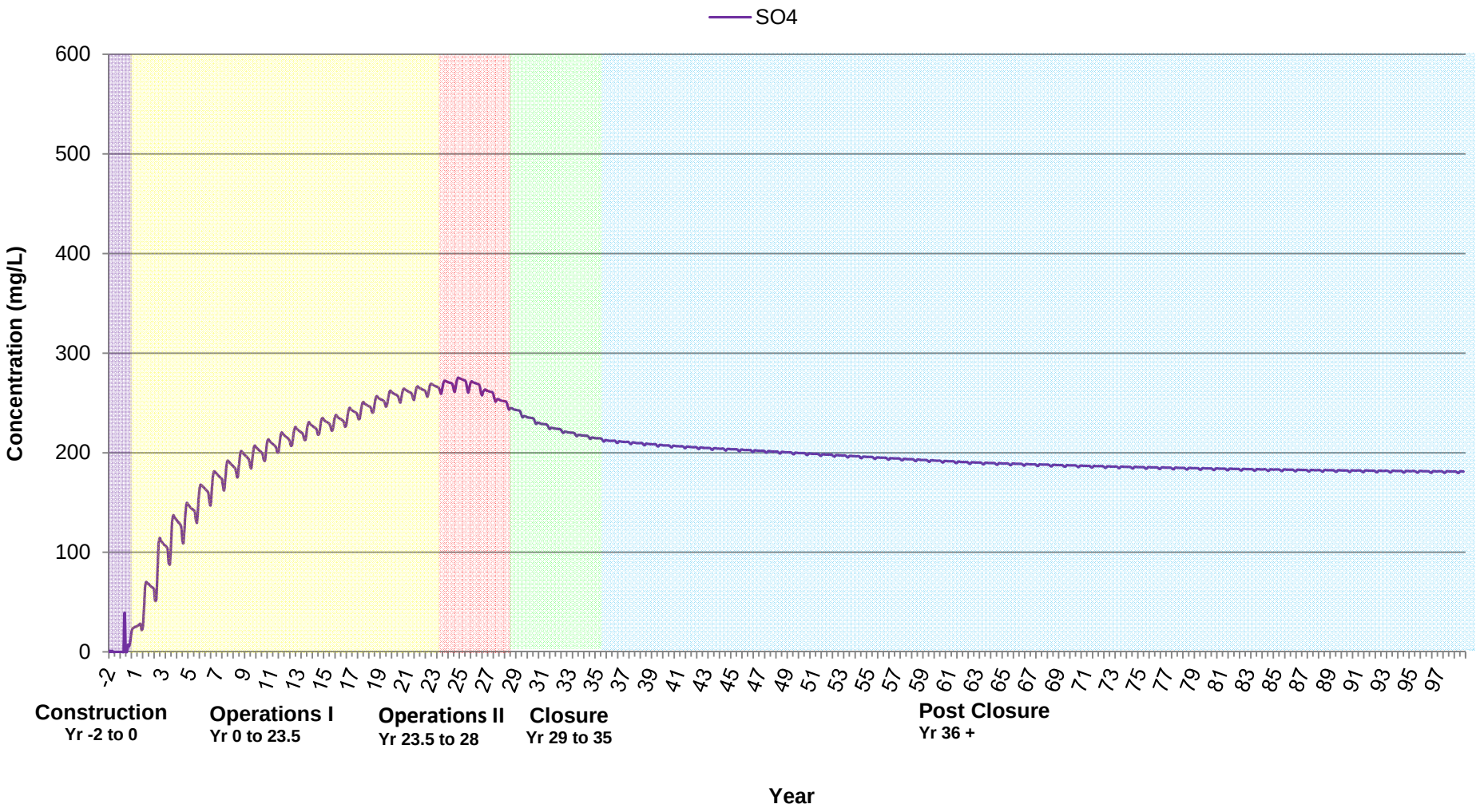
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C1.F

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE SULPHATE CONCENTRATIONS - TMF

Knight Piésold CONSULTING

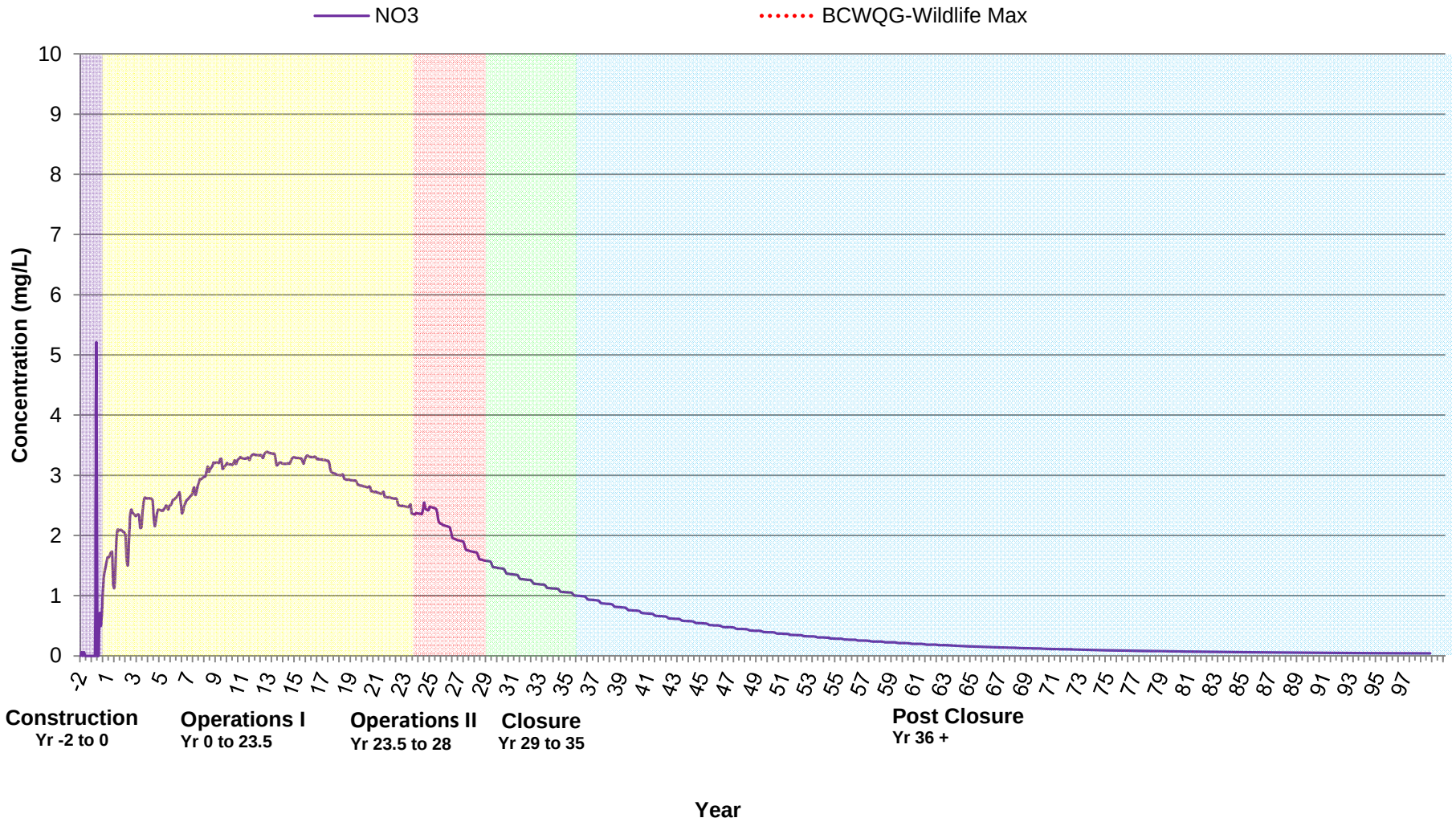
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C1.S04

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.
3. ALL GUIDELINES ARE FIXED VALUES.
4. THE BCWQG-WILDLIFE MAX GUIDELINE (100 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE NITRATE CONCENTRATIONS - TMF

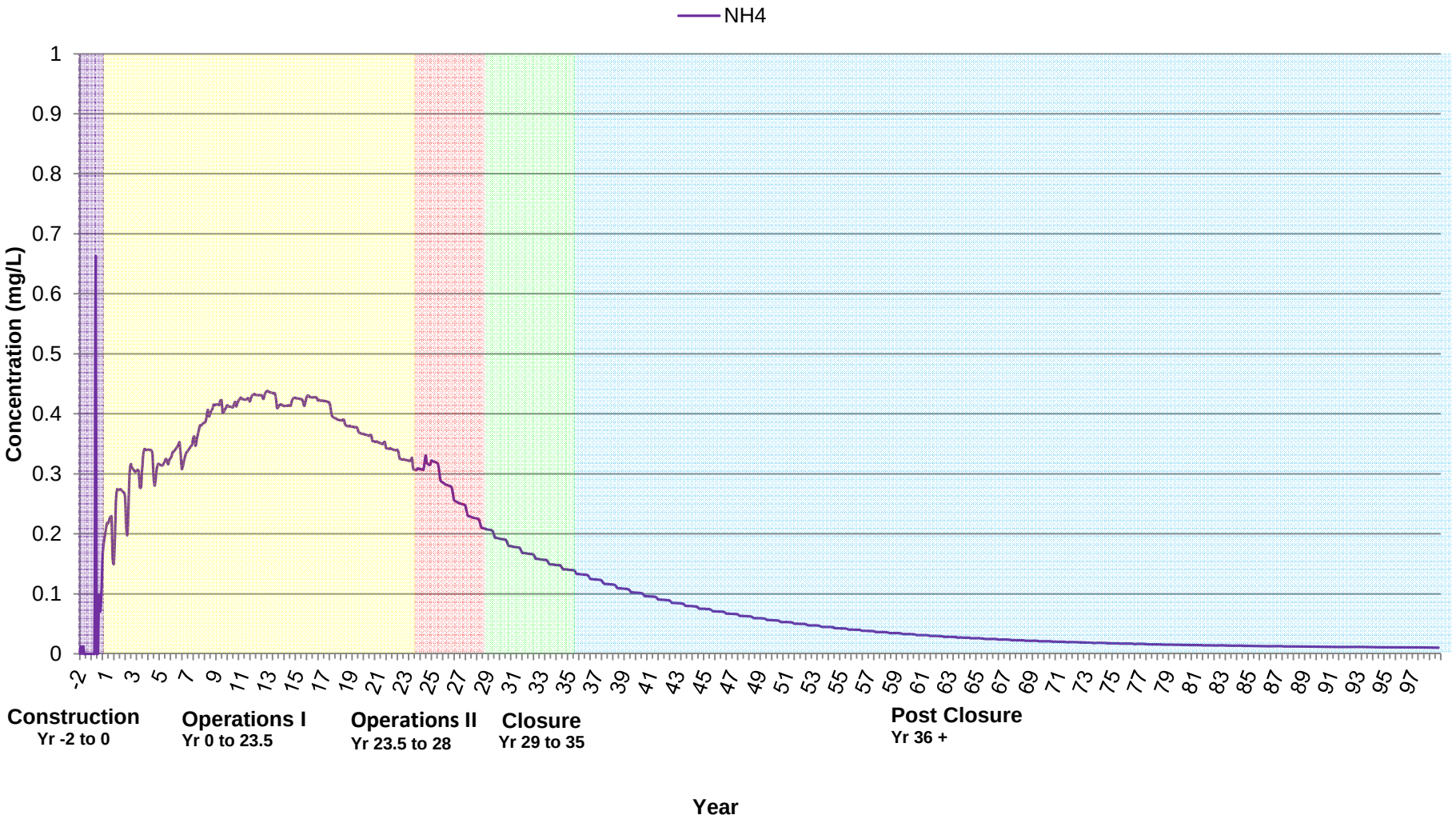
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C1.NO3

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE AMMONIA CONCENTRATIONS - TMF

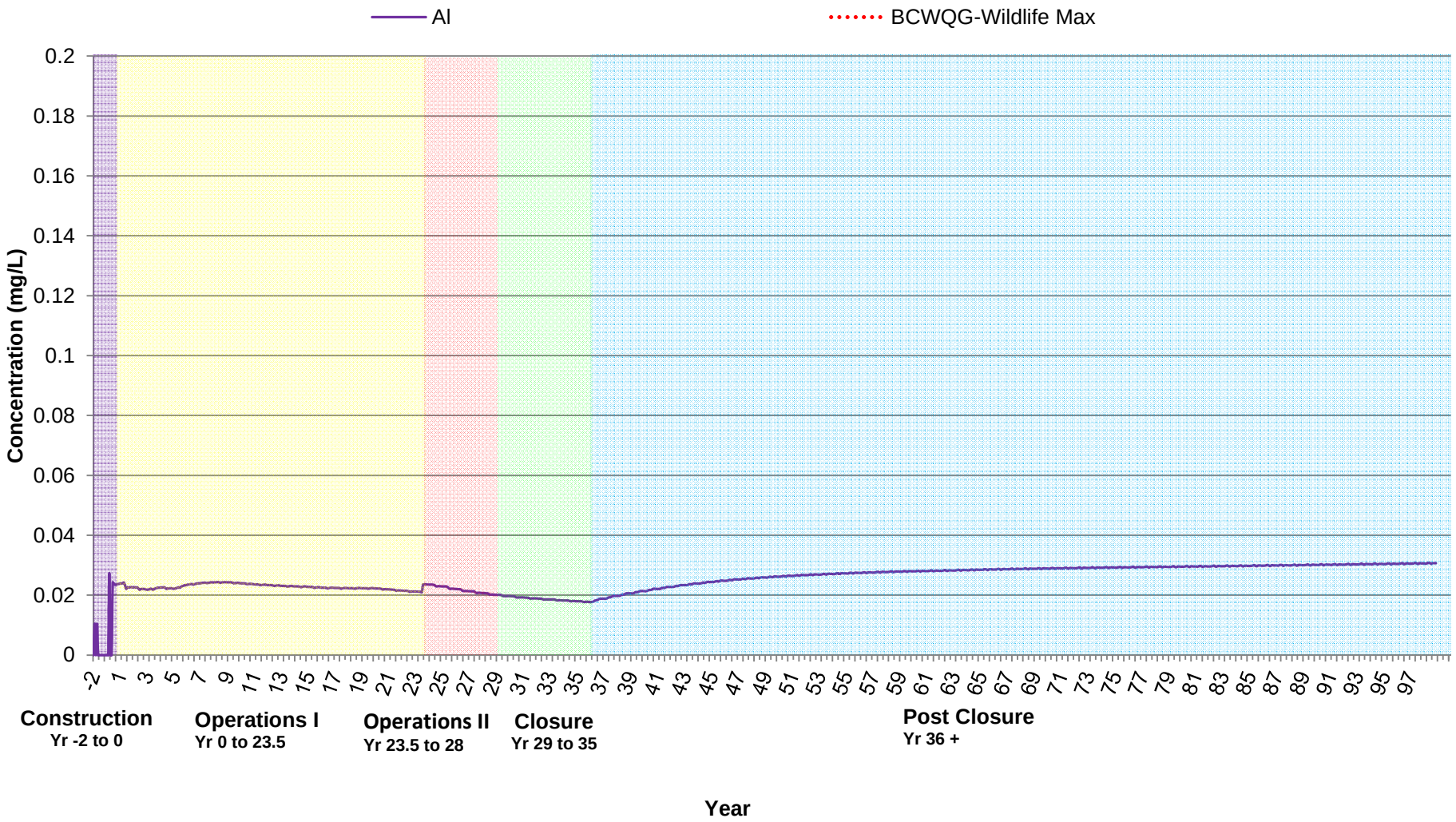
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C1.NH4

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.
3. ALL GUIDELINES ARE FIXED VALUES.
4. THE BCWQG-WILDLIFE MAX GUIDELINE (5 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE ALUMINUM CONCENTRATIONS - TMF

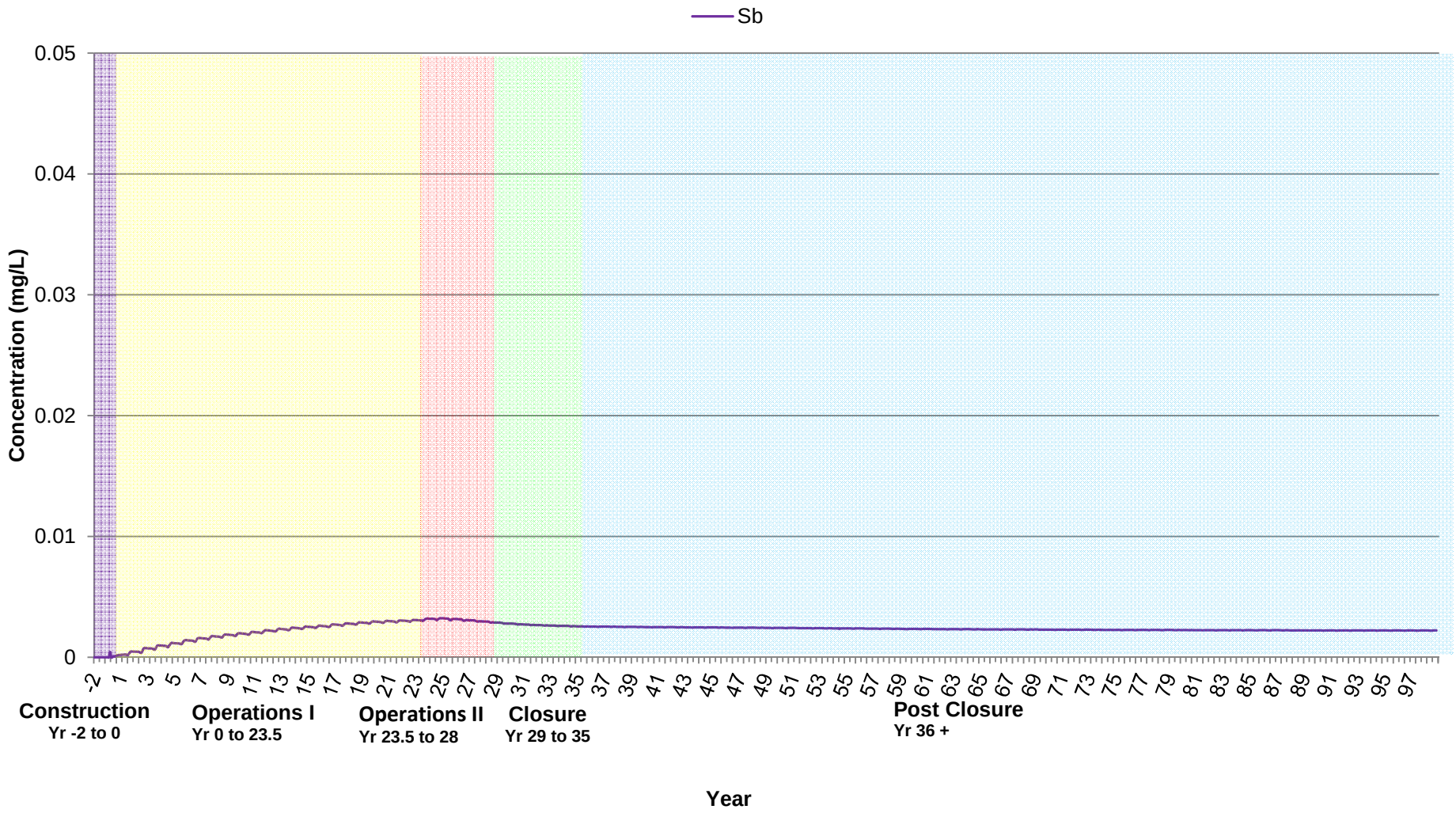
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C1.Al

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE ANTIMONY CONCENTRATIONS - TMF

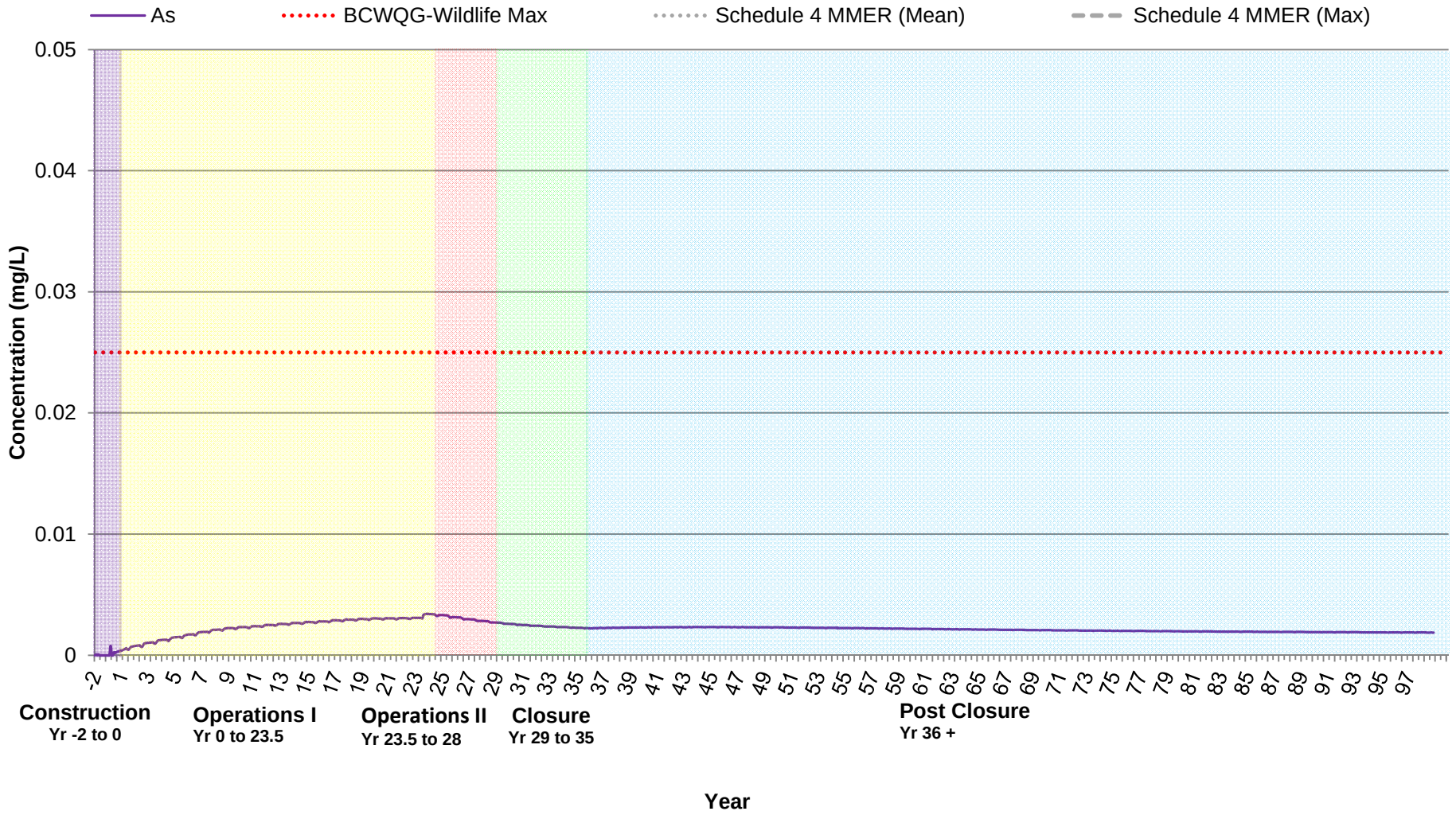
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C1.Sb

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.
3. ALL GUIDELINES ARE FIXED VALUES.
4. THE MMER MAX (1 mg/L) AND MMER MEAN (0.5 mg/L) ARE NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE ARSENIC CONCENTRATIONS - TMF

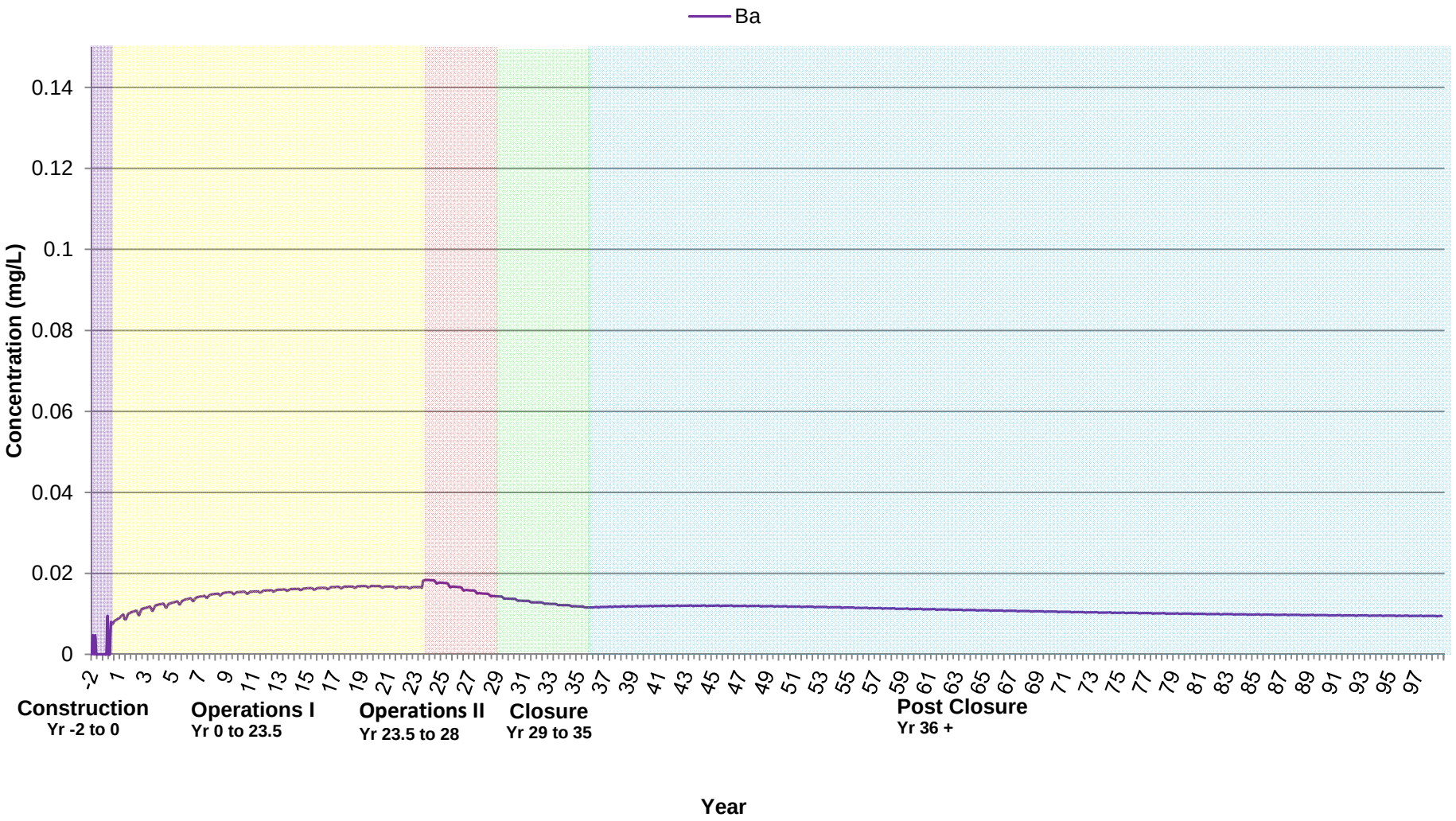
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C1.As

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE BARIUM CONCENTRATIONS - TMF

Knight Piésold CONSULTING

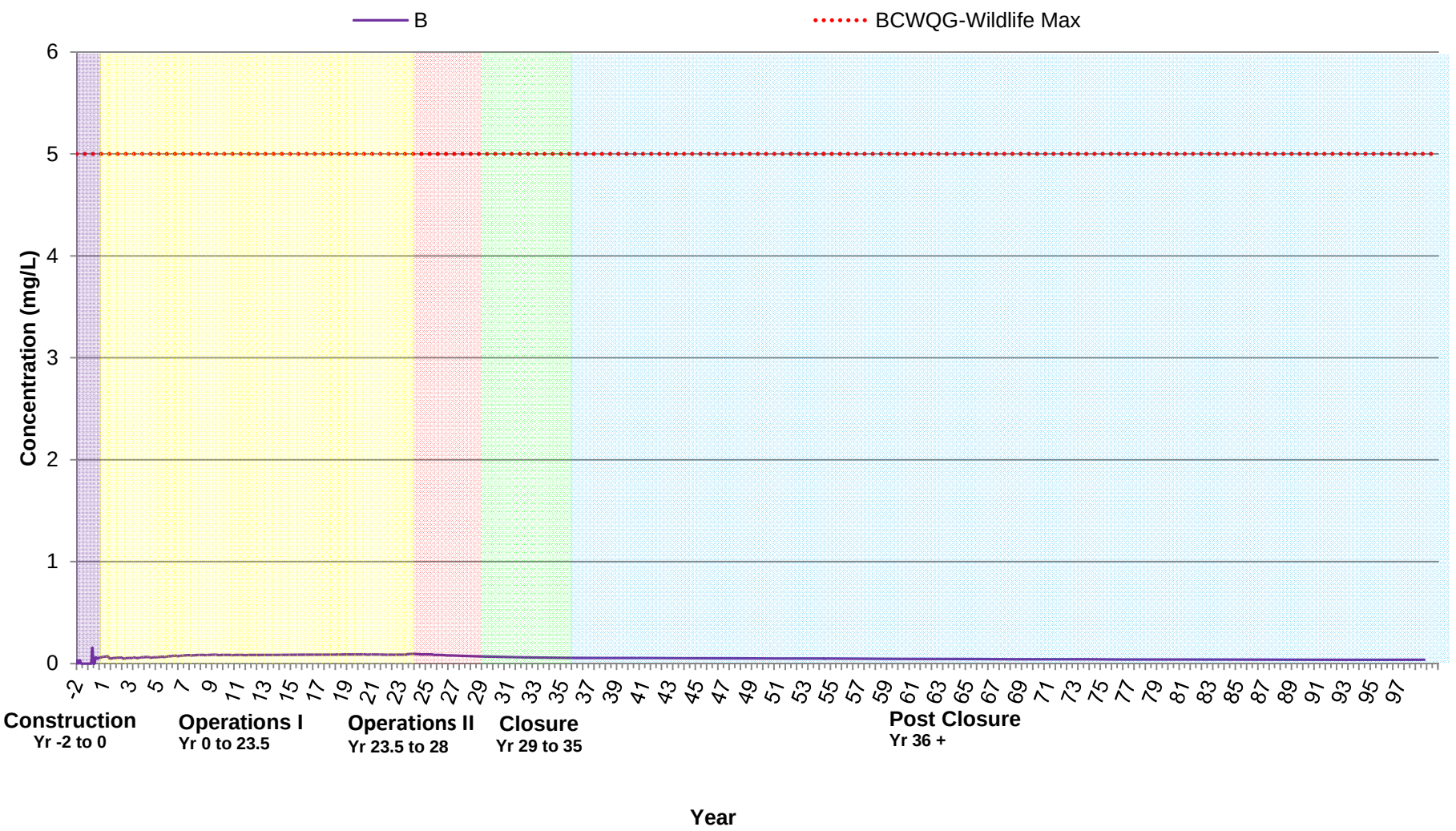
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C1.Ba

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE BORON CONCENTRATIONS - TMF

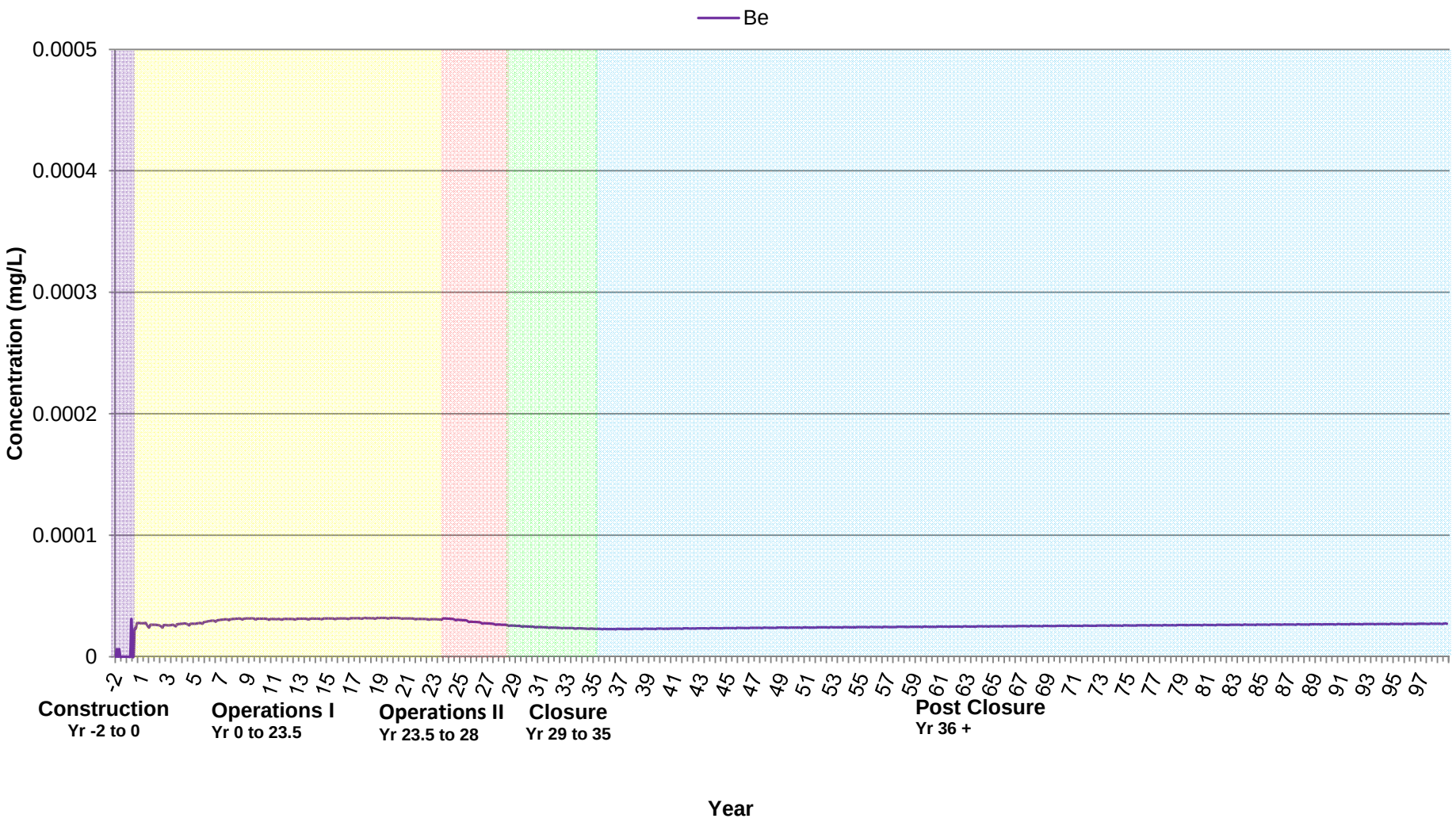
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C1.B

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE BERYILLIUM CONCENTRATIONS - TMF

Knight Piésold CONSULTING

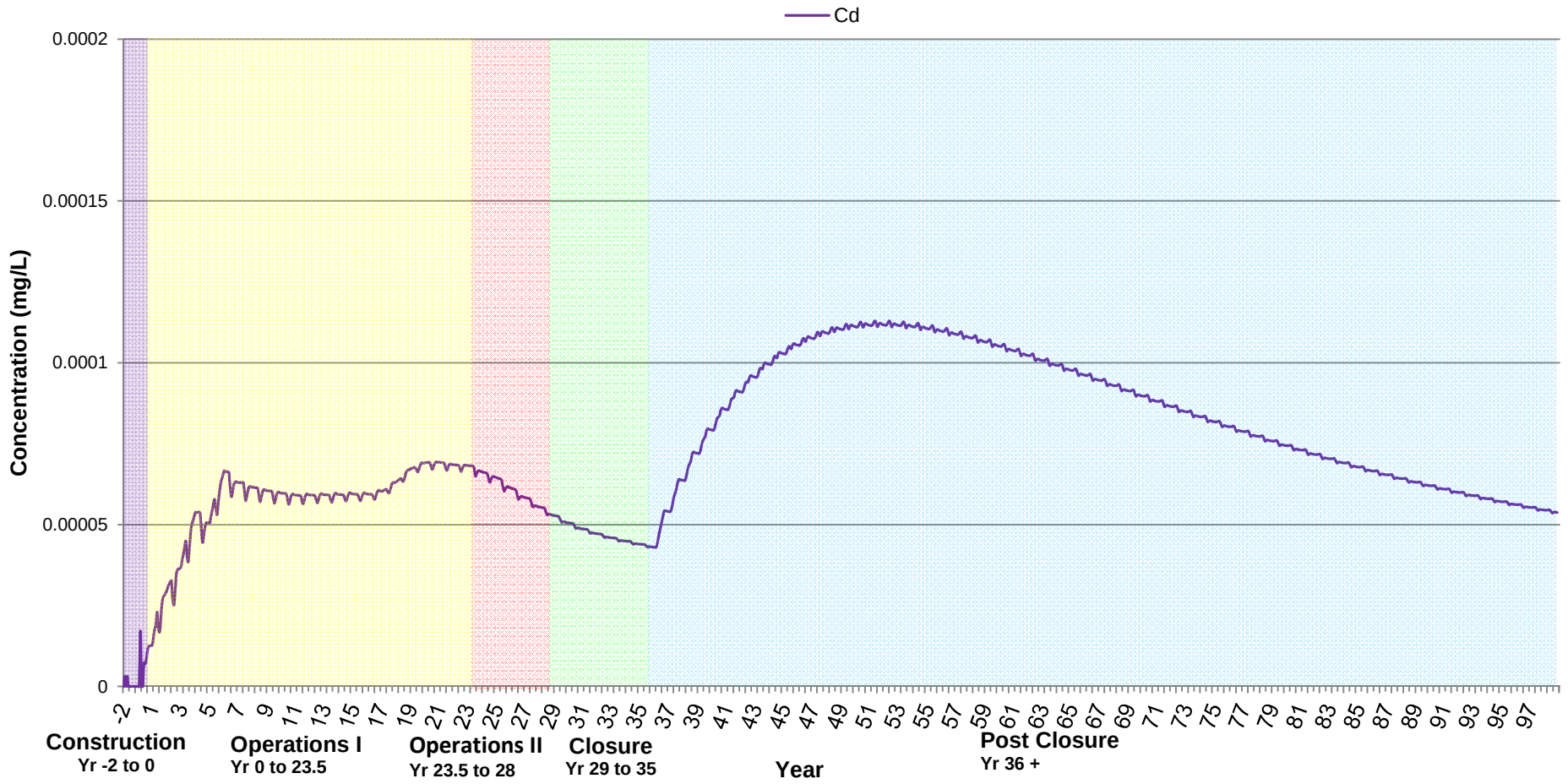
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C1.Be

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE CADMIUM CONCENTRATIONS - TMF

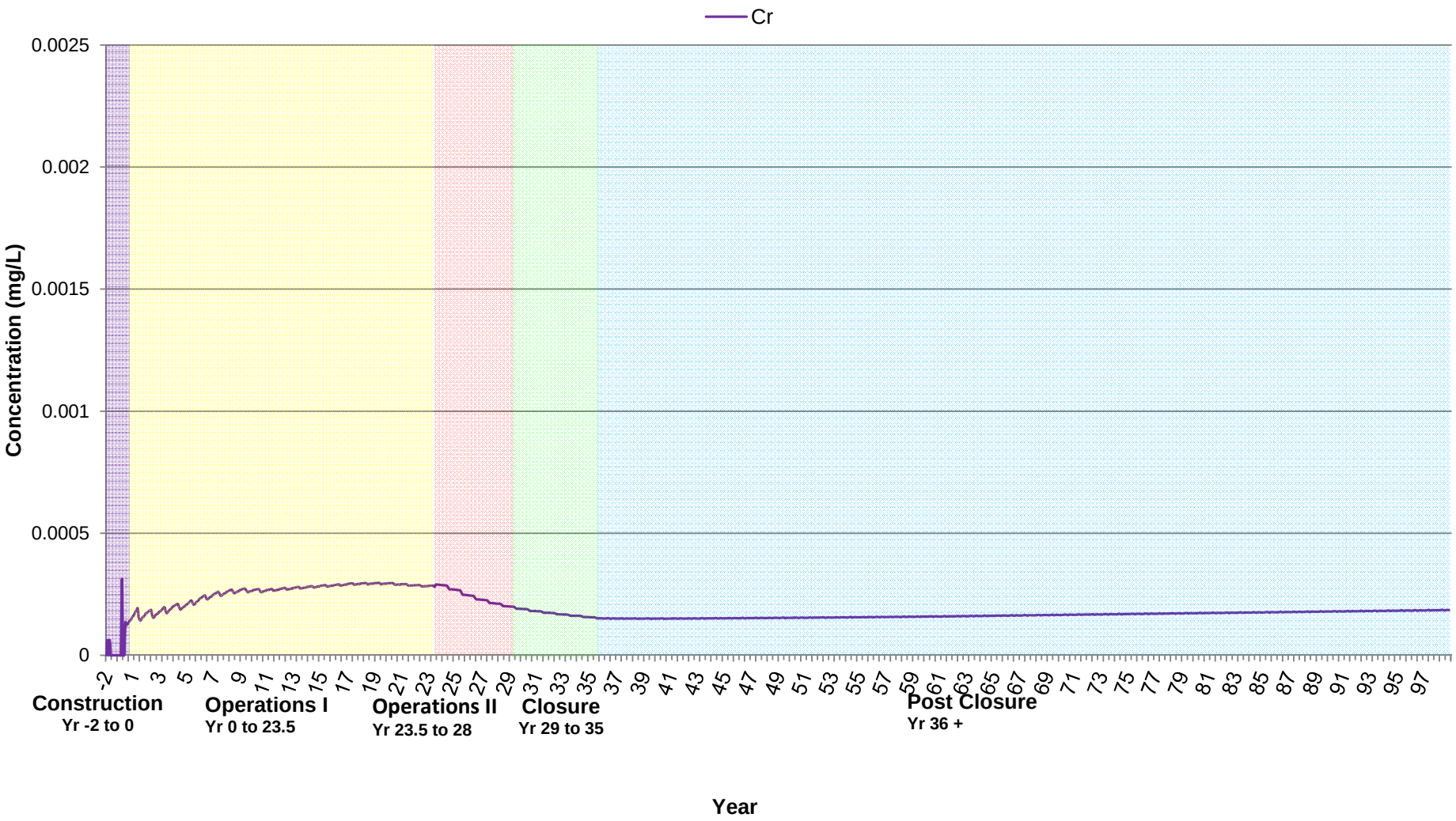
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C1.Cd-D

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE CHROMIUM CONCENTRATIONS - TMF

Knight Piésold CONSULTING

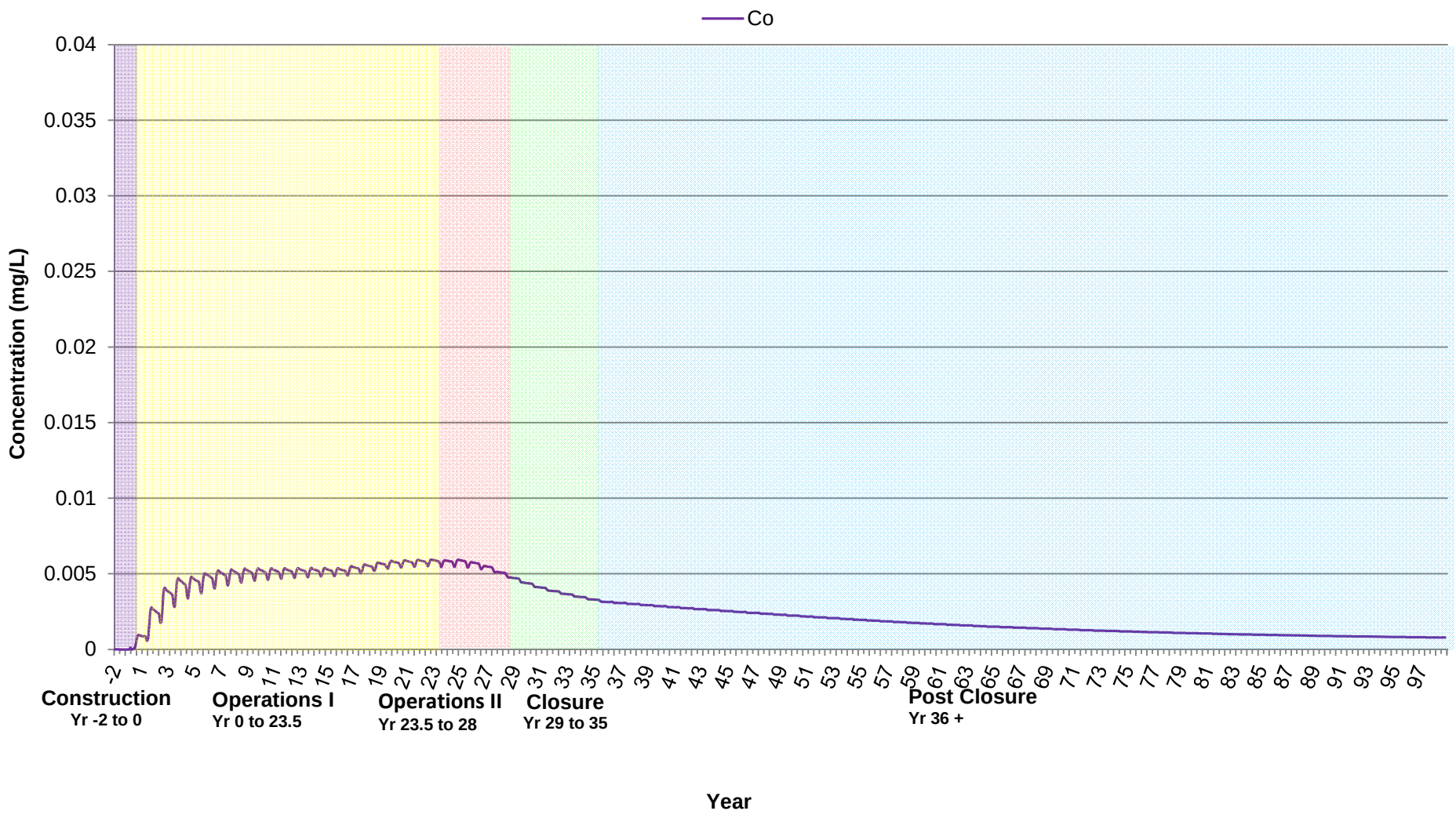
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C1.Cr

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE COBALT CONCENTRATIONS - TMF

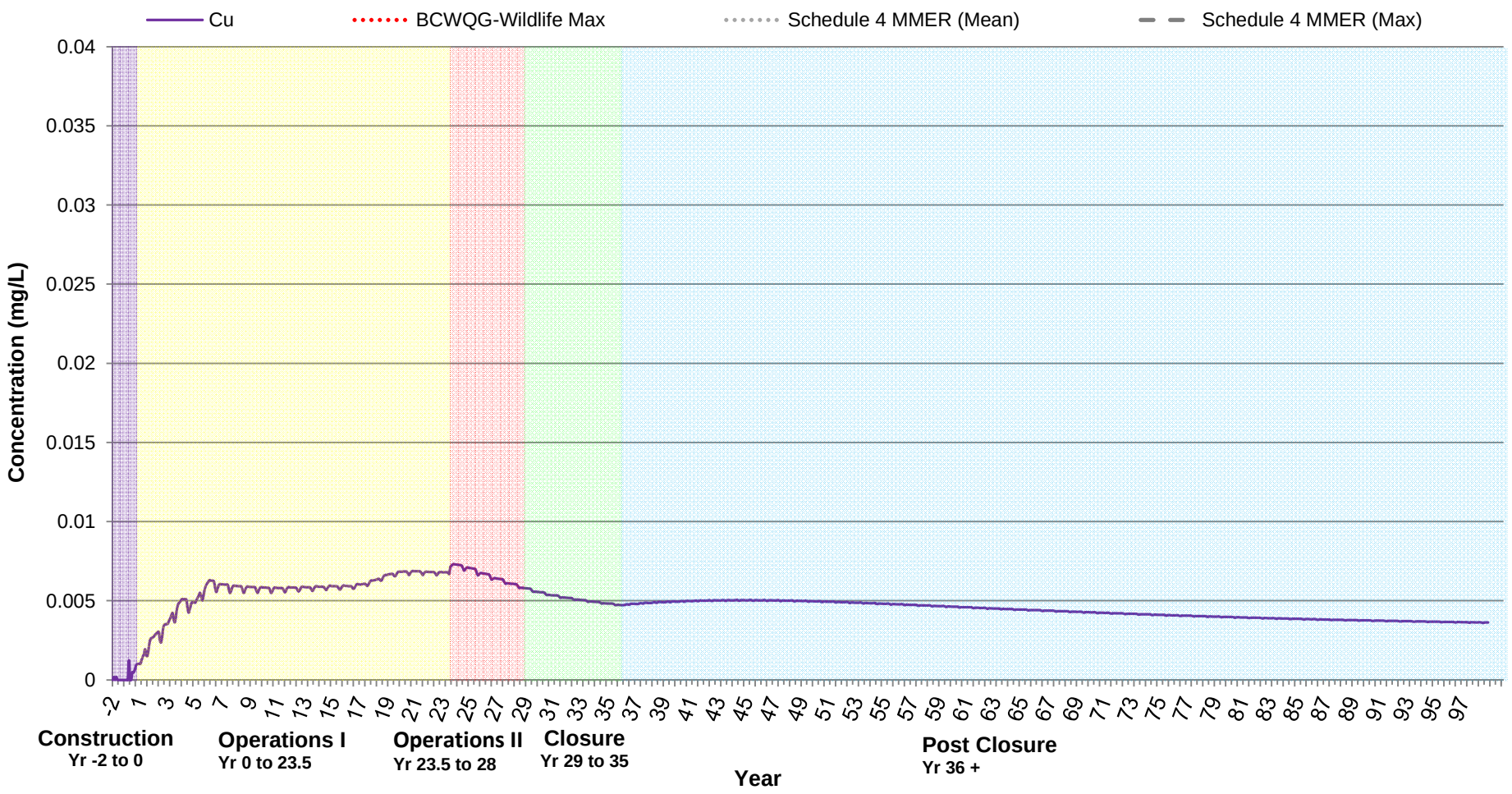
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C1.Co

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.
3. ALL GUIDELINES ARE FIXED VALUES.
4. BCWQG-WILDLIFE MAX (0.3 mg/L), MMER MEAN (0.3 mg/L) AND MMER MAX (0.6 mg/L) ARE NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE COPPER CONCENTRATIONS - TMF

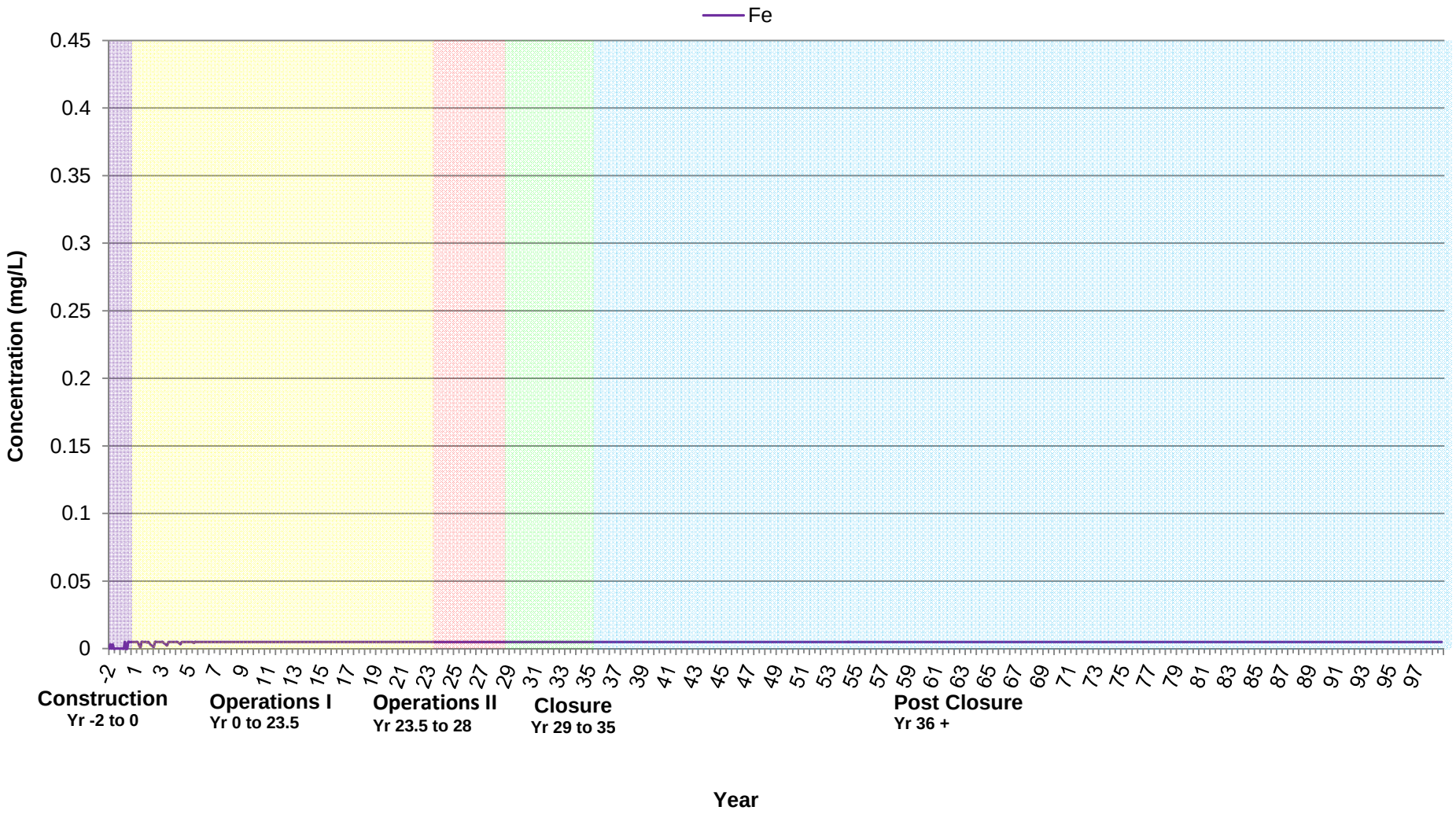
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C1.Cu-T

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE IRON CONCENTRATIONS - TMF

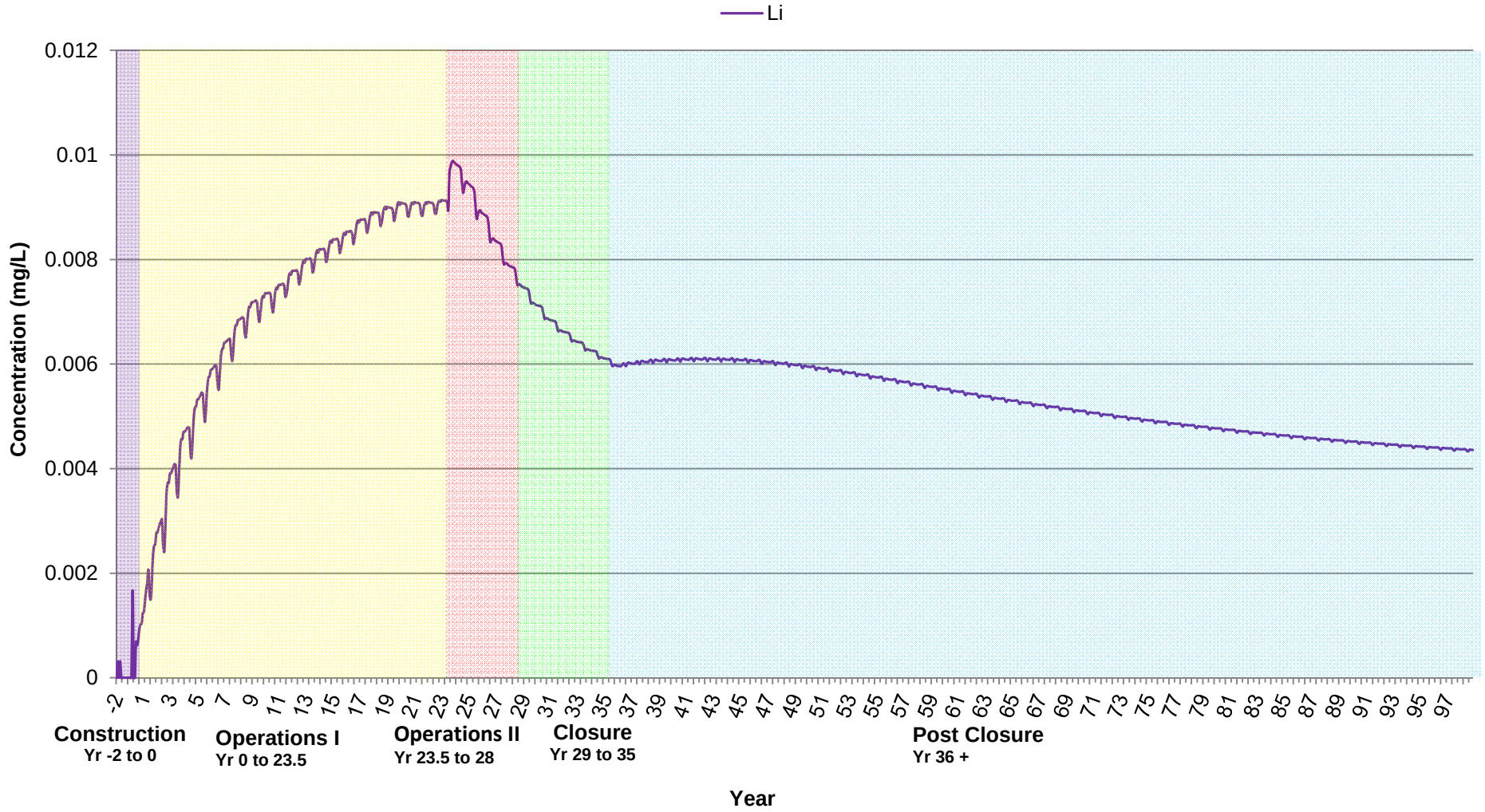
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C1.Fe

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE ZINC CONCENTRATIONS - TMF

Knight Piésold CONSULTING

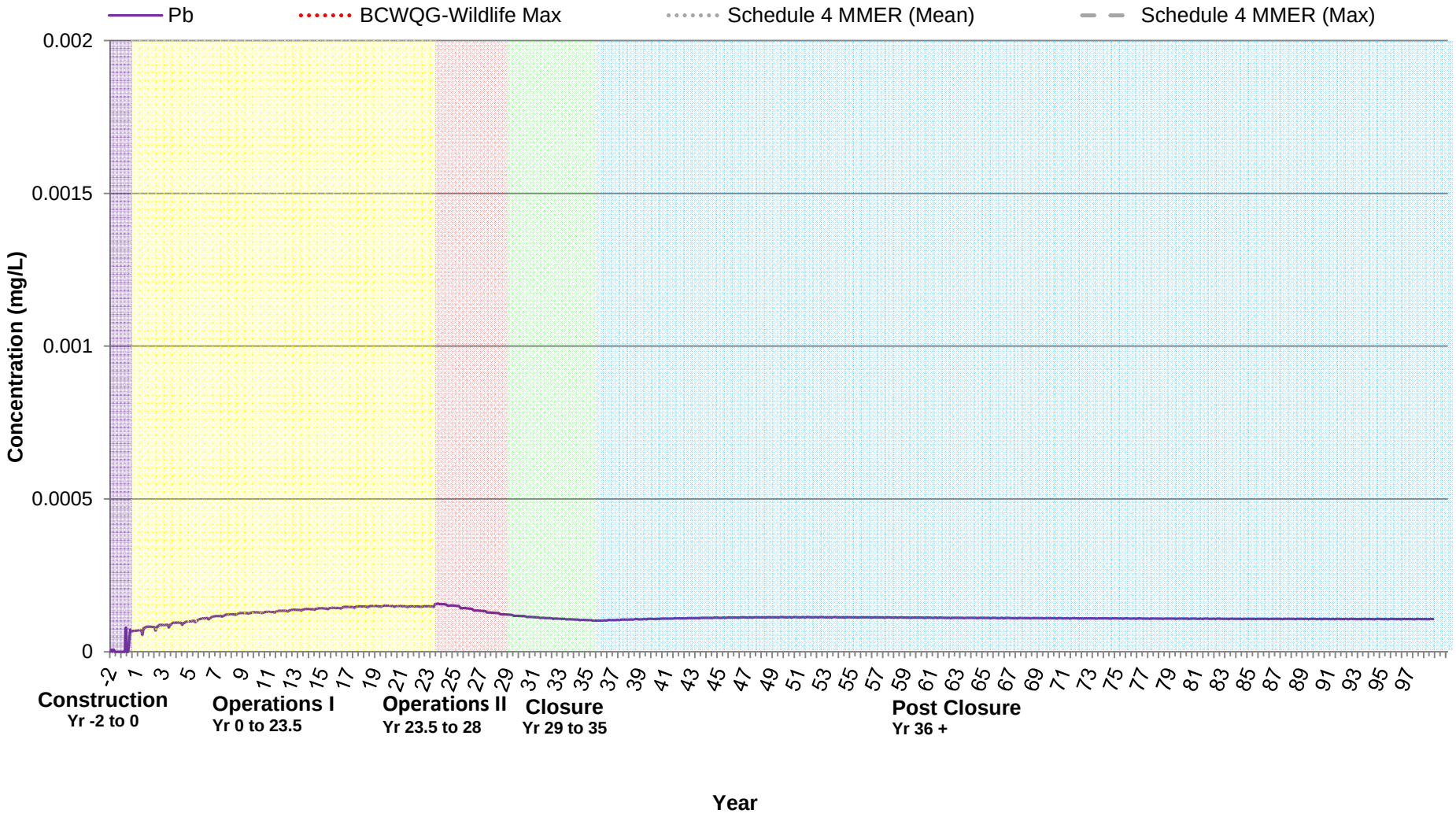
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C1.Li

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.
3. ALL GUIDELINES ARE FIXED VALUES.
4. BCWQG-WILDLIFE MAX (0.1 mg/L), MMER MEAN (0.2 mg/L) AND MMER MAX (0.4 mg/L) GUIDELINES ARE NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE LEAD CONCENTRATIONS - TMF

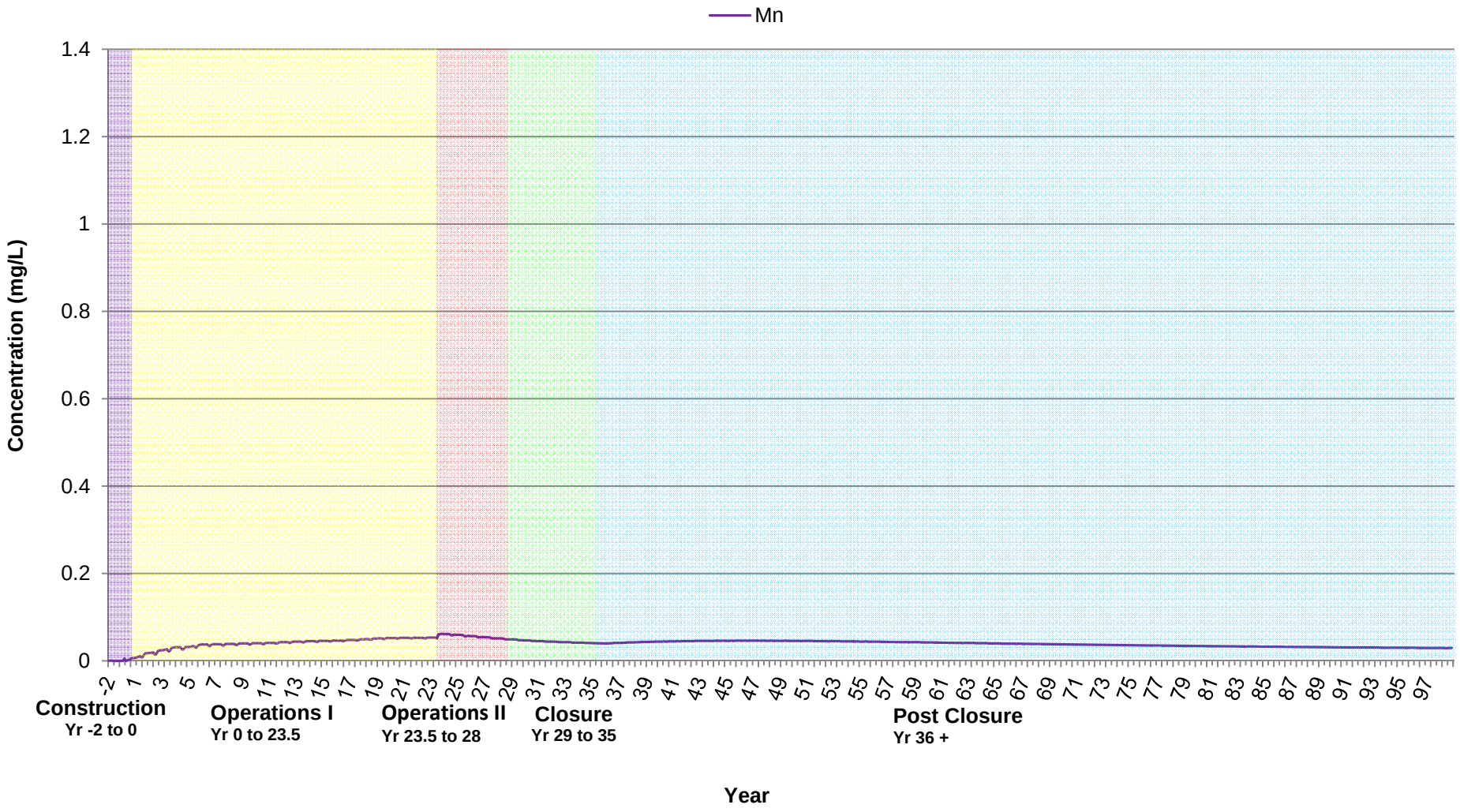
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C1.Pb

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE MANGANESE CONCENTRATIONS - TMF

Knight Piésold CONSULTING

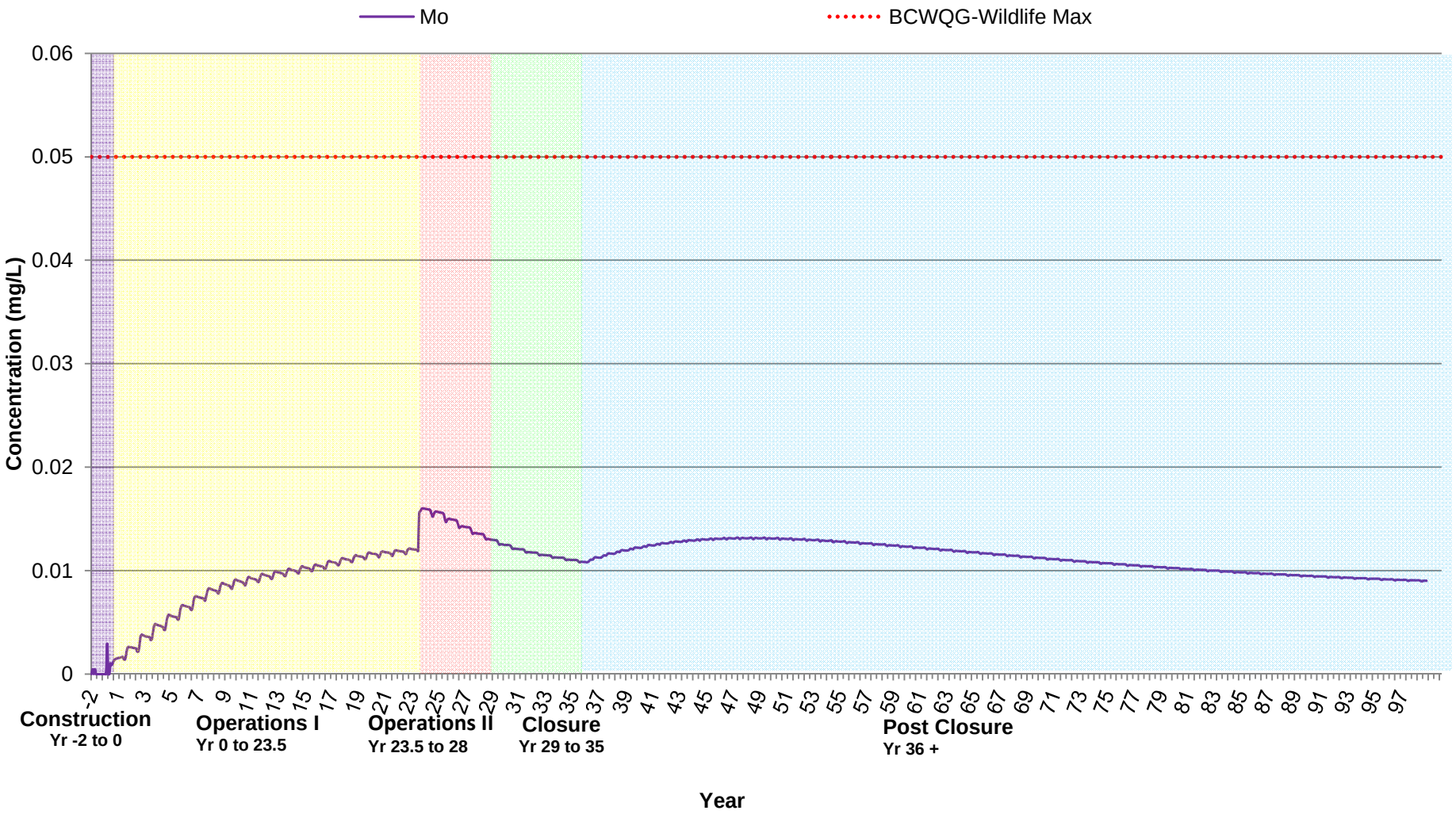
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C1.Mn

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.
3. ALL GUIDELINES ARE FIXED VALUES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE MOLYDBENUM CONCENTRATIONS - TMF

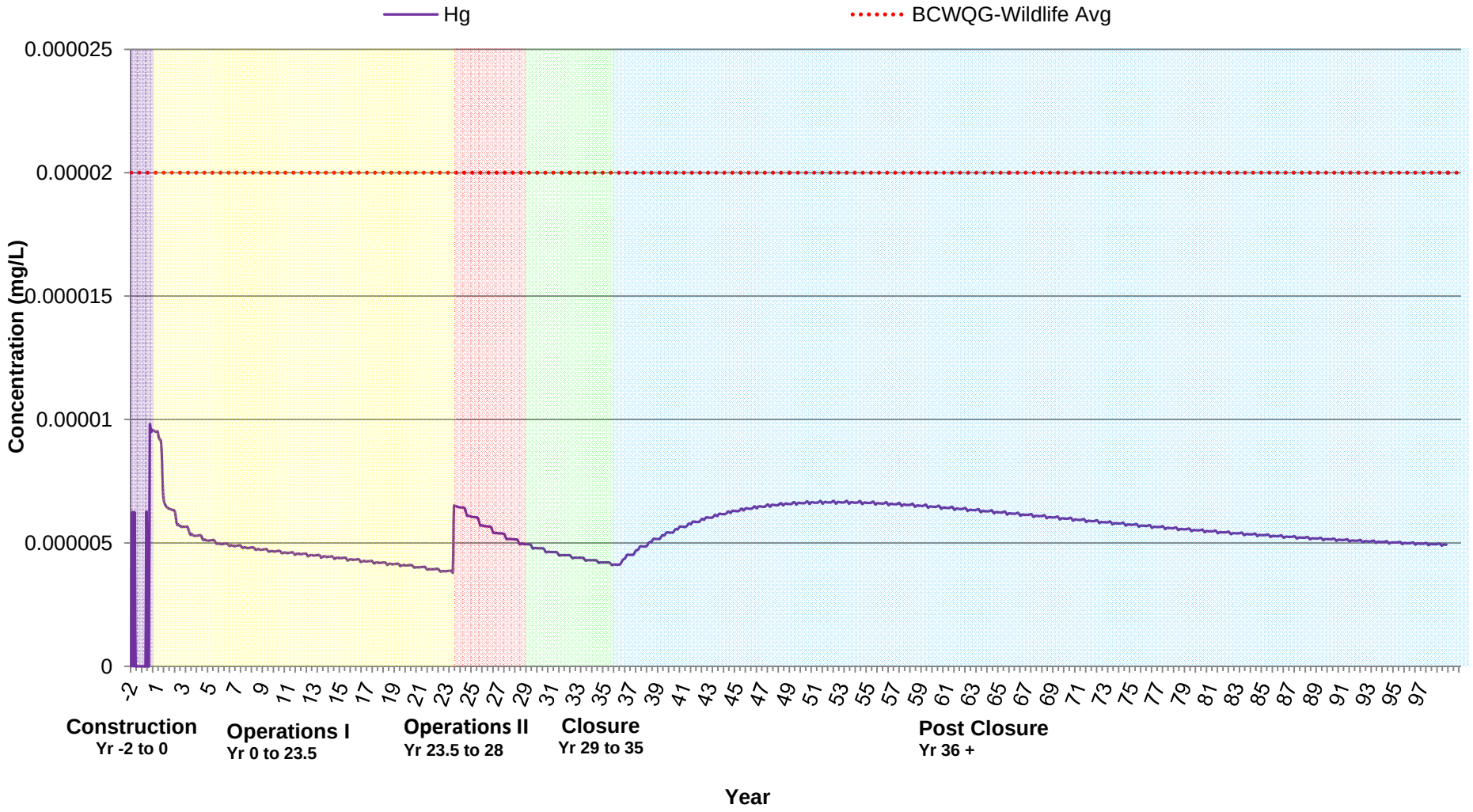
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C1.Mo

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.
3. ALL GUIDELINES ARE FIXED VALUES.
4. GUIDELINE VALUE APPLIED ON ASSUMPTION THAT METHYL-Hg IS EQUAL TO 0.5% OF T-Hg.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE MERCURY CONCENTRATIONS - TMF

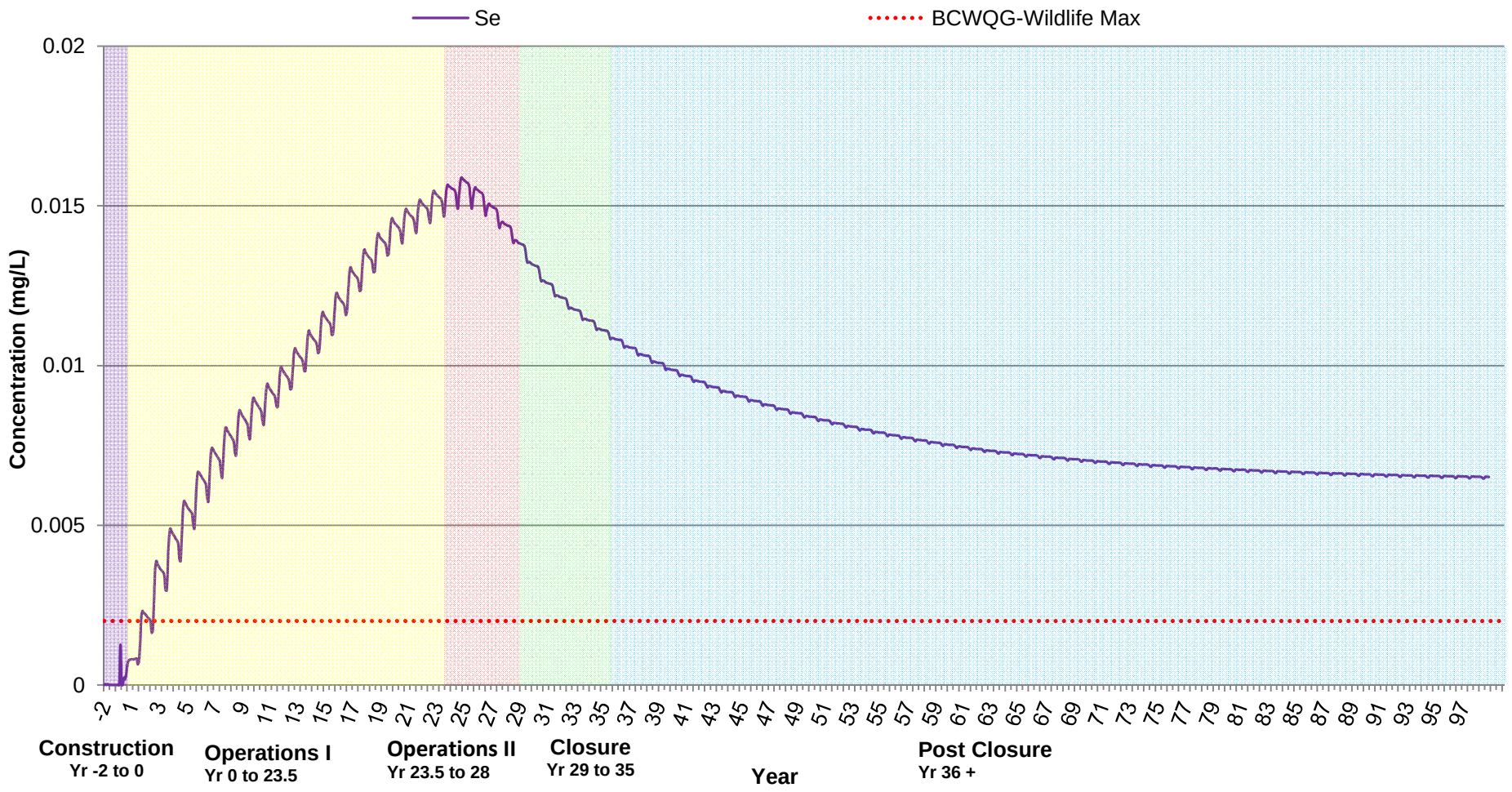
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C1.Hg

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.
3. ALL GUIDELINES ARE FIXED VALUES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE SELENIUM CONCENTRATIONS - TMF

Knight Piésold CONSULTING

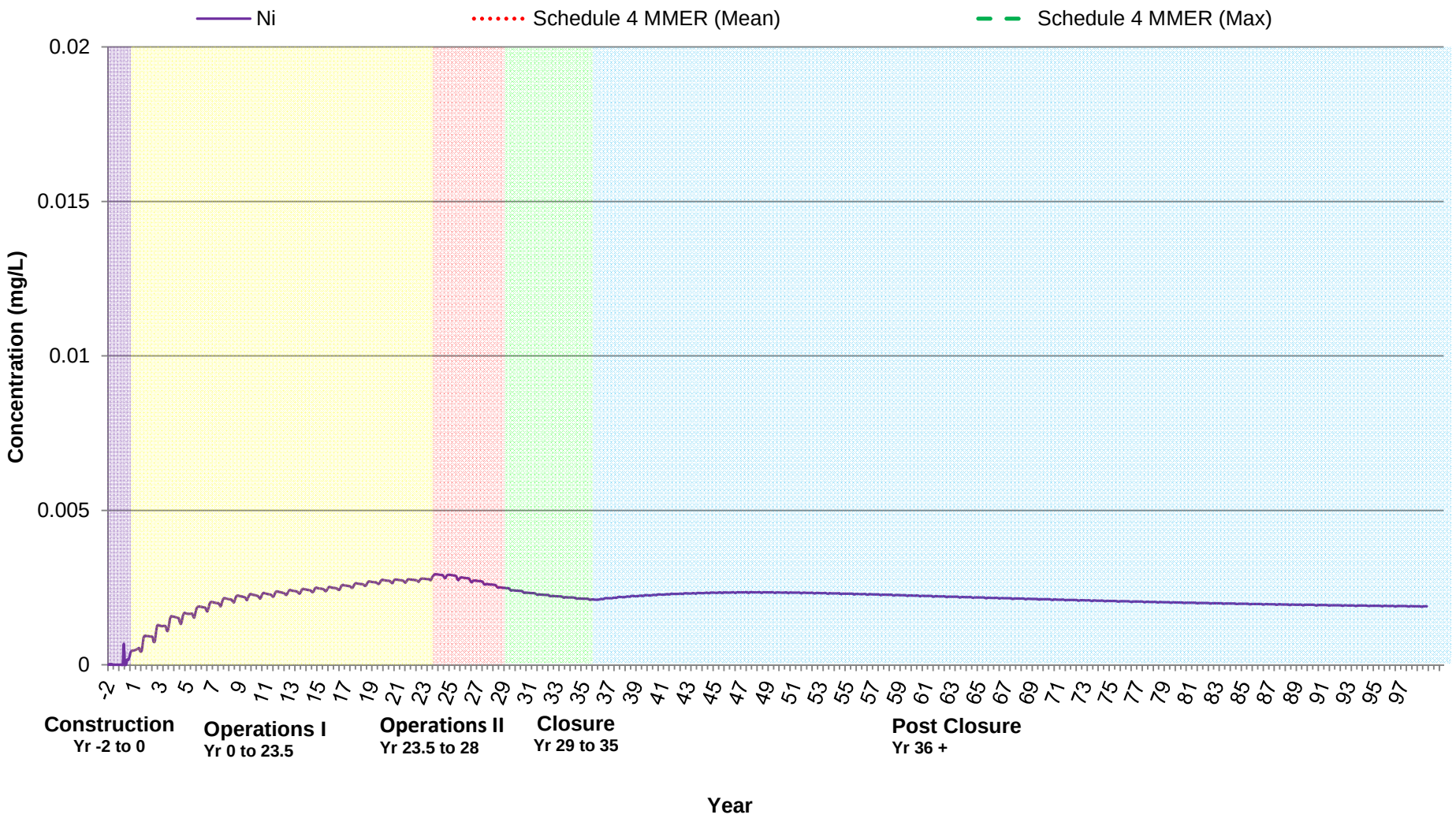
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C1.Se

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.
3. ALL GUIDELINES ARE FIXED VALUES.
4. THE MMER MEAN (0.5 mg/L) AND MMER MAX (1.0 mg/L) ARE NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE NICKEL CONCENTRATIONS - TMF

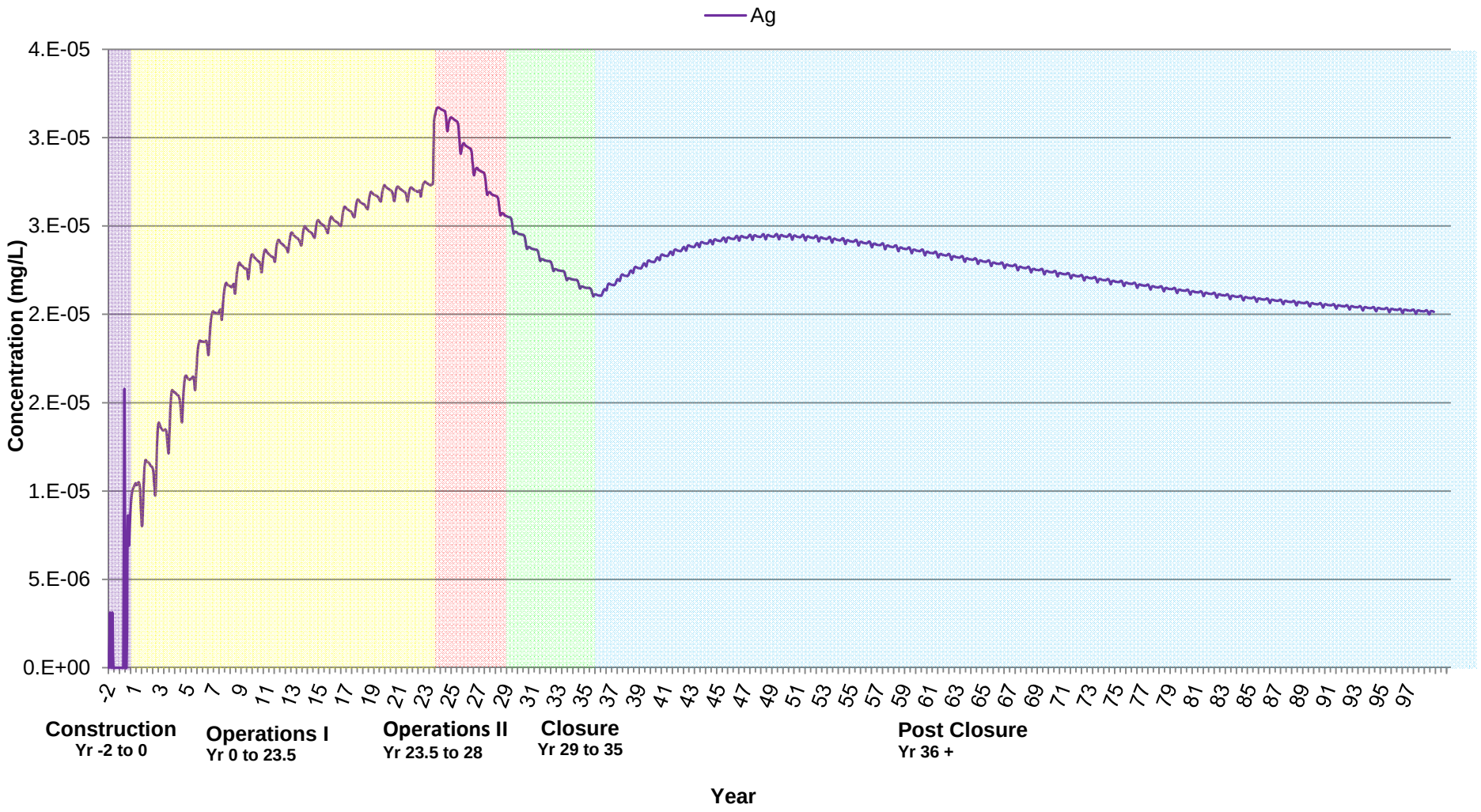
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C1.Ni

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE SILVER CONCENTRATIONS - TMF

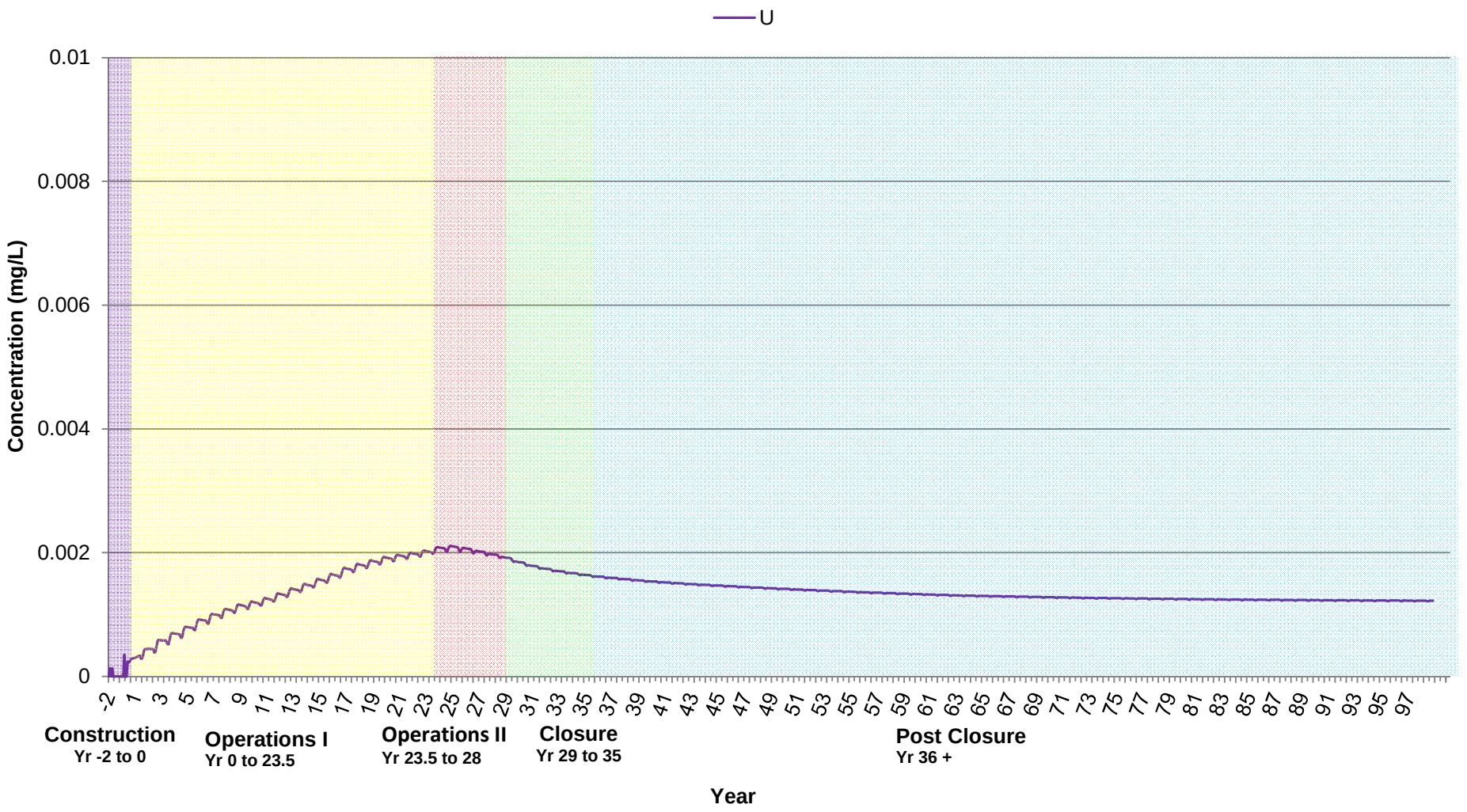
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C1.Ag

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE URANIUM CONCENTRATIONS - TMF

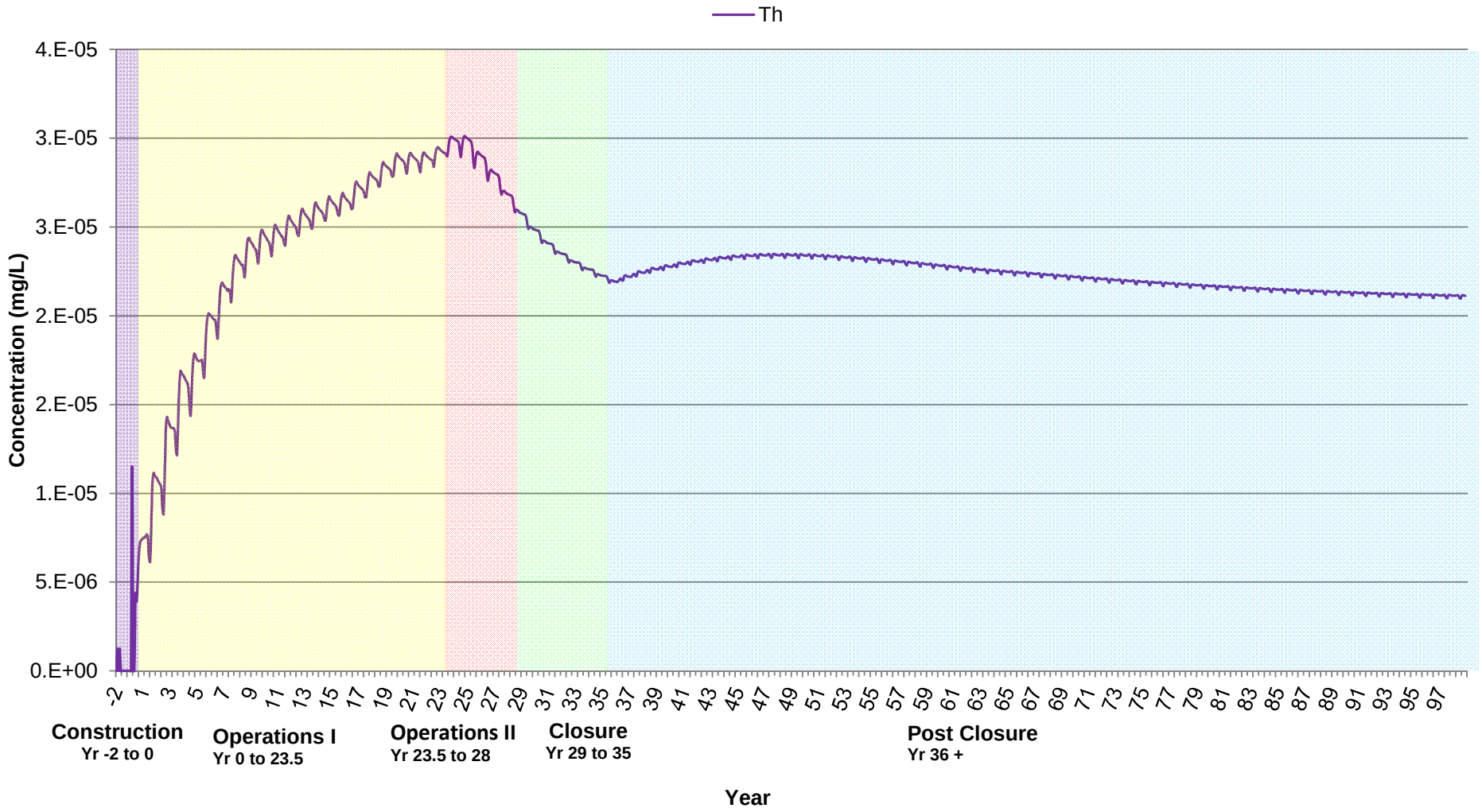
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C1.U

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE THALLIUM CONCENTRATIONS - TMF

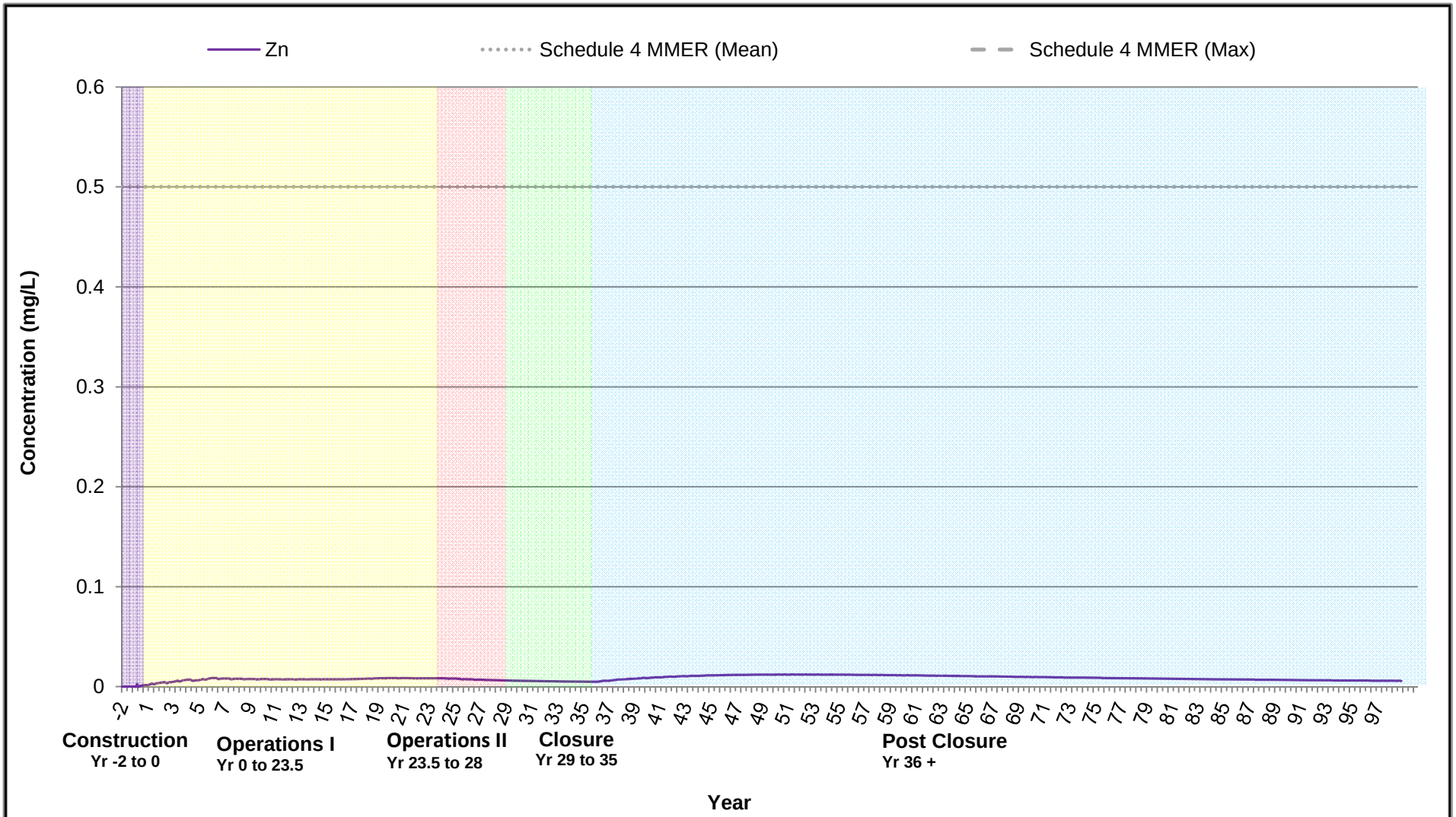
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C1.Th

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.
3. ALL GUIDELINES ARE FIXED VALUES.
4. THE MMER MEAN (0.5 mg/L) AND MMER MAX (1.0 mg/L) ARE NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE ZINC CONCENTRATIONS - TMF

Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

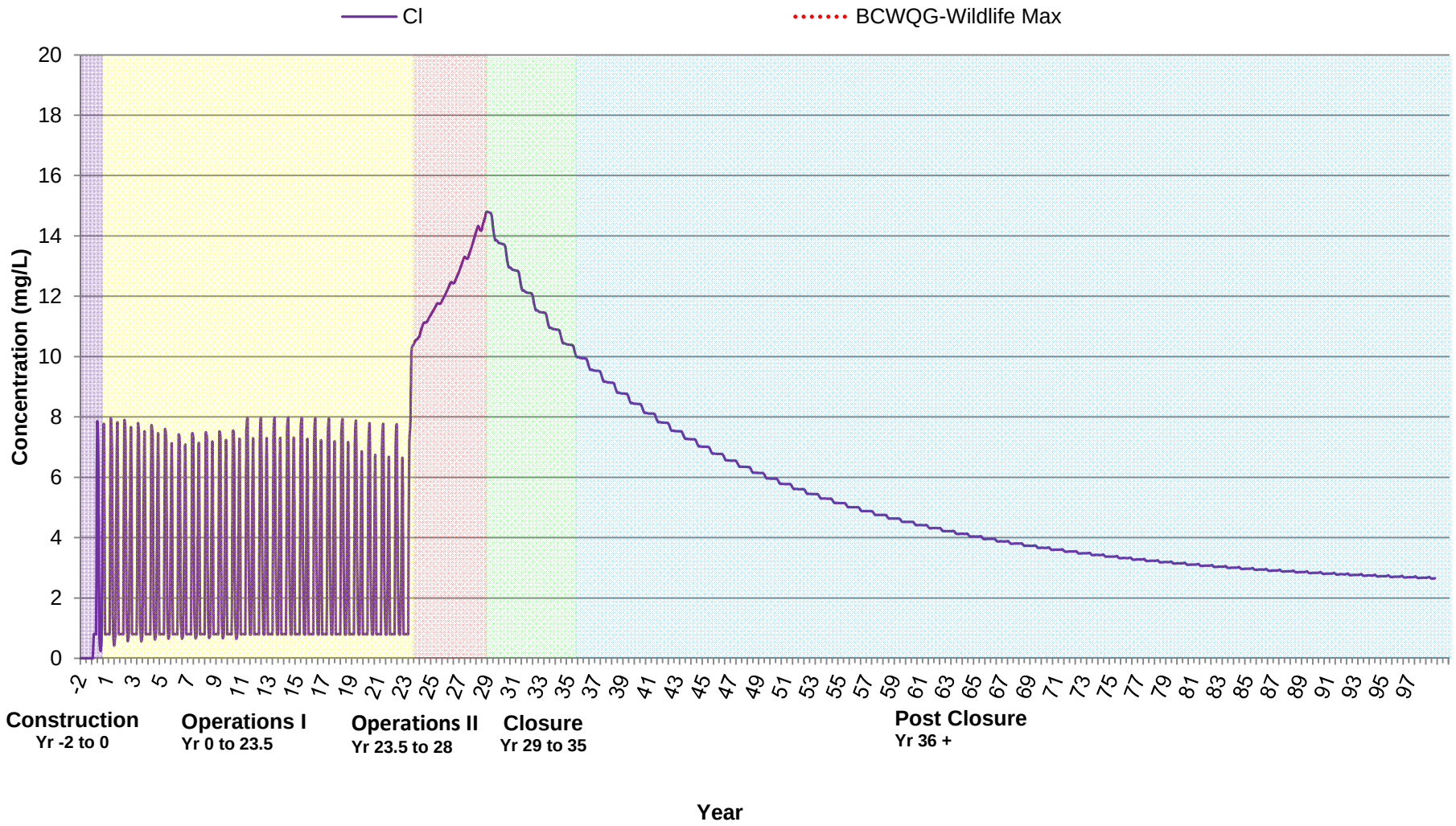
FIGURE C1.Zn

REV 0

APPENDIX C2

OPEN PIT (OP)

(Pages C2-1 to C2-27)



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.
3. ALL GUIDELINES ARE FIXED VALUES.
4. THE BCWQG-WILDLIFE MAX GUIDELINE (600 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE CHLORIDE CONCENTRATIONS - OPEN PIT

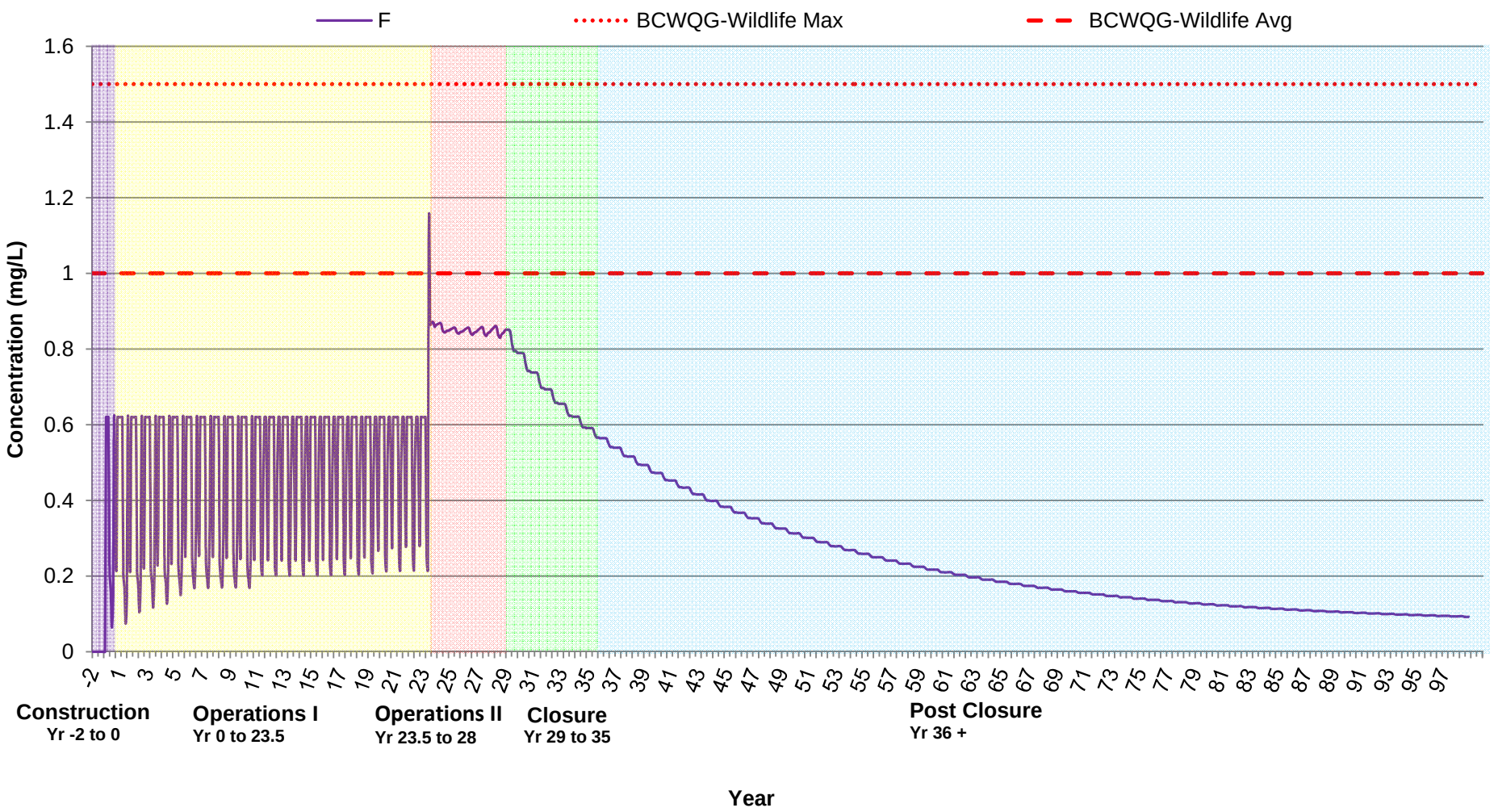
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C2.Cl

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.
3. ALL GUIDELINES ARE FIXED VALUES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE FLUORIDE CONCENTRATIONS - OPEN PIT

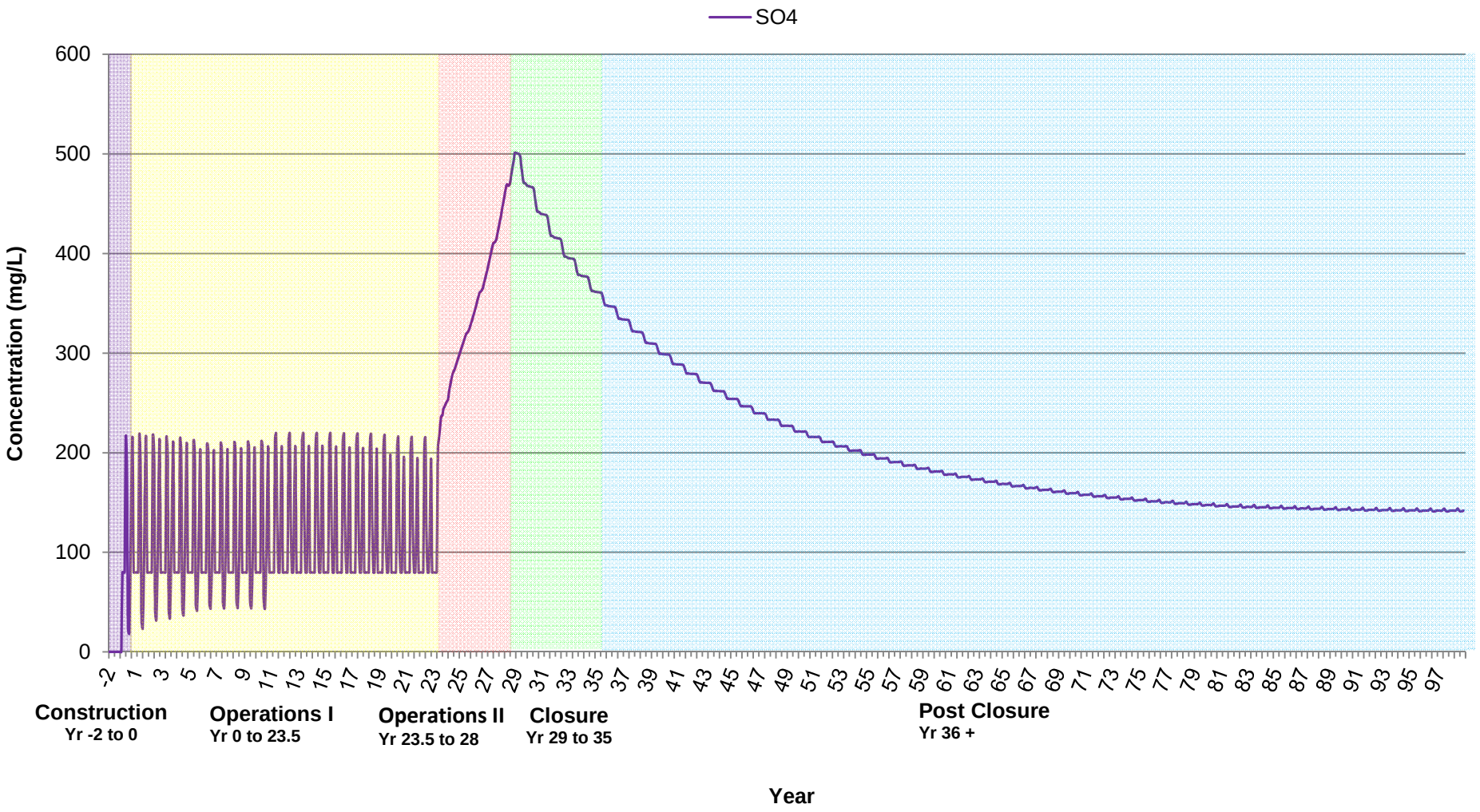
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C2.F

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE SULPHATE CONCENTRATIONS - OPEN PIT

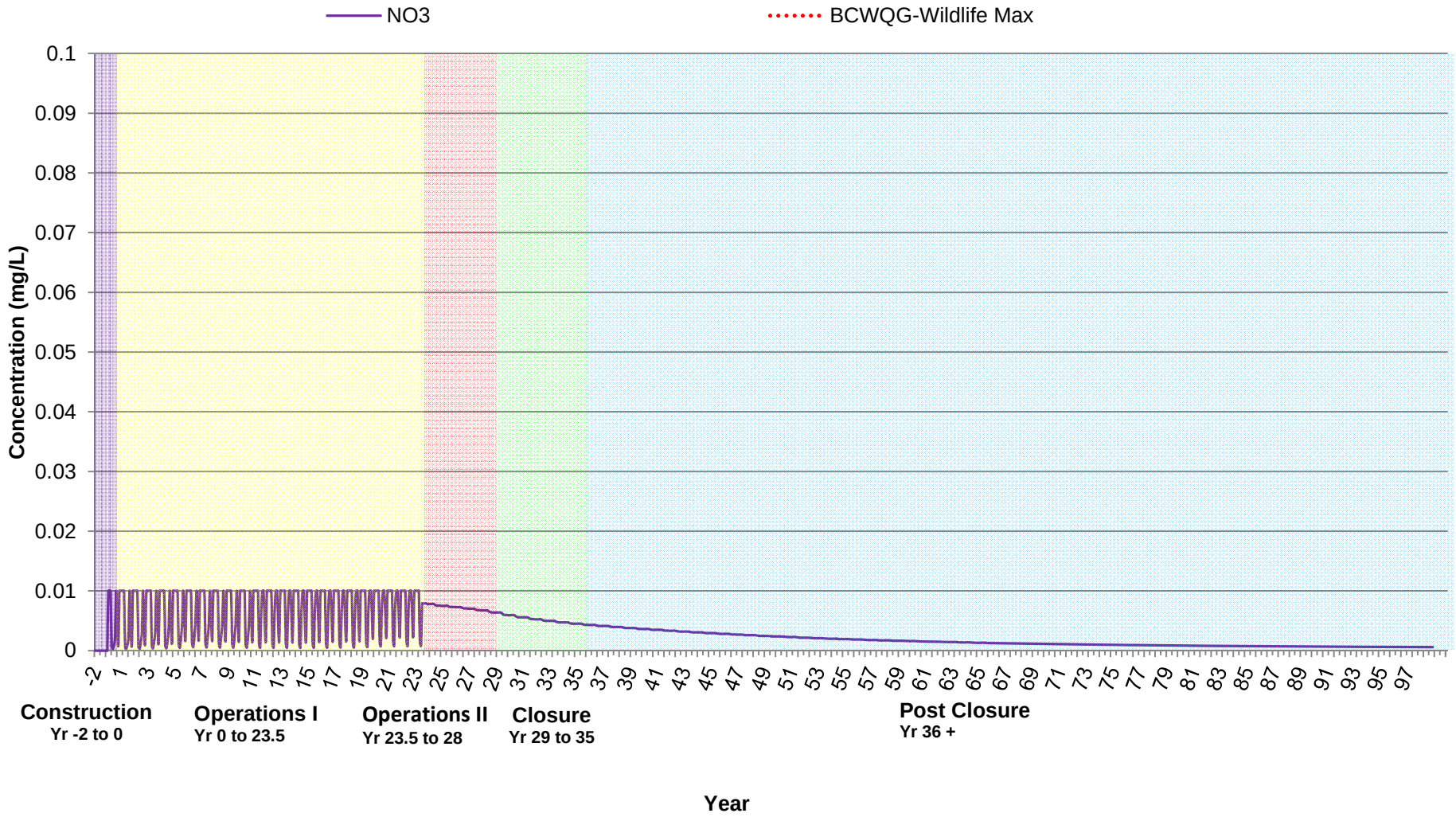
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C2.S04

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.
3. ALL GUIDELINES ARE FIXED VALUES.
4. THE BCWQG-WILDLIFE MAX GUIDELINE (100 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE NITRATE CONCENTRATIONS - OPEN PIT

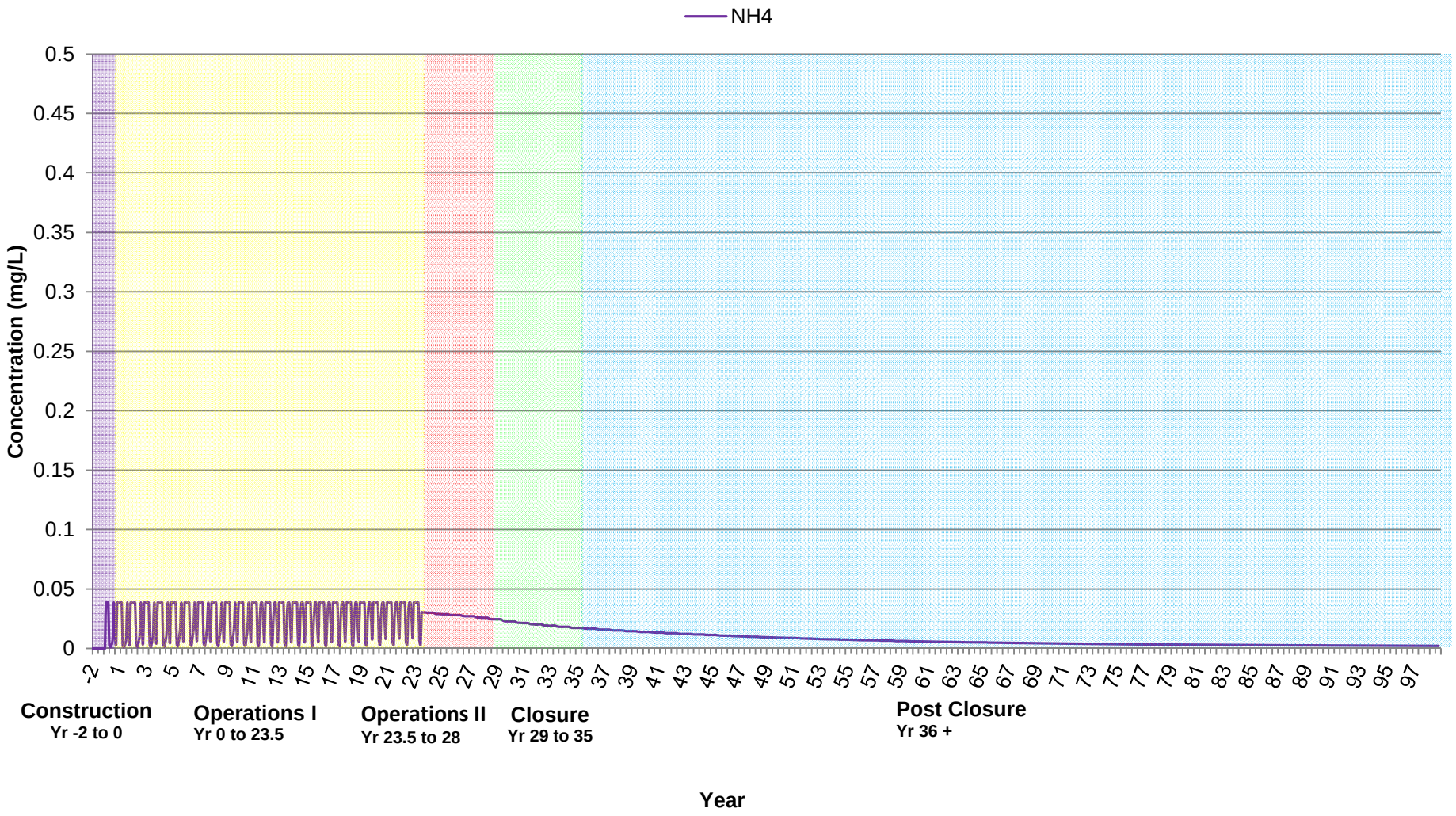
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C2.NO3

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE AMMONIA CONCENTRATIONS - OPEN PIT

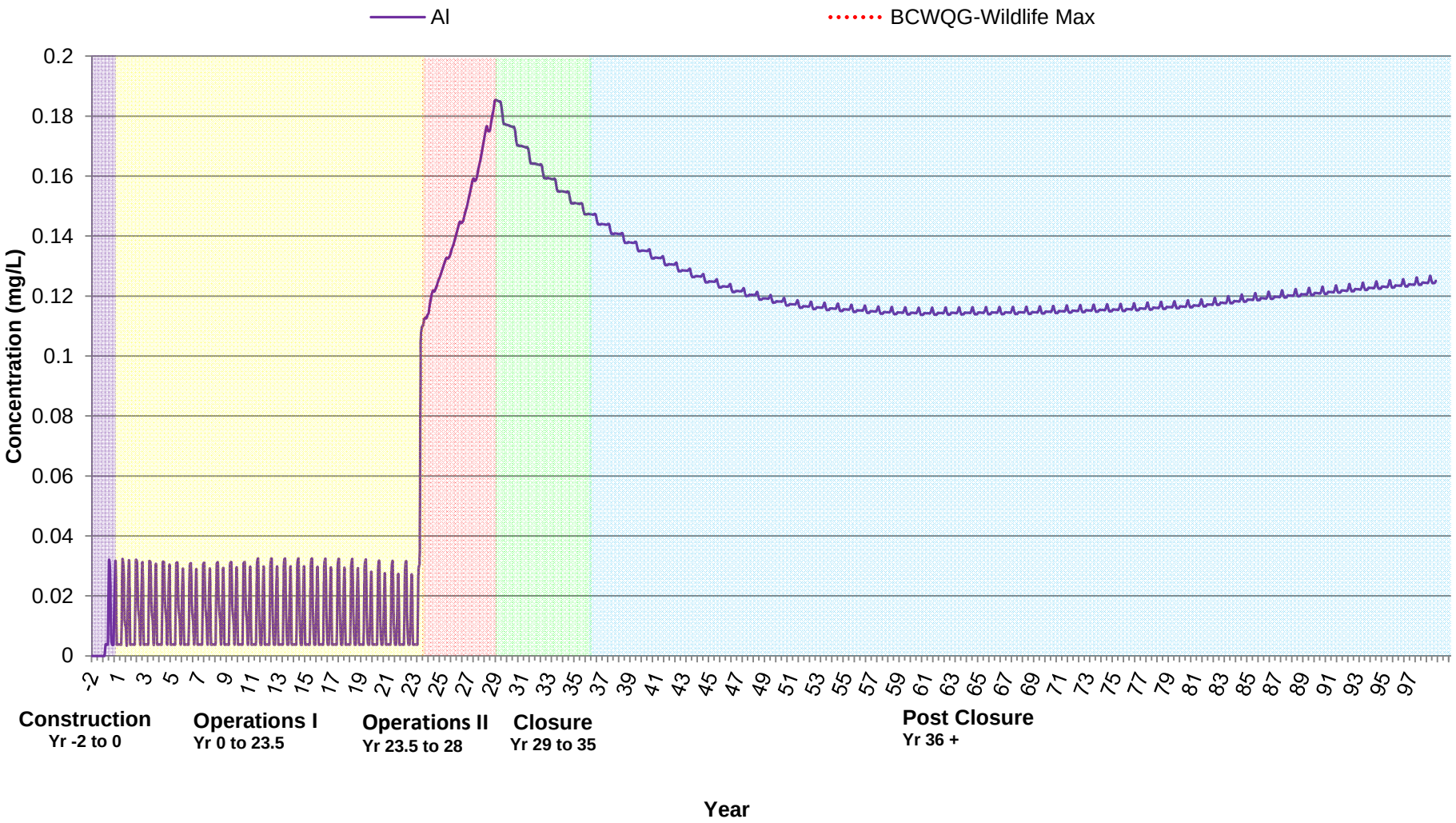
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C2.NH4

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.
3. ALL GUIDELINES ARE FIXED VALUES.
4. THE BCWQG-WILDLIFE MAX GUIDELINE (5 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE ALUMINUM CONCENTRATIONS - OPEN PIT

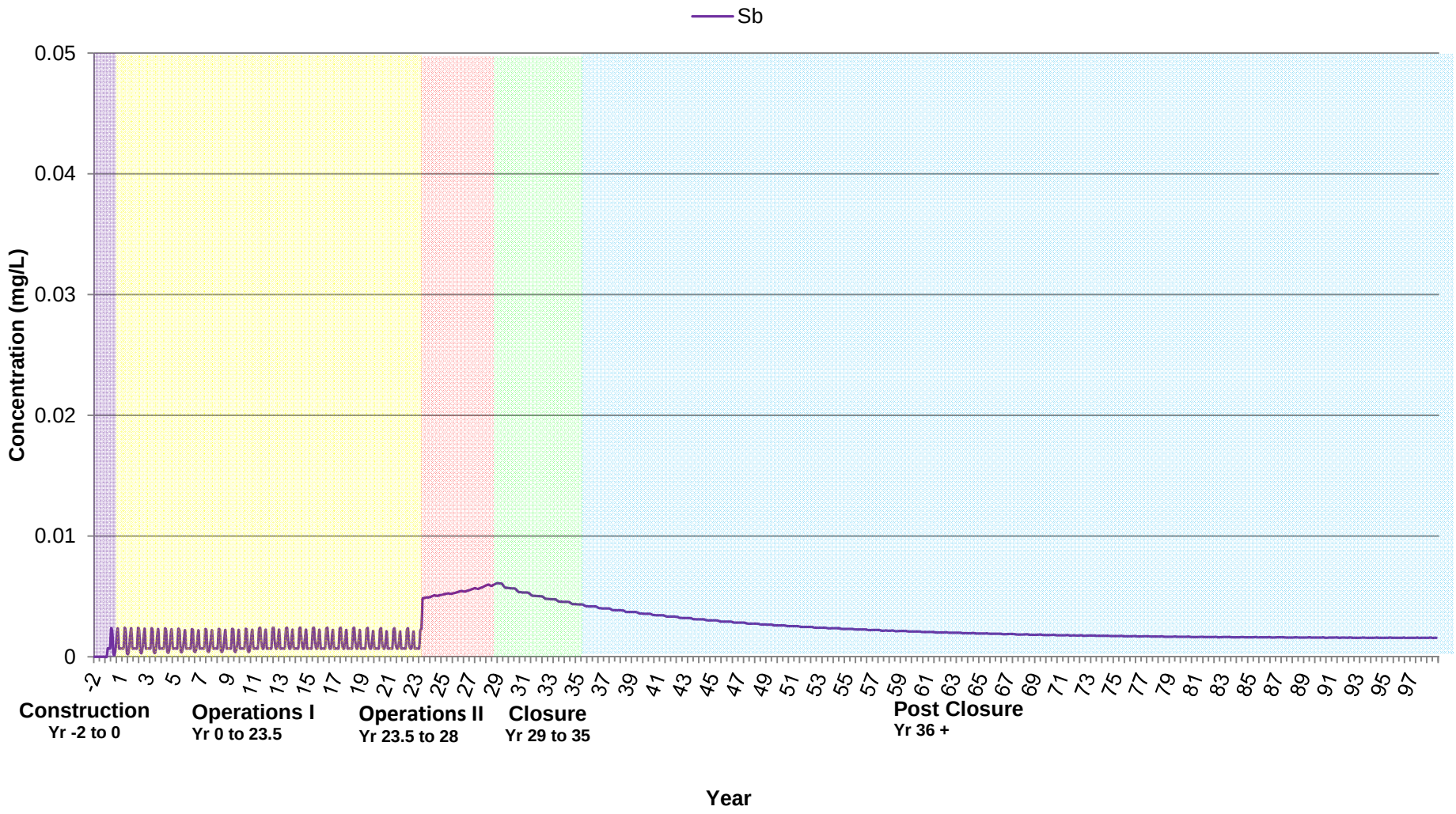
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C2.Al

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE ANTIMONY CONCENTRATIONS - OPEN PIT

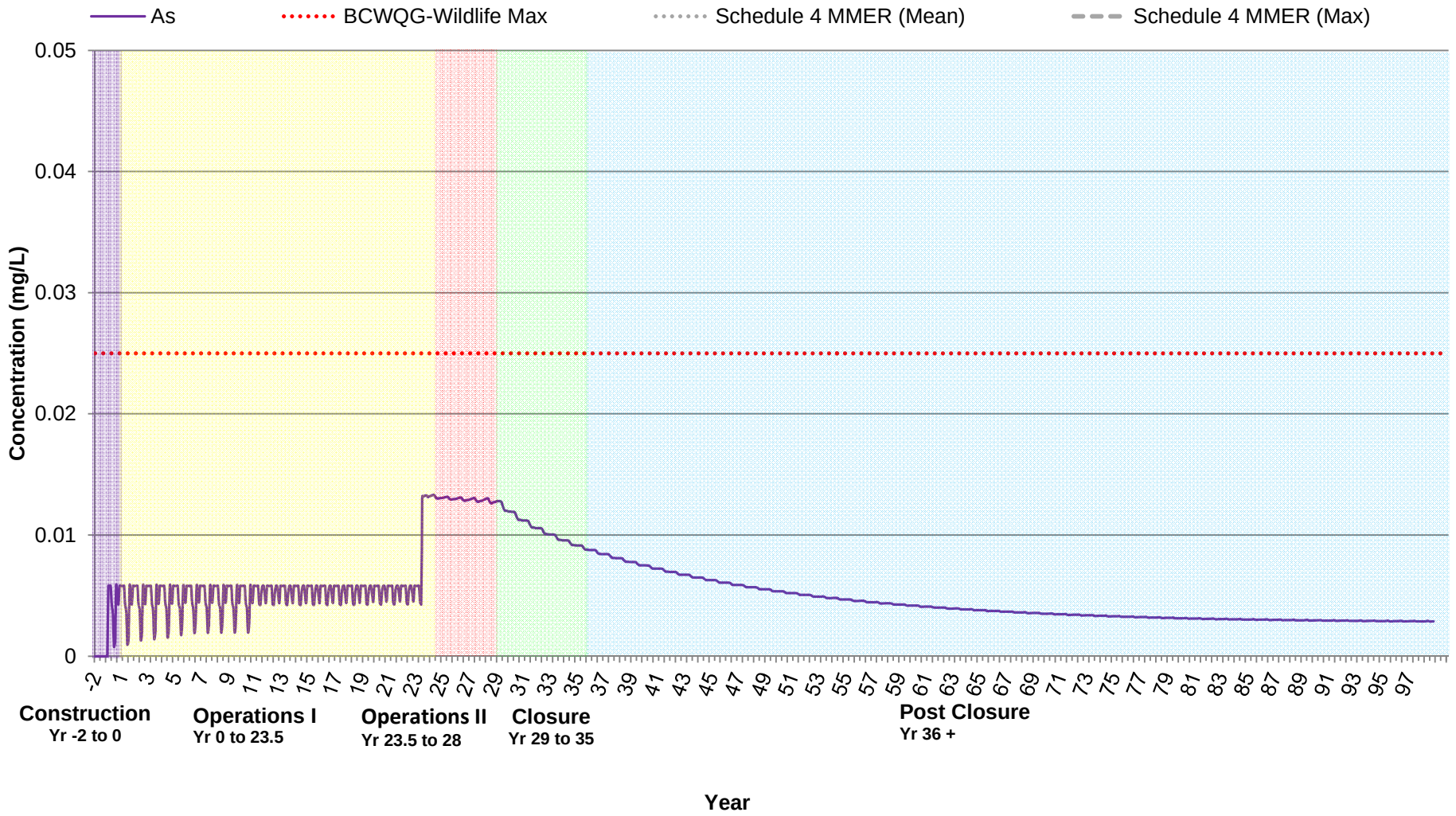
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C2.Sb

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.
3. ALL GUIDELINES ARE FIXED VALUES.
4. THE MMER MAX (1 mg/L) AND MMER MEAN (0.5 mg/L) ARE NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE ARSENIC CONCENTRATIONS - OPEN PIT

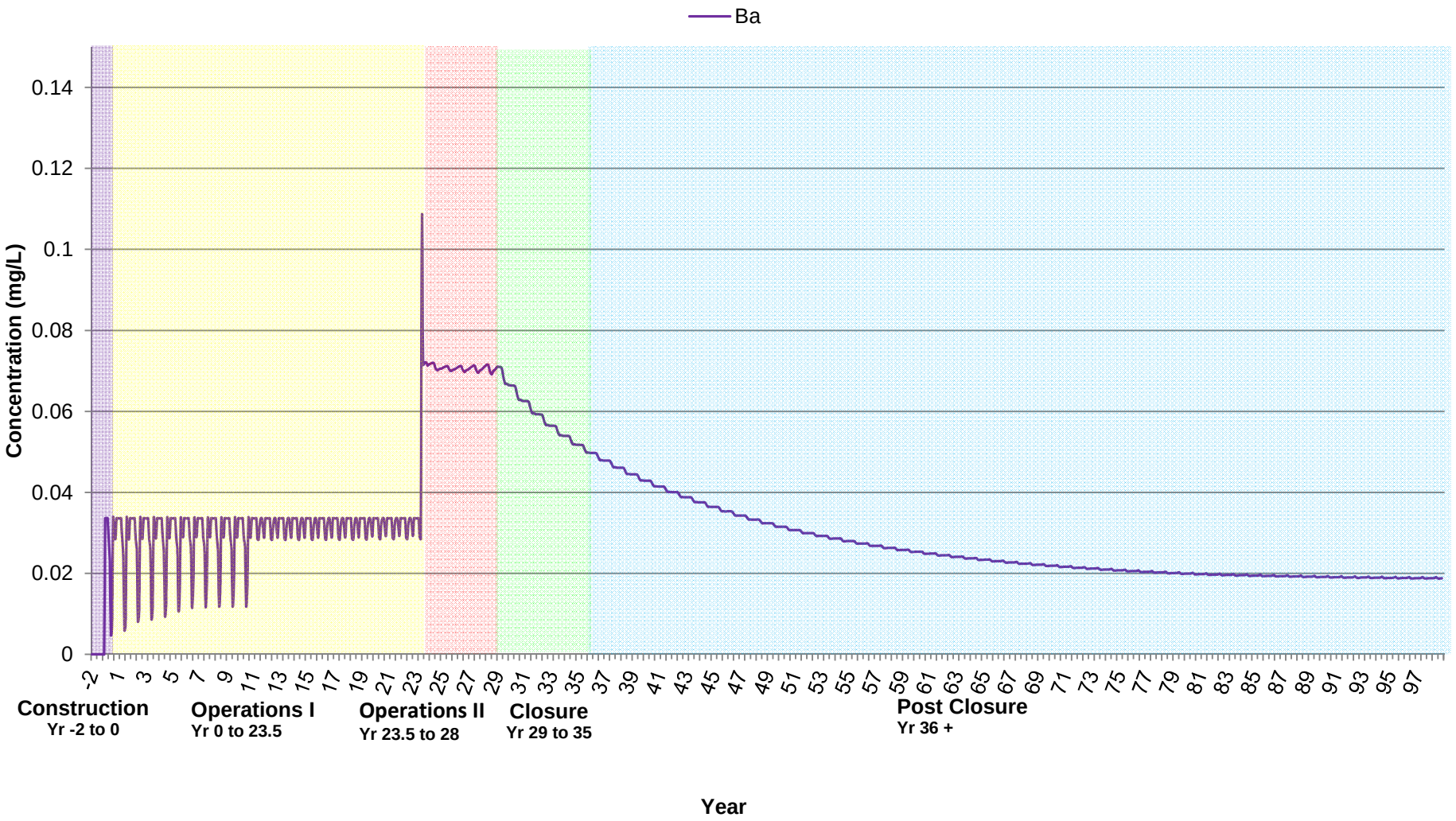
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C2.As

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE BARIUM CONCENTRATIONS - OPEN PIT

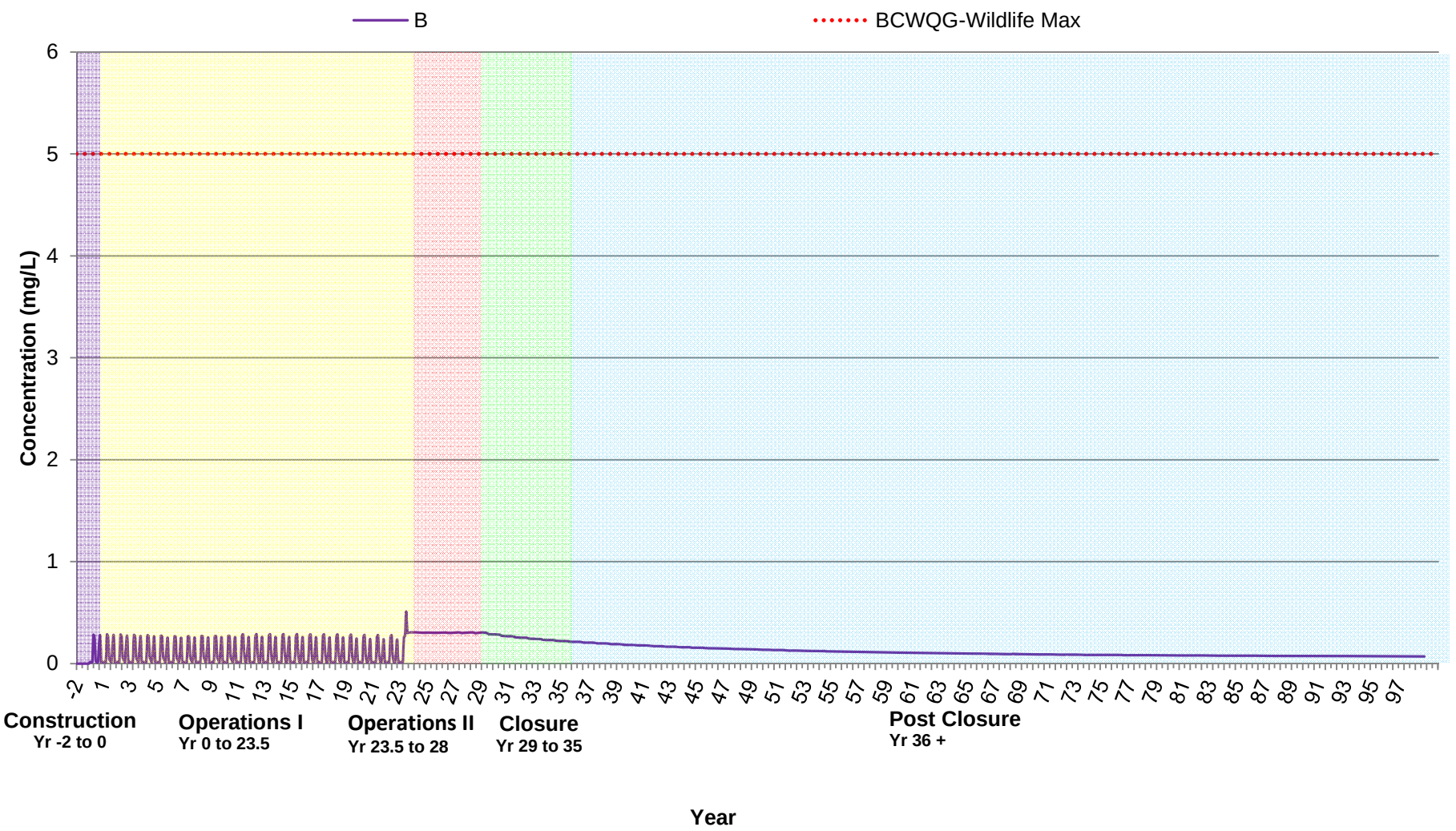
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C2.Ba

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE BORON CONCENTRATIONS - OPEN PIT

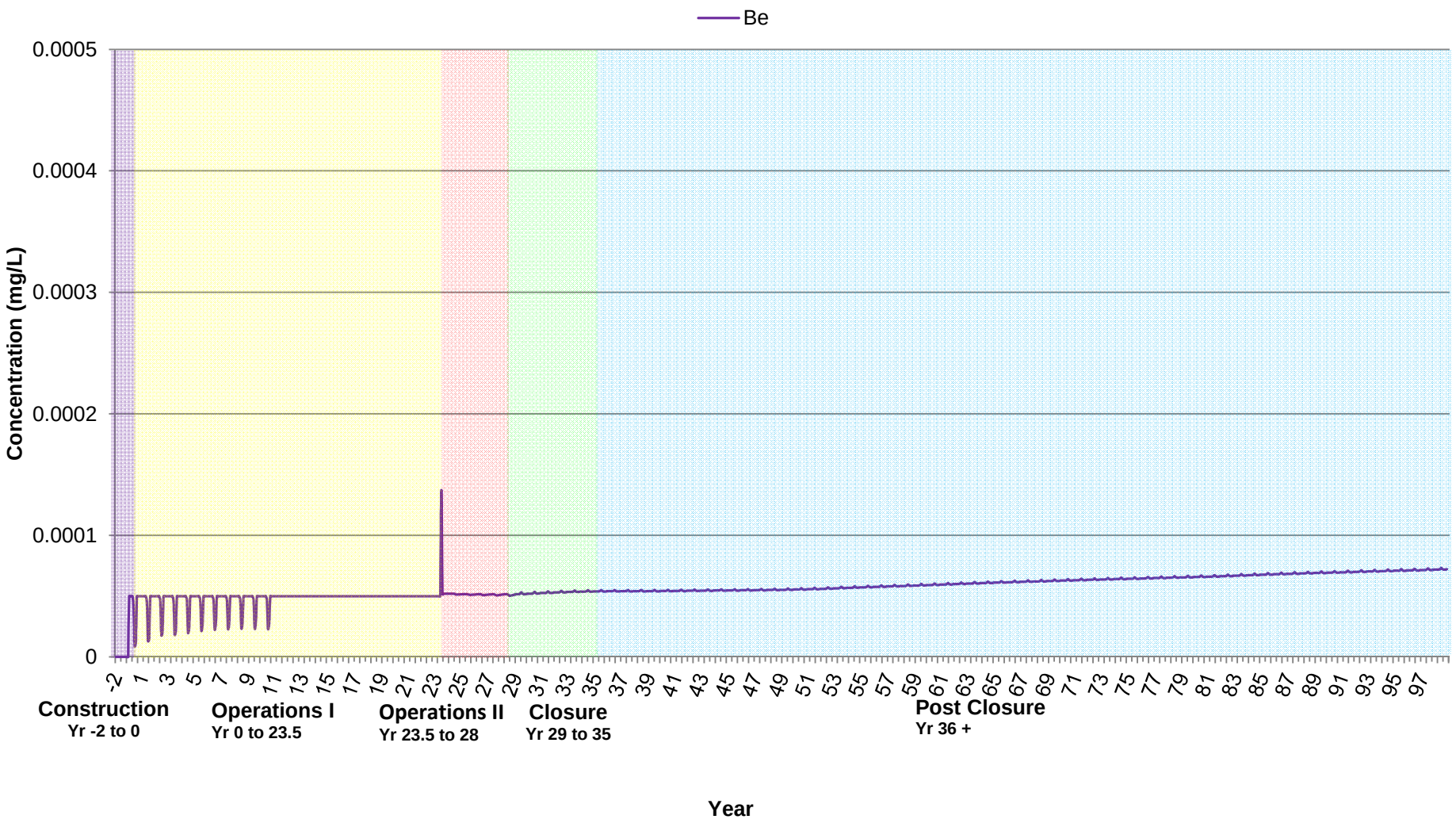
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C2.B

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE BERYILLIUM CONCENTRATIONS - OPEN PIT

Knight Piésold CONSULTING

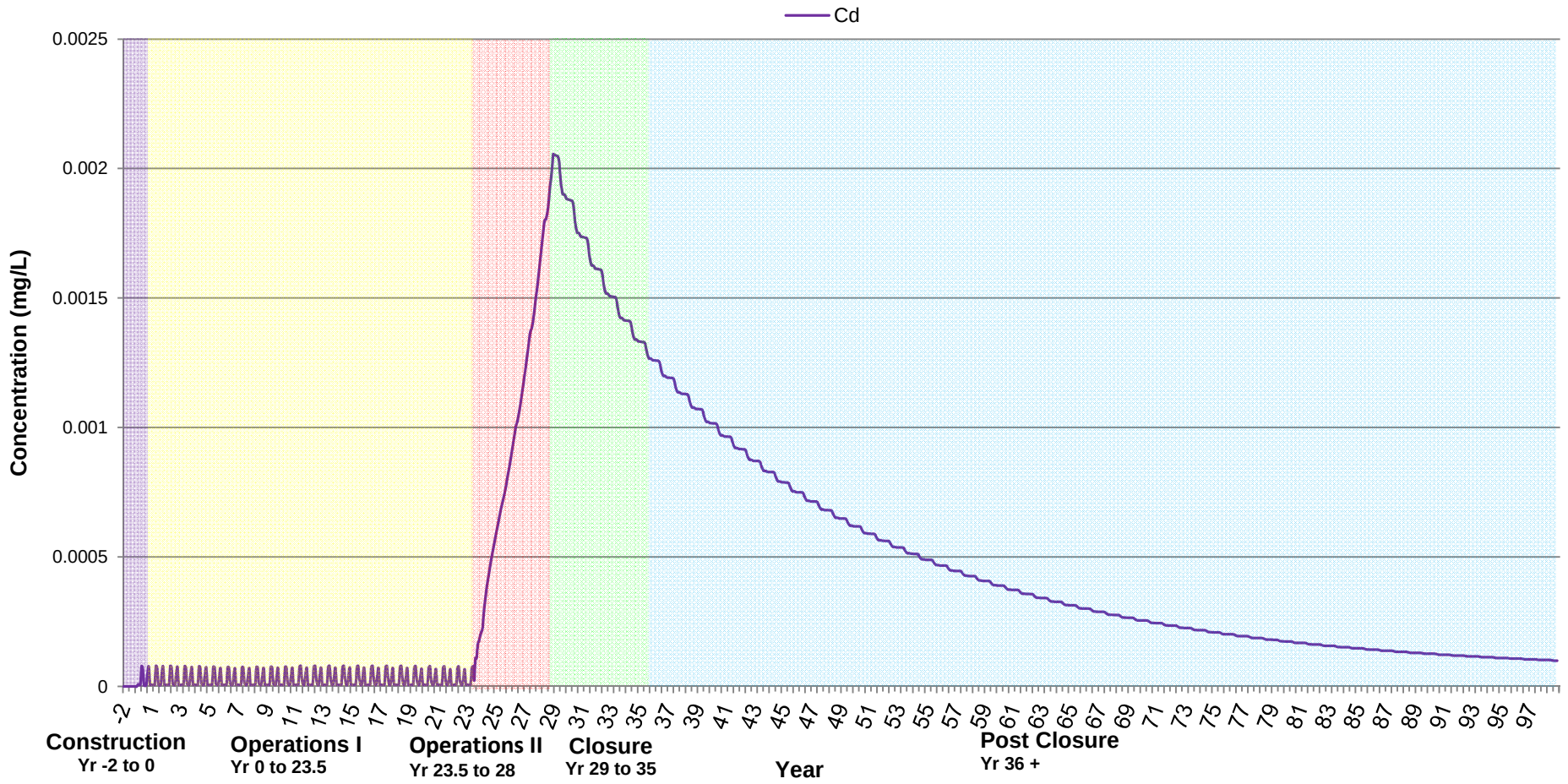
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C2.Be

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE CADMIUM CONCENTRATIONS - OPEN PIT

Knight Piésold CONSULTING

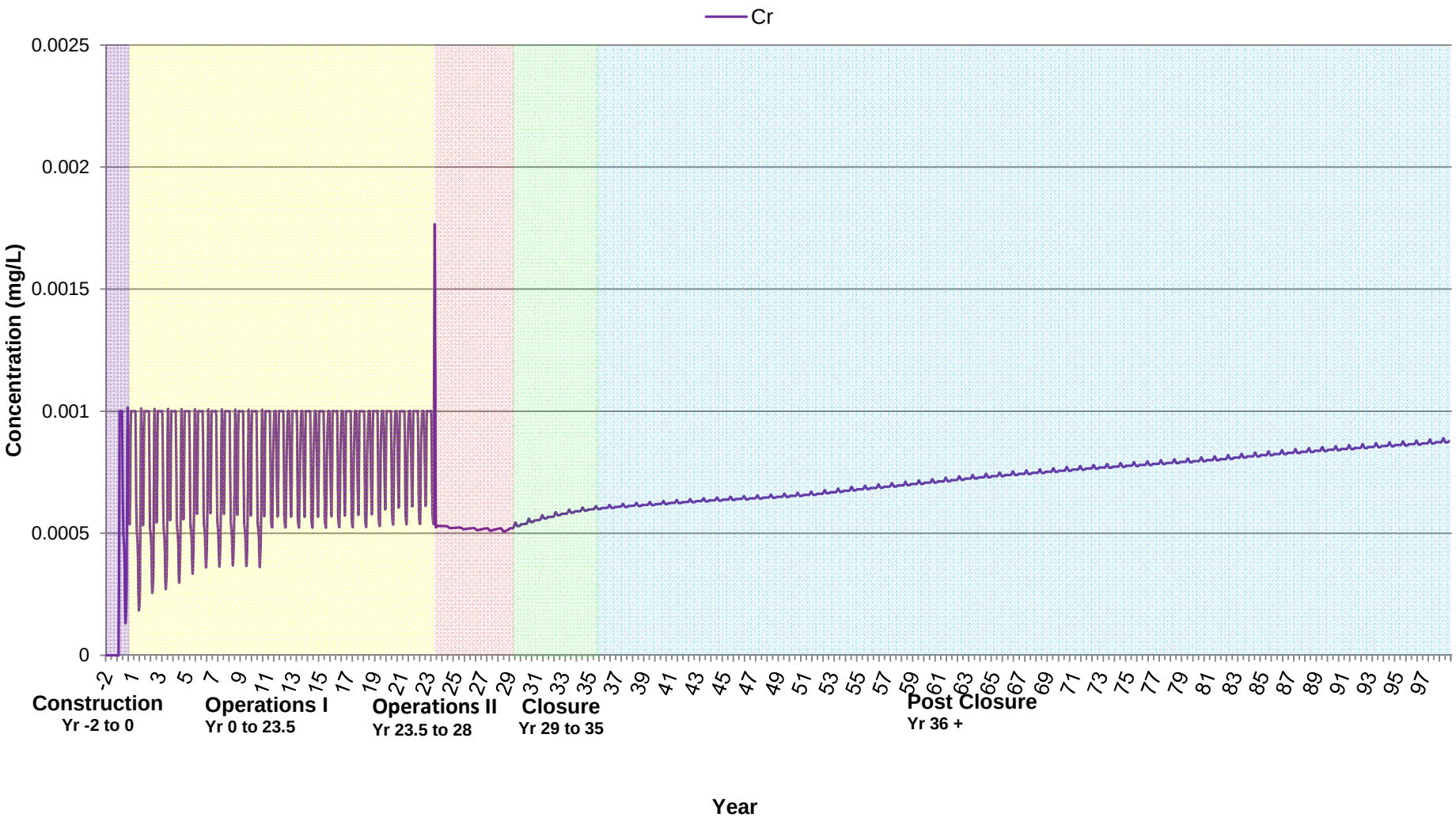
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C2.Cd-D

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE CHROMIUM CONCENTRATIONS - OPEN PIT

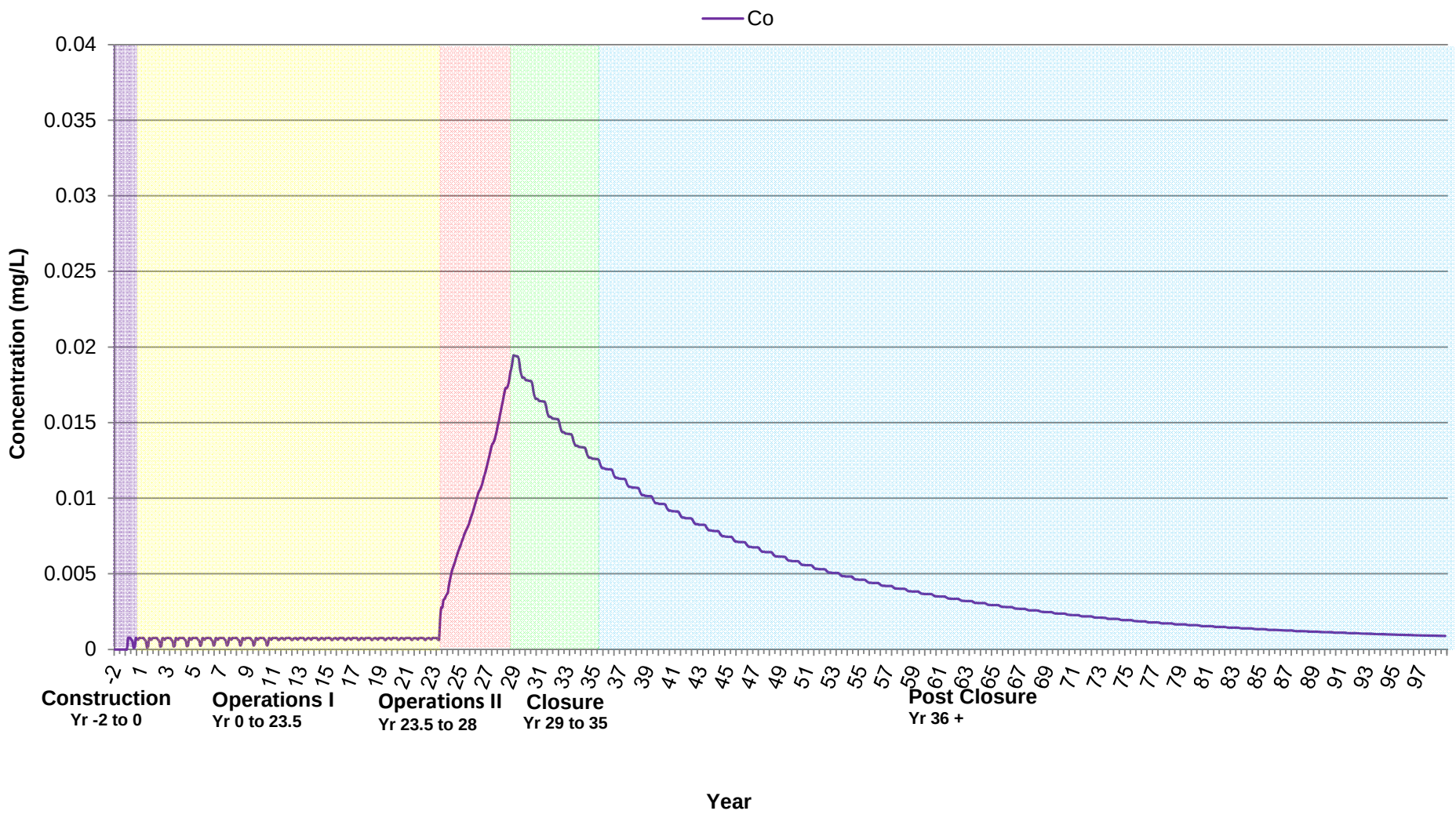
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C2.Cr

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE COBALT CONCENTRATIONS - OPEN PIT

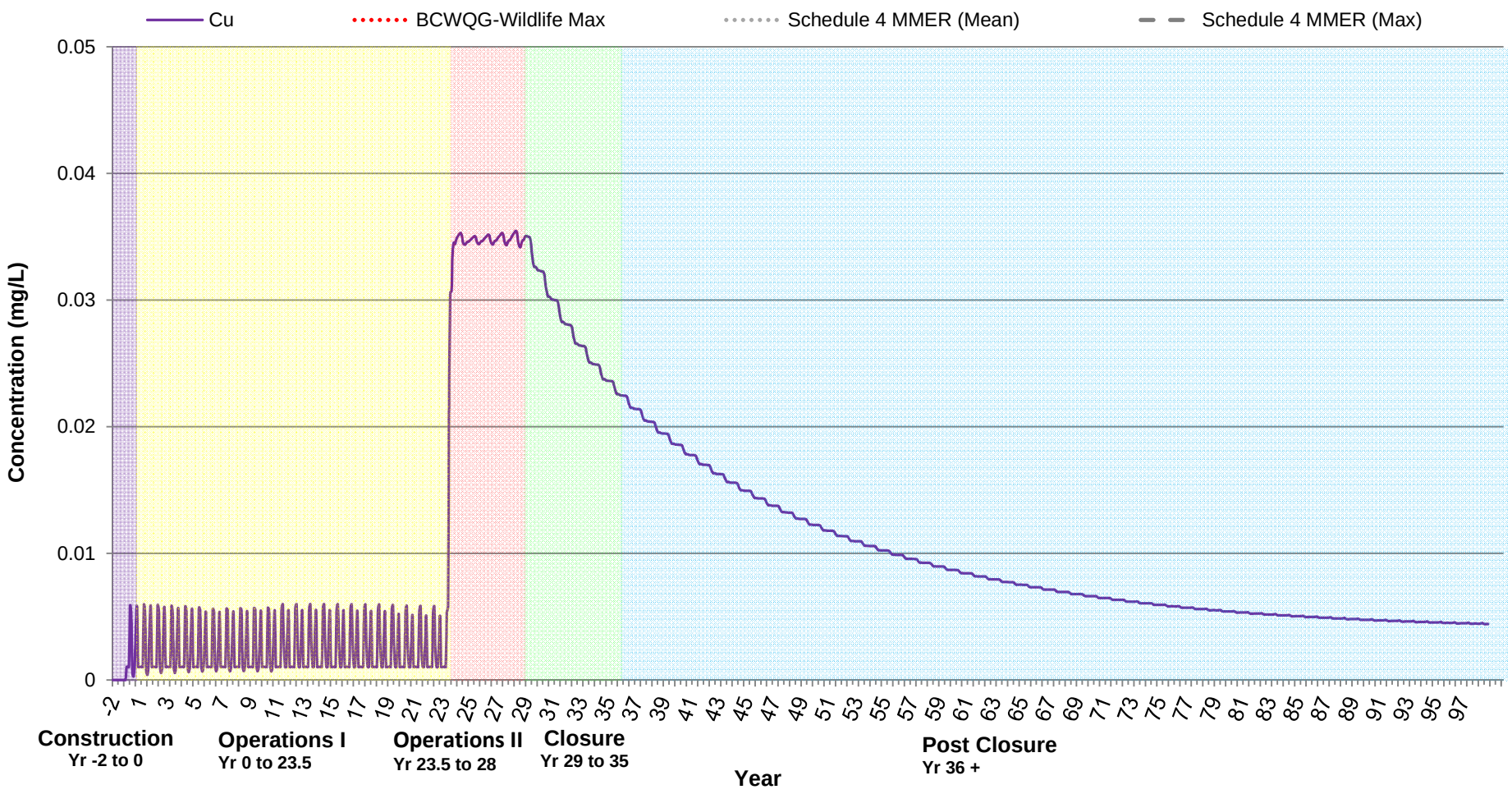
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C2.Co

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.
3. ALL GUIDELINES ARE FIXED VALUES.
4. BCWQG-WILDLIFE MAX (0.3 mg/L), MMER MEAN (0.3 mg/L) AND MMER MAX (0.6 mg/L) ARE NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE COPPER CONCENTRATIONS - OPEN PIT

Knight Piésold CONSULTING

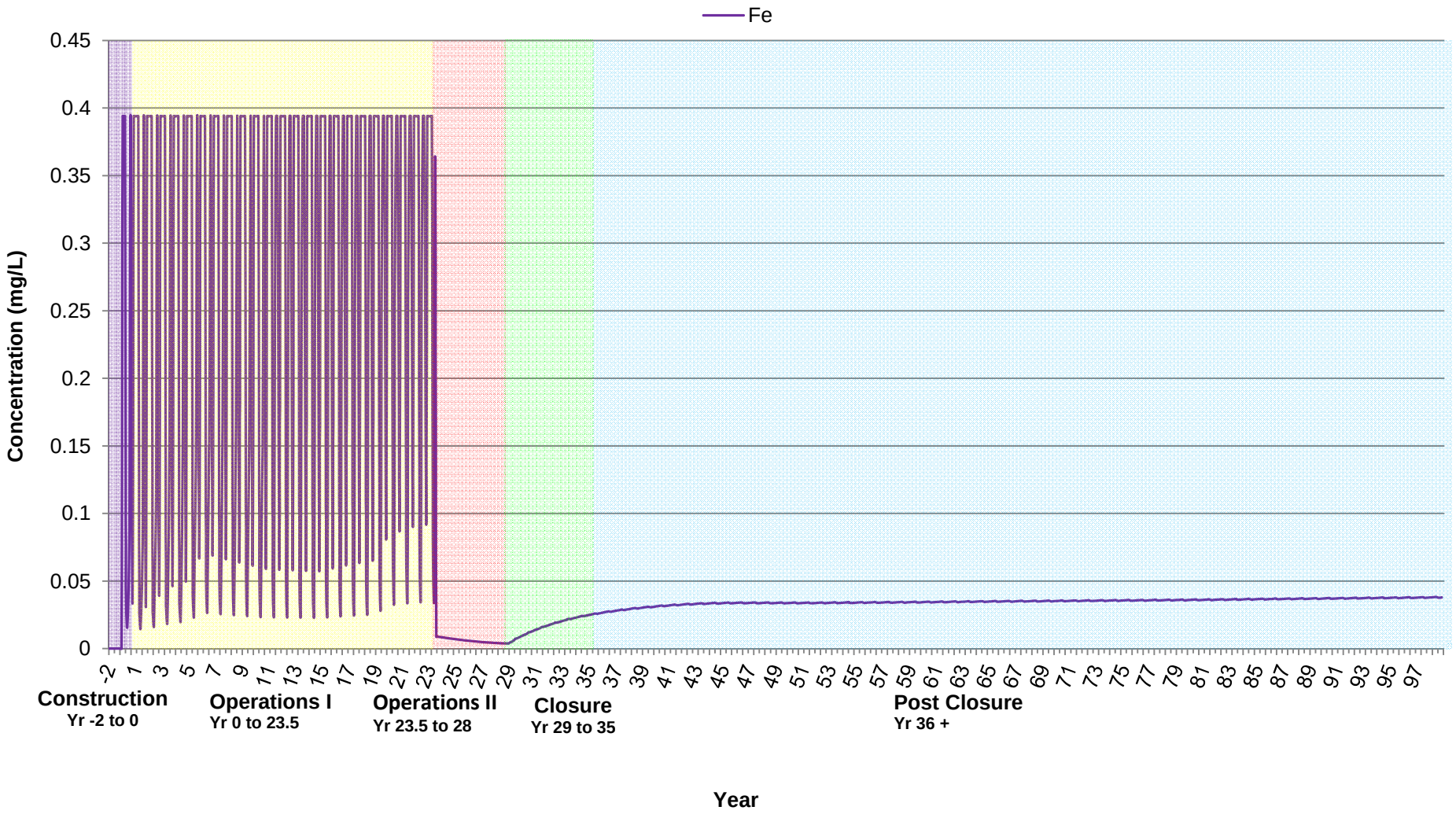
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C2.Cu-T

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE IRON CONCENTRATIONS - OPEN PIT

Knight Piésold CONSULTING

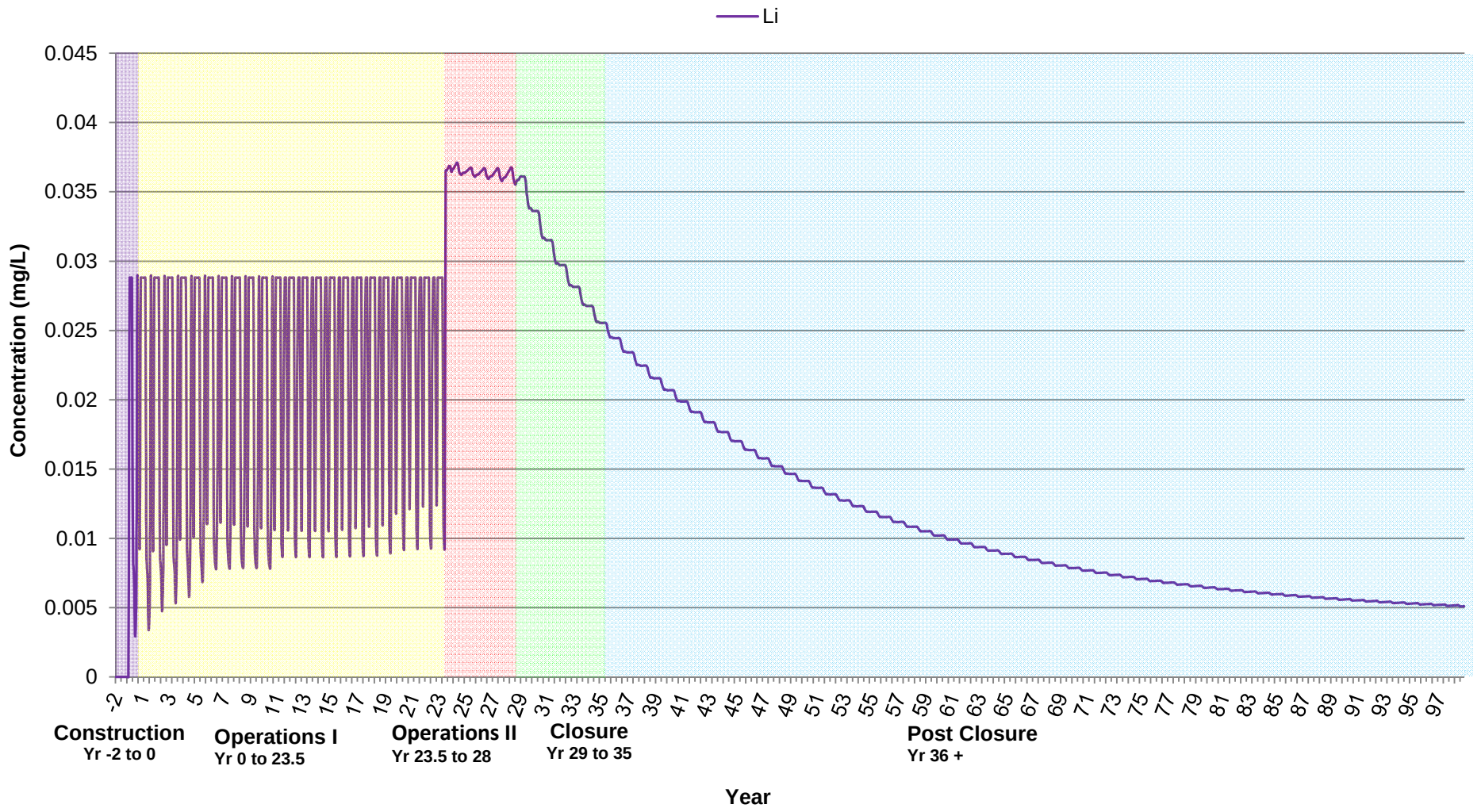
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C2.Fe

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE ZINC CONCENTRATIONS - OPEN PIT

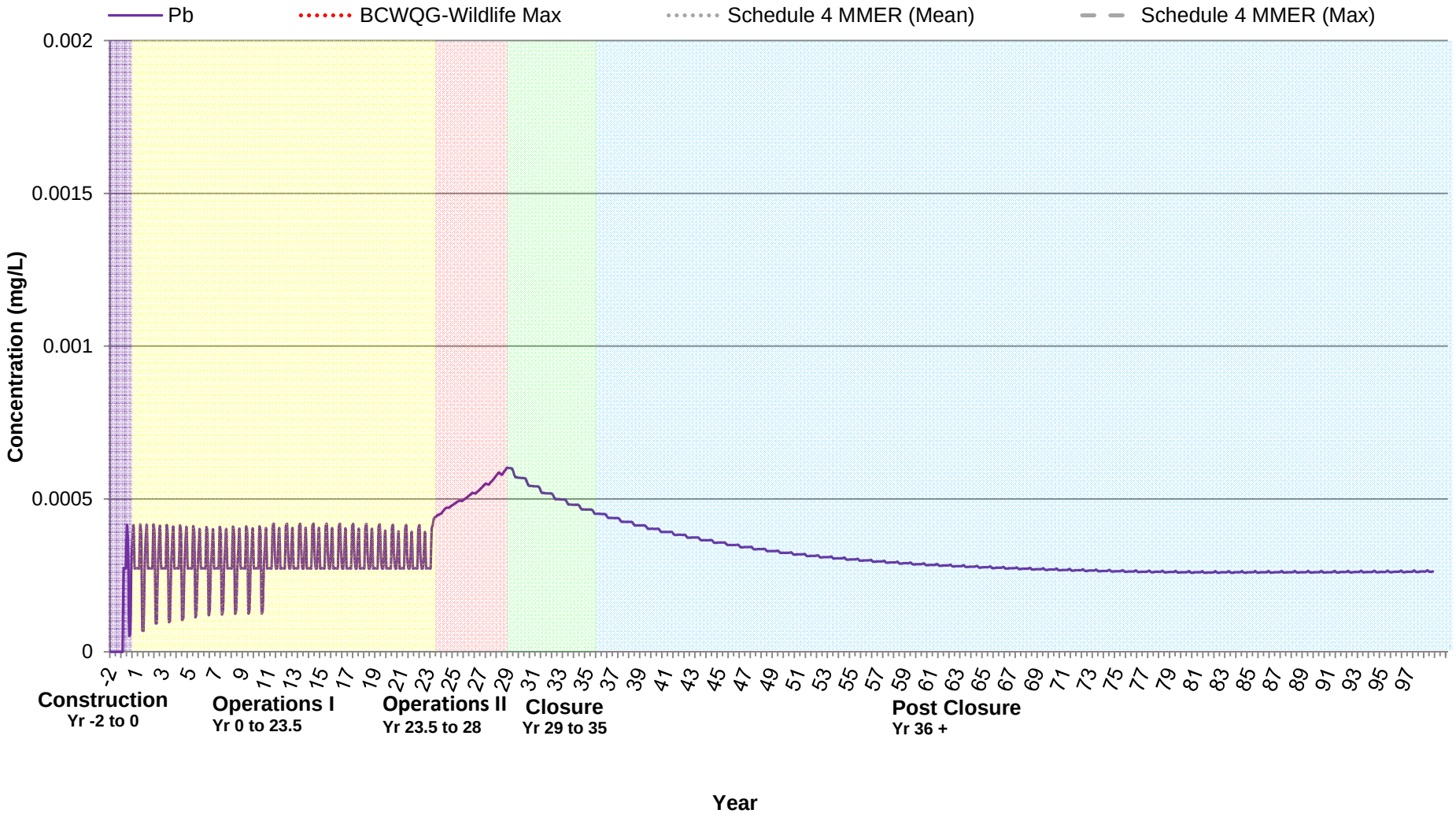
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C2.Li

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.
3. ALL GUIDELINES ARE FIXED VALUES.
4. BCWQG-WILDLIFE MAX (0.1 mg/L), MMER MEAN (0.2 mg/L) AND MMER MAX (0.4 mg/L) GUIDELINES ARE NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE LEAD CONCENTRATIONS - OPEN PIT

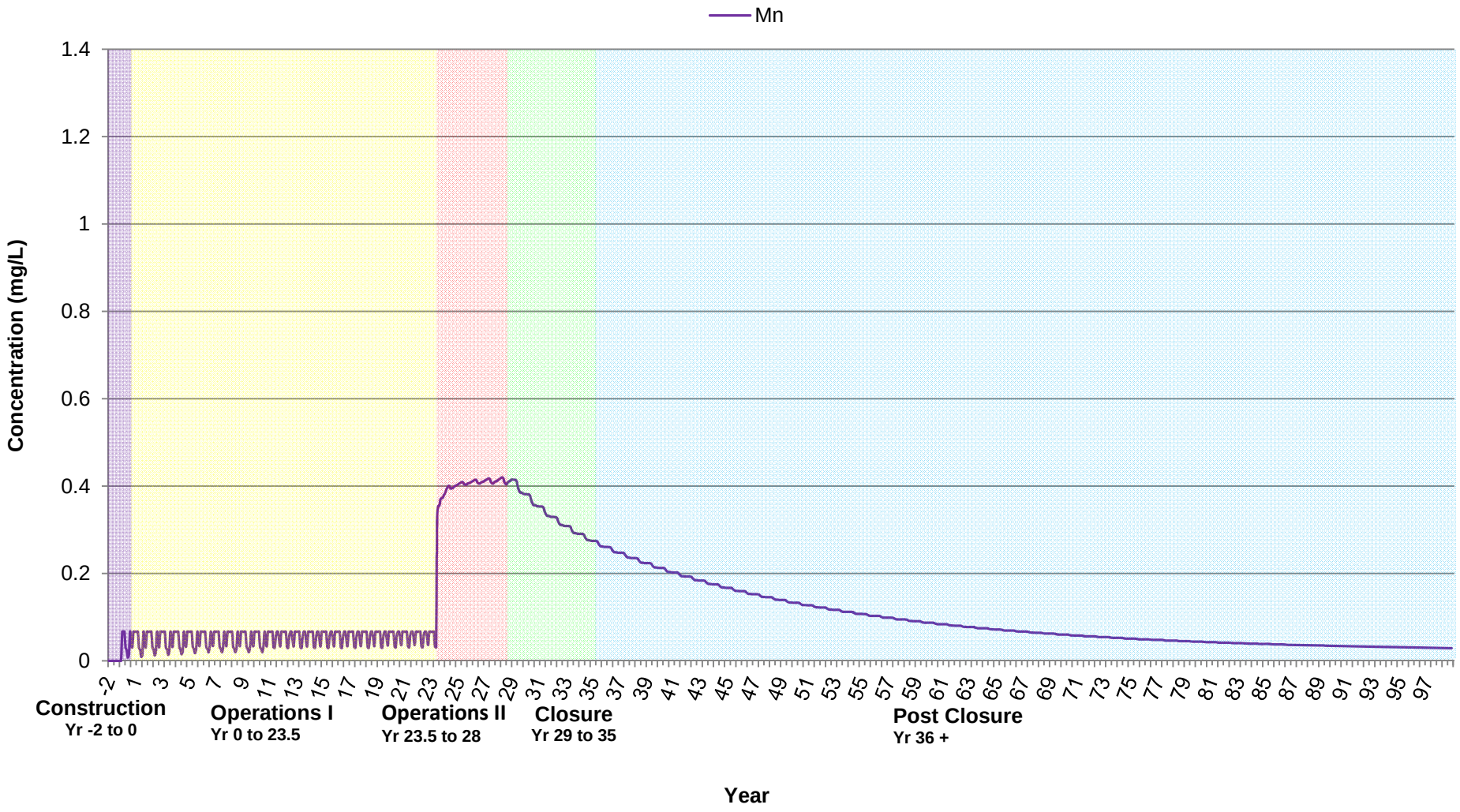
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C2.Pb

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE MANGANESE CONCENTRATIONS - OPEN PIT

Knight Piésold CONSULTING

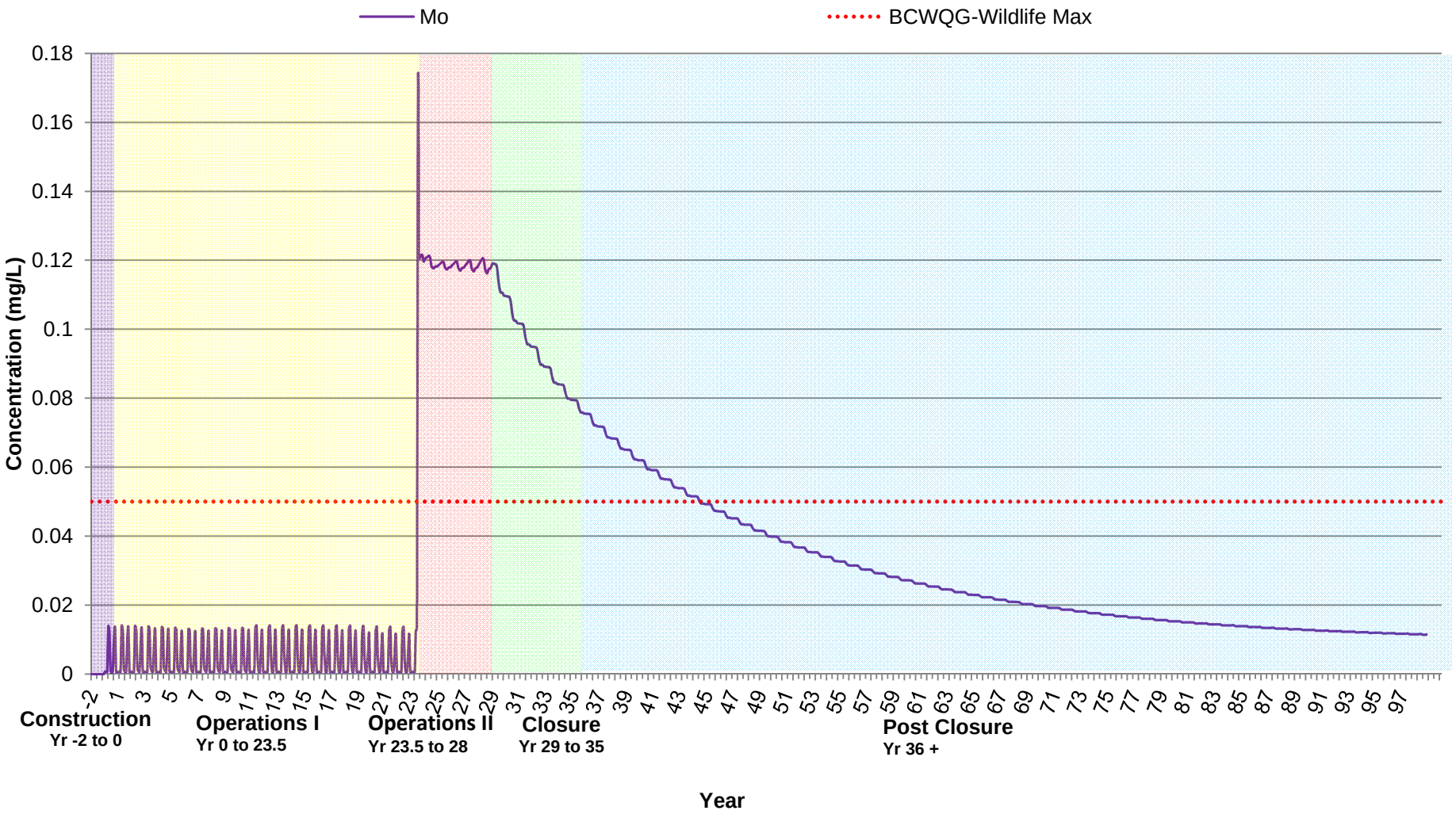
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C2.Mn

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.
3. ALL GUIDELINES ARE FIXED VALUES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE MOLYDBENUM CONCENTRATIONS - OPEN PIT

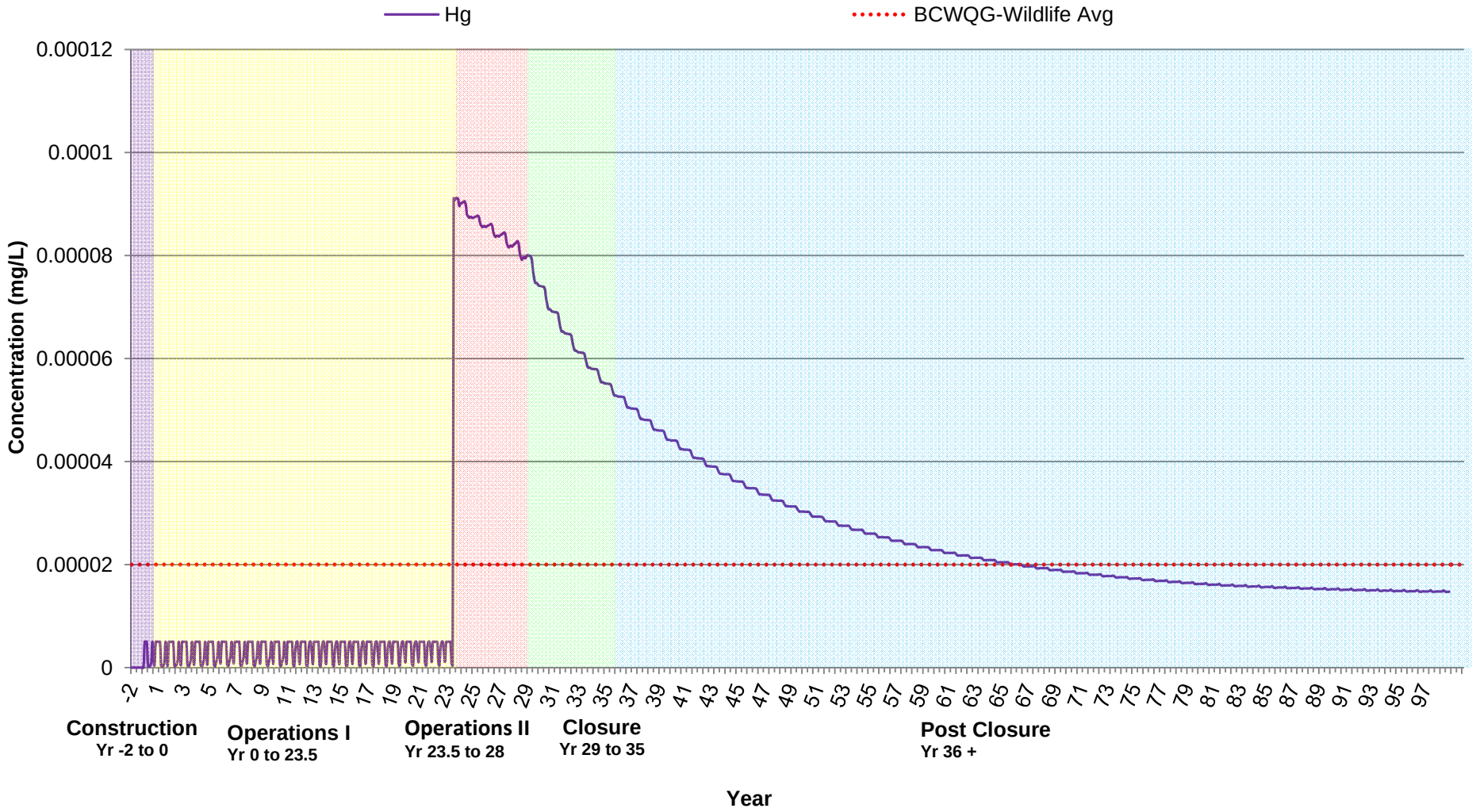
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C2.Mo

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.
3. ALL GUIDELINES ARE FIXED VALUES.
4. GUIDELINE VALUE APPLIED ON ASSUMPTION THAT METHYL-Hg IS EQUAL TO 0.5% OF T-Hg.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE MERCURY CONCENTRATIONS - OPEN PIT

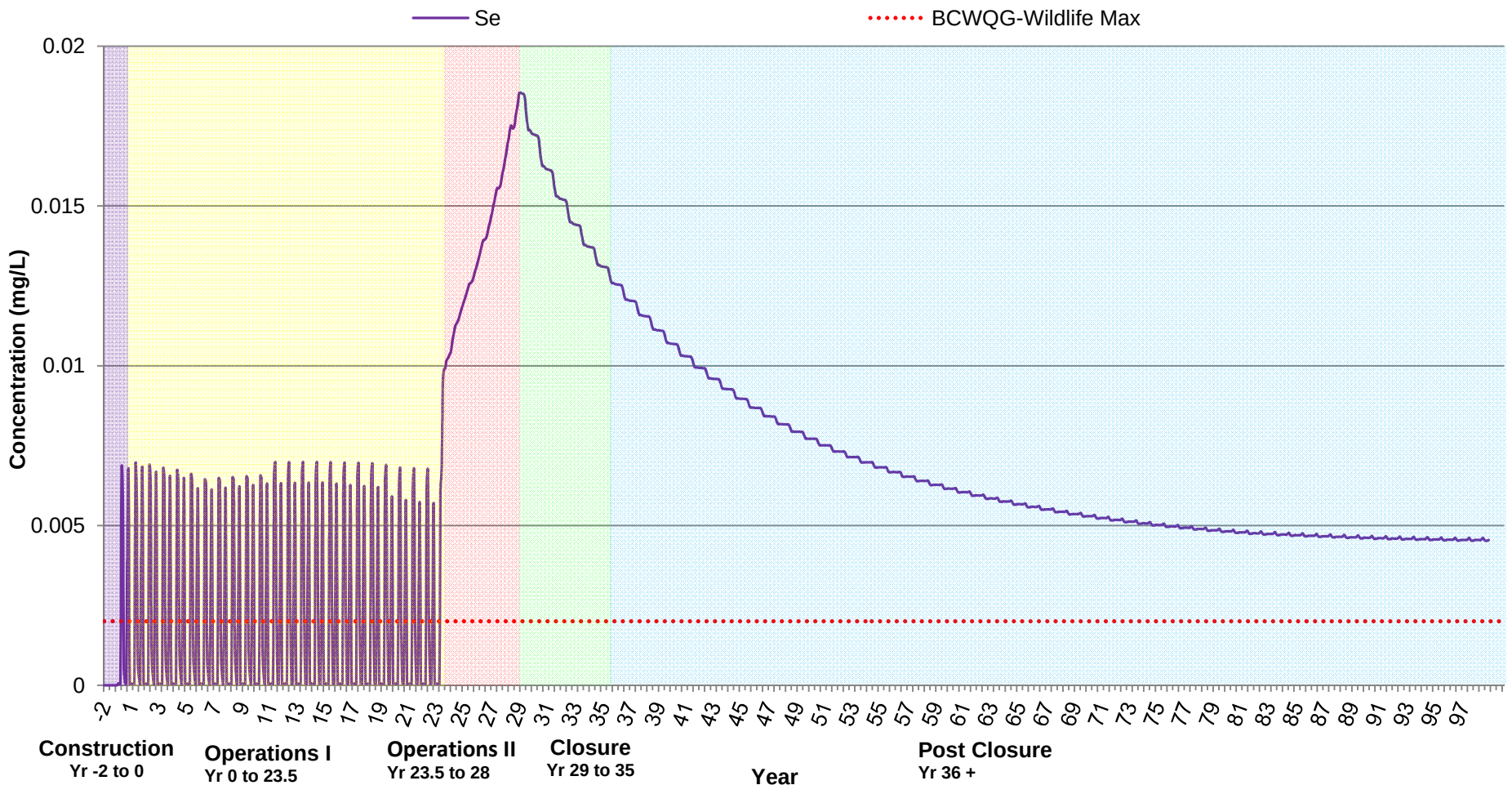
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C2.Hg

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.
3. ALL GUIDELINES ARE FIXED VALUES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE SELENIUM CONCENTRATIONS - OPEN PIT

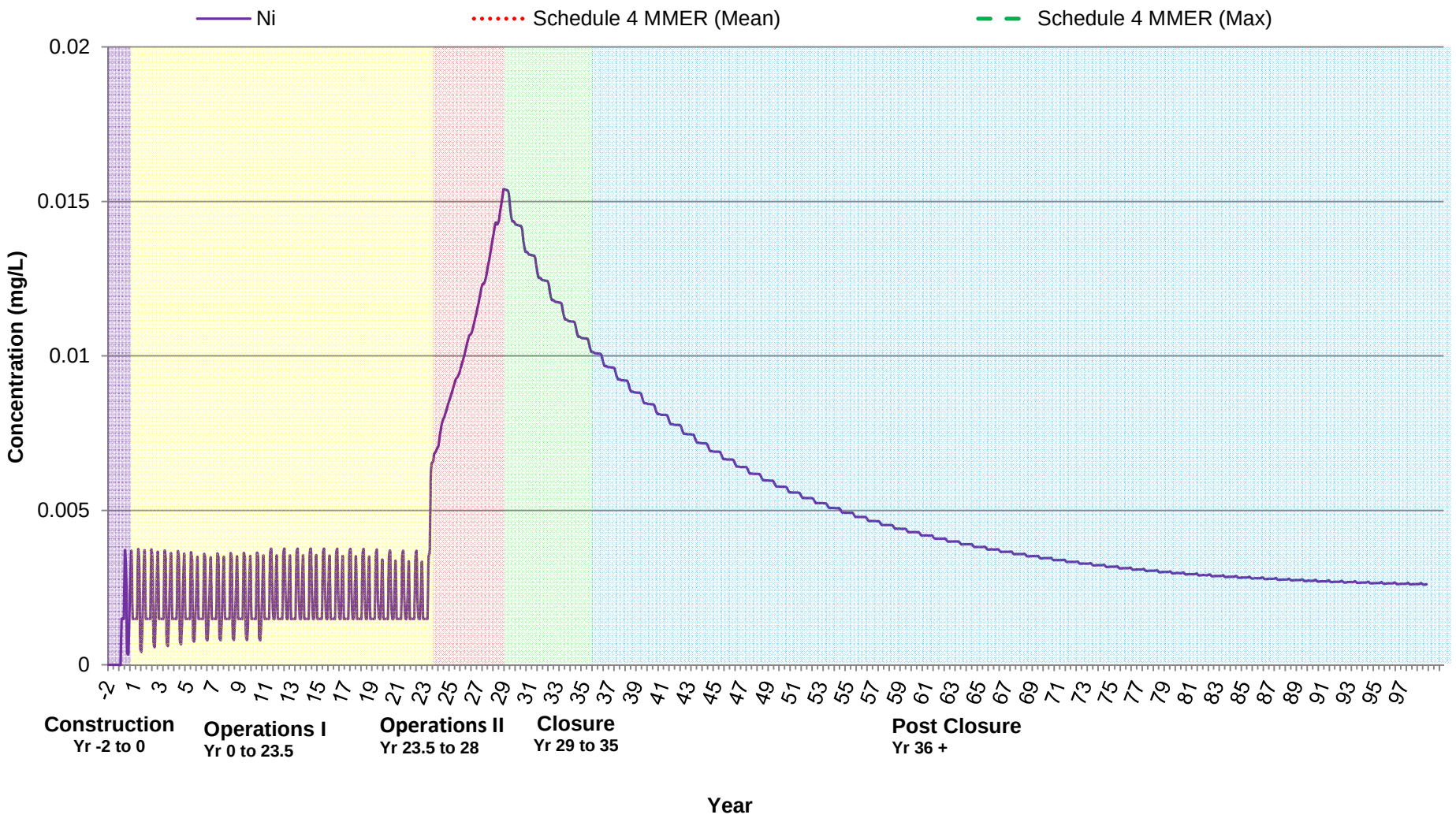
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C2.Se

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.
3. ALL GUIDELINES ARE FIXED VALUES.
4. THE MMER MEAN (0.5 mg/L) AND MMER MAX (1.0 mg/L) ARE NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE NICKEL CONCENTRATIONS - OPEN PIT

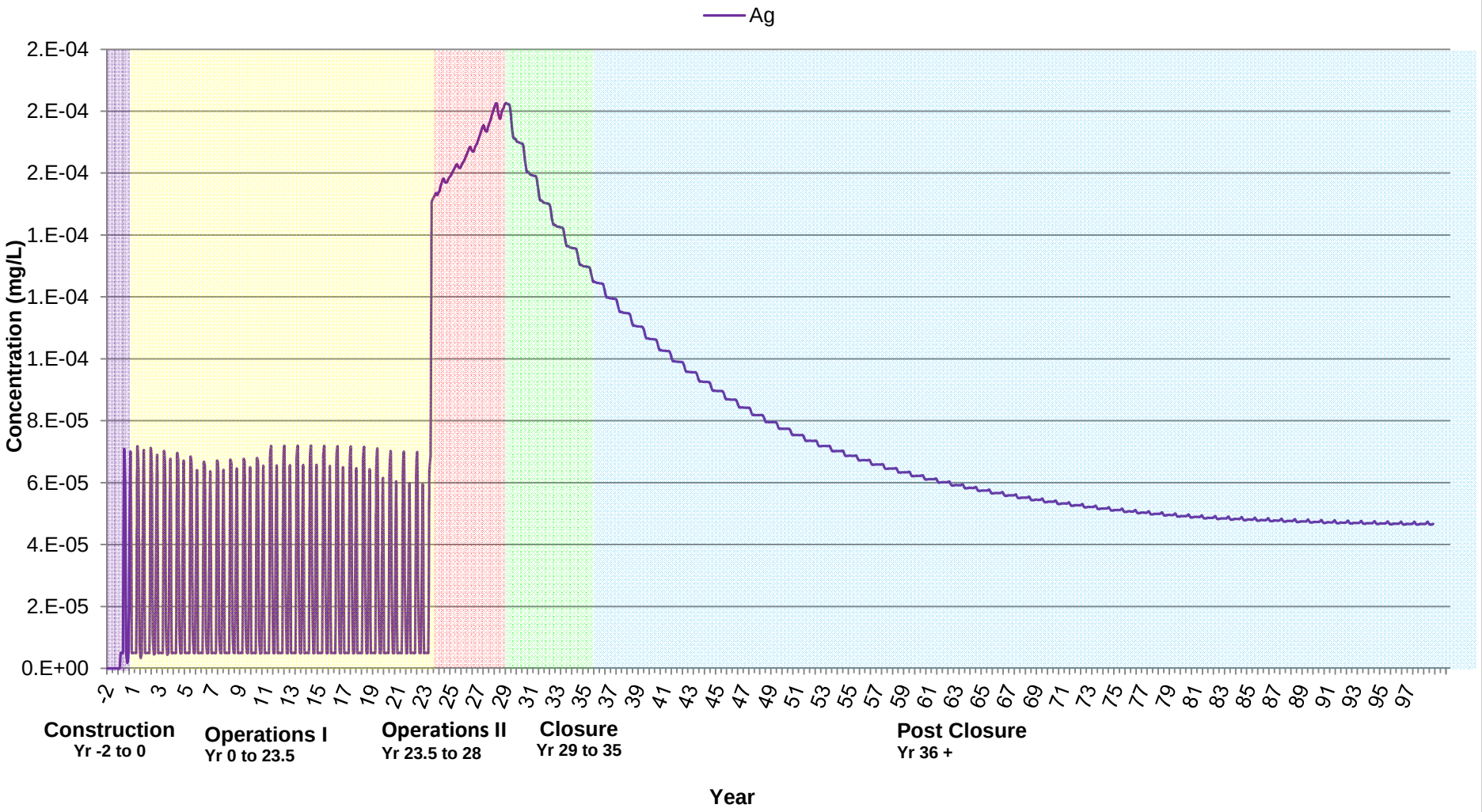
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C2.Ni

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE SILVER CONCENTRATIONS - OPEN PIT

Knight Piésold CONSULTING

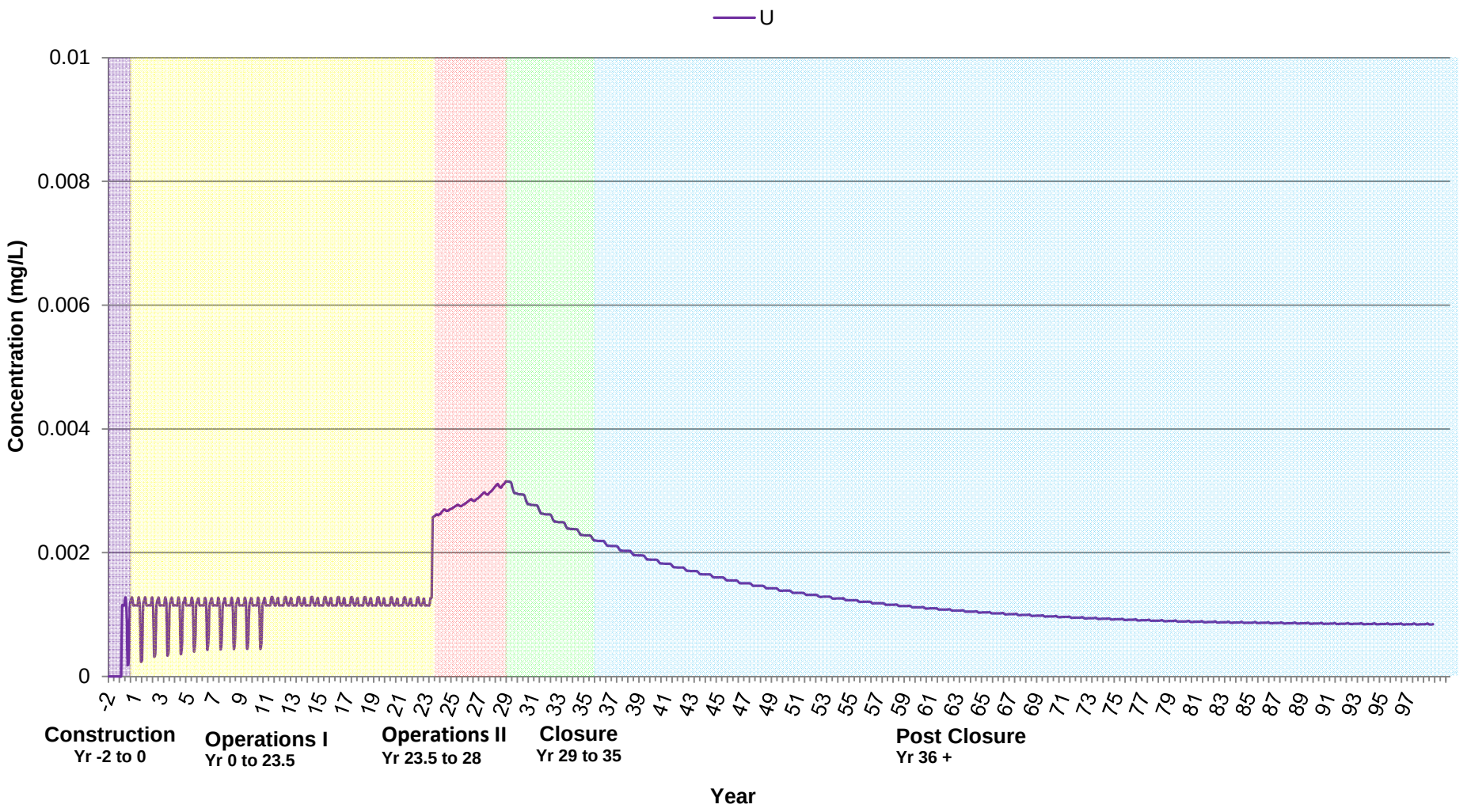
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C2.Ag

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE URANIUM CONCENTRATIONS - OPEN PIT

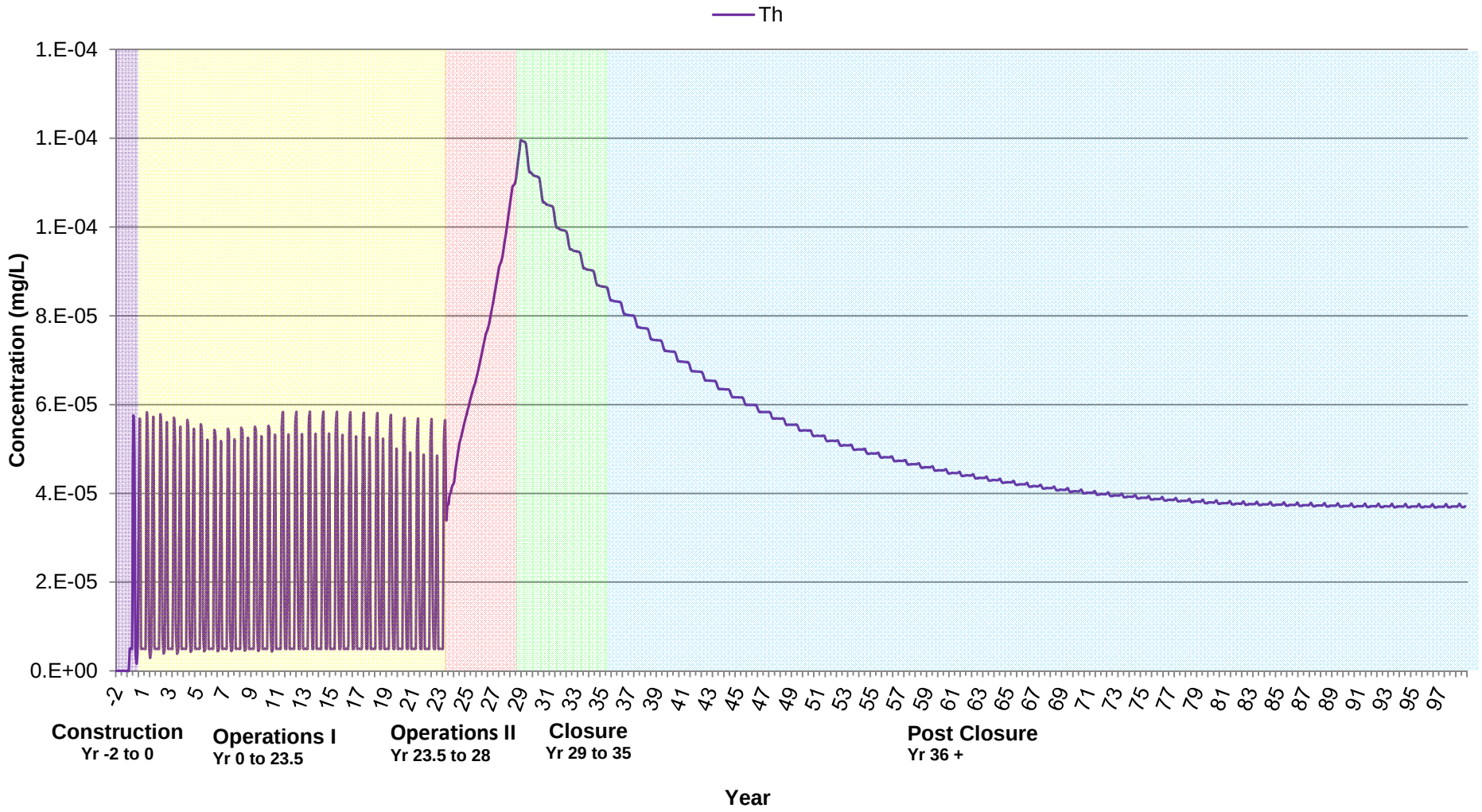
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C2.U

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE THALLIUM CONCENTRATIONS - OPEN PIT

Knight Piésold CONSULTING

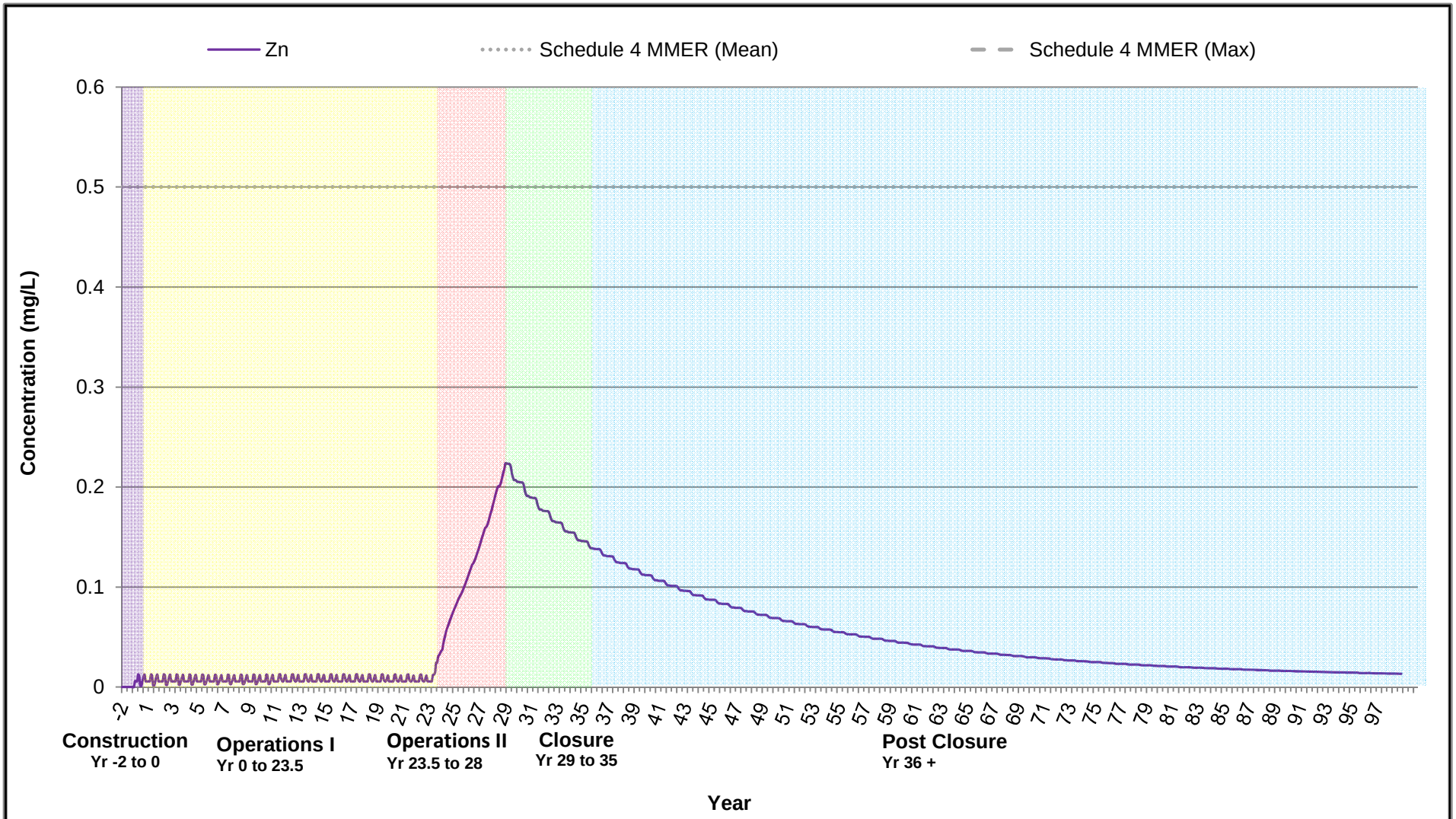
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C2.Th

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.
3. ALL GUIDELINES ARE FIXED VALUES.
4. THE MMER MEAN (0.5 mg/L) AND MMER MAX (1.0 mg/L) ARE NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE ZINC CONCENTRATIONS - OPEN PIT

Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

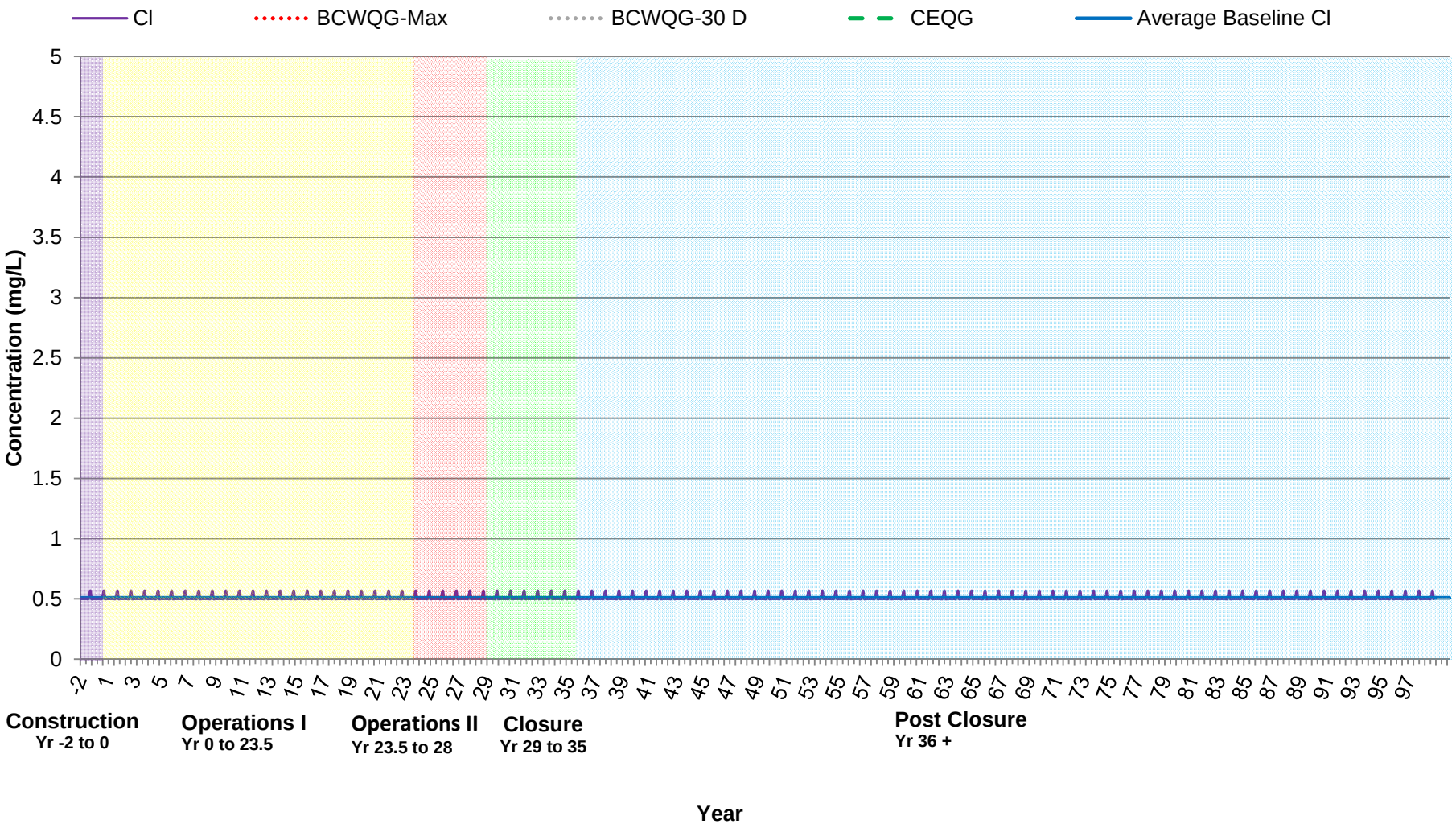
FIGURE C2.Zn

REV 0

APPENDIX C3

P-CREEK

(Pages C3-1 to C3-30)



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. ALL GUIDELINES ARE NOT SHOWN: BCWQG-30 D (150 mg/L); BCWQG-MAX (600 mg/L); CEQG (120 mg/L AND 640 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE CHLORIDE CONCENTRATIONS - P-CREEK

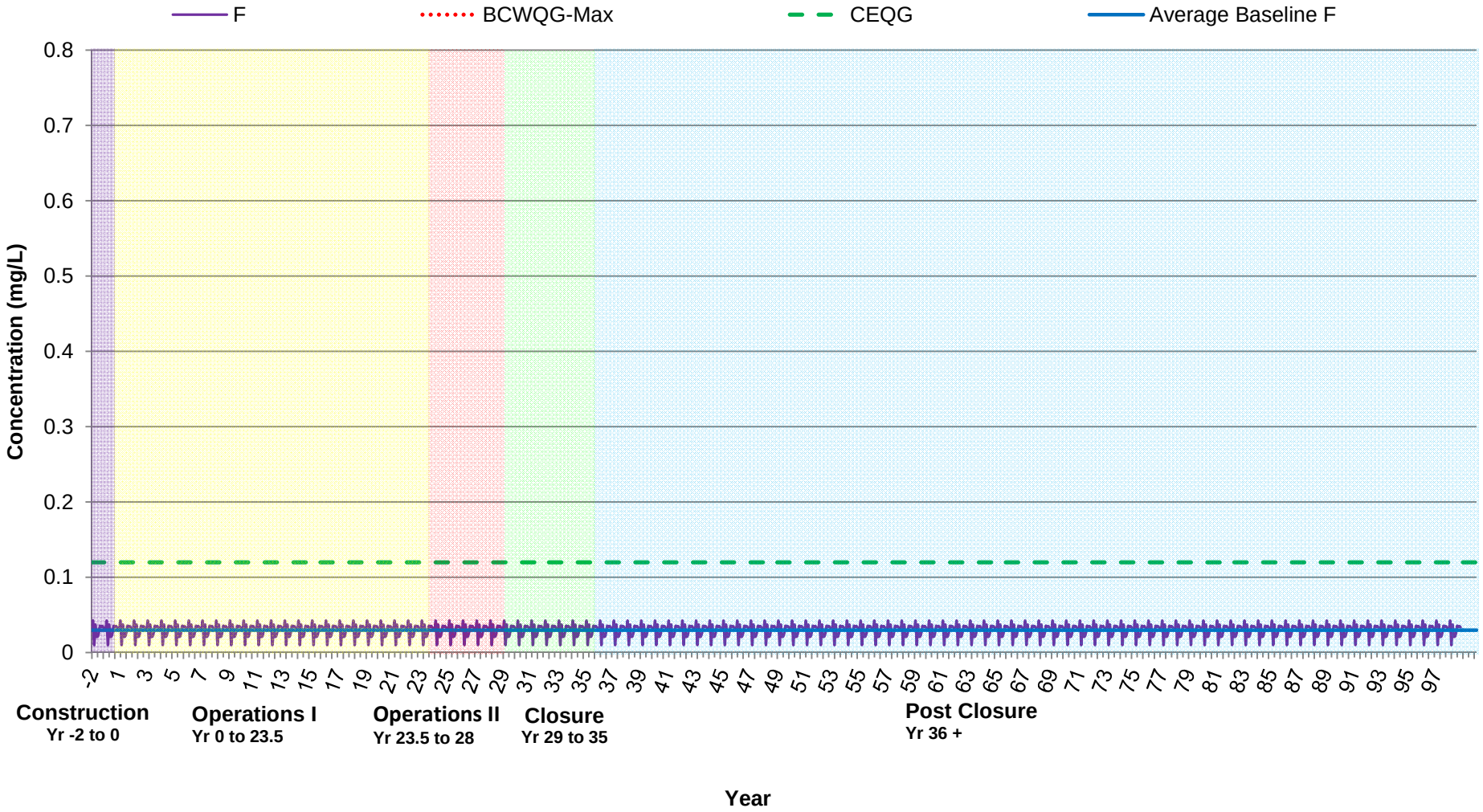
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C3.Cl

REV 0



NOTES:

1. THE BCWQG-MAX IS HARNDESS DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE FLUORIDE CONCENTRATIONS - P-CREEK

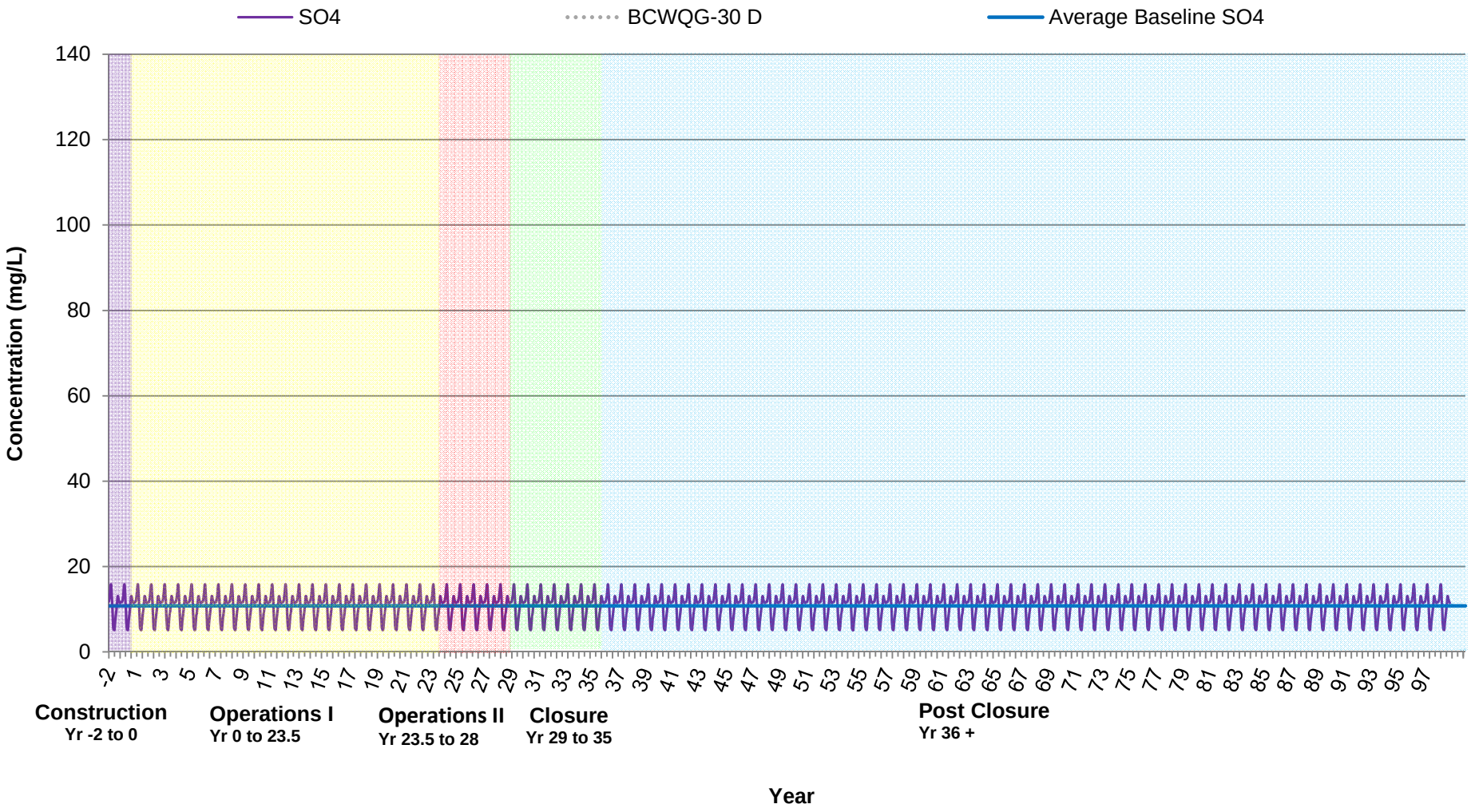
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C3.F

REV 0



NOTES:

1. BCWQG-30 D IS HARDNESS DEPEDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE SULPHATE CONCENTRATIONS - P-CREEK

Knight Piésold CONSULTING

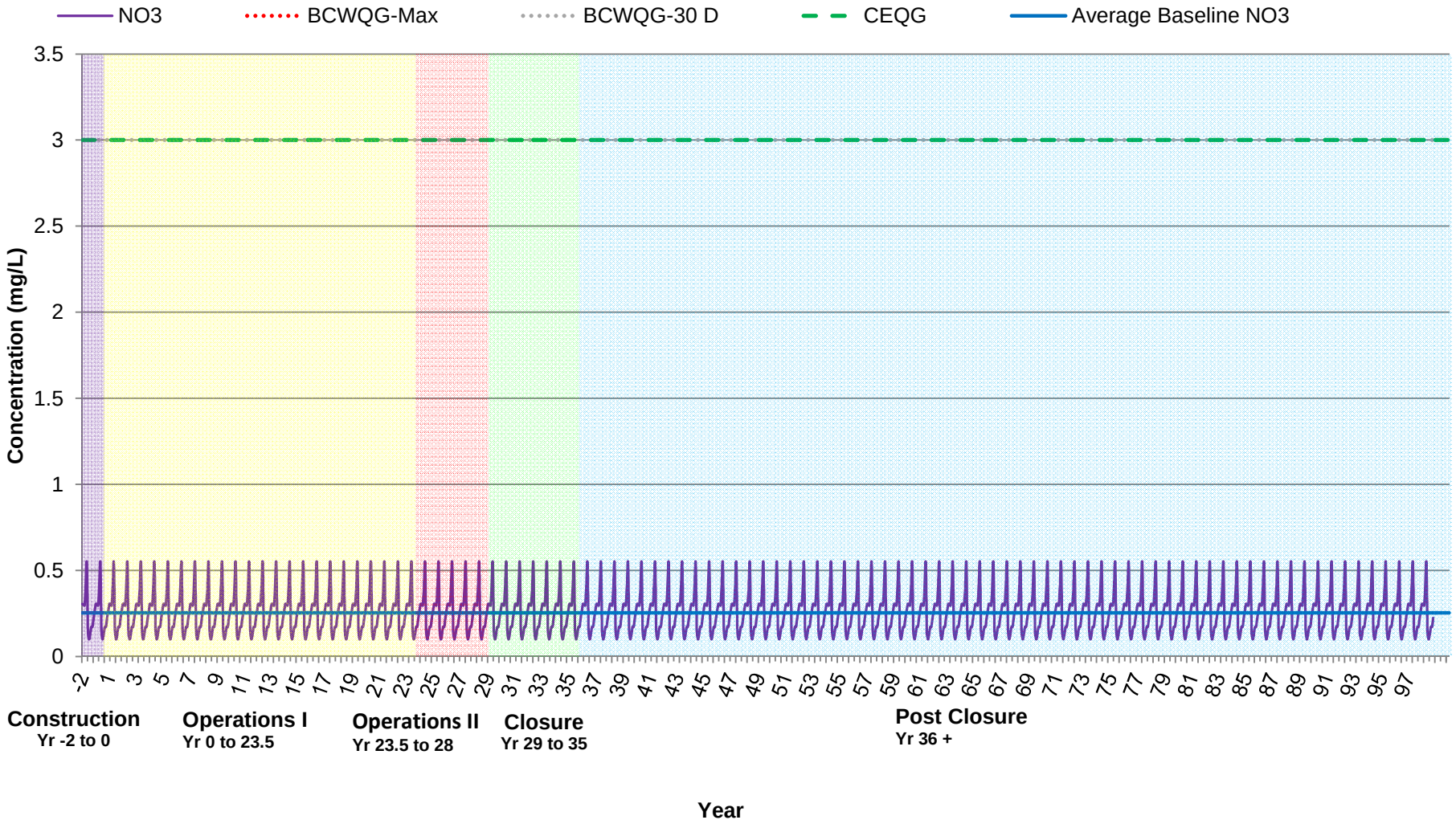
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C3.S04

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. THE BCWQG-MAX (32.8 mg/L) IS NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE NITRATE CONCENTRATIONS - P-CREEK

Knight Piésold CONSULTING

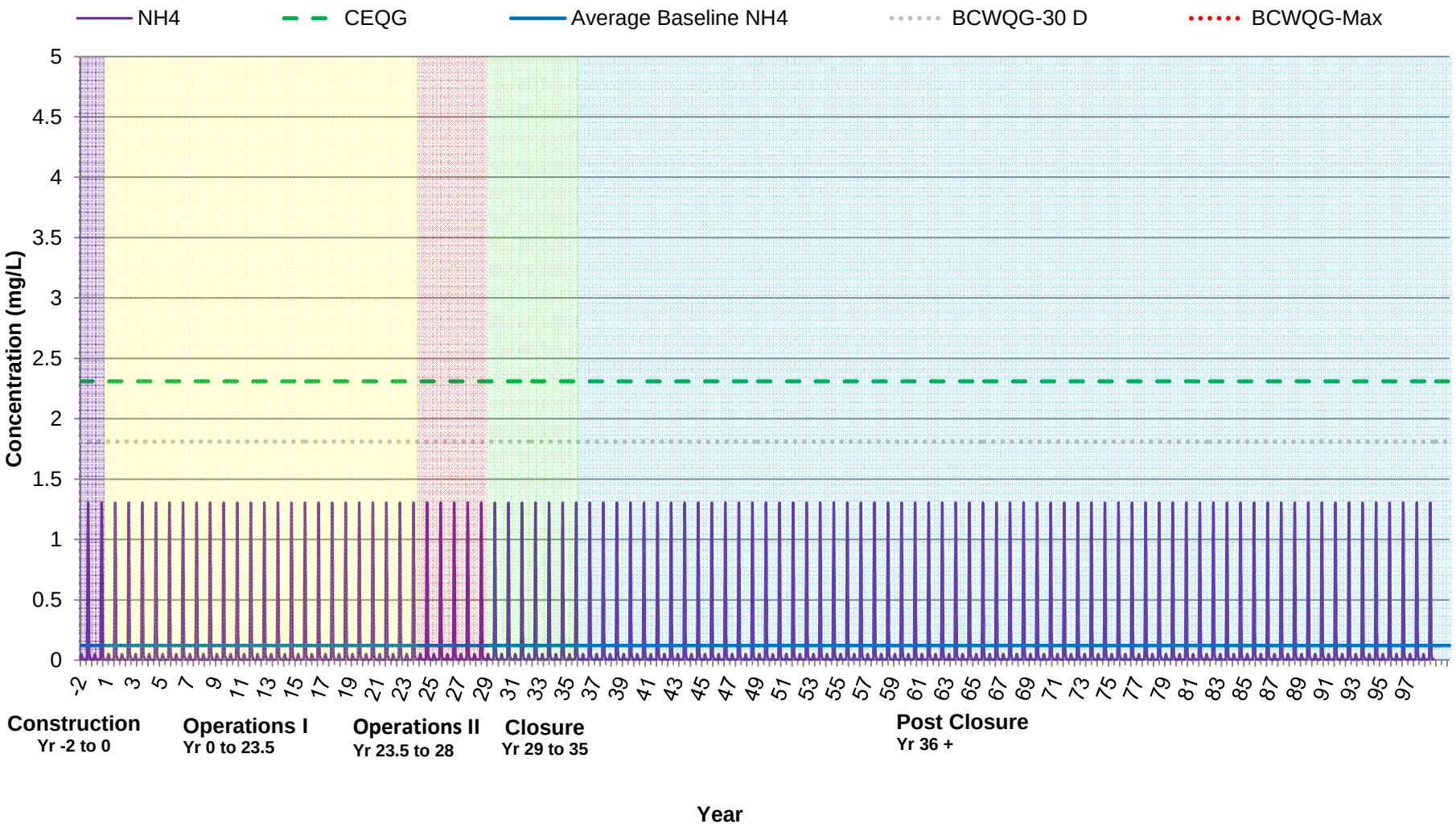
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C3.NO3

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-30 D IS VALID FOR ONLY 6.5≤pH<9 AND 0°C≤T≤20°C.
2. THE BCWQG-MAX (20.15 mg/L) VALID FOR 6.5≤pH<9 IS NOT SHOWN.
3. THE CEQG IS TO BE USED WITH CAUTION FOR WATER WITH T<5°C AND pH>9.
4. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE AMMONIA CONCENTRATIONS - P-CREEK

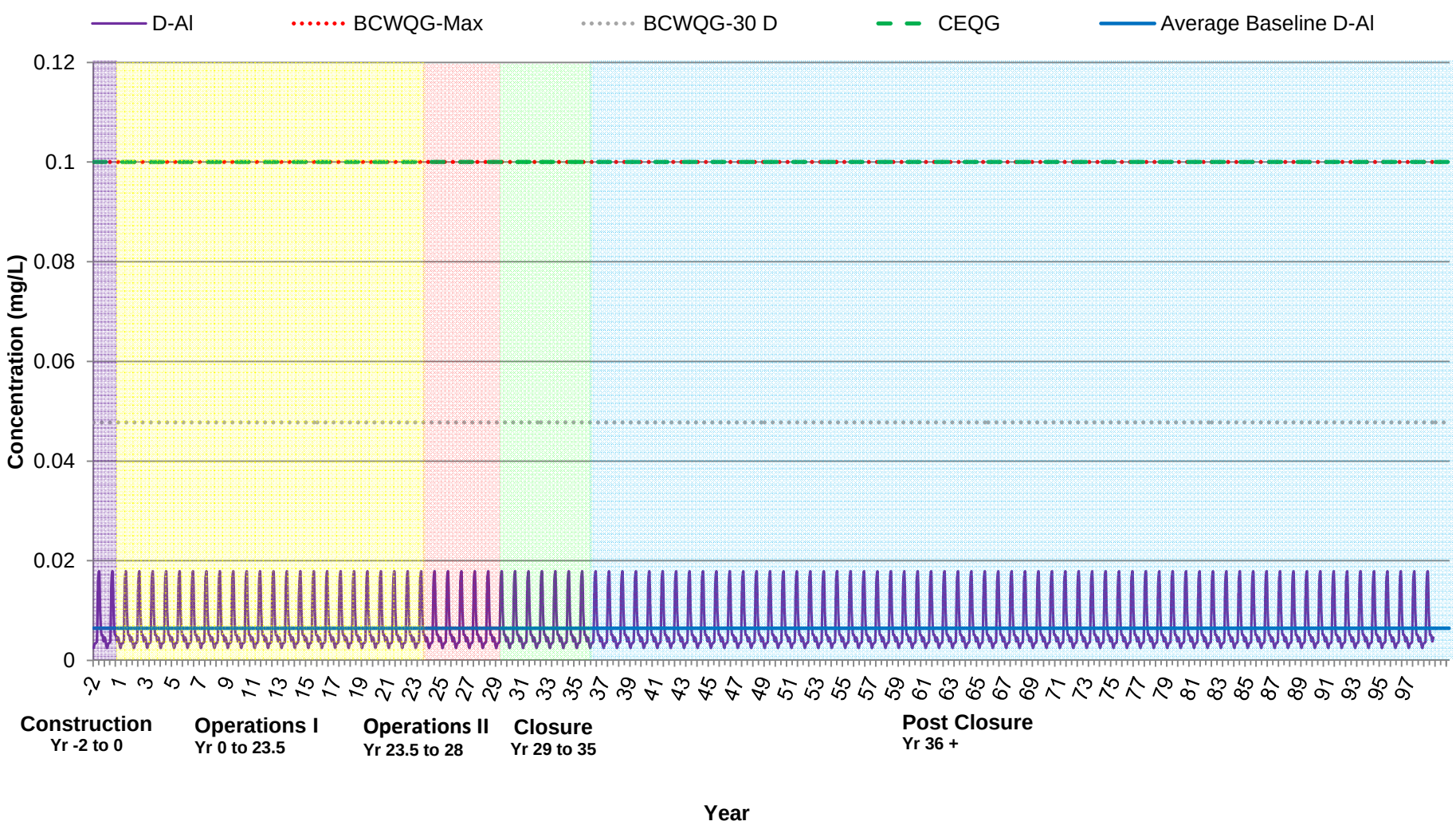
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C3.NH4

REV 0



NOTES:

1. ALL GUIDELINES ARE pH-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. AVERAGE BASELINE pH USED TO CALCULATE GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE DISSOLVED ALUMINUM CONCENTRATIONS - P-CREEK

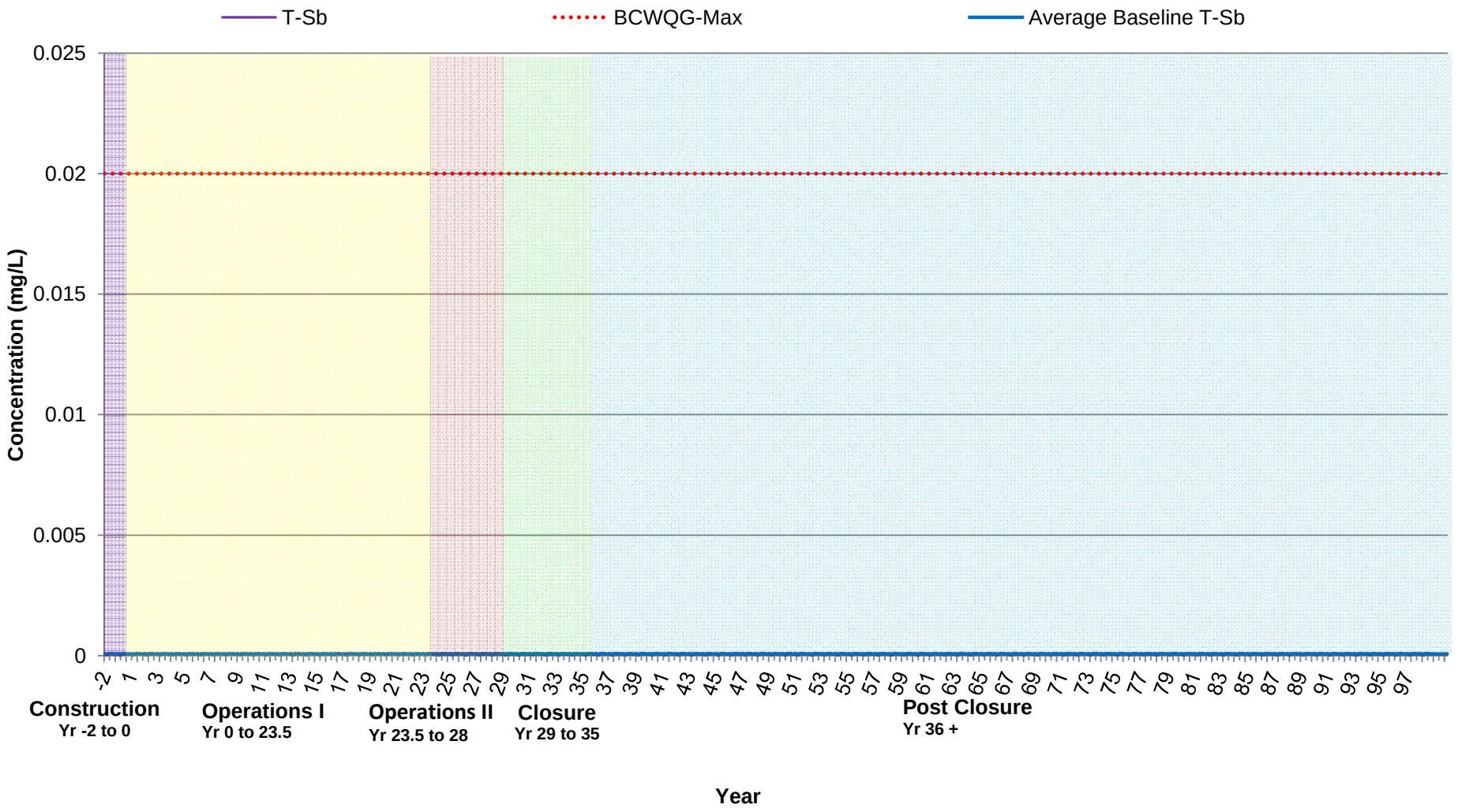
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C3.Al

REV 0



NOTES:

1. THE BCWQG IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE ANTIMONY CONCENTRATIONS - P-CREEK

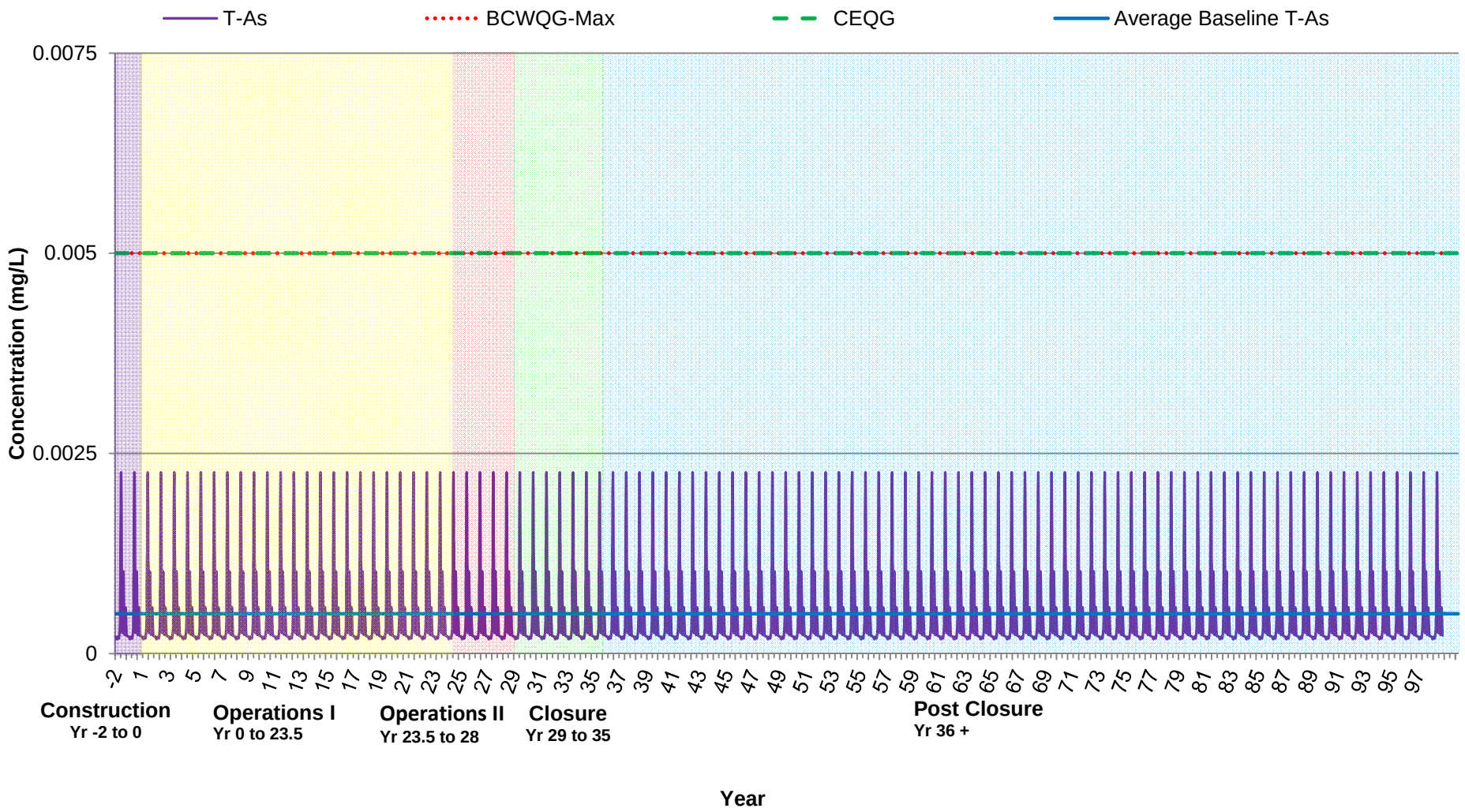
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C3.Sb

REV 0



NOTES:

1. THE BCWQG AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE ARSENIC CONCENTRATIONS - P-CREEK

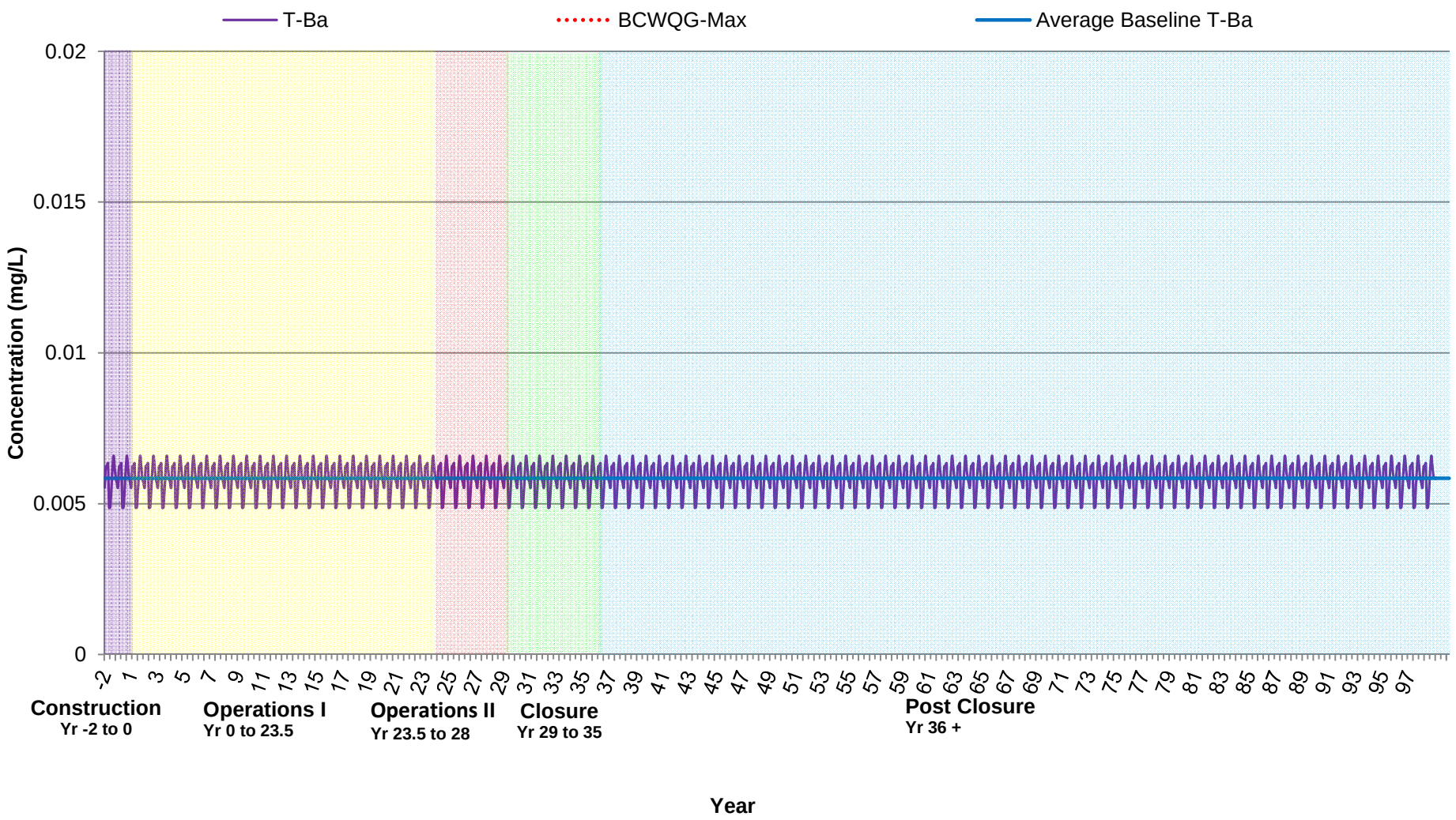
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C3.As

REV 0



NOTES:

1. THE BCWQG-MAX IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. THE BCWQG-30 D (1 mg/L) AND BCWQG-MAX (5 mg/L) ARE NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE BARIUM CONCENTRATIONS - P-CREEK

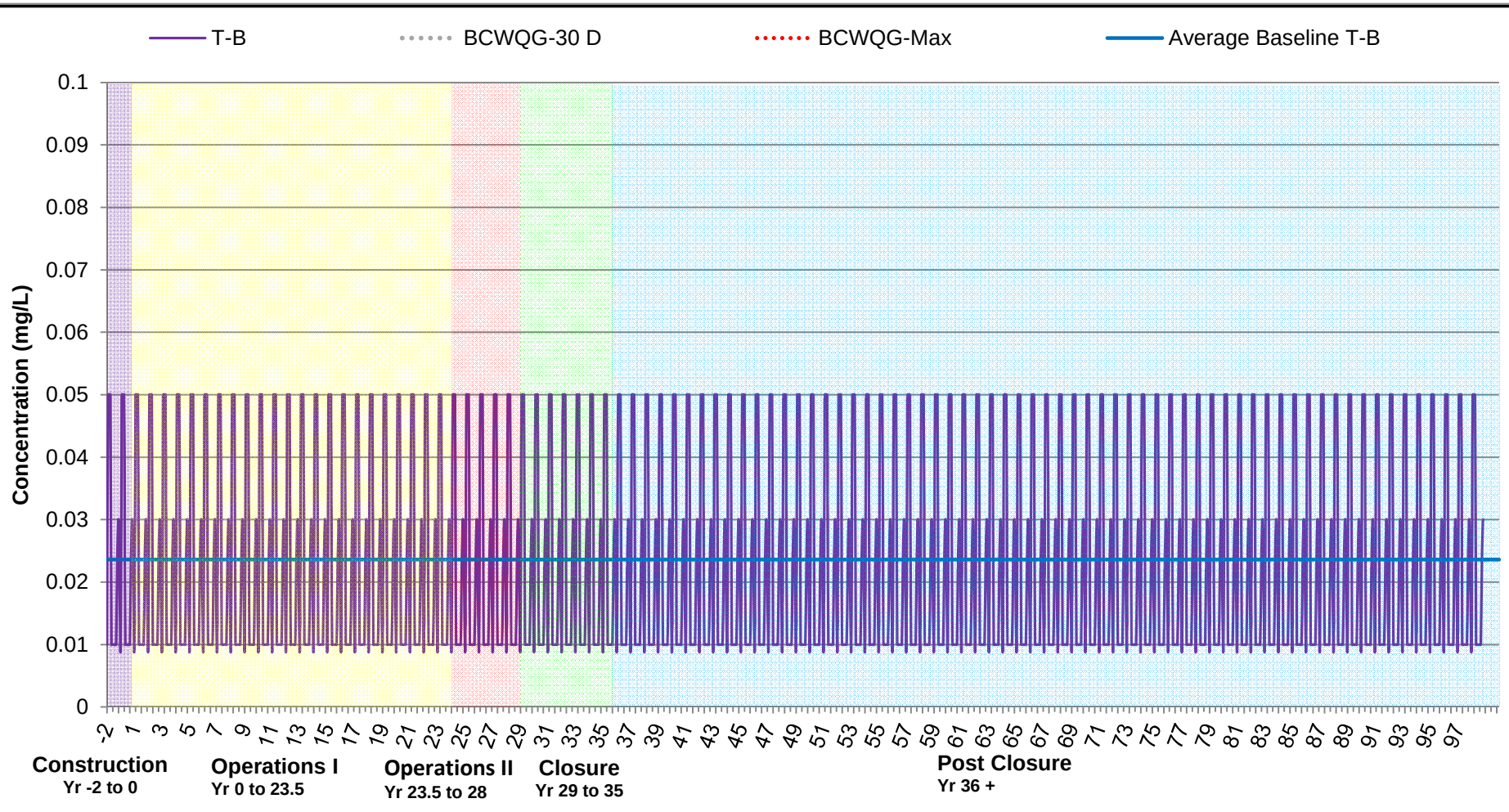
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C3.Ba

REV 0



NOTES:

1. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.
3. THE BCWQG-MAX (1.2 mg/L) IS NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE BORON CONCENTRATIONS - P-CREEK

Knight Piésold CONSULTING

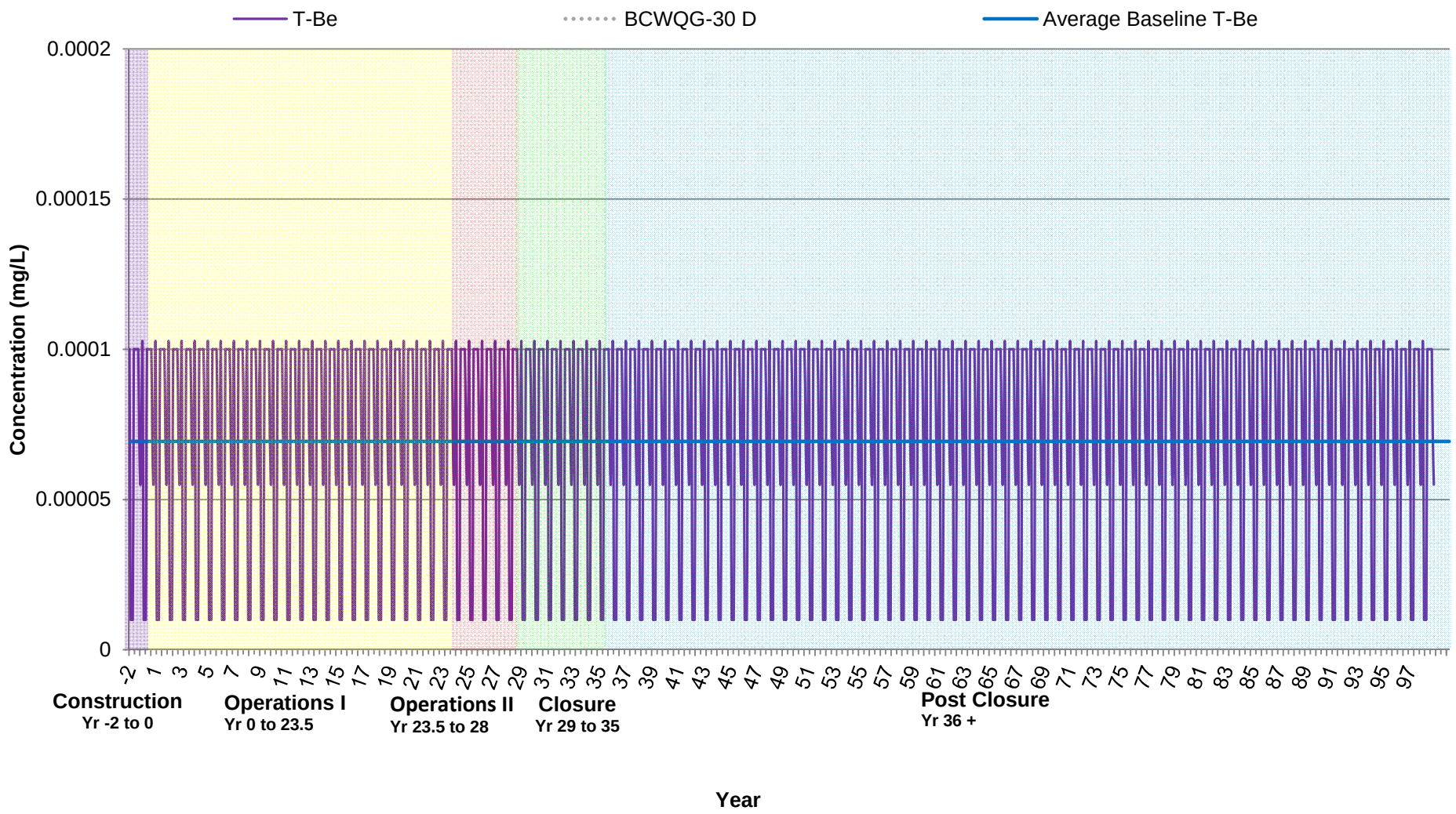
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C3.B

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. THE BCWQG-30 D (0.0053 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE BERYILLIUM CONCENTRATIONS - P-CREEK

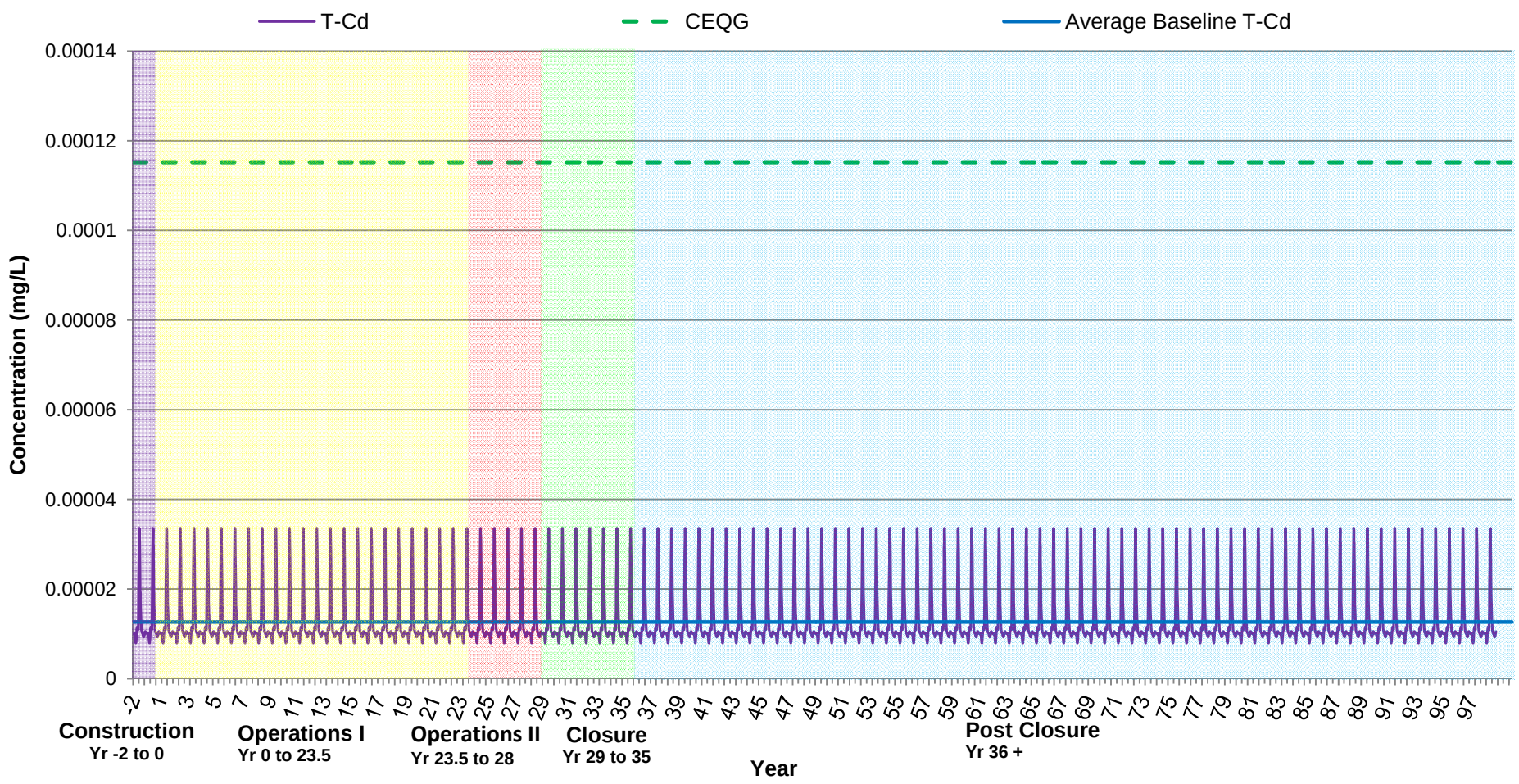
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C3.Be

REV 0



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. THE BCWQG ARE DRAFT GUIDELINES UNDER REVIEW (JUNE 2014).
3. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
4. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE CADMIUM CONCENTRATIONS - P-CREEK

Knight Piésold CONSULTING

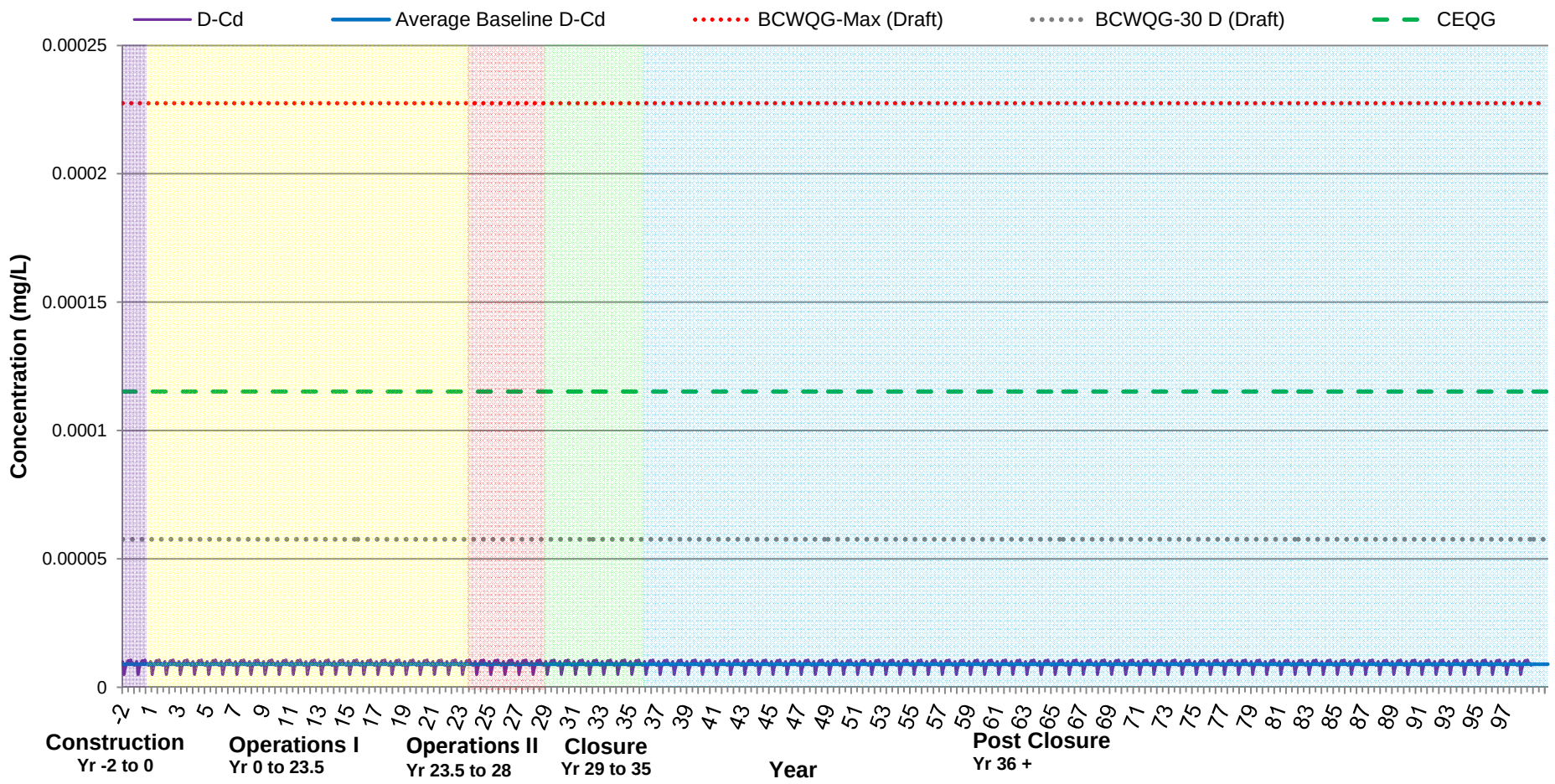
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C3.Cd-T

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE CADMIUM CONCENTRATIONS - P-CREEK

Knight Piésold CONSULTING

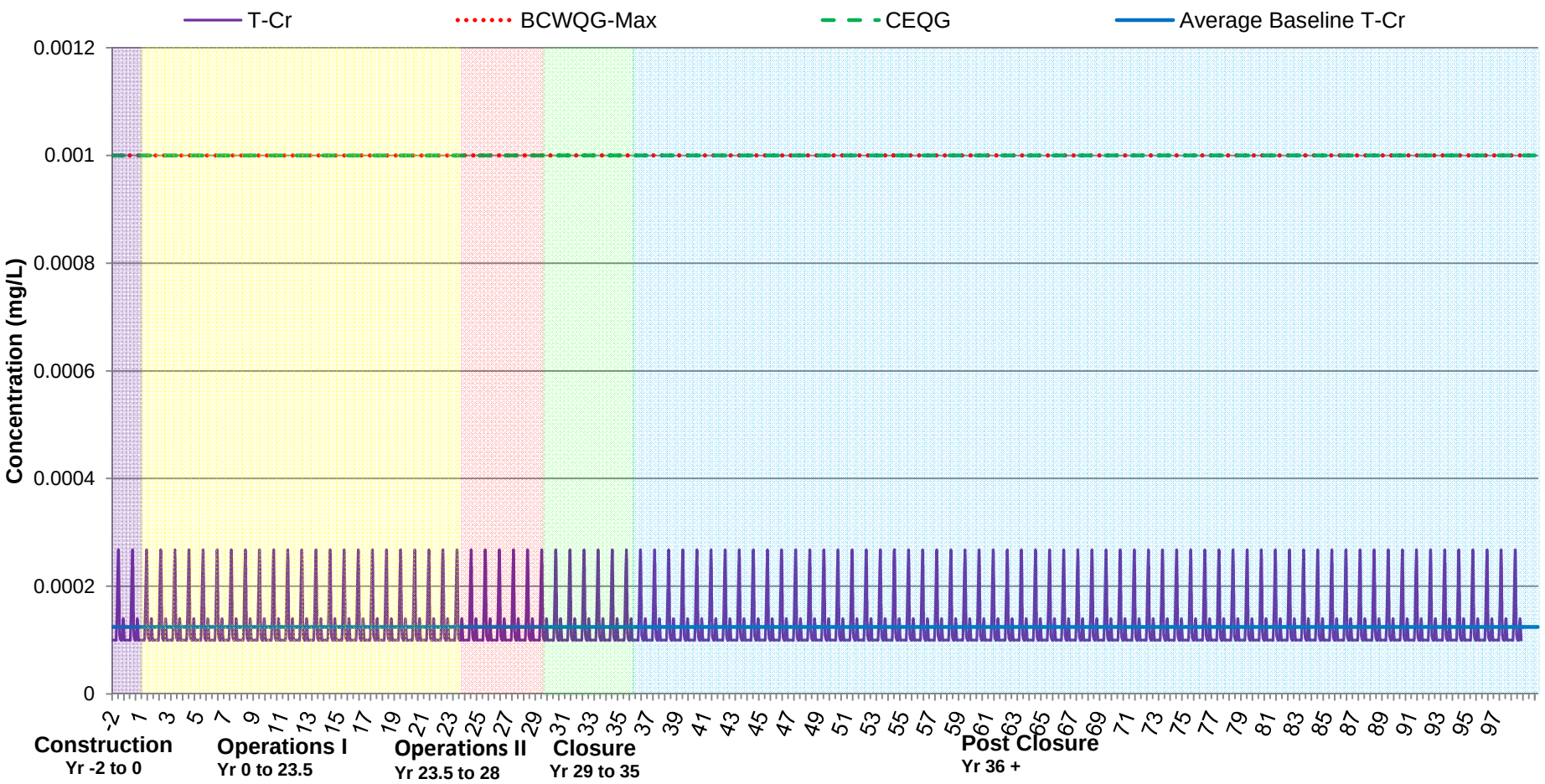
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C3.Cd-D

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. GUIDELINES ARE FOR CHROMIUM (IV), THE SPECIES MOST COMMON IN WELL OXYGENATED SURFACE WATERS.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE CHROMIUM CONCENTRATIONS - P-CREEK

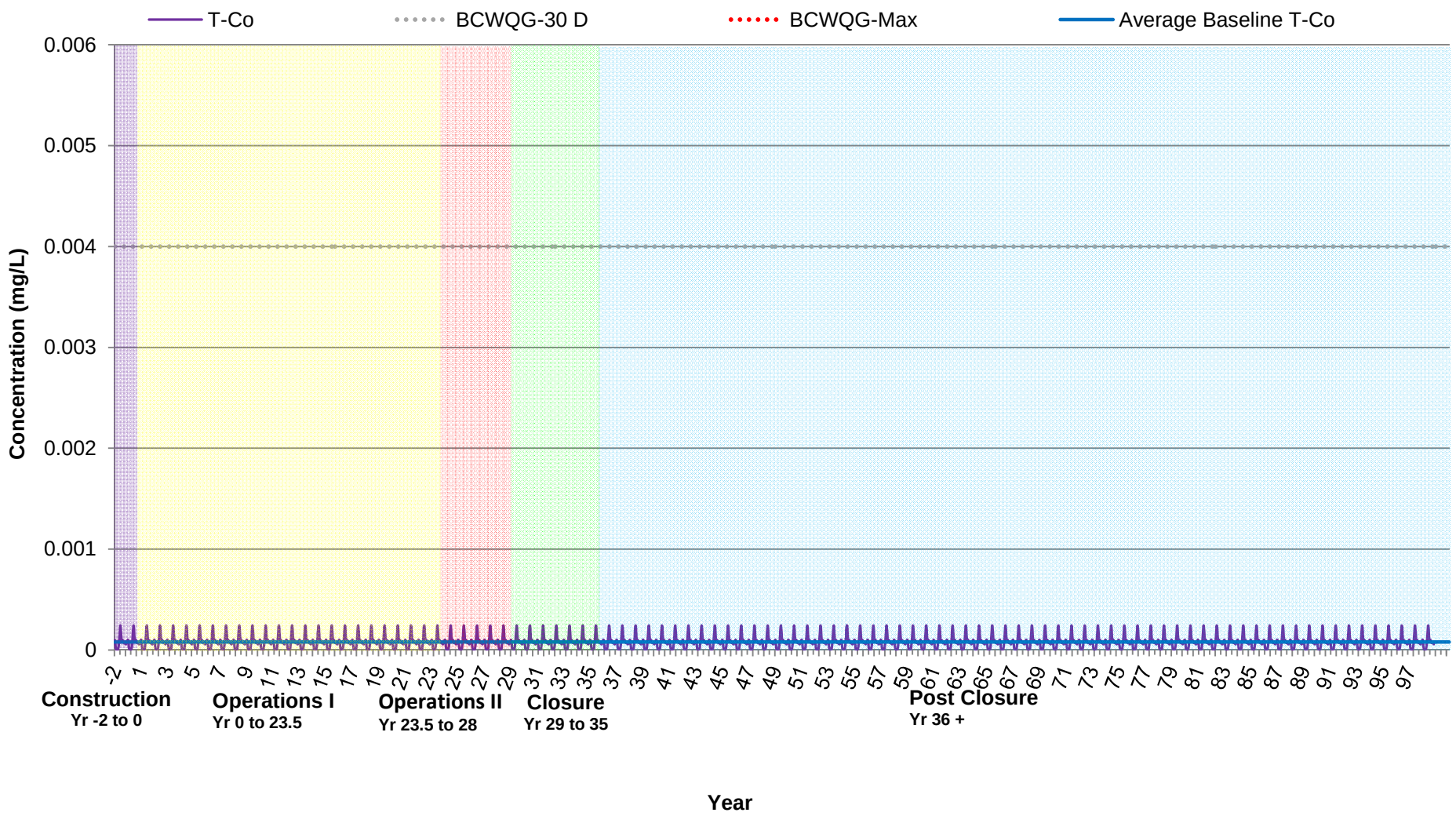
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C3.Cr

REV 0



NOTES:

1. THE BCWQG-30 D AND BCWQG-MAX ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. THE BCWQG-MAX GUIDELINE (0.11 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE COBALT CONCENTRATIONS - P-CREEK

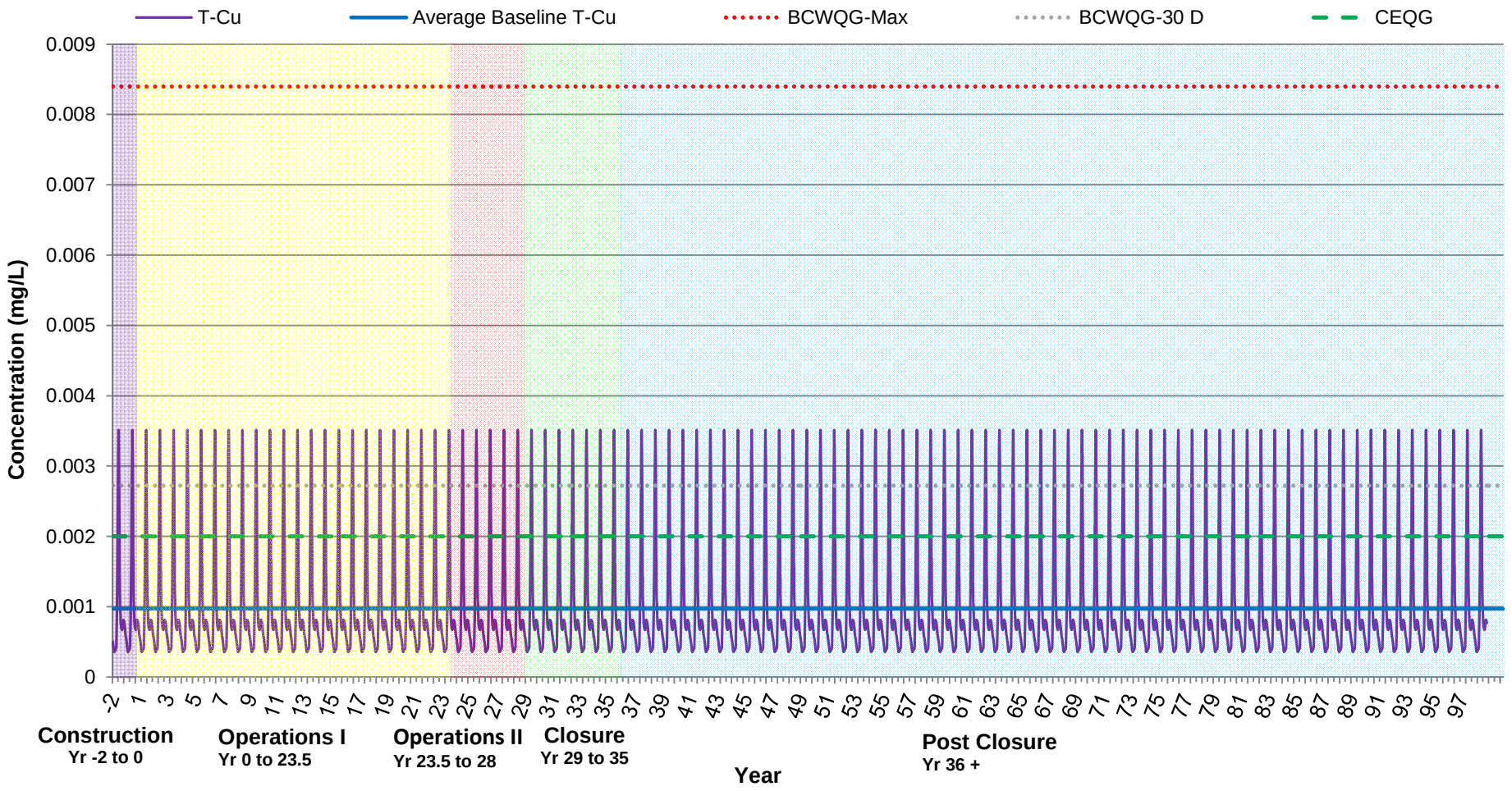
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C3.Co

REV 0



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE COPPER CONCENTRATIONS - P-CREEK

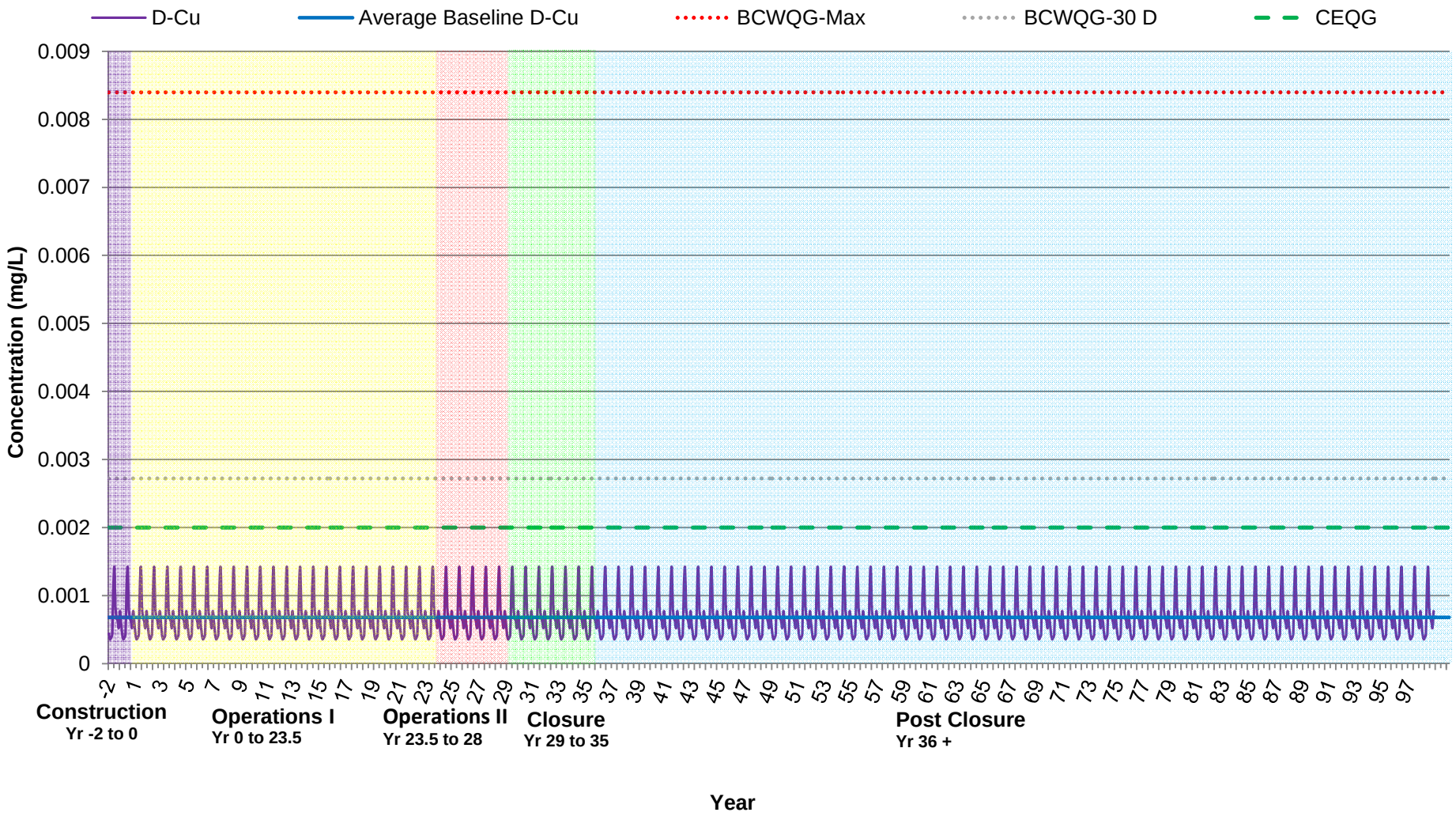
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C3.Cu-T

REV 0



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE COPPER CONCENTRATIONS - P-CREEK

Knight Piésold CONSULTING

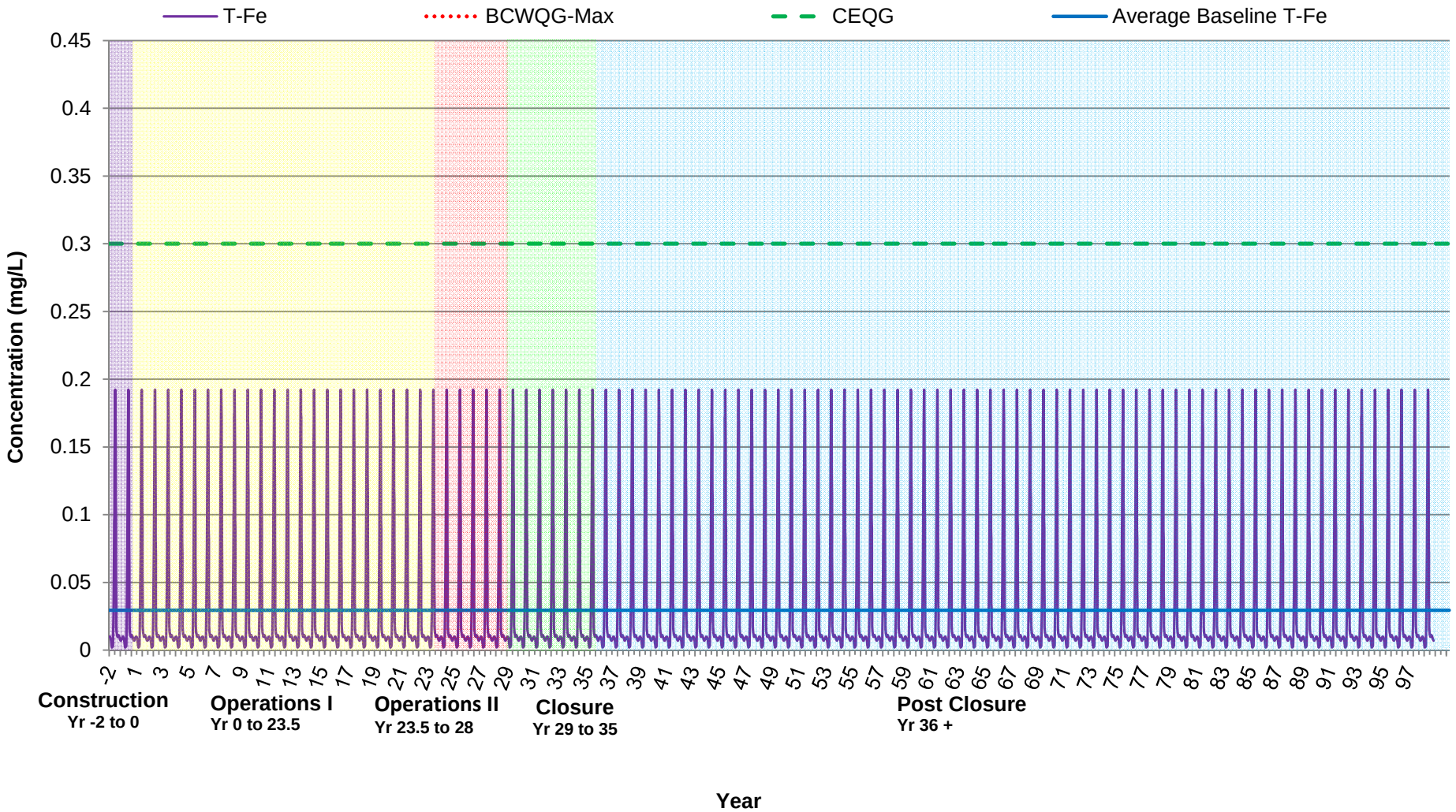
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C3.Cu-D

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. BCWQG-MAX 1.0 mg/L IS NOT SHOWN ON GRAPH.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE TOTAL IRON CONCENTRATIONS - P-CREEK

Knight Piésold CONSULTING

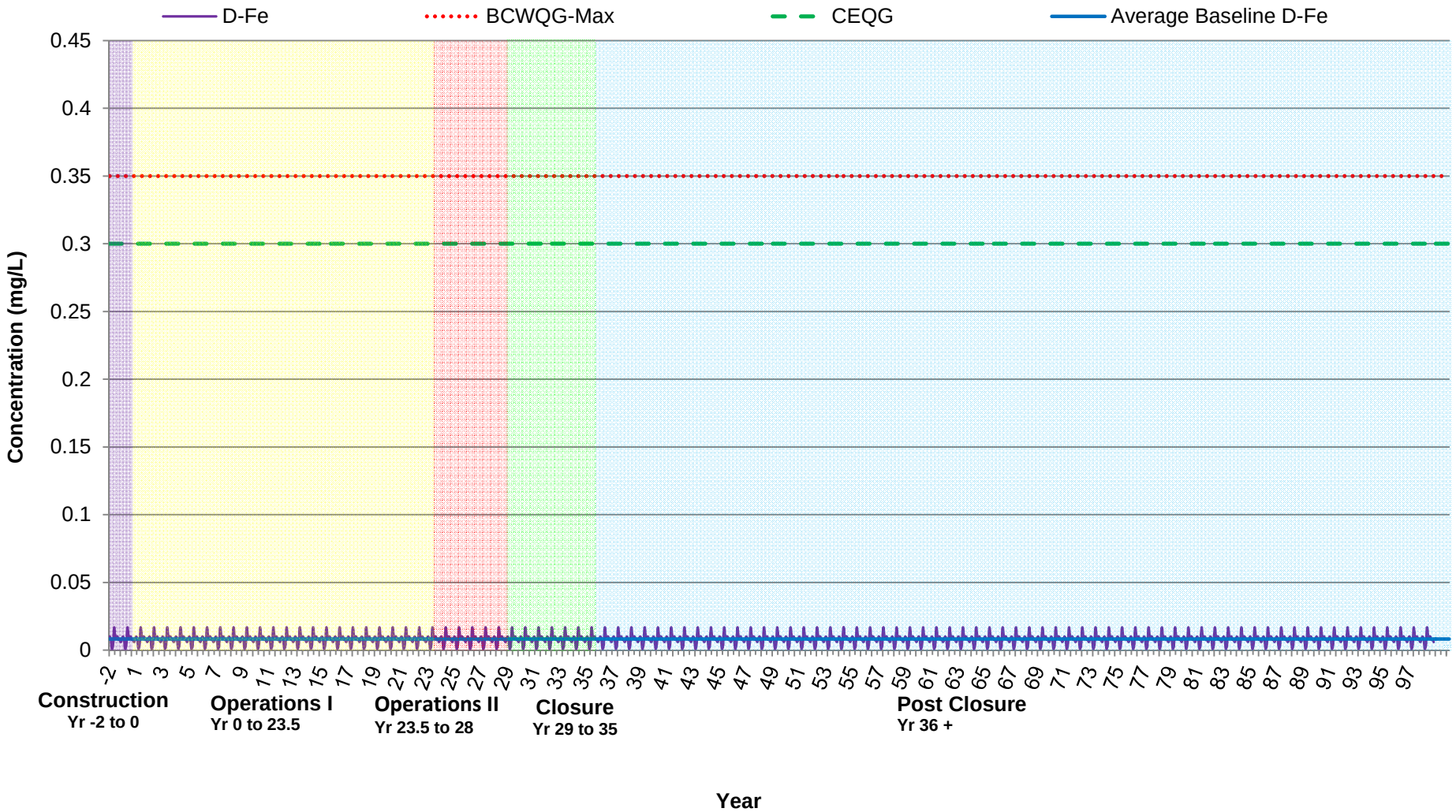
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C3.Fe-T

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE DISSOLVED IRON CONCENTRATIONS - P-CREEK

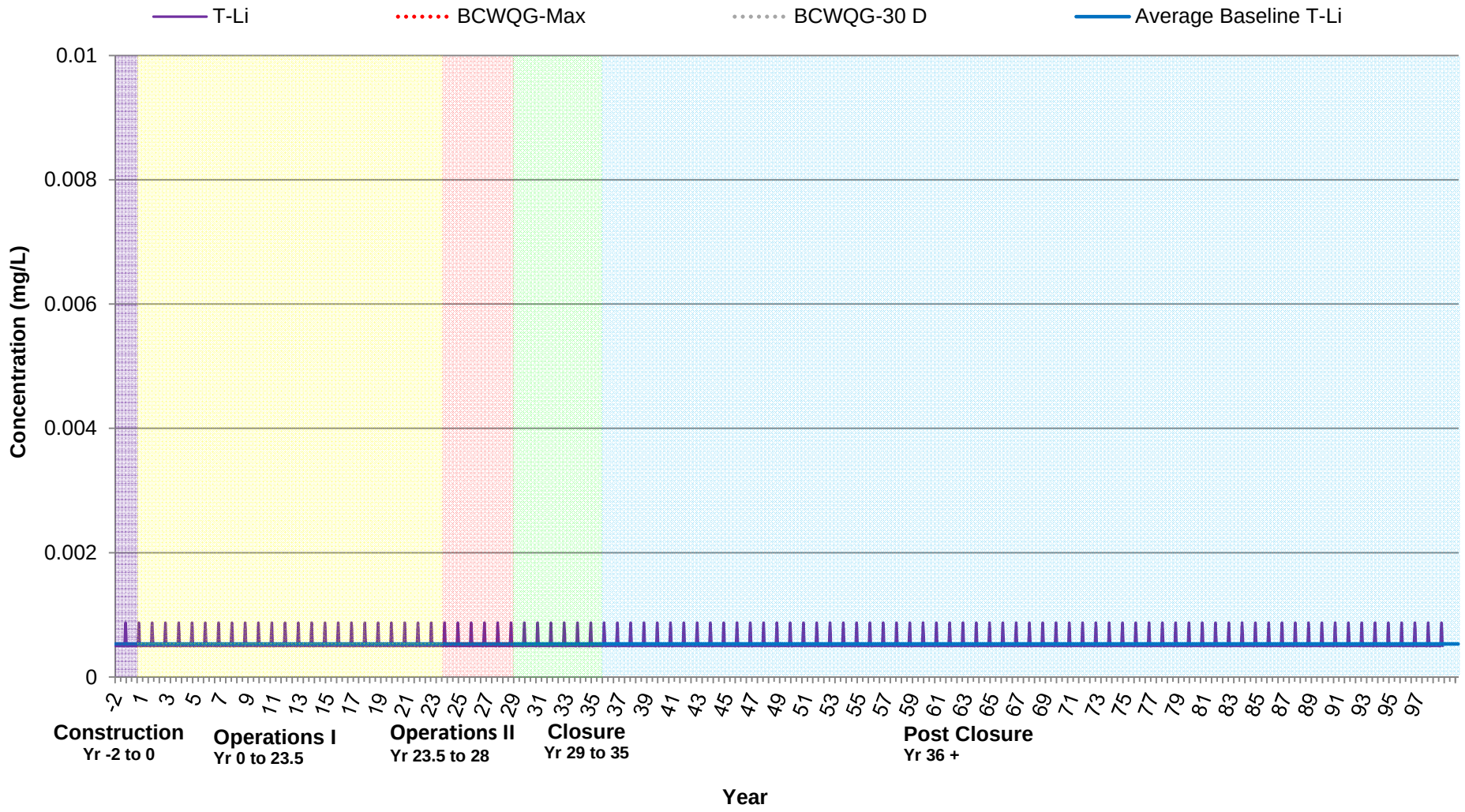
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C3.Fe-D

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. THE BCWQG-30 D (0.096 mg/L) AND BCWQG-MAX (0.87 mg/L) ARE INTERIM (WORKING) AND ARE NOT SHOWN ON GRAPH.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE LITHIUM CONCENTRATIONS - P-CREEK

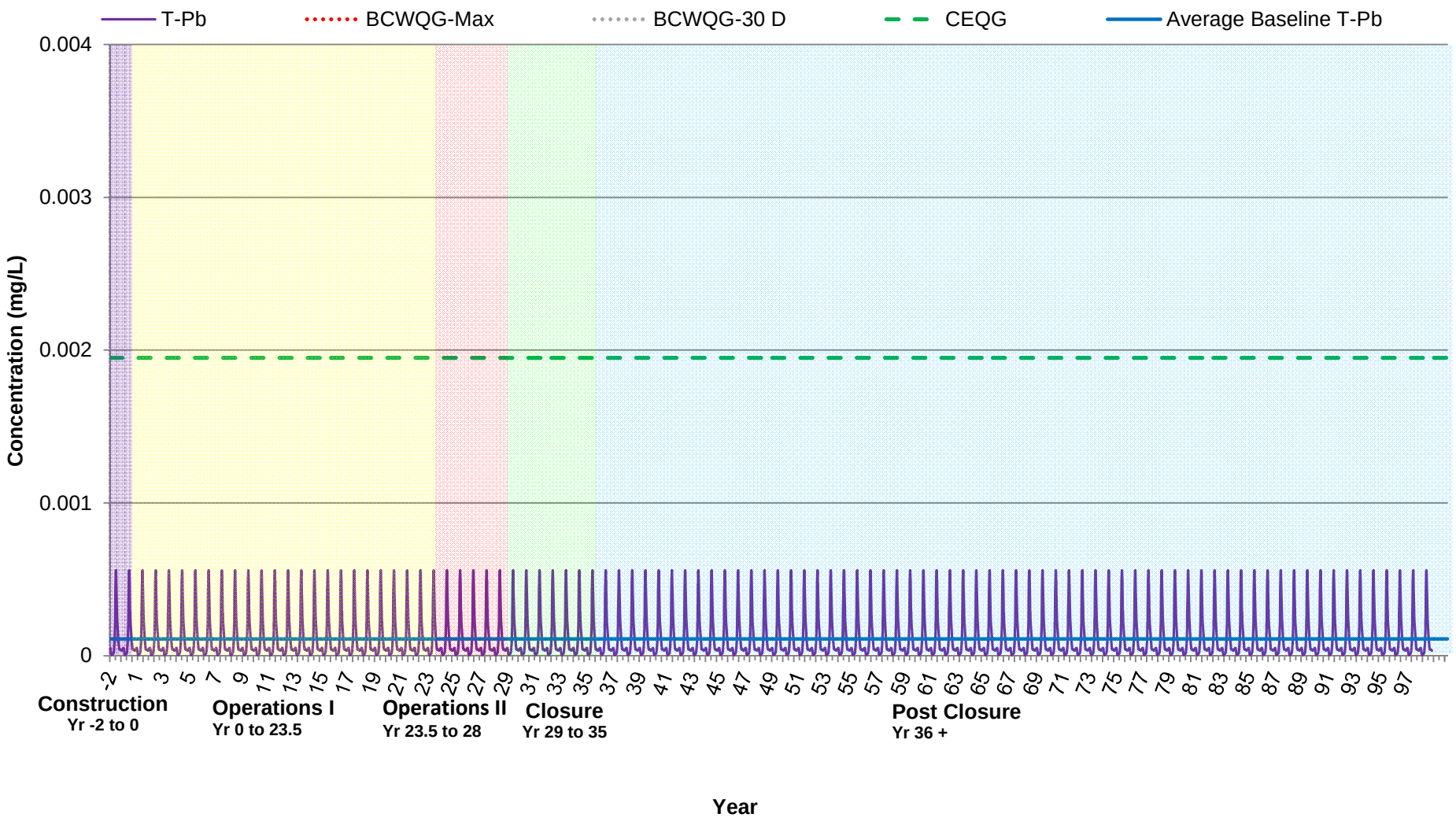
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C3.Li

REV 0



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.
4. THE BCWQG-MAX (CALCULATED AT 0.011 mg/L) IS NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE LEAD CONCENTRATIONS - P-CREEK

Knight Piésold CONSULTING

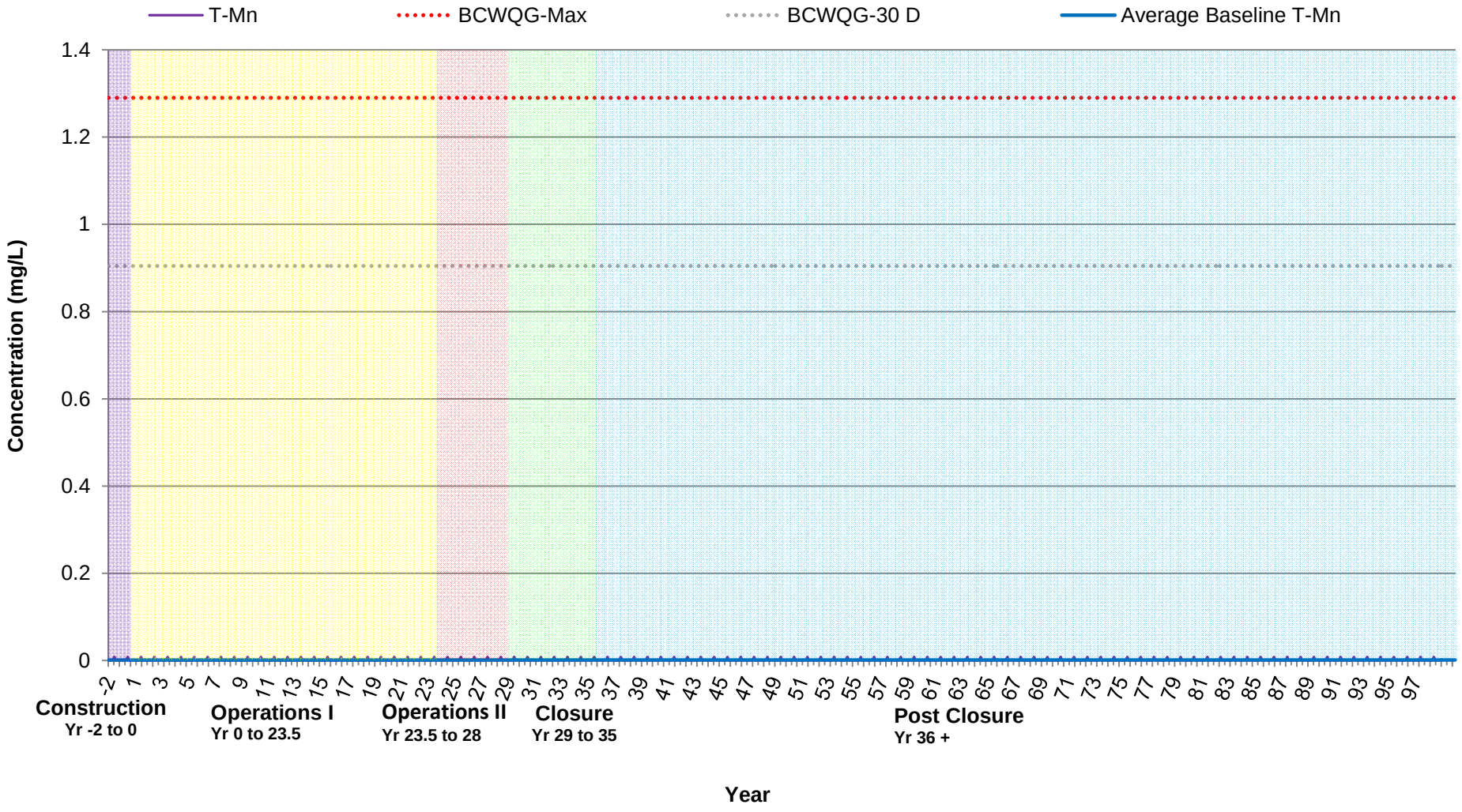
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C3.Pb

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE MANGANESE CONCENTRATIONS - P-CREEK

Knight Piésold CONSULTING

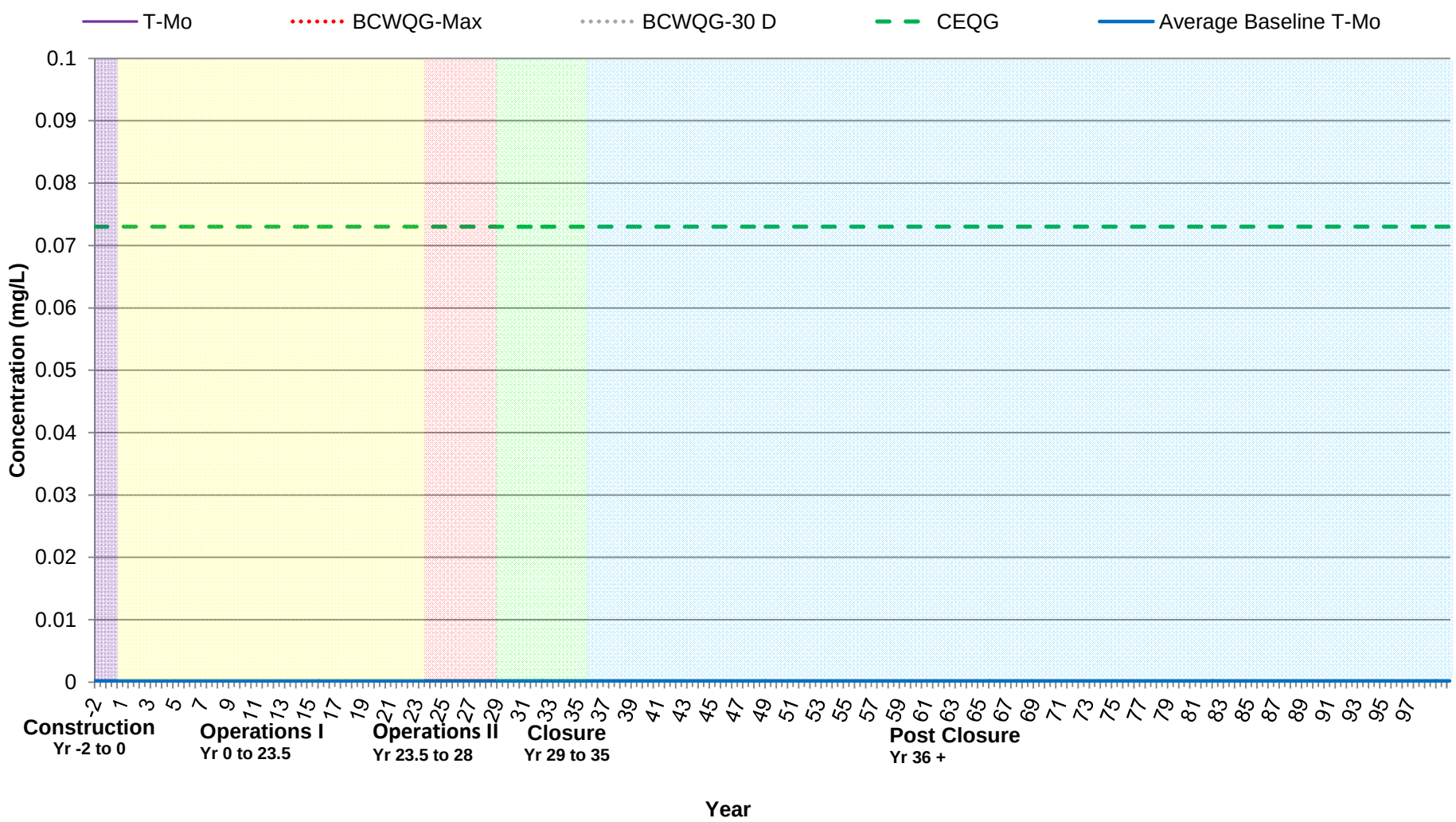
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C3.Mn

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. THE BCWQG-MAX (2 mg/L) AND BCWQG-30 D (1 mg/L) ARE NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE MOLYDBENUM CONCENTRATIONS - P-CREEK

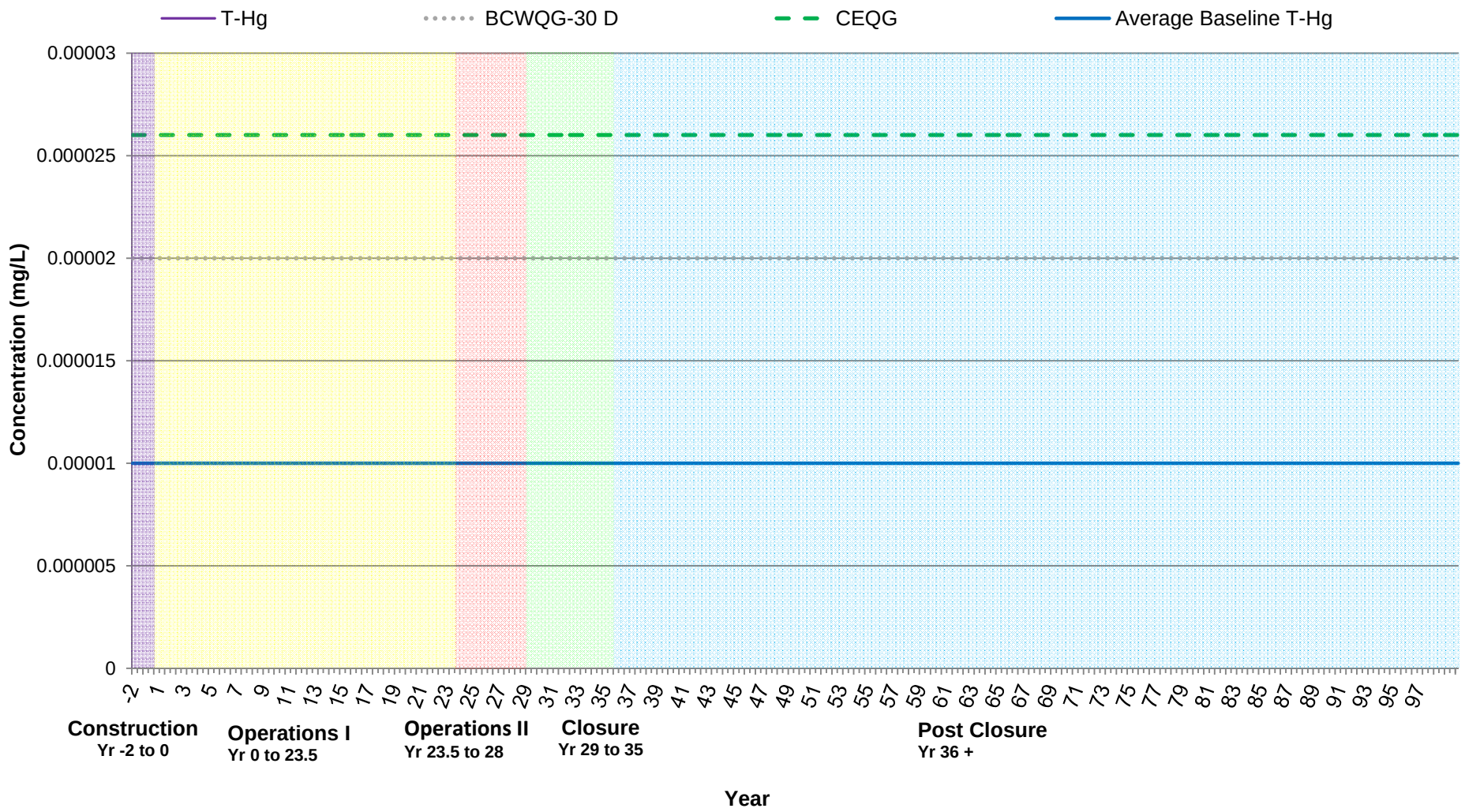
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C3.Mo

REV 0



NOTES:

1. THE BCWQG-30 D AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. BCWQG-30 D VALUE APPLIED ON ASSUMPTION THAT METHYL-Hg IS EQUAL TO 0.5% OF T-Hg.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE MERCURY CONCENTRATIONS - P-CREEK

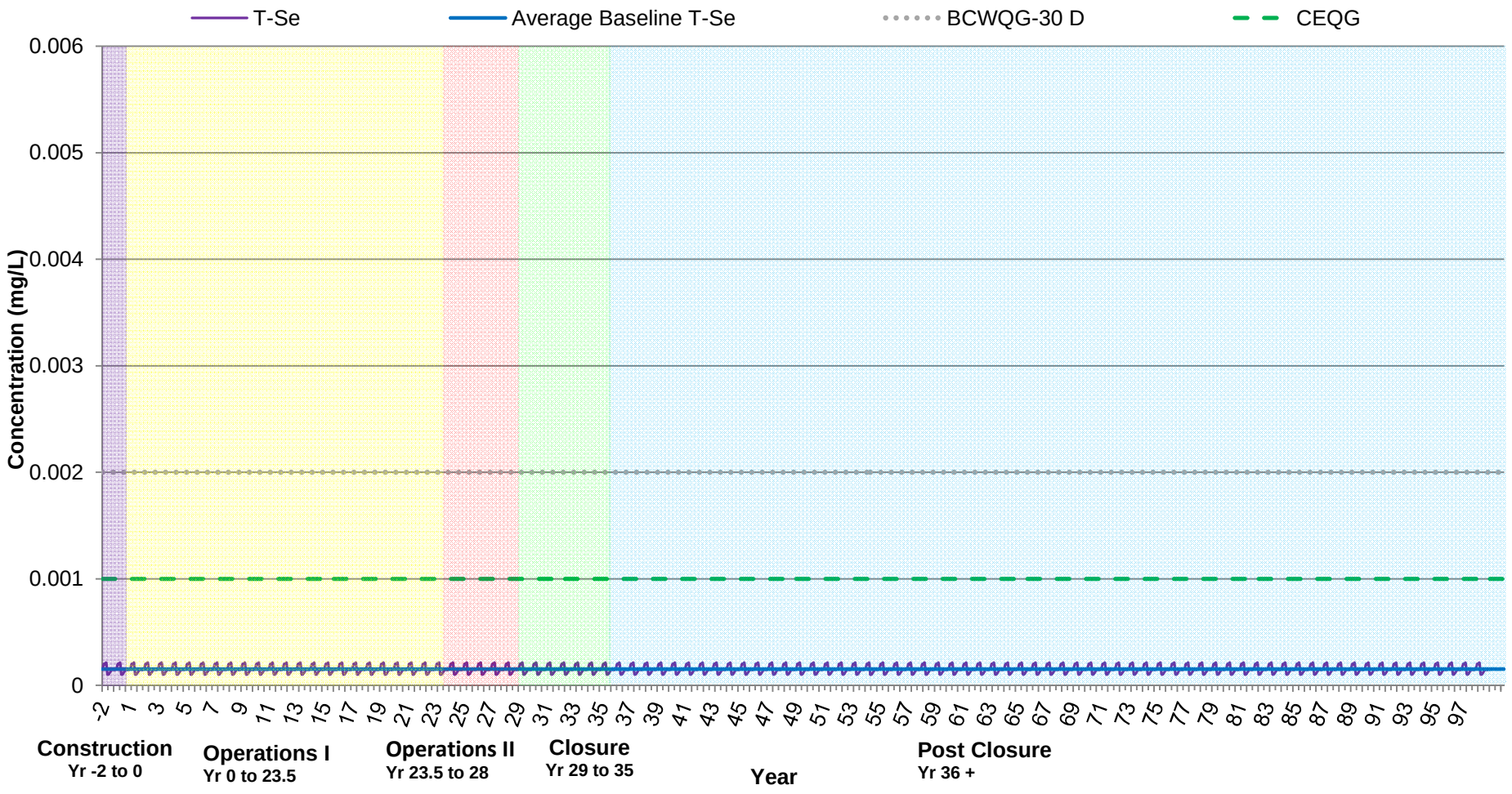
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C3.Hg

REV 0



NOTES:

1. THE BCWQG-30 D AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE SELENIUM CONCENTRATIONS - P-CREEK

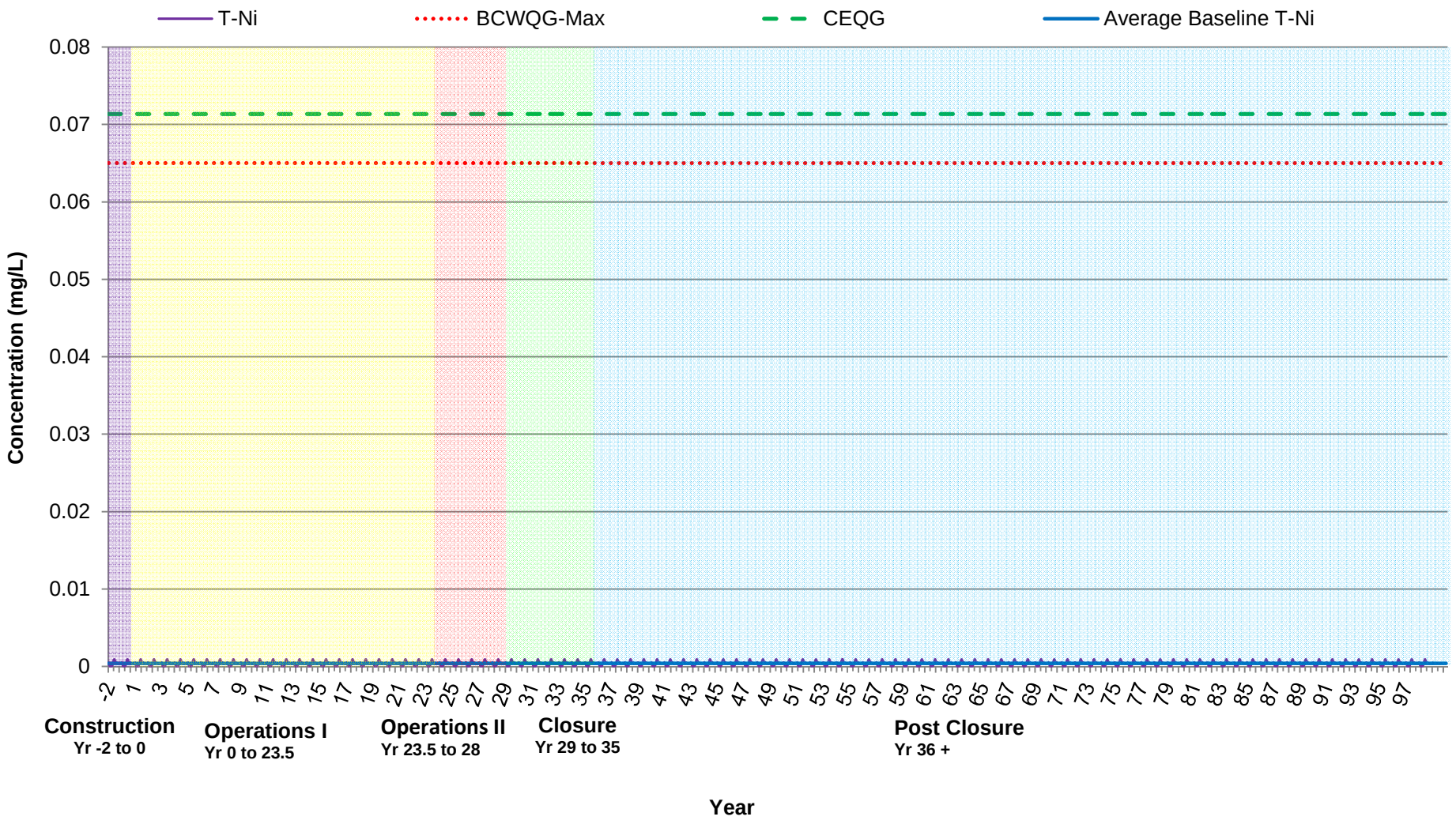
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C3.Se

REV 0



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE NICKEL CONCENTRATIONS - P-CREEK

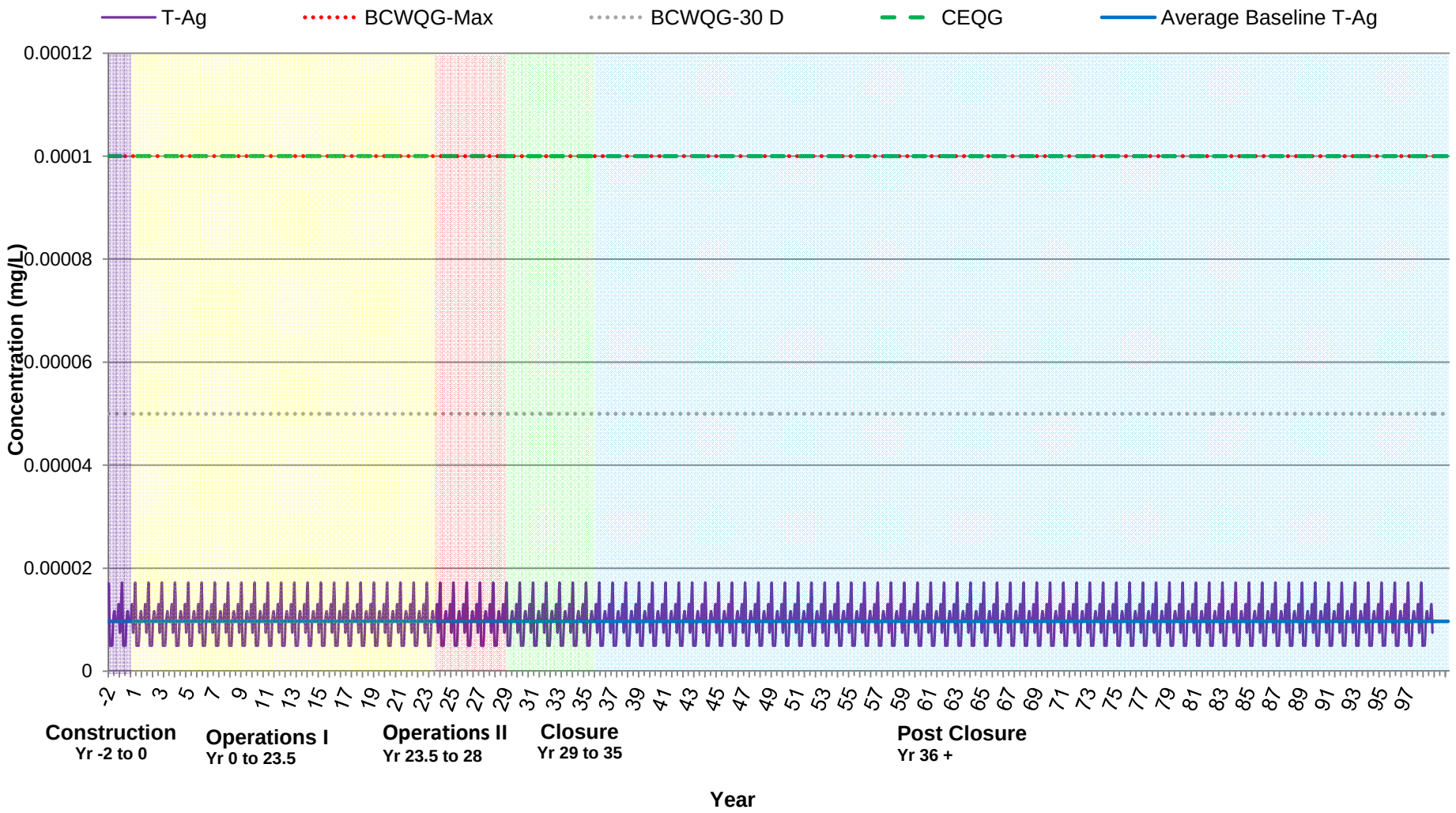
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C3.Ni

REV 0



NOTES:

1. THE BCWQG-30 D AND BCWQG-MAX ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE SILVER CONCENTRATIONS - P-CREEK

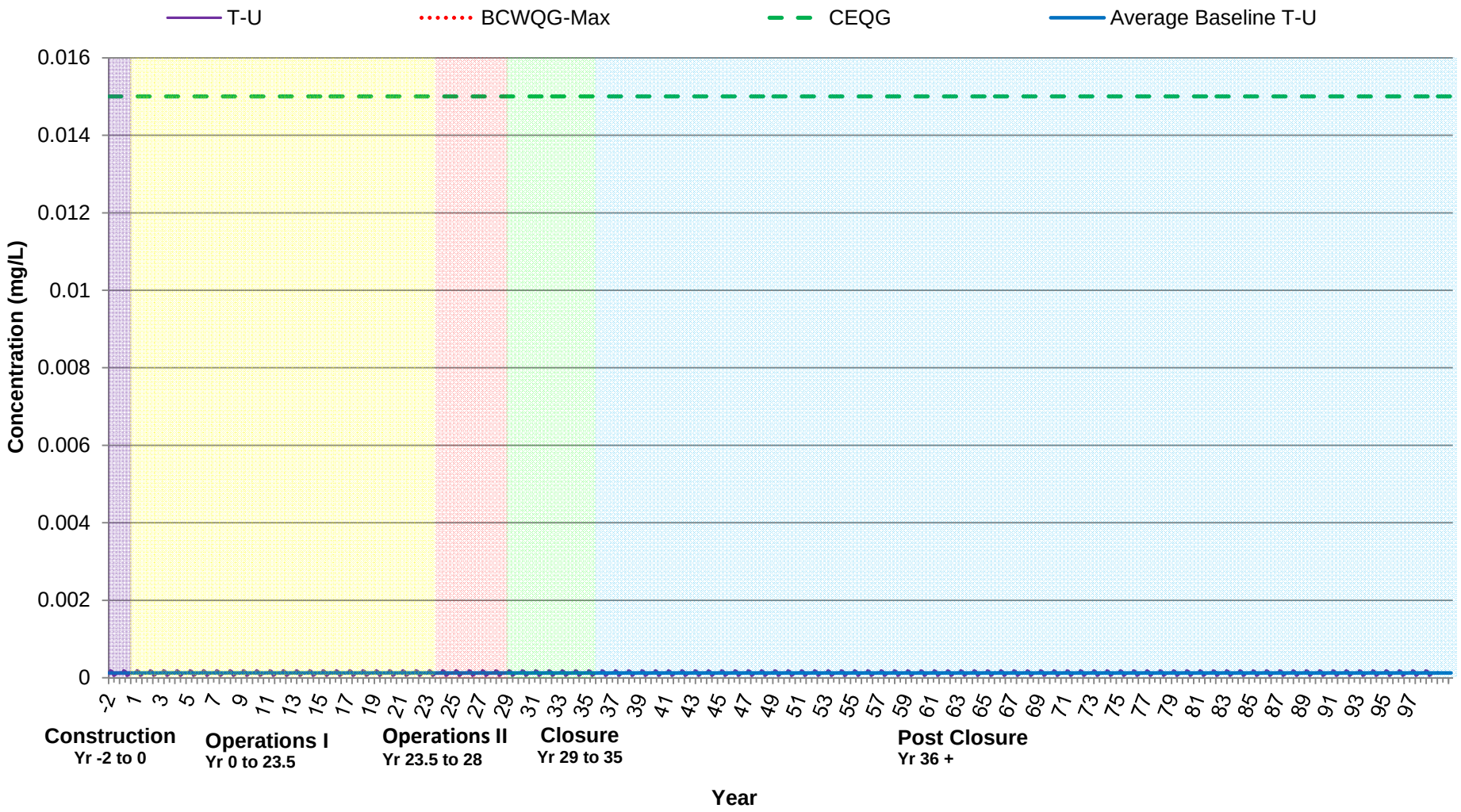
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C3.Ag

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. THE BCWQG-MAX (0.3 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE URANIUM CONCENTRATIONS - P-CREEK

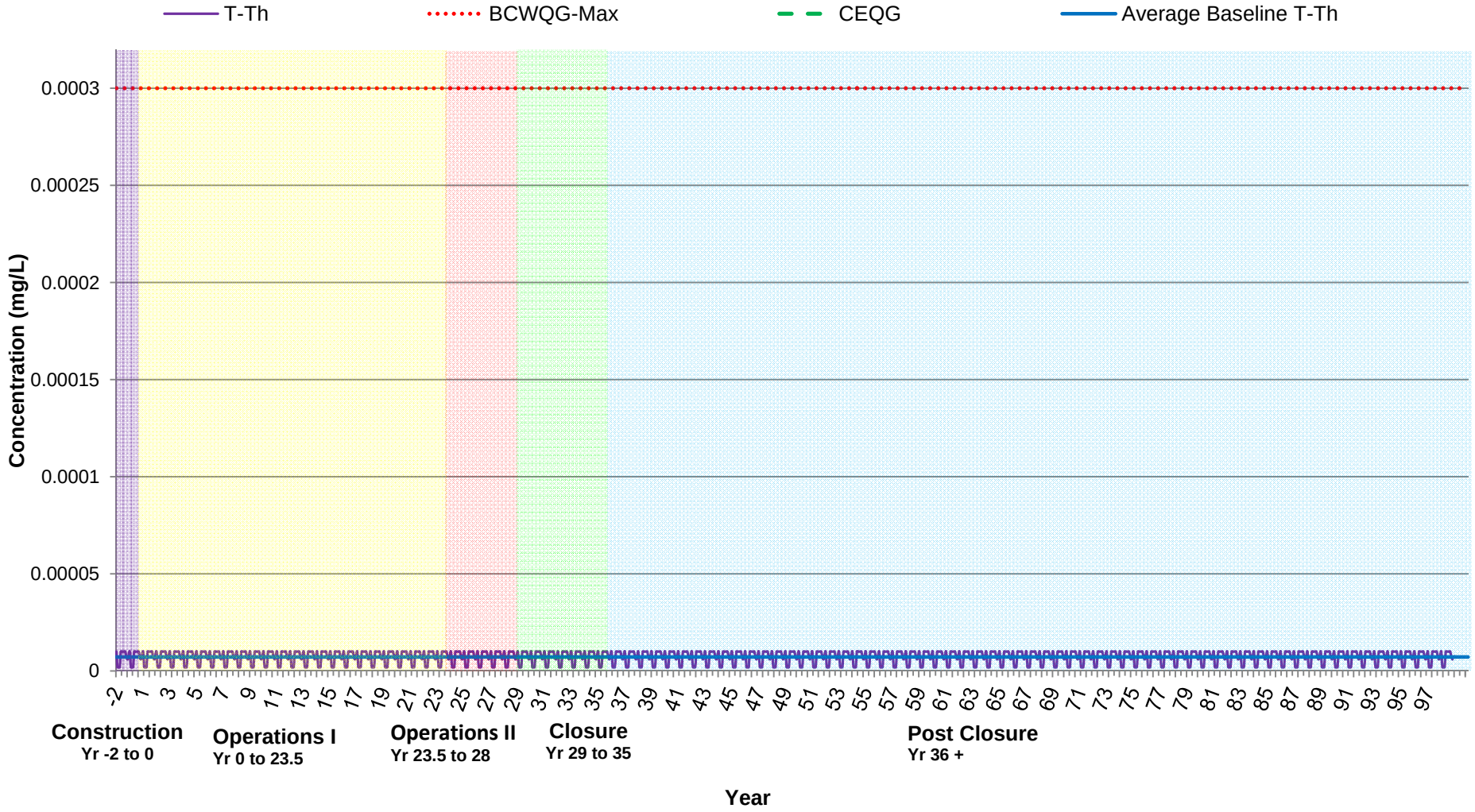
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C3.U

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. THE CEQG (0.0008 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE THALLIUM CONCENTRATIONS - P-CREEK

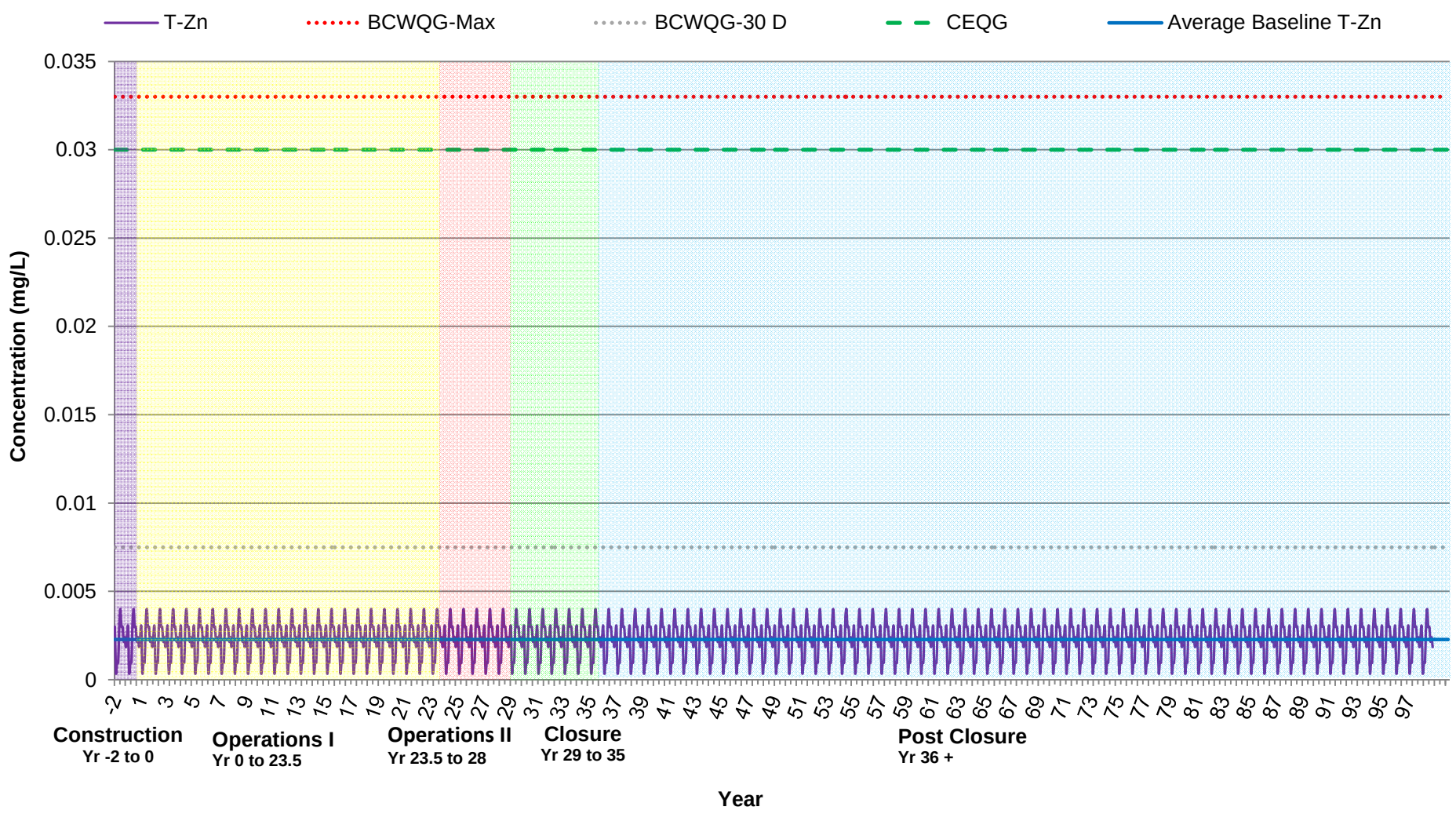
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C3.Th

REV 0



NOTES:

1. BCWQG-30 D AND BCWQG-MAX ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE ZINC CONCENTRATIONS - P-CREEK

Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C3.Zn

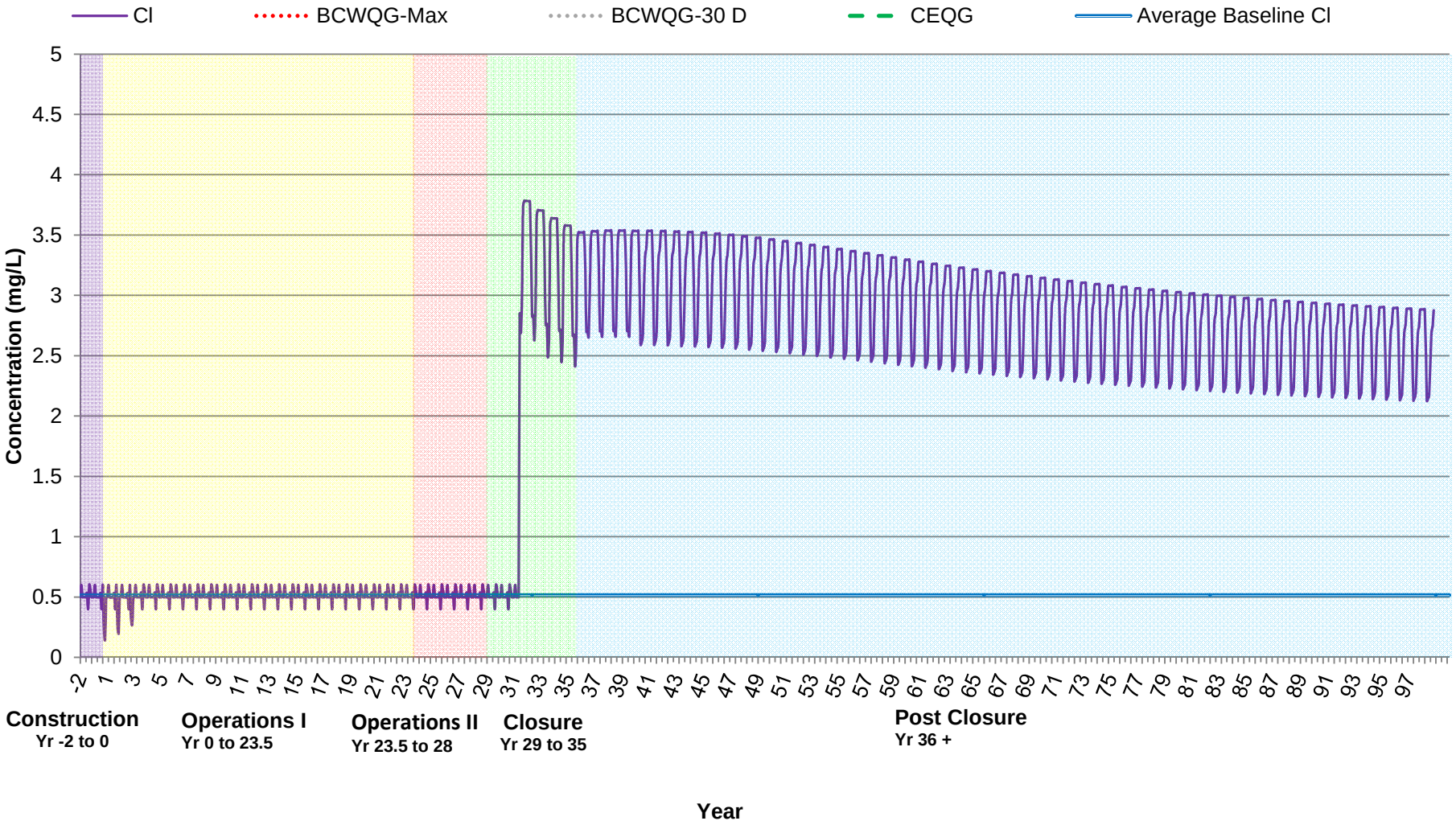
REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

APPENDIX C4

T-CREEK

(Pages C4-1 to C4-30)



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).
3. ALL GUIDELINES ARE NOT SHOWN: BCWQG-30 D (150 mg/L); BCWQG-MAX (600 mg/L); CEQG (120 mg/L AND 640 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE CHLORIDE CONCENTRATIONS - T-CREEK

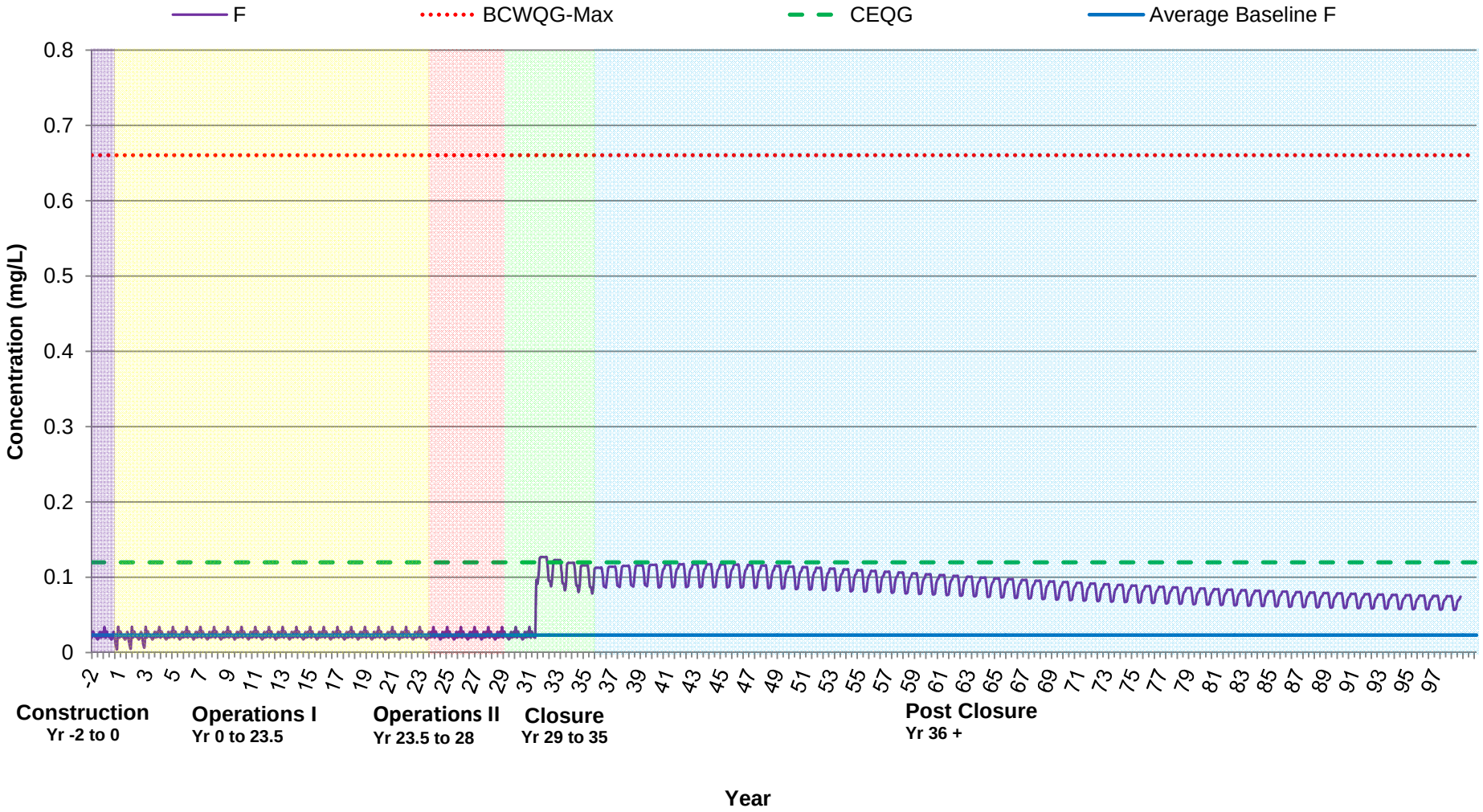
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C4.Cl

REV 0



NOTES:

1. THE BCWQG-MAX IS HARNDESS DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE FLUORIDE CONCENTRATIONS - T-CREEK

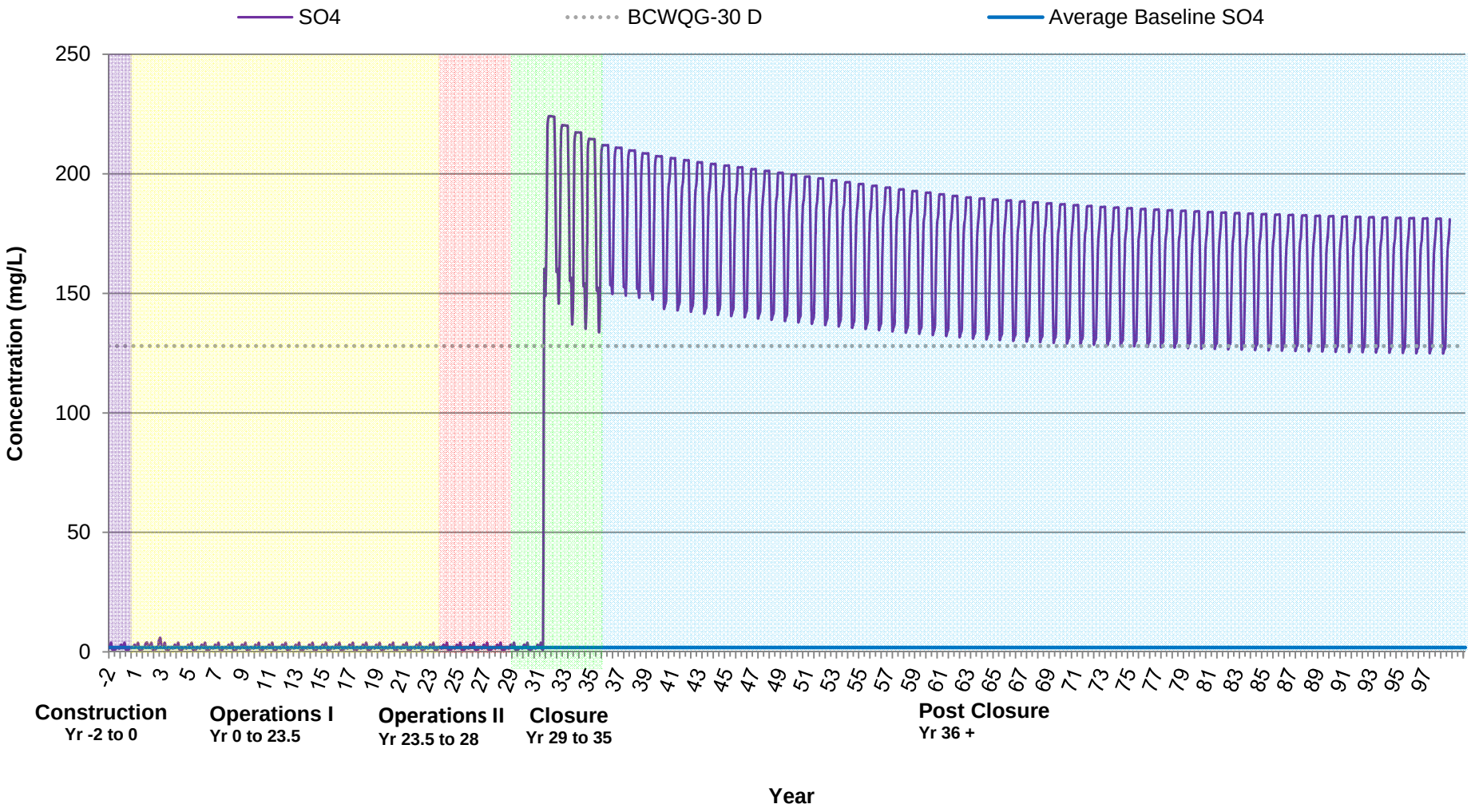
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C4.F

REV 0



NOTES:

1. BCWQG-30 D IS HARDNESS DEPEDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE SULPHATE CONCENTRATIONS - T-CREEK

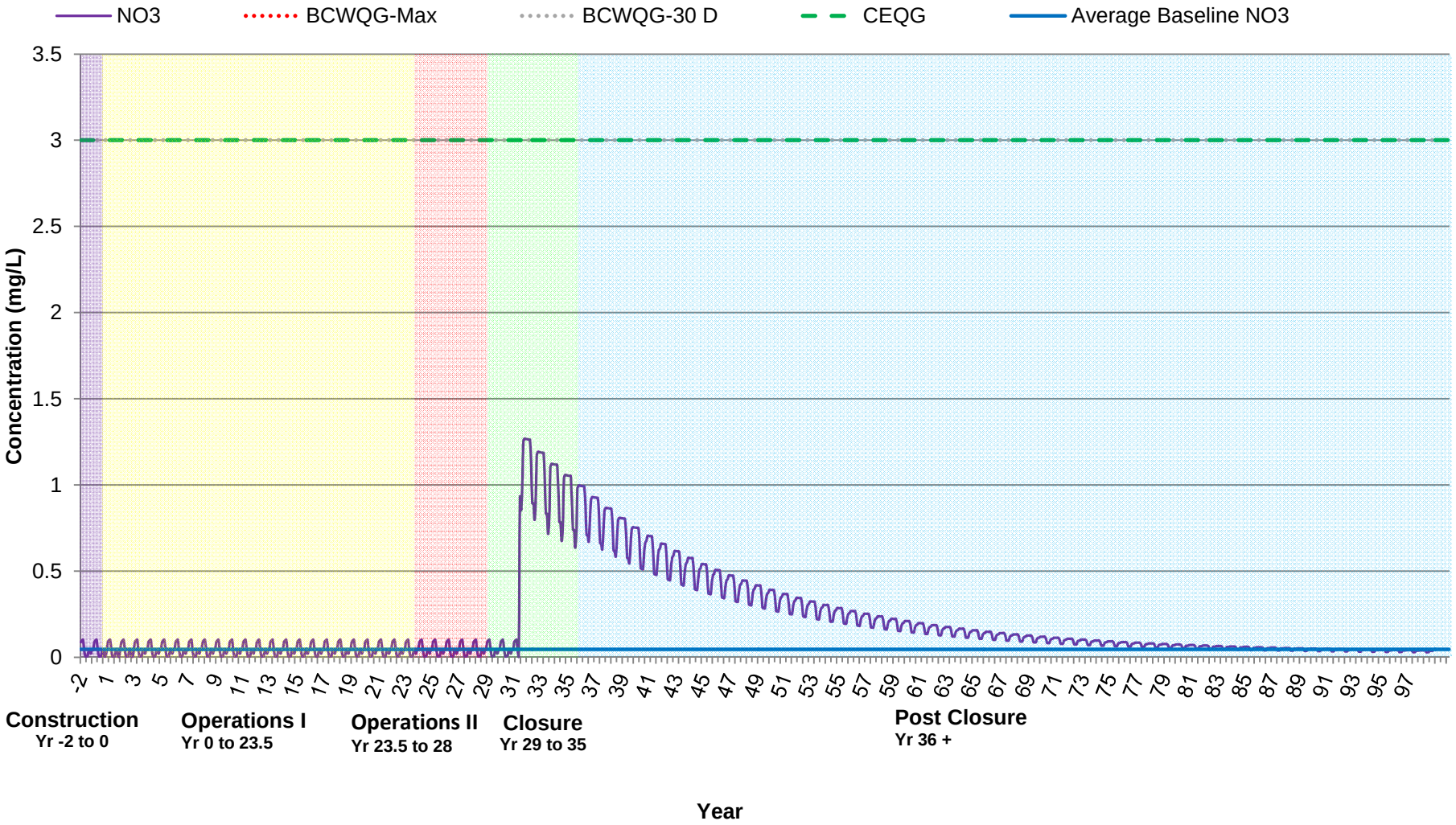
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C4.S04

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).
3. THE BCWQG-MAX (32.8 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE NITRATE CONCENTRATIONS - T-CREEK

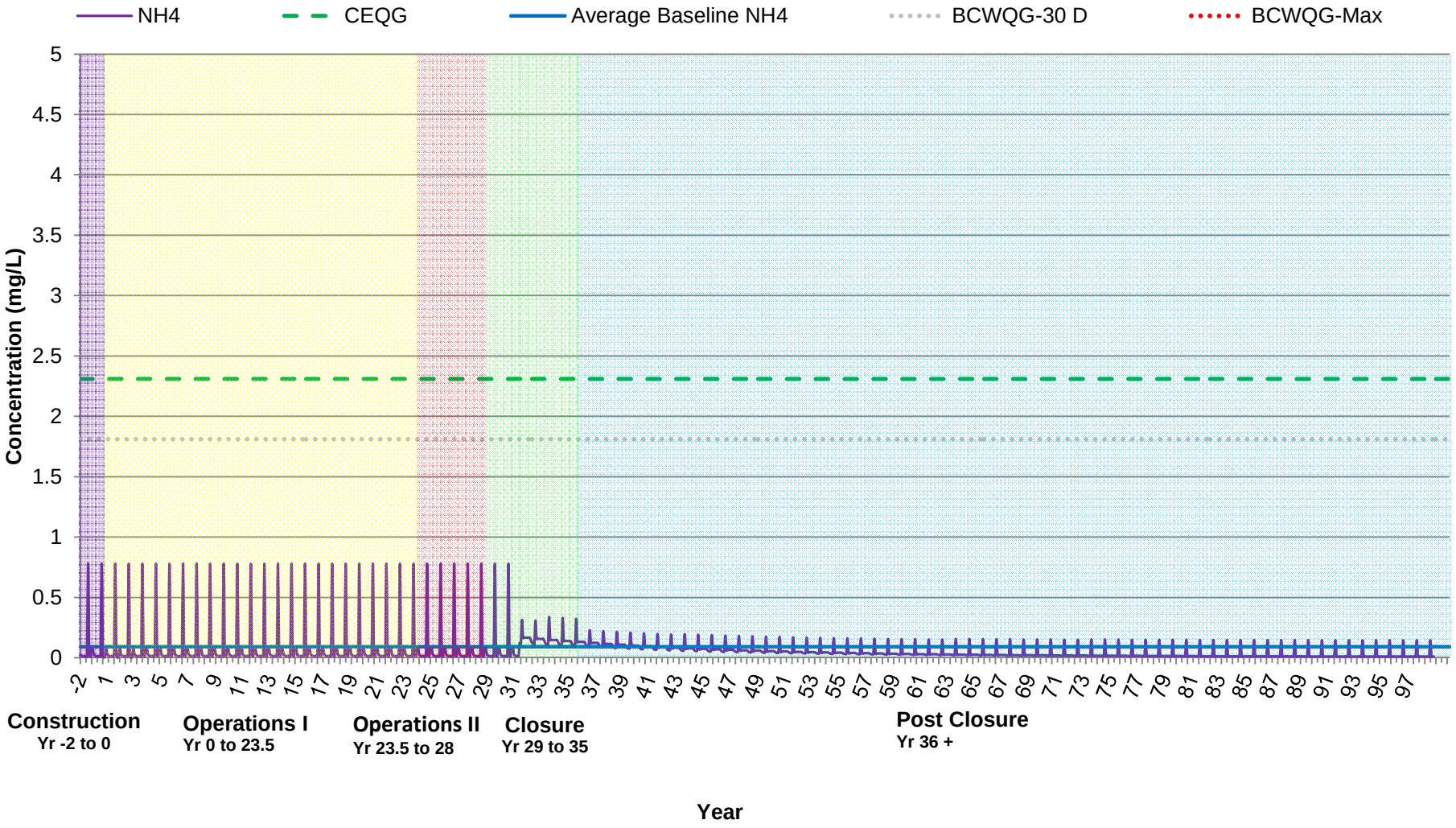
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C4.NO3

REV 0



NOTES:

1. THE BCWQG-30 D IS VALID FOR ONLY 6.5≤pH<9 AND 0°C≤T≤20°C.
2. THE BCWQG-MAX (20.15 mg/L) VALID FOR 6.5≤pH<9 IS NOT SHOWN.
3. THE CEQG IS TO BE USED WITH CAUTION FOR WATER WITH T<5°C AND pH>9.
4. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE AMMONIA CONCENTRATIONS - T-CREEK

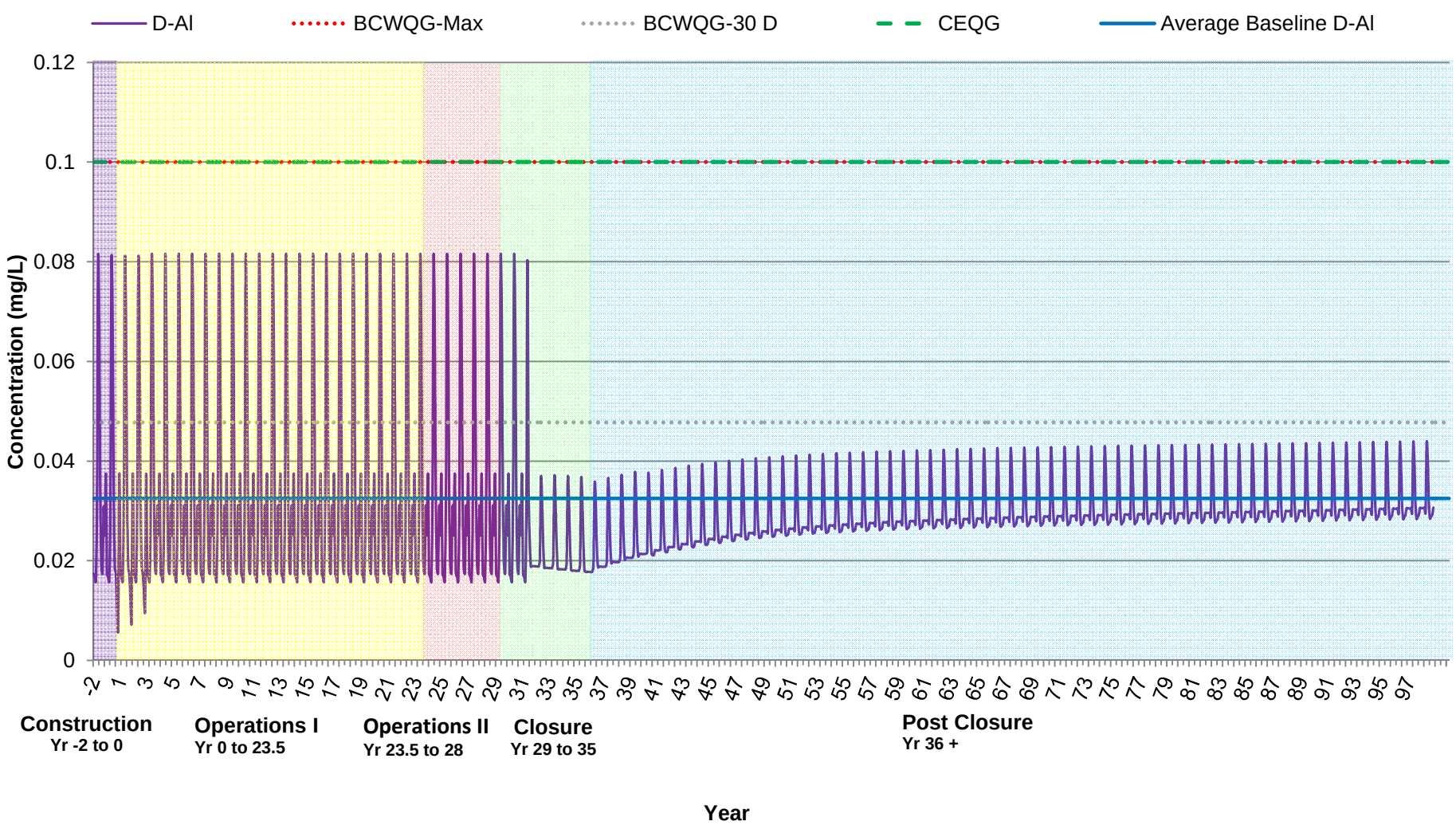
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C4.NH4

REV 0



NOTES:

1. ALL GUIDELINES ARE pH-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).
3. AVERAGE BASELINE pH USED TO CALCULATE GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE DISSOLVED ALUMINUM CONCENTRATIONS - T-CREEK

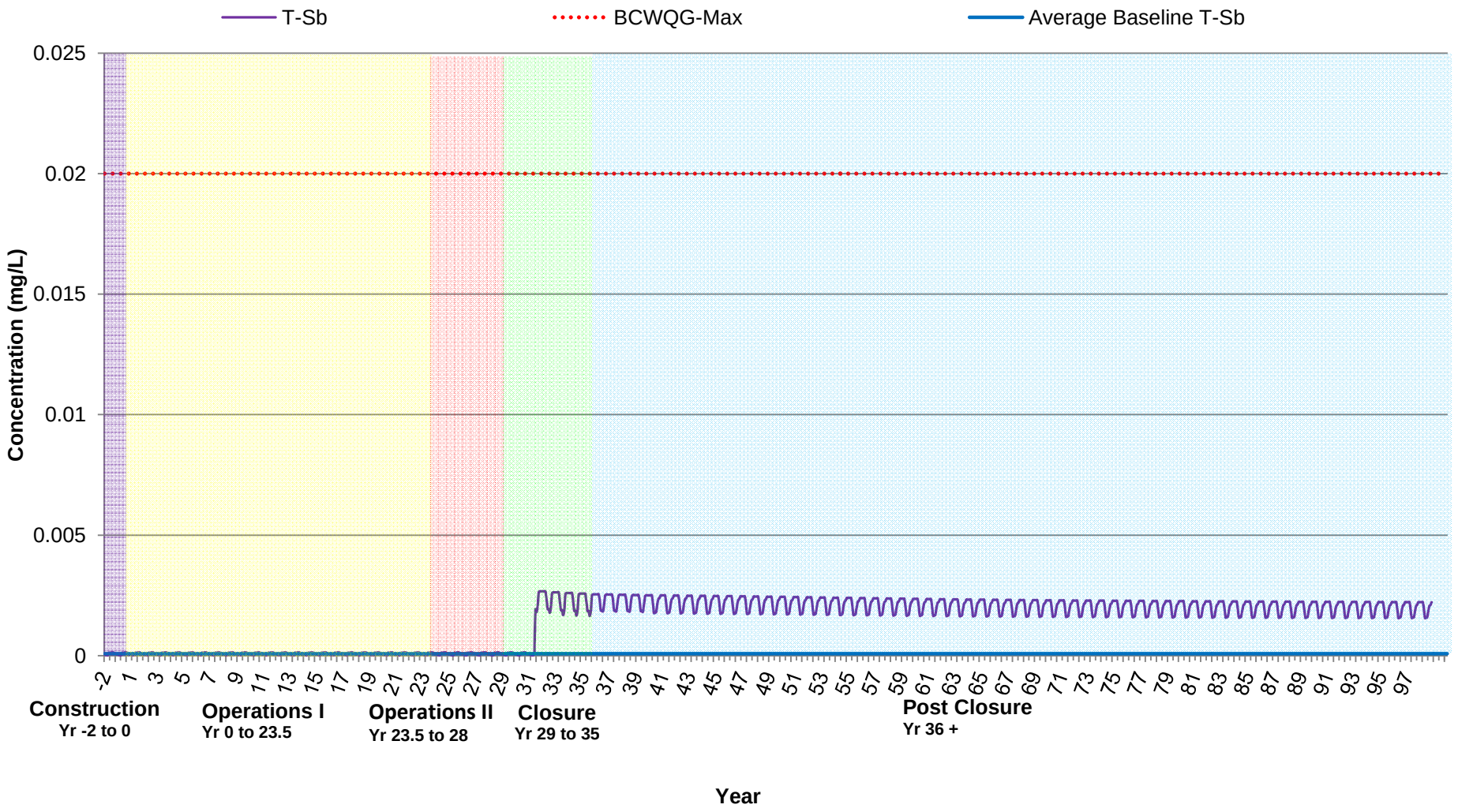
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C4.Al

REV 0



NOTES:

1. THE BCWQG IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE ANTIMONY CONCENTRATIONS - T-CREEK

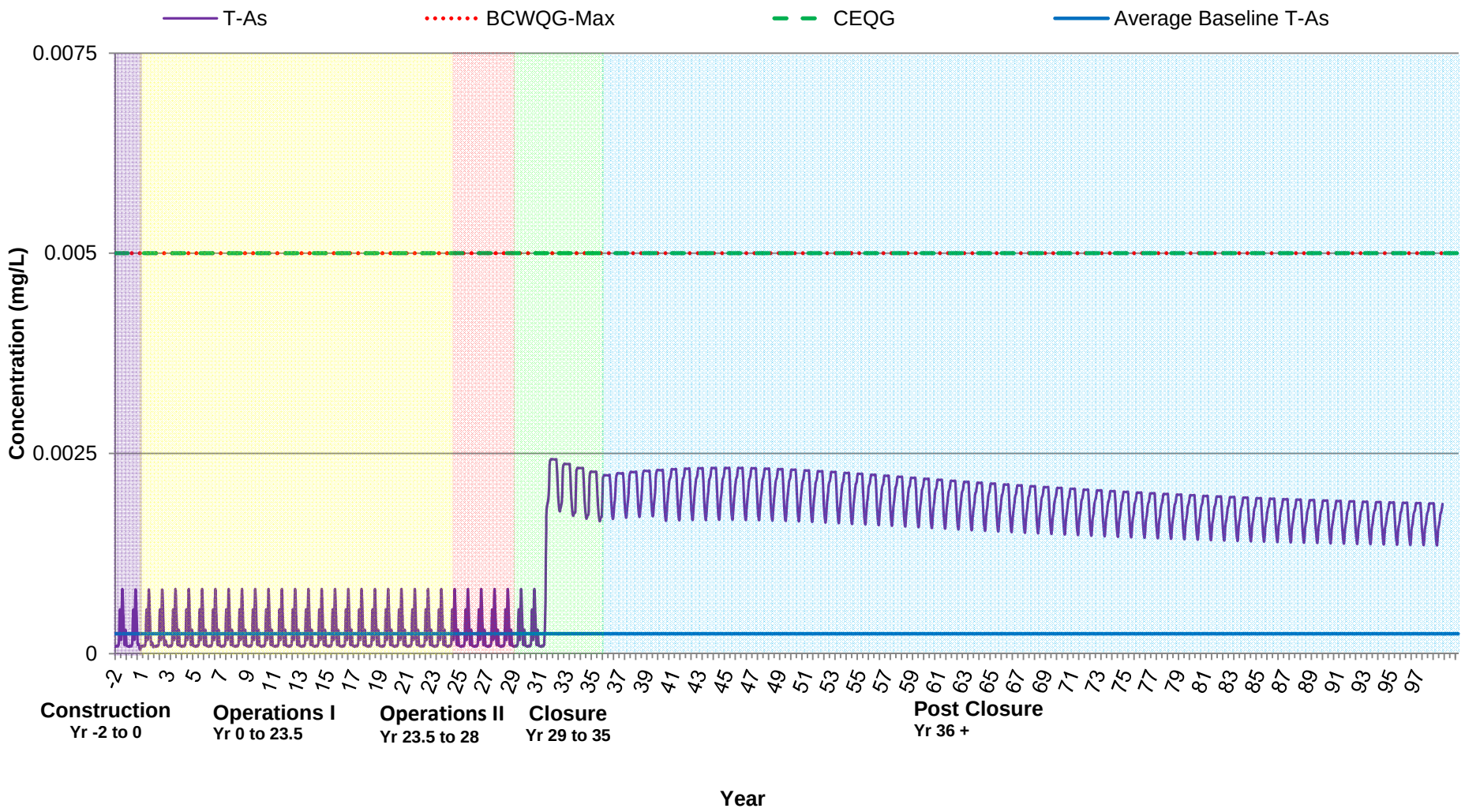
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C4.Sb

REV 0



NOTES:

1. THE BCWQG AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE ARSENIC CONCENTRATIONS - T-CREEK

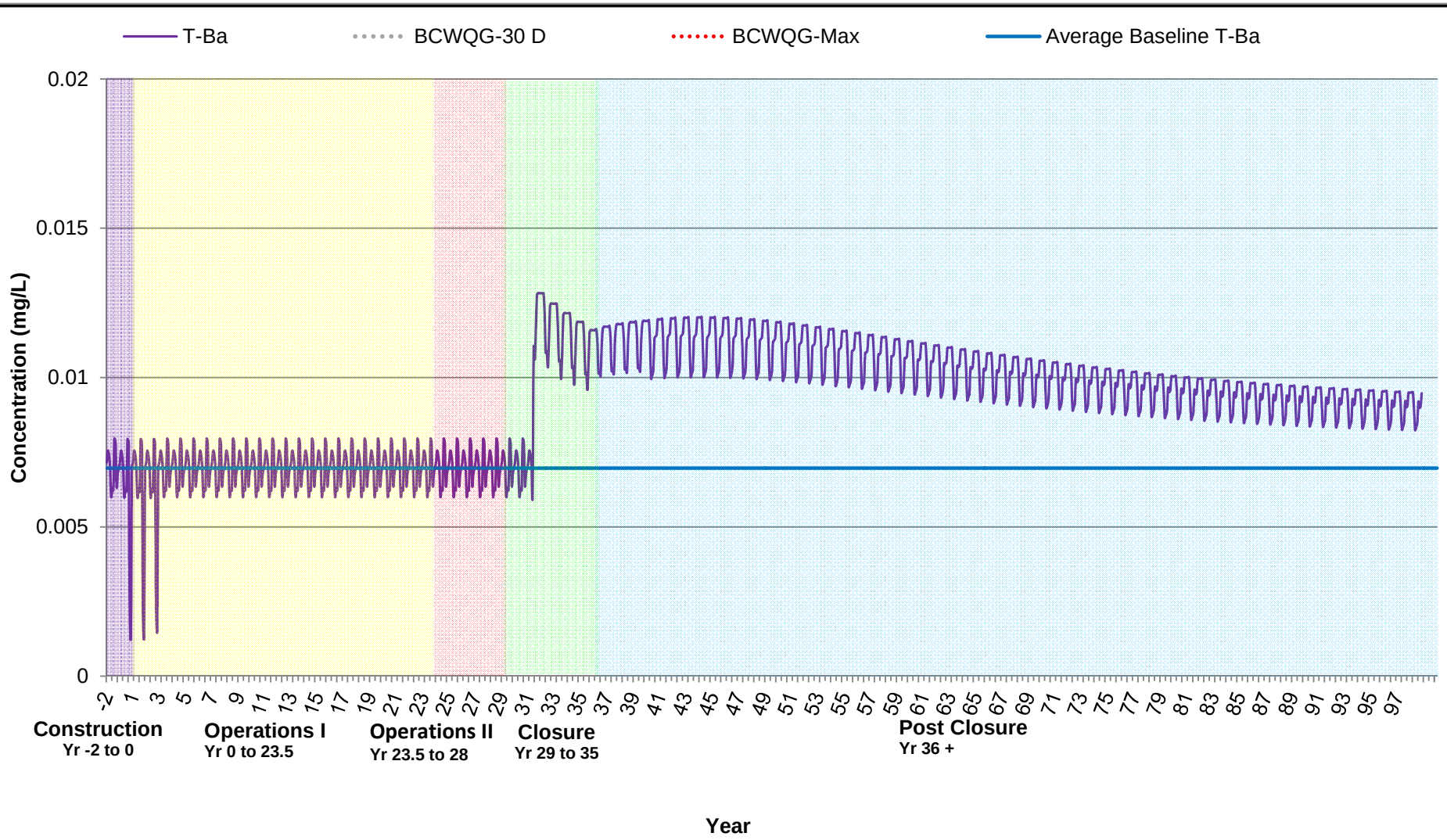
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C4.As

REV 0



NOTES:

1. THE BCWQG-MAX IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).
3. THE BCWQG-30 D (1 mg/L) AND BCWQG-MAX (5 mg/L) ARE NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE BARIUM CONCENTRATIONS - T-CREEK

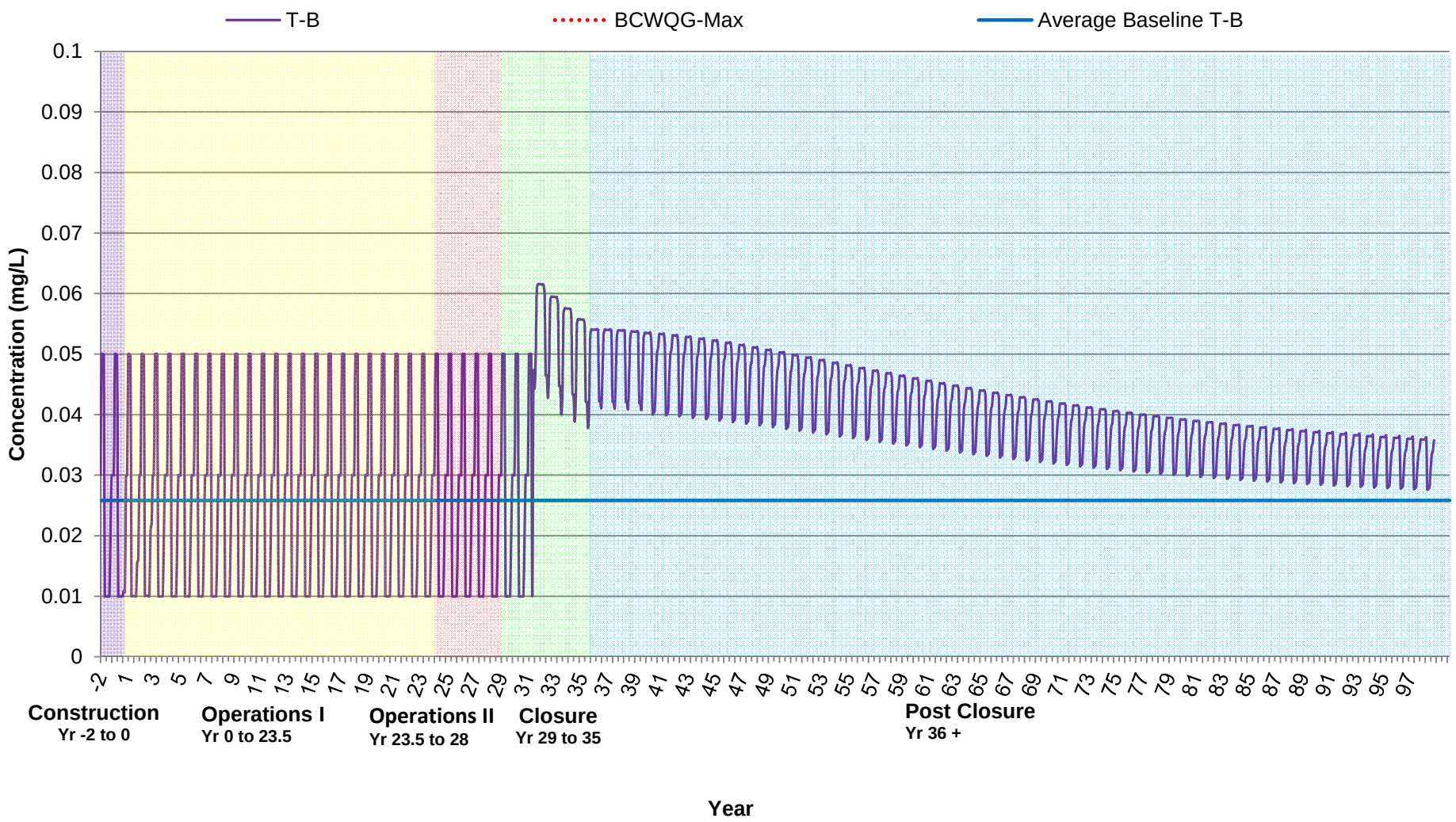
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C4.Ba

REV 0



NOTES:

1. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.
3. THE BCWQG-MAX (1.2 mg/L) IS NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE BORON CONCENTRATIONS - T-CREEK

Knight Piésold CONSULTING

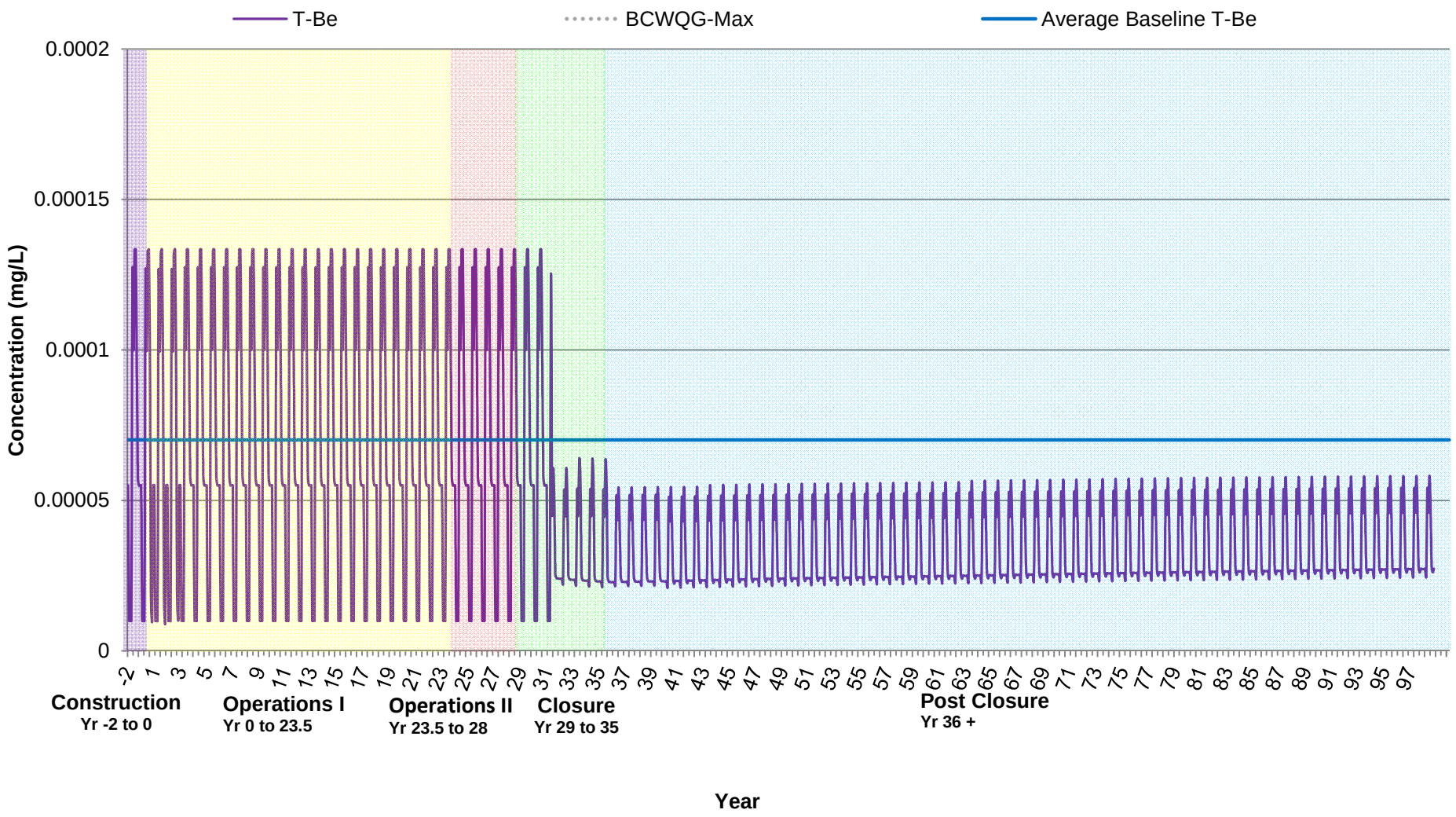
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C4.B

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).
3. THE BCWQG-30 D (0.0053 mg/L) IS NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE BERYILLIUM CONCENTRATIONS - T-CREEK

Knight Piésold CONSULTING

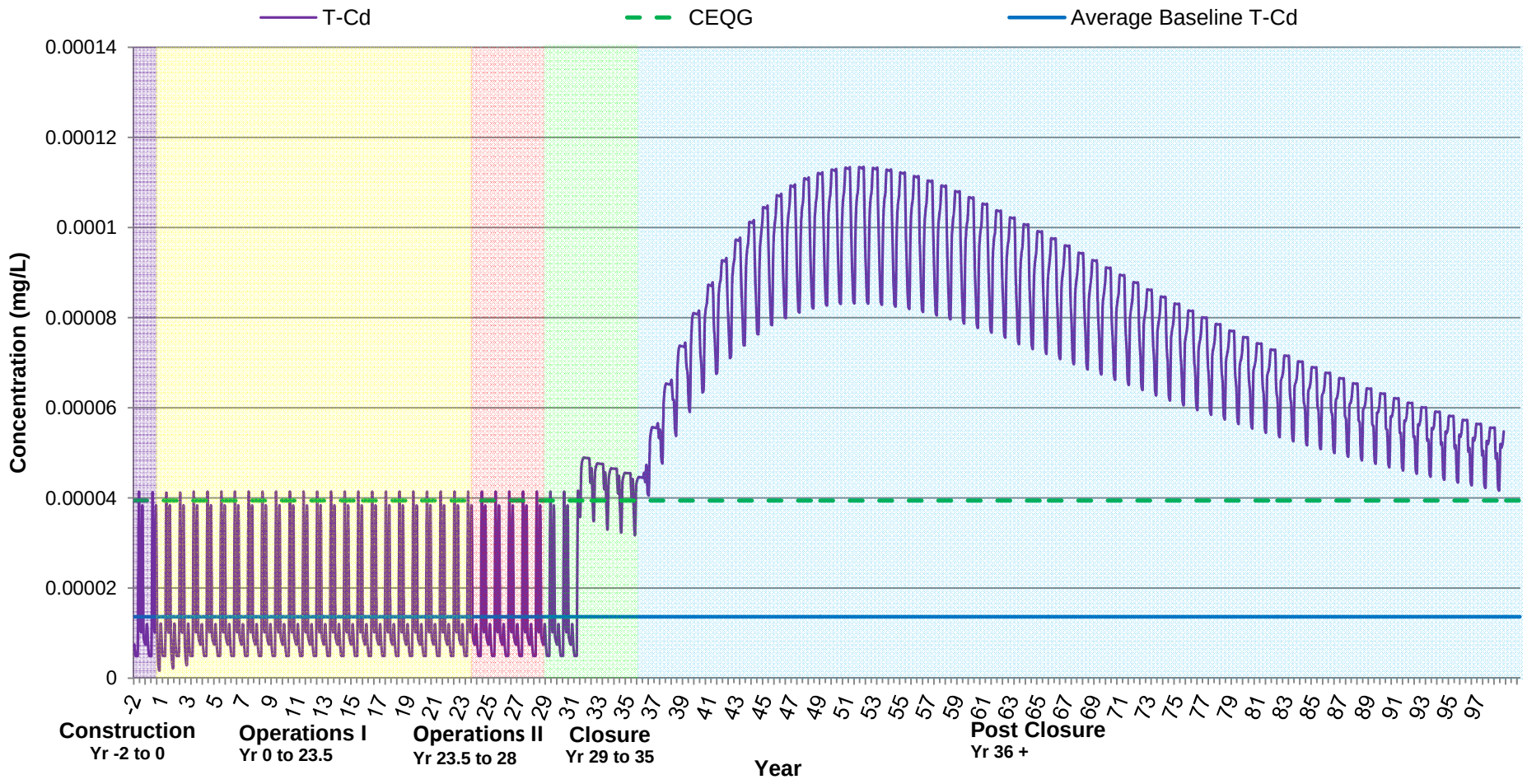
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C4.Be

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. THE BCWQG ARE DRAFT GUIDELINES UNDER REVIEW (JUNE 2014).
3. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).
4. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE CADMIUM CONCENTRATIONS - T-CREEK

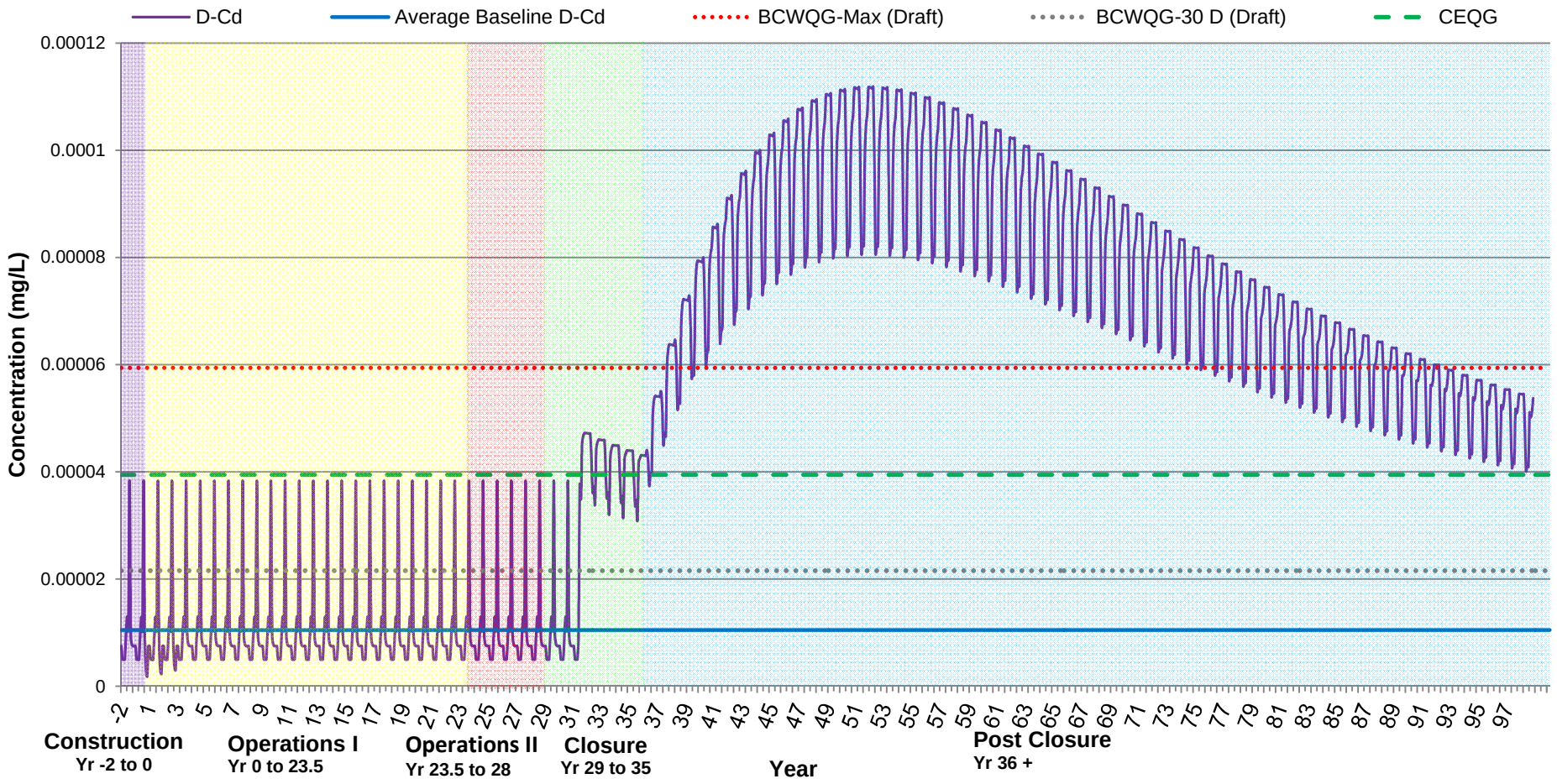
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C4.Cd-T

REV 0



NOTES:

1. BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE CADMIUM CONCENTRATIONS - T-CREEK

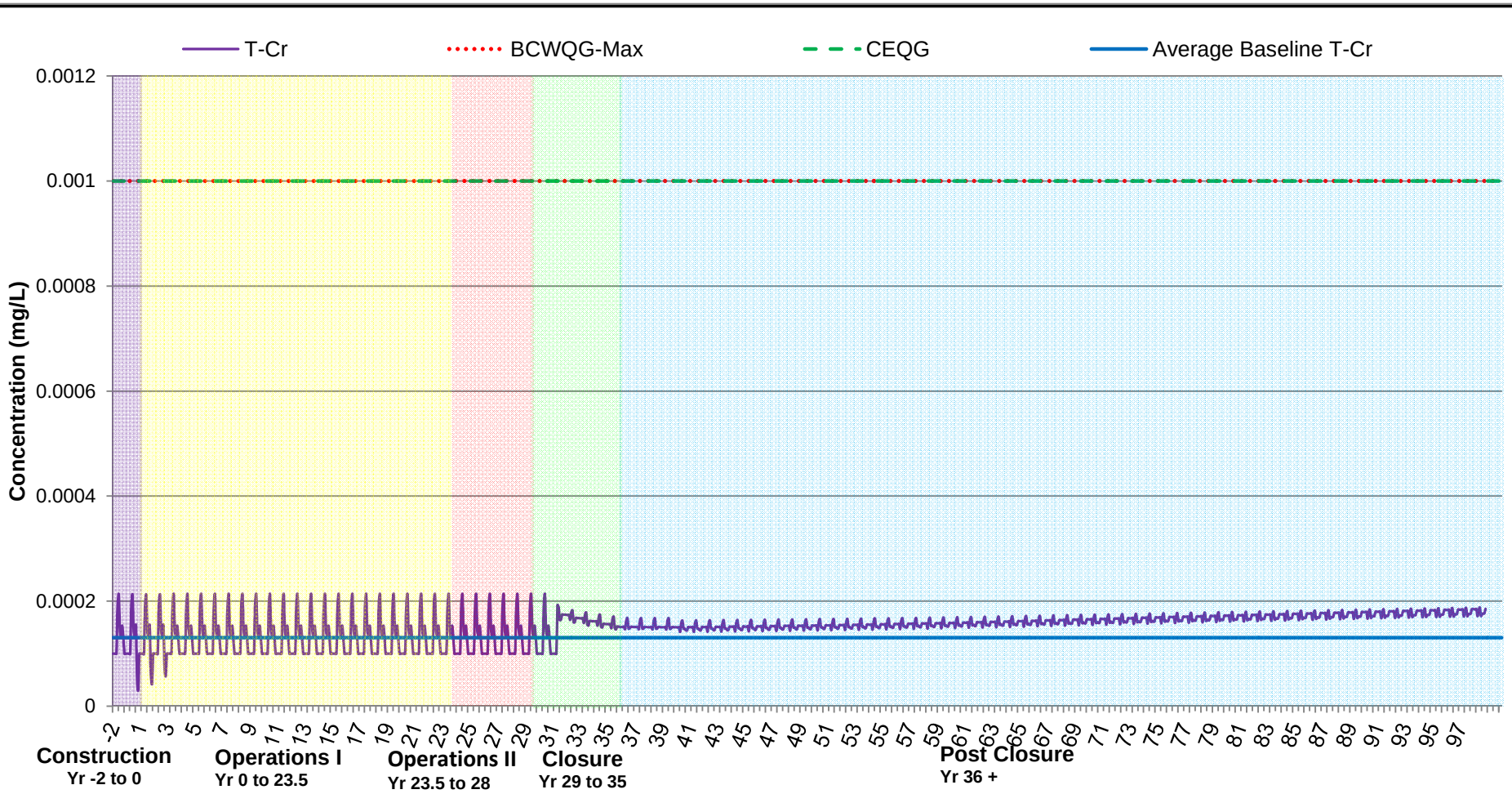
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C4.Cd-D

REV 0



NOTES:

1. GUIDELINES ARE FOR CHROMIUM (IV), THE SPECIES MOST COMMON IN WELL OXYGENATED SURFACE WATERS.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE CHROMIUM CONCENTRATIONS - T-CREEK

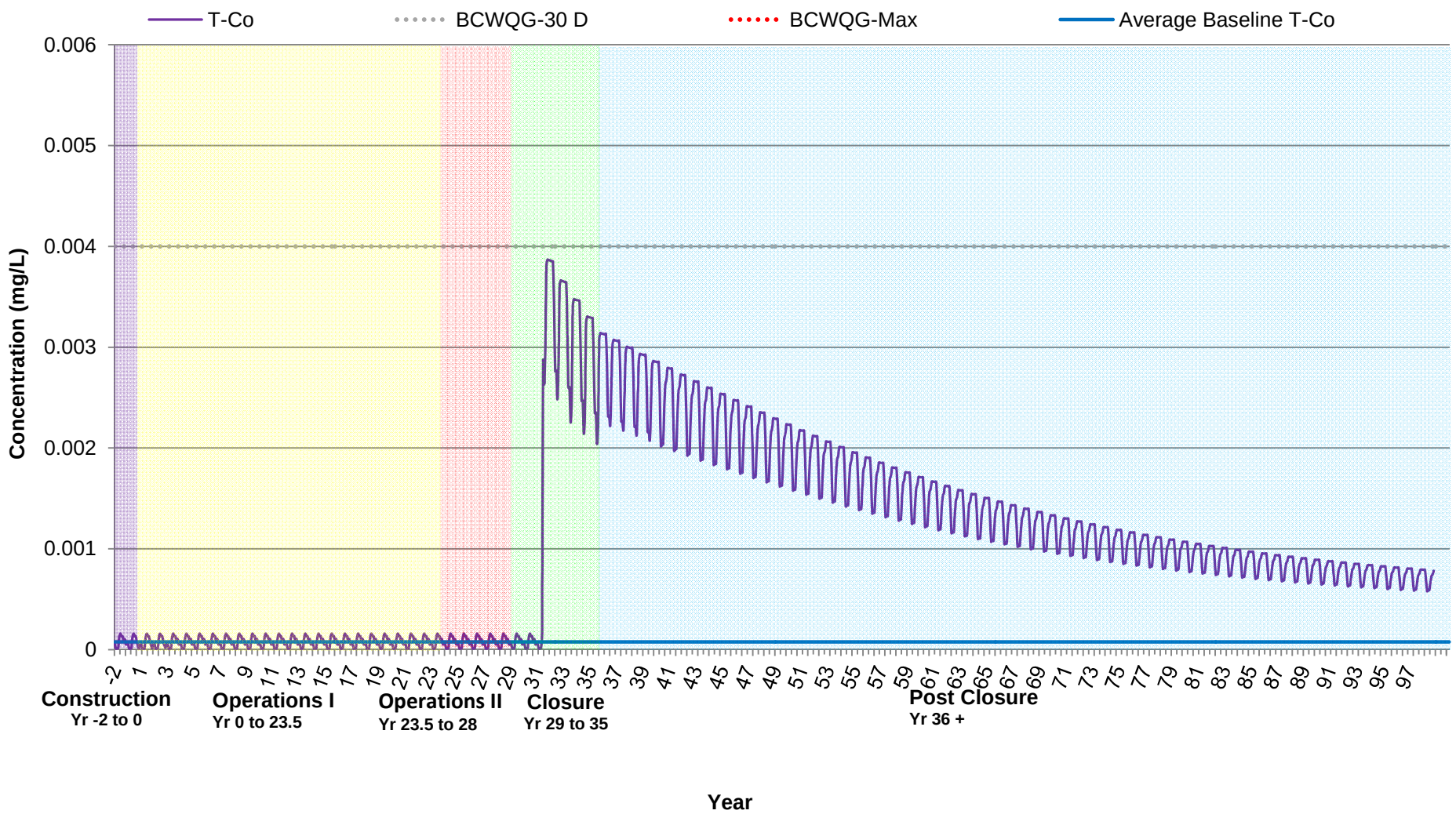
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C4.Cr

REV 0



NOTES:

1. THE BCWQG-30 D AND BCWQG-MAX ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).
3. THE BCWQG-MAX GUIDELINE (0.11 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE COBALT CONCENTRATIONS - T-CREEK

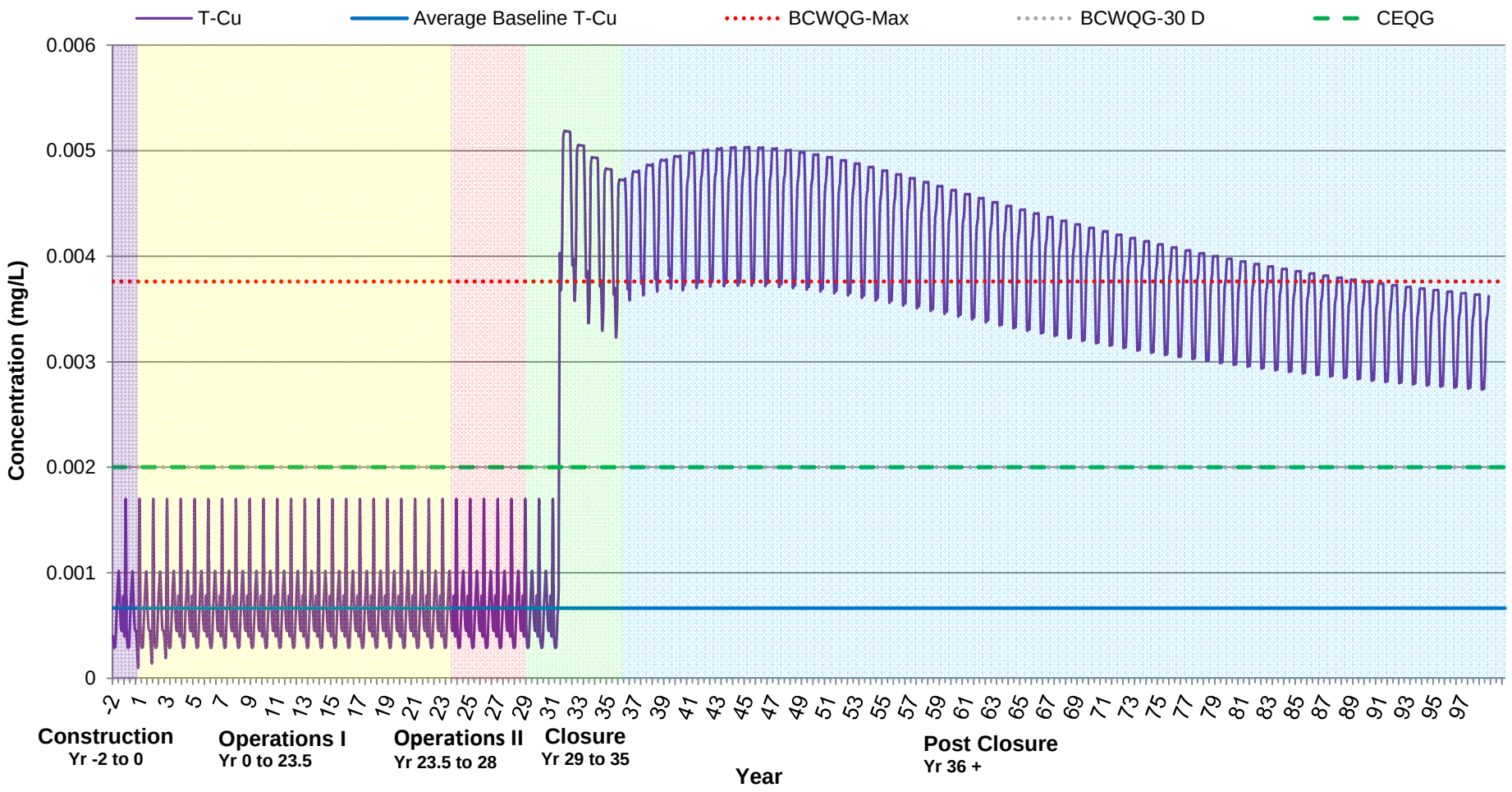
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C4.Co

REV 0



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE COPPER CONCENTRATIONS - T-CREEK

Knight Piésold CONSULTING

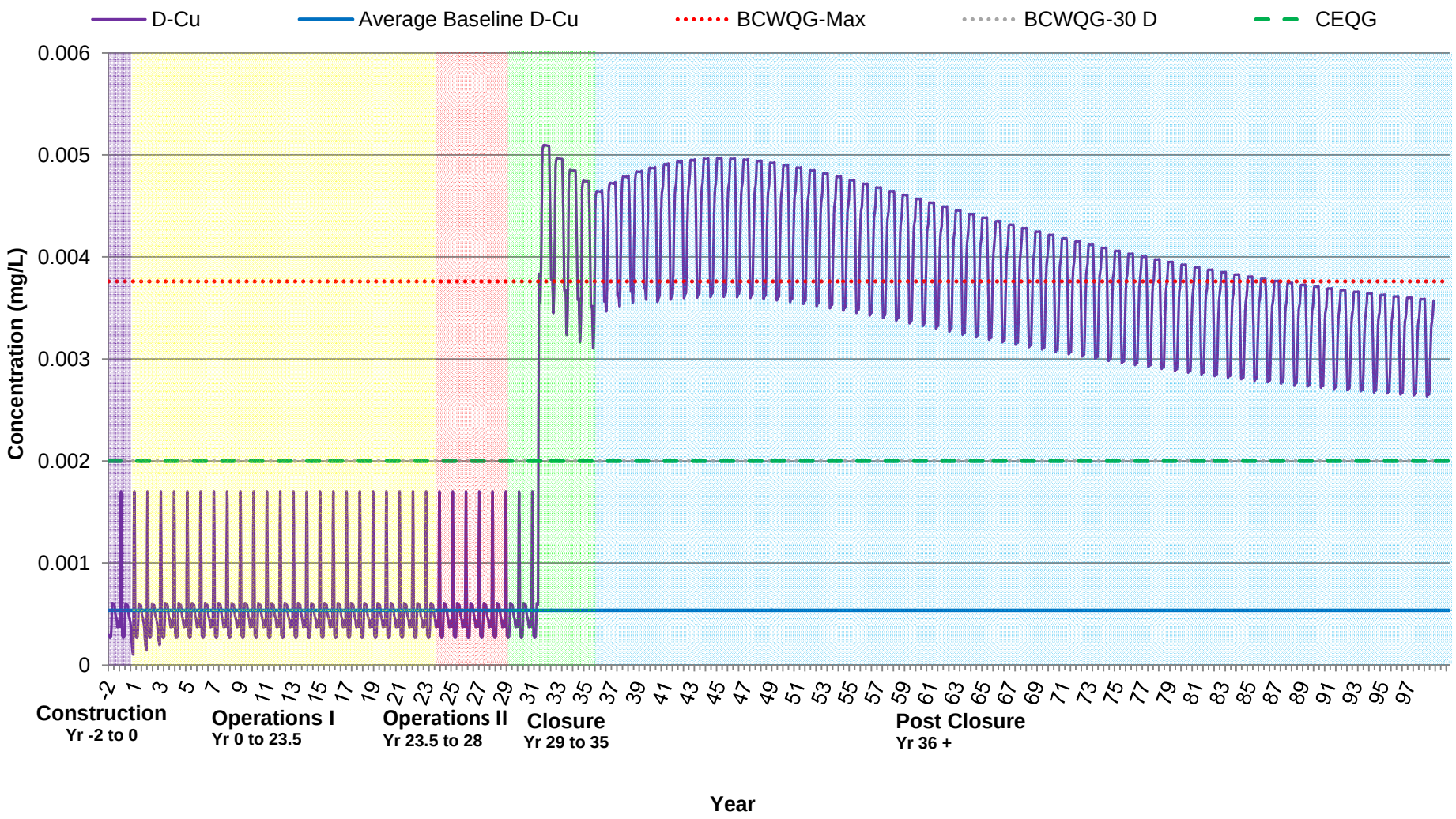
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C4.Cu-T

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE COPPER CONCENTRATIONS - T-CREEK

Knight Piésold CONSULTING

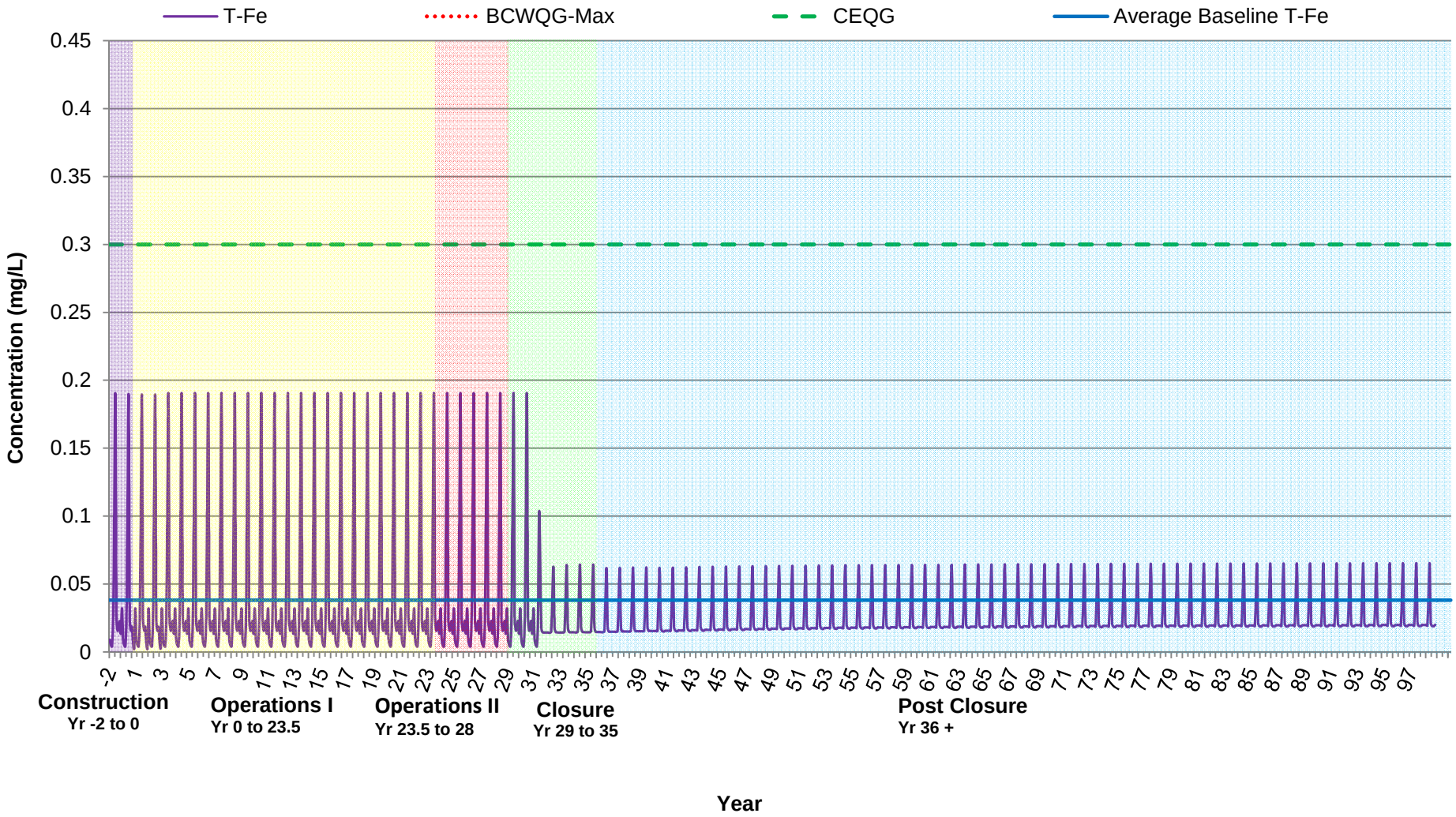
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C4.Cu-D

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).
3. BCWQG-MAX 1.0 mg/L IS NOT SHOWN ON GRAPH.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE TOTAL IRON CONCENTRATIONS - T-CREEK

Knight Piésold CONSULTING

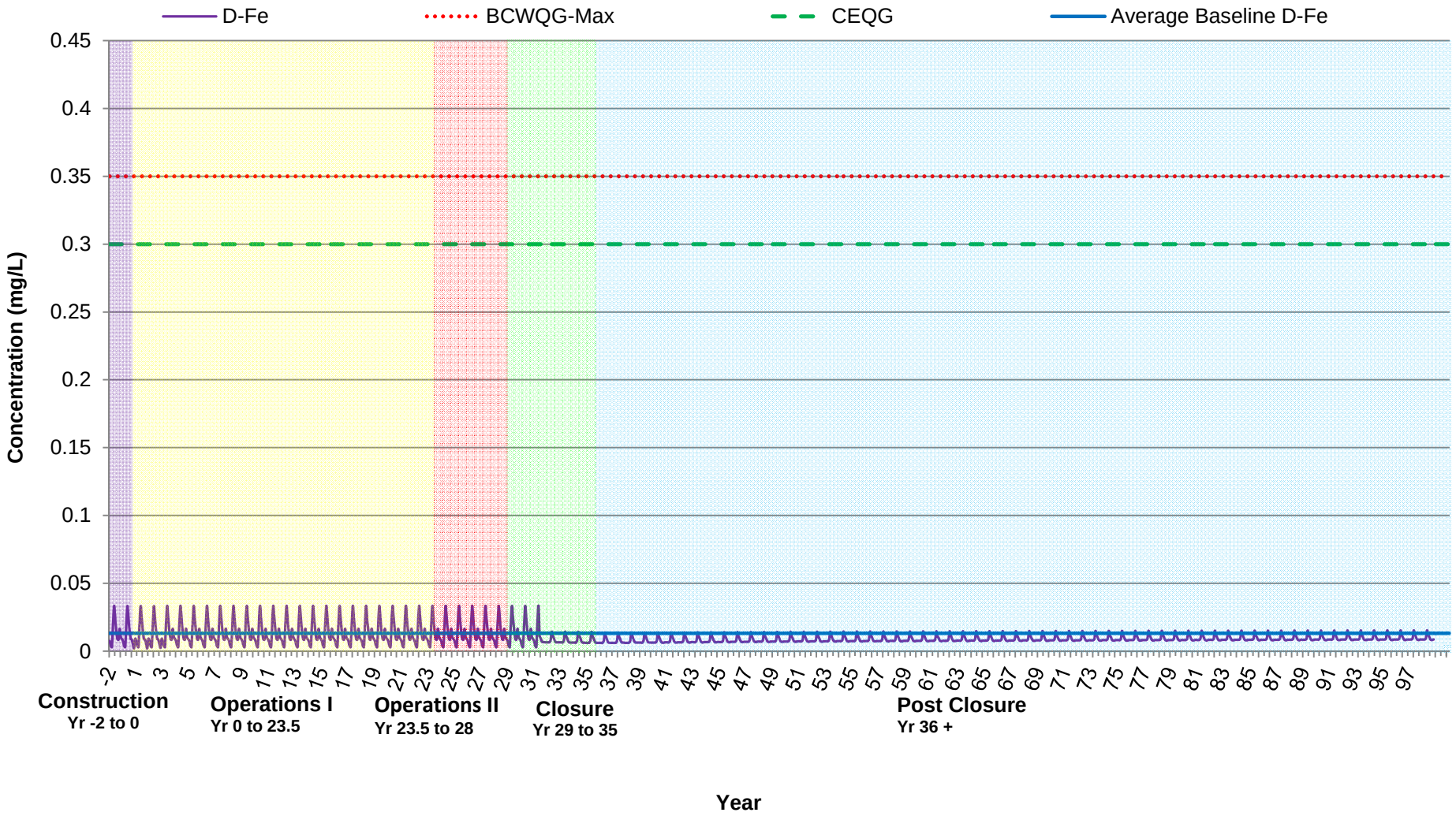
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C4.Fe-T

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE DISSOLVED IRON CONCENTRATIONS - T-CREEK

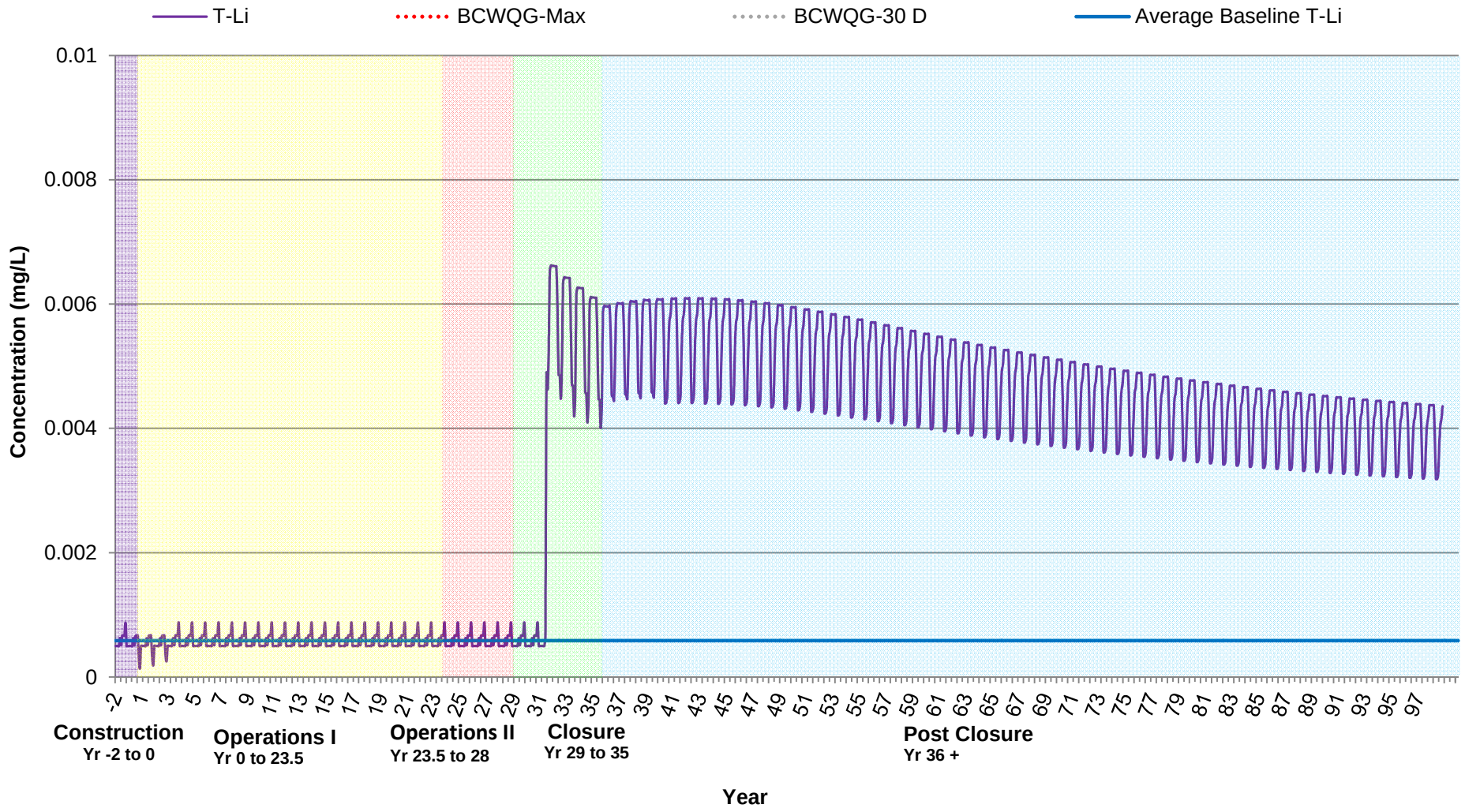
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C4.Fe-D

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).
3. THE BCWQG-30 D (0.096 mg/L) AND BCWQG-MAX (0.87 mg/L) ARE INTERIM (WORKING) AND ARE NOT SHOWN ON GRAPH.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE LITHIUM CONCENTRATIONS - T-CREEK

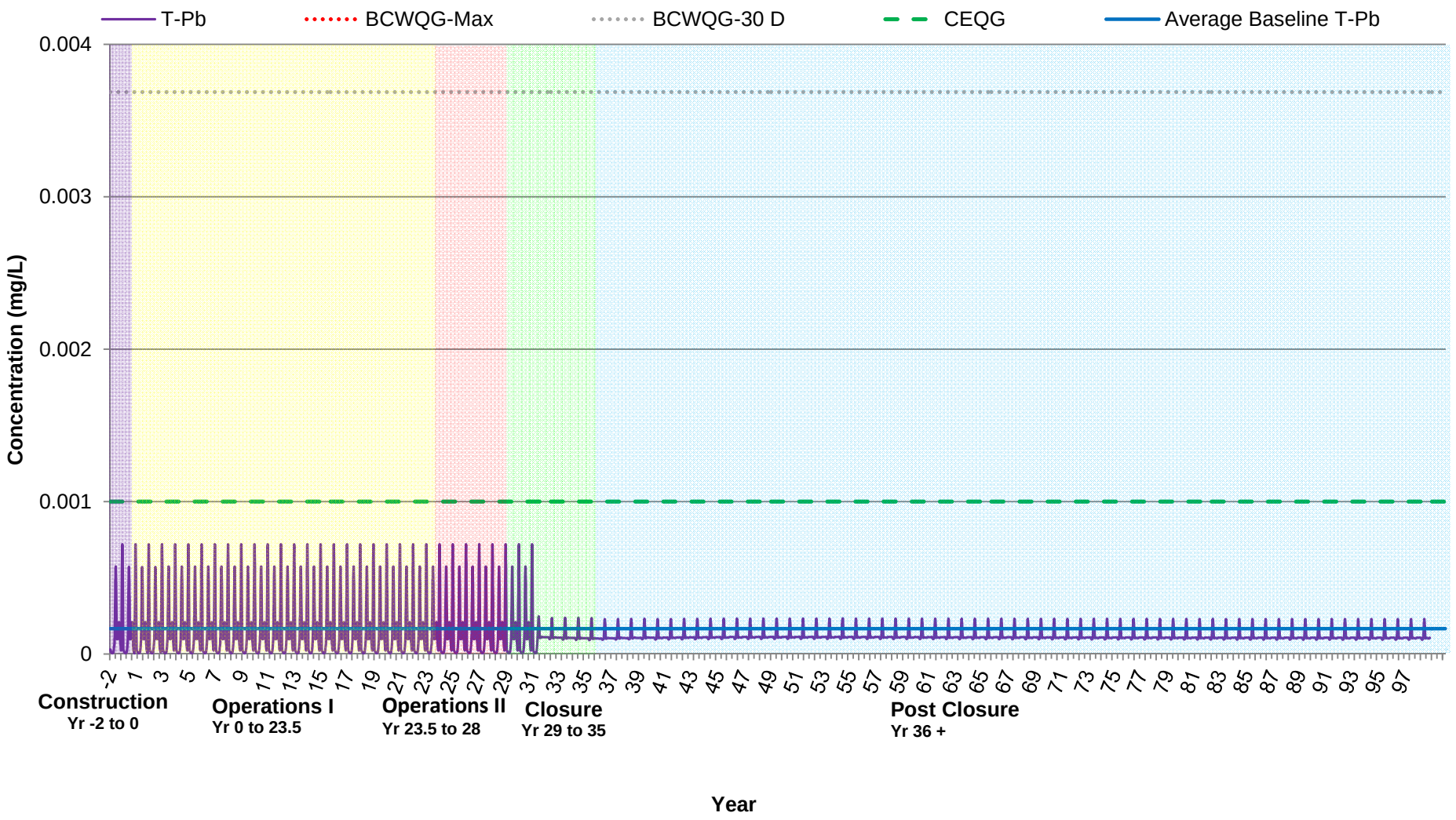
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C4.Li

REV 0



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.
4. THE BCWQG-MAX (CALCULATED AT 0.011 mg/L) IS NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE LEAD CONCENTRATIONS - T-CREEK

Knight Piésold CONSULTING

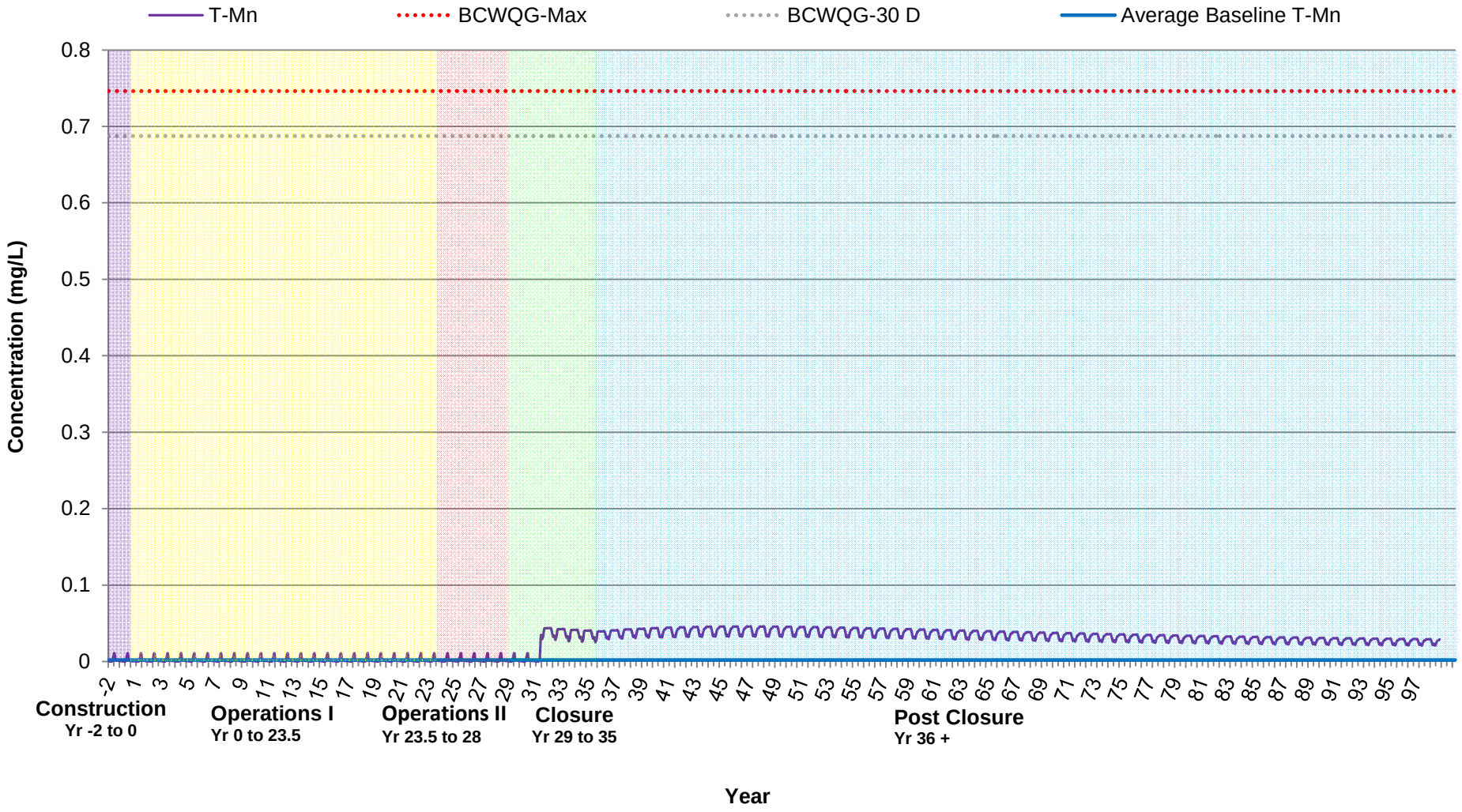
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C4.Pb

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE MANGANESE CONCENTRATIONS - T-CREEK

Knight Piésold CONSULTING

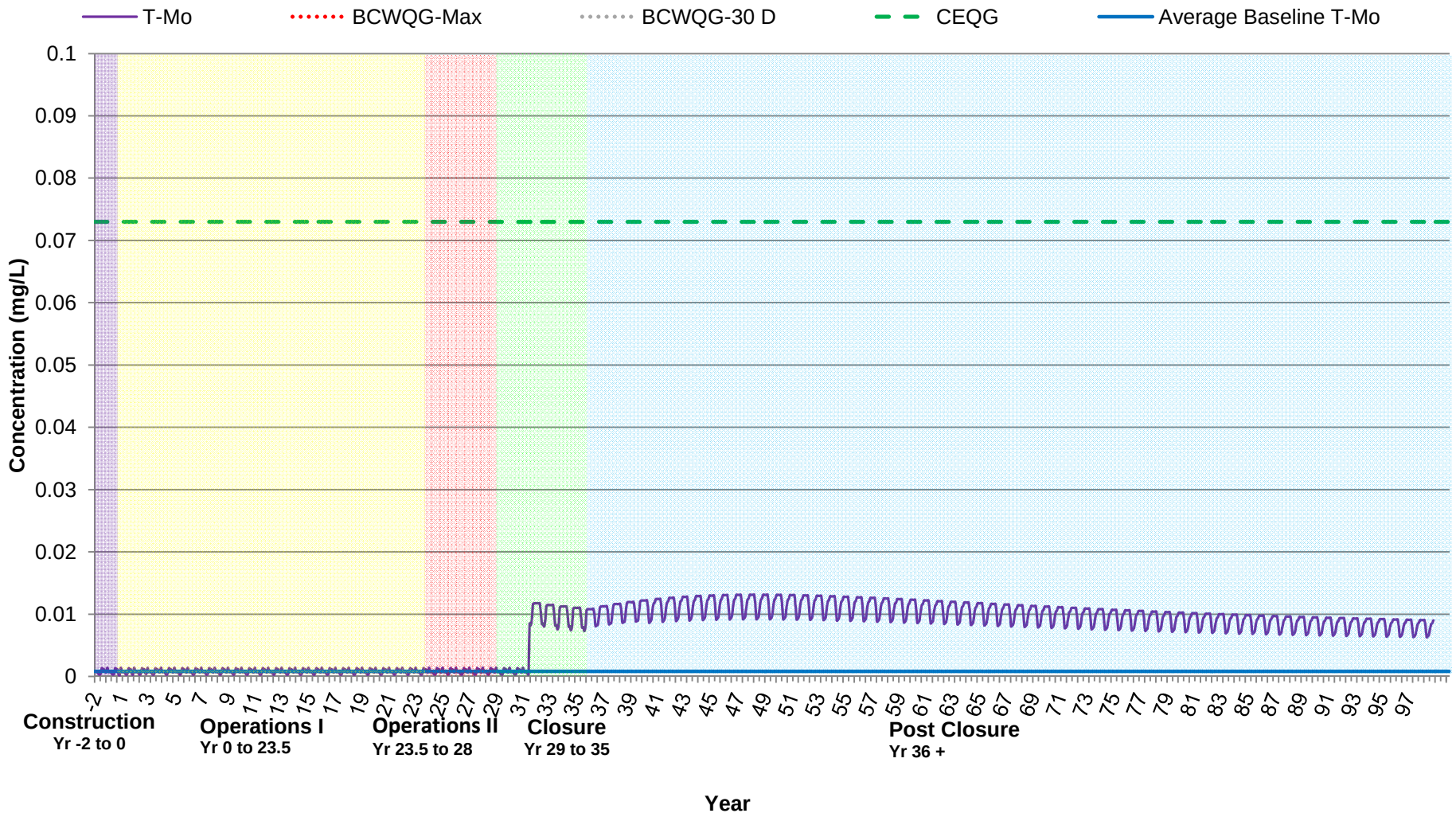
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C4.Mn

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).
3. THE BCWQG-MAX (2 mg/L) AND BCWQG-30 D (1 mg/L) ARE NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE MOLYDBENUM CONCENTRATIONS - T-CREEK

Knight Piésold CONSULTING

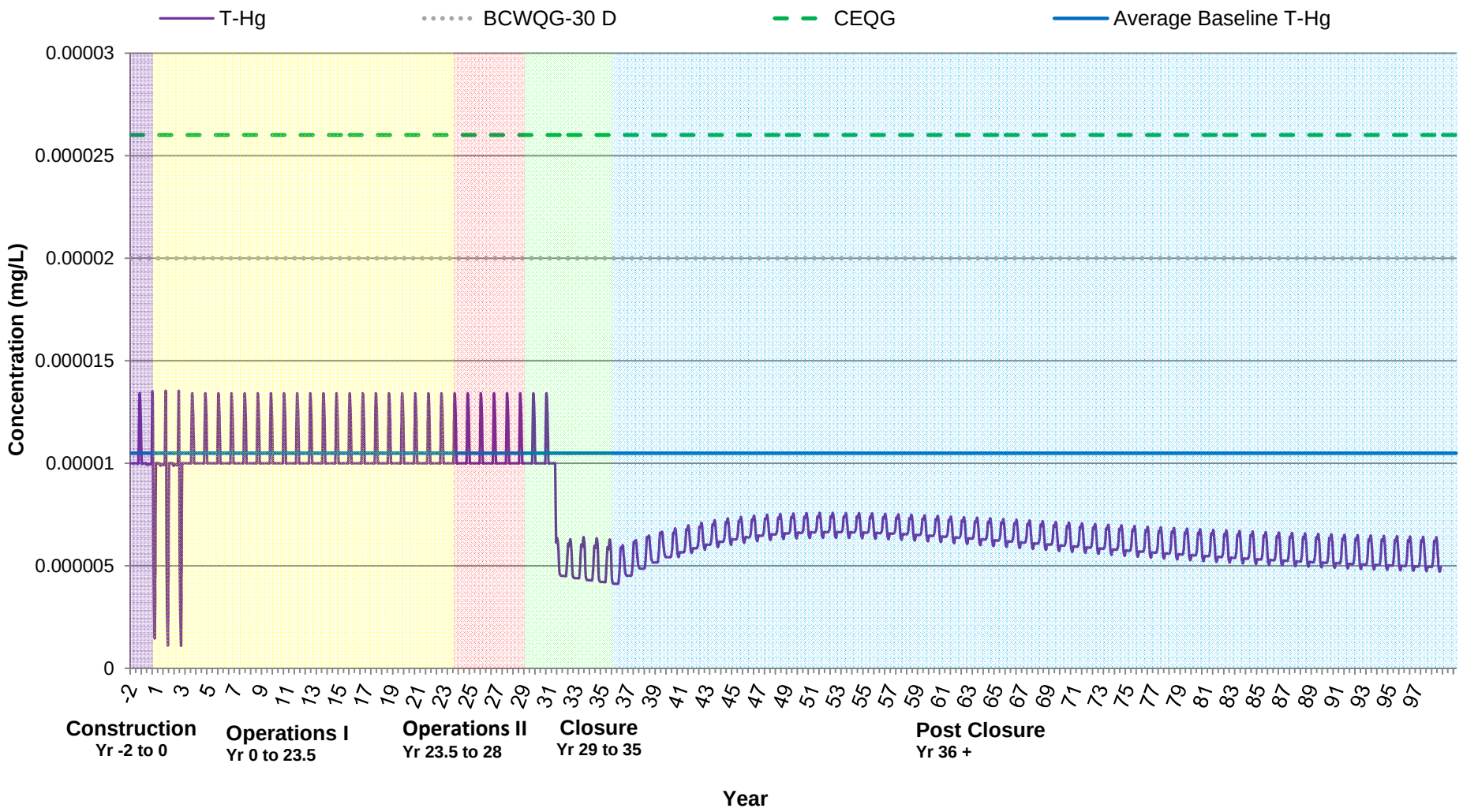
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C4.Mo

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-30 D AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).
3. BCWQG-30 D VALUE APPLIED ON ASSUMPTION THAT METHYL-Hg IS EQUAL TO 0.5% OF T-Hg.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE MERCURY CONCENTRATIONS - T-CREEK

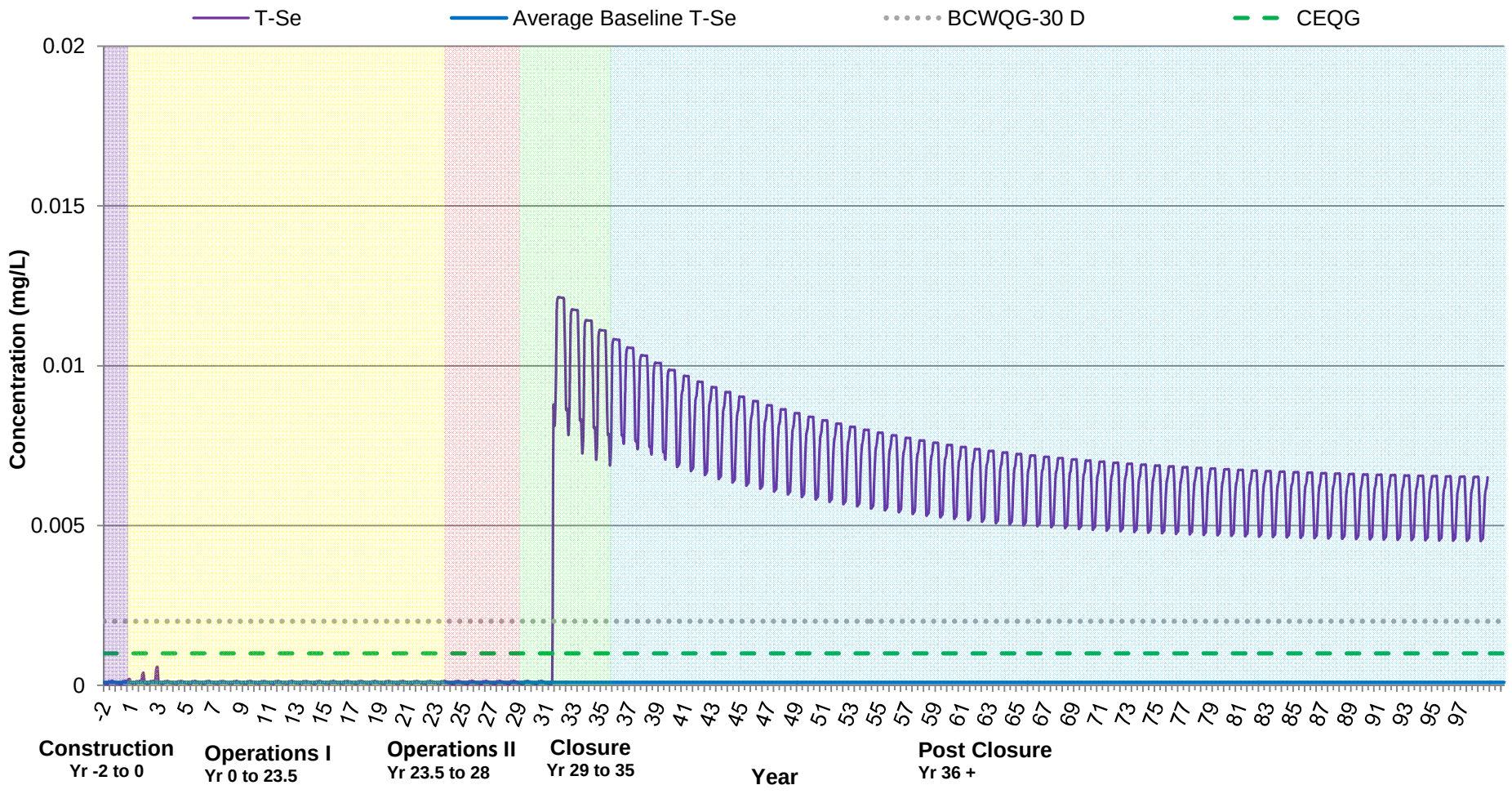
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C4.Hg

REV 0



NOTES:

1. THE BCWQG-30 D AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE SELENIUM CONCENTRATIONS - T-CREEK

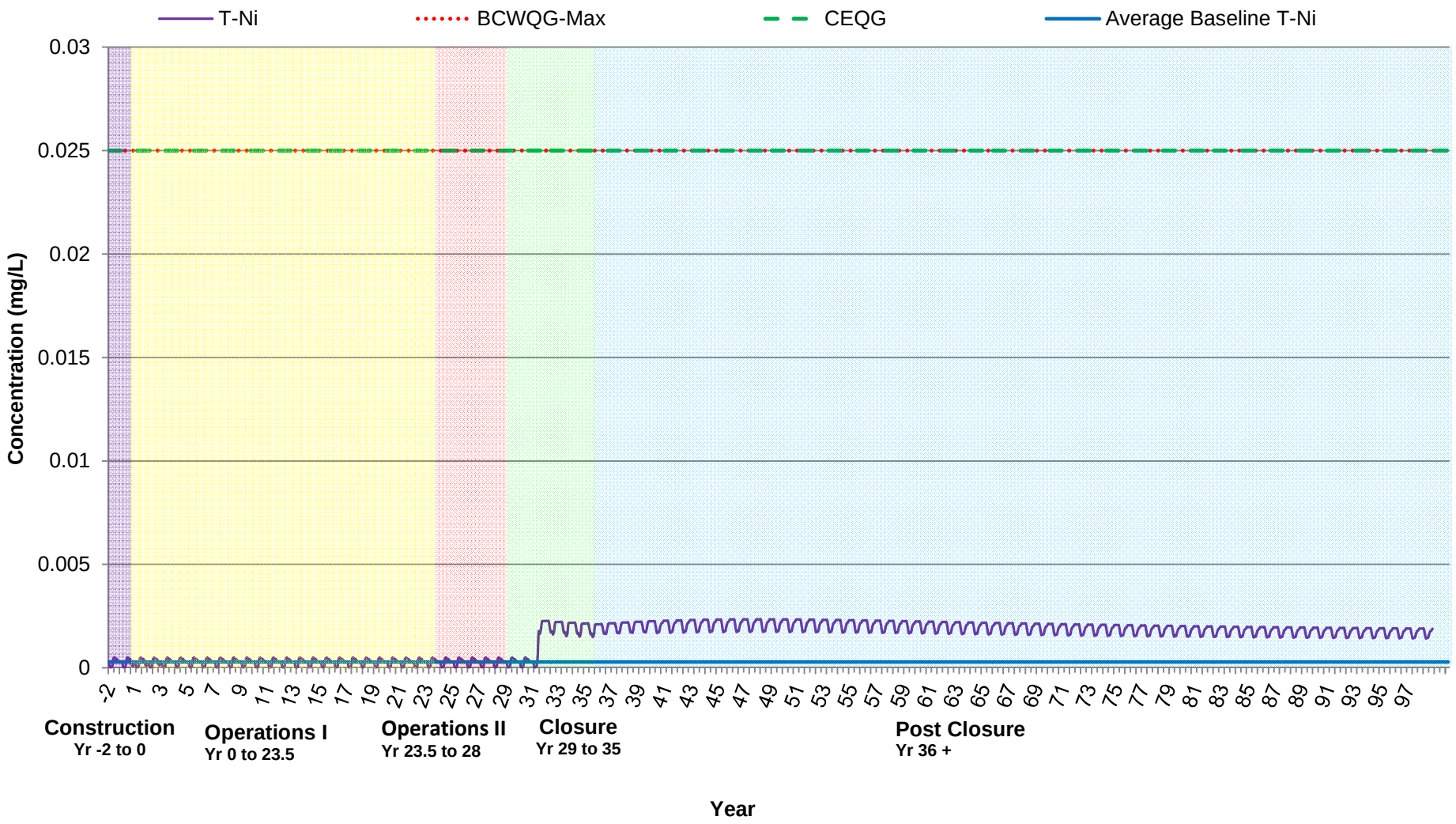
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C4.Se

REV 0



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE NICKEL CONCENTRATIONS - T-CREEK

Knight Piésold CONSULTING

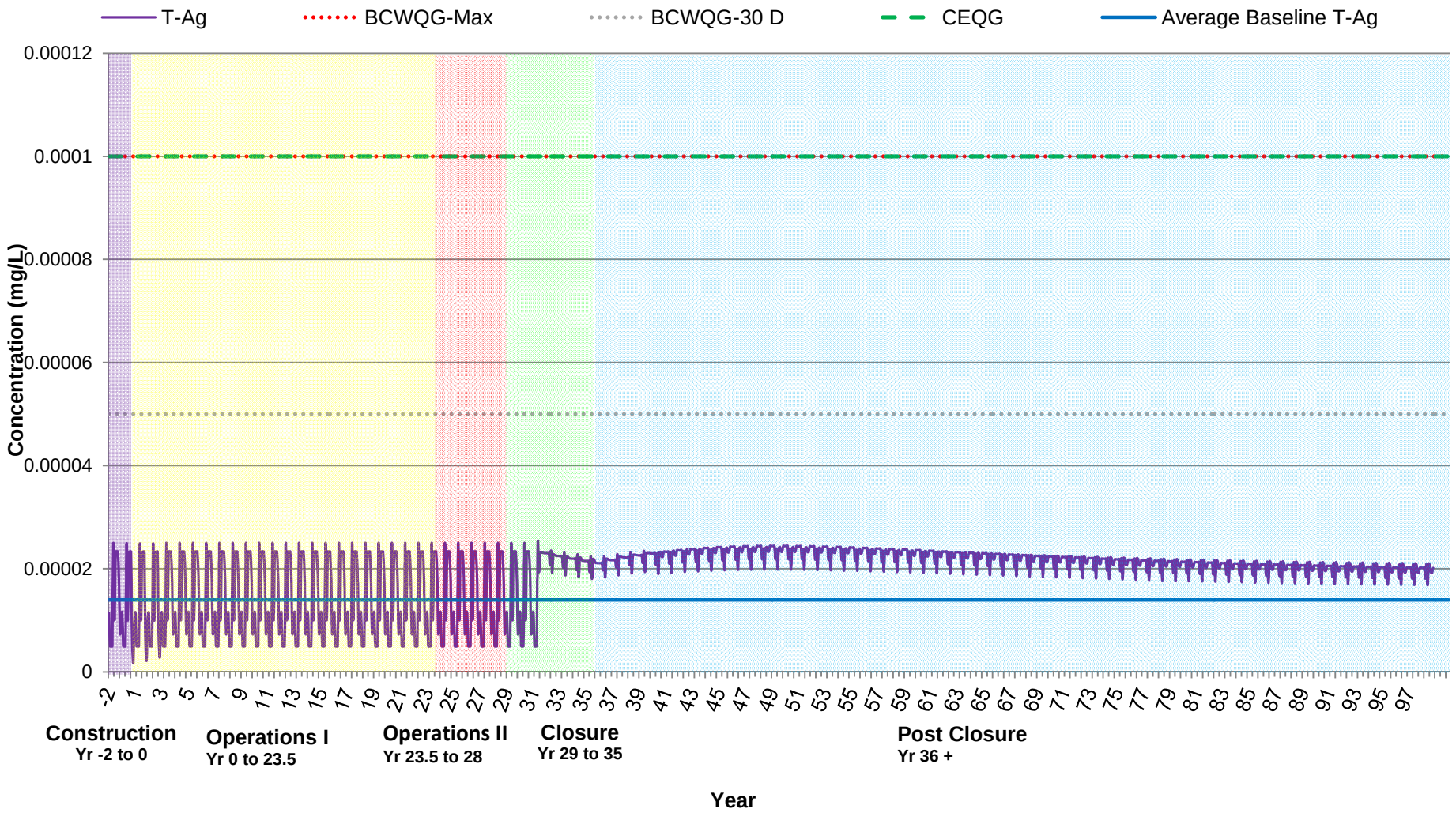
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C4.Ni

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-30 D AND BCWQG-MAX ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE SILVER CONCENTRATIONS - T-CREEK

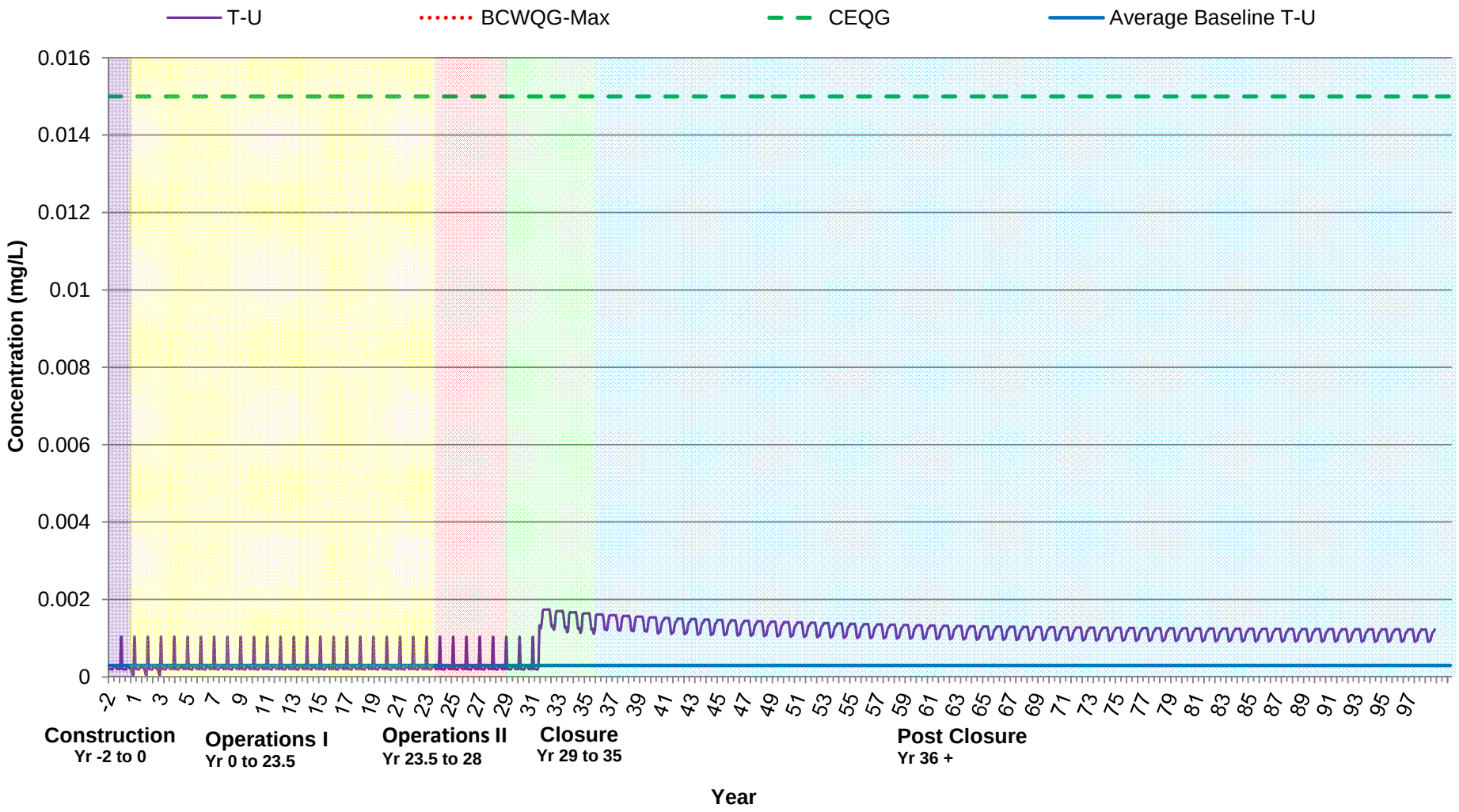
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C4.Ag

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).
3. THE BCWQG-MAX (0.3 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE URANIUM CONCENTRATIONS - T-CREEK

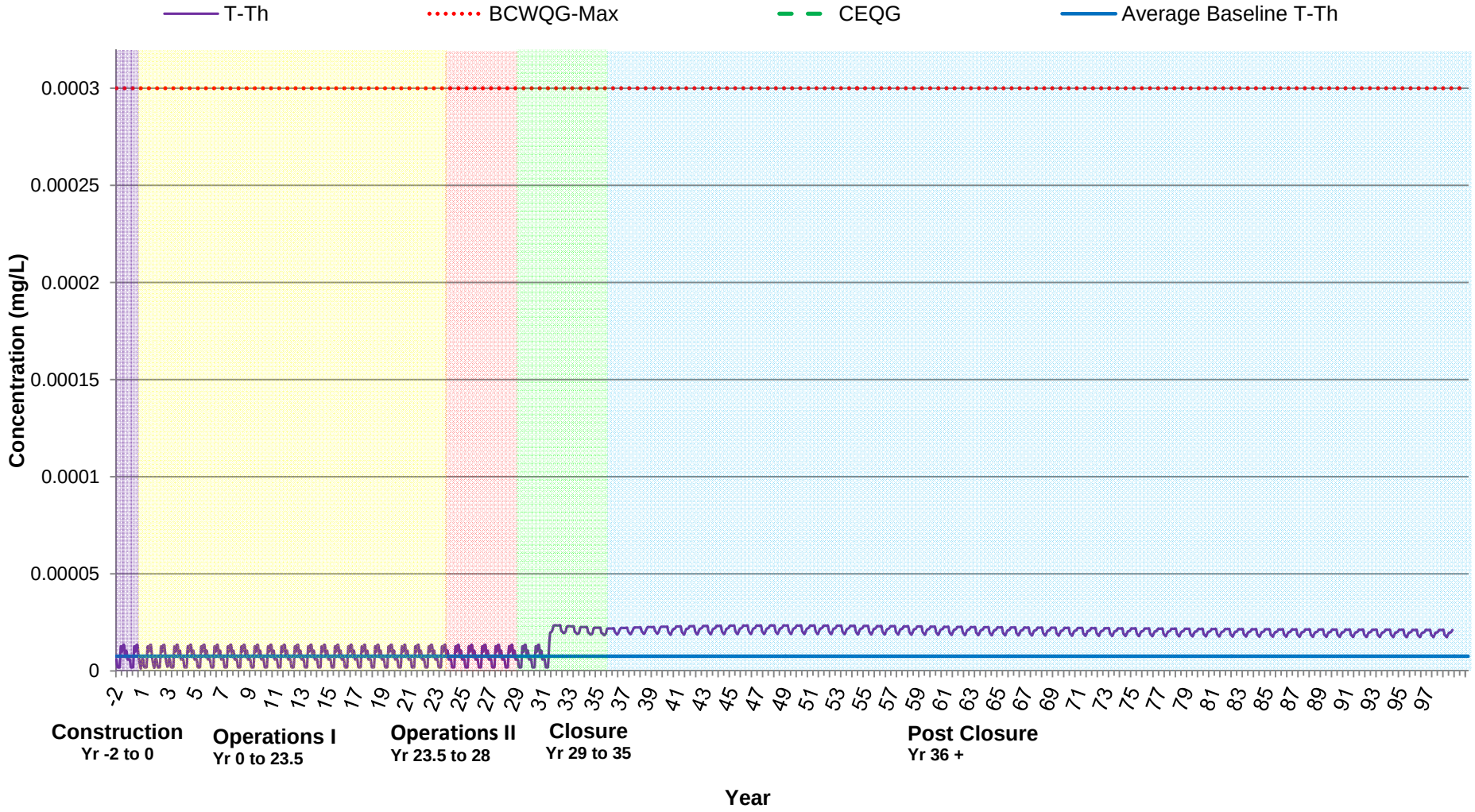
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C4.U

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).
3. THE CEQG (0.0008 mg/L) IS NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE THALLIUM CONCENTRATIONS - T-CREEK

Knight Piésold CONSULTING

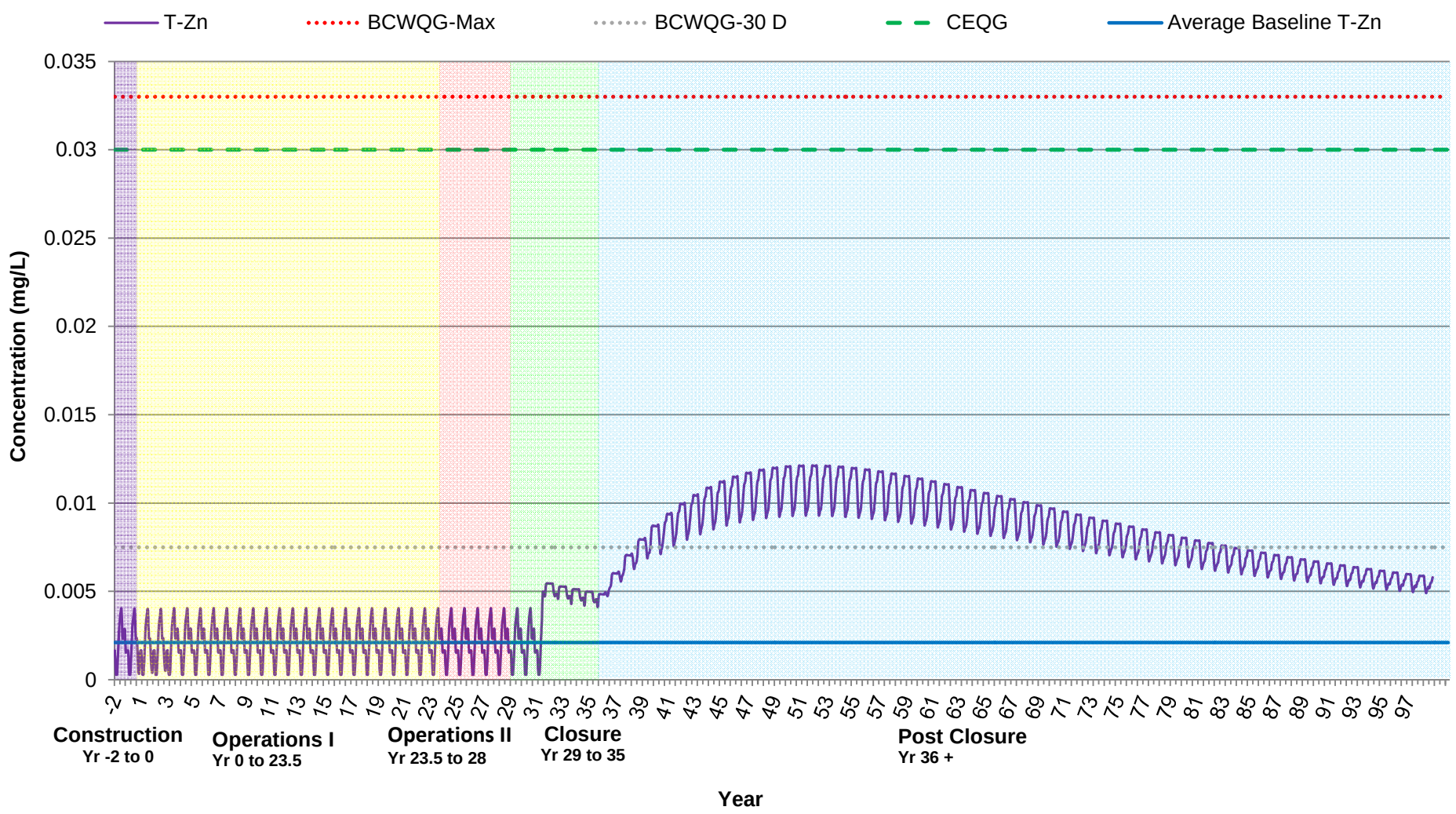
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C4.Th

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. BCWQG-30 D AND BCWQG-MAX ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE ZINC CONCENTRATIONS - T-CREEK

Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C4.Zn

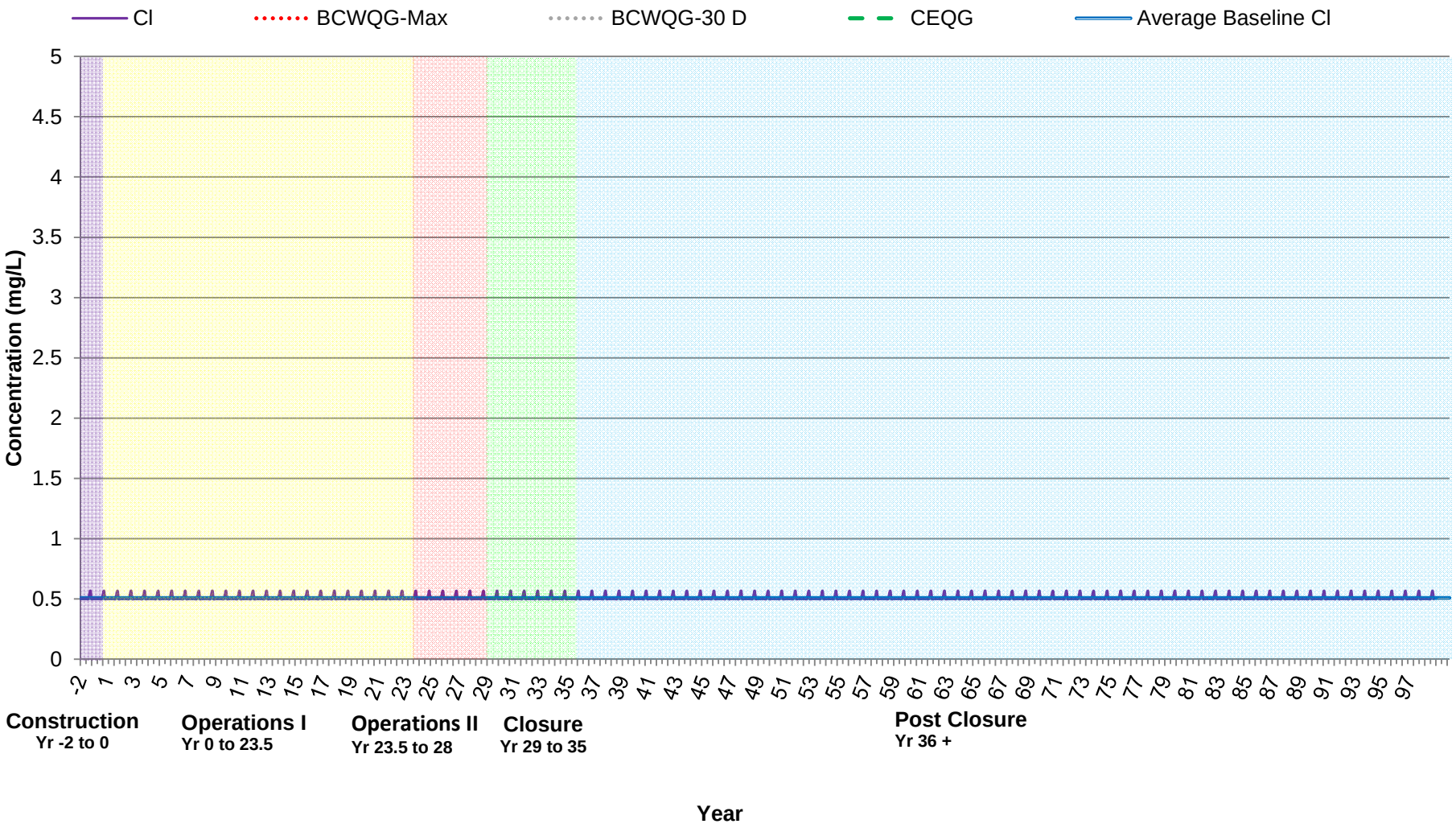
REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

APPENDIX C5

HARPER CREEK BELOW P-CREEK (HP)

(Pages C5-1 to C5-30)



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. ALL GUIDELINES ARE NOT SHOWN: BCWQG-30 D (150 mg/L); BCWQG-MAX (600 mg/L); CEQG (120 mg/L AND 640 mg/L).

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE CHLORIDE CONCENTRATIONS - HARPER CREEK BELOW P-CREEK (HP)

Knight Piésold CONSULTING

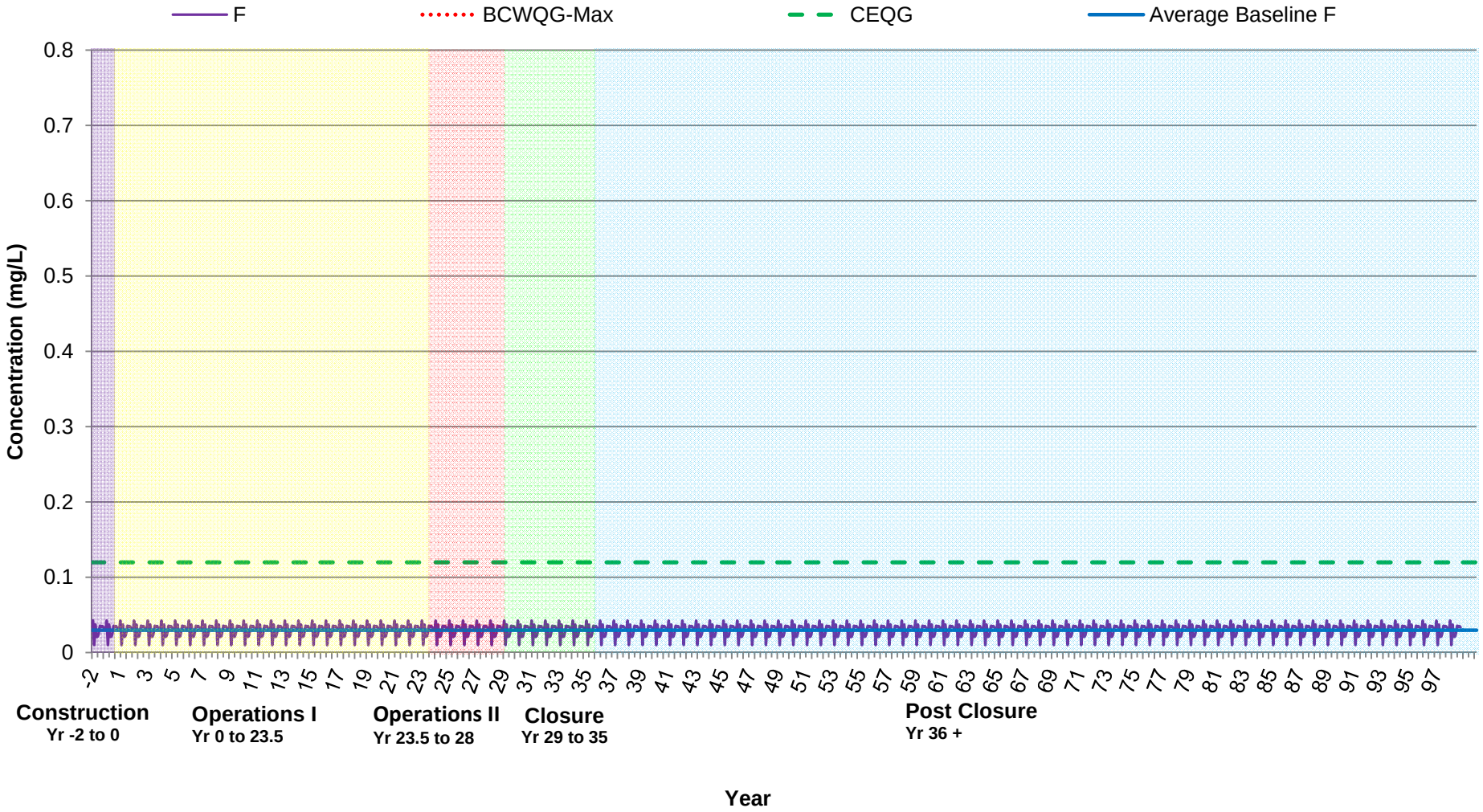
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C5.Cl

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX IS HARNDESS DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE FLUORIDE CONCENTRATIONS - HARPER CREEK BELOW P-CREEK (HP)

Knight Piésold CONSULTING

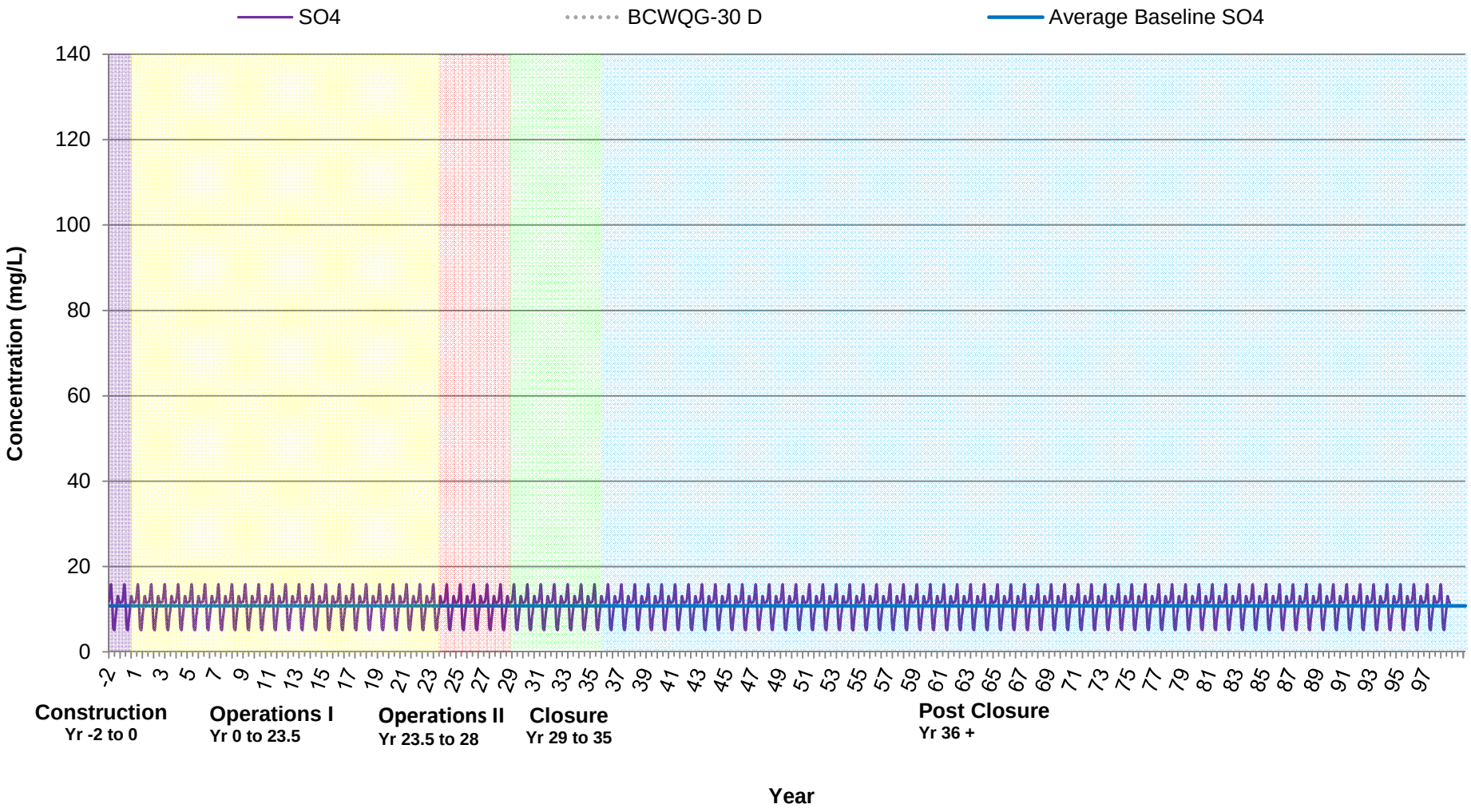
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C5.F

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. BCWQG-30 D IS HARDNESS DEPEDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE SULPHATE CONCENTRATIONS - HARPER CREEK BELOW P-CREEK (HP)

Knight Piésold CONSULTING

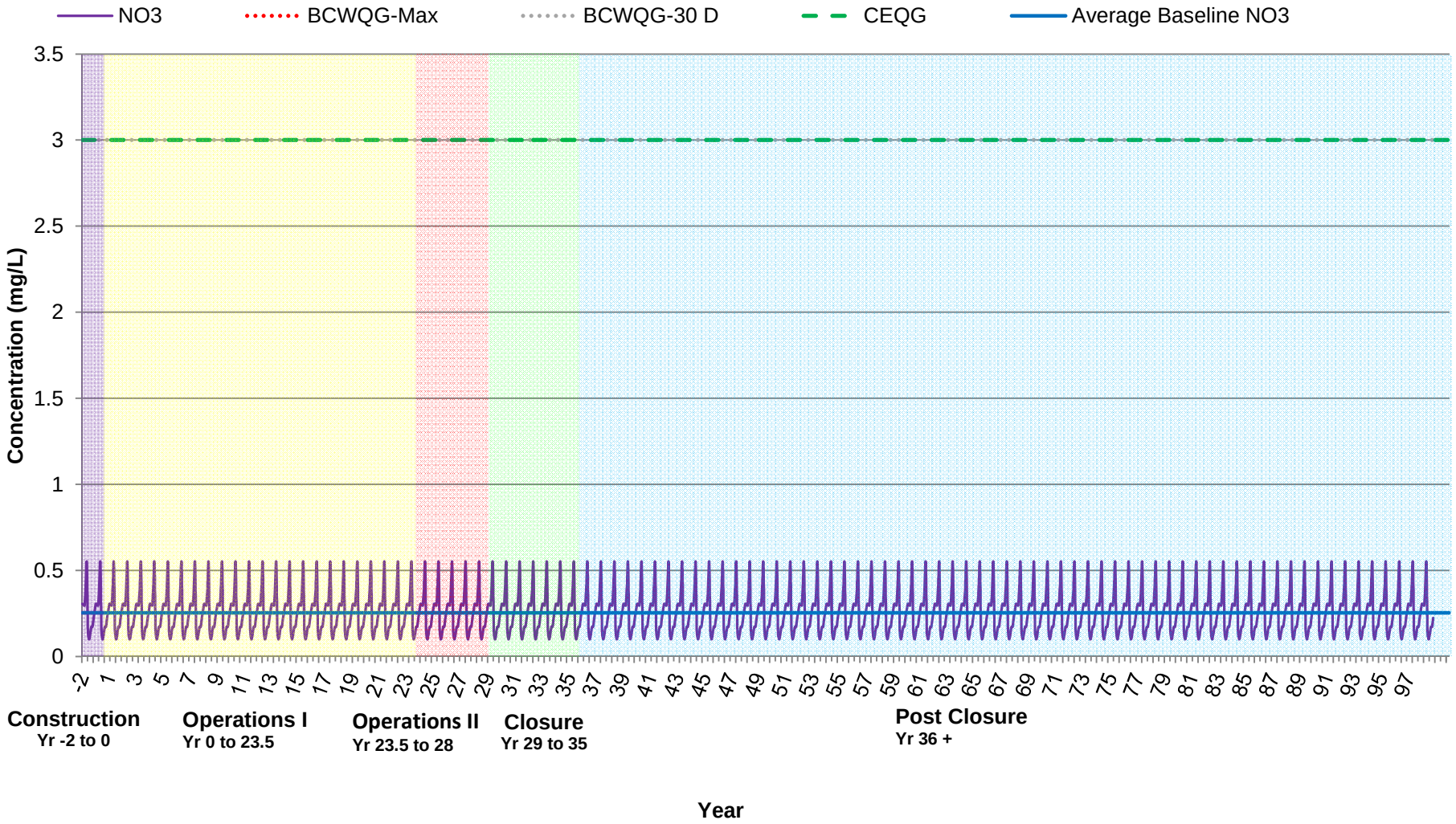
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C5.S04

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. THE BCWQG-MAX (32.8 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE NITRATE CONCENTRATIONS - HARPER CREEK BELOW P-CREEK (HP)

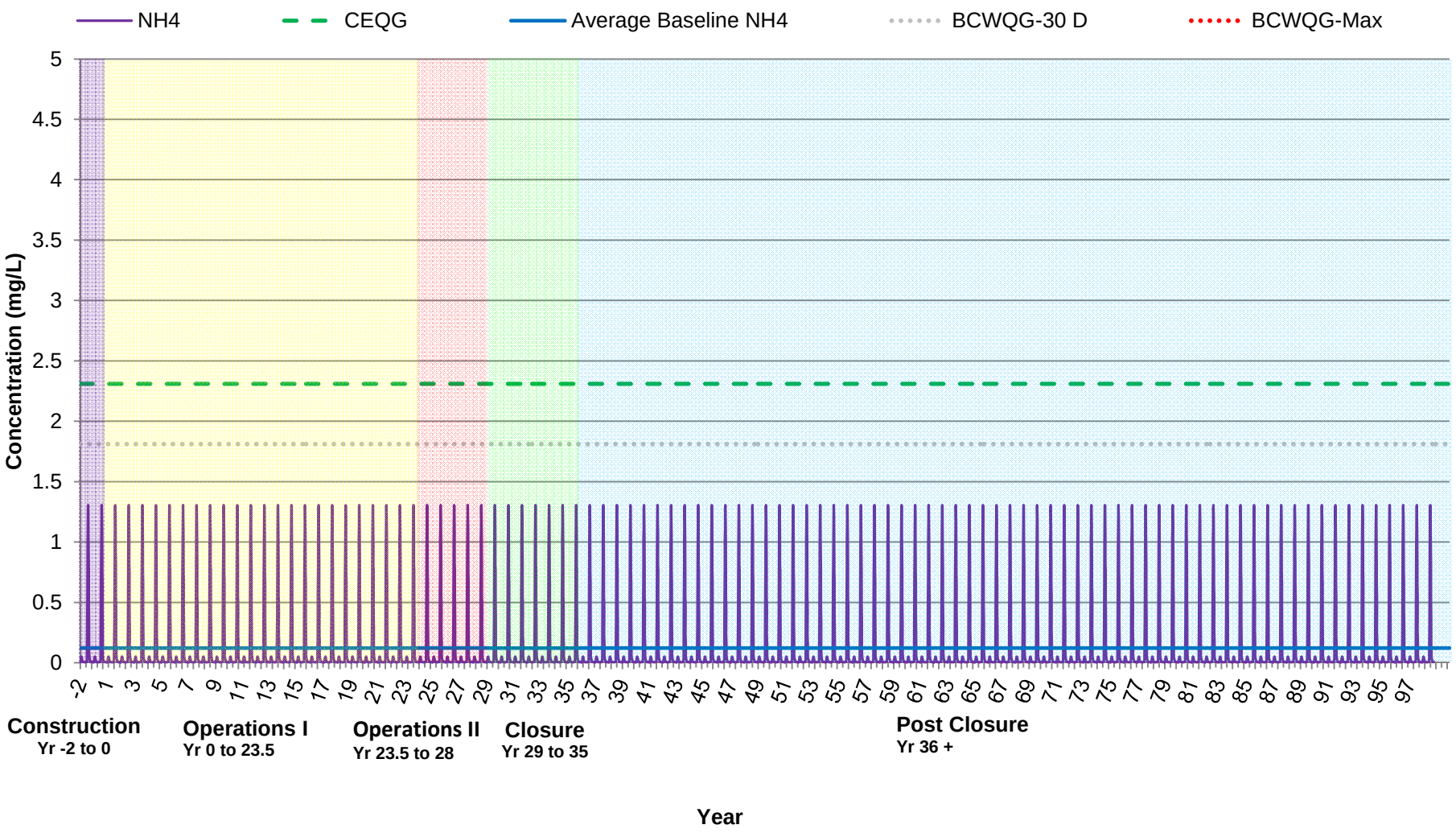
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C5.NO3

REV 0



NOTES:

1. THE BCWQG-30 D IS VALID FOR ONLY 6.5≤pH<9 AND 0°C≤T≤20°C.
2. THE BCWQG-MAX (20.15 mg/L) VALID FOR 6.5≤pH<9 IS NOT SHOWN.
3. THE CEQG IS TO BE USED WITH CAUTION FOR WATER WITH T<5°C AND pH>9.
4. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE AMMONIA CONCENTRATIONS - HARPER CREEK BELOW P-CREEK (HP)

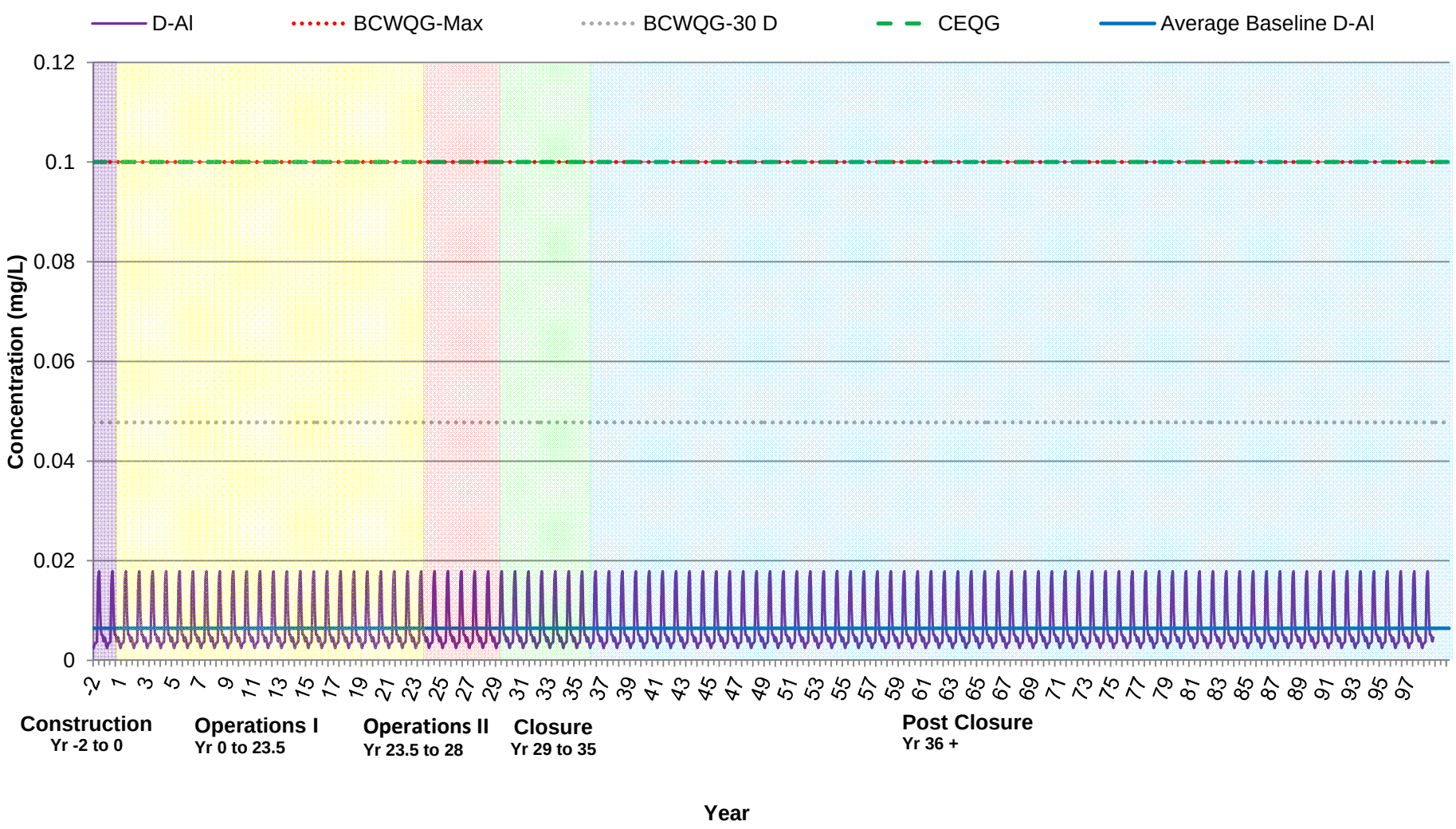
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C5.NH4

REV 0



NOTES:

1. ALL GUIDELINES ARE pH-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. AVERAGE BASELINE pH USED TO CALCULATE GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE DISSOLVED ALUMINUM CONCENTRATIONS - HARPER CREEK BELOW P-CREEK (HP)

Knight Piésold CONSULTING

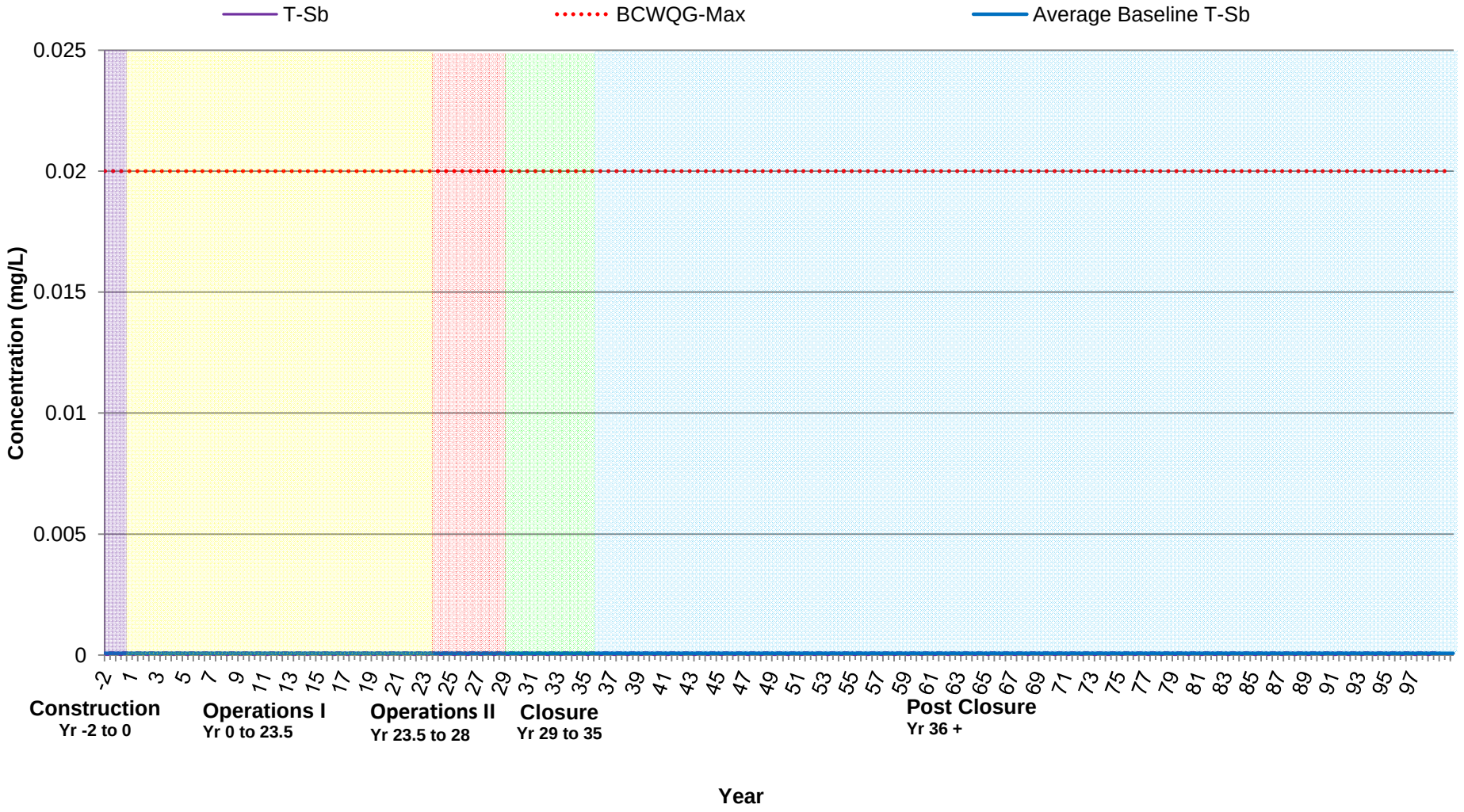
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C5.Al

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE ANTIMONY CONCENTRATIONS - HARPER CREEK BELOW P-CREEK (HP)

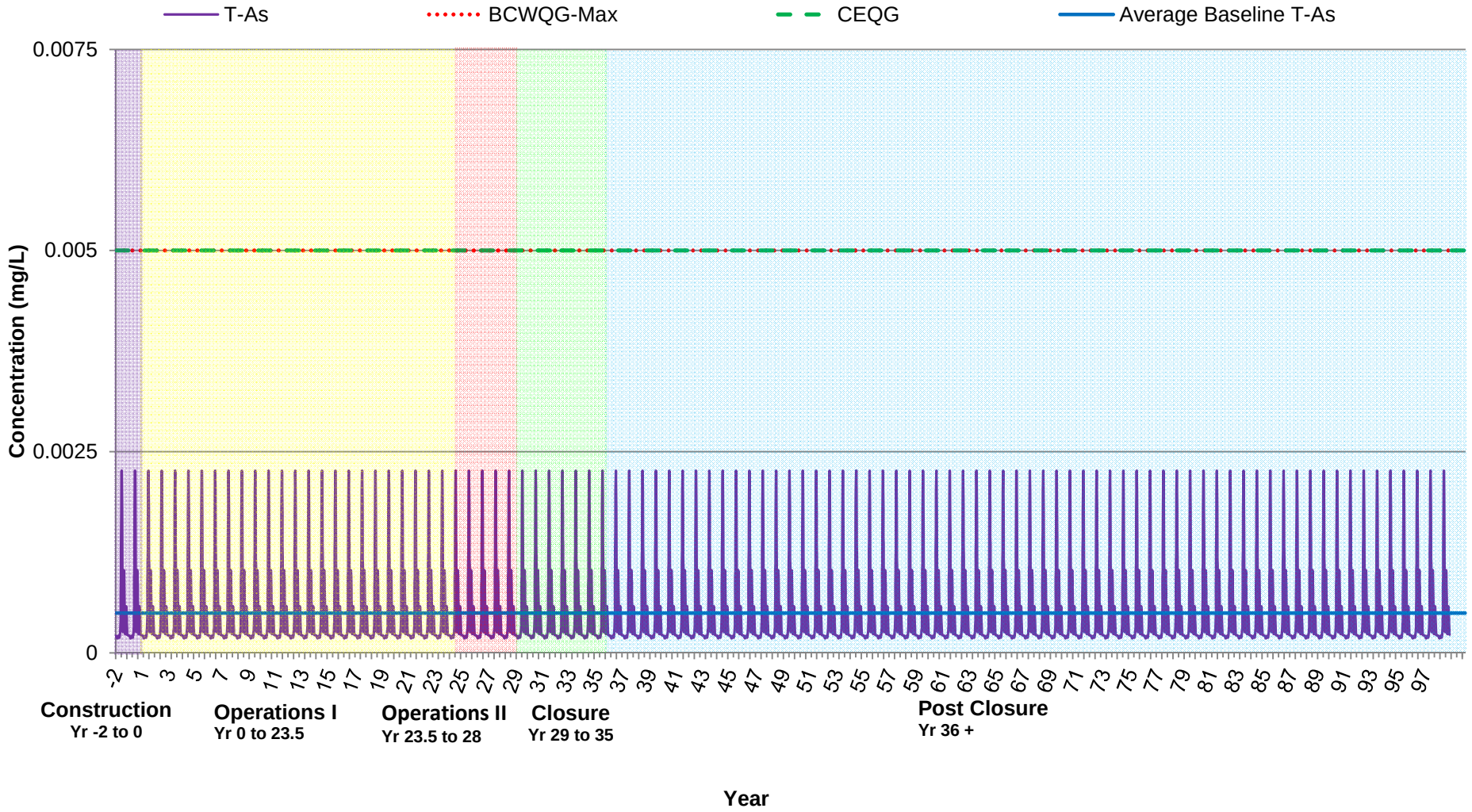
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C5.Sb

REV 0



NOTES:

1. THE BCWQG AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE ARSENIC CONCENTRATIONS - HARPER CREEK BELOW P-CREEK (HP)

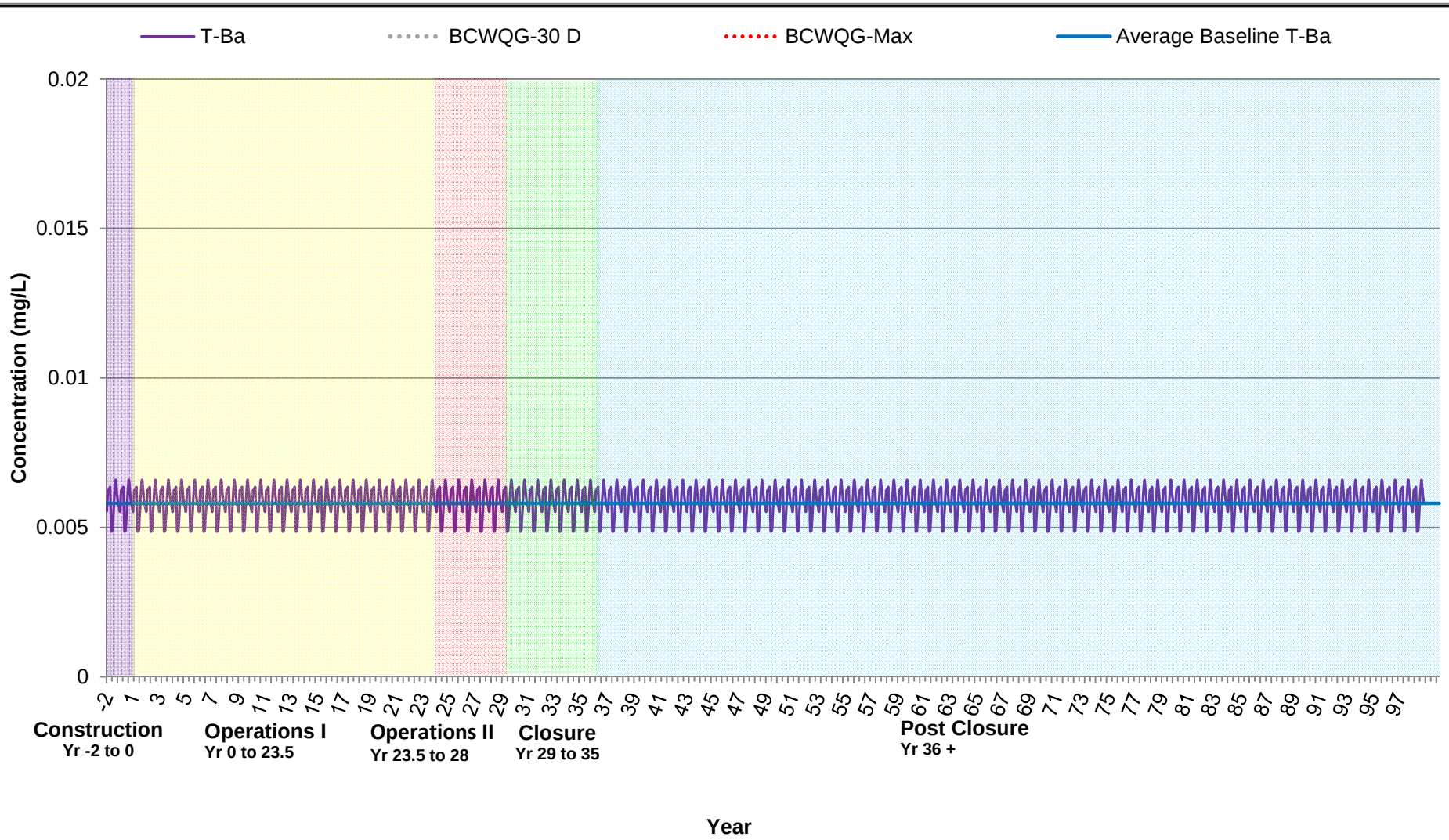
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C5.As

REV 0



NOTES:

1. THE BCWQG-MAX IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. THE BCWQG-30 D (1 mg/L) AND BCWQG-MAX (5 mg/L) ARE NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE BARIUM CONCENTRATIONS - HARPER CREEK BELOW P-CREEK (HP)

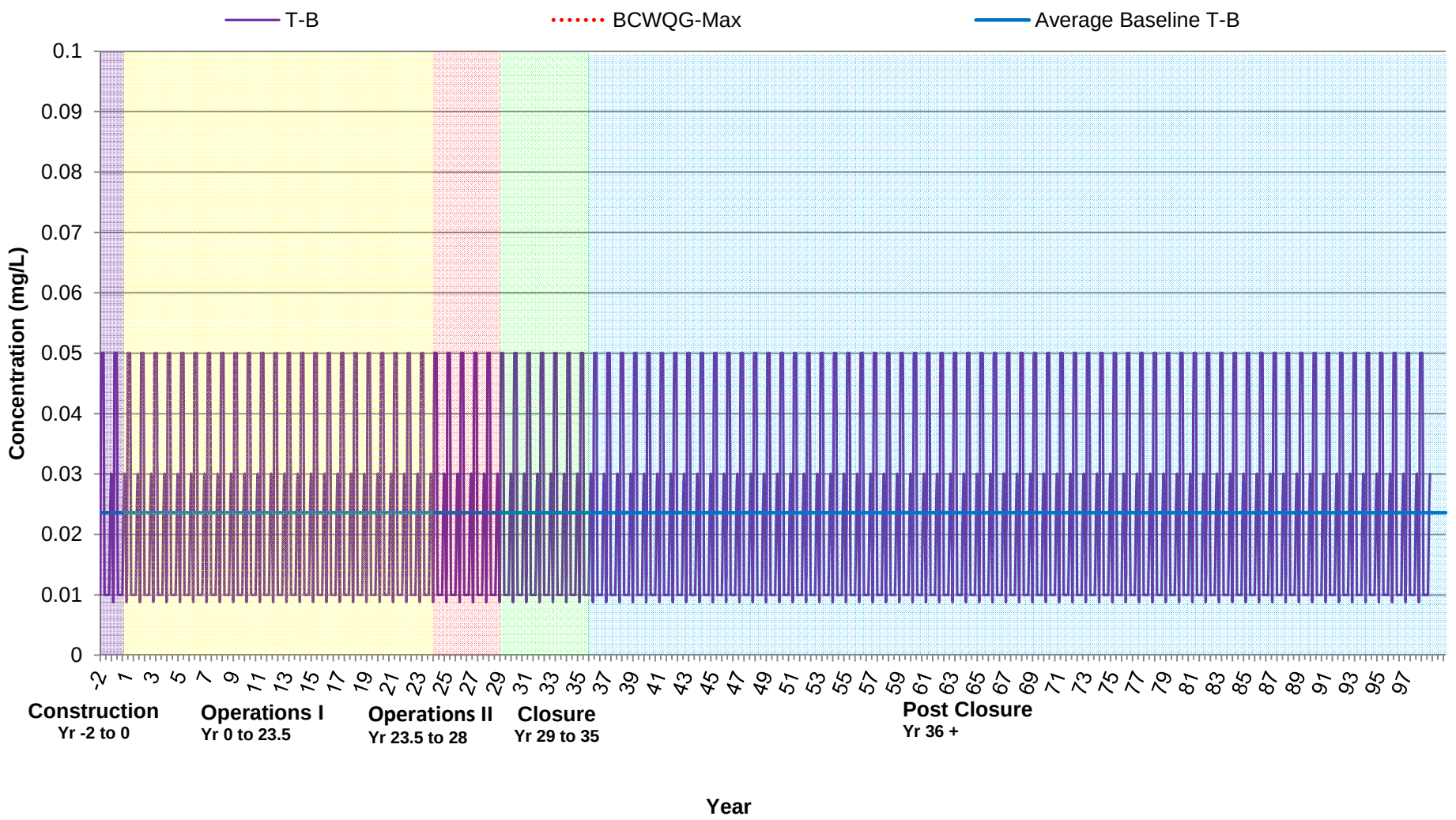
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C5.Ba

REV 0



NOTES:

1. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.
3. THE BCWQG-MAX (1.2 mg/L) IS NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE BORON CONCENTRATIONS - HARPER CREEK BELOW P-CREEK (HP)

Knight Piésold CONSULTING

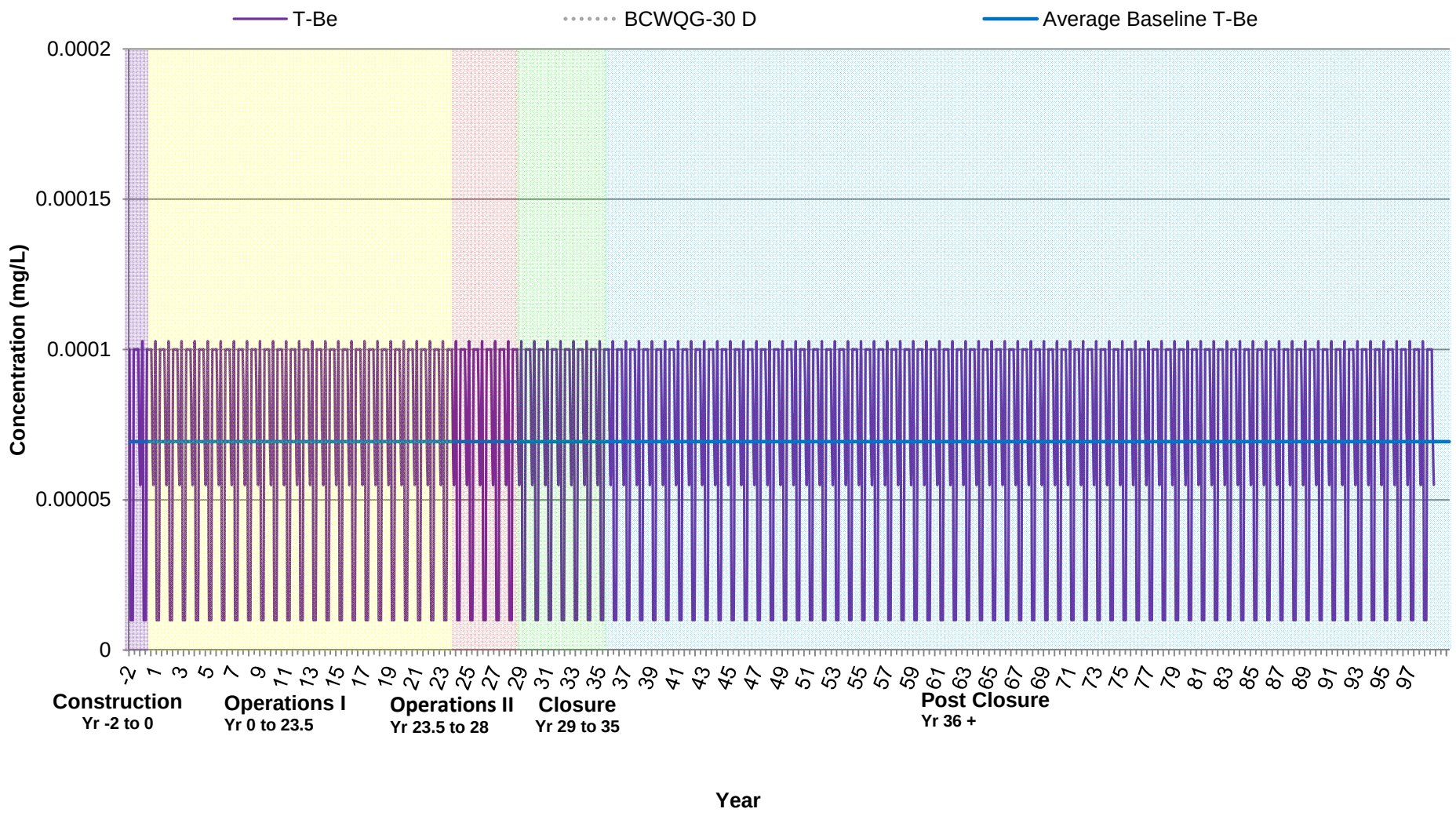
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C5.B

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. THE BCWQG-30 D (0.0053 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE BERYILLIUM CONCENTRATIONS - HARPER CREEK BELOW P-CREEK (HP)

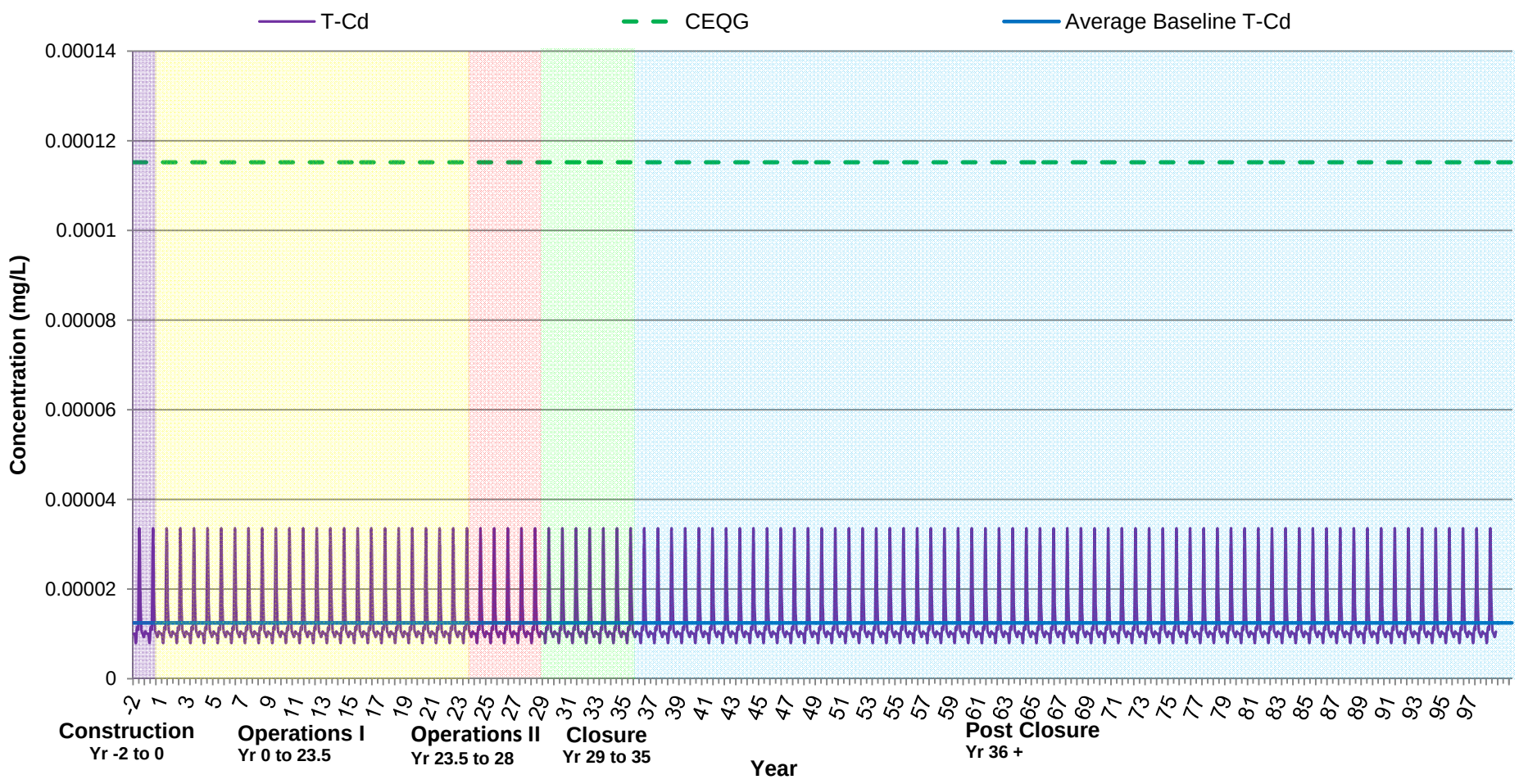
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C5.Be

REV 0



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. THE BCWQG ARE DRAFT GUIDELINES UNDER REVIEW (JUNE 2014).
3. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
4. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE CADMIUM CONCENTRATIONS - HARPER CREEK BELOW P-CREEK (HP)

Knight Piésold CONSULTING

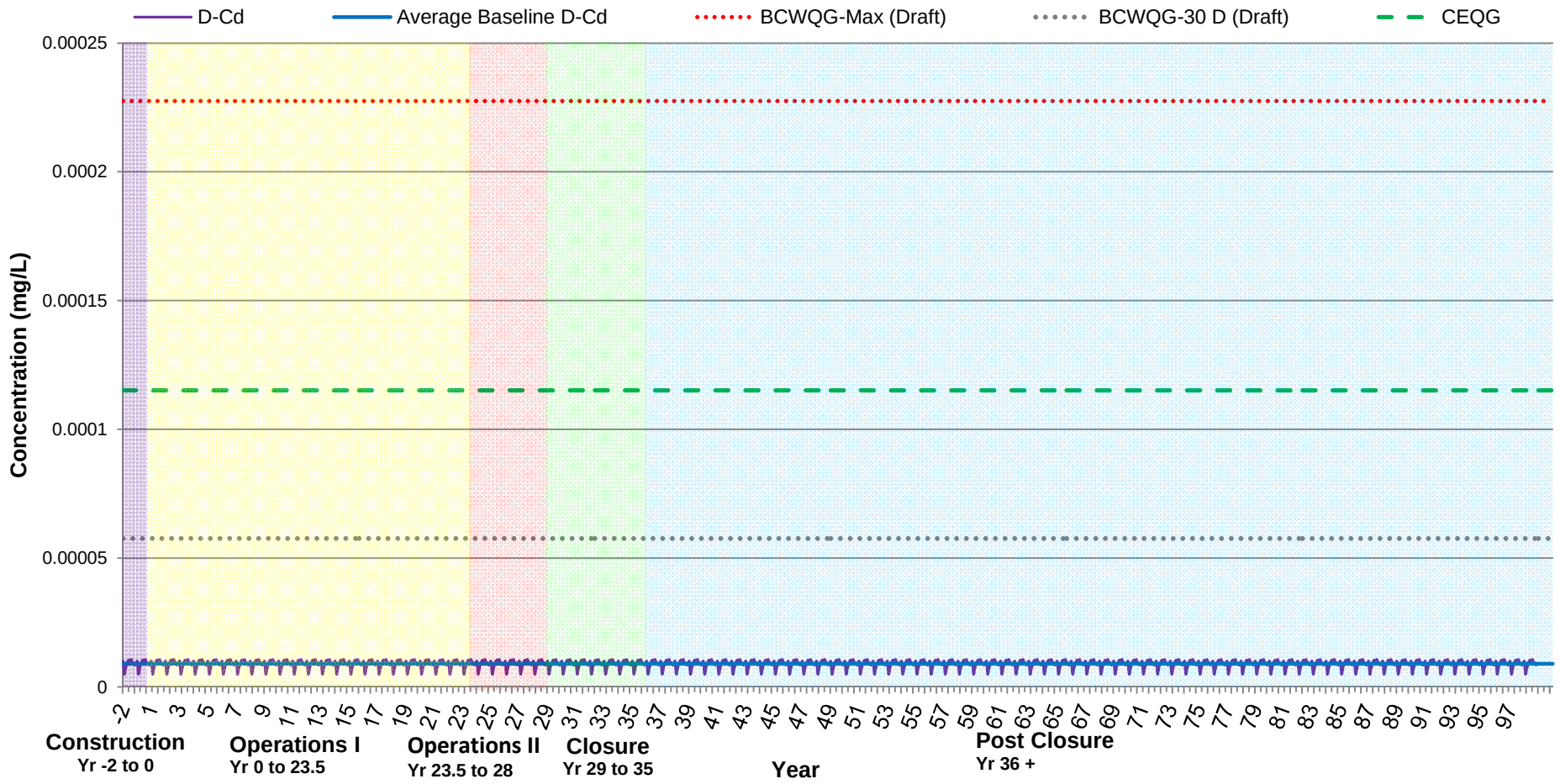
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C5.Cd-T

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. THE BCWQG ARE DRAFT GUIDELINES UNDER REVIEW (JUNE 2014).
3. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
4. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE CADMIUM CONCENTRATIONS - HARPER CREEK BELOW P-CREEK (HP)

Knight Piésold CONSULTING

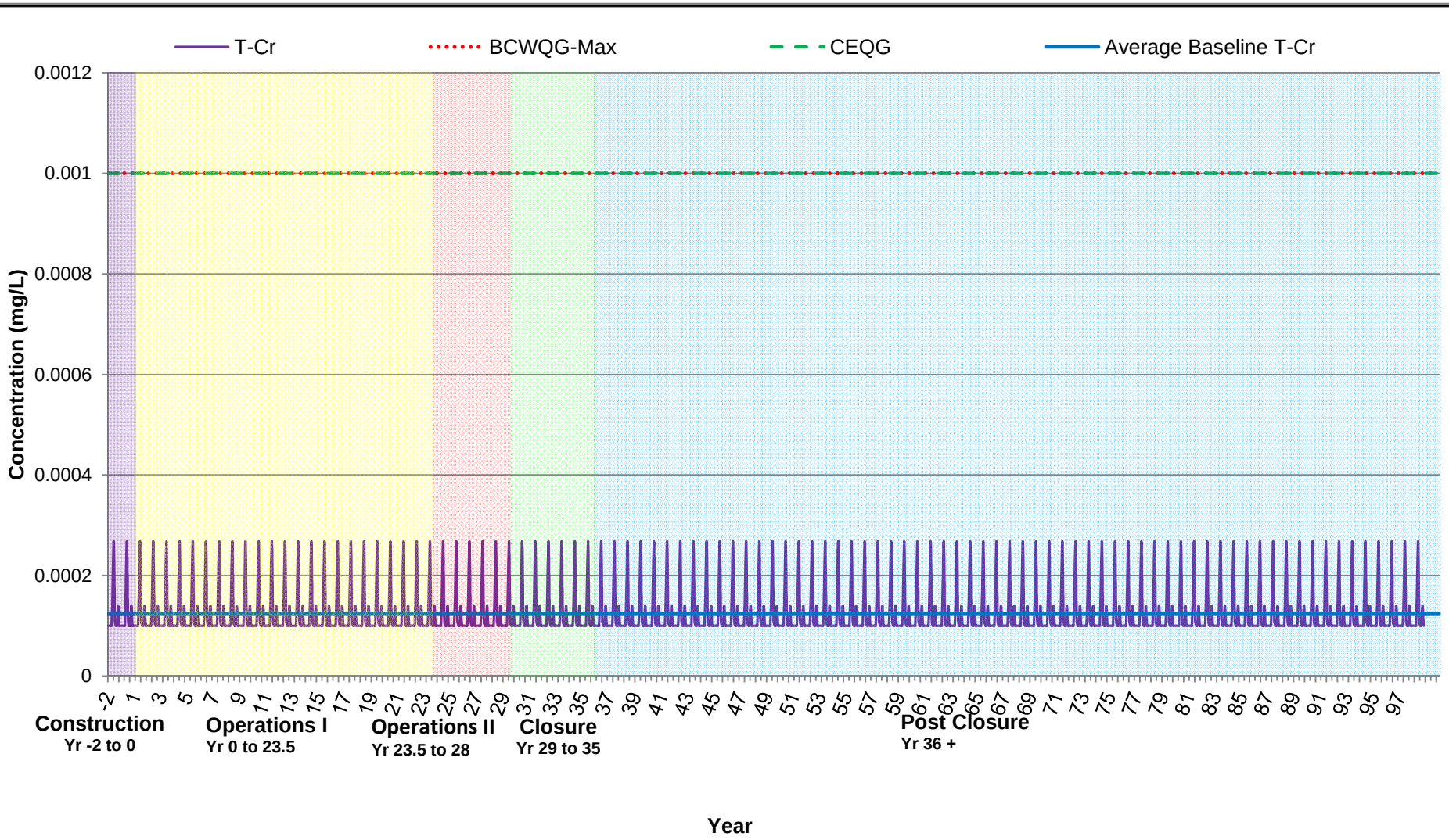
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C5.Cd-D

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. GUIDELINES ARE FOR CHROMIUM (IV), THE SPECIES MOST COMMON IN WELL OXYGENATED SURFACE WATERS.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE CHROMIUM CONCENTRATIONS - HARPER CREEK BELOW P-CREEK (HP)

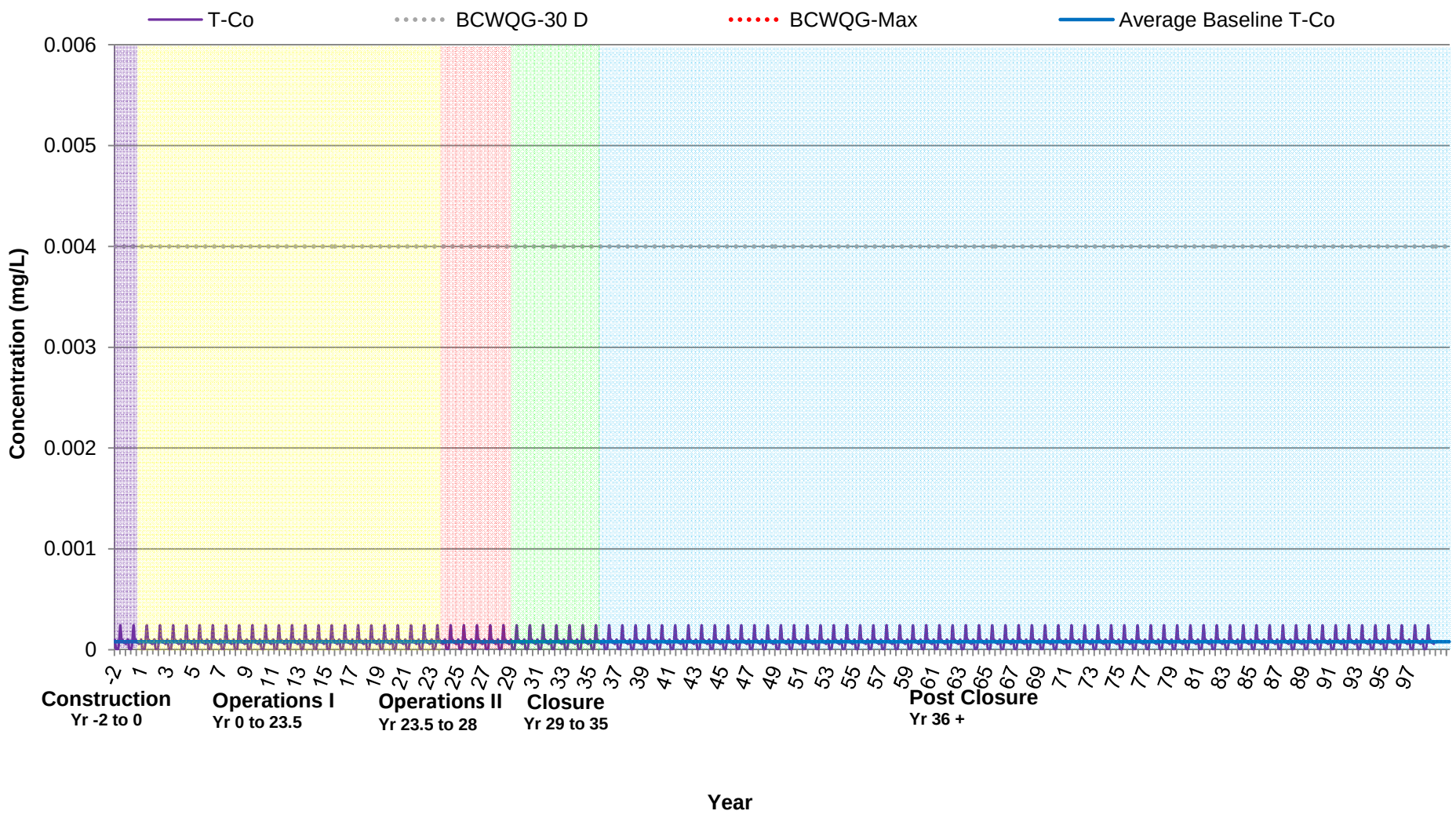
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C5.Cr

REV 0



NOTES:

1. THE BCWQG-30 D AND BCWQG-MAX ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. THE BCWQG-MAX GUIDELINE (0.11 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE COBALT CONCENTRATIONS - HARPER CREEK BELOW P-CREEK (HP)

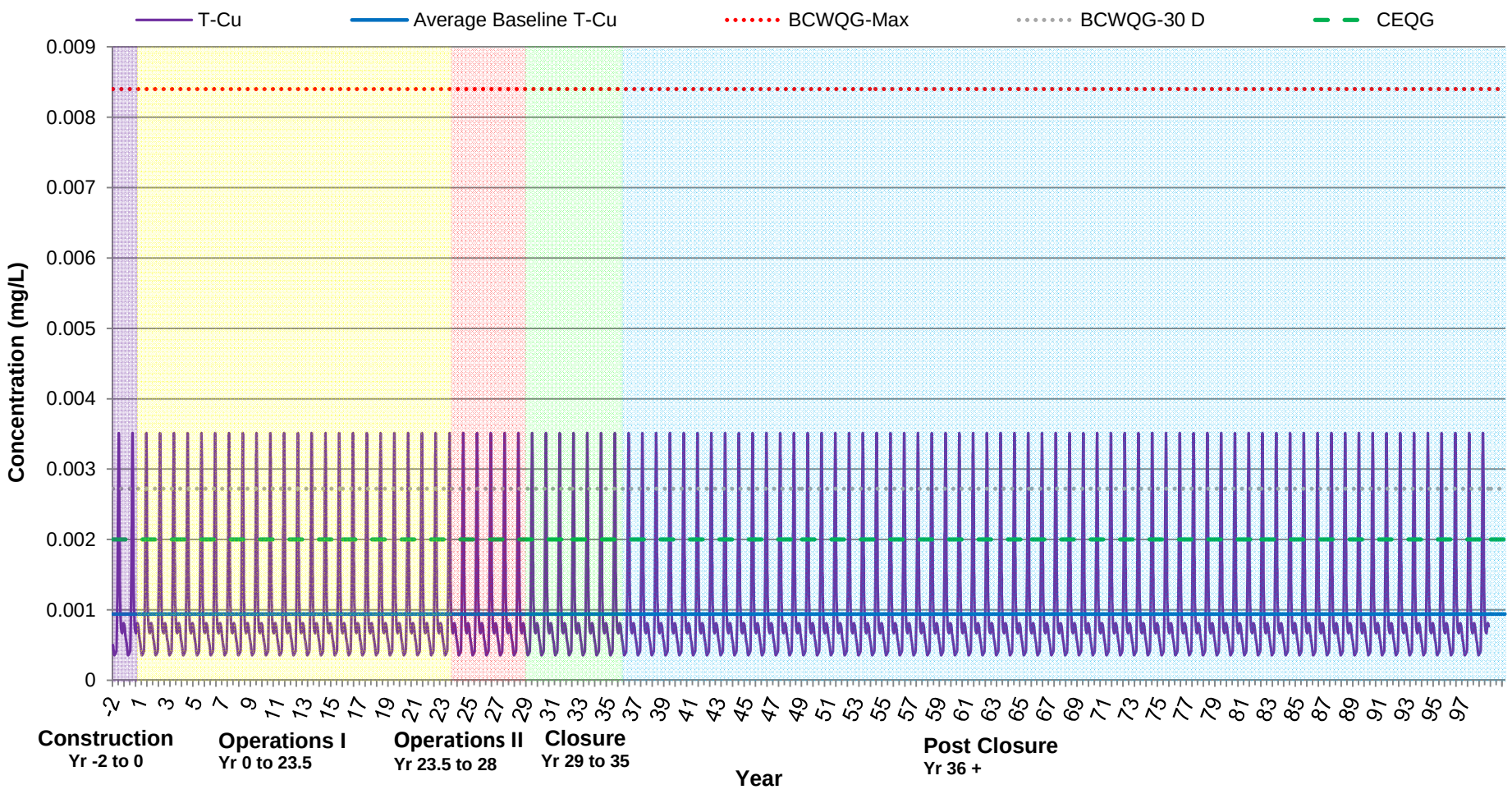
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C5.Co

REV 0



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE COPPER CONCENTRATIONS - HARPER CREEK BELOW P-CREEK (HP)

Knight Piésold CONSULTING

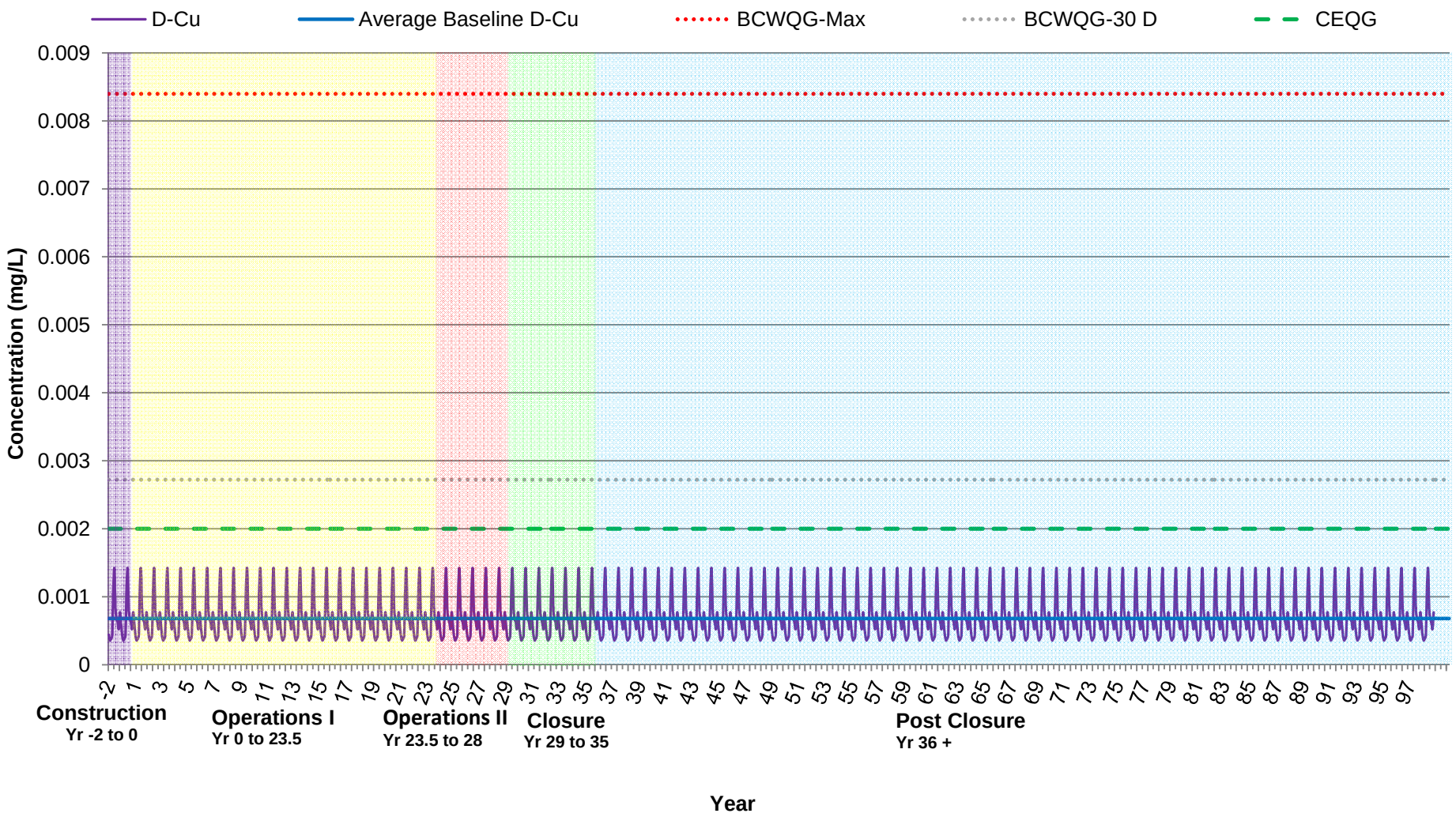
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C5.Cu-T

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE COPPER CONCENTRATIONS - HARPER CREEK BELOW P-CREEK (HP)

Knight Piésold CONSULTING

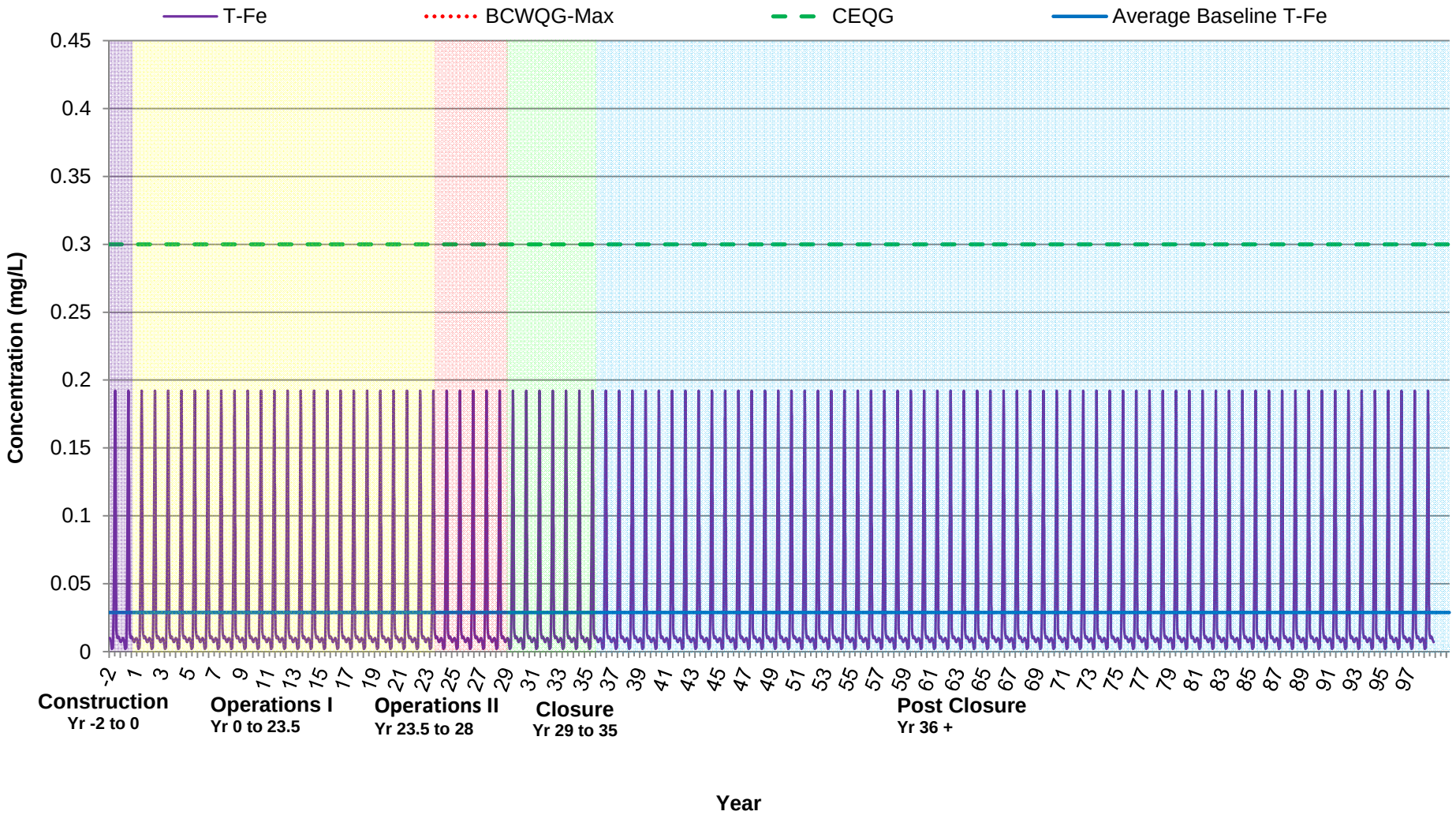
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C5.Cu-D

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. BCWQG-MAX 1.0 mg/L IS NOT SHOWN ON GRAPH.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE TOTAL IRON CONCENTRATIONS - HARPER CREEK BELOW P-CREEK (HP)

Knight Piésold CONSULTING

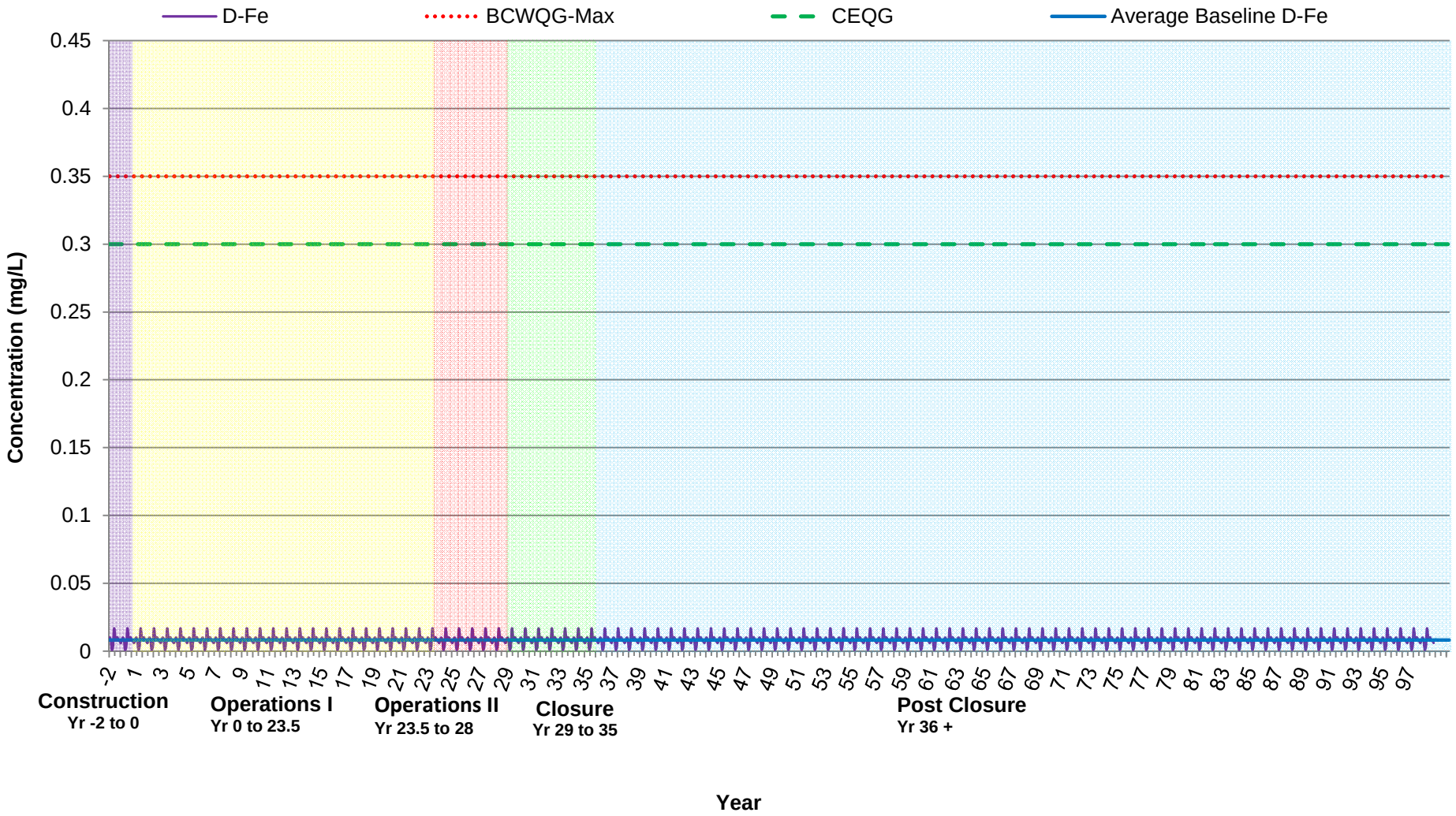
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C5.Fe-T

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE DISSOLVED IRON CONCENTRATIONS - HARPER CREEK BELOW P-CREEK (HP)

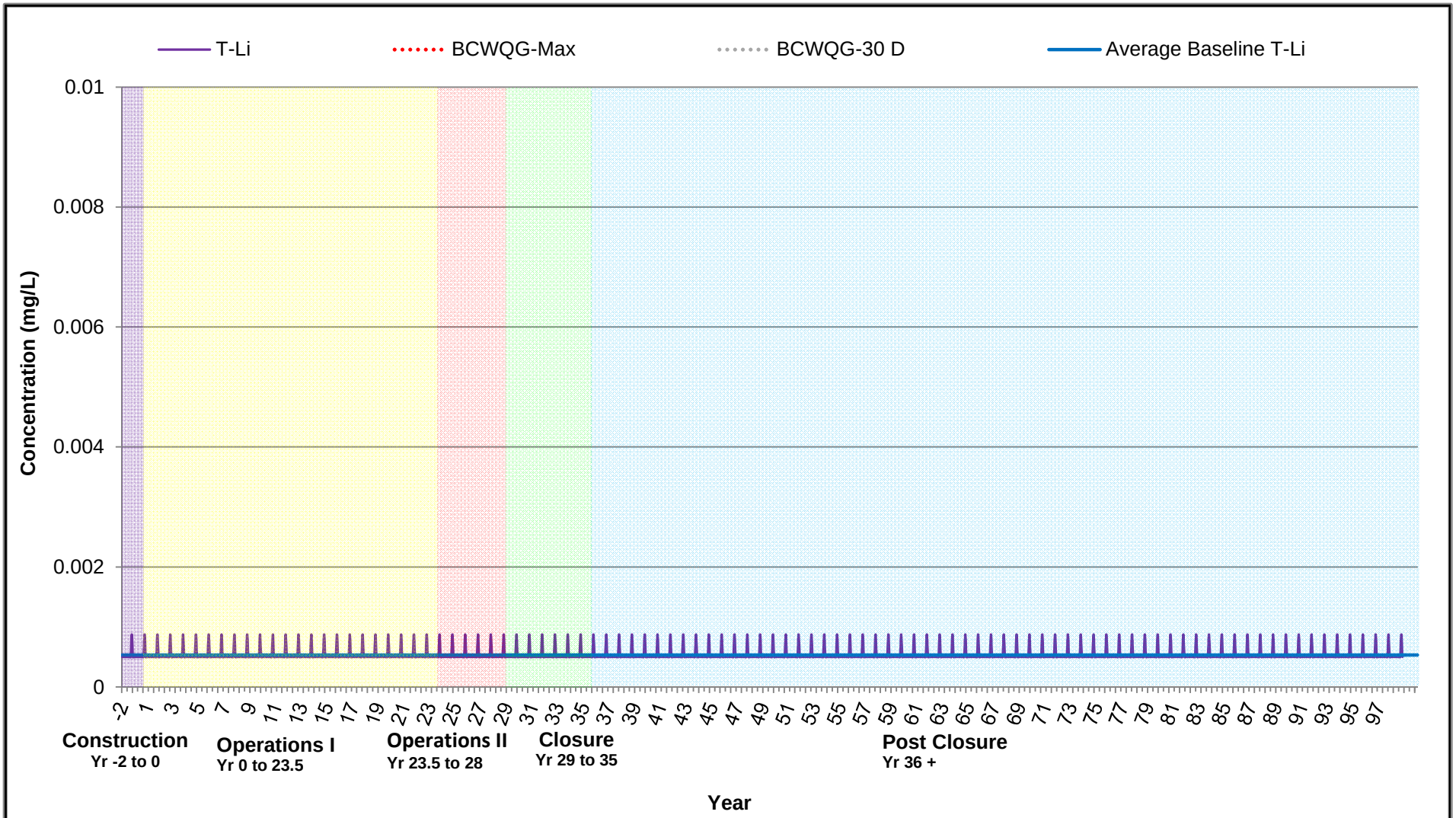
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C5.Fe-D

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. THE BCWQG-30 D (0.096 mg/L) AND BCWQG-MAX (0.87 mg/L) ARE INTERIM (WORKING) AND ARE NOT SHOWN ON GRAPH.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE LITHIUM CONCENTRATIONS - HARPER CREEK BELOW P-CREEK (HP)

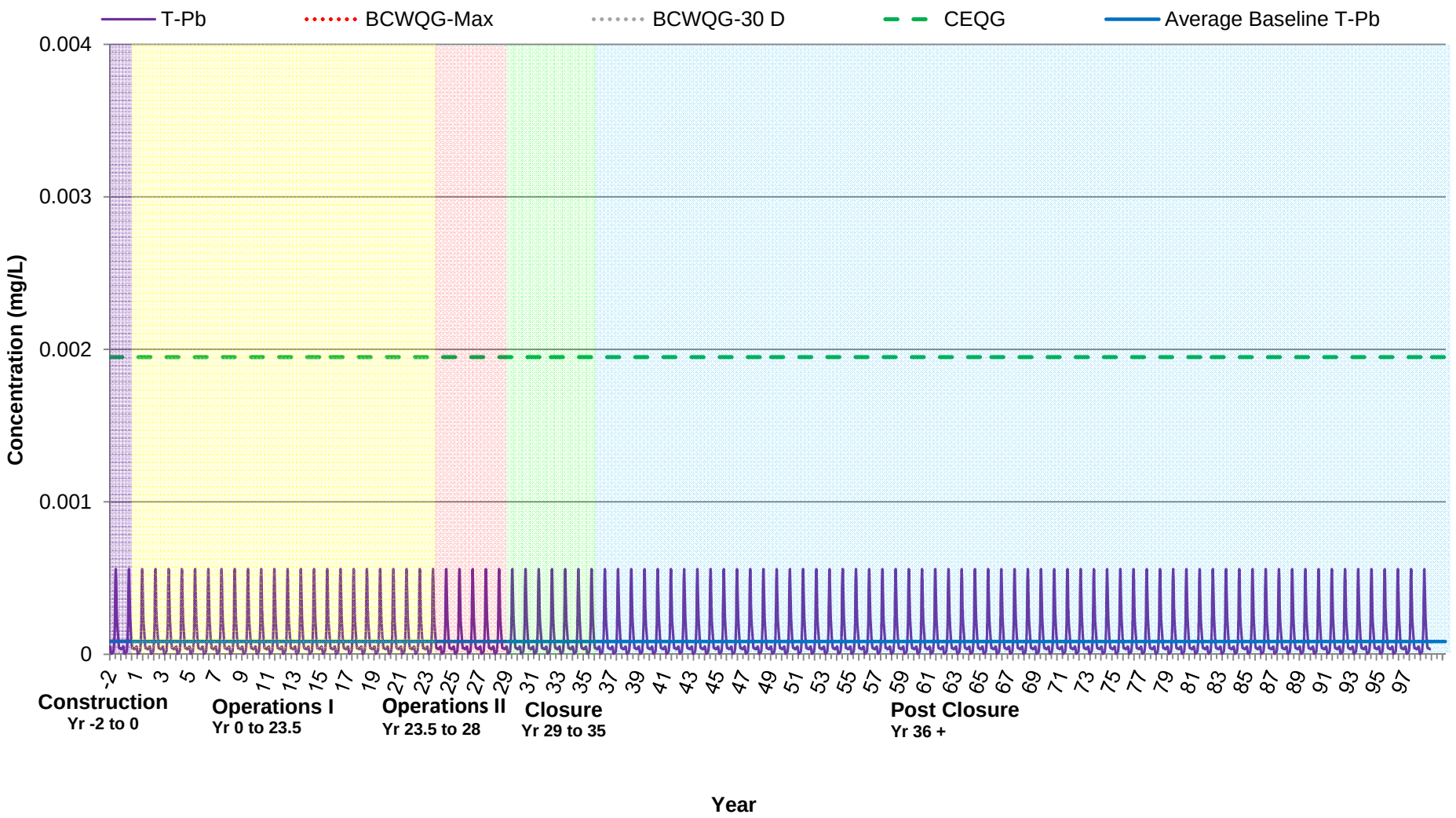
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C5.Li

REV 0



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.
4. THE BCWQG-MAX (CALCULATED AT 0.011 mg/L) IS NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE LEAD CONCENTRATIONS - HARPER CREEK BELOW P-CREEK (HP)

Knight Piésold CONSULTING

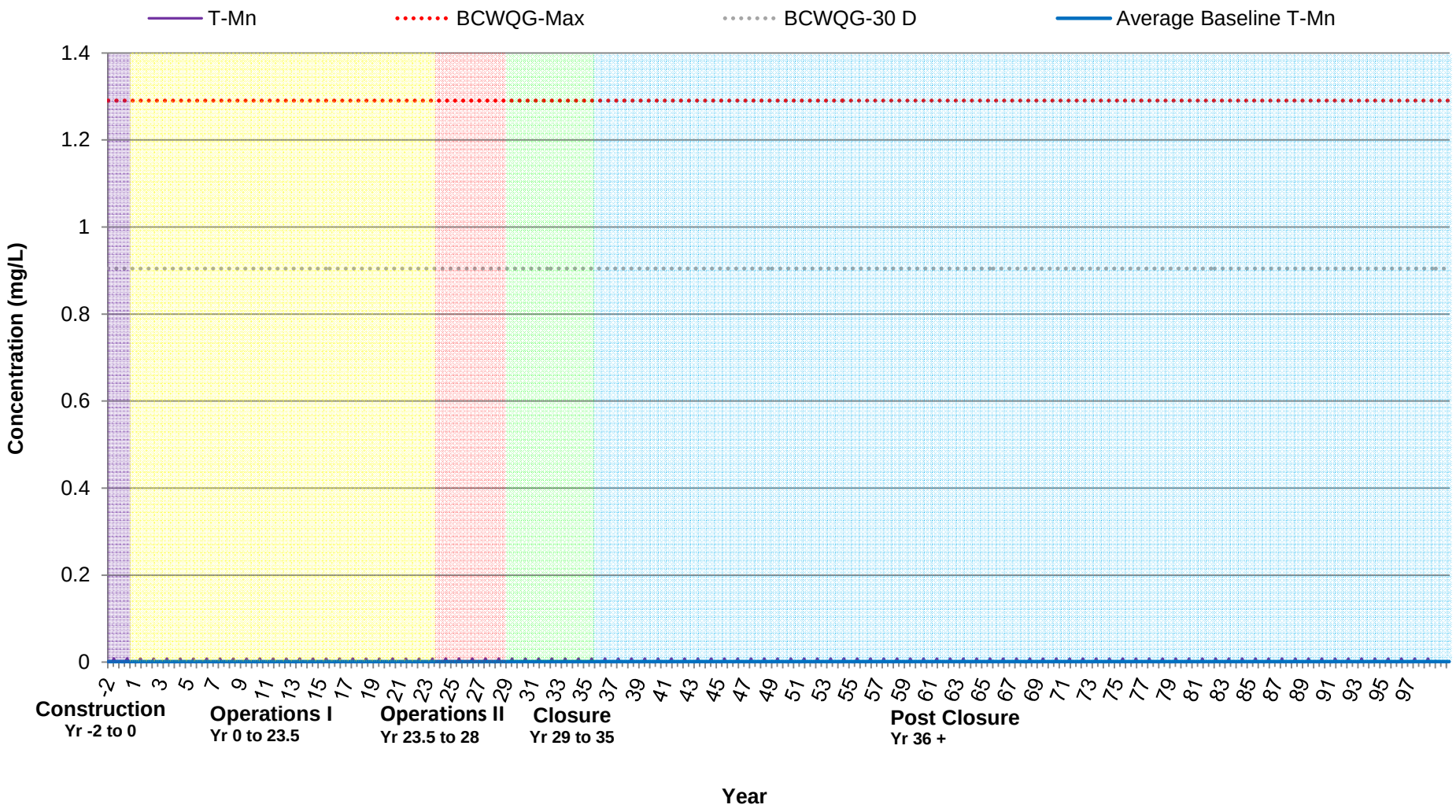
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C5.Pb

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE MANGANESE CONCENTRATIONS - HARPER CREEK BELOW P-CREEK (HP)

Knight Piésold CONSULTING

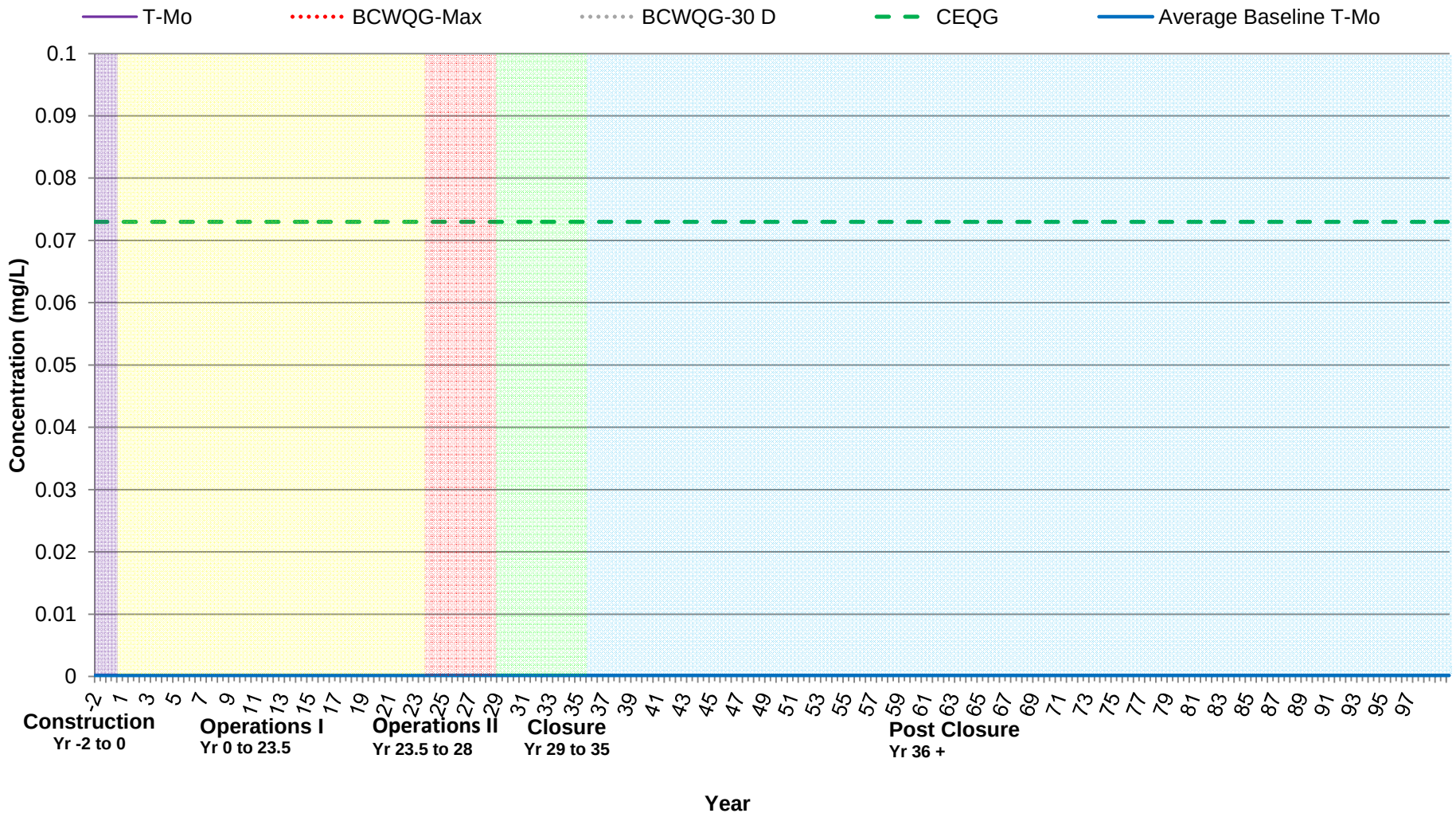
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C5.Mn

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. THE BCWQG-MAX (2 mg/L) AND BCWQG-30 D (1 mg/L) ARE NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE MOLYDBENUM CONCENTRATIONS - HARPER CREEK BELOW P-CREEK (HP)

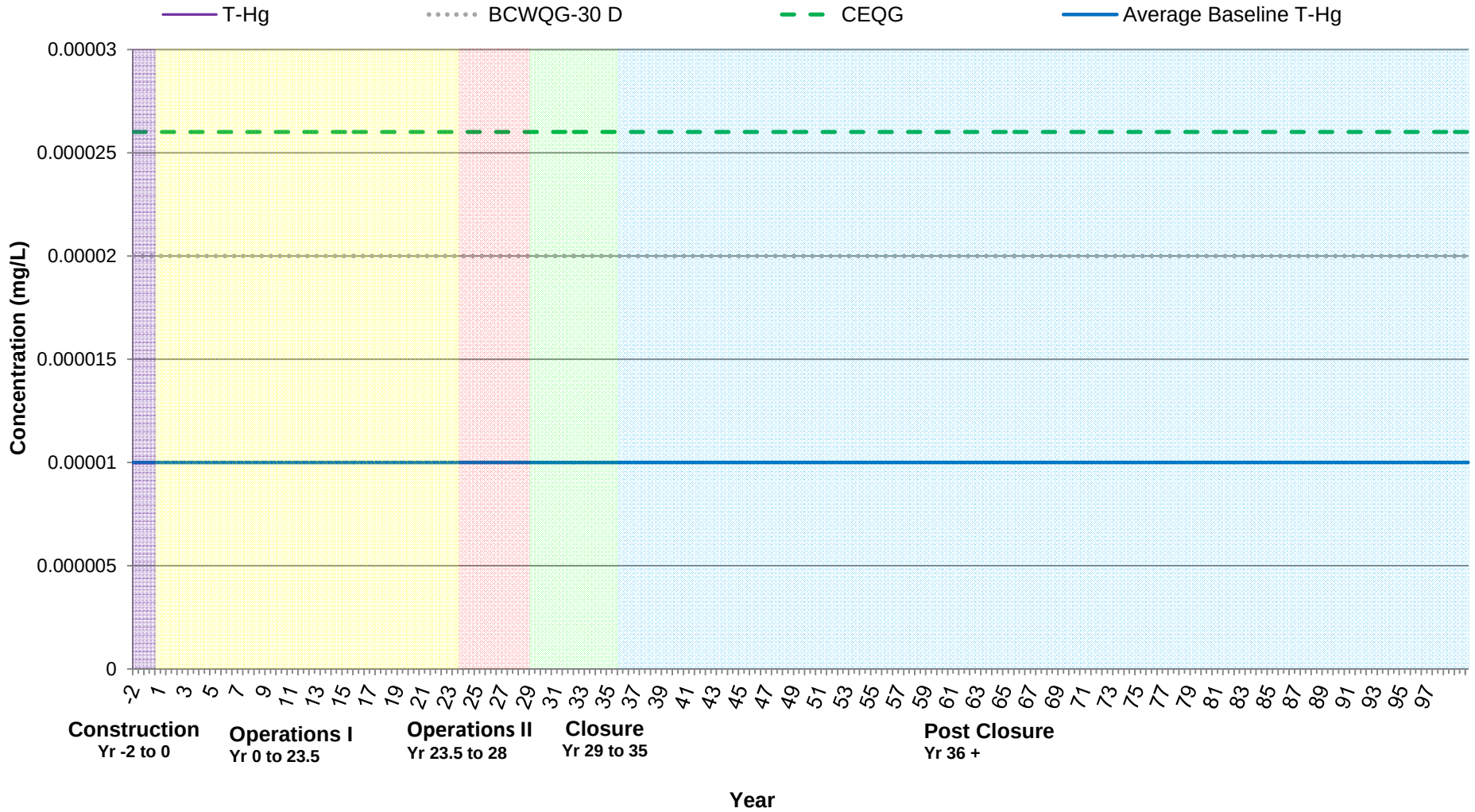
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C5.Mo

REV 0



NOTES:

1. THE BCWQG-30 D AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. BCWQG-30 D VALUE APPLIED ON ASSUMPTION THAT METHYL-Hg IS EQUAL TO 0.5% OF T-Hg.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE MERCURY CONCENTRATIONS - HARPER CREEK BELOW P-CREEK (HP)

Knight Piésold CONSULTING

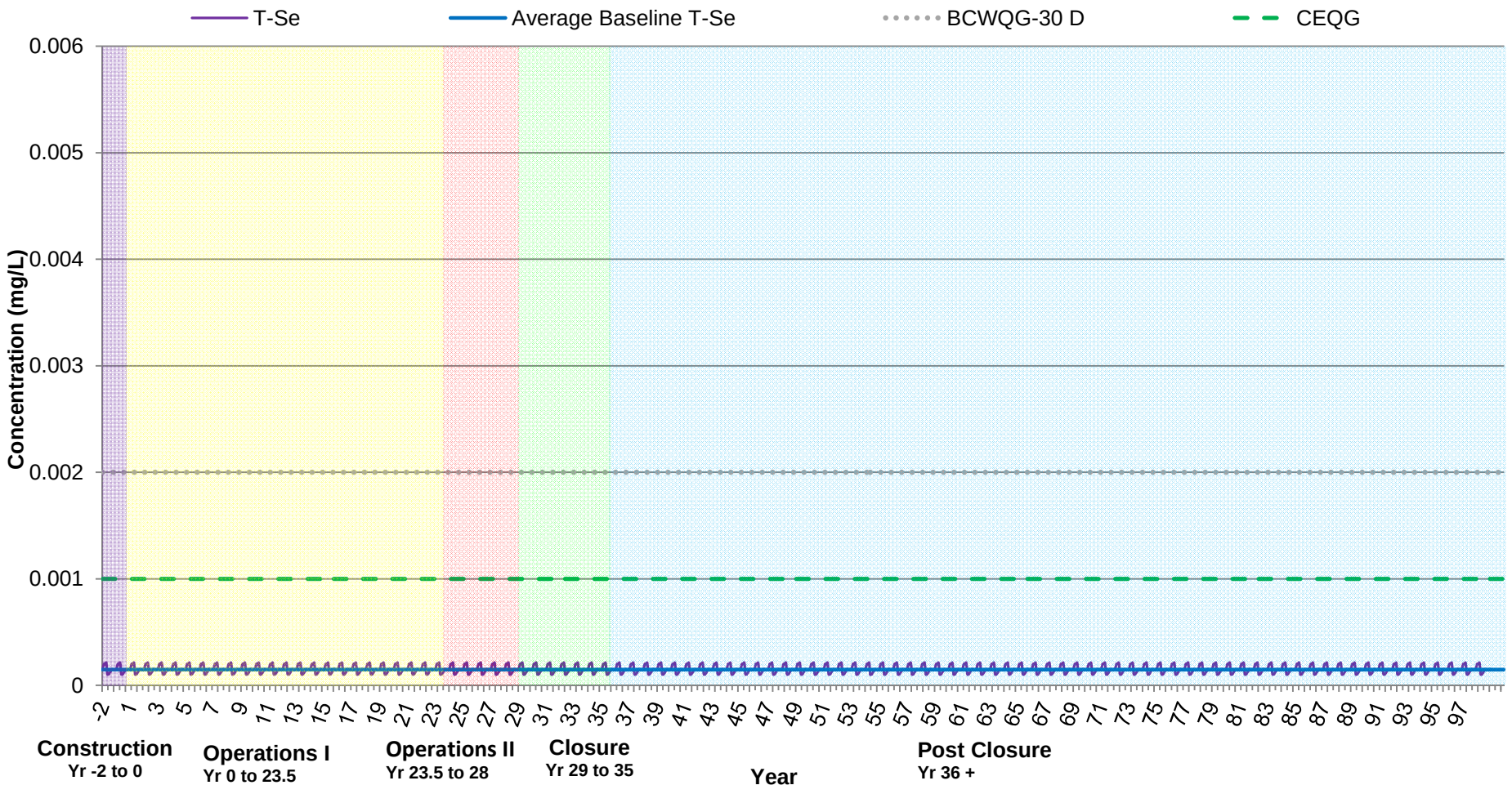
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C5.Hg

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-30 D AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE SELENIUM CONCENTRATIONS - HARPER CREEK BELOW P-CREEK (HP)

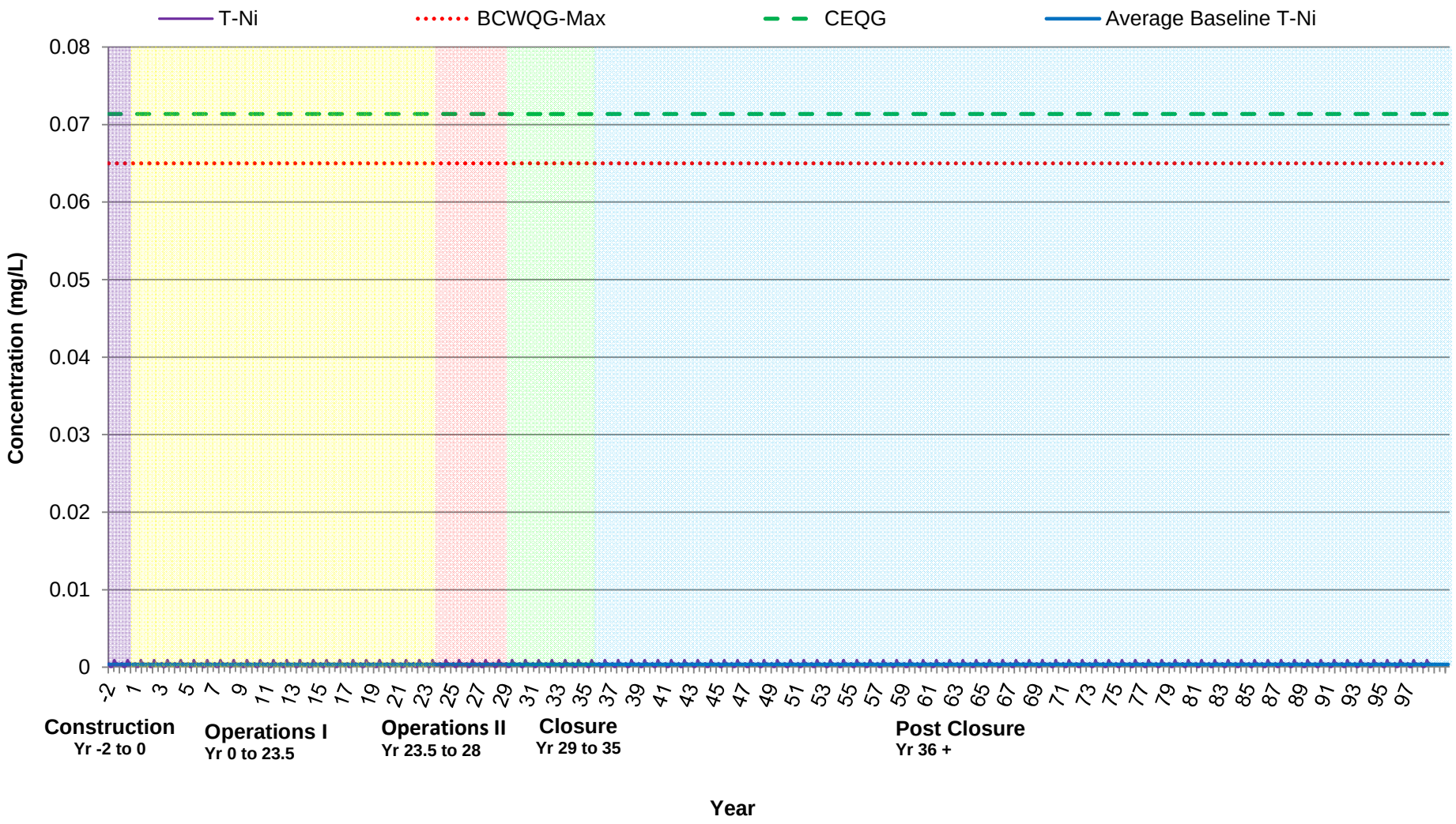
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C5.Se

REV 0



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES, WHERE APPROPRIATE.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE NICKEL CONCENTRATIONS - HARPER CREEK BELOW P-CREEK (HP)

Knight Piésold CONSULTING

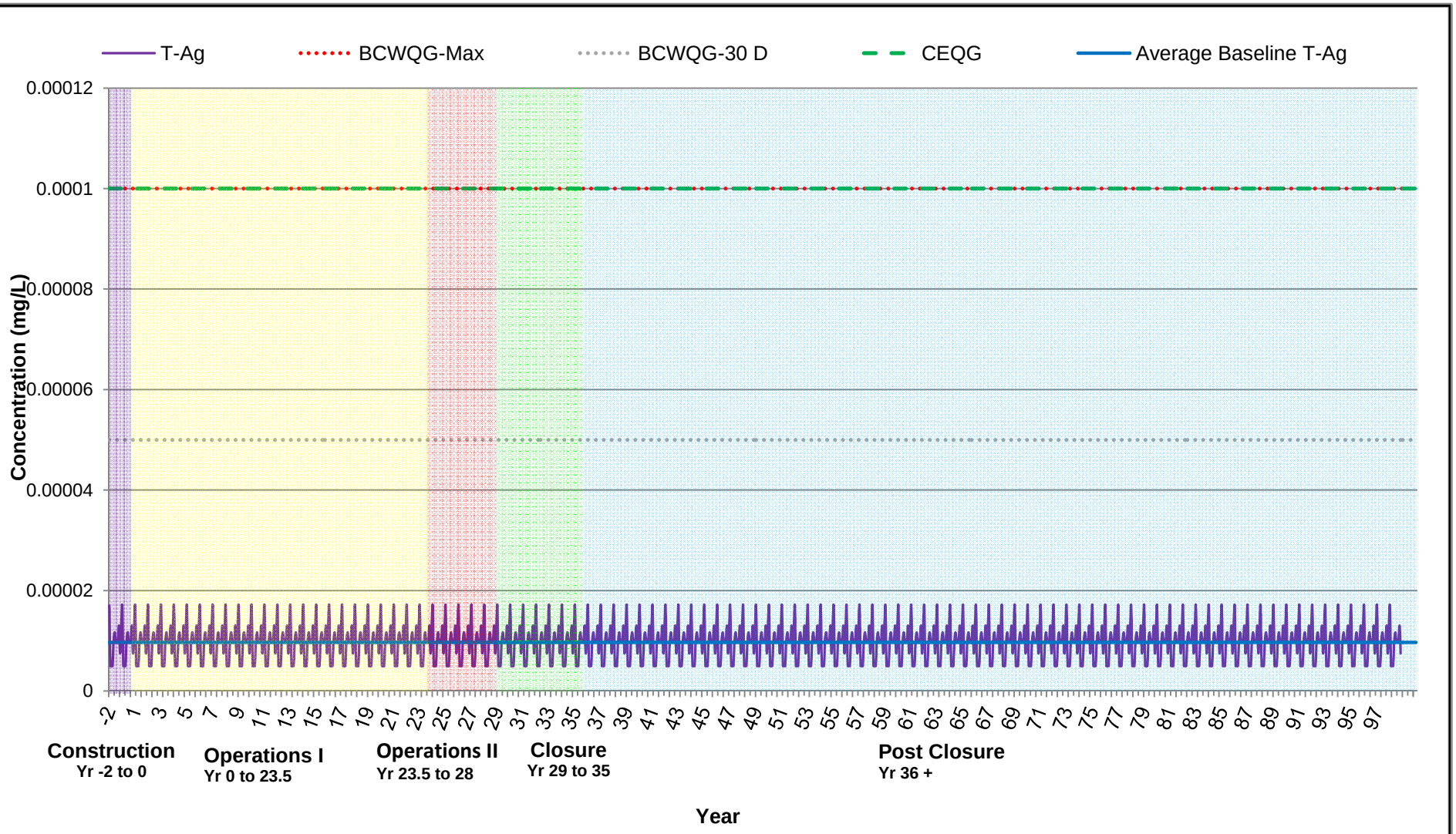
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C5.Ni

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-30 D AND BCWQG-MAX ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE SILVER CONCENTRATIONS - HARPER CREEK BELOW P-CREEK (HP)

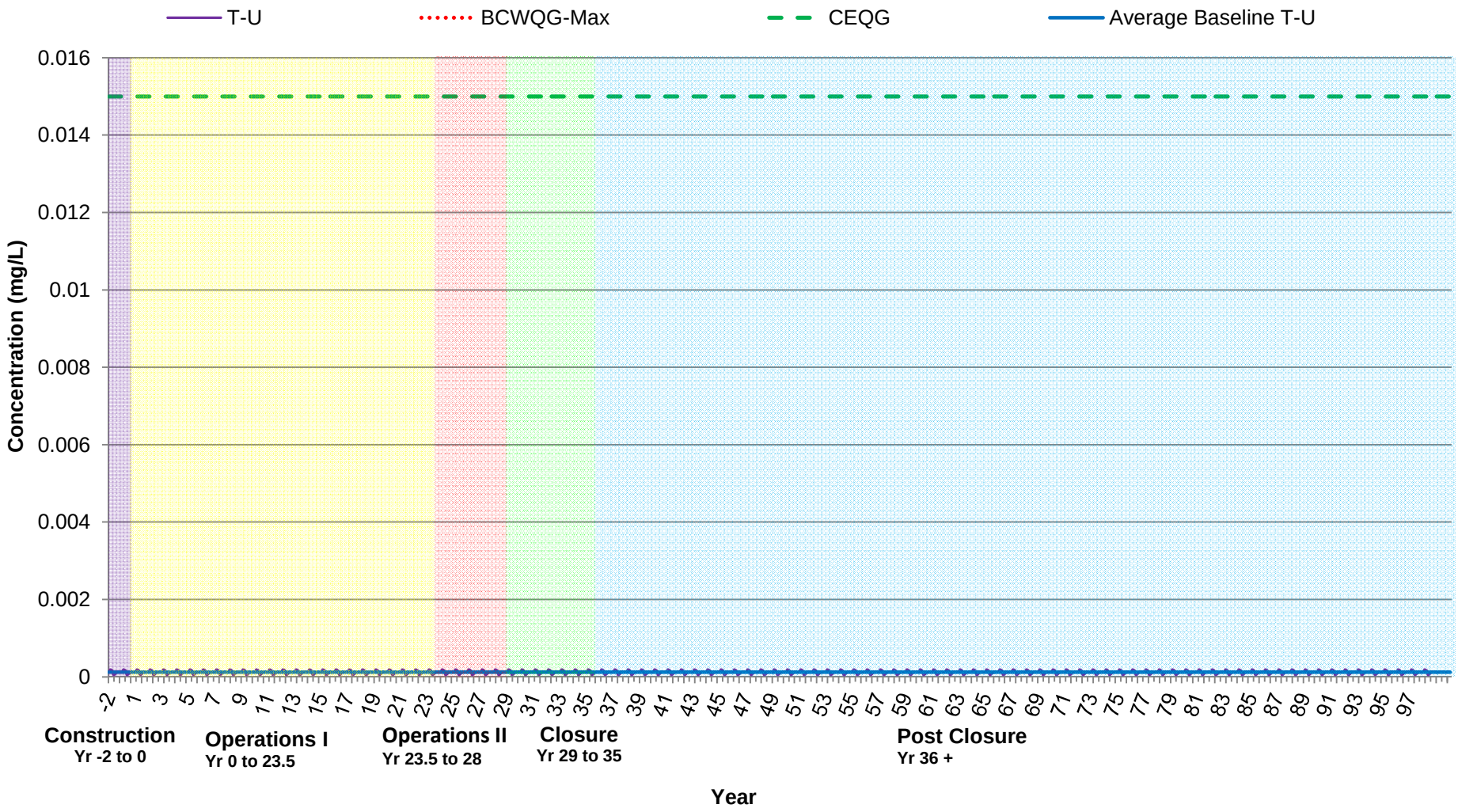
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C5.Ag

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. THE BCWQG-MAX (0.3 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE URANIUM CONCENTRATIONS - HARPER CREEK BELOW P-CREEK (HP)

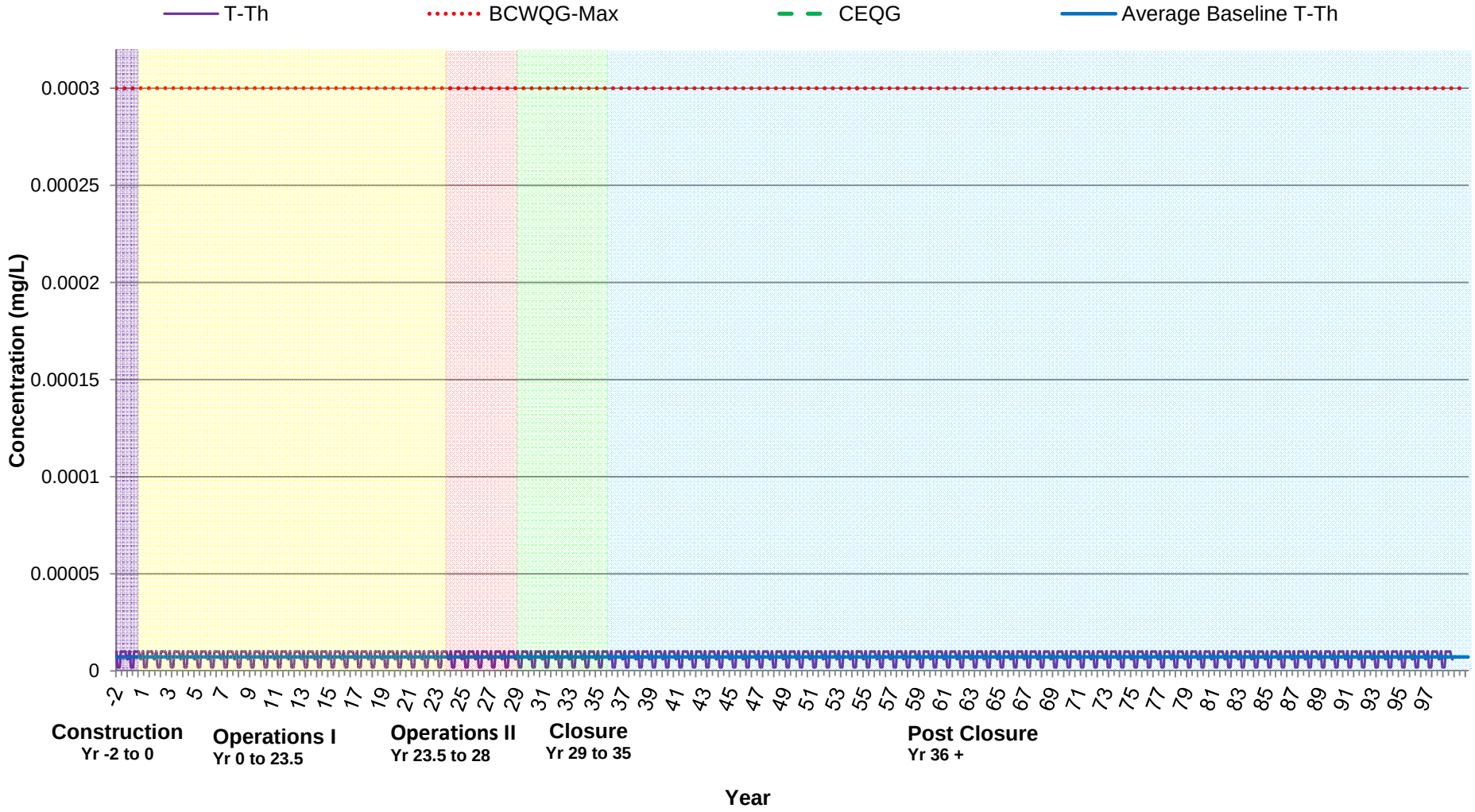
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C5.U

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. THE CEQG (0.0008 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE THALLIUM CONCENTRATIONS - HARPER CREEK BELOW P-CREEK (HP)

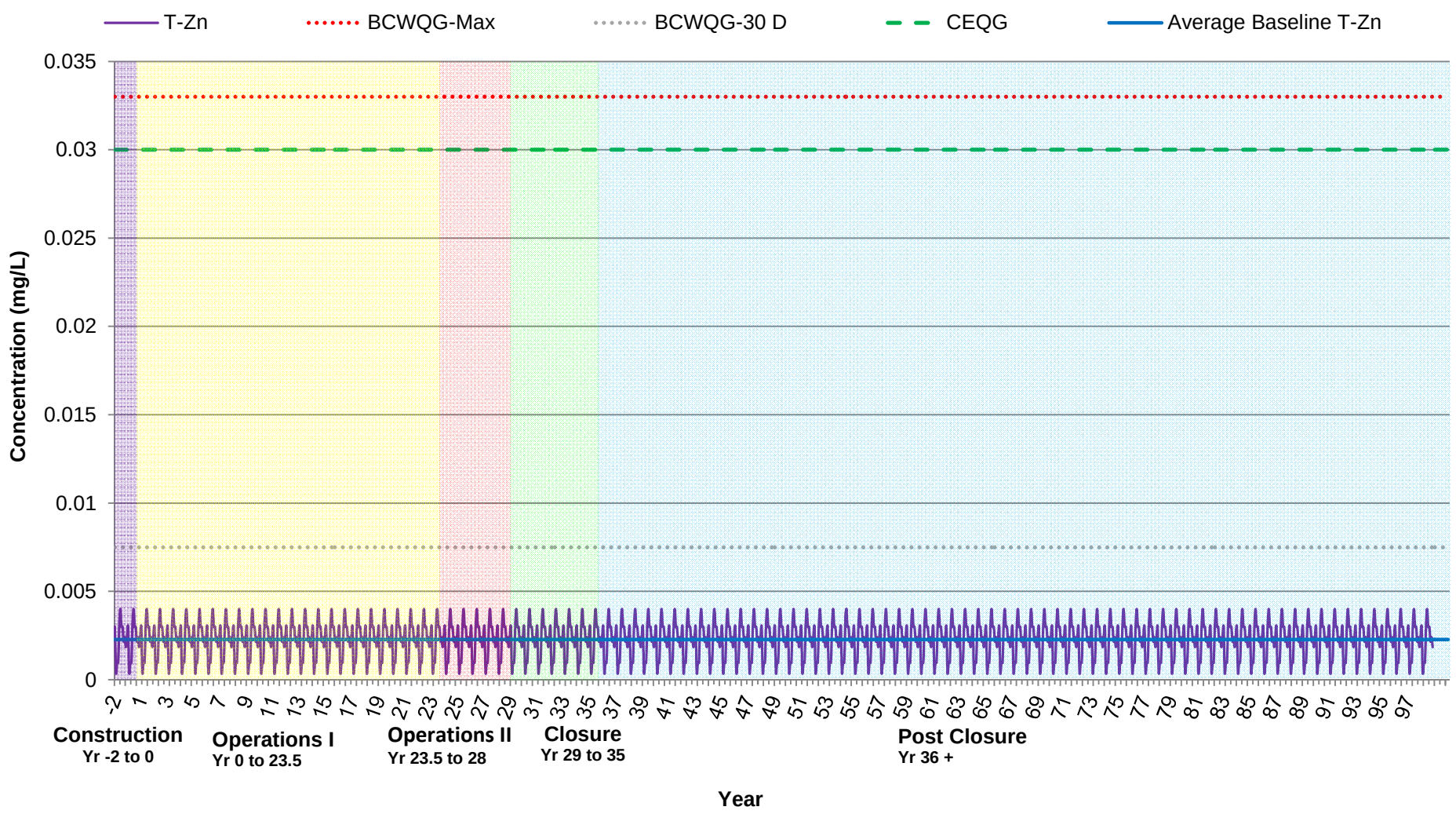
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C5.Th

REV 0



NOTES:

1. BCWQG-30 D AND BCWQG-MAX ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE ZINC CONCENTRATIONS - HARPER CREEK BELOW P-CREEK (HP)

Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

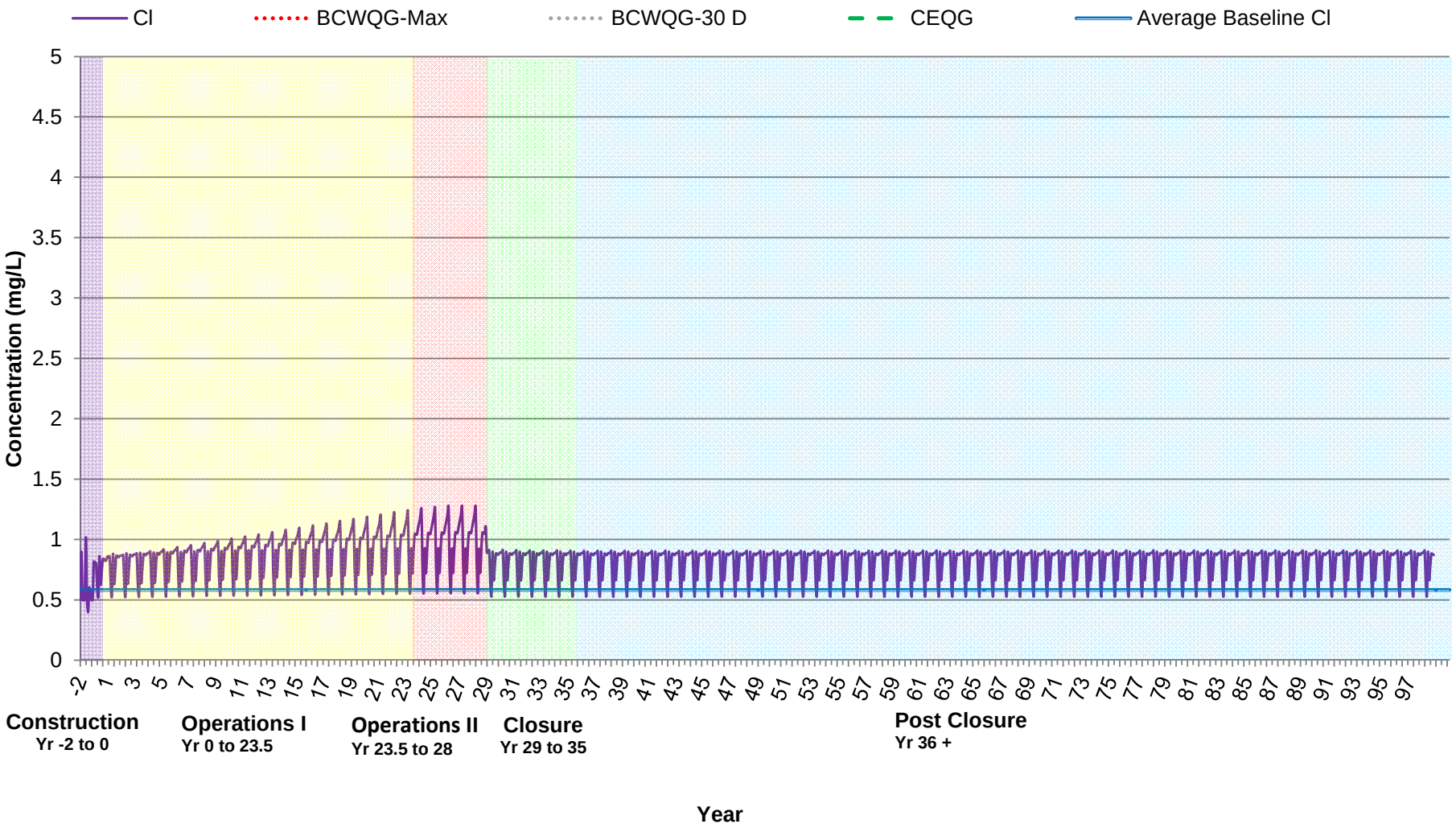
FIGURE C5.Zn

REV 0

APPENDIX C6

MID HARPER CREEK (HM)

(Pages C6-1 to C6-30)



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).
3. ALL GUIDELINES ARE NOT SHOWN: BCWQG-30 D (150 mg/L); BCWQG-MAX (600 mg/L); CEQG (120 mg/L AND 640 mg/L).

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE CHLORIDE CONCENTRATIONS - MID HARPER CREEK (HM)

Knight Piésold CONSULTING

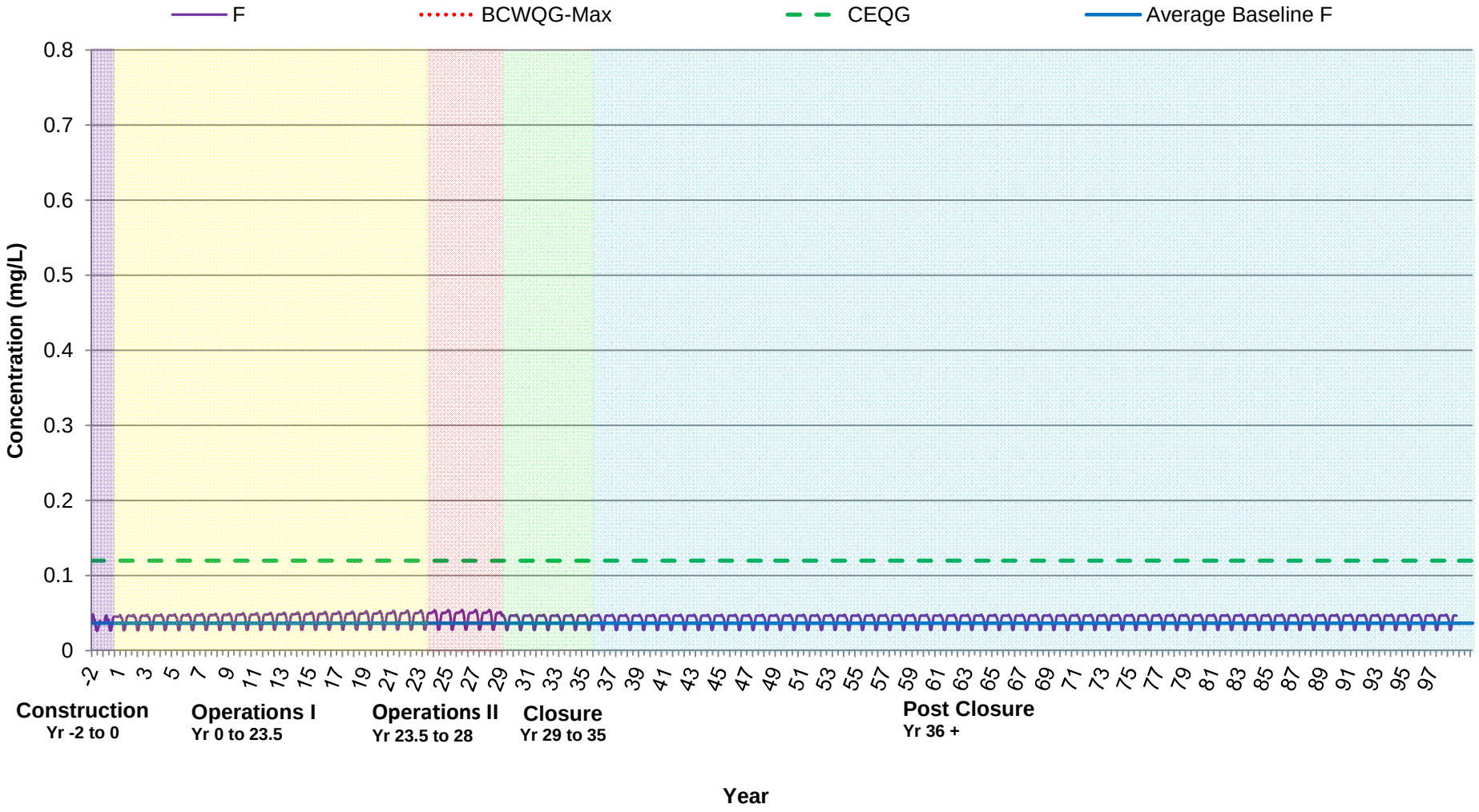
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C6.Cl

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX IS HARNDESS DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE FLUORIDE CONCENTRATIONS - MID HARPER CREEK (HM)

Knight Piésold CONSULTING

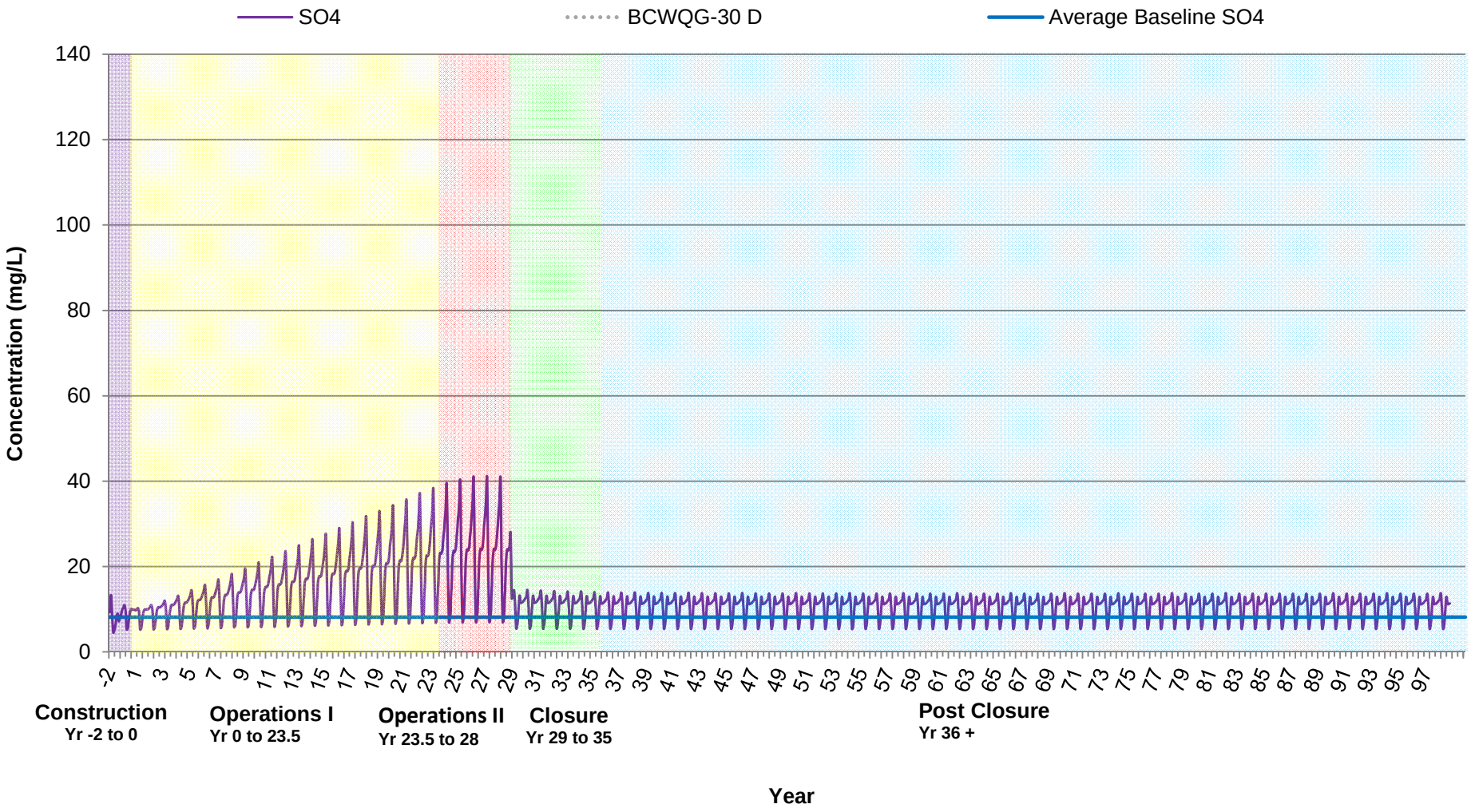
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C6.F

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. BCWQG-30 D IS HARDNESS DEPEDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE SULPHATE CONCENTRATIONS - MID HARPER CREEK (HM)

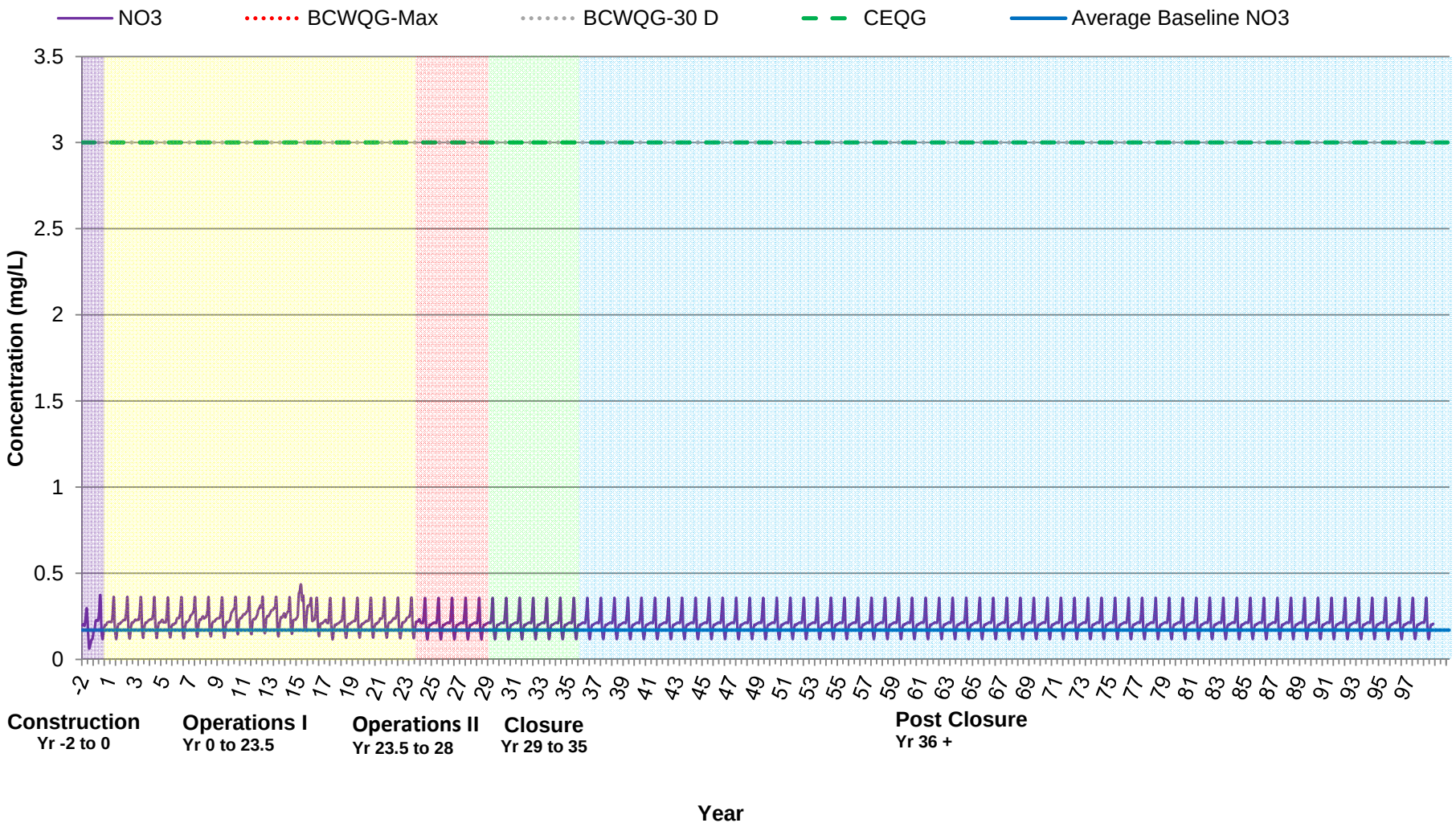
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C6.S04

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).
3. THE BCWQG-MAX (32.8 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE NITRATE CONCENTRATIONS - MID HARPER CREEK (HM)

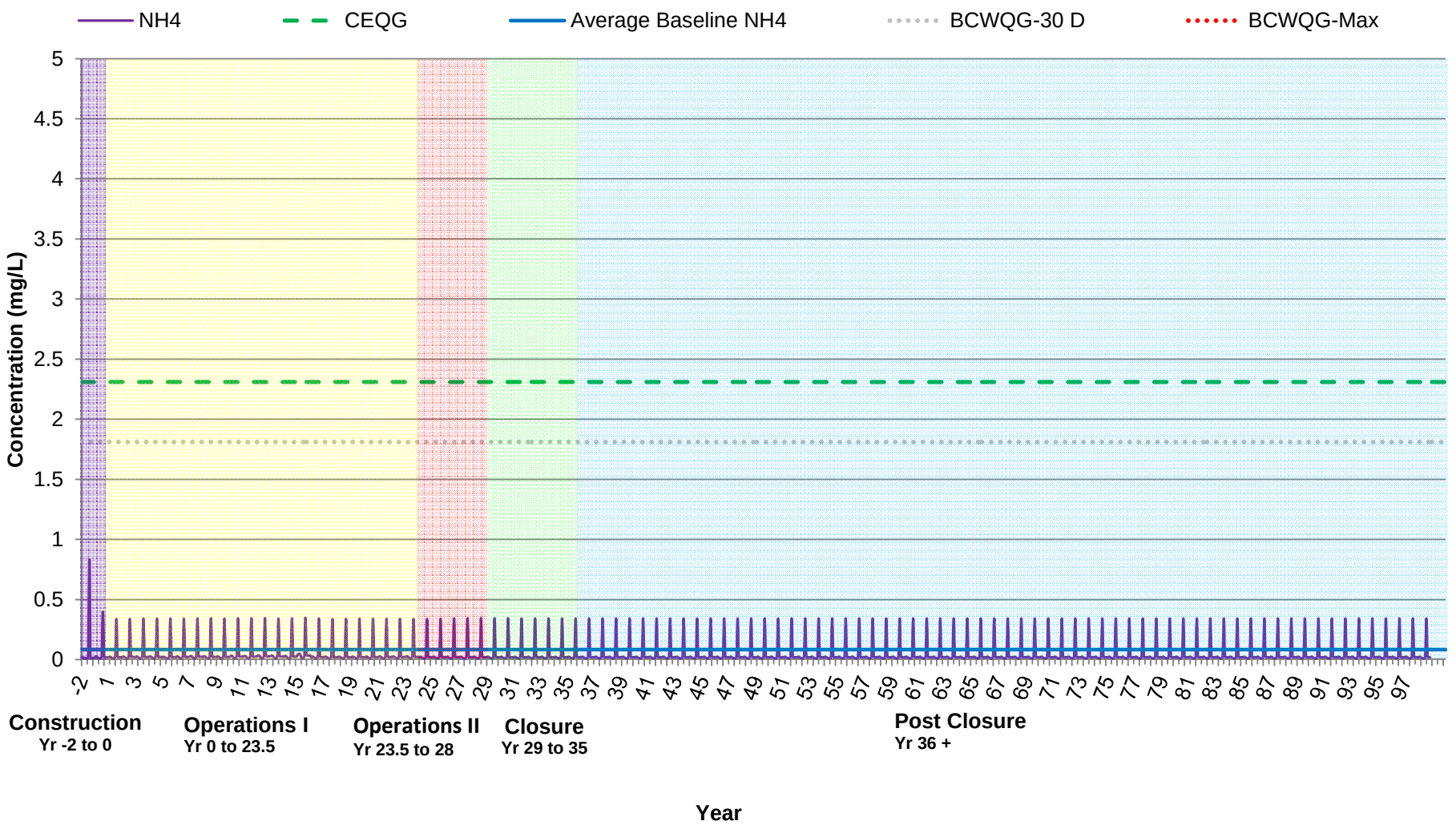
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C6.NO3

REV 0



NOTES:

1. THE BCWQG-30 D IS VALID FOR ONLY 6.5≤pH<9 AND 0°C≤T≤20°C.
2. THE BCWQG-MAX (20.15 mg/L) VALID FOR 6.5≤pH<9 IS NOT SHOWN.
3. THE CEQG IS TO BE USED WITH CAUTION FOR WATER WITH T<5°C AND pH>9.
4. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE AMMONIA CONCENTRATIONS - MID HARPER CREEK (HM)

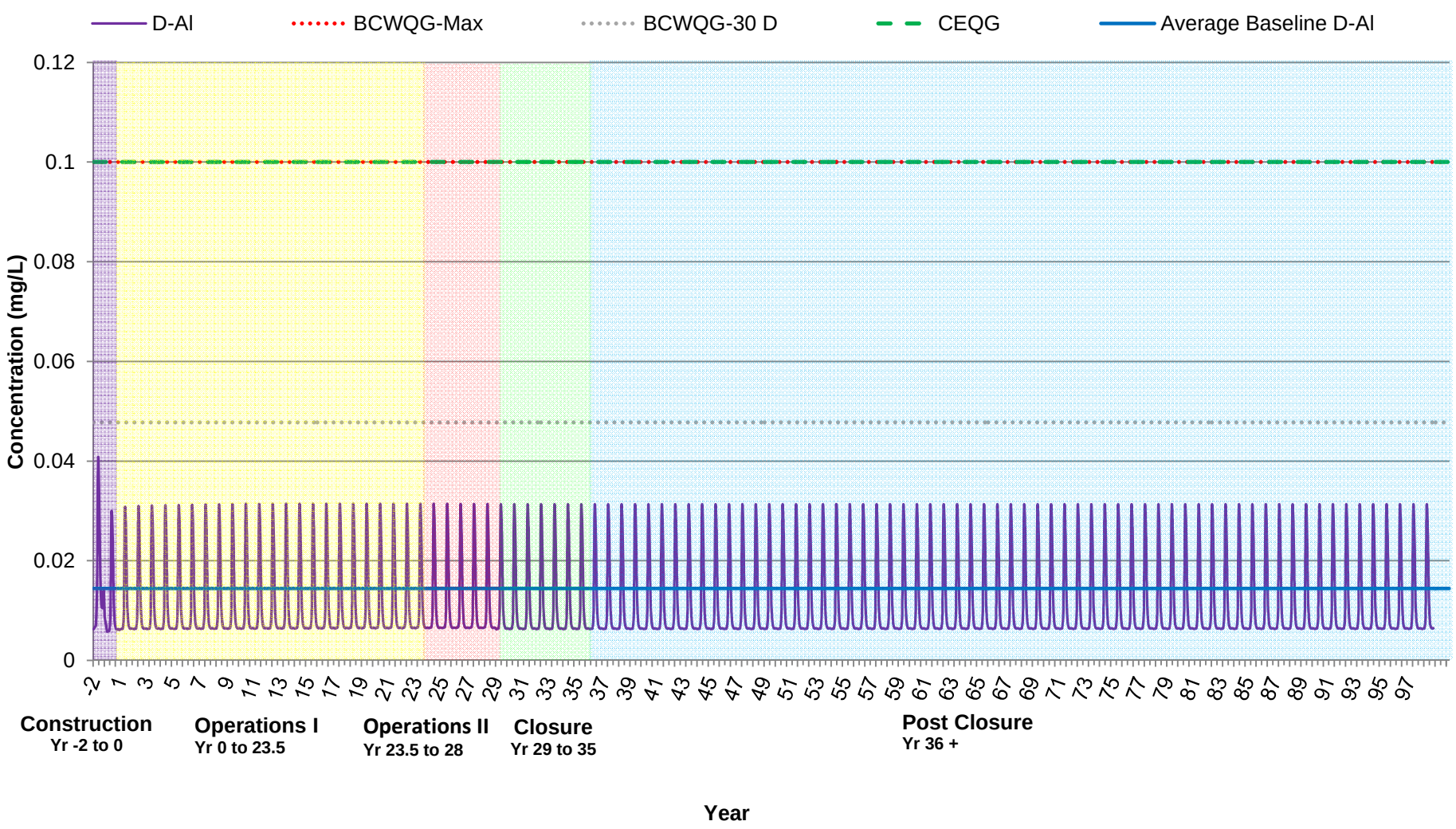
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C6.NH4

REV 0



NOTES:

1. ALL GUIDELINES ARE pH-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).
3. AVERAGE BASELINE pH USED TO CALCULATE GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE DISSOLVED ALUMINUM CONCENTRATIONS - MID HARPER CREEK (HM)

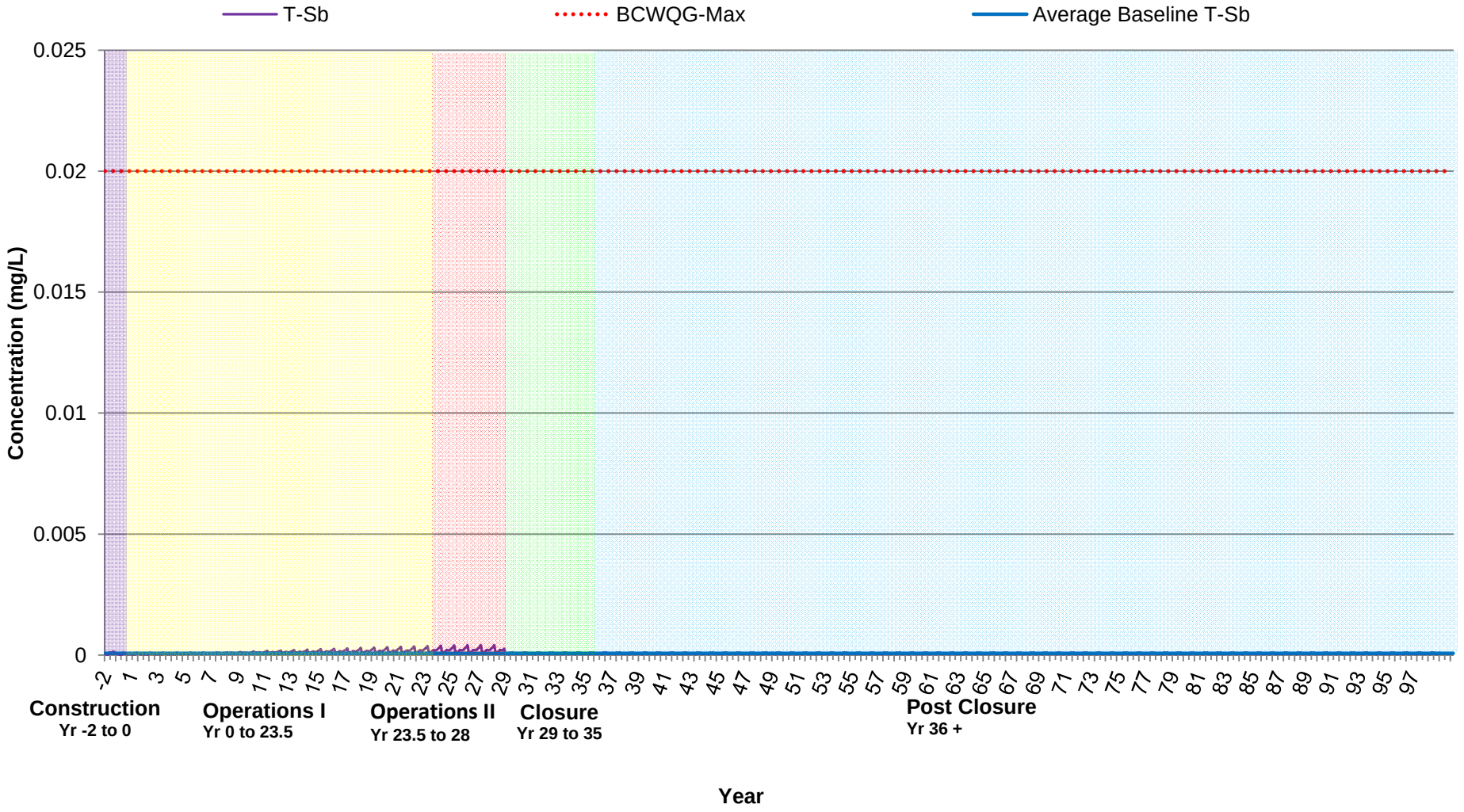
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C6.Al

REV 0



NOTES:

1. THE BCWQG IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE ANTIMONY CONCENTRATIONS - MID HARPER CREEK (HM)

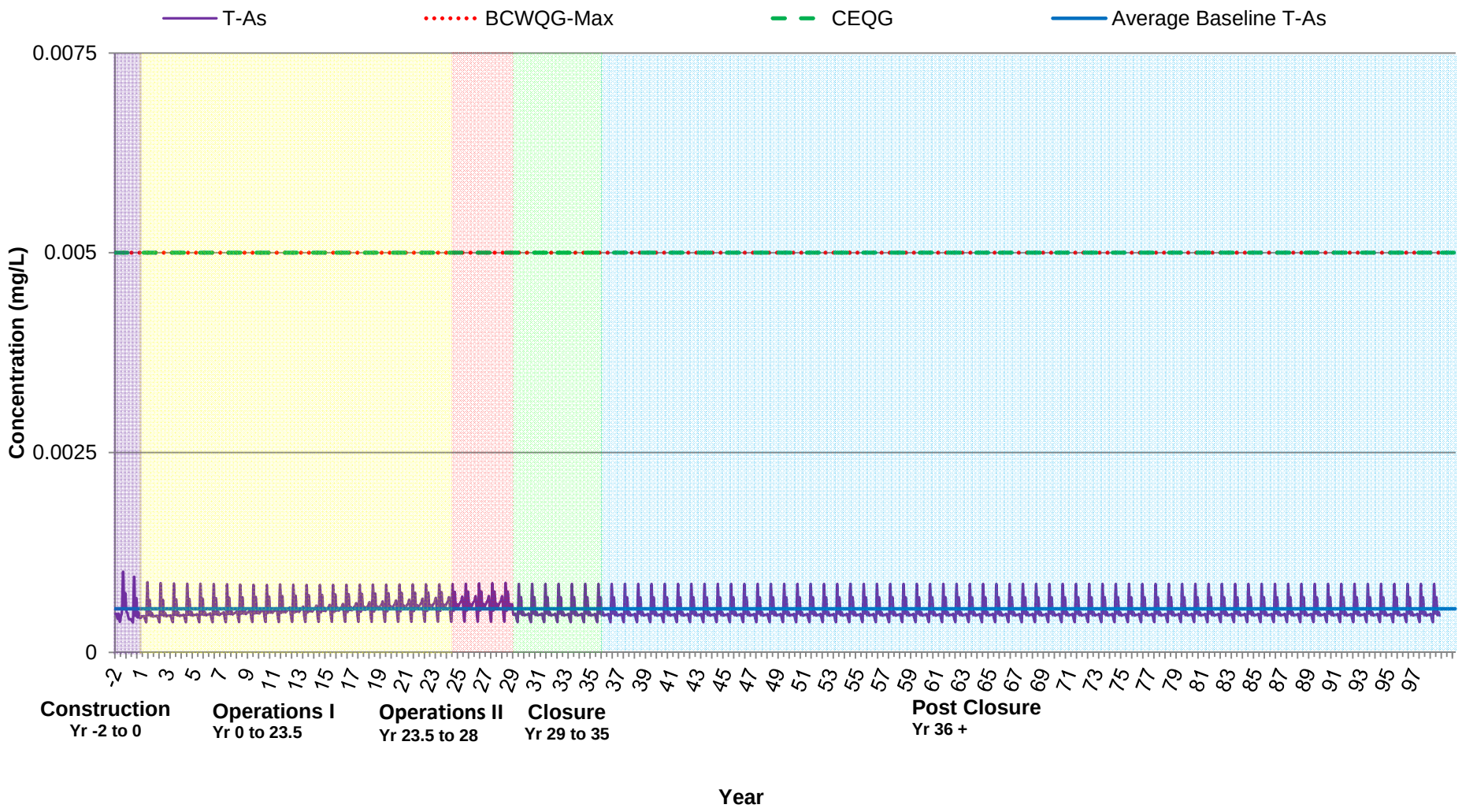
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C6.Sb

REV 0



NOTES:

1. THE BCWQG AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE ARSENIC CONCENTRATIONS - MID HARPER CREEK (HM)

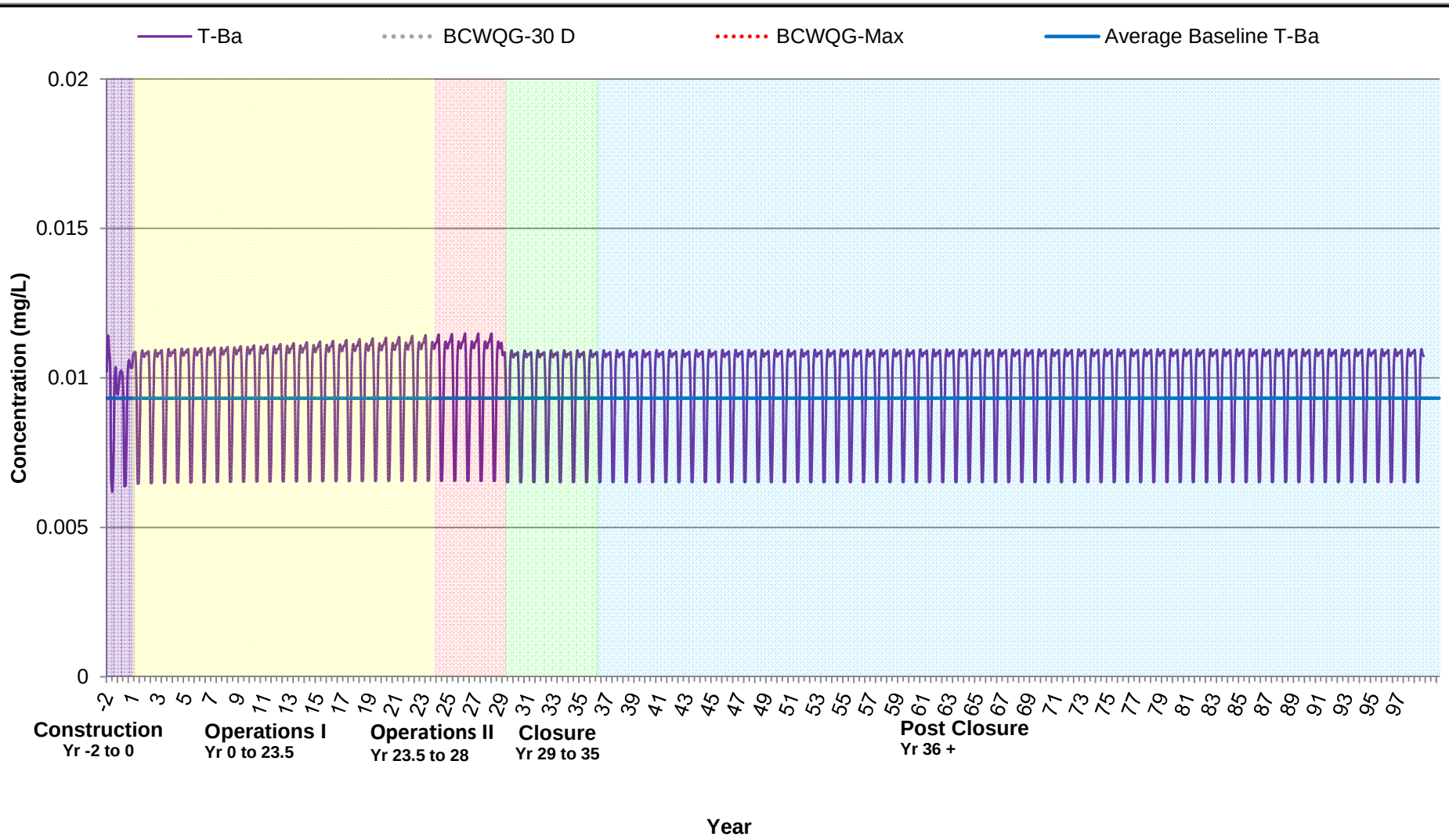
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C6.As

REV 0



NOTES:

1. THE BCWQG-MAX IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).
3. THE BCWQG-30 D (1 mg/L) AND BCWQG-MAX (5 mg/L) ARE NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE BARIUM CONCENTRATIONS - MID HARPER CREEK (HM)

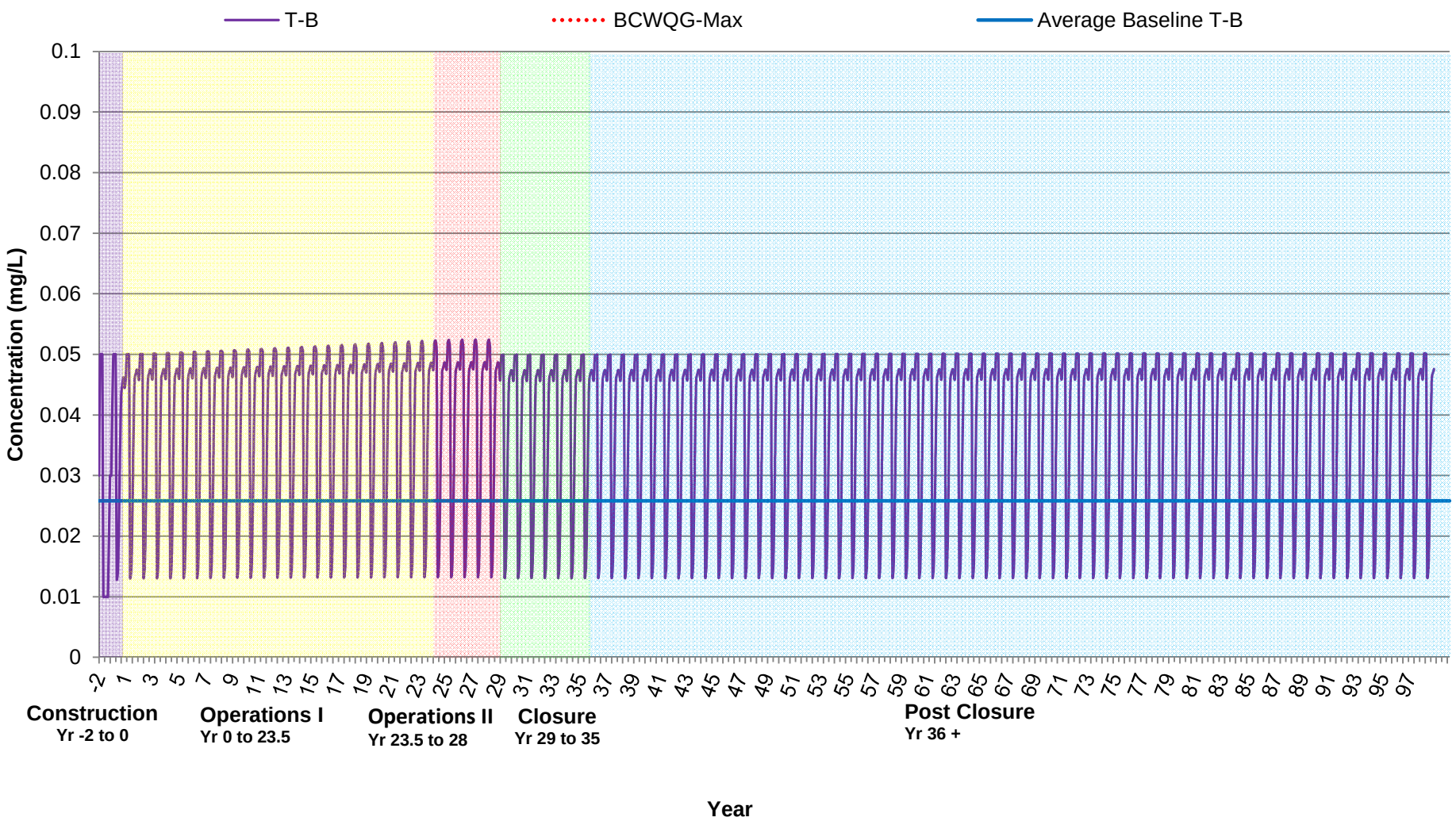
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C6.Ba

REV 0



NOTES:

1. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.
3. THE BCWQG-MAX (1.2 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE BORON CONCENTRATIONS - MID HARPER CREEK (HM)

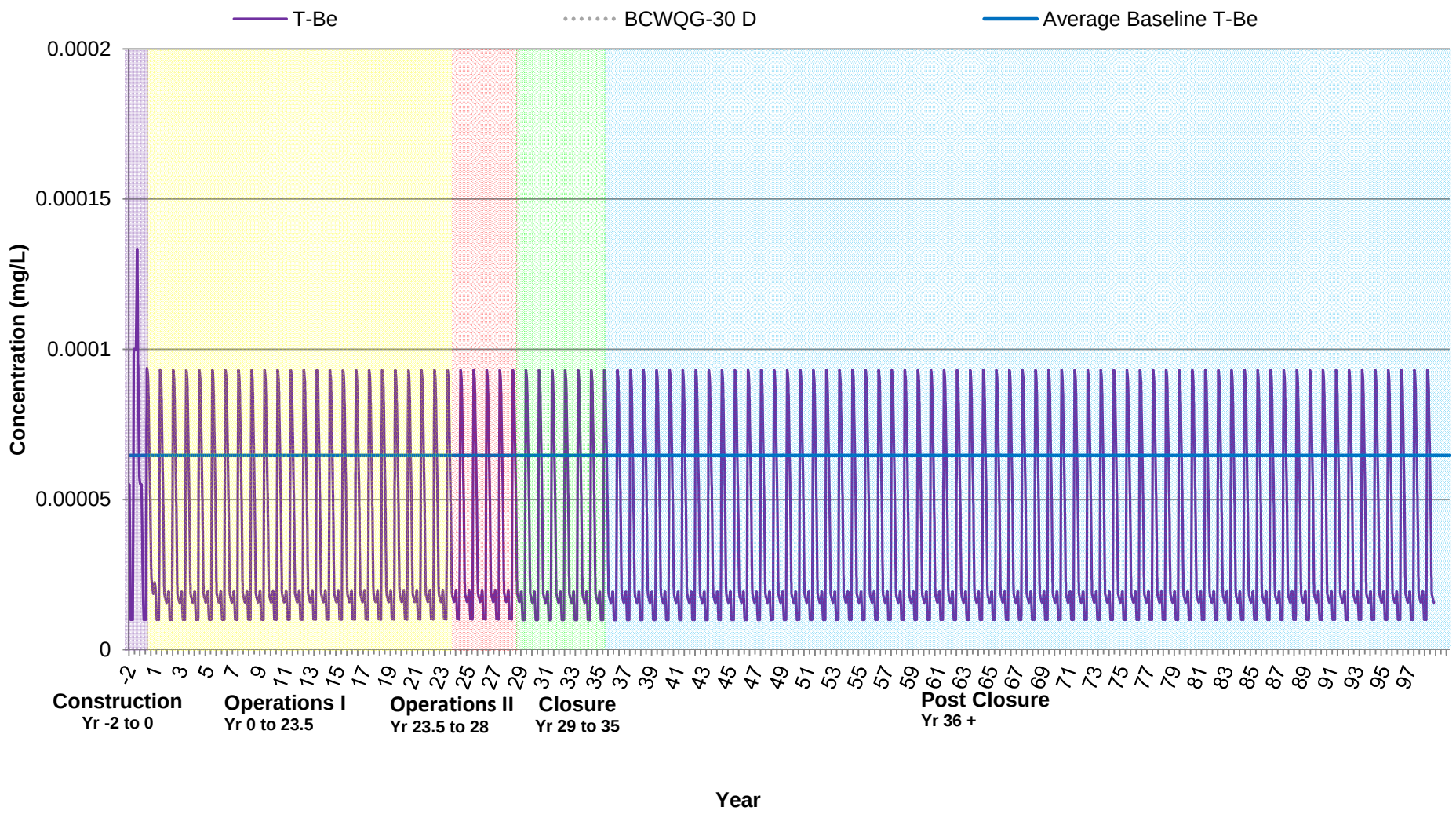
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C6.B

REV 0



NOTES:

1. THE BCWQG-MAX IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).
3. THE BCWQG-30 D (0.0053 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE BERYILLIUM CONCENTRATIONS - MID HARPER CREEK (HM)

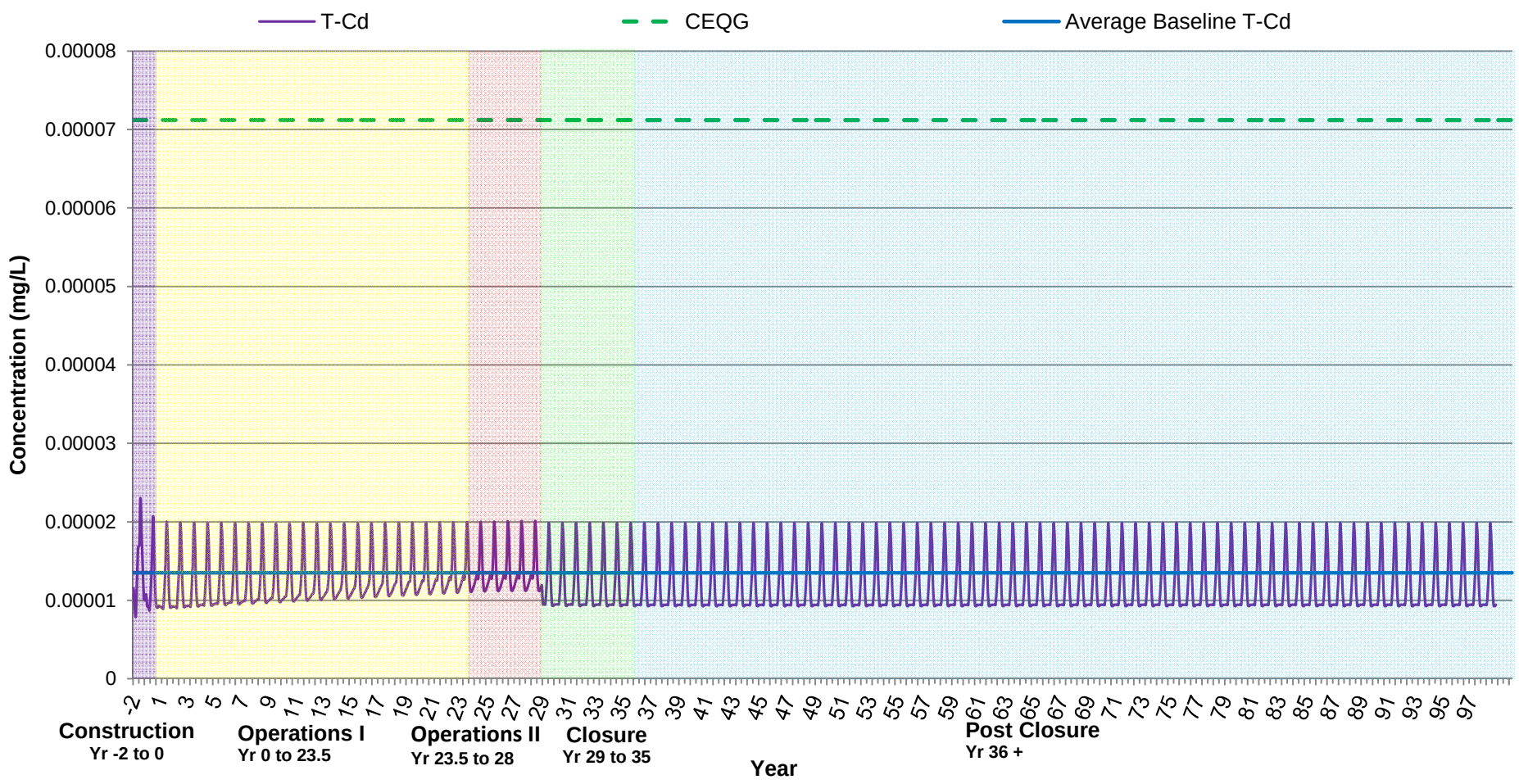
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C6.Be

REV 0



NOTES:

1. BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE CADMIUM CONCENTRATIONS - MID HARPER CREEK (HM)

Knight Piésold CONSULTING

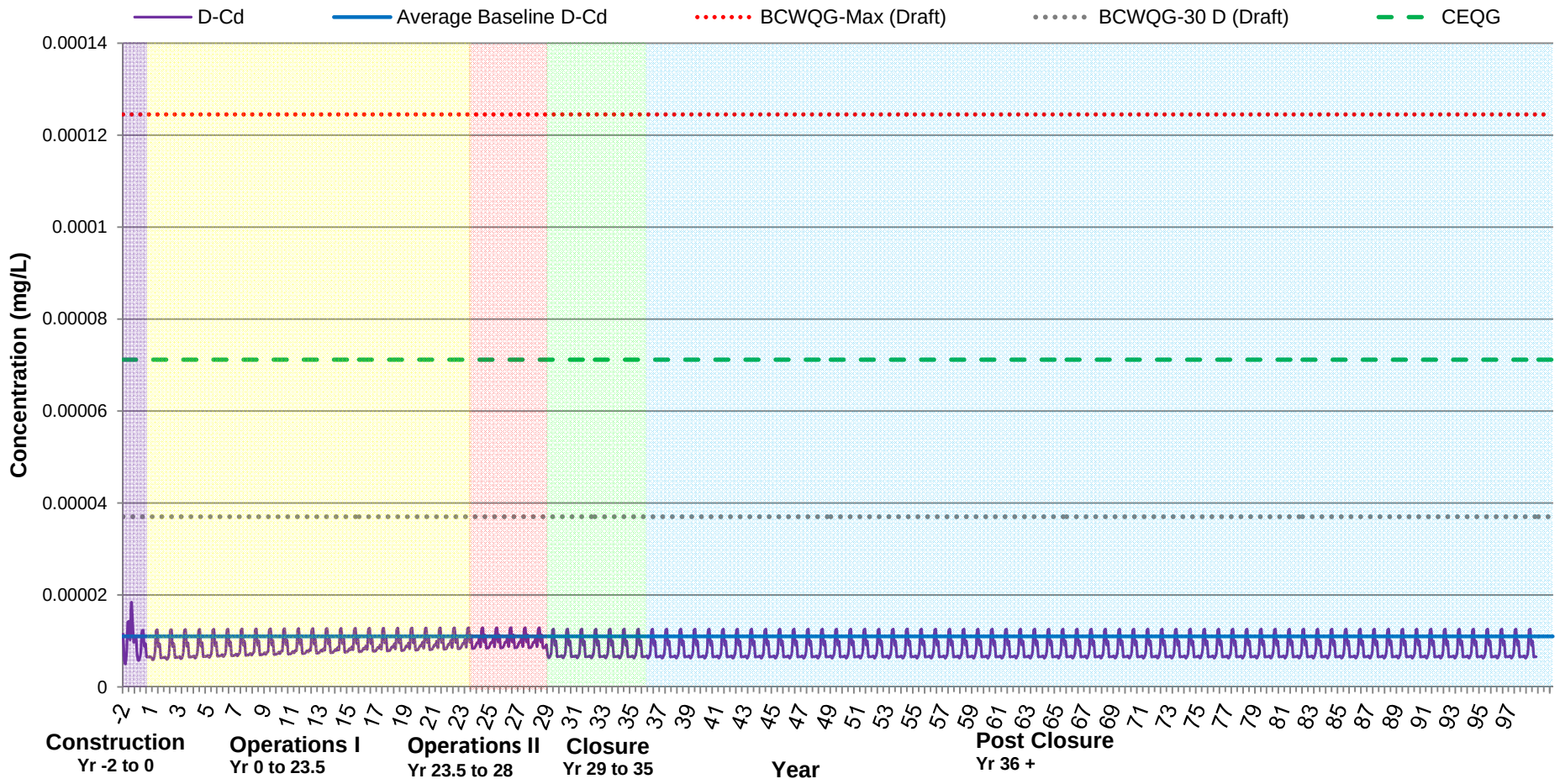
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C6.Cd-T

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. THE BCWQG ARE DRAFT GUIDELINES UNDER REVIEW (JUNE 2014).
3. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).
4. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE CADMIUM CONCENTRATIONS - MID HARPER CREEK (HM)

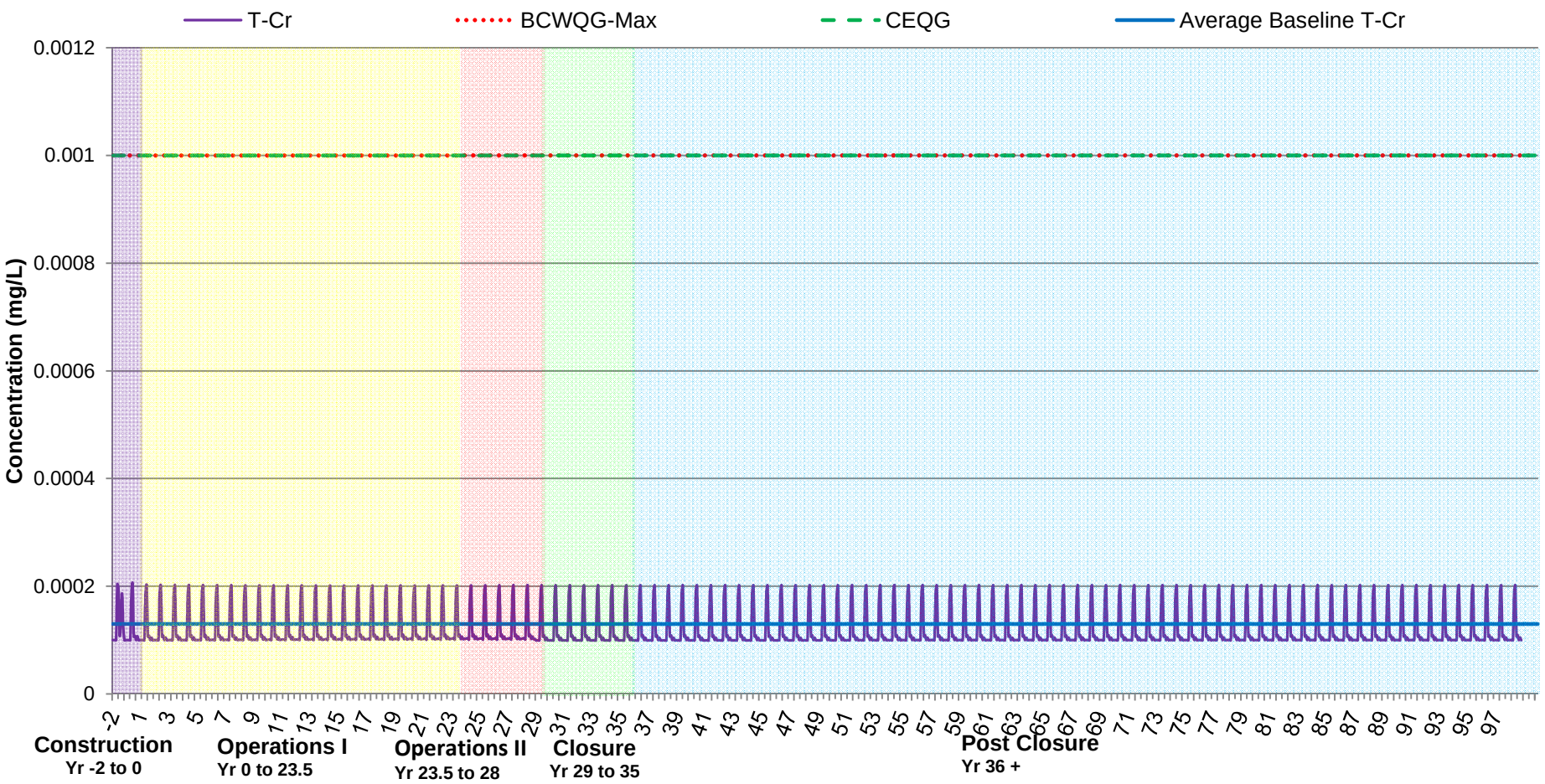
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C6.Cd-D

REV 0



NOTES:

1. GUIDELINES ARE FOR CHROMIUM (IV), THE SPECIES MOST COMMON IN WELL OXYGENATED SURFACE WATERS.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE CHROMIUM CONCENTRATIONS - MID HARPER CREEK (HM)

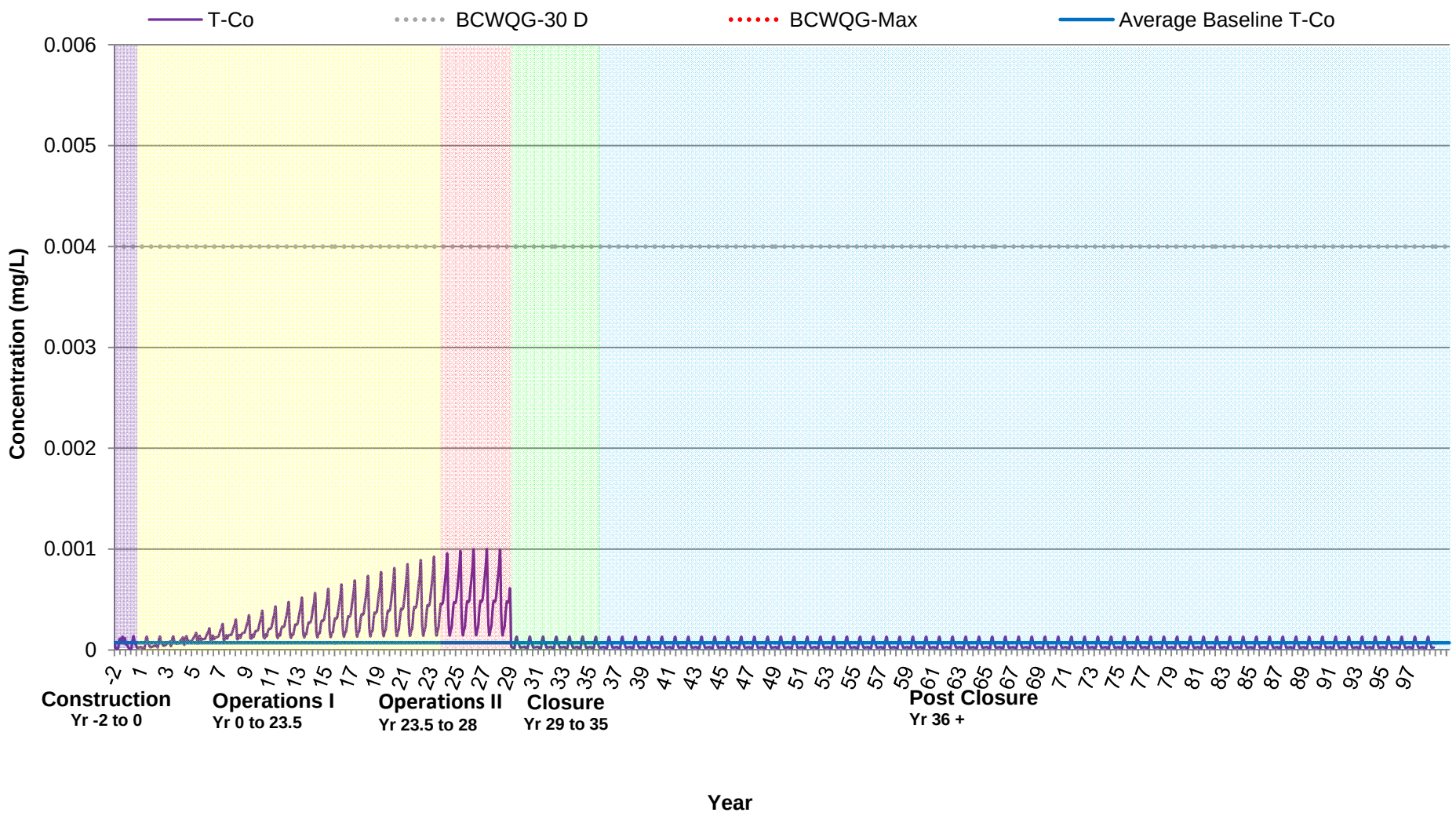
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C6.Cr

REV 0



NOTES:

1. THE BCWQG-30 D AND BCWQG-MAX ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).
3. THE BCWQG-MAX GUIDELINE (0.11 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE COBALT CONCENTRATIONS - MID HARPER CREEK (HM)

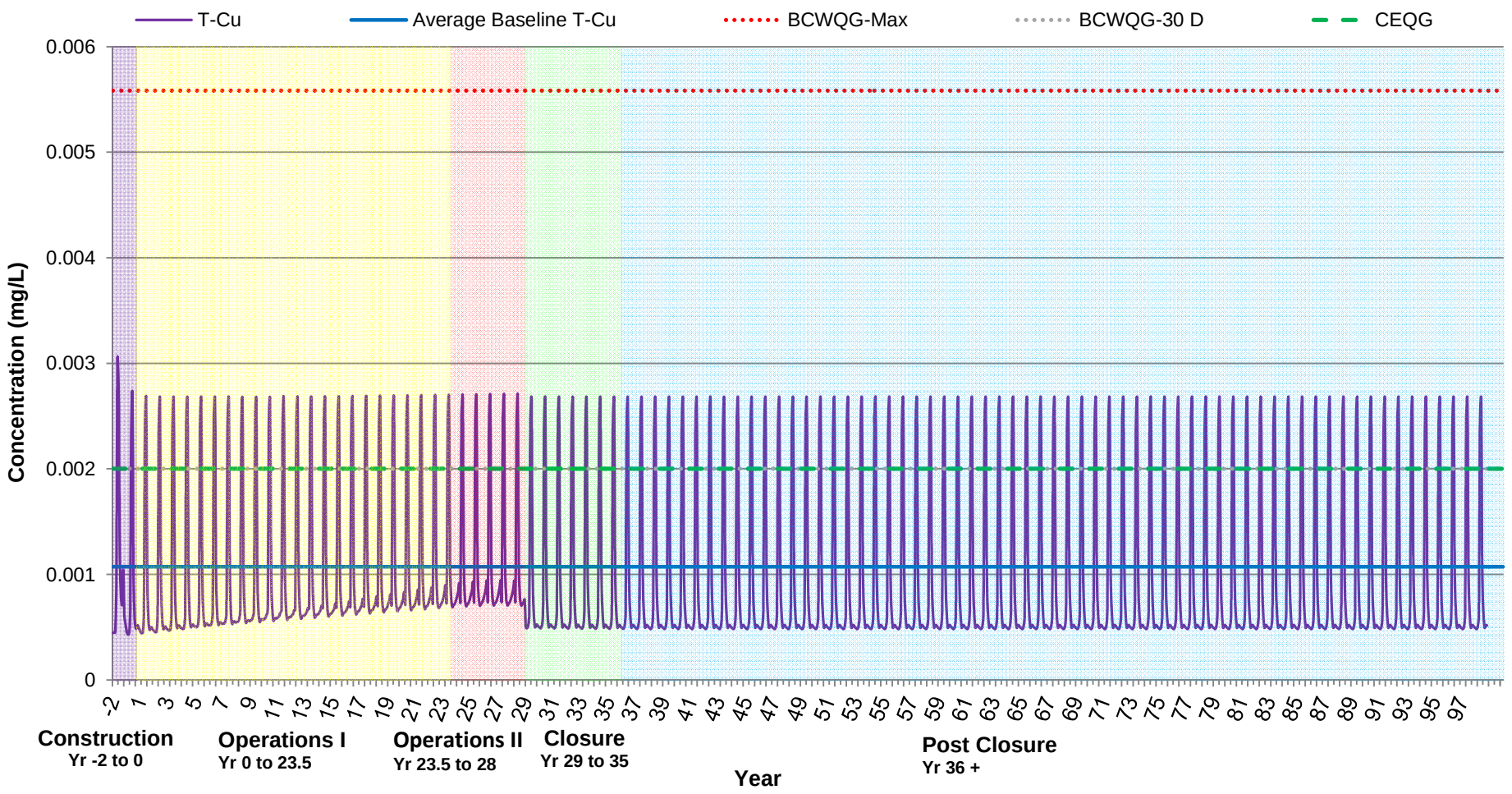
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C6.Co

REV 0



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE COPPER CONCENTRATIONS - MID HARPER CREEK (HM)

Knight Piésold CONSULTING

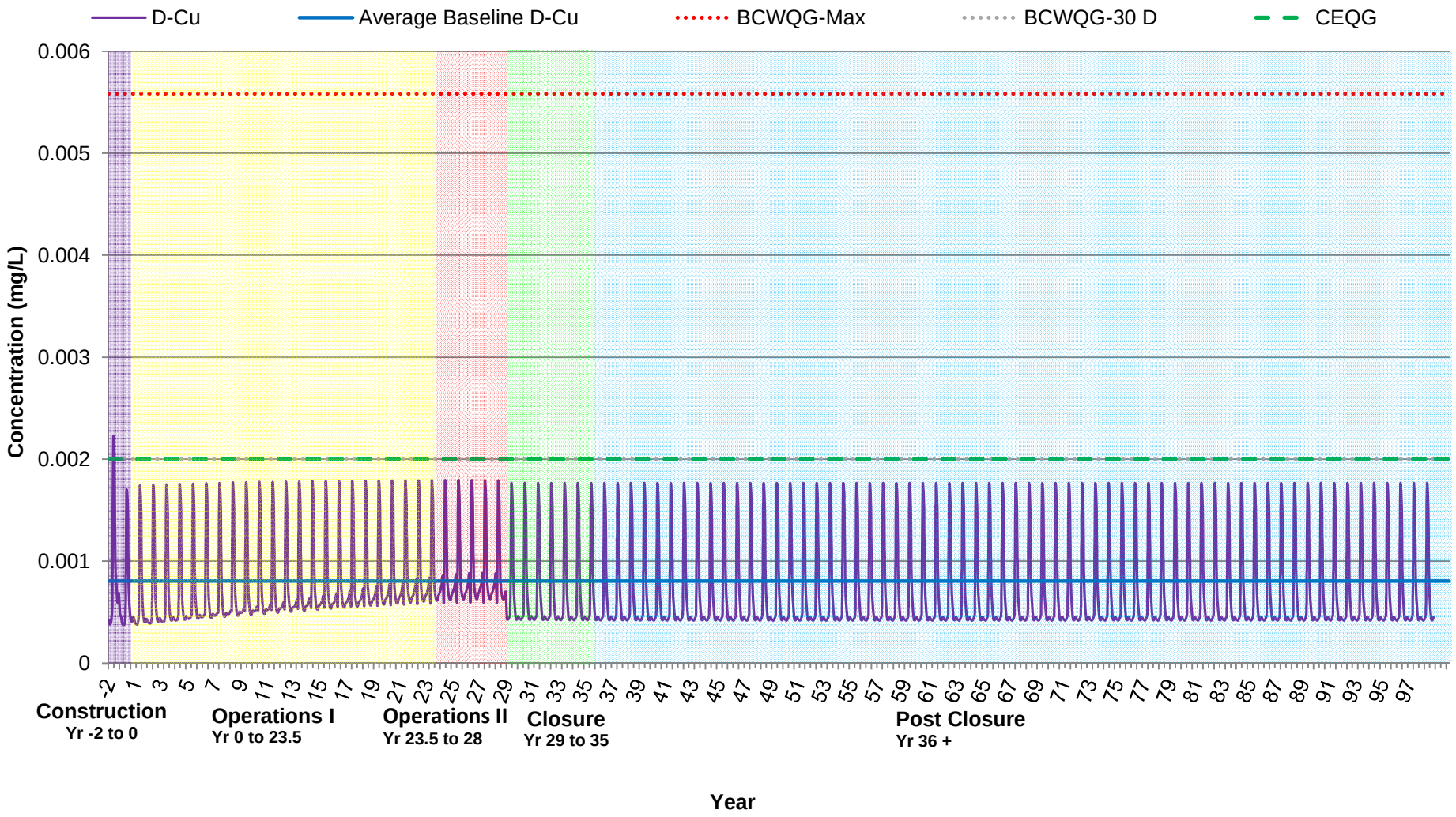
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C6.Cu-T

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE COPPER CONCENTRATIONS - MID HARPER CREEK (HM)

Knight Piésold CONSULTING

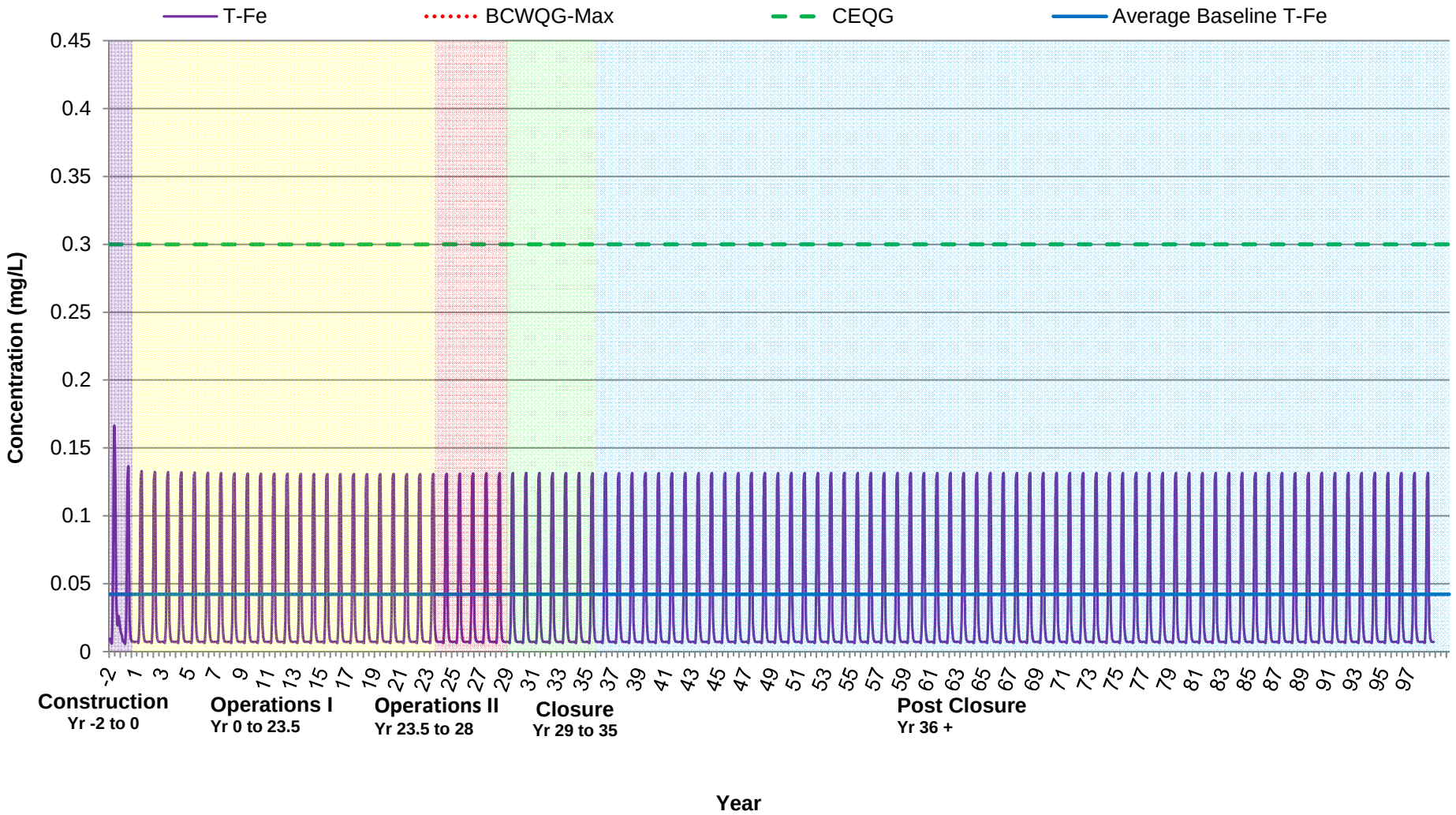
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C6.Cu-D

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).
3. BCWQG-MAX 1.0 mg/L IS NOT SHOWN ON GRAPH.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE TOTAL IRON CONCENTRATIONS - MID HARPER CREEK (HM)

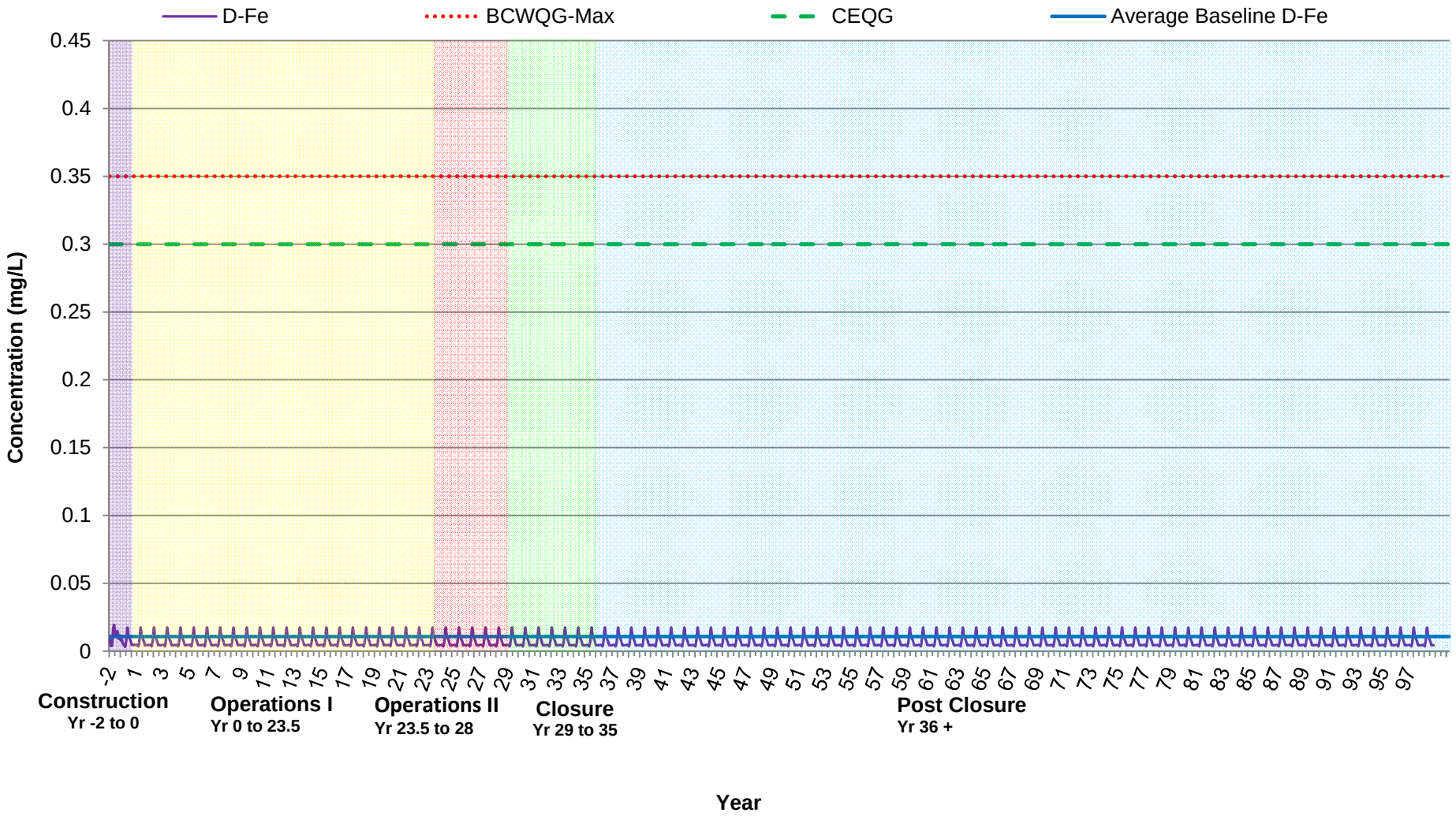
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C6.Fe-T

REV 0



NOTES:

1. THE BCWQG-MAX AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE DISSOLVED IRON CONCENTRATIONS - MID HARPER CREEK (HM)

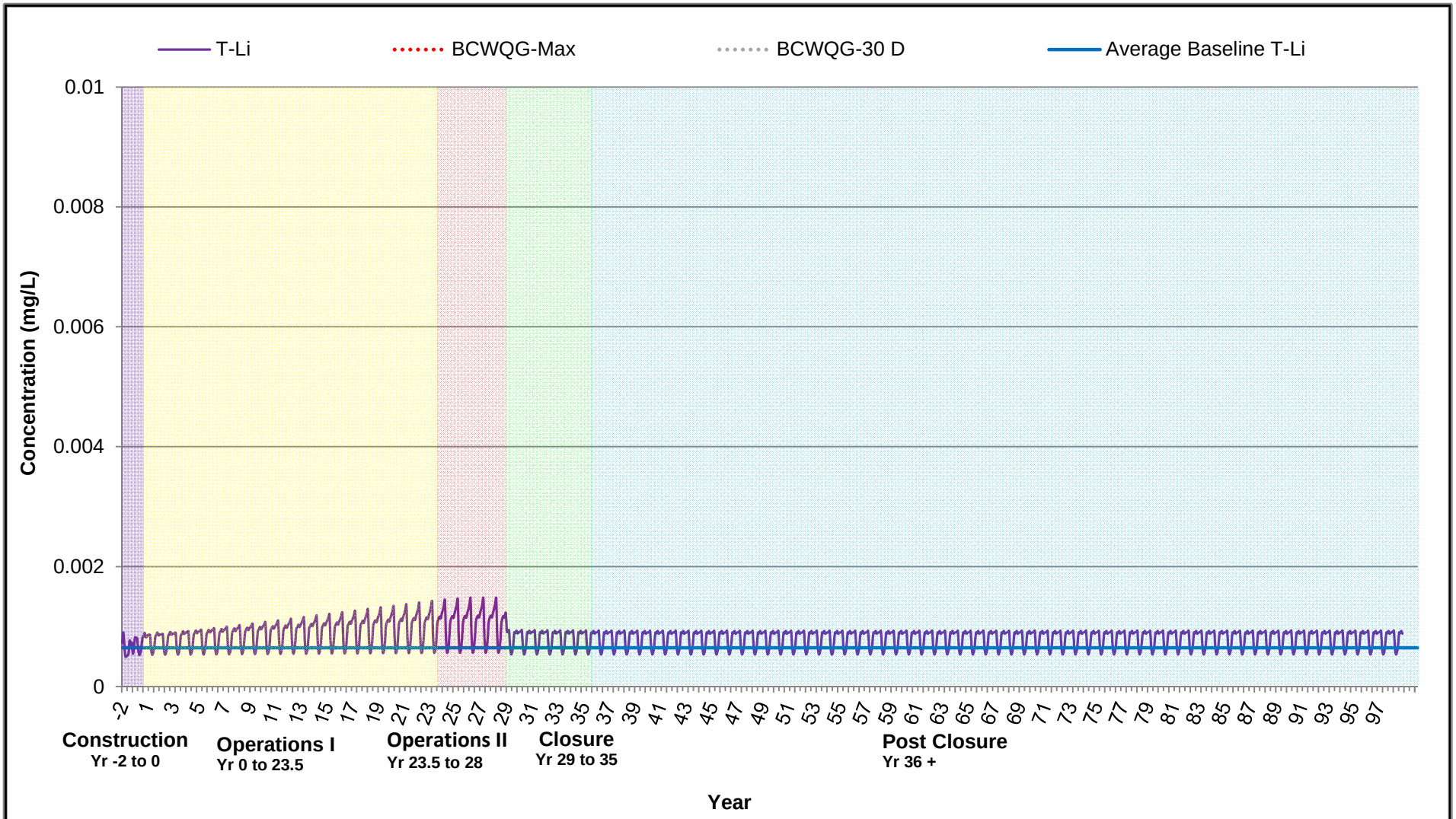
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C6.Fe-D

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).
3. THE BCWQG-30 D (0.096 mg/L) AND BCWQG-MAX (0.87 mg/L) ARE INTERIM (WORKING) AND ARE NOT SHOWN ON GRAPH.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE LITHIUM CONCENTRATIONS - MID HARPER CREEK (HM)

Knight Piésold CONSULTING

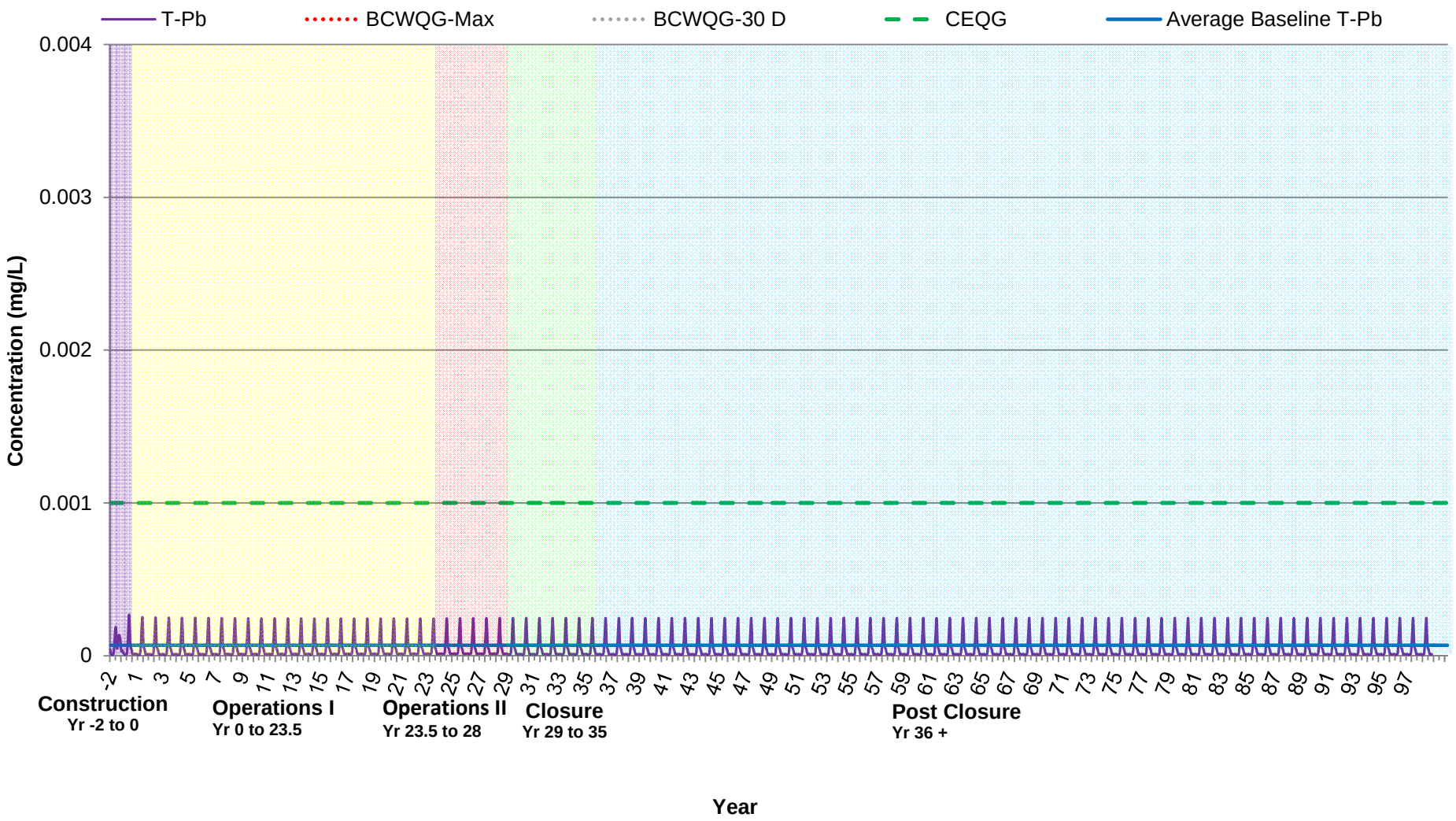
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C6.Li

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.
4. THE BCWQG-MAX (CALCULATED AT 0.011 mg/L) IS NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE LEAD CONCENTRATIONS - MID HARPER CREEK (HM)

Knight Piésold CONSULTING

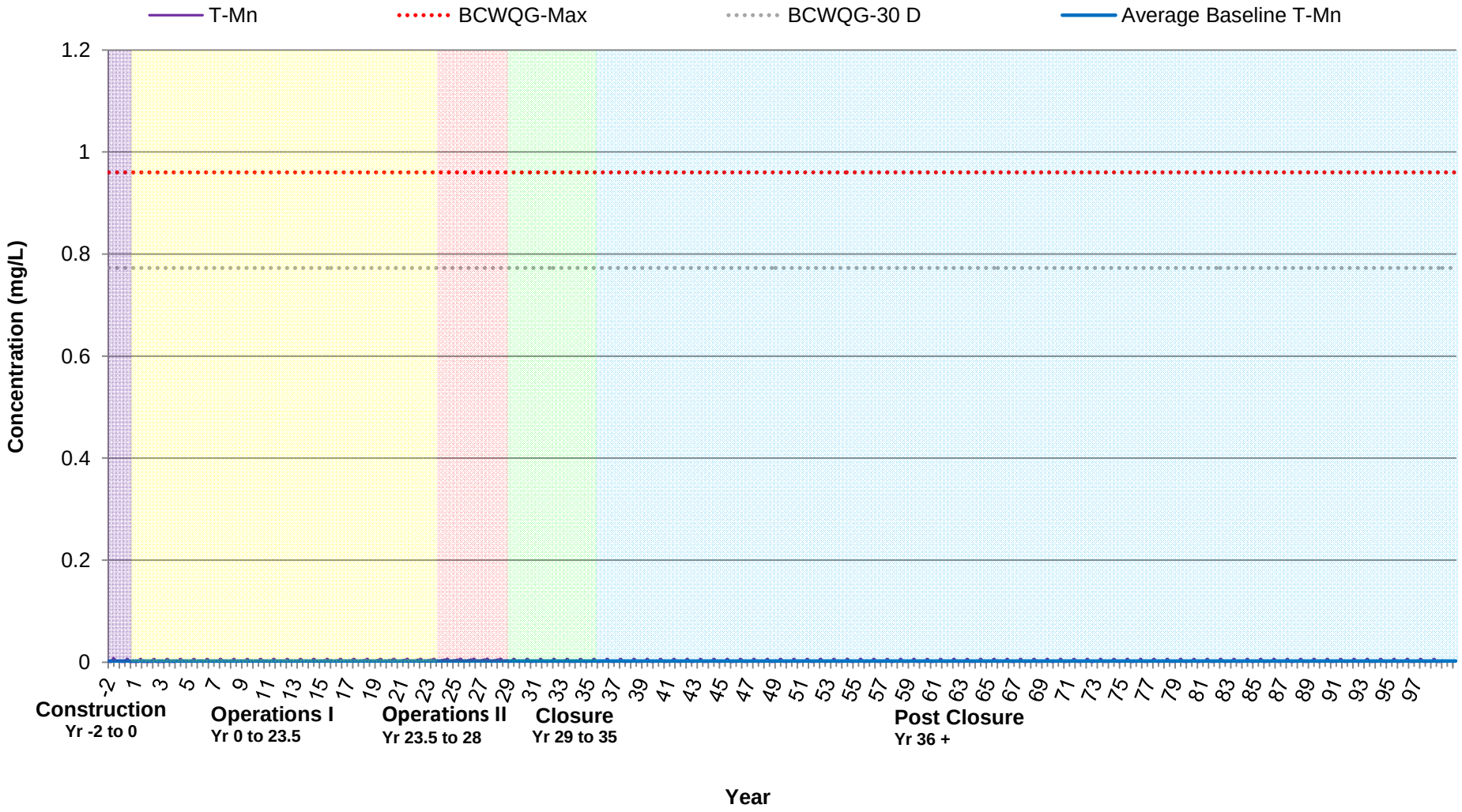
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C6.Pb

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE MANGANESE CONCENTRATIONS - MID HARPER CREEK (HM)

Knight Piésold CONSULTING

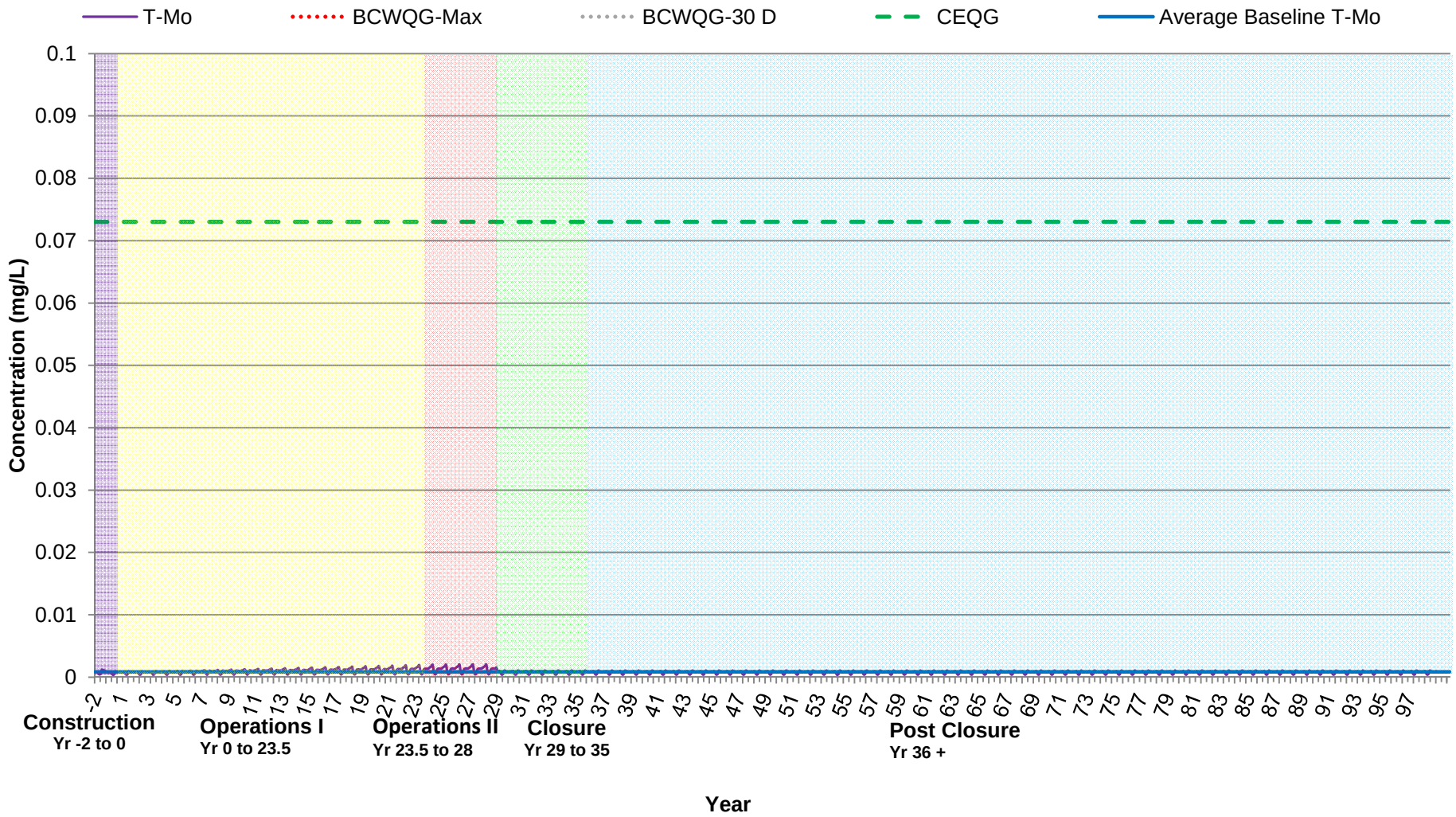
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C6.Mn

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).
3. THE BCWQG-MAX (2 mg/L) AND BCWQG-30 D (1 mg/L) ARE NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE MOLYDBENUM CONCENTRATIONS - MID HARPER CREEK (HM)

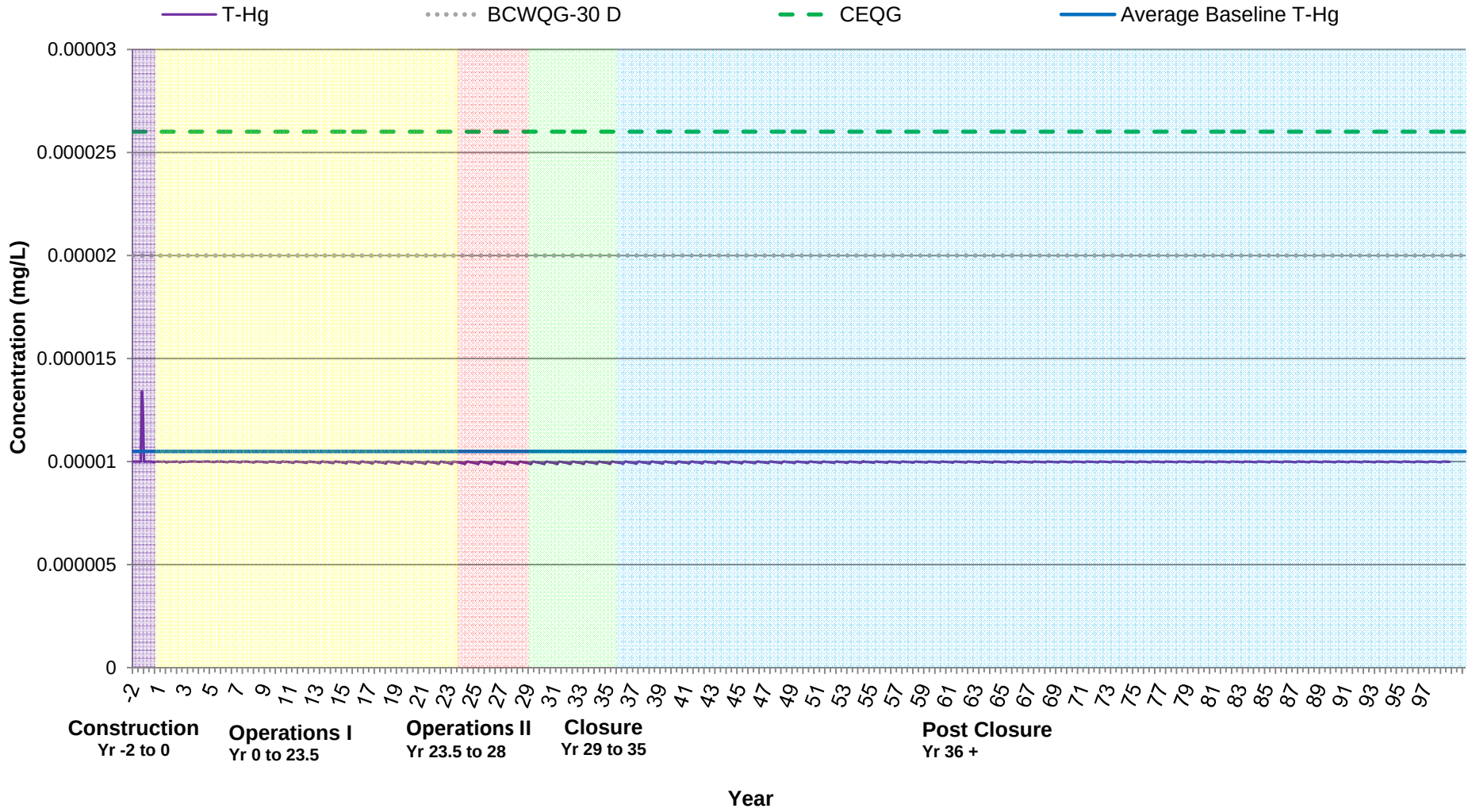
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C6.Mo

REV 0



NOTES:

1. THE BCWQG-30 D AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).
3. BCWQG-30 D VALUE APPLIED ON ASSUMPTION THAT METHYL-Hg IS EQUAL TO 0.5% OF T-Hg.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE MERCURY CONCENTRATIONS - MID HARPER CREEK (HM)

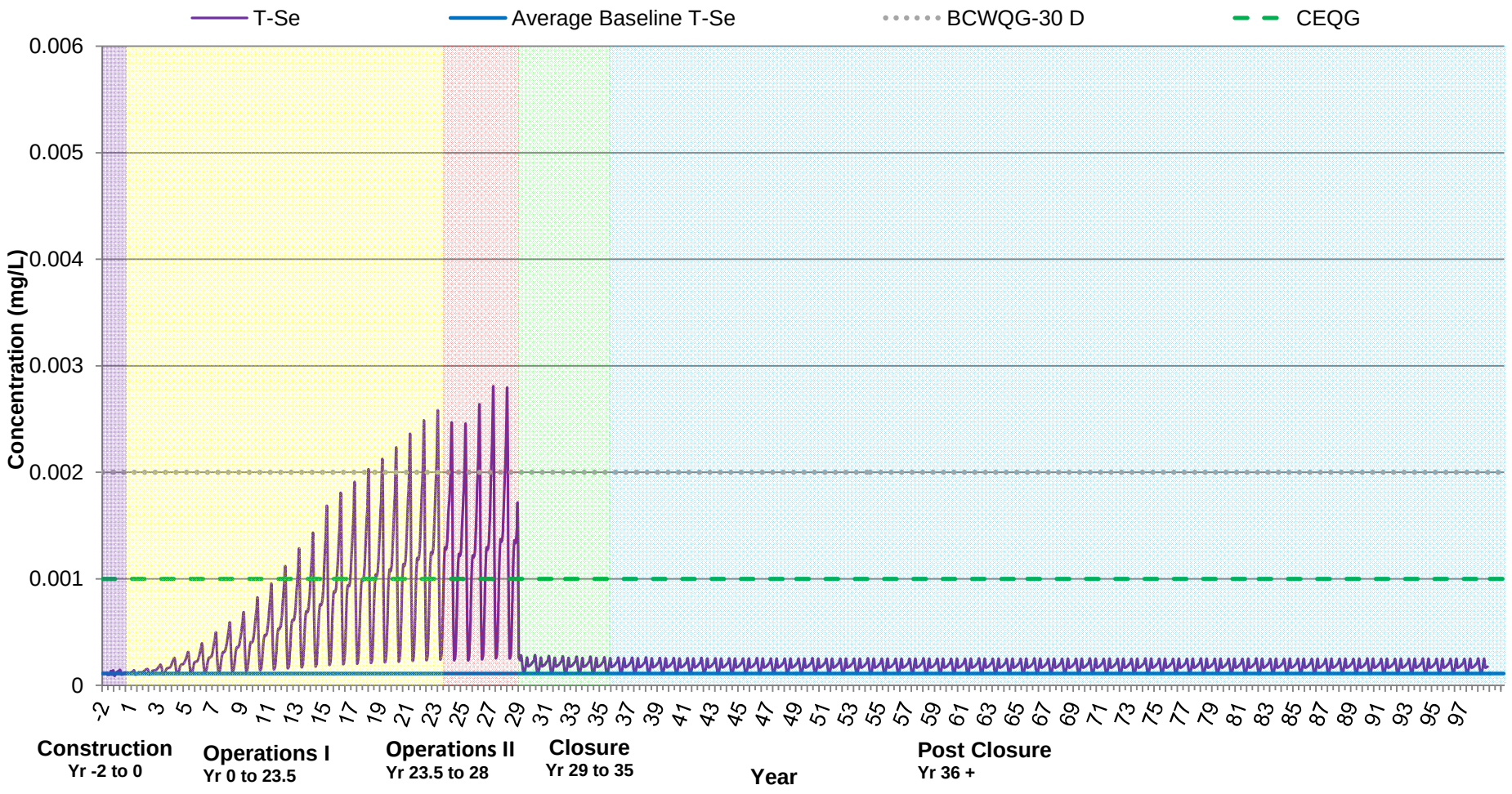
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C6.Hg

REV 0



NOTES:

1. THE BCWQG-30 D AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE SELENIUM CONCENTRATIONS - MID HARPER CREEK (HM)

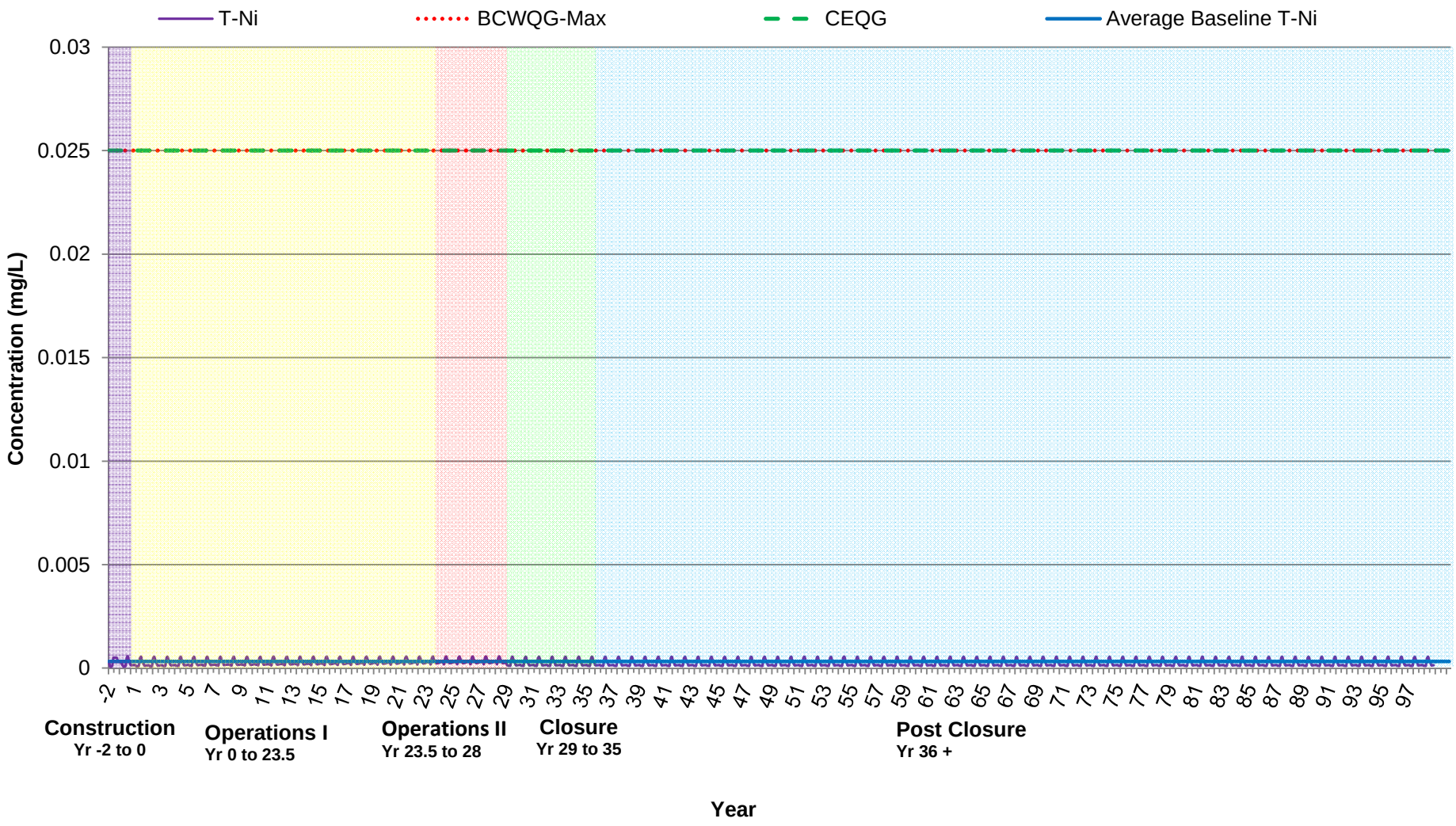
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C6.Se

REV 0



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE NICKEL CONCENTRATIONS - MID HARPER CREEK (HM)

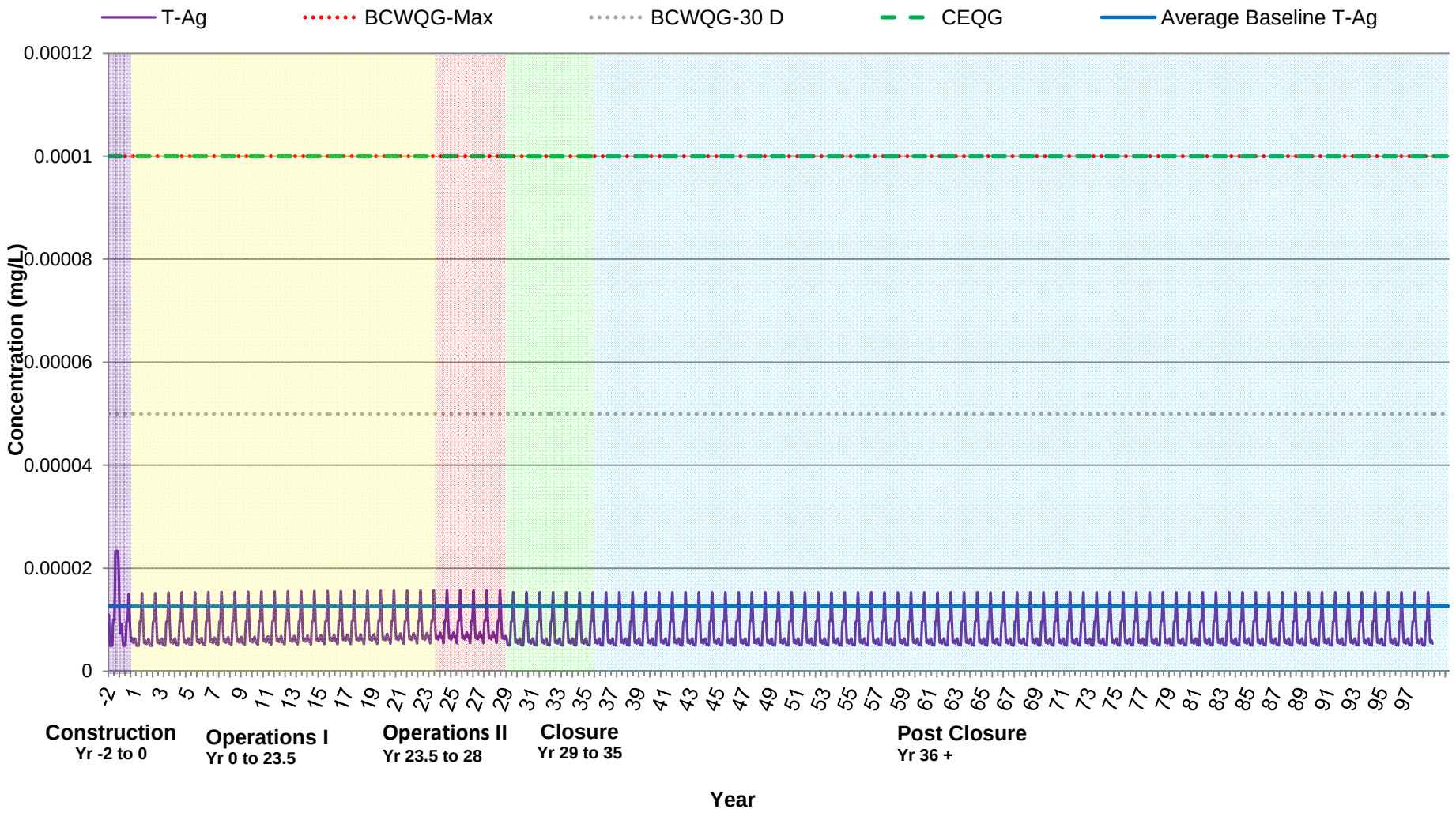
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C6.Ni

REV 0



NOTES:

1. THE BCWQG-30 D AND BCWQG-MAX ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE SILVER CONCENTRATIONS - MID HARPER CREEK (HM)

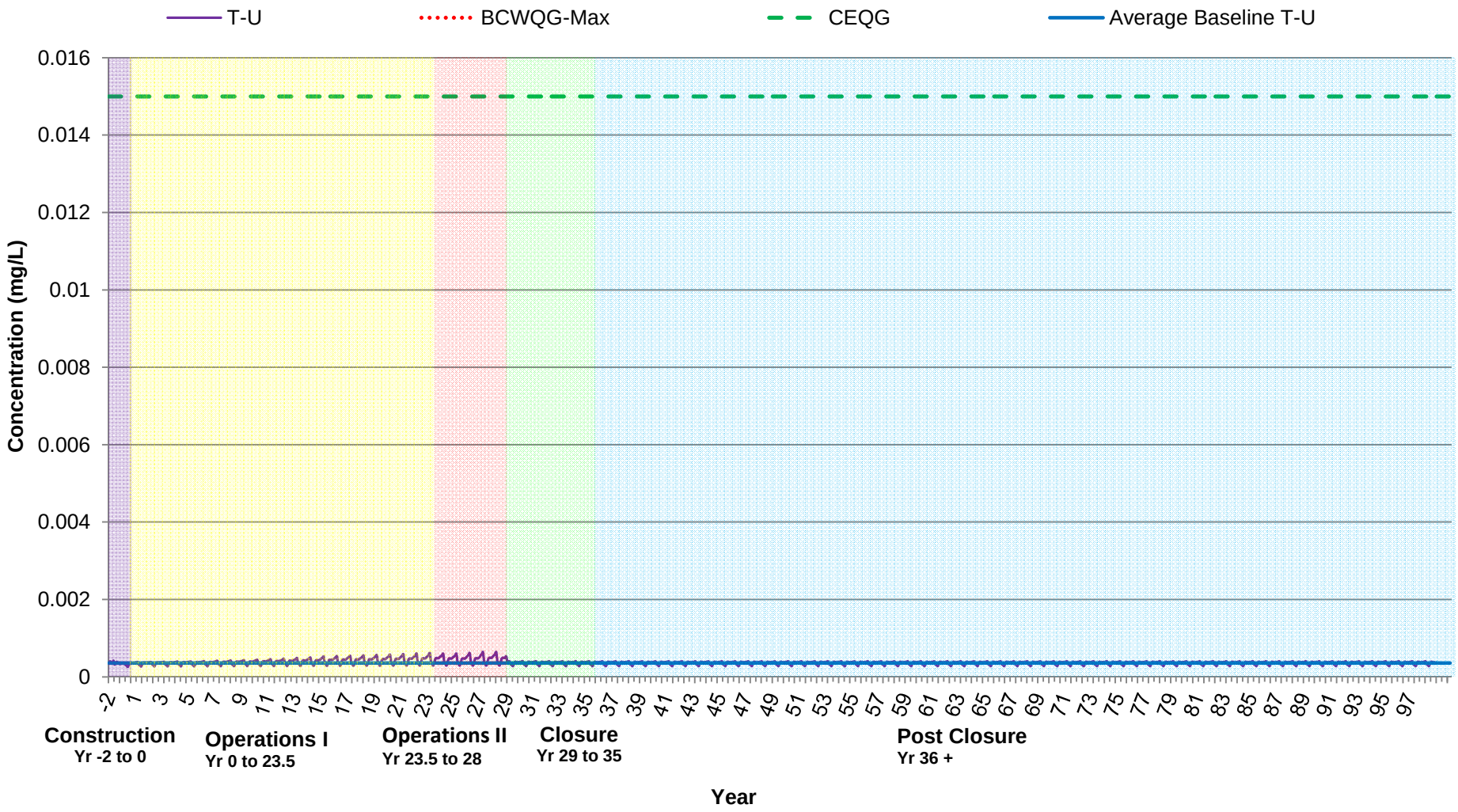
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C6.Ag

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).
3. THE BCWQG-MAX (0.3 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE URANIUM CONCENTRATIONS - MID HARPER CREEK (HM)

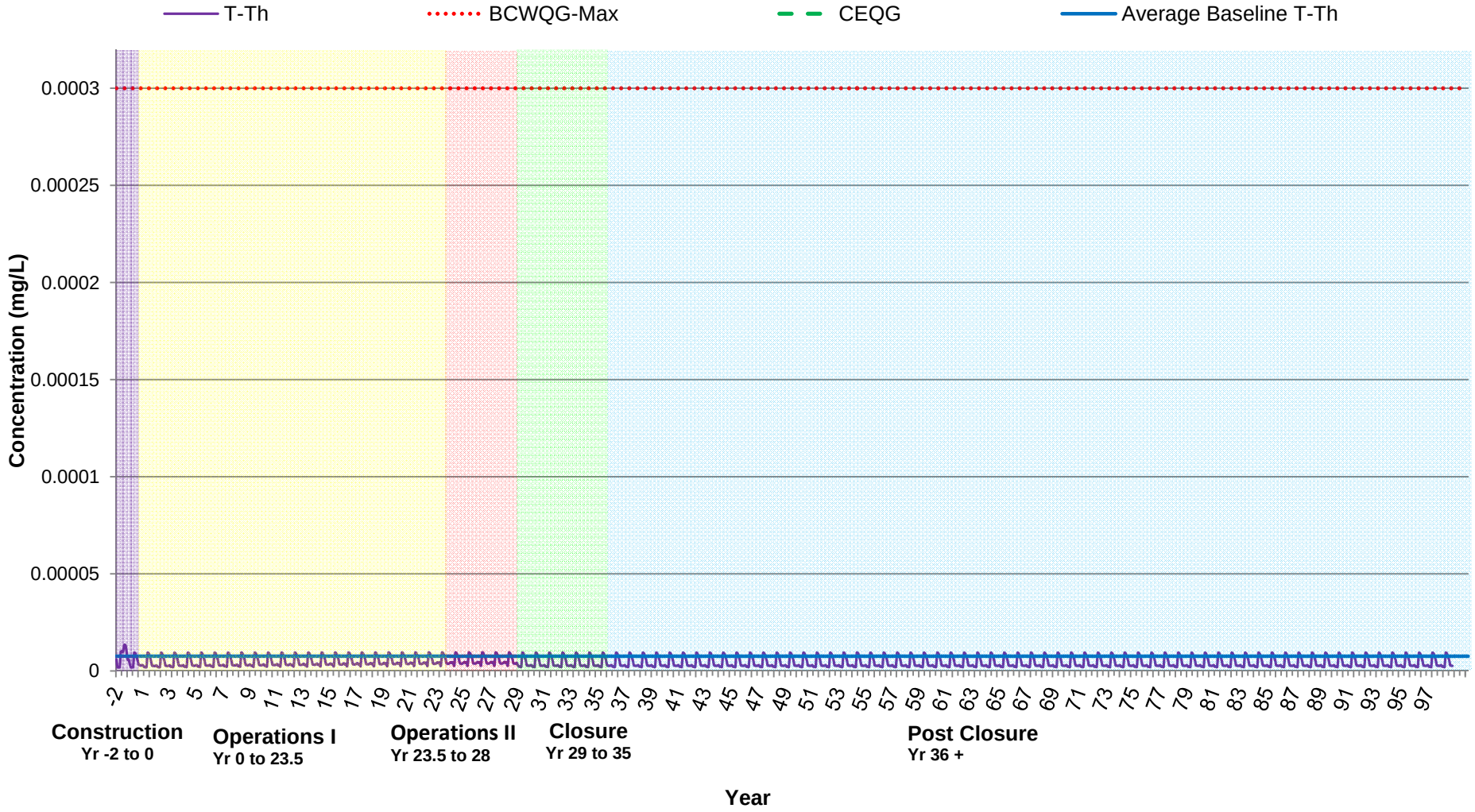
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C6.U

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).
3. THE CEQG (0.0008 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE THALLIUM CONCENTRATIONS - MID HARPER CREEK (HM)

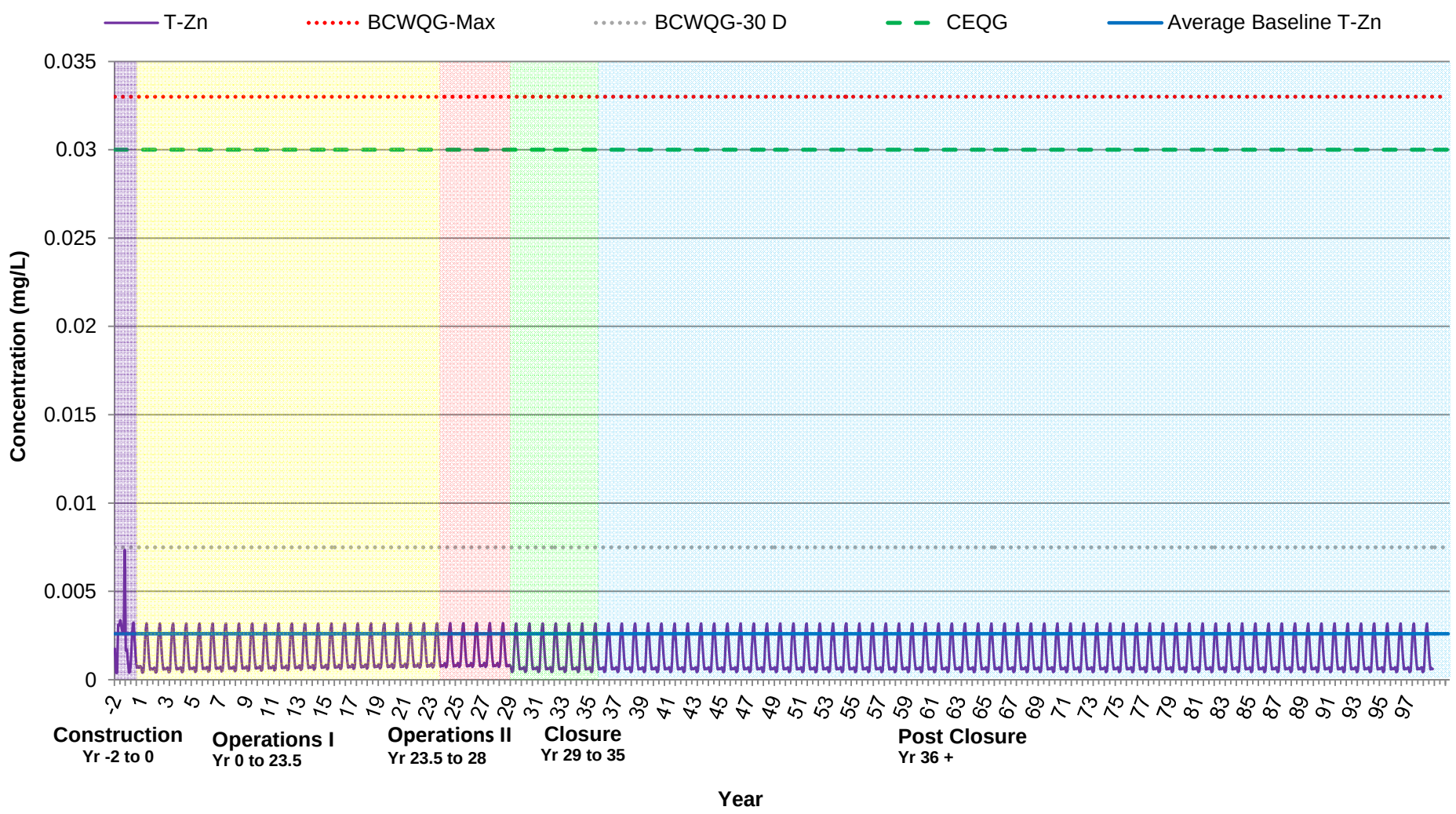
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C6.Th

REV 0



NOTES:

1. BCWQG-30 D AND BCWQG-MAX ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE ZINC CONCENTRATIONS - MID HARPER CREEK (HM)

Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

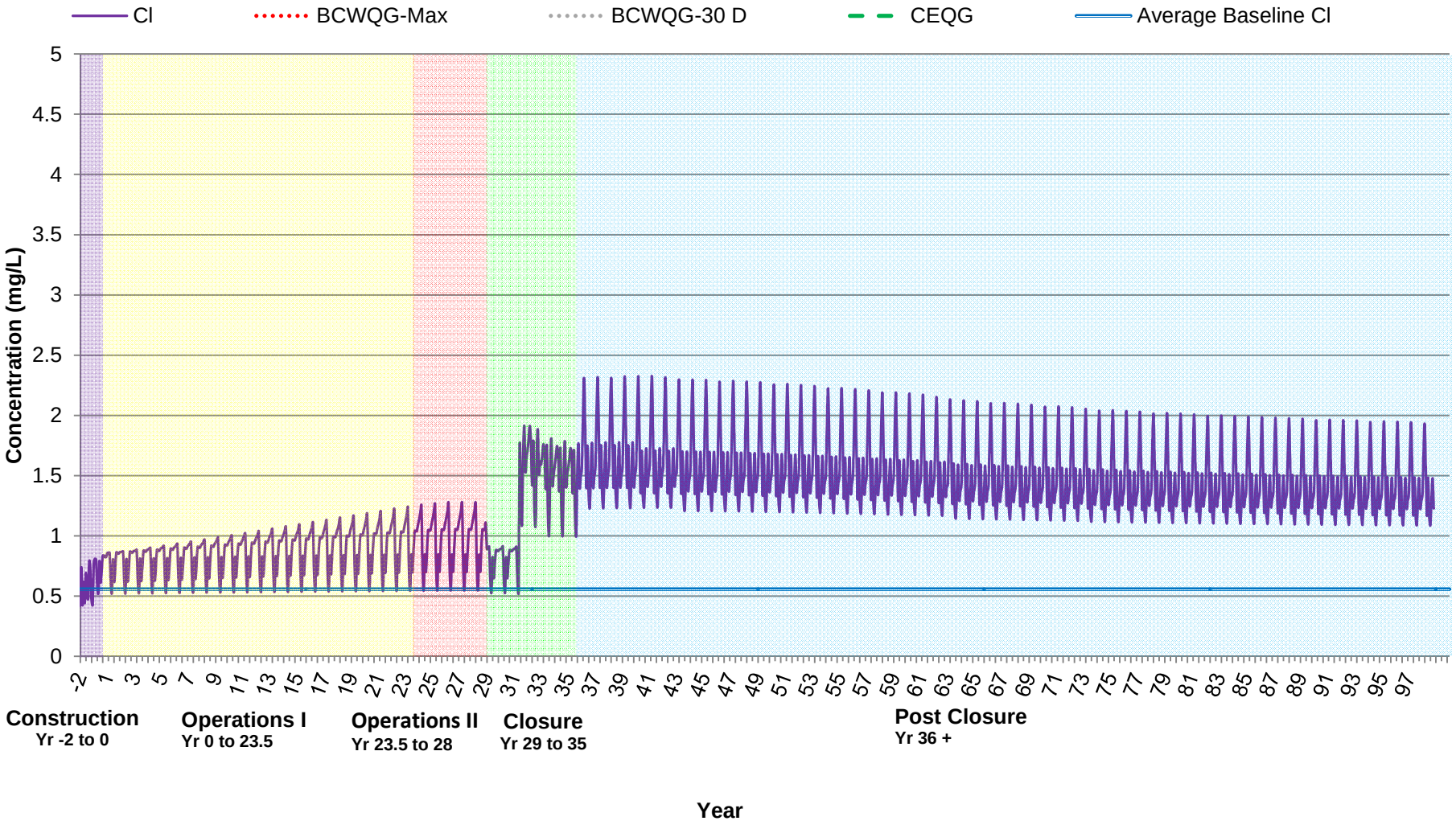
FIGURE C6.Zn

REV 0

APPENDIX C7

HARPER CREEK BELOW T-CREEK (HT)

(Pages C7-1 to C7-30)



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 34.5 mg/L).
3. ALL GUIDELINES ARE NOT SHOWN: BCWQG-30 D (150 mg/L); BCWQG-MAX (600 mg/L); CEQG (120 mg/L AND 640 mg/L).

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE CHLORIDE CONCENTRATIONS - HARPER CREEK BELOW T-CREEK (HT)

Knight Piésold CONSULTING

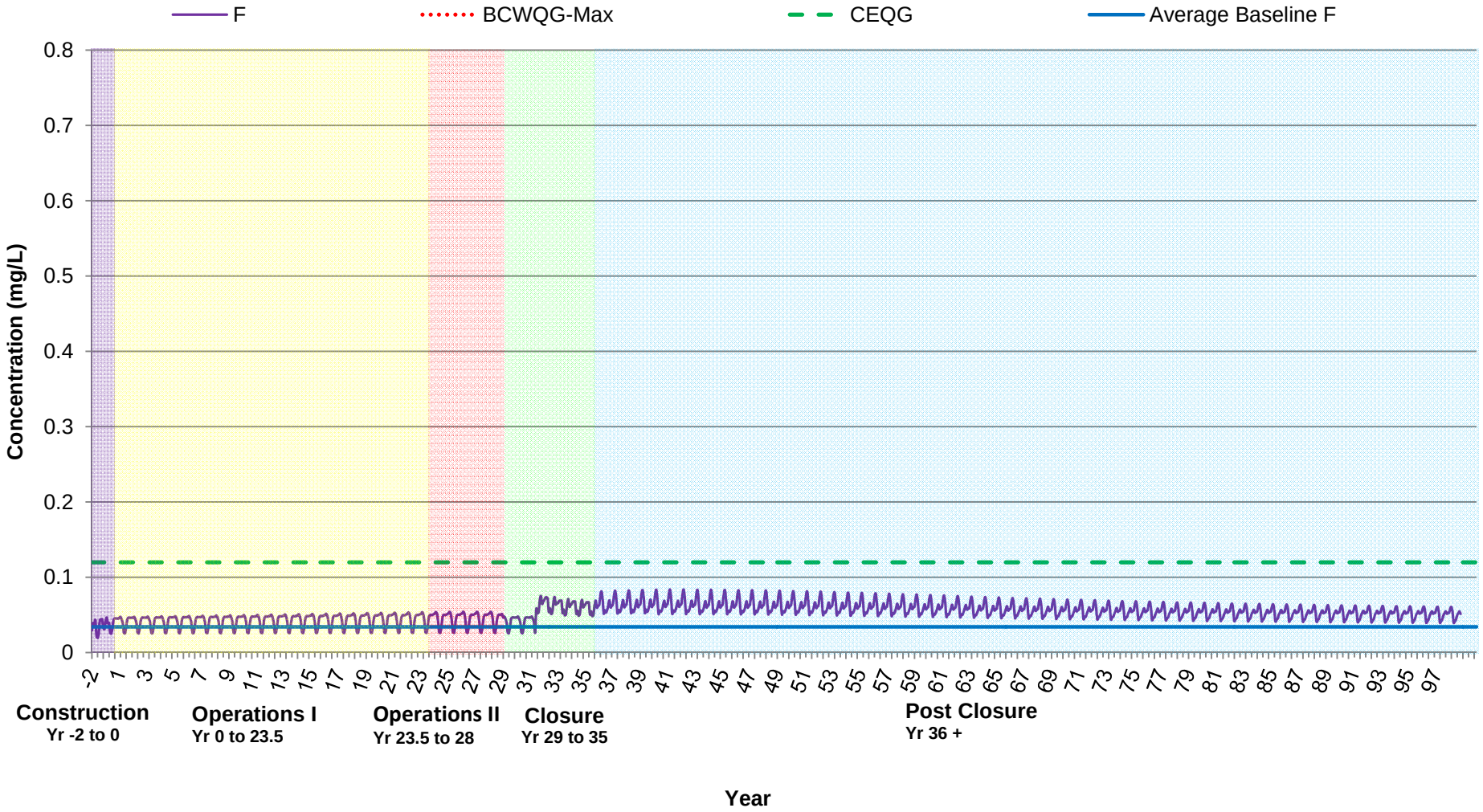
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C7.Cl

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX IS HARNDESS DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 34.5 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE FLUORIDE CONCENTRATIONS - HARPER CREEK BELOW T-CREEK (HT)

Knight Piésold CONSULTING

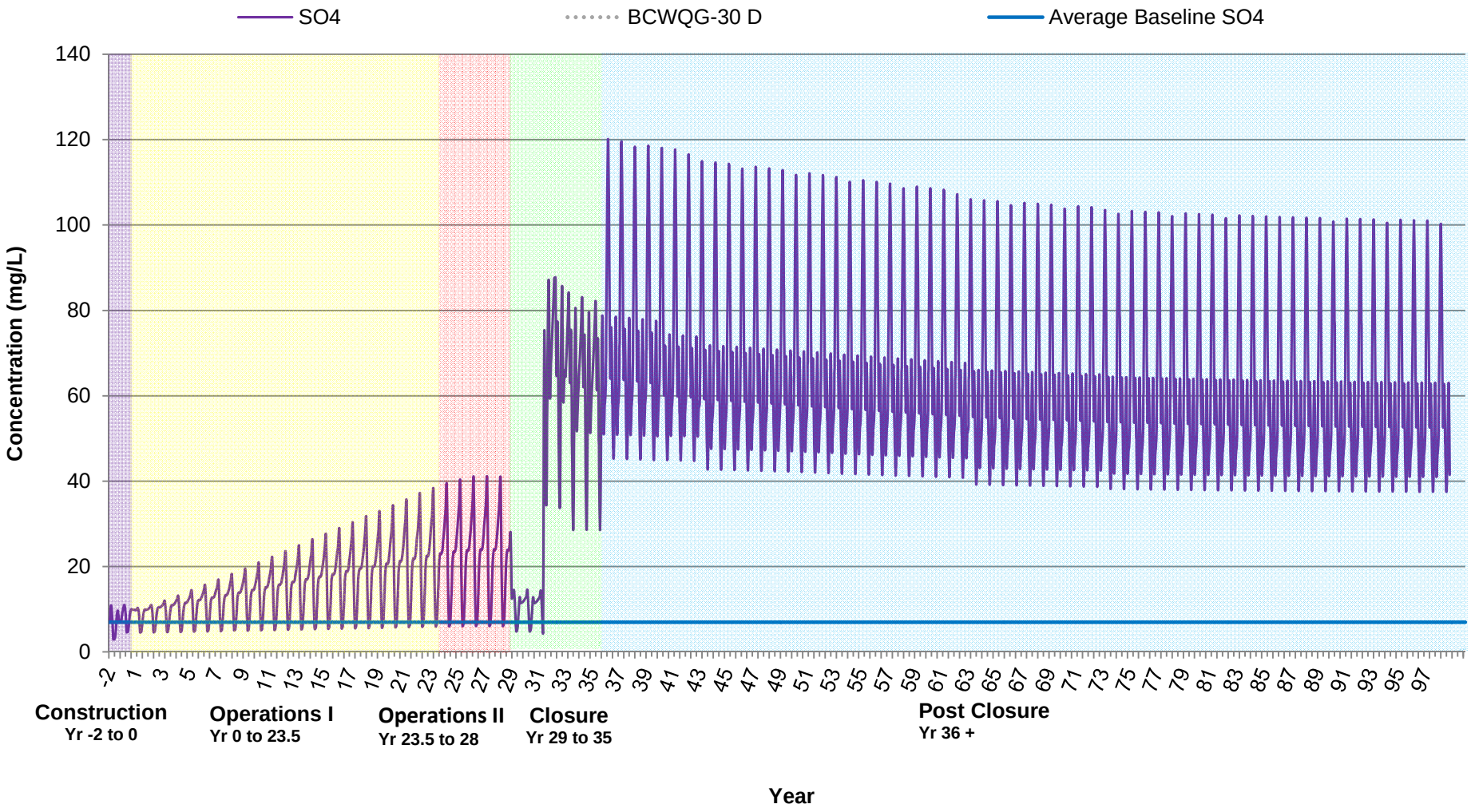
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C7.F

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. BCWQG-30 D IS HARDNESS DEPEDENT.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 34.5 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE SULPHATE CONCENTRATIONS - HARPER CREEK BELOW T-CREEK (HT)

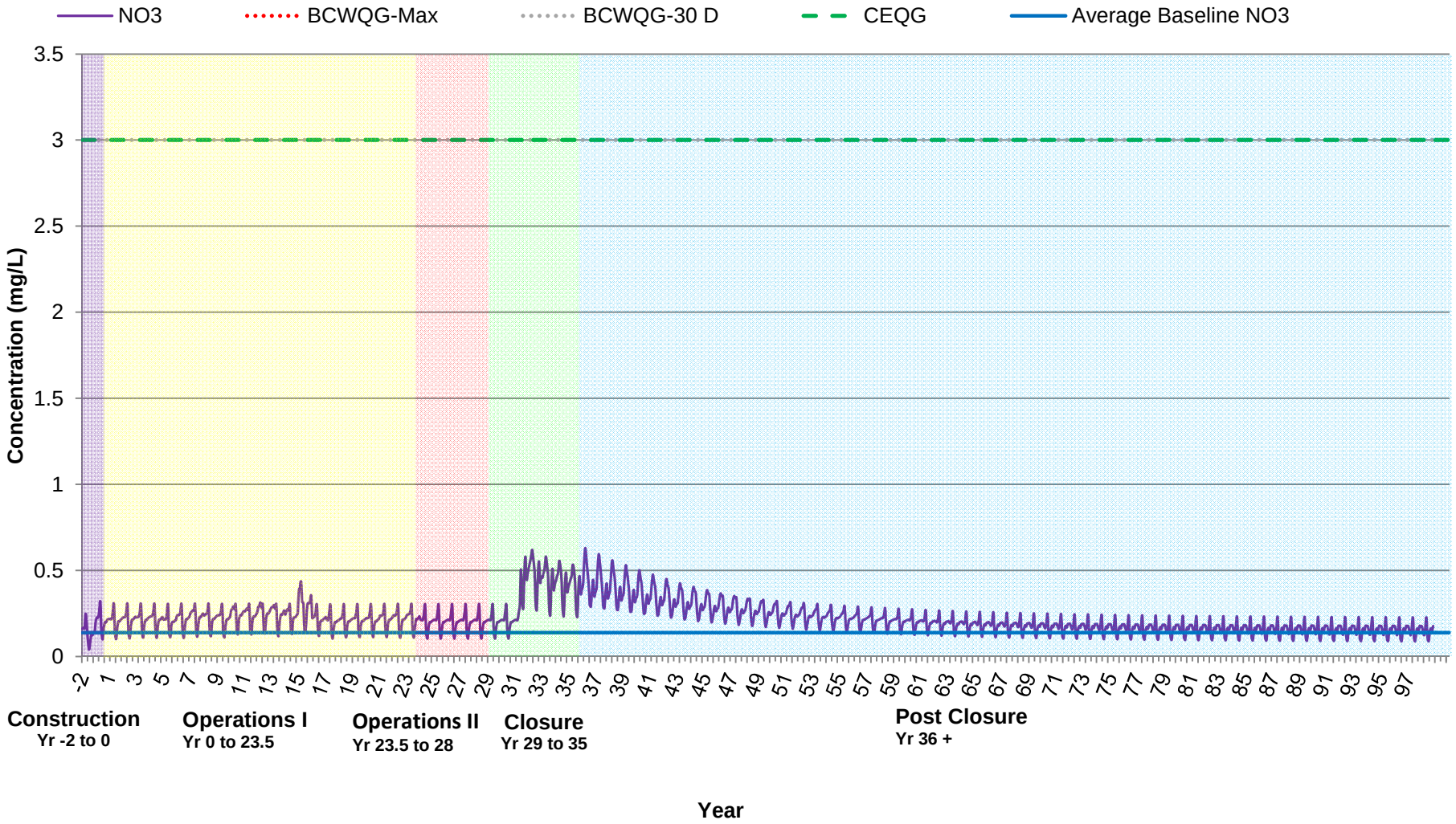
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C7.S04

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 34.5 mg/L).
3. THE BCWQG-MAX (32.8 mg/L) IS NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE NITRATE CONCENTRATIONS - HARPER CREEK BELOW T-CREEK (HT)

Knight Piésold CONSULTING

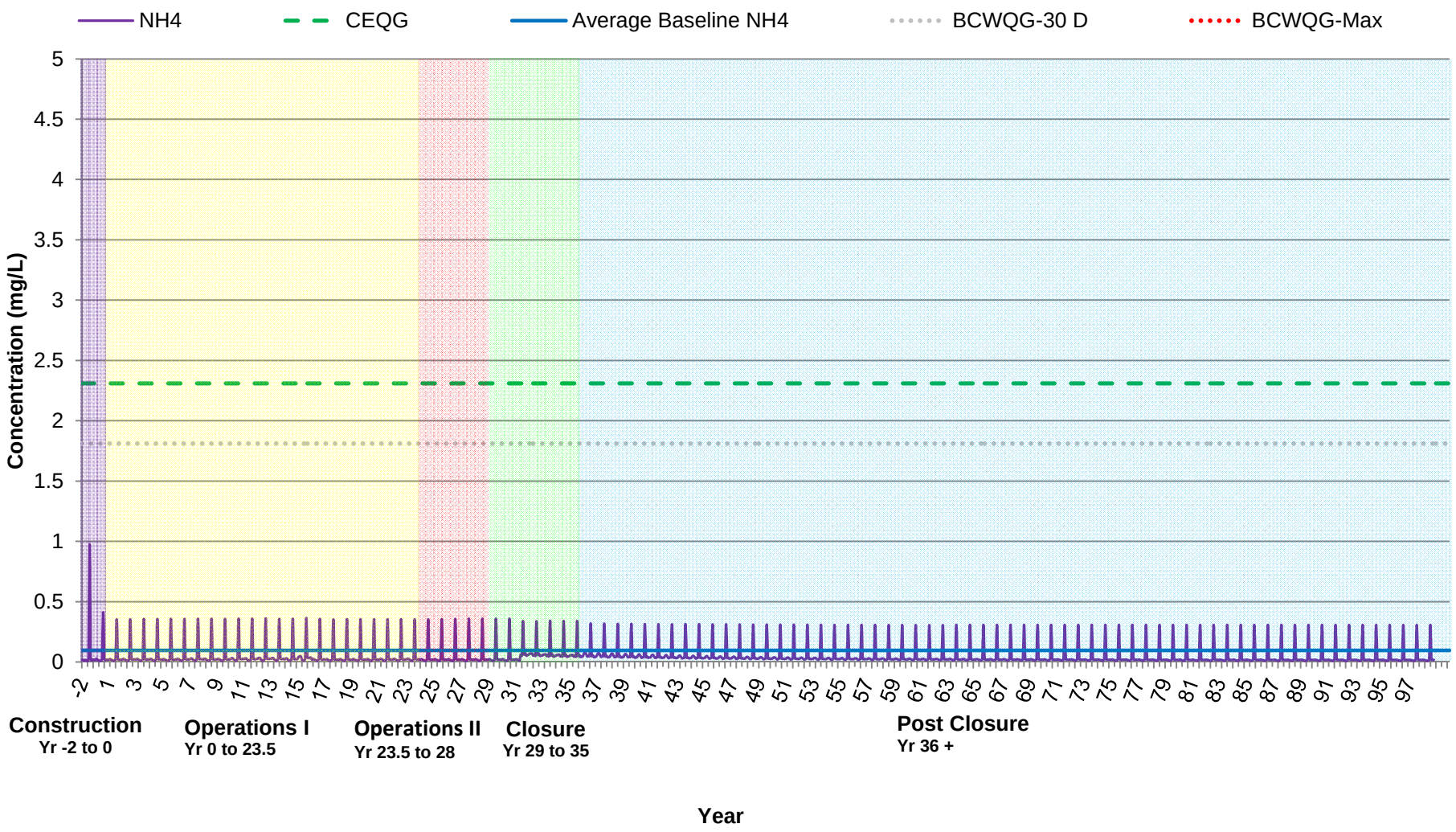
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C7.NO3

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-30 D IS VALID FOR ONLY 6.5≤pH<9 AND 0°C≤T≤20°C.
2. THE BCWQG-MAX (20.15 mg/L) VALID FOR 6.5≤pH<9 IS NOT SHOWN.
3. THE CEQG IS TO BE USED WITH CAUTION FOR WATER WITH T<5°C AND pH>9.
4. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 34.5 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE AMMONIA CONCENTRATIONS - HARPER CREEK BELOW T-CREEK (HT)

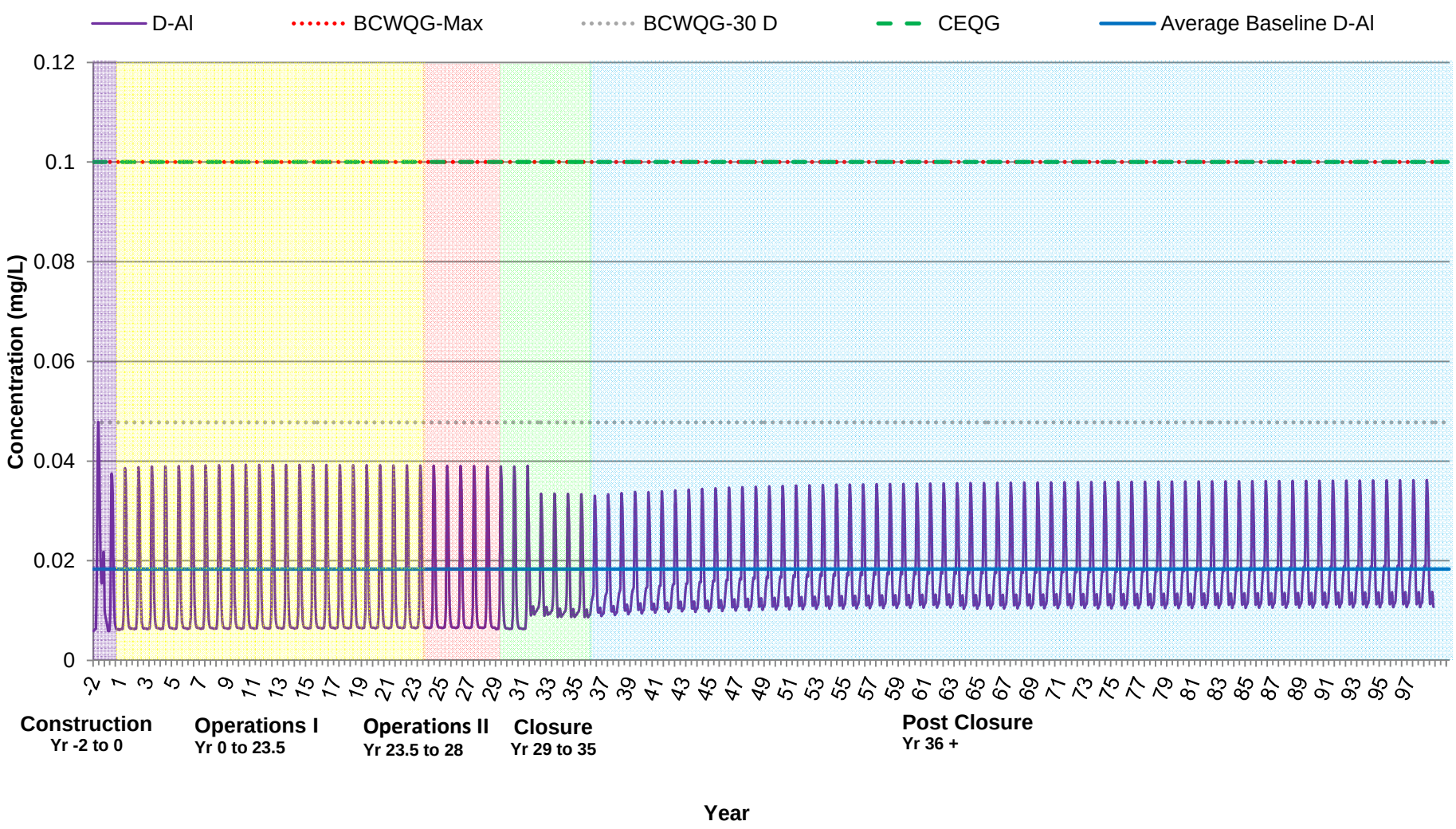
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C7.NH4

REV 0



NOTES:

1. ALL GUIDELINES ARE pH-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 34.5 mg/L).
3. AVERAGE BASELINE pH USED TO CALCULATE GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE DISSOLVED ALUMINUM CONCENTRATIONS - HARPER CREEK BELOW T-CREEK (HT)

Knight Piésold CONSULTING

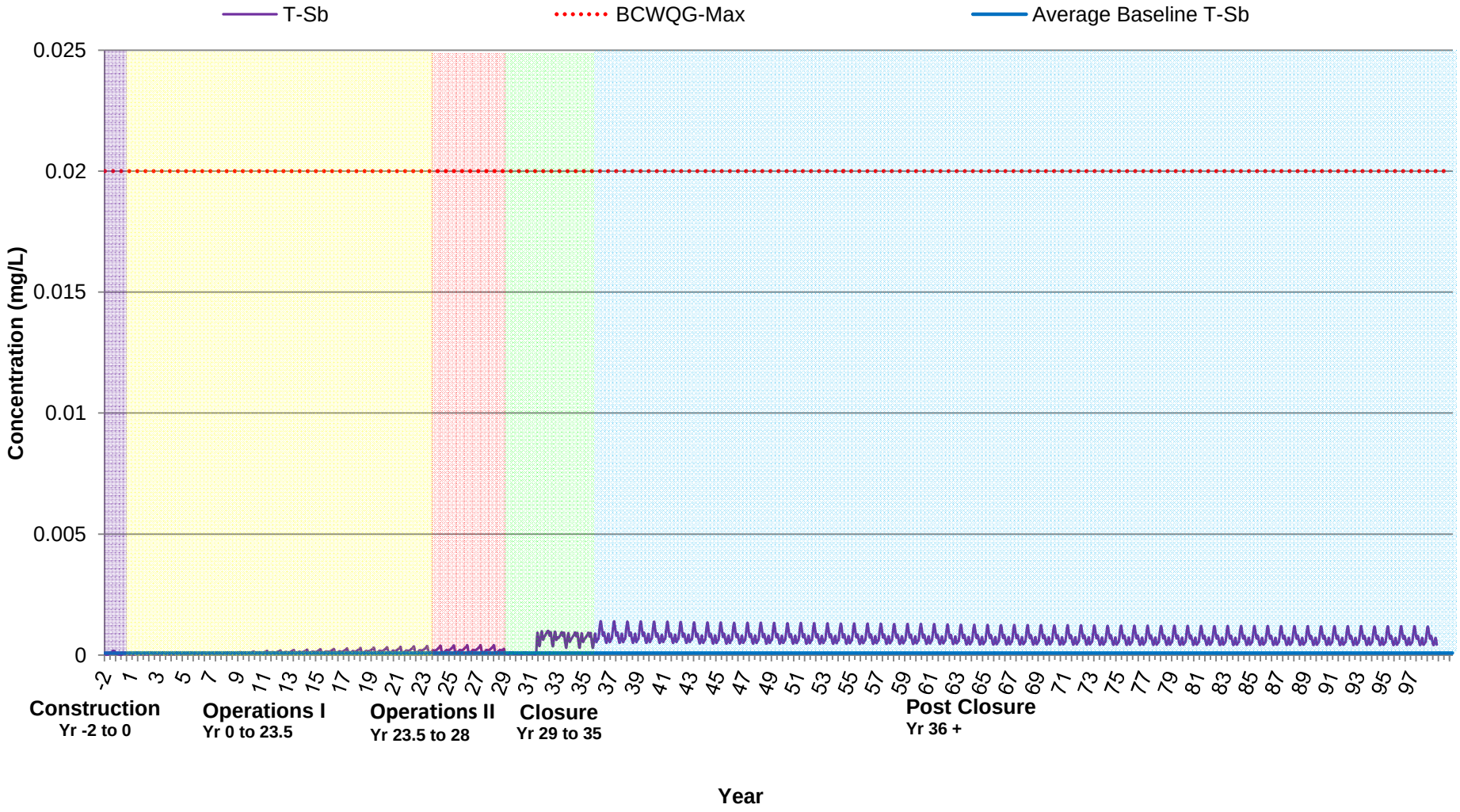
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C7.Al

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 34.5 mg/L).

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE ANTIMONY CONCENTRATIONS - HARPER CREEK BELOW T-CREEK (HT)

Knight Piésold CONSULTING

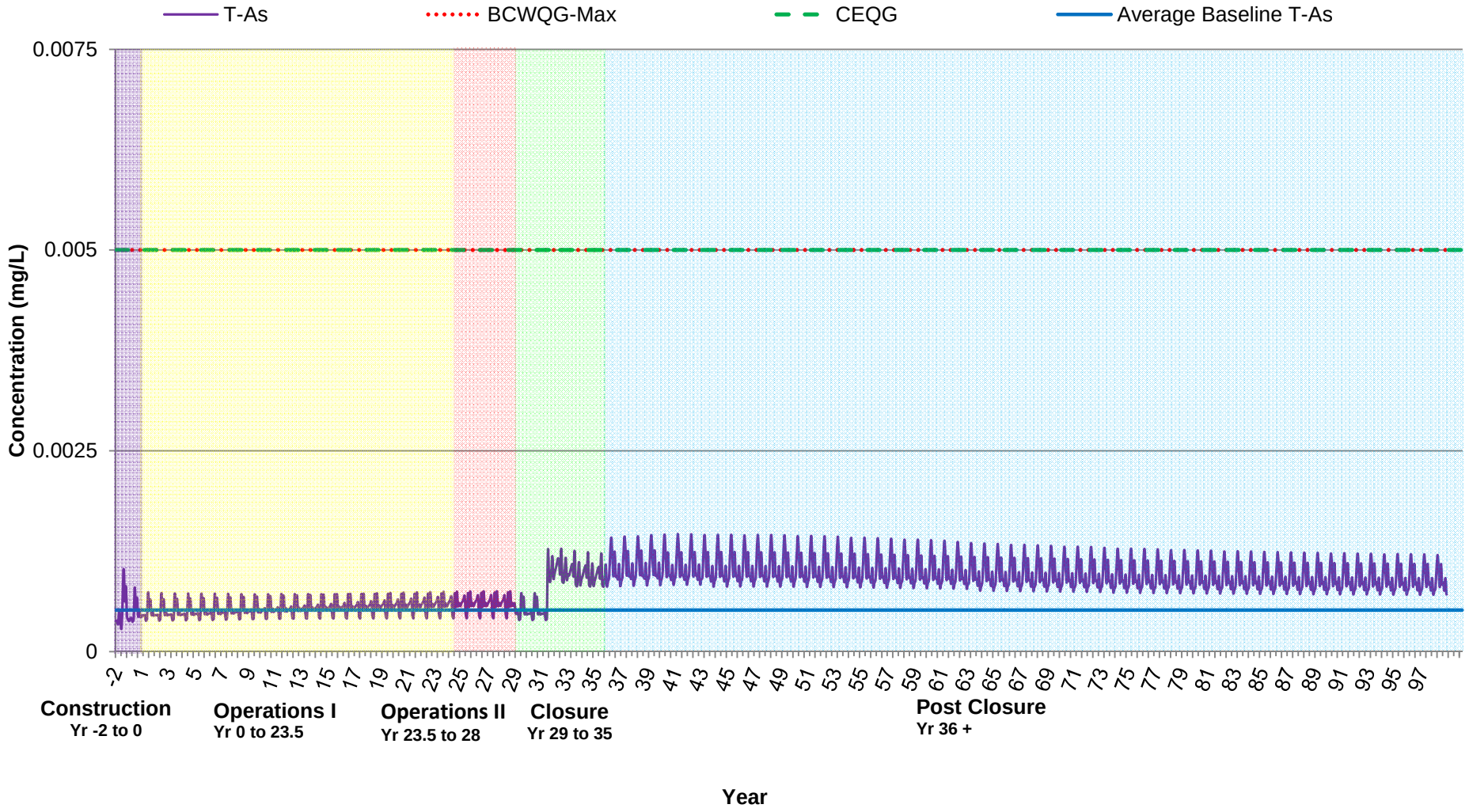
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C7.Sb

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 34.5 mg/L).

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE ARSENIC CONCENTRATIONS - HARPER CREEK BELOW T-CREEK (HT)

Knight Piésold CONSULTING

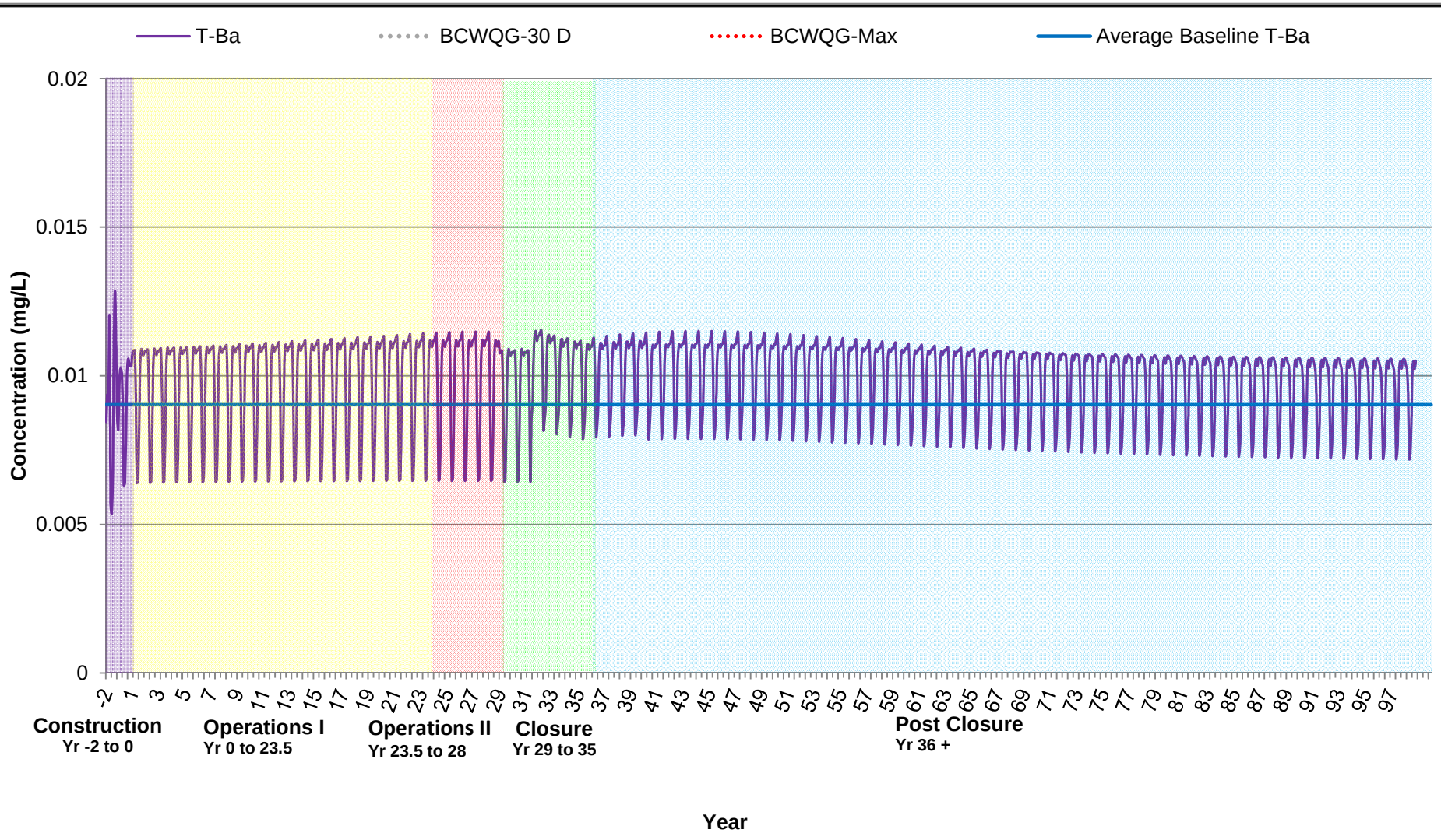
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C7.As

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 34.5 mg/L).
3. THE BCWQG-30 D (1 mg/L) AND BCWQG-MAX (5 mg/L) ARE NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE BARIUM CONCENTRATIONS - HARPER CREEK BELOW T-CREEK (HT)

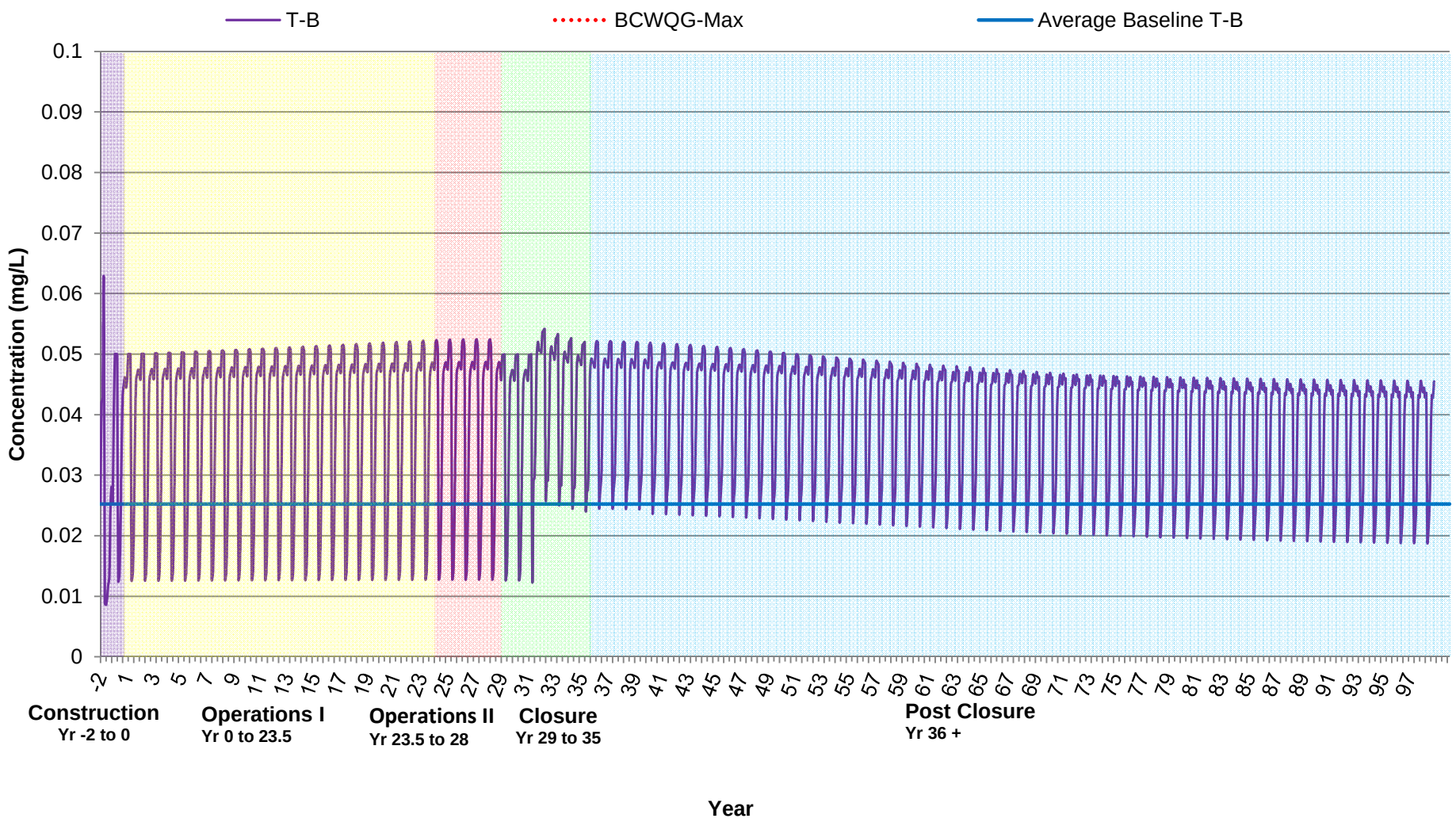
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C7.Ba

REV 0



NOTES:

1. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 34.5 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.
3. THE BCWQG-MAX (1.2 mg/L) IS NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE BORON CONCENTRATIONS - HARPER CREEK BELOW T-CREEK (HT)

Knight Piésold CONSULTING

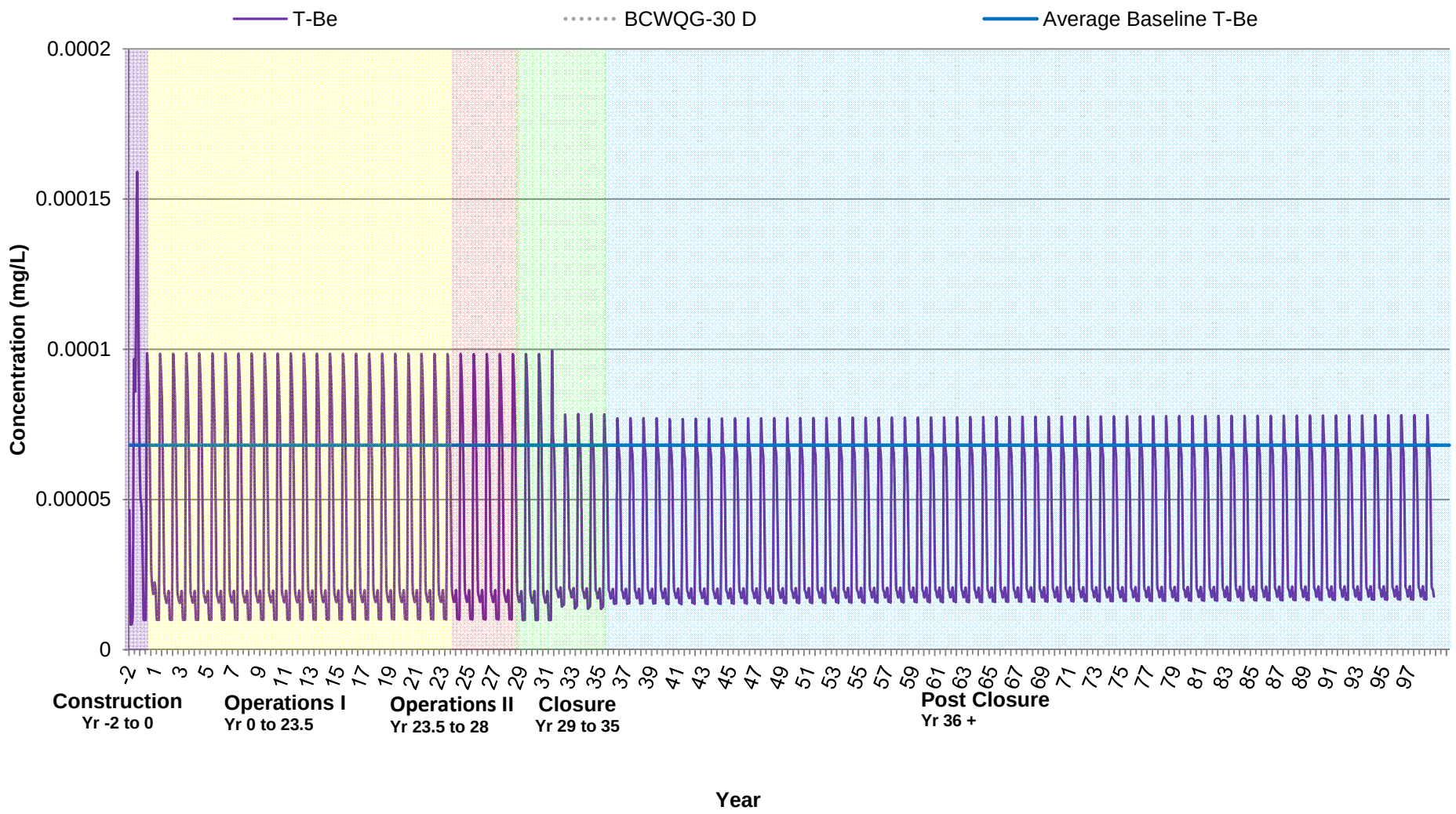
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C7.B

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 34.5 mg/L).
3. THE BCWQG-30 D (0.0053 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE BERYILLIUM CONCENTRATIONS - HARPER CREEK BELOW T-CREEK (HT)

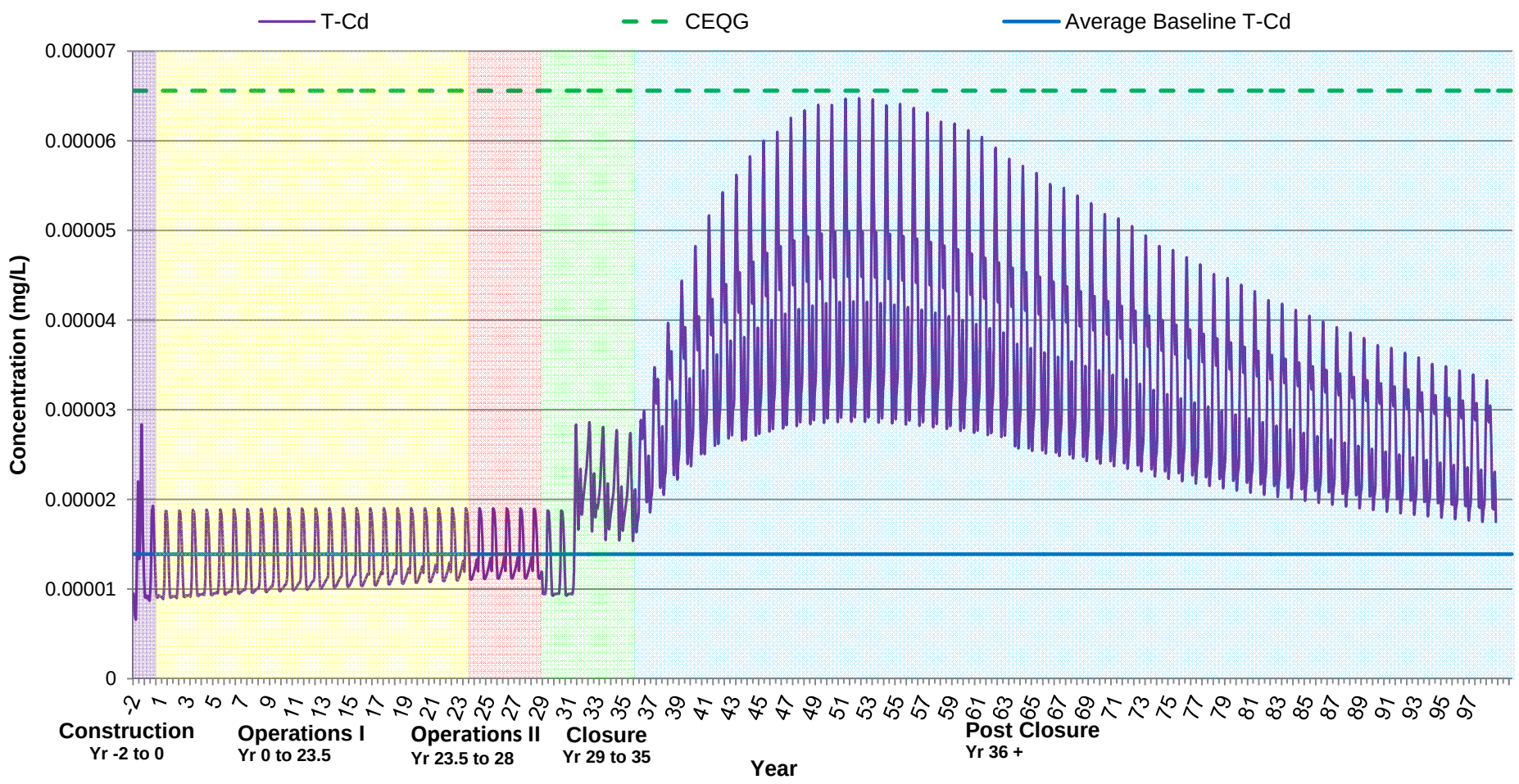
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C7.Be

REV 0



NOTES:

1. BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 34.5 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE CADMIUM CONCENTRATIONS - HARPER CREEK BELOW T-CREEK (HT)

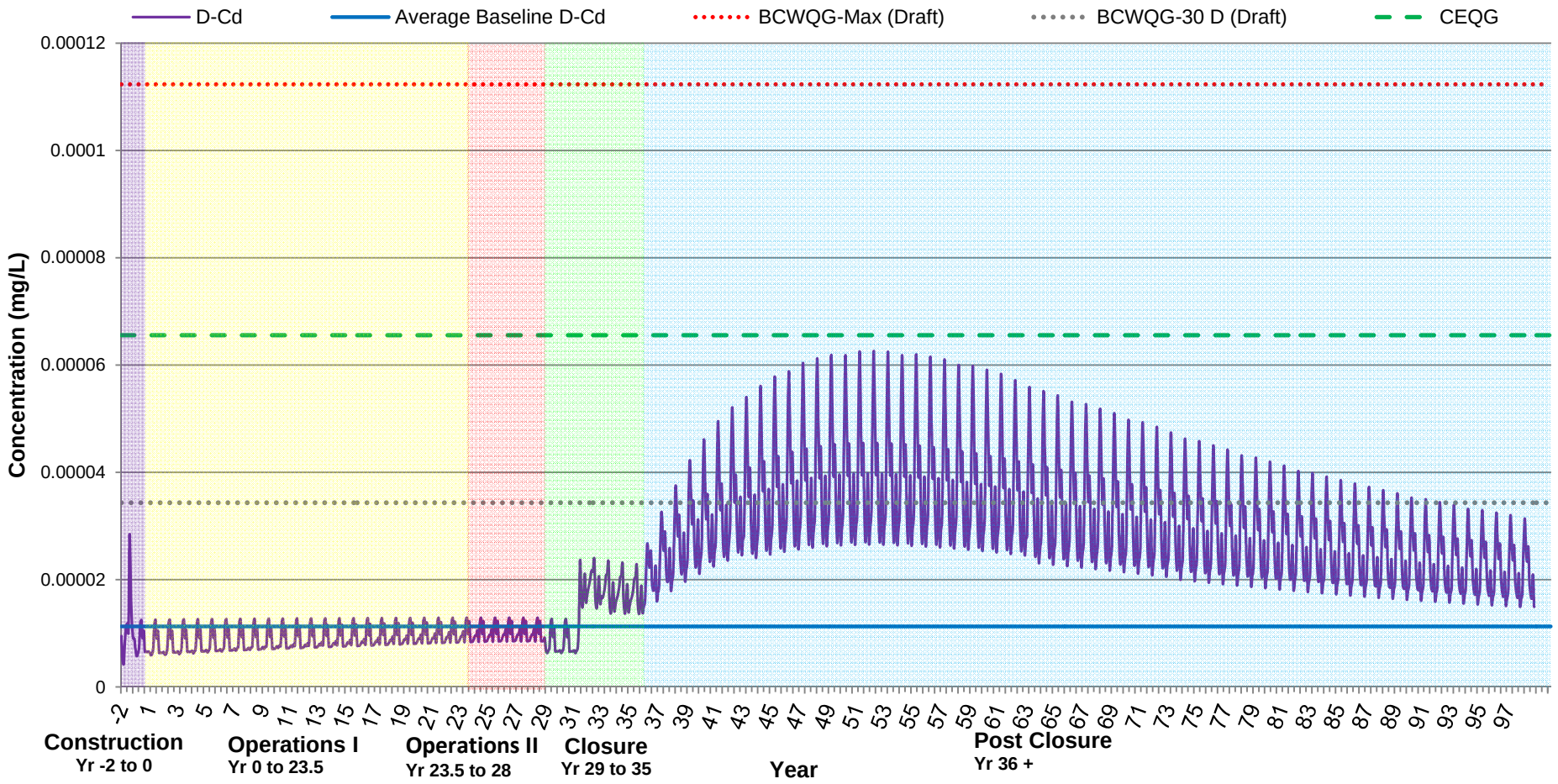
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C7.Cd-T

REV 0



NOTES:

1. THE BCWQG AND CEQG ARE HARDNESS-DEPENDENT.
2. THE BCWQG ARE DRAFT GUIDELINES UNDER REVIEW (JUNE 2014).
3. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 34.5 mg/L).
4. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE CADMIUM CONCENTRATIONS - HARPER CREEK BELOW T-CREEK (HT)

Knight Piésold CONSULTING

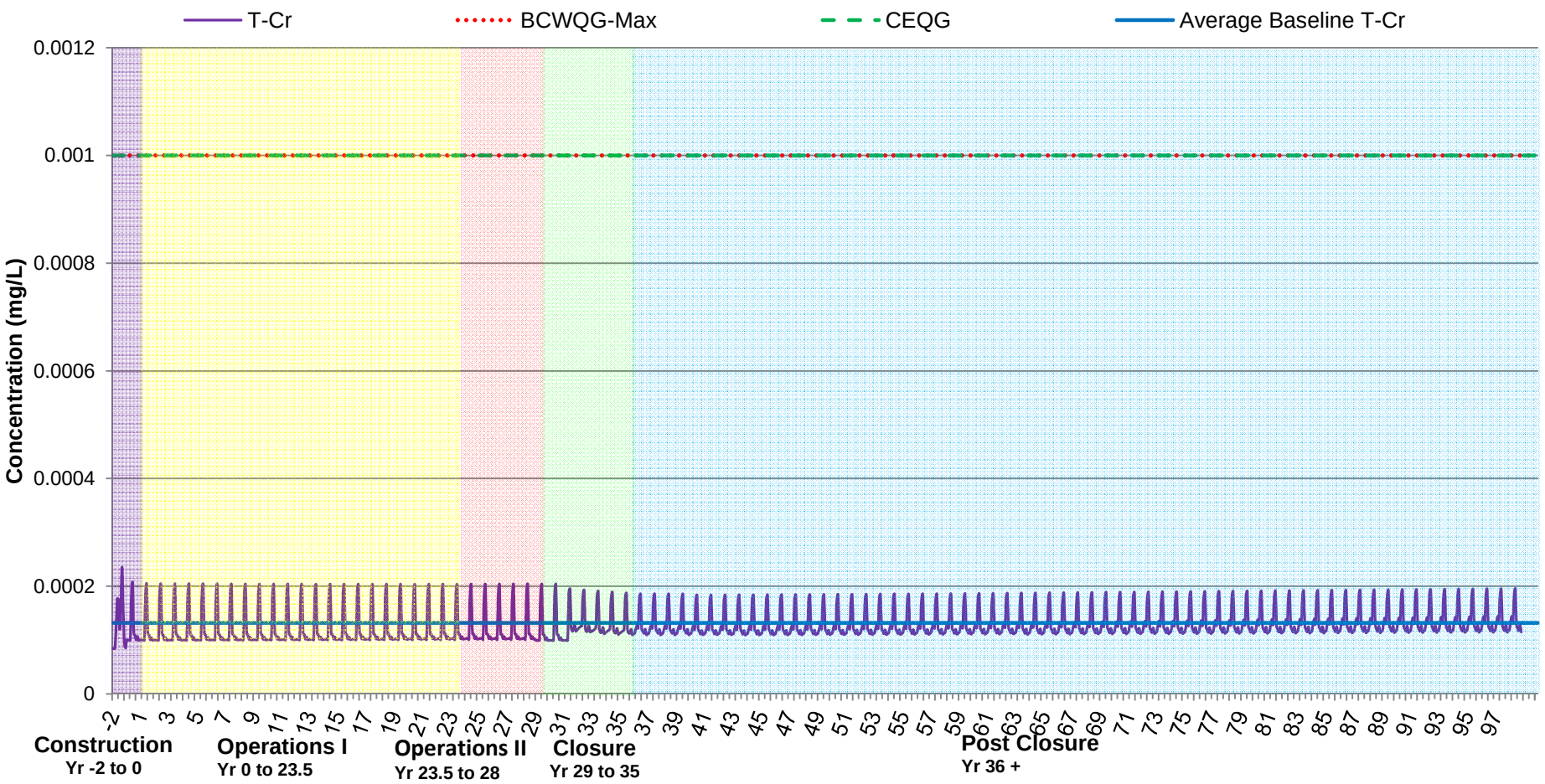
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C7.Cd-D

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. GUIDELINES ARE FOR CHROMIUM (IV), THE SPECIES MOST COMMON IN WELL OXYGENATED SURFACE WATERS.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 34.5 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE CHROMIUM CONCENTRATIONS - HARPER CREEK BELOW T-CREEK (HT)

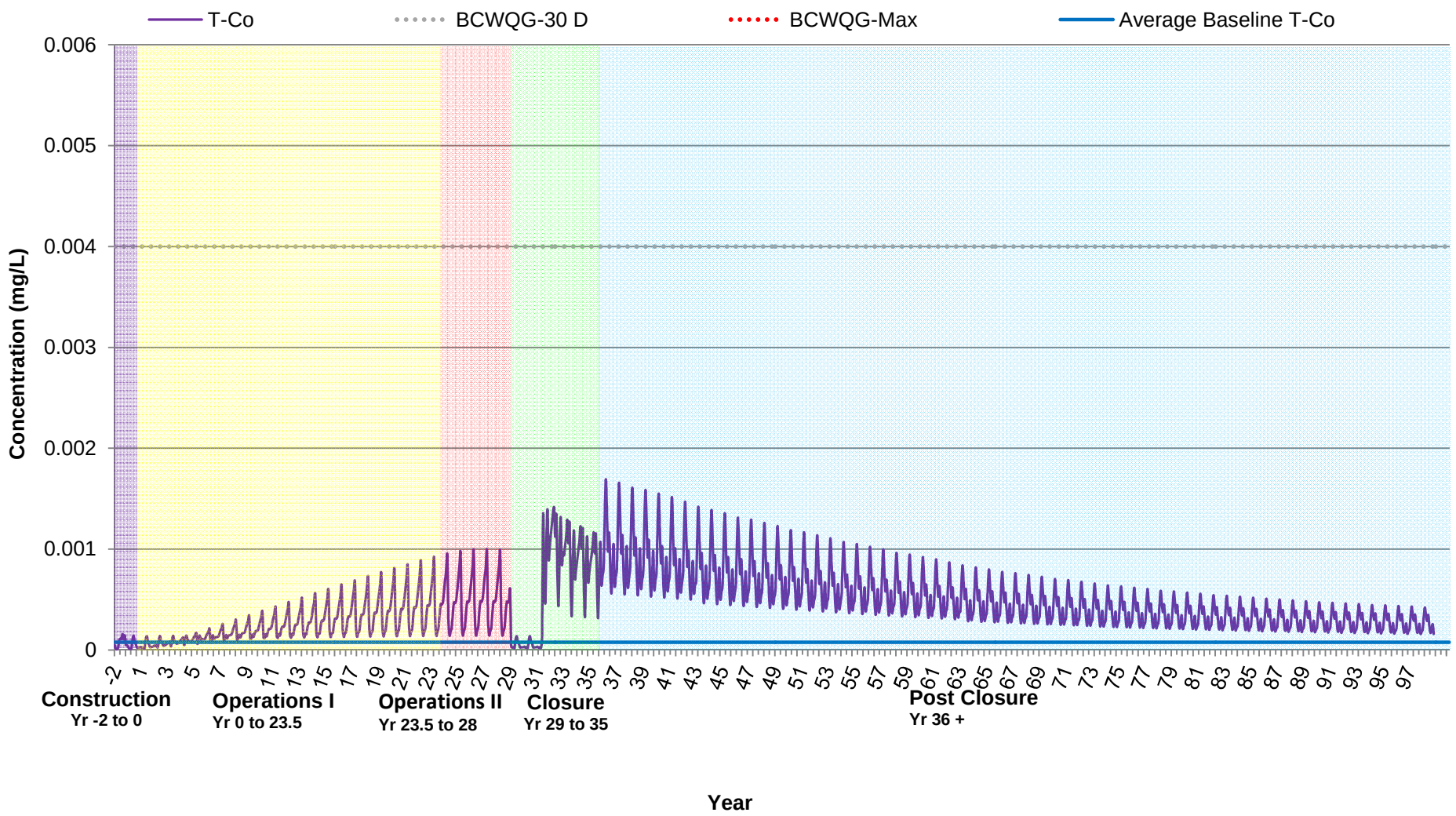
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C7.Cr

REV 0



NOTES:

1. THE BCWQG-30 D AND BCWQG-MAX ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 34.5 mg/L).
3. THE BCWQG-MAX GUIDELINE (0.11 mg/L) IS NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE COBALT CONCENTRATIONS - HARPER CREEK BELOW T-CREEK (HT)

Knight Piésold CONSULTING

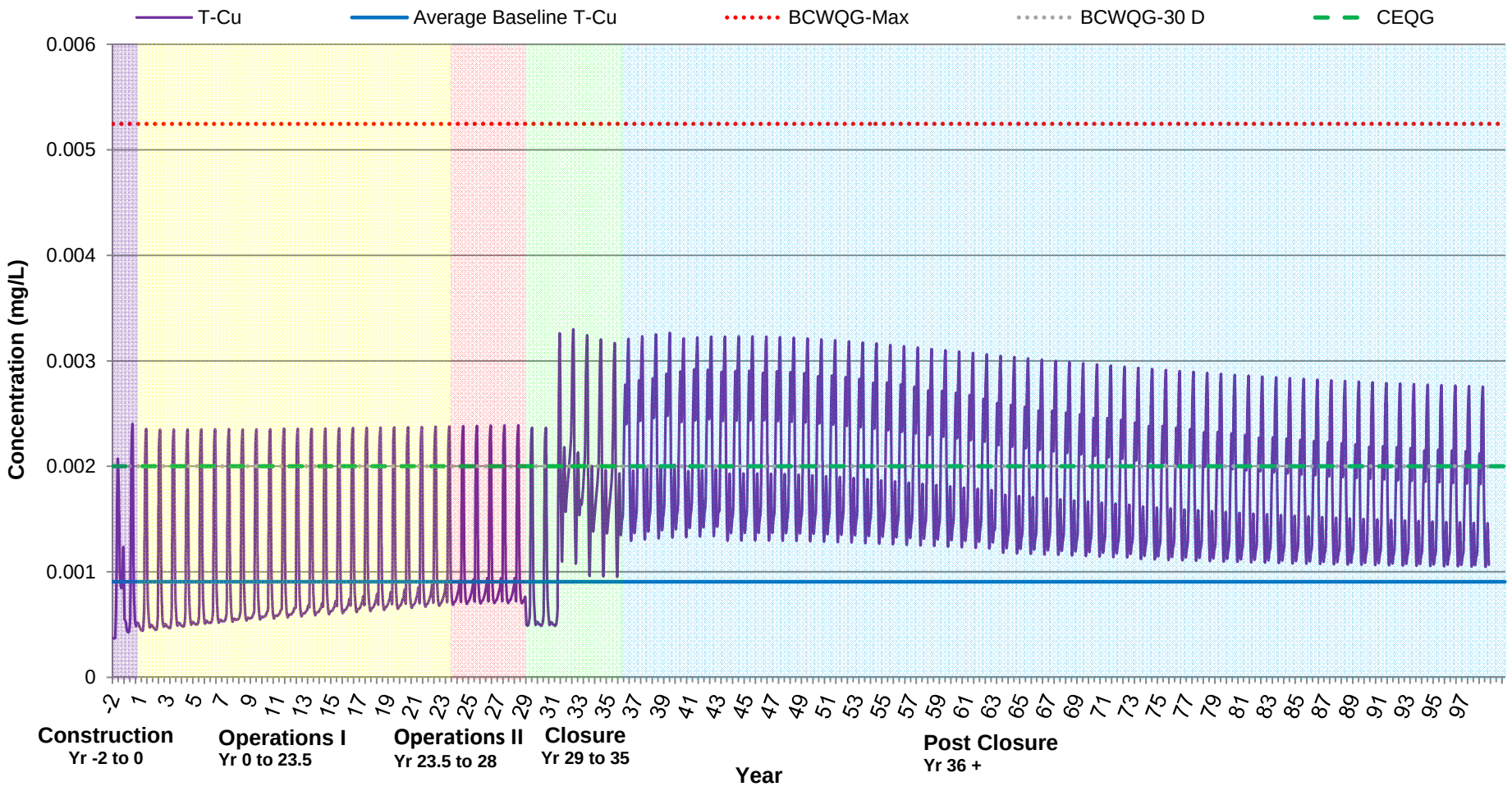
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C7.Co

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 34.5 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE COPPER CONCENTRATIONS - HARPER CREEK BELOW T-CREEK (HT)

Knight Piésold CONSULTING

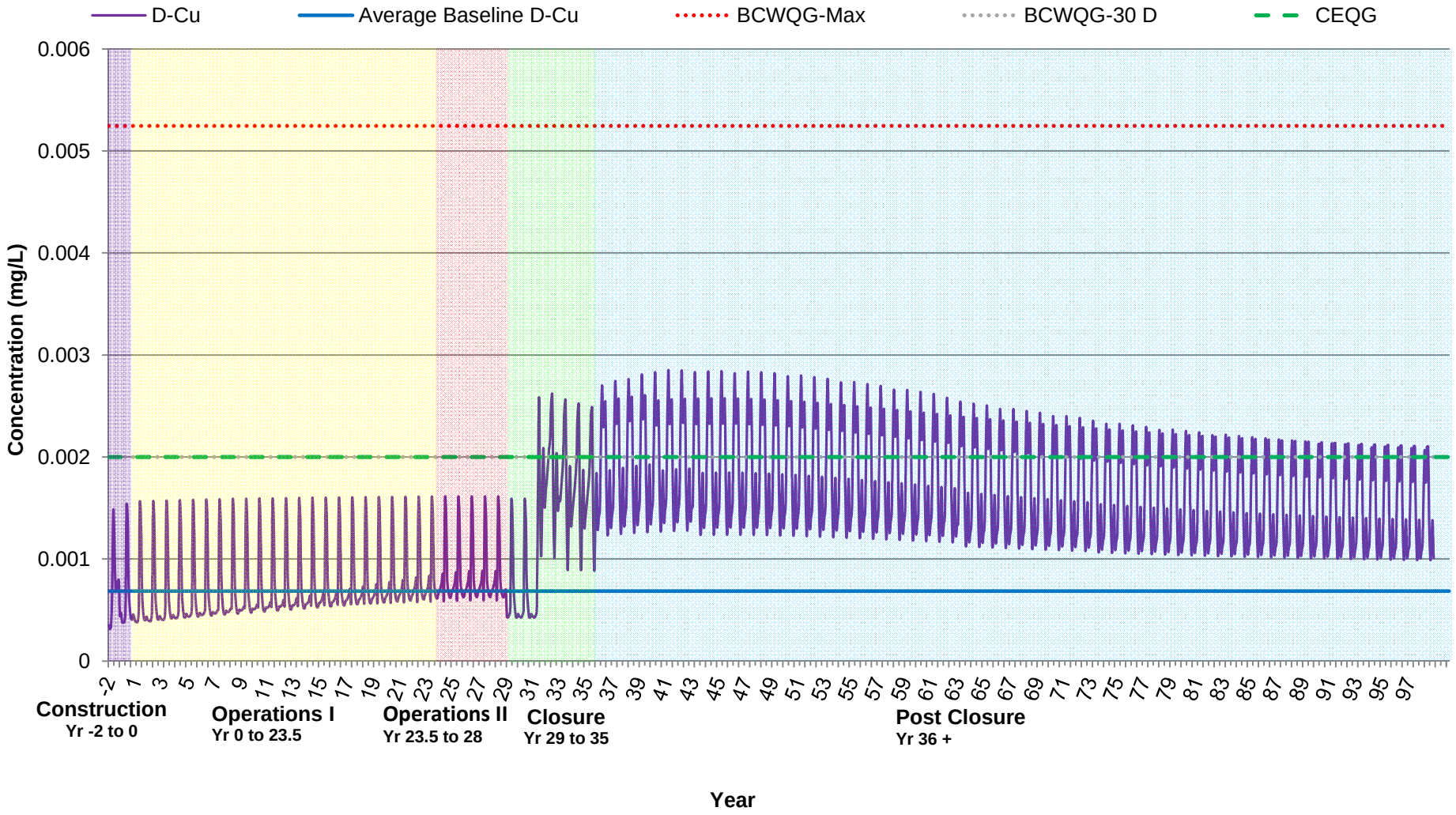
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C7.Cu-T

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 34.5 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE DISSOLVED COPPER CONCENTRATIONS - HARPER CREEK BELOW T-CREEK (HT)

Knight Piésold CONSULTING

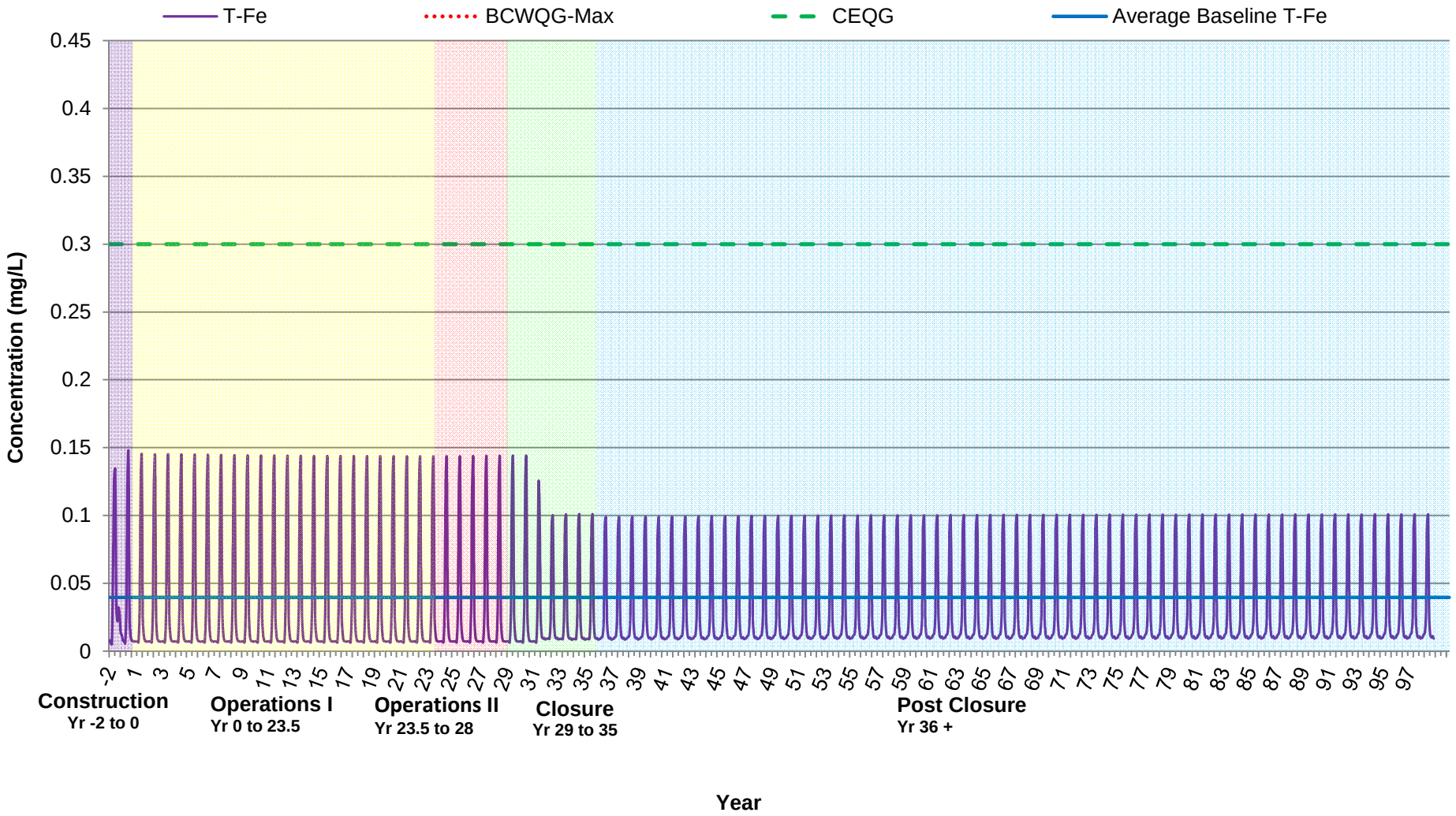
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C7.Cu-D

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 34.5 mg/L).
3. BCWQG-MAX 1.0 mg/L IS NOT SHOWN ON GRAPH.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE TOTAL IRON CONCENTRATIONS - HARPER CREEK BELOW T-CREEK (HT)

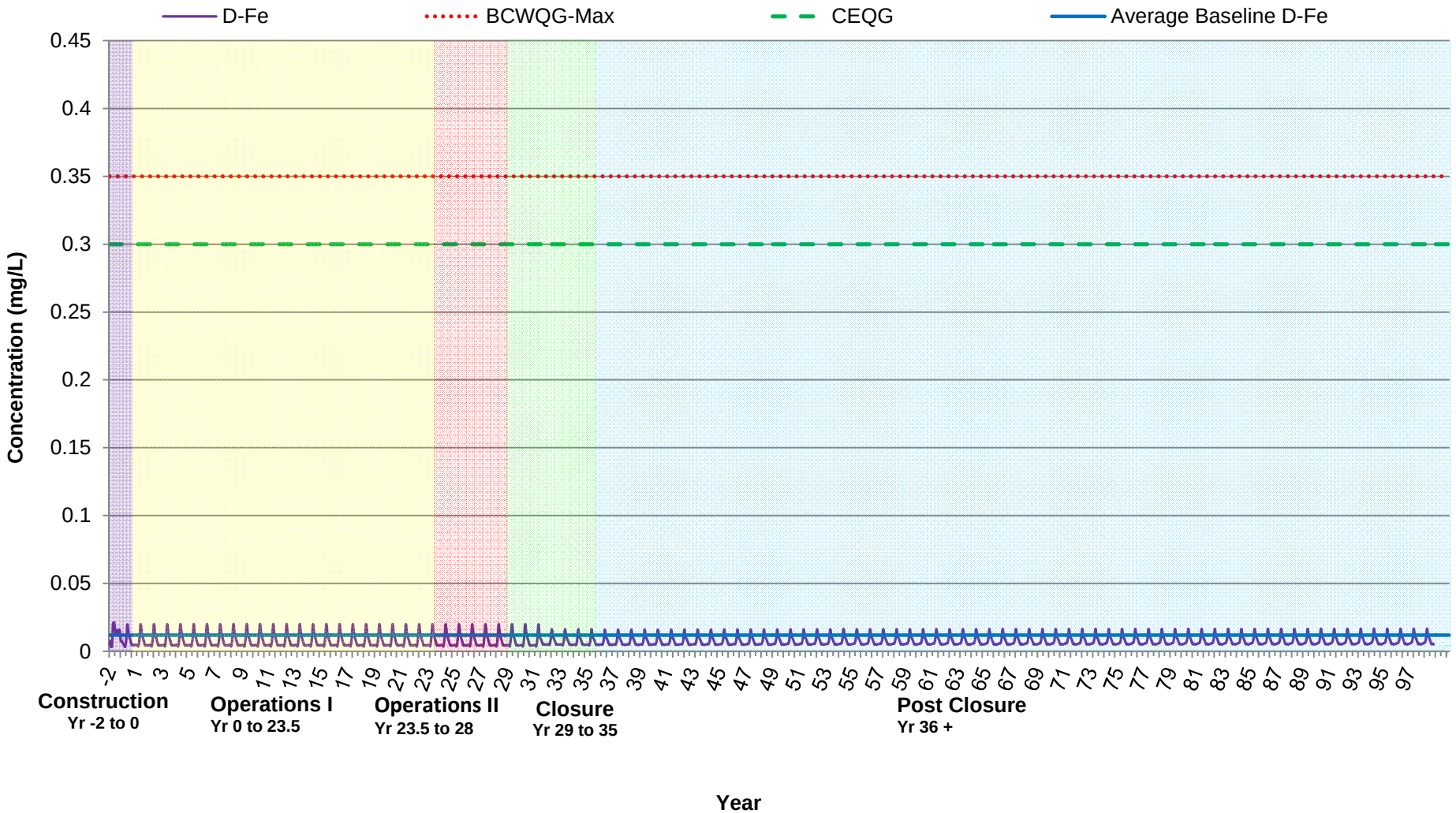
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C7.Fe-T

REV 0



NOTES:

1. THE BCWQG-MAX AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 34.5 mg/L).

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE DISSOLVED IRON CONCENTRATIONS - HARPER CREEK BELOW T-CREEK (HT)

Knight Piésold CONSULTING

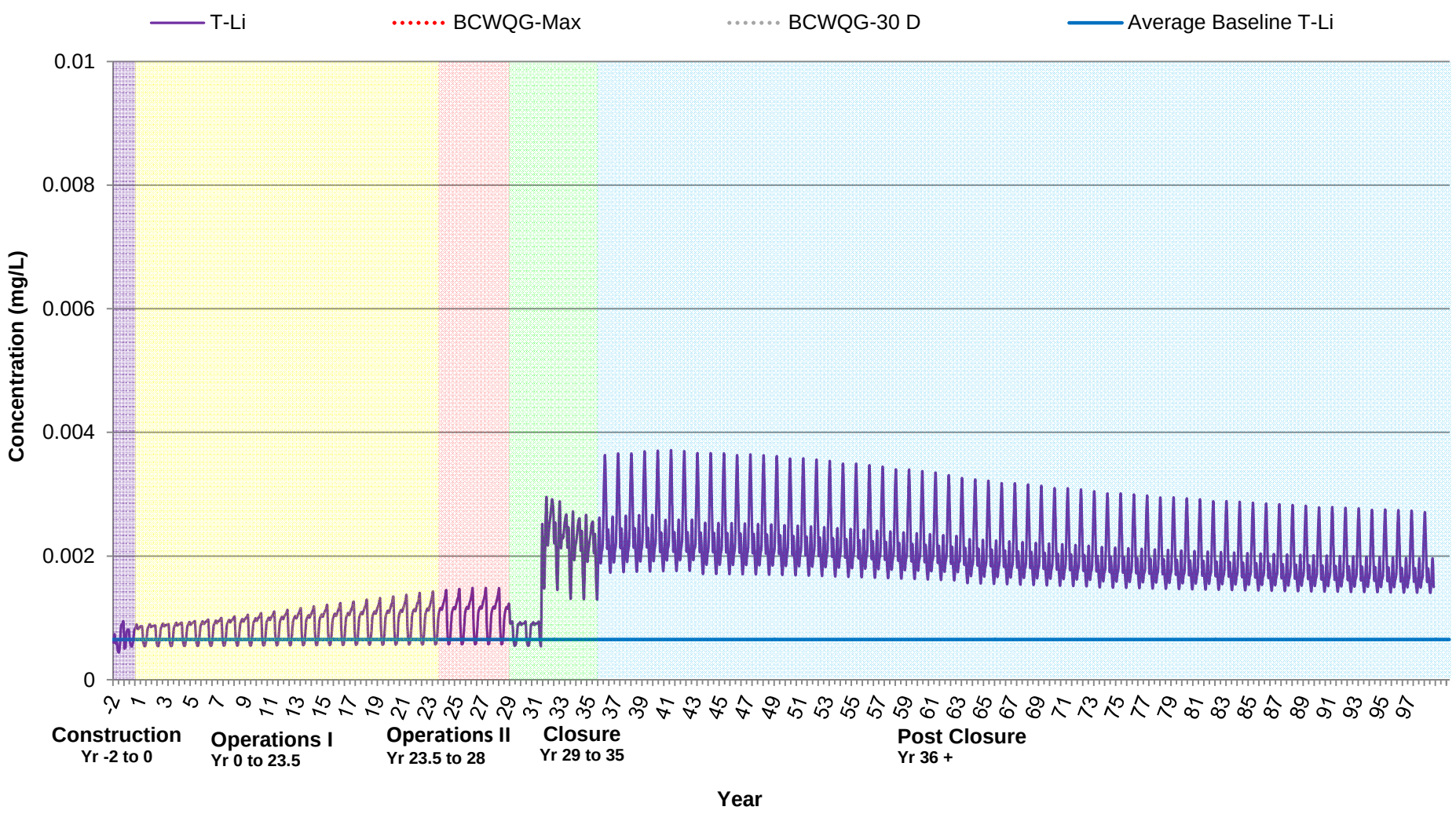
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C7.Fe-D

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 34.5 mg/L).
3. THE BCWQG-30 D (0.096 mg/L) AND BCWQG-MAX (0.87 mg/L) ARE INTERIM (WORKING) AND ARE NOT SHOWN ON GRAPH.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE LITHIUM CONCENTRATIONS - HARPER CREEK BELOW T-CREEK (HT)

Knight Piésold CONSULTING

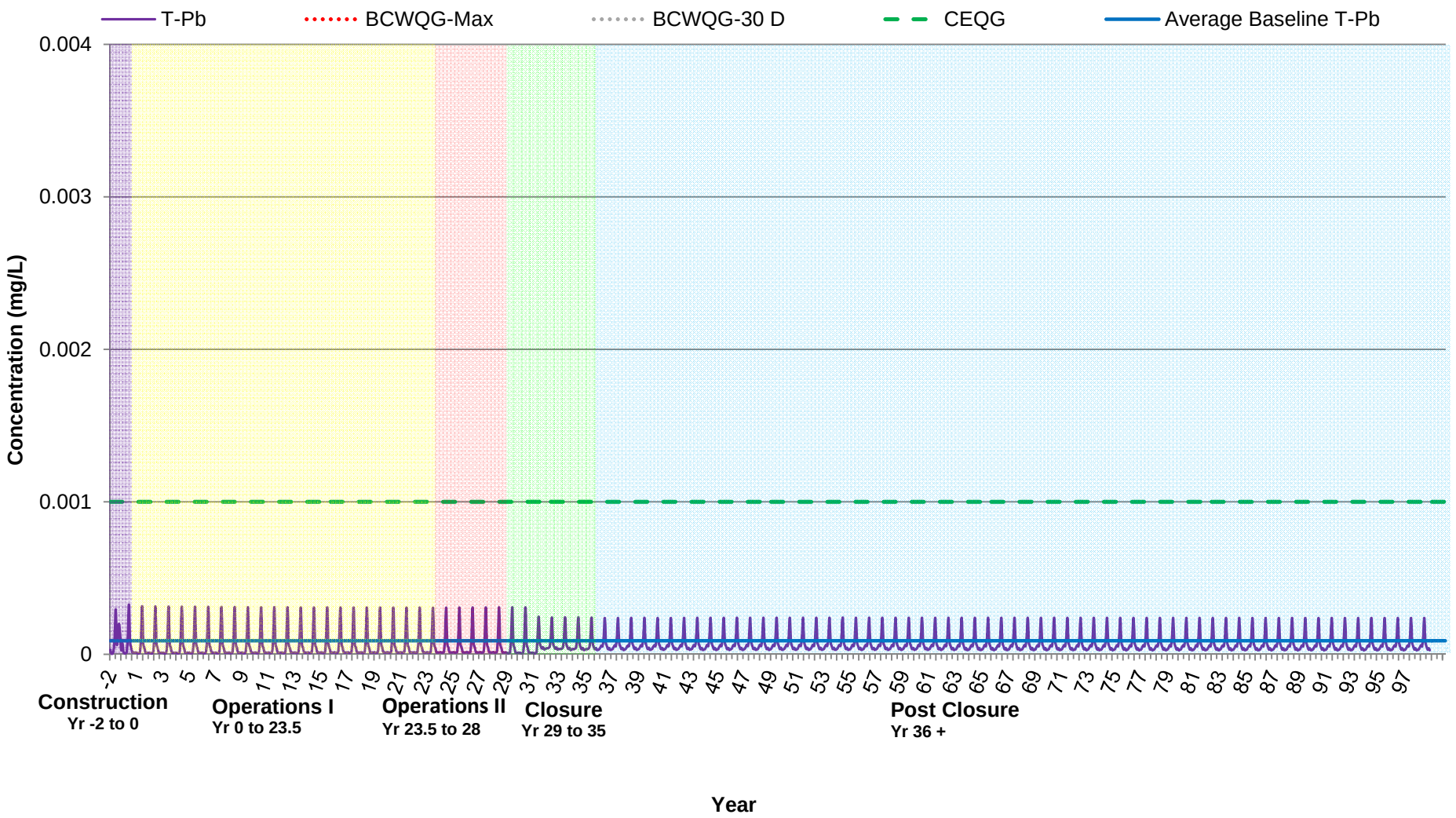
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C7.Li

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 34.5 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.
4. THE BCWQG-MAX (CALCULATED AT 0.011 mg/L) IS NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE LEAD CONCENTRATIONS - HARPER CREEK BELOW T-CREEK (HT)

Knight Piésold CONSULTING

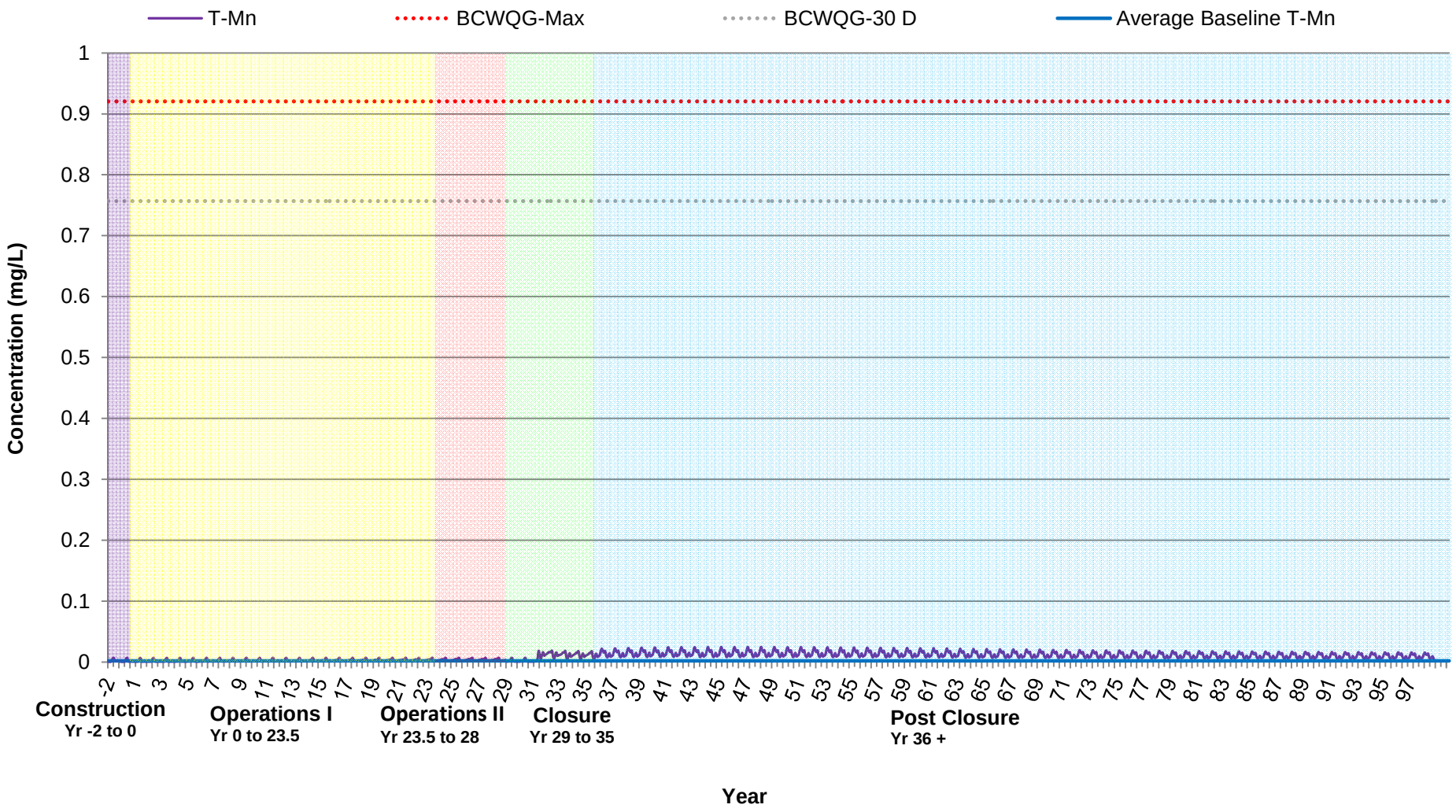
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C7.Pb

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 34.5 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE MANGANESE CONCENTRATIONS - HARPER CREEK BELOW T-CREEK (HT)

Knight Piésold CONSULTING

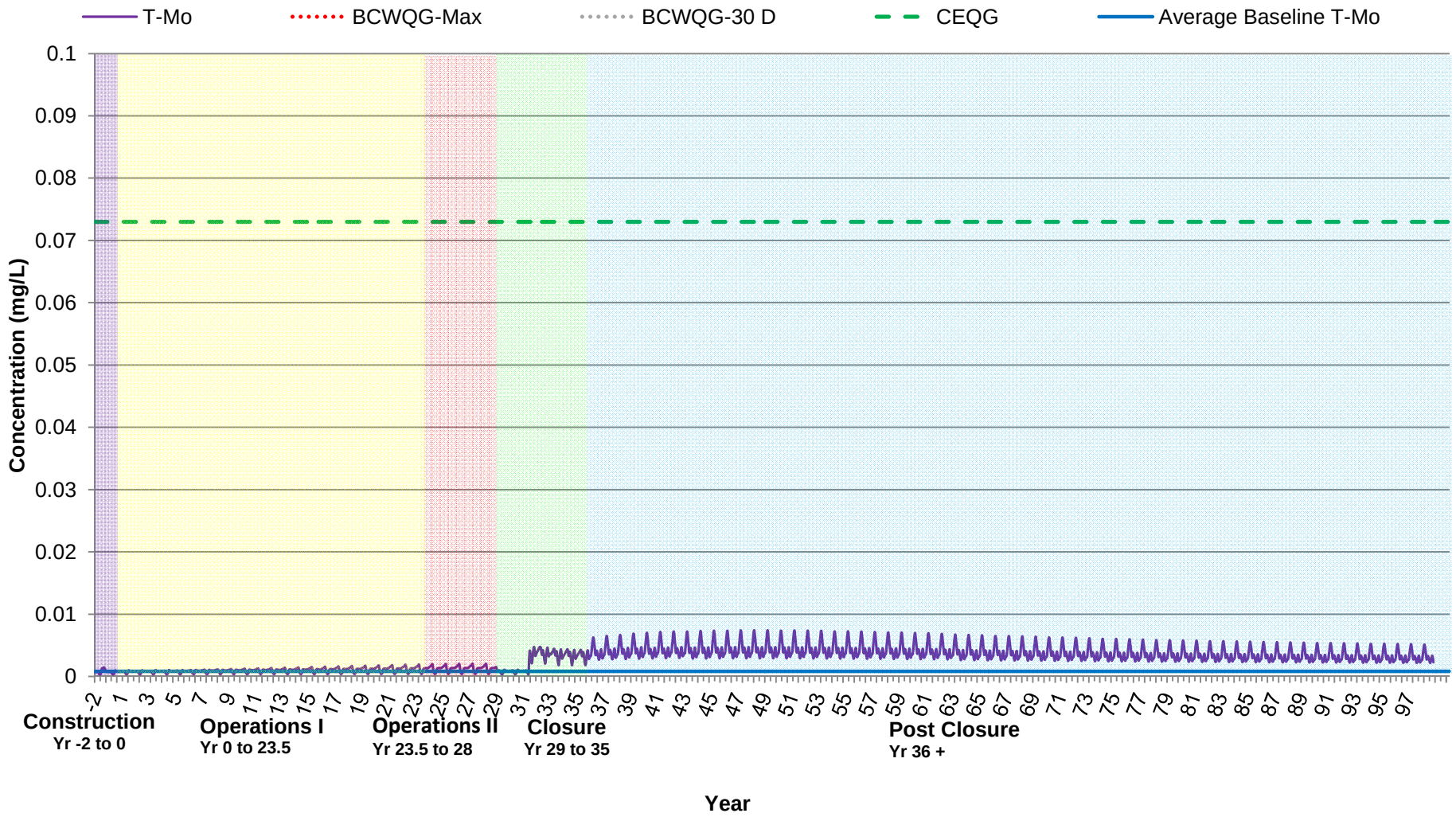
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C7.Mn

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 34.5 mg/L).
3. THE BCWQG-MAX (2 mg/L) AND BCWQG-30 D (1 mg/L) ARE NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE MOLYDBENUM CONCENTRATIONS - HARPER CREEK BELOW T-CREEK (HT)

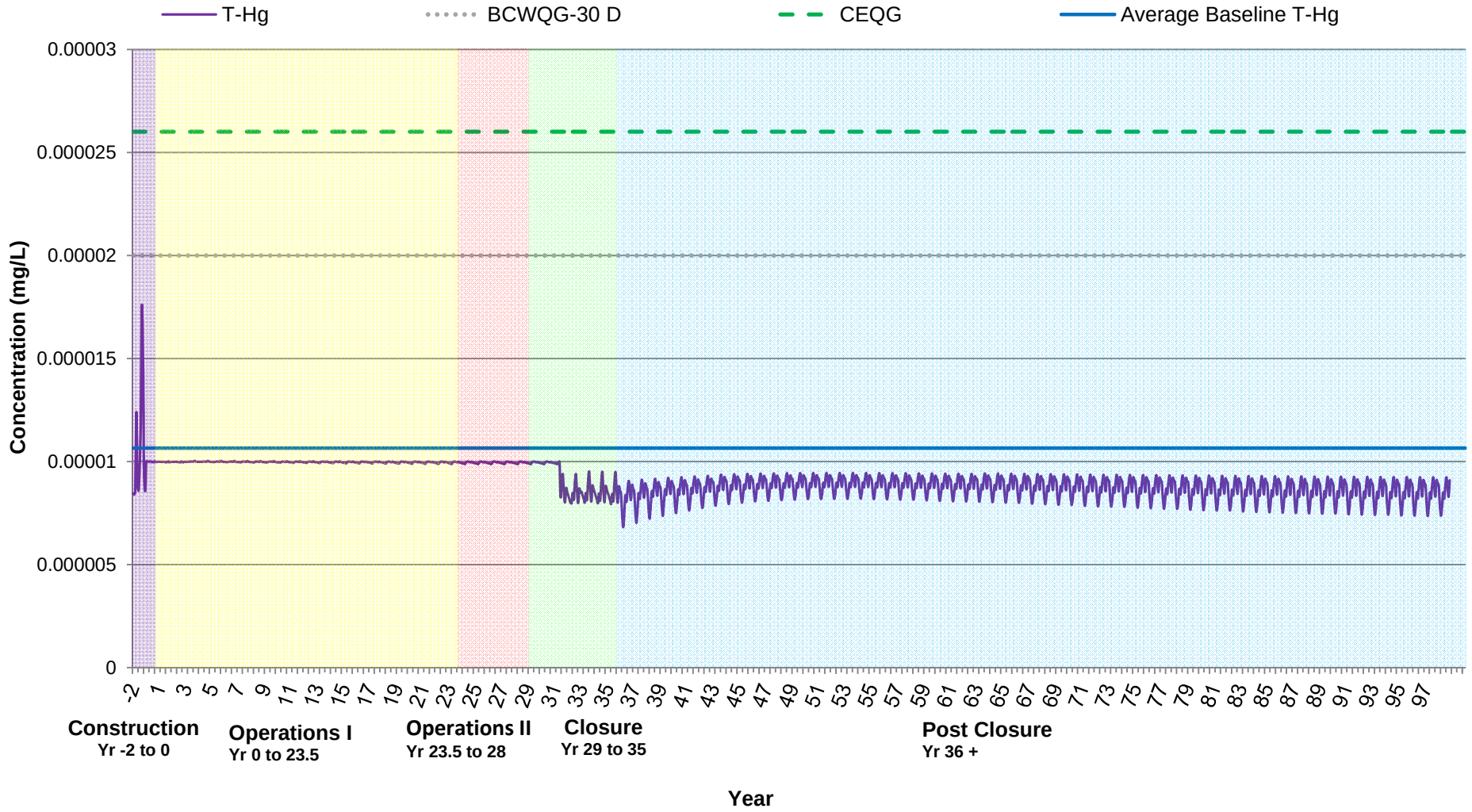
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C7.Mo

REV 0



NOTES:

1. THE BCWQG-30 D AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 34.5 mg/L).
3. BCWQG-30 D VALUE APPLIED ON ASSUMPTION THAT METHYL-Hg IS EQUAL TO 0.5% OF T-Hg.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE MERCURY CONCENTRATIONS - HARPER CREEK BELOW T-CREEK (HT)

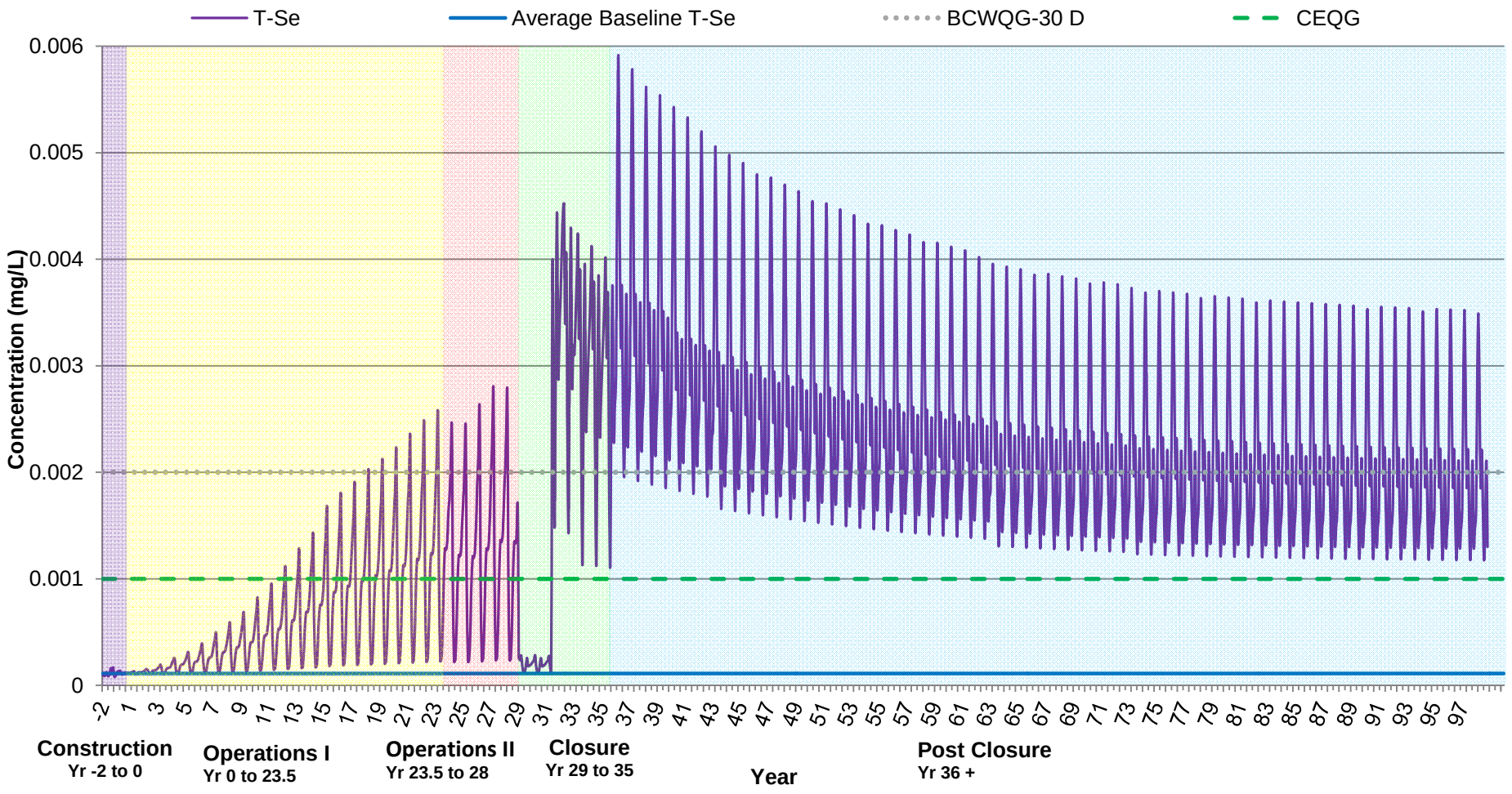
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C7.Hg

REV 0



NOTES:

1. THE BCWQG-30 D AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 34.5 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE SELENIUM CONCENTRATIONS - HARPER CREEK BELOW T-CREEK (HT)

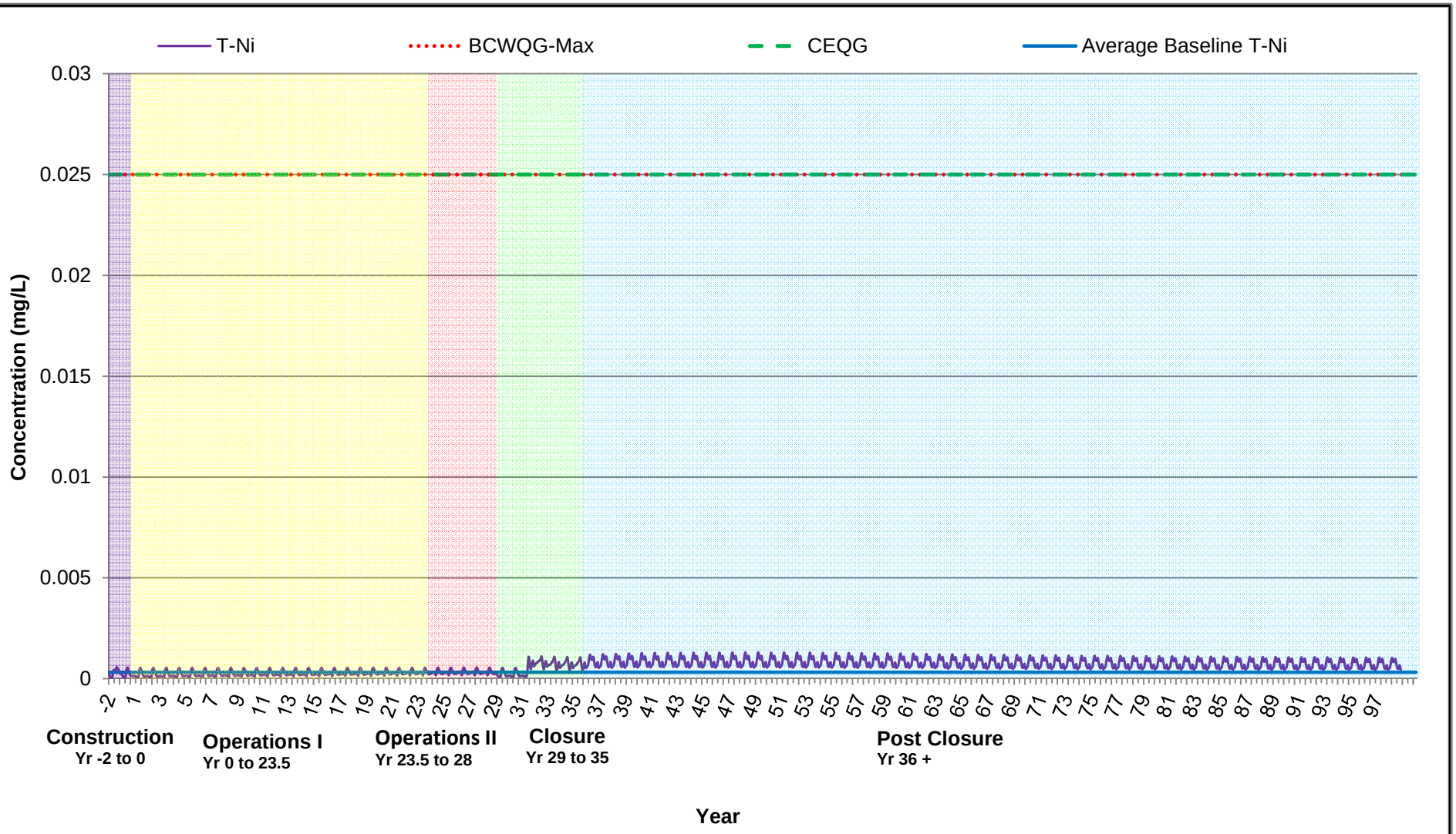
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C7.Se

REV 0



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 34.5 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE NICKEL CONCENTRATIONS - HARPER CREEK BELOW T-CREEK (HT)

Knight Piésold CONSULTING

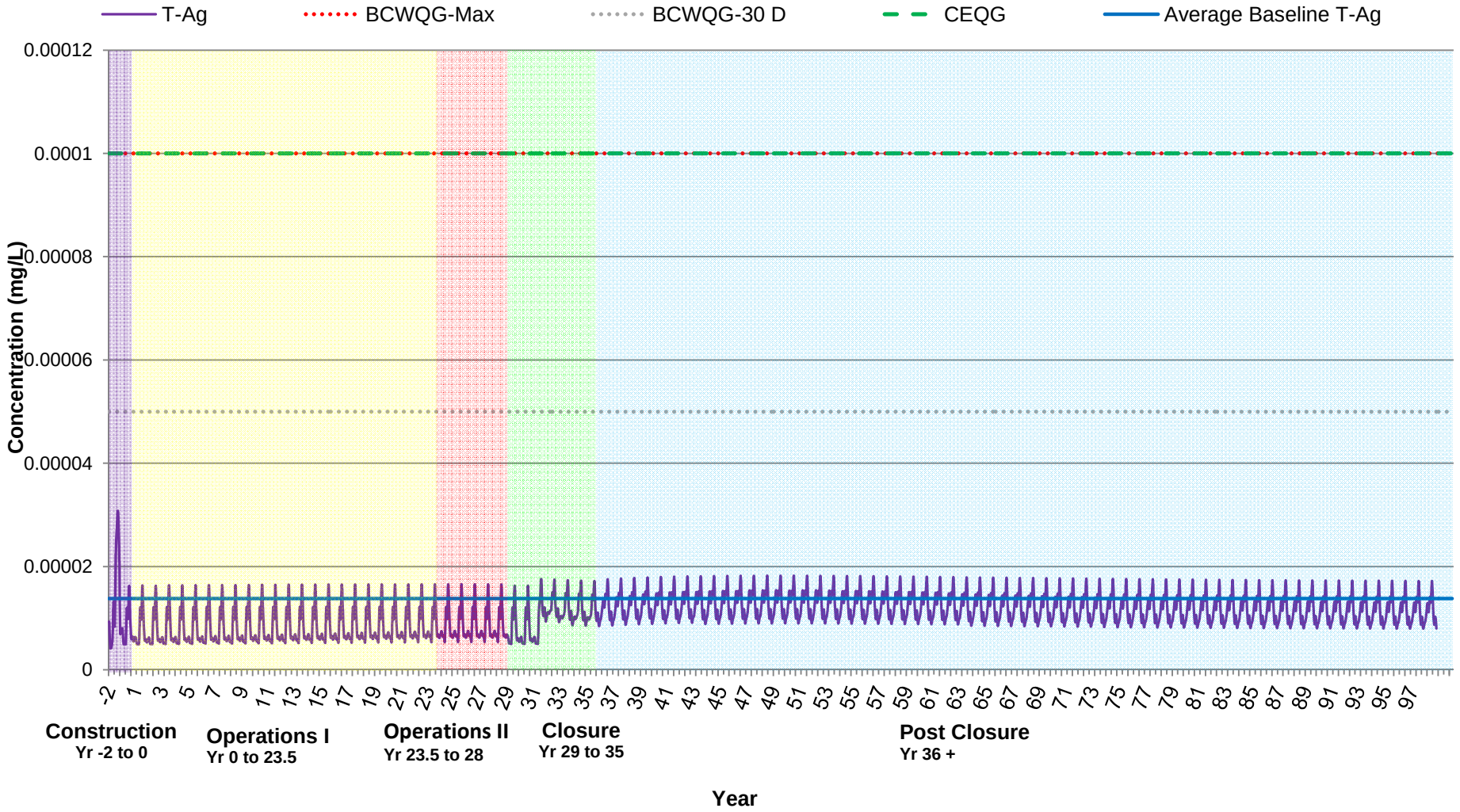
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C7.Ni

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-30 D AND BCWQG-MAX ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 34.5 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE SILVER CONCENTRATIONS - HARPER CREEK BELOW T-CREEK (HT)

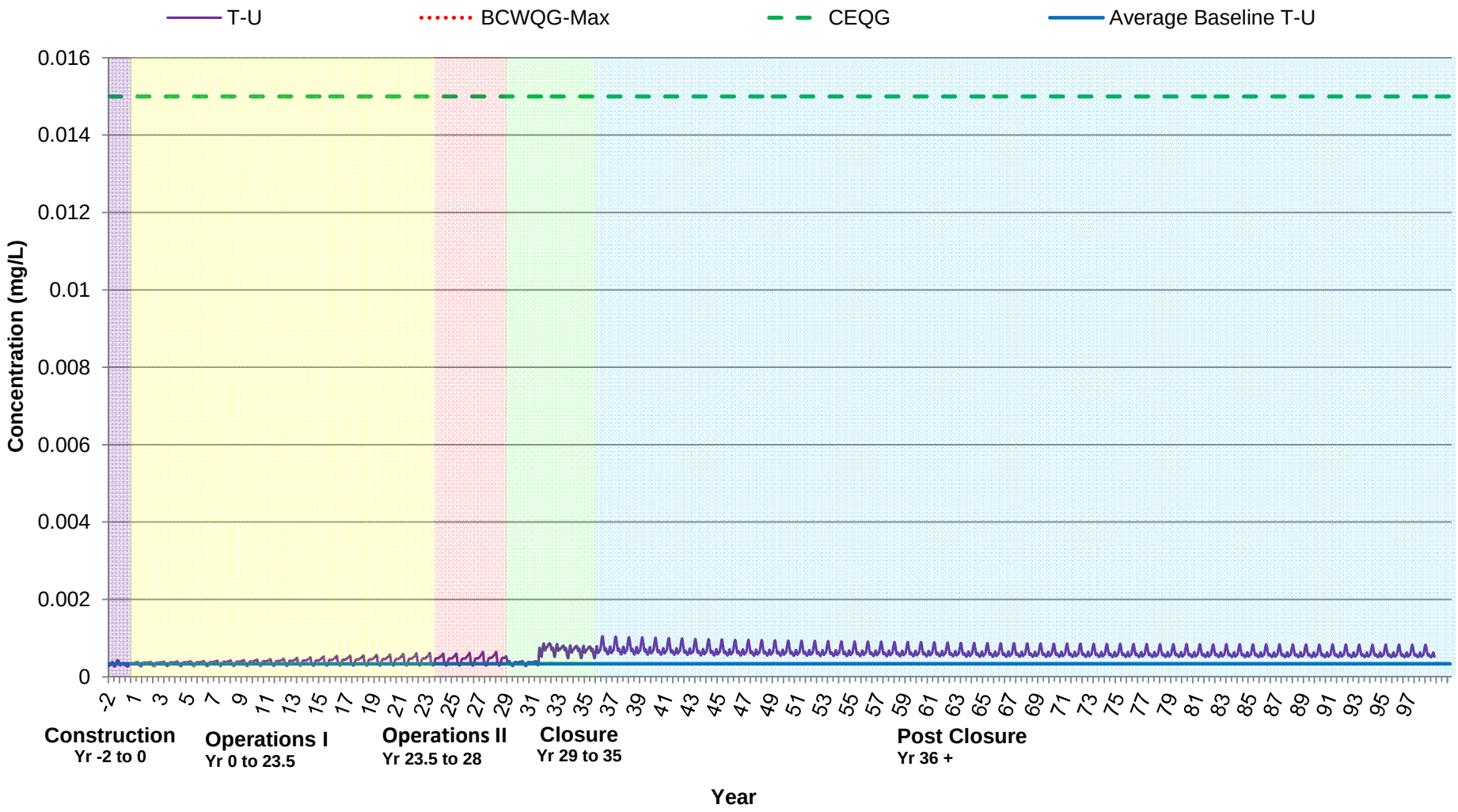
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C7.Ag

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 34.5 mg/L).
3. THE BCWQG-MAX (0.3 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE URANIUM CONCENTRATIONS - HARPER CREEK BELOW T-CREEK (HT)

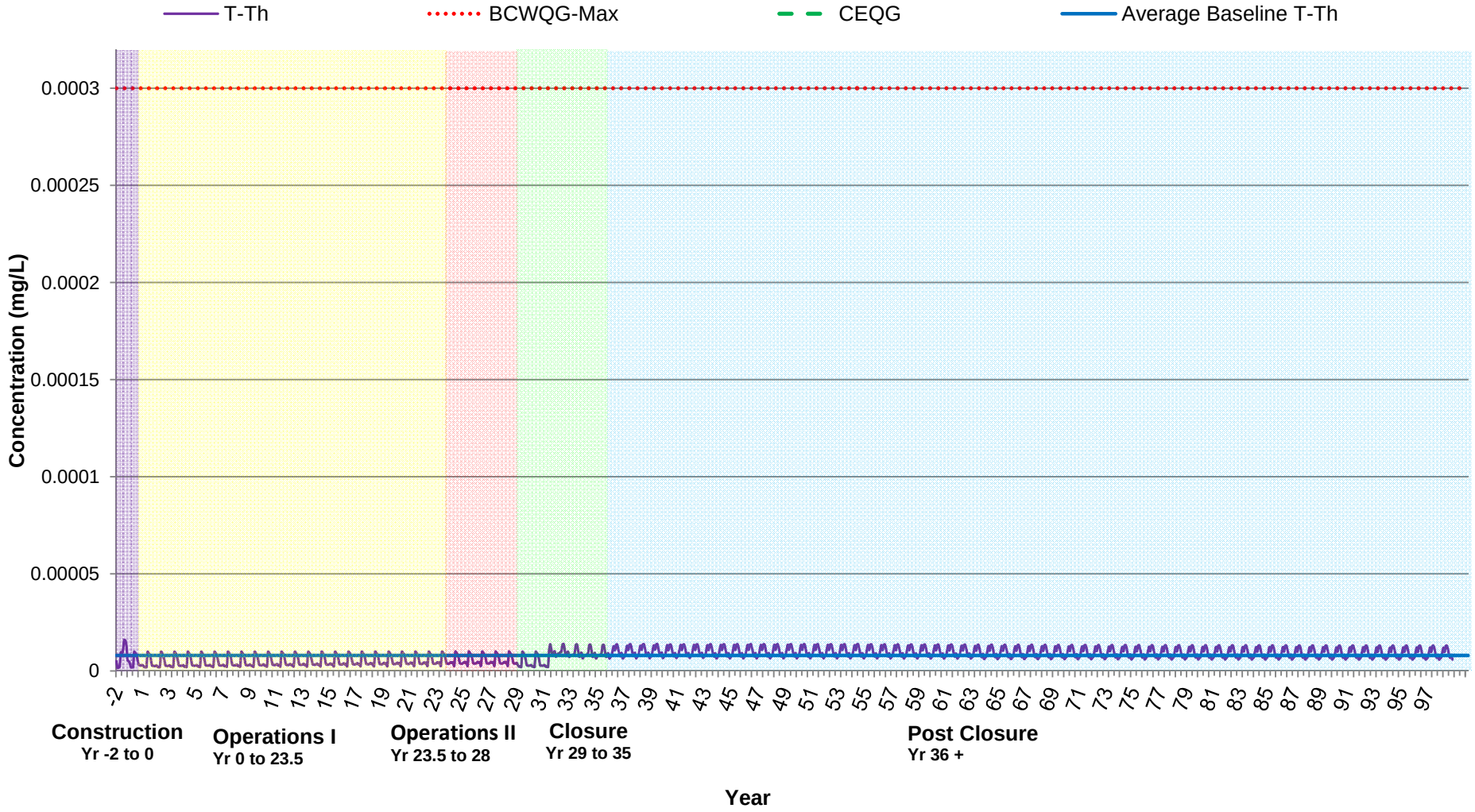
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C7.U

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 34.5 mg/L).
3. THE CEQG (0.0008 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE THALLIUM CONCENTRATIONS - HARPER CREEK BELOW T-CREEK (HT)

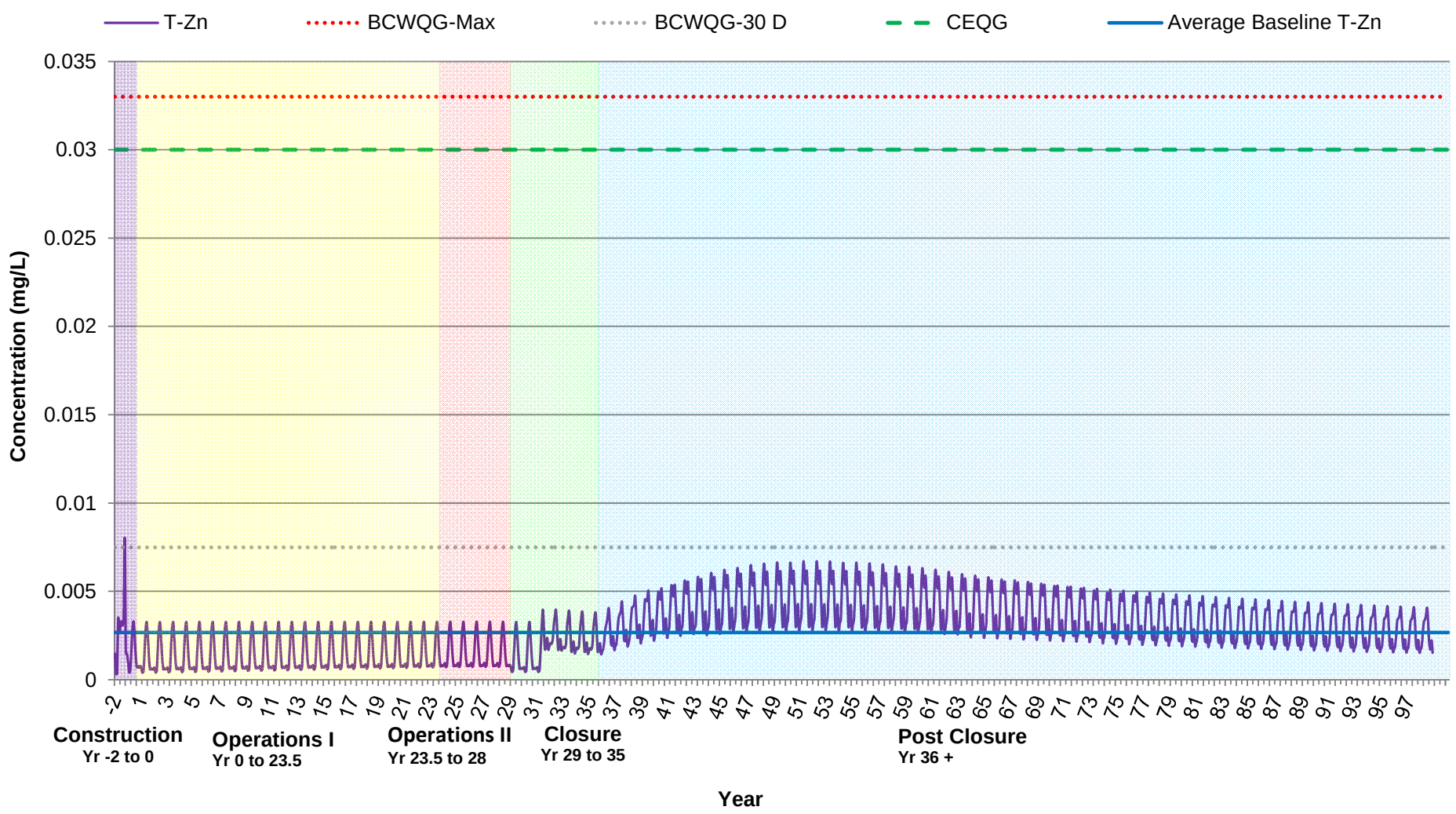
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C7.Th

REV 0



NOTES:

1. BCWQG-30 D AND BCWQG-MAX ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 34.5 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE ZINC CONCENTRATIONS - HARPER CREEK BELOW T-CREEK (HT)

Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

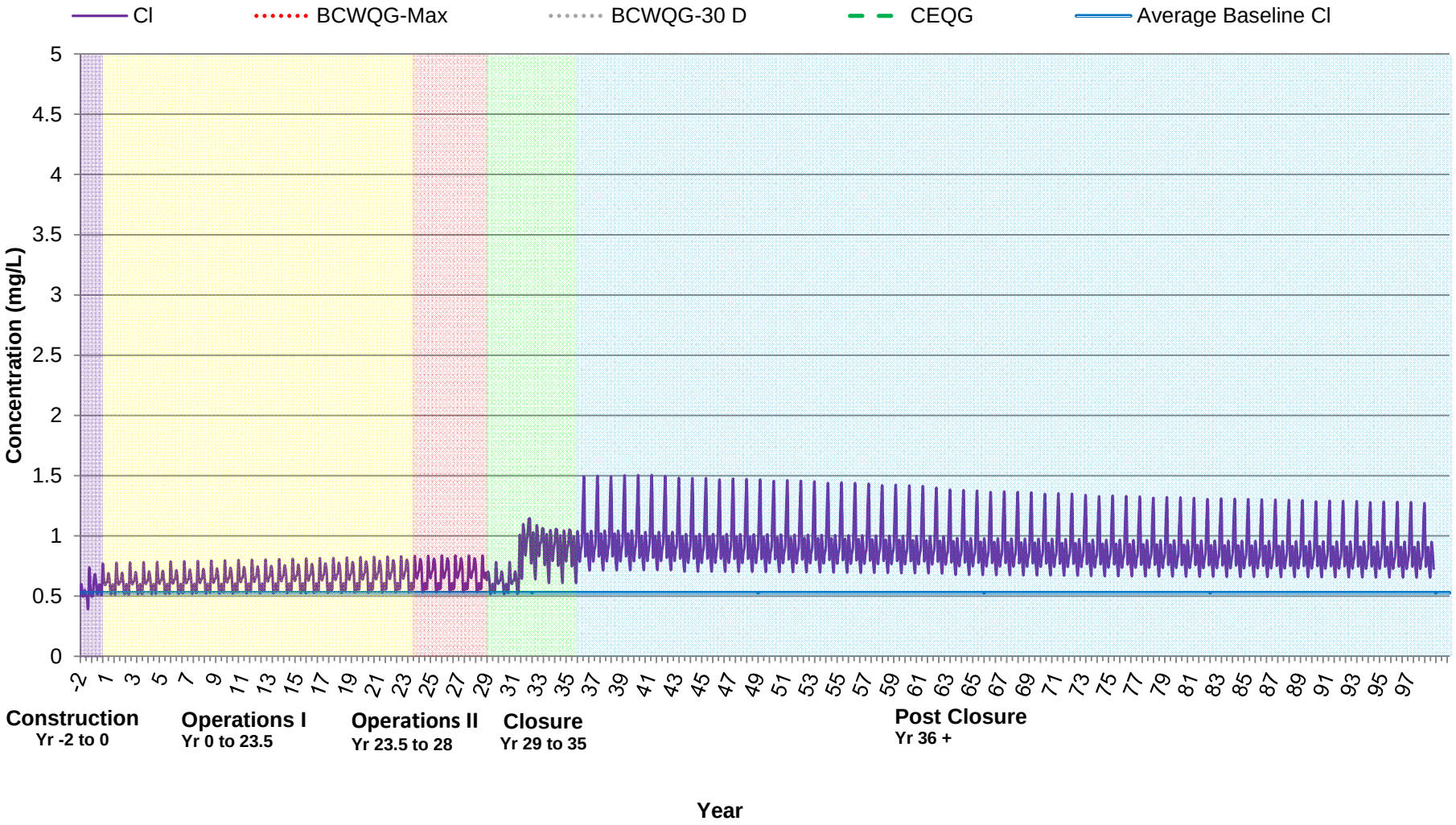
FIGURE C7.Zn

REV 0

APPENDIX C8

HARPER CREEK ABOVE BARRIÈRE RIVER (HB)

(Pages C8-1 to C8-30)



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).
3. ALL GUIDELINES ARE NOT SHOWN: BCWQG-30 D (150 mg/L); BCWQG-MAX (600 mg/L); CEQG (120 mg/L AND 640 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE CHLORIDE CONCENTRATIONS - HARPER CREEK ABOVE BARRIÉRE RIVER (HB)

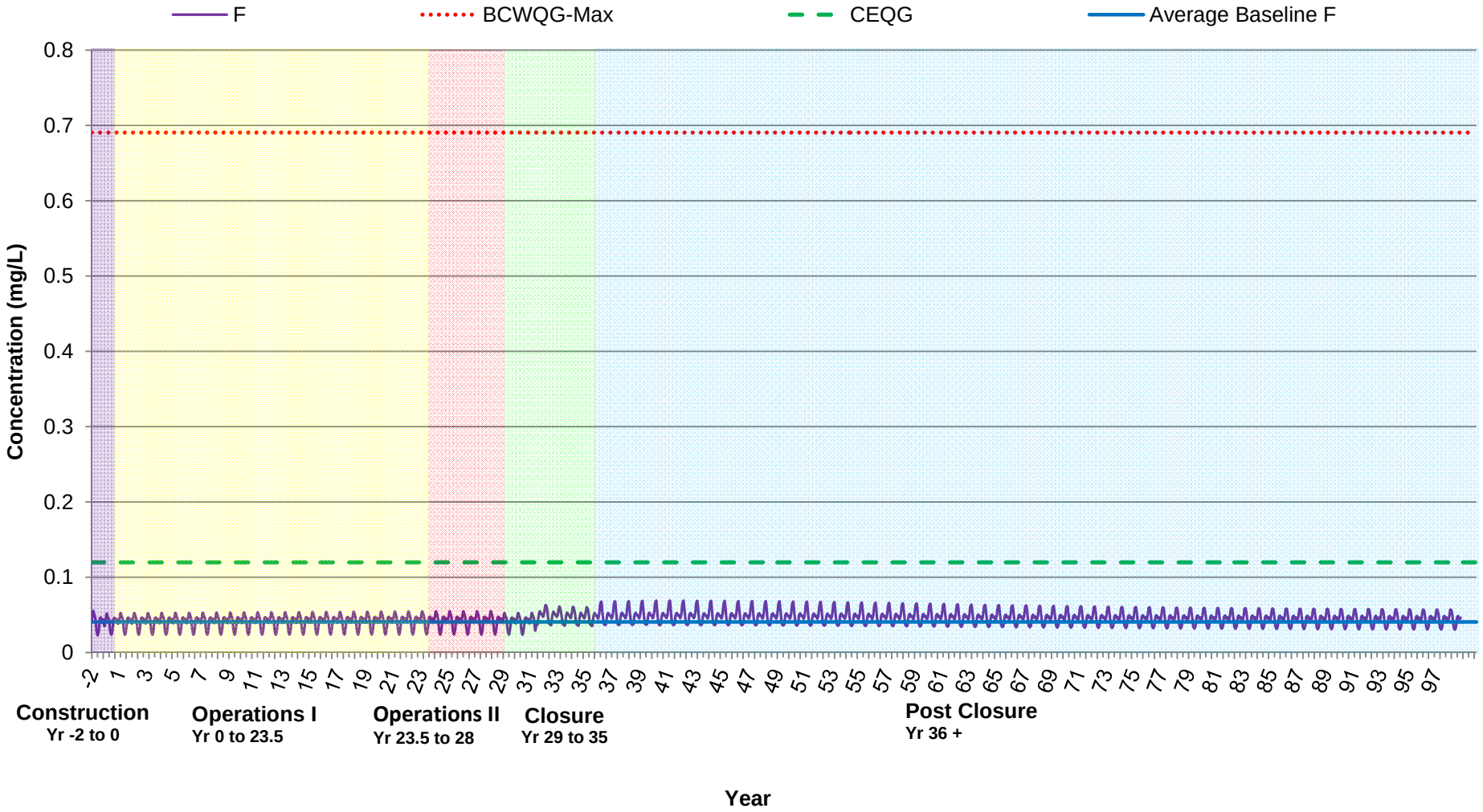
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C8.Cl

REV 0



NOTES:

1. THE BCWQG-MAX IS HARNDESS DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE FLUORIDE CONCENTRATIONS - HARPER CREEK ABOVE BARRIÉRE RIVER (HB)

Knight Piésold CONSULTING

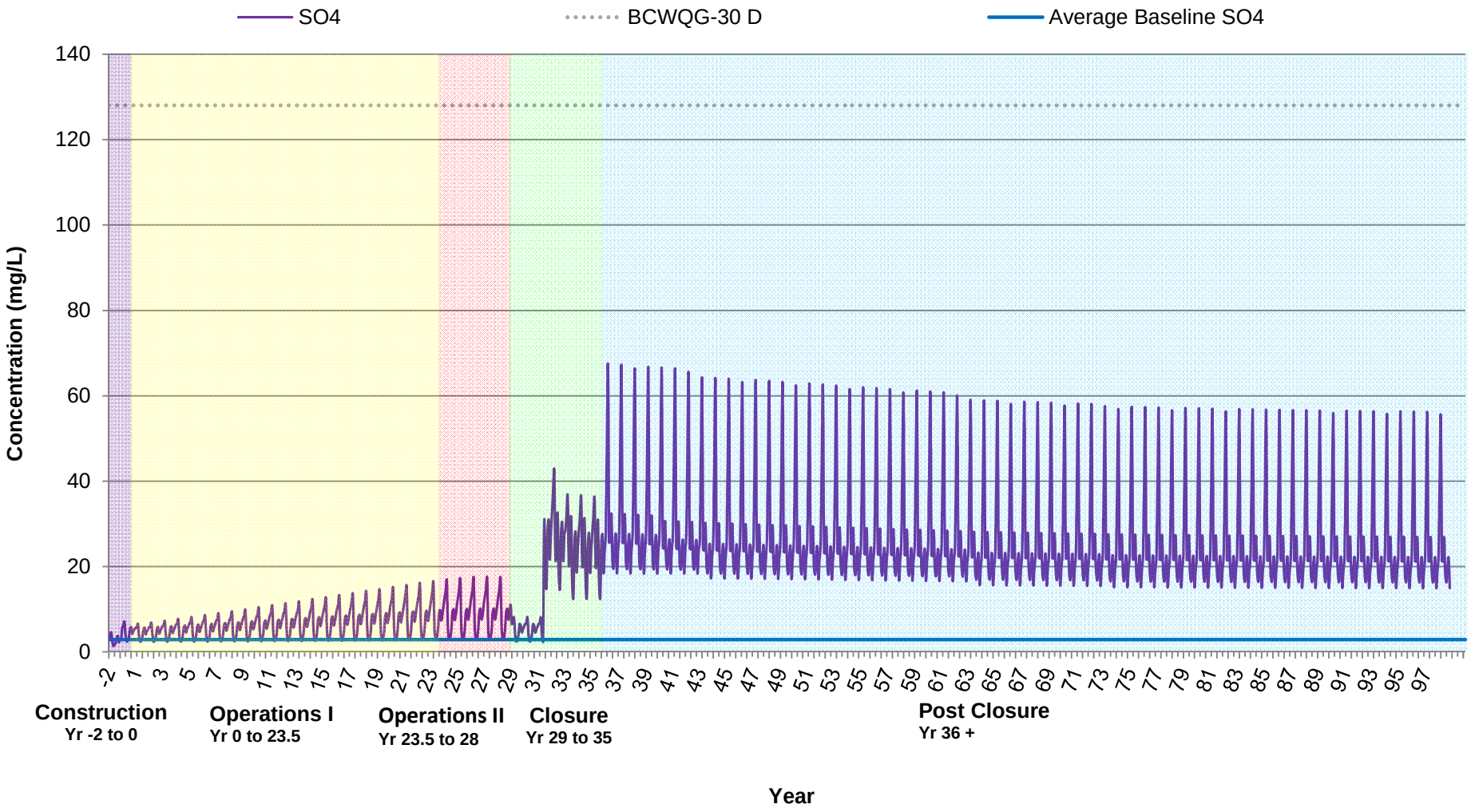
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C8.F

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. BCWQG-30 D IS HARDNESS DEPEDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE SULPHATE CONCENTRATIONS - HARPER CREEK ABOVE BARRIÉRE RIVER (HB)

Knight Piésold CONSULTING

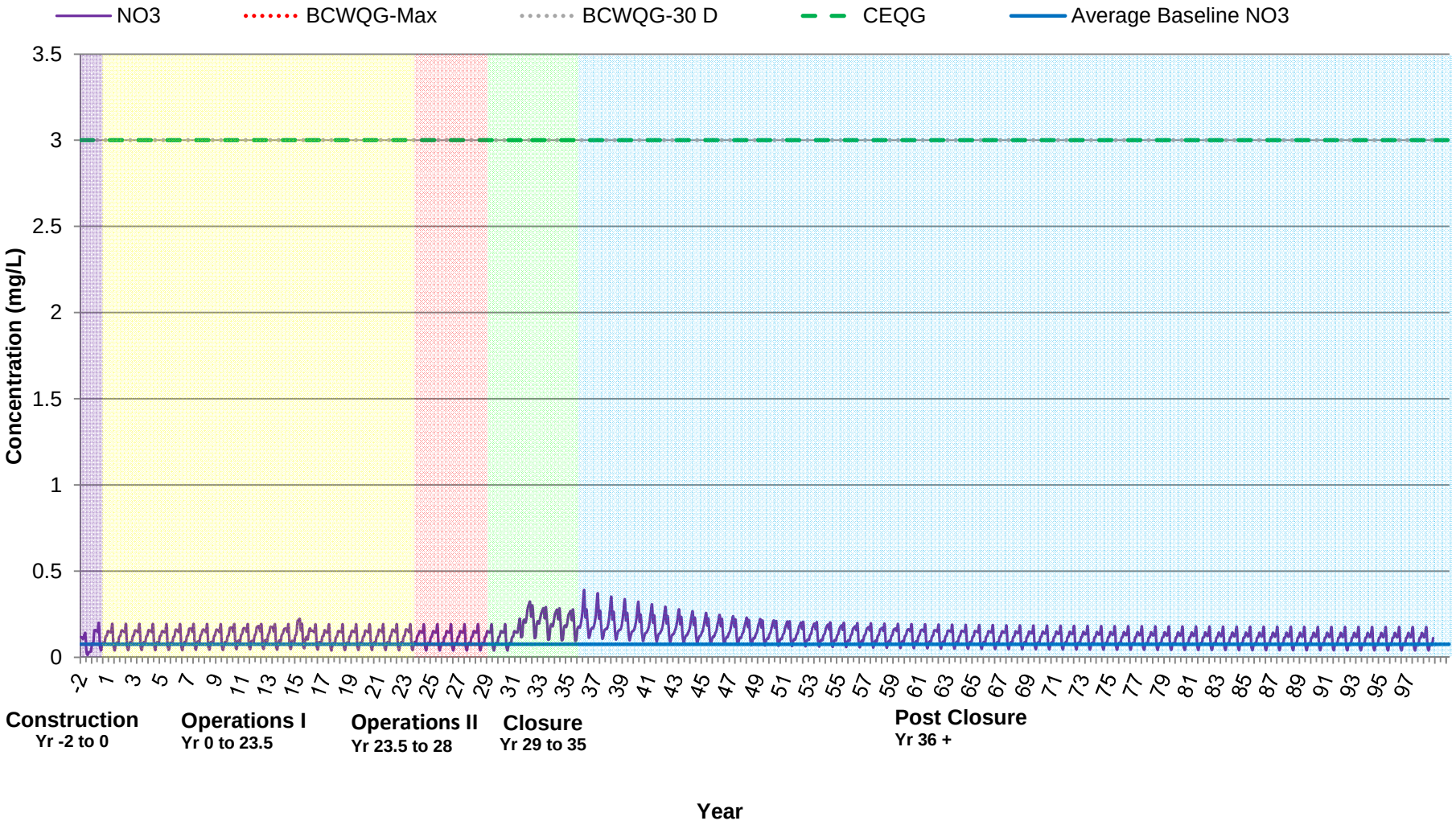
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C8.S04

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).
3. THE BCWQG-MAX (32.8 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE NITRATE CONCENTRATIONS - HARPER CREEK ABOVE BARRIÉRE RIVER (HB)

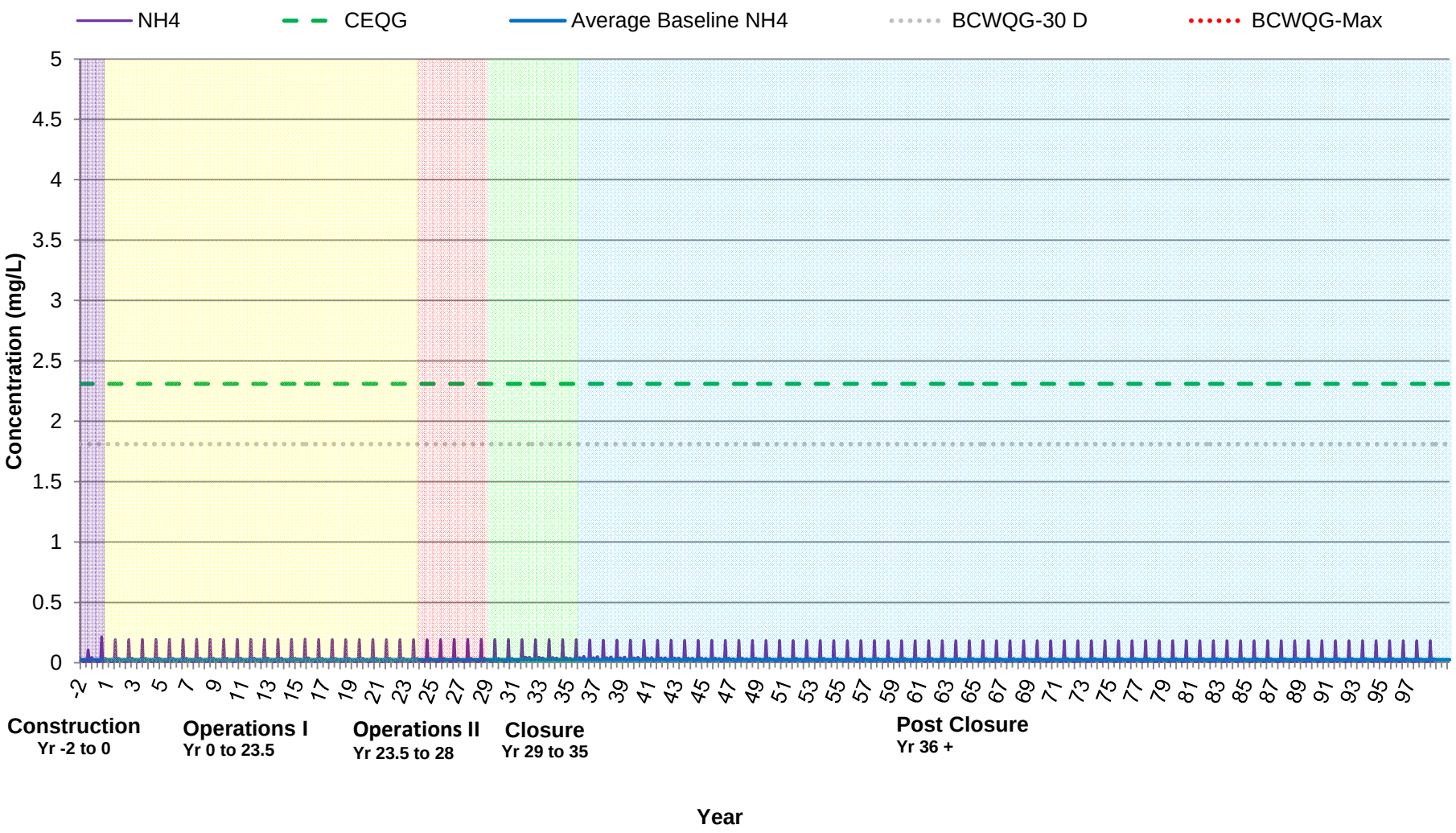
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C8.NO3

REV 0



NOTES:

1. THE BCWQG-30 D IS VALID FOR ONLY 6.5≤pH<9 AND 0°C≤T≤20°C.
2. THE BCWQG-MAX (20.15 mg/L) VALID FOR 6.5≤pH<9 IS NOT SHOWN.
3. THE CEQG IS TO BE USED WITH CAUTION FOR WATER WITH T<5°C AND pH>9.
4. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE AMMONIA CONCENTRATIONS - HARPER CREEK ABOVE BARRIÉRE RIVER (HB)

Knight Piésold CONSULTING

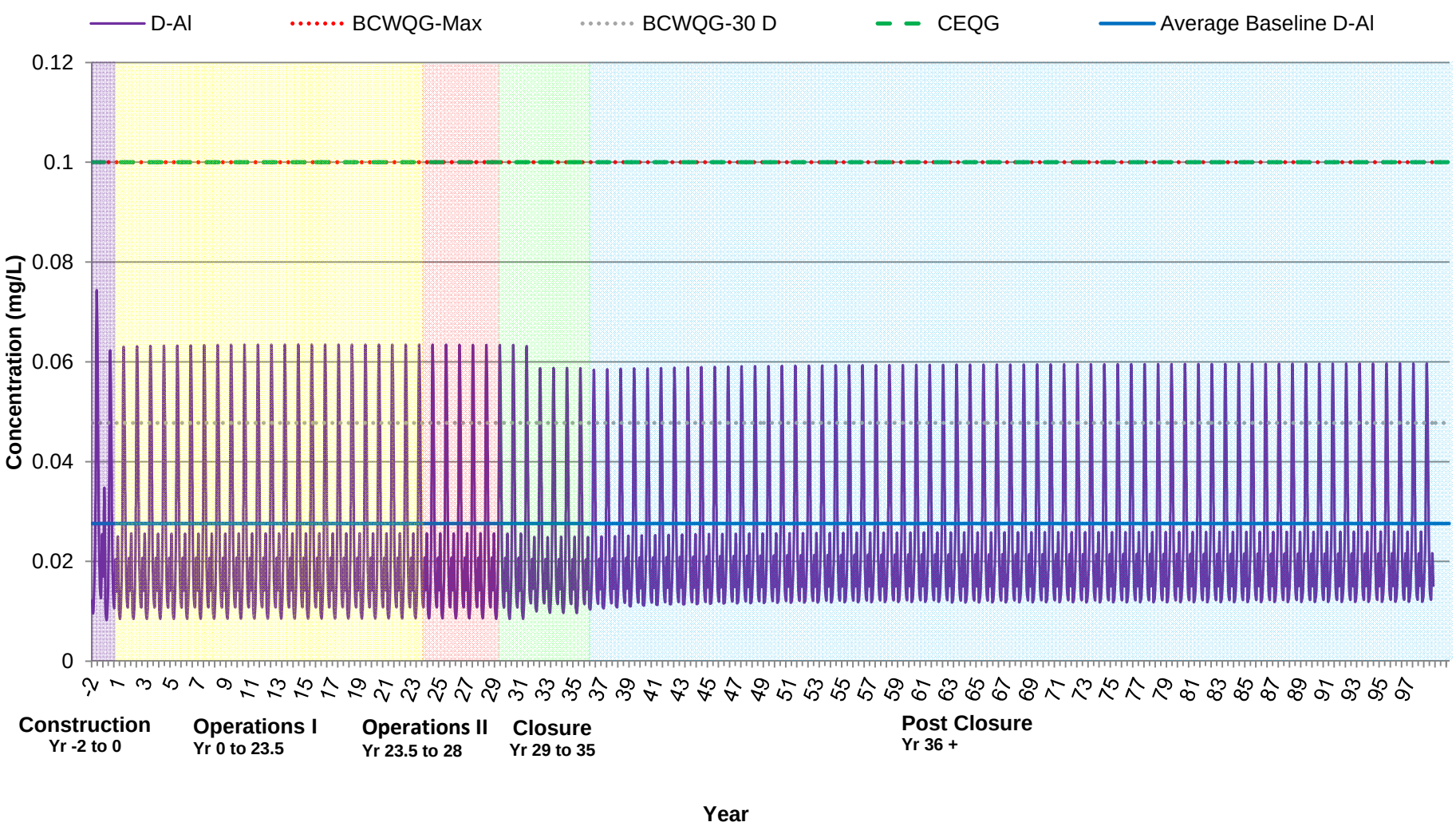
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C8.NH4

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE pH-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).
3. AVERAGE BASELINE pH USED TO CALCULATE GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE DISSOLVED ALUMINUM CONCENTRATIONS - HARPER CREEK ABOVE BARRIÉRE RIVER (HB)

Knight Piésold CONSULTING

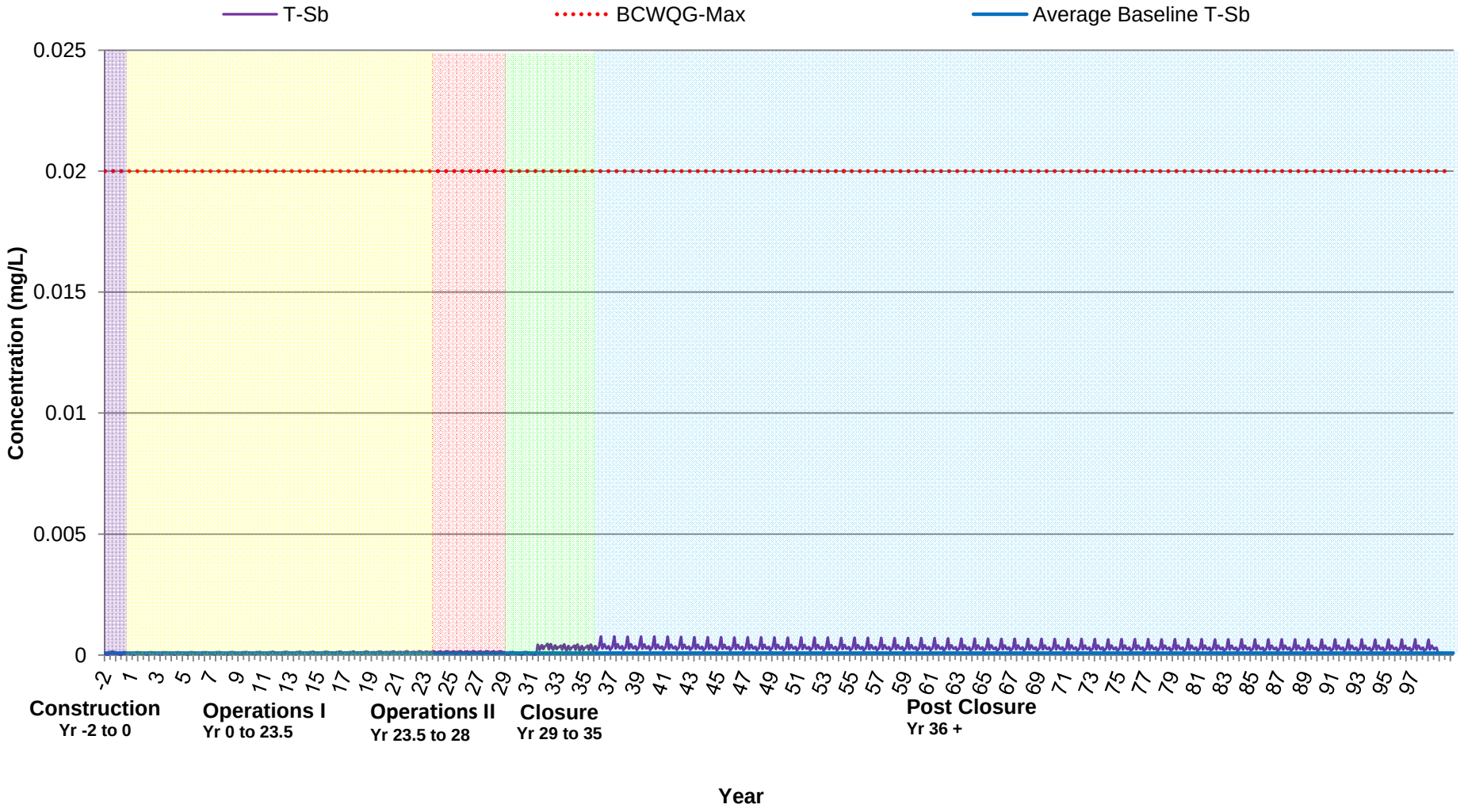
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C8.Al

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE ANTIMONY CONCENTRATIONS - HARPER CREEK ABOVE BARRIÉRE RIVER (HB)

Knight Piésold CONSULTING

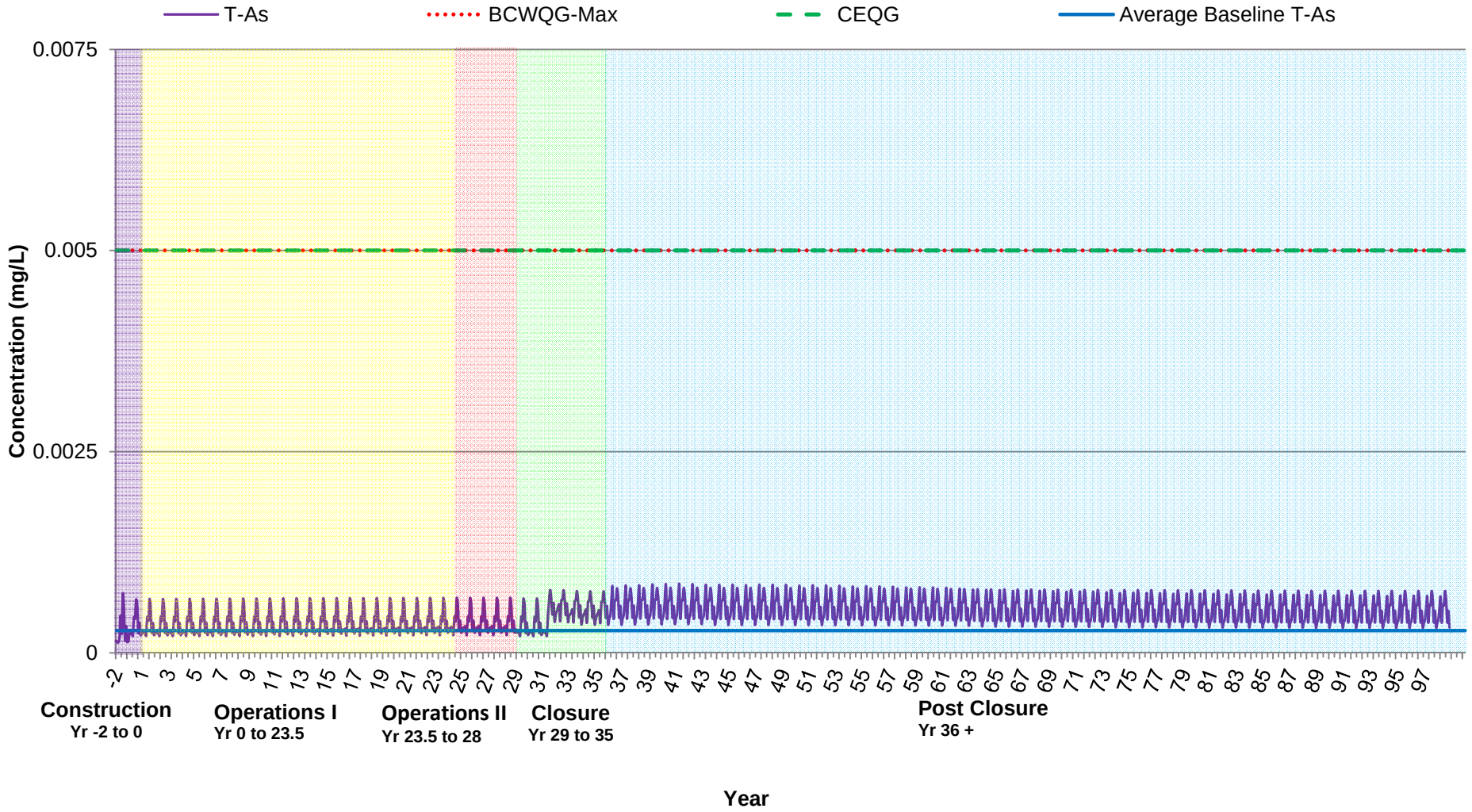
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C8.Sb

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE ARSENIC CONCENTRATIONS - HARPER CREEK ABOVE BARRIÉRE RIVER (HB)

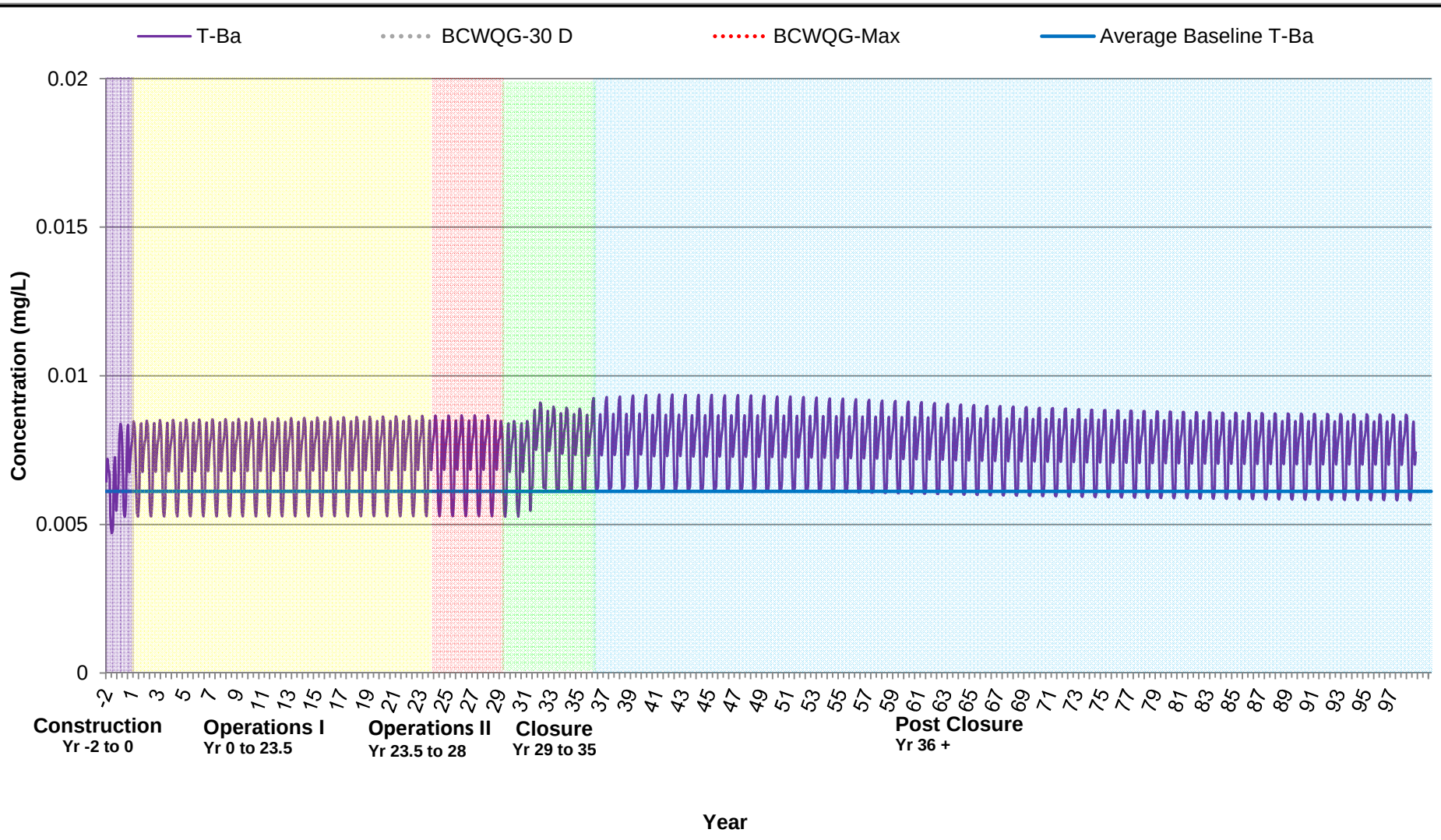
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C8.As

REV 0



NOTES:

1. THE BCWQG-MAX IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).
3. THE BCWQG-30 D (1 mg/L) AND BCWQG-MAX (5 mg/L) ARE NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE BARIUM CONCENTRATIONS - HARPER CREEK ABOVE BARRIÉRE RIVER (HB)

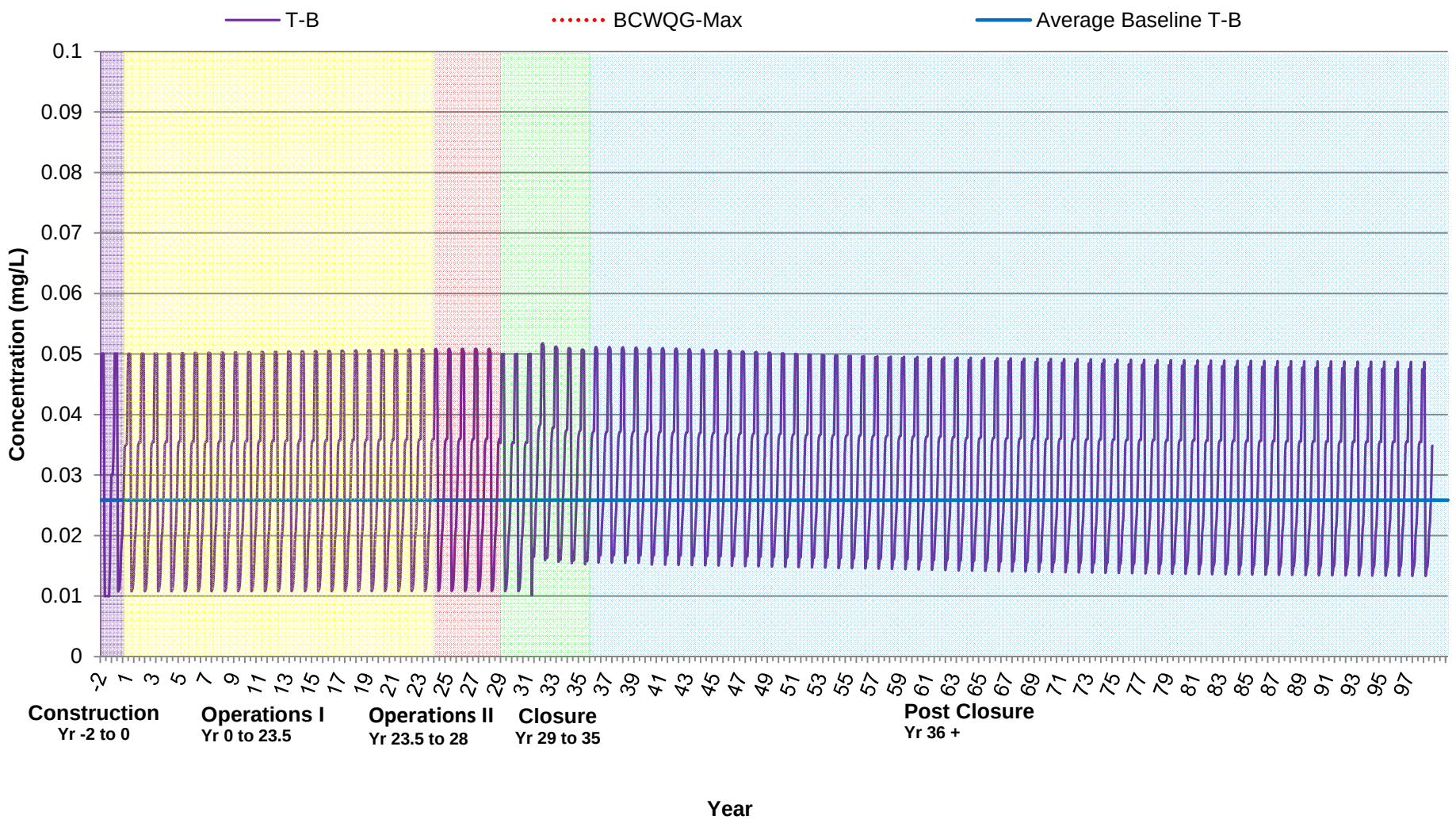
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C8.Ba

REV 0



NOTES:

1. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.
3. THE BCWQG-MAX (1.2 mg/L) IS NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE BORON CONCENTRATIONS - HARPER CREEK ABOVE BARRIÉRE RIVER (HB)

Knight Piésold CONSULTING

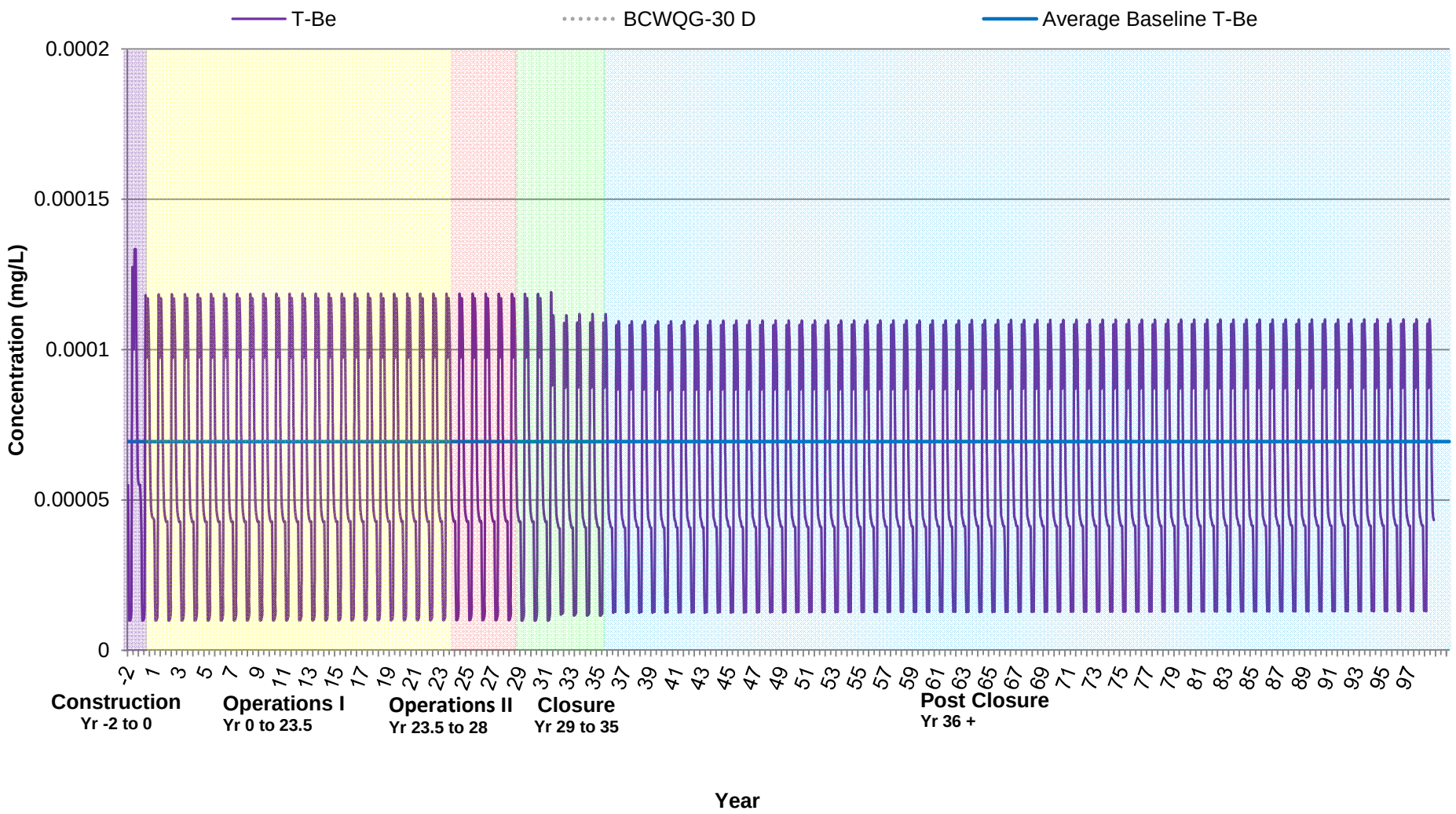
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C8.B

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).
3. THE BCWQG-30 D (0.0053 mg/L) IS NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE BERYILLIUM CONCENTRATIONS - HARPER CREEK ABOVE BARRIÉRE RIVER (HB)

Knight Piésold CONSULTING

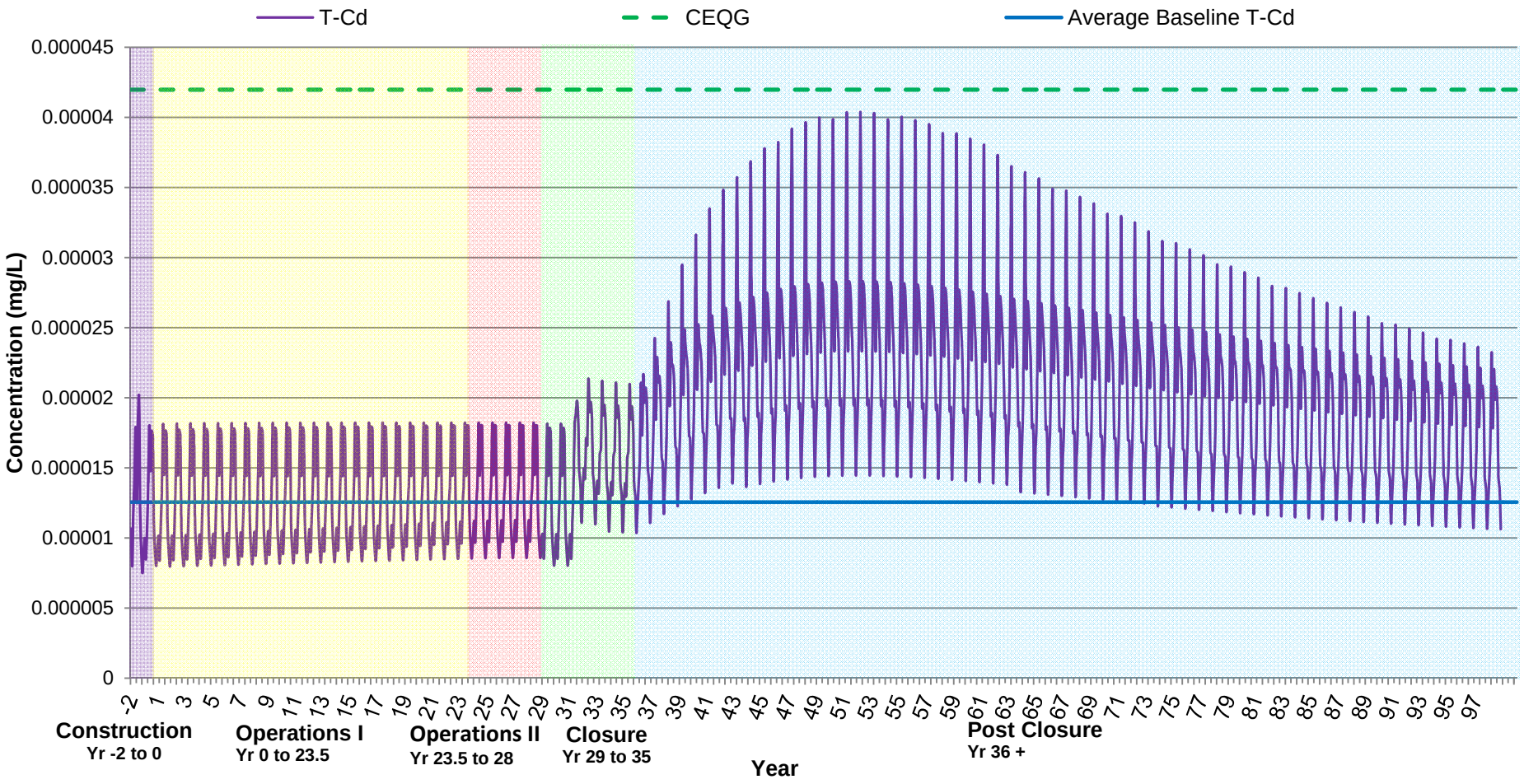
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C8.Be

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE CADMIUM CONCENTRATIONS - HARPER CREEK ABOVE BARRIÉRE RIVER (HB)

Knight Piésold CONSULTING

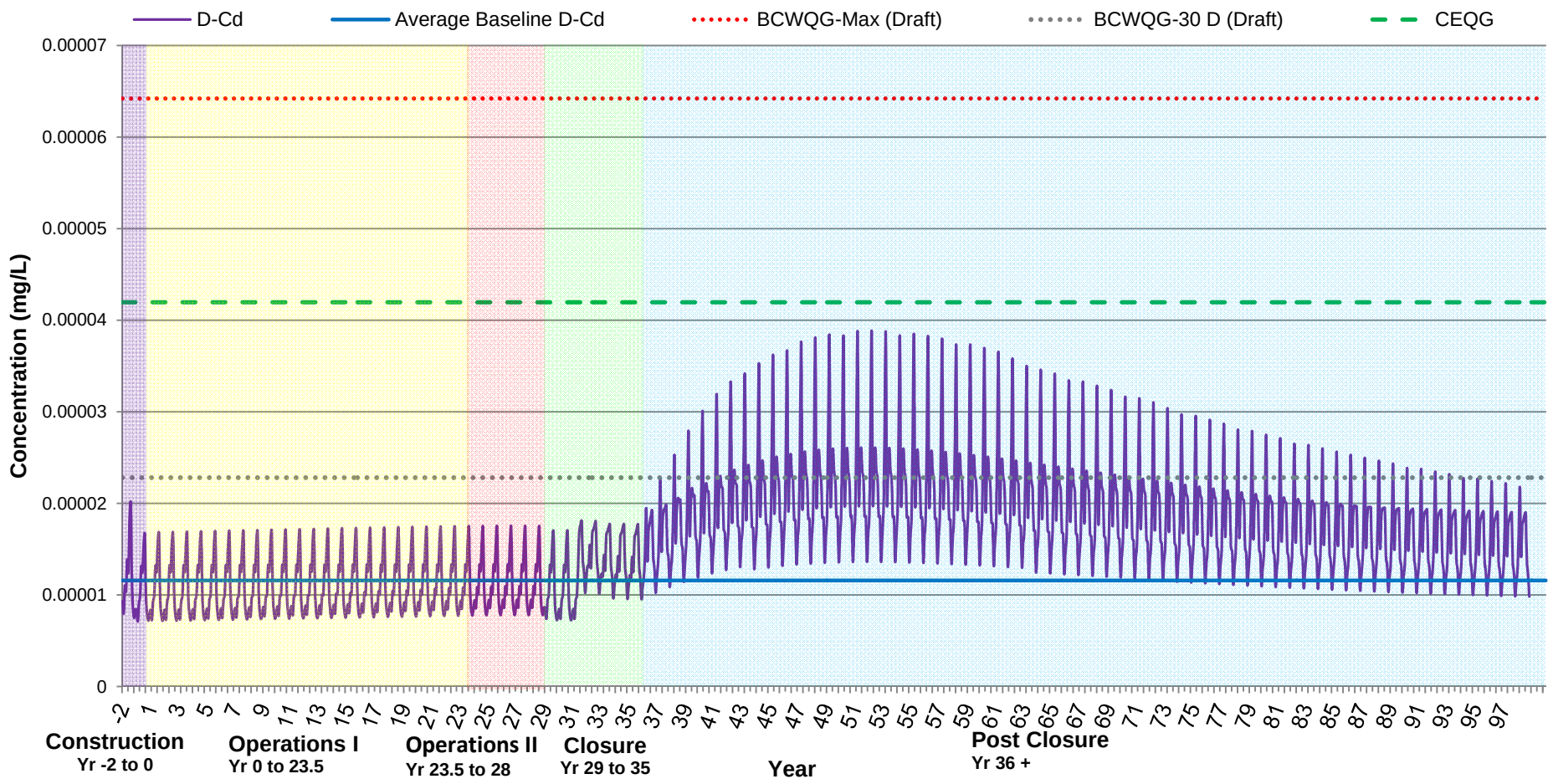
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C8.Cd-T

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. THE BCWQG ARE DRAFT GUIDELINES UNDER REVIEW (JUNE 2014).
3. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).
4. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE CADMIUM CONCENTRATIONS - HARPER CREEK ABOVE BARRIÉRE RIVER (HB)

Knight Piésold CONSULTING

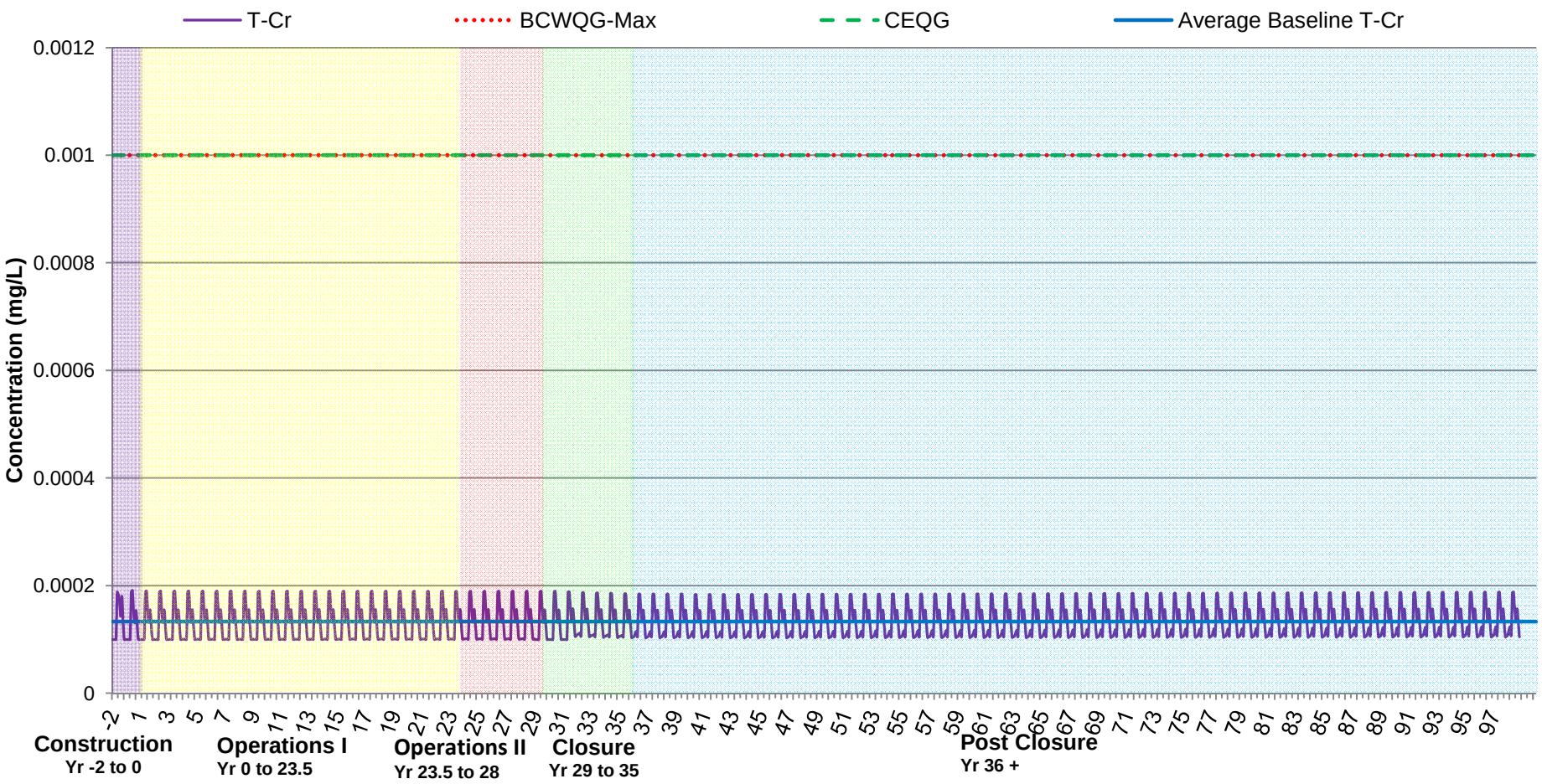
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C8.Cd-D

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. GUIDELINES ARE FOR CHROMIUM (IV), THE SPECIES MOST COMMON IN WELL OXYGENATED SURFACE WATERS.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE CHROMIUM CONCENTRATIONS - HARPER CREEK ABOVE BARRIÉRE RIVER (HB)

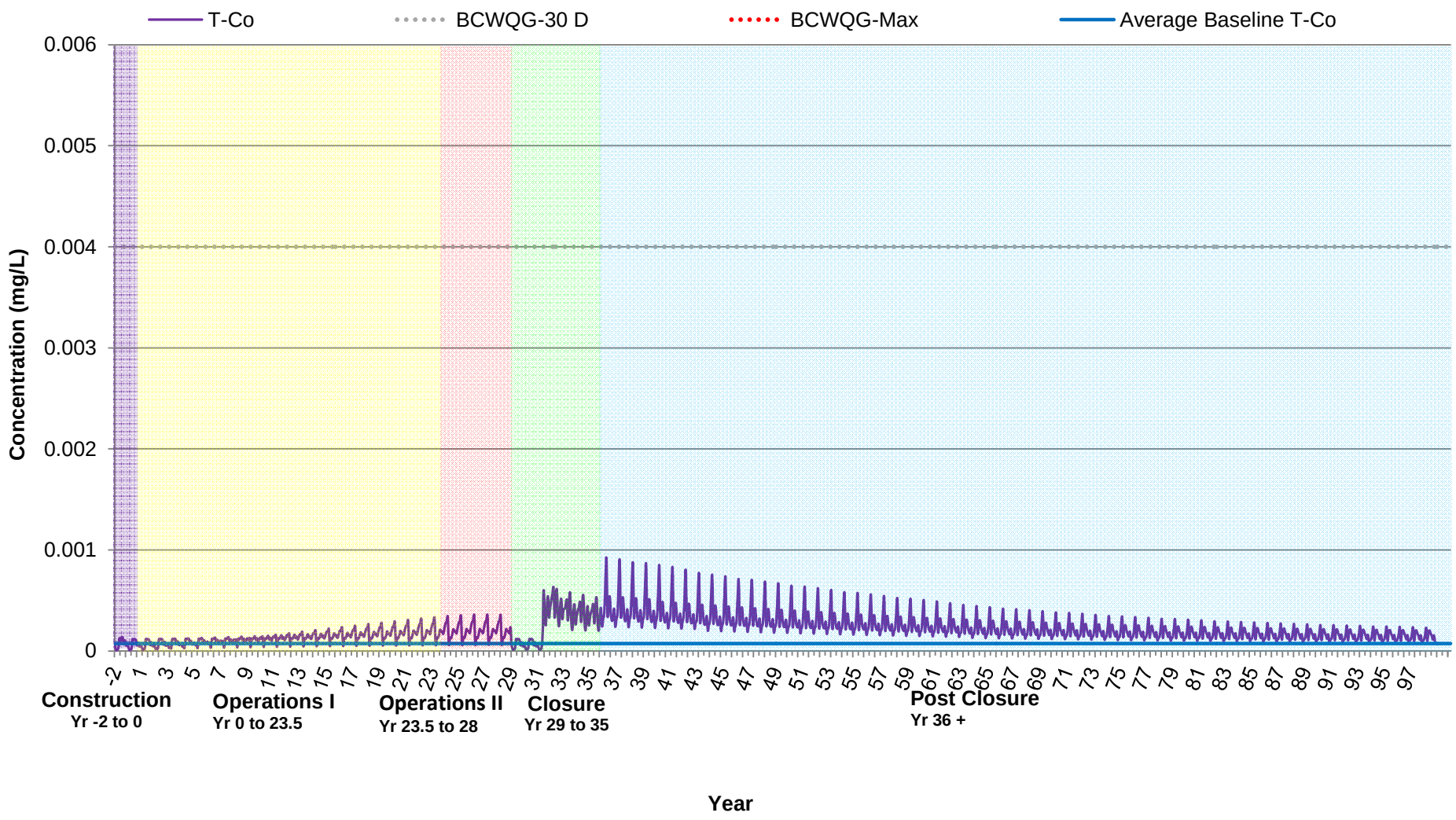
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C8.Cr

REV 0



NOTES:

1. THE BCWQG-30 D AND BCWQG-MAX ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).
3. THE BCWQG-MAX GUIDELINE (0.11 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE COBALT CONCENTRATIONS - HARPER CREEK ABOVE BARRIÉRE RIVER (HB)

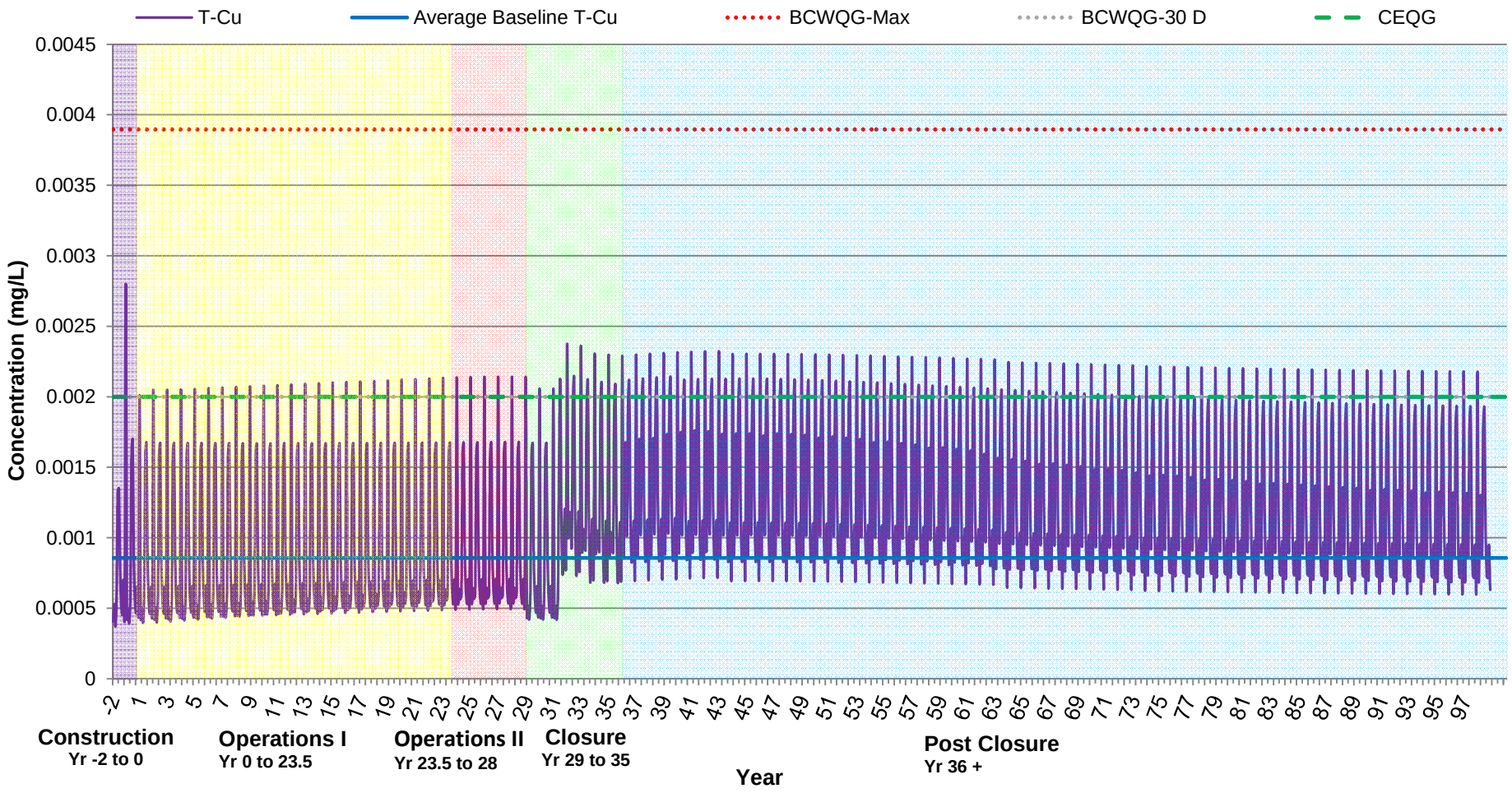
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C8.Co

REV 0



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE COPPER CONCENTRATIONS - HARPER CREEK ABOVE BARRIÉRE RIVER (HB)

Knight Piésold CONSULTING

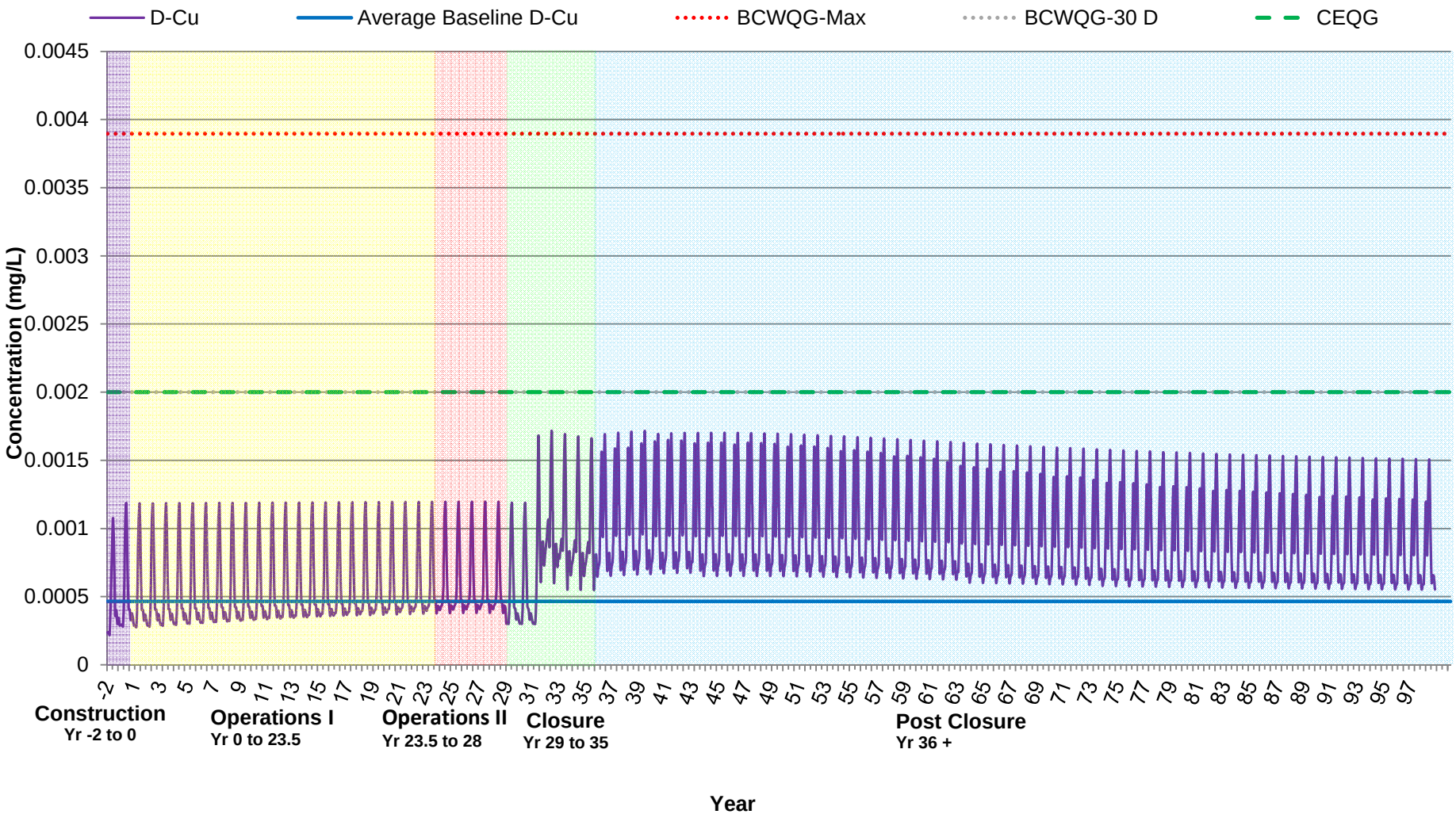
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C8.Cu-T

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE COPPER CONCENTRATIONS - HARPER CREEK ABOVE BARRIÉRE RIVER (HB)

Knight Piésold CONSULTING

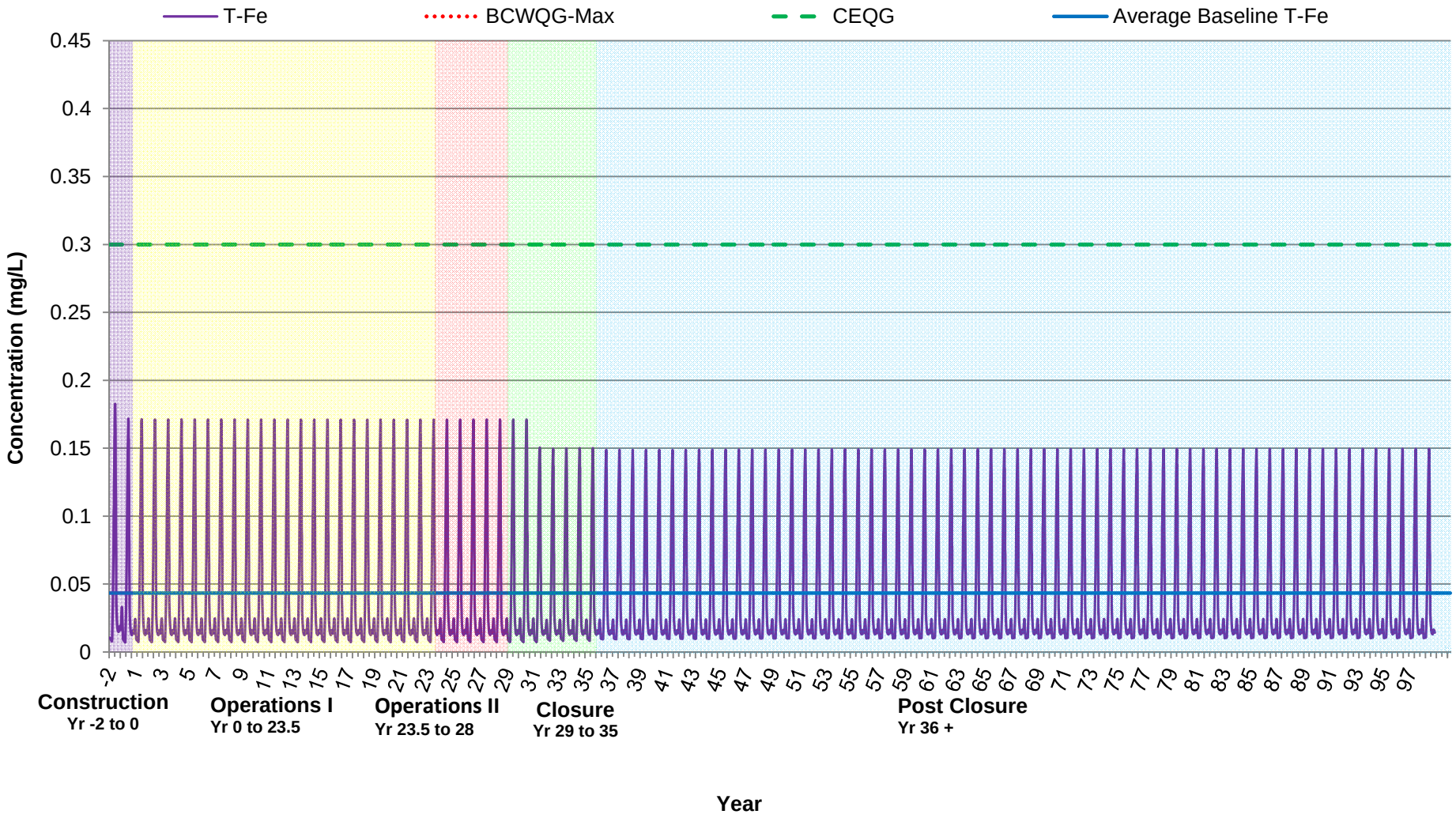
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C8.Cu-D

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).
3. BCWQG-MAX 1.0 mg/L IS NOT SHOWN ON GRAPH.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE TOTAL IRON CONCENTRATIONS - HARPER CREEK ABOVE BARRIÉRE RIVER (HB)

Knight Piésold CONSULTING

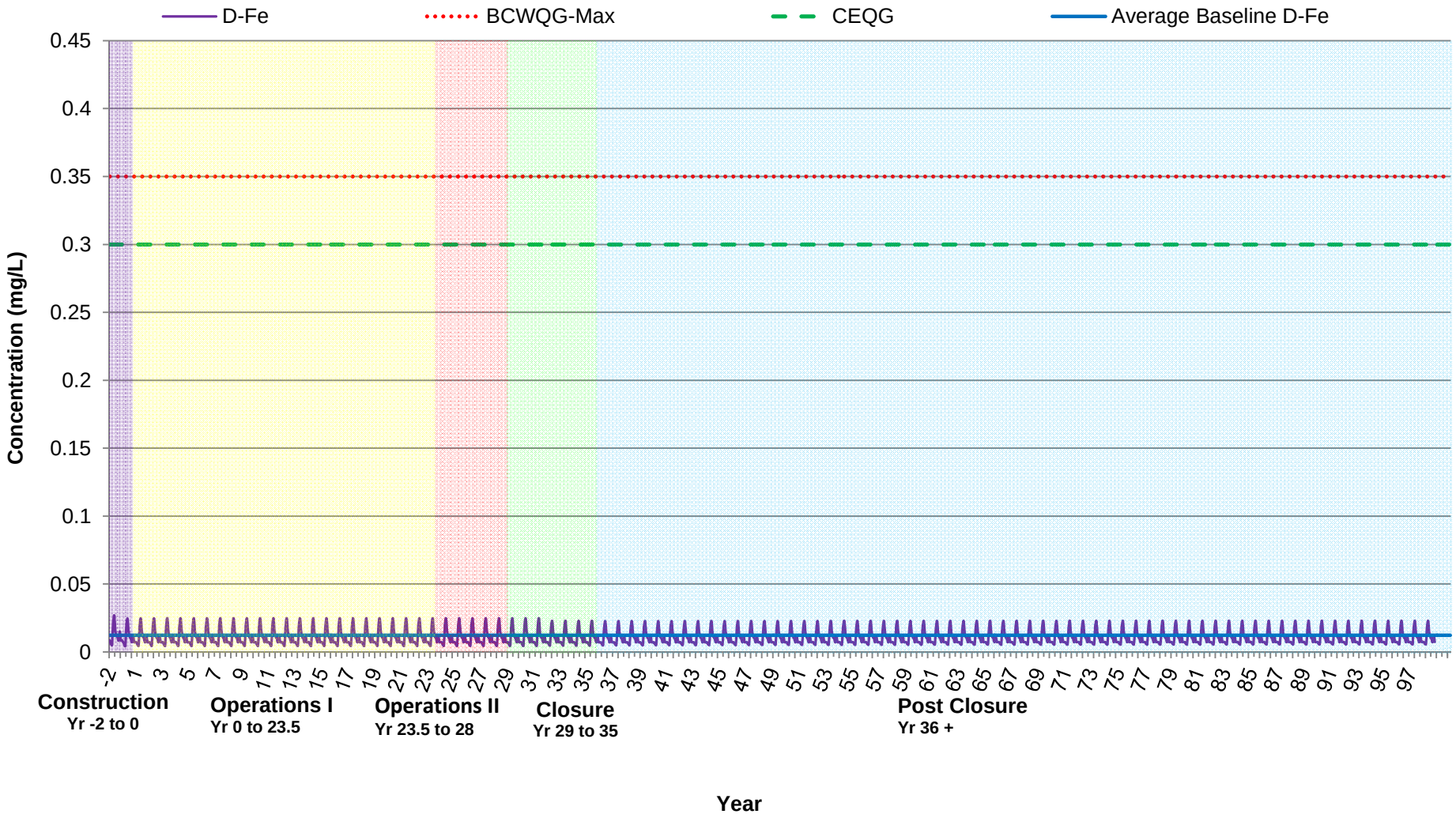
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C8.Fe-T

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE DISSOLVED IRON CONCENTRATIONS - HARPER CREEK ABOVE BARRIÉRE RIVER (HB)

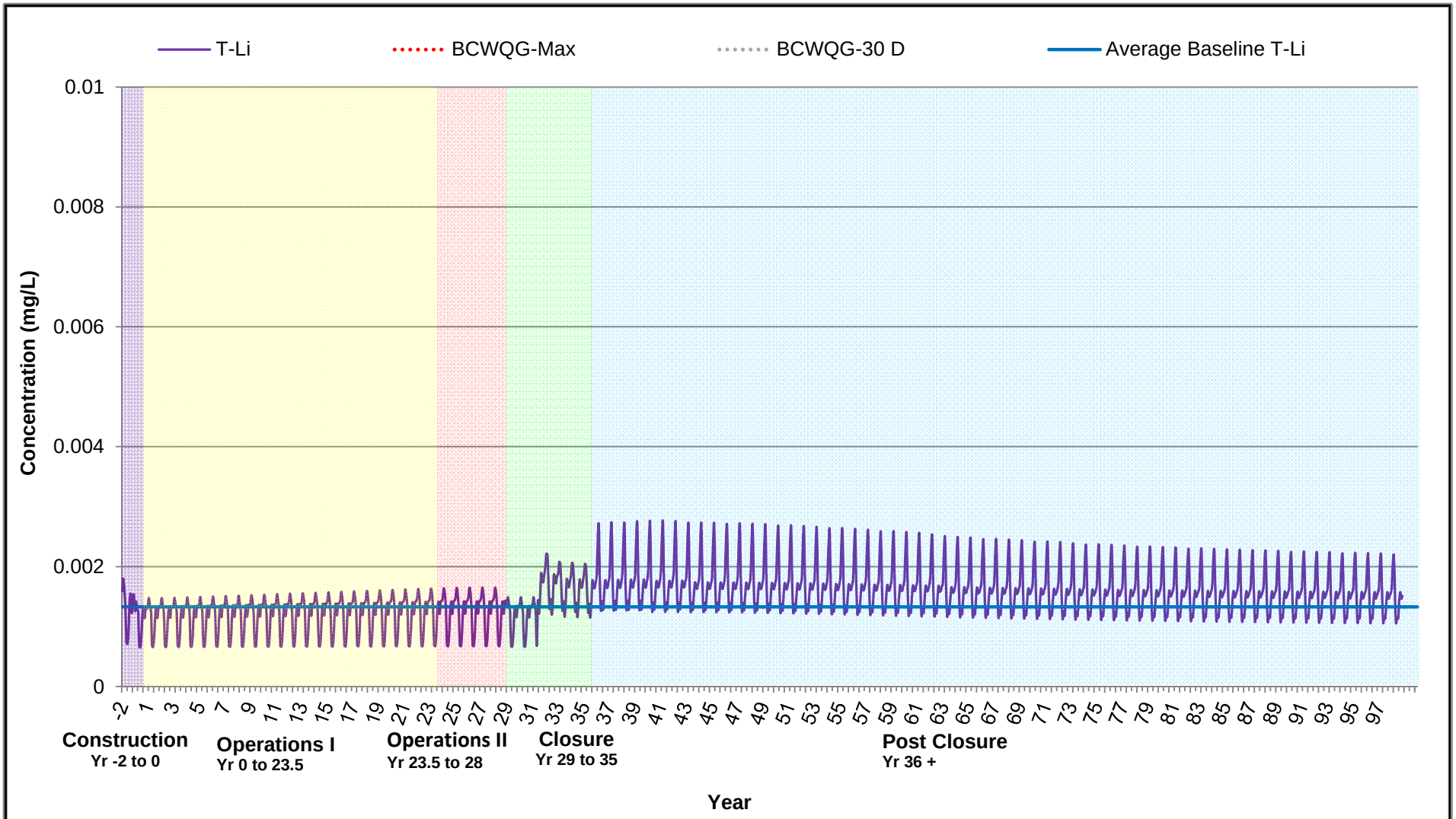
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C8.Fe-D

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).
3. THE BCWQG-30 D (0.096 mg/L) AND BCWQG-MAX (0.87 mg/L) ARE INTERIM (WORKING) AND ARE NOT SHOWN ON GRAPH.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE LITHIUM CONCENTRATIONS - HARPER CREEK ABOVE BARRIÉRE RIVER (HB)

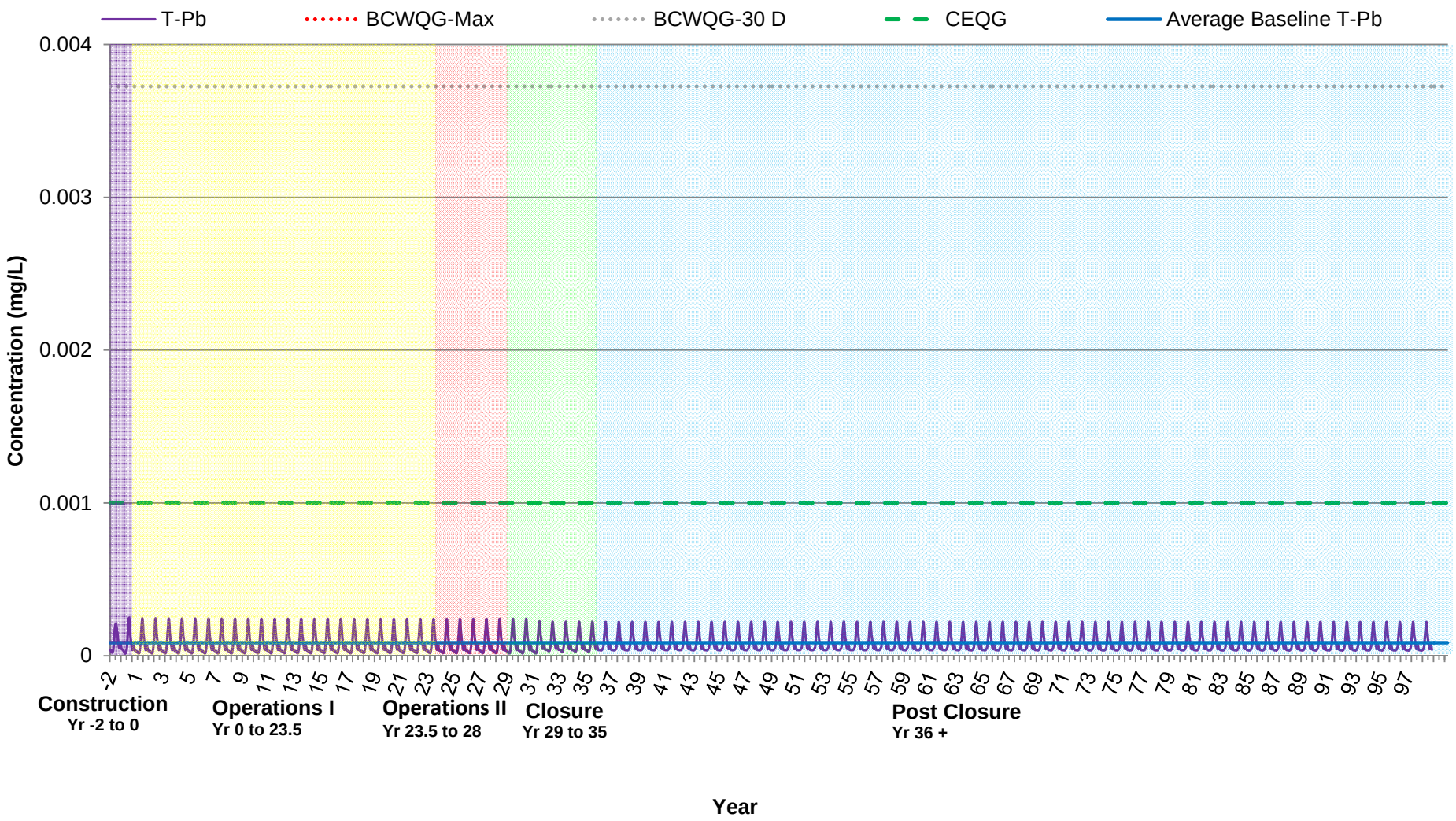
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C8.Li

REV 0



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.
4. THE BCWQG-MAX (CALCULATED AT 0.011 mg/L) IS NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE LEAD CONCENTRATIONS - HARPER CREEK ABOVE BARRIÉRE RIVER (HB)

Knight Piésold CONSULTING

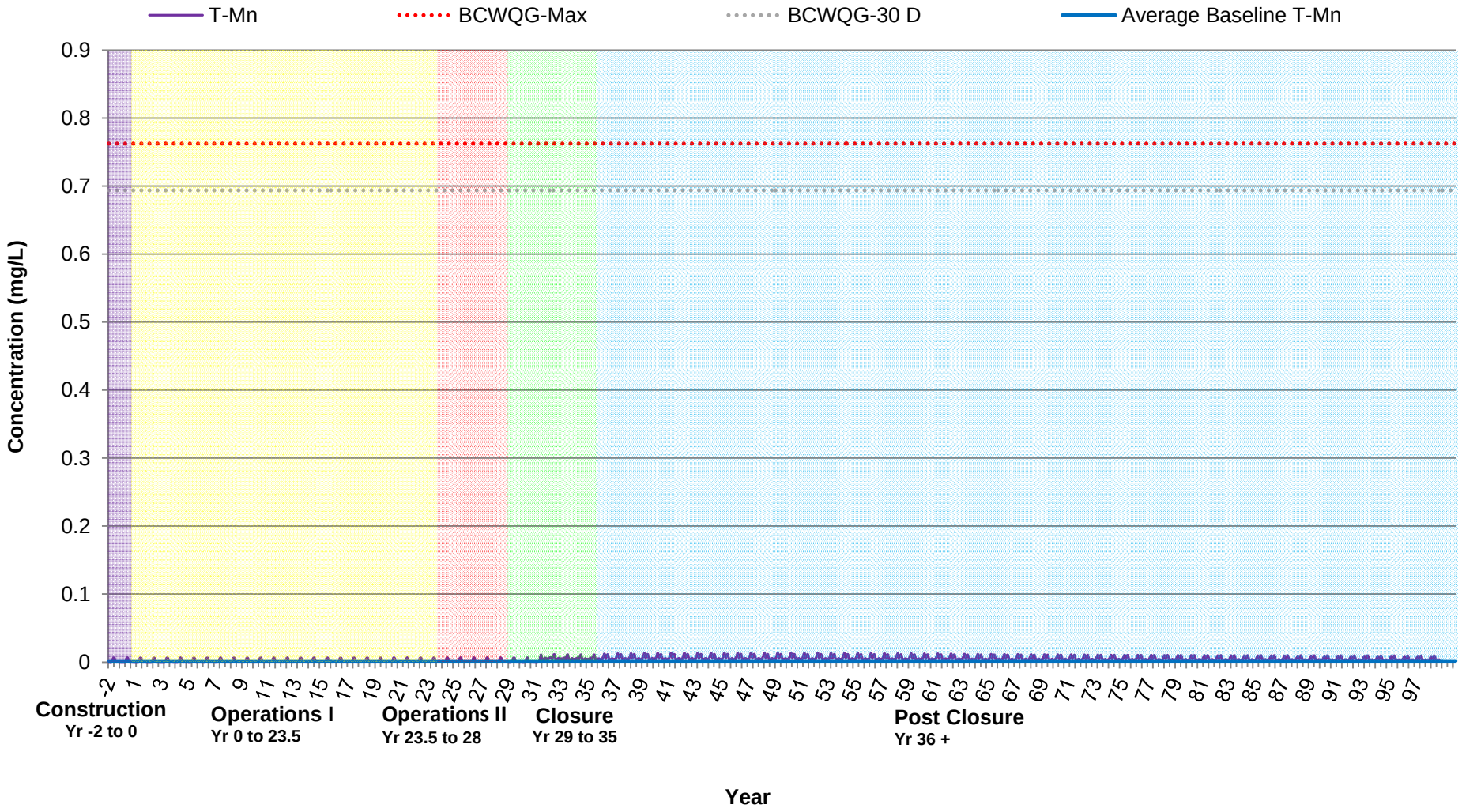
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C8.Pb

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE MANGANESE CONCENTRATIONS - HARPER CREEK ABOVE BARRIÉRE RIVER (HB)

Knight Piésold CONSULTING

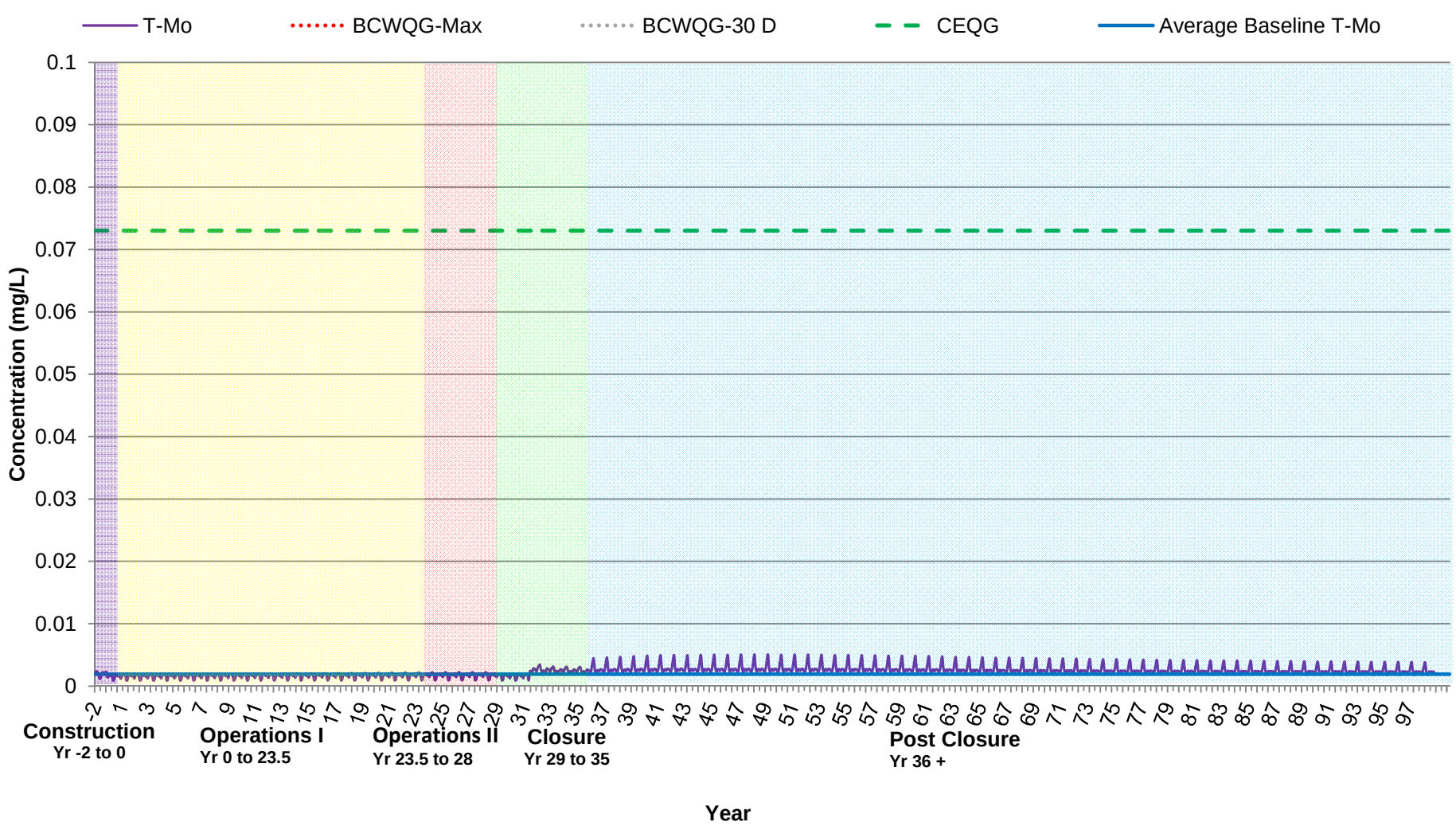
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C8.Mn

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).
3. THE BCWQG-MAX (2 mg/L) AND BCWQG-30 D (1 mg/L) ARE NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE MOLYDBENUM CONCENTRATIONS - HARPER CREEK ABOVE BARRIÉRE RIVER (HB)

Knight Piésold CONSULTING

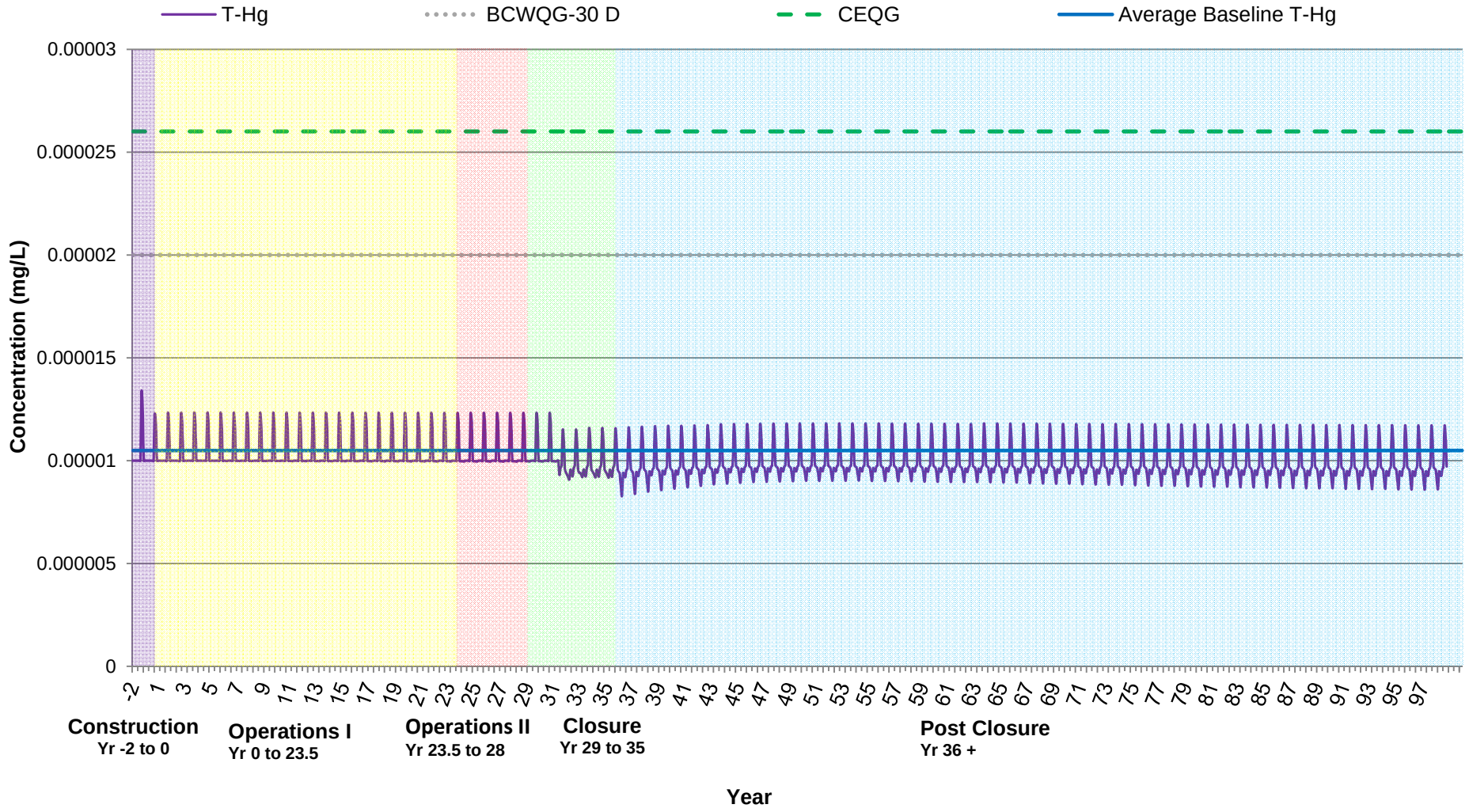
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C8.Mo

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-30 D AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).
3. BCWQG-30 D VALUE APPLIED ON ASSUMPTION THAT METHYL-Hg IS EQUAL TO 0.5% OF T-Hg.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE MERCURY CONCENTRATIONS - HARPER CREEK ABOVE BARRIÉRE RIVER (HB)

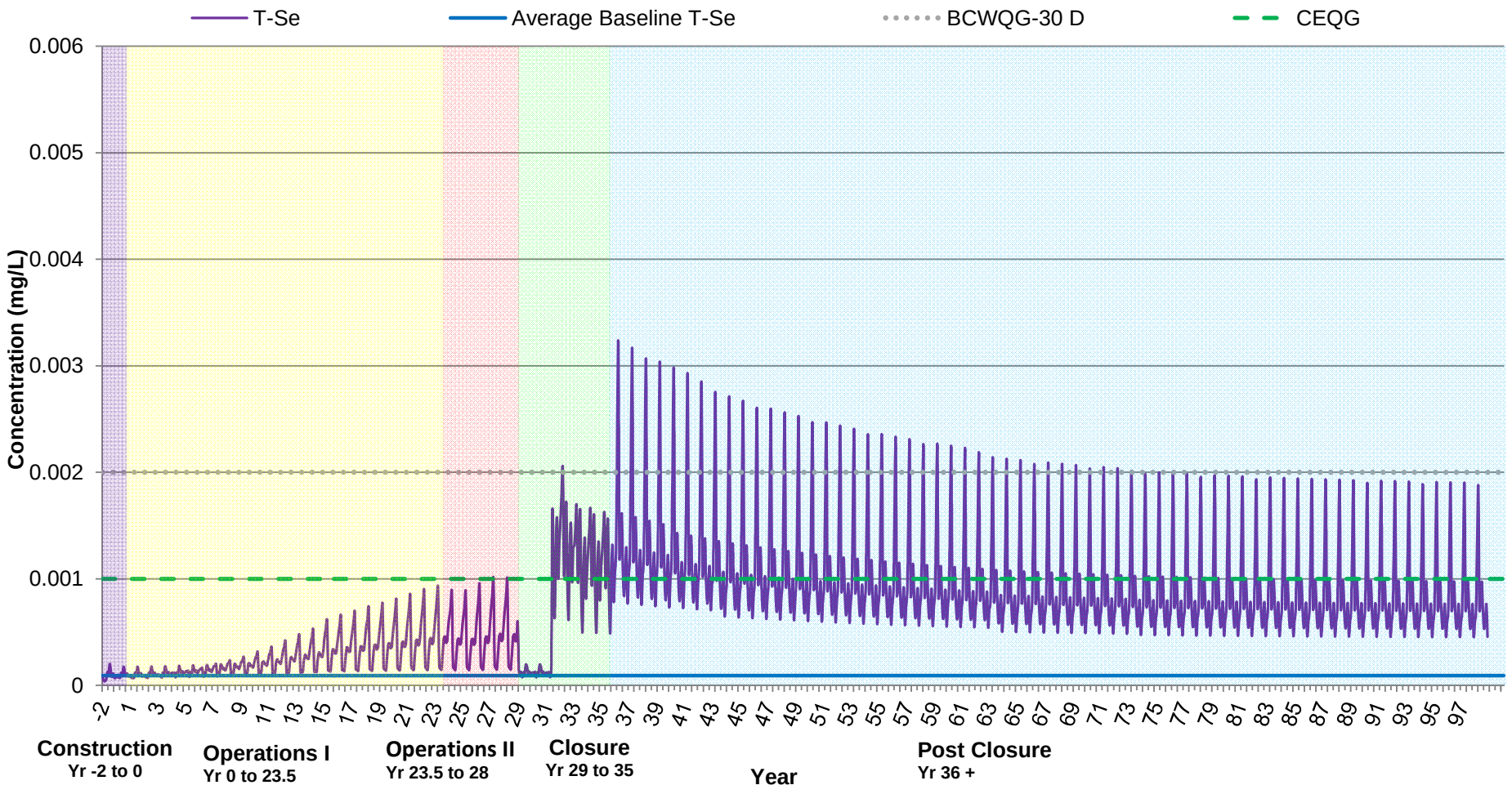
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C8.Hg

REV 0



NOTES:

1. THE BCWQG-30 D AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE SELENIUM CONCENTRATIONS - HARPER CREEK ABOVE BARRIÉRE RIVER (HB)

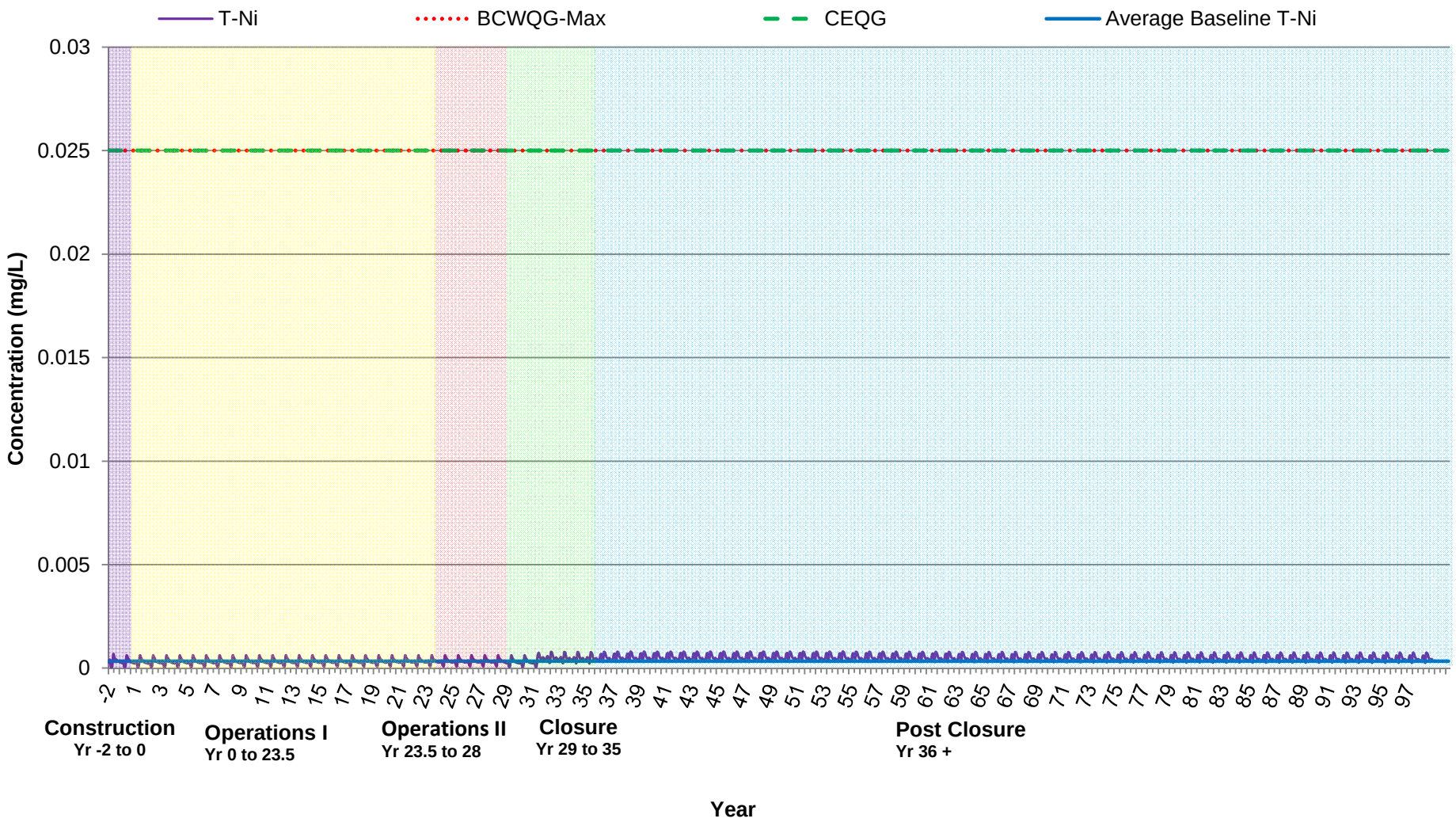
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C8.Se

REV 0



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE NICKEL CONCENTRATIONS - HARPER CREEK ABOVE BARRIÉRE RIVER (HB)

Knight Piésold CONSULTING

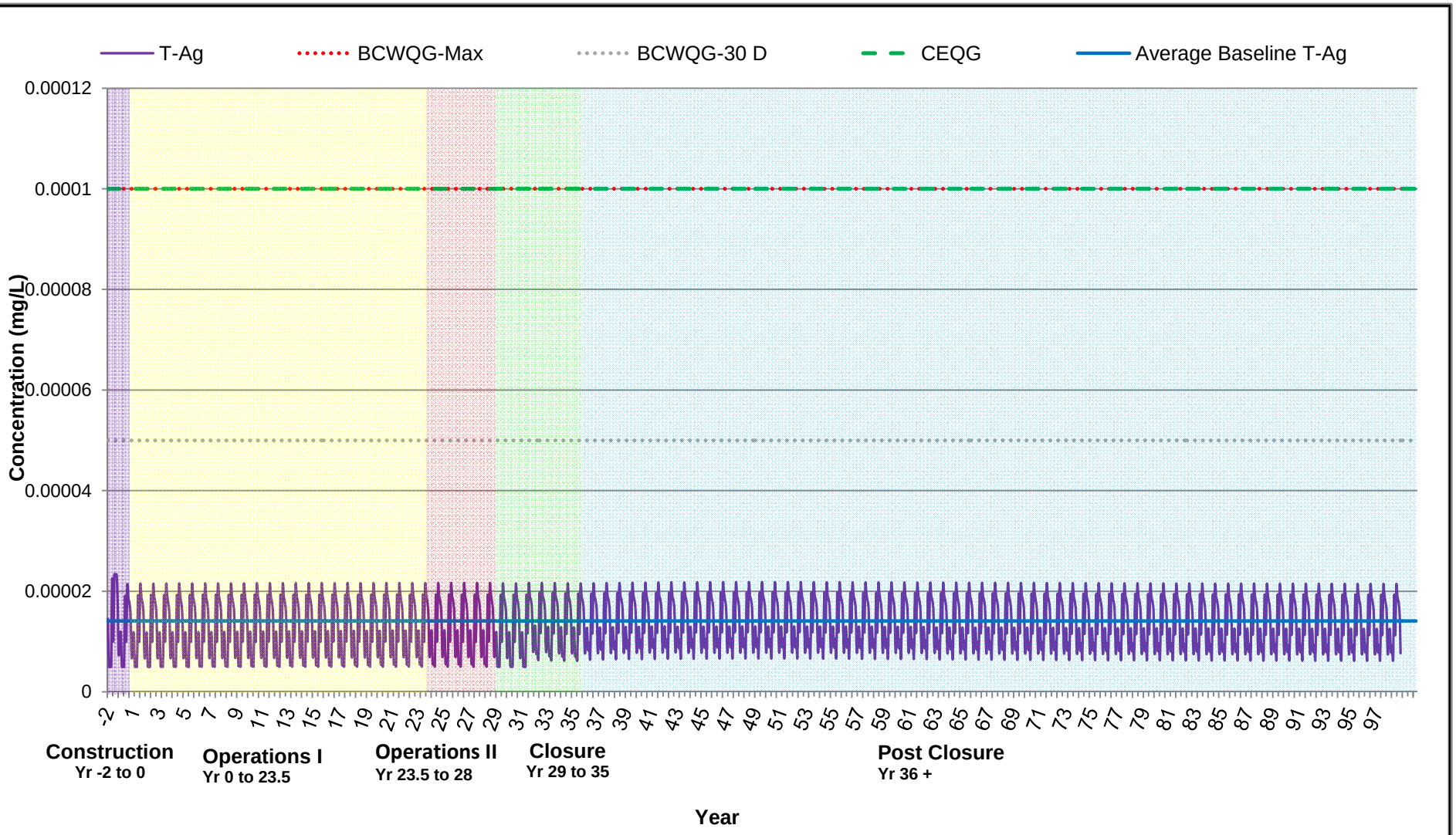
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C8.Ni

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-30 D AND BCWQG-MAX ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE SILVER CONCENTRATIONS - HARPER CREEK ABOVE BARRIÉRE RIVER (HB)

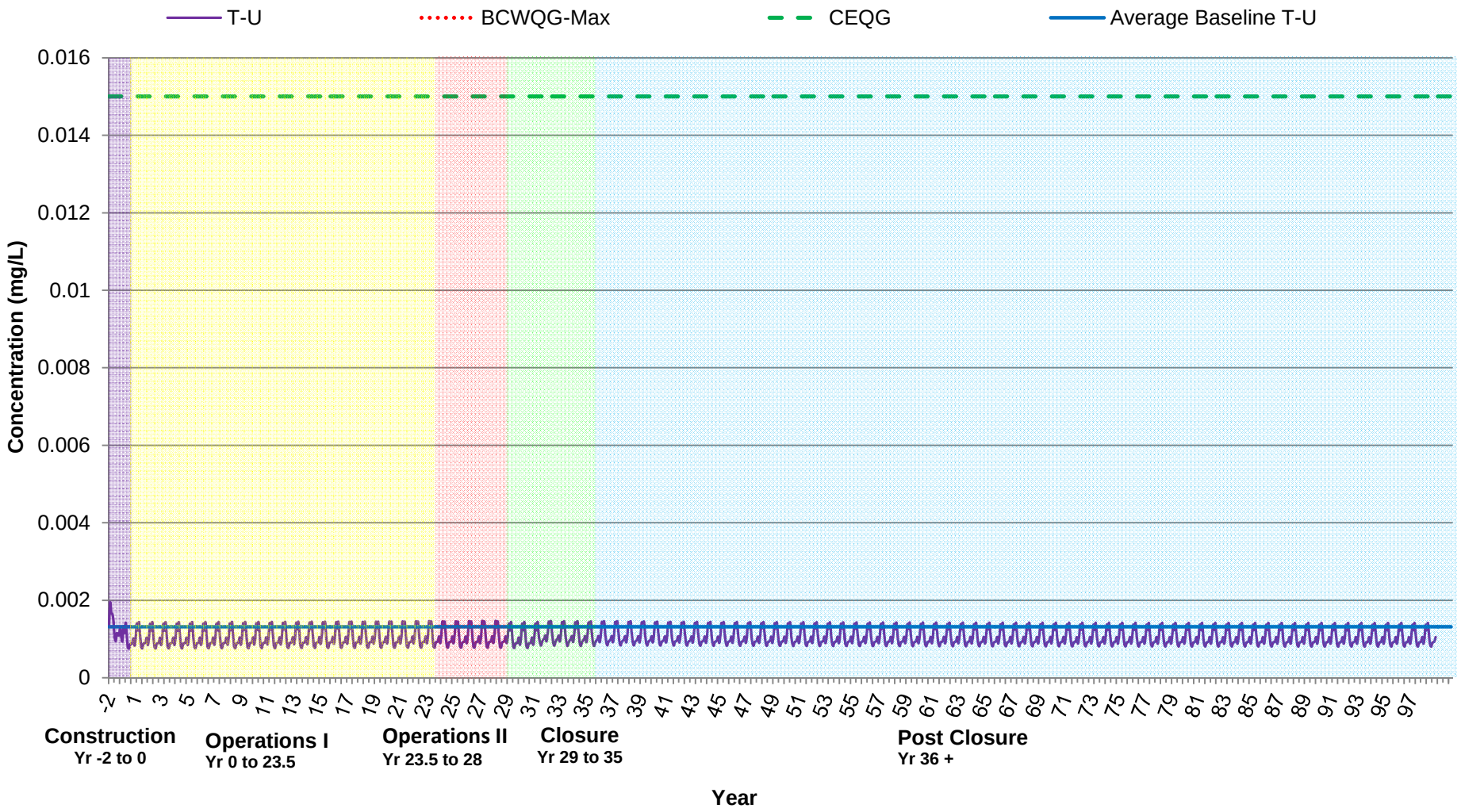
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C8.Ag

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).
3. THE BCWQG-MAX (0.3 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE URANIUM CONCENTRATIONS - HARPER CREEK ABOVE BARRIÉRE RIVER (HB)

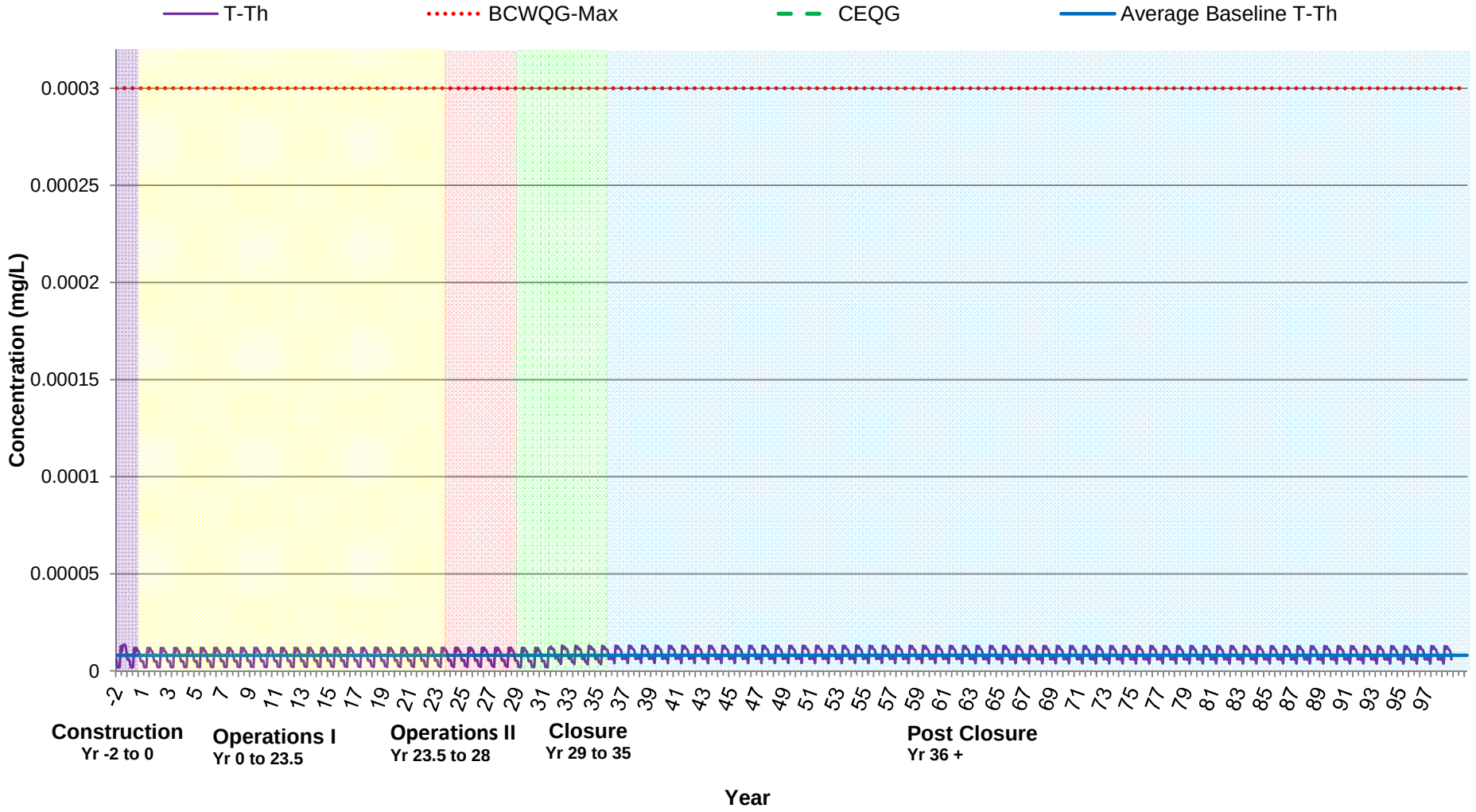
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C8.U

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).
3. THE CEQG (0.0008 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE THALLIUM CONCENTRATIONS - HARPER CREEK ABOVE BARRIÉRE RIVER (HB)

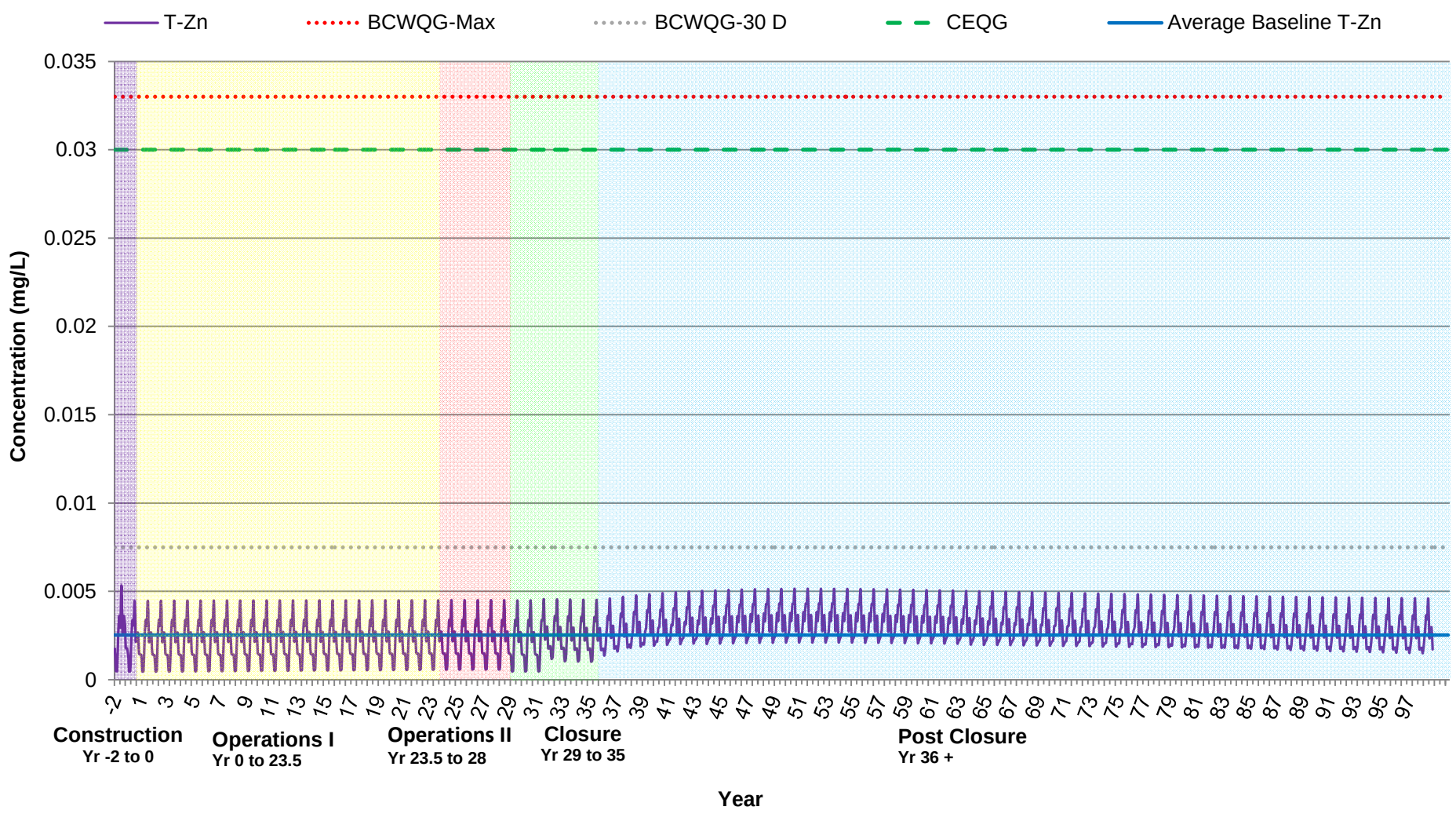
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C8.Th

REV 0



NOTES:

1. BCWQG-30 D AND BCWQG-MAX ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE ZINC CONCENTRATIONS - HARPER CREEK ABOVE BARRIÉRE RIVER (HB)

Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C8.Zn

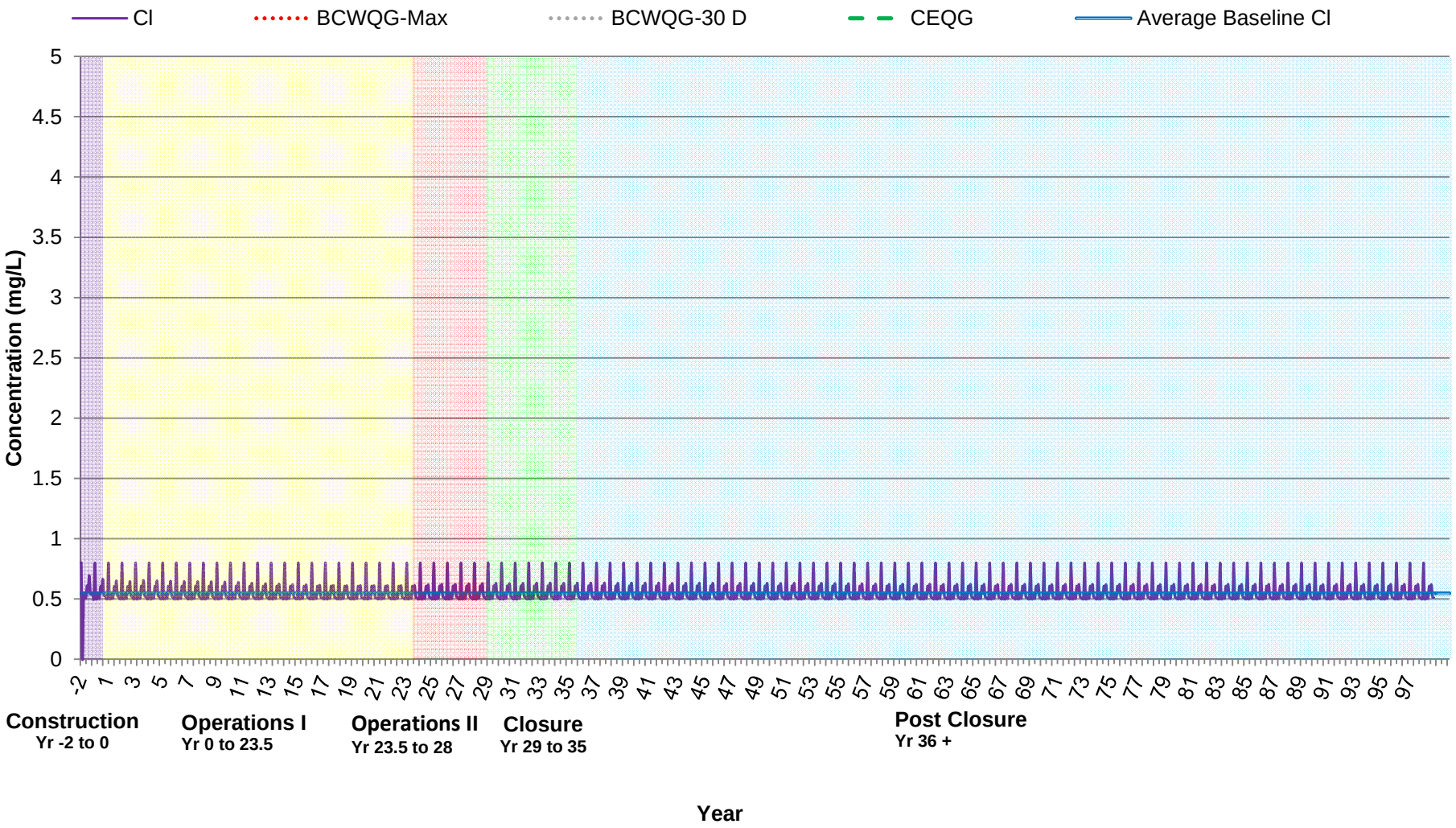
REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

APPENDIX C9

MID BAKER CREEK (BK1)

(Pages C9-1 to C9-30)



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS BK1/BK2 (AVERAGE HARDNESS OF 101 mg/L).
3. ALL GUIDELINES ARE NOT SHOWN: BCWQG-30 D (150 mg/L); BCWQG-MAX (600 mg/L); CEQG (120 mg/L AND 640 mg/L).

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE CHLORIDE CONCENTRATIONS - MID BAKER CREEK (BK1)

Knight Piésold CONSULTING

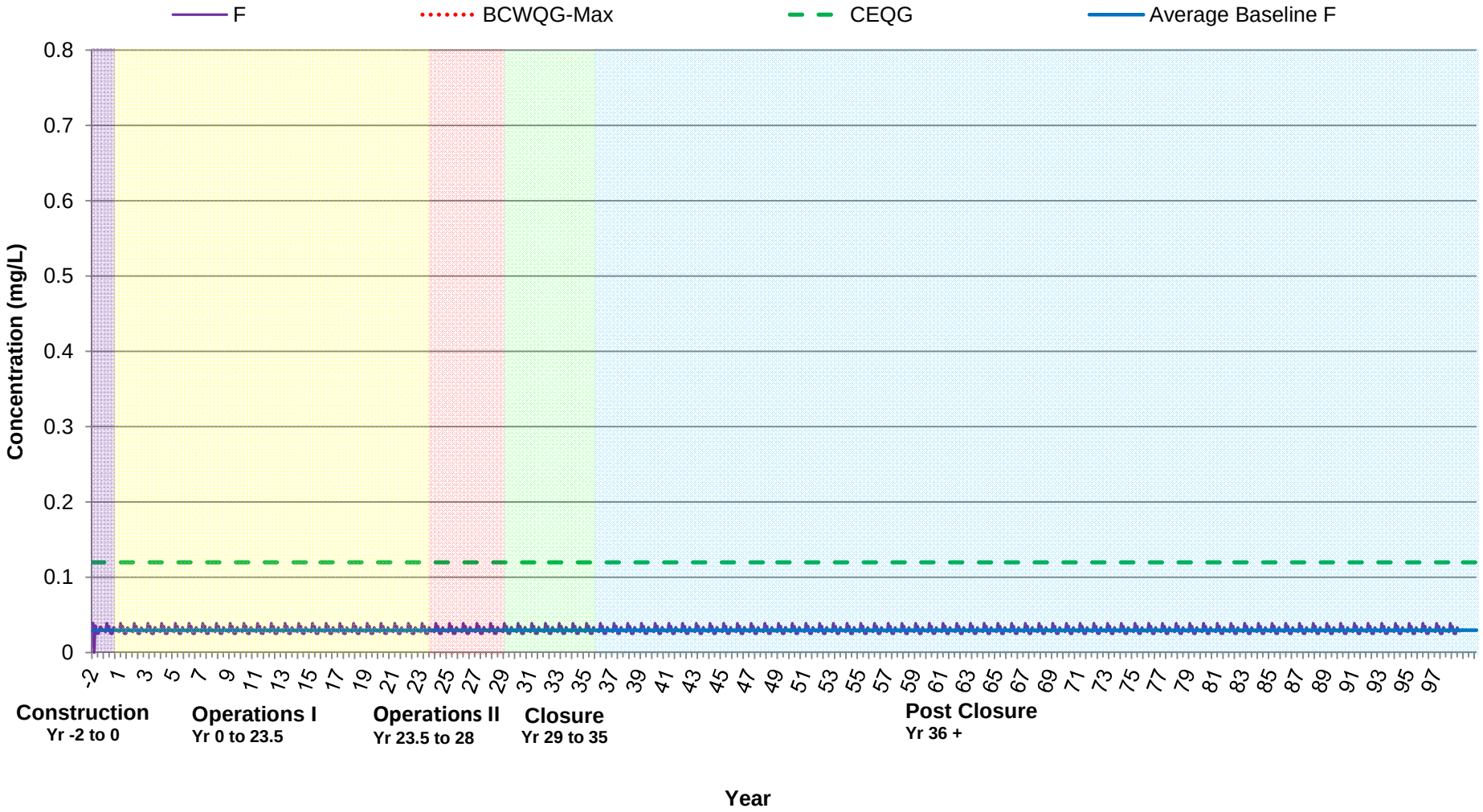
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C9.Cl

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX IS HARNDESS DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS BK1/BK2 (AVERAGE HARDNESS OF 101 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE FLUORIDE CONCENTRATIONS - MID BAKER CREEK (BK1)

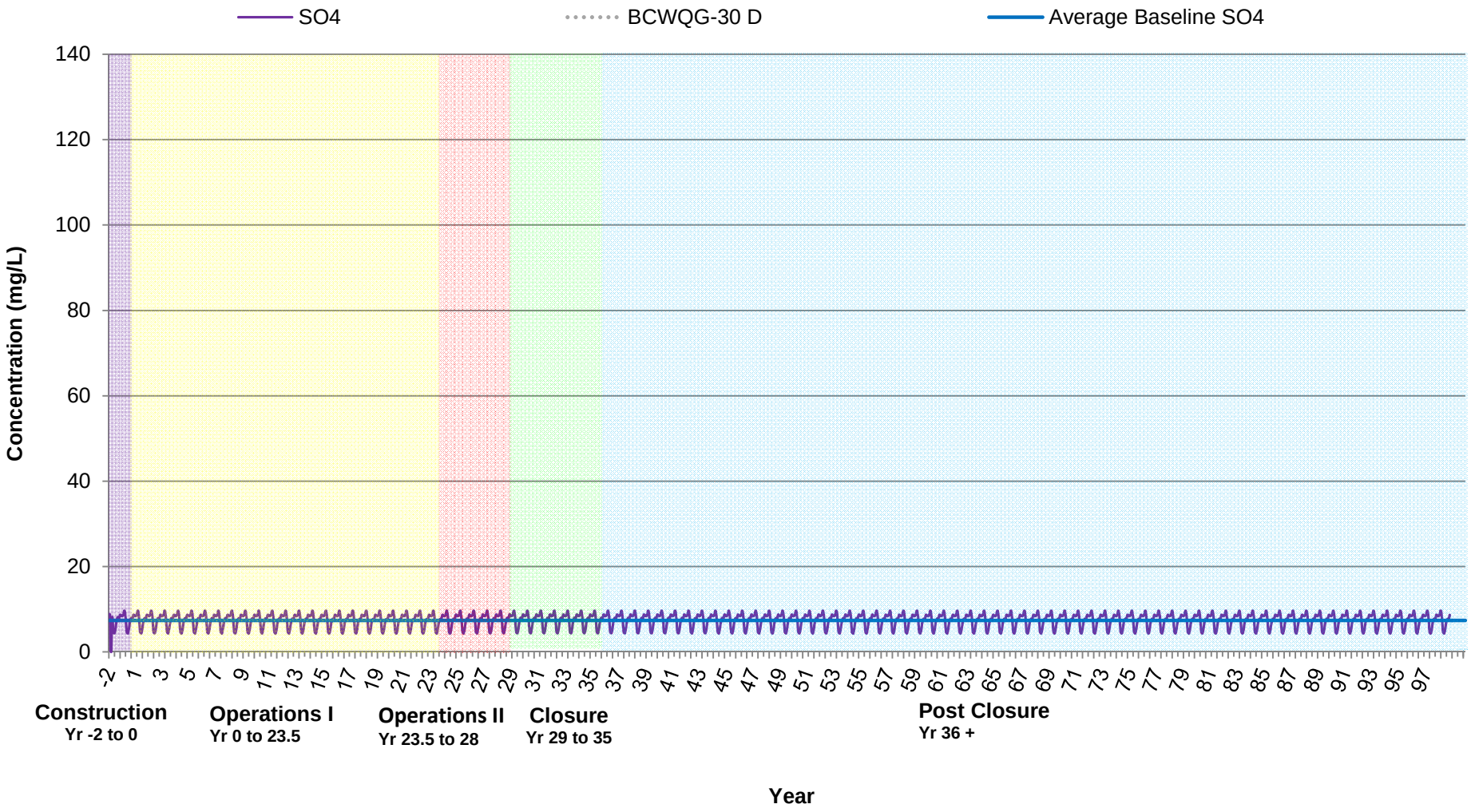
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C9.F

REV 0



NOTES:

1. BCWQG-30 D IS HARDNESS DEPEDENT.
2. BASELINE SITE USED FOR COMPARISON IS BK1/BK2 (AVERAGE HARDNESS OF 101 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE SULPHATE CONCENTRATIONS - MID BAKER CREEK (BK1)

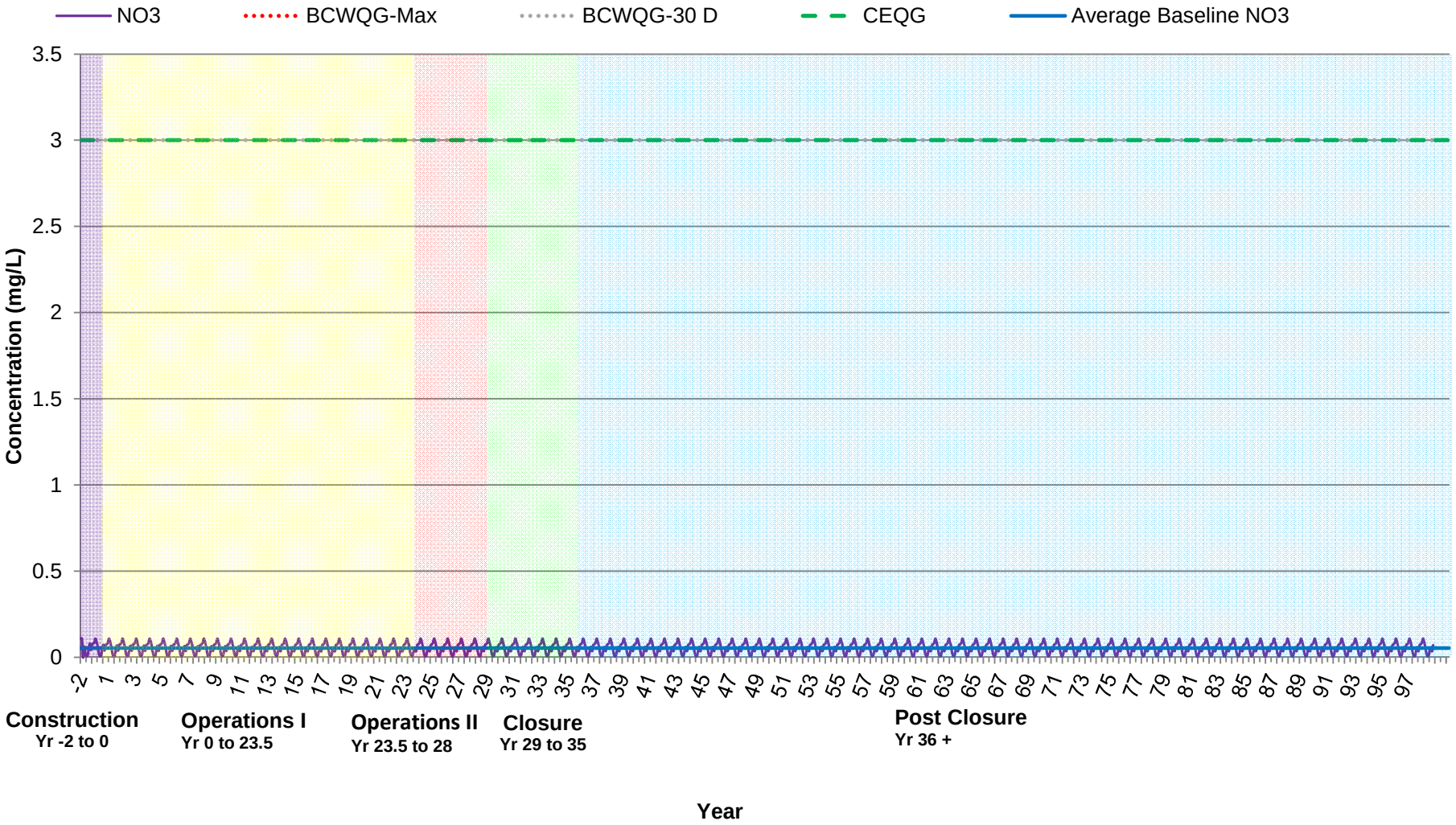
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C9.S04

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS BK1/BK2 (AVERAGE HARDNESS OF 101 mg/L).
3. THE BCWQG-MAX (32.8 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE NITRATE CONCENTRATIONS - MID BAKER CREEK (BK1)

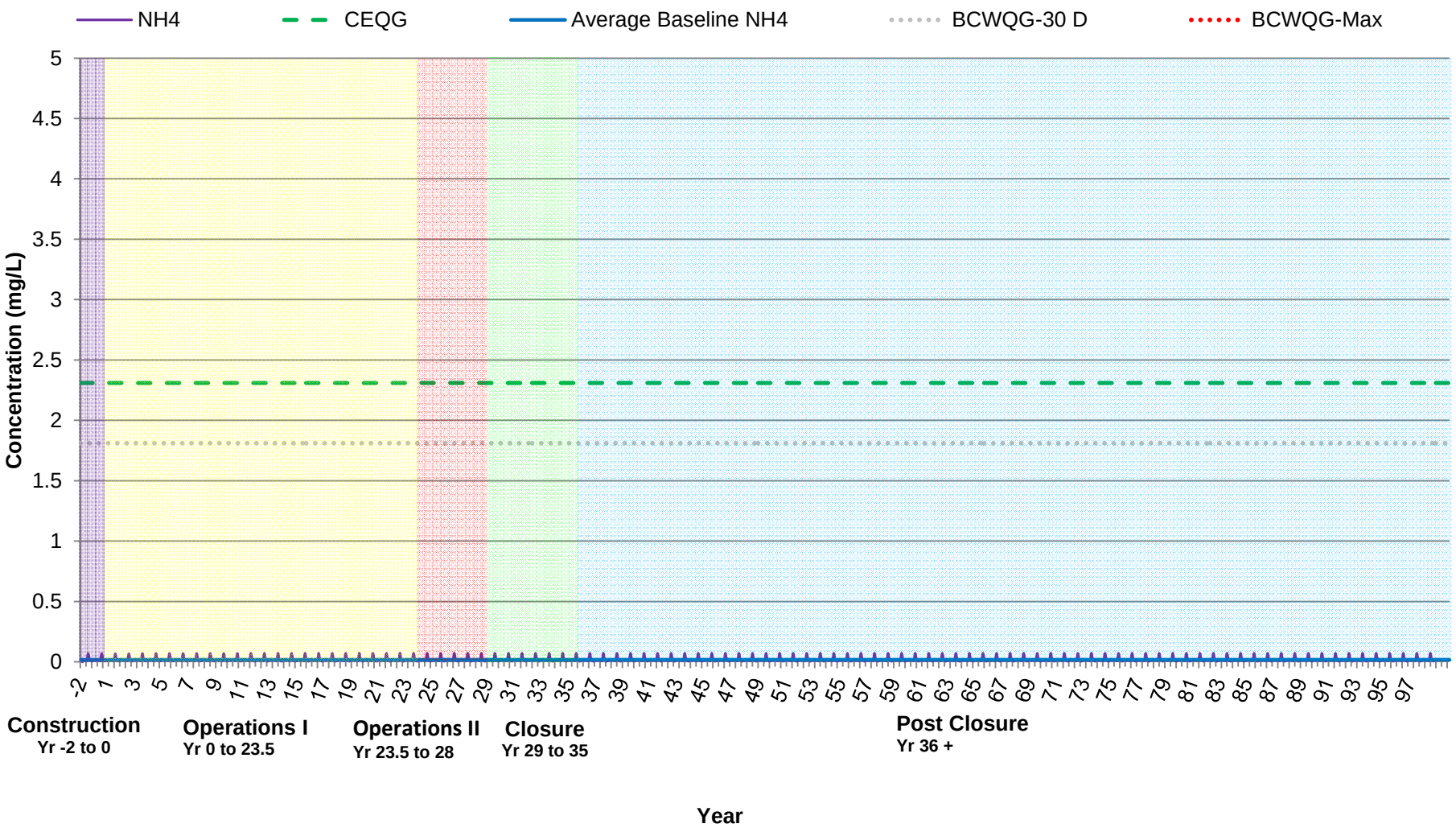
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C9.NO3

REV 0



NOTES:

1. THE BCWQG-30 D IS VALID FOR ONLY 6.5≤pH<9 AND 0°C≤T≤20°C.
2. THE BCWQG-MAX (20.15 mg/L) VALID FOR 6.5≤pH<9 IS NOT SHOWN.
3. THE CEQG IS TO BE USED WITH CAUTION FOR WATER WITH T<5°C AND pH>9.
4. BASELINE SITE USED FOR COMPARISON IS BK1/BK2 (AVERAGE HARDNESS OF 101 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE AMMONIA CONCENTRATIONS - MID BAKER CREEK (BK1)

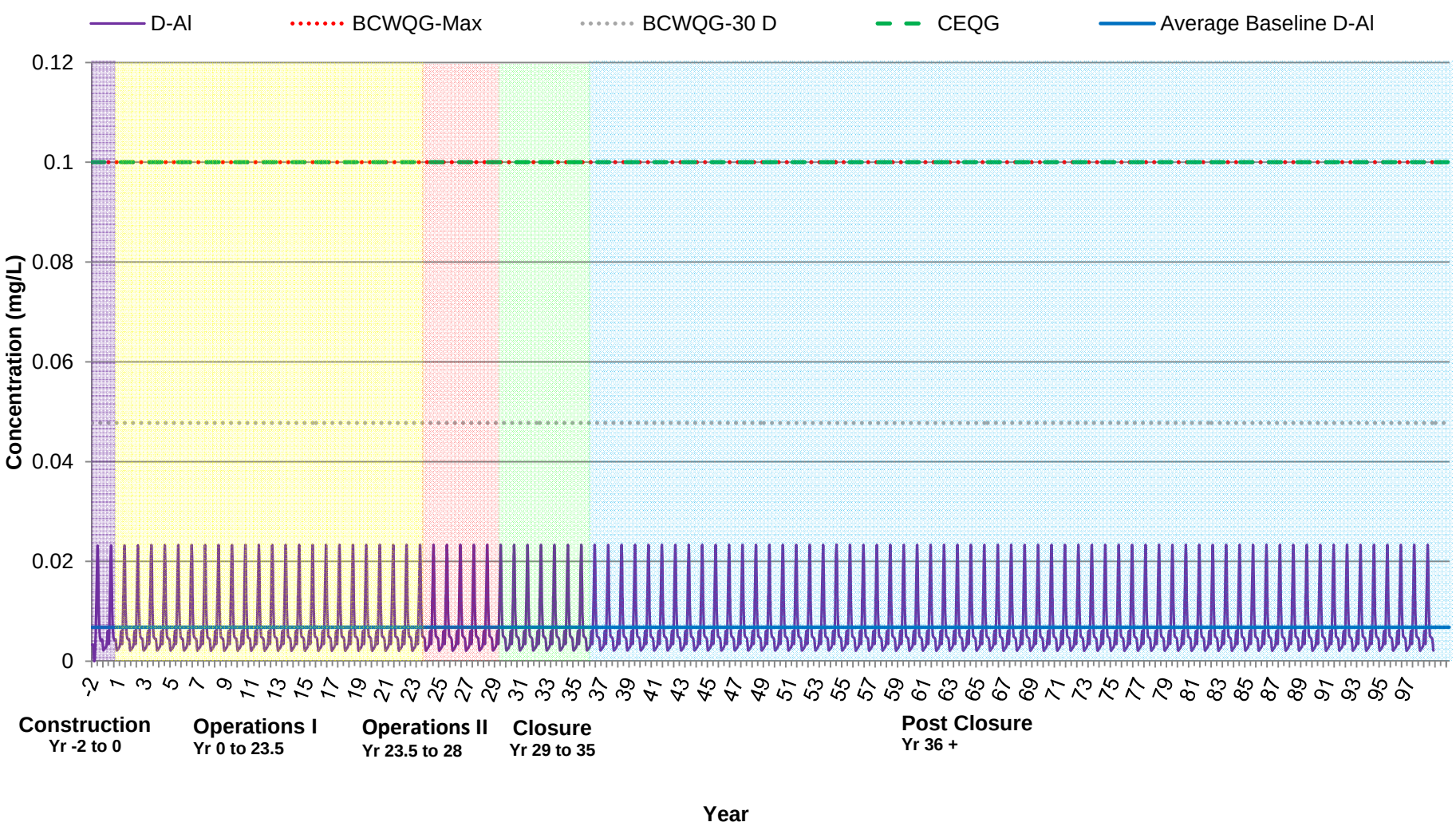
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C9.NH4

REV 0



NOTES:

1. ALL GUIDELINES ARE pH-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS BK1/BK2 (AVERAGE HARDNESS OF 101 mg/L).
3. AVERAGE BASELINE pH USED TO CALCULATE GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE DISSOLVED ALUMINUM CONCENTRATIONS - MID BAKER CREEK (BK1)

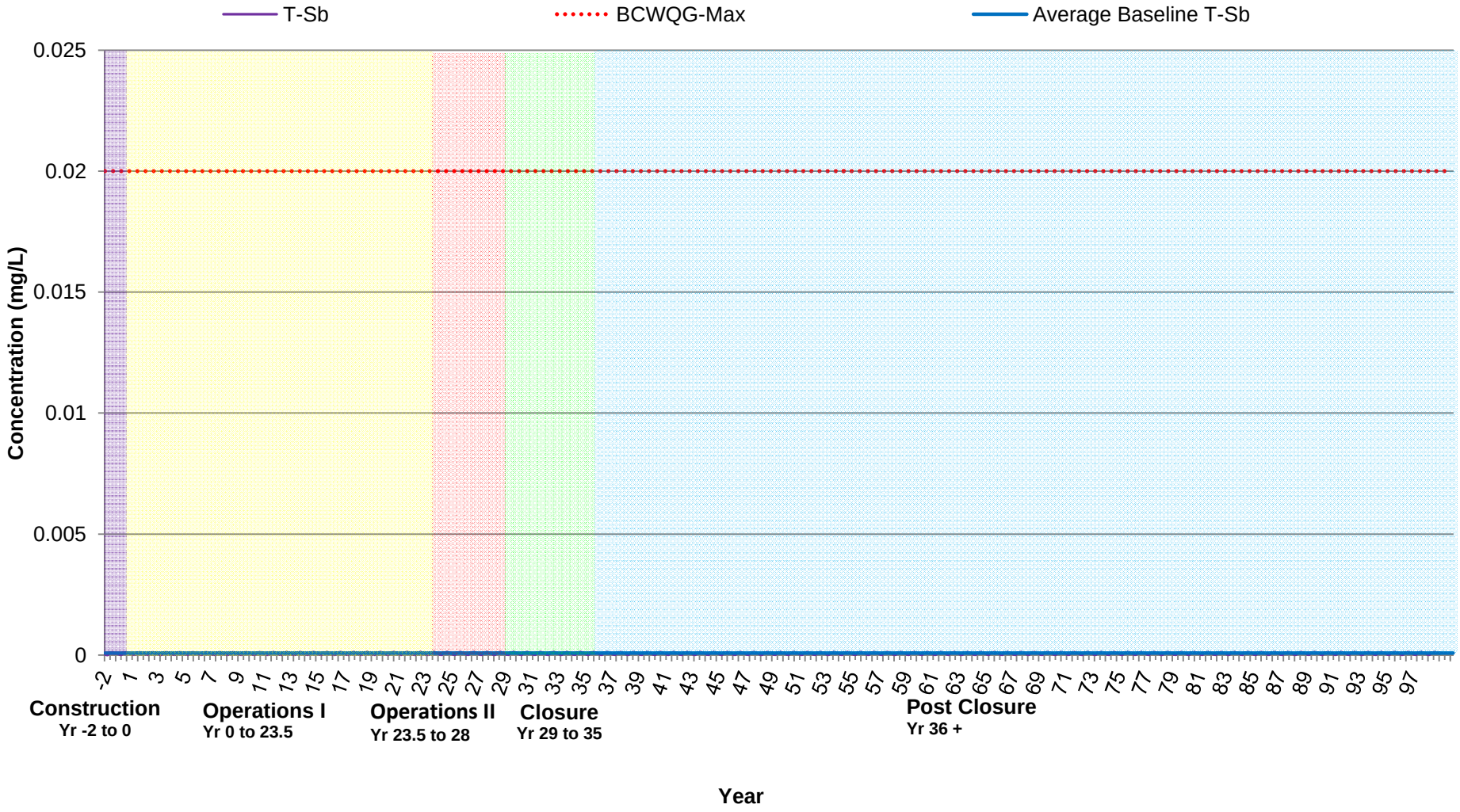
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C9.Al

REV 0



NOTES:

1. THE BCWQG IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS BK1/BK2 (AVERAGE HARDNESS OF 101 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE ANTIMONY CONCENTRATIONS - MID BAKER CREEK (BK1)

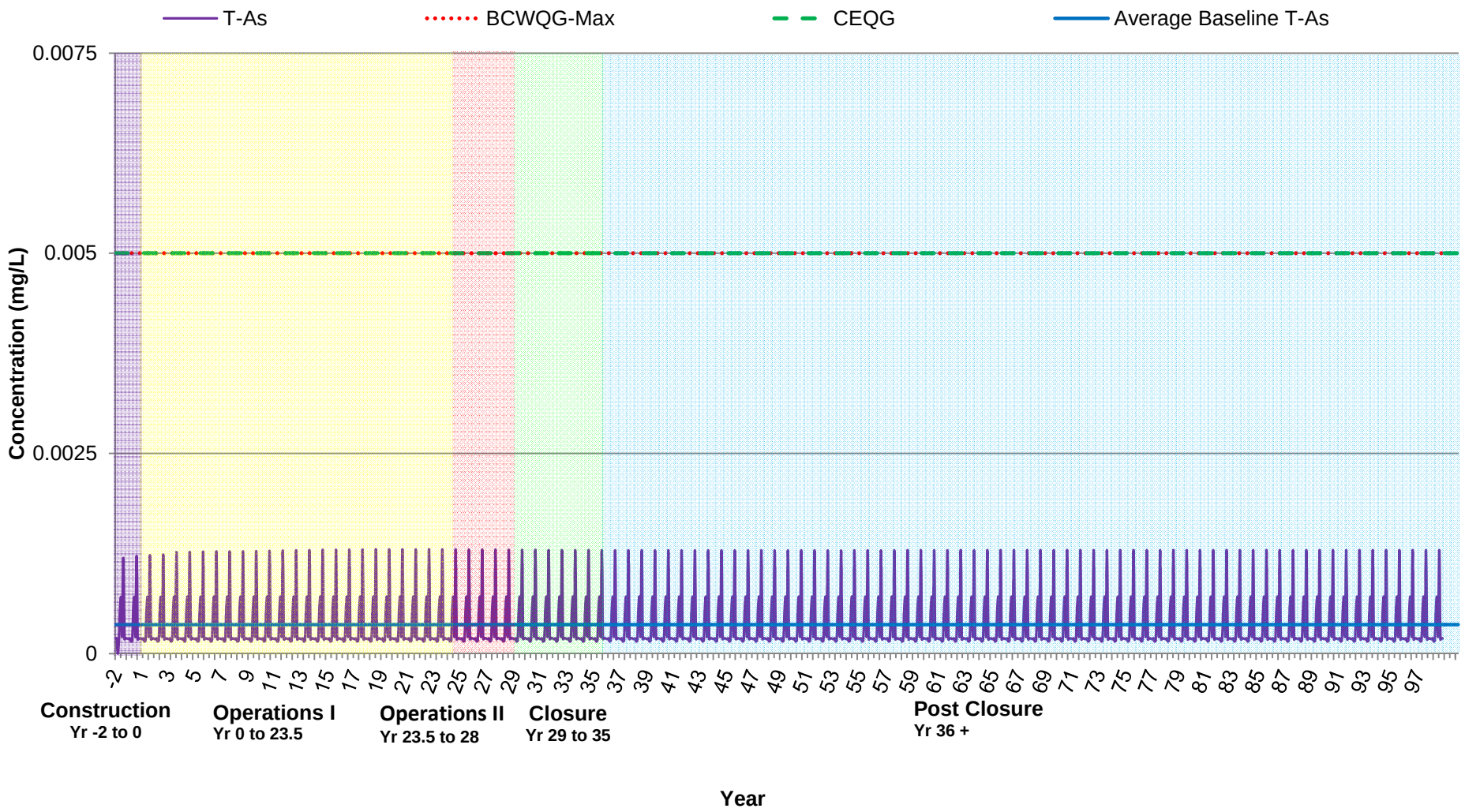
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C9.Sb

REV 0



NOTES:

1. THE BCWQG AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS BK1/BK2 (AVERAGE HARDNESS OF 101 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE ARSENIC CONCENTRATIONS - MID BAKER CREEK (BK1)

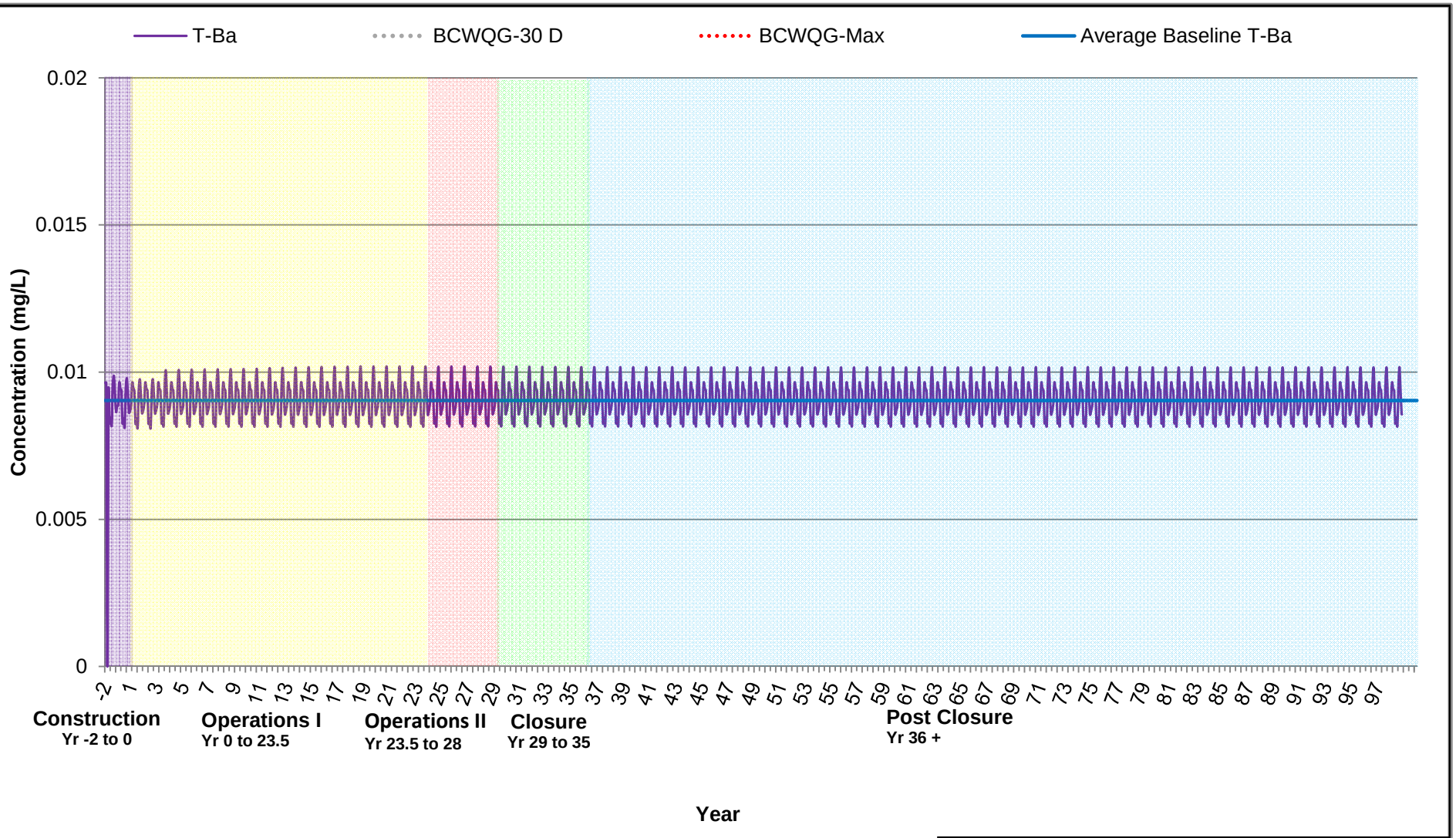
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C9.As

REV 0



NOTES:

1. THE BCWQG-MAX IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS BK1/BK2 (AVERAGE HARDNESS OF 101 mg/L).
3. THE BCWQG- 30 D (1 mg/L) AND BCWQG-MAX (5 mg/L) ARE NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE BARIUM CONCENTRATIONS - MID BAKER CREEK (BK1)

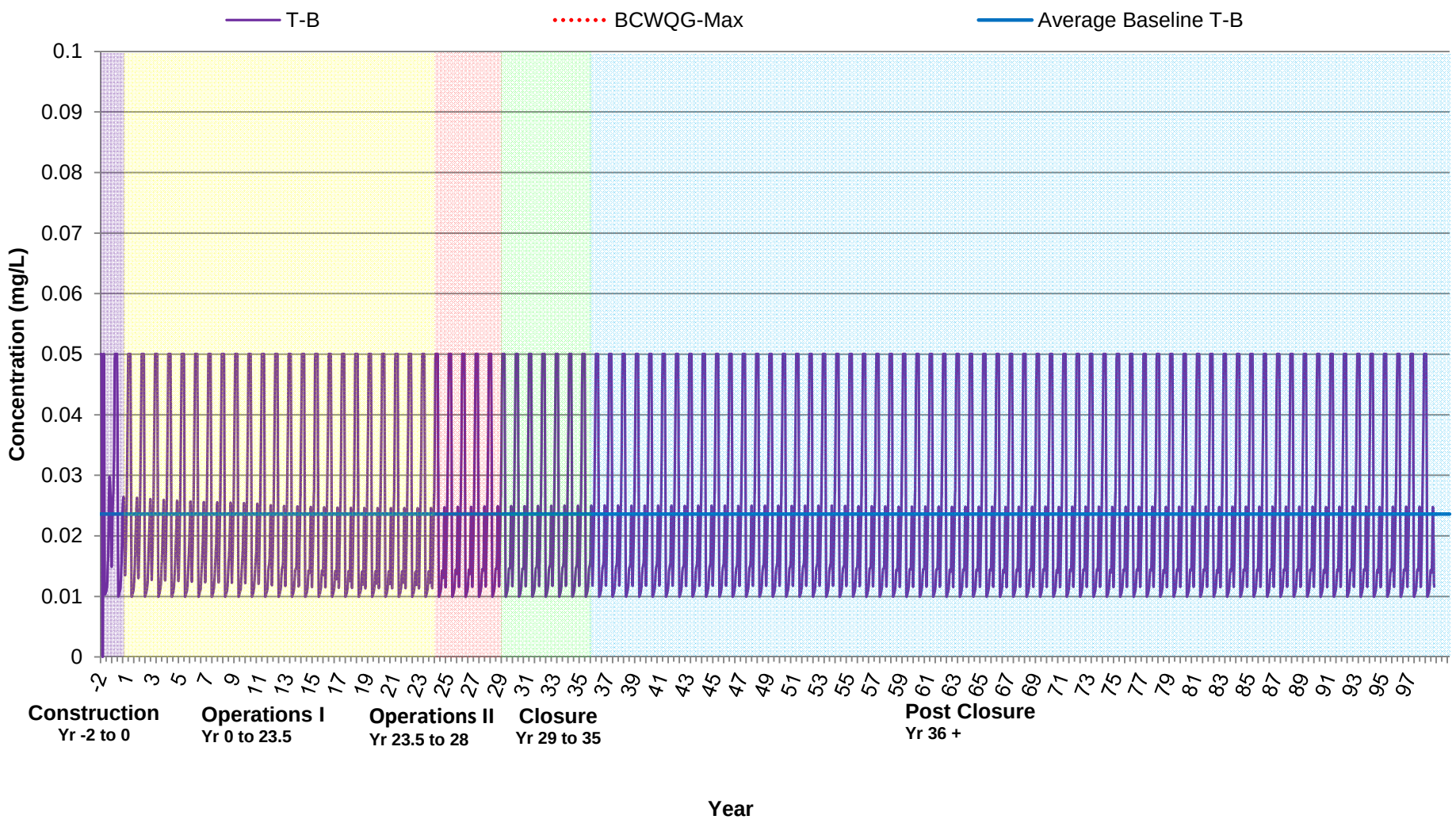
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C9.Ba

REV 0



NOTES:

1. BASELINE SITE USED FOR COMPARISON IS BK1/BK2 (AVERAGE HARDNESS OF 101 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.
3. THE BCWQG-MAX (1.2 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE BORON CONCENTRATIONS - MID BAKER CREEK (BK1)

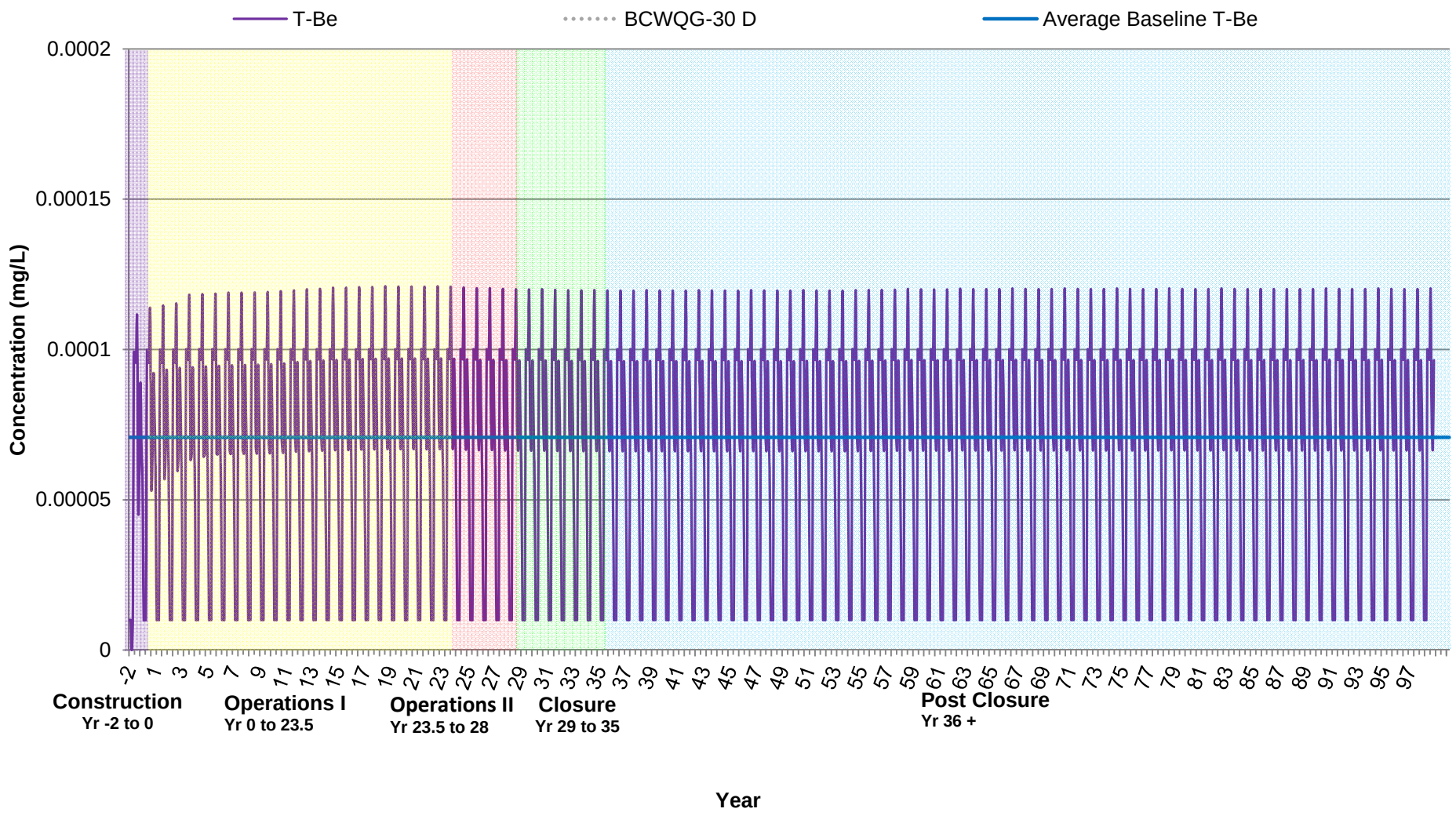
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C9.B

REV 0



NOTES:

1. THE BCWQG-MAX IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS BK1/BK2 (AVERAGE HARDNESS OF 101 mg/L).
3. THE BCWQG-30 D (0.0053 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE BERYILLIUM CONCENTRATIONS - MID BAKER CREEK (BK1)

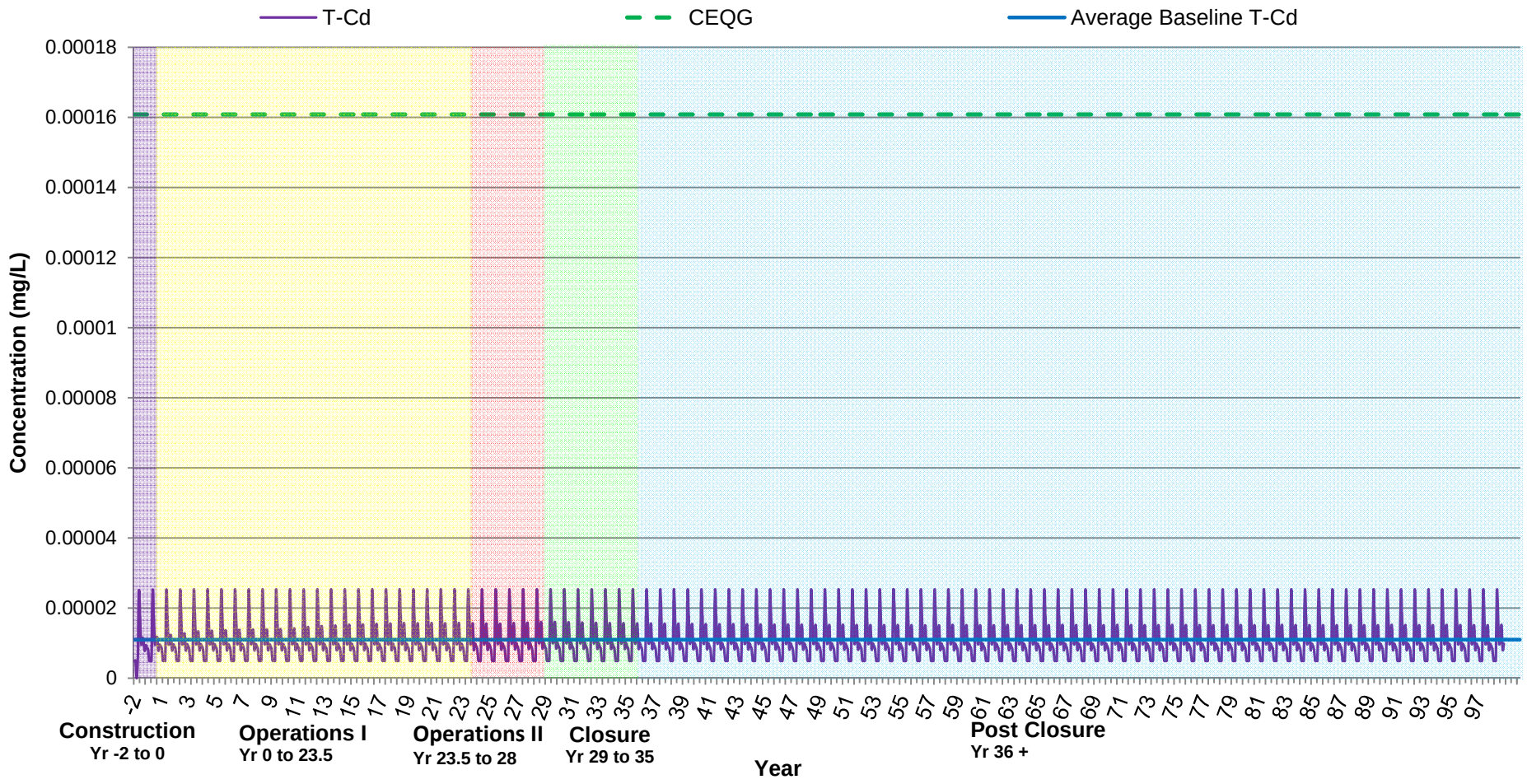
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C9.Be

REV 0



NOTES:

1. BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS BK1/BK2 (AVERAGE HARDNESS OF 101 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE CADMIUM CONCENTRATIONS - MID BAKER CREEK (BK1)

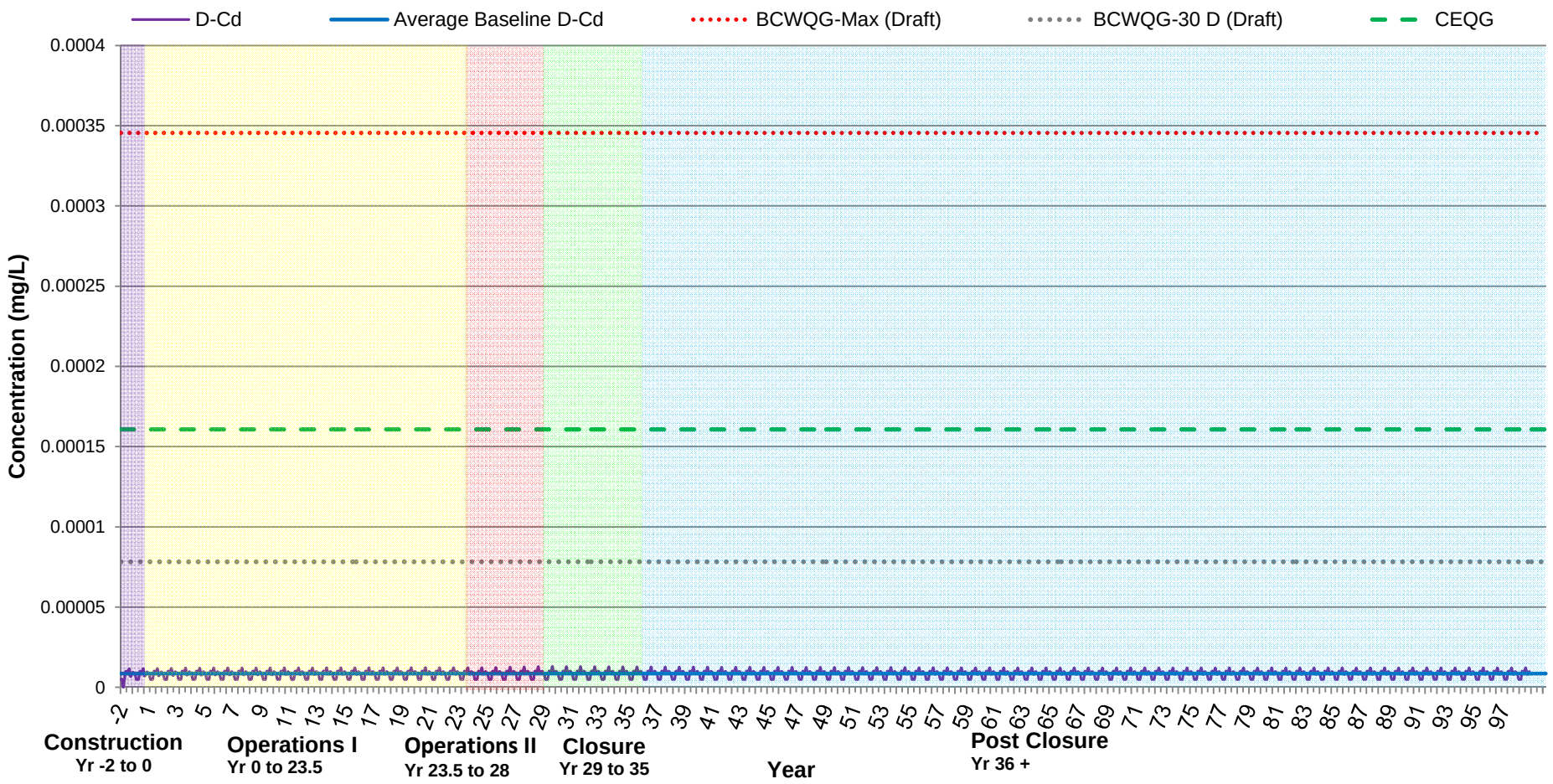
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C9.Cd-T

REV 0



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. THE BCWQG ARE DRAFT GUIDELINES UNDER REVIEW (JUNE 2014).
3. BASELINE SITE USED FOR COMPARISON IS BK1/BK2 (AVERAGE HARDNESS OF 101 mg/L).
4. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE CADMIUM CONCENTRATIONS - MID BAKER CREEK (BK1)

Knight Piésold CONSULTING

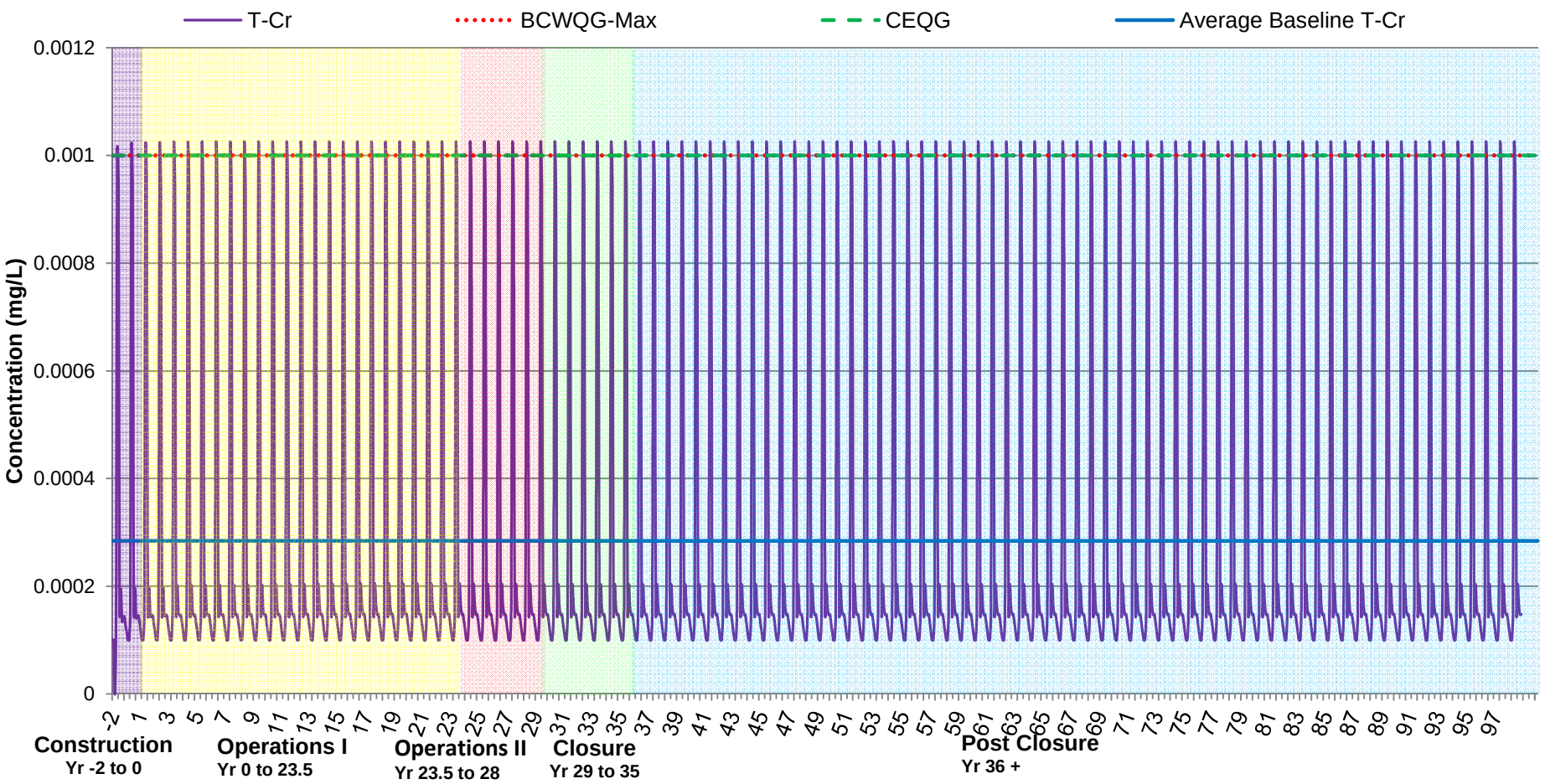
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C9.Cd-D

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. GUIDELINES ARE FOR CHROMIUM (IV), THE SPECIES MOST COMMON IN WELL OXYGENATED SURFACE WATERS.
2. BASELINE SITE USED FOR COMPARISON IS BK1/BK2 (AVERAGE HARDNESS OF 101 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE CHROMIUM CONCENTRATIONS - MID BAKER CREEK (BK1)

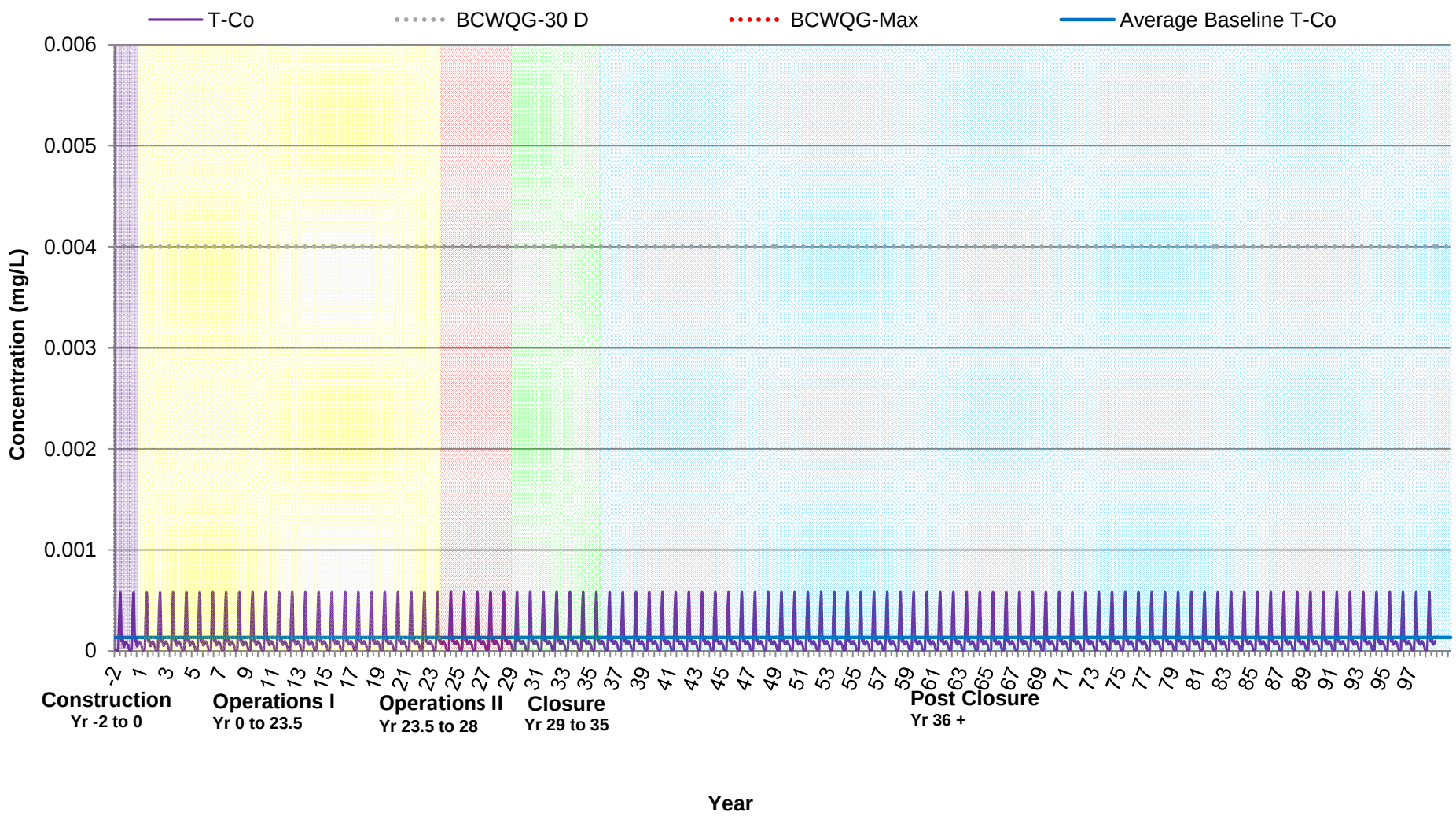
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C9.Cr

REV 0



NOTES:

1. THE BCWQG-30 D AND BCWQG-MAX ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS BK1/BK2 (AVERAGE HARDNESS OF 101 mg/L).
3. THE BCWQG-MAX GUIDELINE (0.11 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE COBALT CONCENTRATIONS - MID BAKER CREEK (BK1)

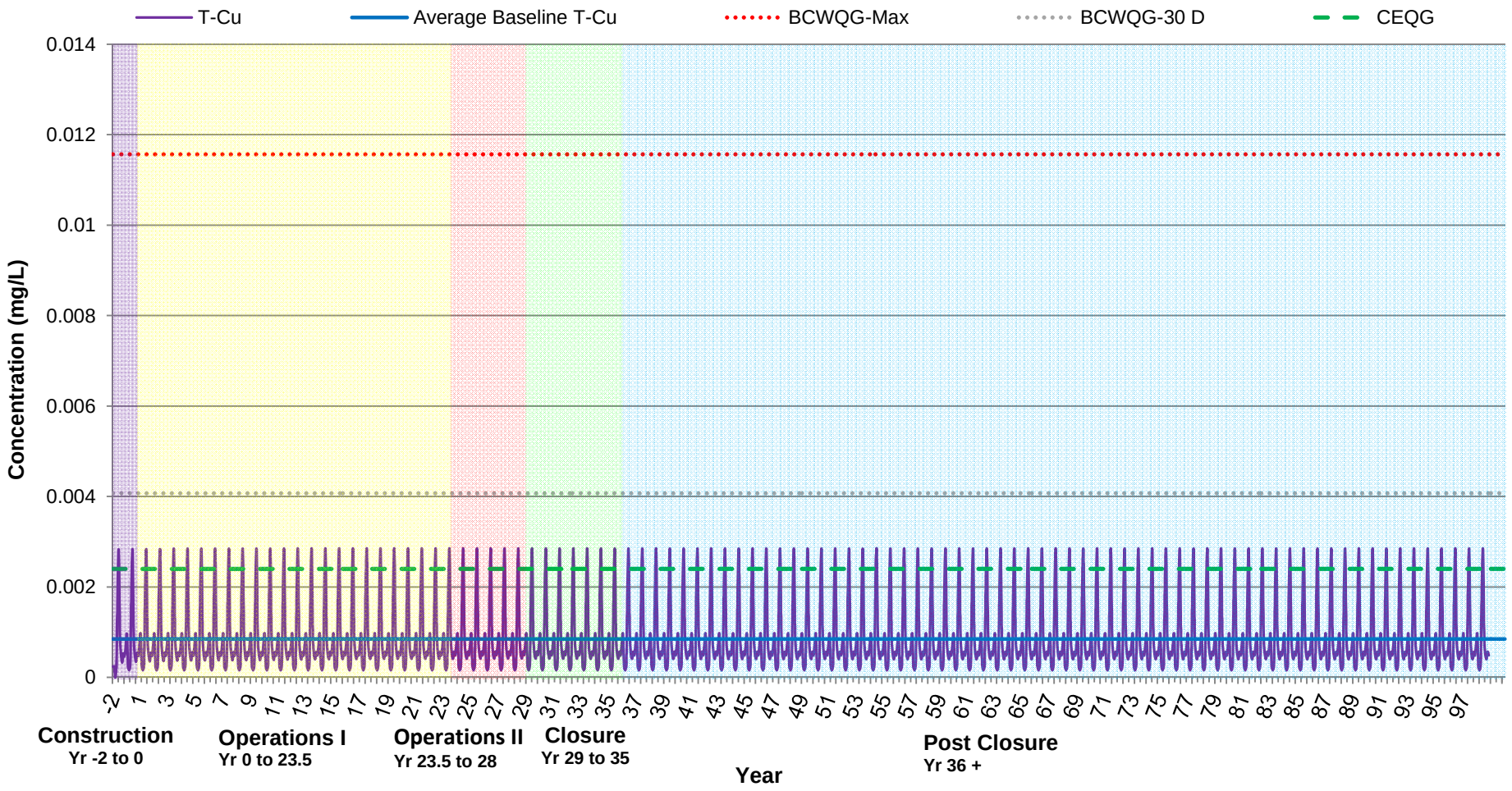
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C9.Co

REV 0



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS BK1/BK2 (AVERAGE HARDNESS OF 101 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE COPPER CONCENTRATIONS - MID BAKER CREEK (BK1)

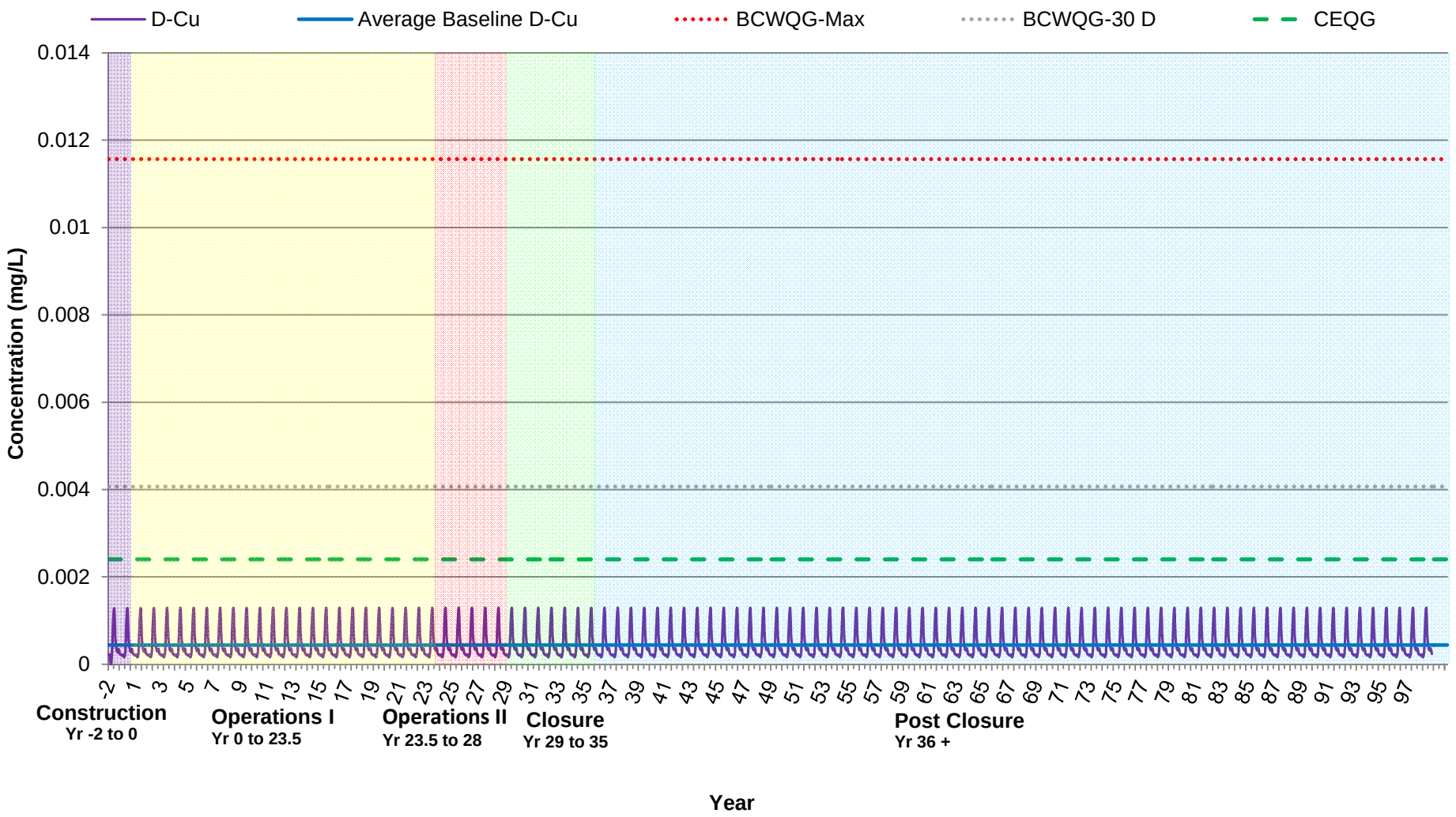
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C9.Cu-T

REV 0



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS BK1/BK2 (AVERAGE HARDNESS OF 101 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE COPPER CONCENTRATIONS - MID BAKER CREEK (BK1)

Knight Piésold CONSULTING

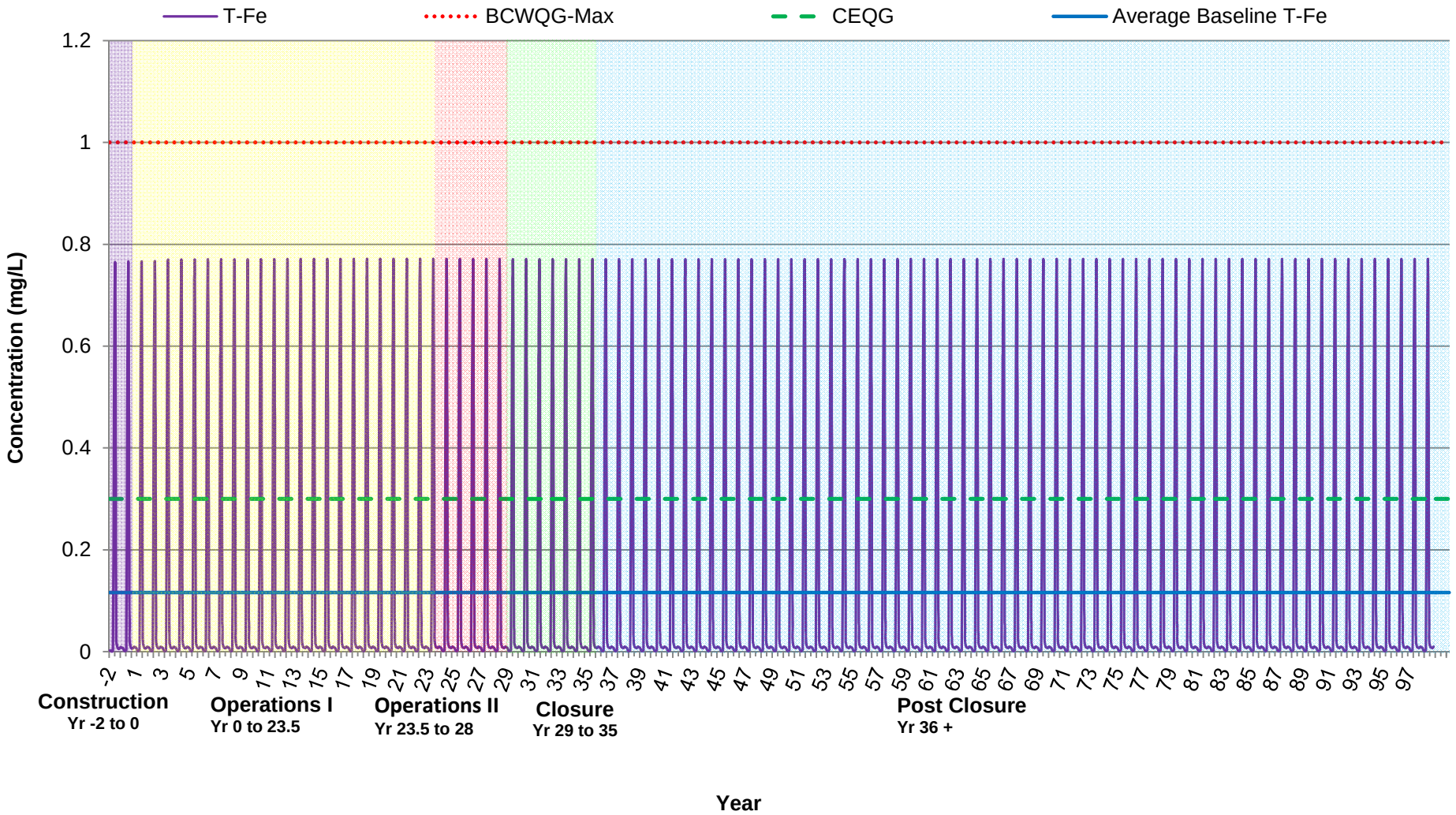
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C9.Cu-D

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS BK1/BK2 (AVERAGE HARDNESS OF 101 mg/L).
3. BCWQG-MAX 1.0 mg/L IS NOT SHOWN ON GRAPH.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE TOTAL IRON CONCENTRATIONS - MID BAKER CREEK (BK1)

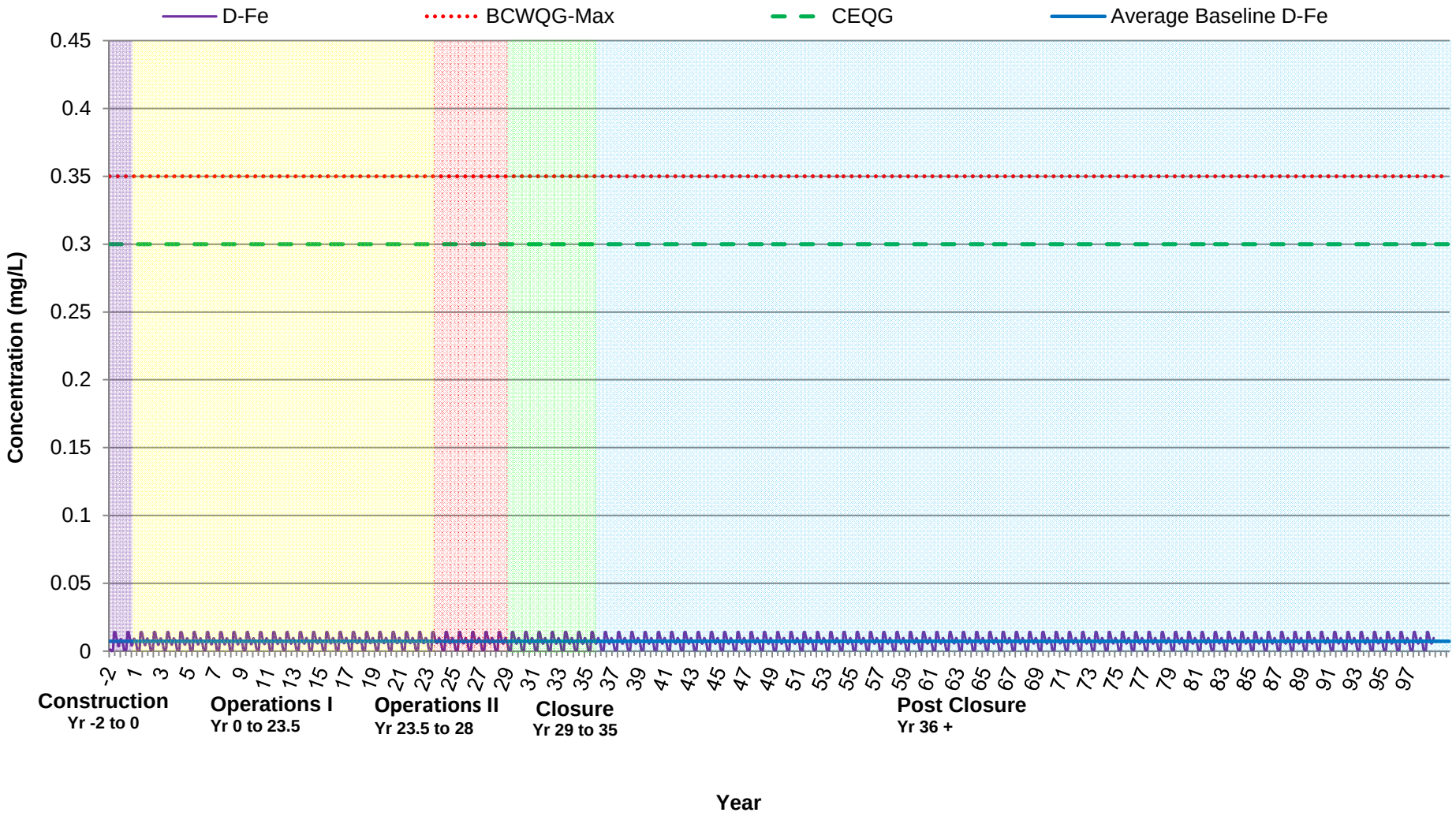
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C9.Fe-T

REV 0



NOTES:

1. THE BCWQG-MAX AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS BK1/BK2 (AVERAGE HARDNESS OF 101 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE DISSOLVED IRON CONCENTRATIONS - MID BAKER CREEK (BK1)

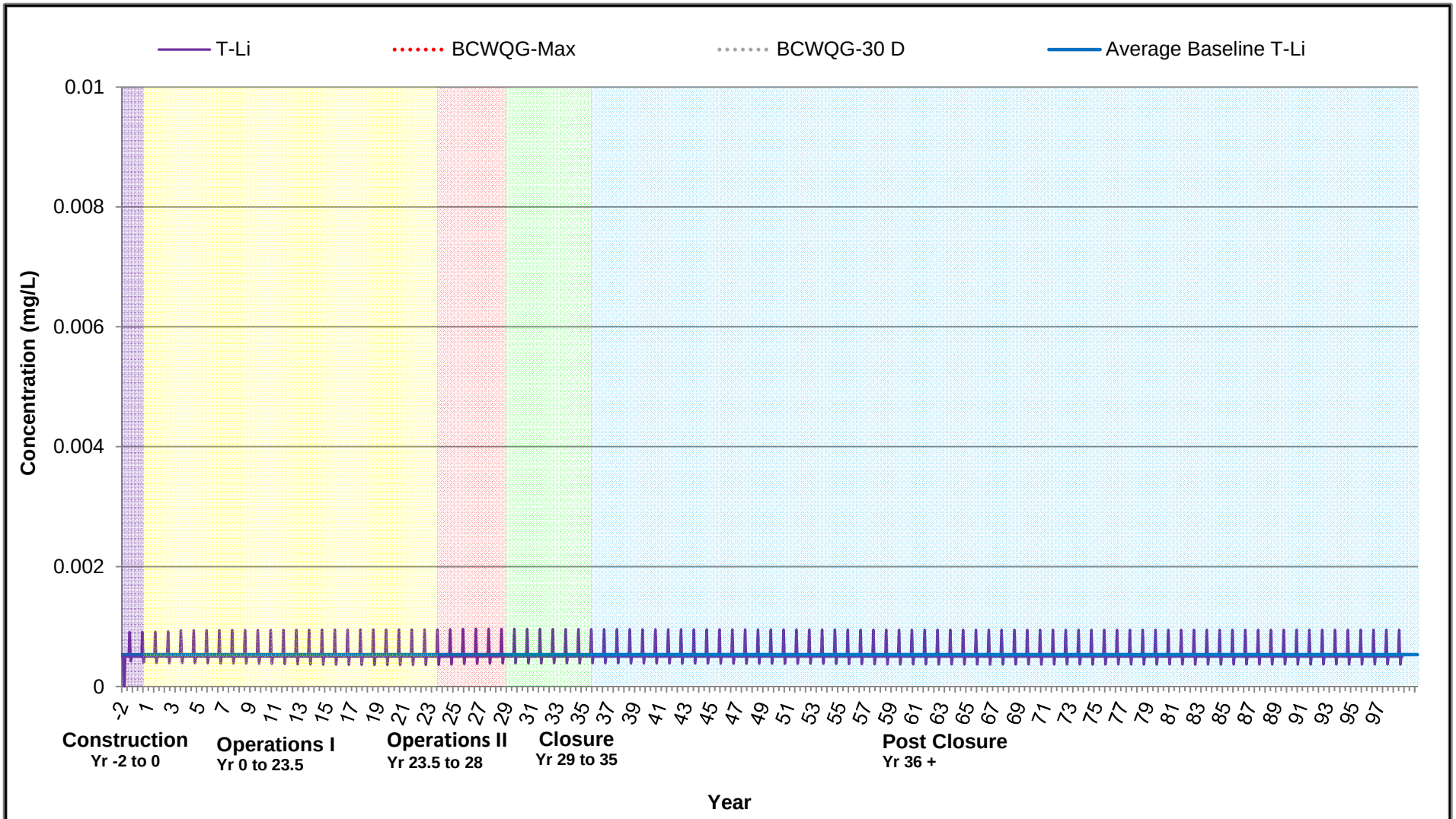
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C9.Fe-D

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS BK1/BK2 (AVERAGE HARDNESS OF 101 mg/L).
3. THE BCWQG-30 D (0.096 mg/L) AND BCWQG-MAX (0.87 mg/L) ARE INTERIM (WORKING) AND ARE NOT SHOWN ON GRAPH.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE LITHIUM CONCENTRATIONS - MID BAKER CREEK (BK1)

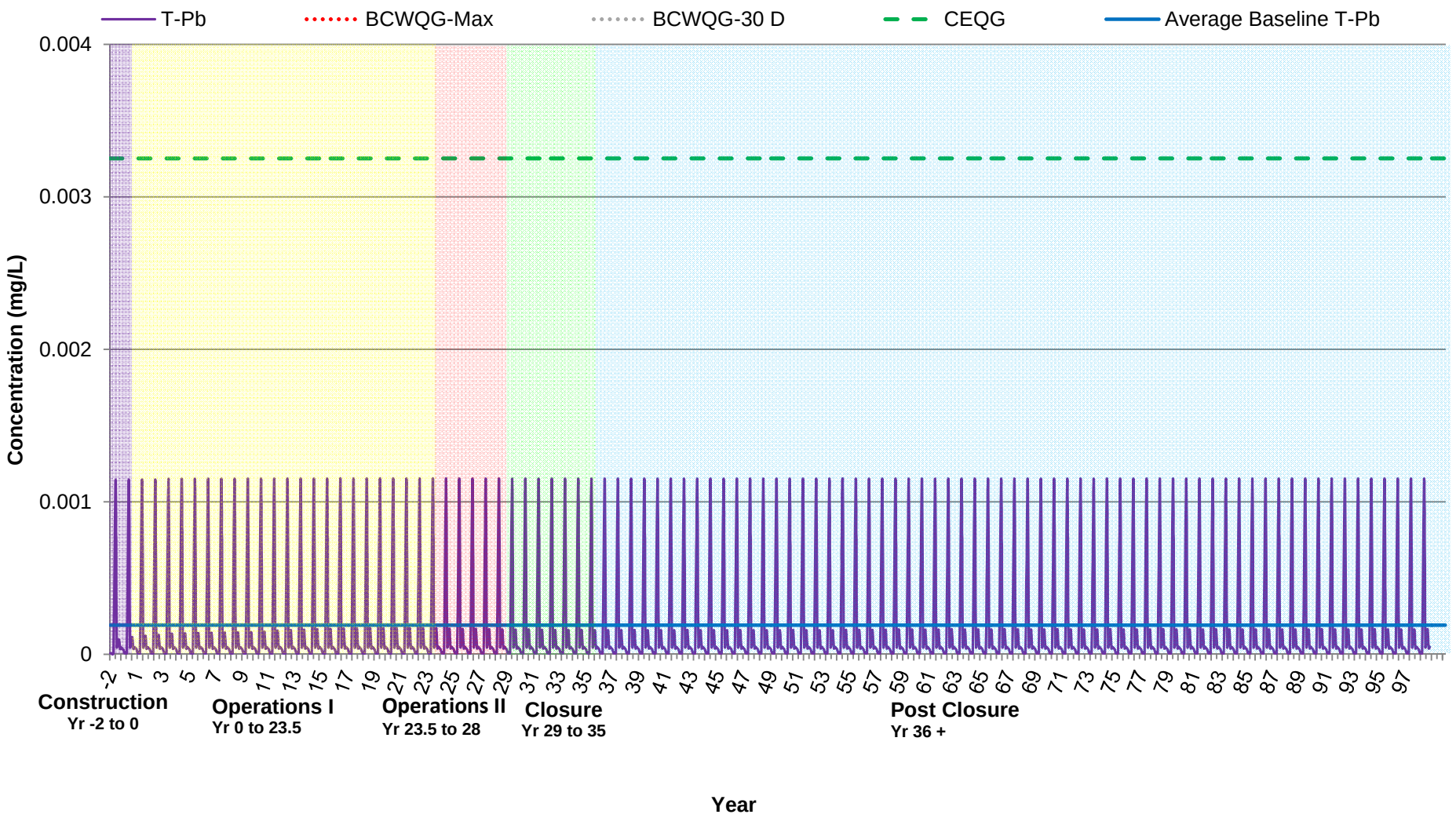
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C9.Li

REV 0



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS BK1/BK2 (AVERAGE HARDNESS OF 101 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.
4. THE BCWQG-MAX (CALCULATED AT 0.011 mg/L) IS NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE LEAD CONCENTRATIONS - MID BAKER CREEK (BK1)

Knight Piésold CONSULTING

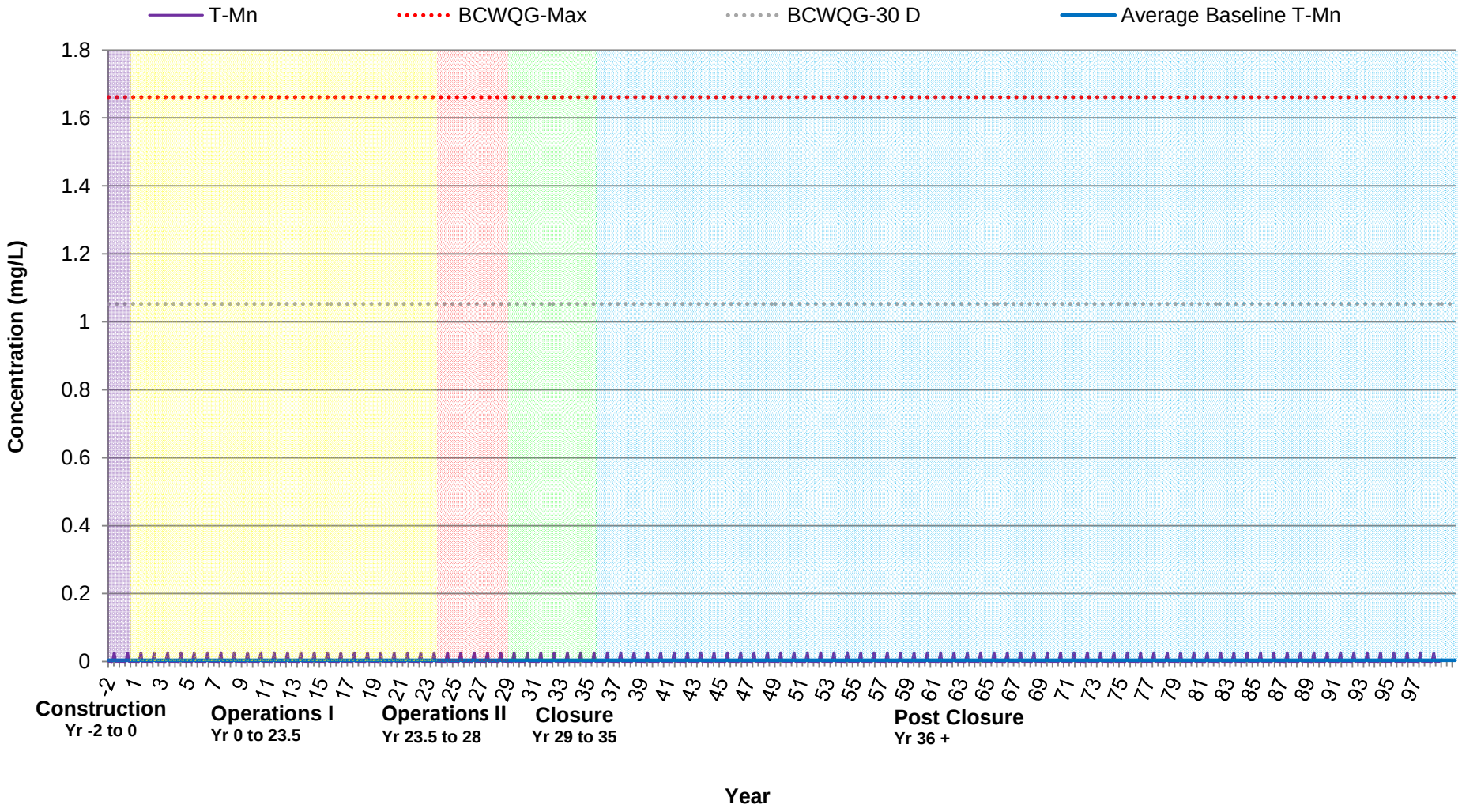
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C9.Pb

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS BK1/BK2 (AVERAGE HARDNESS OF 101 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE MANGANESE CONCENTRATIONS - MID BAKER CREEK (BK1)

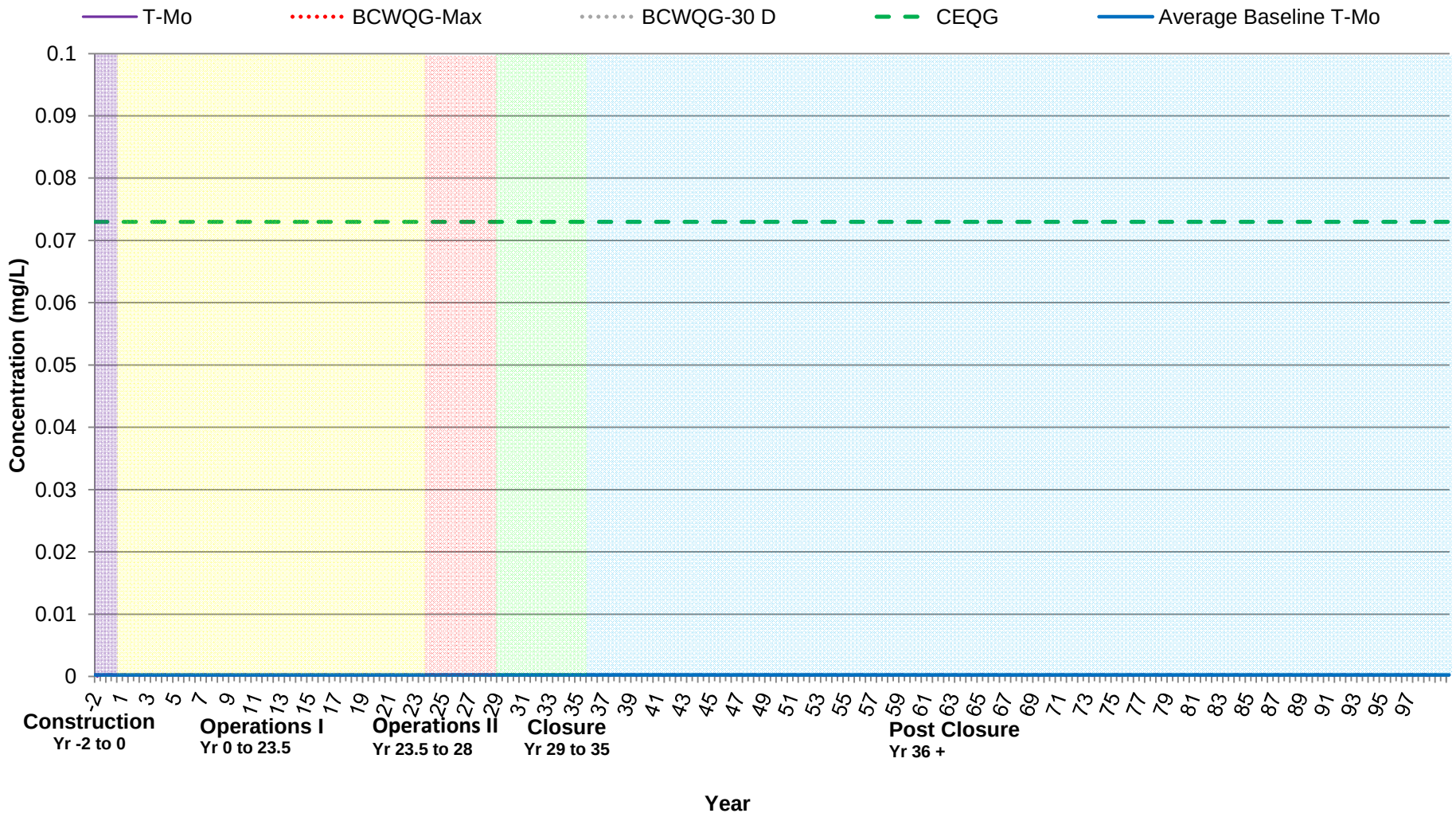
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C9.Mn

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS BK1/BK2 (AVERAGE HARDNESS OF 101 mg/L).
3. THE BCWQG-MAX (2 mg/L) AND BCWQG-30 D (1 mg/L) ARE NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE MOLYDBENUM CONCENTRATIONS - MID BAKER CREEK (BK1)

Knight Piésold CONSULTING

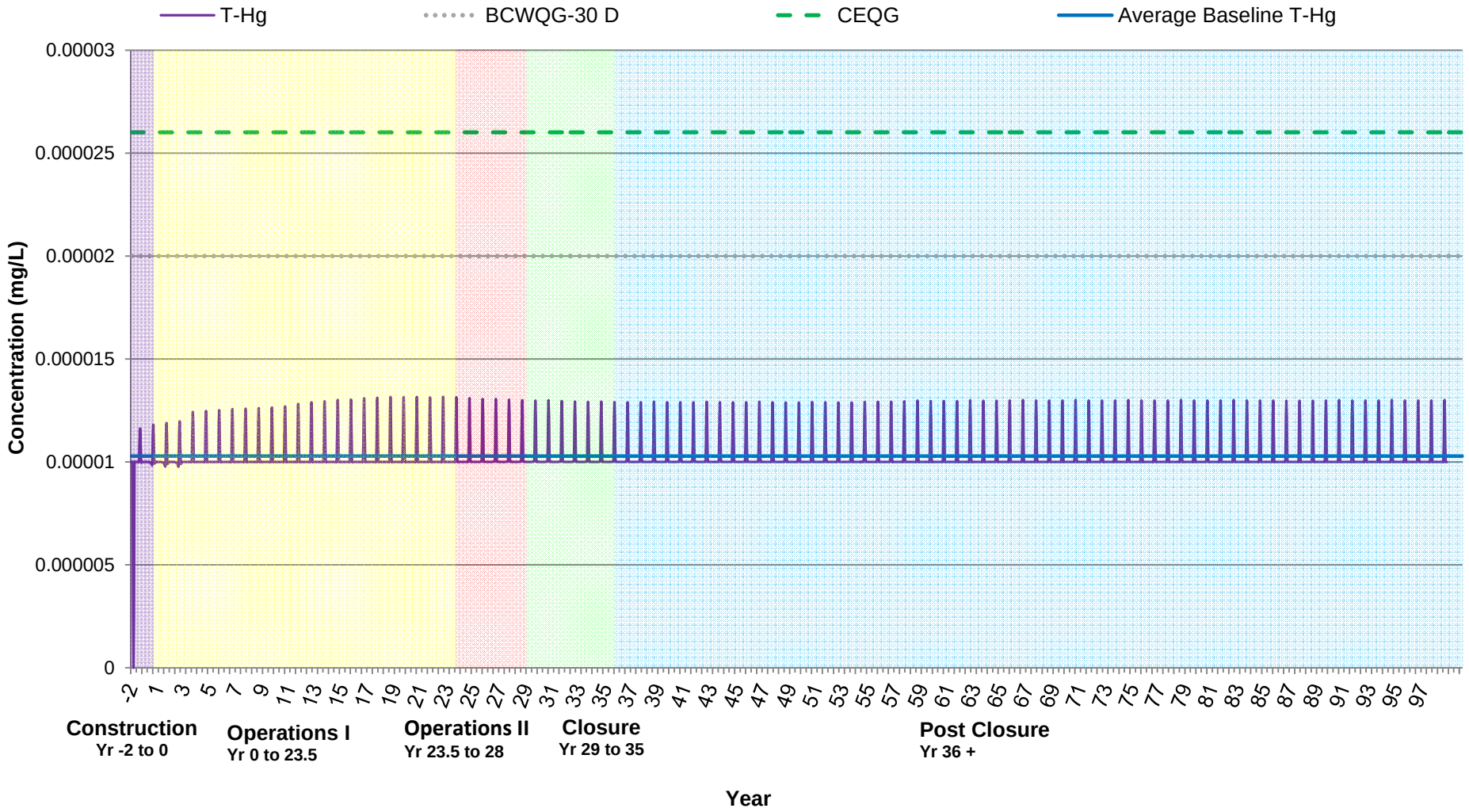
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C9.Mo

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-30 D AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS BK1/BK2 (AVERAGE HARDNESS OF 101 mg/L).
3. BCWQG-30 D VALUE APPLIED ON ASSUMPTION THAT METHYL-Hg IS EQUAL TO 0.5% OF T-Hg.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE MERCURY CONCENTRATIONS - MID BAKER CREEK (BK1)

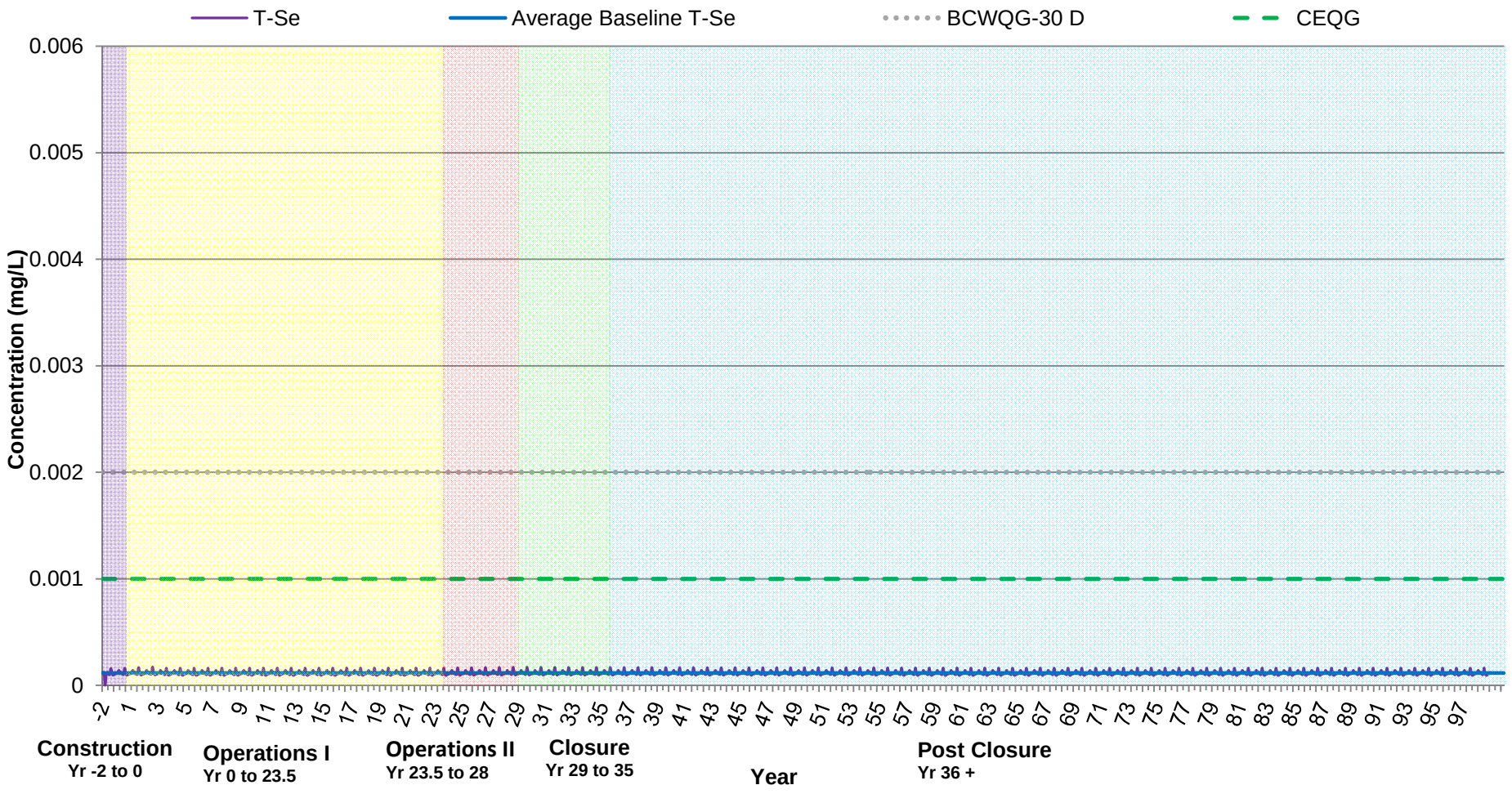
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C9.Hg

REV 0



NOTES:

1. THE BCWQG-30 D AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS BK1/BK2 (AVERAGE HARDNESS OF 101 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE SELENIUM CONCENTRATIONS - MID BAKER CREEK (BK1)

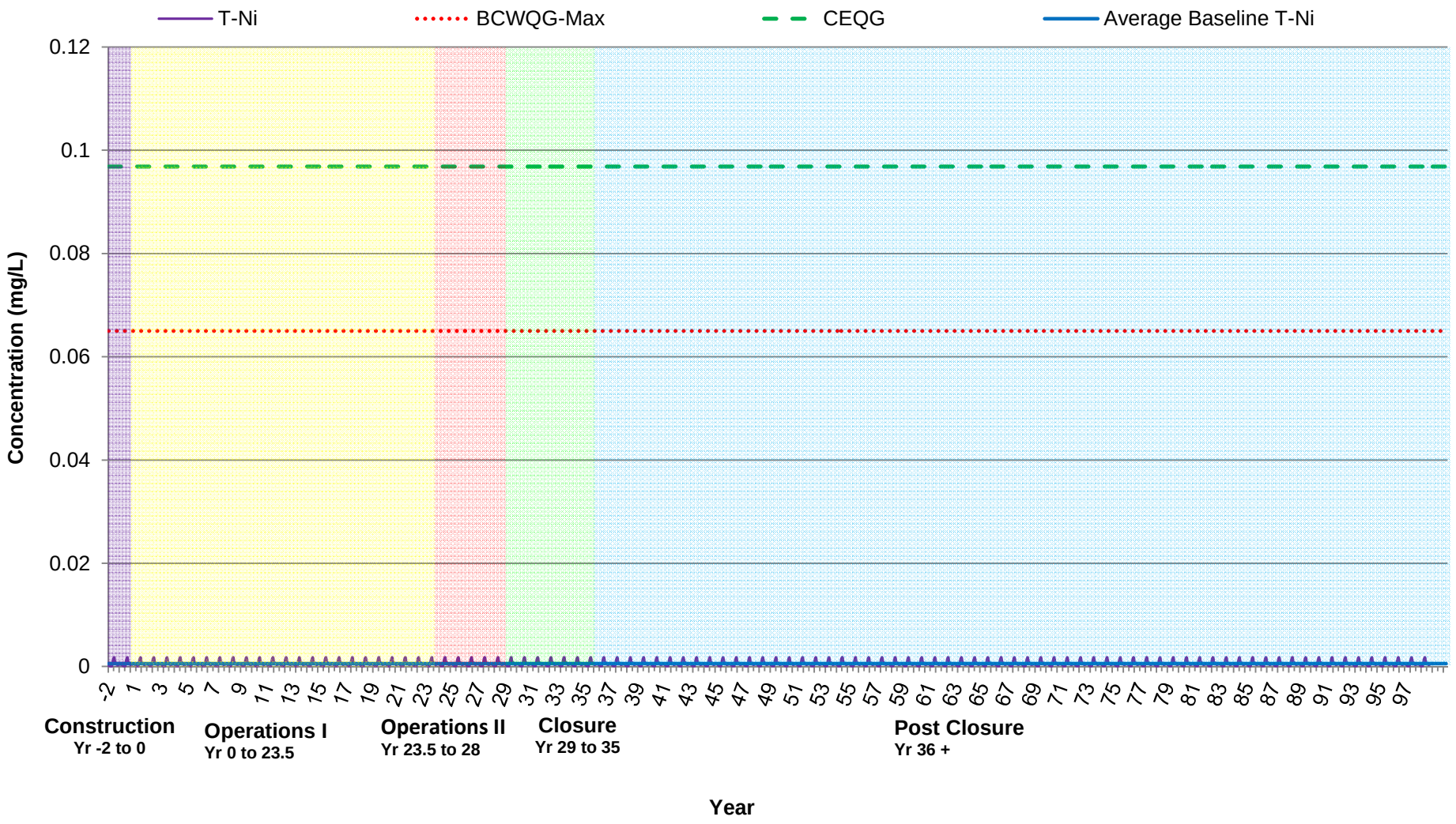
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C9.Se

REV 0



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS BK1/BK2 (AVERAGE HARDNESS OF 101 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE NICKEL CONCENTRATIONS - MID BAKER CREEK (BK1)

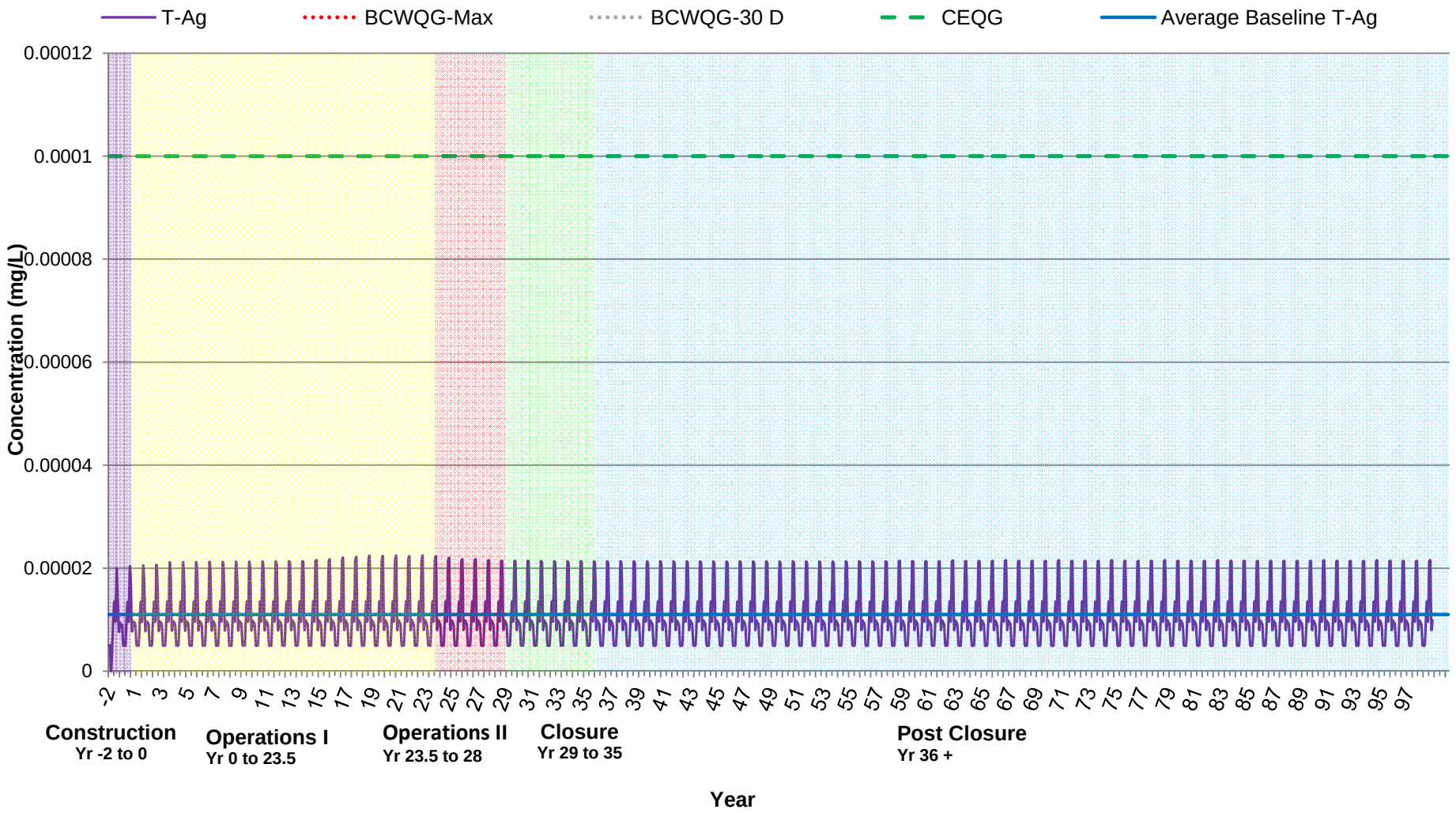
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C9.Ni

REV 0



NOTES:

1. THE BCWQG-30 D AND BCWQG-MAX ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS BK1/BK2 (AVERAGE HARDNESS OF 101 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE SILVER CONCENTRATIONS - MID BAKER CREEK (BK1)

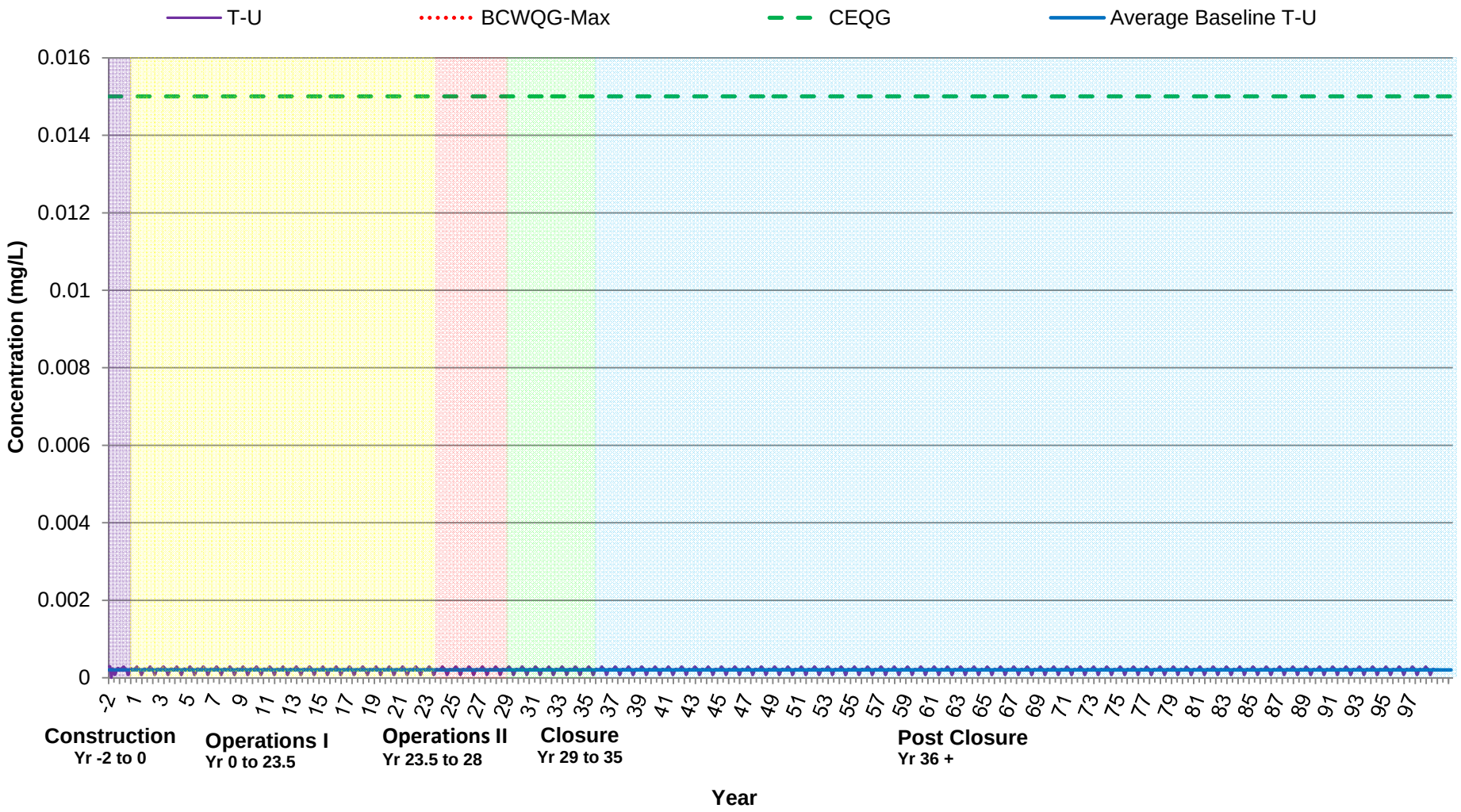
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C9.Ag

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS BK1/BK2 (AVERAGE HARDNESS OF 101 mg/L).
3. THE BCWQG-MAX (0.3 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE URANIUM CONCENTRATIONS - MID BAKER CREEK (BK1)

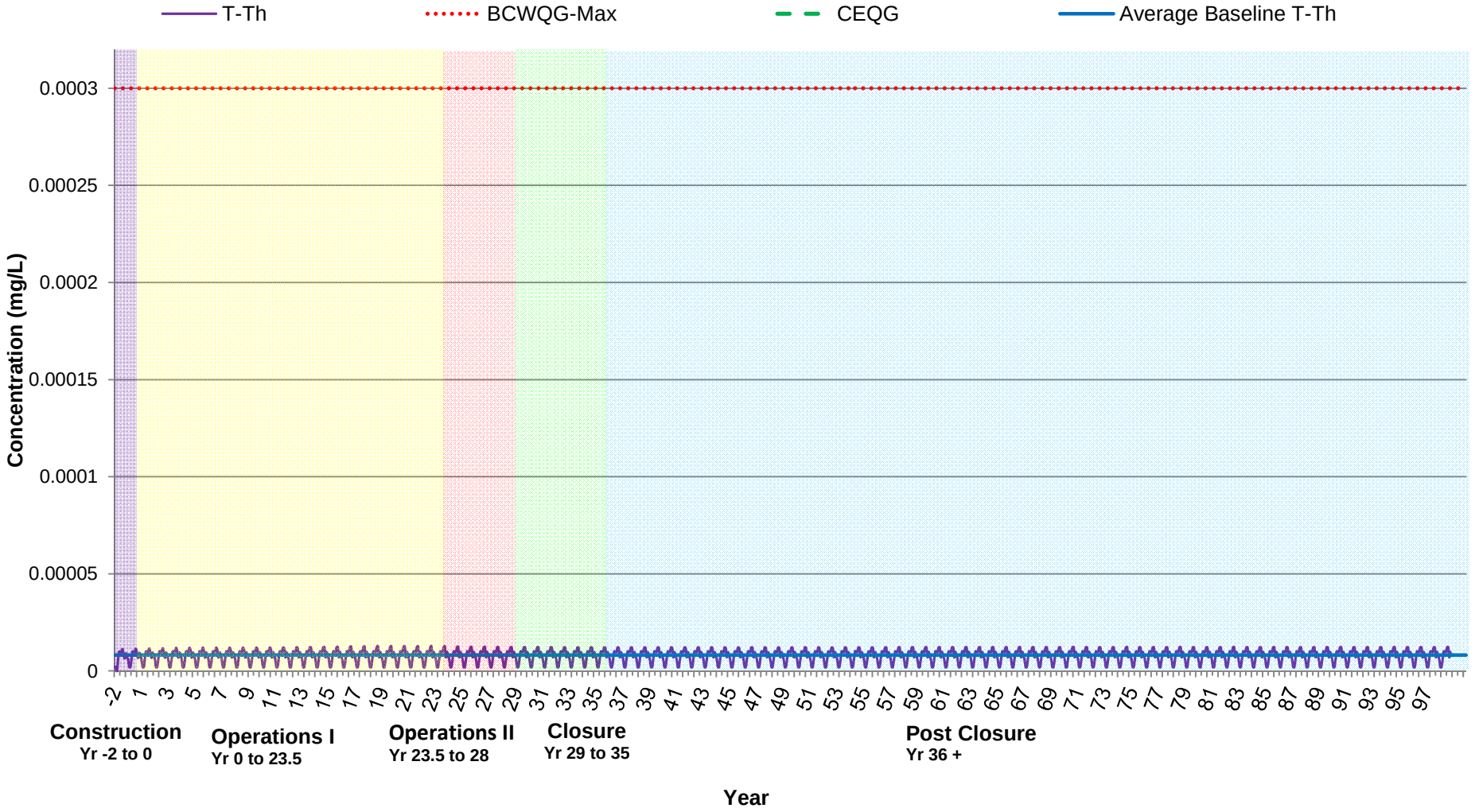
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C9.U

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS BK1/BK2 (AVERAGE HARDNESS OF 101 mg/L).
3. THE CEQG (0.0008 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE THALLIUM CONCENTRATIONS - MID BAKER CREEK (BK1)

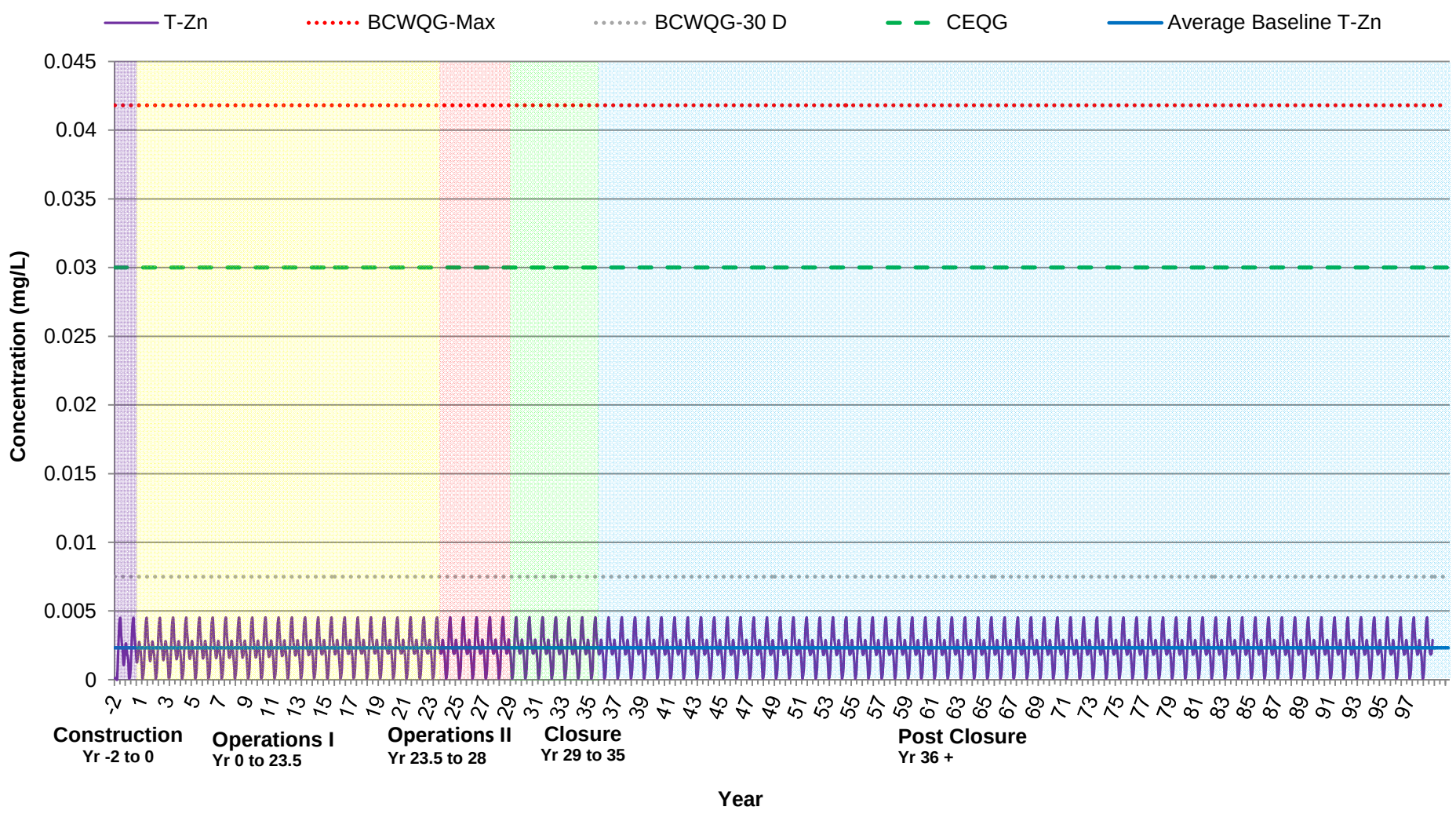
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P/A NO. VA101-458/14

REF. NO. 3

FIGURE C9.Th

REV 0



NOTES:

1. BCWQG-30 D AND BCWQG-MAX ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS BK1/BK2 (AVERAGE HARDNESS OF 101 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE ZINC CONCENTRATIONS - MID BAKER CREEK (BK1)

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P/A NO. VA101-458/14

REF. NO. 3

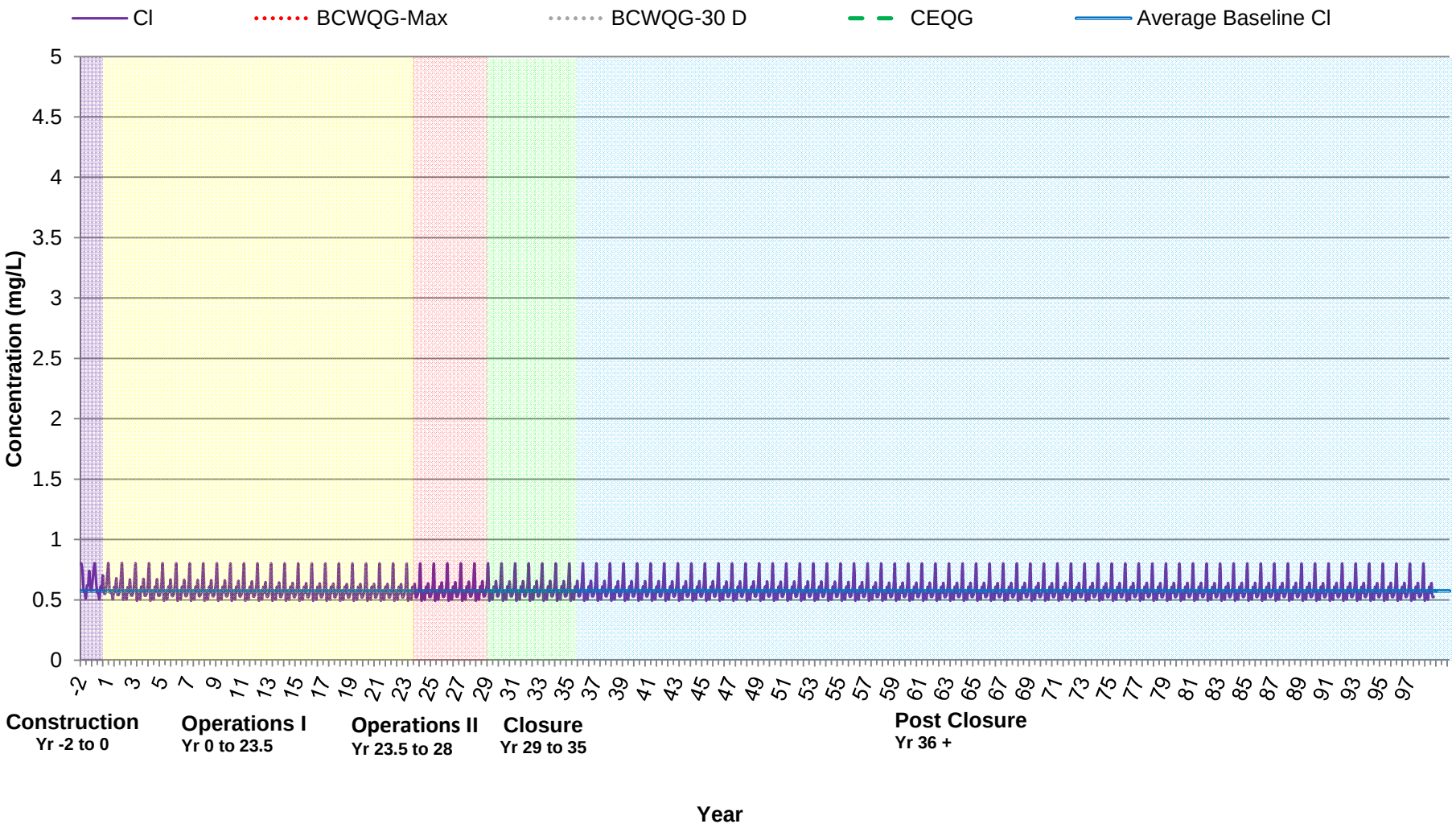
FIGURE C9.Zn

REV 0

APPENDIX C10

BAKER CREEK ABOVE NORTH THOMPSON RIVER (BK0)

(Pages C10-1 to C10-30)



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS BK0 (AVERAGE HARDNESS OF 144 mg/L).
3. ALL GUIDELINES ARE NOT SHOWN: BCWQG-30 D (150 mg/L); BCWQG-MAX (600 mg/L); CEQG (120 mg/L AND 640 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	3OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE CHLORIDE CONCENTRATIONS - LOWER BAKER CREEK (BK0)

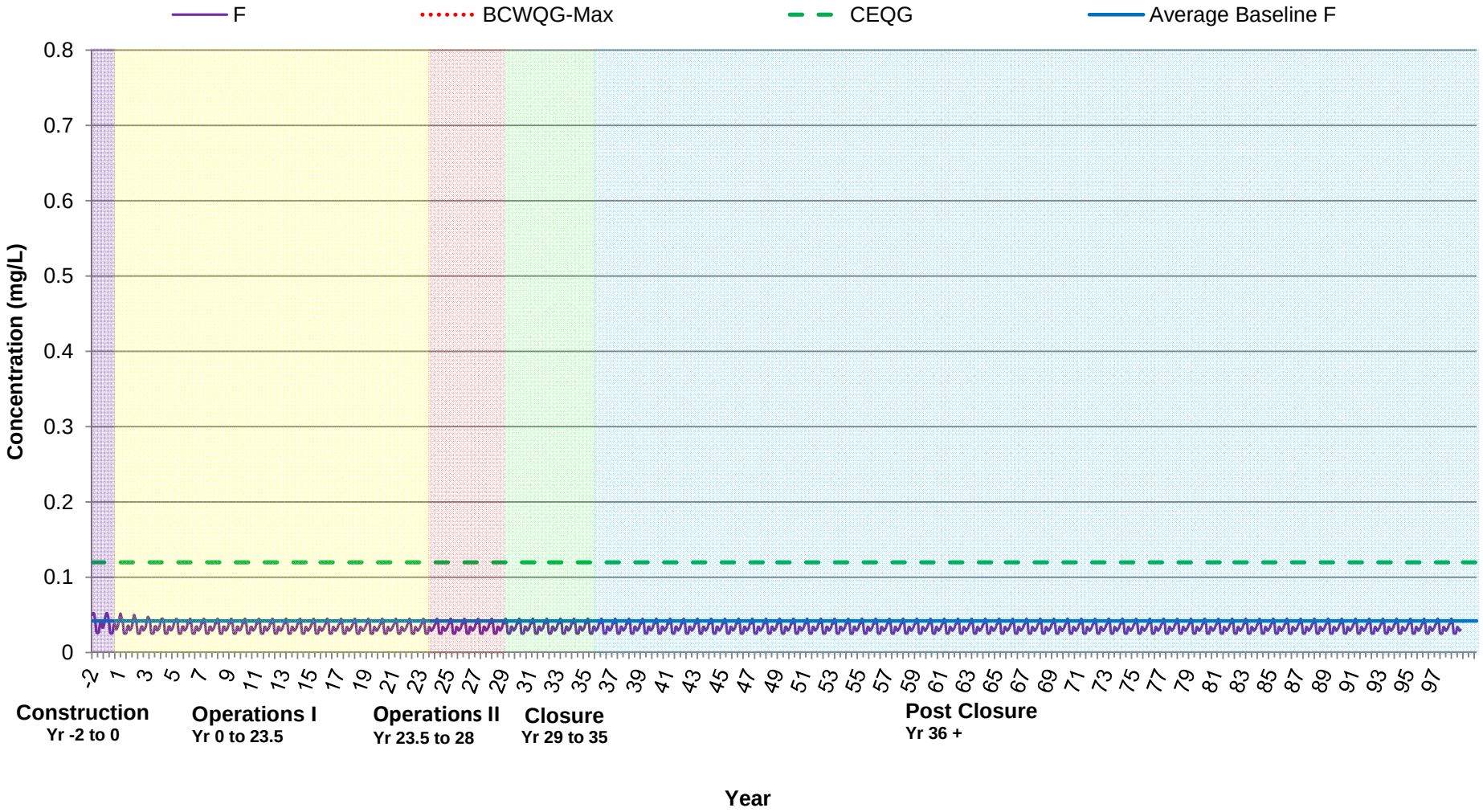
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C10.Cl

REV 0



NOTES:

1. THE BCWQG-MAX IS HARNDESS DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS BK0 (AVERAGE HARDNESS OF 144 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	3OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE FLUORIDE CONCENTRATIONS - LOWER BAKER CREEK (BK0)

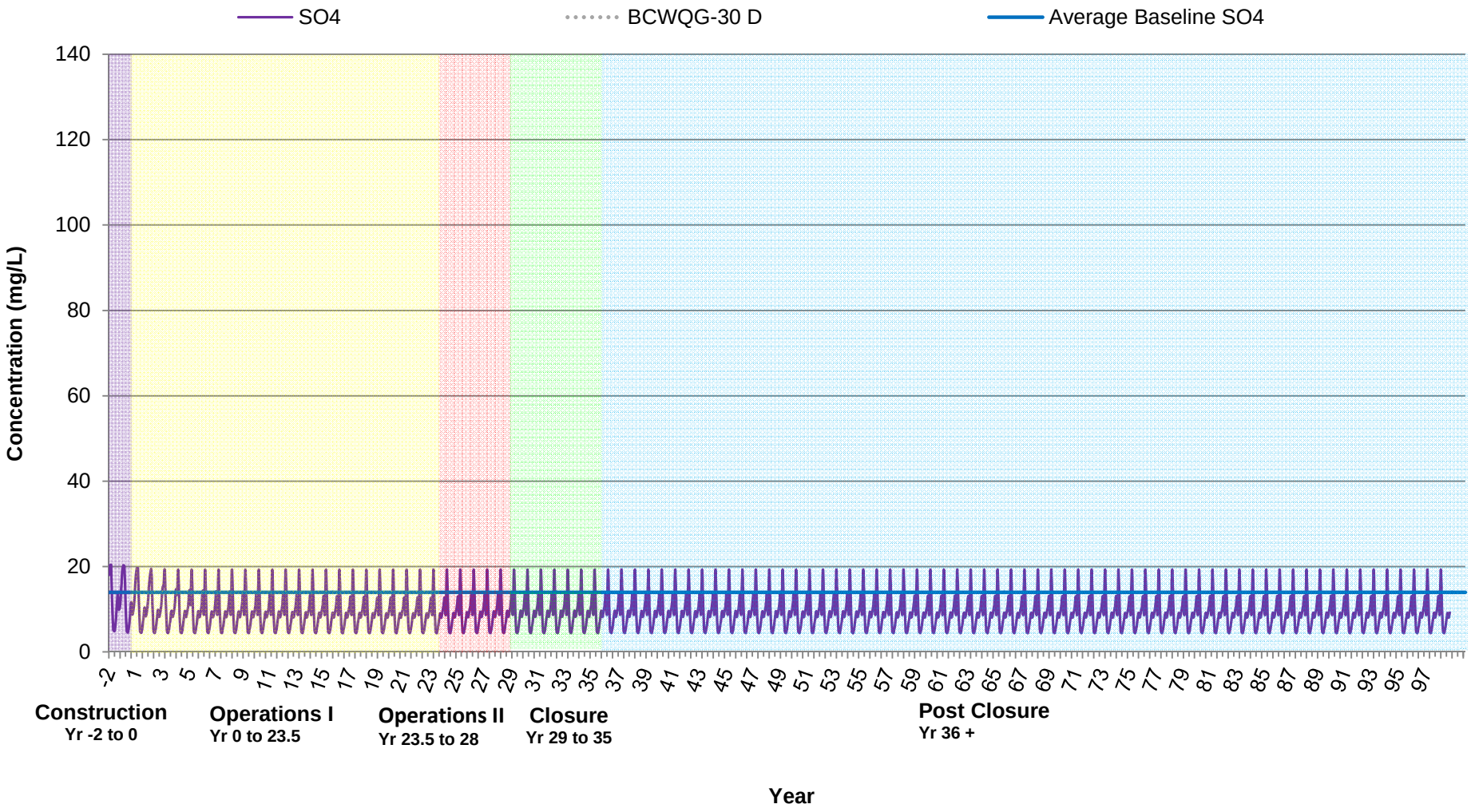
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C10.F

REV 0



NOTES:

1. BCWQG-30 D IS HARDNESS DEPEDENT.
2. BASELINE SITE USED FOR COMPARISON IS BK0 (AVERAGE HARDNESS OF 144 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	3OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE SULPHATE CONCENTRATIONS - LOWER BAKER CREEK (BK0)

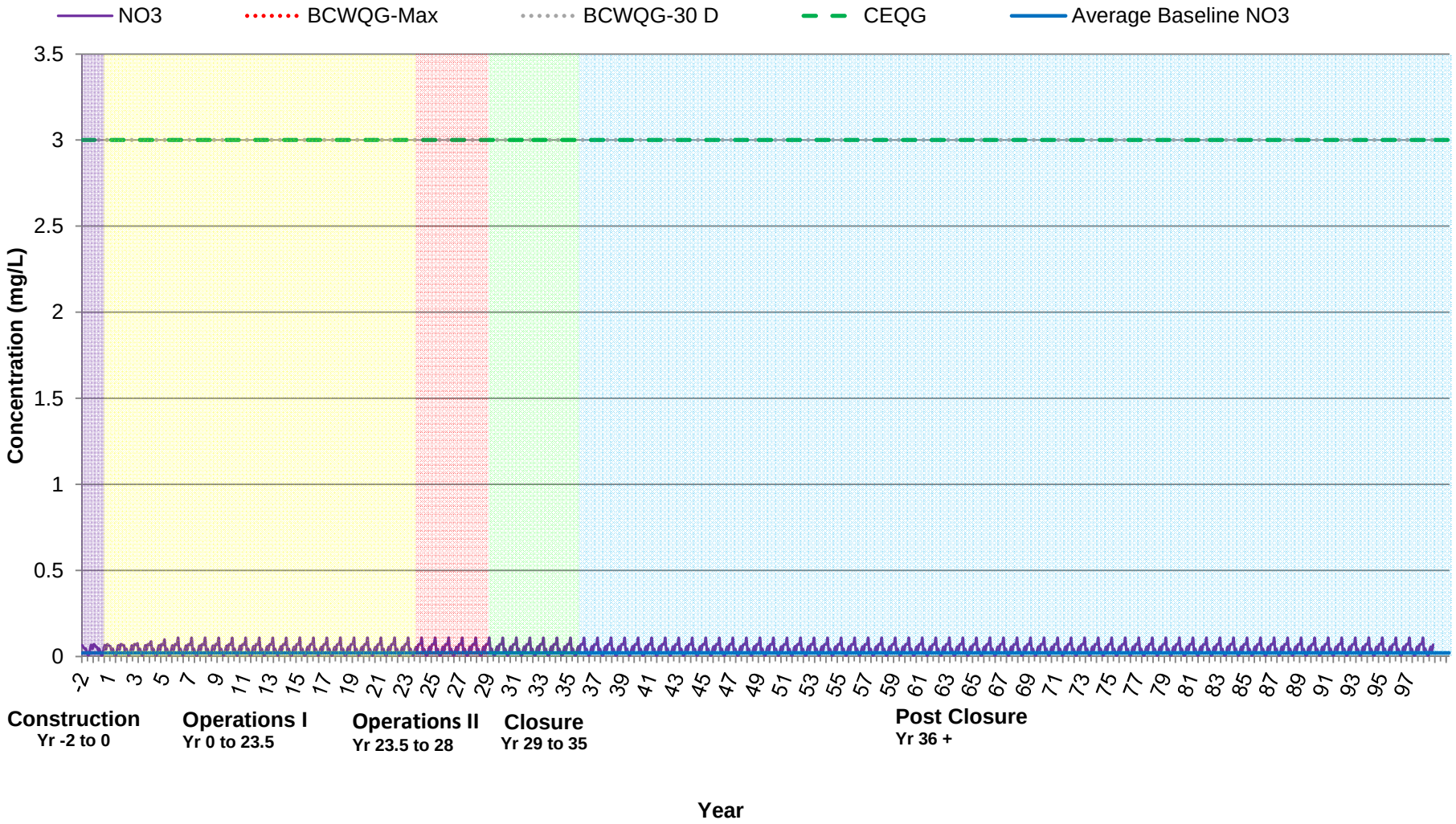
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C10.S04

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS BK0 (AVERAGE HARDNESS OF 144 mg/L).
3. THE BCWQG-MAX (32.8 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	3OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE NITRATE CONCENTRATIONS - LOWER BAKER CREEK (BK0)

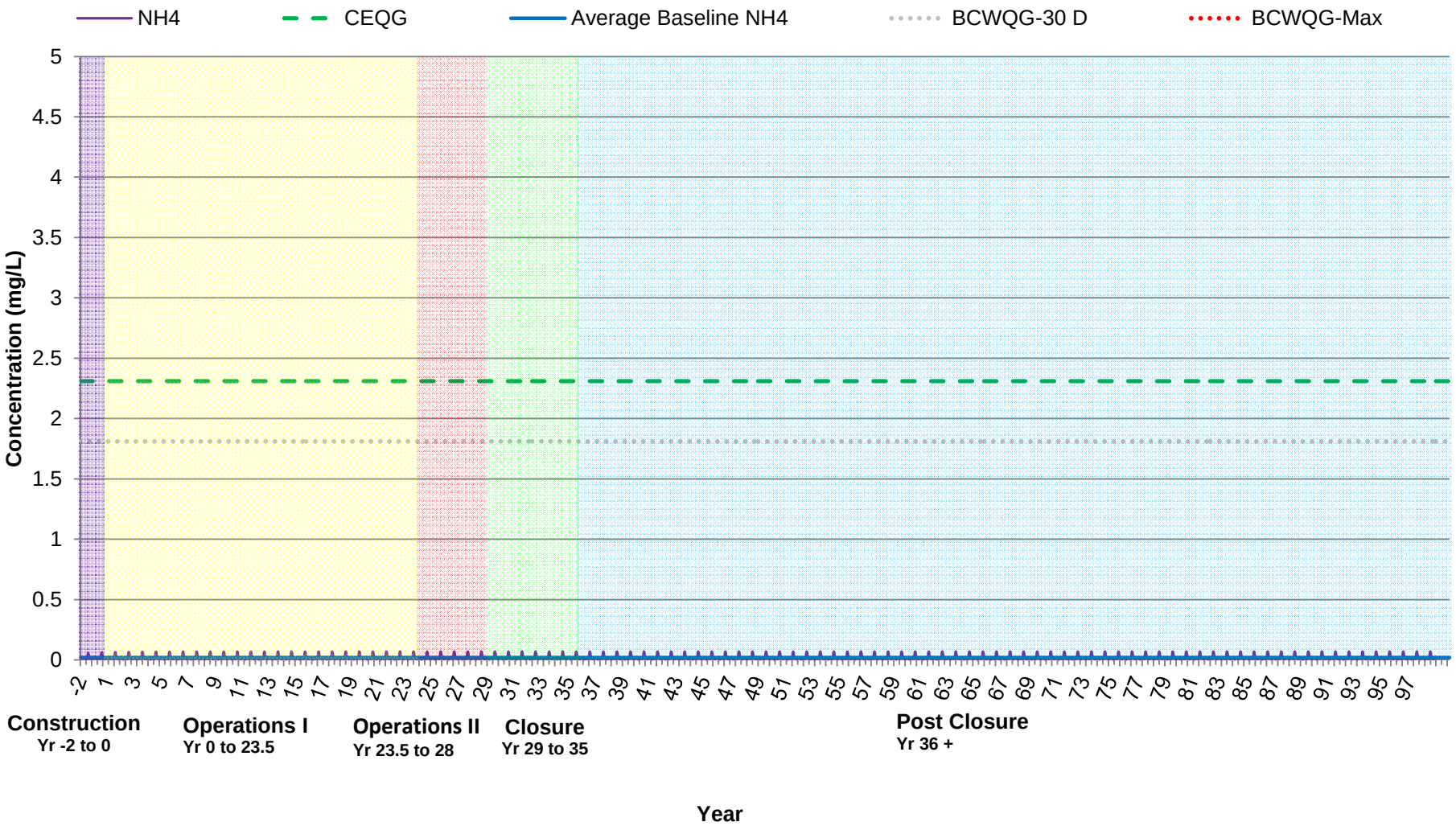
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C10.NO3

REV 0



NOTES:

1. THE BCWQG-30 D IS VALID FOR ONLY 6.5≤pH<9 AND 0°C≤T≤20°C.
2. THE BCWQG-MAX (20.15 mg/L) VALID FOR 6.5≤pH<9 IS NOT SHOWN.
3. THE CEQG IS TO BE USED WITH CAUTION FOR WATER WITH T<5°C AND pH>9.
4. BASELINE SITE USED FOR COMPARISON IS BK0 (AVERAGE HARDNESS OF 144 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	3OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE AMMONIA CONCENTRATIONS - LOWER BAKER CREEK (BK0)

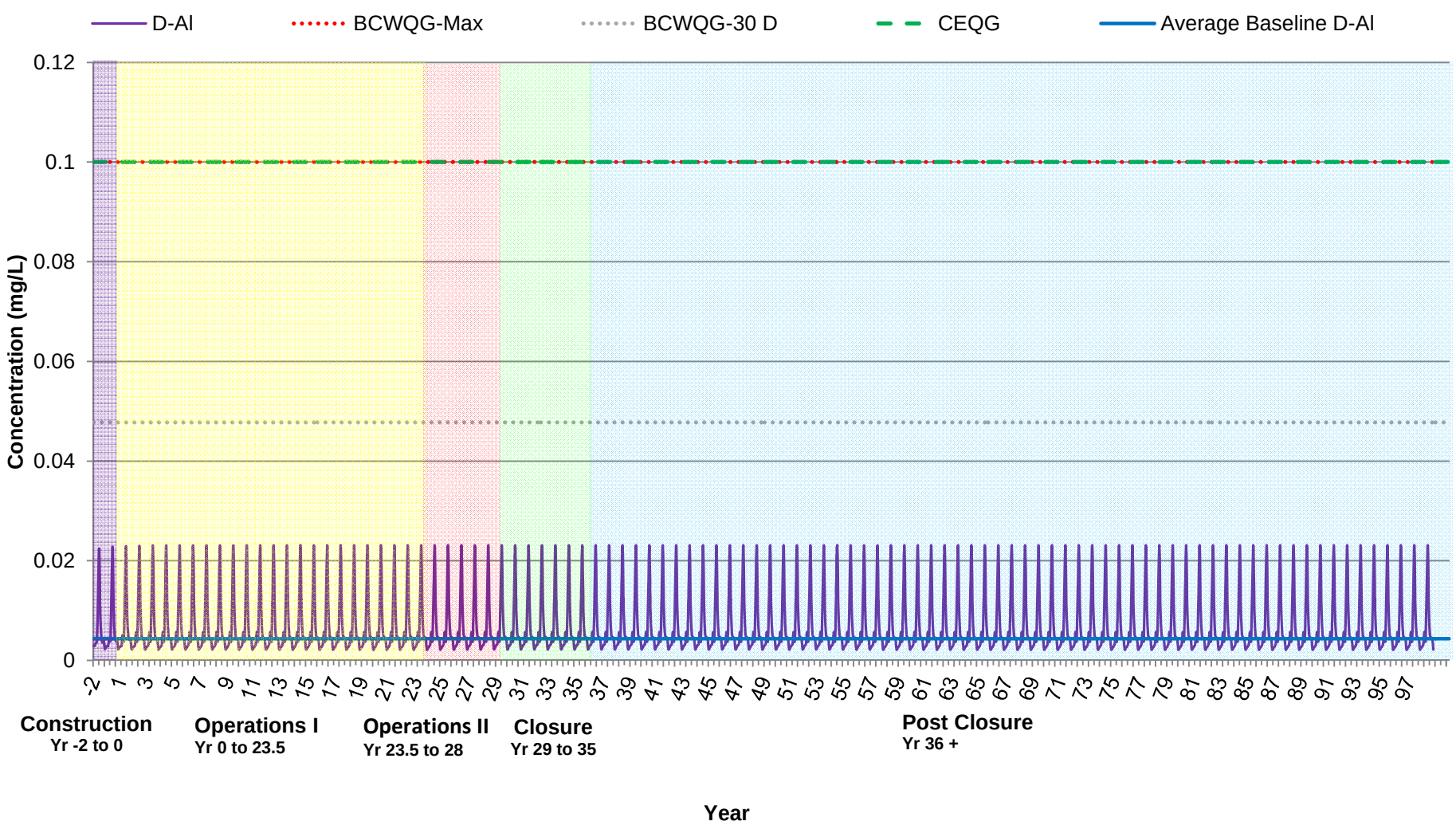
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C10.NH4

REV 0



NOTES:

1. ALL GUIDELINES ARE pH-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS BK0 (AVERAGE HARDNESS OF 144 mg/L).
3. AVERAGE BASELINE pH USED TO CALCULATE GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	3OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE DISSOLVED ALUMINUM CONCENTRATIONS - LOWER BAKER CREEK (BK0)

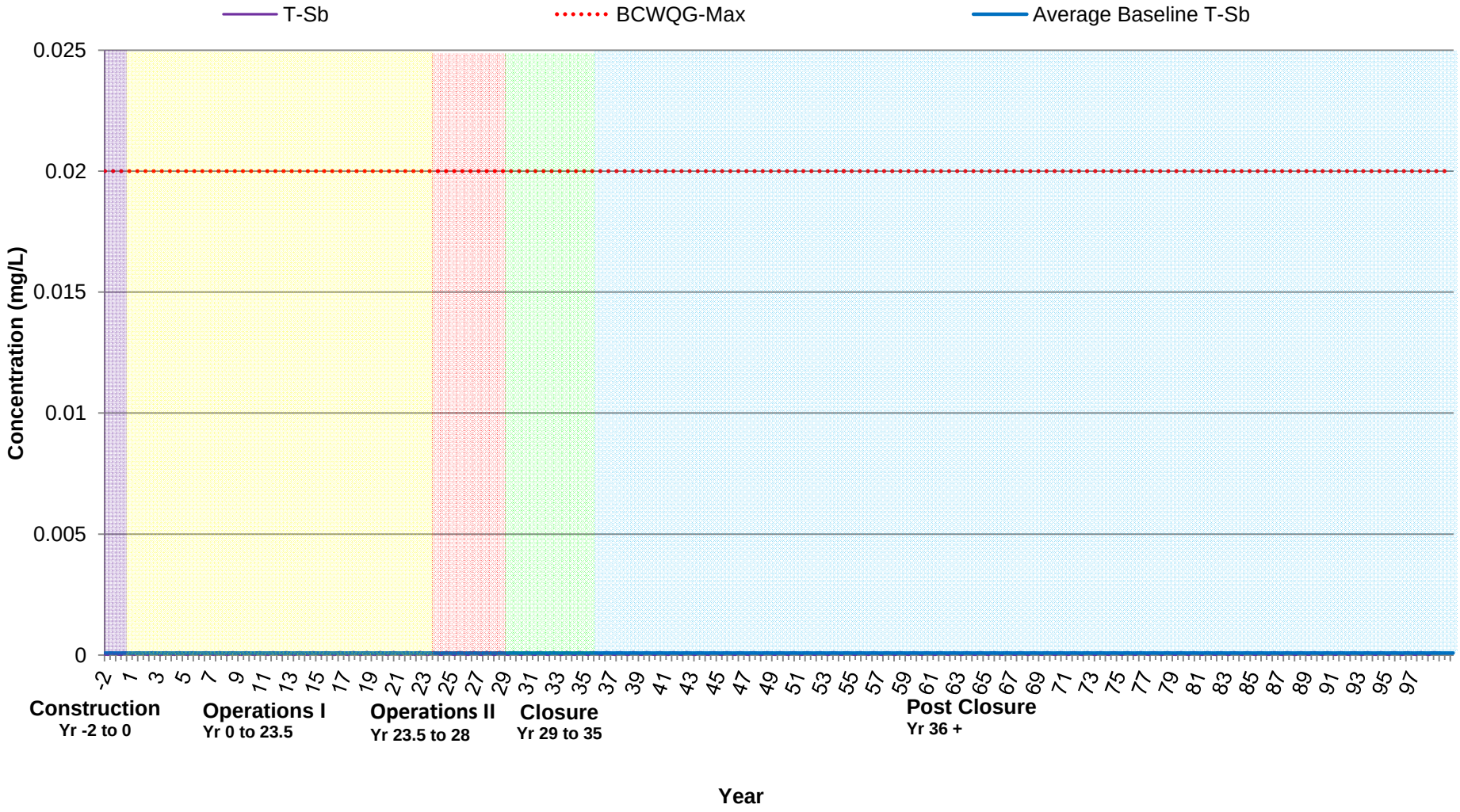
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C10.Al

REV 0



NOTES:

1. THE BCWQG IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS BK0 (AVERAGE HARDNESS OF 144 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	3OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE ANTIMONY CONCENTRATIONS - LOWER BAKER CREEK (BK0)

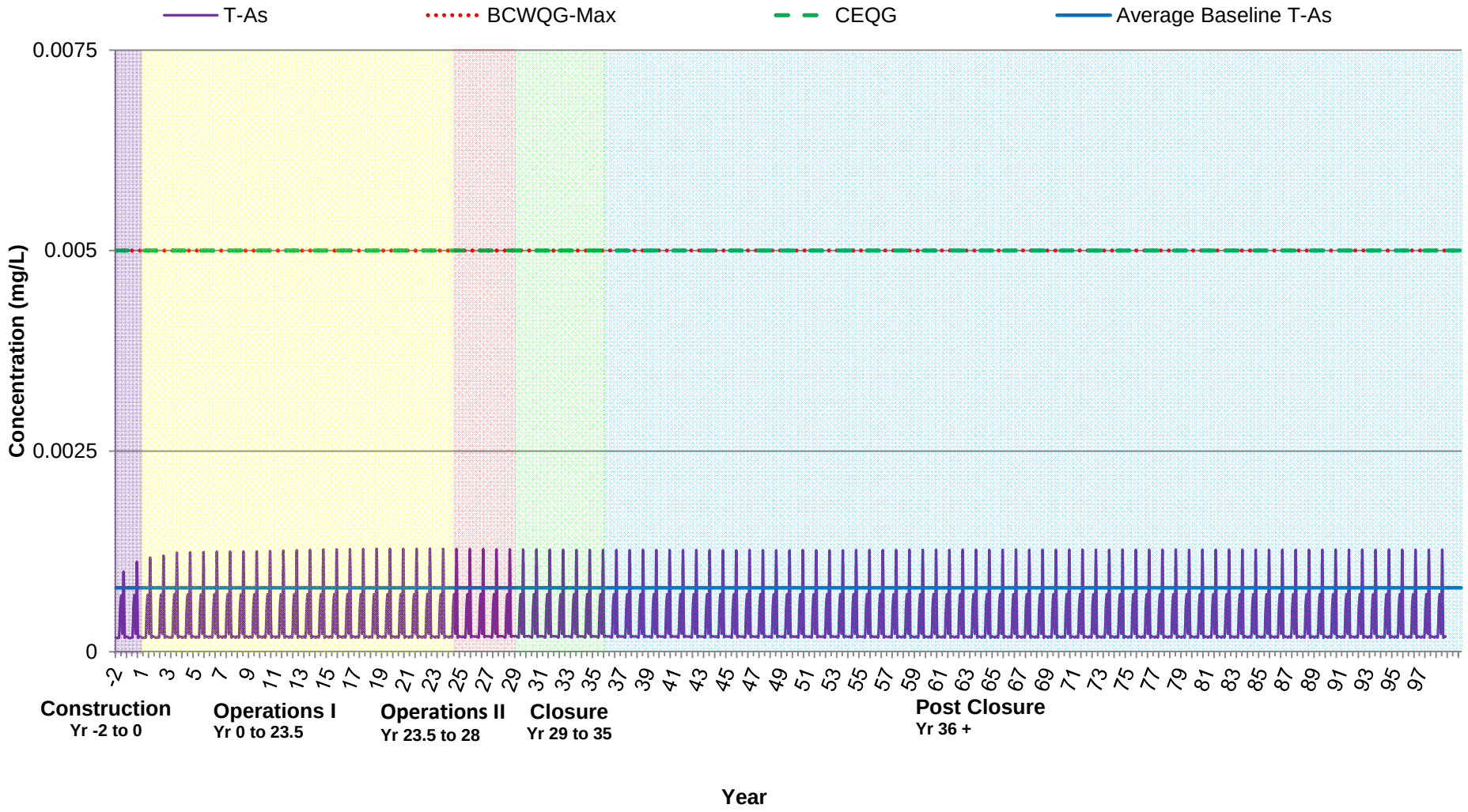
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C10.Sb

REV 0



NOTES:

1. THE BCWQG AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS BK0 (AVERAGE HARDNESS OF 144 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	3OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE ARSENIC CONCENTRATIONS - LOWER BAKER CREEK (BK0)

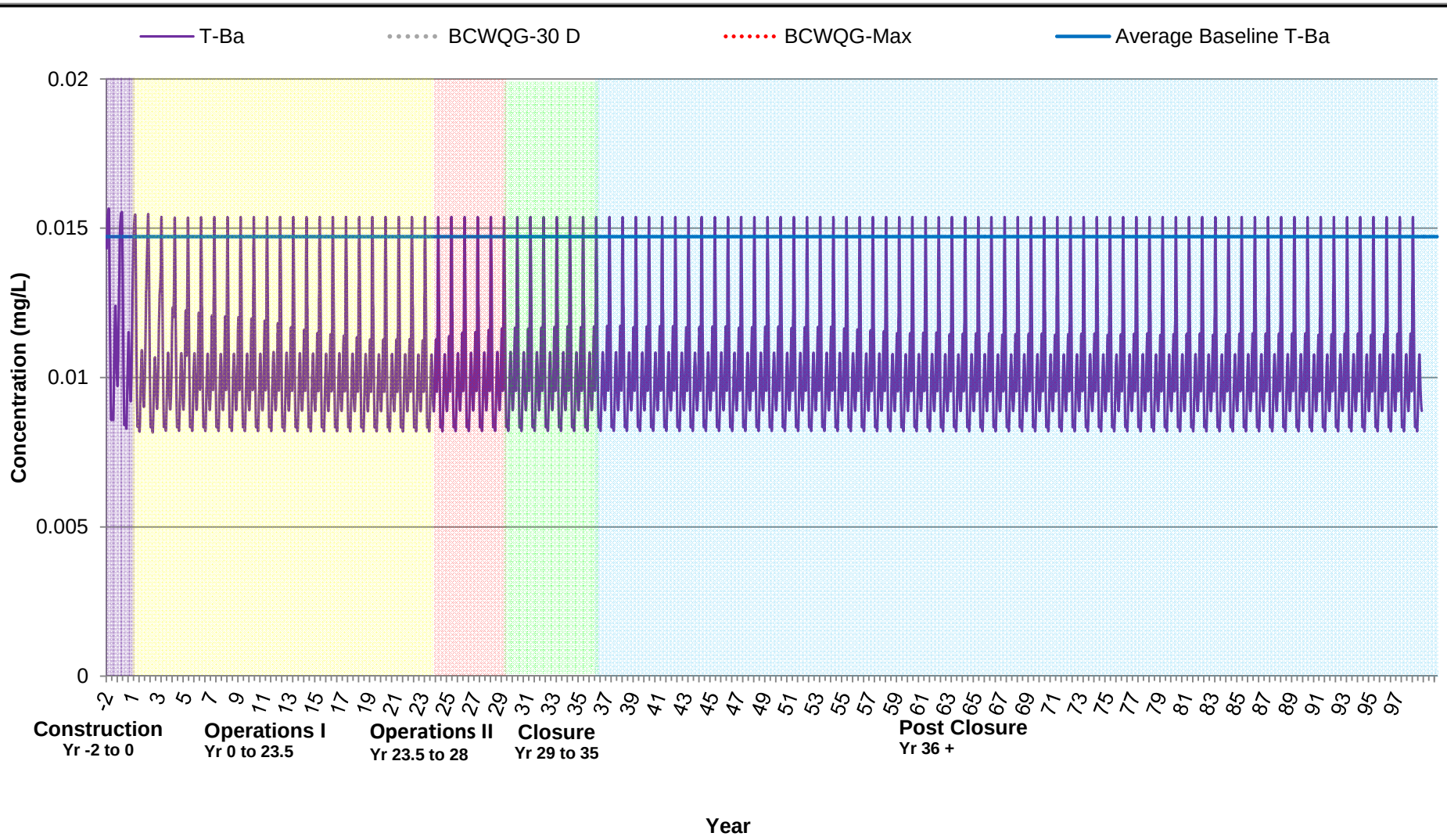
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C10.As

REV 0



NOTES:

1. THE BCWQG-MAX IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS BK0 (AVERAGE HARDNESS OF 144 mg/L).
3. THE BCWQG-30 D (1 mg/L) AND BCWQG-MAX (5 mg/L) ARE NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	3OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE BARIUM CONCENTRATIONS - LOWER BAKER CREEK (BK0)

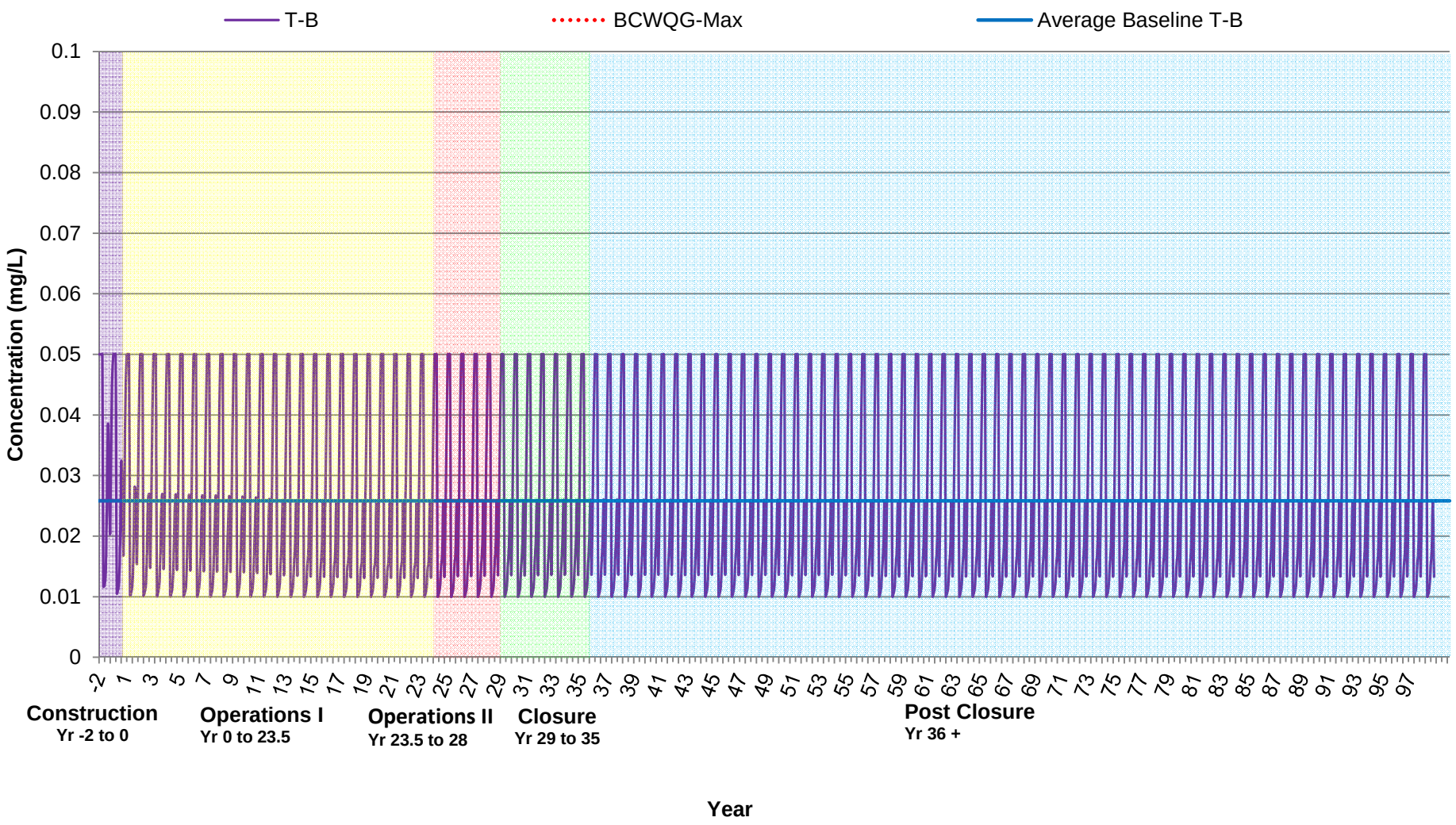
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C10.Ba

REV 0



NOTES:

1. BASELINE SITE USED FOR COMPARISON IS BK0 (AVERAGE HARDNESS OF 144 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.
3. THE BCWQG-MAX (1.2 mg/L) IS NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE BORON CONCENTRATIONS - LOWER BAKER CREEK (BK0)

Knight Piésold CONSULTING

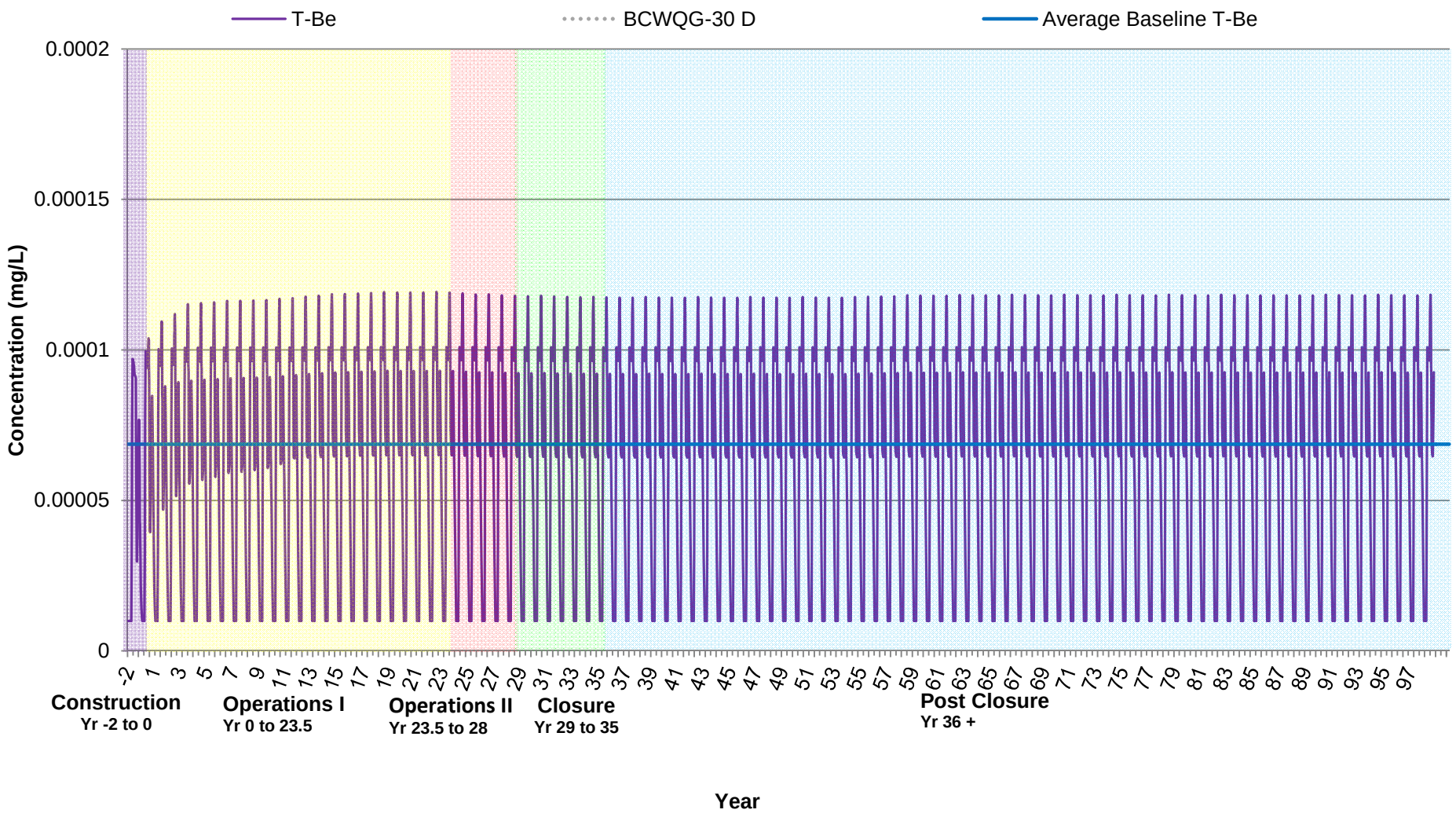
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C10.B

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	3OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS BK0 (AVERAGE HARDNESS OF 144 mg/L).
3. THE BCWQG-30 D (0.0053 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	3OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE BERYILLIUM CONCENTRATIONS - LOWER BAKER CREEK (BK0)

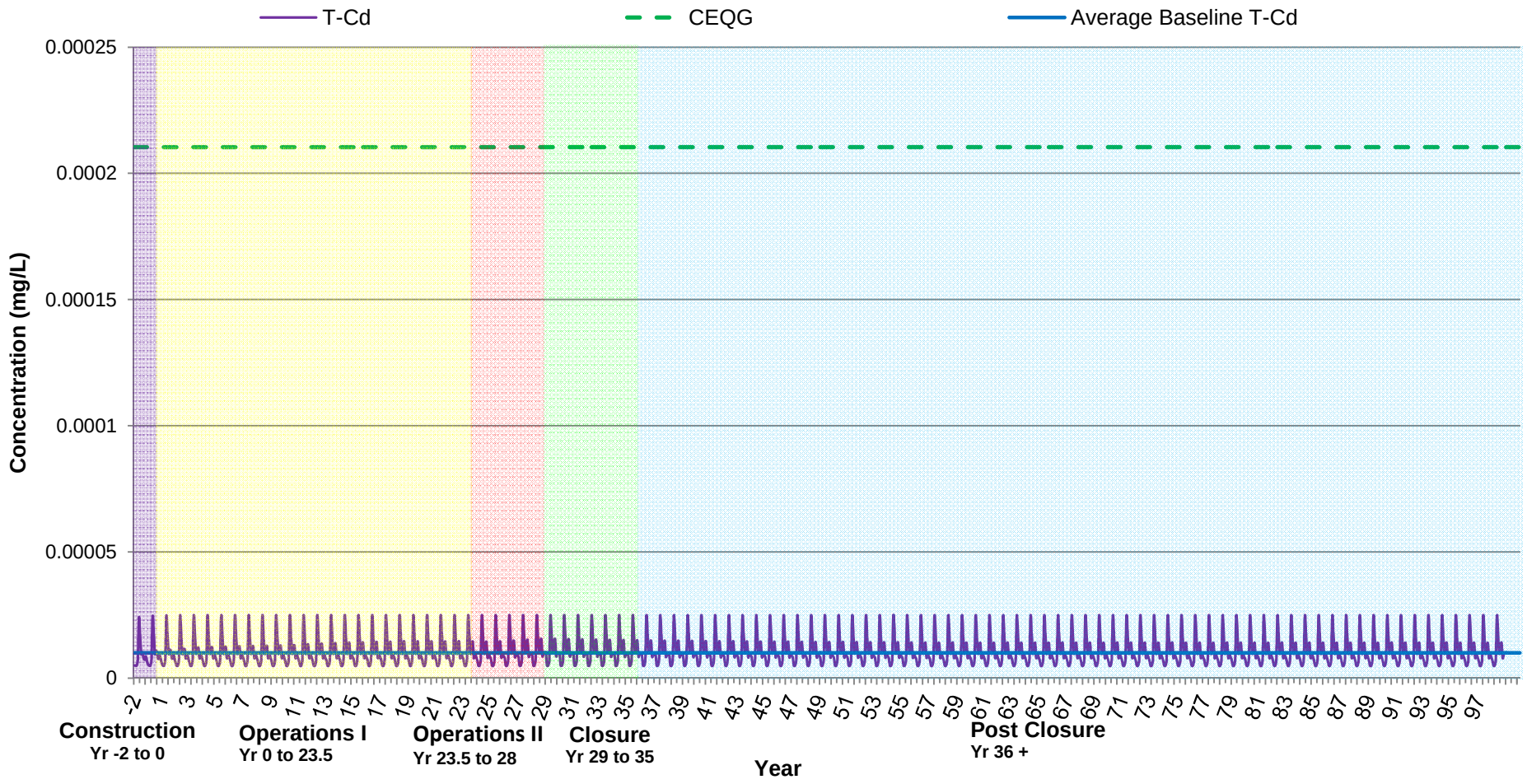
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C10.Be

REV 0



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. THE BCWQG ARE DRAFT GUIDELINES UNDER REVIEW (JUNE 2014).
3. BASELINE SITE USED FOR COMPARISON IS BK0 (AVERAGE HARDNESS OF 144 mg/L).
4. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE CADMIUM CONCENTRATIONS - LOWER BAKER CREEK (BK0)

Knight Piésold CONSULTING

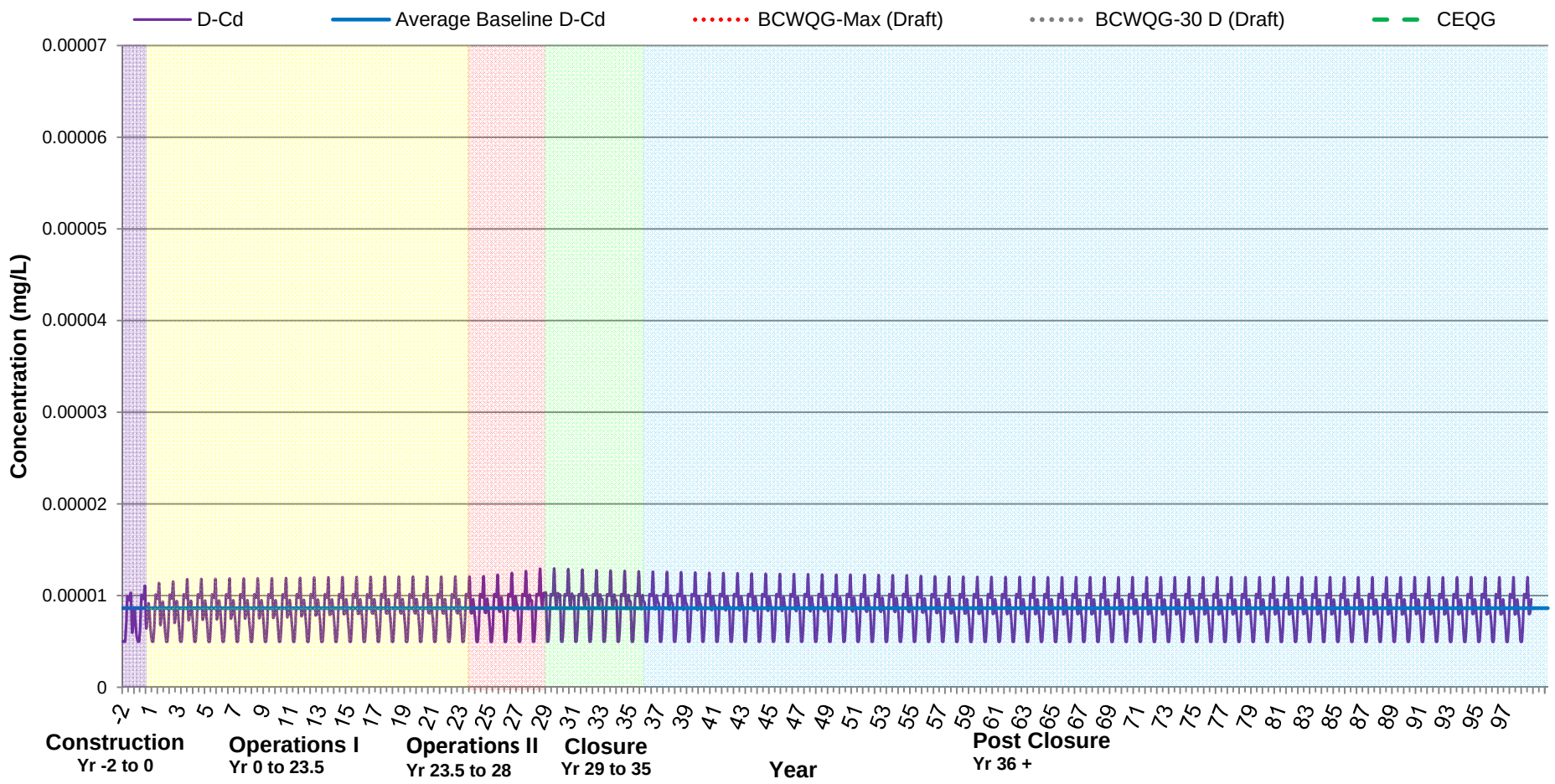
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C10.Cd-T

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	3OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS BK0 (AVERAGE HARDNESS OF 144 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	3OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE CADMIUM CONCENTRATIONS - LOWER BAKER CREEK (BK0)

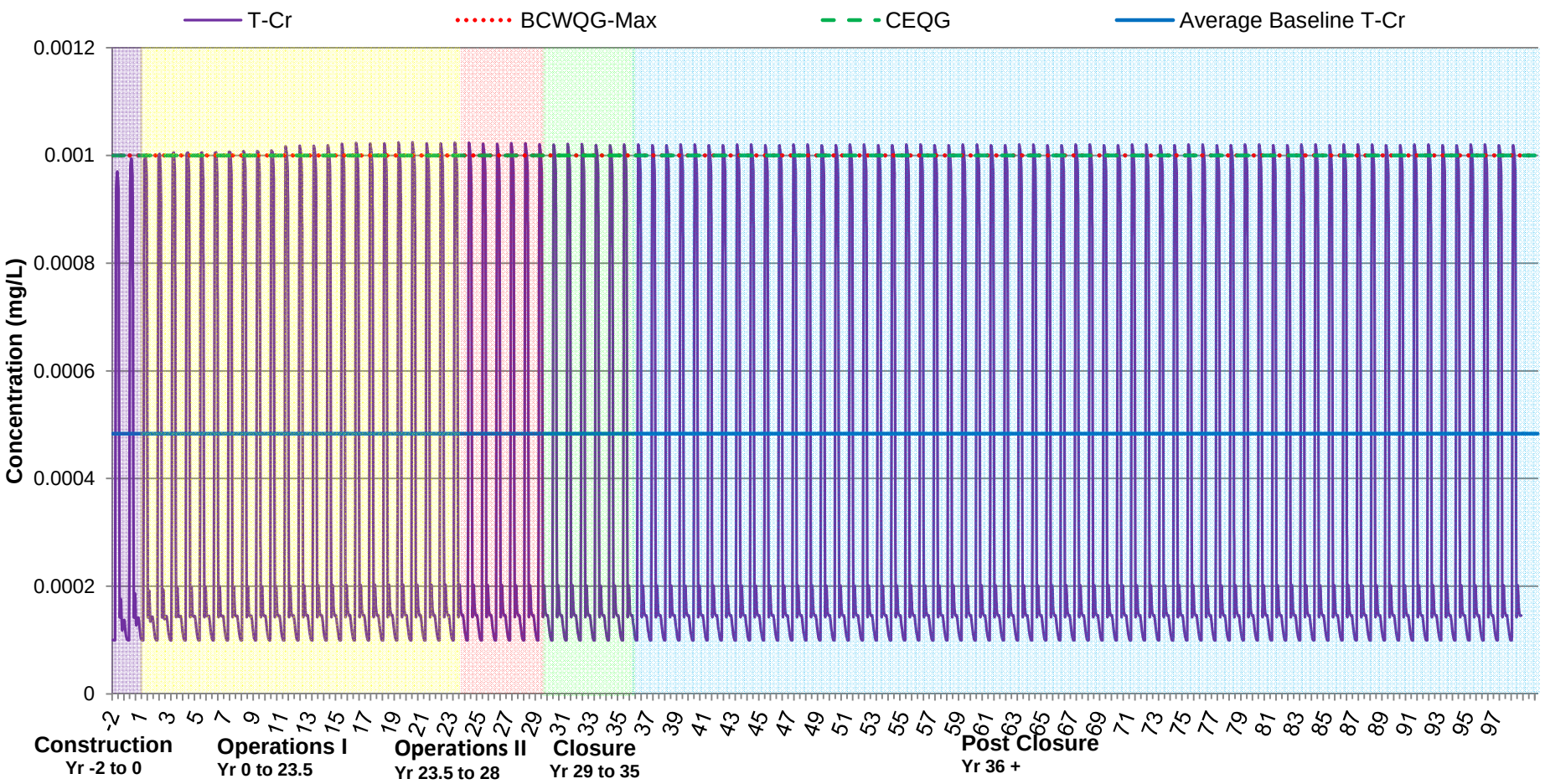
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C10.Cd-D

REV 0



NOTES:

1. GUIDELINES ARE FOR CHROMIUM (IV), THE SPECIES MOST COMMON IN WELL OXYGENATED SURFACE WATERS.
2. BASELINE SITE USED FOR COMPARISON IS BK0 (AVERAGE HARDNESS OF 144 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	3OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE CHROMIUM CONCENTRATIONS - LOWER BAKER CREEK (BK0)

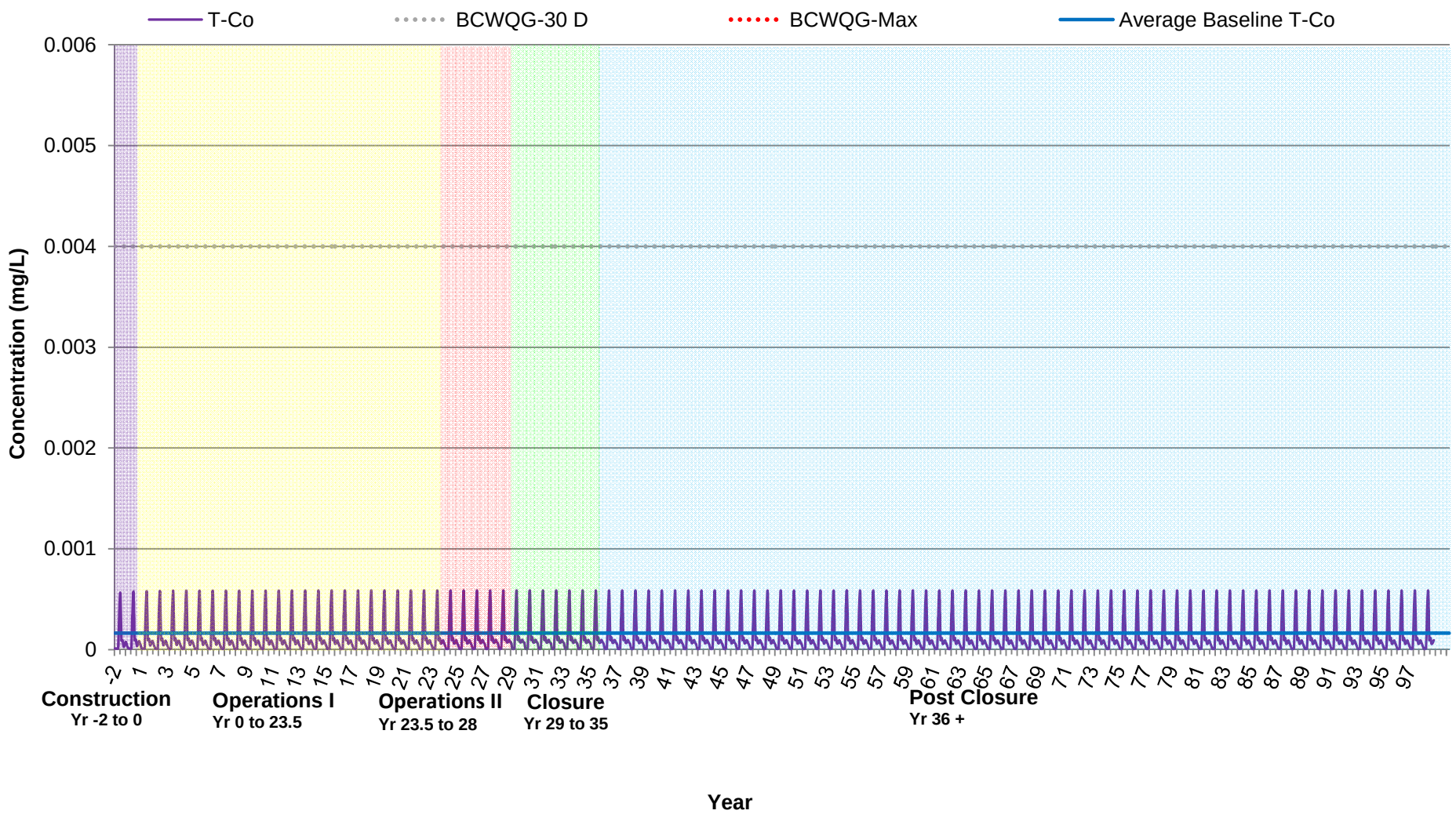
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C10.Cr

REV 0



NOTES:

1. THE BCWQG-30 D AND BCWQG-MAX ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS BK0 (AVERAGE HARDNESS OF 144 mg/L).
3. THE BCWQG-MAX GUIDELINE (0.11 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	3OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE COBALT CONCENTRATIONS - LOWER BAKER CREEK (BK0)

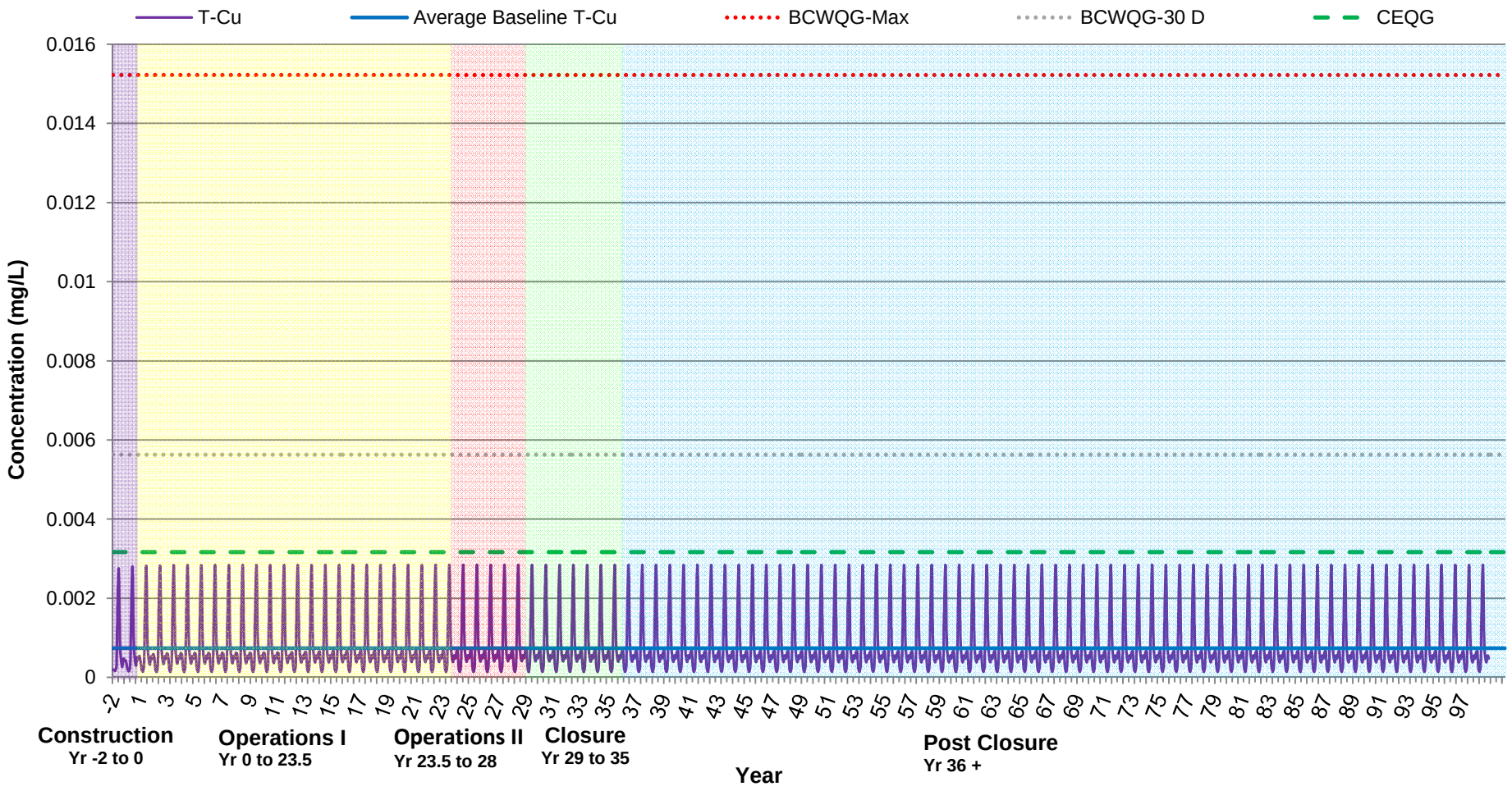
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C10.Co

REV 0



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS BK0 (AVERAGE HARDNESS OF 144 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE COPPER CONCENTRATIONS - LOWER BAKER CREEK (BK0)

Knight Piésold CONSULTING

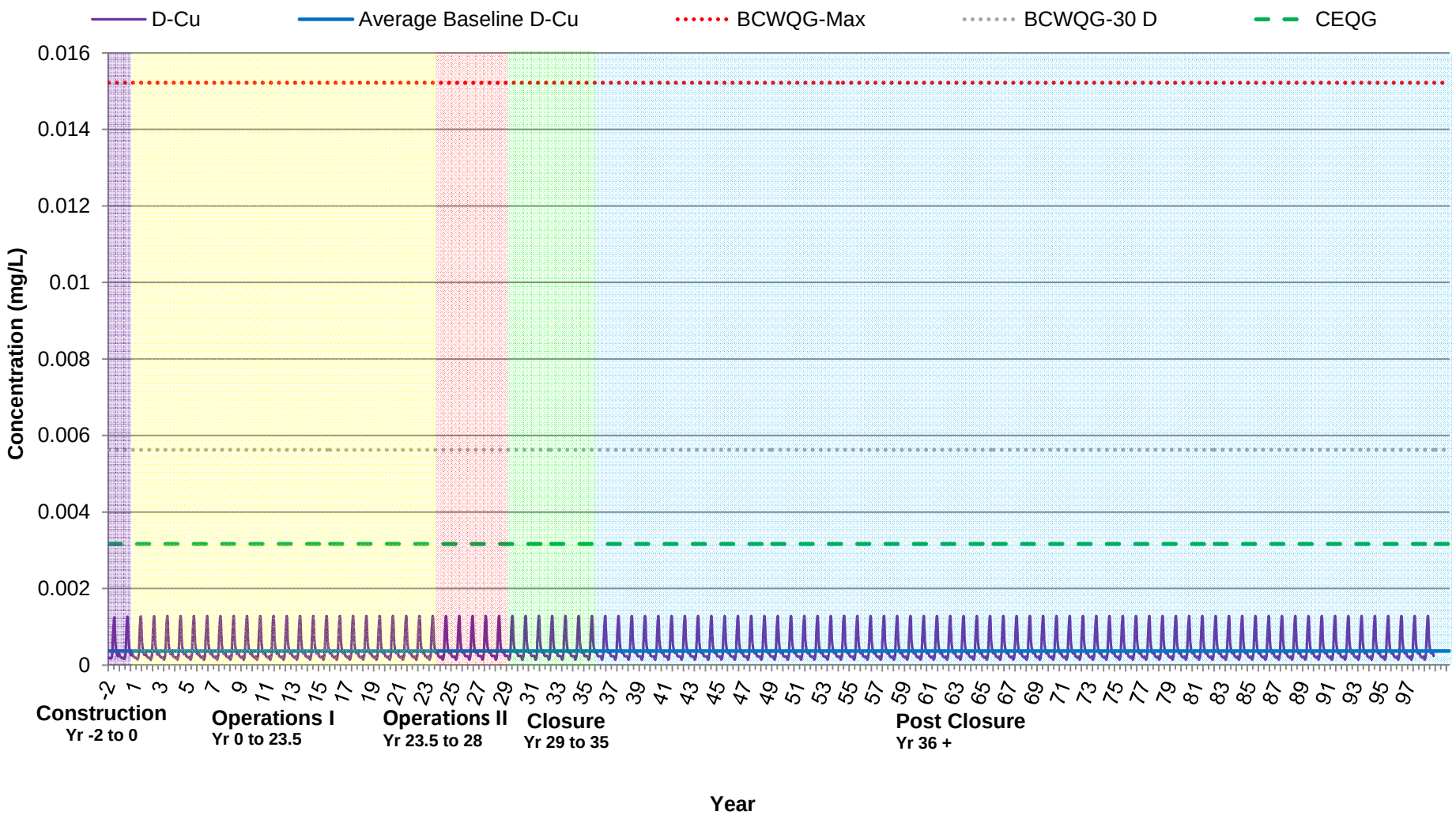
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C10.Cu-T

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	3OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS BK0 (AVERAGE HARDNESS OF 144 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE COPPER CONCENTRATIONS - LOWER BAKER CREEK (BK0)

Knight Piésold CONSULTING

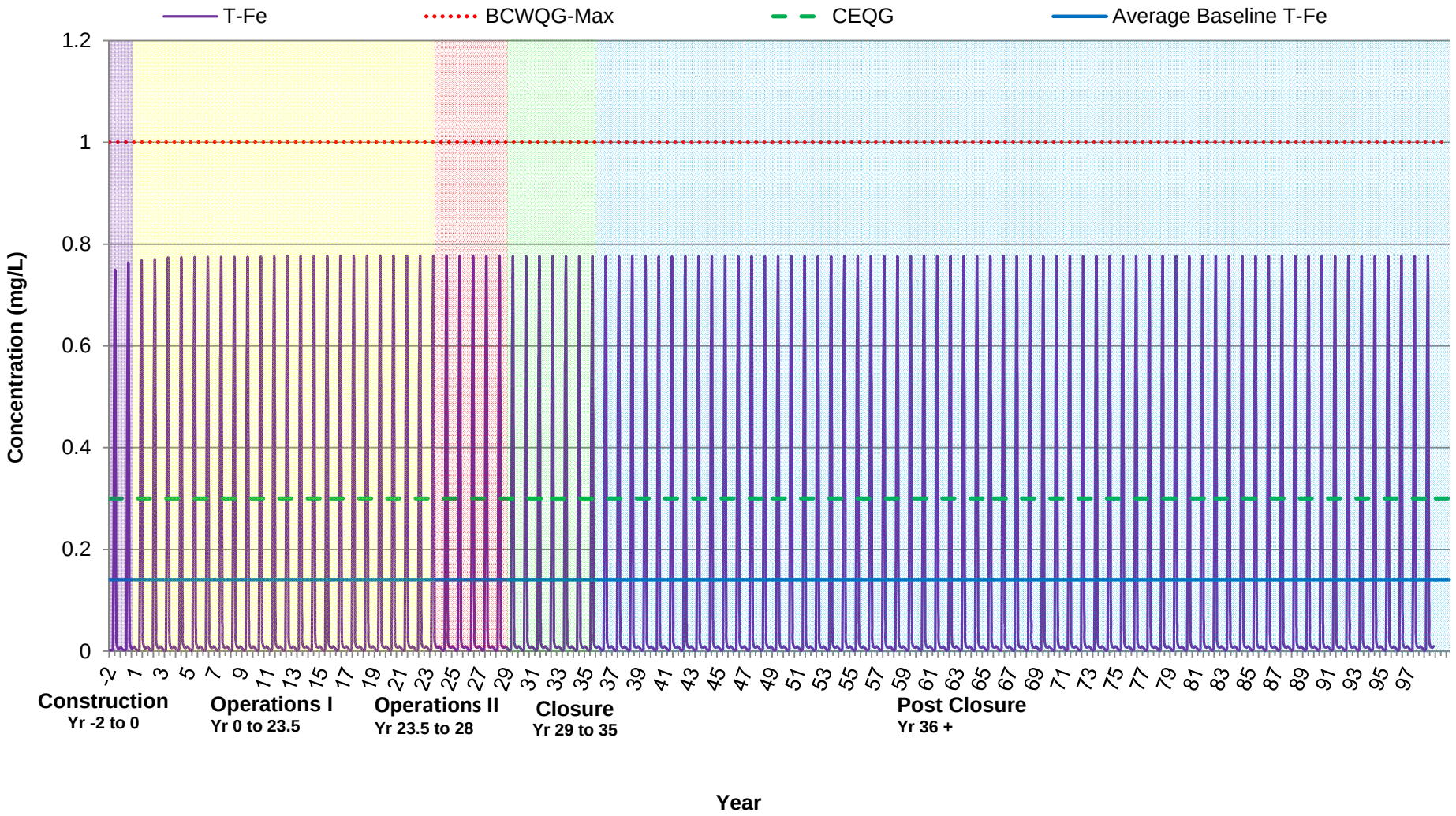
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C10.Cu-D

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	3OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS BK0 (AVERAGE HARDNESS OF 144 mg/L).
3. BCWQG-MAX 1.0 mg/L IS NOT SHOWN ON GRAPH.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	3OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE TOTAL IRON CONCENTRATIONS - LOWER BAKER CREEK (BK0)

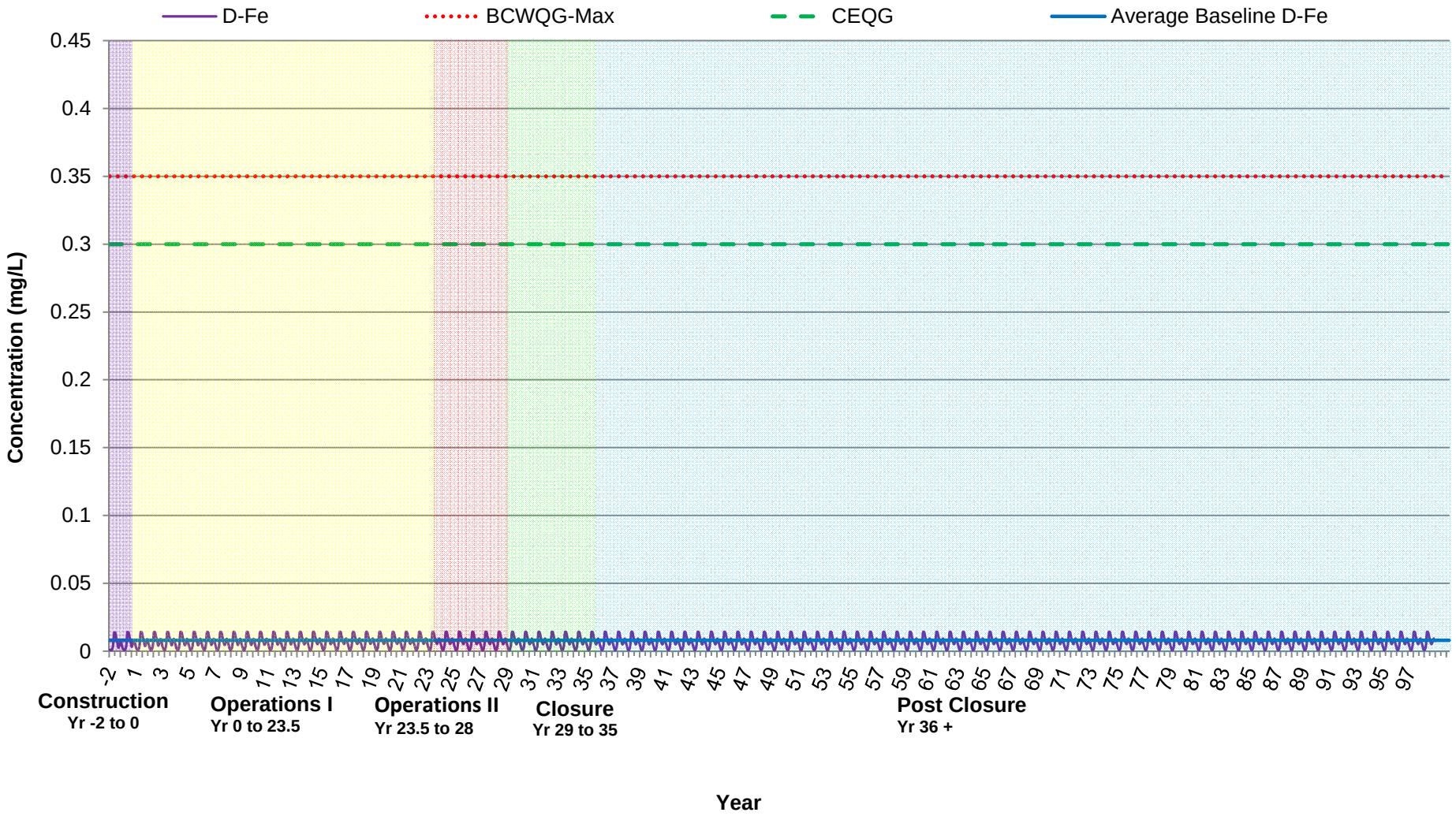
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C10.Fe-T

REV 0



NOTES:

1. THE BCWQG-MAX AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS BK0 (AVERAGE HARDNESS OF 144 mg/L).

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE DISSOLVED IRON CONCENTRATIONS - LOWER BAKER CREEK (BK0)

Knight Piésold CONSULTING

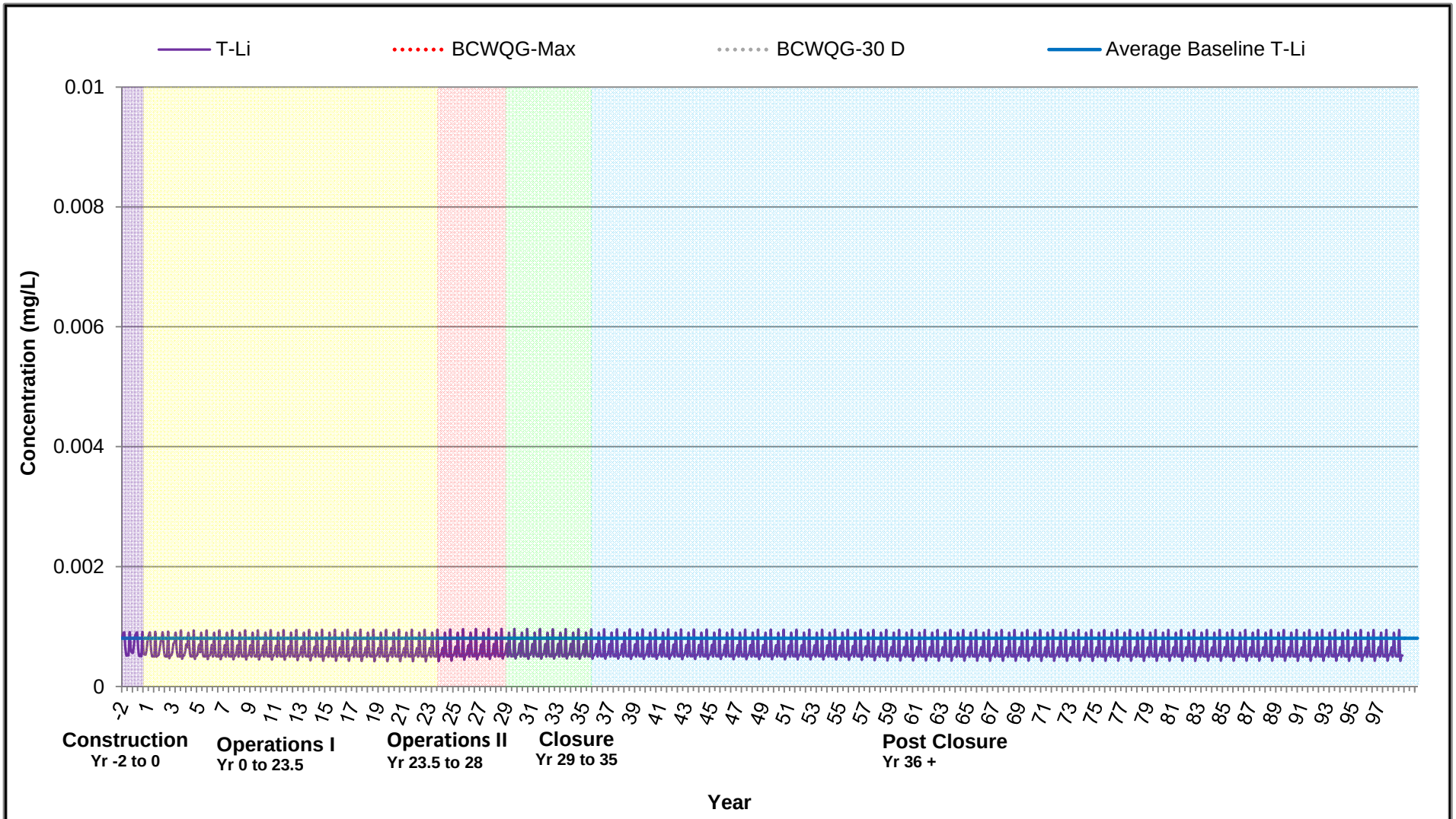
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C10.Fe-D

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	3OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS BK0 (AVERAGE HARDNESS OF 144 mg/L).
3. THE BCWQG-30 D (0.096 mg/L) AND BCWQG-MAX (0.87 mg/L) ARE INTERIM (WORKING) AND ARE NOT SHOWN ON GRAPH.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	3OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE LITHIUM CONCENTRATIONS - LOWER BAKER CREEK (BK0)

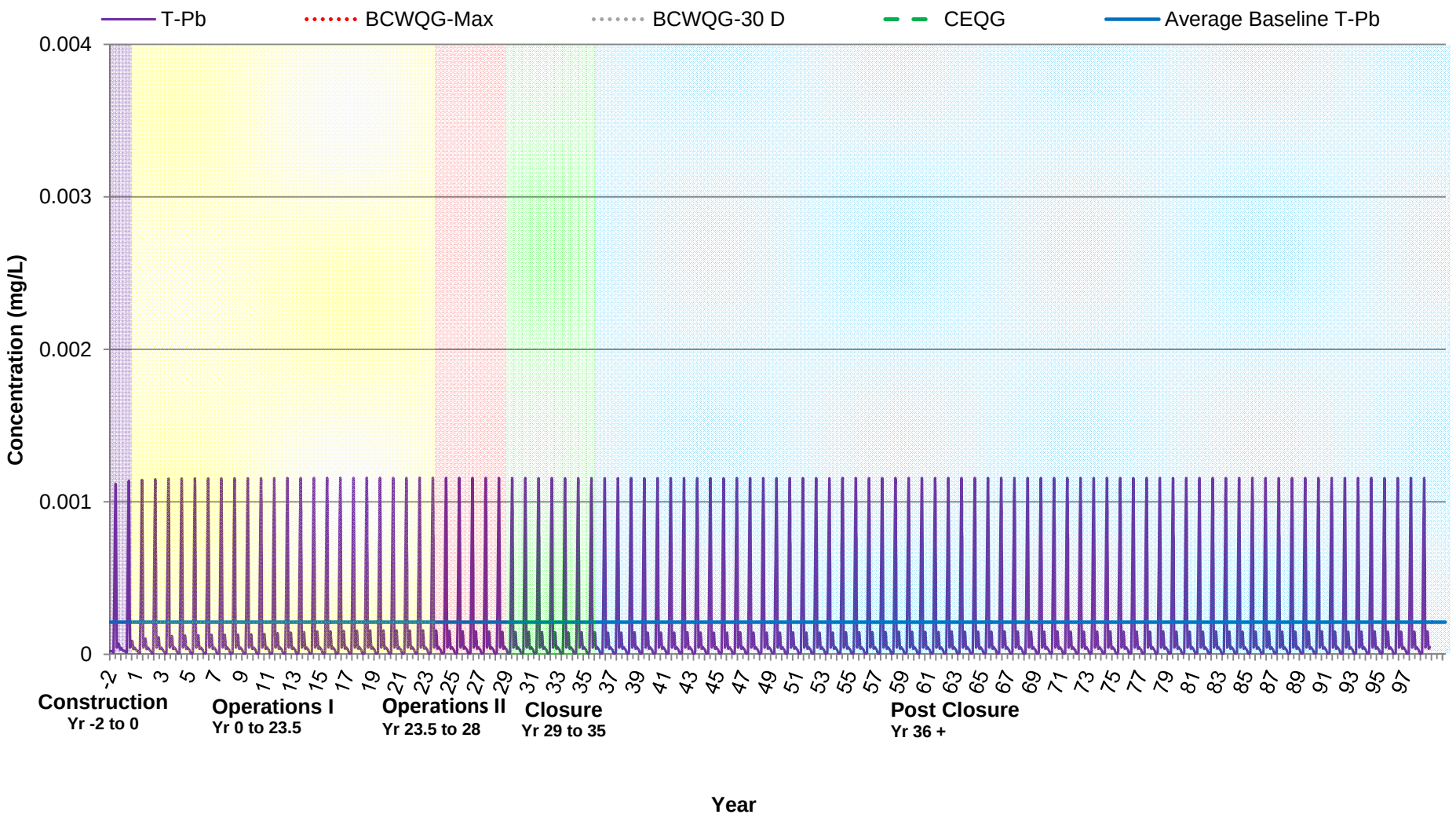
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C10.Li

REV 0



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS BK0 (AVERAGE HARDNESS OF 144 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.
4. THE BCWQG-MAX (CALCULATED AT 0.011 mg/L) IS NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE LEAD CONCENTRATIONS - LOWER BAKER CREEK (BK0)

Knight Piésold CONSULTING

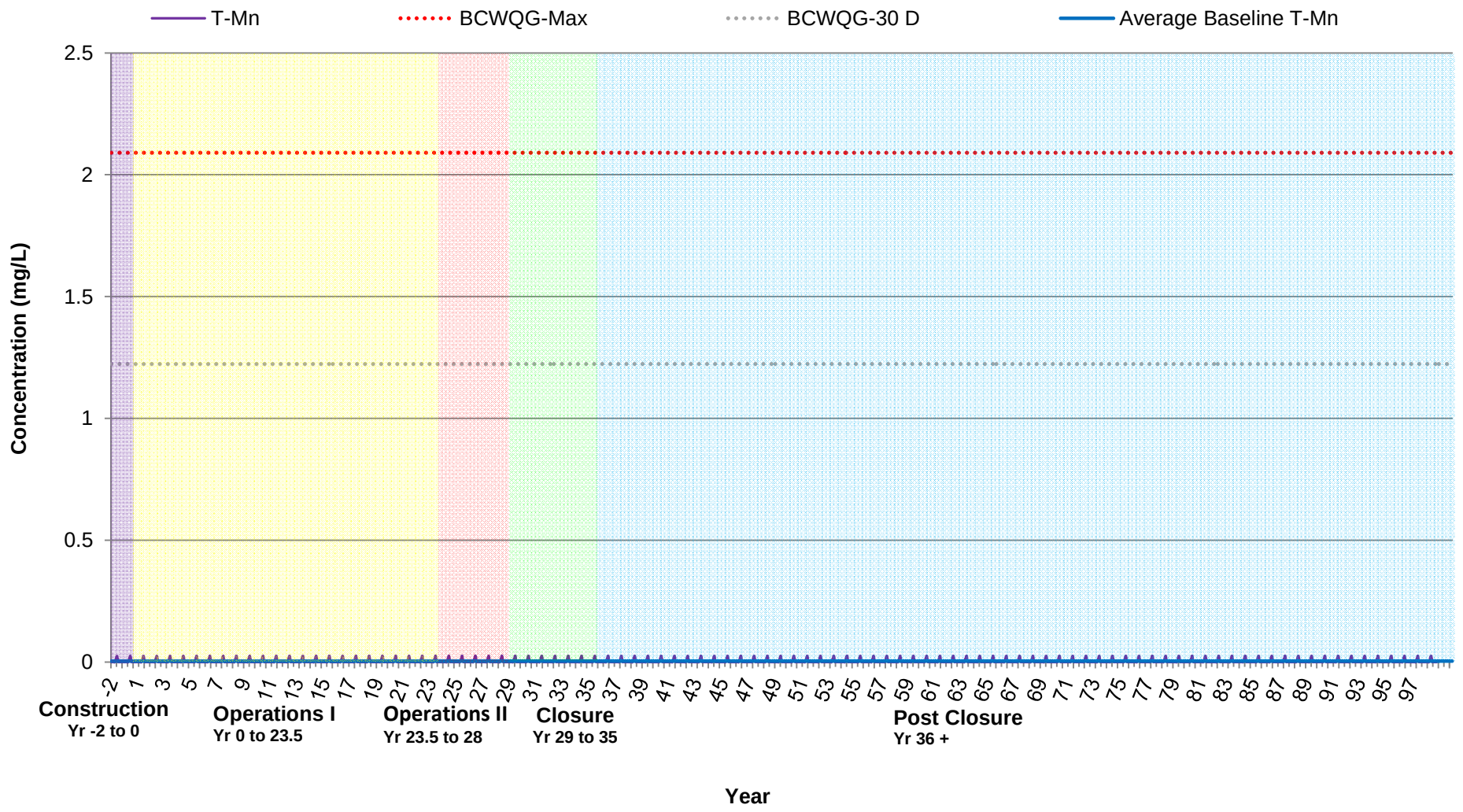
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C10.Pb

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	3OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS BK0 (AVERAGE HARDNESS OF 144 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE MANGANESE CONCENTRATIONS - LOWER BAKER CREEK (BK0)

Knight Piésold CONSULTING

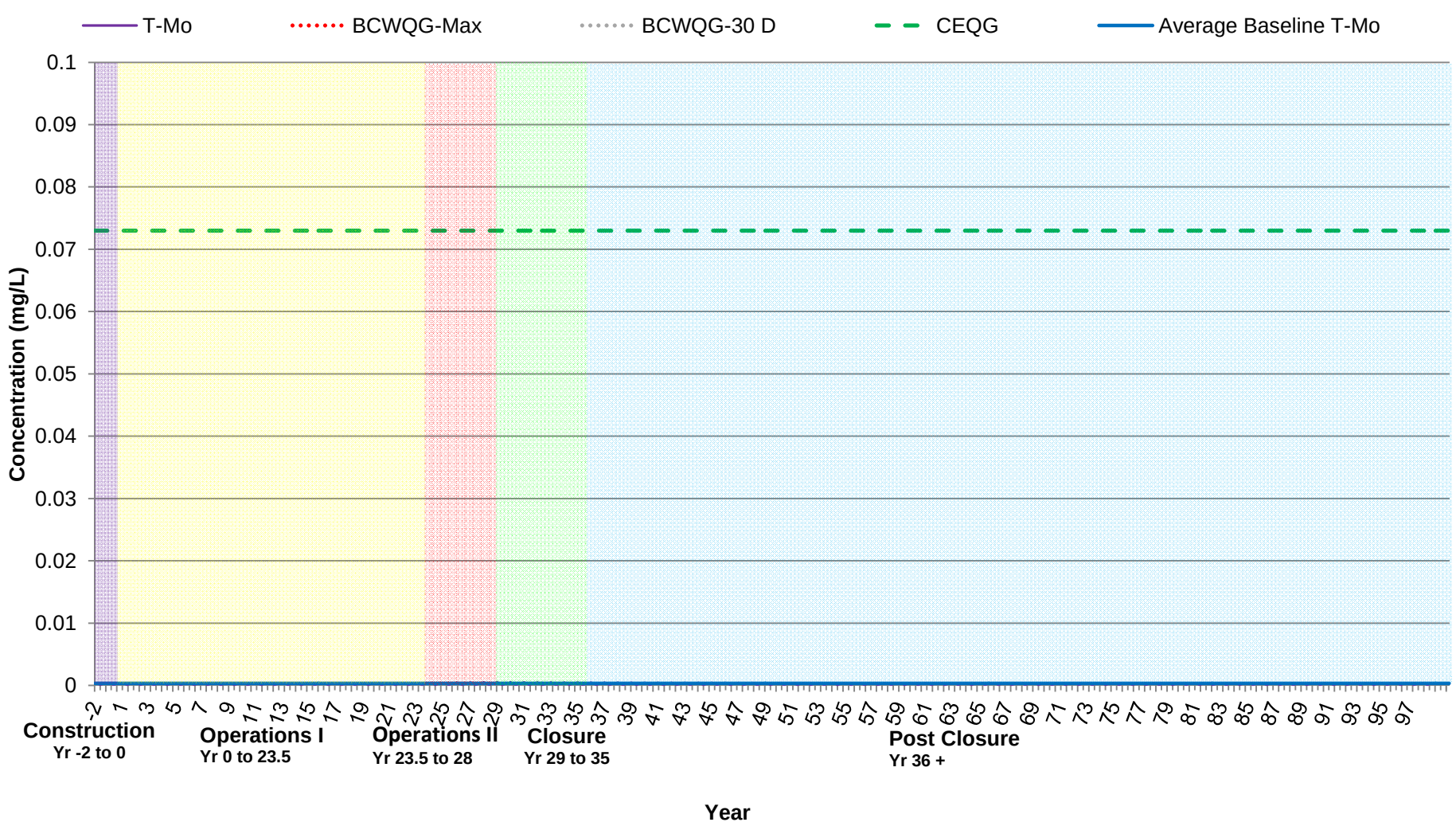
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C10.Mn

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	3OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS BK0 (AVERAGE HARDNESS OF 144 mg/L).
3. THE BCWQG-MAX (2 mg/L) AND BCWQG-30 D (1 mg/L) ARE NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE MOLYDBENUM CONCENTRATIONS - LOWER BAKER CREEK (BK0)

Knight Piésold CONSULTING

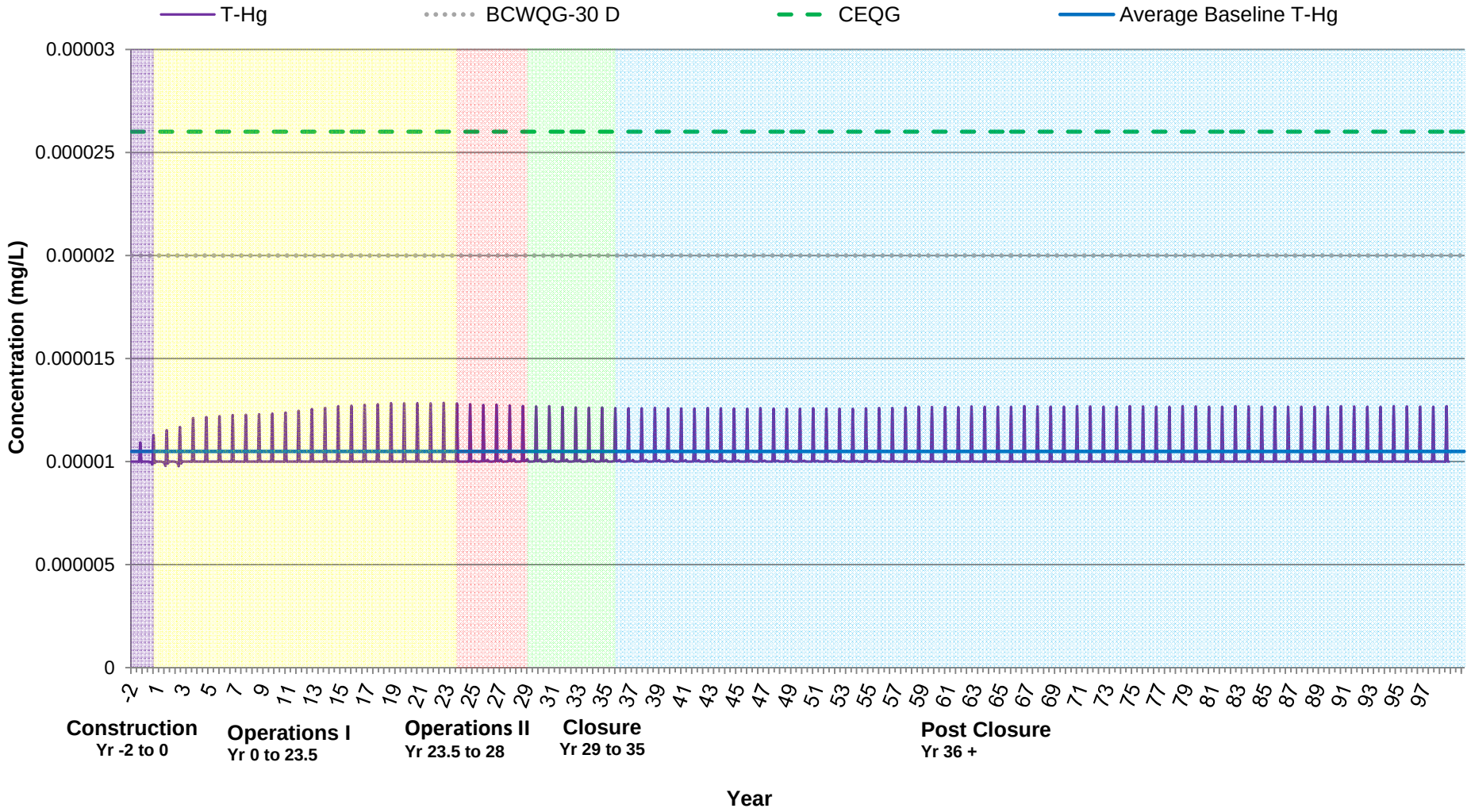
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C10.Mo

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	3OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-30 D AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS BK0 (AVERAGE HARDNESS OF 144 mg/L).
3. BCWQG-30 D VALUE APPLIED ON ASSUMPTION THAT METHYL-Hg IS EQUAL TO 0.5% OF T-Hg.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	3OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE MERCURY CONCENTRATIONS - LOWER BAKER CREEK (BK0)

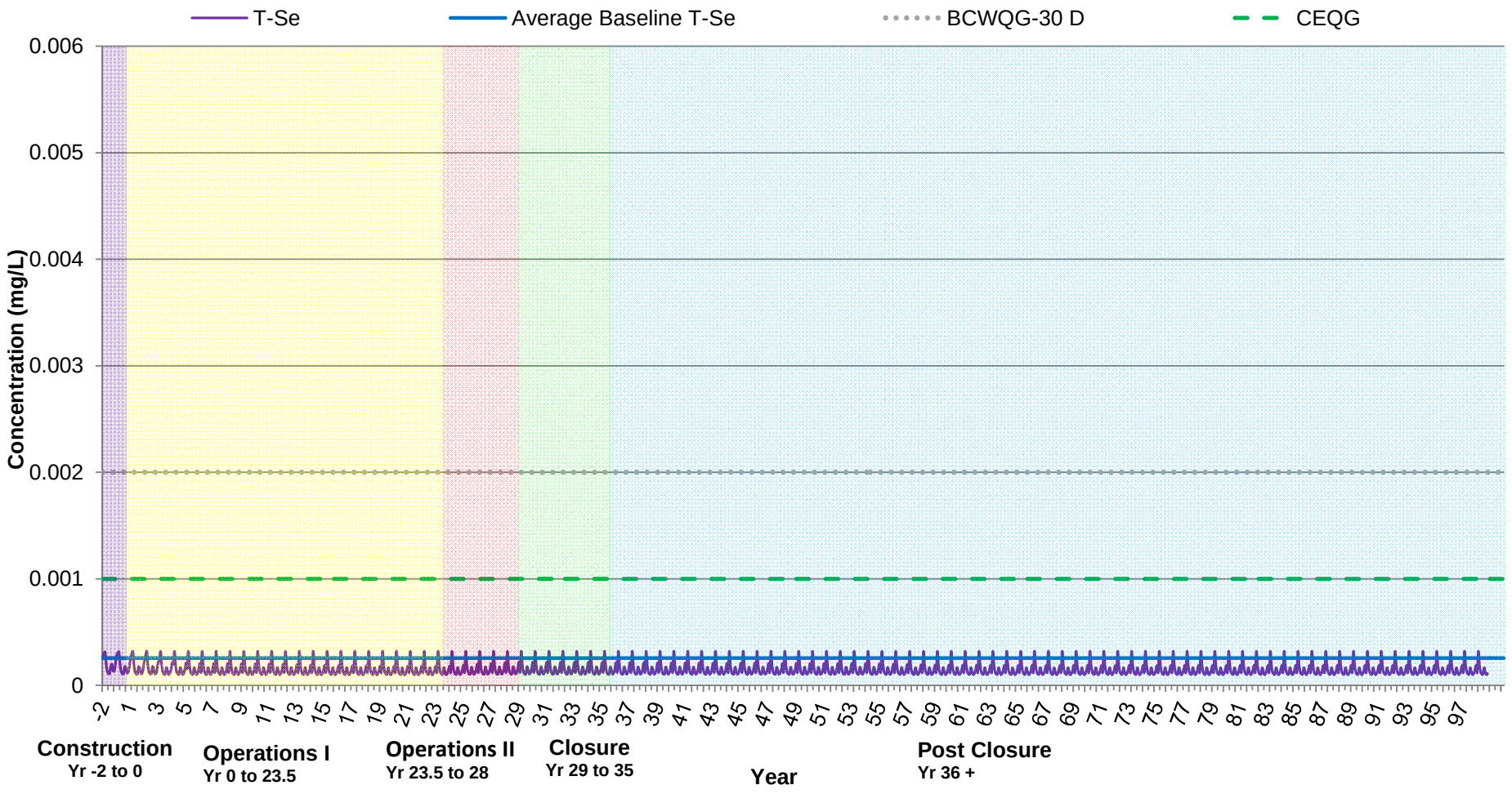
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C10.Hg

REV 0



NOTES:

1. THE BCWQG-30 D AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS BK0 (AVERAGE HARDNESS OF 144 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	3OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE SELENIUM CONCENTRATIONS - LOWER BAKER CREEK (BK0)

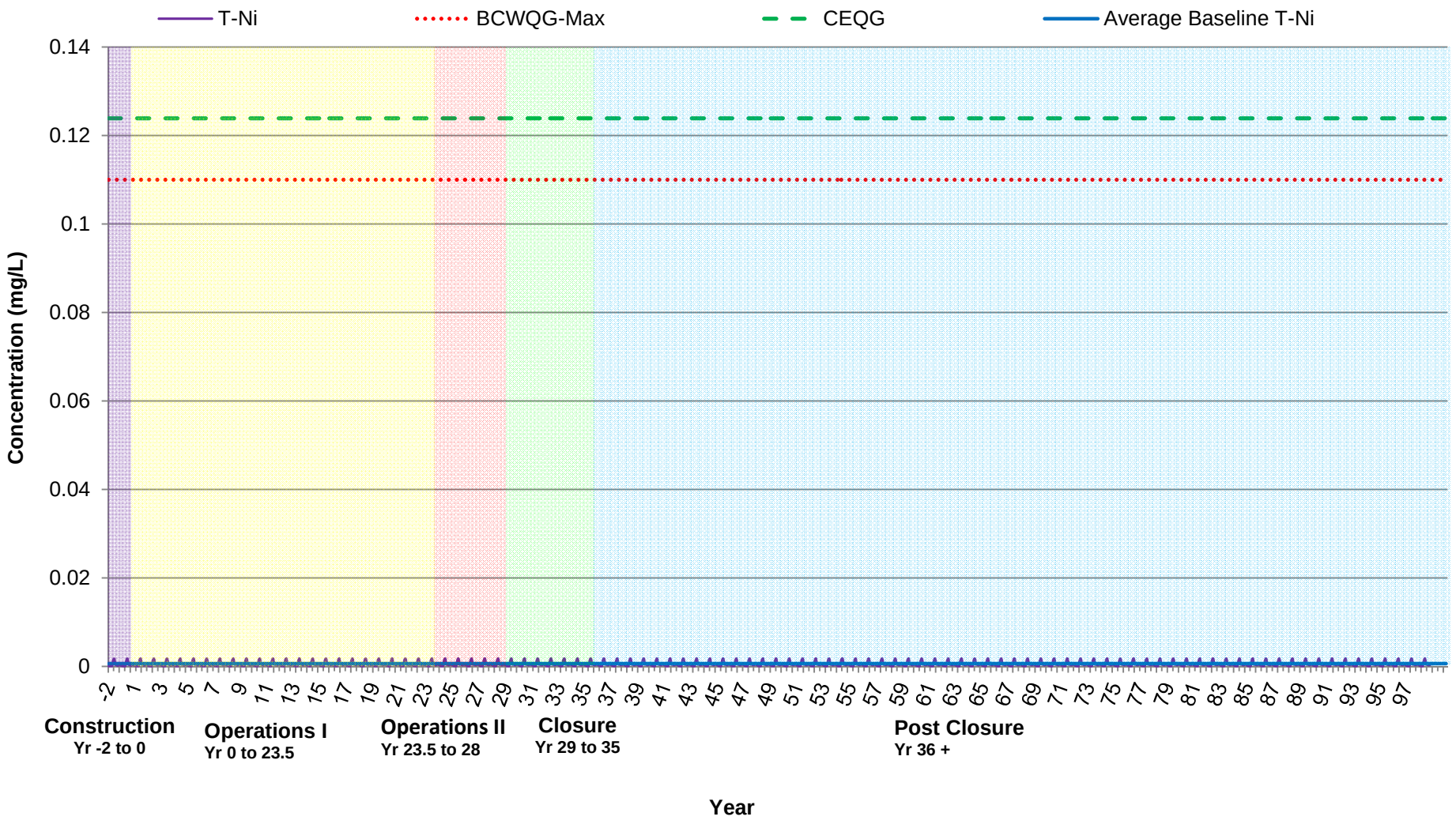
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C10.Se

REV 0



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS BK0 (AVERAGE HARDNESS OF 144 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE NICKEL CONCENTRATIONS - LOWER BAKER CREEK (BK0)

Knight Piésold CONSULTING

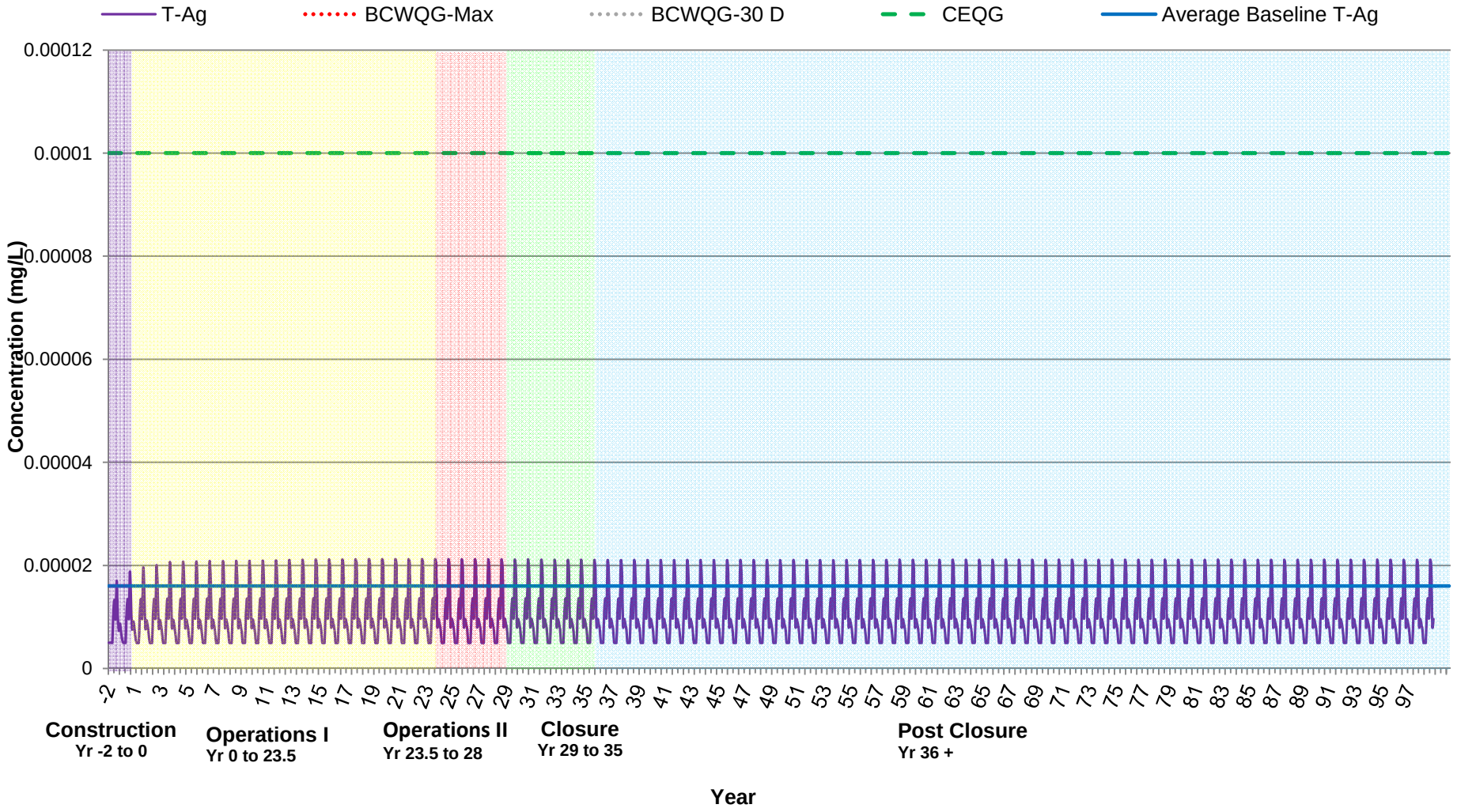
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C10.Ni

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	3OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-30 D AND BCWQG-MAX ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS BK0 (AVERAGE HARDNESS OF 144 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	3OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE SILVER CONCENTRATIONS - LOWER BAKER CREEK (BK0)

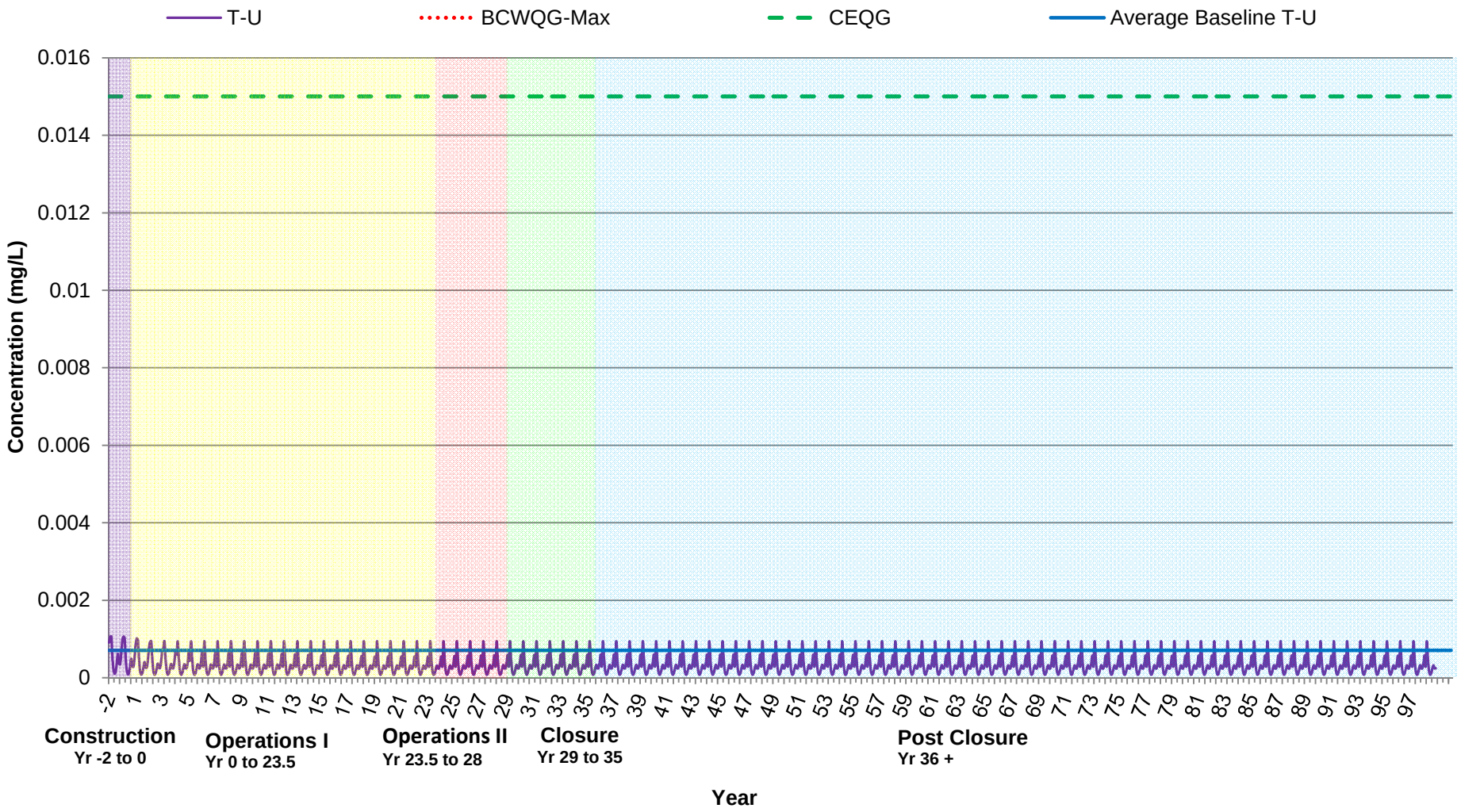
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C10.Ag

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS BK0 (AVERAGE HARDNESS OF 144 mg/L).
3. THE BCWQG-MAX (0.3 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	3OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE URANIUM CONCENTRATIONS - LOWER BAKER CREEK (BK0)

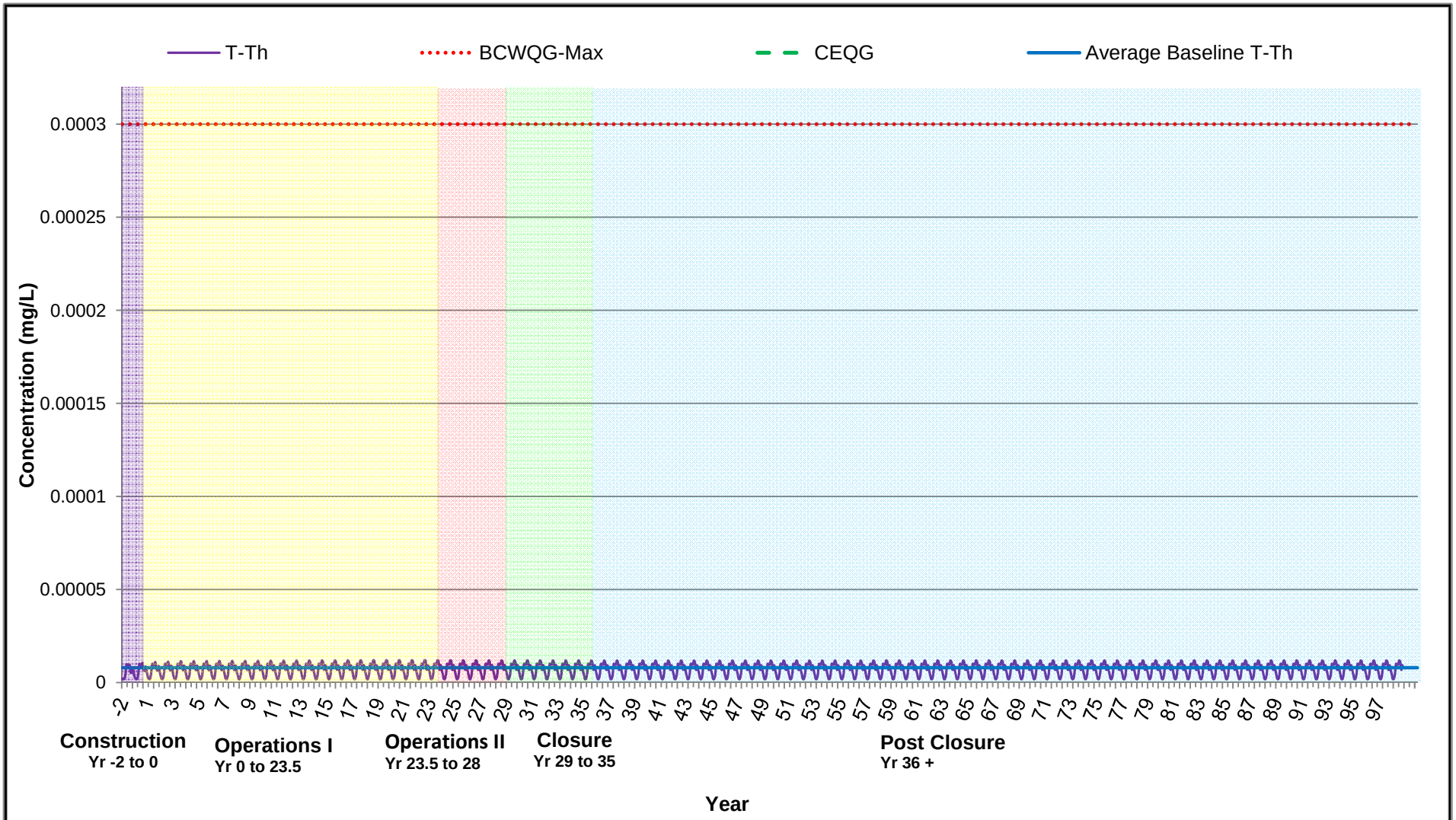
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C10.U

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS BK0 (AVERAGE HARDNESS OF 144 mg/L).
3. THE CEQG (0.0008 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	3OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE THALLIUM CONCENTRATIONS - LOWER BAKER CREEK (BK0)

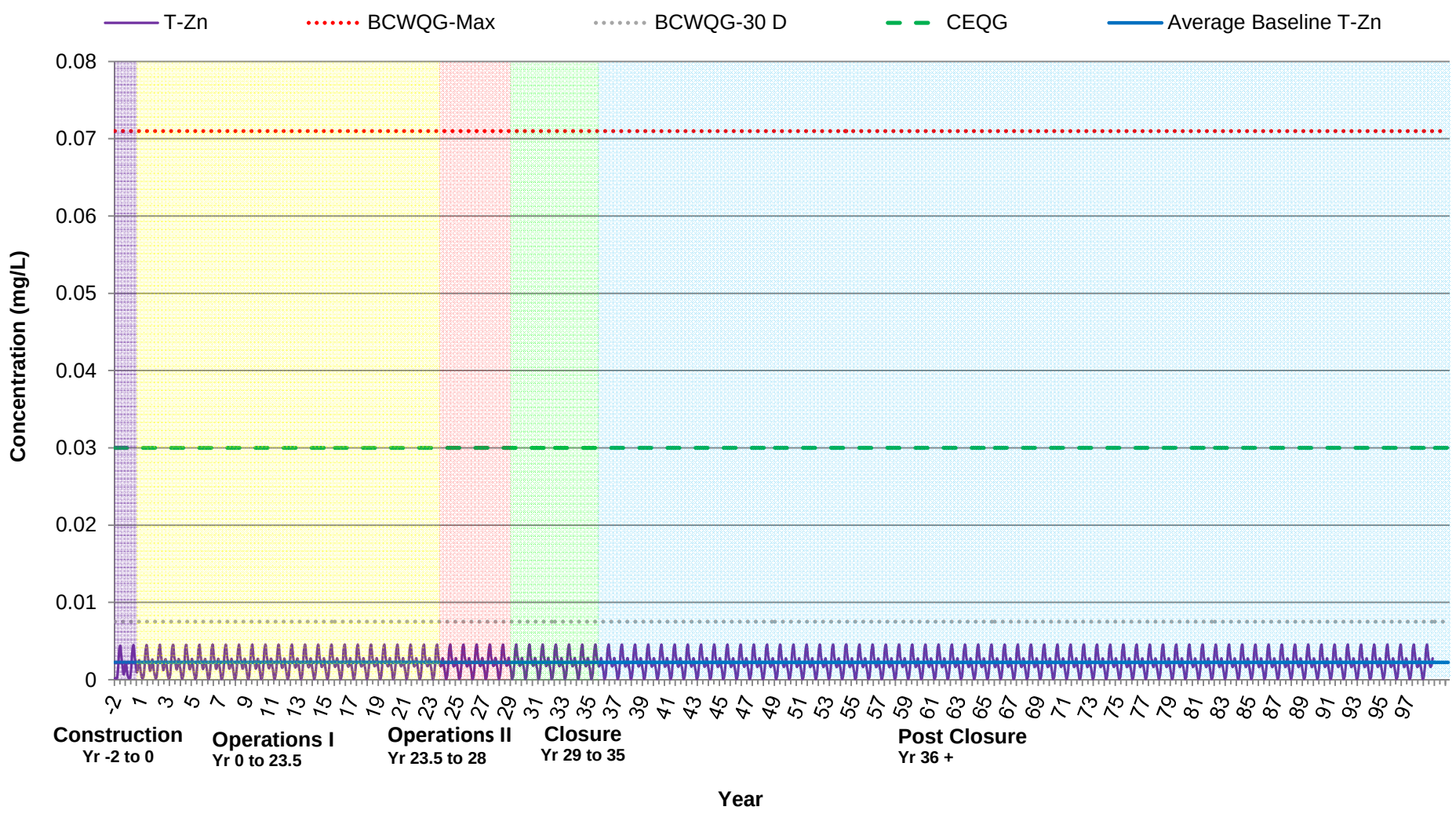
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C10.Th

REV 0



NOTES:

1. BCWQG-30 D AND BCWQG-MAX ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS BK0 (AVERAGE HARDNESS OF 144 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE ZINC CONCENTRATIONS - LOWER BAKER CREEK (BK0)

Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C10.Zn

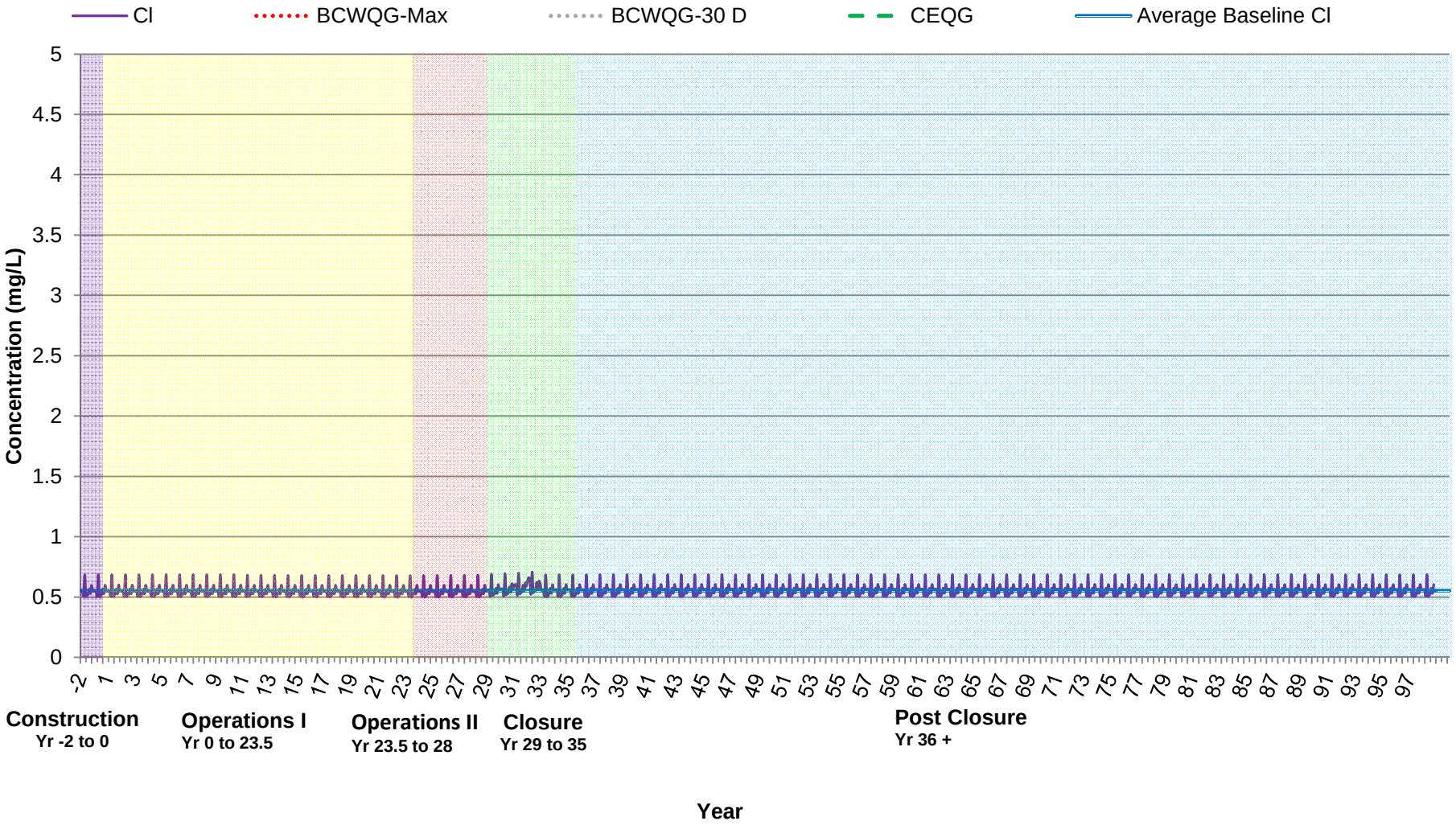
REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	3OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

APPENDIX C11

JONES CREEK ABOVE NORTH THOMPSON RIVER (J1)

(Pages C11-1 to C11-30)



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS J1(AVERAGE HARDNESS OF 126 mg/L).
3. ALL GUIDELINES ARE NOT SHOWN: BCWQG-30 D (150 mg/L); BCWQG-MAX (600 mg/L); CEQG (120 mg/L AND 640 mg/L).

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE CHLORIDE CONCENTRATIONS - JONES CREEK (J1)

Knight Piésold CONSULTING

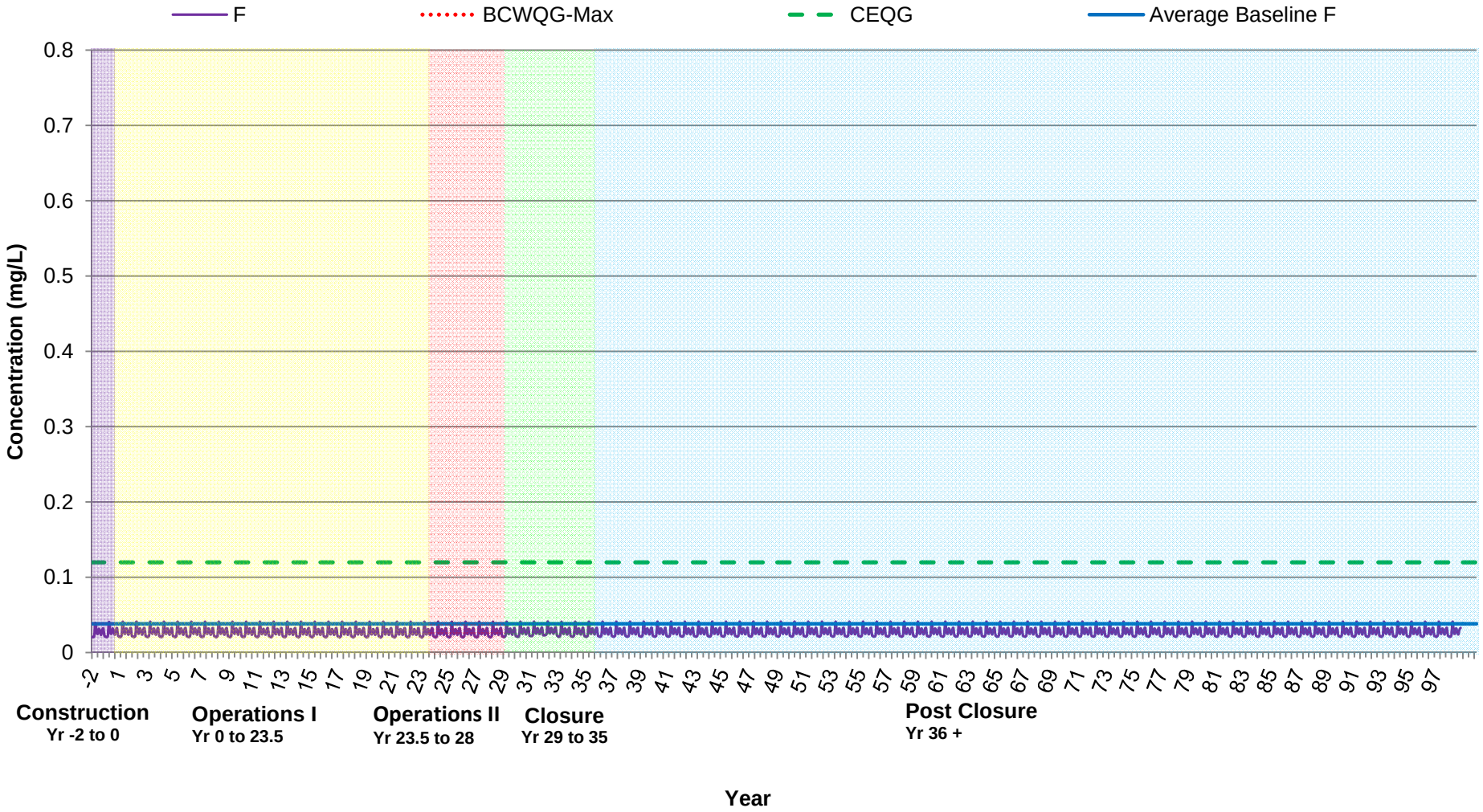
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C11.Cl

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX IS HARNDESS DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS J1(AVERAGE HARDNESS OF 126 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE FLUORIDE CONCENTRATIONS - JONES CREEK (J1)

Knight Piésold CONSULTING

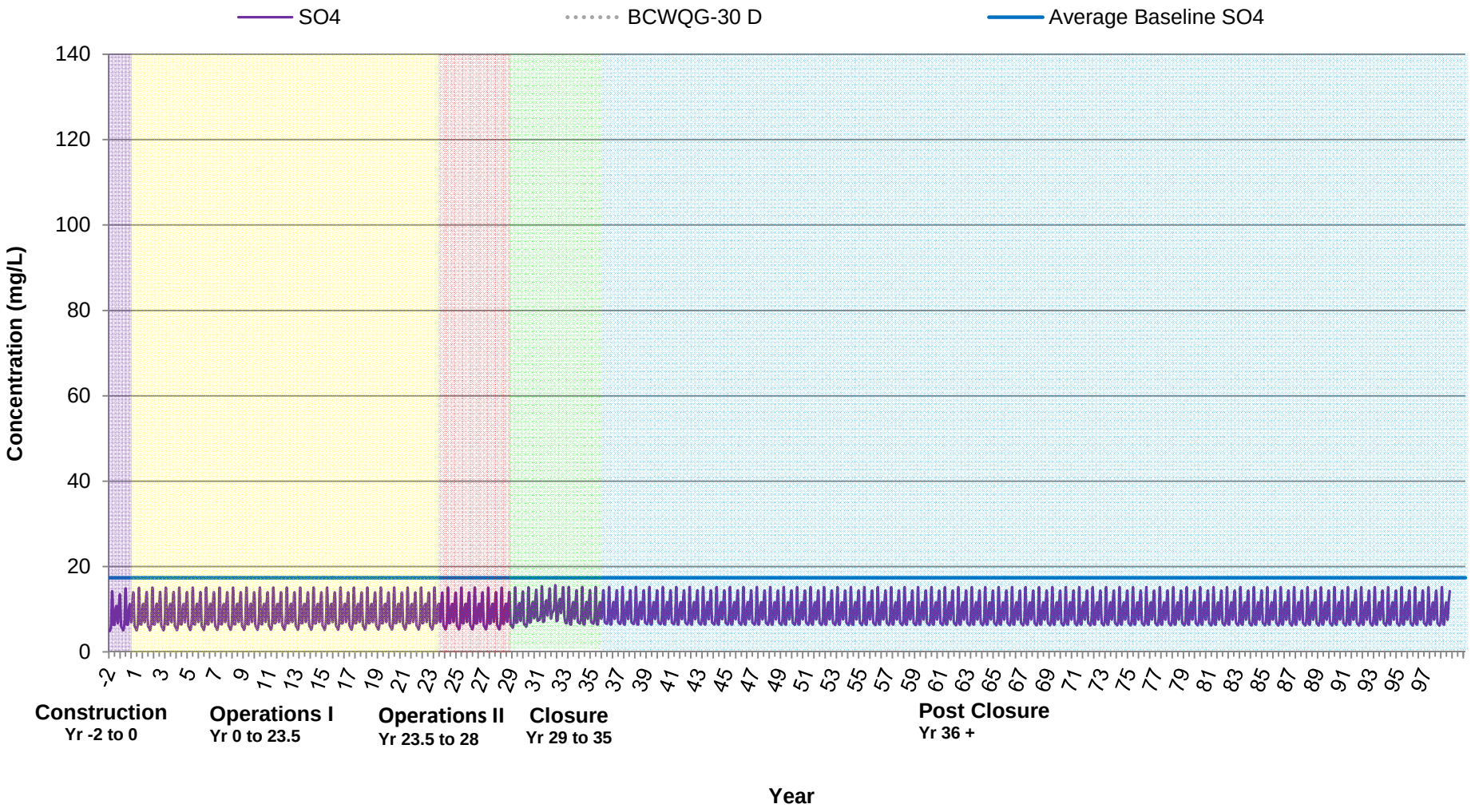
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C11.F

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. BCWQG-30 D IS HARDNESS DEPEDENT.
2. BASELINE SITE USED FOR COMPARISON IS J1(AVERAGE HARDNESS OF 126 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE SULPHATE CONCENTRATIONS - JONES CREEK (J1)

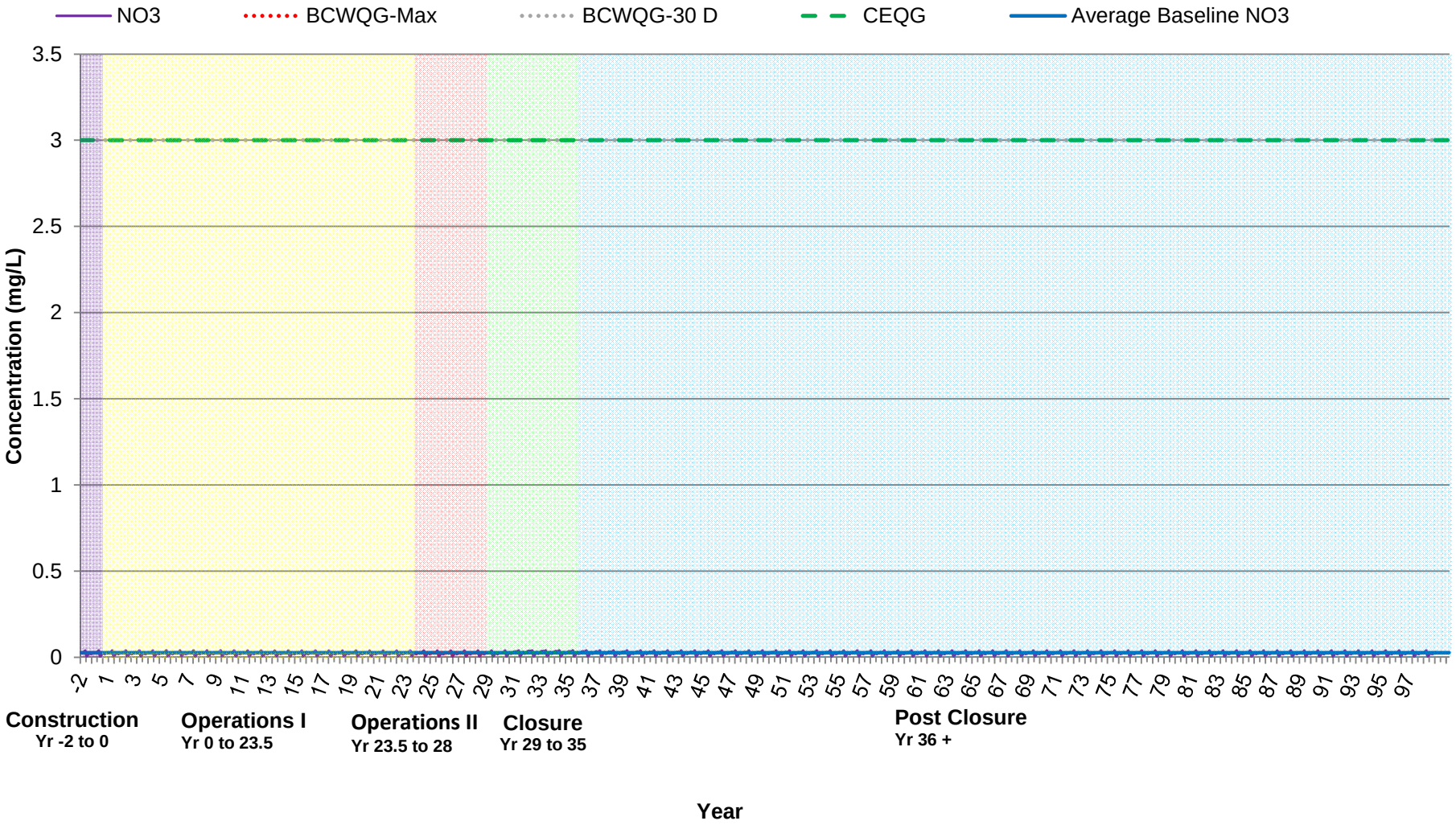
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C11.S04

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS J1(AVERAGE HARDNESS OF 126 mg/L).
3. THE BCWQG-MAX (32.8 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE NITRATE CONCENTRATIONS - JONES CREEK (J1)

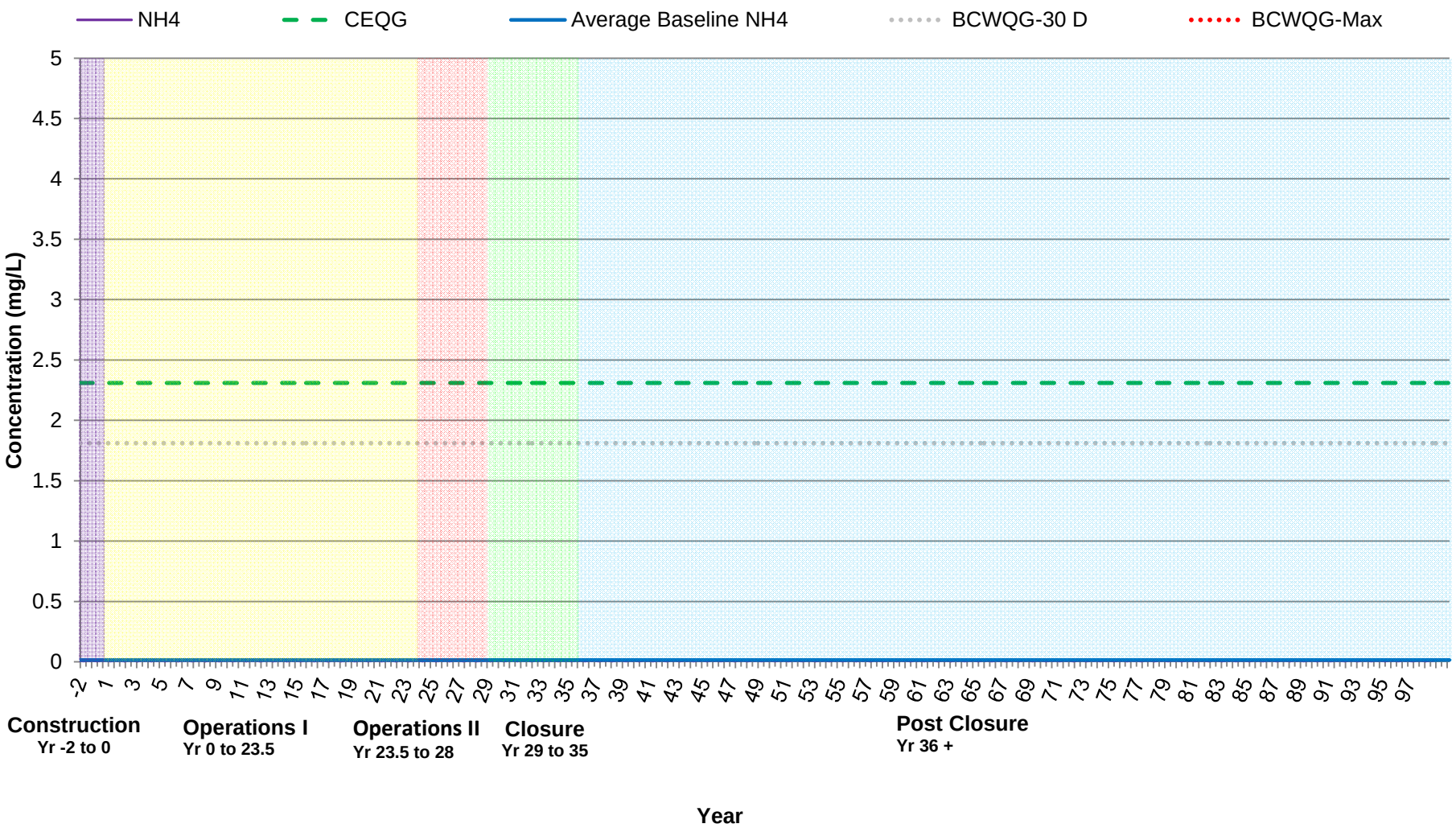
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C11.NO3

REV 0



NOTES:

1. THE BCWQG-30 D IS VALID FOR ONLY 6.5≤pH<9 AND 0°C≤T≤20°C.
2. THE BCWQG-MAX (20.15 mg/L) VALID FOR 6.5≤pH<9 IS NOT SHOWN.
3. THE CEQG IS TO BE USED WITH CAUTION FOR WATER WITH T<5°C AND pH>9.
4. BASELINE SITE USED FOR COMPARISON IS J1(AVERAGE HARDNESS OF 126 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE AMMONIA CONCENTRATIONS - JONES CREEK (J1)

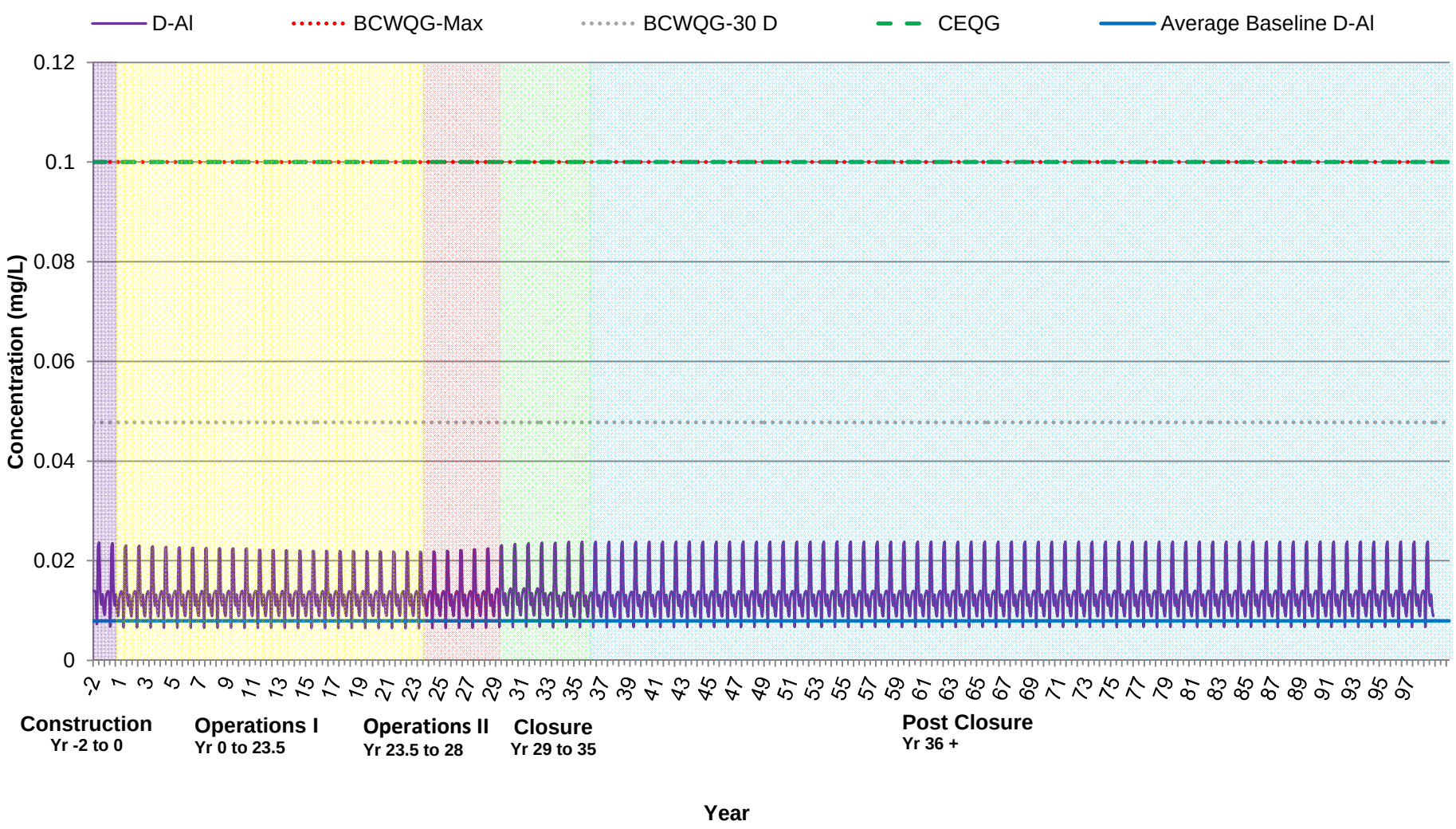
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C11.NH4

REV 0



NOTES:

1. ALL GUIDELINES ARE pH-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS J1(AVERAGE HARDNESS OF 126 mg/L).
3. AVERAGE BASELINE pH USED TO CALCULATE GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE DISSOLVED ALUMINUM CONCENTRATIONS - JONES CREEK (J1)

Knight Piésold CONSULTING

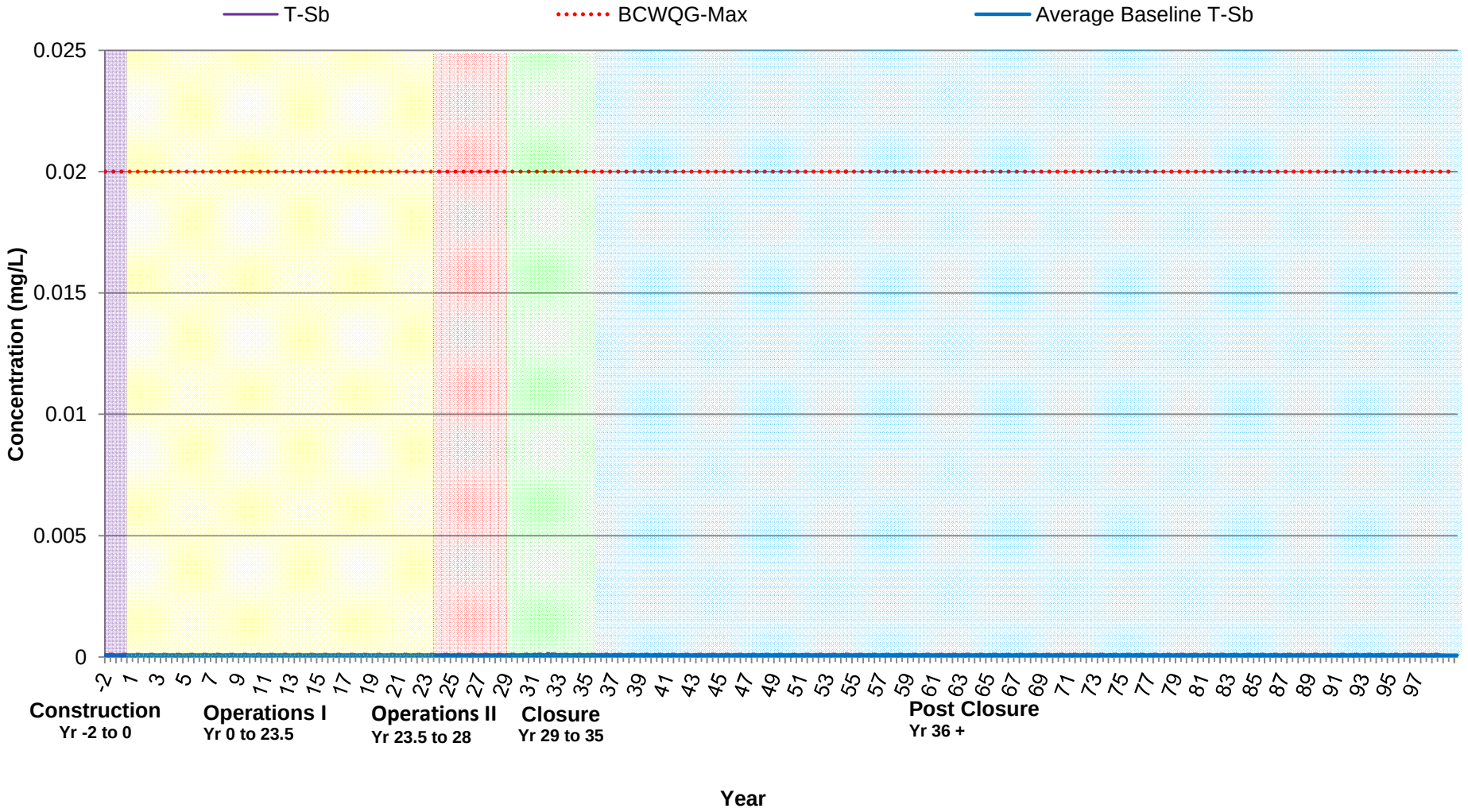
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C11.Al

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS J1(AVERAGE HARDNESS OF 126 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE ANTIMONY CONCENTRATIONS - JONES CREEK (J1)

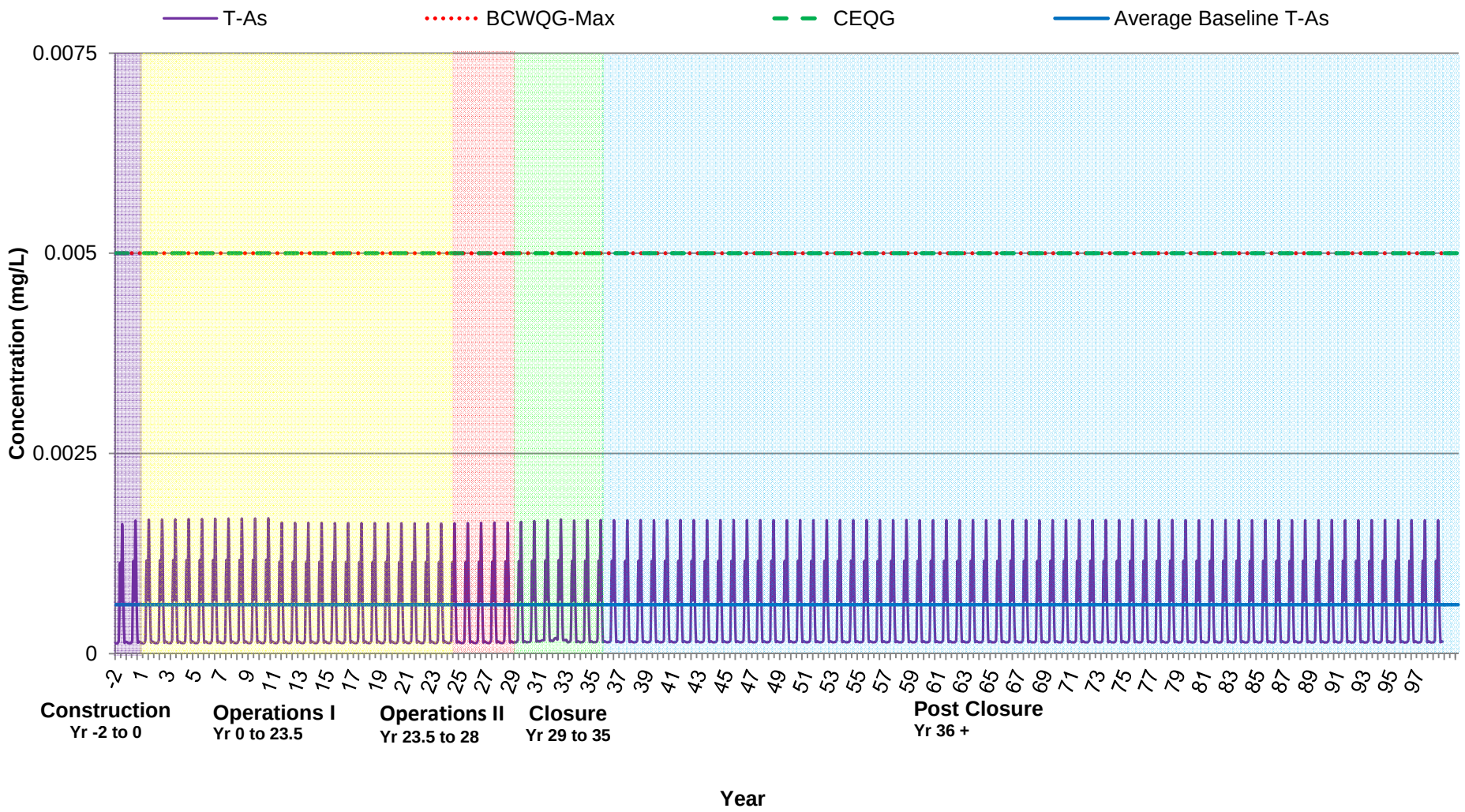
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C11.Sb

REV 0



NOTES:

1. THE BCWQG AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS J1(AVERAGE HARDNESS OF 126 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE ARSENIC CONCENTRATIONS - JONES CREEK (J1)

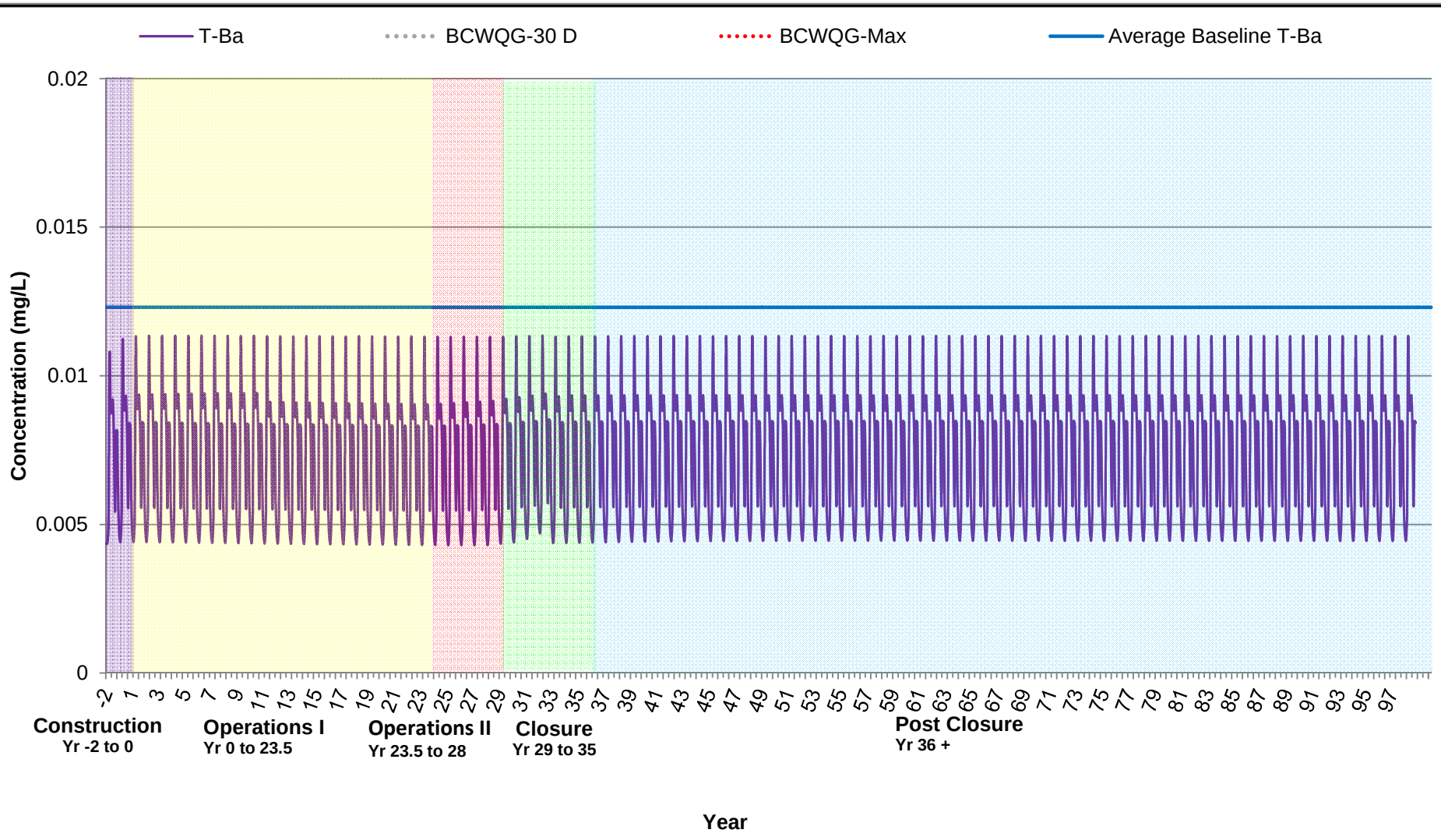
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C11.As

REV 0



NOTES:

1. THE BCWQG-MAX IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS J1(AVERAGE HARDNESS OF 126 mg/L).
3. THE BCWQG-30 D (1 mg/L) AND BCWQG-MAX (5 mg/L) ARE NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE BARIUM CONCENTRATIONS - JONES CREEK (J1)

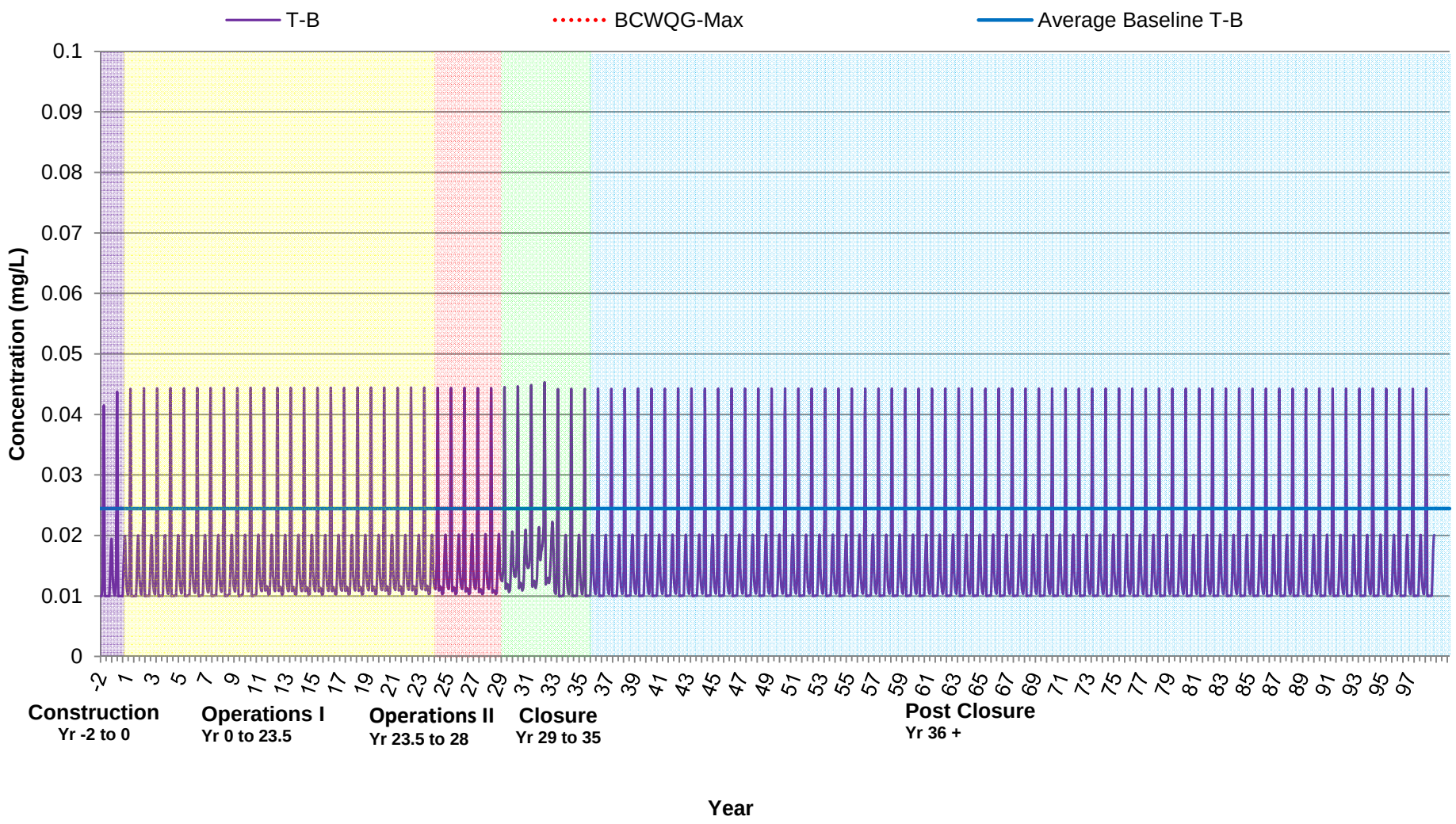
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C11.Ba

REV 0



NOTES:

1. BASELINE SITE USED FOR COMPARISON IS J1(AVERAGE HARDNESS OF 126 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.
3. THE BCWQG-MAX (1.2 mg/L) IS NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE BORON CONCENTRATIONS - JONES CREEK (J1)

Knight Piésold CONSULTING

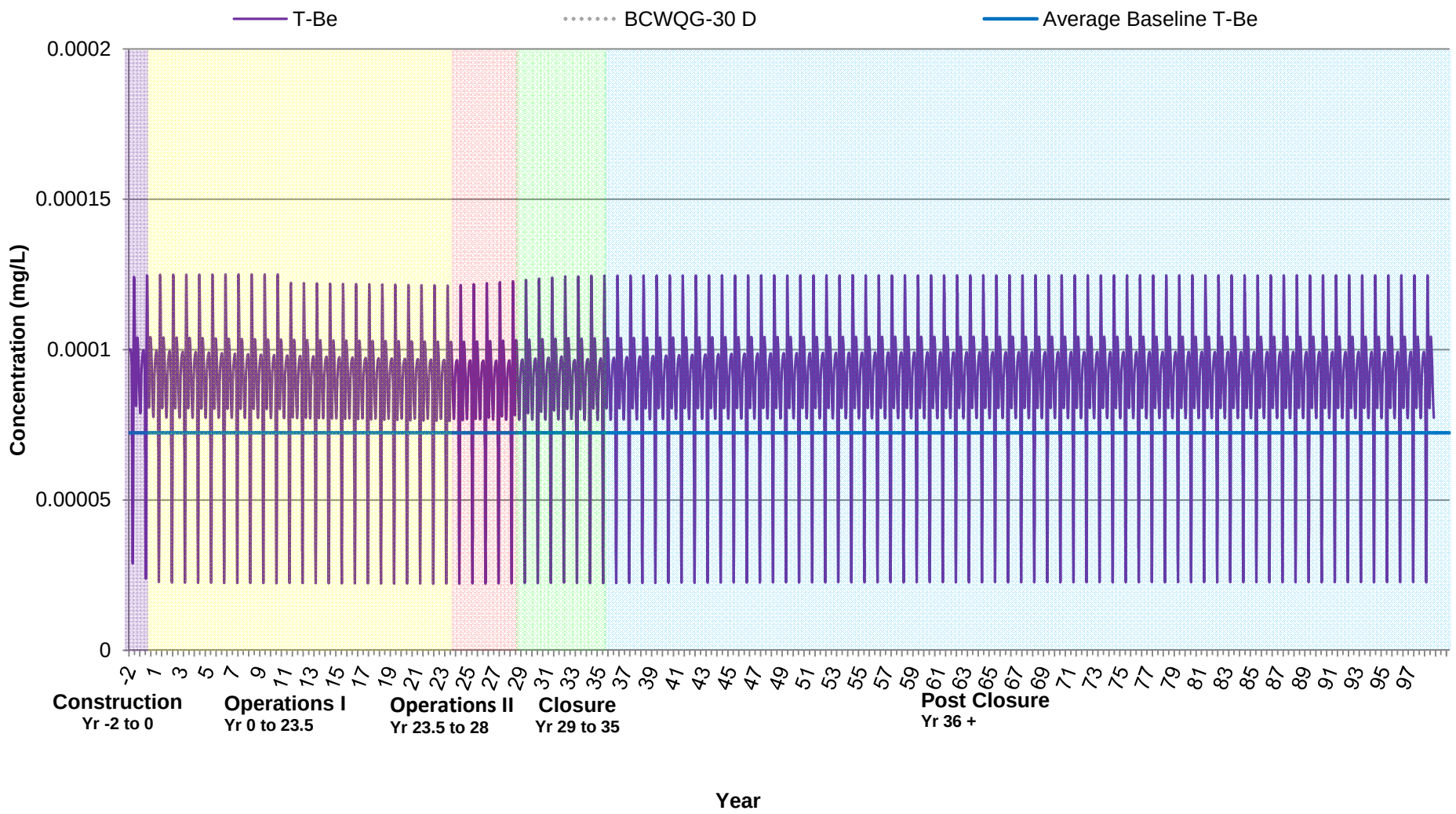
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C11.B

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS J1(AVERAGE HARDNESS OF 126 mg/L).
3. THE BCWQG-30 D (0.0053 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE BERYILLIUM CONCENTRATIONS - JONES CREEK (J1)

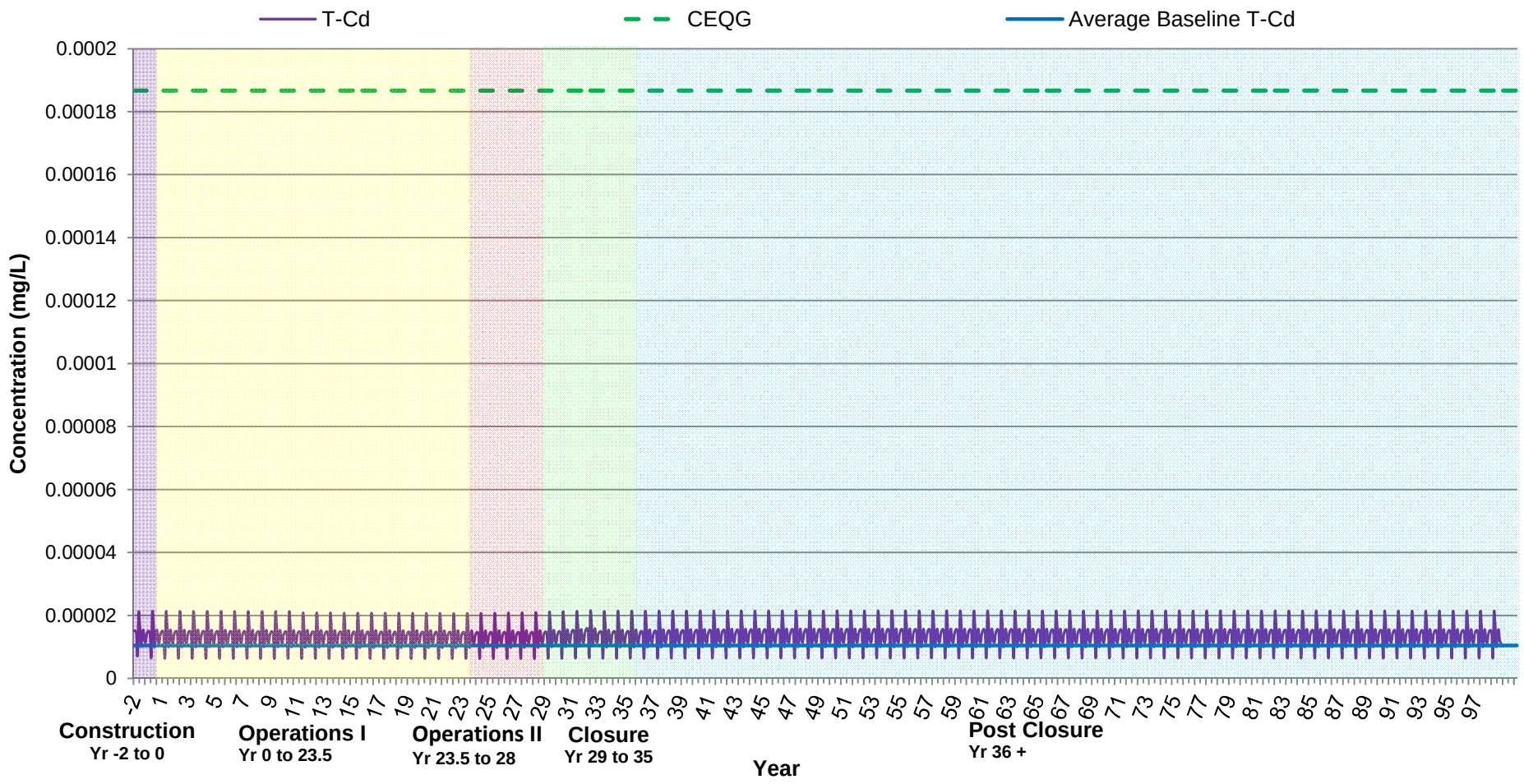
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C11.Be

REV 0



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. THE BCWQG ARE DRAFT GUIDELINES UNDER REVIEW (JUNE 2014).
3. BASELINE SITE USED FOR COMPARISON IS J1(AVERAGE HARDNESS OF 126 mg/L).
4. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE CADMIUM CONCENTRATIONS - JONES CREEK (J1)

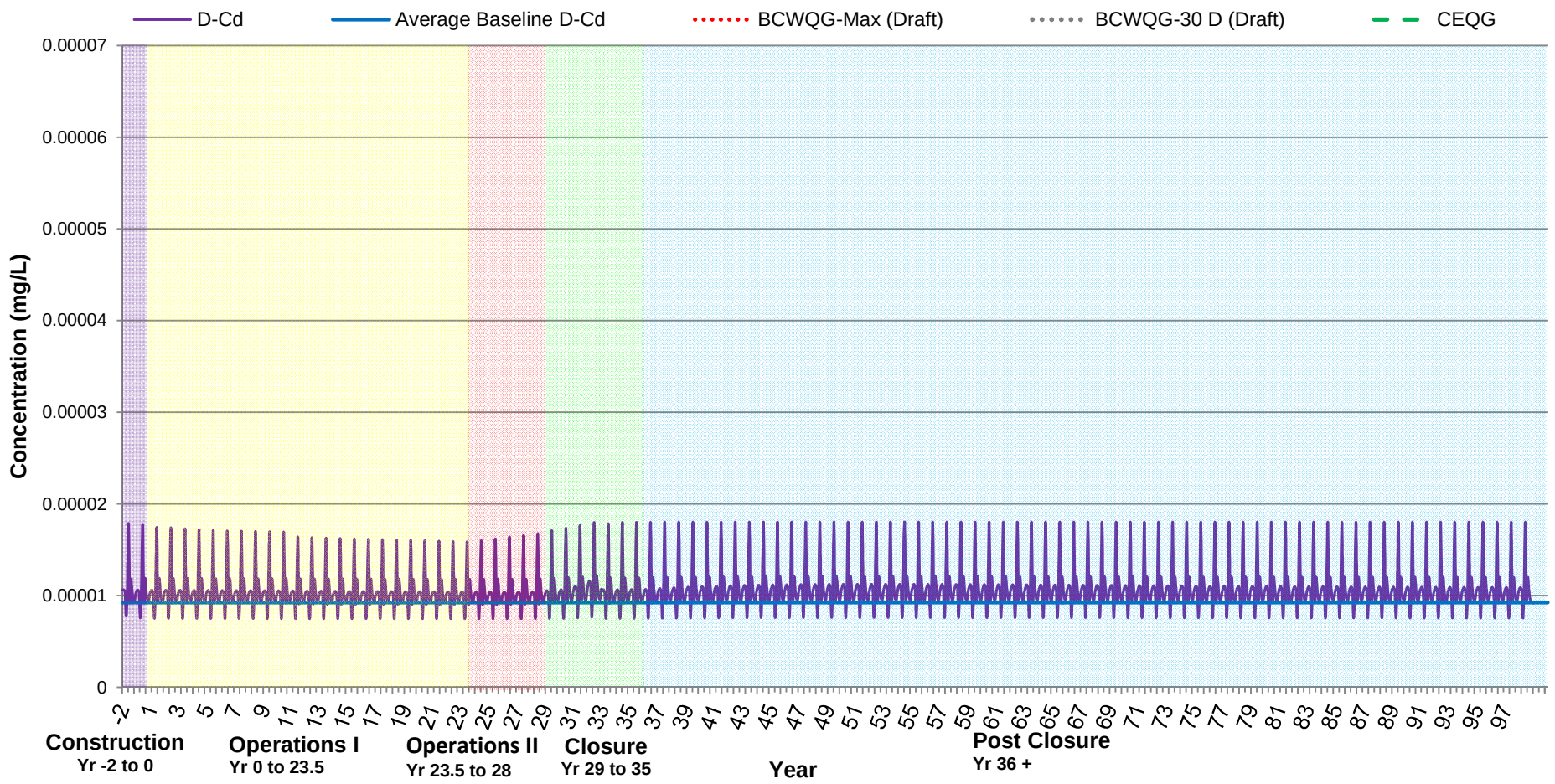
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C11.Cd-T

REV 0



NOTES:

1. BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS J1(AVERAGE HARDNESS OF 126 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE CADMIUM CONCENTRATIONS - JONES CREEK (J1)

Knight Piésold CONSULTING

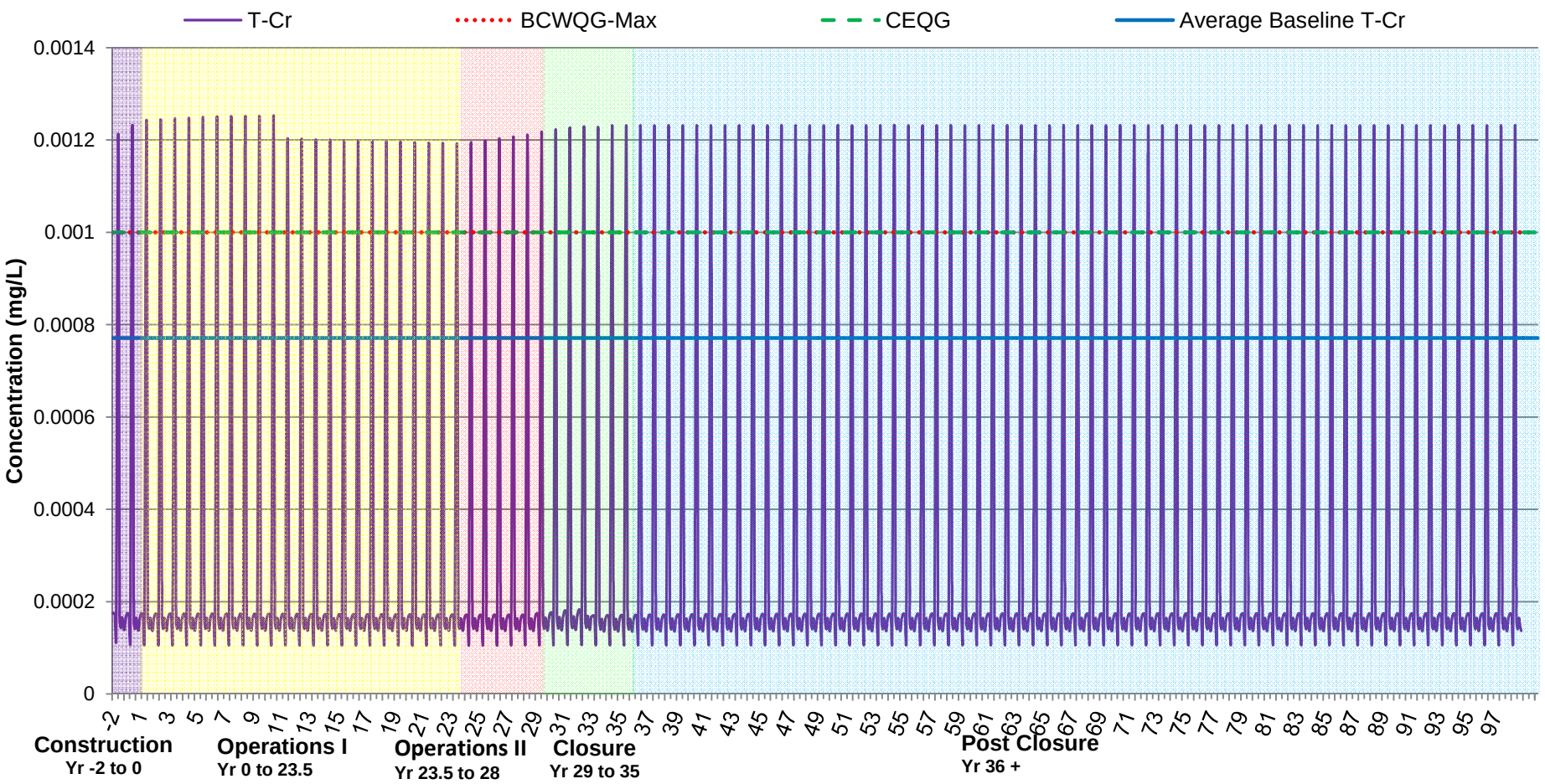
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C11.Cd-D

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. GUIDELINES ARE FOR CHROMIUM (IV), THE SPECIES MOST COMMON IN WELL OXYGENATED SURFACE WATERS.
2. BASELINE SITE USED FOR COMPARISON IS J1(AVERAGE HARDNESS OF 126 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE CHROMIUM CONCENTRATIONS - JONES CREEK (J1)

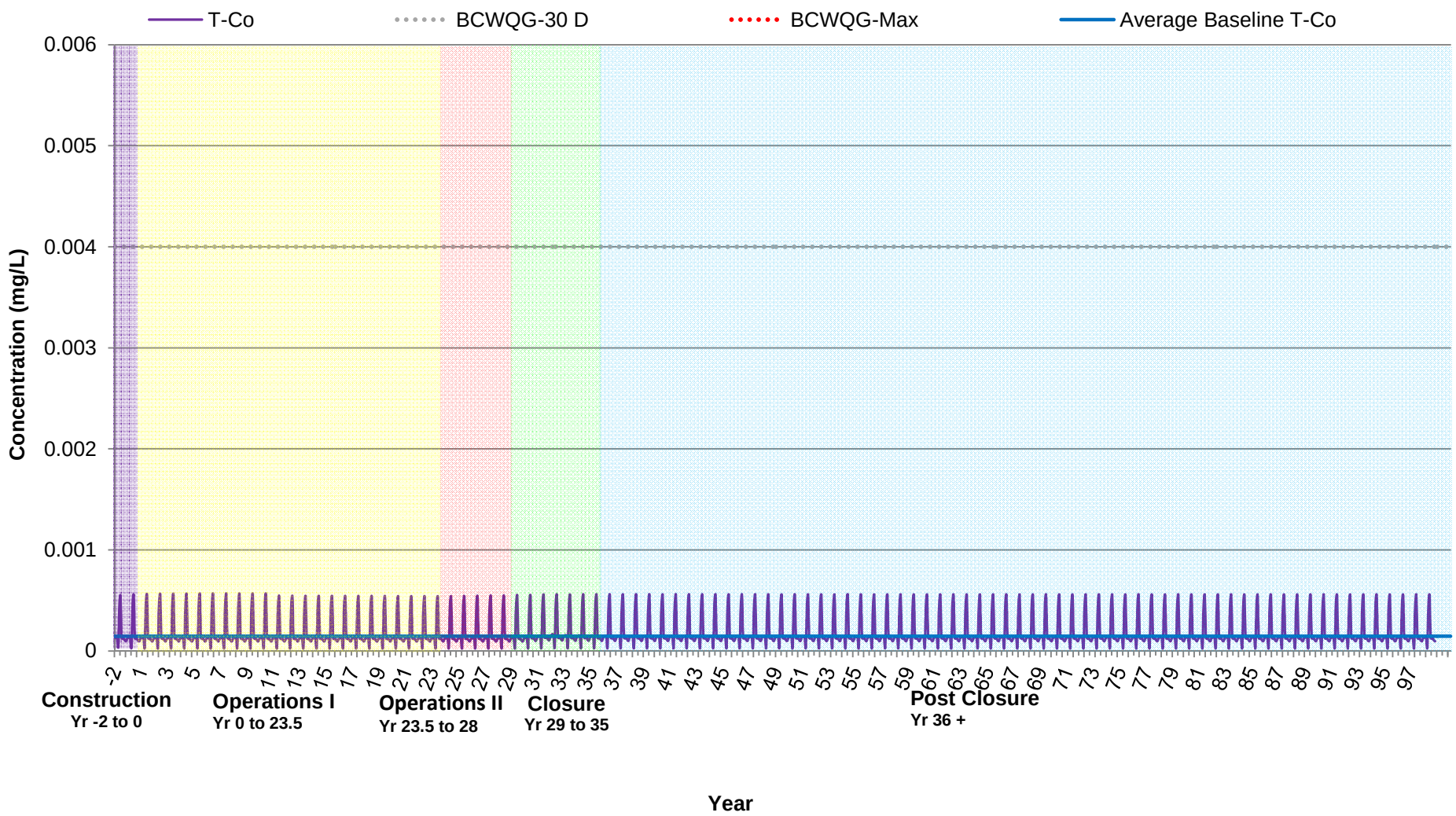
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C11.Cr

REV 0



NOTES:

1. THE BCWQG-30 D AND BCWQG-MAX ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS J1(AVERAGE HARDNESS OF 126 mg/L).
3. THE BCWQG-MAX GUIDELINE (0.11 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE COBALT CONCENTRATIONS - JONES CREEK (J1)

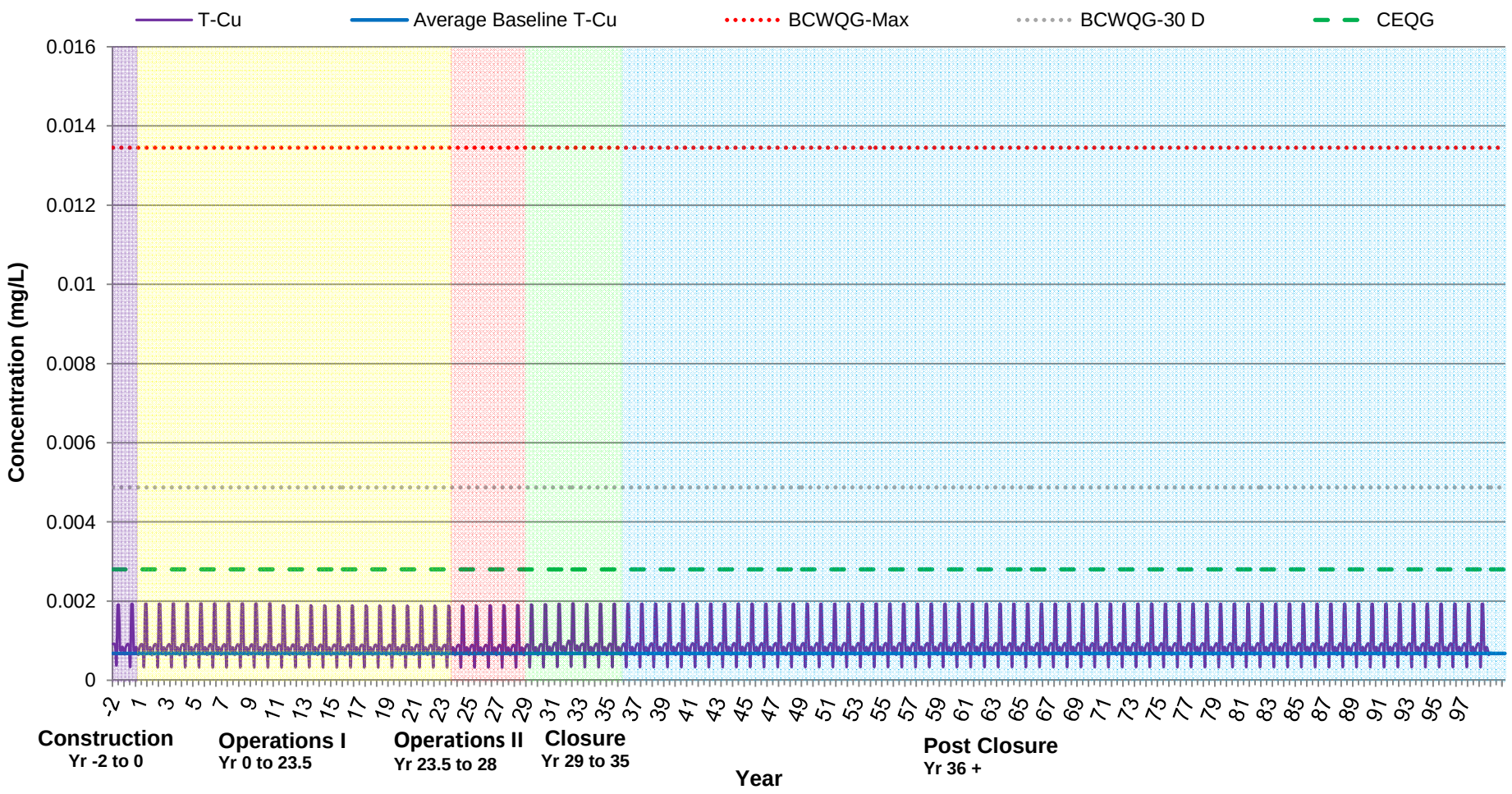
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C11.Co

REV 0



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS J1(AVERAGE HARDNESS OF 126 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE COPPER CONCENTRATIONS - JONES CREEK (J1)

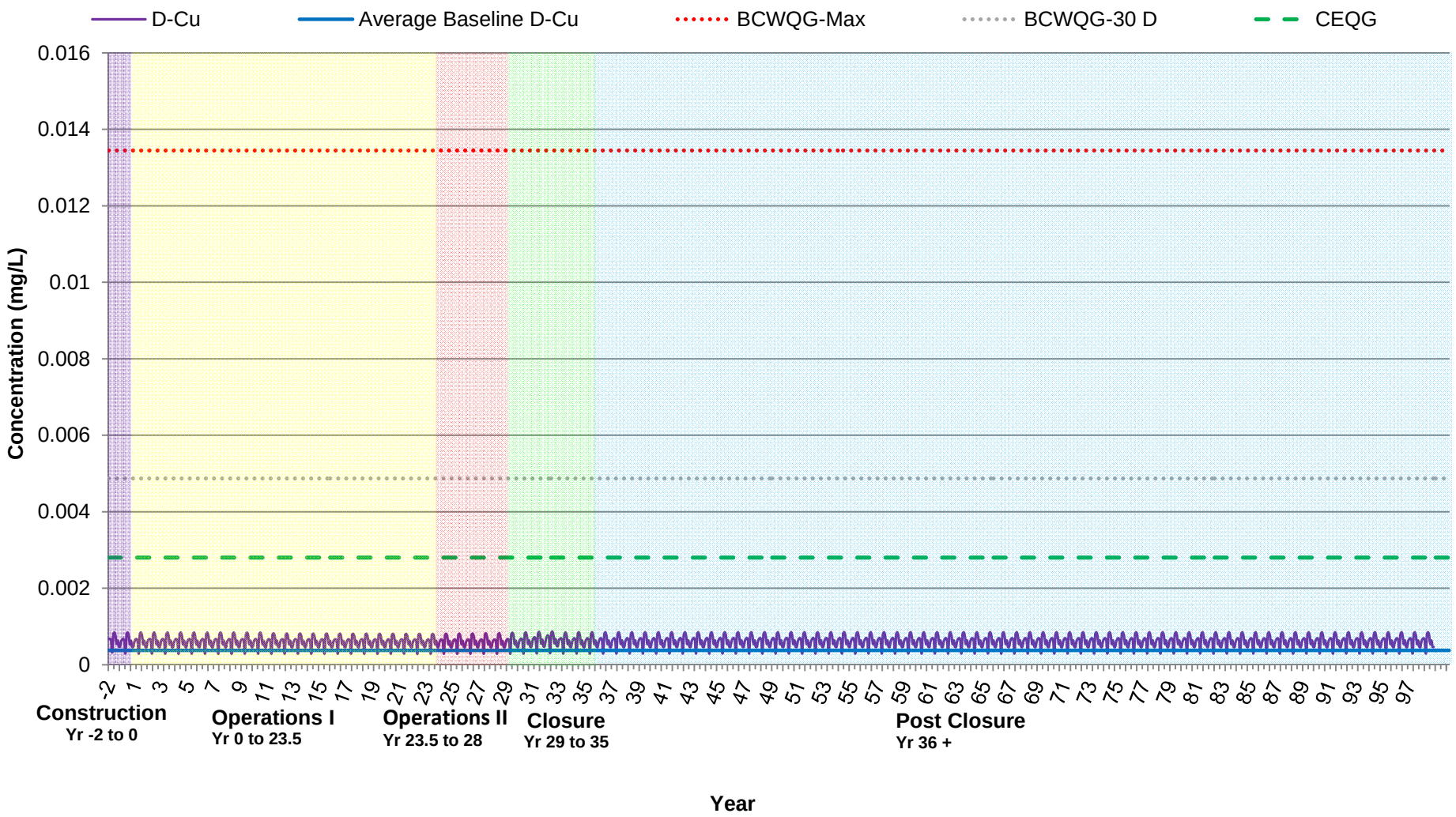
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C11.Cu-T

REV 0



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS J1(AVERAGE HARDNESS OF 126 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE COPPER CONCENTRATIONS - JONES CREEK (J1)

Knight Piésold CONSULTING

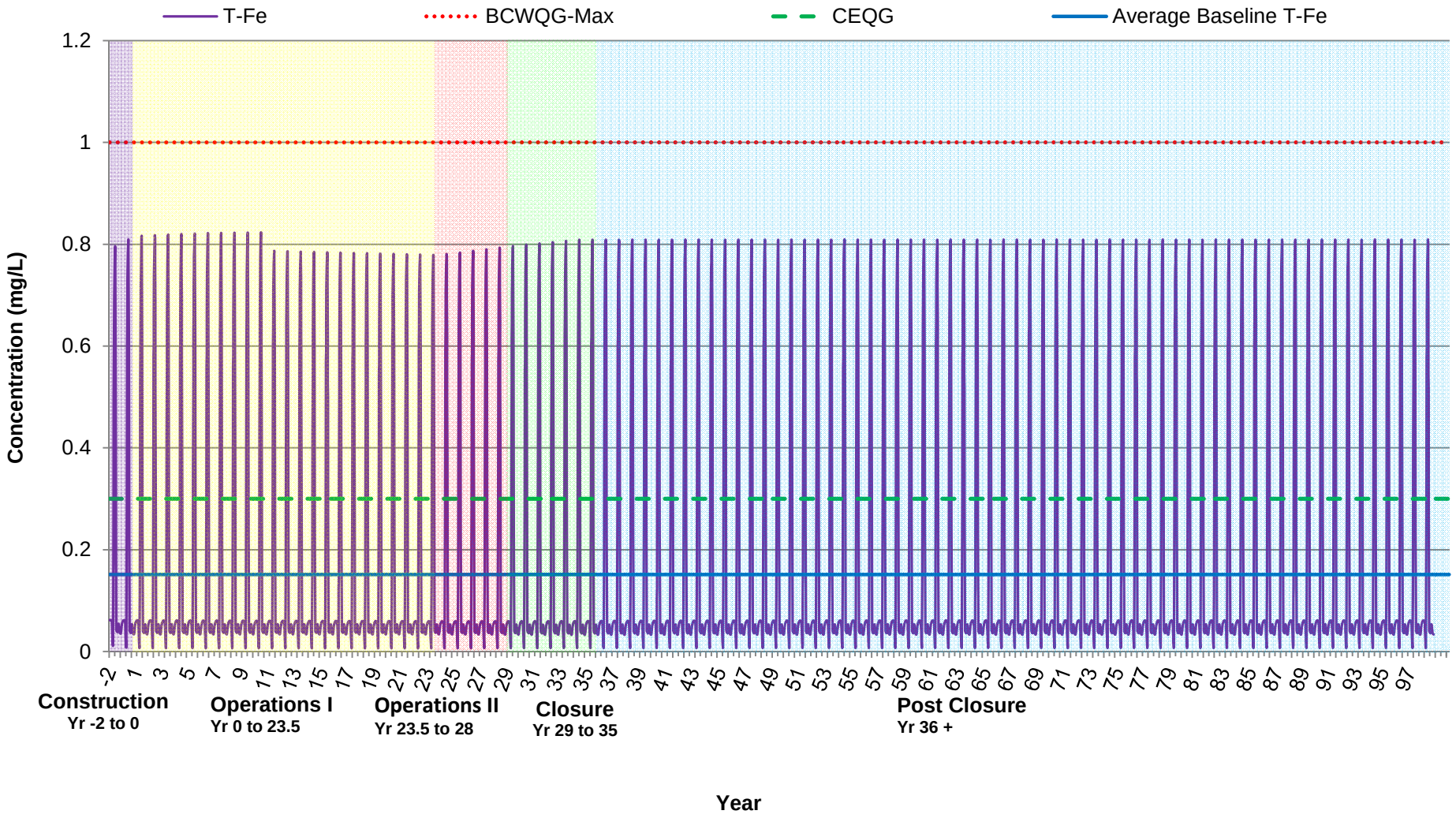
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C11.Cu-D

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS J1(AVERAGE HARDNESS OF 126 mg/L).
3. BCWQG-MAX 1.0 mg/L IS NOT SHOWN ON GRAPH.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE TOTAL IRON CONCENTRATIONS - JONES CREEK (J1)

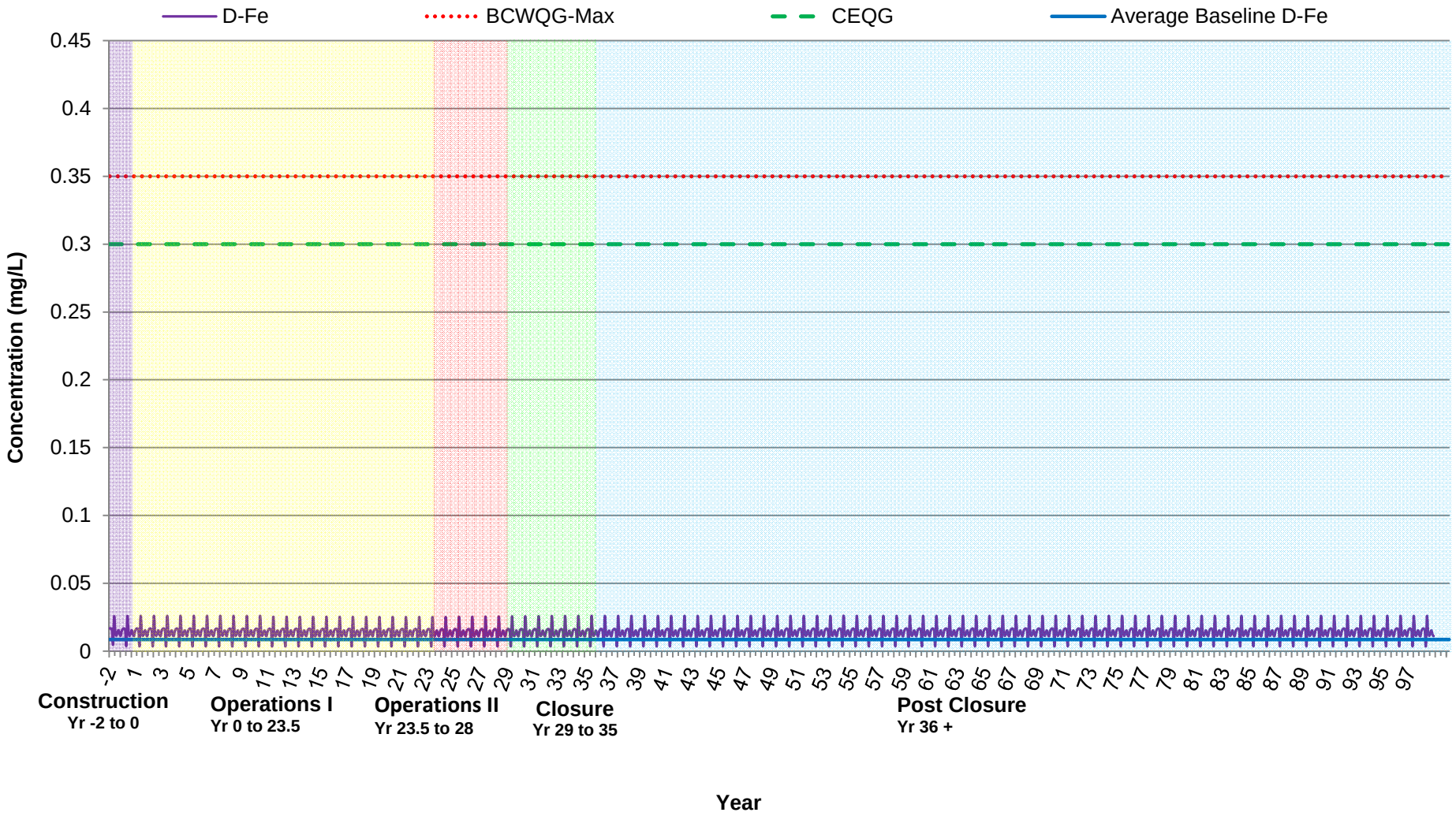
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C11.Fe-T

REV 0



NOTES:

1. THE BCWQG-MAX AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS J1(AVERAGE HARDNESS OF 126 mg/L).

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE DISSOLVED IRON CONCENTRATIONS - JONES CREEK (J1)

Knight Piésold CONSULTING

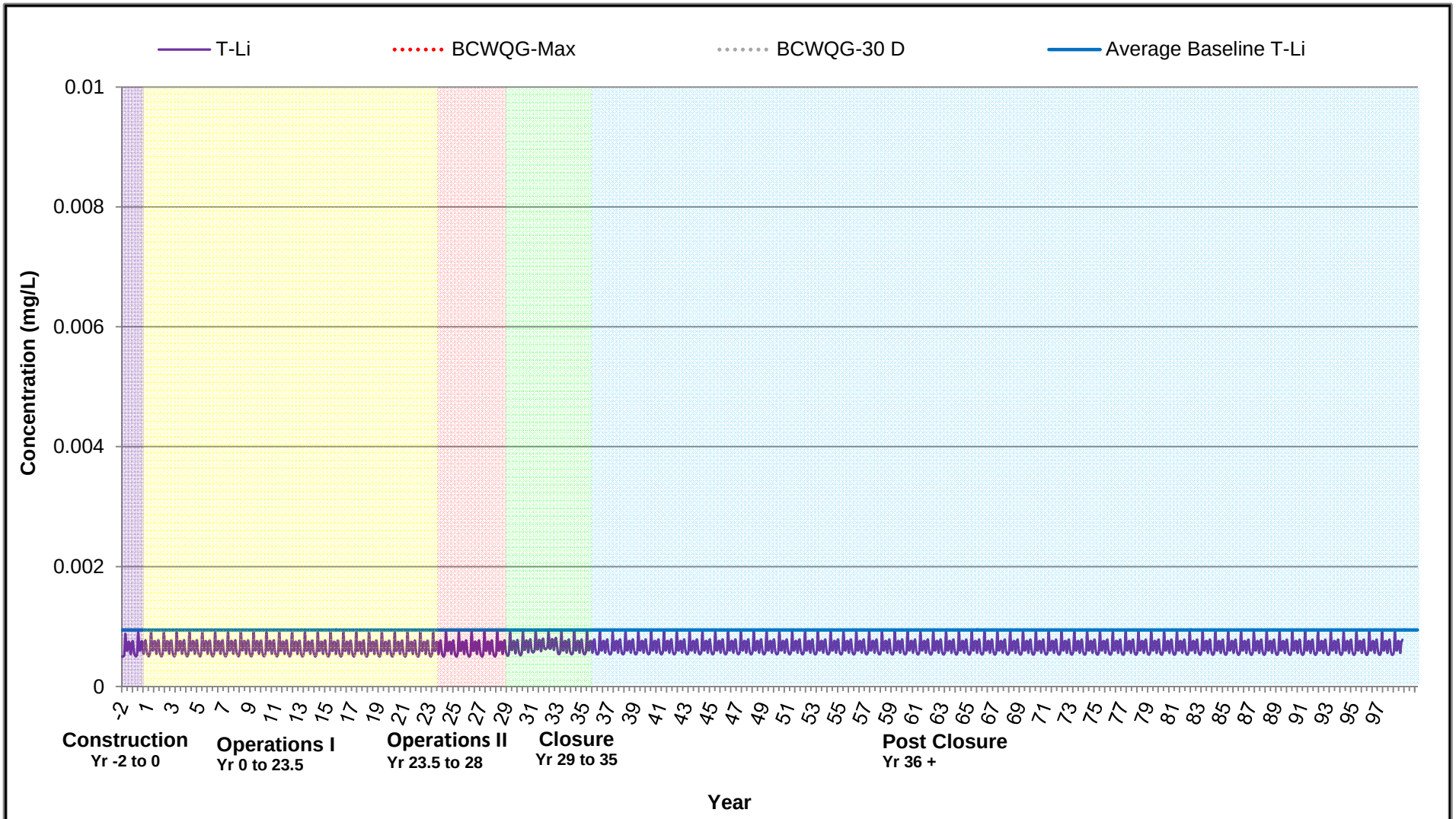
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C11.Fe-D

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS J1(AVERAGE HARDNESS OF 126 mg/L).
3. THE BCWQG-30 D (0.096 mg/L) AND BCWQG-MAX (0.87 mg/L) ARE INTERIM (WORKING) AND ARE NOT SHOWN ON GRAPH.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE LITHIUM CONCENTRATIONS - JONES CREEK (J1)

Knight Piésold CONSULTING

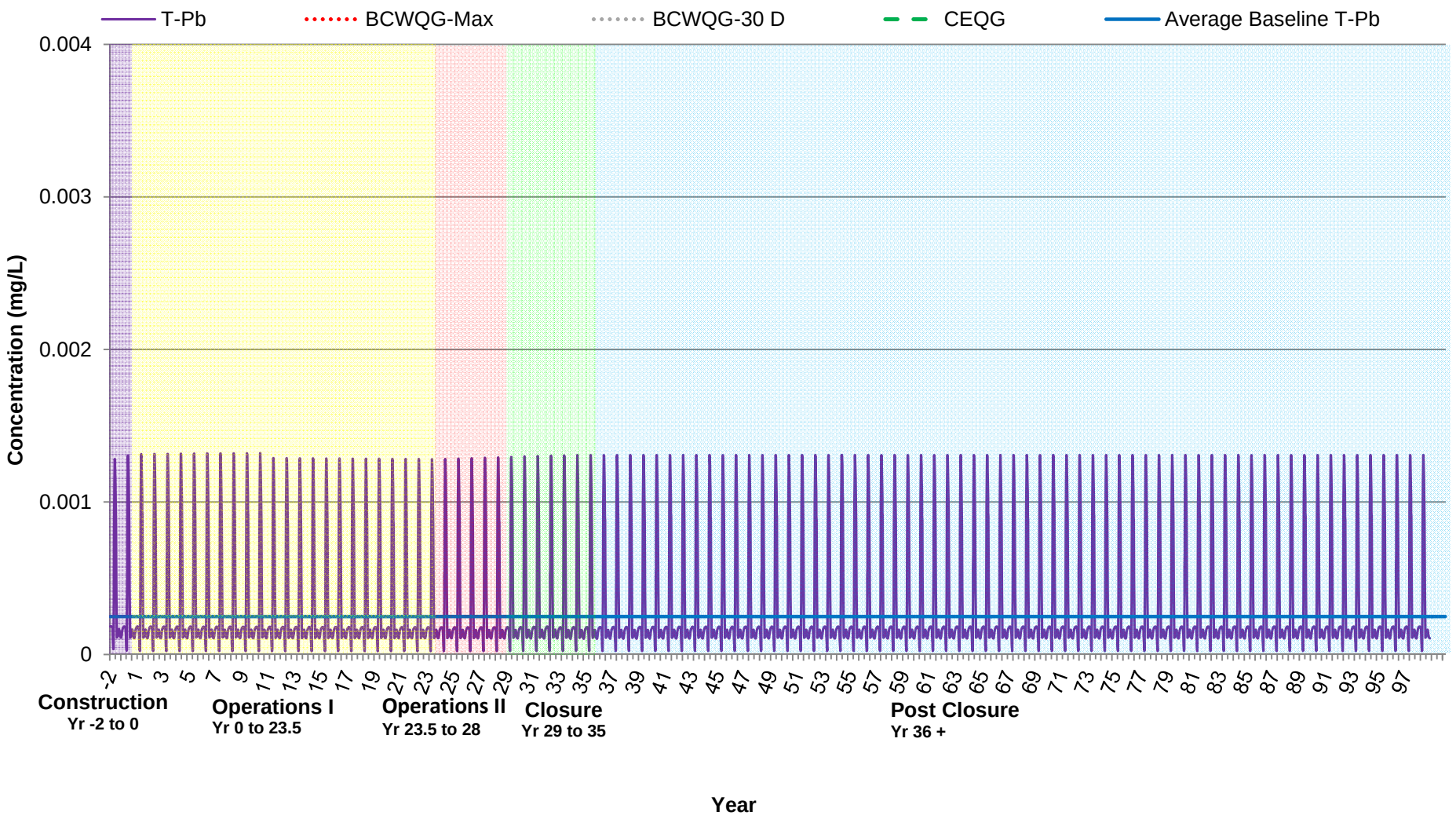
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C11.Li

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS J1(AVERAGE HARDNESS OF 126 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.
4. THE BCWQG-MAX (CALCULATED AT 0.011 mg/L) IS NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE LEAD CONCENTRATIONS - JONES CREEK (J1)

Knight Piésold CONSULTING

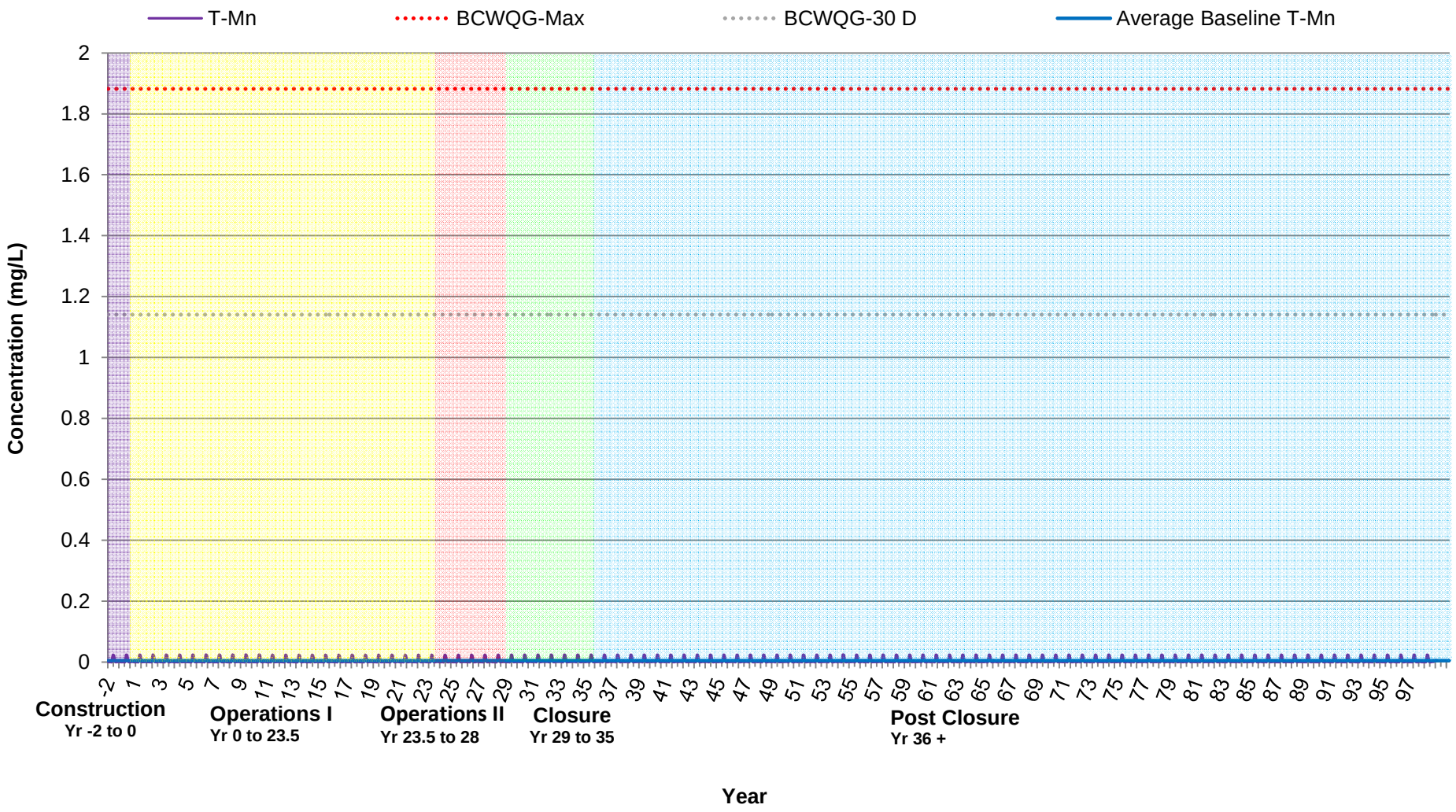
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C11.Pb

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS J1(AVERAGE HARDNESS OF 126 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE MANGANESE CONCENTRATIONS - JONES CREEK (J1)

Knight Piésold CONSULTING

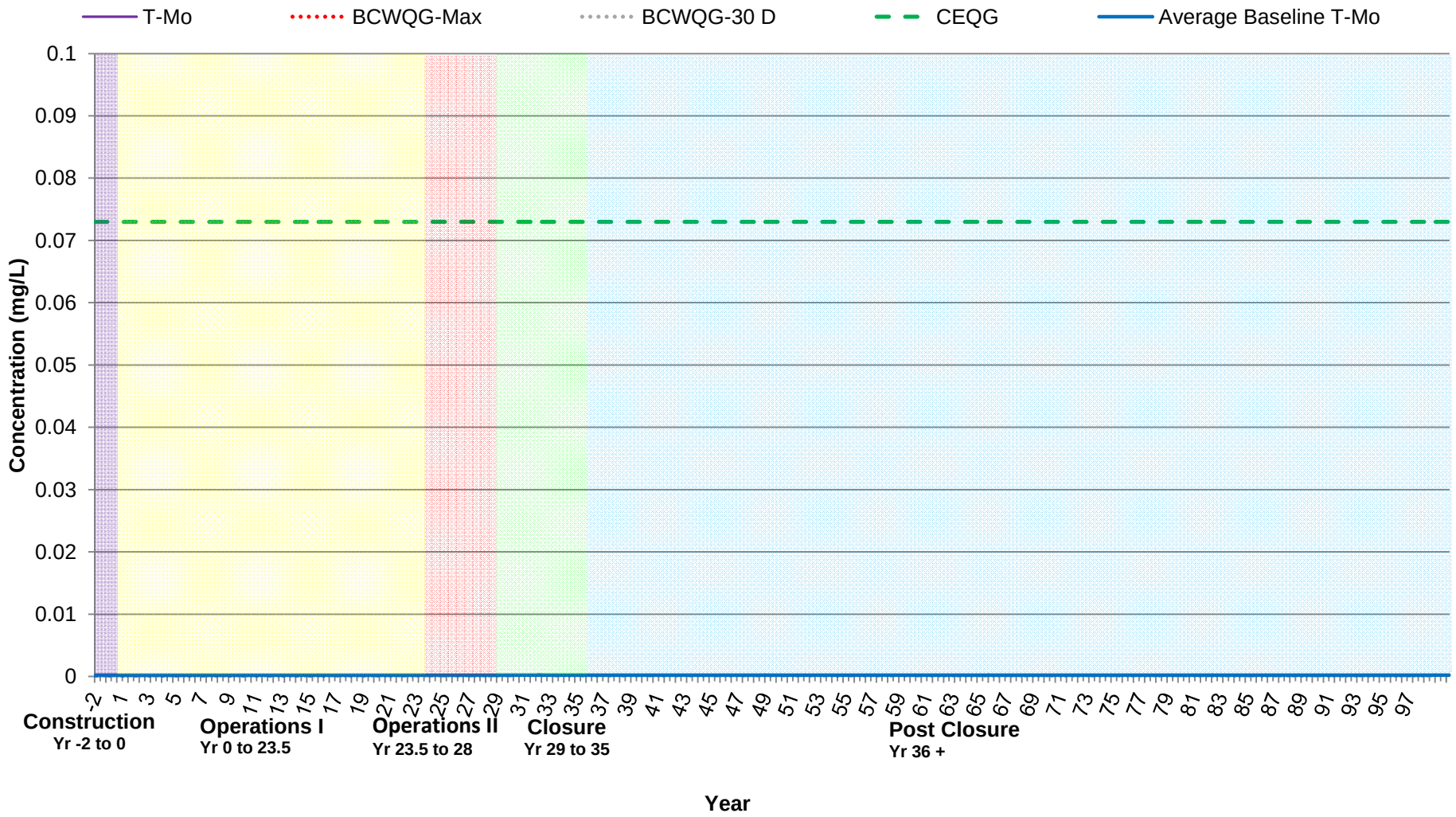
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C11.Mn

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS J1(AVERAGE HARDNESS OF 126 mg/L).
3. THE BCWQG-MAX (2 mg/L) AND BCWQG-30 D (1 mg/L) ARE NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE MOLYDBENUM CONCENTRATIONS - JONES CREEK (J1)

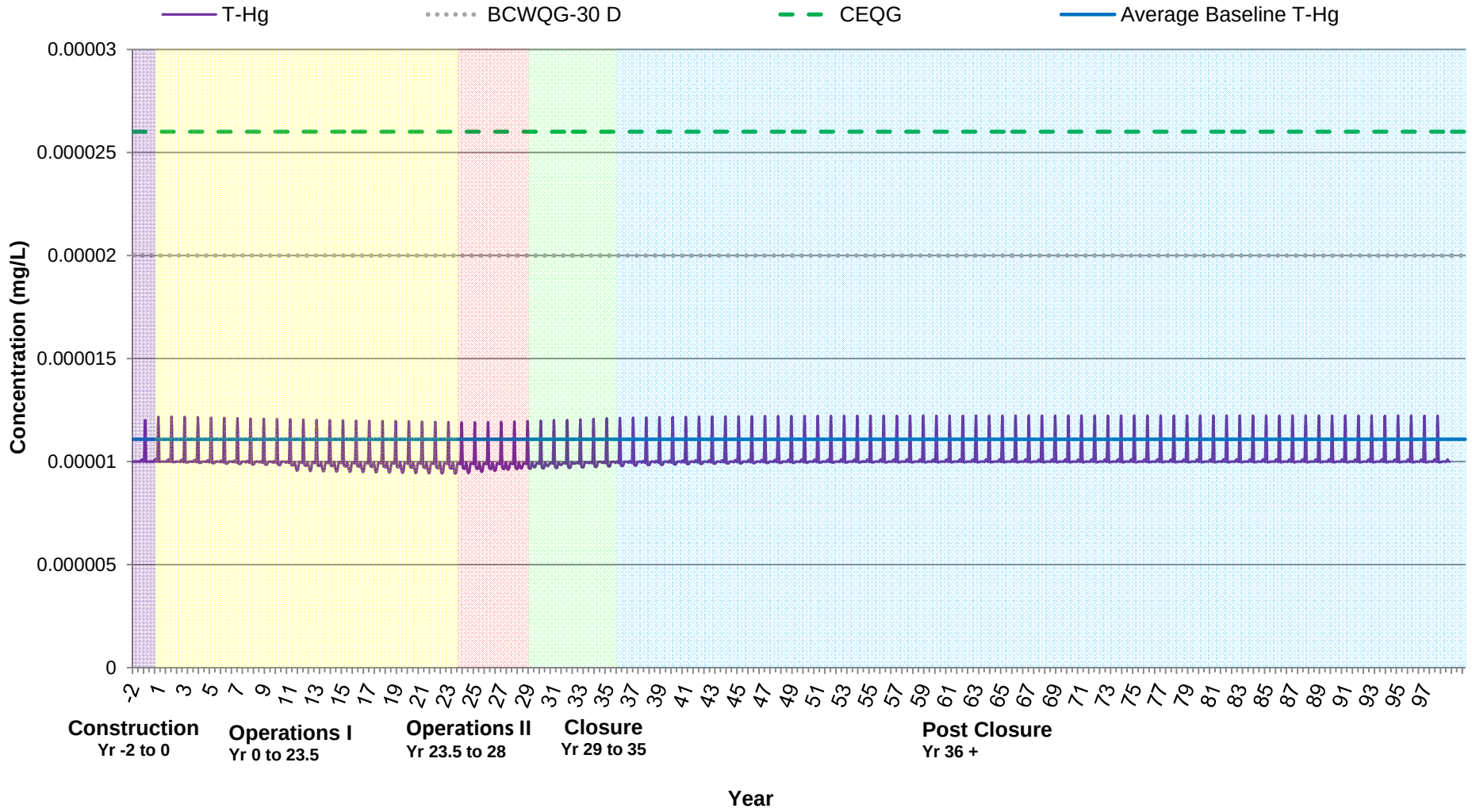
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C11.Mo

REV 0



NOTES:

1. THE BCWQG-30 D AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS J1(AVERAGE HARDNESS OF 126 mg/L).
3. BCWQG-30 D VALUE APPLIED ON ASSUMPTION THAT METHYL-Hg IS EQUAL TO 0.5% OF T-Hg.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE MERCURY CONCENTRATIONS - JONES CREEK (J1)

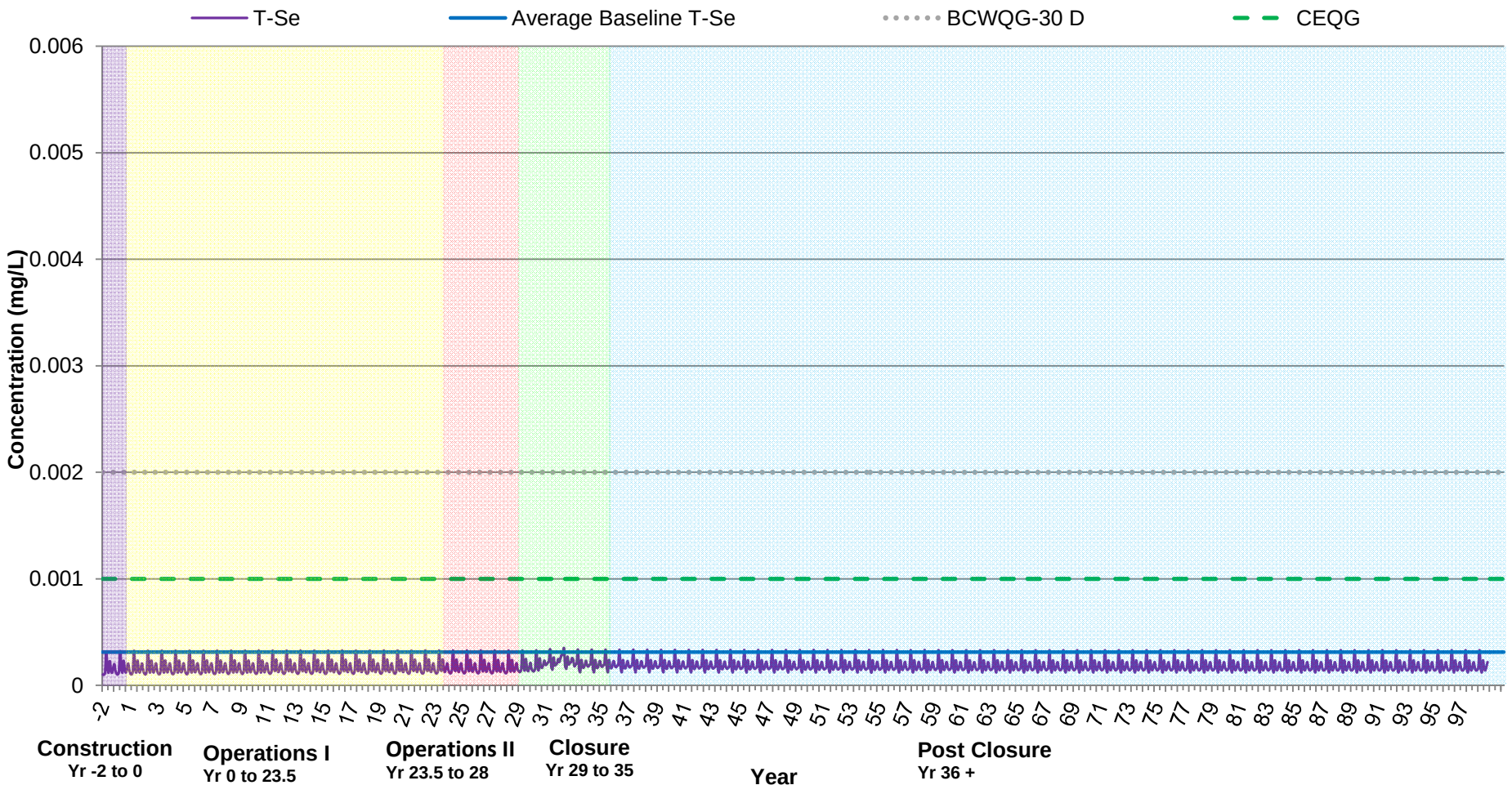
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C11.Hg

REV 0



NOTES:

1. THE BCWQG-30 D AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS J1(AVERAGE HARDNESS OF 126 mg/L).

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE SELENIUM CONCENTRATIONS - JONES CREEK (J1)

Knight Piésold CONSULTING

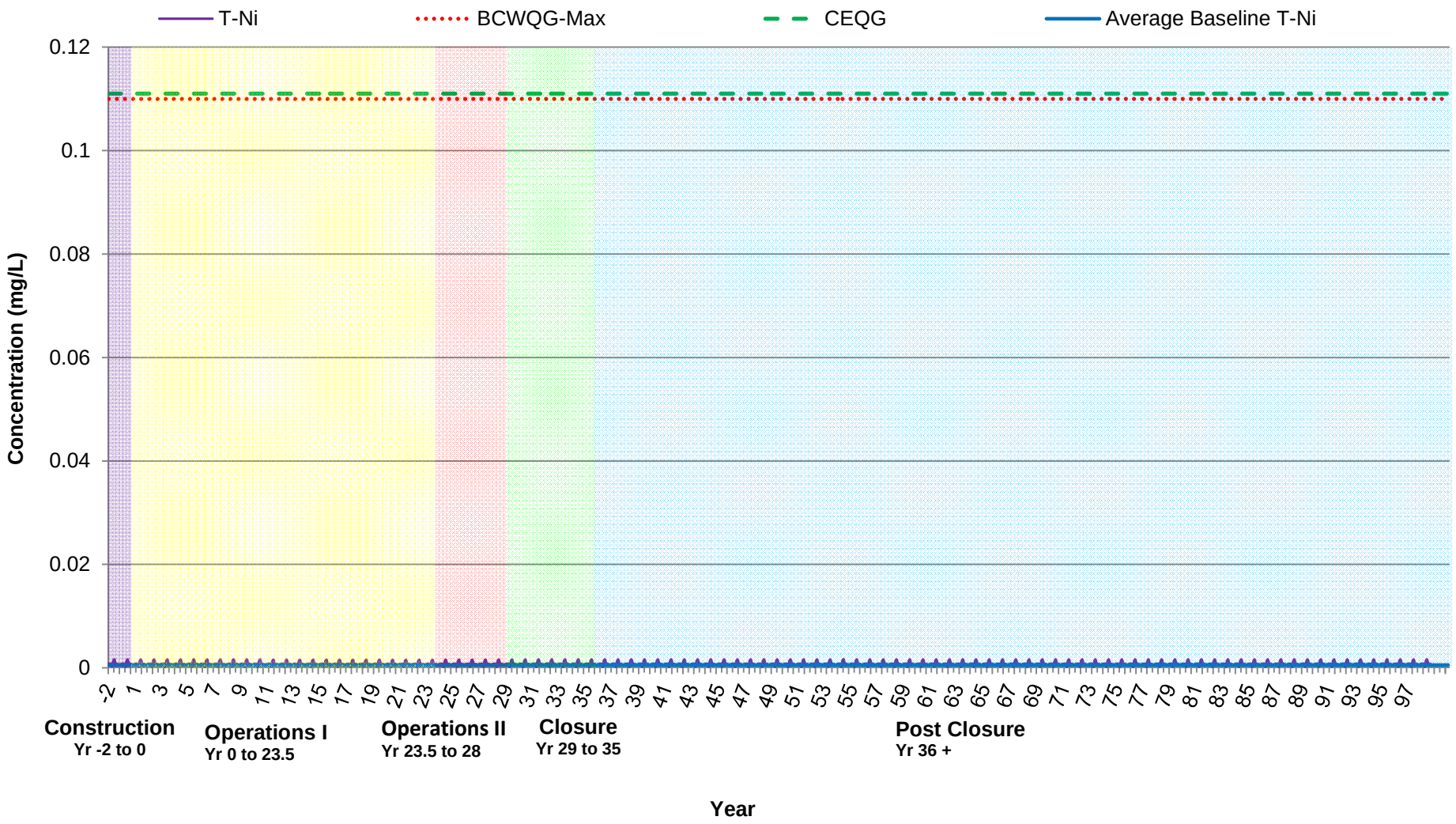
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C11.Se

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS J1(AVERAGE HARDNESS OF 126 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE NICKEL CONCENTRATIONS - JONES CREEK (J1)

Knight Piésold CONSULTING

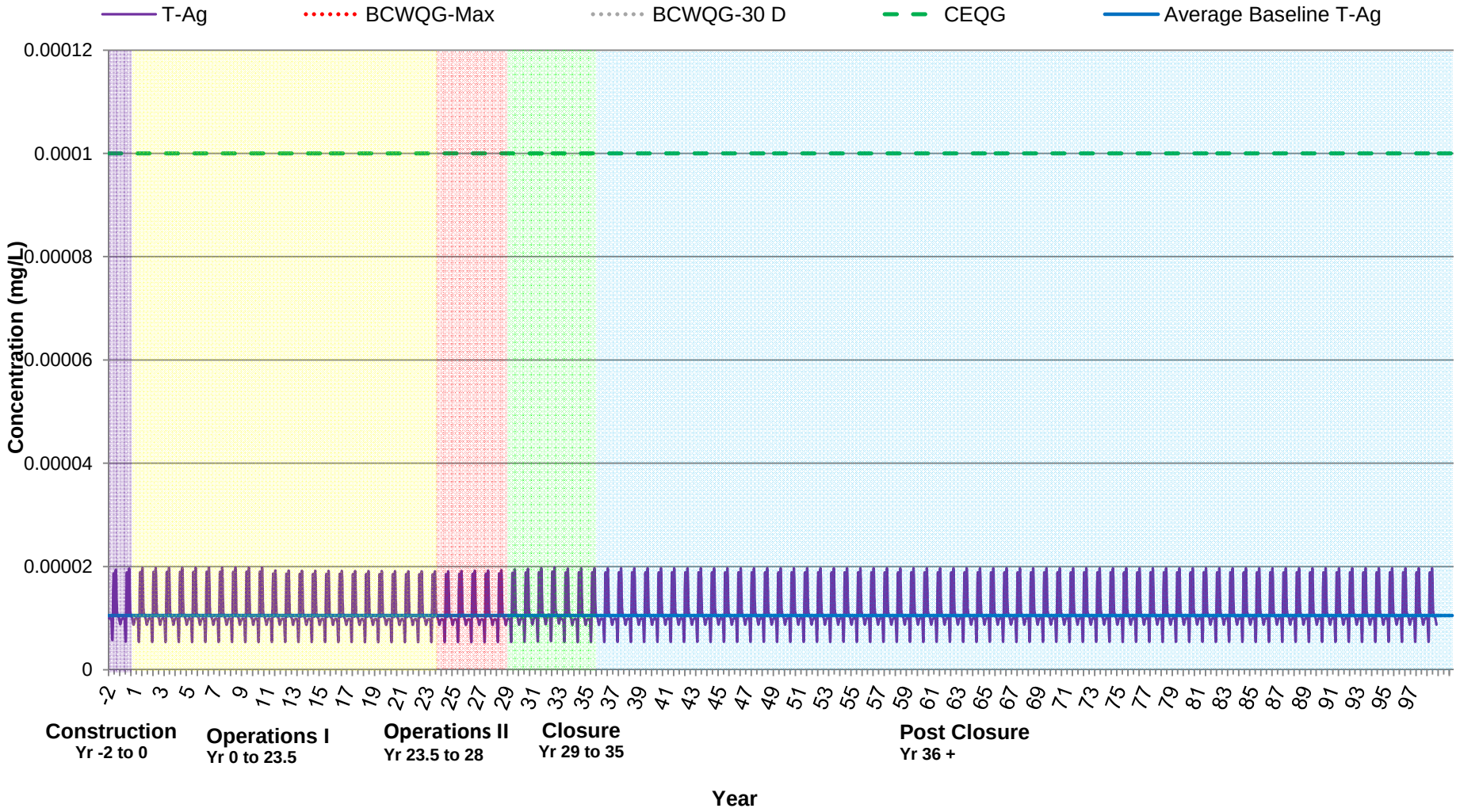
P/A NO. VA101-458/14

REF. NO. 3

FIGURE C11.Ni

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-30 D AND BCWQG-MAX ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS J1(AVERAGE HARDNESS OF 126 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE SILVER CONCENTRATIONS - JONES CREEK (J1)

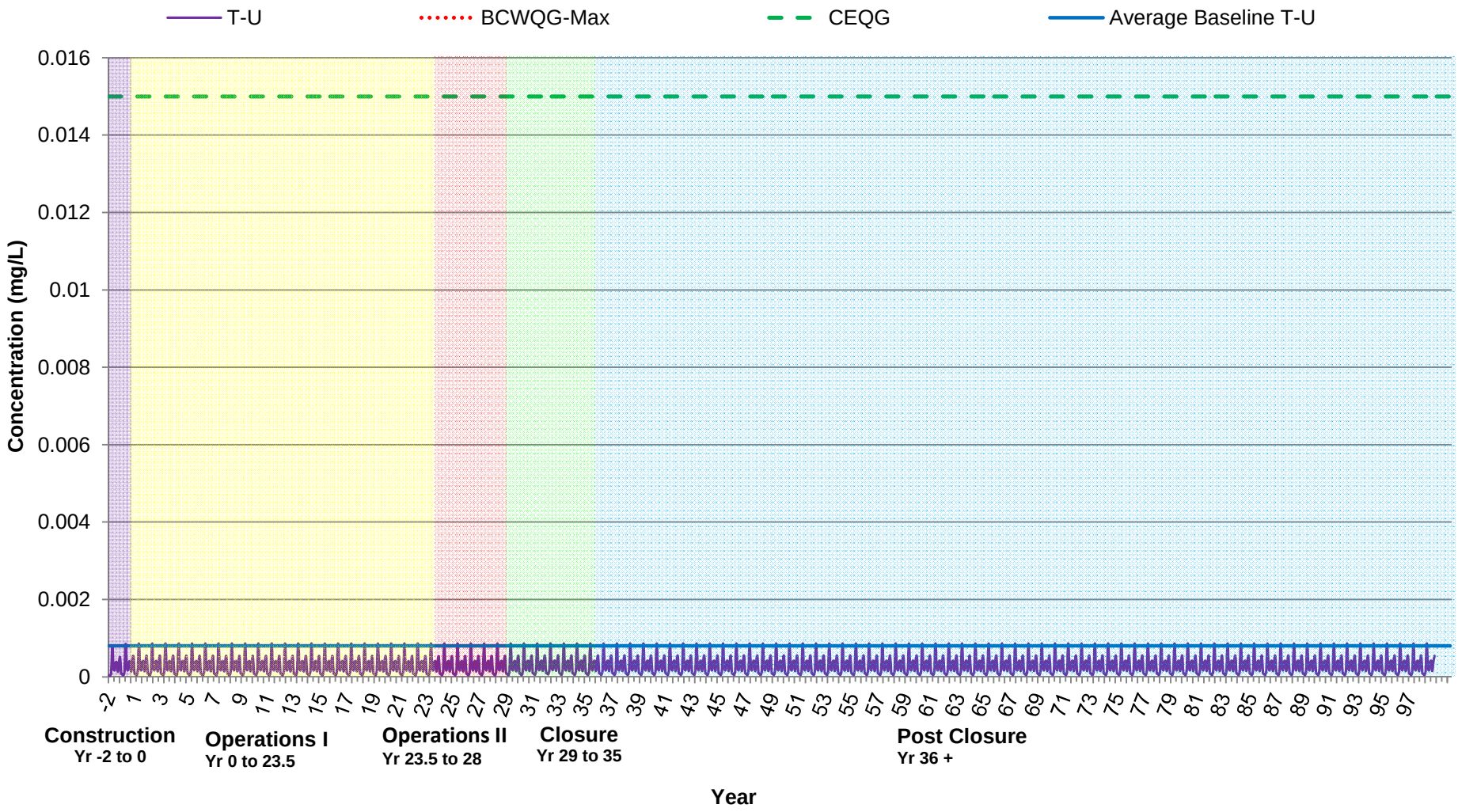
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C11.Ag

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS J1(AVERAGE HARDNESS OF 126 mg/L).
3. THE BCWQG-MAX (0.3 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE URANIUM CONCENTRATIONS - JONES CREEK (J1)

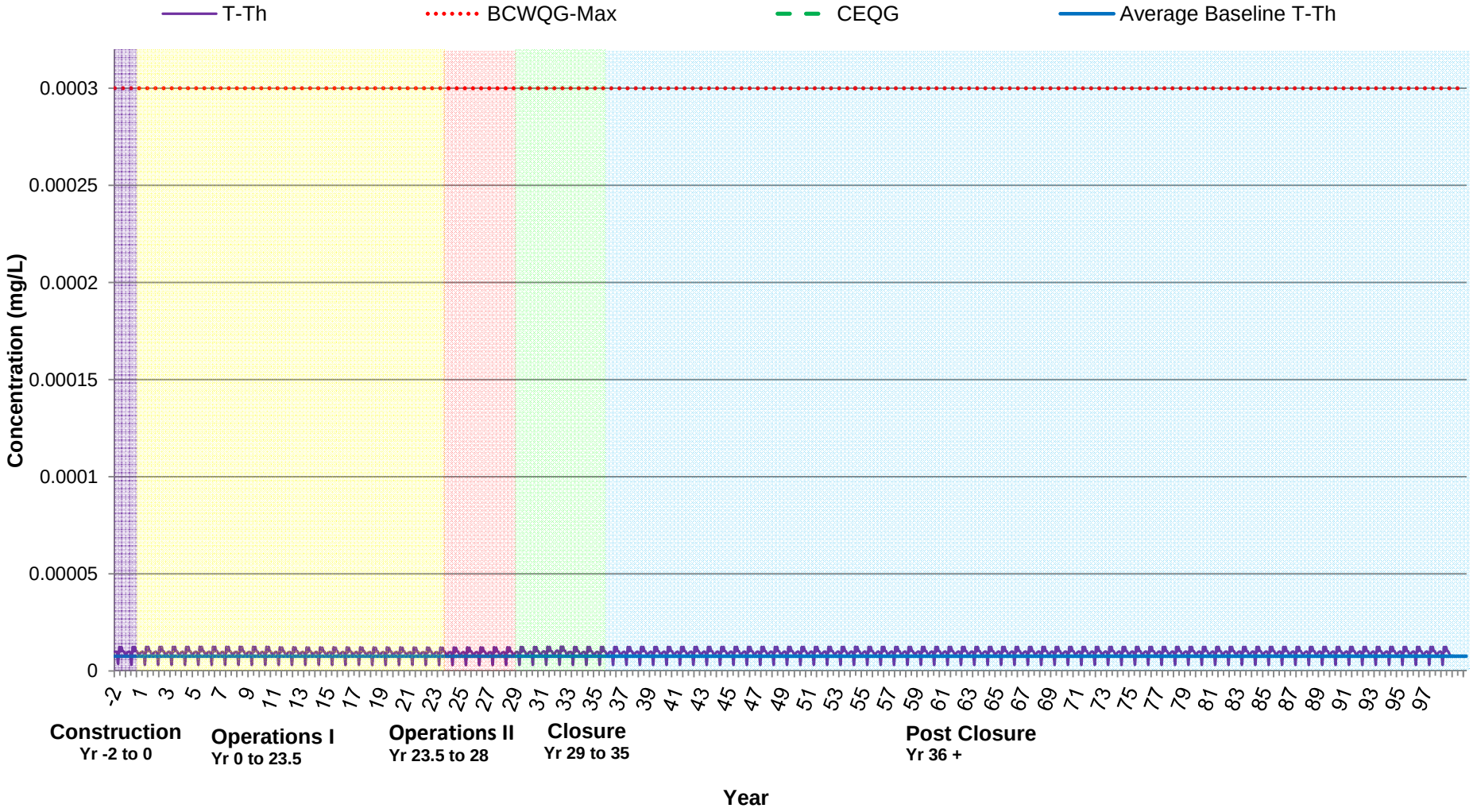
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C11.U

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS J1(AVERAGE HARDNESS OF 126 mg/L).
3. THE CEQG (0.0008 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE THALLIUM CONCENTRATIONS - JONES CREEK (J1)

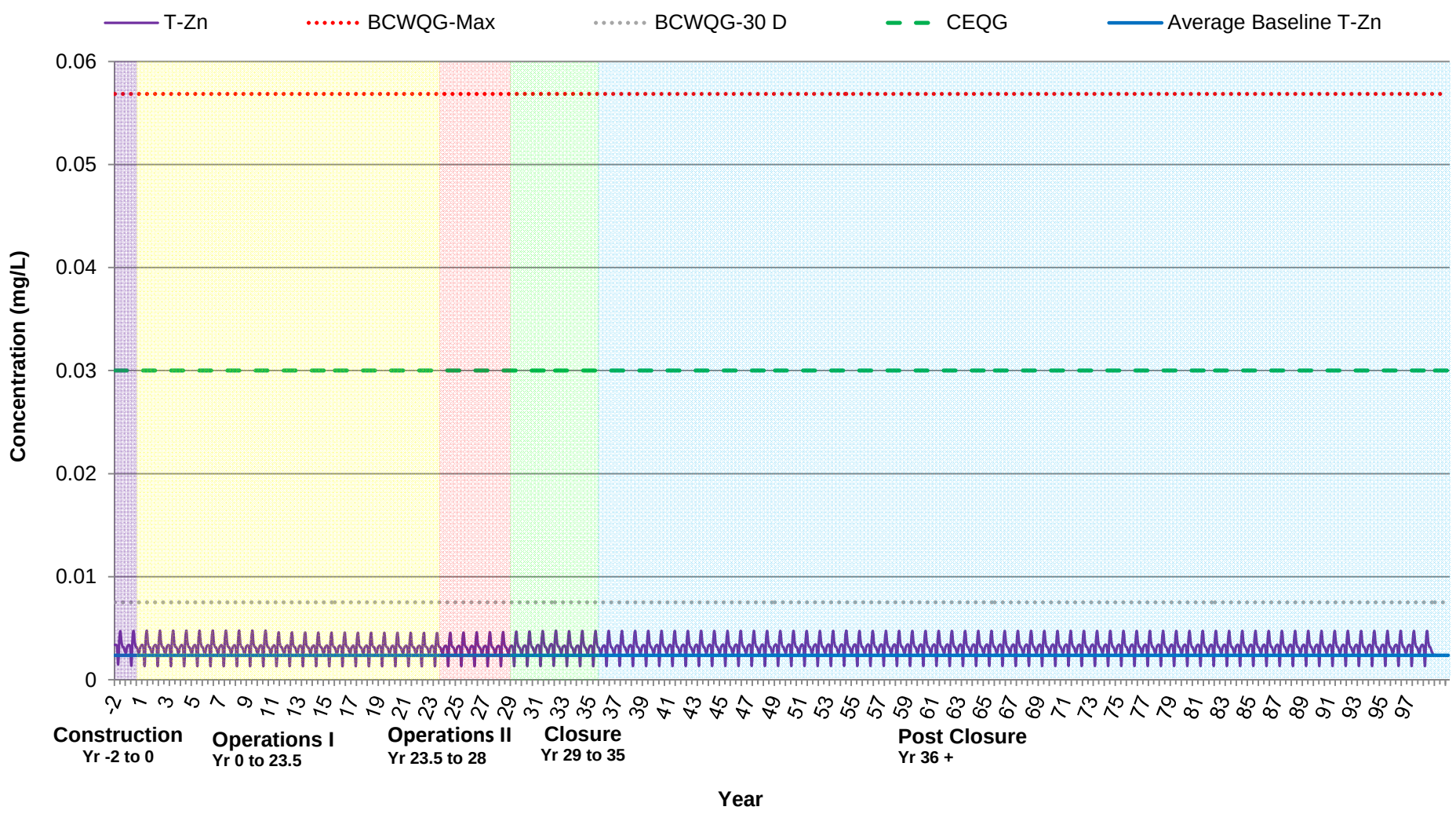
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C11.Th

REV 0



NOTES:

1. BCWQG-30 D AND BCWQG-MAX ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS J1(AVERAGE HARDNESS OF 126 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED EXPECTED CASE ZINC CONCENTRATIONS - JONES CREEK (J1)

Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE C11.Zn

REV 0

APPENDIX D

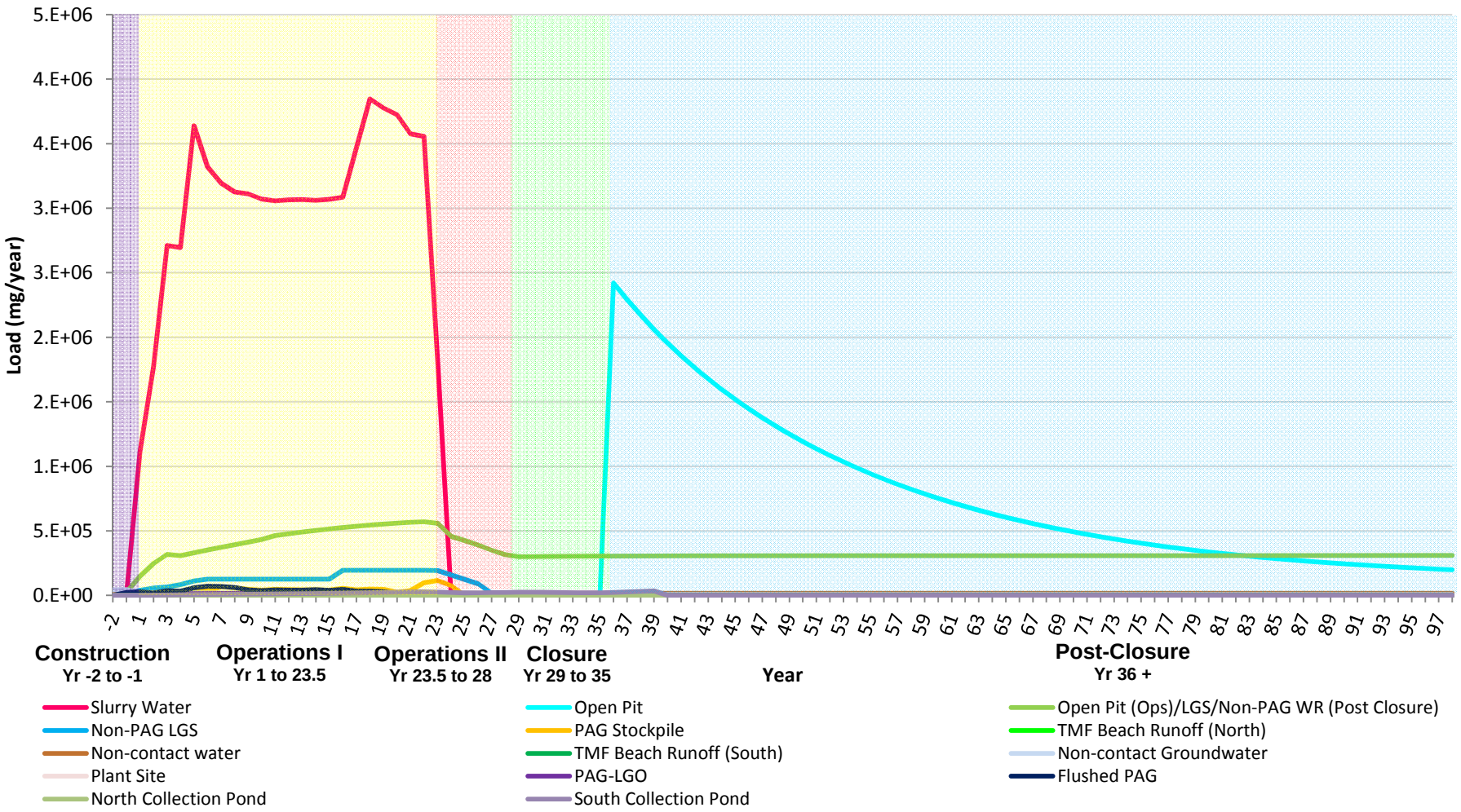
EXPECTED CASE LOADING CHARTS

Appendix D1 Tailings Management Facility (TMF)
Appendix D2 Open Pit (OP)
Appendix D3 T-Creek
Appendix D4 Mid Harper Creek (HM)
Appendix D5 Harper Creek below T-Creek (HT)
Appendix D6 Harper Creek above Barrière River (HB)
Appendix D7 Baker Creek above North Thompson River (BK0)
Appendix D8 Jones Creek above North Thompson River (J1)

APPENDIX D1

TAILINGS MANAGEMENT FACILITY (TMF)

(Pages D1-1 to D1-3)



NOTES:

1. GRAPH DEPICTS SUM OF ANNUAL LOADS FROM VARIOUS TMF LOADING SOURCES.
2. THE TMF RECEIVES SLURRY WATER UNTIL YEAR 23.5.
3. THE TMF RECEIVES WATER FROM PUMPED FROM THE OPEN PIT AT YEAR 36.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

CADMIUM LOADING SOURCES - TMF

Knight Piésold CONSULTING

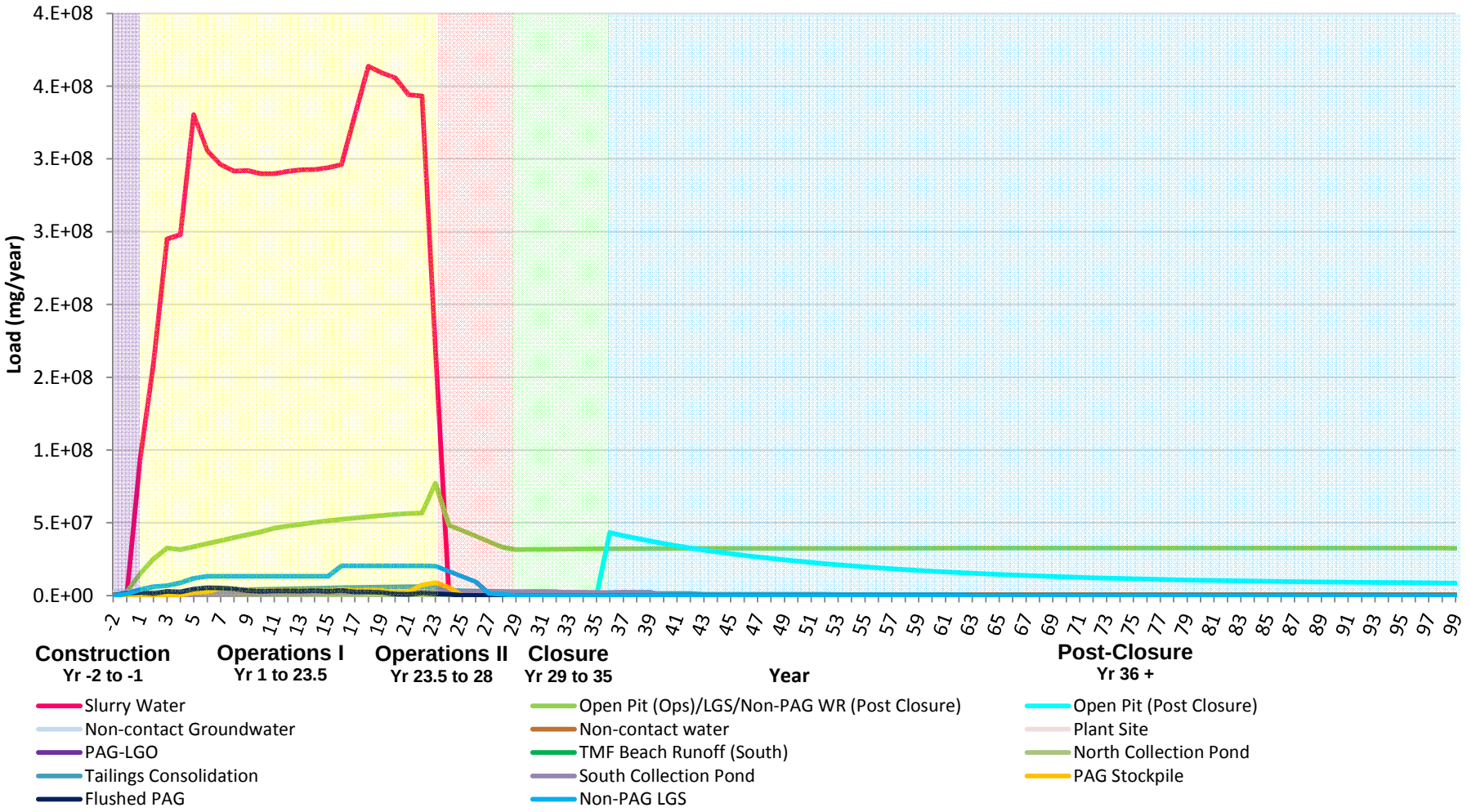
P/A NO. VA101-458/14

REF. NO. 3

FIGURE D1.1

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	11OCT'14	ISSUED WITH REPORT	CJ	EJA	KJB



NOTES:

1. GRAPH DEPICTS SUM OF ANNUAL LOADS FROM VARIOUS LOADING SOURCES.
2. THE TMF RECEIVES SLURRY WATER UNTIL YEAR 23.5.
3. THE TMF RECEIVES WATER FROM THE OPEN PIT AT YEAR 36.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

COPPER LOADING SOURCES - TMF

Knight Piésold CONSULTING

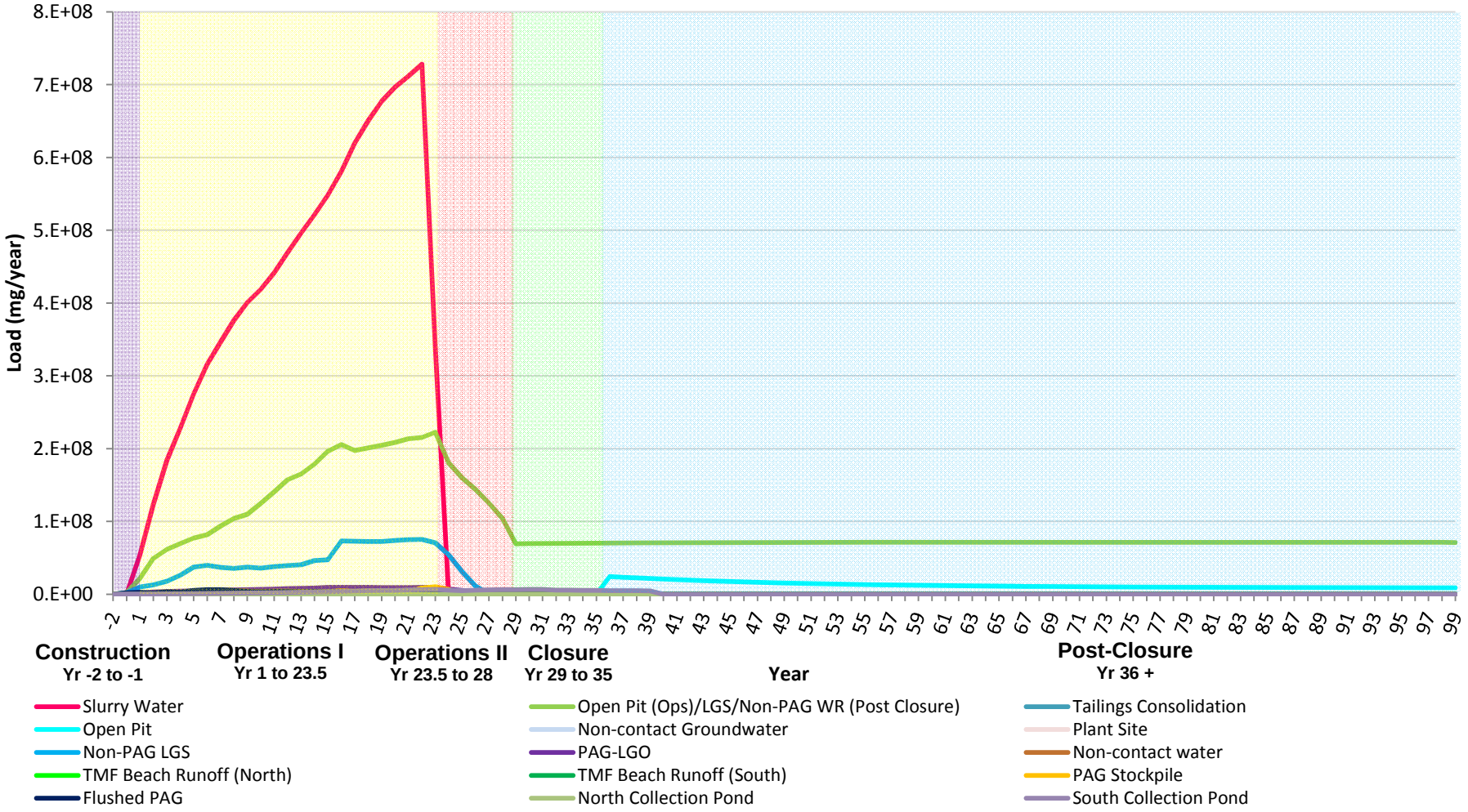
P/A NO. VA101-458/14

REF. NO. 3

FIGURE D1.2

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	11OCT'14	ISSUED WITH REPORT	CJ	EJA	KJB



NOTES:

1. GRAPH DEPICTS SUM OF ANNUAL LOADS FROM VARIOUS LOADING SOURCES.
2. THE TMF RECEIVES SLURRY WATER UNTIL YEAR 23.5.
3. THE TMF RECEIVES WATER FROM THE OPEN PIT AT YEAR 36.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SELENIUM LOADING SOURCES - TMF

Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE D1.3

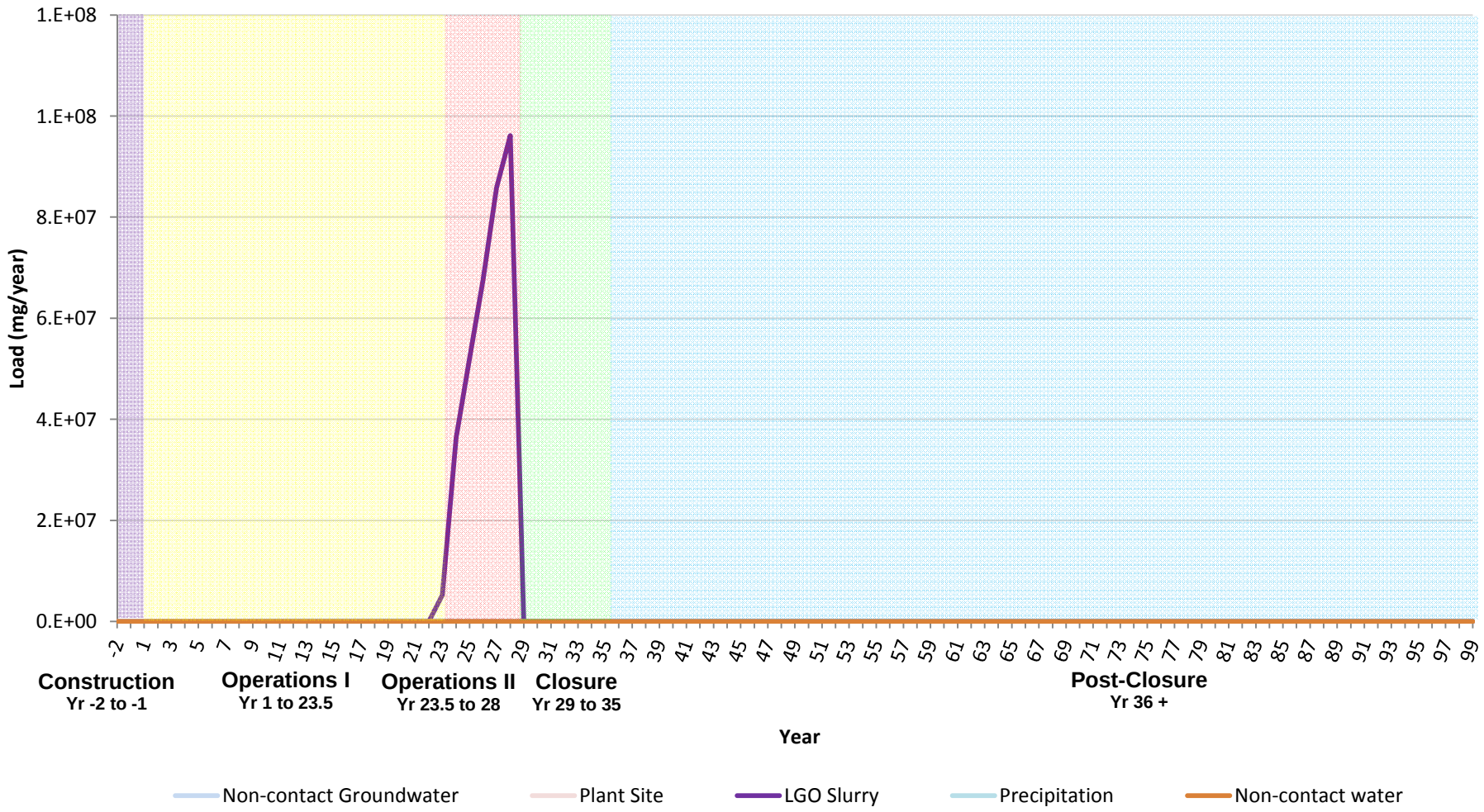
REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	11OCT'14	ISSUED WITH REPORT	CJ	EJA	KJB

APPENDIX D2

OPEN PIT (OP)

(Pages D2-1 to D2-3)



NOTES:

1. GRAPH DEPICTS SUM OF ANNUAL LOADS FROM ALL LOADING SOURCES.

0	11OCT'14	ISSUED WITH REPORT	CJ	EJA	KJB
REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

CADMIUM LOADING SOURCES - OPEN PIT

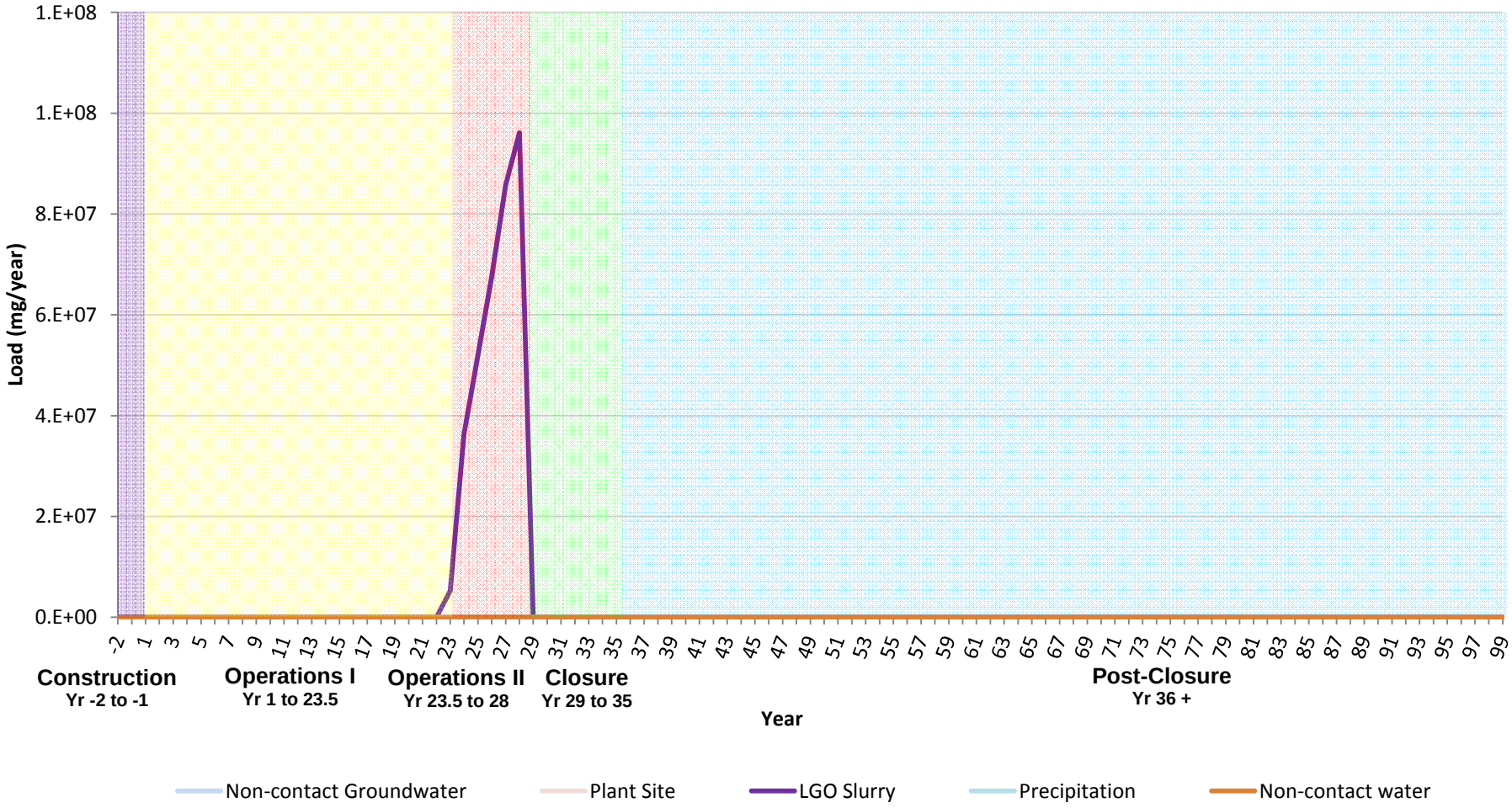
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE D2.1

REV 0



NOTES:

1. GRAPH DEPICTS SUM OF ANNUAL LOADS FROM ALL LOADING SOURCES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

COPPER LOADING SOURCES - OPEN PIT

Knight Piésold CONSULTING

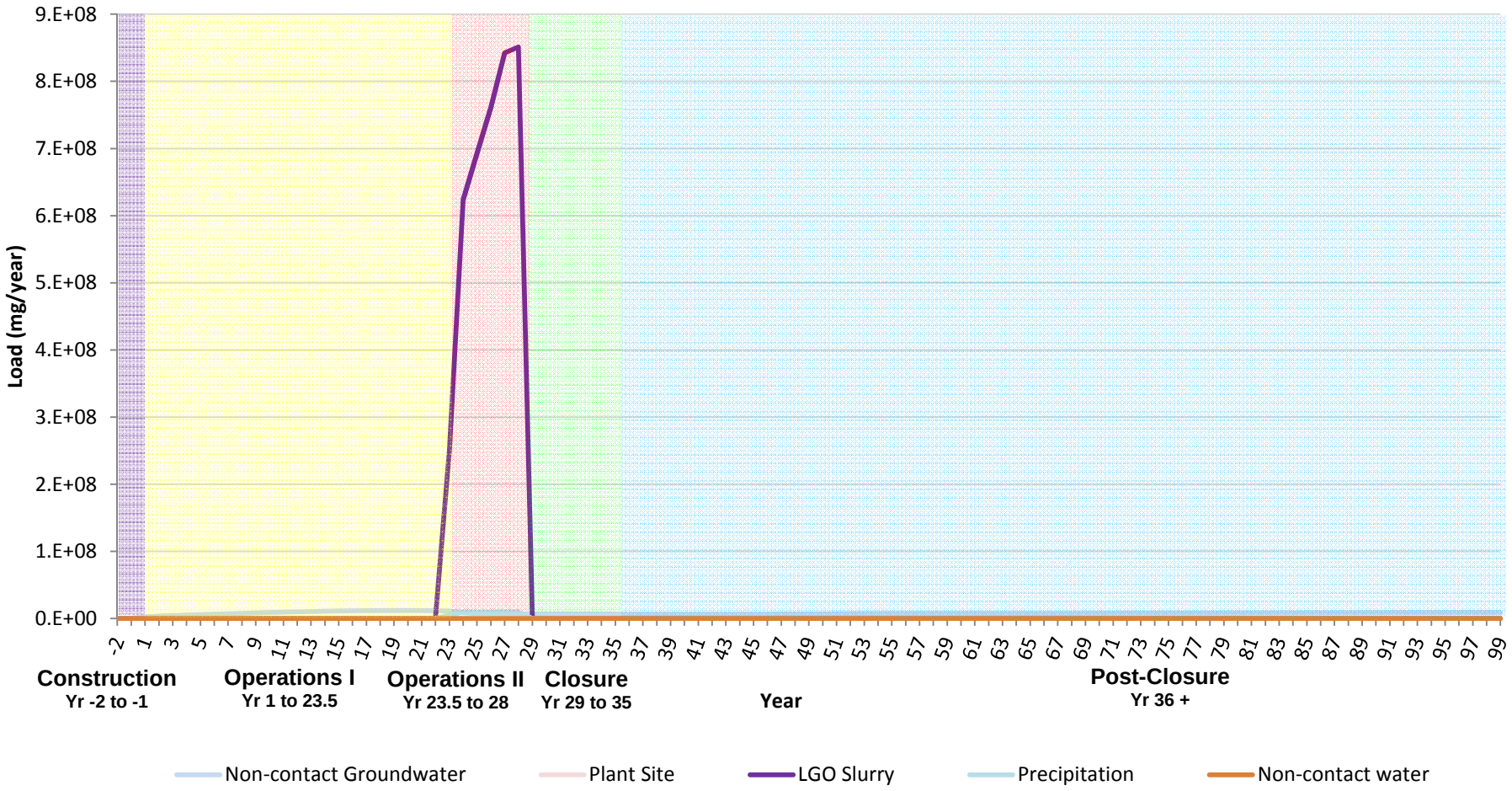
P/A NO. VA101-458/14

REF. NO. 3

FIGURE D2.2

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	11OCT'14	ISSUED WITH REPORT	CJ	EJA	KJB



NOTES:

1. GRAPH DEPICTS SUM OF ANNUAL LOADS FROM ALL LOADING SOURCES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SELENIUM LOADING SOURCES - OPEN PIT

Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE D2.3

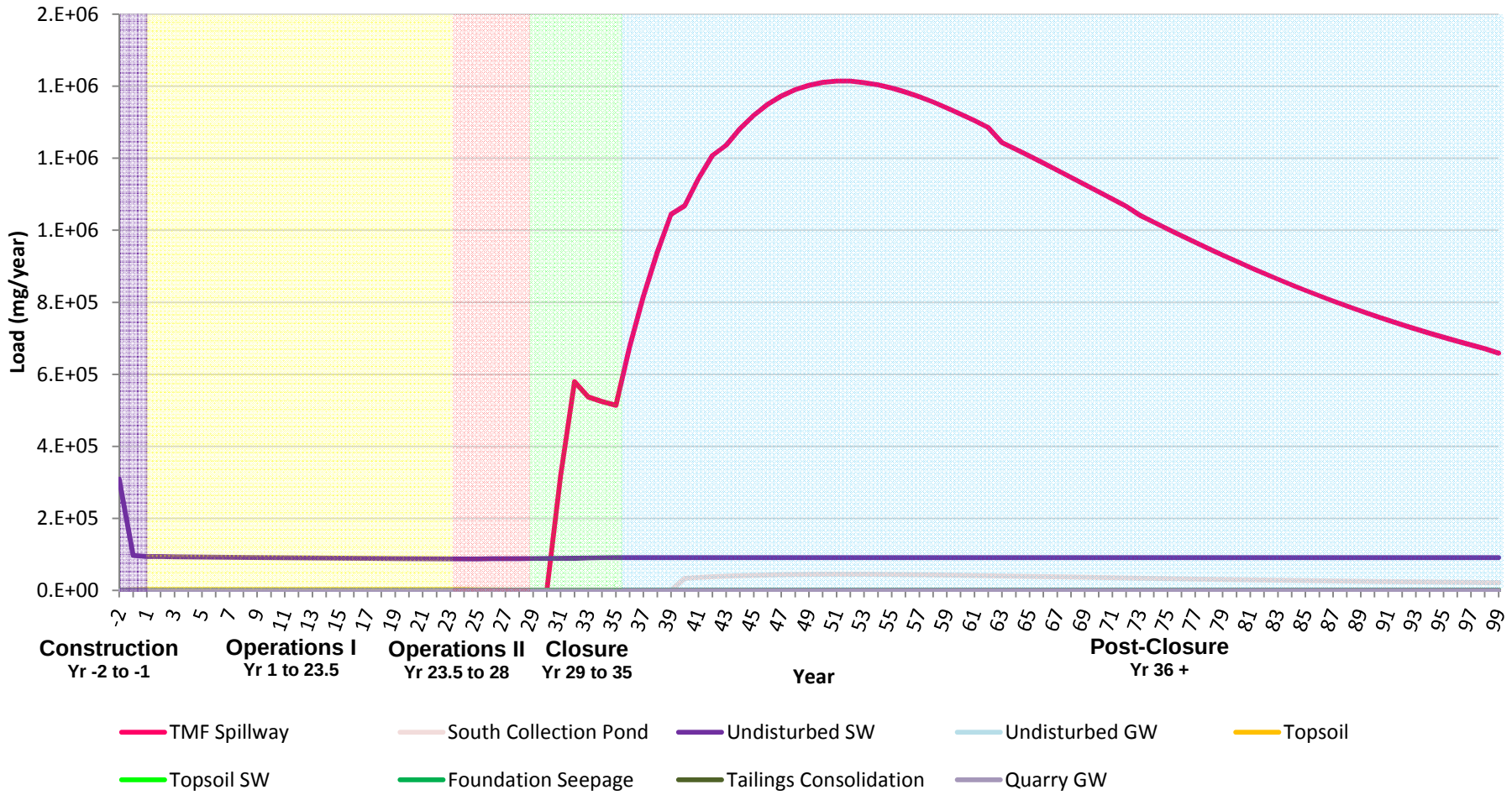
REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	11OCT'14	ISSUED WITH REPORT	CJ	EJA	KJB

APPENDIX D3

T-CREEK

(Pages D3-1 to D3-3)



NOTES:

1. GRAPH DEPICTS SUM OF ANNUAL LOADS FROM ALL LOADING SOURCES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

CADMIUM LOADING SOURCES - T-CREEK

Knight Piésold CONSULTING

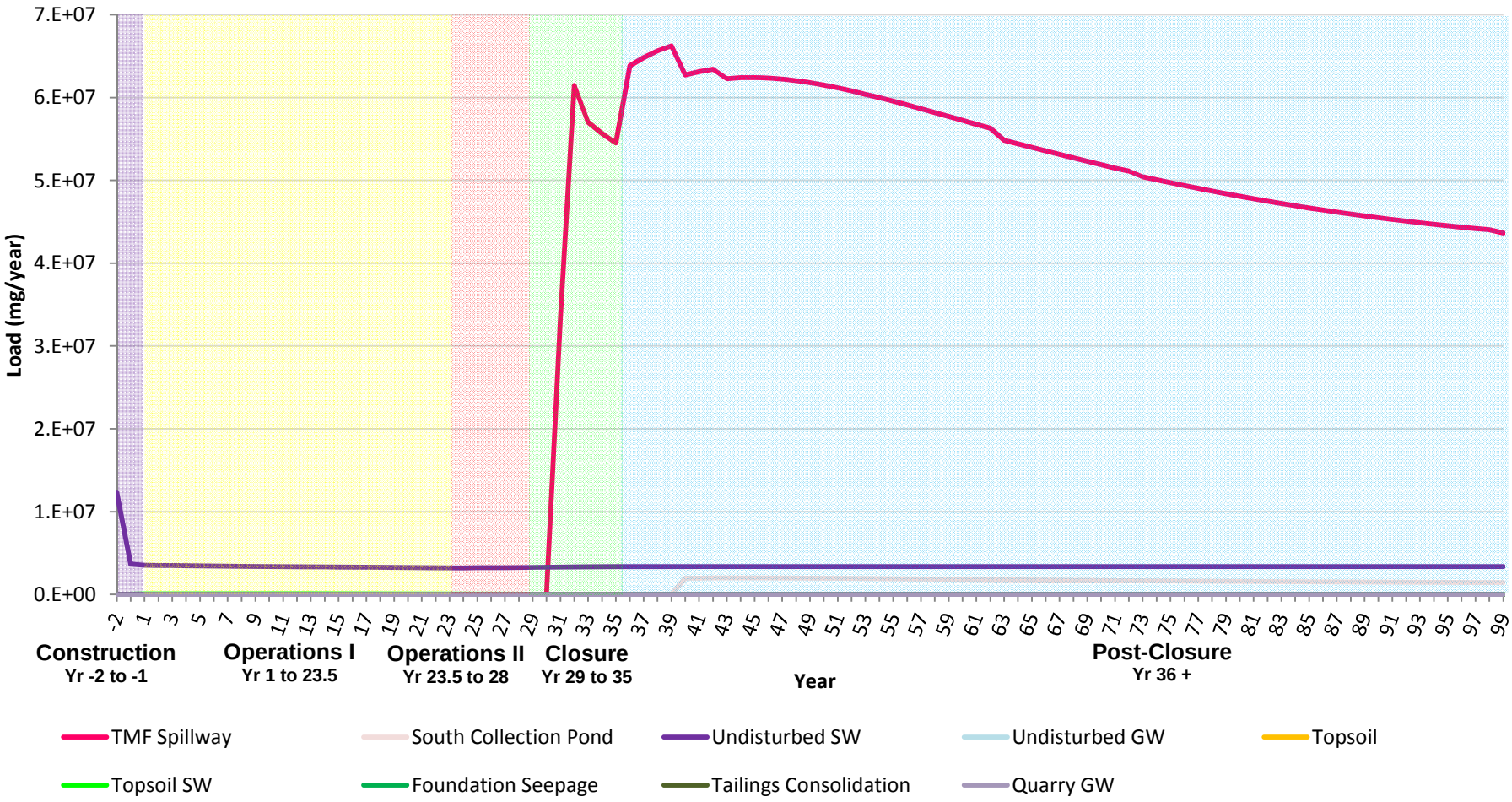
P/A NO. VA101-458/14

REF. NO. 3

FIGURE D3.1

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	11JUNE'14	ISSUED WITH REPORT	CJ	EJA	KJB



NOTES:

1. GRAPH DEPICTS SUM OF ANNUAL LOADS FROM ALL LOADING SOURCES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	11JUNE'14	ISSUED WITH REPORT	CJ	EJA	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

COPPER LOADING SOURCES - T-CREEK

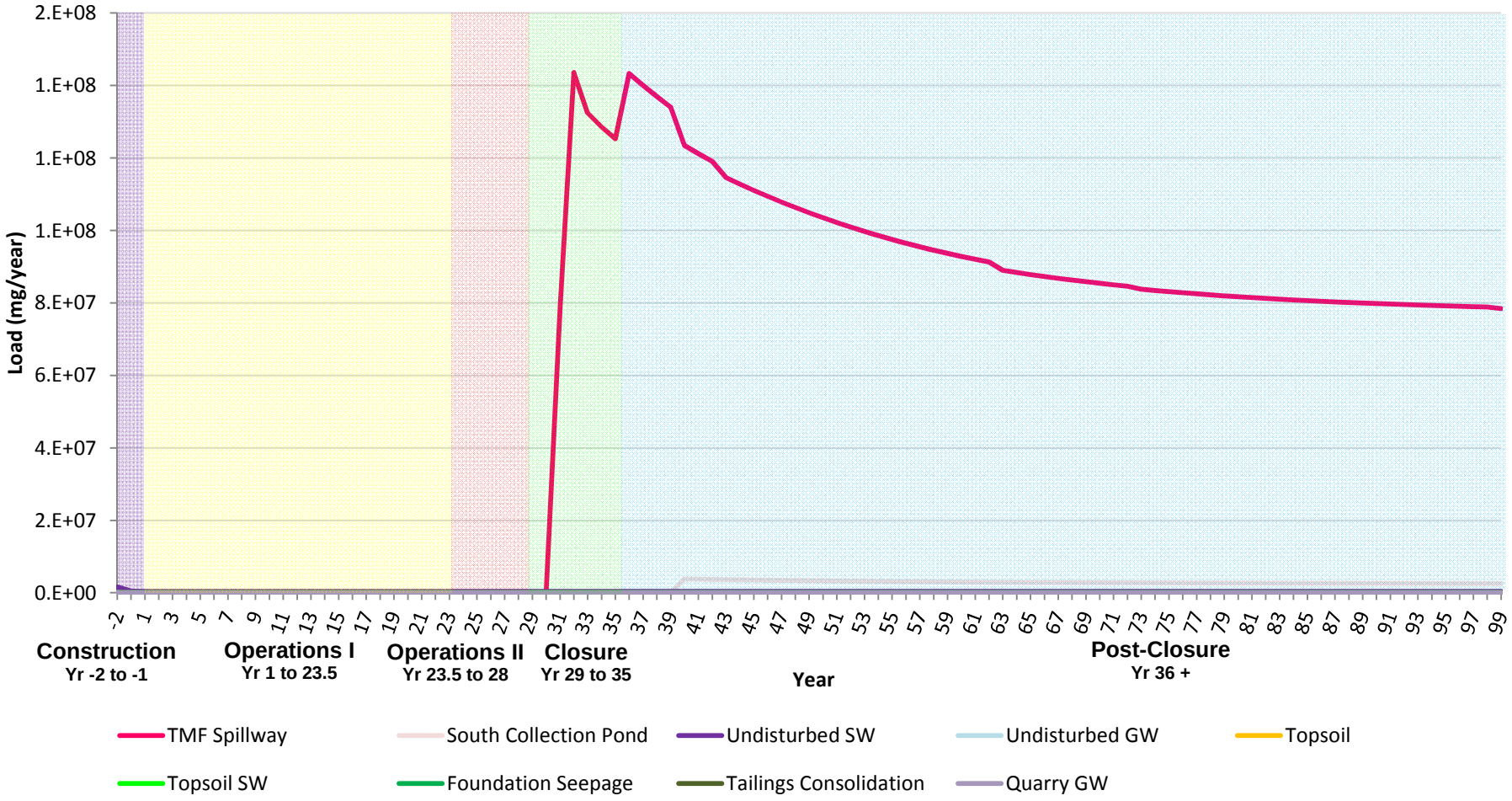
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE D3.2

REV 0



NOTES:

1. GRAPH DEPICTS SUM OF ANNUAL LOADS FROM ALL LOADING SOURCES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SELENIUM LOADING SOURCES - T-CREEK

Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE D3.3

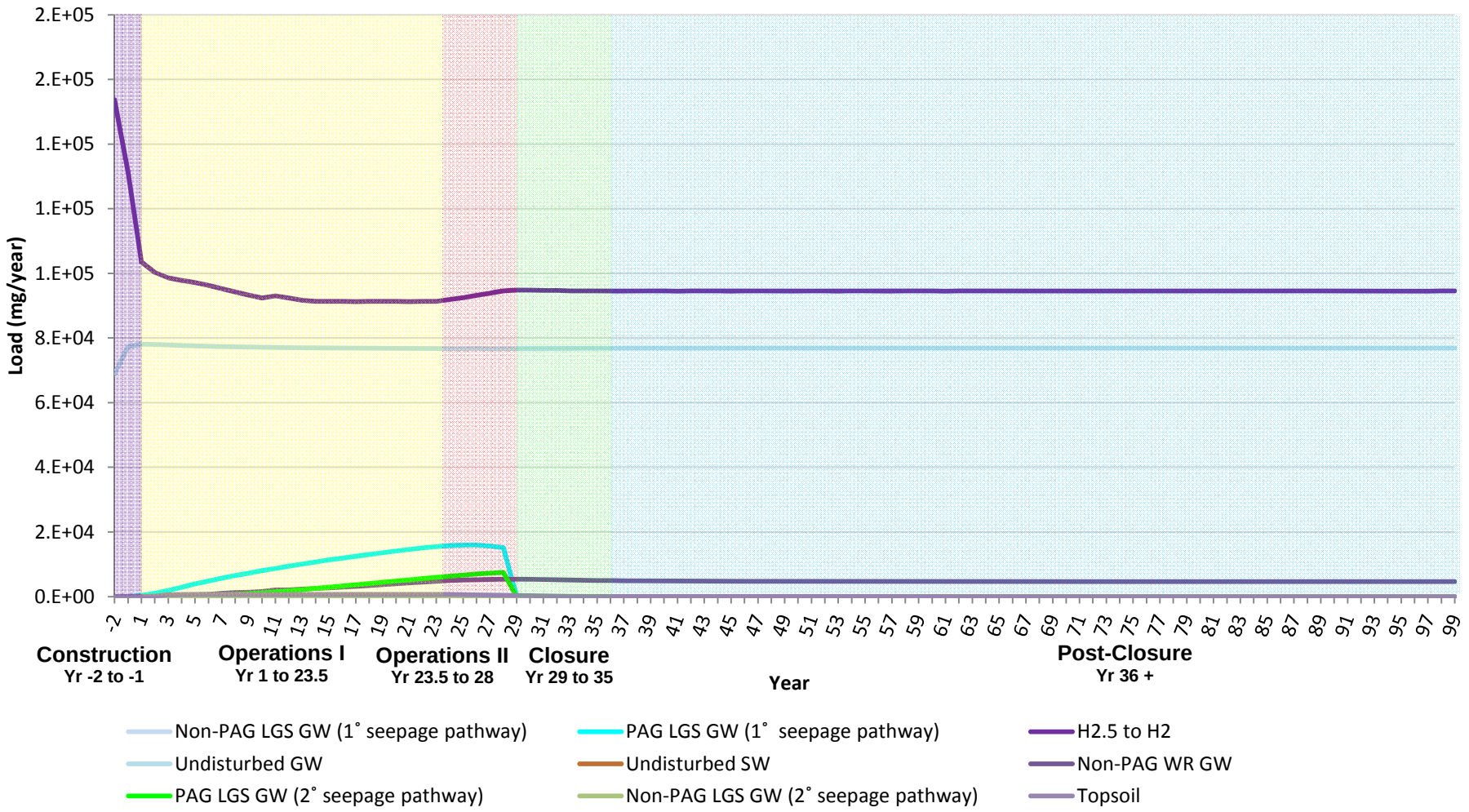
REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	11JUNE'14	ISSUED WITH REPORT	CJ	EJA	KJB

APPENDIX D4

MID HARPER CREEK (HM)

(Pages D4-1 to D4-3)



NOTES:

1. GRAPH DEPICTS SUM OF ANNUAL LOADS FROM ALL LOADING SOURCES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

CADMIUM LOADING SOURCES - MID-HARPER CREEK

Knight Piésold CONSULTING

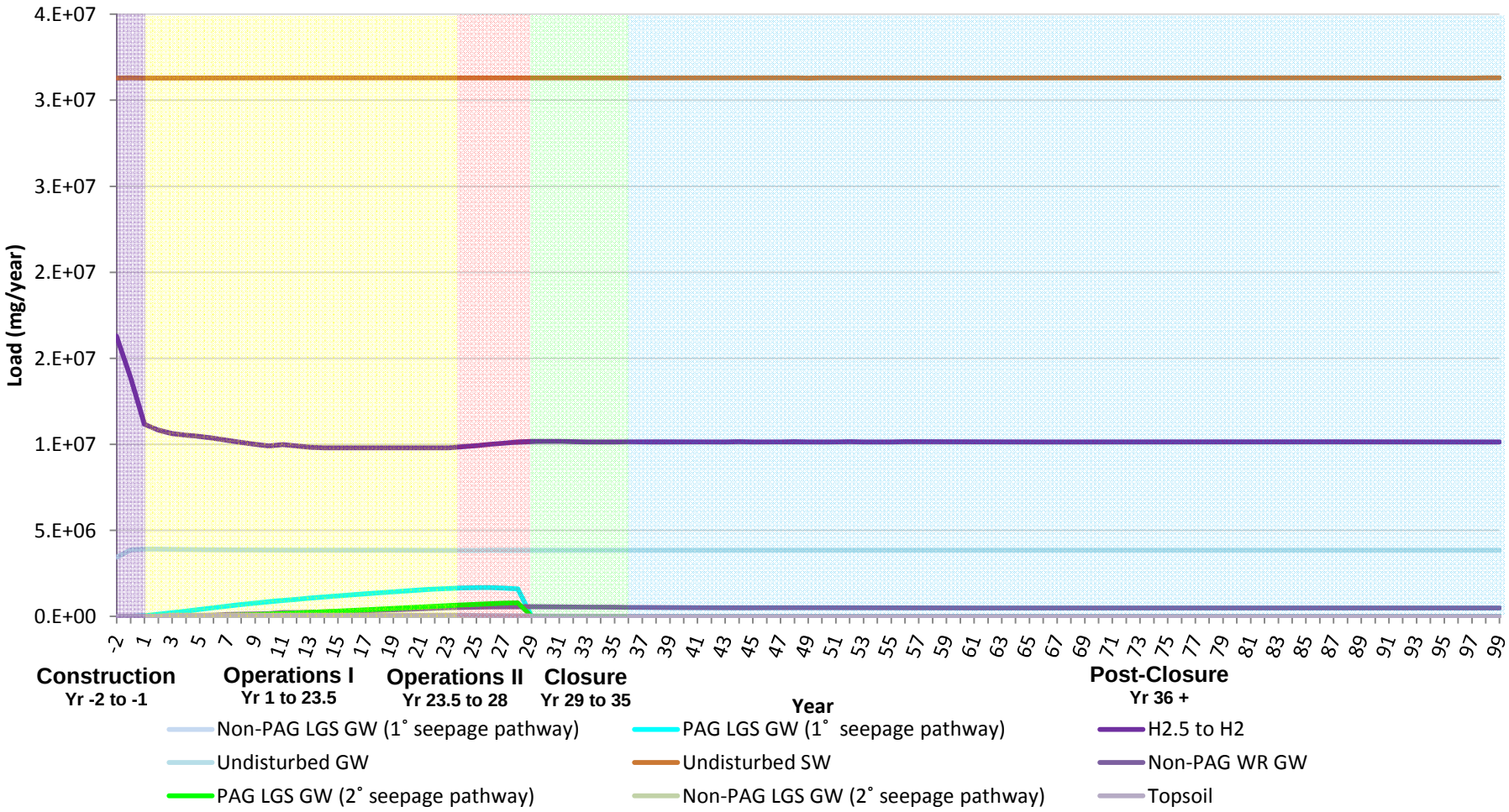
P/A NO. VA101-458/14

REF. NO. 3

FIGURE D4.1

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	11OCT'14	ISSUED WITH REPORT	CJ	EJA	KJB



NOTES:

1. GRAPH DEPICTS SUM OF ANNUAL LOADS FROM ALL LOADING SOURCES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

COPPER LOADING SOURCES - MID-HARPER CREEK

Knight Piésold CONSULTING

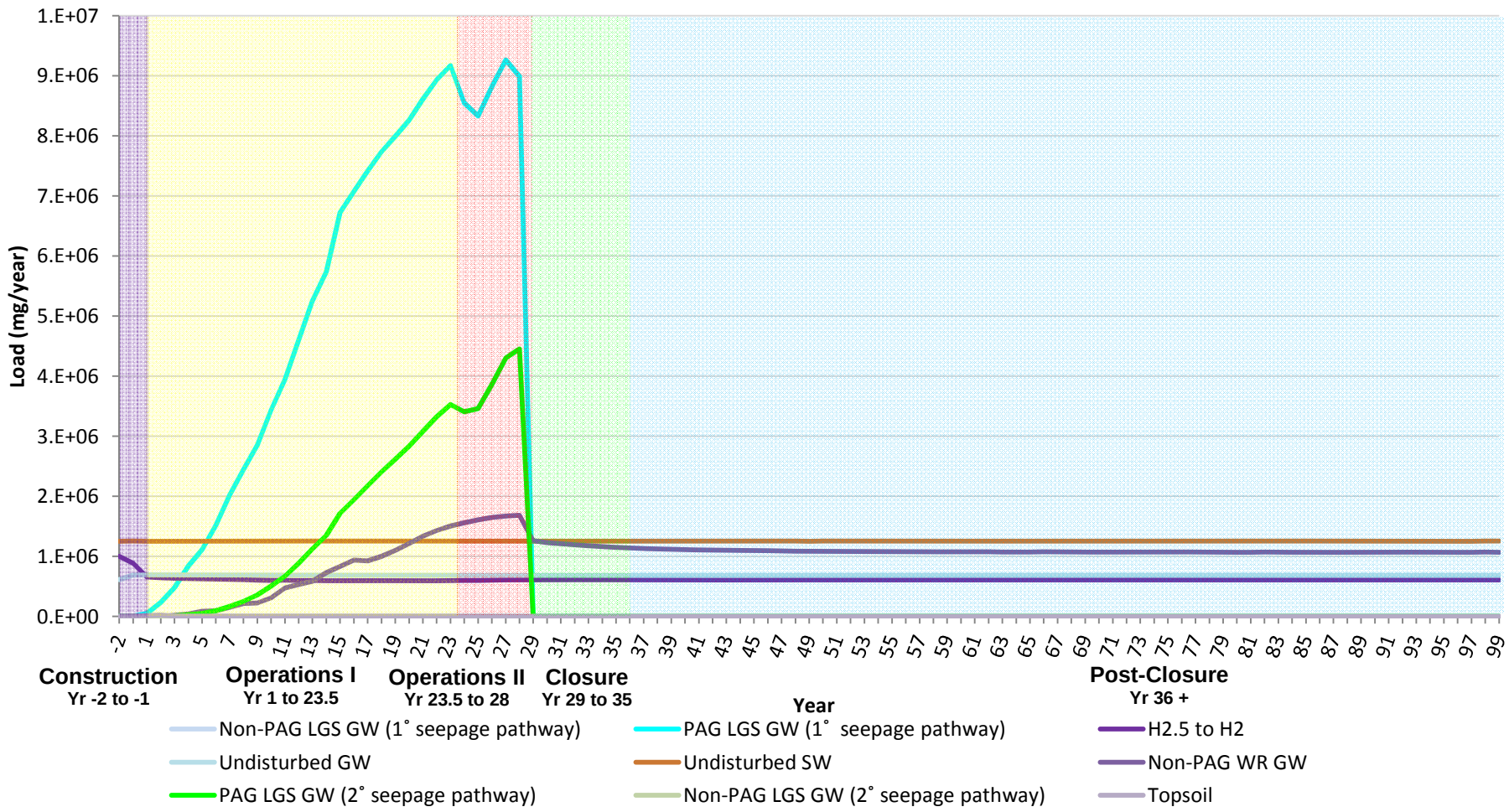
P/A NO. VA101-458/14

REF. NO. 3

FIGURE D4.2

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	11OCT'14	ISSUED WITH REPORT	CJ	EJA	KJB



NOTES:

1. GRAPH DEPICTS SUM OF ANNUAL LOADS FROM ALL LOADING SOURCES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SELENIUM LOADING SOURCES - MID-HARPER CREEK

Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE D4.3

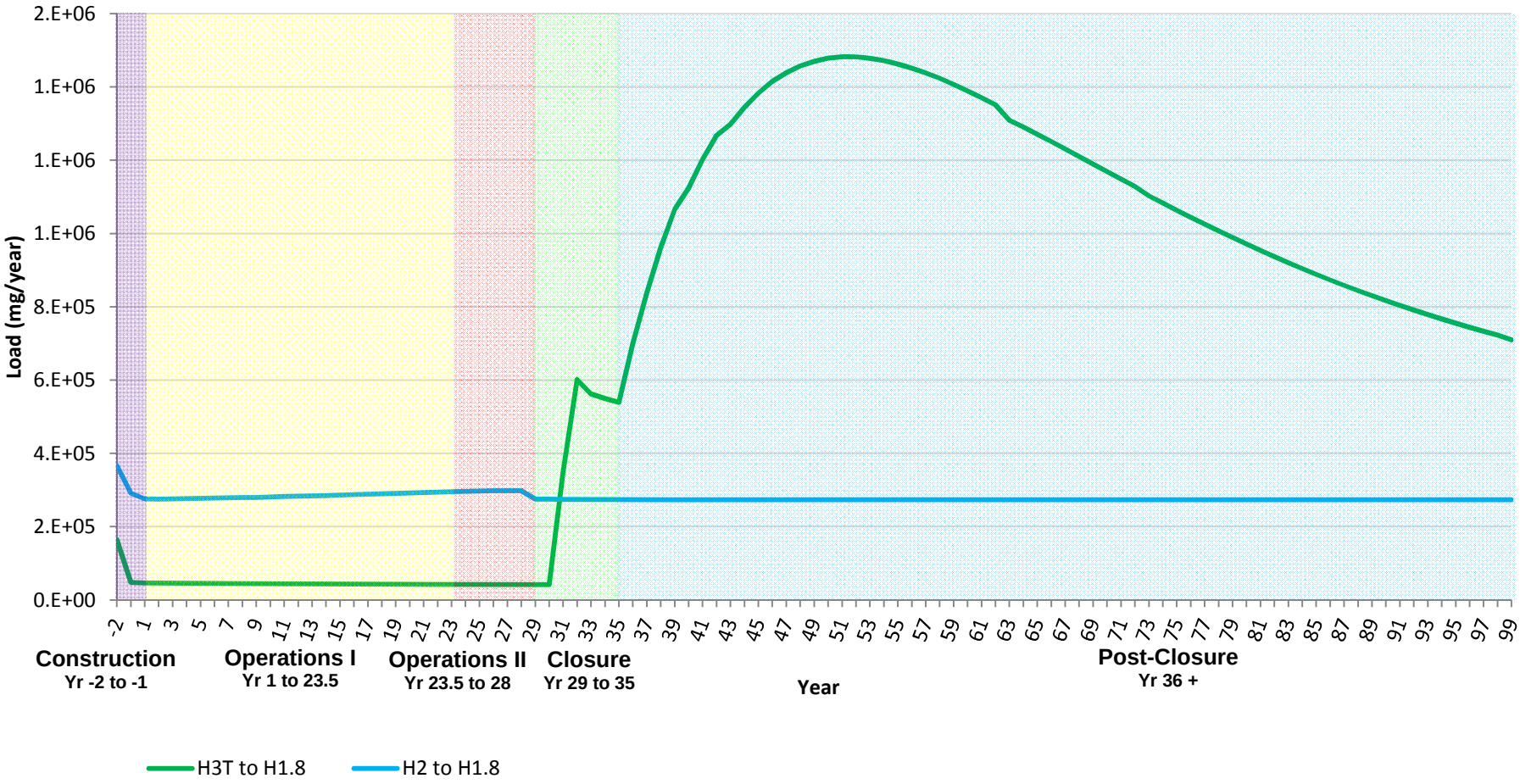
REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	11OCT'14	ISSUED WITH REPORT	CJ	EJA	KJB

APPENDIX D5

HARPER CREEK BELOW T-CREEK (HT)

(Pages D5-1 to D5-3)



NOTES:

1. GRAPH DEPICTS SUM OF ANNUAL LOADS FROM ALL LOADING SOURCES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	11OCT'14	ISSUED WITH REPORT	CJ	EJA	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

CADMIUM LOADING SOURCES - HARPER CREEK BELOW T-CREEK

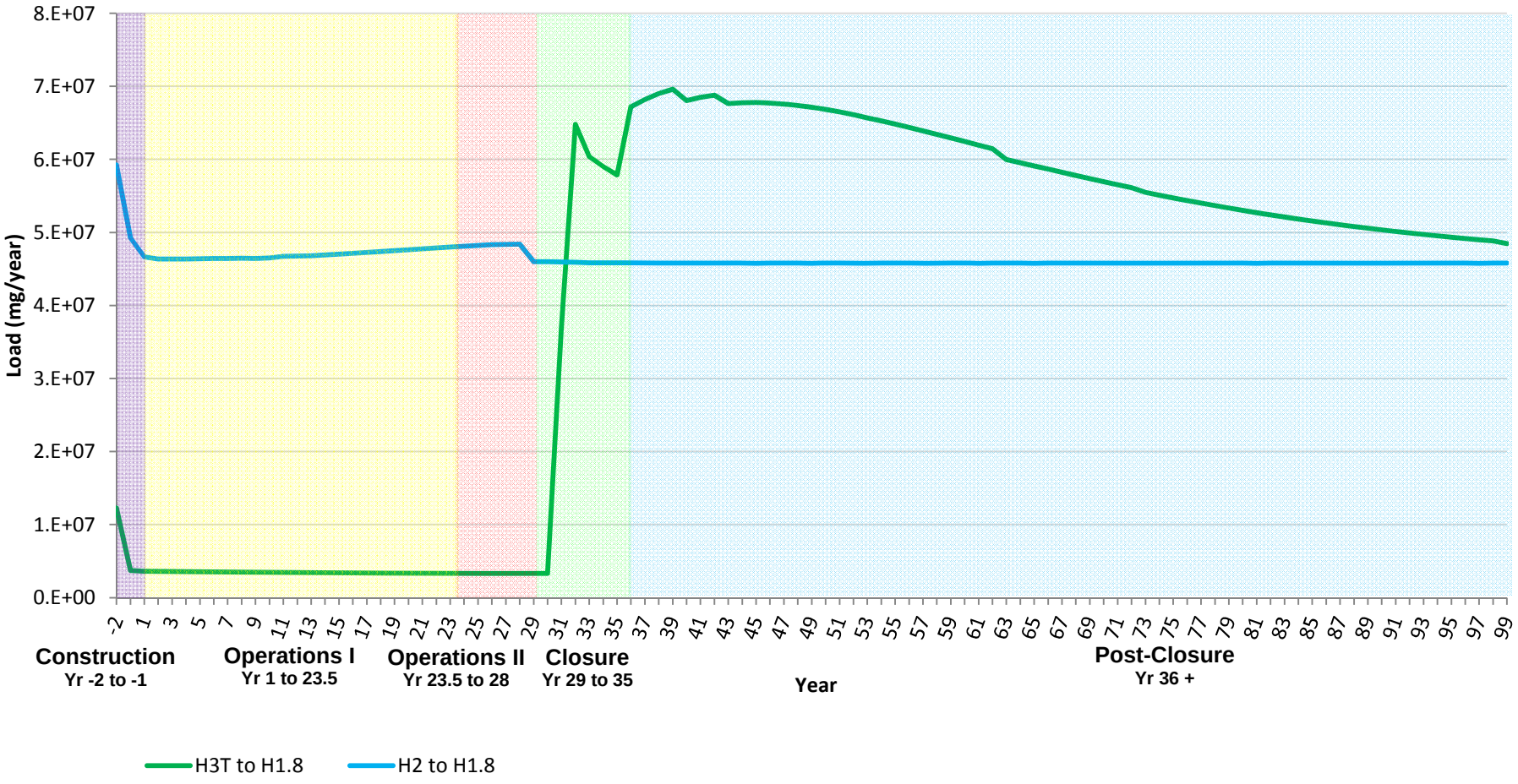
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE D5.1

REV 0



NOTES:

1. GRAPH DEPICTS SUM OF ANNUAL LOADS FROM VARIOUS TMF LOADING SOURCES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

COPPER LOADING SOURCES - HARPER CREEK BELOW T-CREEK

Knight Piésold CONSULTING

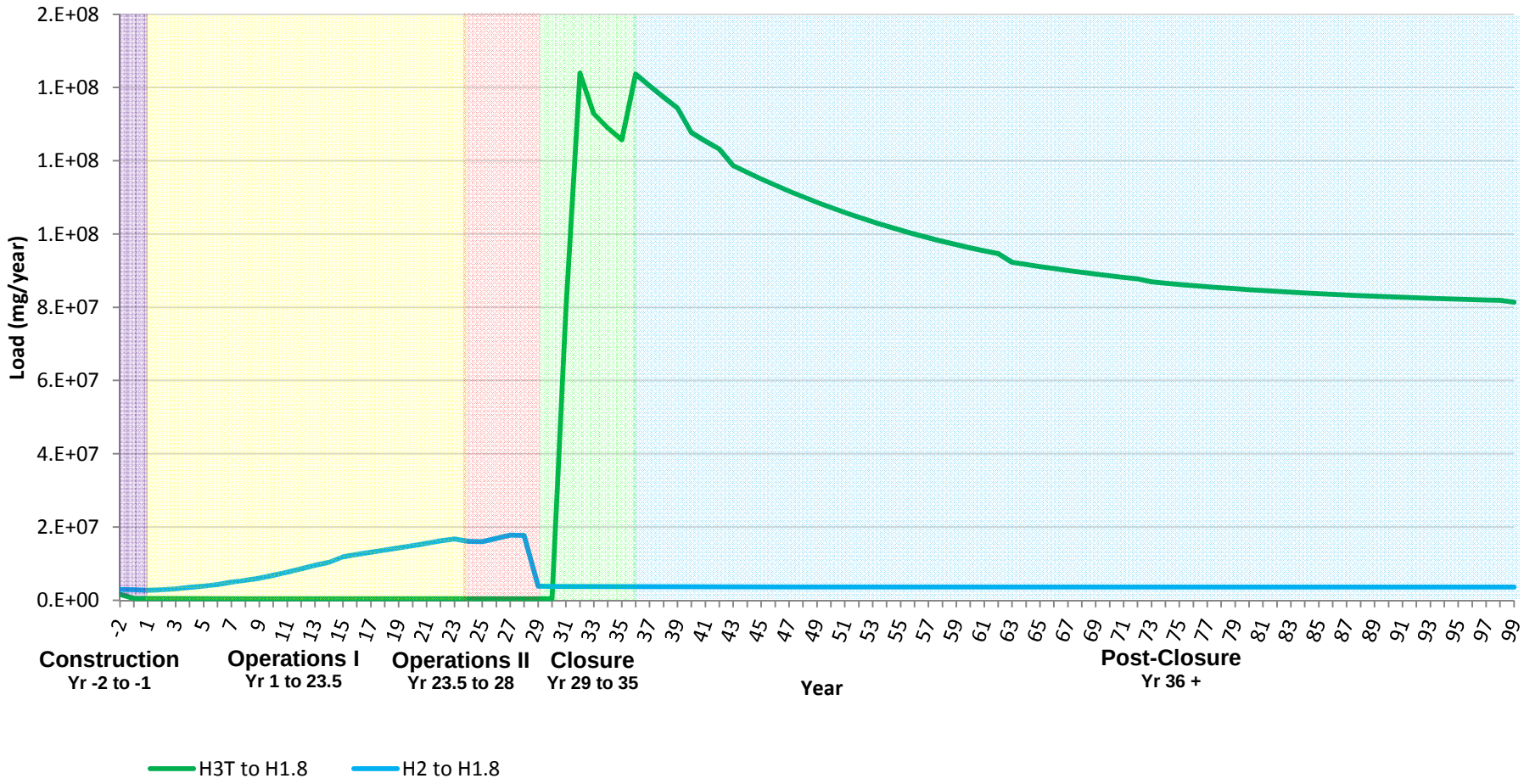
P/A NO. VA101-458/14

REF. NO. 3

FIGURE D5.2

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	11OCT'14	ISSUED WITH REPORT	CJ	EJA	KJB



NOTES:

1. GRAPH DEPICTS SUM OF ANNUAL LOADS FROM VARIOUS TMF LOADING SOURCES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	11OCT'14	ISSUED WITH REPORT	CJ	EJA	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SELENIUM LOADING SOURCES - HARPER CREEK BELOW T-CREEK

Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

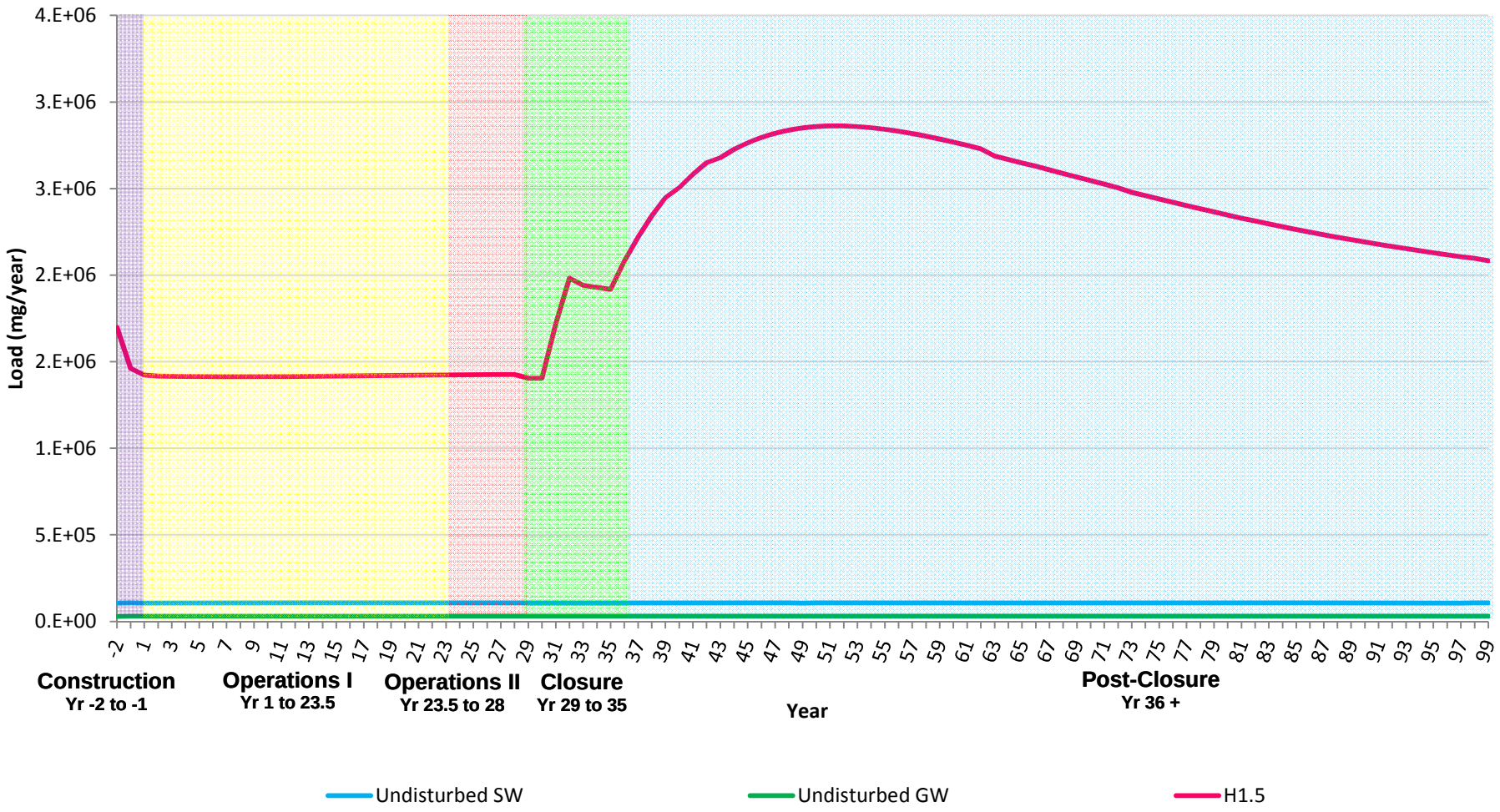
FIGURE D5.3

REV 0

APPENDIX D6

HARPER CREEK ABOVE BARRIÈRE RIVER (HB)

(Pages D6-1 to D6-3)



NOTES:

1. GRAPH DEPICTS SUM OF ANNUAL LOADS FROM ALL LOADING SOURCES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

CADMIUM LOADING SOURCES - HARPER CREEK ABOVE BARRIERE RIVER

Knight Piésold CONSULTING

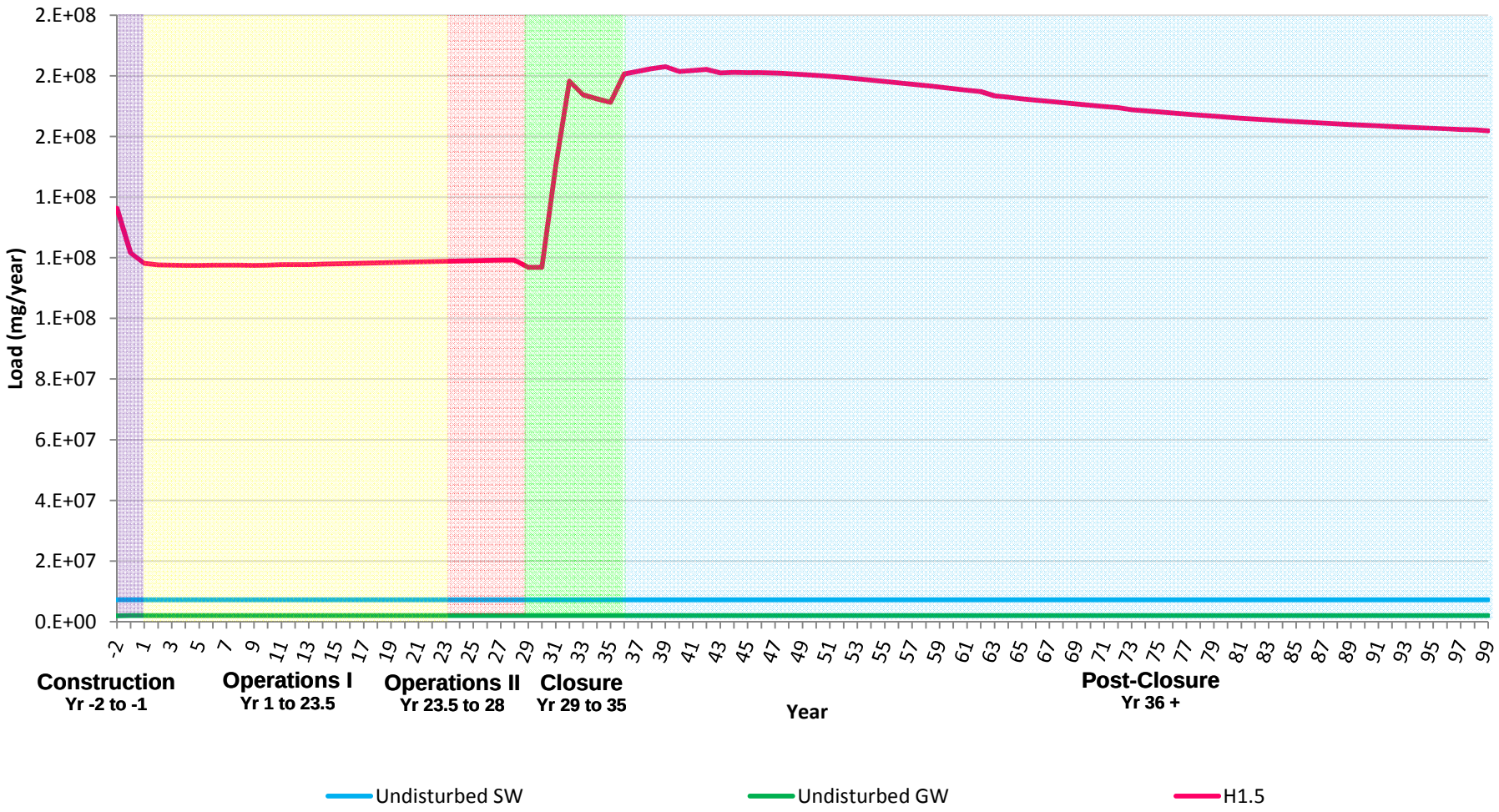
P/A NO. VA101-458/14

REF. NO. 3

FIGURE D6.1

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	11OCT'14	ISSUED WITH REPORT	CJ	EJA	KJB



NOTES:

1. GRAPH DEPICTS SUM OF ANNUAL LOADS FROM ALL LOADING SOURCES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

COPPER LOADING SOURCES - HARPER CREEK ABOVE BARRIERE RIVER

Knight Piésold CONSULTING

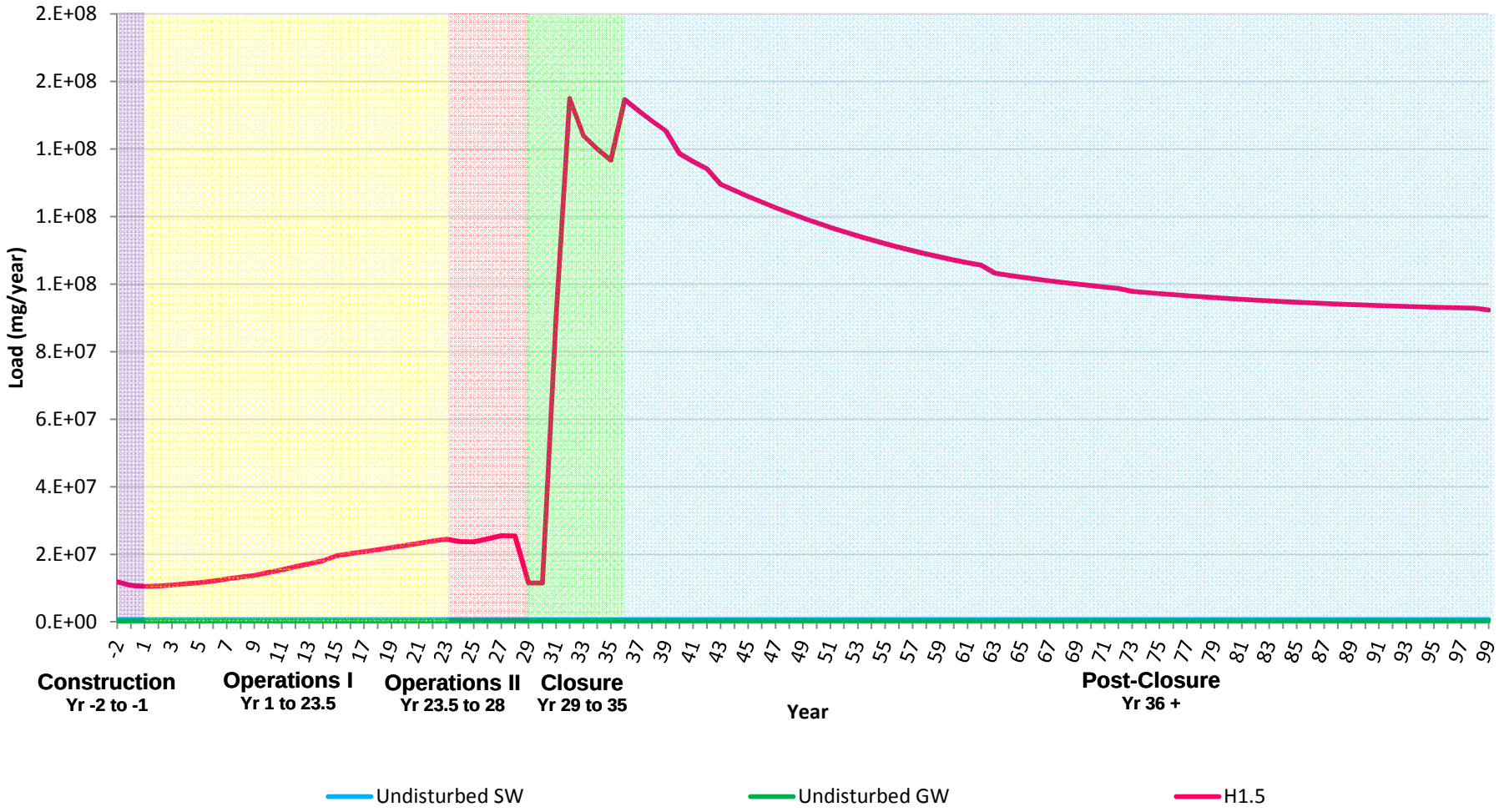
P/A NO. VA101-458/14

REF. NO. 3

FIGURE D6.2

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	11OCT'14	ISSUED WITH REPORT	CJ	EJA	KJB



NOTES:

1. GRAPH DEPICTS SUM OF ANNUAL LOADS FROM ALL LOADING SOURCES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SELENIUM LOADING SOURCES - HARPER CREEK ABOVE BARRIERE RIVER

Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE D6.3

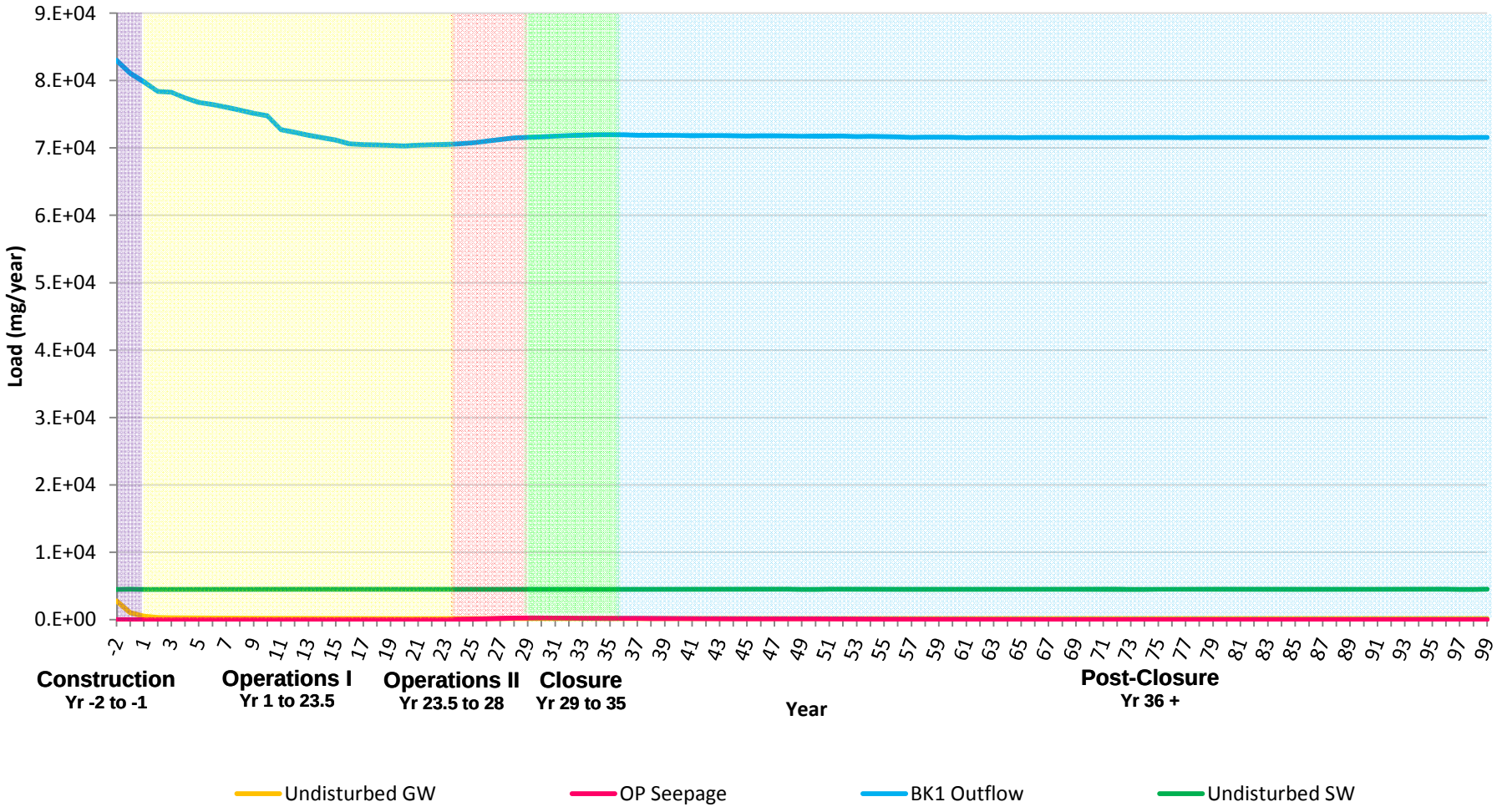
REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	11OCT'14	ISSUED WITH REPORT	CJ	EJA	KJB

APPENDIX D7

BAKER CREEK ABOVE NORTH THOMPSON RIVER (BK0)

(Pages D7-1 to D7-3)



NOTES:

1. GRAPH DEPICTS SUM OF ANNUAL LOADS FROM ALL LOADING SOURCES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

CADMIUM LOADING SOURCES - LOWER BAKER CREEK

Knight Piésold CONSULTING

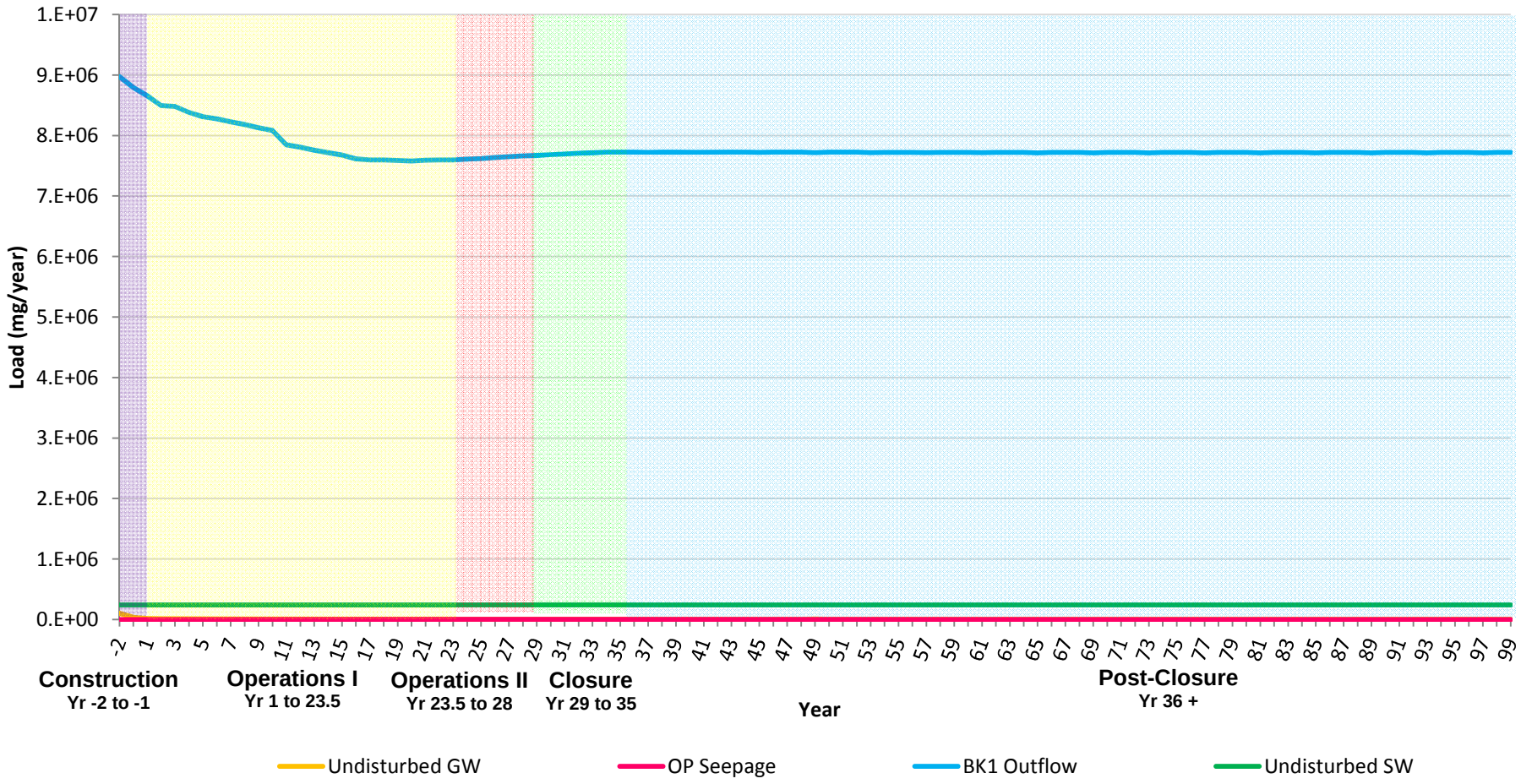
P/A NO. VA101-458/14

REF. NO. 3

FIGURE D7.1

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	11OCT'14	ISSUED WITH REPORT	CJ	EJA	KJB



NOTES:

1. GRAPH DEPICTS SUM OF ANNUAL LOADS FROM ALL LOADING SOURCES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

COPPER LOADING SOURCES - LOWER BAKER CREEK

Knight Piésold CONSULTING

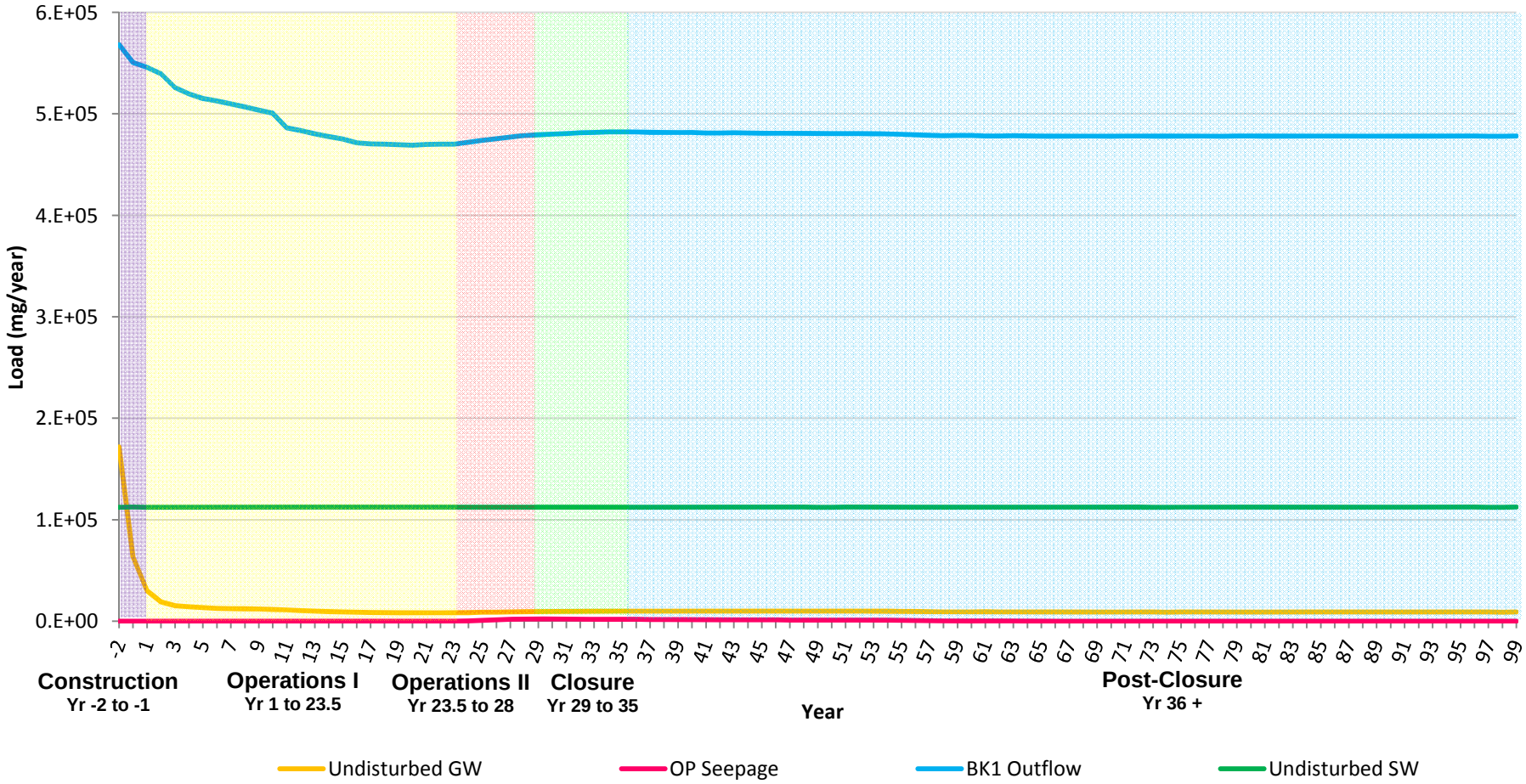
P/A NO. VA101-458/14

REF. NO. 3

FIGURE D7.2

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	11OCT'14	ISSUED WITH REPORT	CJ	EJA	KJB



NOTES:

1. GRAPH DEPICTS SUM OF ANNUAL LOADS FROM ALL LOADING SOURCES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SELENIUM LOADING SOURCES - LOWER BAKER CREEK

Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE D7.3

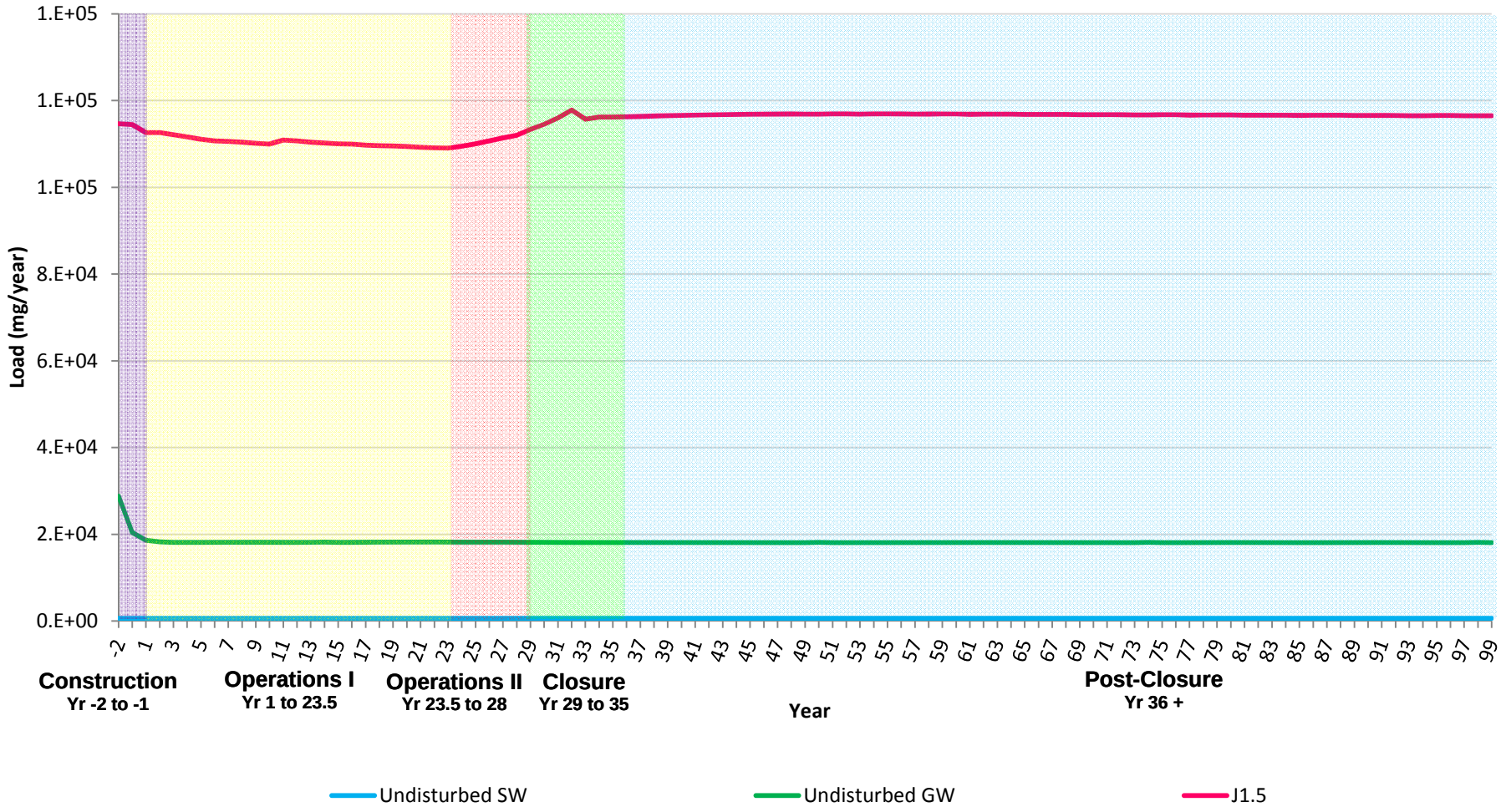
REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	11OCT'14	ISSUED WITH REPORT	CJ	EJA	KJB

APPENDIX D8

JONES CREEK ABOVE NORTH THOMPSON RIVER (J1)

(Pages D8-1 to D8-3)



NOTES:

1. GRAPH DEPICTS SUM OF ANNUAL LOADS FROM ALL LOADING SOURCES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

CADMIUM LOADING SOURCES - JONES CREEK

Knight Piésold CONSULTING

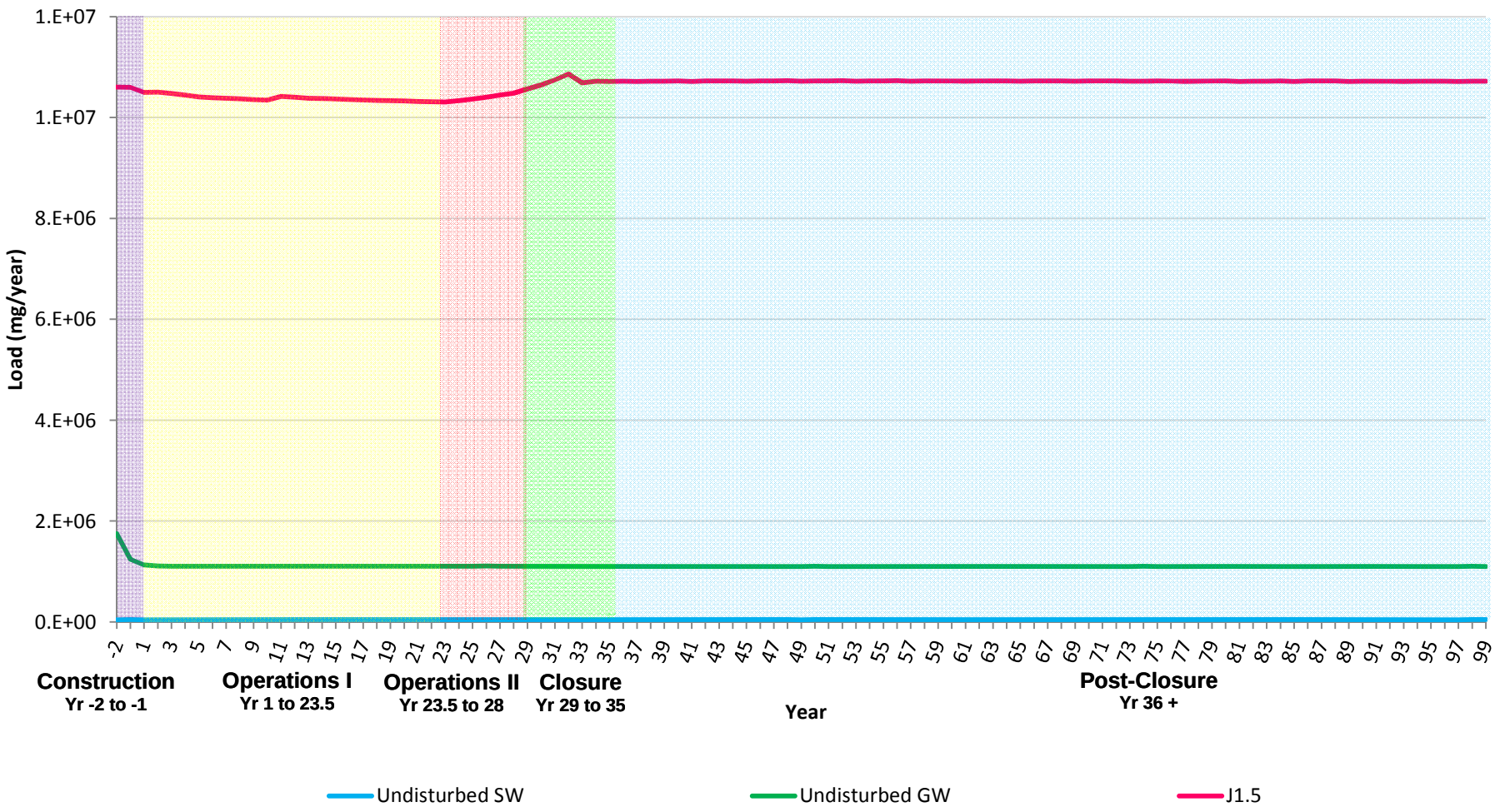
P/A NO. VA101-458/14

REF. NO. 3

FIGURE D8.1

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	11OCT'14	ISSUED WITH REPORT	CMJ	EJA	KJB



NOTES:

1. GRAPH DEPICTS SUM OF ANNUAL LOADS FROM ALL LOADING SOURCES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	11OCT'14	ISSUED WITH REPORT	CMJ	EJA	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

COPPER LOADING SOURCES - JONES CREEK

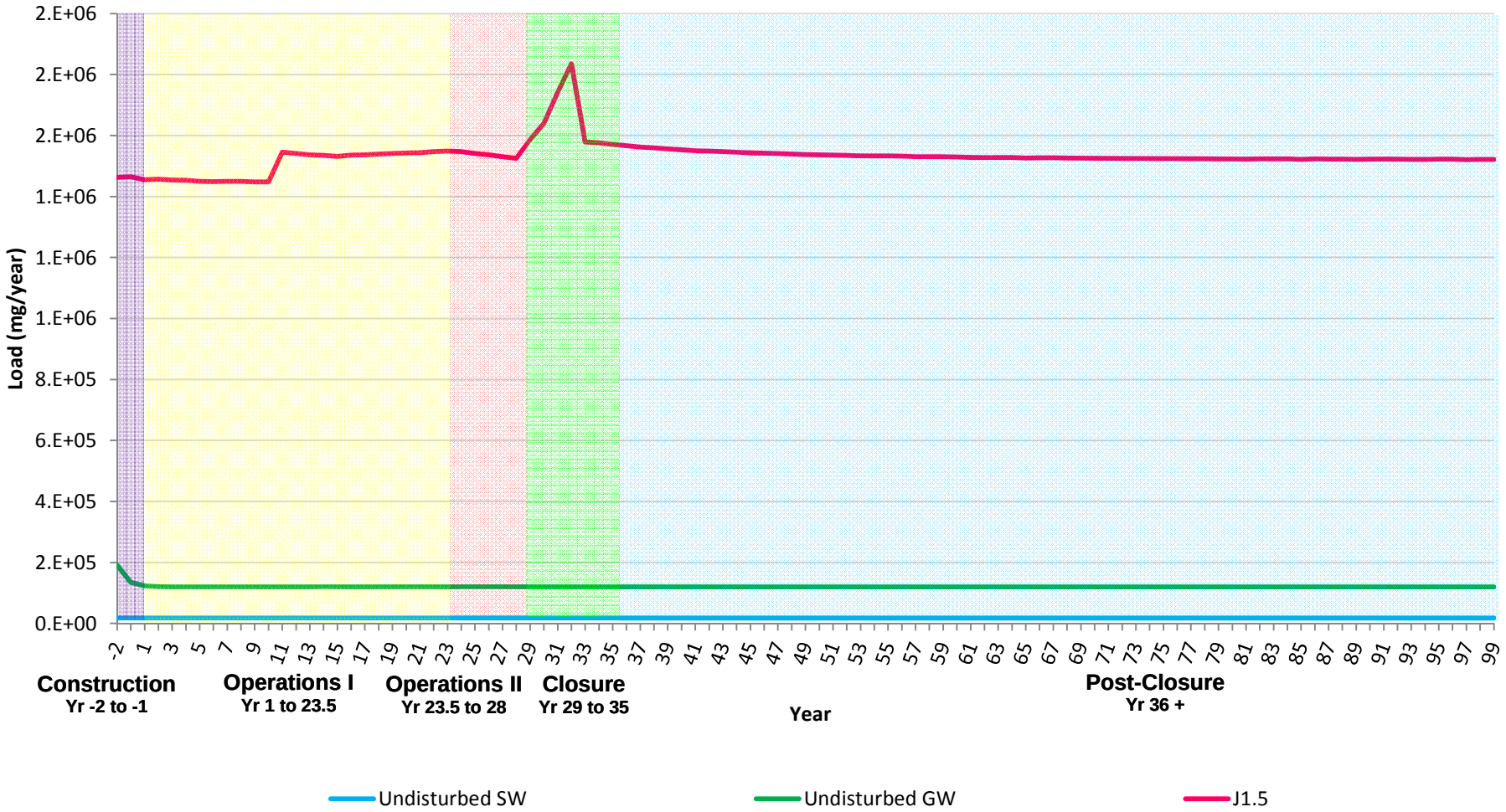
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE D8.2

REV 0



NOTES:

1. GRAPH DEPICTS SUM OF ANNUAL LOADS FROM ALL LOADING SOURCES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	11OCT'14	ISSUED WITH REPORT	CMJ	EJA	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SELENIUM LOADING SOURCES - JONES CREEK

Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE D8.3

REV 0

APPENDIX E

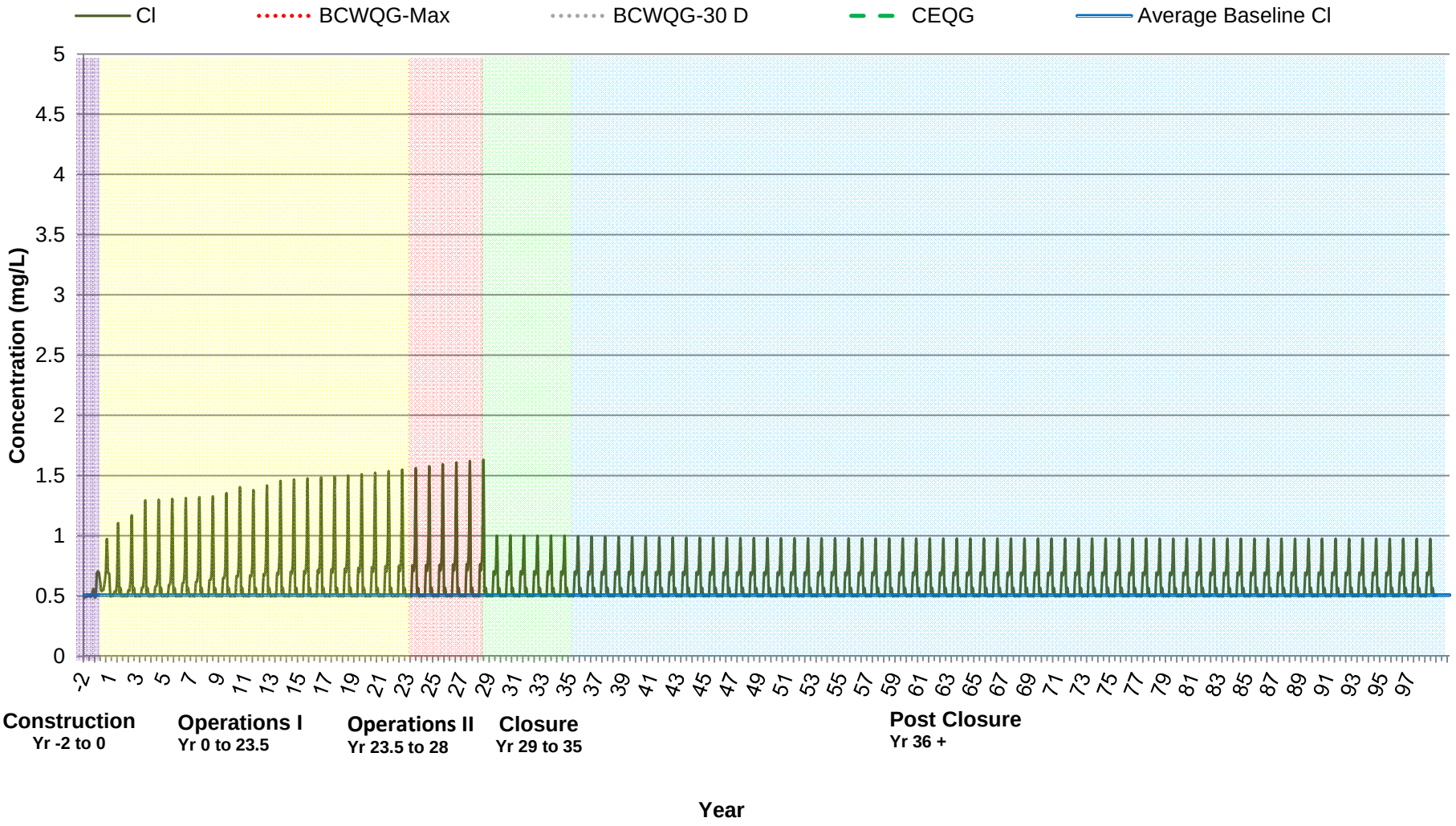
SEEPAGE SENSITIVITY CASE

Appendix E1 P-Creek
Appendix E2 Harper Creek Below P-Creek (HP)

APPENDIX E1

P-CREEK

(Pages E1-1 to E1-30)



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. ALL GUIDELINES ARE NOT SHOWN: BCWQG-30 D (150 mg/L); BCWQG-MAX (600 mg/L); CEQG (120 mg/L AND 640 mg/L).

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE CHLORIDE CONCENTRATIONS - P-CREEK

Knight Piésold CONSULTING

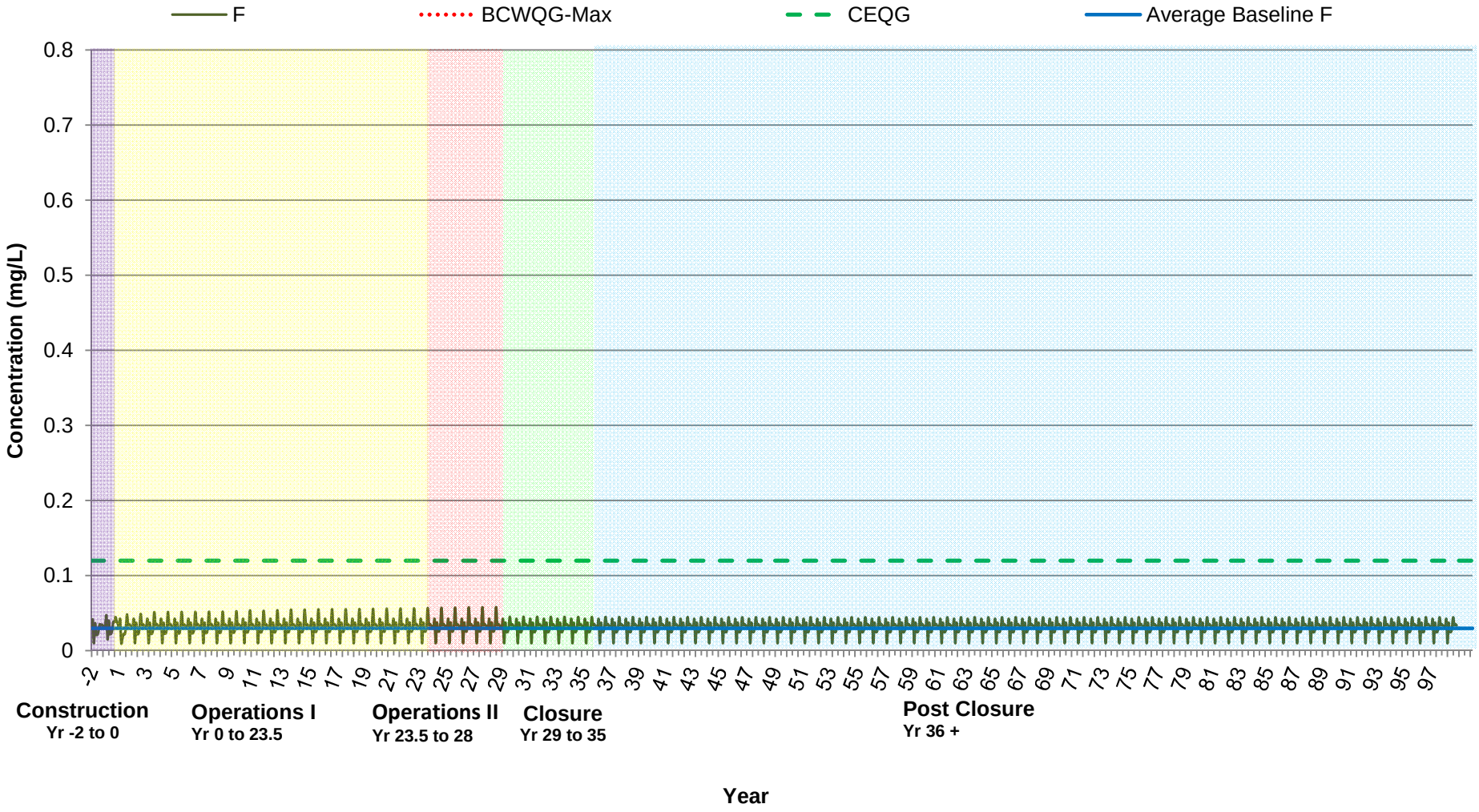
P/A NO. VA101-458/14

REF. NO. 3

FIGURE E1.Cl

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX IS HARNDESS DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE FLUORIDE CONCENTRATIONS - P-CREEK

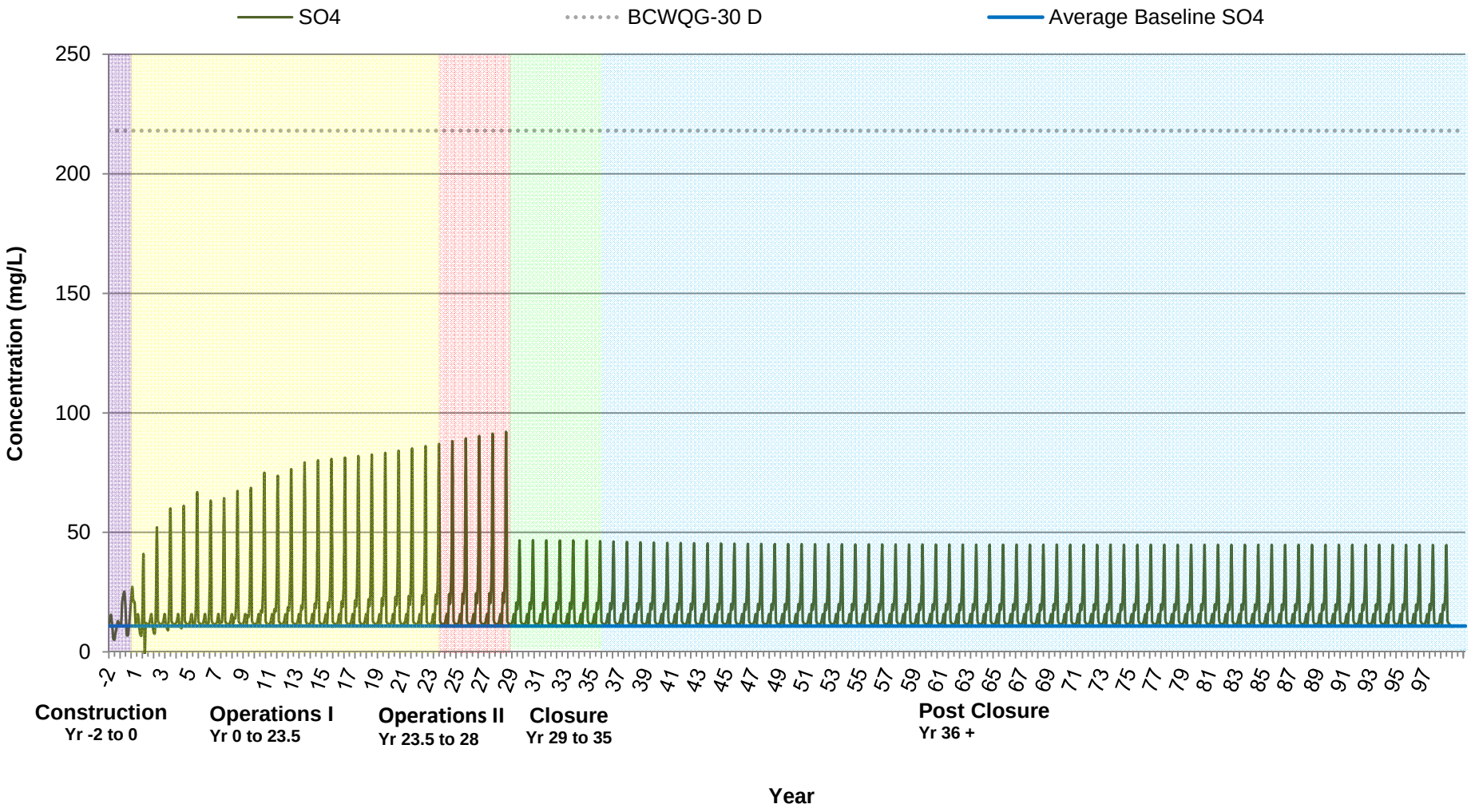
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE E1.F

REV 0



NOTES:

1. BCWQG-30 D IS HARDNESS DEPEDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE SULPHATE CONCENTRATIONS - P-CREEK

Knight Piésold CONSULTING

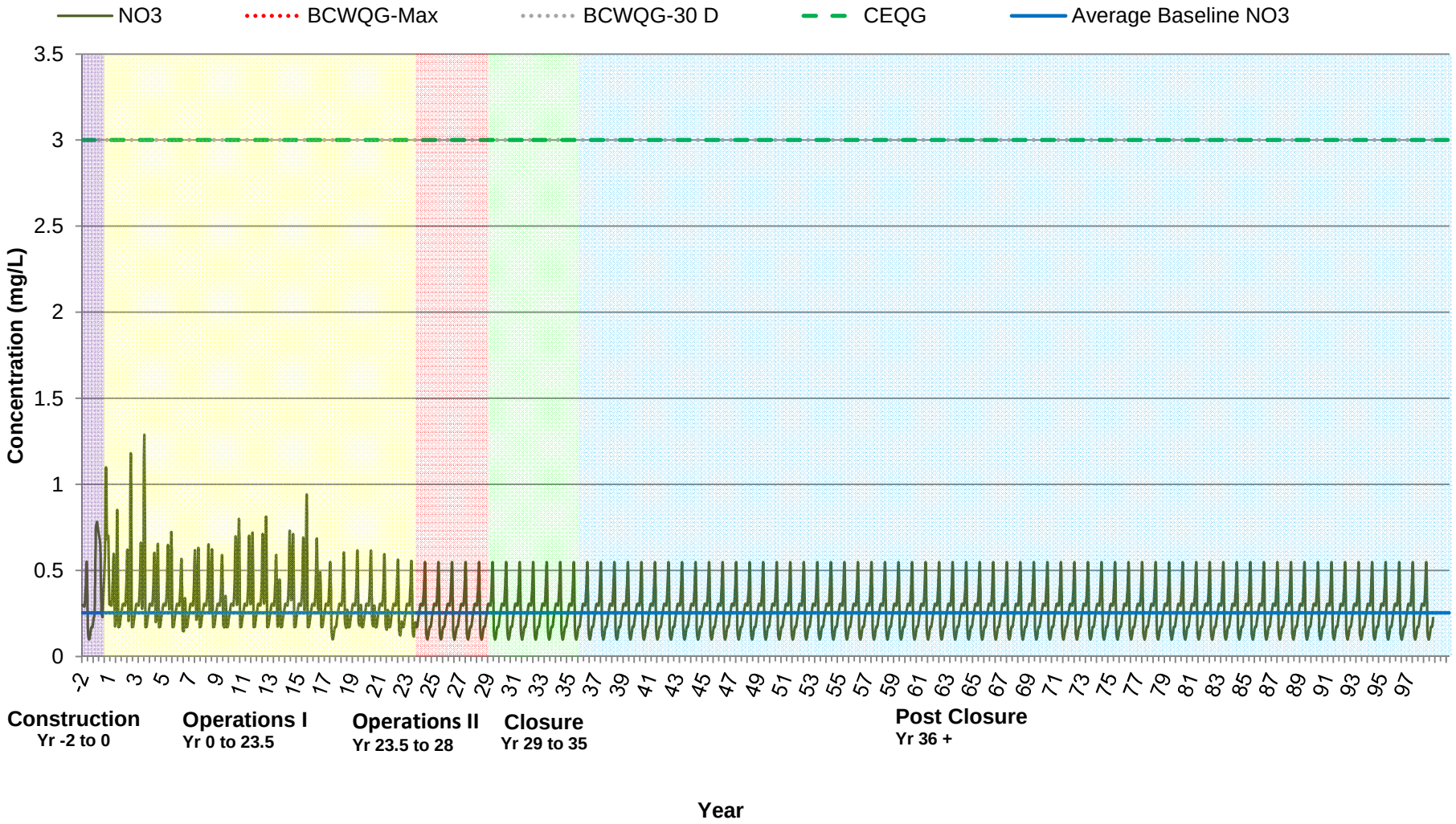
P/A NO. VA101-458/14

REF. NO. 3

FIGURE E1.S04

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. THE BCWQG-MAX (32.8 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE NITRATE CONCENTRATIONS - P-CREEK

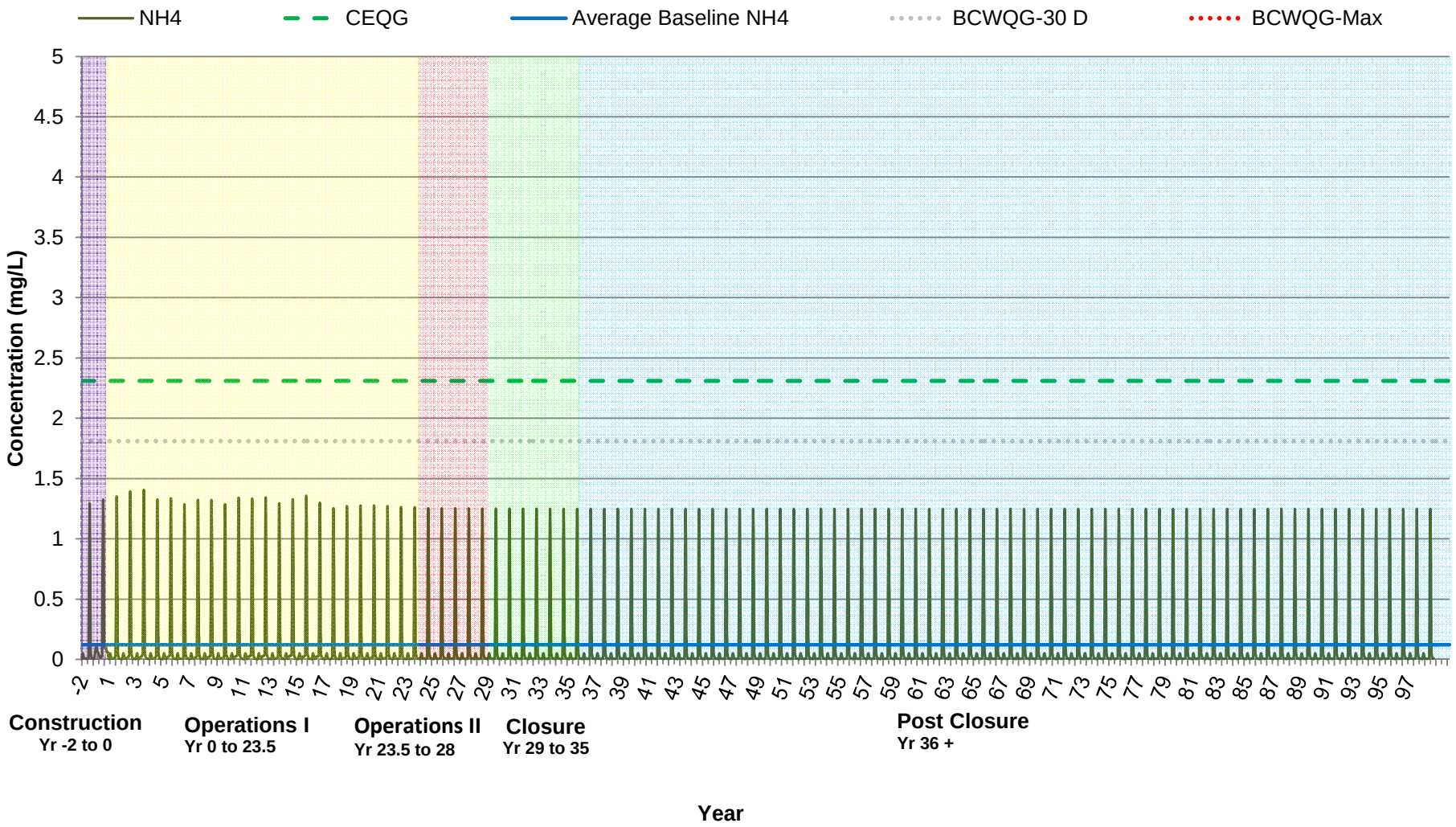
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE E1.NO3

REV 0



NOTES:

1. THE BCWQG-30 D IS VALID FOR ONLY 6.5≤pH<9 AND 0°C≤T≤20°C.
2. THE BCWQG-MAX (20.15 mg/L) VALID FOR 6.5≤pH<9 IS NOT SHOWN.
3. THE CEQG IS TO BE USED WITH CAUTION FOR WATER WITH T<5°C AND pH>9.
4. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE AMMONIA CONCENTRATIONS - P-CREEK

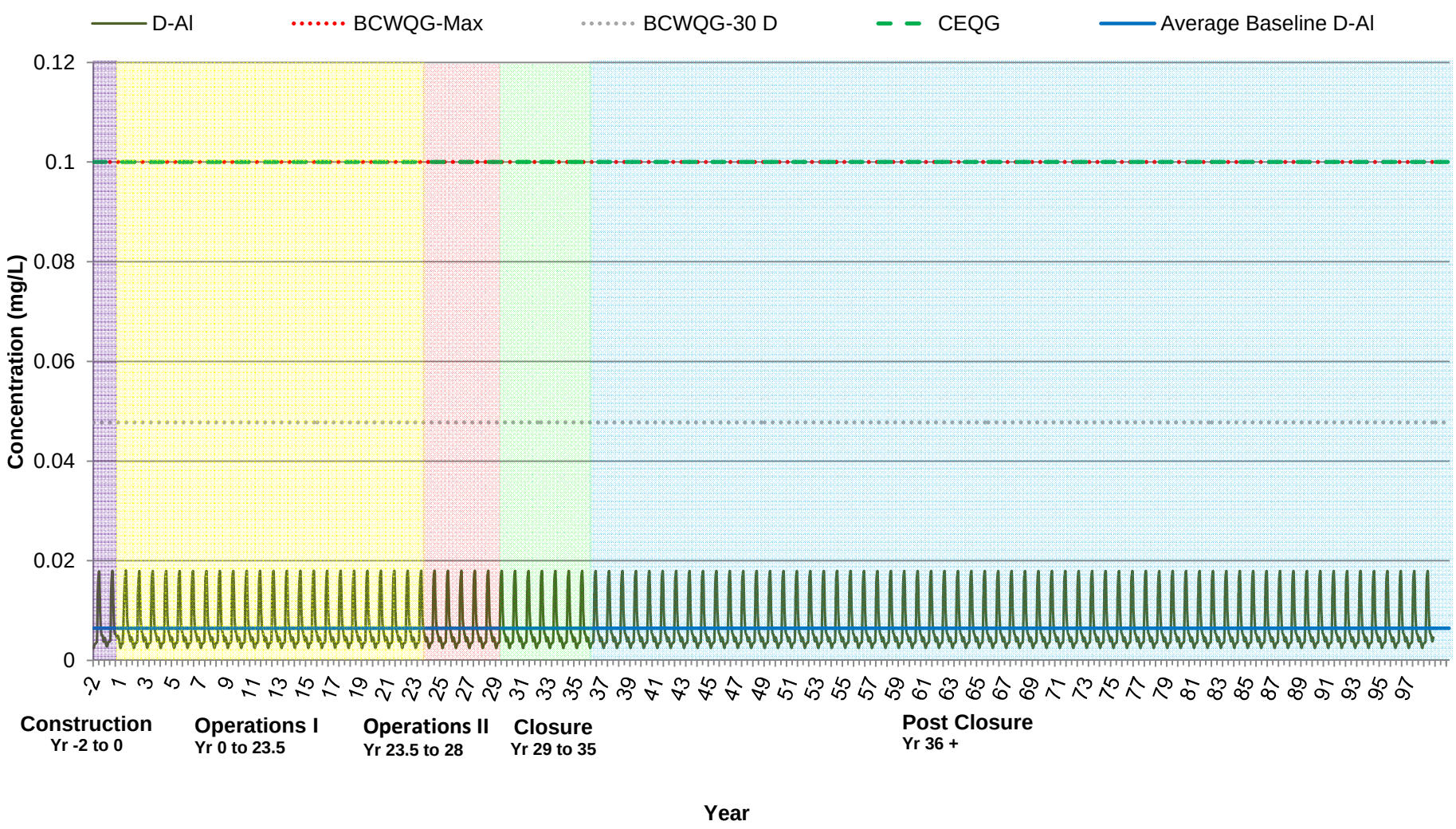
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE E1.NH4

REV 0



NOTES:

1. ALL GUIDELINES ARE pH-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. AVERAGE BASELINE pH USED TO CALCULATE GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE
DISSOLVED ALUMINUM CONCENTRATIONS - P-CREEK

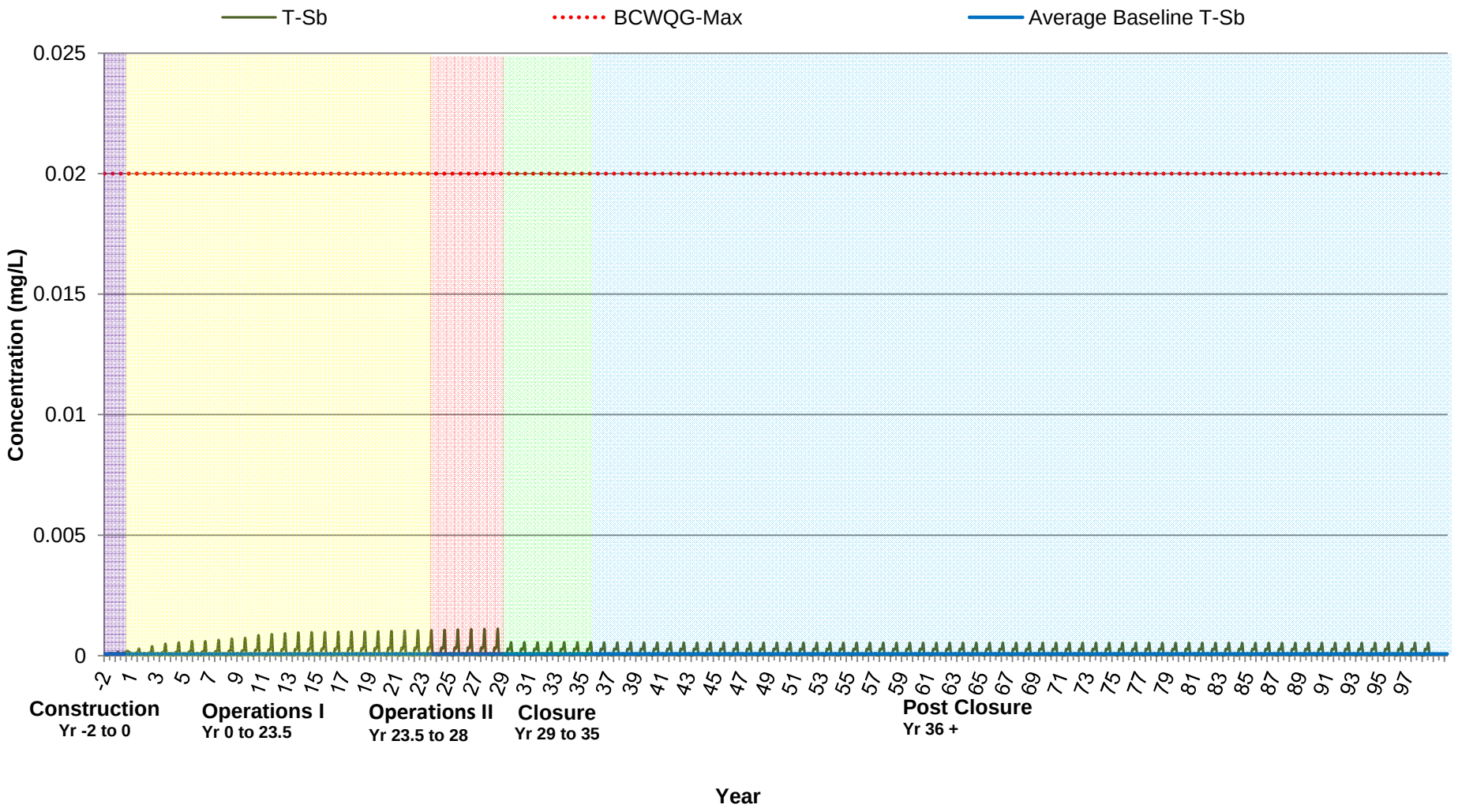
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P/A NO. VA101-458/14

REF. NO. 3

FIGURE E1.Al

REV 0



NOTES:

1. THE BCWQG IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE ANTIMONY CONCENTRATIONS - P-CREEK

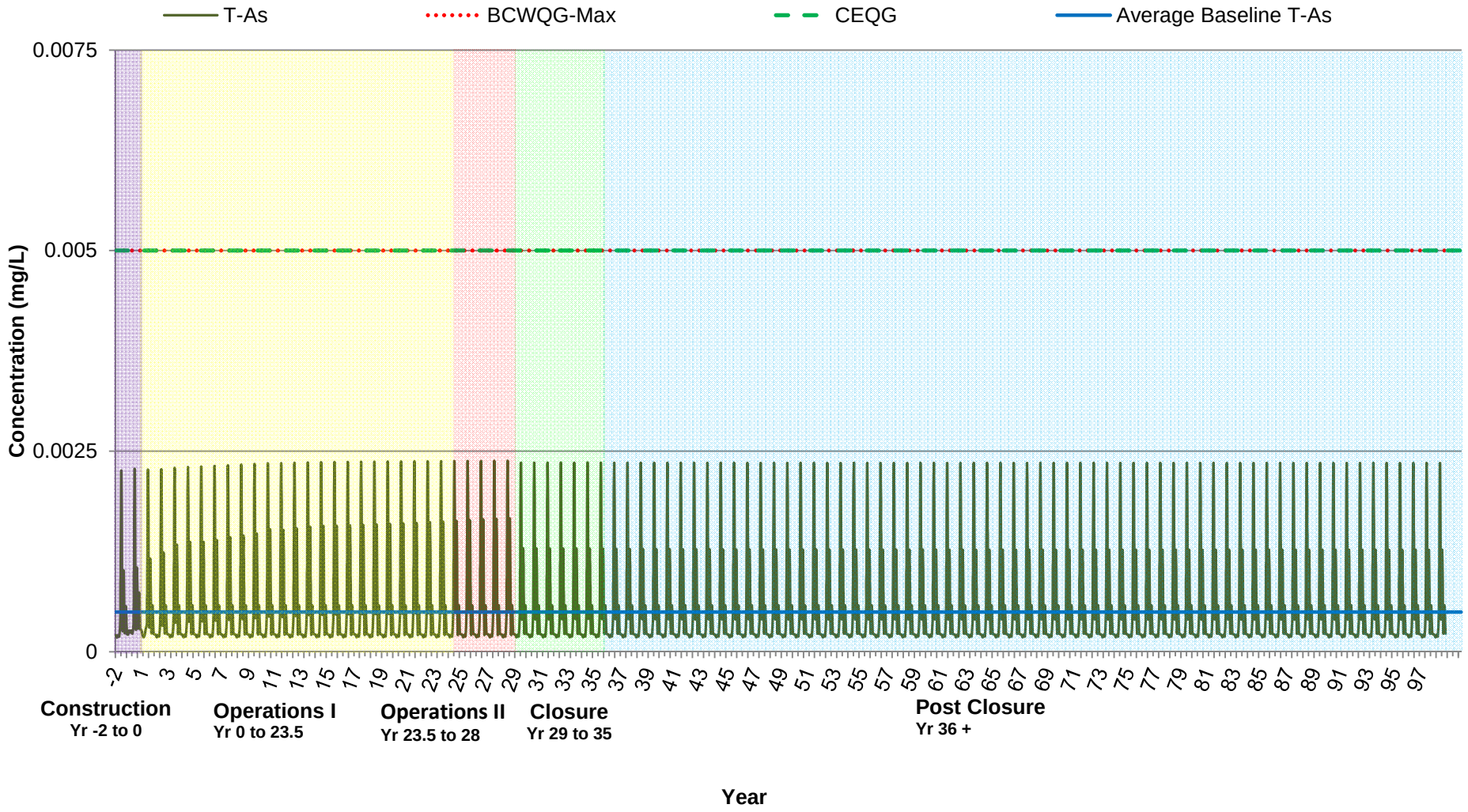
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P/A NO. VA101-458/14

REF. NO. 3

FIGURE E1.Sb

REV 0



NOTES:

1. THE BCWQG AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE ARSENIC CONCENTRATIONS - P-CREEK

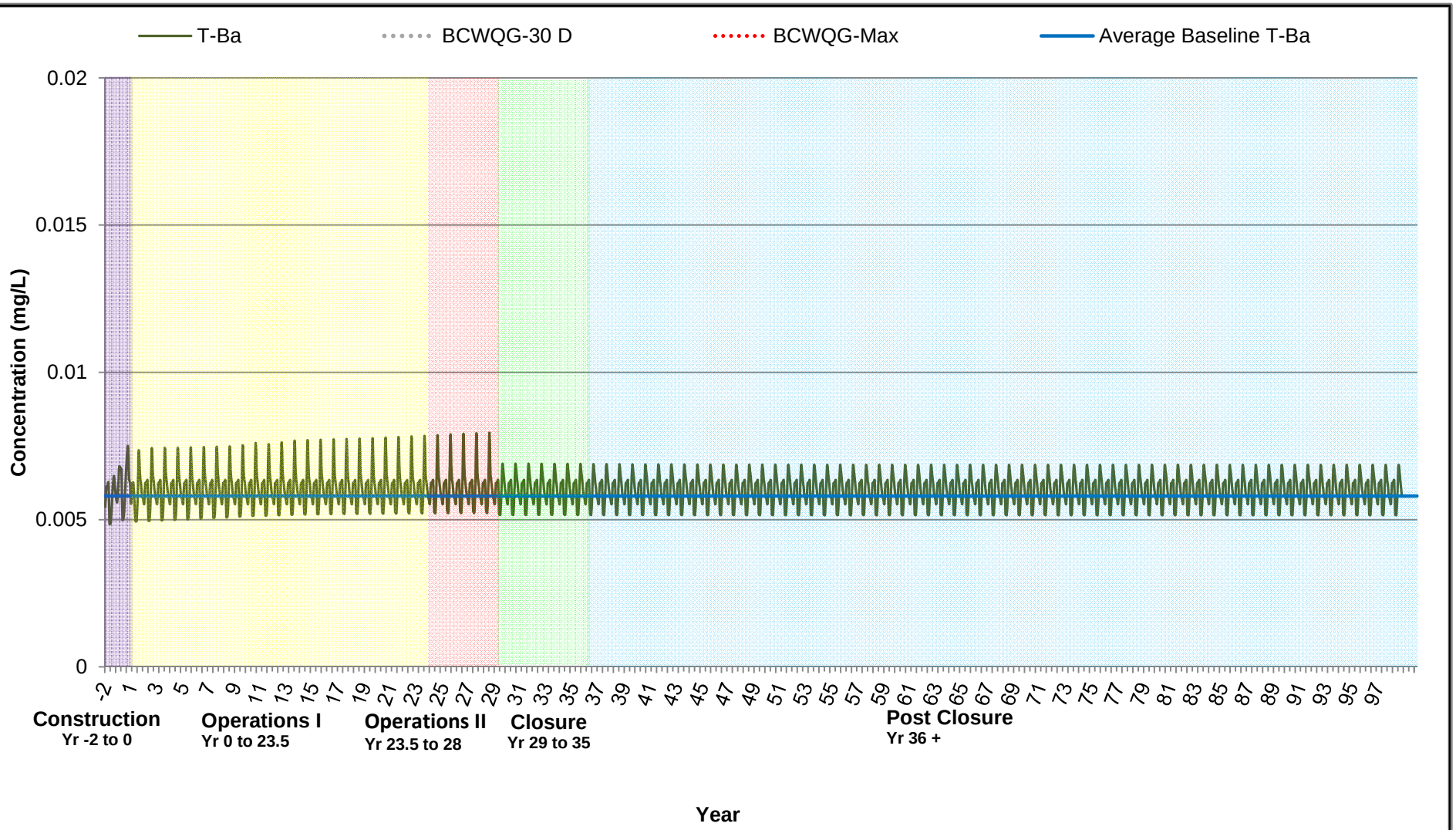
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P/A NO. VA101-458/14

REF. NO. 3

FIGURE E1.As

REV 0



NOTES:

1. THE BCWQG-MAX IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. THE BCWQG-30 D (1 mg/L) AND BCWQG-MAX (5 mg/L) ARE NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE BARIUM CONCENTRATIONS - P-CREEK

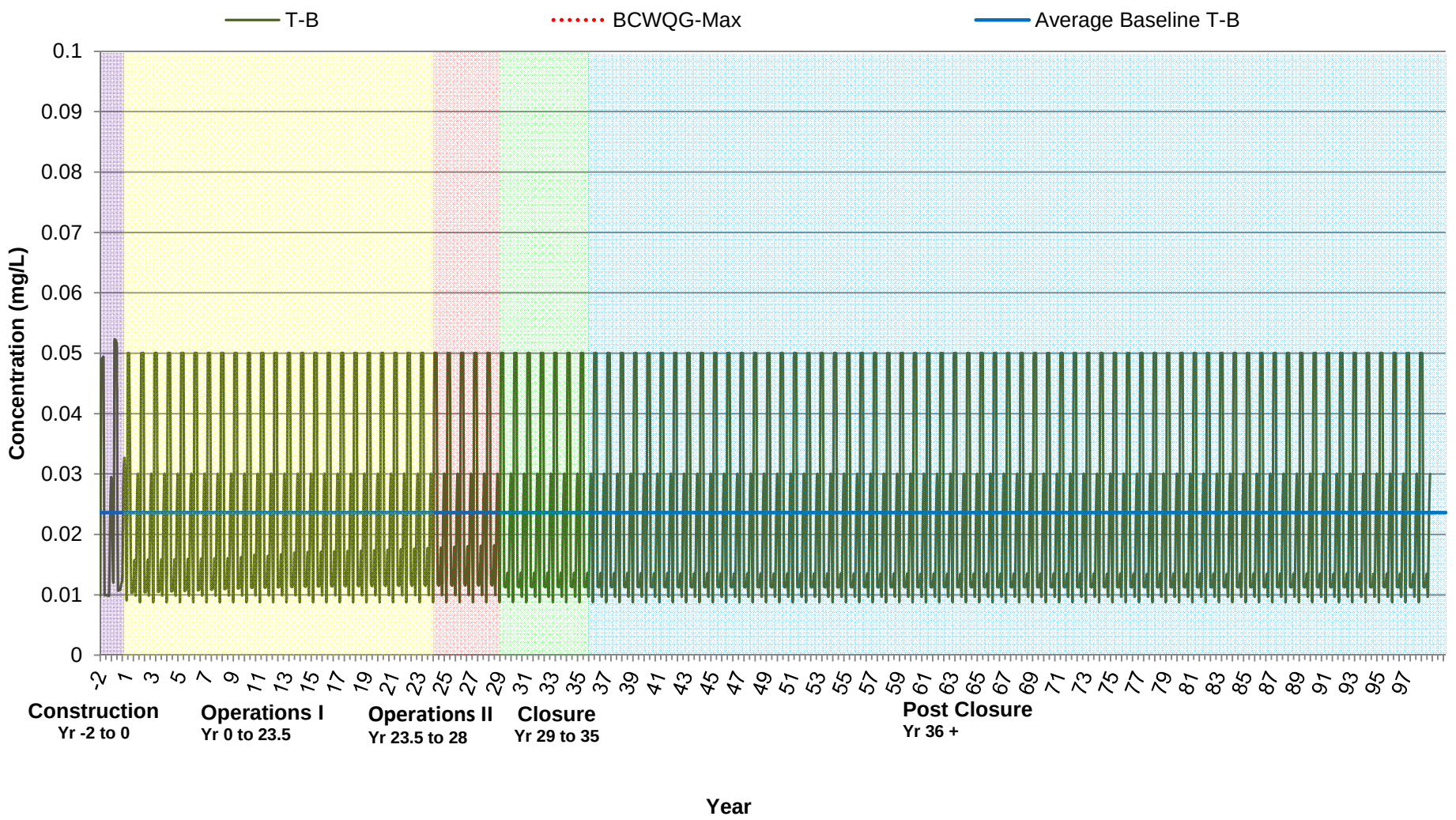
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE E1.Ba

REV 0



NOTES:

1. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.
3. THE BCWQG-MAX (1.2 mg/L) IS NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE BORON CONCENTRATIONS - P-CREEK

Knight Piésold CONSULTING

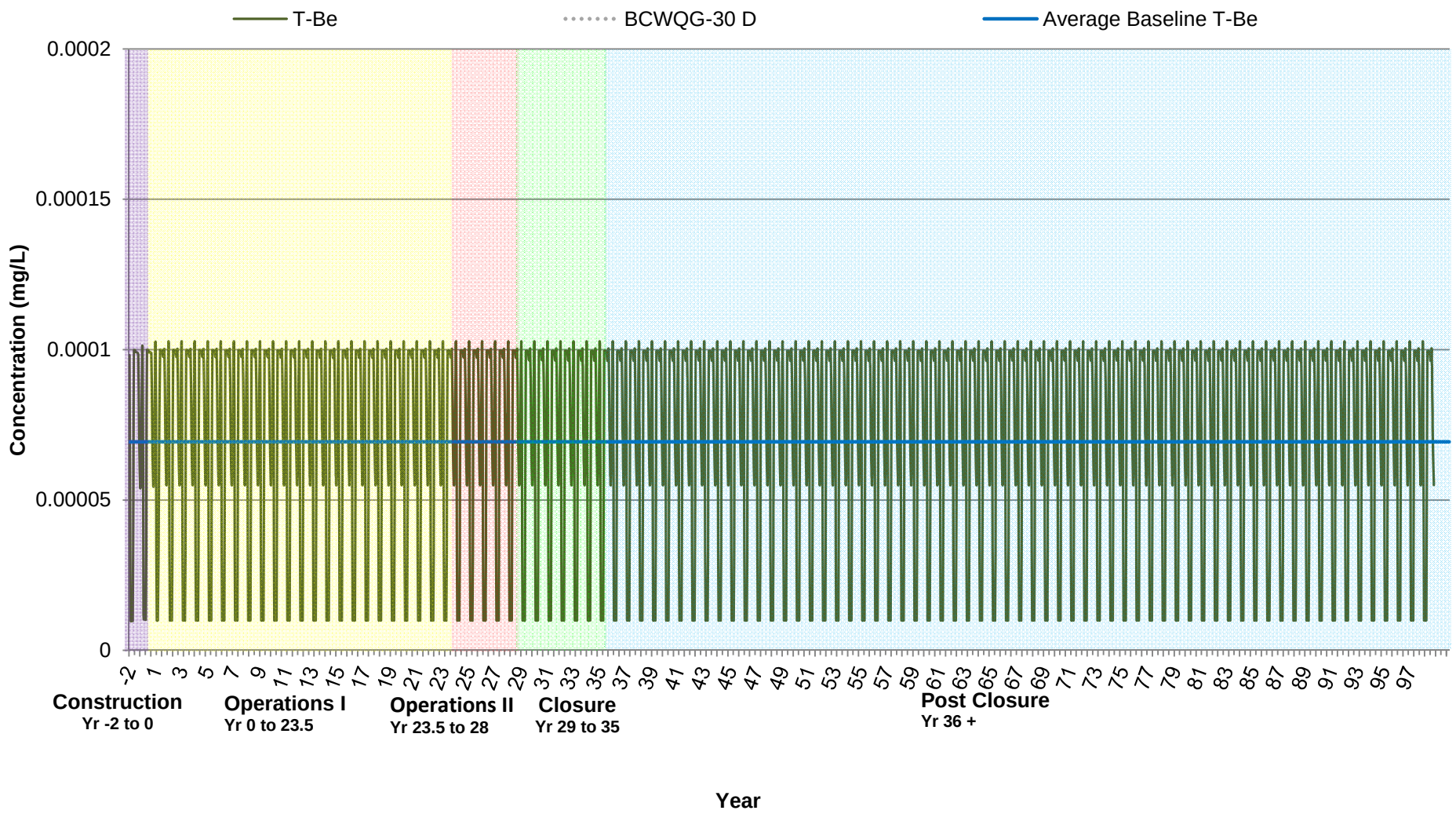
P/A NO. VA101-458/14

REF. NO. 3

FIGURE E1.B

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. THE BCWQG-30 D (0.0053 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE BERYILLIUM CONCENTRATIONS - P-CREEK

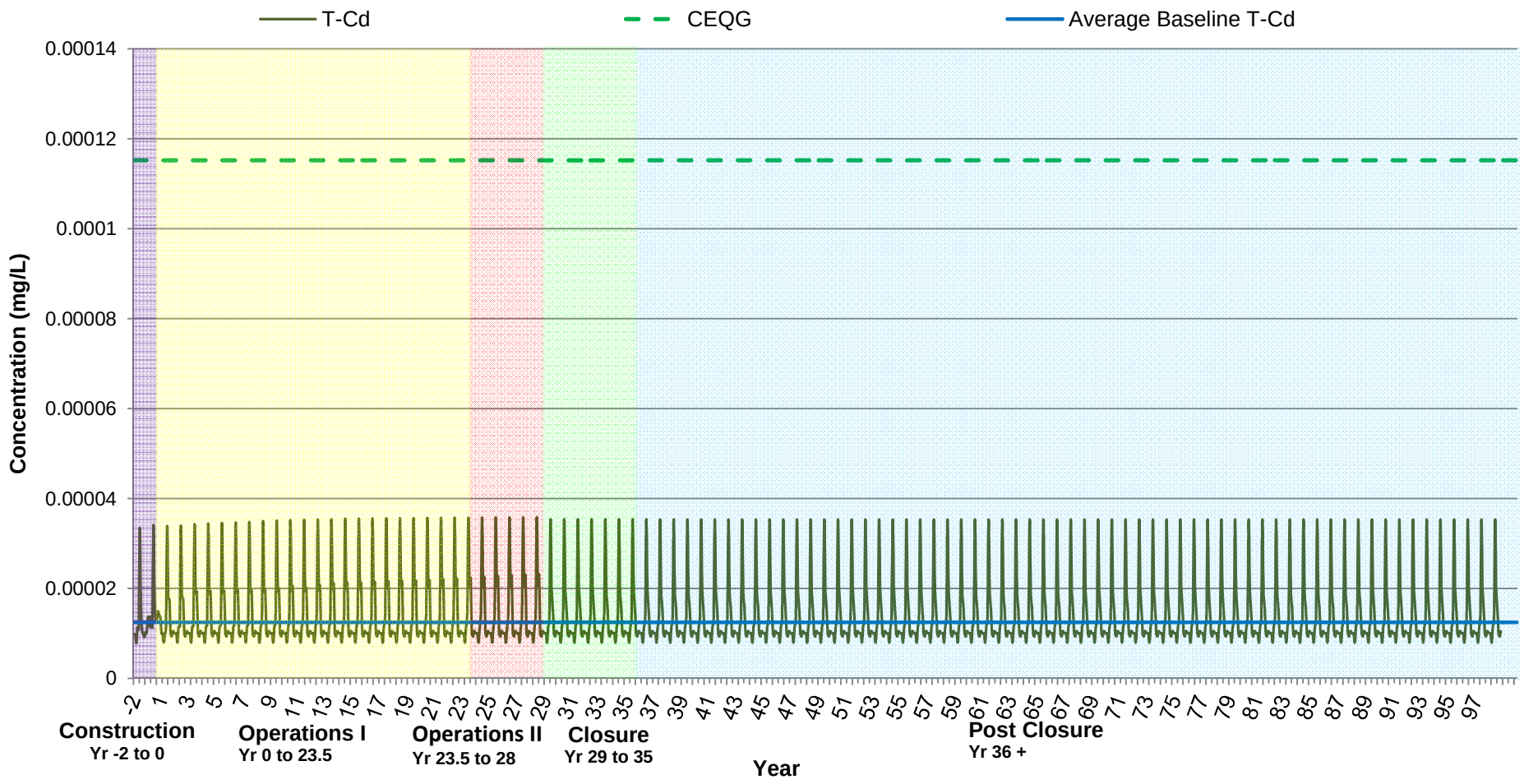
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE E1.Be

REV 0



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. THE BCWQG ARE DRAFT GUIDELINES UNDER REVIEW (JUNE 2014).
3. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
4. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE CADMIUM CONCENTRATIONS - P-CREEK

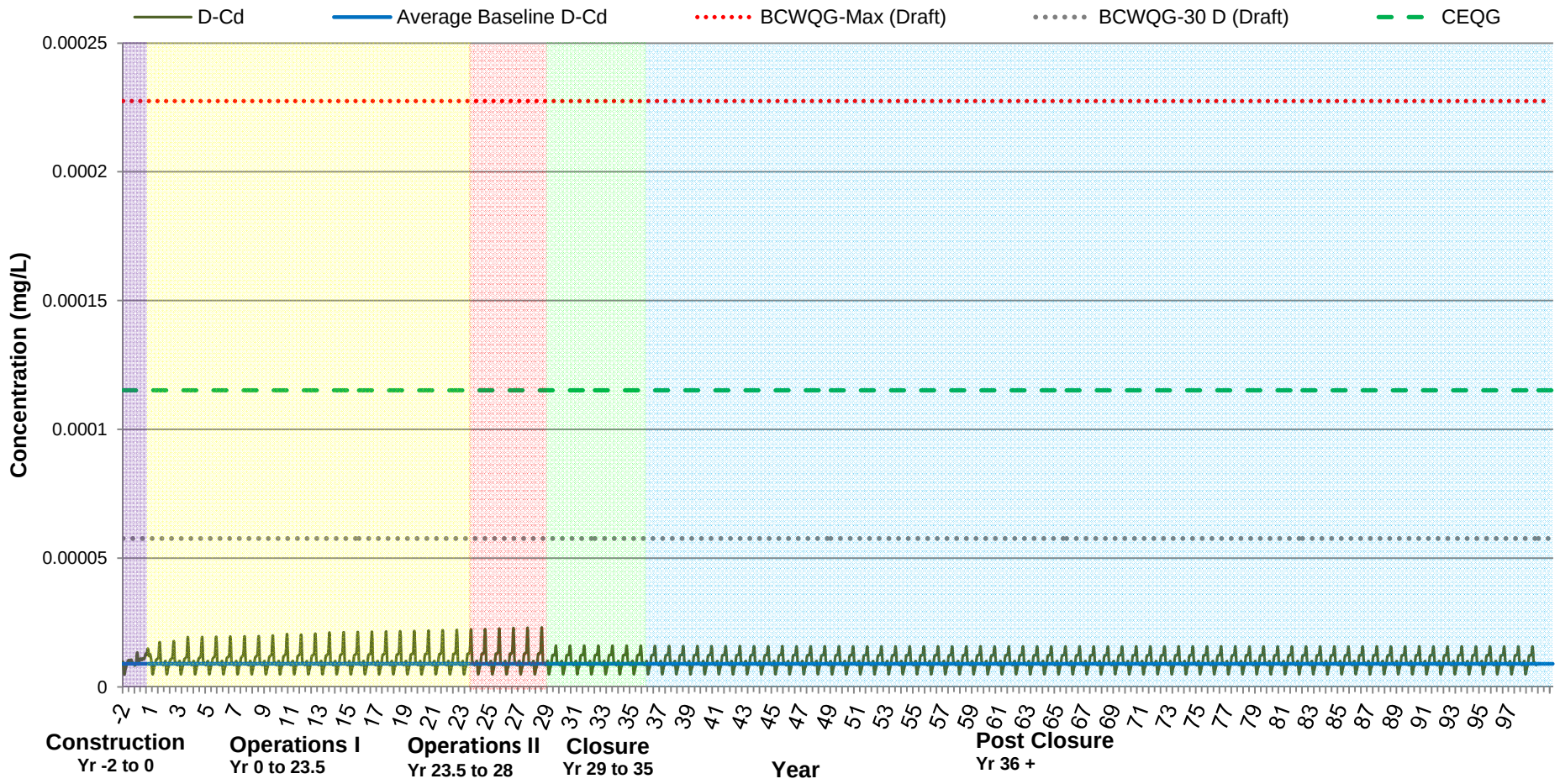
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE E1.Cd-T

REV 0



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. THE BCWQG ARE DRAFT GUIDELINES UNDER REVIEW (JUNE 2014).
3. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
4. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE CADMIUM CONCENTRATIONS - P-CREEK

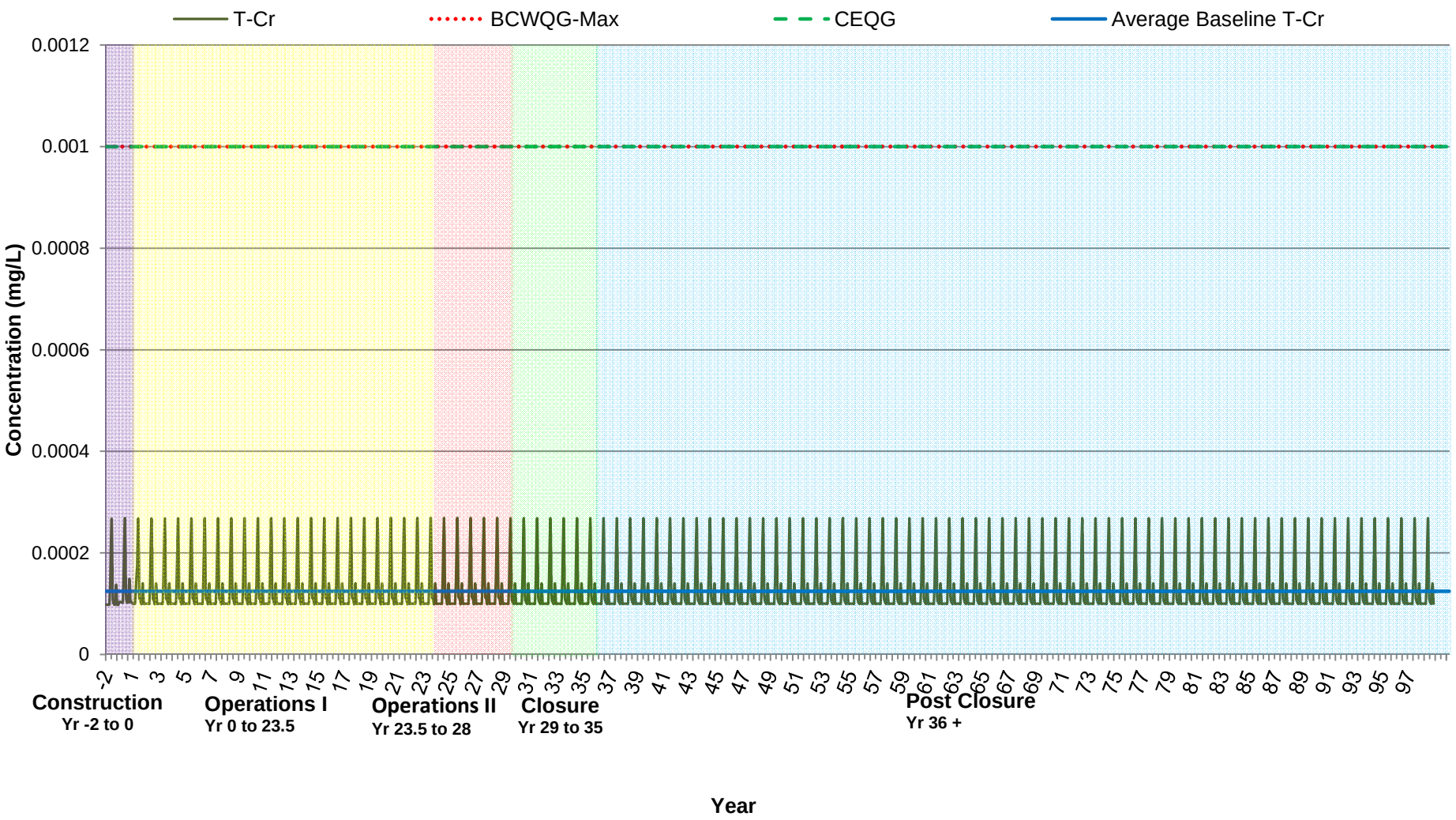
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P/A NO. VA101-458/14

REF. NO. 3

FIGURE E1.Cd-D

REV 0



NOTES:

1. GUIDELINES ARE FOR CHROMIUM (IV), THE SPECIES MOST COMMON IN WELL OXYGENATED SURFACE WATERS.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE CHROMIUM CONCENTRATIONS - P-CREEK

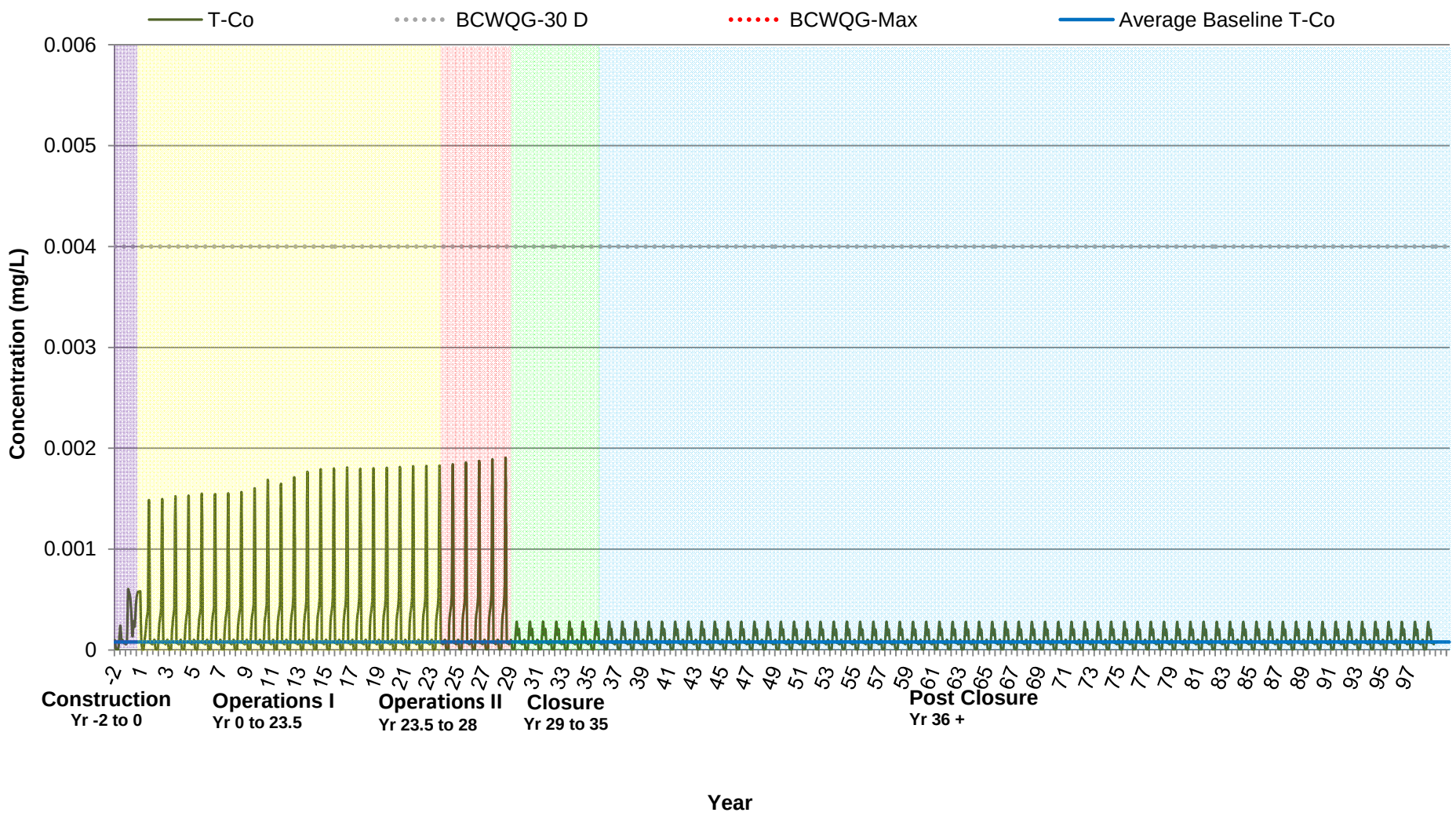
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE E1.Cr

REV 0



NOTES:

1. THE BCWQG-30 D AND BCWQG-MAX ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. THE BCWQG-MAX GUIDELINE (0.11 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE COBALT CONCENTRATIONS - P-CREEK

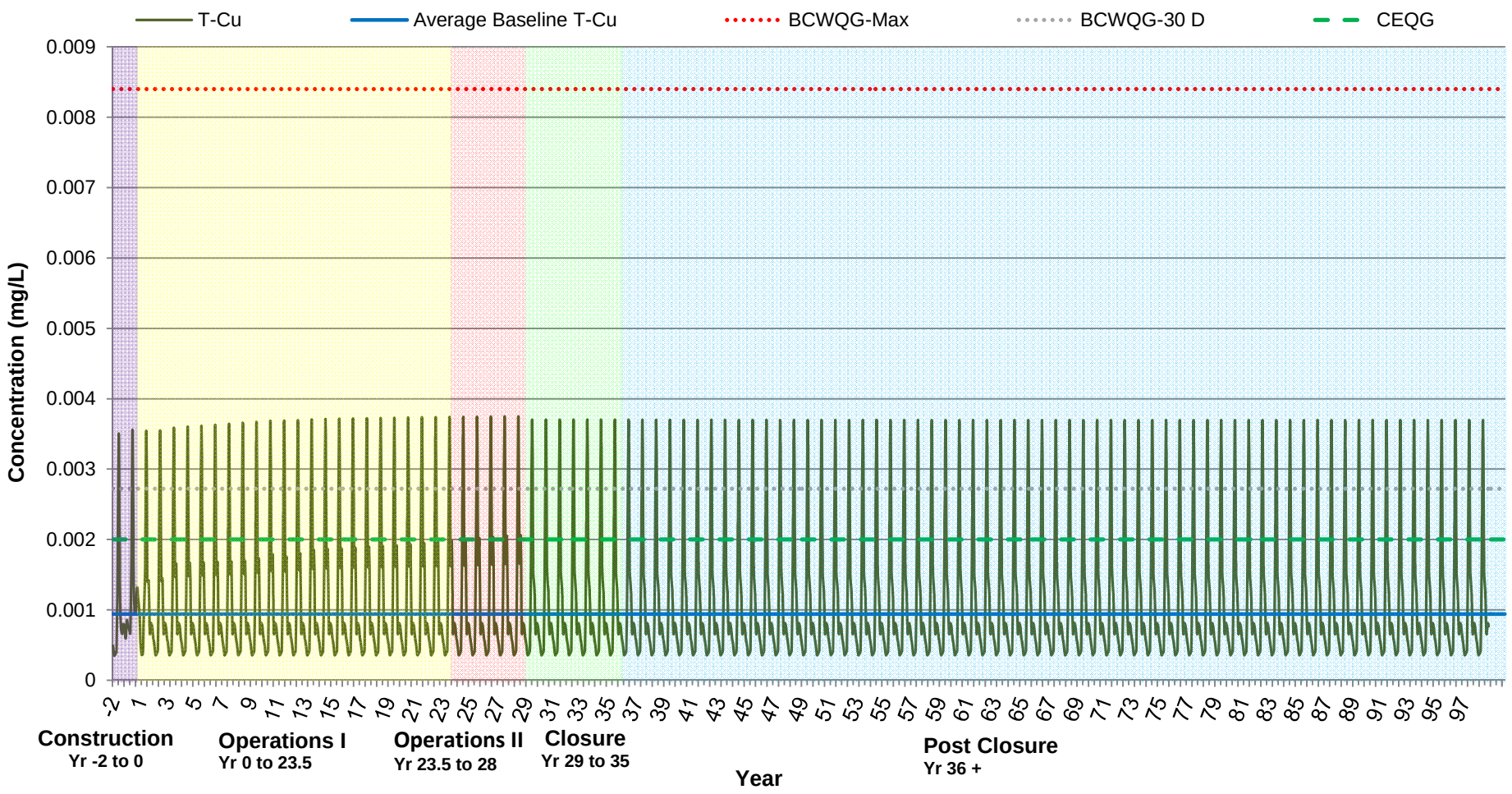
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE E1.Co

REV 0



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE COPPER CONCENTRATIONS - P-CREEK

Knight Piésold CONSULTING

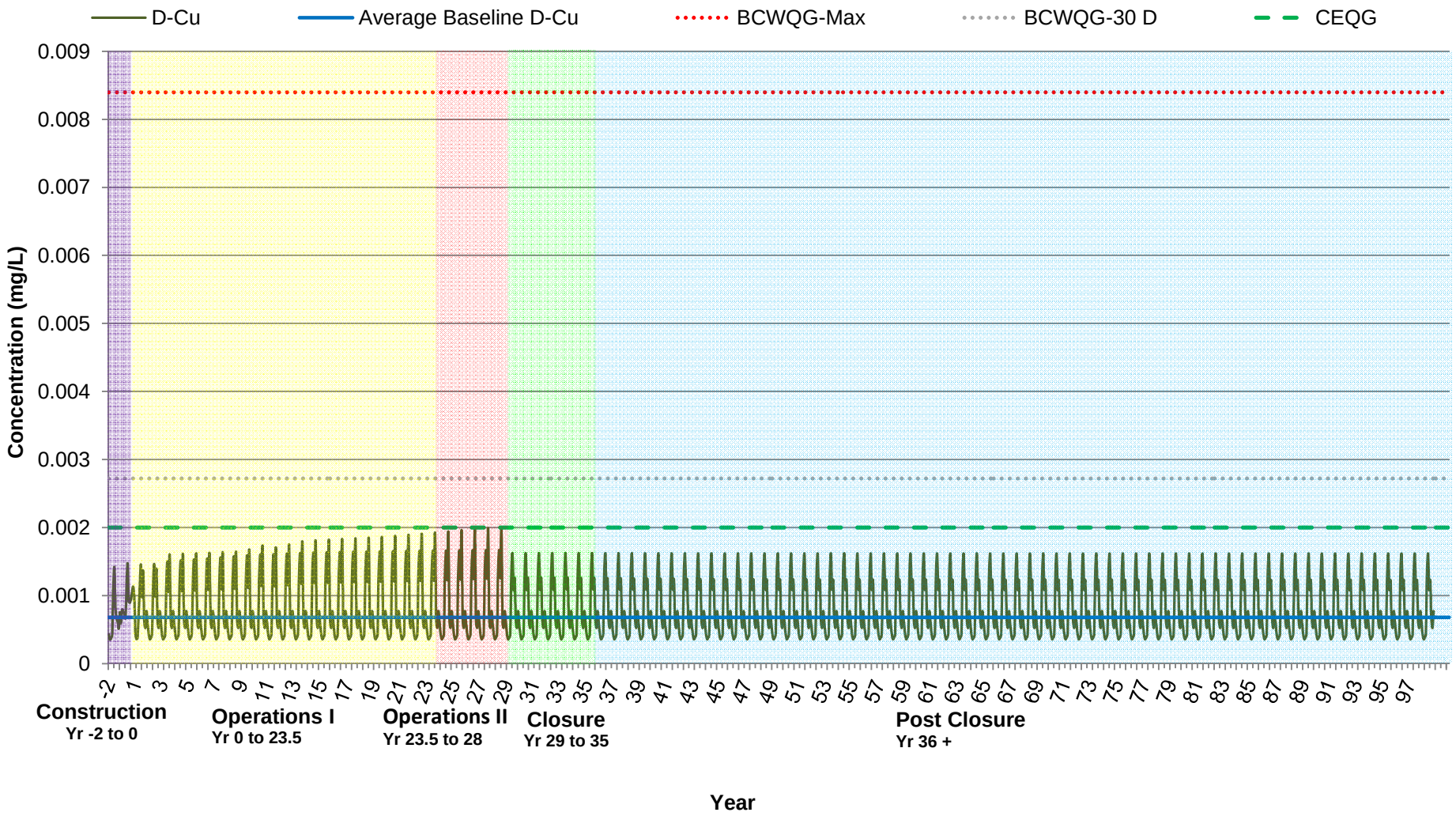
P/A NO. VA101-458/14

REF. NO. 3

FIGURE E1.Cu-T

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE COPPER CONCENTRATIONS - P-CREEK

Knight Piésold CONSULTING

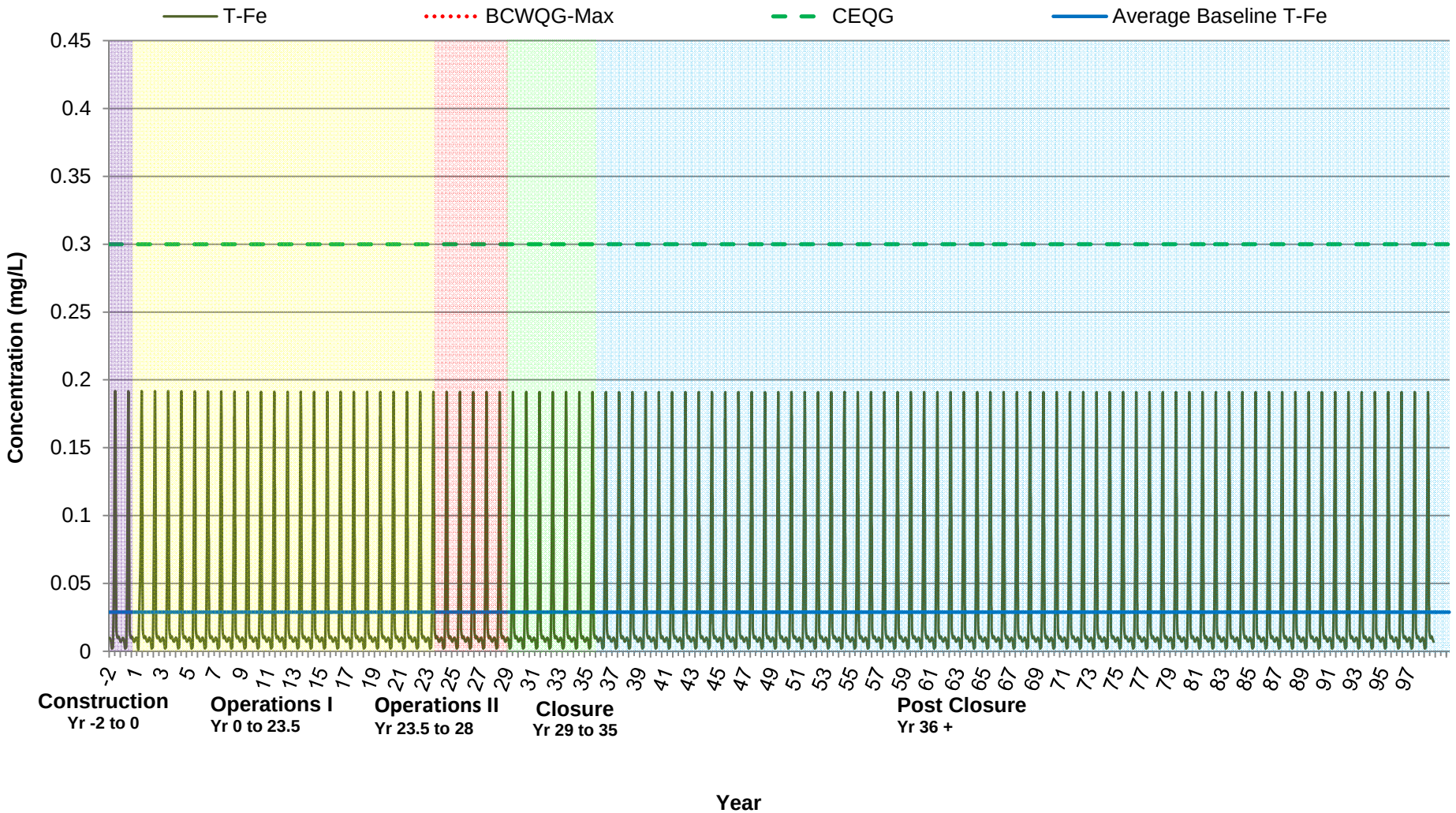
P/A NO. VA101-458/14

REF. NO. 3

FIGURE E1.Cu-D

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. BCWQG-MAX 1.0 mg/L IS NOT SHOWN ON GRAPH.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE TOTAL IRON CONCENTRATIONS - P-CREEK

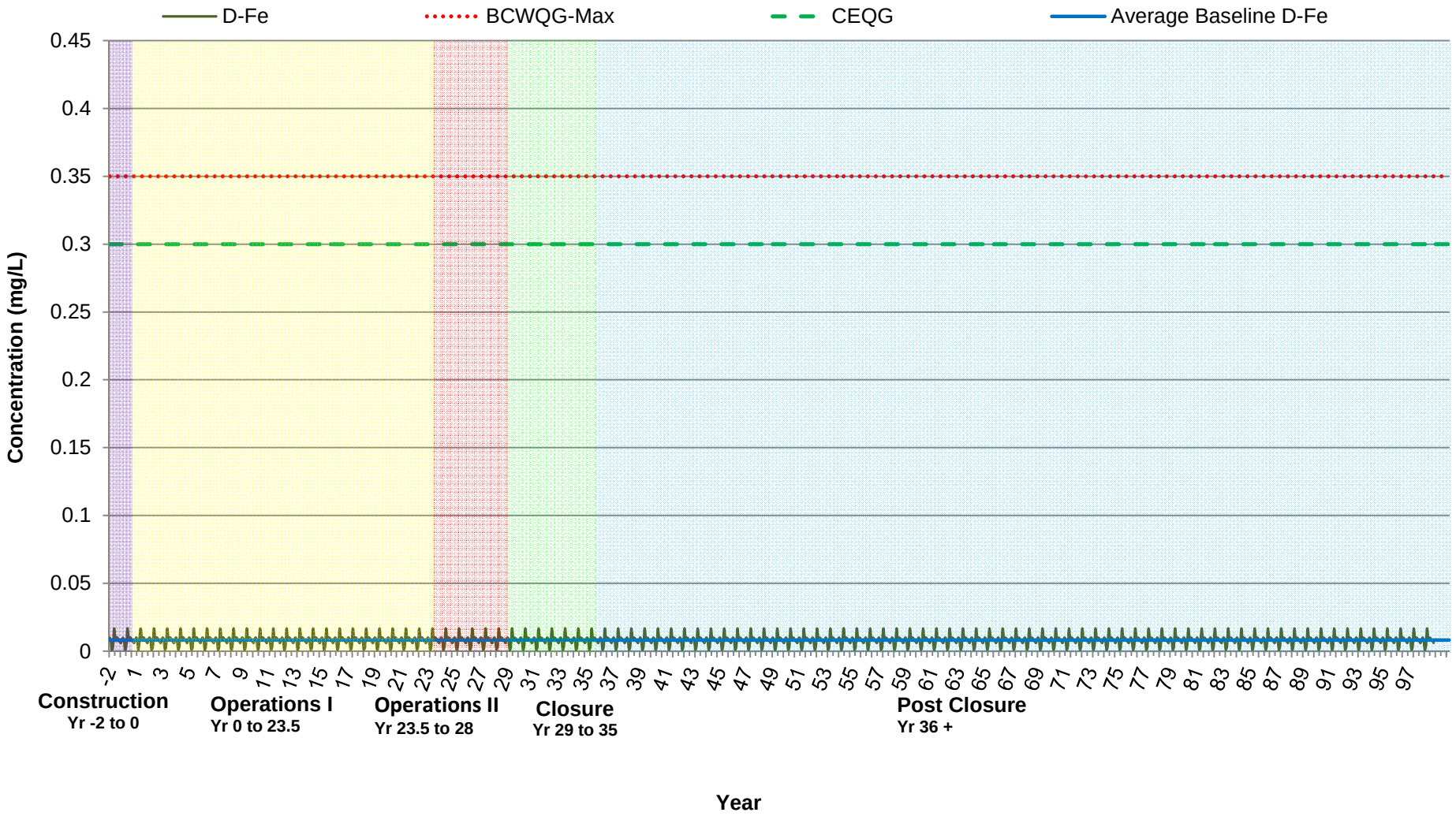
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE E1.Fe-T

REV 0



NOTES:

1. THE BCWQG-MAX AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE DISSOLVED IRON CONCENTRATIONS - P-CREEK

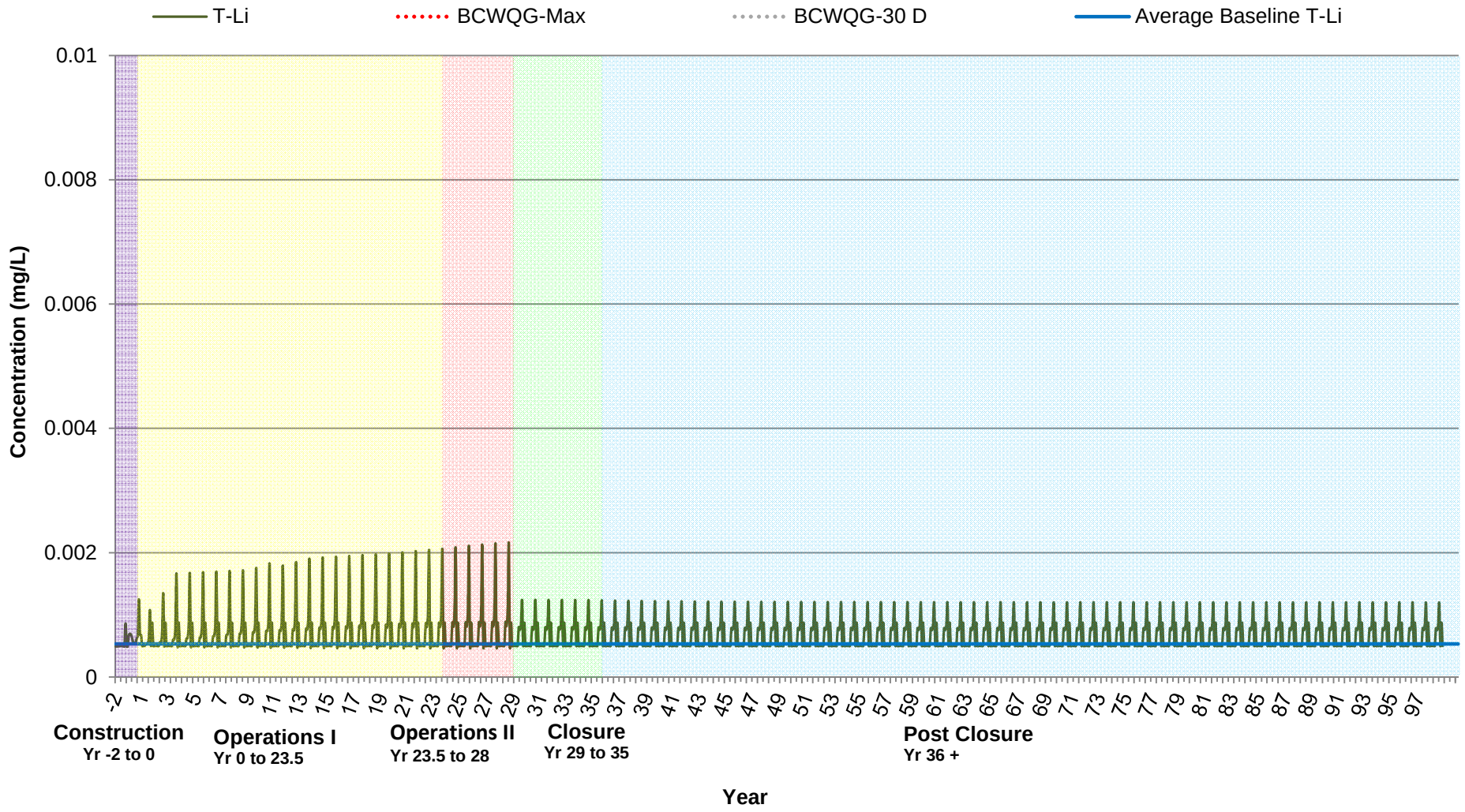
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE E1.Fe-D

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. THE BCWQG-30 D (0.096 mg/L) AND BCWQG-MAX (0.87 mg/L) ARE INTERIM (WORKING) AND ARE NOT SHOWN ON GRAPH.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE LITHIUM CONCENTRATIONS - P-CREEK

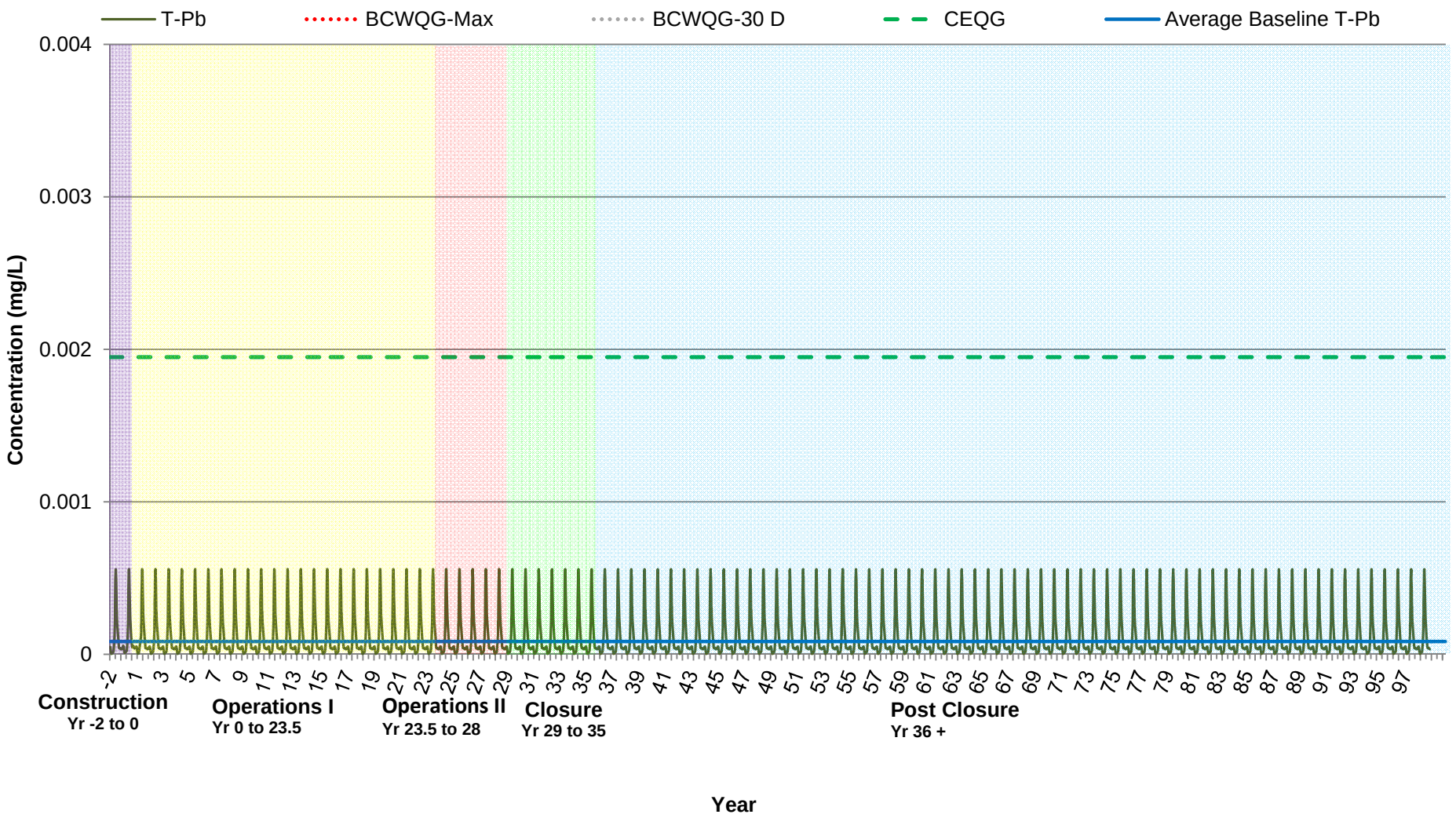
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE E1.Li

REV 0



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.
4. THE BCWQG-MAX (CALCULATED AT 0.011 mg/L) IS NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE LEAD CONCENTRATIONS - P-CREEK

Knight Piésold CONSULTING

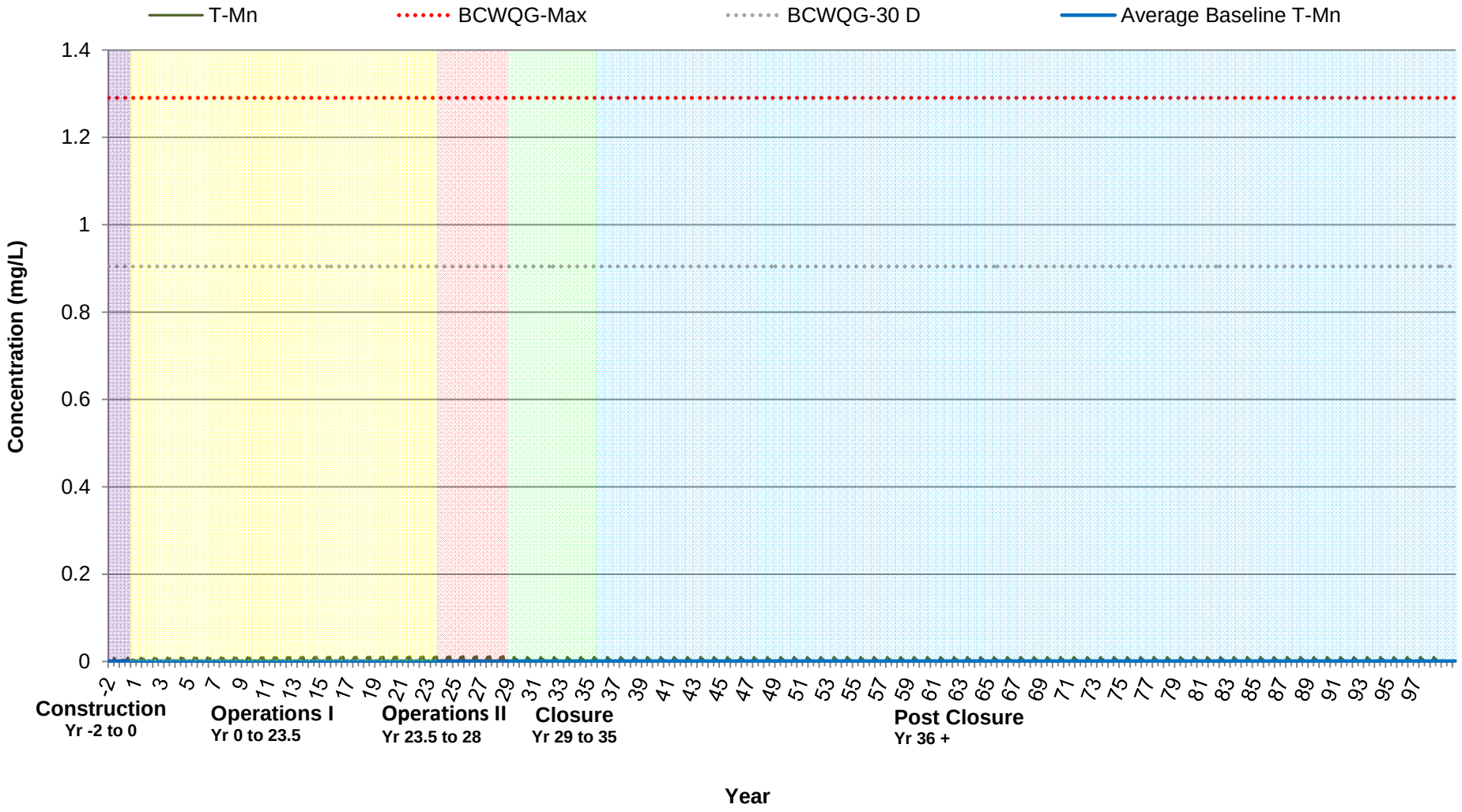
P/A NO. VA101-458/14

REF. NO. 3

FIGURE E1.Pb

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE MANGANESE CONCENTRATIONS - P-CREEK

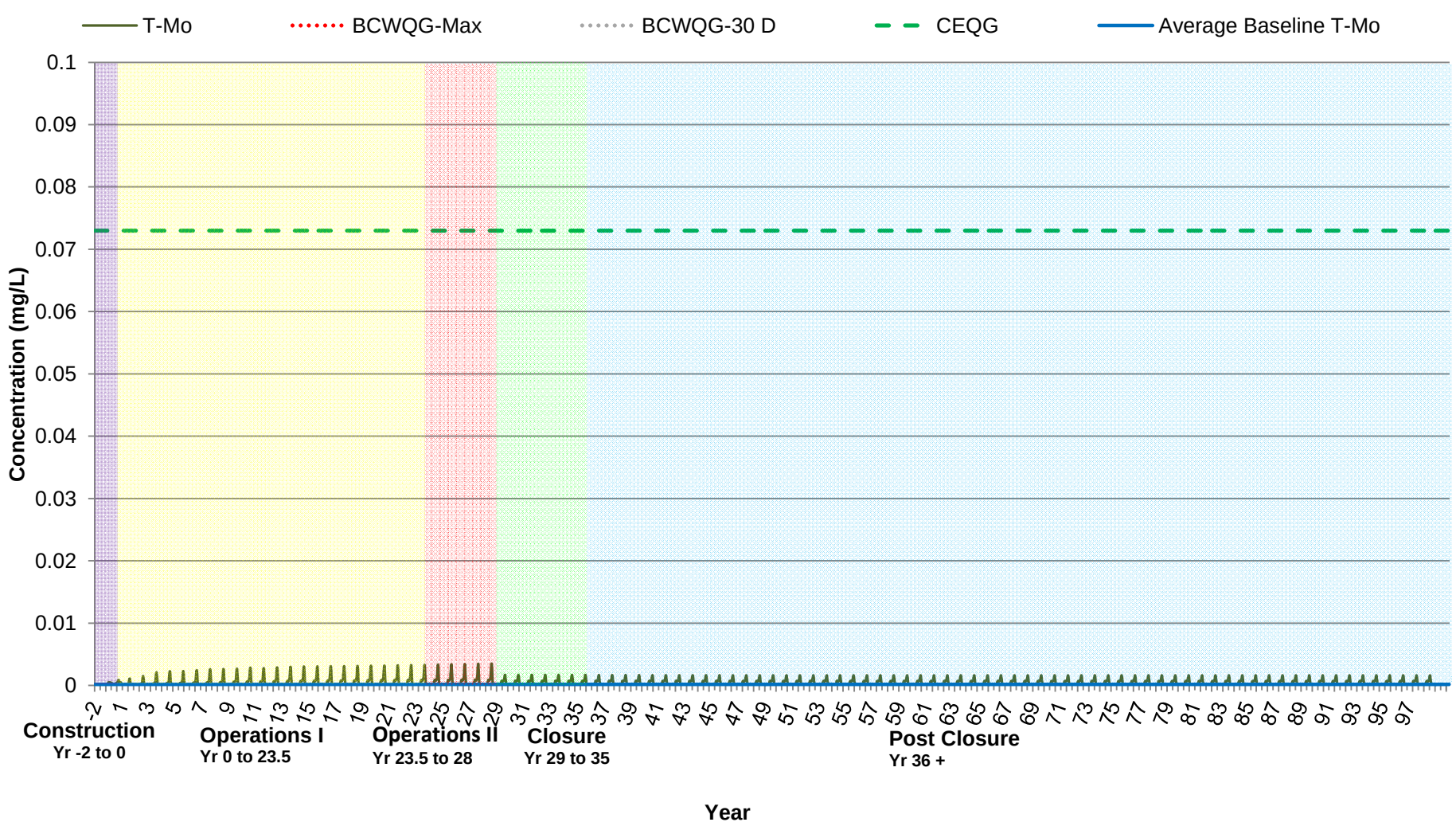
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE E1.Mn

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. THE BCWQG-MAX (2 mg/L) AND BCWQG-30 D (1 mg/L) ARE NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE MOLYDBENUM CONCENTRATIONS - P-CREEK

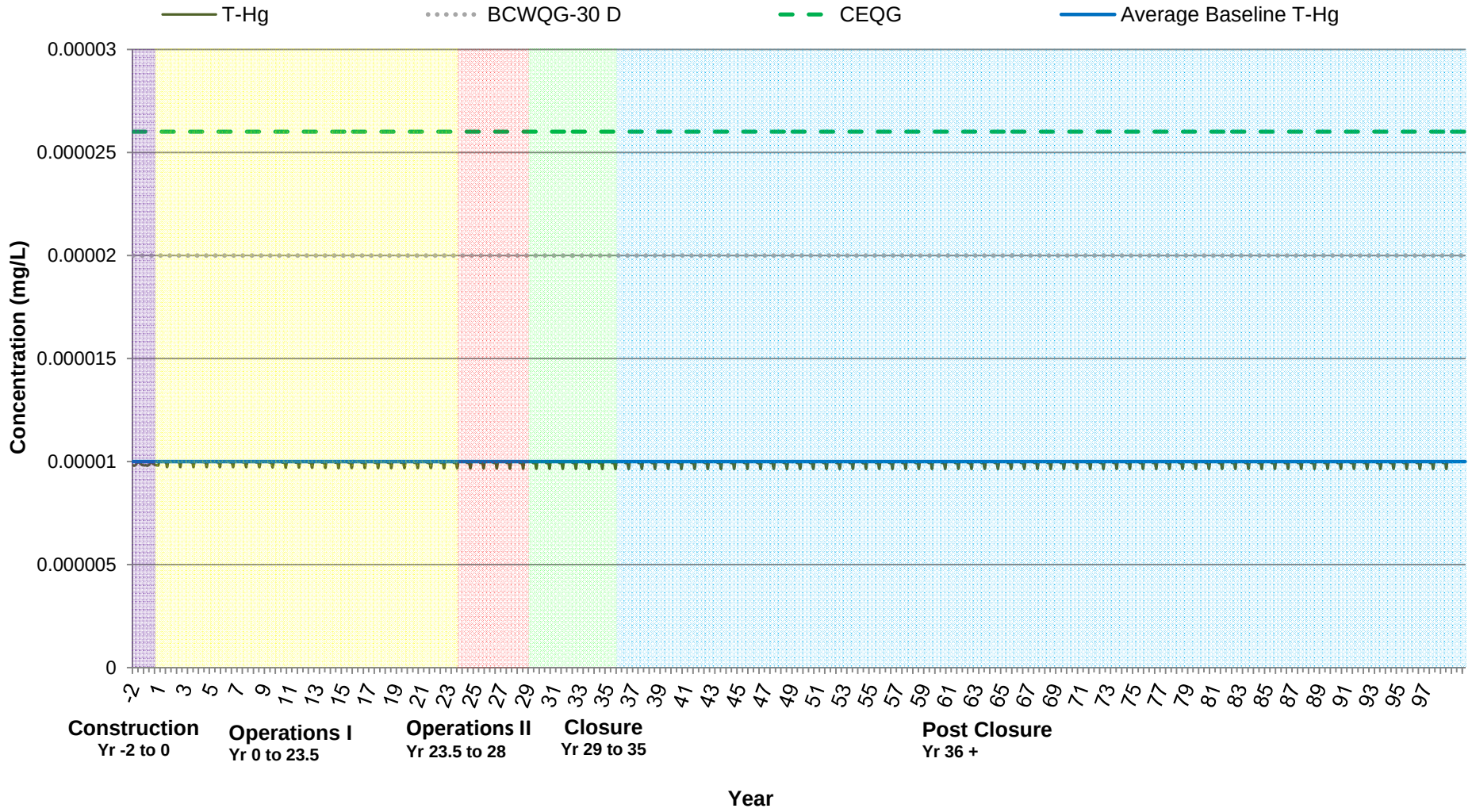
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE E1.Mo

REV 0



NOTES:

1. THE BCWQG-30 D AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. BCWQG-30 D VALUE APPLIED ON ASSUMPTION THAT METHYL-Hg IS EQUAL TO 0.5% OF T-Hg.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE MERCURY CONCENTRATIONS - P-CREEK

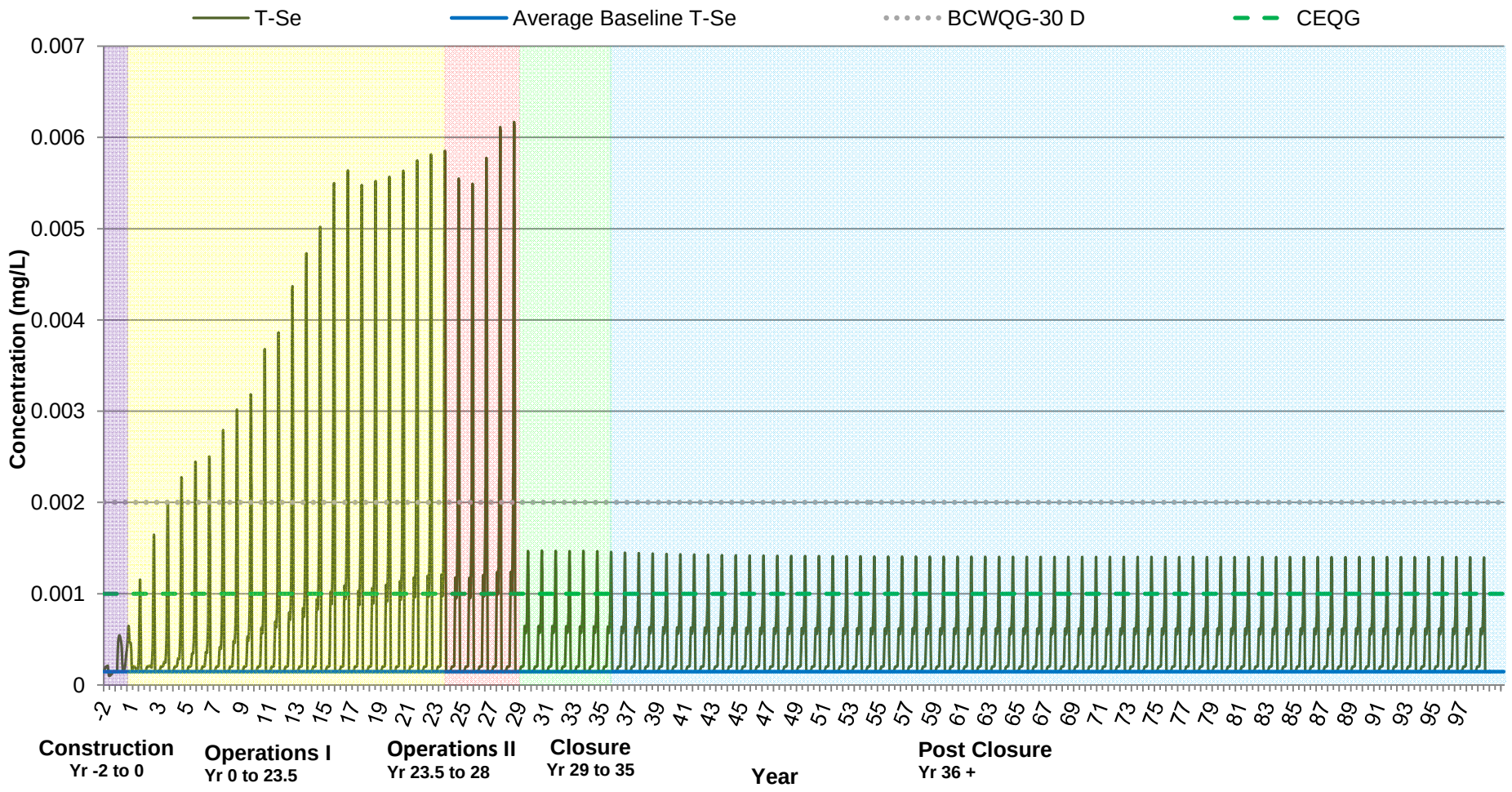
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE E1.Hg

REV 0



NOTES:

1. THE BCWQG-30 D AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE SELENIUM CONCENTRATIONS - P-CREEK

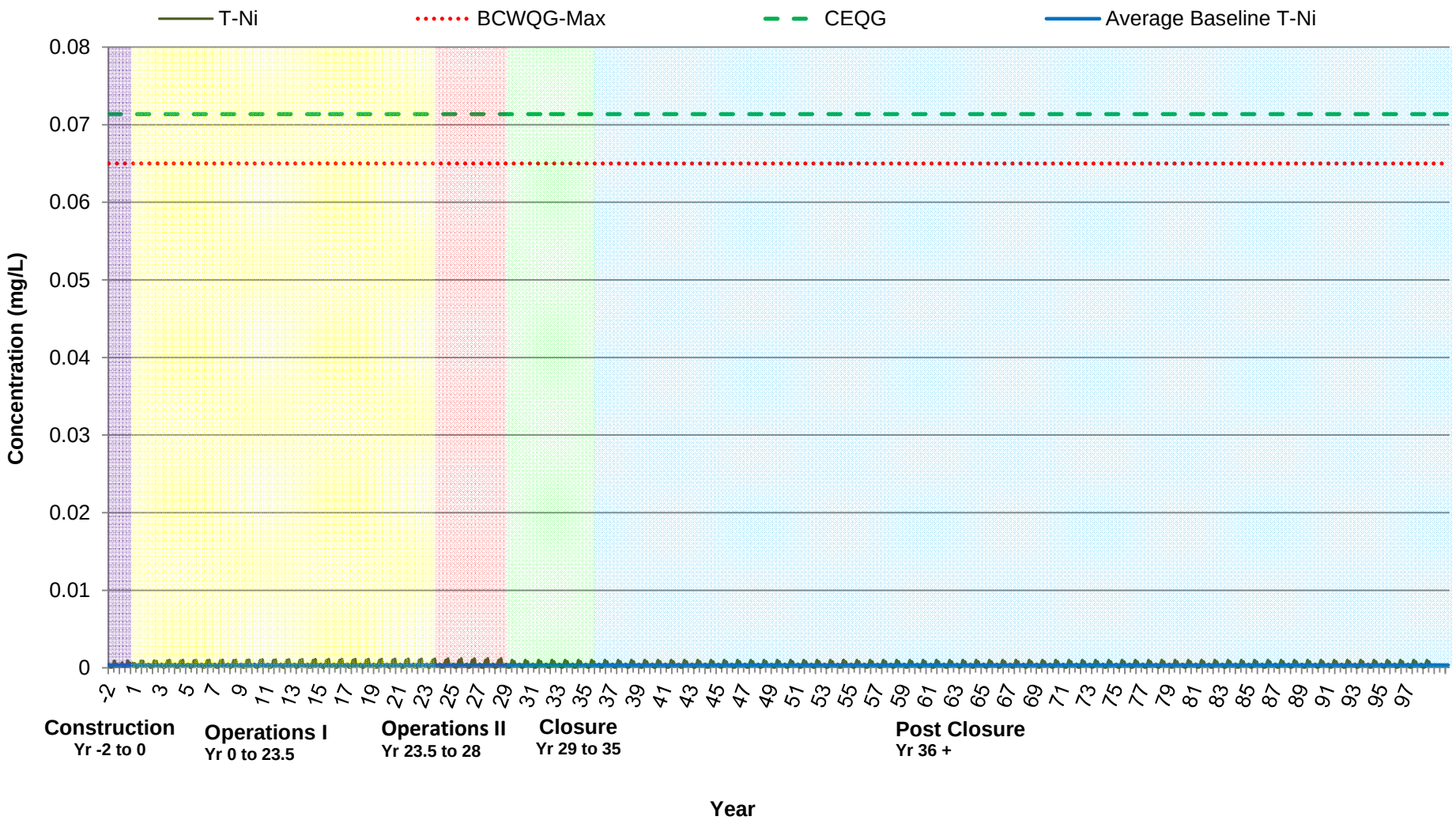
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE E1.Se

REV 0



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES, WHERE APPROPRIATE.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE NICKEL CONCENTRATIONS - P-CREEK

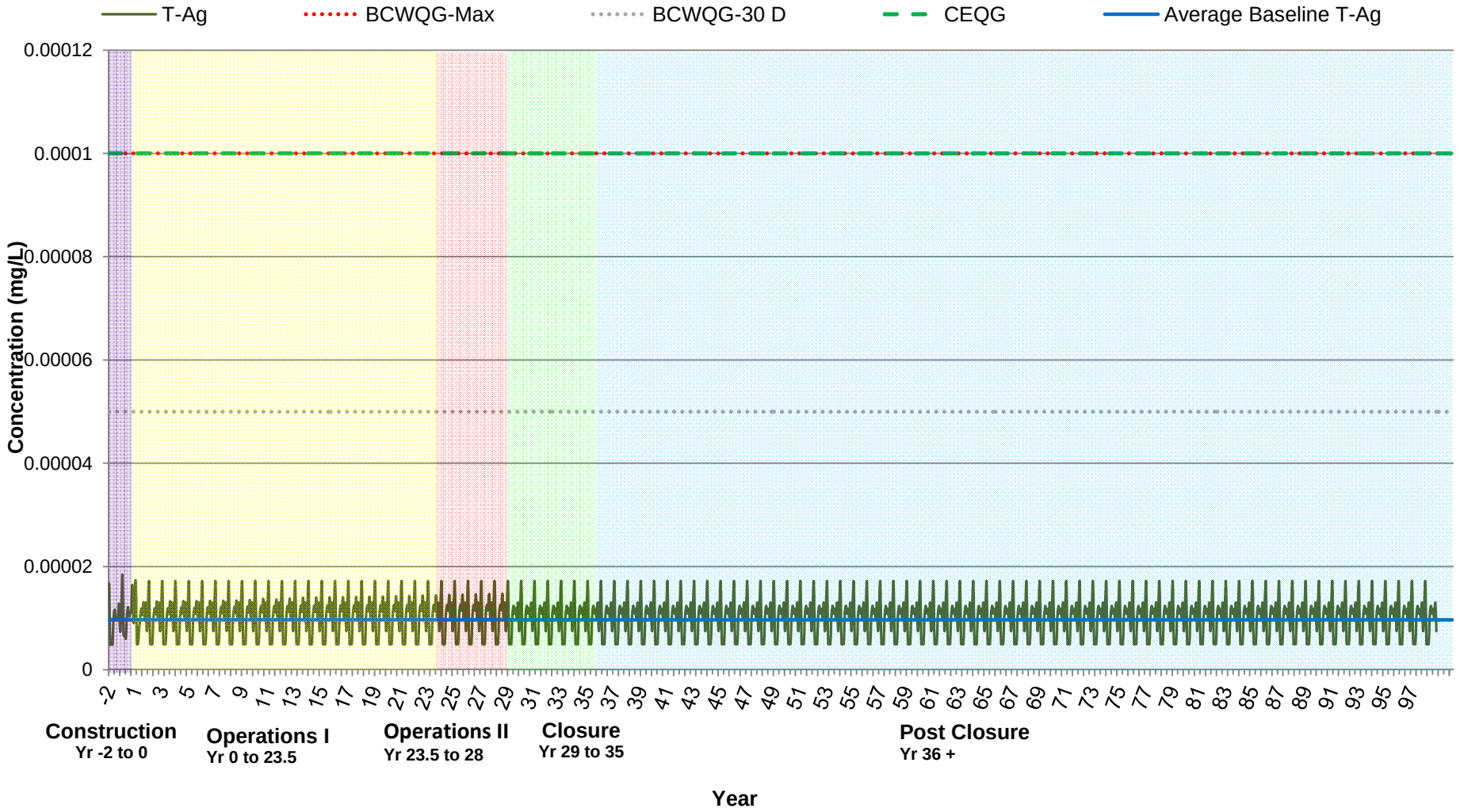
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE E1.Ni

REV 0



NOTES:

1. THE BCWQG-30 D AND BCWQG-MAX ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE SILVER CONCENTRATIONS - P-CREEK

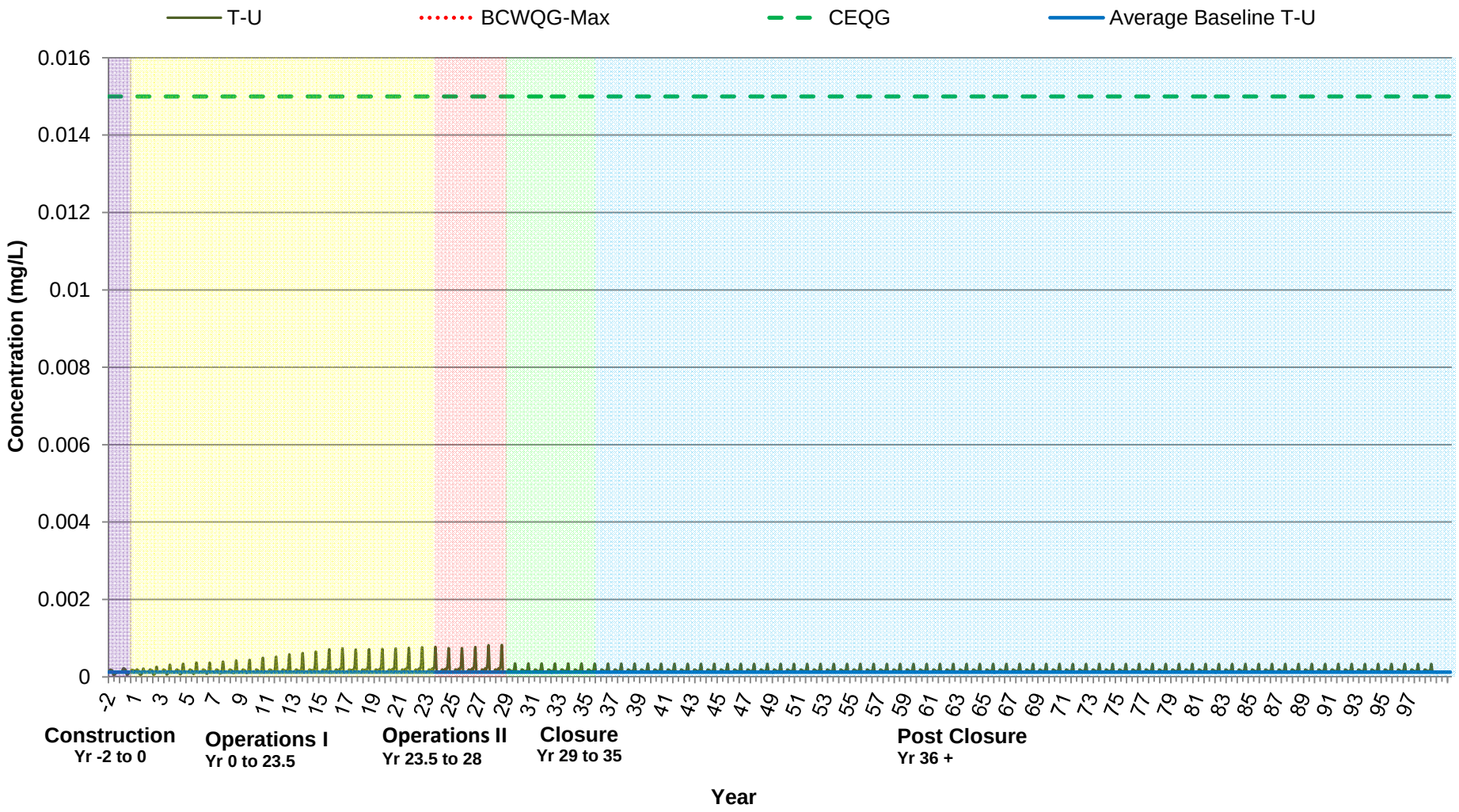
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE E1.Ag

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. THE BCWQG-MAX (0.3 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE URANIUM CONCENTRATIONS - P-CREEK

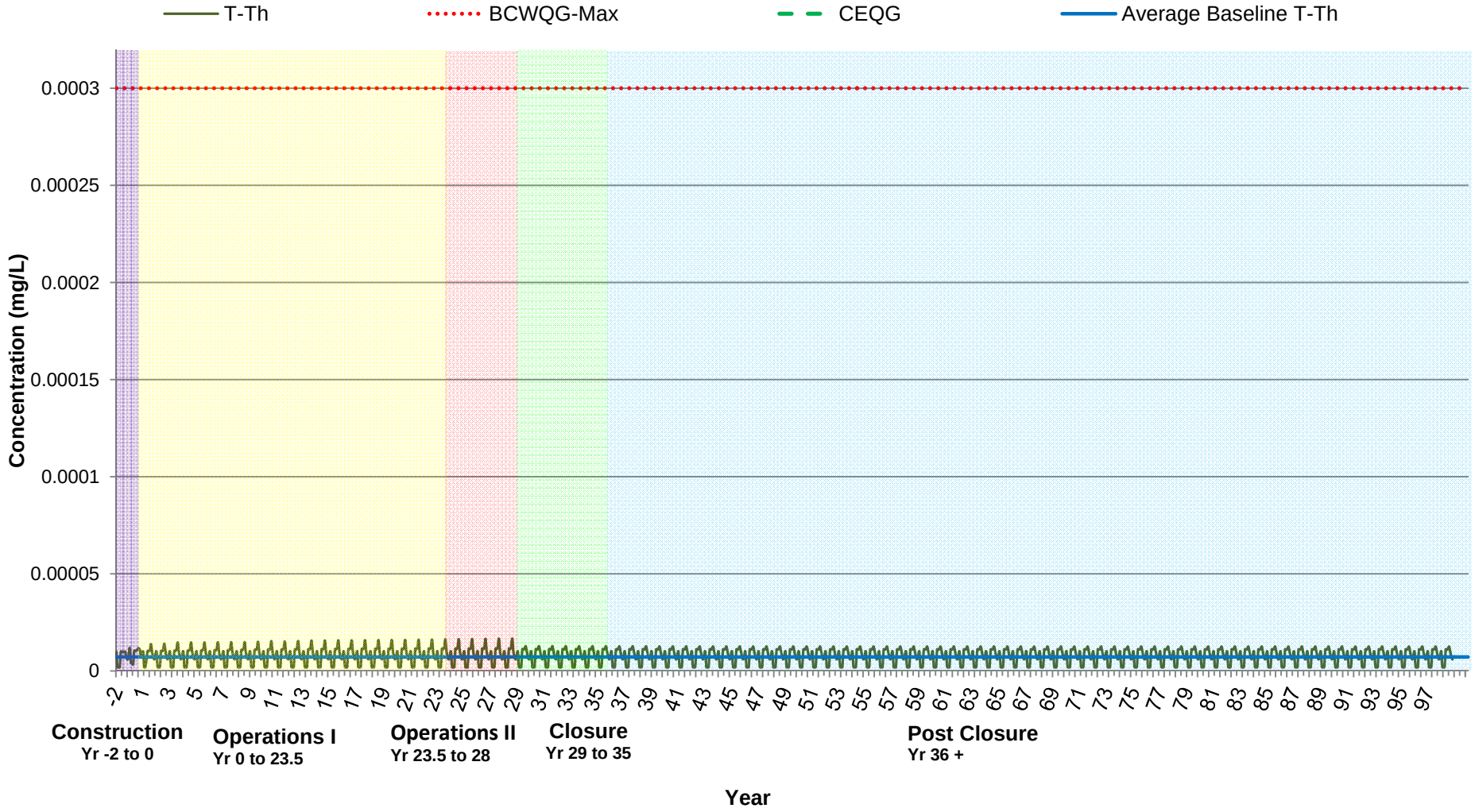
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P/A NO. VA101-458/14

REF. NO. 3

FIGURE E1.U

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. THE CEQG (0.0008 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE THALLIUM CONCENTRATIONS - P-CREEK

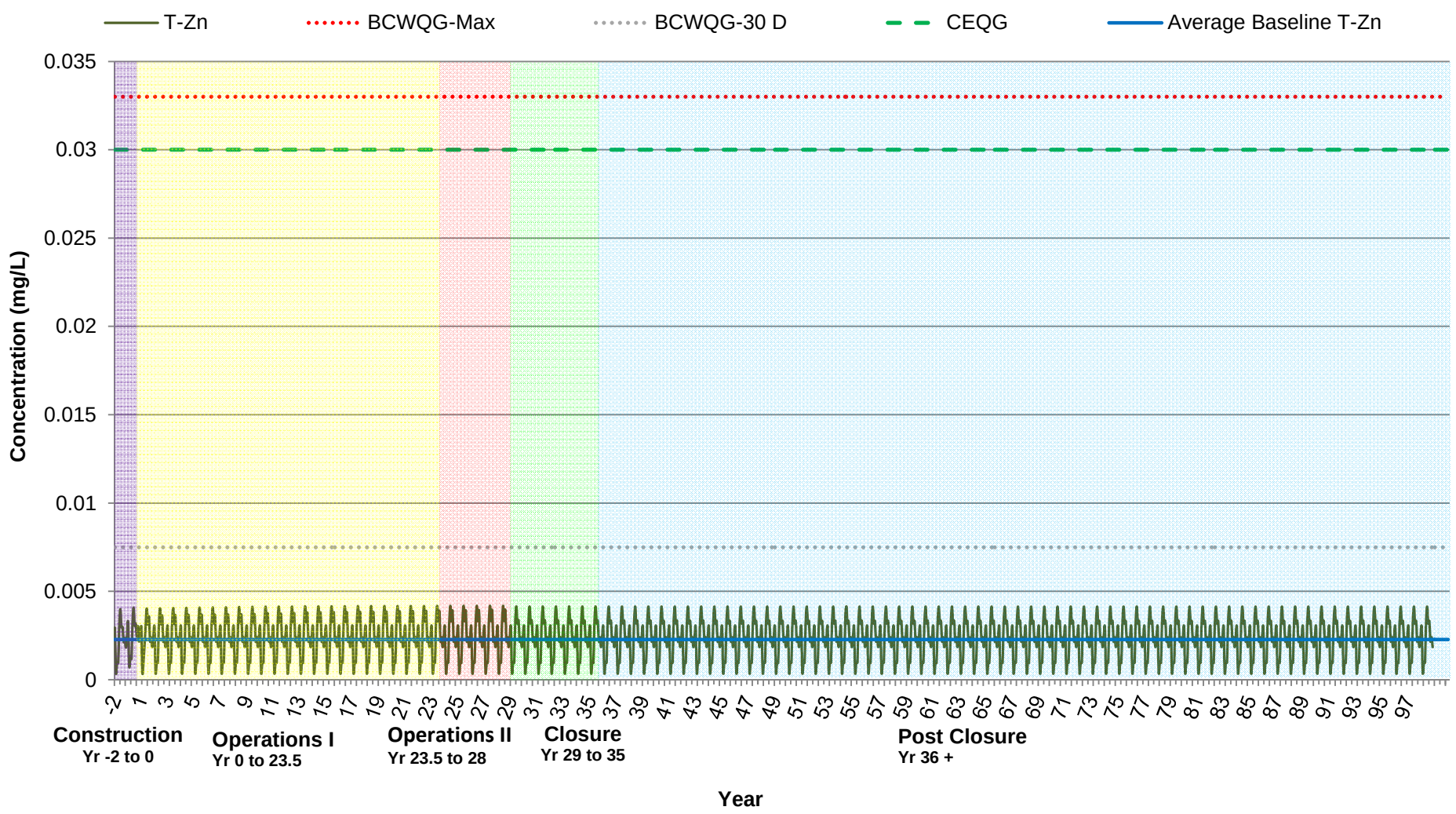
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE E1.Th

REV 0



NOTES:

1. BCWQG-30 D AND BCWQG-MAX ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE ZINC CONCENTRATIONS - P-CREEK

Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

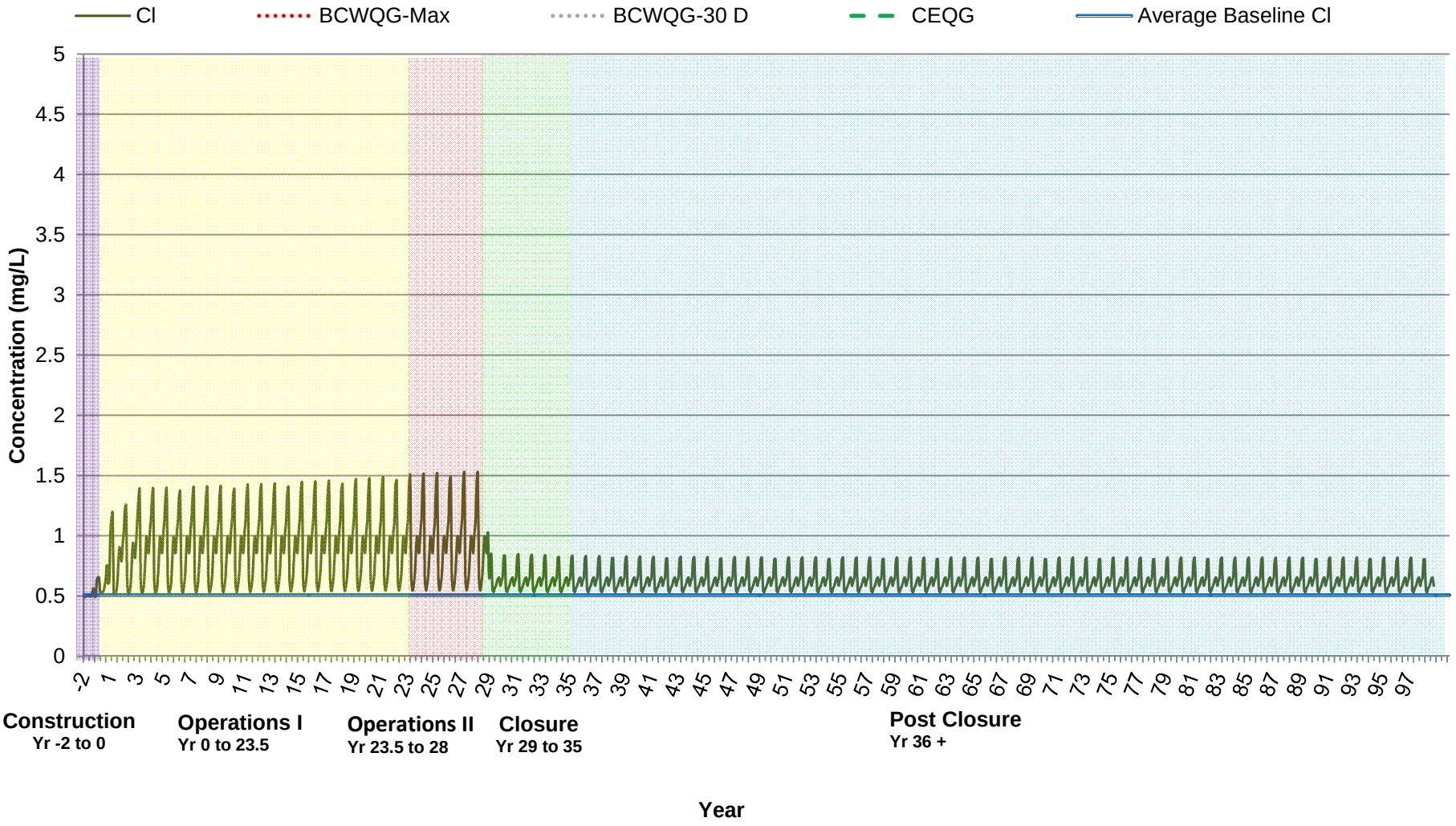
FIGURE E1.Zn

REV 0

APPENDIX E2

HARPER CREEK BELOW P-CREEK (HP)

(Pages E2-1 to E2-30)



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. ALL GUIDELINES ARE NOT SHOWN: BCWQG-30 D (150 mg/L); BCWQG-MAX (600 mg/L); CEQG (120 mg/L AND 640 mg/L).

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE CHLORIDE CONCENTRATIONS - HARPER CREEK BELOW P-CREEK (HP)

Knight Piésold CONSULTING

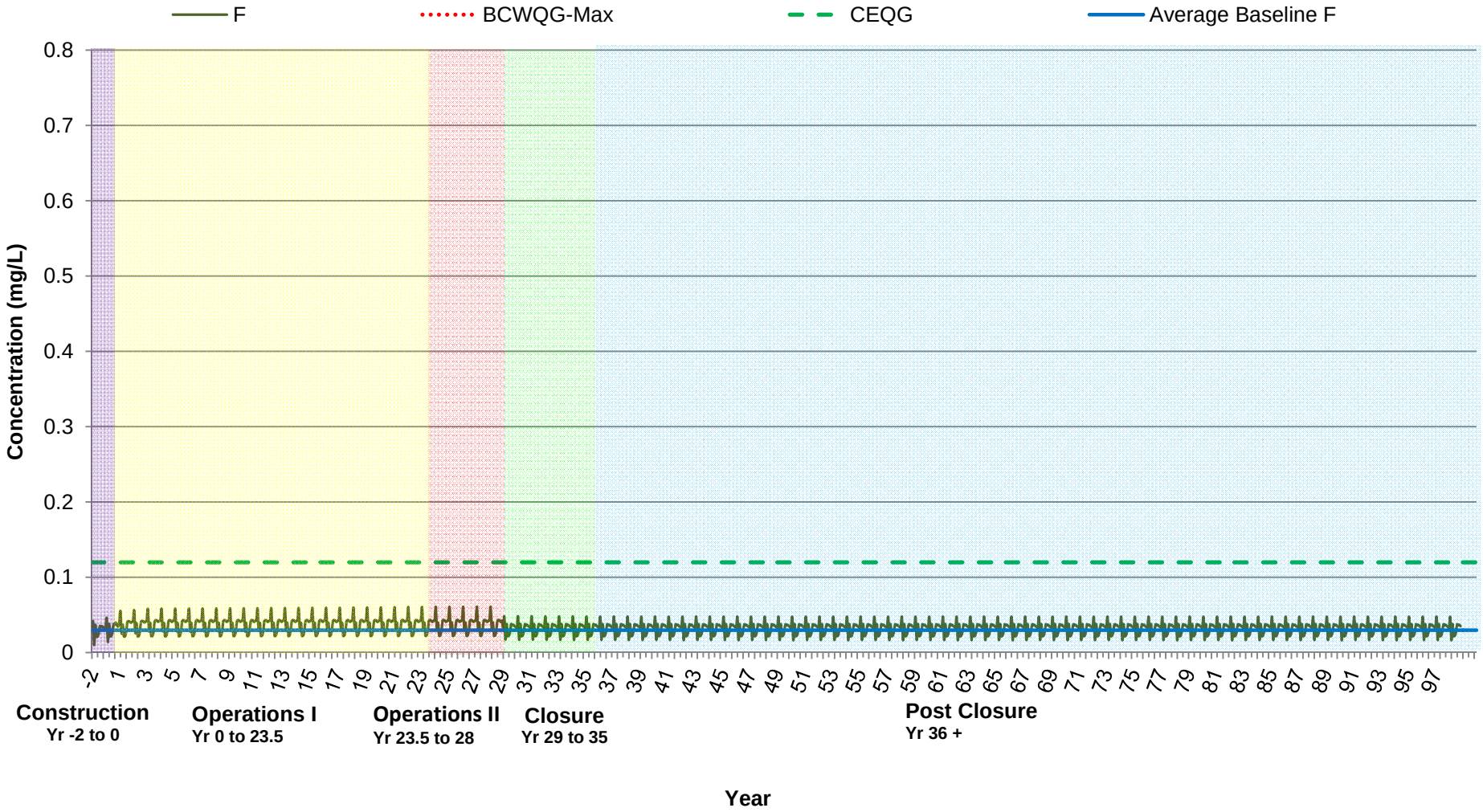
P/A NO. VA101-458/14

REF. NO. 3

FIGURE E2.Cl

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX IS HARNDESS DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE FLUORIDE CONCENTRATIONS - HARPER CREEK BELOW P-CREEK (HP)

Knight Piésold CONSULTING

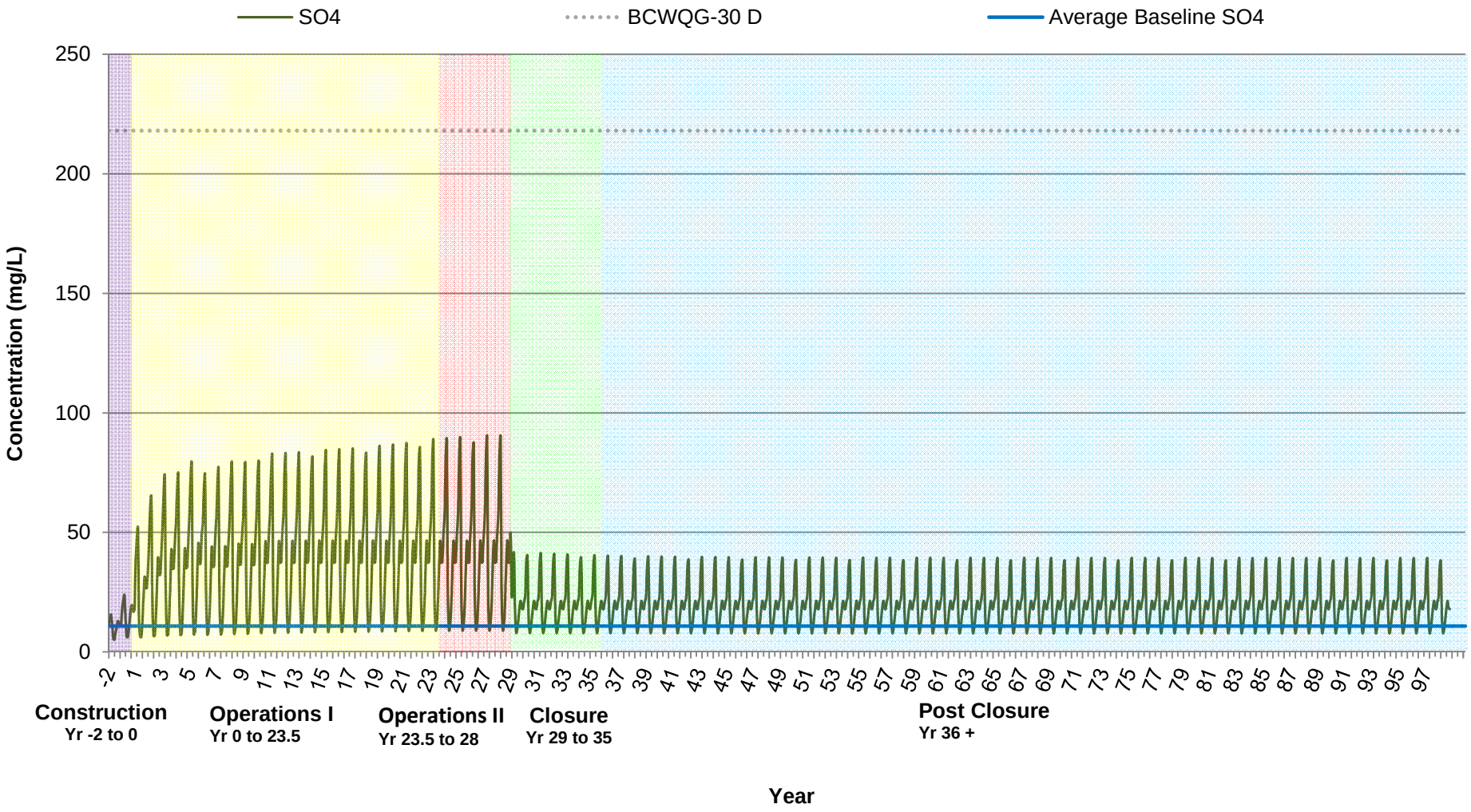
P/A NO. VA101-458/14

REF. NO. 3

FIGURE E2.F

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. BCWQG-30 D IS HARDNESS DEPEDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE SULPHATE CONCENTRATIONS - HARPER CREEK BELOW P-CREEK (HP)

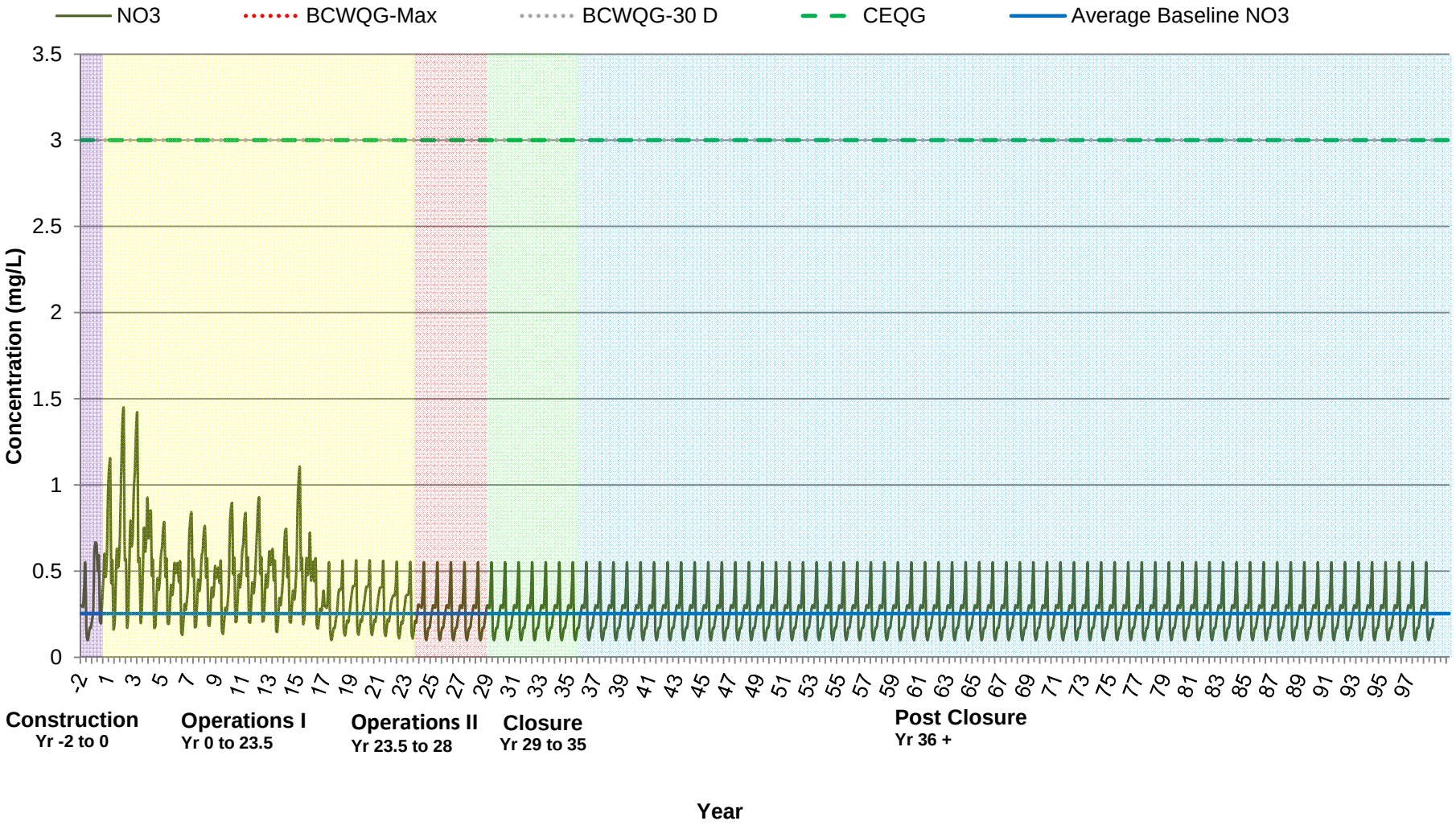
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE E2.S04

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. THE BCWQG-MAX (32.8 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE NITRATE CONCENTRATIONS - HARPER CREEK BELOW P-CREEK (HP)

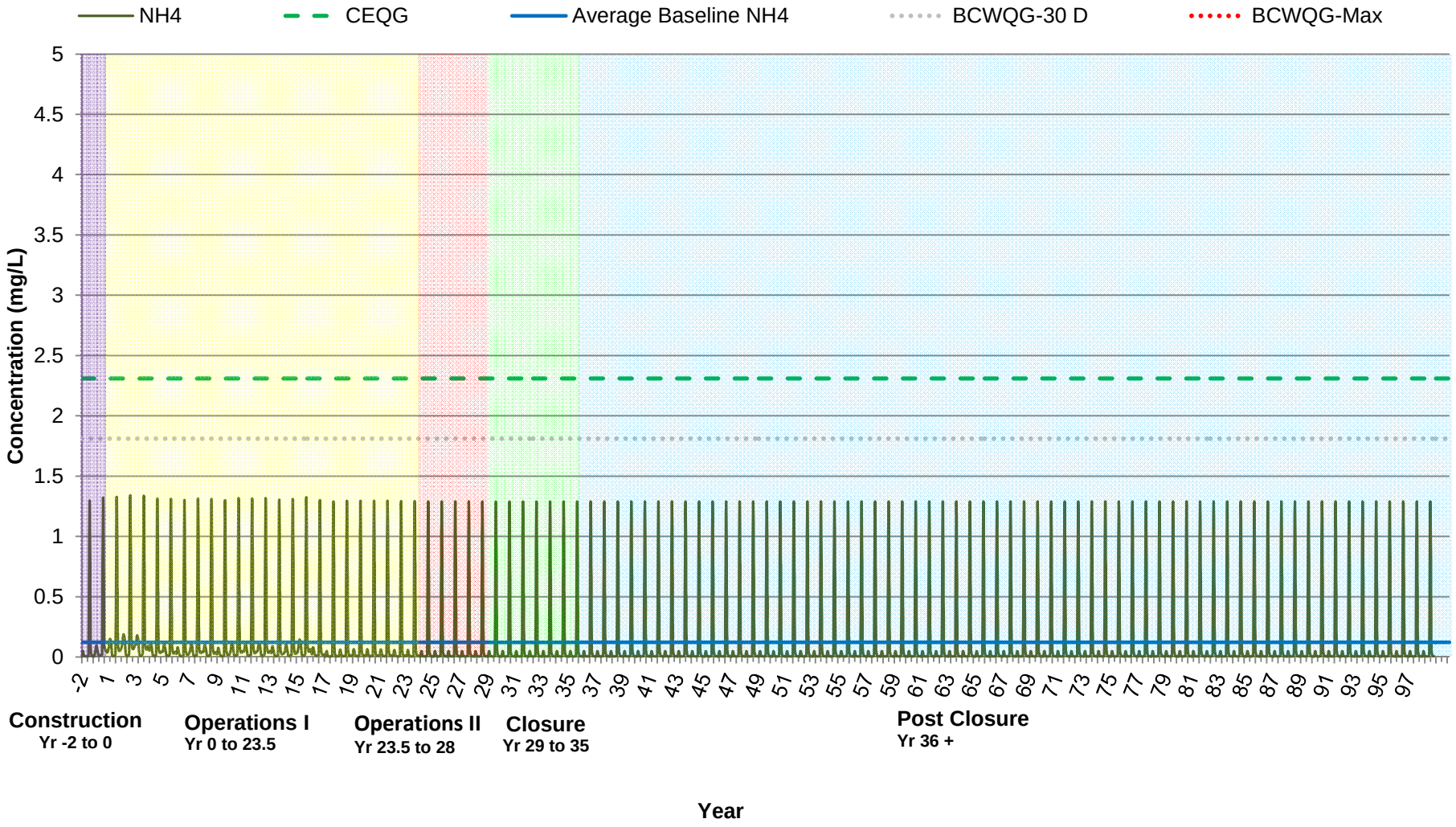
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE E2.NO3

REV 0



NOTES:

1. THE BCWQG-30 D IS VALID FOR ONLY 6.5≤pH<9 AND 0°C≤T≤20°C.
2. THE BCWQG-MAX (20.15 mg/L) VALID FOR 6.5≤pH<9 IS NOT SHOWN.
3. THE CEQG IS TO BE USED WITH CAUTION FOR WATER WITH T<5°C AND pH>9.
4. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE AMMONIA CONCENTRATIONS - HARPER CREEK BELOW P-CREEK (HP)

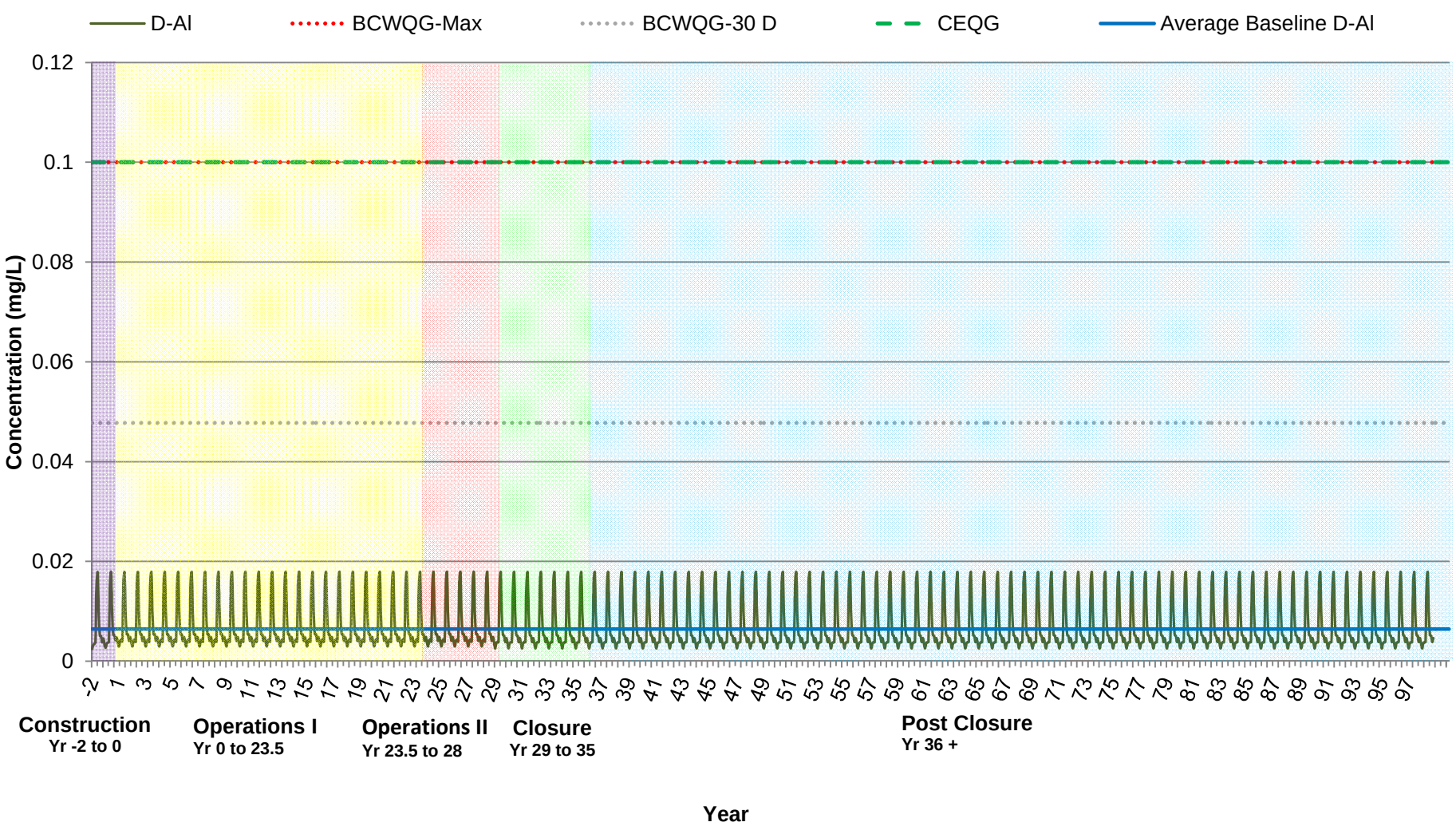
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE E2.NH4

REV 0



NOTES:

1. ALL GUIDELINES ARE pH-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. AVERAGE BASELINE pH USED TO CALCULATE GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE
DISSOLVED ALUMINUM CONCENTRATIONS -
HARPER CREEK BELOW P-CREEK (HP)

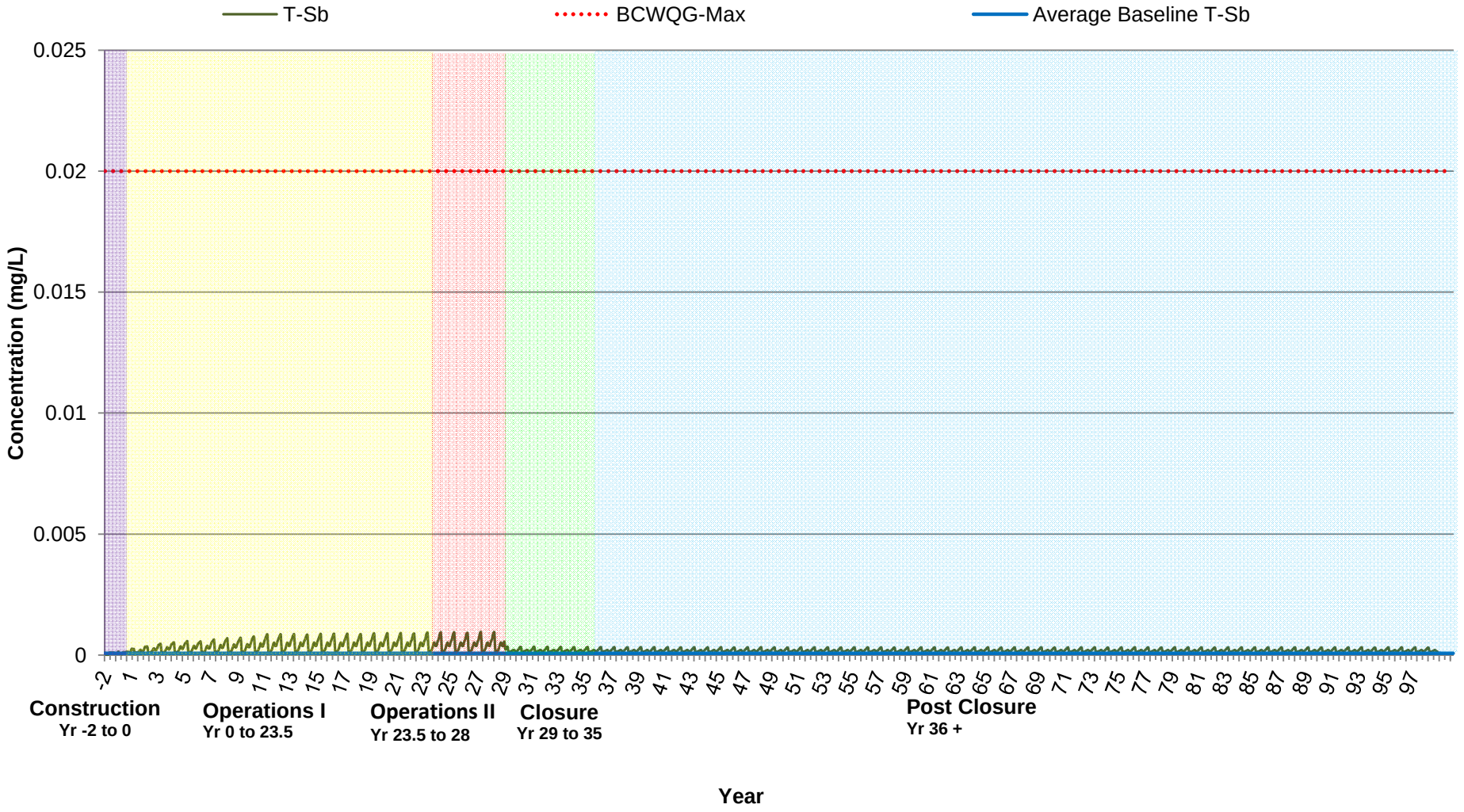
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE E2.Al

REV 0



NOTES:

1. THE BCWQG IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE ANTIMONY CONCENTRATIONS - HARPER CREEK BELOW P-CREEK (HP)

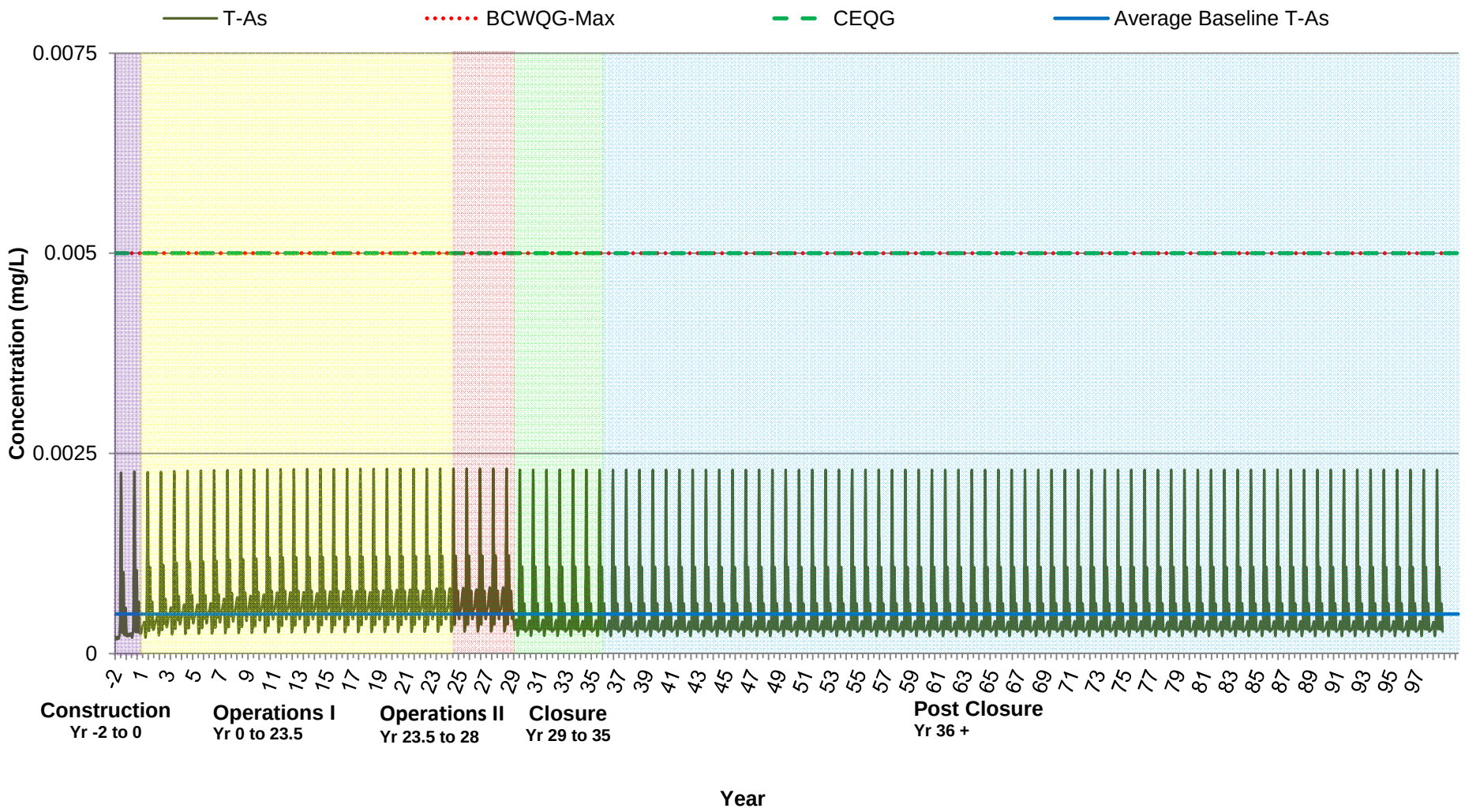
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE E2.Sb

REV 0



NOTES:

1. THE BCWQG AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE
ARSENIC CONCENTRATIONS -
HARPER CREEK BELOW P-CREEK (HP)

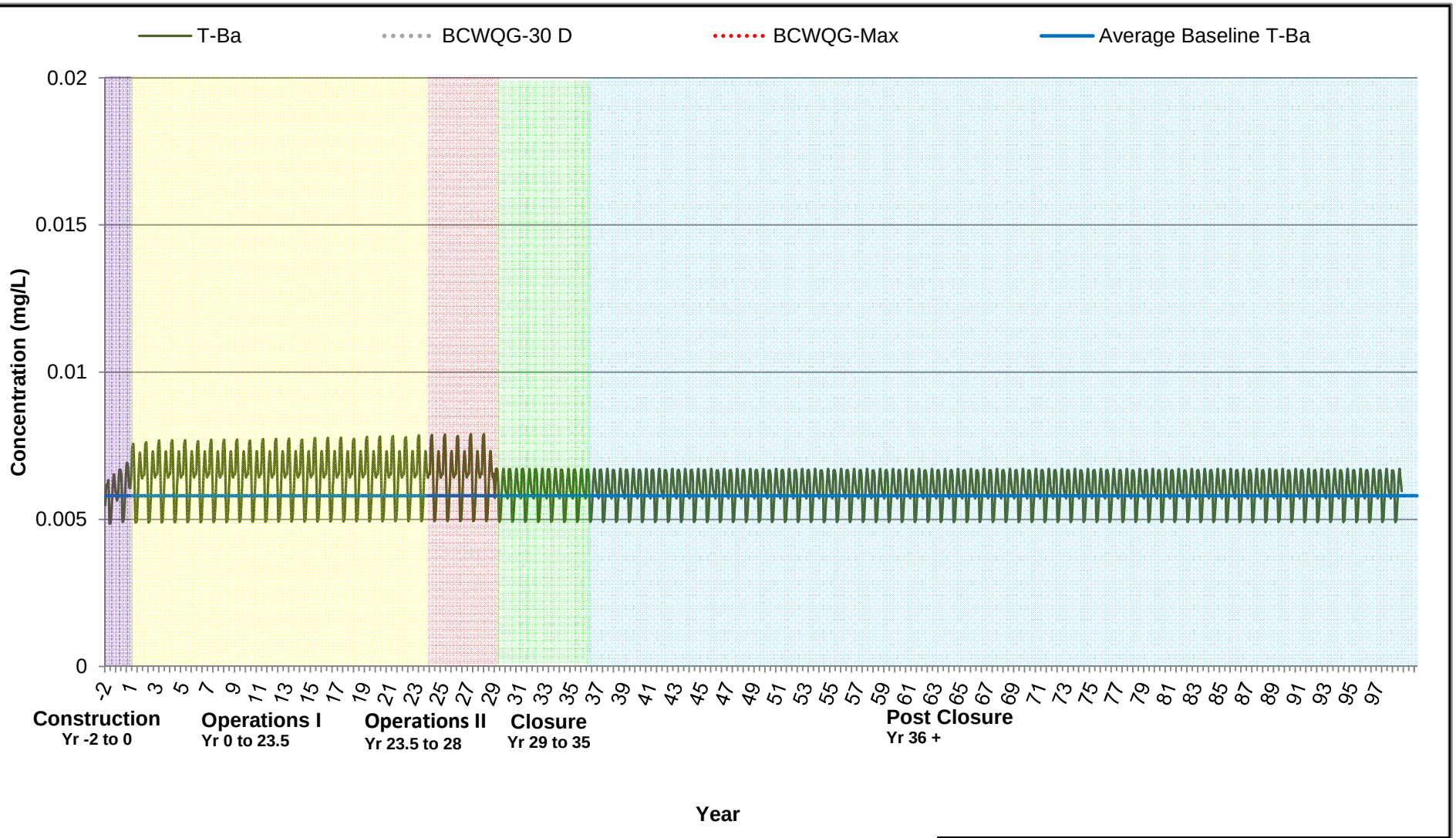
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE E2.As

REV 0



NOTES:

1. THE BCWQG-MAX IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. THE BCWQG-30 D (1 mg/L) AND BCWQG-MAX (5 mg/L) ARE NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE
BARIUM CONCENTRATIONS -
HARPER CREEK BELOW P-CREEK (HP)

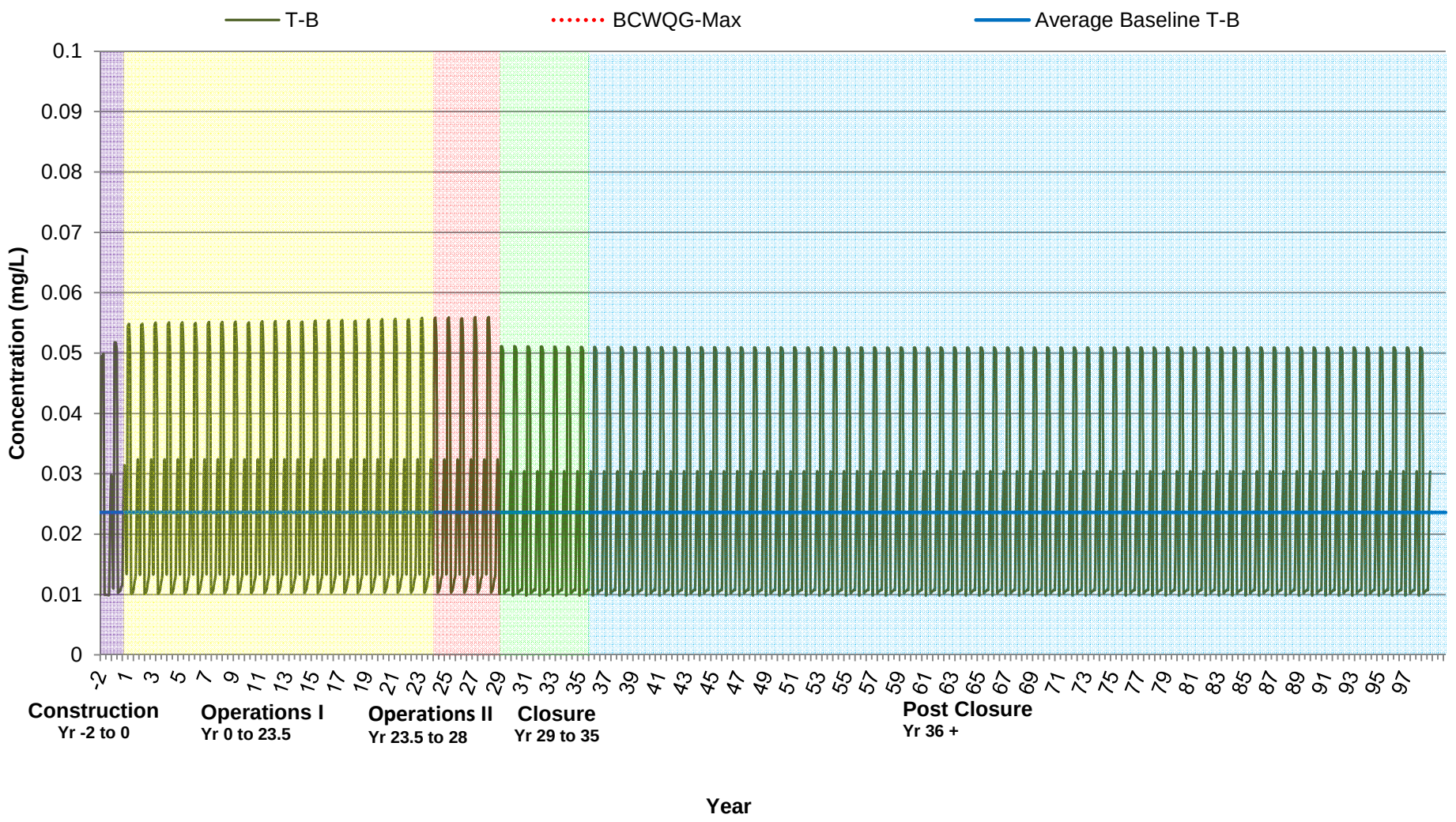
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE E2.Ba

REV 0



NOTES:

1. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.
3. THE BCWQG-MAX (1.2 mg/L) IS NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE
BORON CONCENTRATIONS -
HARPER CREEK BELOW P-CREEK (HP)

Knight Piésold CONSULTING

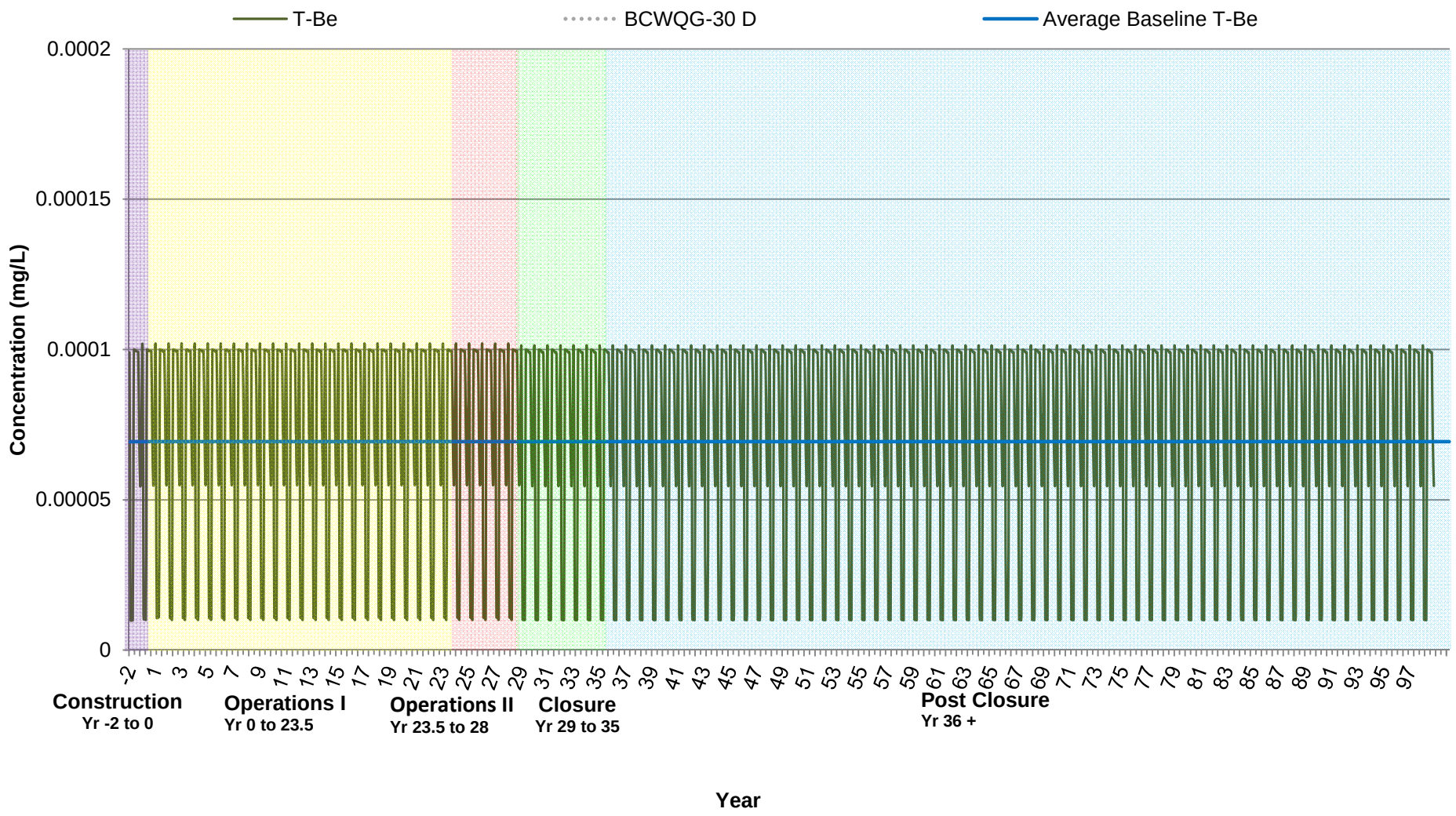
P/A NO. VA101-458/14

REF. NO. 3

FIGURE E2.B

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. THE BCWQG-30 D (0.0053 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE BERYILLIUM CONCENTRATIONS - HARPER CREEK BELOW P-CREEK (HP)

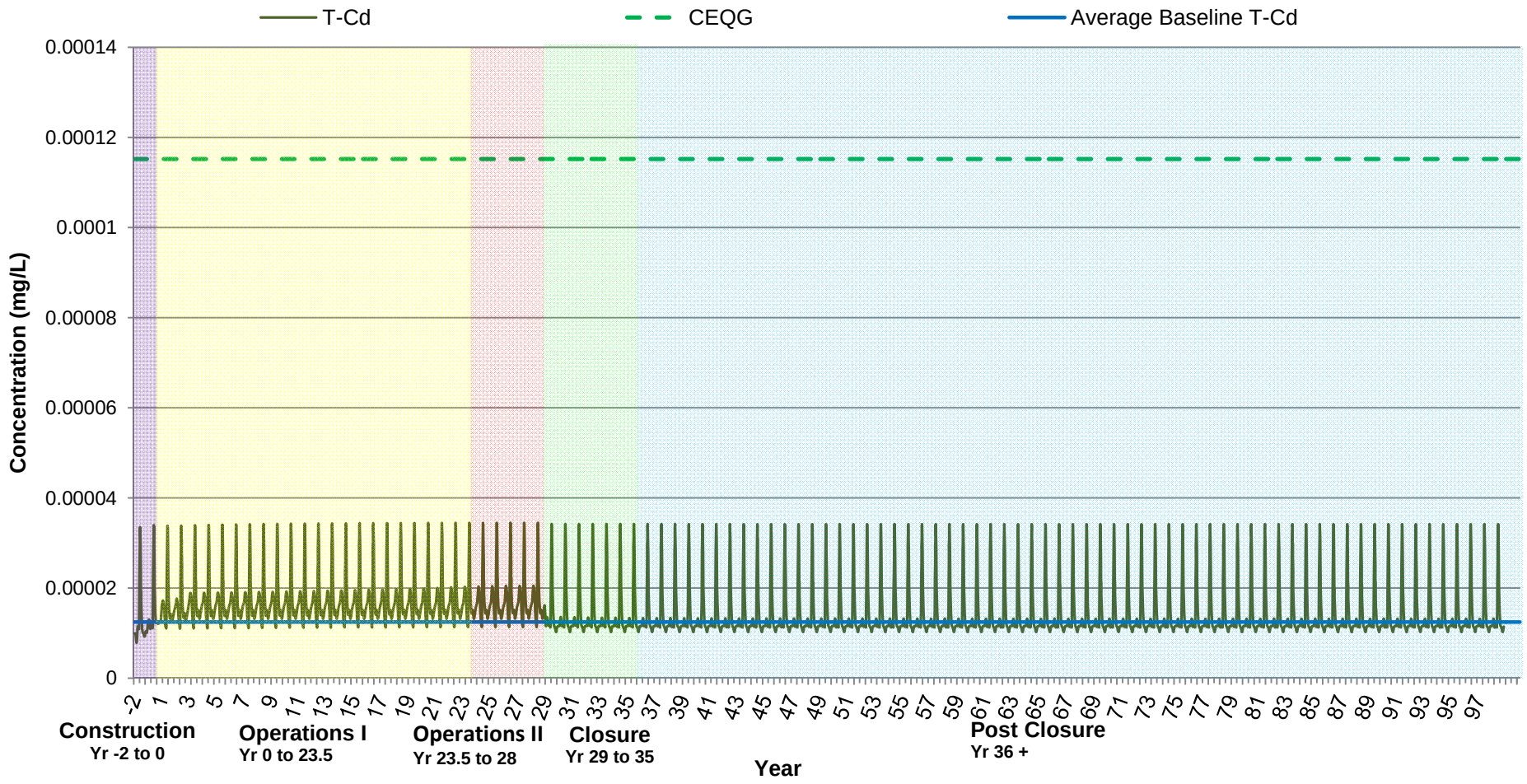
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE E2.Be

REV 0



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. THE BCWQG ARE DRAFT GUIDELINES UNDER REVIEW (JUNE 2014).
3. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
4. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE CADMIUM CONCENTRATIONS - HARPER CREEK BELOW P-CREEK (HP)

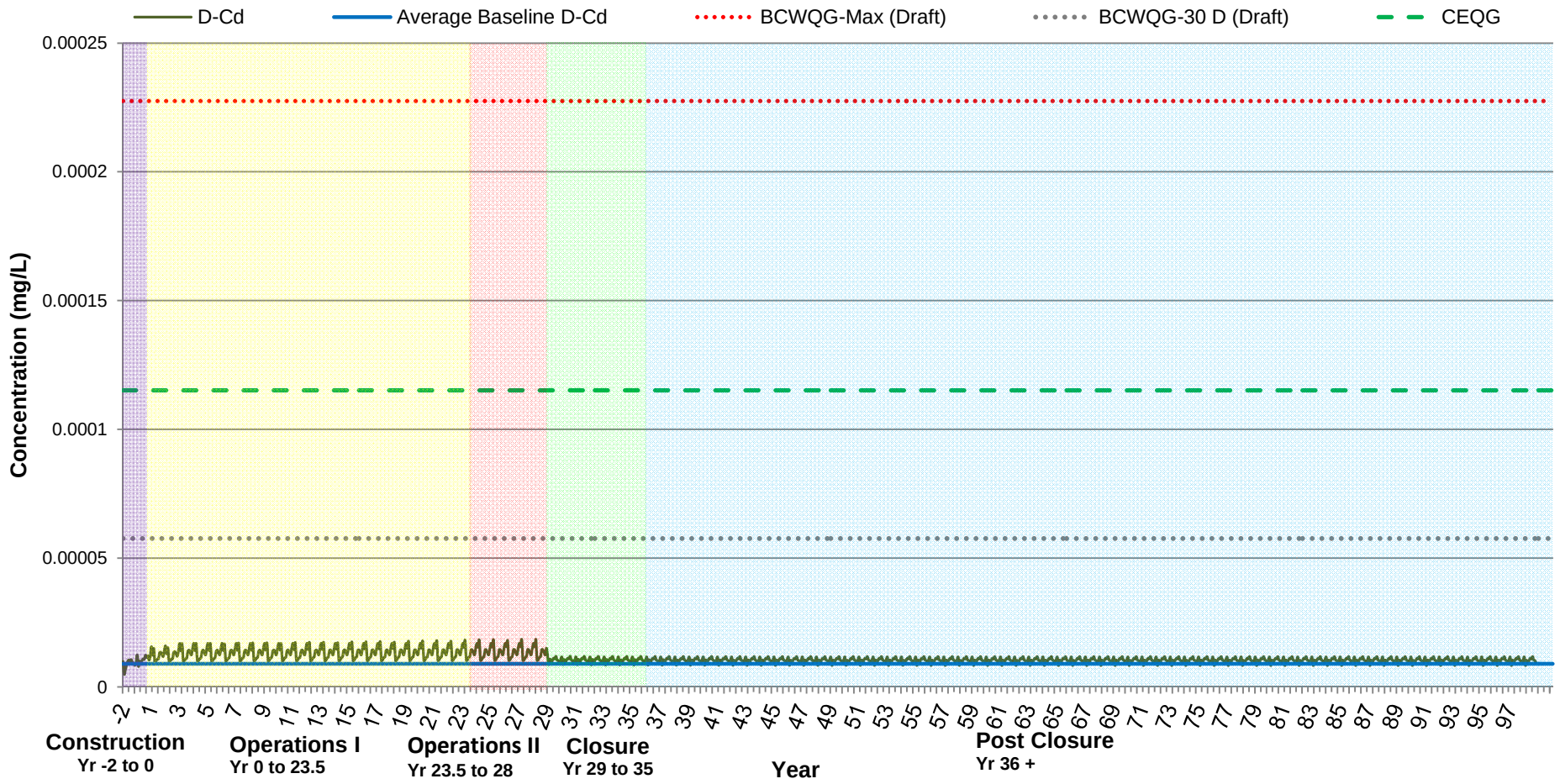
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE E2.Cd-T

REV 0



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. THE BCWQG ARE DRAFT GUIDELINES UNDER REVIEW (JUNE 2014).
3. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
4. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE CADMIUM CONCENTRATIONS - HARPER CREEK BELOW P-CREEK (HP)

Knight Piésold CONSULTING

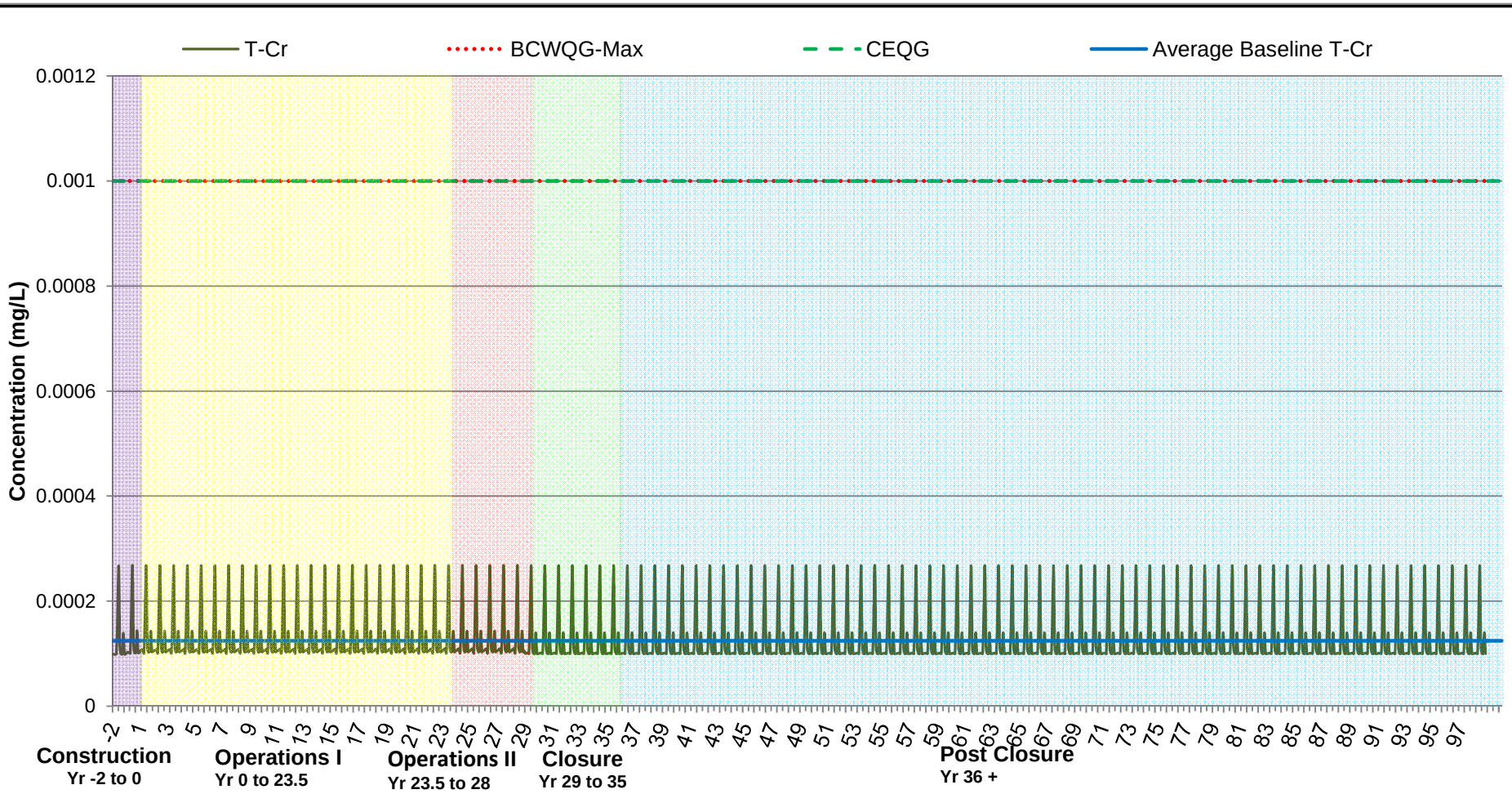
P/A NO. VA101-458/14

REF. NO. 3

FIGURE E2.Cd-D

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. GUIDELINES ARE FOR CHROMIUM (IV), THE SPECIES MOST COMMON IN WELL OXYGENATED SURFACE WATERS.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE CHROMIUM CONCENTRATIONS - HARPER CREEK BELOW P-CREEK (HP)

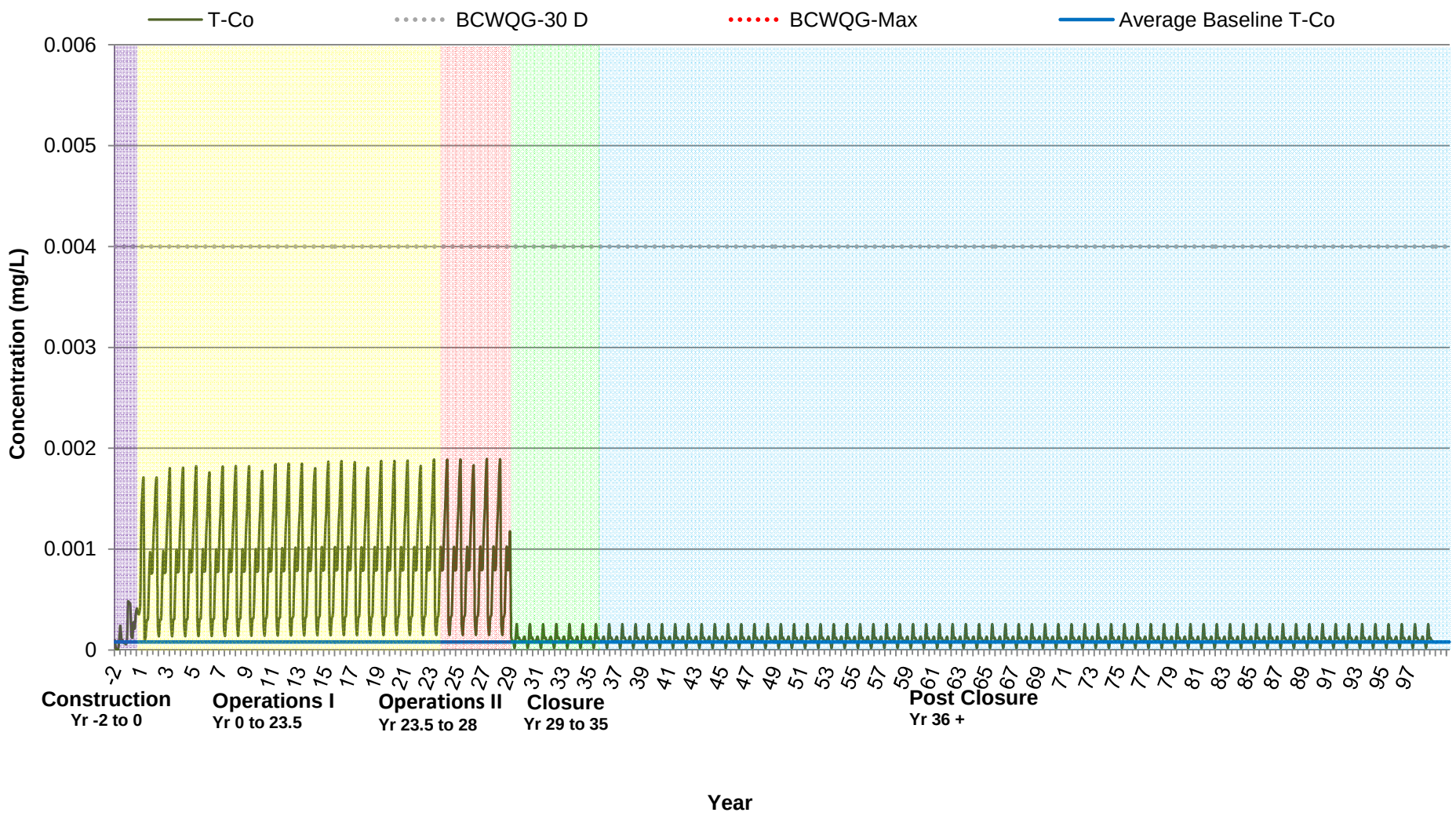
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE E2.Cr

REV 0



NOTES:

1. THE BCWQG-30 D AND BCWQG-MAX ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. THE BCWQG-MAX GUIDELINE (0.11 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE COBALT CONCENTRATIONS - HARPER CREEK BELOW P-CREEK (HP)

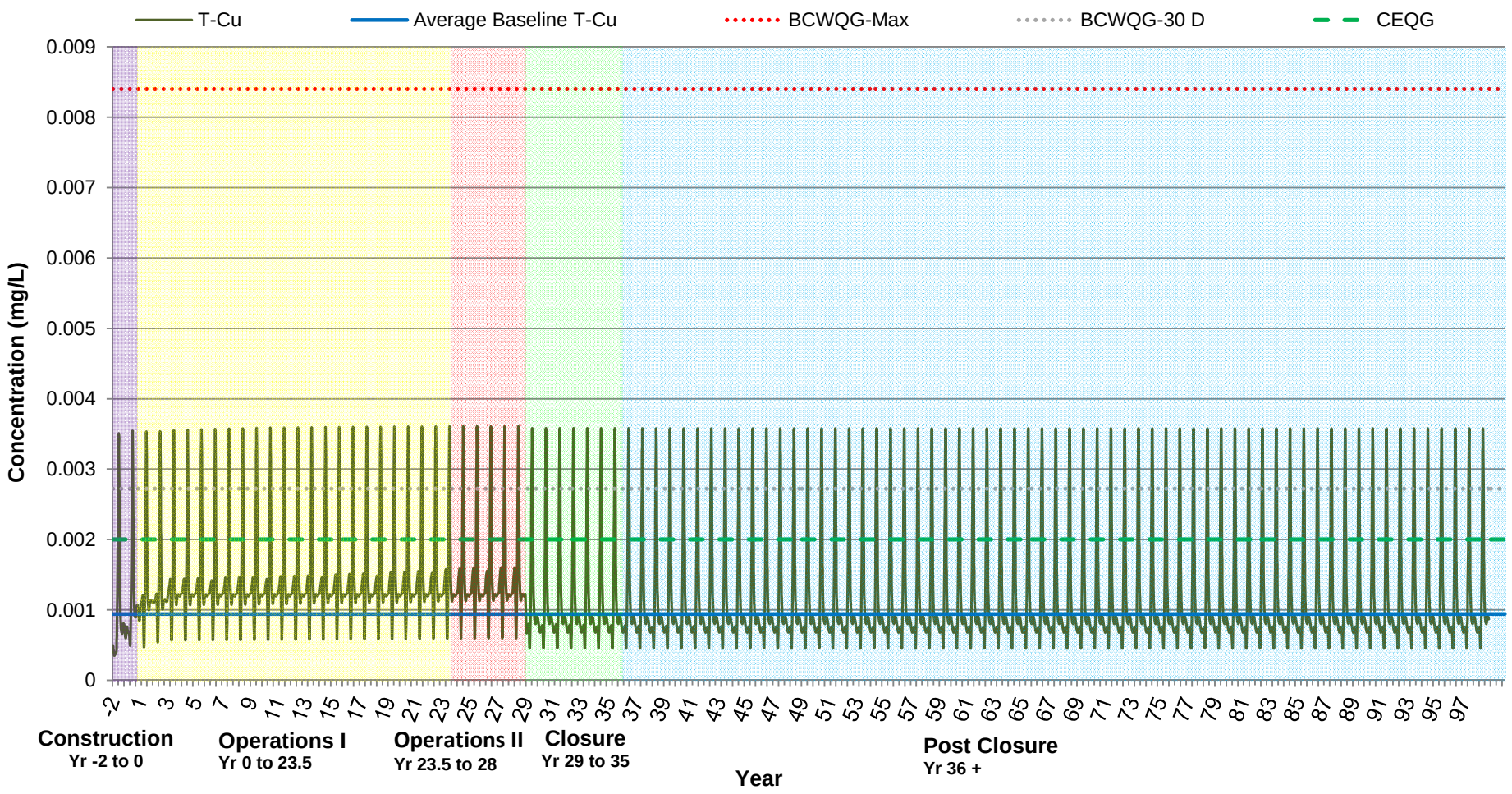
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE E2.Co

REV 0



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE COPPER CONCENTRATIONS - HARPER CREEK BELOW P-CREEK (HP)

Knight Piésold CONSULTING

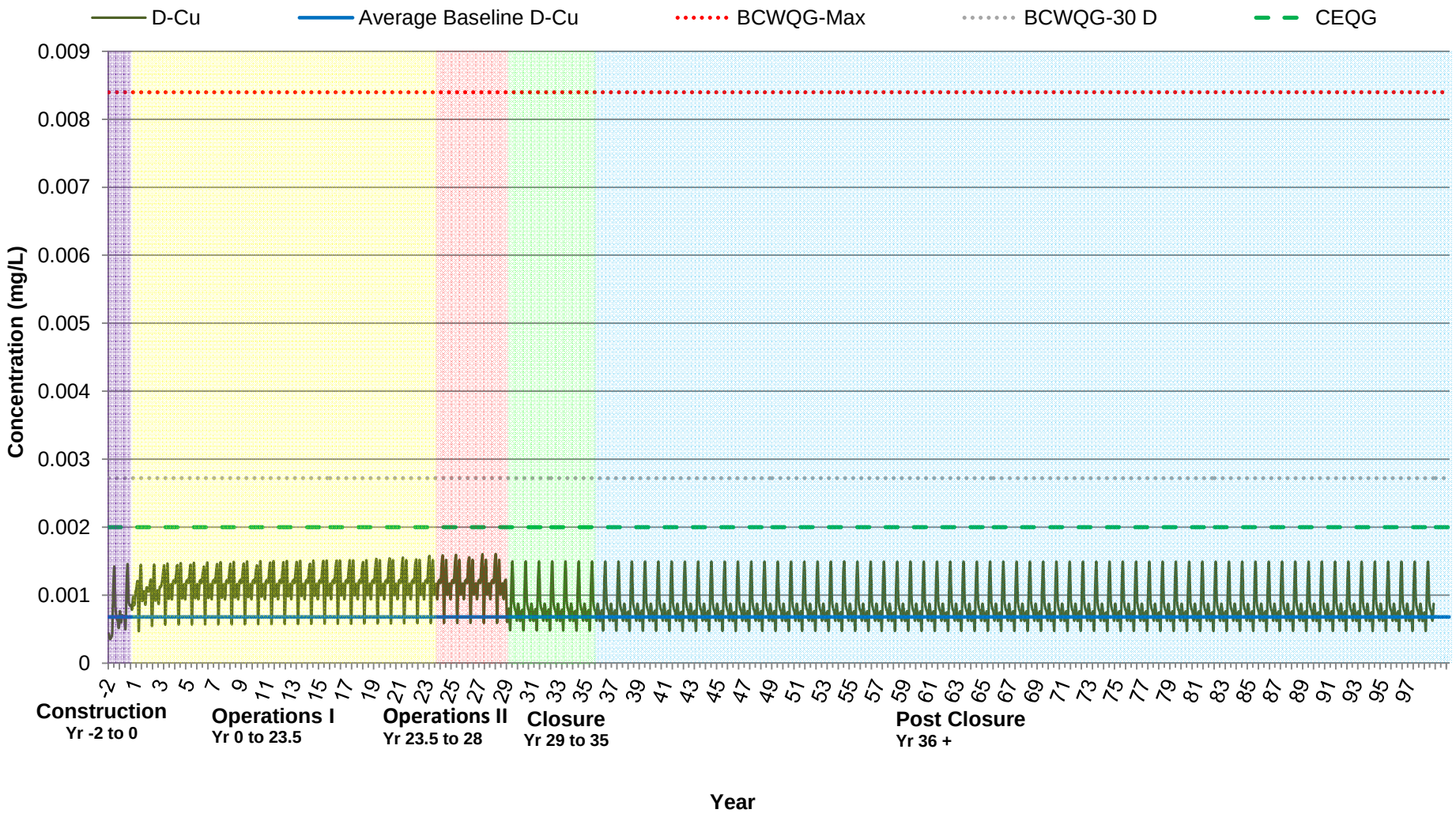
P/A NO. VA101-458/14

REF. NO. 3

FIGURE E2.Cu-T

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE COPPER CONCENTRATIONS - HARPER CREEK BELOW P-CREEK (HP)

Knight Piésold CONSULTING

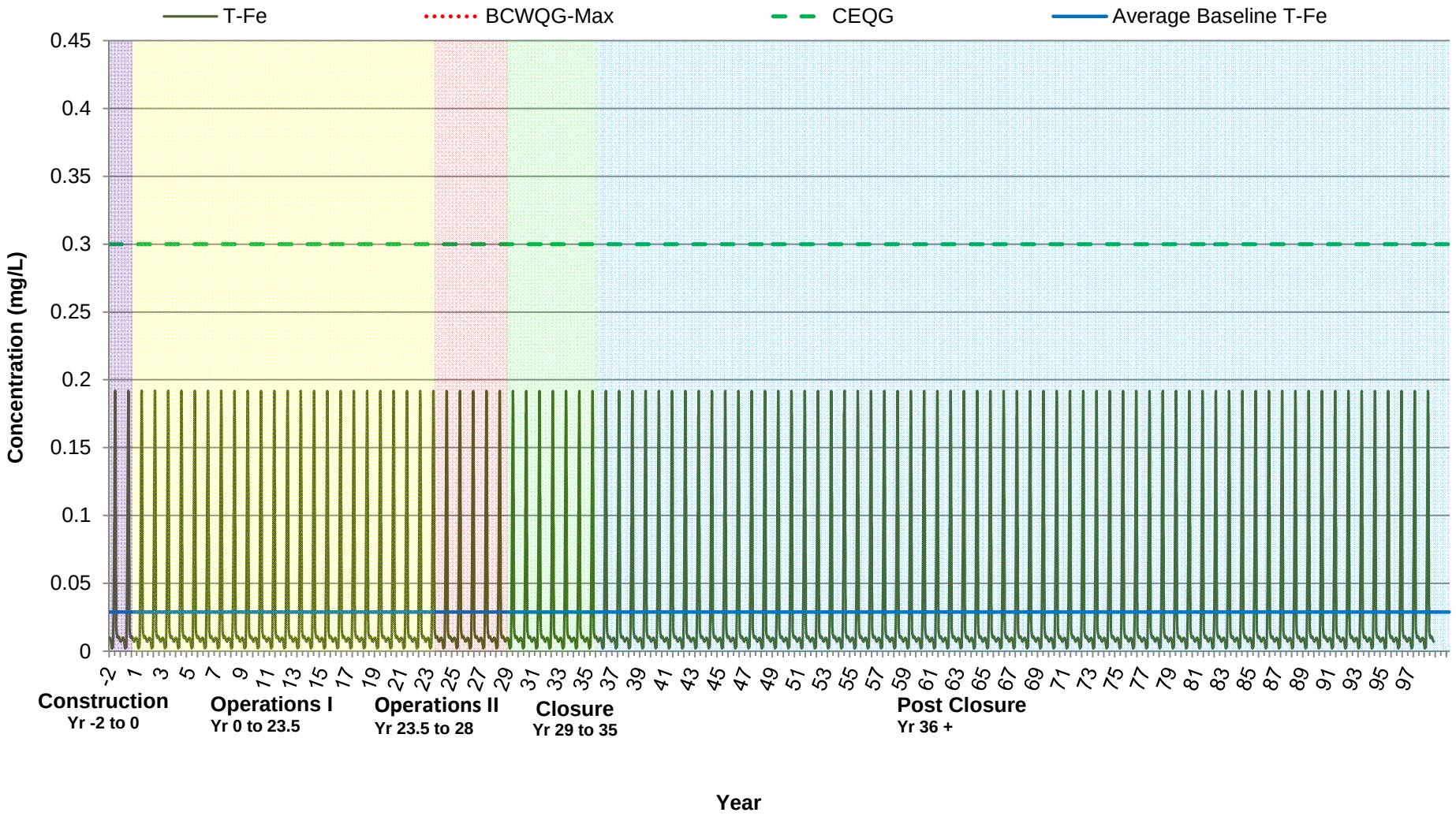
P/A NO. VA101-458/14

REF. NO. 3

FIGURE E2.Cu-D

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. BCWQG-MAX 1.0 mg/L IS NOT SHOWN ON GRAPH.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE
TOTAL IRON CONCENTRATIONS -
HARPER CREEK BELOW P-CREEK (HP)

Knight Piésold CONSULTING

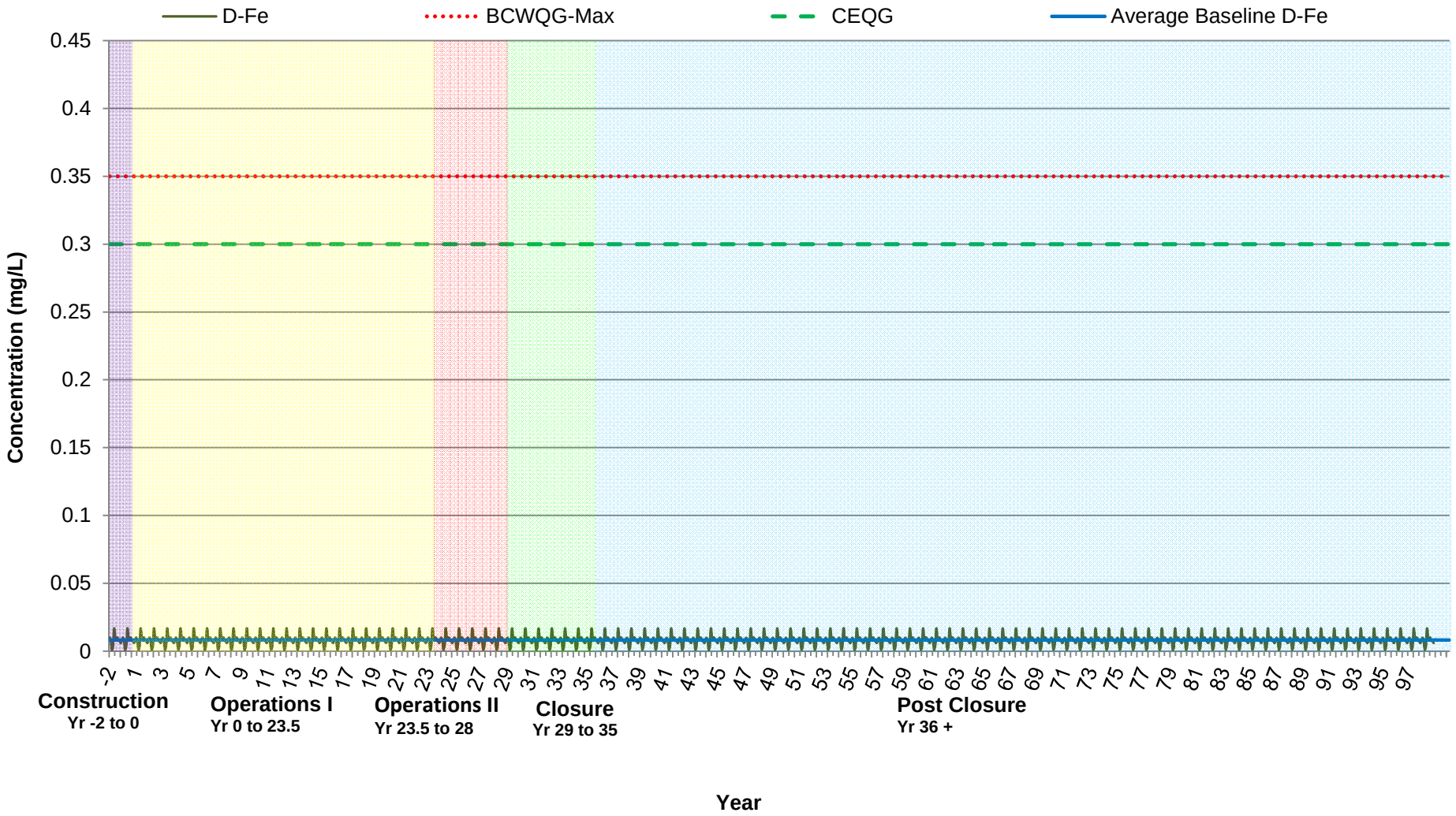
P/A NO. VA101-458/14

REF. NO. 3

FIGURE E2.Fe-T

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE
DISSOLVED IRON CONCENTRATIONS -
HARPER CREEK BELOW P-CREEK (HP)

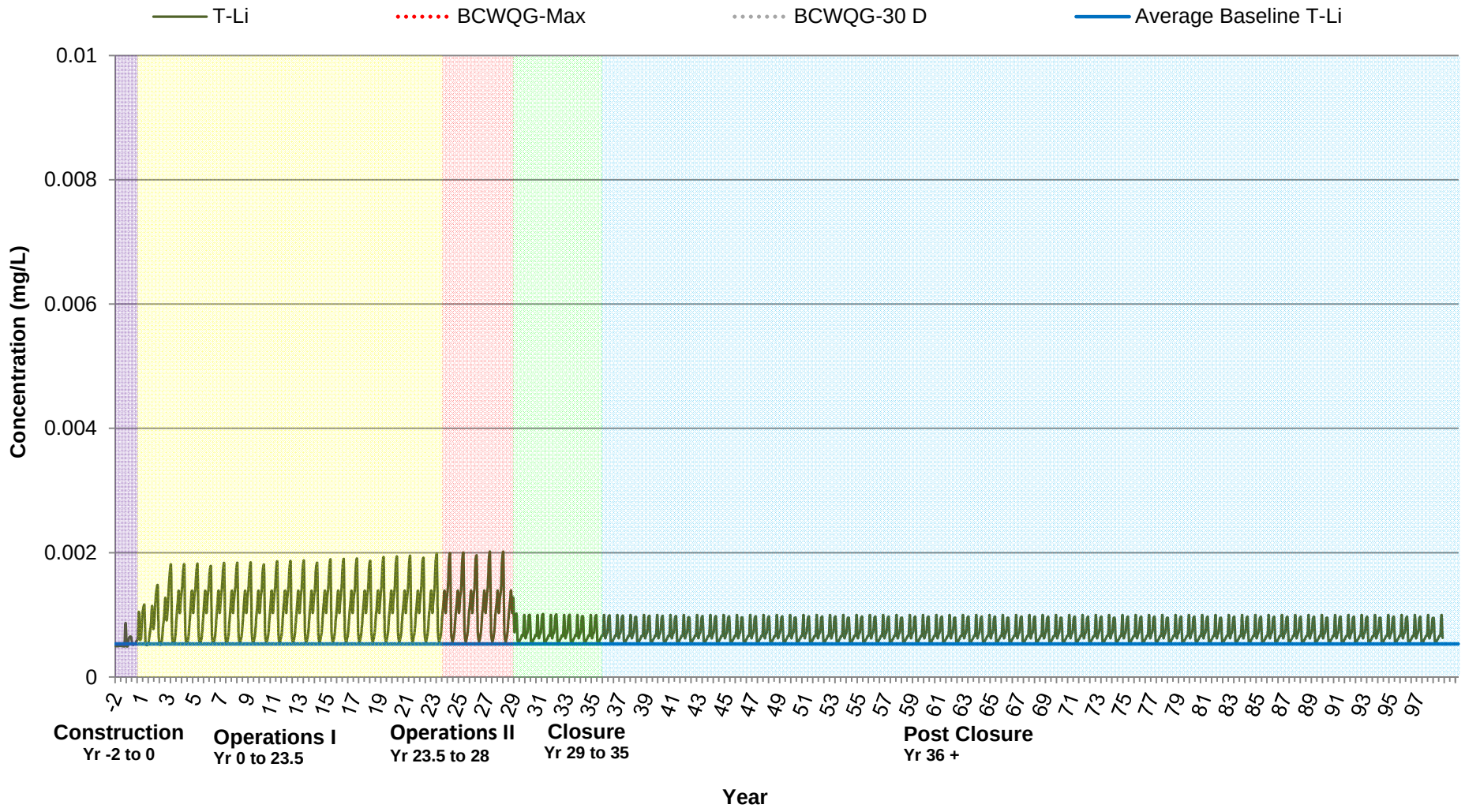
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE E2.Fe-D

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. THE BCWQG-30 D (0.096 mg/L) AND BCWQG-MAX (0.87 mg/L) ARE INTERIM (WORKING) AND ARE NOT SHOWN ON GRAPH.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE
LITHIUM CONCENTRATIONS -
HARPER CREEK BELOW P-CREEK (HP)

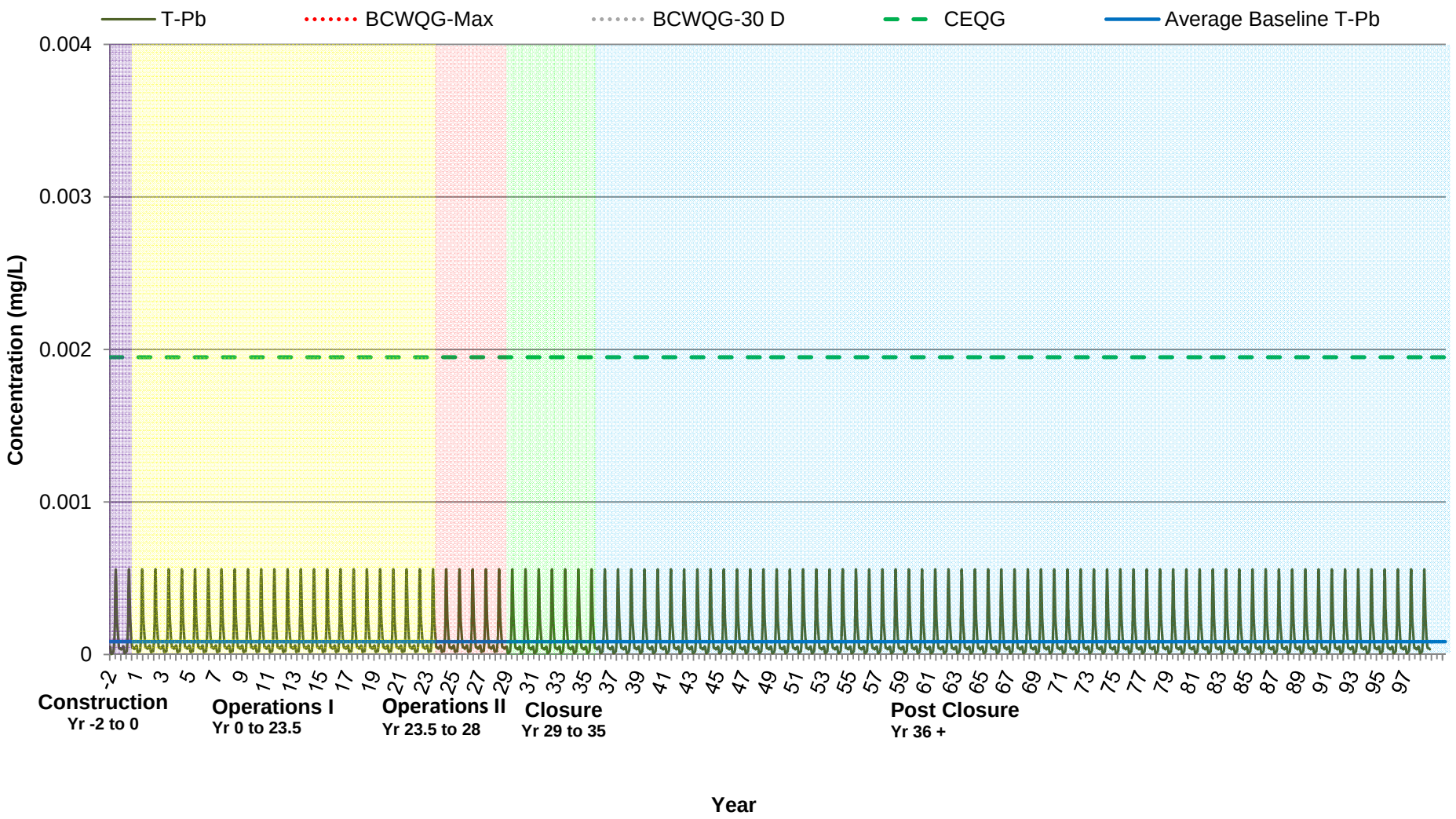
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE E2.Li

REV 0



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.
4. THE BCWQG-MAX (CALCULATED AT 0.011 mg/L) IS NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE
LEAD CONCENTRATIONS -
HARPER CREEK BELOW P-CREEK (HP)

Knight Piésold CONSULTING

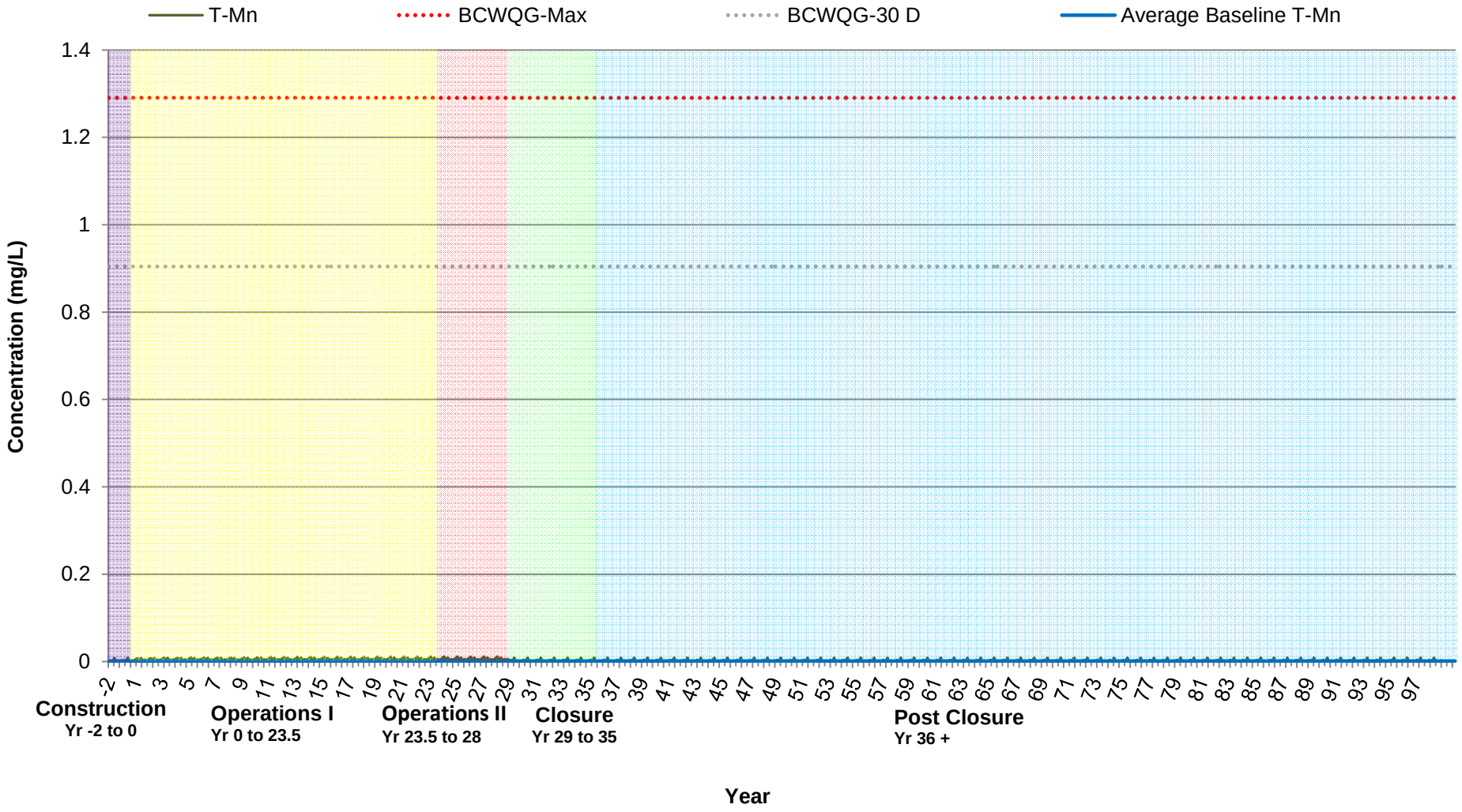
P/A NO. VA101-458/14

REF. NO. 3

FIGURE E2.Pb

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE MANGANESE CONCENTRATIONS - HARPER CREEK BELOW P-CREEK (HP)

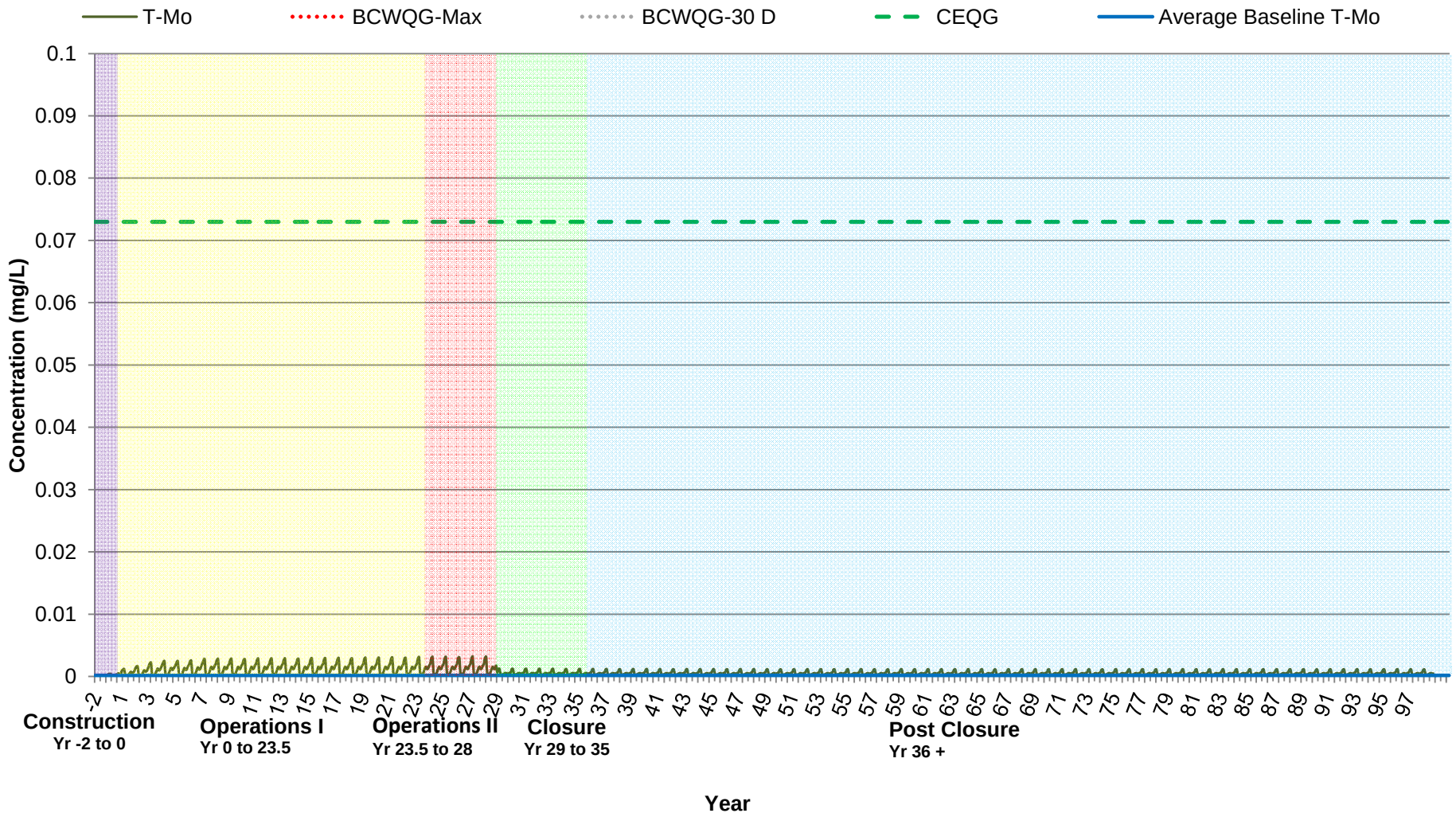
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE E2.Mn

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. THE BCWQG-MAX (2 mg/L) AND BCWQG-30 D (1 mg/L) ARE NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE MOLYDBENUM CONCENTRATIONS - HARPER CREEK BELOW P-CREEK (HP)

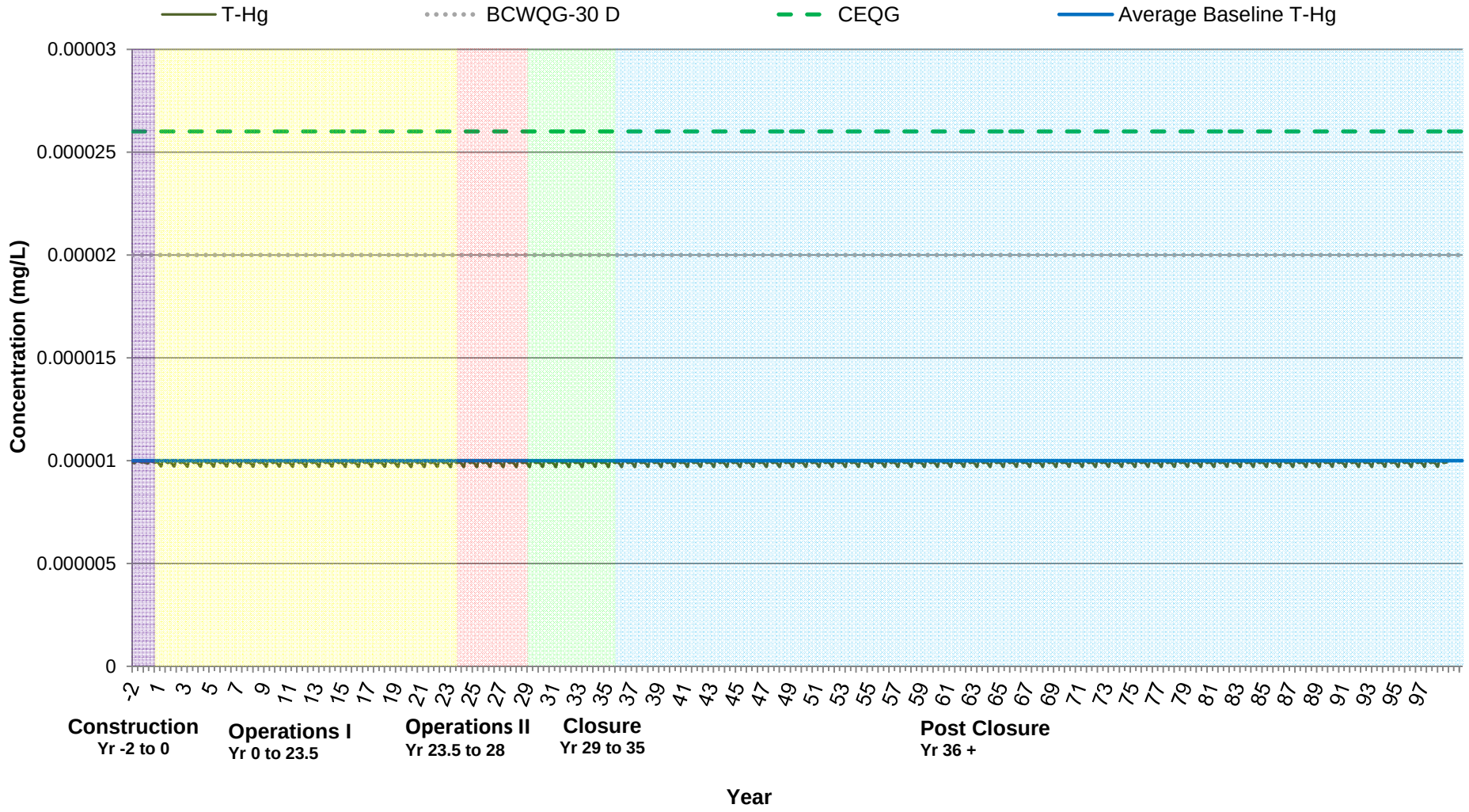
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE E2.Mo

REV 0



NOTES:

1. THE BCWQG-30 D AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. BCWQG-30 D VALUE APPLIED ON ASSUMPTION THAT METHYL-Hg IS EQUAL TO 0.5% OF T-Hg.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE MERCURY CONCENTRATIONS - HARPER CREEK BELOW P-CREEK (HP)

Knight Piésold CONSULTING

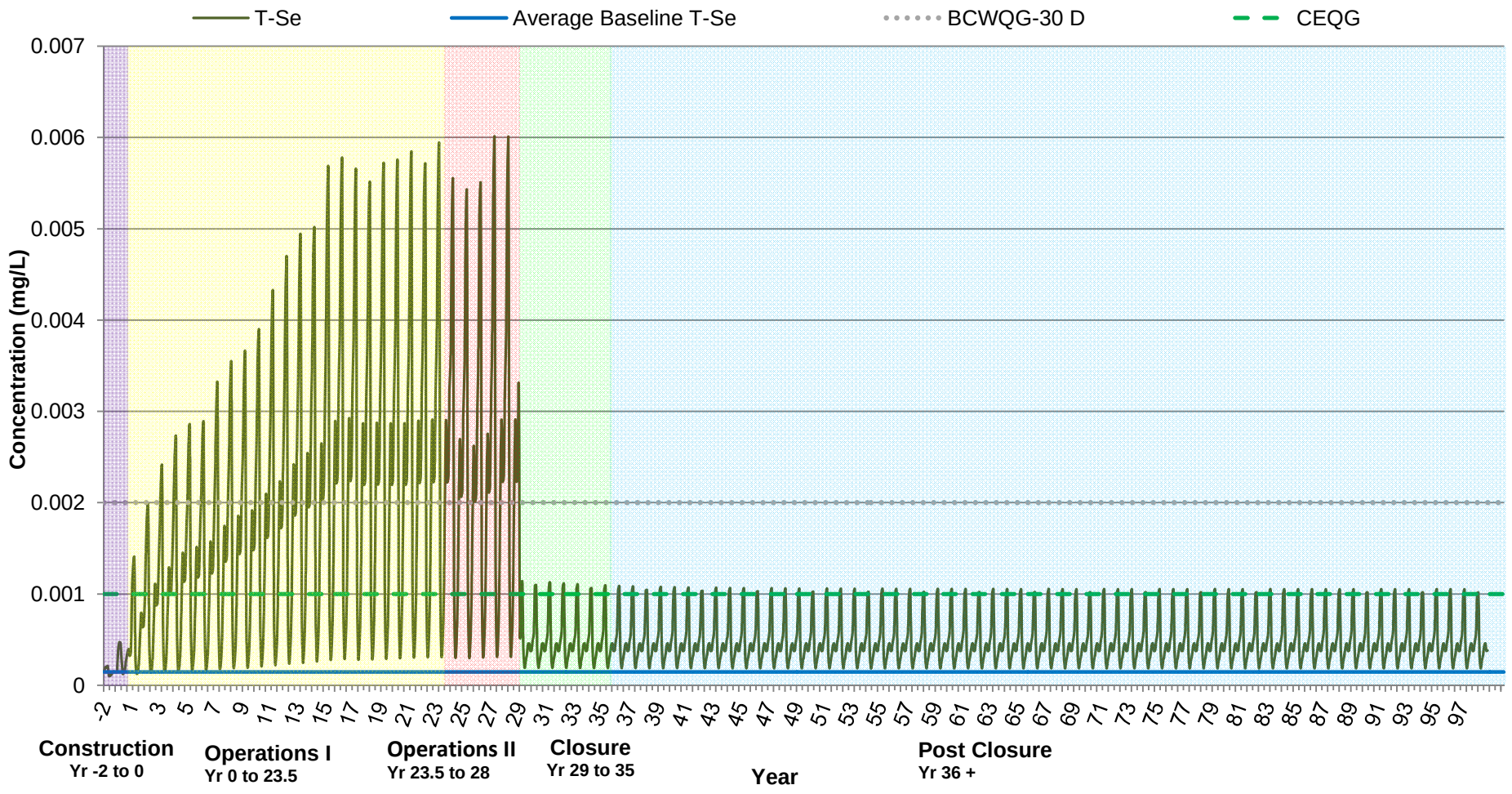
P/A NO. VA101-458/14

REF. NO. 3

FIGURE E2.Hg

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-30 D AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE
SELENIUM CONCENTRATIONS -
HARPER CREEK BELOW P-CREEK (HP)

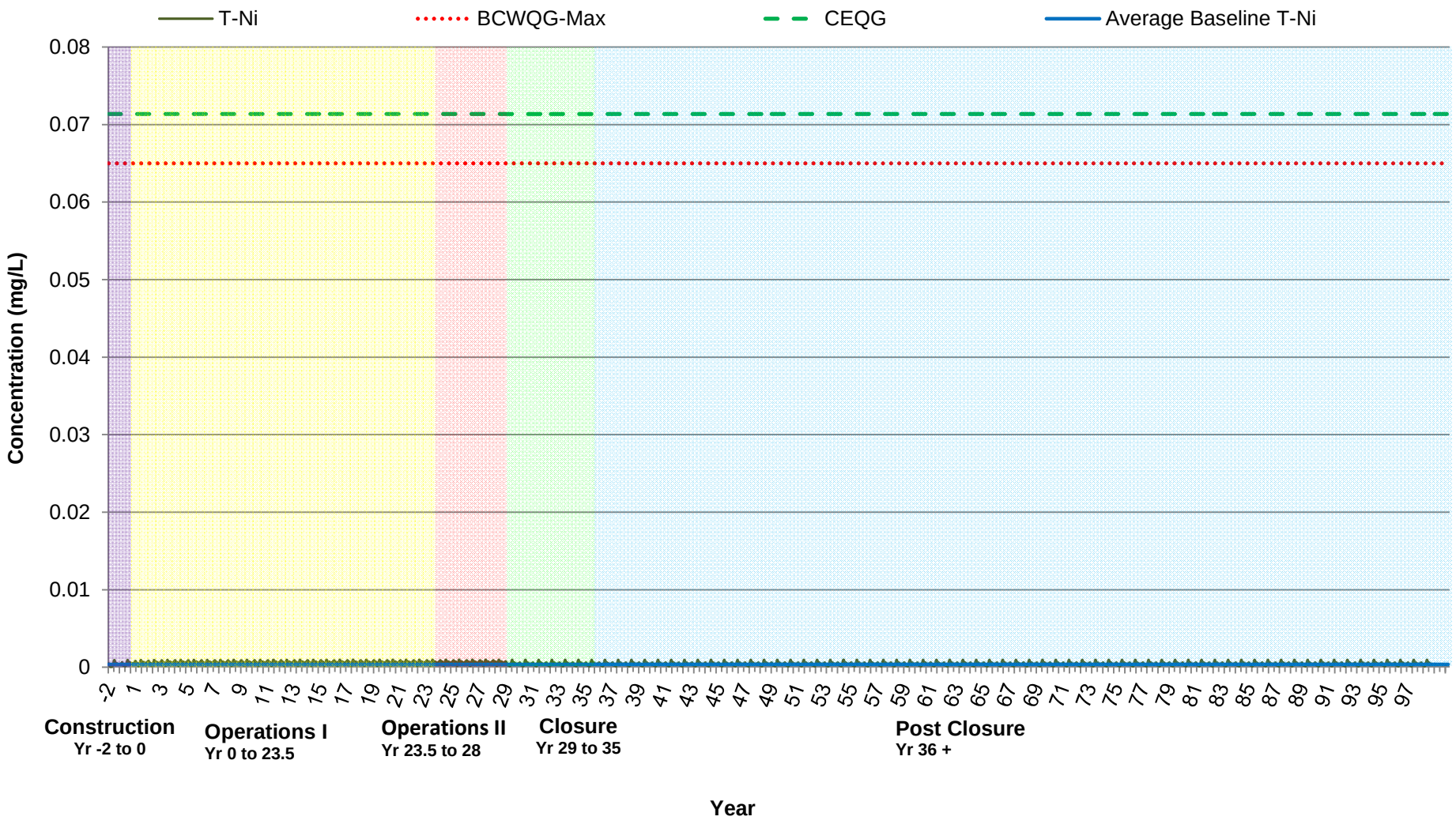
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE E2.Se

REV 0



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES, WHERE APPROPRIATE.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE NICKEL CONCENTRATIONS - HARPER CREEK BELOW P-CREEK (HP)

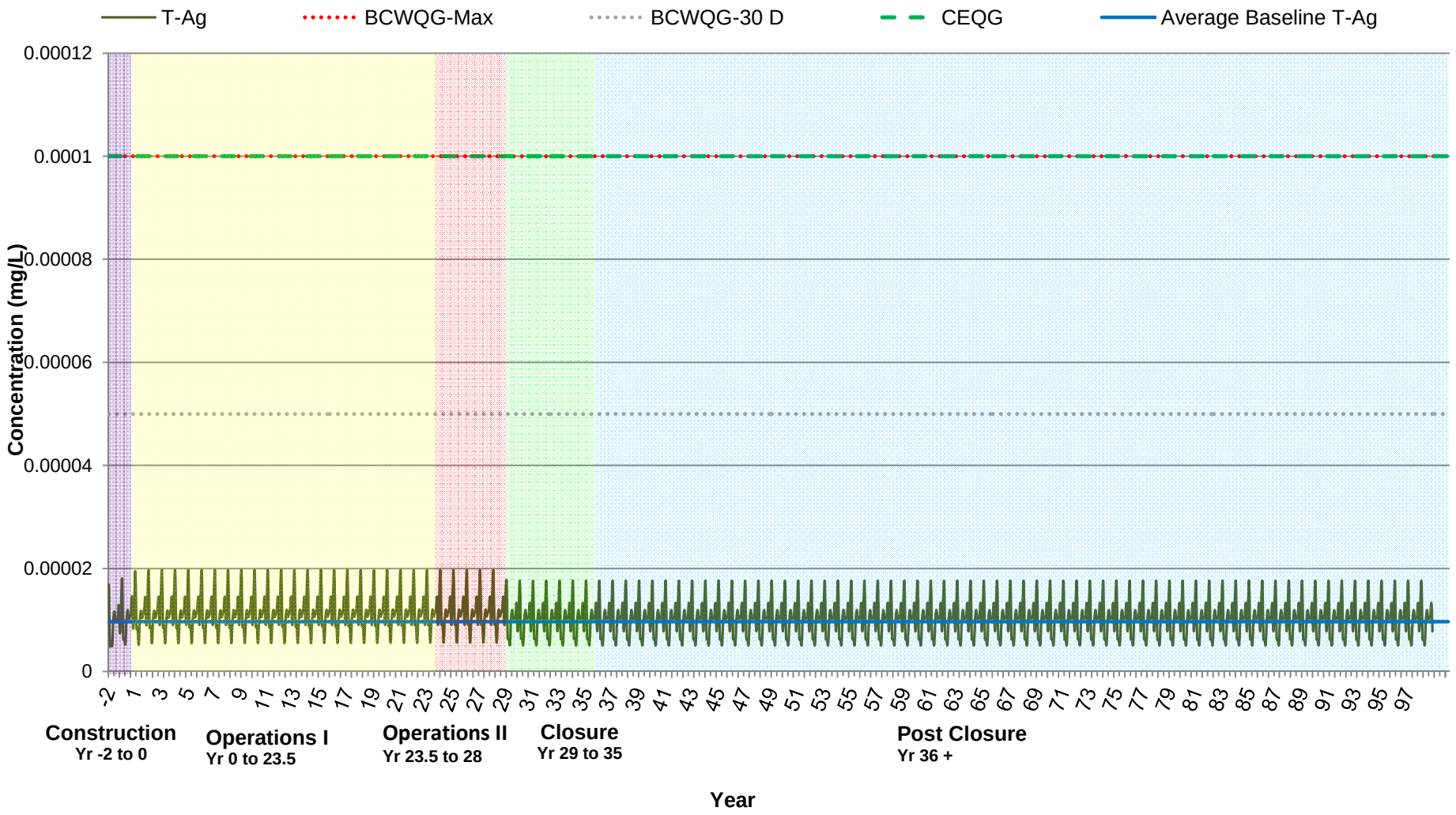
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE E2.Ni

REV 0



NOTES:

1. THE BCWQG-30 D AND BCWQG-MAX ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE
SILVER CONCENTRATIONS -
HARPER CREEK BELOW P-CREEK (HP)

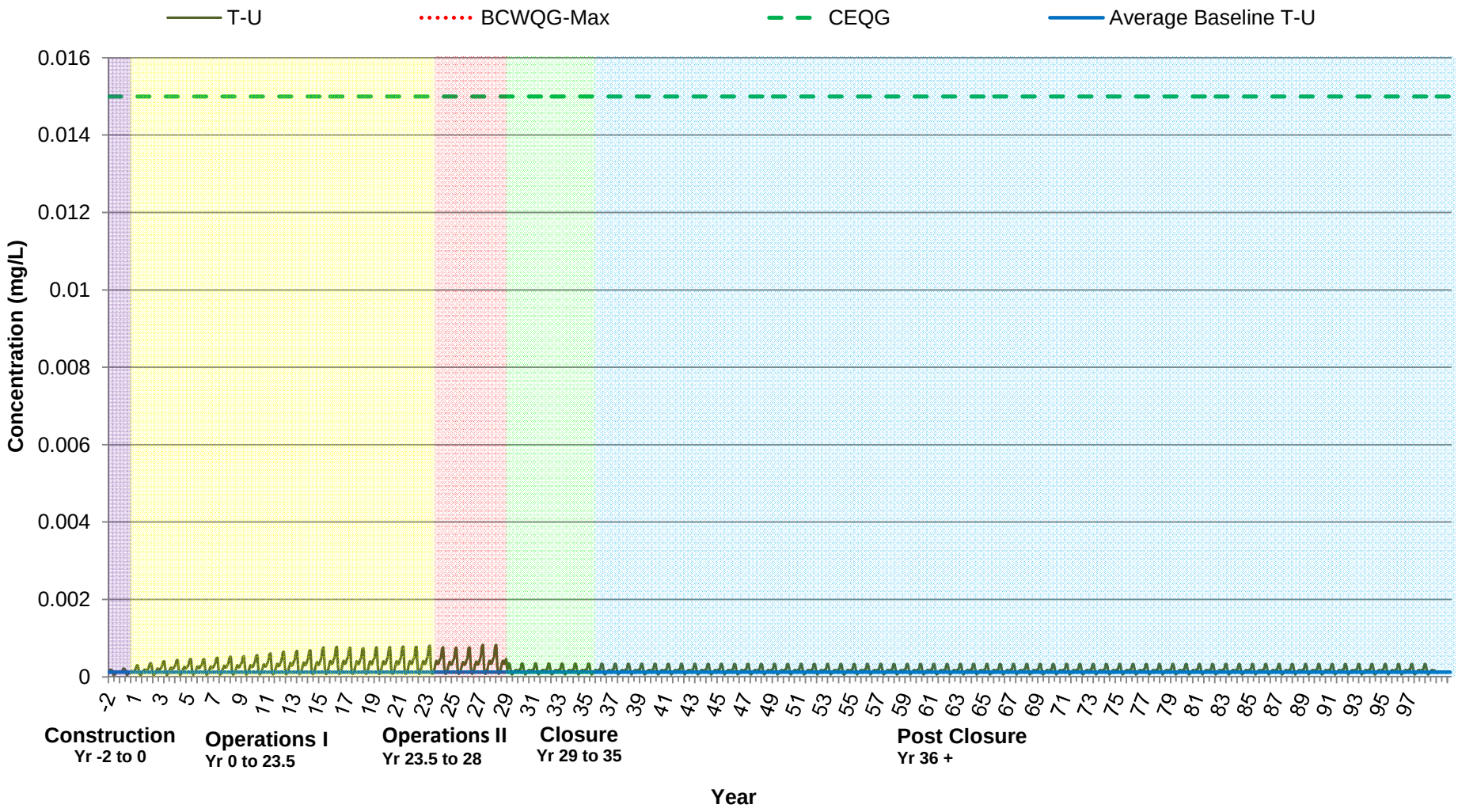
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE E2.Ag

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. THE BCWQG-MAX (0.3 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE
URANIUM CONCENTRATIONS -
HARPER CREEK BELOW P-CREEK (HP)

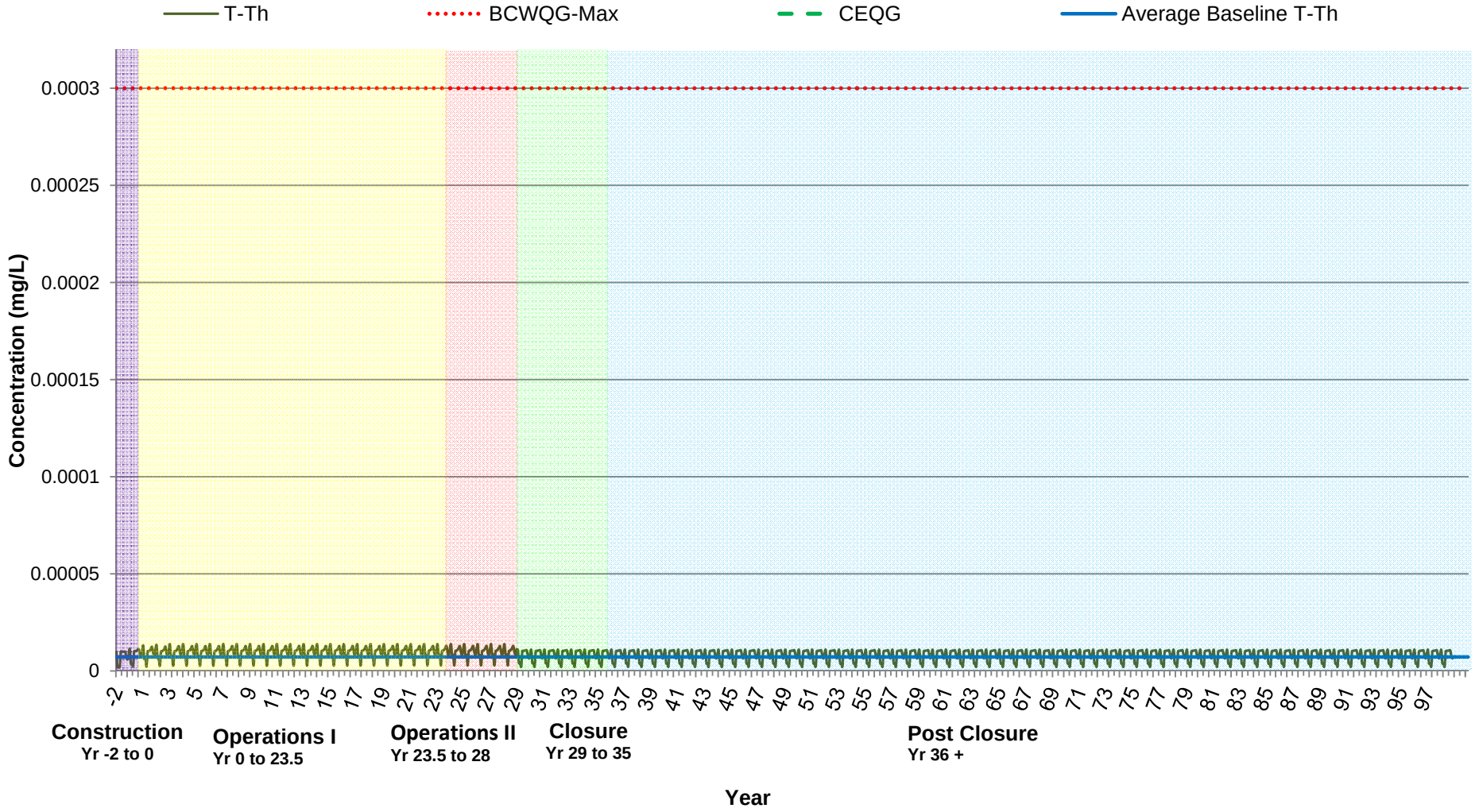
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE E2.U

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. THE CEQG (0.0008 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE THALLIUM CONCENTRATIONS - HARPER CREEK BELOW P-CREEK (HP)

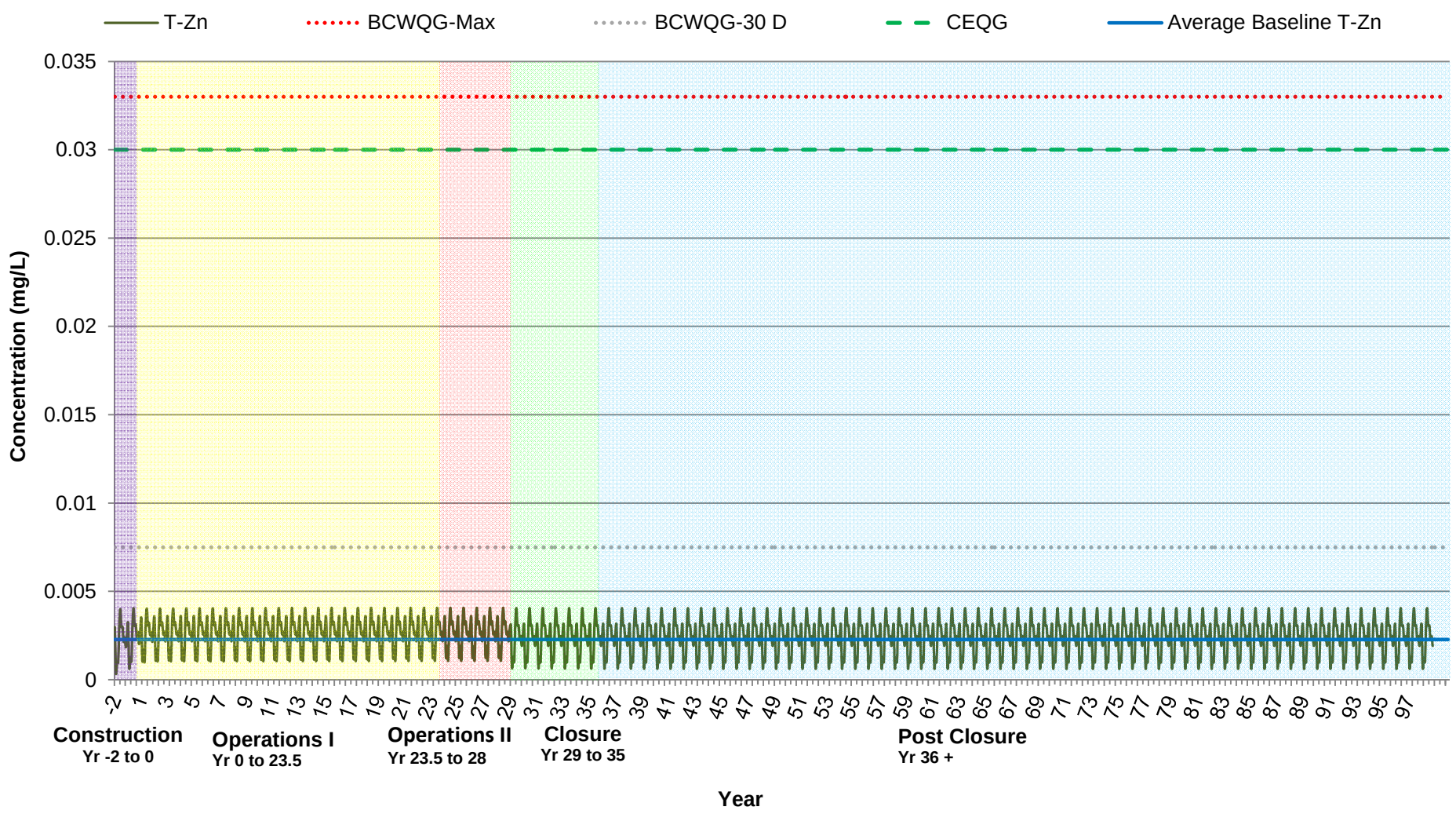
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE E2.Th

REV 0



NOTES:

1. BCWQG-30 D AND BCWQG-MAX ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

SEEPAGE SENSITIVTY CASE
ZINC CONCENTRATIONS -
HARPER CREEK BELOW P-CREEK (HP)

Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE E2.Zn

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

APPENDIX F

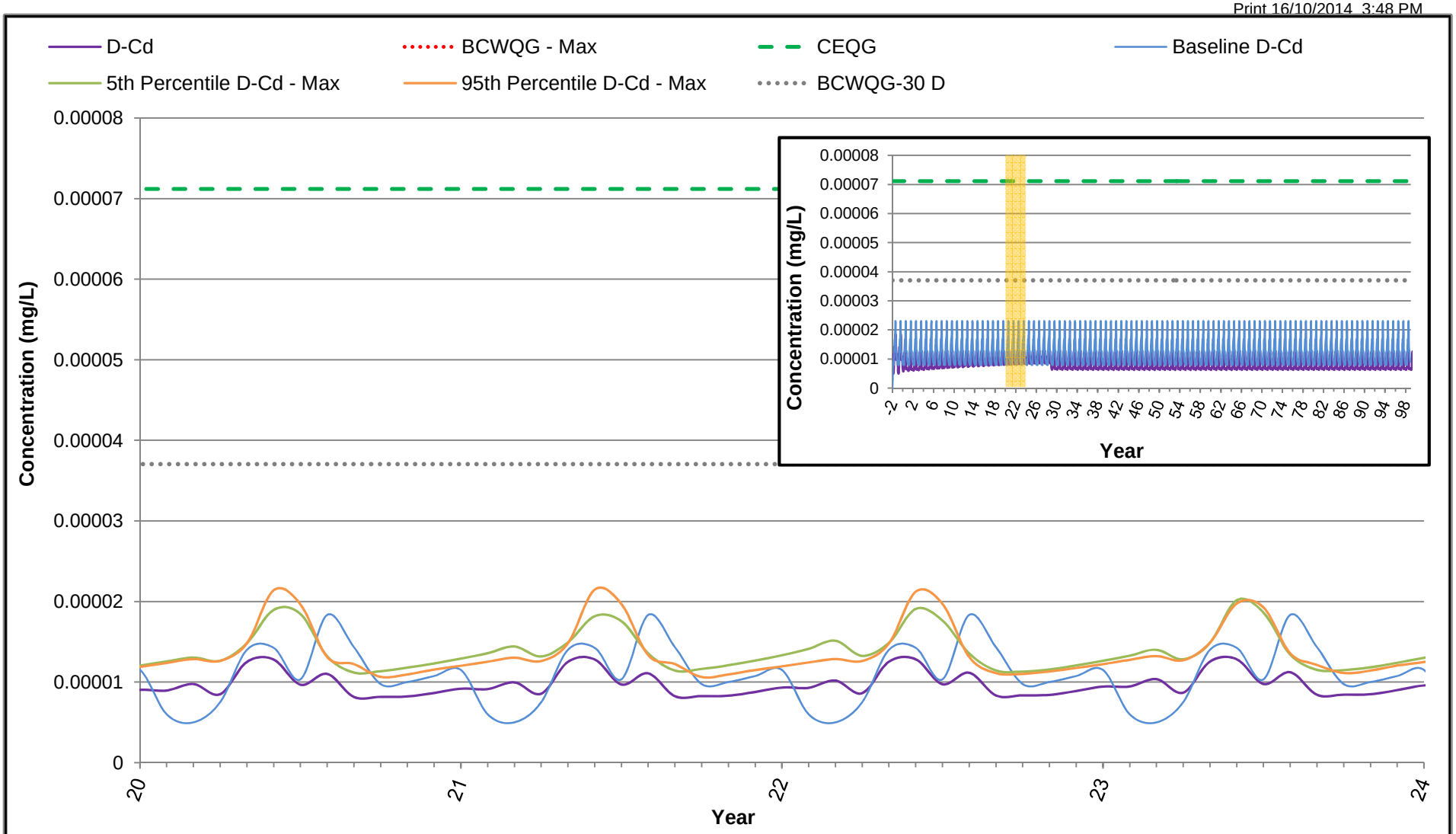
5TH AND 95TH PERCENTILE PRECIPITATION CASES

Appendix F1 Mid Harper Creek (HM)
Appendix F2 Harper Creek below T-Creek (HT)
Appendix F3 Harper Creek above Barrière River (HB)

APPENDIX F1

MID HARPER CREEK (HM)

(Pages F1-1 to F1-12)



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS DEPENDENT GUIDELINES.
2. THE BASELINE DATA PLOTTED AND USED FOR GUIDELINES CALCULATIONS IS FROM H2 (BASELINE HARDNESS EQUALS 38 mg/L)
3. VARIABLE CASE CLIMATE INPUTS RUN FOR YEARS 21 THROUGH 22 - SEE INSET FOR RELATIVE TIME FRAME (HIGHLIGHTED IN ORANGE).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	LA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

VARIABLE CASE WATER QUALITY MODEL
PREDICTED DISSOLVED CADMIUM CONCENTRATIONS
HM - OPERATIONS I

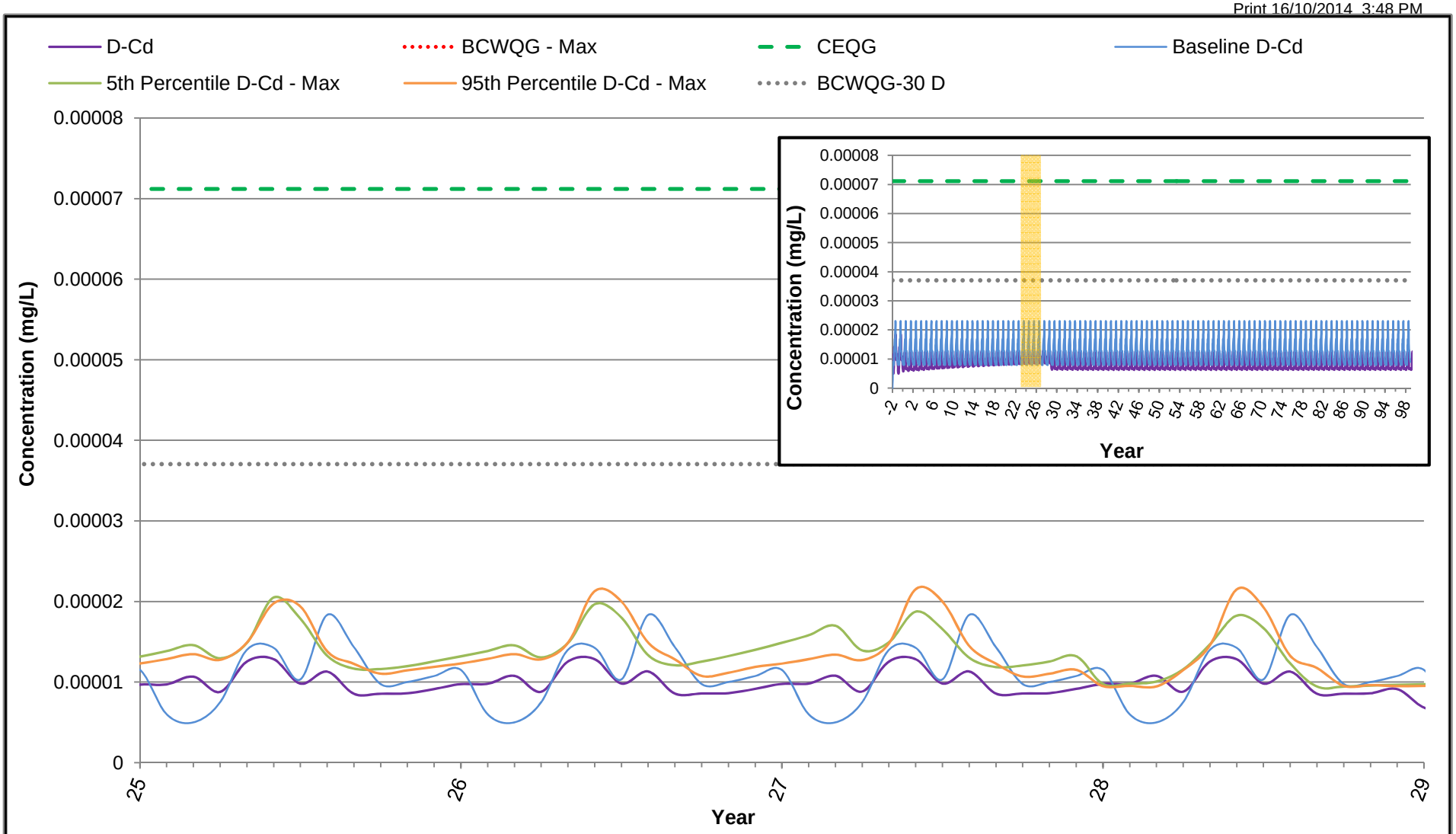
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE F1.Cd-A

REV 0



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS DEPENDENT GUIDELINES.
2. THE BASELINE DATA PLOTTED AND USED FOR GUIDELINES CALCULATIONS IS FROM H2 (BASELINE HARDNESS EQUALS 38 mg/L)
3. VARIABLE CASE CLIMATE INPUTS RUN FOR YEARS 26 THROUGH 27 - SEE INSET FOR RELATIVE TIME FRAME (HIGHLIGHTED IN ORANGE).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	LA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

VARIABLE CASE WATER QUALITY MODEL
PREDICTED DISSOLVED CADMIUM CONCENTRATIONS
HM - OPERATIONS II

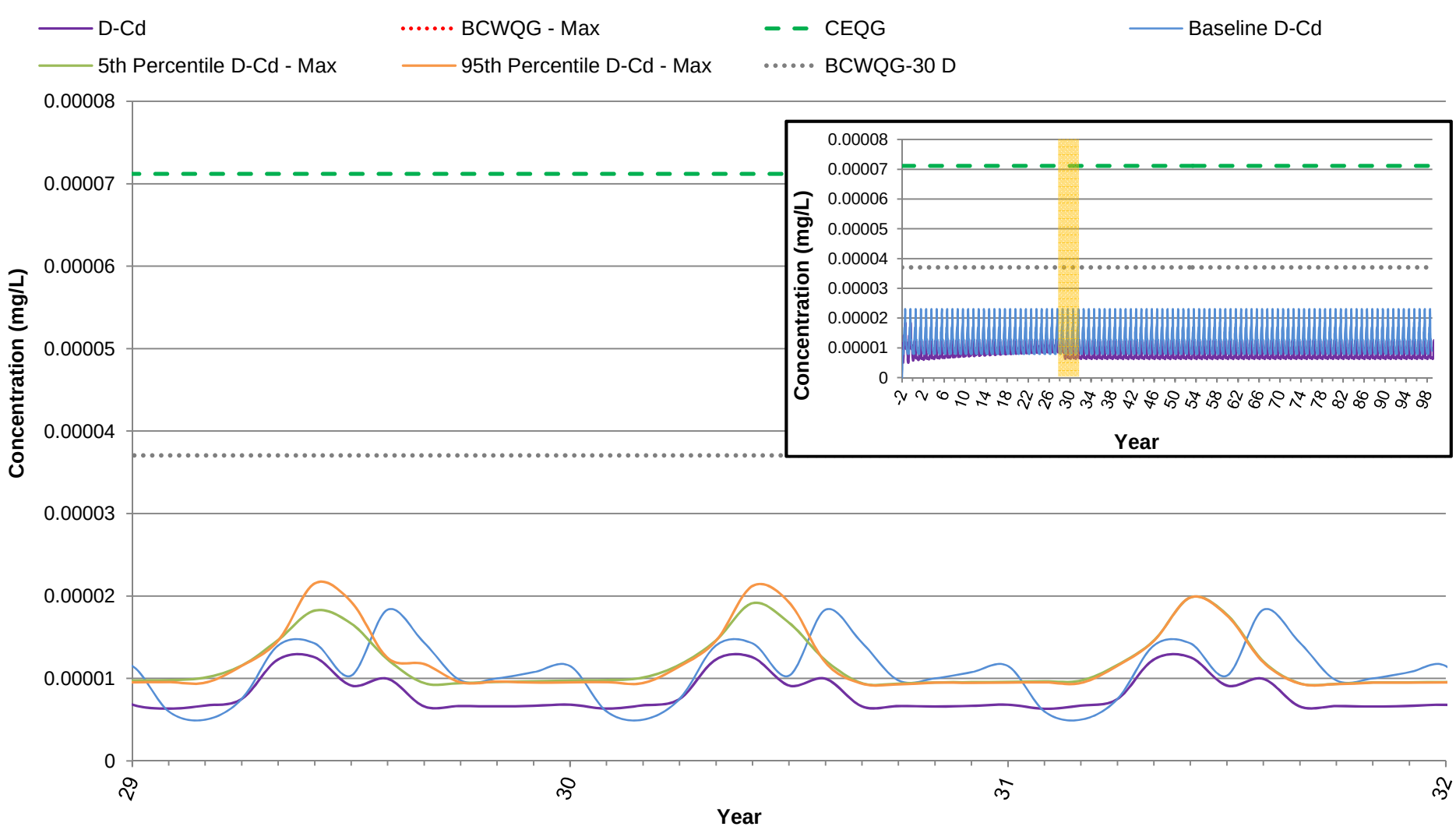
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE F1.Cd-B

REV 0



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS DEPENDENT GUIDELINES.
2. THE BASELINE DATA PLOTTED AND USED FOR GUIDELINES CALCULATIONS IS FROM H2 (BASELINE HARDNESS EQUALS 38 mg/L)
3. VARIABLE CASE CLIMATE INPUTS RUN FOR YEARS 21 THROUGH 22 - SEE INSET FOR RELATIVE TIME FRAME (HIGHLIGHTED IN ORANGE).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	LA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

VARIABLE CASE WATER QUALITY MODEL
PREDICTED DISSOLVED CADMIUM CONCENTRATIONS
HM - CLOSURE

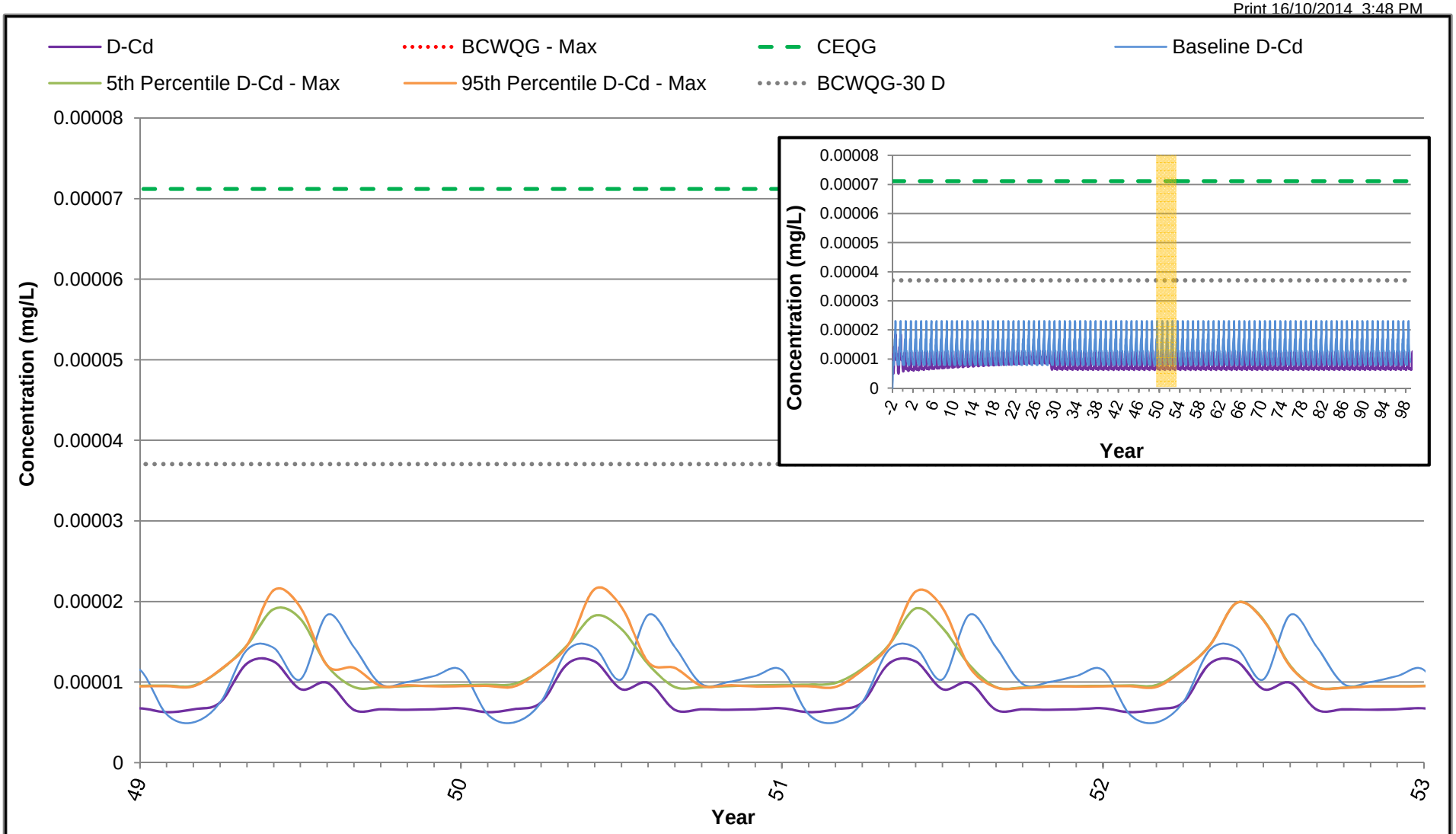
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE F1.Cd-C

REV 0



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS DEPENDENT GUIDELINES.
2. THE BASELINE DATA PLOTTED AND USED FOR GUIDELINES CALCULATIONS IS FROM H2 (BASELINE HARDNESS EQUALS 38 mg/L)
3. VARIABLE CASE CLIMATE INPUTS RUN FOR YEARS 21 THROUGH 22 - SEE INSET FOR RELATIVE TIME FRAME (HIGHLIGHTED IN ORANGE).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	LA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

VARIABLE CASE WATER QUALITY MODEL
PREDICTED DISSOLVED CADMIUM CONCENTRATIONS
HM - POST CLOSURE

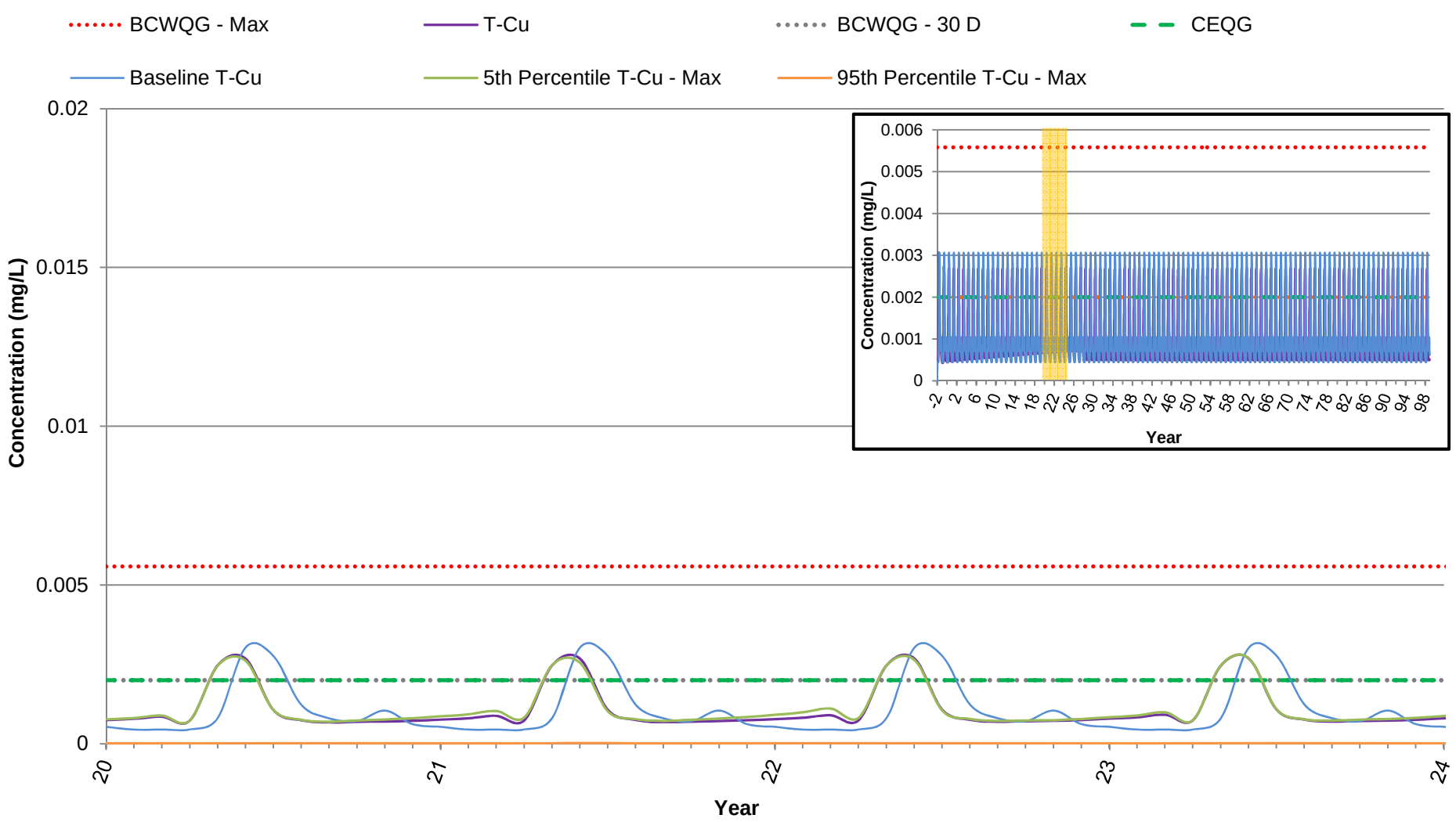
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE F1.Cd-D

REV 0



NOTES:

1. THE BCWQG-30 DAY AVERAGE, BCWQG-MAX AND CEQG GUIDELINES ARE HARDNESS DEPENDENT GUIDELINES.
2. THE BASELINE DATA PLOTTED AND USED FOR GUIDELINES CALCULATIONS IS FROM H2 (BASELINE HARDNESS EQUALS 38 mg/L)
3. VARIABLE CASE CLIMATE INPUTS RUN FOR YEARS 21 THROUGH 22 - SEE INSET FOR RELATIVE TIME FRAME (HIGHLIGHTED IN ORANGE).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	LA	JEM	KJB

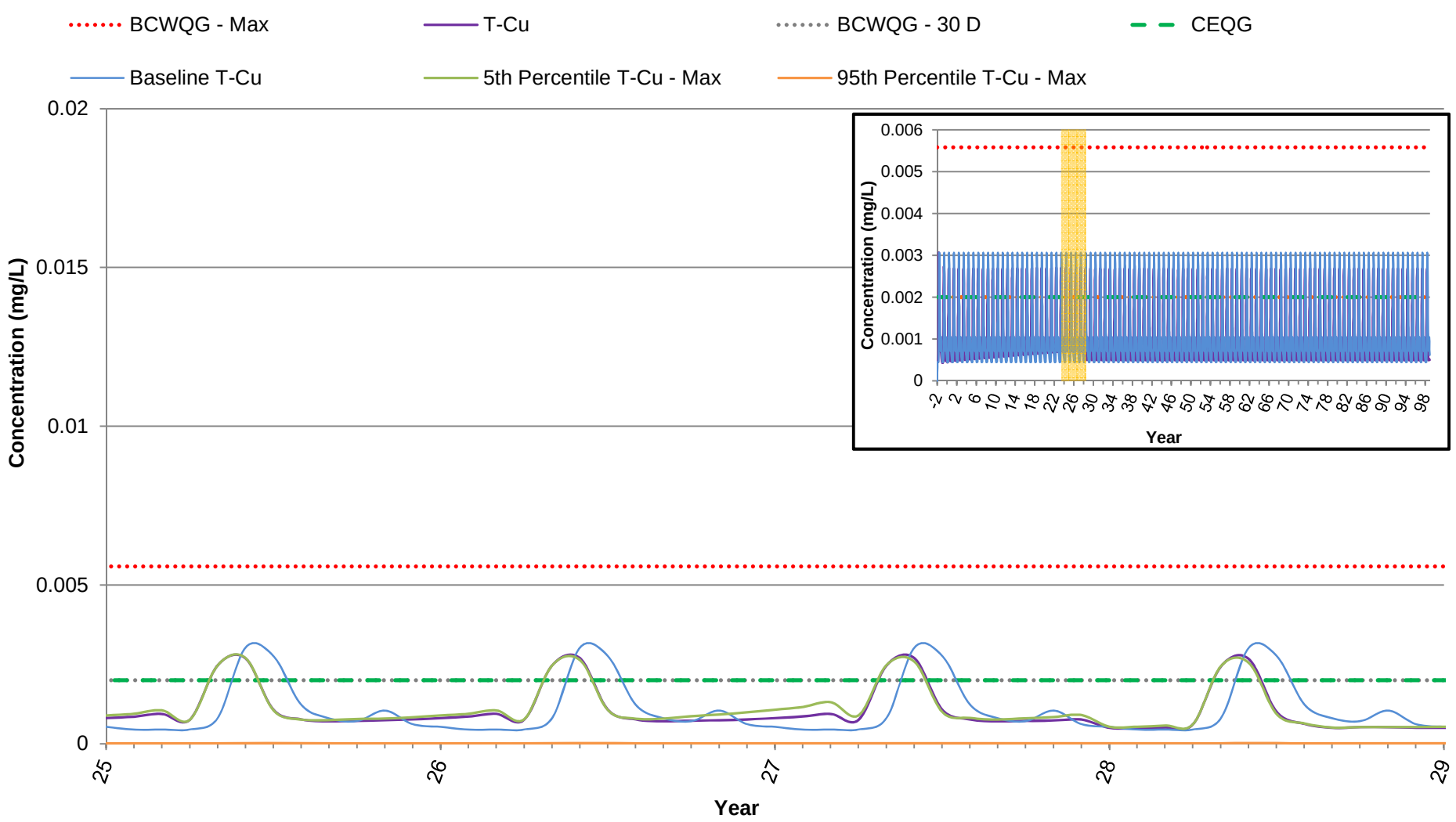
HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

VARIABLE CASE WATER QUALITY MODEL
PREDICTED TOTAL COPPER CONCENTRATIONS
HM - OPERATIONS I

Knight Piésold CONSULTING

P/A NO. VA101-458/14 | REF. NO. 3

FIGURE F1.Cu-A | REV 0



NOTES:

1. THE BCWQG-30 DAY AVERAGE, BCWQG-MAX AND CEQG GUIDELINES ARE HARDNESS DEPENDENT GUIDELINES.
2. THE BASELINE DATA PLOTTED AND USED FOR GUIDELINES CALCULATIONS IS FROM H2 (BASELINE HARDNESS EQUALS 38 mg/L)
3. VARIABLE CASE CLIMATE INPUTS RUN FOR YEARS 26 THROUGH 27 - SEE INSET FOR RELATIVE TIME FRAME (HIGHLIGHTED IN ORANGE).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	LA	JEM	KJB

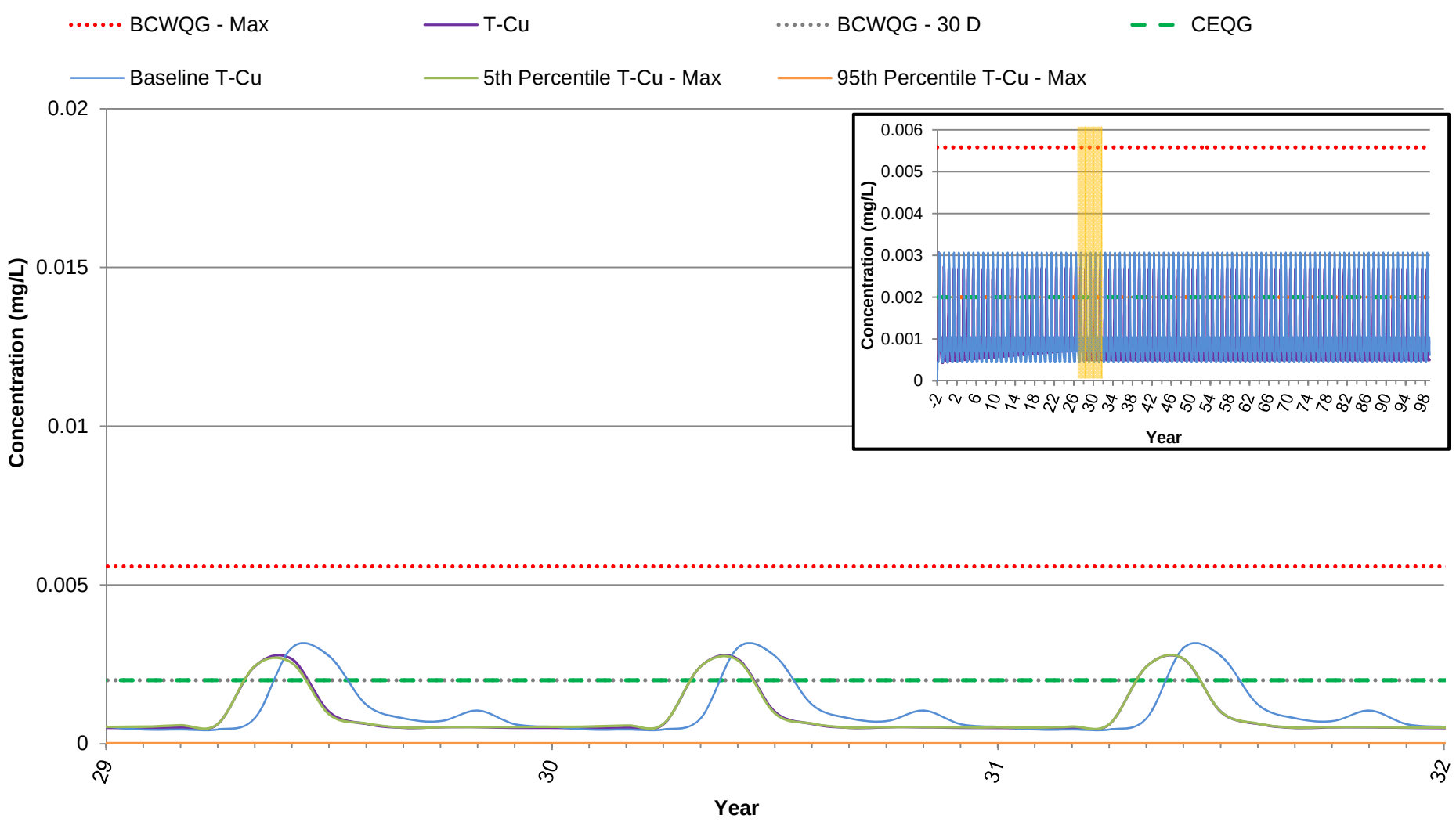
HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

**VARIABLE CASE WATER QUALITY MODEL
PREDICTED TOTAL COPPER CONCENTRATIONS
HM - OPERATIONS II**

Knight Piésold CONSULTING

P/A NO. VA101-458/14 | REF. NO. 3

FIGURE F1.Cu-B | REV 0



NOTES:

1. THE BCWQG-30 DAY AVERAGE, BCWQG-MAX AND CEQG GUIDELINES ARE HARDNESS DEPENDENT GUIDELINES.
2. THE BASELINE DATA PLOTTED AND USED FOR GUIDELINES CALCULATIONS IS FROM H2 (BASELINE HARDNESS EQUALS 38 mg/L)
3. VARIABLE CASE CLIMATE INPUTS RUN FOR YEARS 29 THROUGH 30 - SEE INSET FOR RELATIVE TIME FRAME (HIGHLIGHTED IN ORANGE).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	LA	JEM	KJB

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

VARIABLE CASE WATER QUALITY MODEL
PREDICTED TOTAL COPPER CONCENTRATIONS
HM - CLOSURE

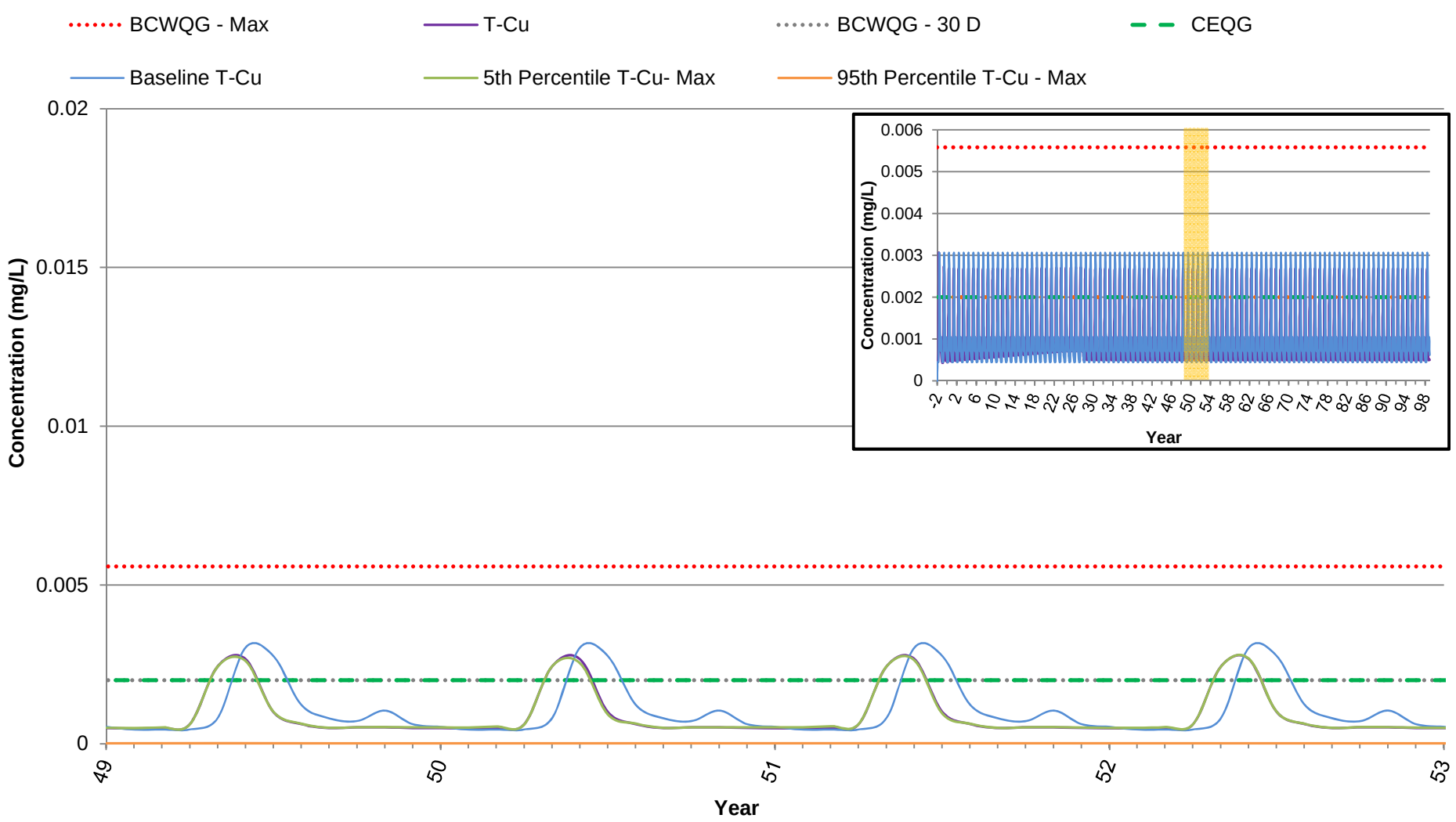
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE F1.Cu-C

REV 0



NOTES:

1. THE BCWQG-30 DAY AVERAGE, BCWQG-MAX AND CEQG GUIDELINES ARE HARDNESS DEPENDENT GUIDELINES.
2. THE BASELINE DATA PLOTTED AND USED FOR GUIDELINES CALCULATIONS IS FROM H2 (BASELINE HARDNESS EQUALS 38 mg/L)
3. VARIABLE CASE CLIMATE INPUTS RUN FOR YEARS 50 THROUGH 51 - SEE INSET FOR RELATIVE TIME FRAME (HIGHLIGHTED IN ORANGE).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	LA	JEM	KJB

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

VARIABLE CASE WATER QUALITY MODEL
PREDICTED TOTAL COPPER CONCENTRATIONS
HM - POST CLOSURE

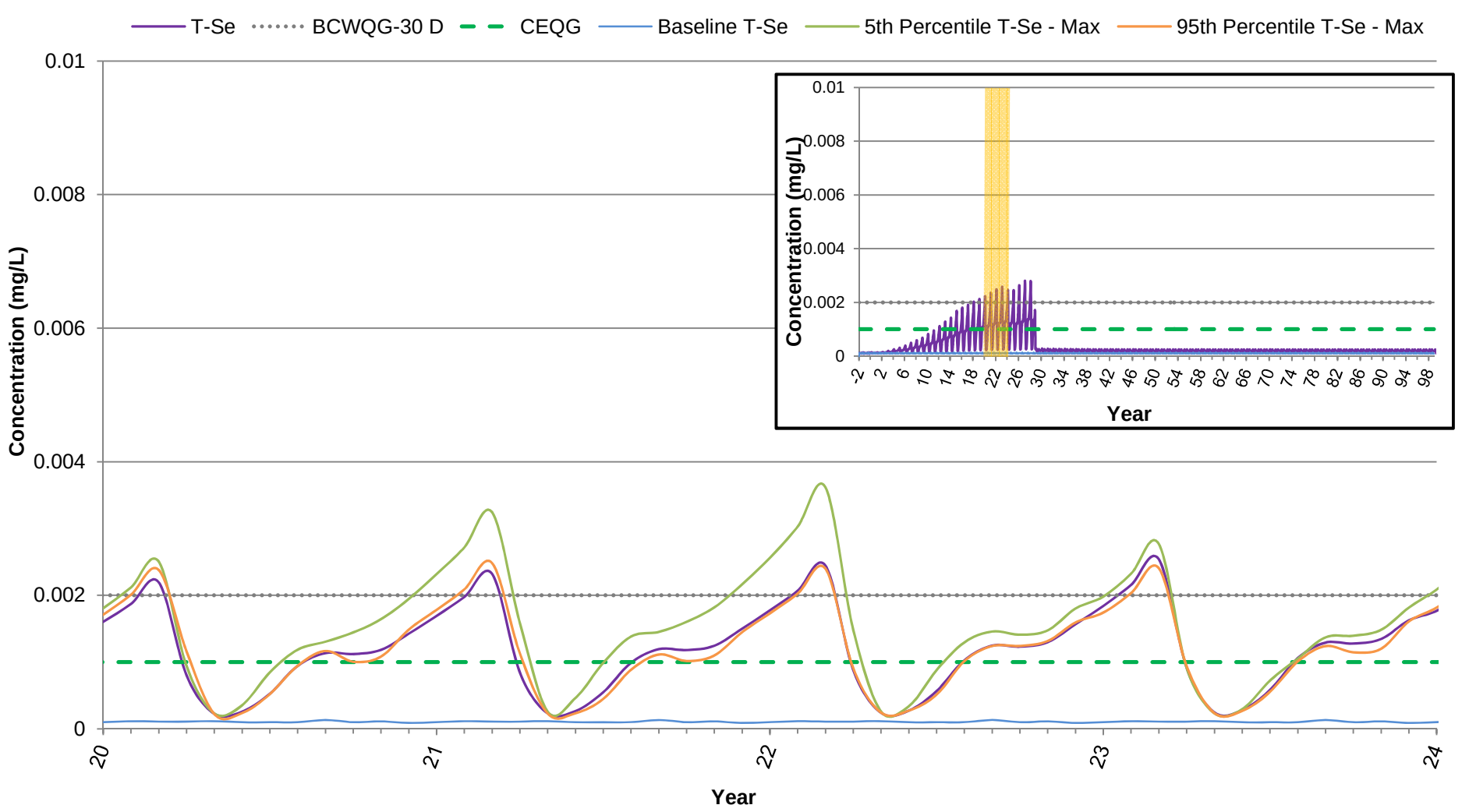
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE F1.Cu-D

REV 0



NOTES:

1. THE BCWQG-MAX AND CEQG GUIDELINES ARE FIXED VALUES.
2. VARIABLE CASE CLIMATE INPUTS RUN FOR YEARS 21 THROUGH 22 - SEE INSET FOR RELATIVE TIME FRAME (HIGHLIGHTED IN ORANGE).

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

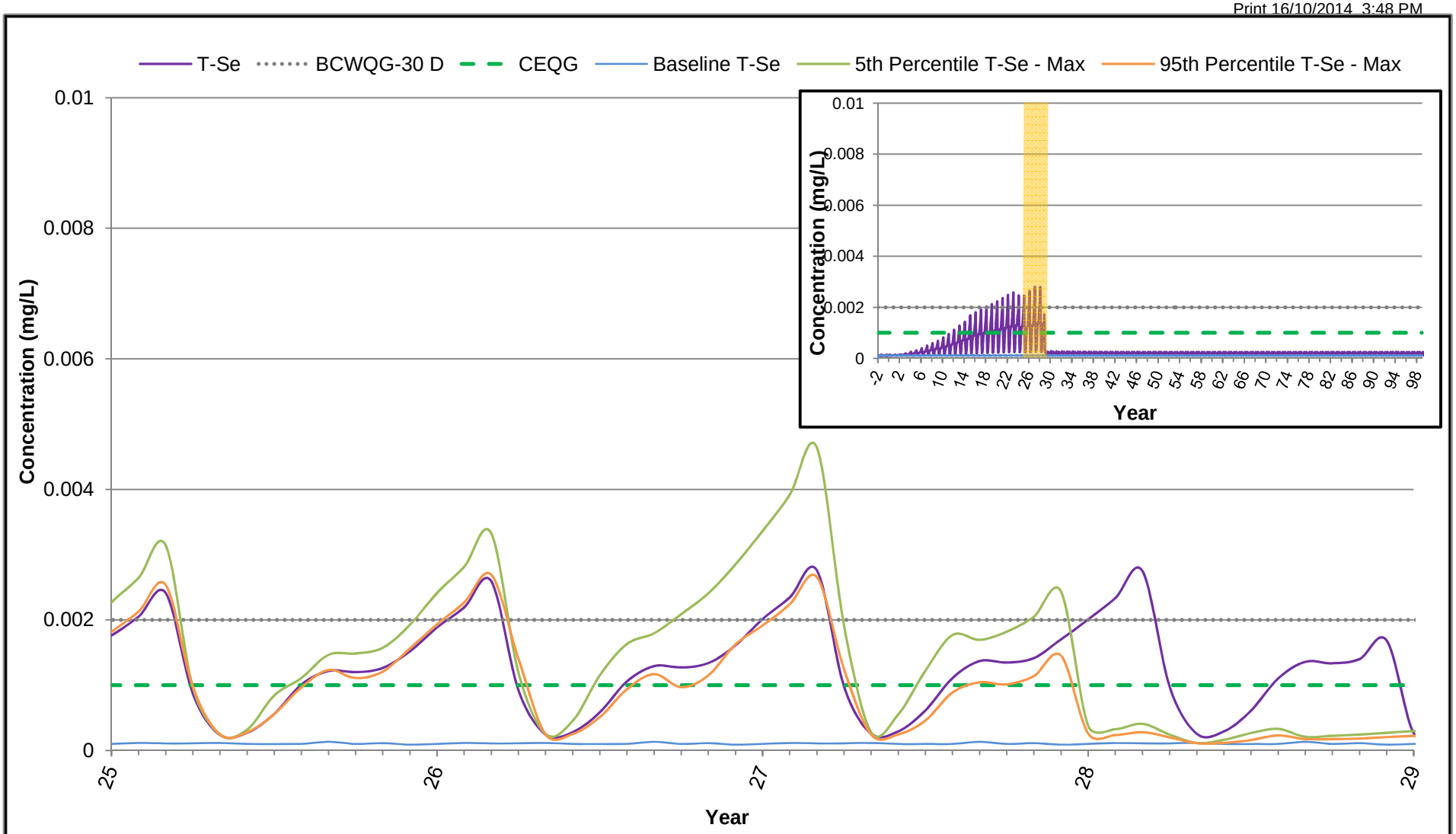
**VARIABLE CASE WATER QUALITY MODEL
PREDICTED TOTAL SELENIUM CONCENTRATIONS
HM - OPERATIONS I**

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FIGURE F1.Se-A | REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG GUIDELINES ARE FIXED VALUES.
2. VARIABLE CASE CLIMATE INPUTS RUN FOR YEARS 26 THROUGH 27 - SEE INSET FOR RELATIVE TIME FRAME (HIGHLIGHTED IN ORANGE).

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

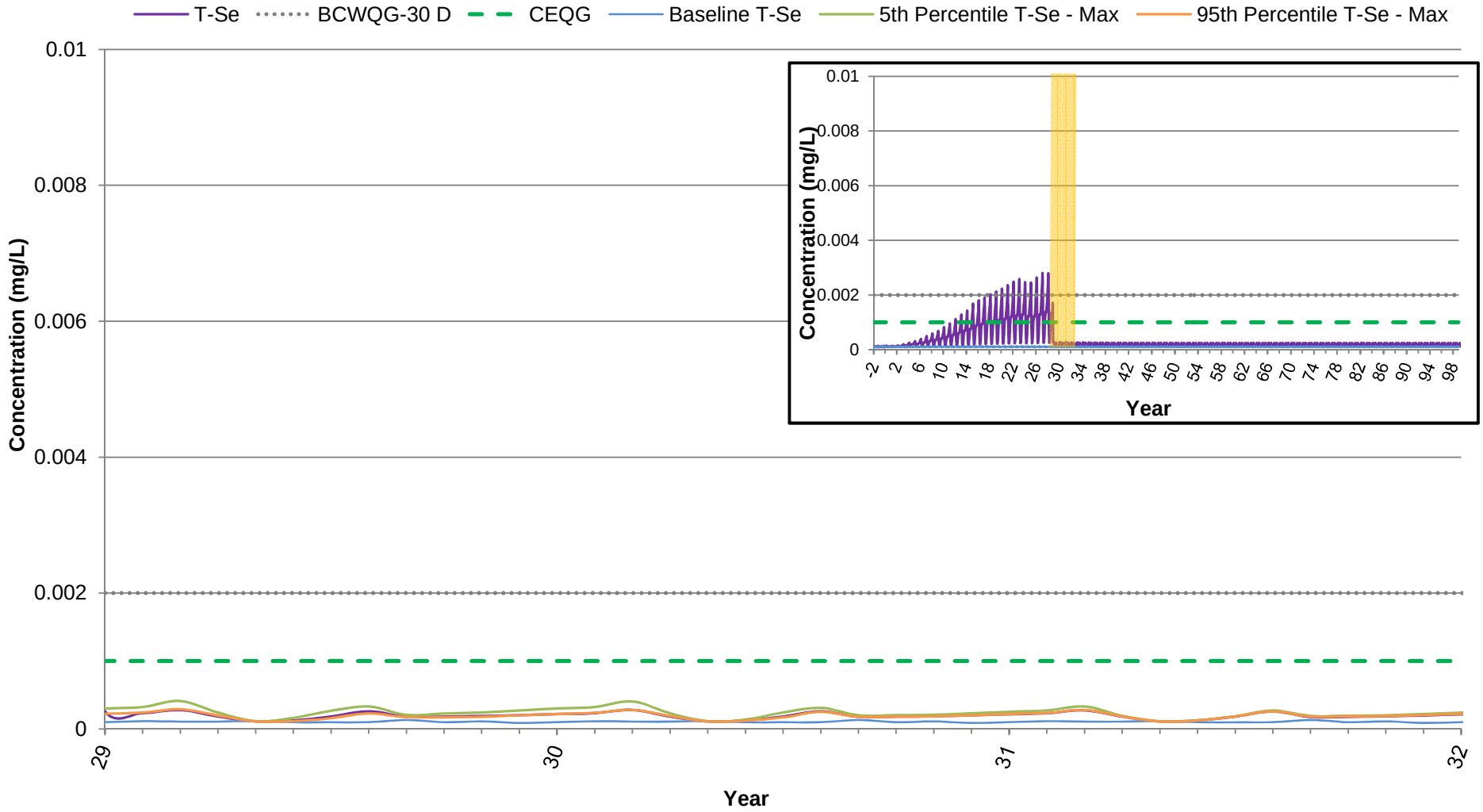
VARIABLE CASE WATER QUALITY MODEL
PREDICTED TOTAL SELENIUM CONCENTRATIONS
HM - OPERATIONS II

Knight Piésold CONSULTING

P/A NO. VA101-458/14 | REF. NO. 3

FIGURE F1.Se-B | REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG GUIDELINES ARE FIXED VALUES.
2. VARIABLE CASE CLIMATE INPUTS RUN FOR YEARS 29 THROUGH 30 - SEE INSET FOR RELATIVE TIME FRAME (HIGHLIGHTED IN ORANGE).

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

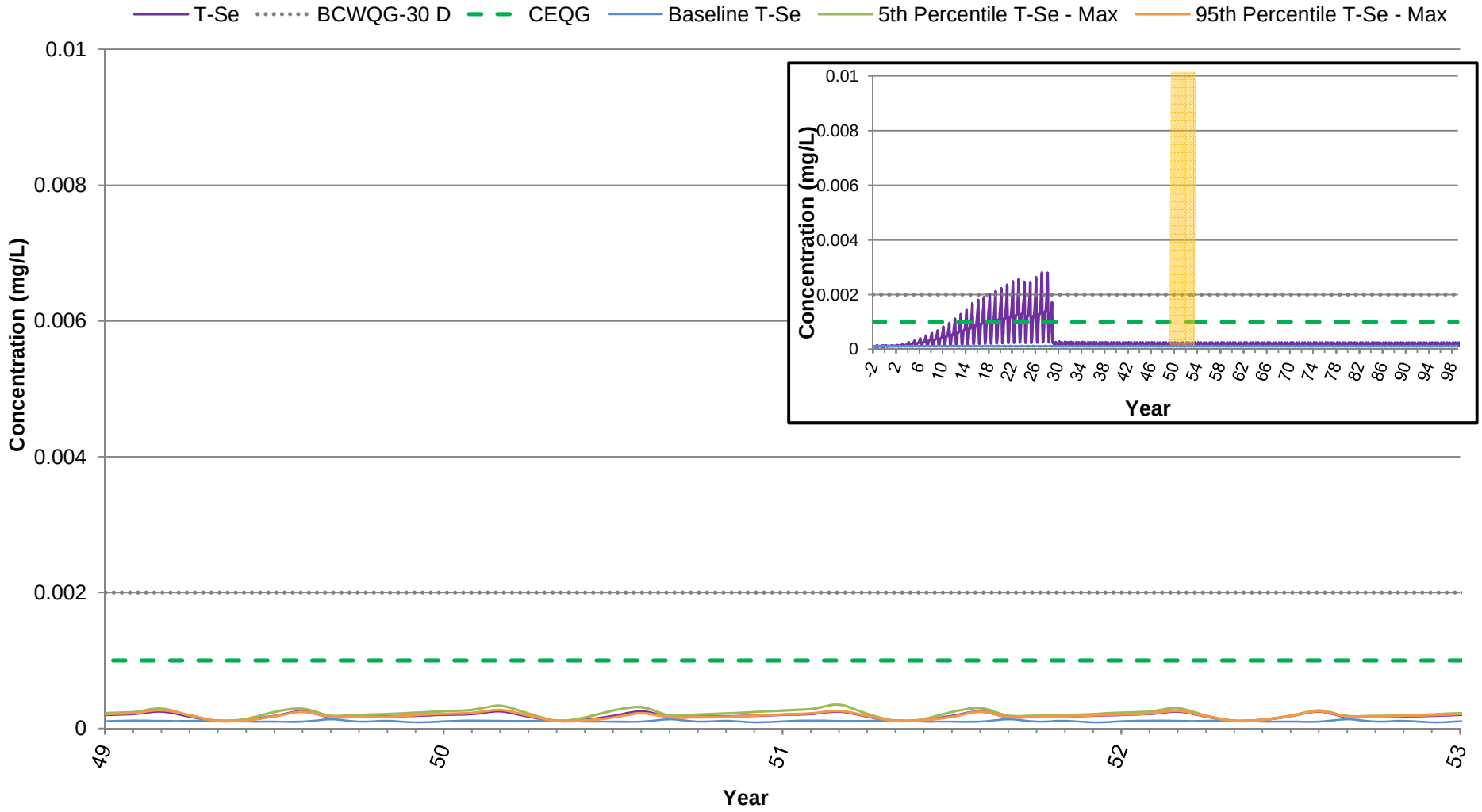
VARIABLE CASE WATER QUALITY MODEL
PREDICTED TOTAL SELENIUM CONCENTRATIONS
HM - CLOSURE

Knight Piésold CONSULTING

P/A NO. VA101-458/14 | REF. NO. 3

FIGURE F1.Se-C | REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG GUIDELINES ARE FIXED VALUES.
2. VARIABLE CASE CLIMATE INPUTS RUN FOR YEARS 50 THROUGH 51 - SEE INSET FOR RELATIVE TIME FRAME (HIGHLIGHTED IN ORANGE).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

VARIABLE CASE WATER QUALITY MODEL
PREDICTED TOTAL SELENIUM CONCENTRATIONS
HM - POST CLOSURE

Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

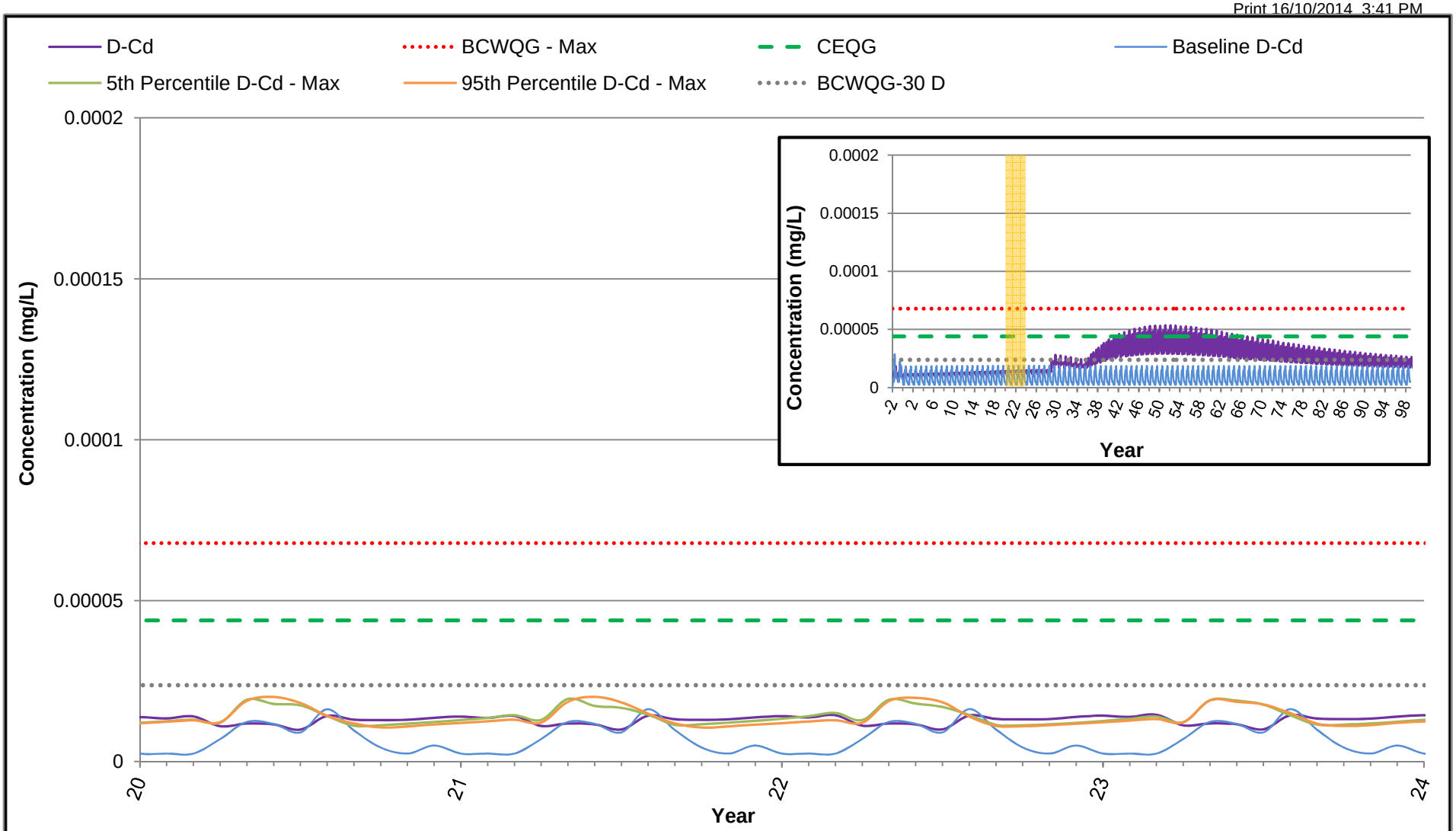
FIGURE F1.Se-D

REV 0

APPENDIX F2

HARPER CREEK BELOW T-CREEK (HT)

(Pages F2-1 to F2-12)



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS DEPENDENT GUIDELINES.
2. THE BASELINE DATA PLOTTED AND USED FOR GUIDELINES CALCULATIONS IS FROM H2 (BASELINE HARDNESS EQUALS 38 mg/L)
3. VARIABLE CASE CLIMATE INPUTS RUN FOR YEARS 21 THROUGH 22 - SEE INSET FOR RELATIVE TIME FRAME (HIGHLIGHTED IN ORANGE).

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

VARIABLE CASE WATER QUALITY MODEL
PREDICTED DISSOLVED CADMIUM CONCENTRATIONS
HT - OPERATIONS I

Knight Piésold CONSULTING

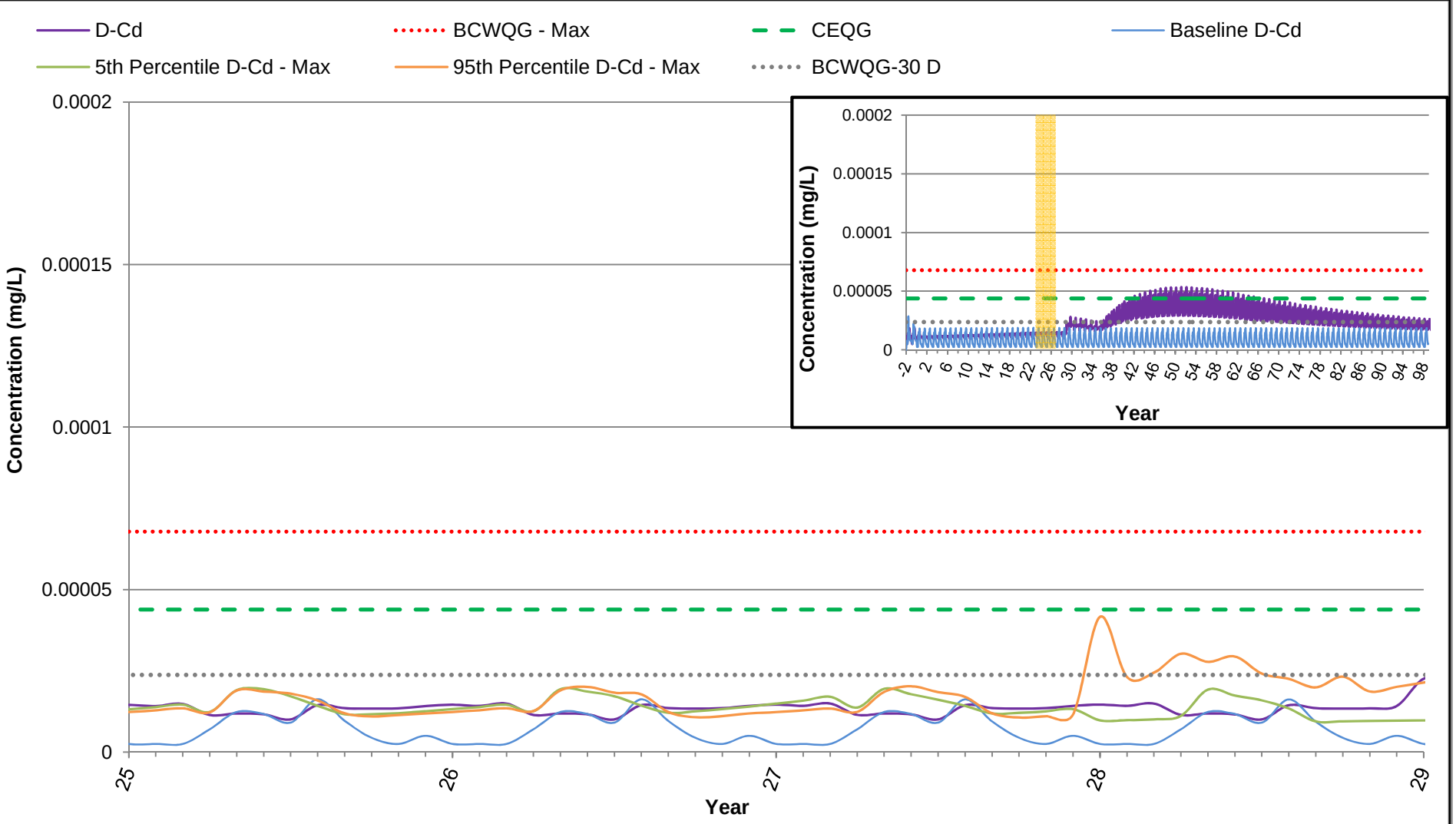
P/A NO. VA101-458/14

REF. NO. 3

FIGURE F2.Cd-A

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	LA	JEM	-



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS DEPENDENT GUIDELINES.
2. THE BASELINE DATA PLOTTED AND USED FOR GUIDELINES CALCULATIONS IS FROM H2 (BASELINE HARDNESS EQUALS 38 mg/L)
3. VARIABLE CASE CLIMATE INPUTS RUN FOR YEARS 26 THROUGH 27 - SEE INSET FOR RELATIVE TIME FRAME (HIGHLIGHTED IN ORANGE).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	LA	JEM	-

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

VARIABLE CASE WATER QUALITY MODEL
PREDICTED DISSOLVED CADMIUM CONCENTRATIONS
HT - OPERATIONS II

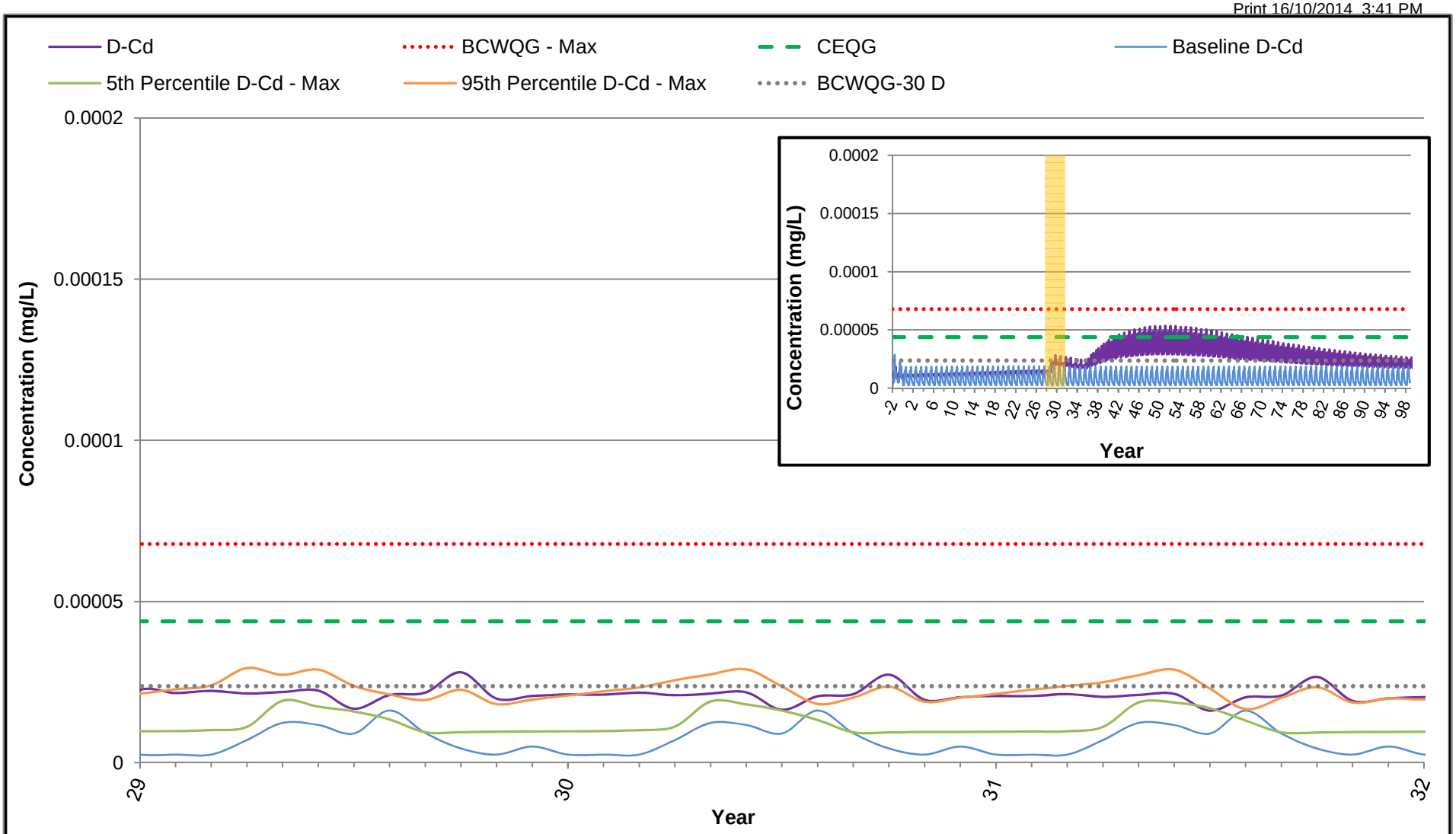
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE F2.Cd-B

REV 0



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS DEPENDENT GUIDELINES.
2. THE BASELINE DATA PLOTTED AND USED FOR GUIDELINES CALCULATIONS IS FROM H2 (BASELINE HARDNESS EQUALS 38 mg/L)
3. VARIABLE CASE CLIMATE INPUTS RUN FOR YEARS 21 THROUGH 22 - SEE INSET FOR RELATIVE TIME FRAME (HIGHLIGHTED IN ORANGE).

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

VARIABLE CASE WATER QUALITY MODEL
PREDICTED DISSOLVED CADMIUM CONCENTRATIONS
HT - CLOSURE

Knight Piésold CONSULTING

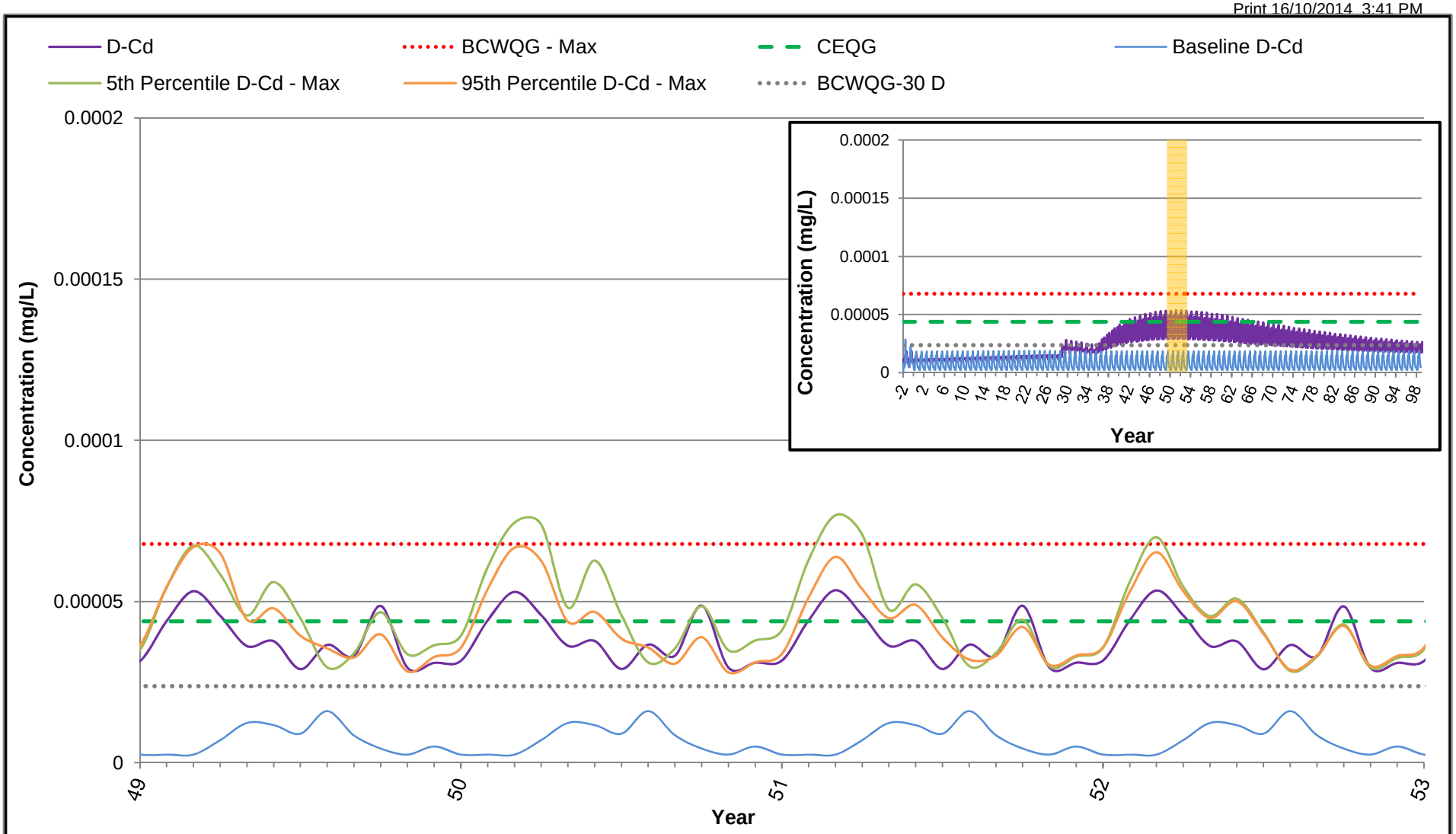
P/A NO. VA101-458/14

REF. NO. 3

FIGURE F2.Cd-C

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	LA	JEM	-



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS DEPENDENT GUIDELINES.
2. THE BASELINE DATA PLOTTED AND USED FOR GUIDELINES CALCULATIONS IS FROM H2 (BASELINE HARDNESS EQUALS 38 mg/L)
3. VARIABLE CASE CLIMATE INPUTS RUN FOR YEARS 21 THROUGH 22 - SEE INSET FOR RELATIVE TIME FRAME (HIGHLIGHTED IN ORANGE).

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

VARIABLE CASE WATER QUALITY MODEL
PREDICTED DISSOLVED CADMIUM CONCENTRATIONS
HT - POST CLOSURE

Knight Piésold CONSULTING

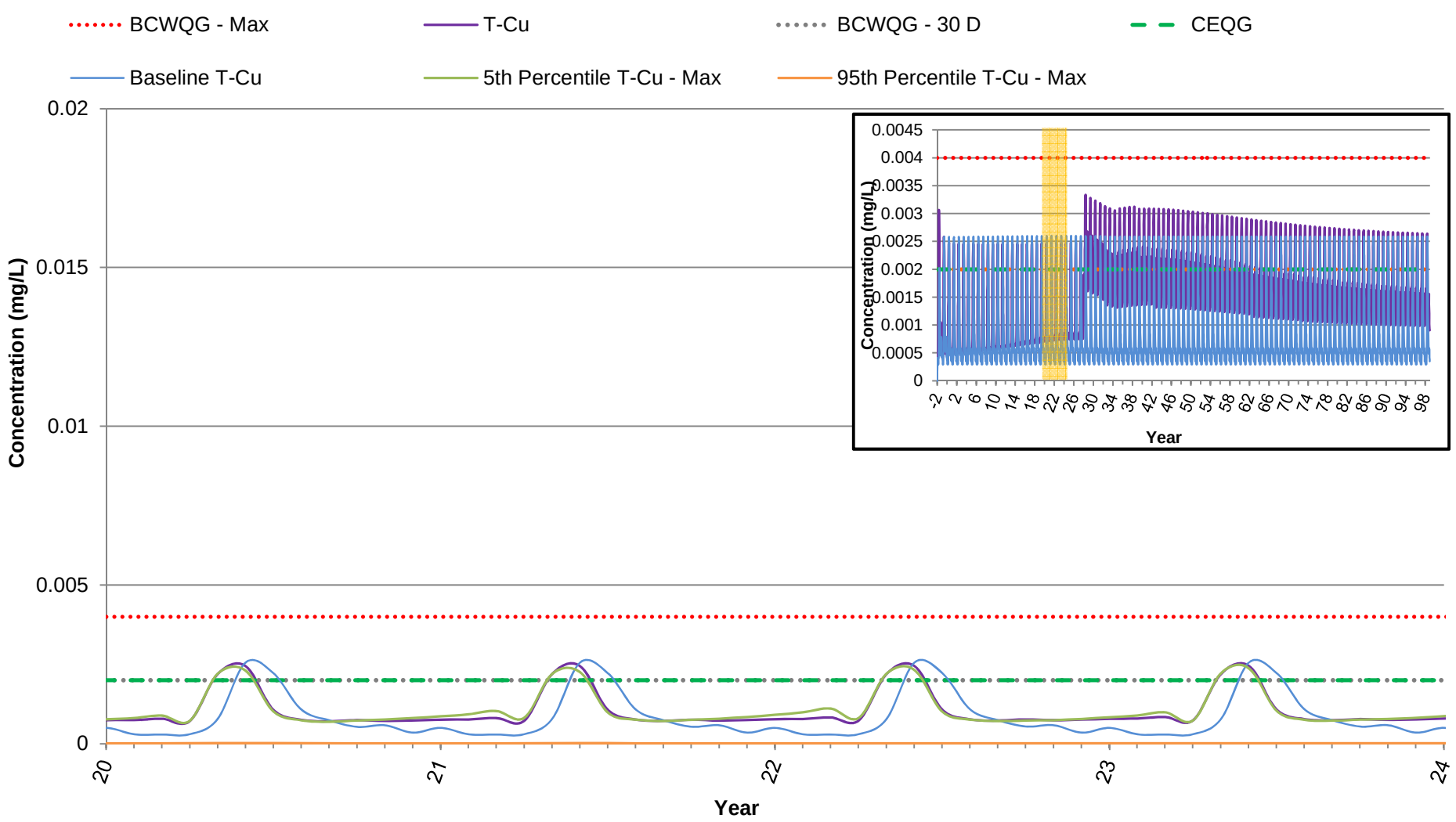
P/A NO. VA101-458/14

REF. NO. 3

FIGURE F2.Cd-D

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	LA	JEM	-



NOTES:

1. THE BCWQG-30 DAY AVERAGE, BCWQG-MAX AND CEQG GUIDELINES ARE HARDNESS DEPENDENT GUIDELINES.
2. THE BASELINE DATA PLOTTED AND USED FOR GUIDELINES CALCULATIONS IS FROM H2 (BASELINE HARDNESS EQUALS 38 mg/L)
3. VARIABLE CASE CLIMATE INPUTS RUN FOR YEARS 21 THROUGH 22 - SEE INSET FOR RELATIVE TIME FRAME (HIGHLIGHTED IN ORANGE).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	LA	JEM	-

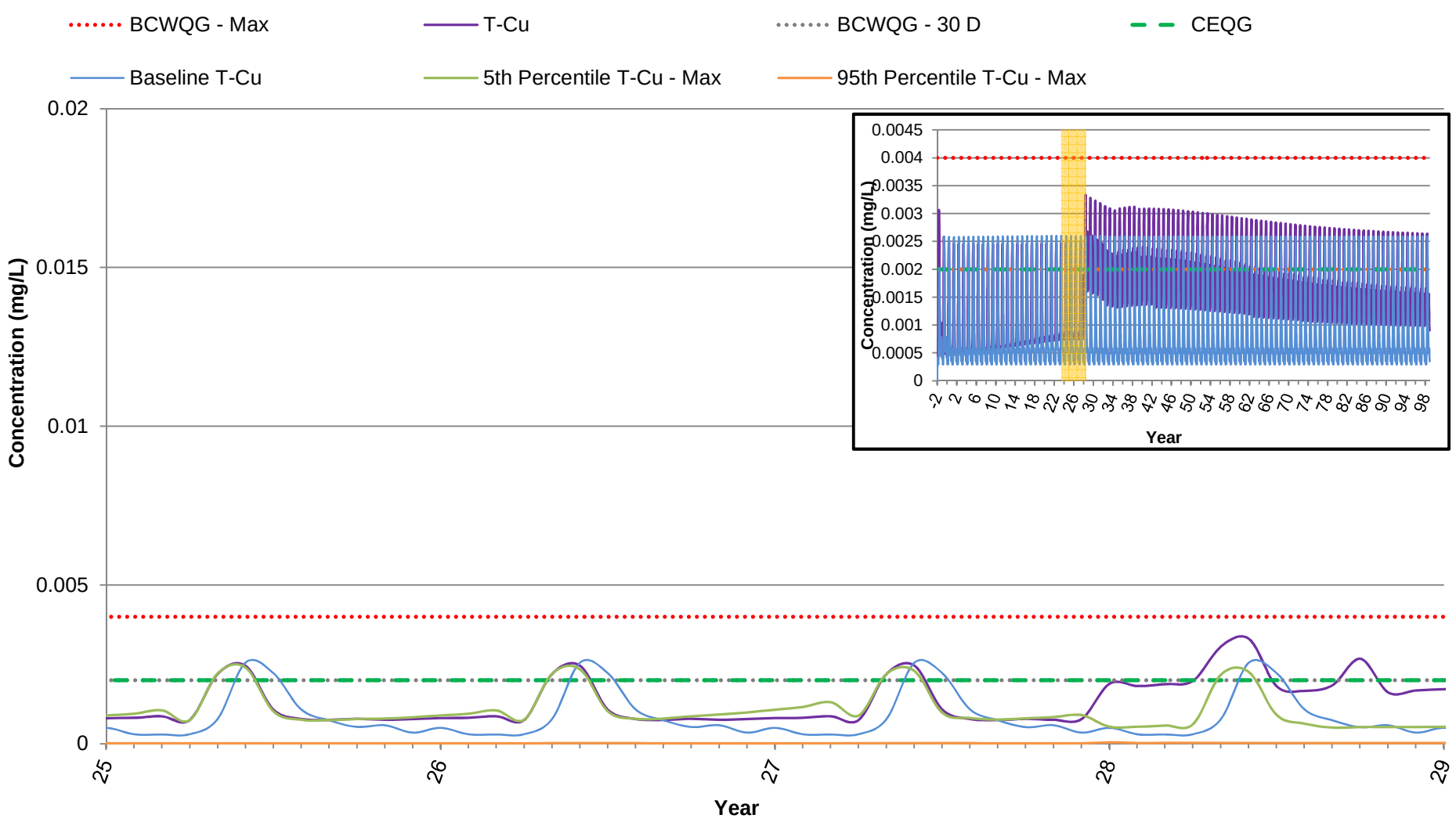
HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

VARIABLE CASE WATER QUALITY MODEL
PREDICTED TOTAL COPPER CONCENTRATIONS
HT - OPERATIONS I

Knight Piésold CONSULTING

P/A NO. VA101-458/14 | REF. NO. 3

FIGURE F2.Cu-A | REV 0



NOTES:

1. THE BCWQG-30 DAY AVERAGE, BCWQG-MAX AND CEQG GUIDELINES ARE HARDNESS DEPENDENT GUIDELINES.
2. THE BASELINE DATA PLOTTED AND USED FOR GUIDELINES CALCULATIONS IS FROM H2 (BASELINE HARDNESS EQUALS 38 mg/L)
3. VARIABLE CASE CLIMATE INPUTS RUN FOR YEARS 26 THROUGH 27 - SEE INSET FOR RELATIVE TIME FRAME (HIGHLIGHTED IN ORANGE).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	LA	JEM	-

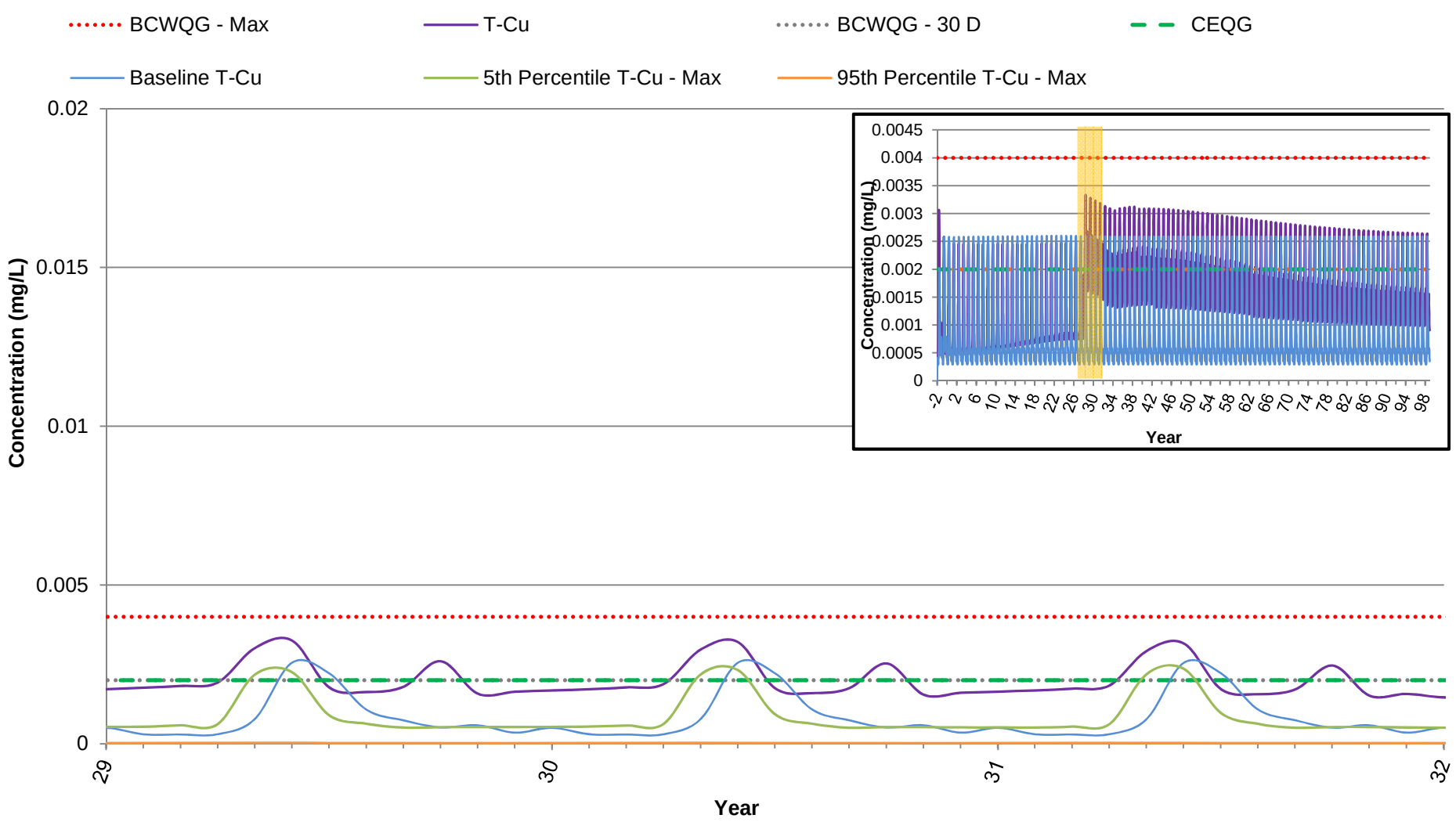
HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

**VARIABLE CASE WATER QUALITY MODEL
PREDICTED TOTAL COPPER CONCENTRATIONS
HT - OPERATIONS II**

Knight Piésold CONSULTING

P/A NO. VA101-458/14 | REF. NO. 3

FIGURE F2.Cu-B | REV 0



NOTES:

1. THE BCWQG-30 DAY AVERAGE, BCWQG-MAX AND CEQG GUIDELINES ARE HARDNESS DEPENDENT GUIDELINES.
2. THE BASELINE DATA PLOTTED AND USED FOR GUIDELINES CALCULATIONS IS FROM H2 (BASELINE HARDNESS EQUALS 38 mg/L)
3. VARIABLE CASE CLIMATE INPUTS RUN FOR YEARS 29 THROUGH 30 - SEE INSET FOR RELATIVE TIME FRAME (HIGHLIGHTED IN ORANGE).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	LA	JEM	-

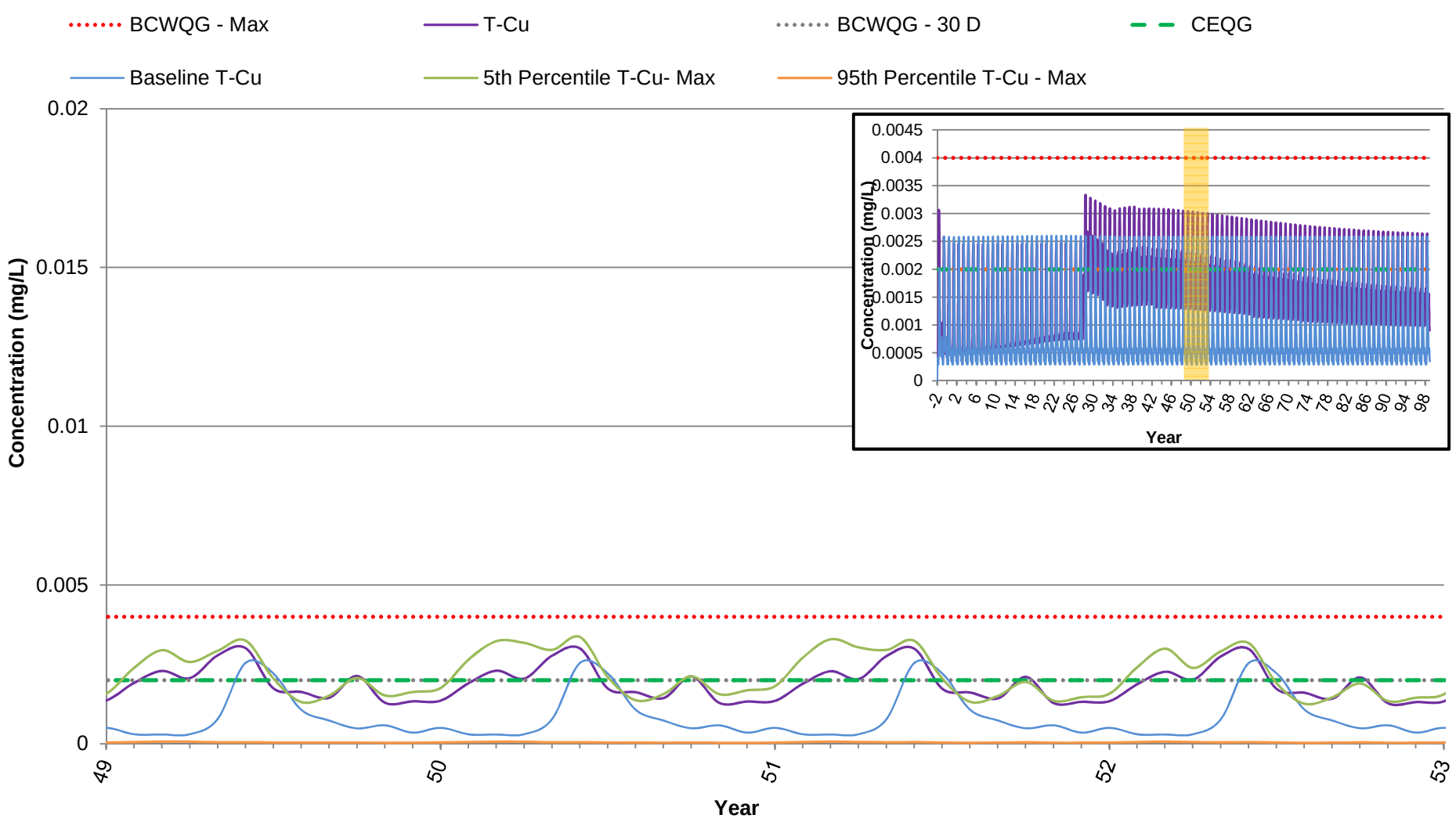
HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

**VARIABLE CASE WATER QUALITY MODEL
PREDICTED TOTAL COPPER CONCENTRATIONS
HT - CLOSURE**

Knight Piésold CONSULTING

P/A NO. VA101-458/14 | REF. NO. 3

FIGURE F2.Cu-C | REV 0



NOTES:

1. THE BCWQG-30 DAY AVERAGE, BCWQG-MAX AND CEQG GUIDELINES ARE HARDNESS DEPENDENT GUIDELINES.
2. THE BASELINE DATA PLOTTED AND USED FOR GUIDELINES CALCULATIONS IS FROM H2 (BASELINE HARDNESS EQUALS 38 mg/L)
3. VARIABLE CASE CLIMATE INPUTS RUN FOR YEARS 50 THROUGH 51 - SEE INSET FOR RELATIVE TIME FRAME (HIGHLIGHTED IN ORANGE).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	LA	JEM	-

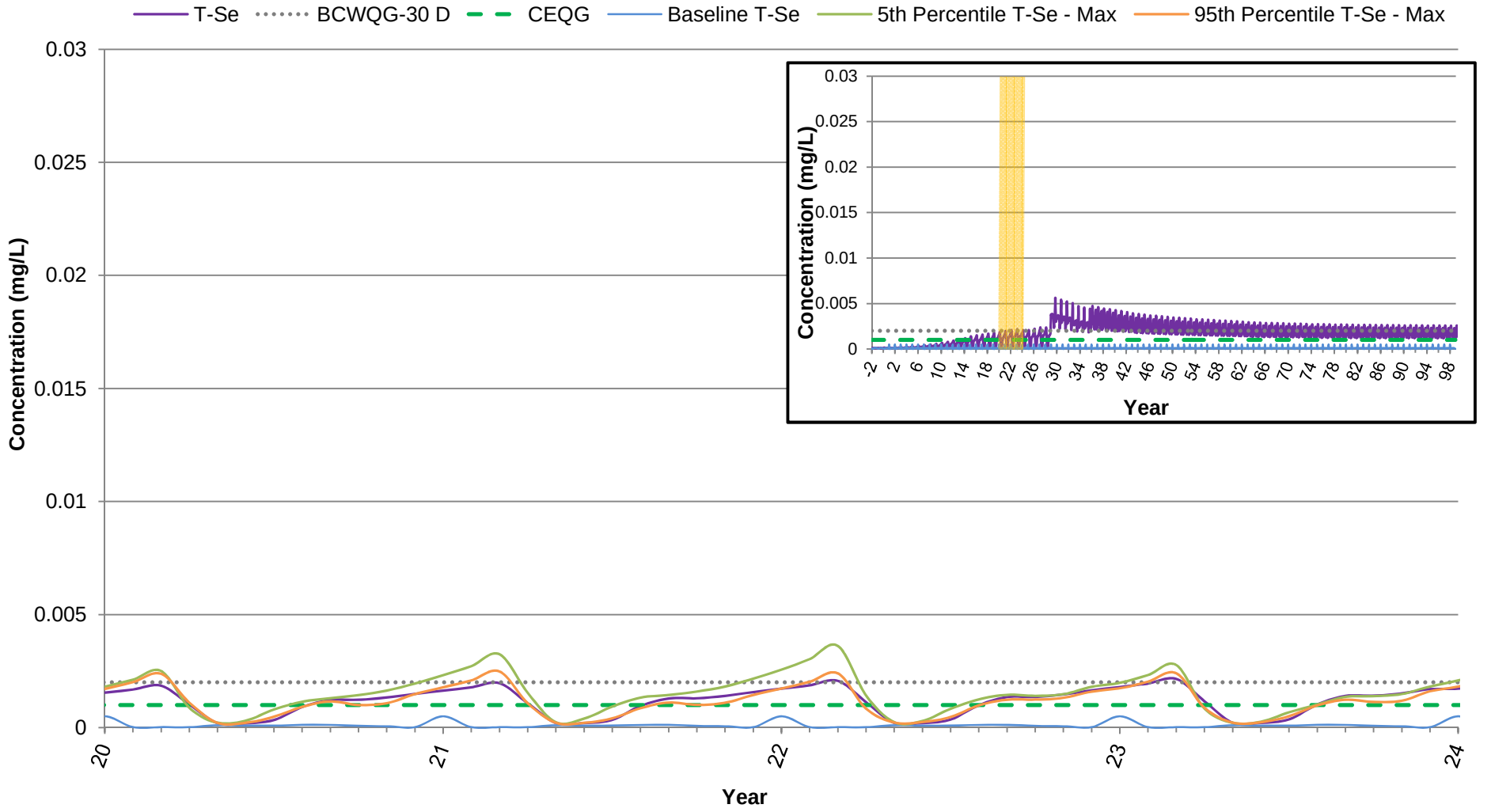
HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

VARIABLE CASE WATER QUALITY MODEL
PREDICTED TOTAL COPPER CONCENTRATIONS
HT - POST CLOSURE

Knight Piésold CONSULTING

P/A NO. VA101-458/14 | REF. NO. 3

FIGURE F2.Cu-D | REV 0



NOTES:

1. THE BCWQG-MAX AND CEQG GUIDELINES ARE FIXED VALUES.
2. VARIABLE CASE CLIMATE INPUTS RUN FOR YEARS 21 THROUGH 22 - SEE INSET FOR RELATIVE TIME FRAME (HIGHLIGHTED IN ORANGE).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

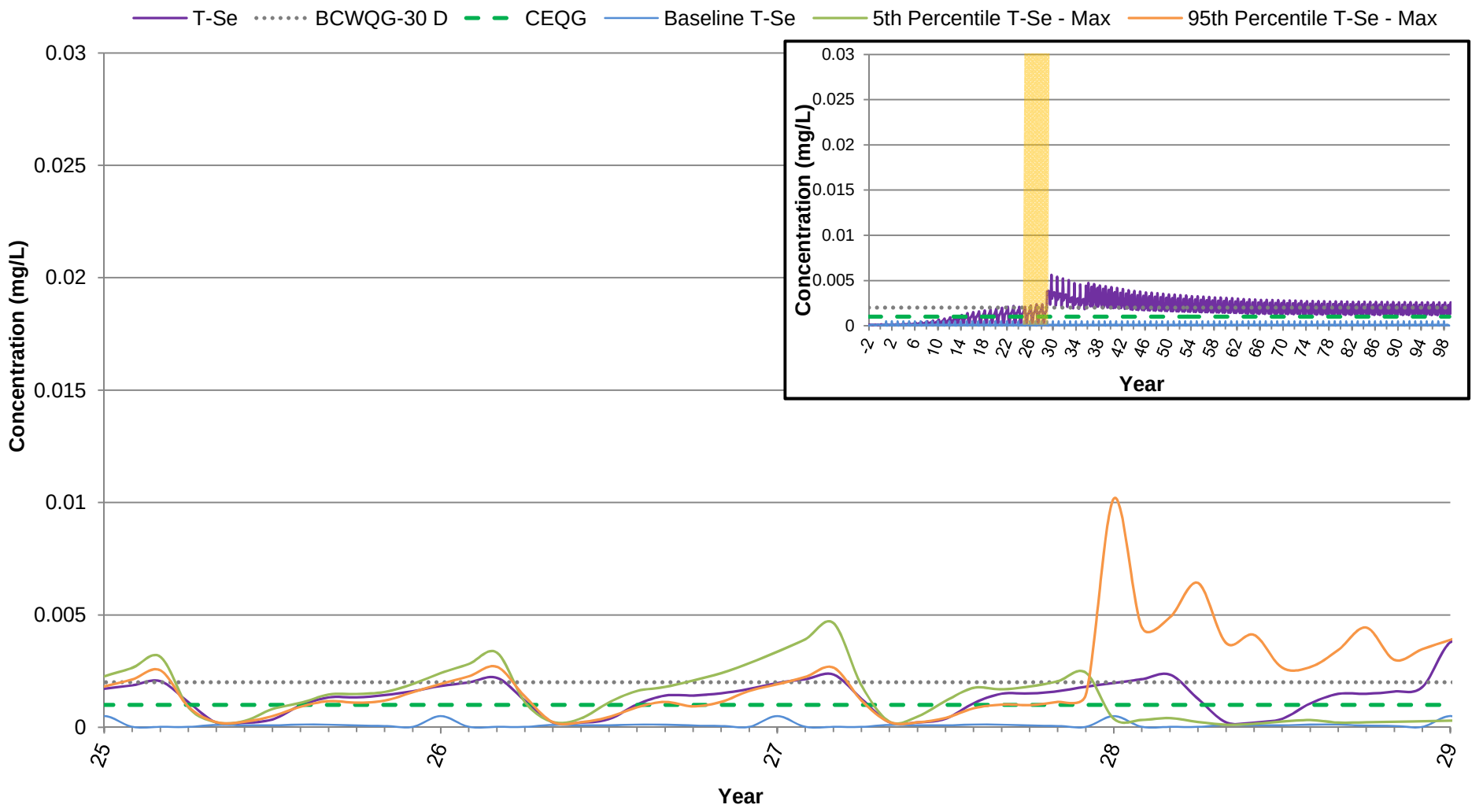
HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

**VARIABLE CASE WATER QUALITY MODEL
PREDICTED TOTAL SELENIUM CONCENTRATIONS
HT - OPERATIONS I**

Knight Piésold CONSULTING

P/A NO. VA101-458/14 | REF. NO. 3

FIGURE F2.Se-A | REV 0



NOTES:

1. THE BCWQG-MAX AND CEQG GUIDELINES ARE FIXED VALUES.
2. VARIABLE CASE CLIMATE INPUTS RUN FOR YEARS 26 THROUGH 27 - SEE INSET FOR RELATIVE TIME FRAME (HIGHLIGHTED IN ORANGE).

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

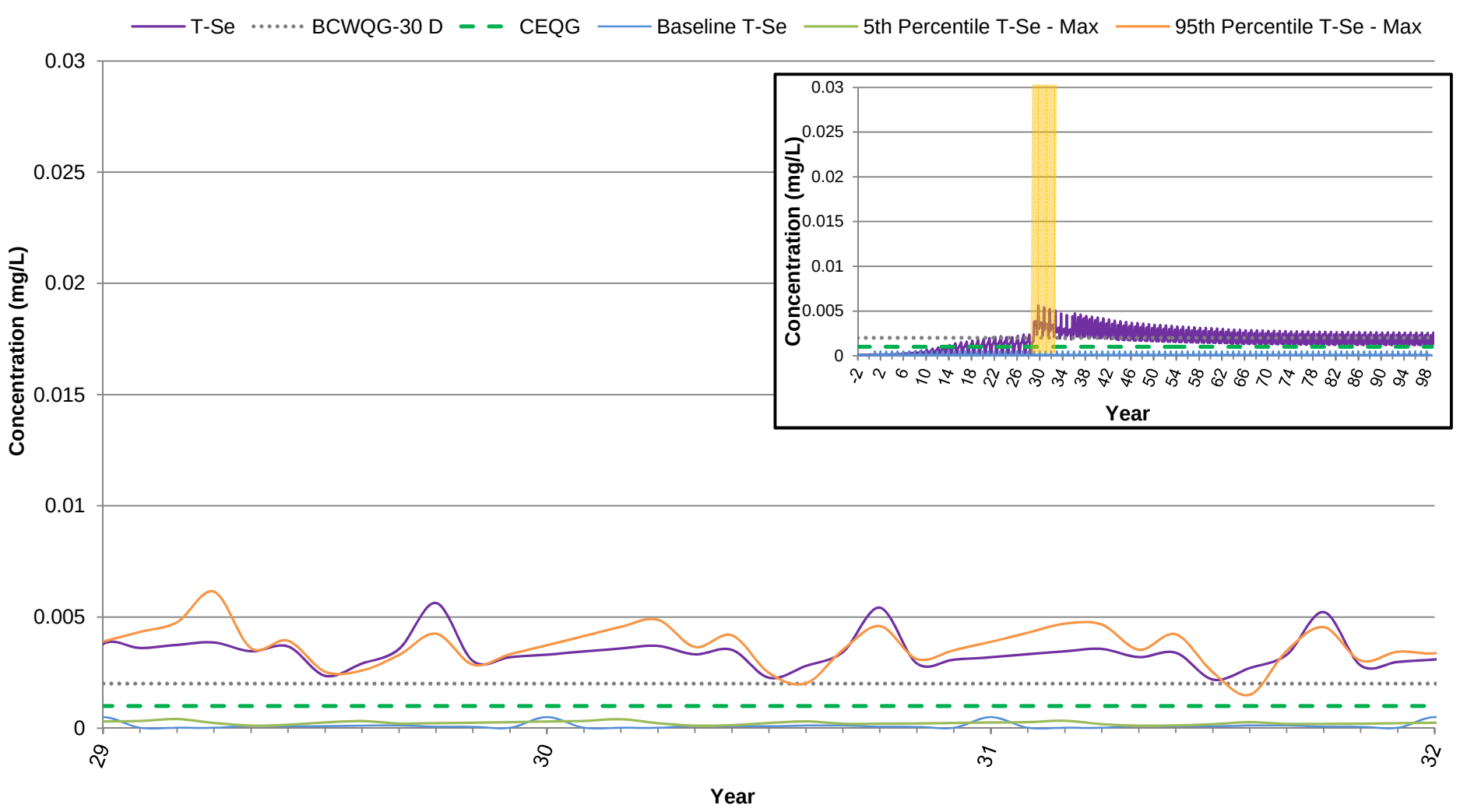
**VARIABLE CASE WATER QUALITY MODEL
PREDICTED TOTAL SELENIUM CONCENTRATIONS
HT - OPERATIONS II**

Knight Piésold CONSULTING

P/A NO. VA101-458/14 | REF. NO. 3

FIGURE F2.Se-B | REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG GUIDELINES ARE FIXED VALUES.
2. VARIABLE CASE CLIMATE INPUTS RUN FOR YEARS 29 THROUGH 30 - SEE INSET FOR RELATIVE TIME FRAME (HIGHLIGHTED IN ORANGE).

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

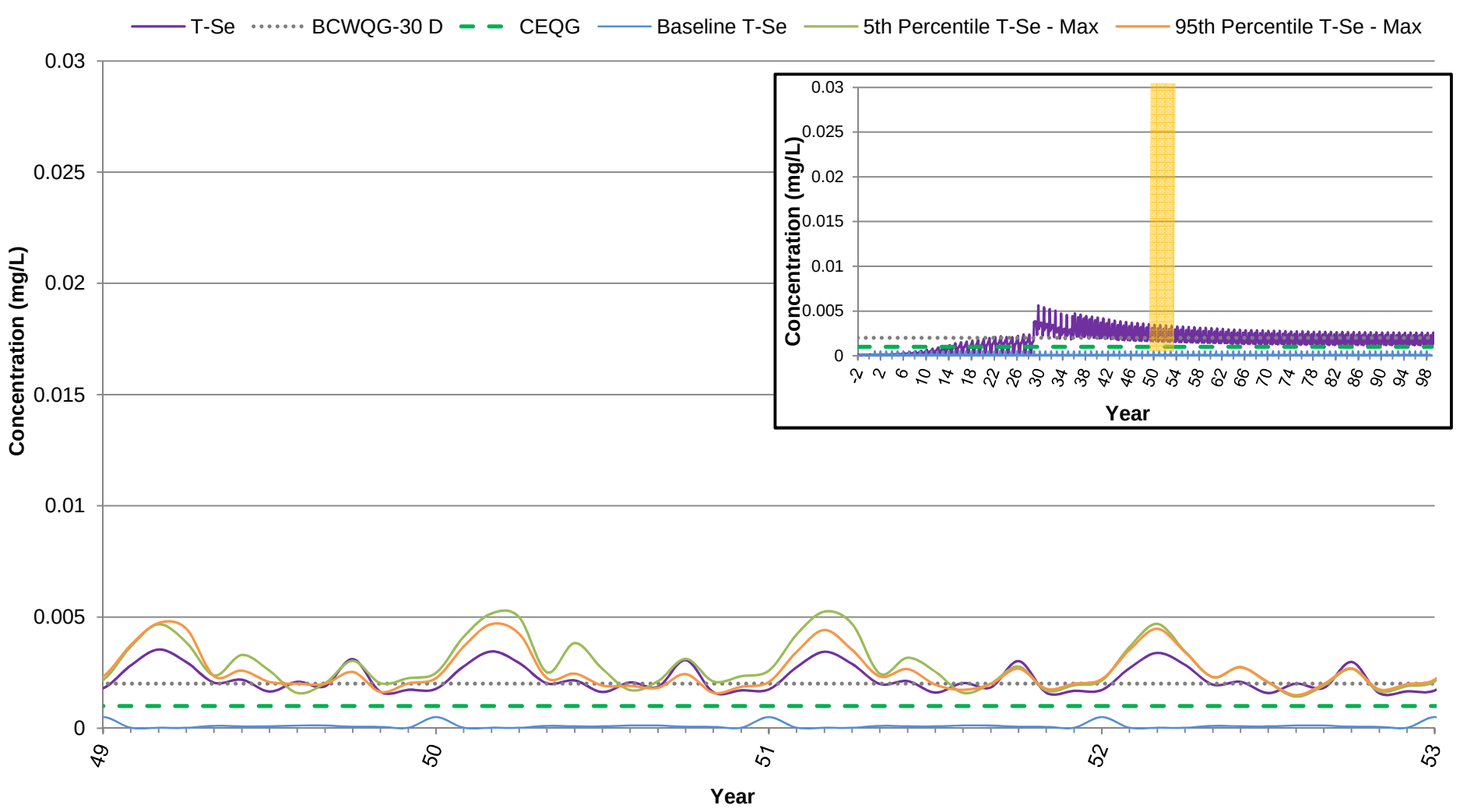
VARIABLE CASE WATER QUALITY MODEL
PREDICTED TOTAL SELENIUM CONCENTRATIONS
HT - CLOSURE

Knight Piésold CONSULTING

P/A NO. VA101-458/14 | REF. NO. 3

FIGURE F2.Se-C | REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG GUIDELINES ARE FIXED VALUES.
2. VARIABLE CASE CLIMATE INPUTS RUN FOR YEARS 50 THROUGH 51 - SEE INSET FOR RELATIVE TIME FRAME (HIGHLIGHTED IN ORANGE).

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

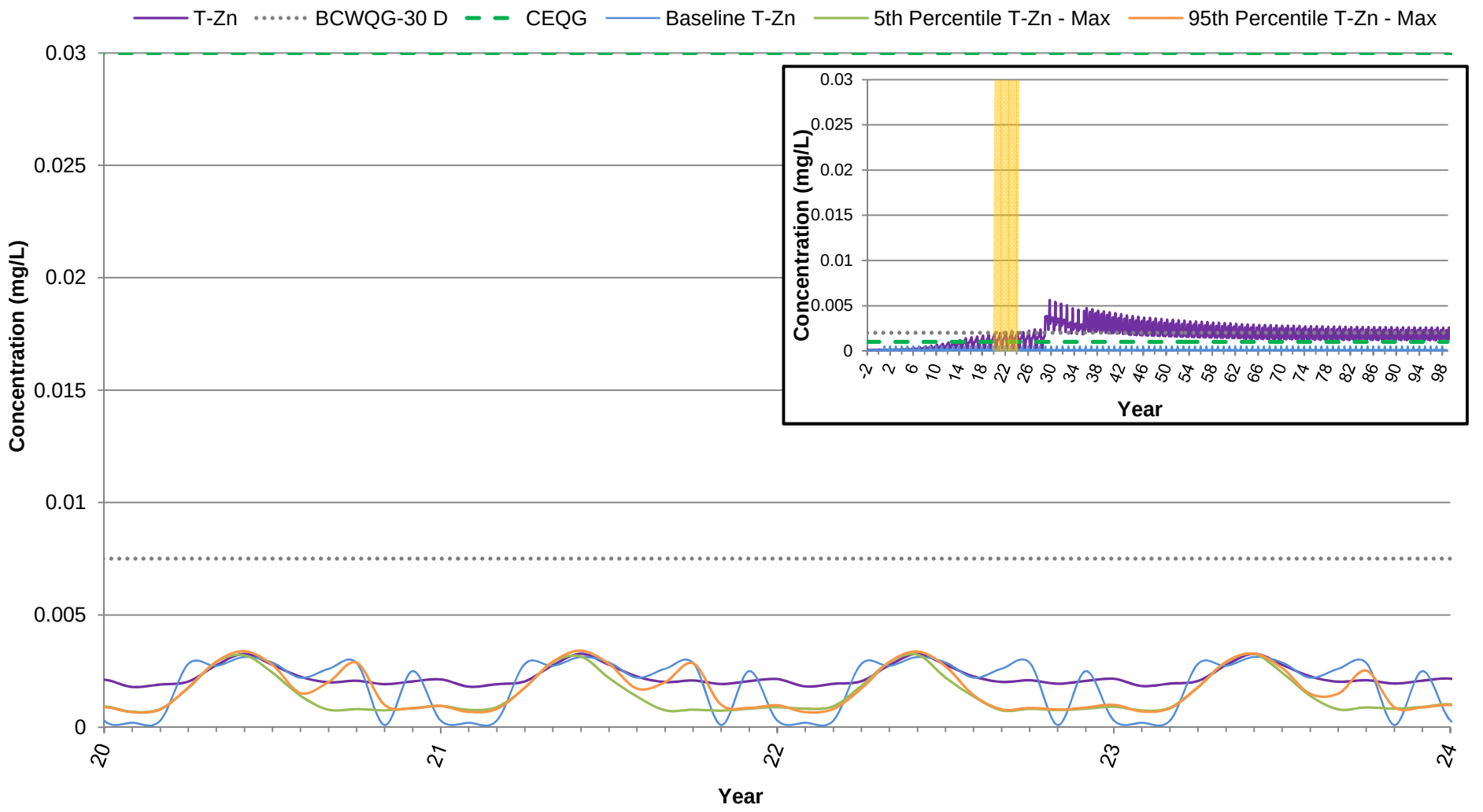
VARIABLE CASE WATER QUALITY MODEL
PREDICTED TOTAL SELENIUM CONCENTRATIONS
HT - POST CLOSURE

Knight Piésold CONSULTING

P/A NO. VA101-458/14 | REF. NO. 3

FIGURE F2.Se-D | REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG GUIDELINES ARE FIXED VALUES.
2. VARIABLE CASE CLIMATE INPUTS RUN FOR YEARS 21 THROUGH 22 - SEE INSET FOR RELATIVE TIME FRAME (HIGHLIGHTED IN ORANGE).

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

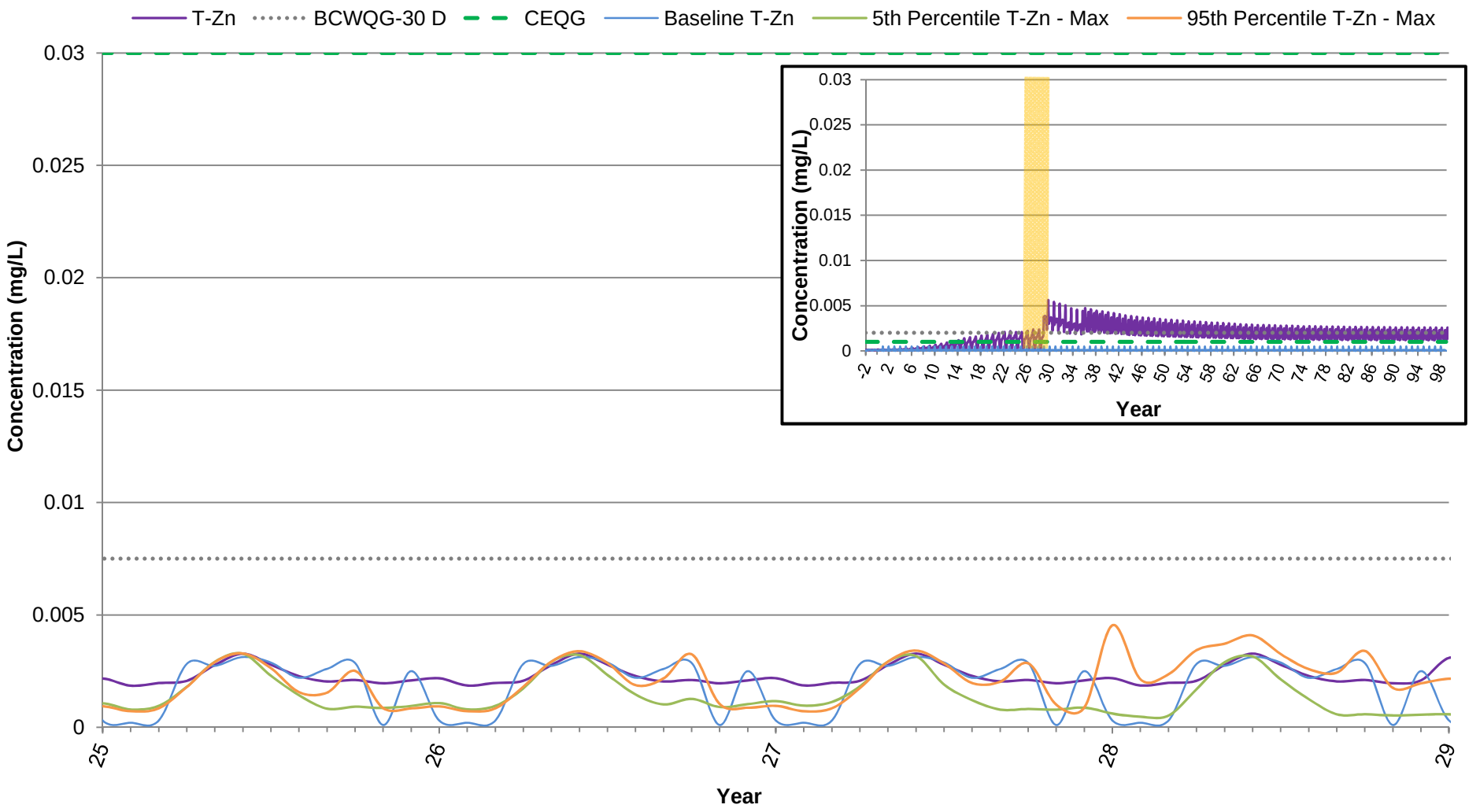
VARIABLE CASE WATER QUALITY MODEL
PREDICTED TOTAL ZINC CONCENTRATIONS
HT - OPERATIONS I

Knight Piésold CONSULTING

P/A NO. VA101-458/14 | REF. NO. 3

FIGURE F2.Zn-A | REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG GUIDELINES ARE FIXED VALUES.
2. VARIABLE CASE CLIMATE INPUTS RUN FOR YEARS 21 THROUGH 22 - SEE INSET FOR RELATIVE TIME FRAME (HIGHLIGHTED IN ORANGE).

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

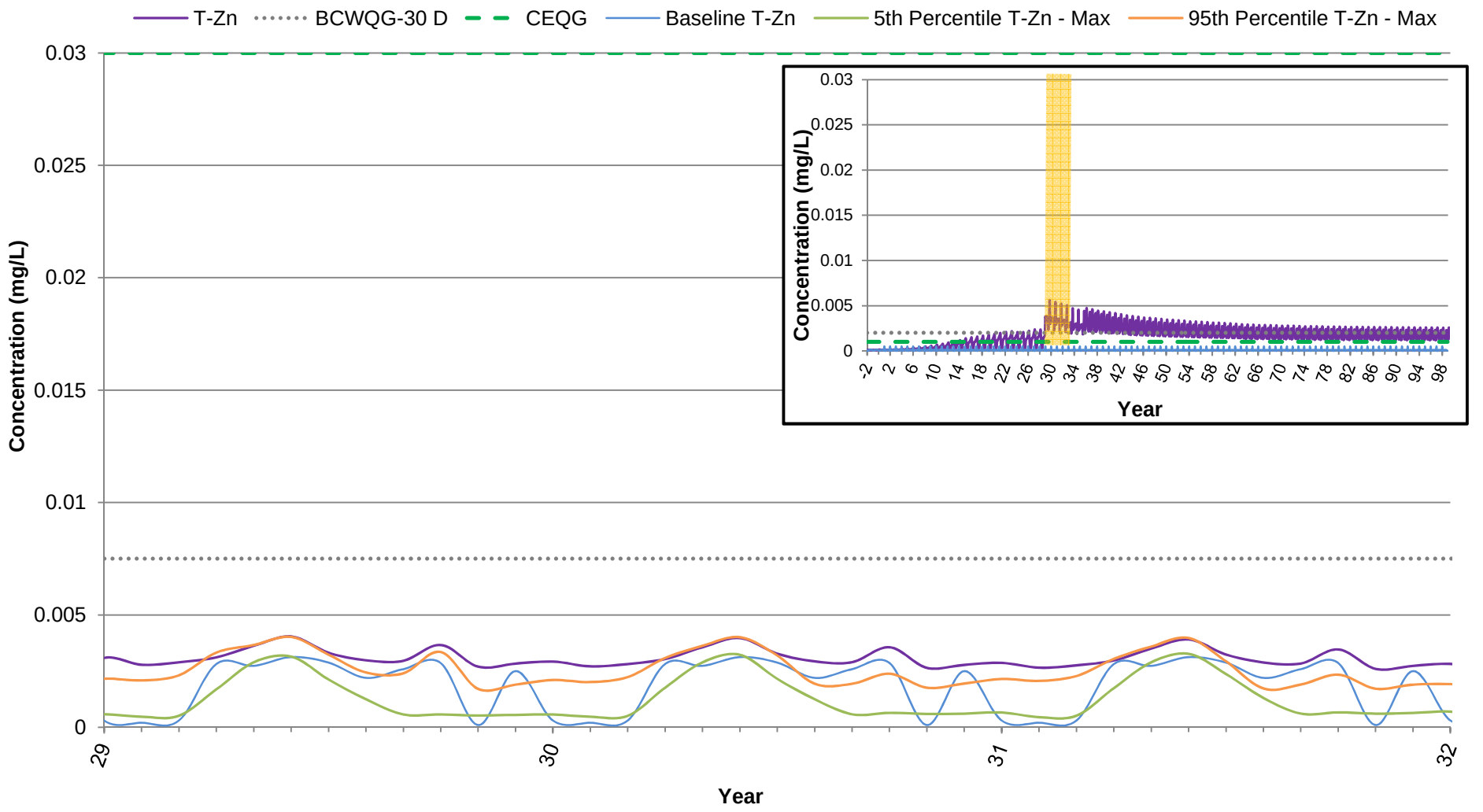
VARIABLE CASE WATER QUALITY MODEL
PREDICTED TOTAL ZINC CONCENTRATIONS
HT - OPERATIONS I

Knight Piésold CONSULTING

P/A NO. VA101-458/14 | REF. NO. 3

FIGURE F2.Zn-B | REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG GUIDELINES ARE FIXED VALUES.
2. VARIABLE CASE CLIMATE INPUTS RUN FOR YEARS 21 THROUGH 22 - SEE INSET FOR RELATIVE TIME FRAME (HIGHLIGHTED IN ORANGE).

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

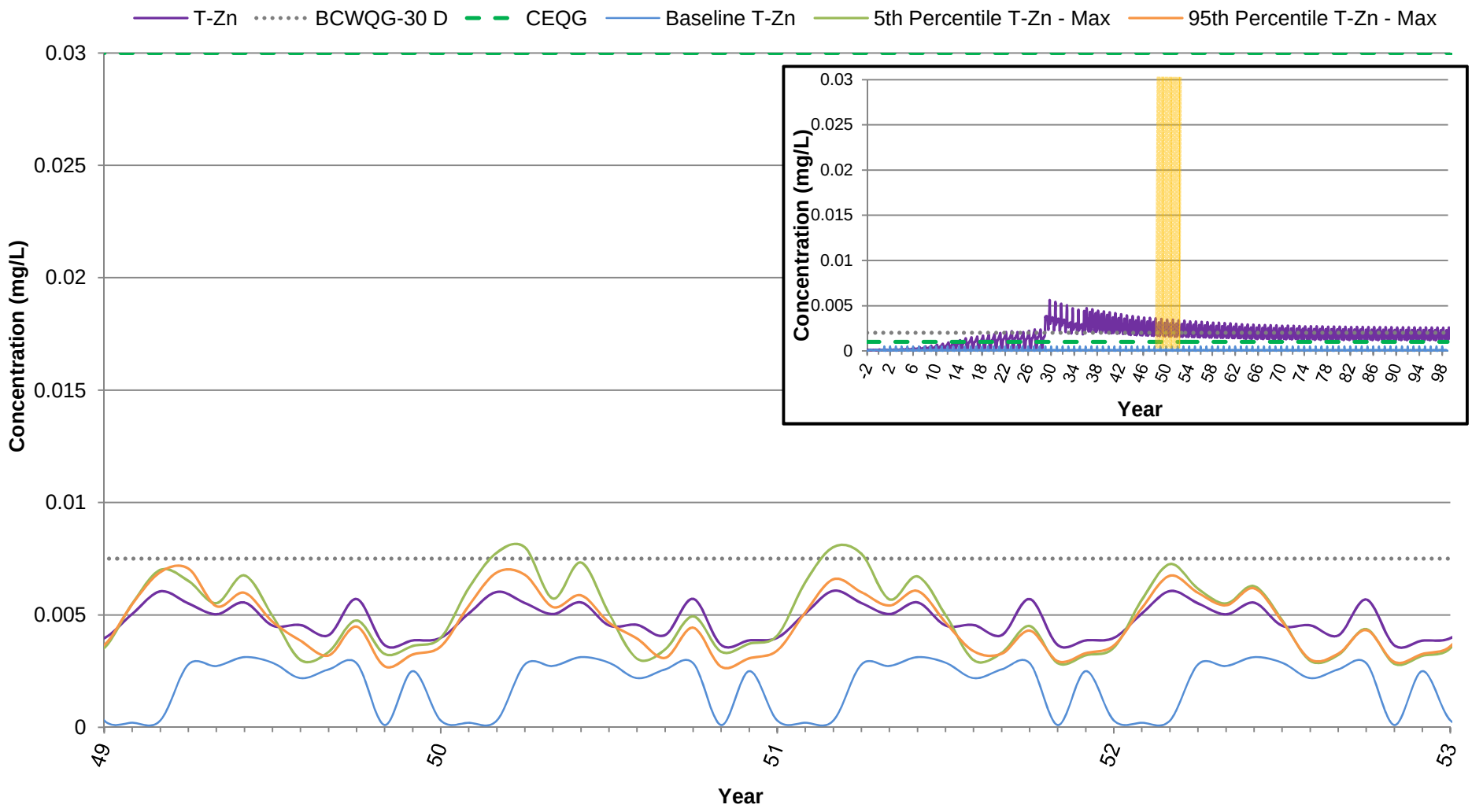
VARIABLE CASE WATER QUALITY MODEL
PREDICTED TOTAL ZINC CONCENTRATIONS
HT - OPERATIONS I

Knight Piésold CONSULTING

P/A NO. VA101-458/14 | REF. NO. 3

FIGURE F2.Zn-C | REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG GUIDELINES ARE FIXED VALUES.
2. VARIABLE CASE CLIMATE INPUTS RUN FOR YEARS 21 THROUGH 22 - SEE INSET FOR RELATIVE TIME FRAME (HIGHLIGHTED IN ORANGE).

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

**VARIABLE CASE WATER QUALITY MODEL
PREDICTED TOTAL ZINC CONCENTRATIONS
HT - OPERATIONS I**

Knight Piésold CONSULTING

P/A NO. VA101-458/14 | REF. NO. 3

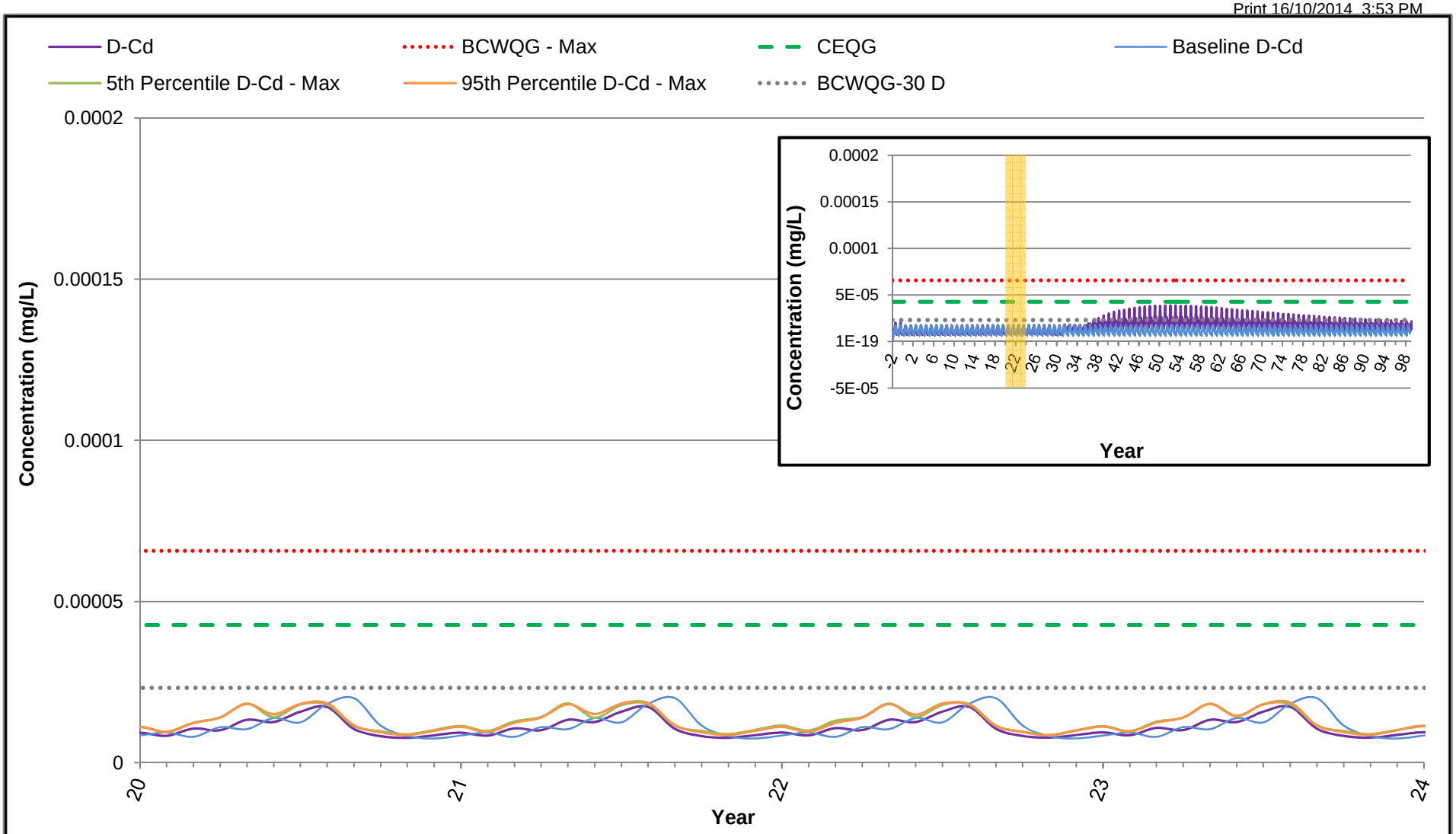
FIGURE F2.Zn-D | REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

APPENDIX F3

HARPER CREEK ABOVE BARRIÈRE RIVER (HB)

(Pages F3-1 to F3-12)



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS DEPENDENT GUIDELINES.
2. THE BASELINE DATA PLOTTED AND USED FOR GUIDELINES CALCULATIONS IS FROM H2 (BASELINE HARDNESS EQUALS 38 mg/L)
3. VARIABLE CASE CLIMATE INPUTS RUN FOR YEARS 21 THROUGH 22 - SEE INSET FOR RELATIVE TIME FRAME (HIGHLIGHTED IN ORANGE).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	18JUL'14	ISSUED WITH REPORT	LA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

VARIABLE CASE WATER QUALITY MODEL
PREDICTED DISSOLVED CADMIUM CONCENTRATIONS
HB - OPERATIONS I

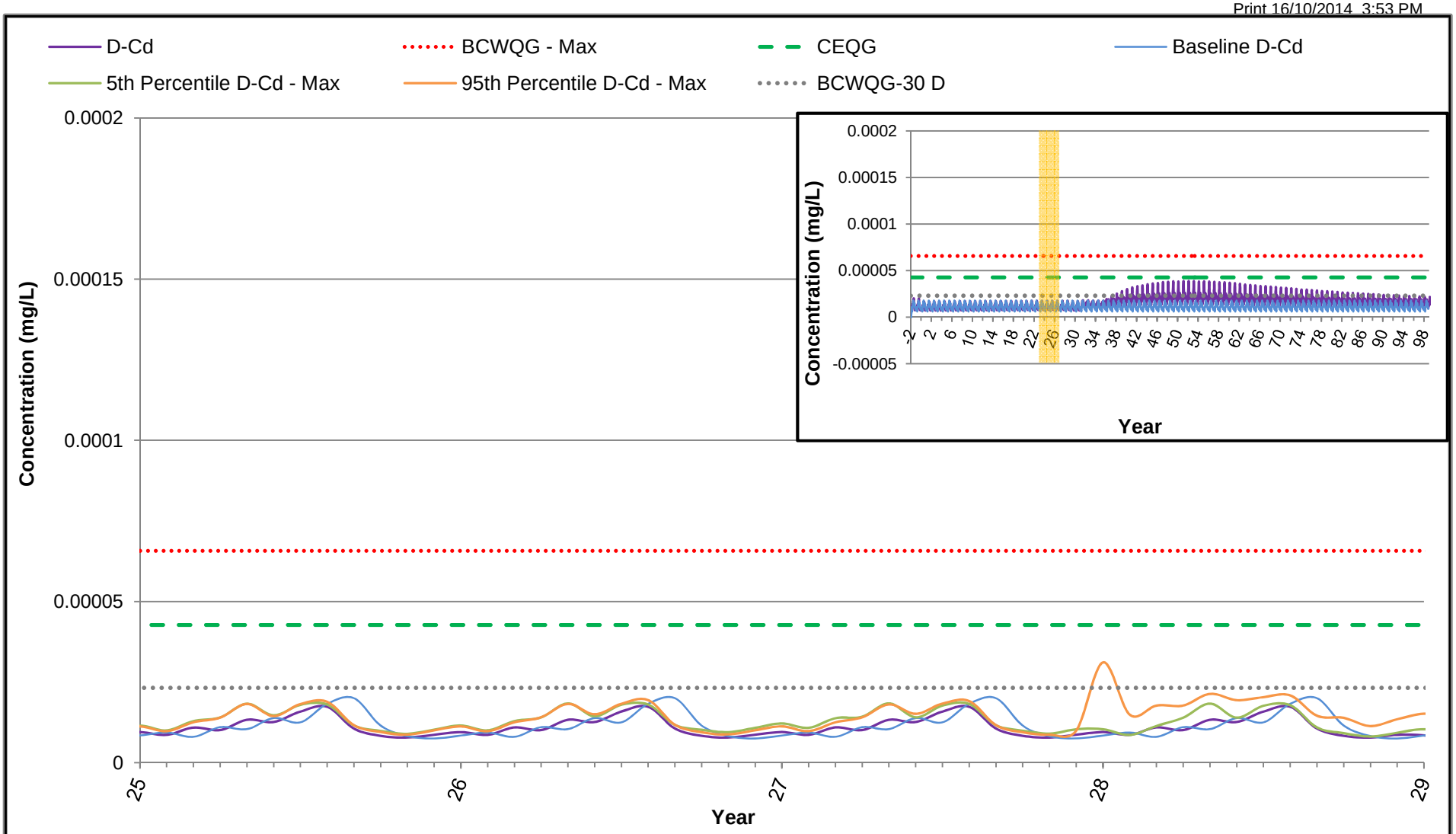
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE F3.Cd-A

REV 0



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS DEPENDENT GUIDELINES.
2. THE BASELINE DATA PLOTTED AND USED FOR GUIDELINES CALCULATIONS IS FROM H2 (BASELINE HARDNESS EQUALS 38 mg/L)
3. VARIABLE CASE CLIMATE INPUTS RUN FOR YEARS 26 THROUGH 27 - SEE INSET FOR RELATIVE TIME FRAME (HIGHLIGHTED IN ORANGE).

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

VARIABLE CASE WATER QUALITY MODEL
PREDICTED DISSOLVED CADMIUM CONCENTRATIONS
HB - OPERATIONS II

Knight Piésold CONSULTING

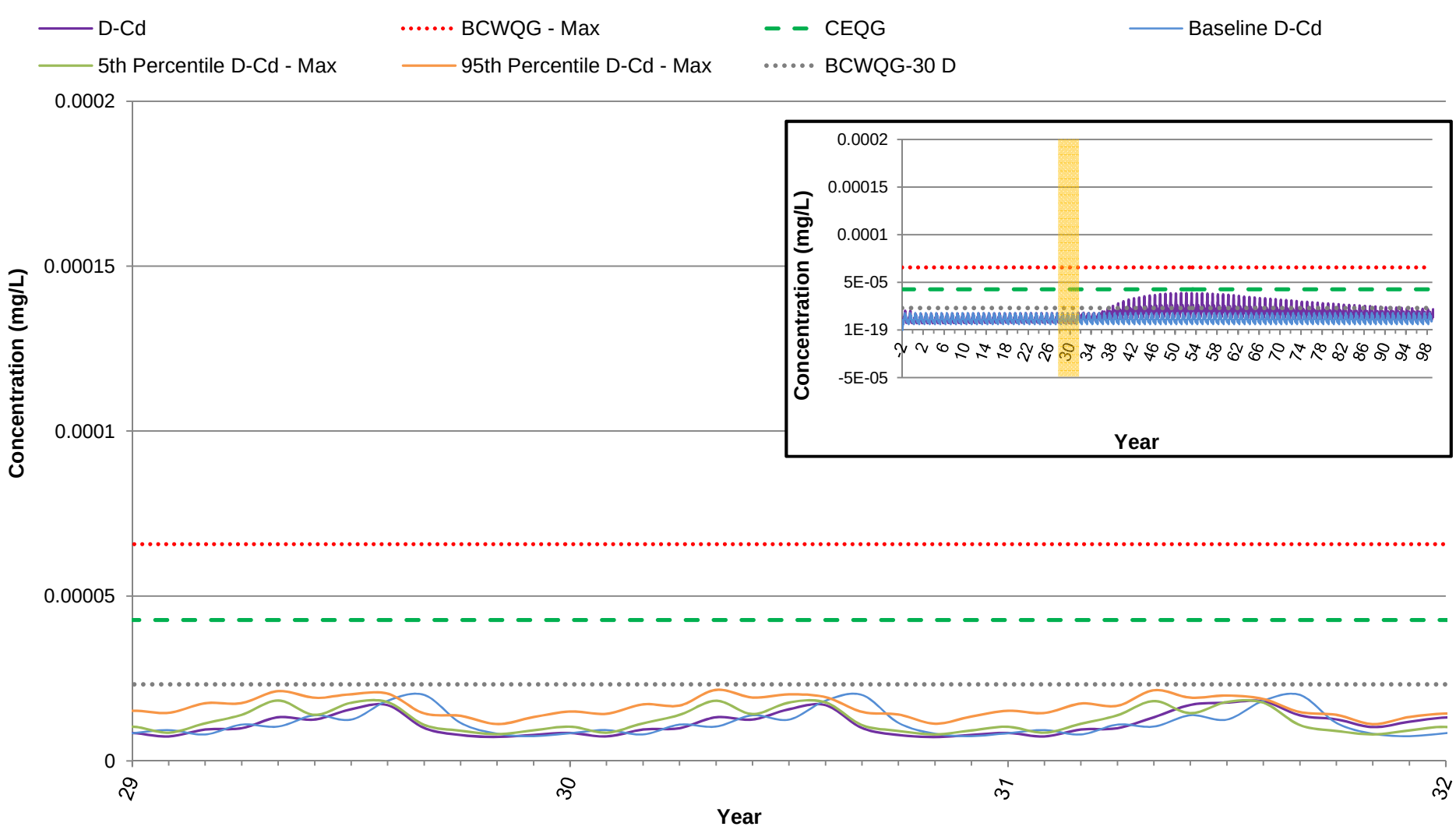
P/A NO. VA101-458/14

REF. NO. 3

FIGURE F3.Cd-B

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	18JUL'14	ISSUED WITH REPORT	LA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS DEPENDENT GUIDELINES.
2. THE BASELINE DATA PLOTTED AND USED FOR GUIDELINES CALCULATIONS IS FROM H2 (BASELINE HARDNESS EQUALS 38 mg/L)
3. VARIABLE CASE CLIMATE INPUTS RUN FOR YEARS 21 THROUGH 22 - SEE INSET FOR RELATIVE TIME FRAME (HIGHLIGHTED IN ORANGE).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	18JUL'14	ISSUED WITH REPORT	LA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

VARIABLE CASE WATER QUALITY MODEL
PREDICTED DISSOLVED CADMIUM CONCENTRATIONS
HB - CLOSURE

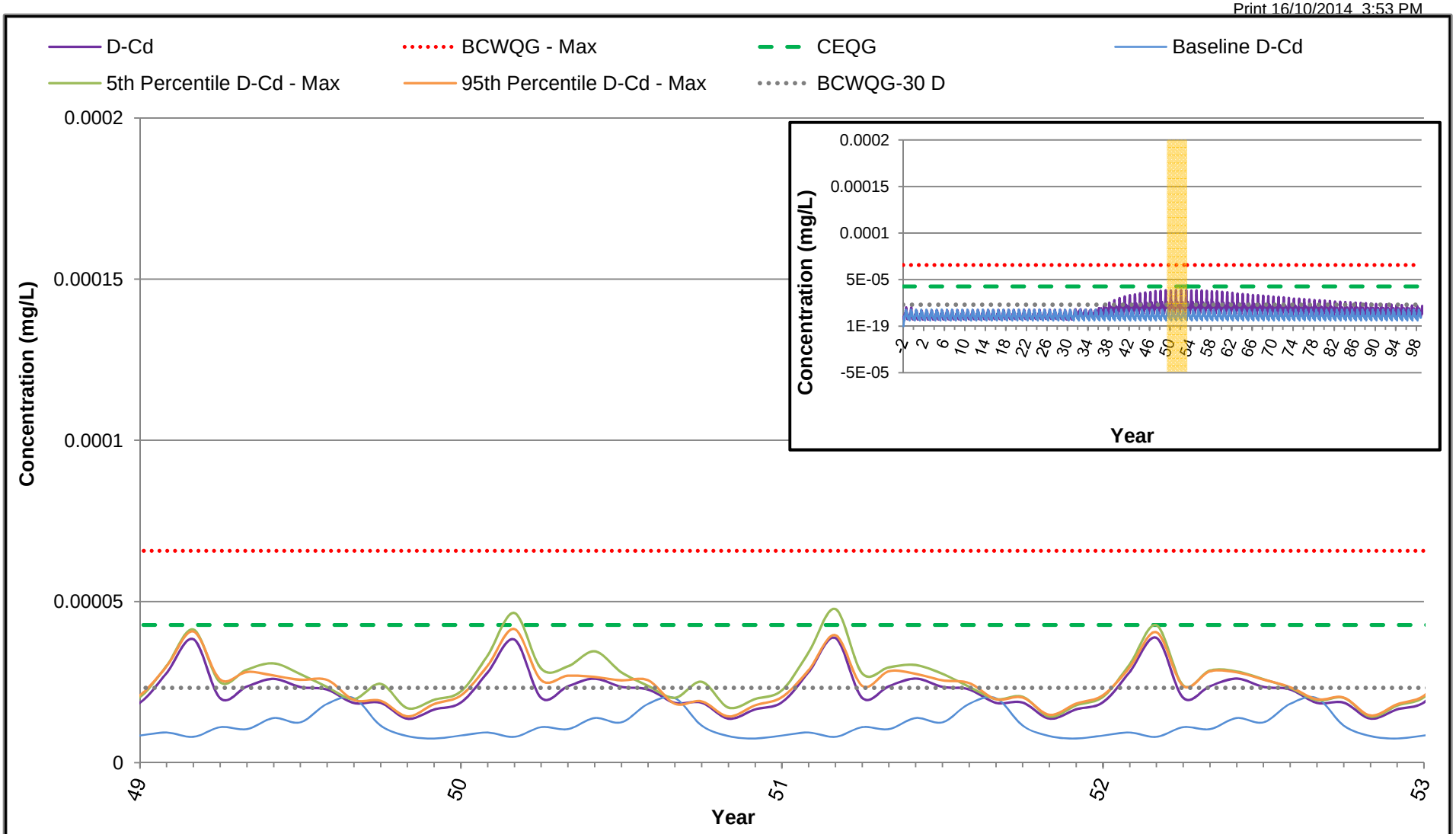
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE F3.Cd-C

REV 0



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS DEPENDENT GUIDELINES.
2. THE BASELINE DATA PLOTTED AND USED FOR GUIDELINES CALCULATIONS IS FROM H2 (BASELINE HARDNESS EQUALS 38 mg/L)
3. VARIABLE CASE CLIMATE INPUTS RUN FOR YEARS 21 THROUGH 22 - SEE INSET FOR RELATIVE TIME FRAME (HIGHLIGHTED IN ORANGE).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	18JUL'14	ISSUED WITH REPORT	LA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

VARIABLE CASE WATER QUALITY MODEL
PREDICTED DISSOLVED CADMIUM CONCENTRATIONS
HB - POST CLOSURE

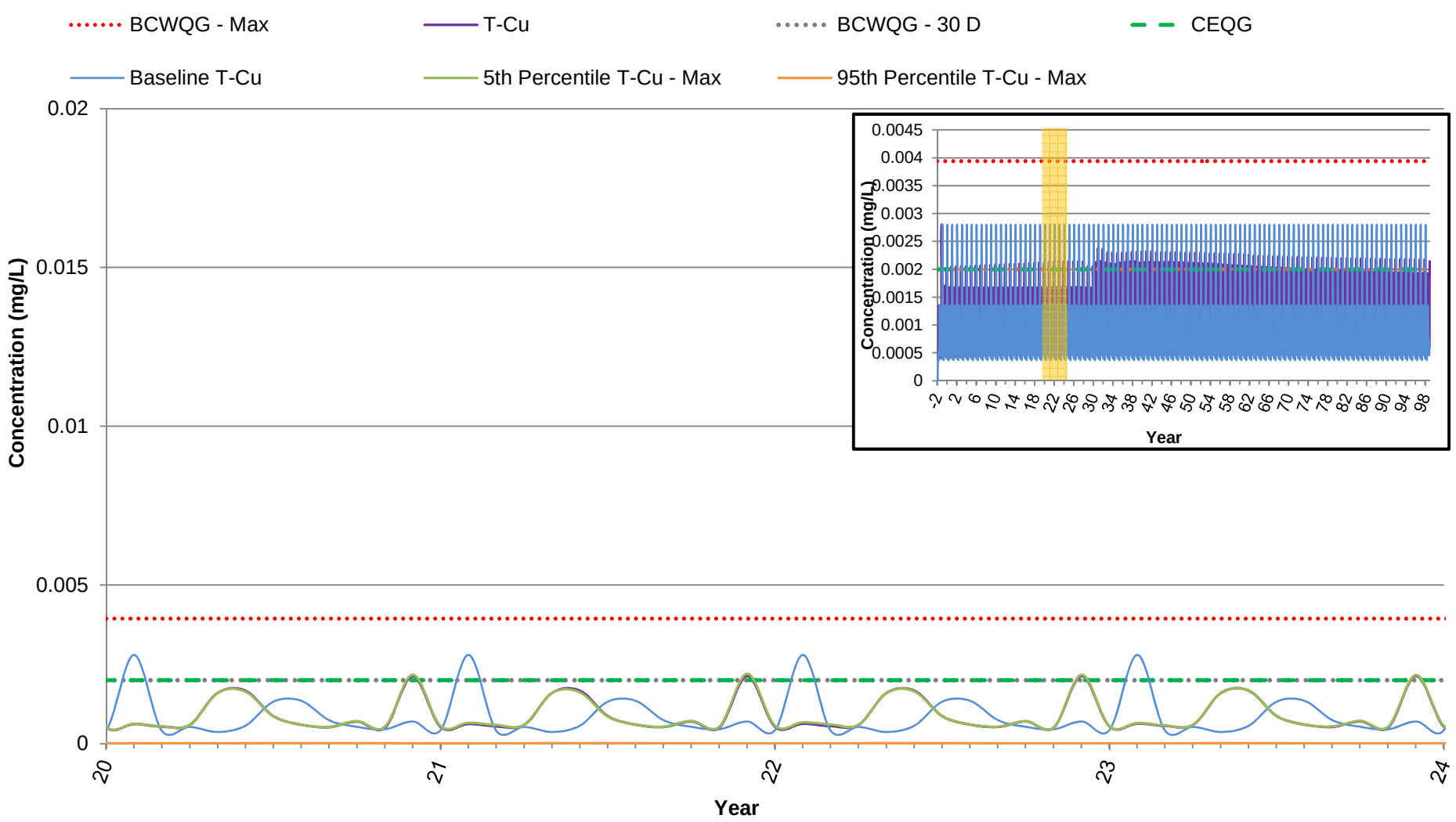
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE FB.Cd-D

REV 0



NOTES:

1. THE BCWQG-30 DAY AVERAGE, BCWQG-MAX AND CEQG GUIDELINES ARE HARDNESS DEPENDENT GUIDELINES.
2. THE BASELINE DATA PLOTTED AND USED FOR GUIDELINES CALCULATIONS IS FROM H2 (BASELINE HARDNESS EQUALS 38 mg/L)
3. VARIABLE CASE CLIMATE INPUTS RUN FOR YEARS 21 THROUGH 22 - SEE INSET FOR RELATIVE TIME FRAME (HIGHLIGHTED IN ORANGE).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	18JUL'14	ISSUED WITH REPORT	LA	JEM	KJB

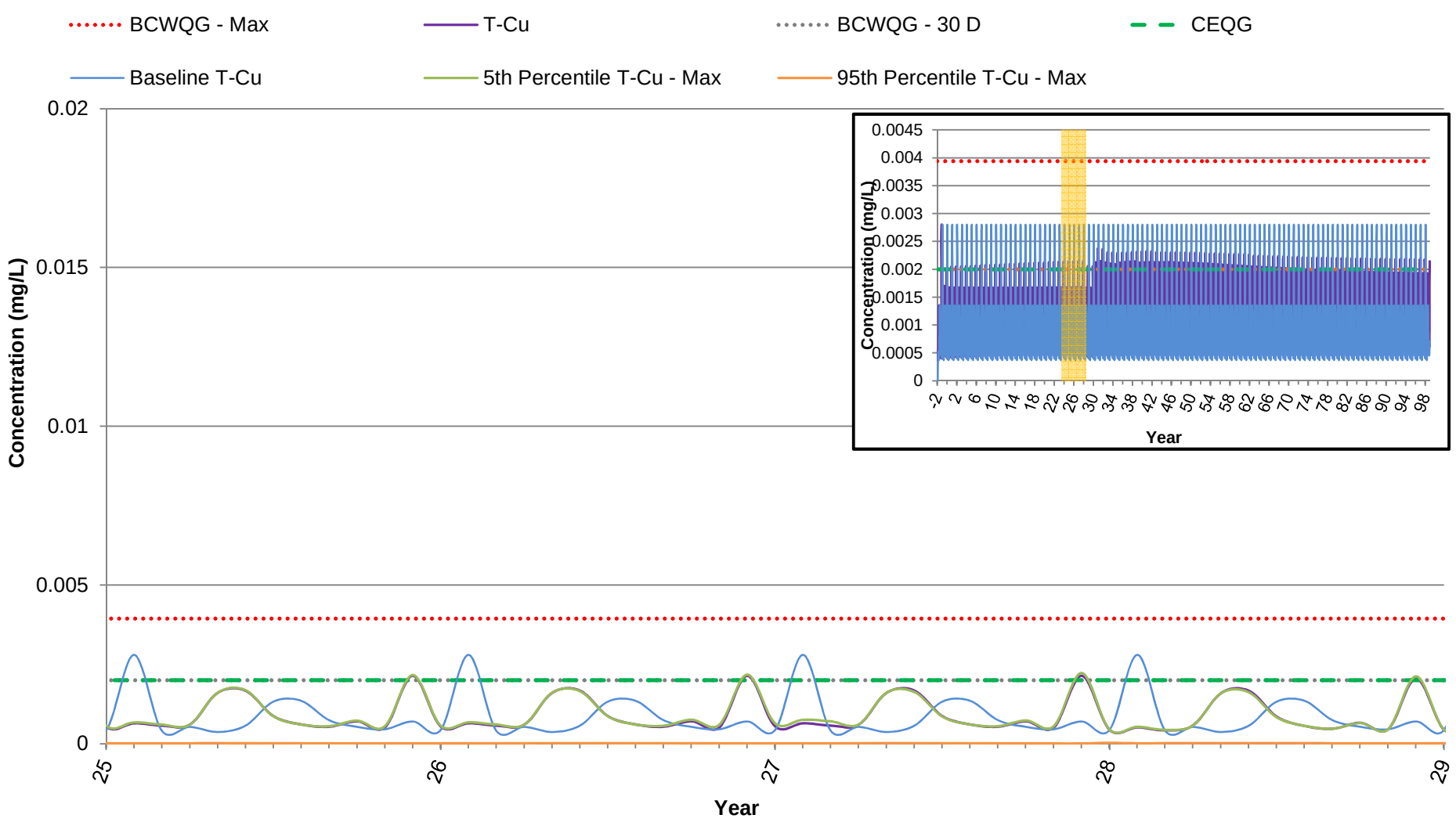
HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

VARIABLE CASE WATER QUALITY MODEL
PREDICTED TOTAL COPPER CONCENTRATIONS
HB - OPERATIONS I

Knight Piésold CONSULTING

P/A NO. VA101-458/14 | REF. NO. 3

FIGURE F3.Cu-A | REV 0



NOTES:

1. THE BCWQG-30 DAY AVERAGE, BCWQG-MAX AND CEQG GUIDELINES ARE HARDNESS DEPENDENT GUIDELINES.
2. THE BASELINE DATA PLOTTED AND USED FOR GUIDELINES CALCULATIONS IS FROM H2 (BASELINE HARDNESS EQUALS 38 mg/L)
3. VARIABLE CASE CLIMATE INPUTS RUN FOR YEARS 26 THROUGH 27 - SEE INSET FOR RELATIVE TIME FRAME (HIGHLIGHTED IN ORANGE).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	18JUL'14	ISSUED WITH REPORT	LA	JEM	KJB

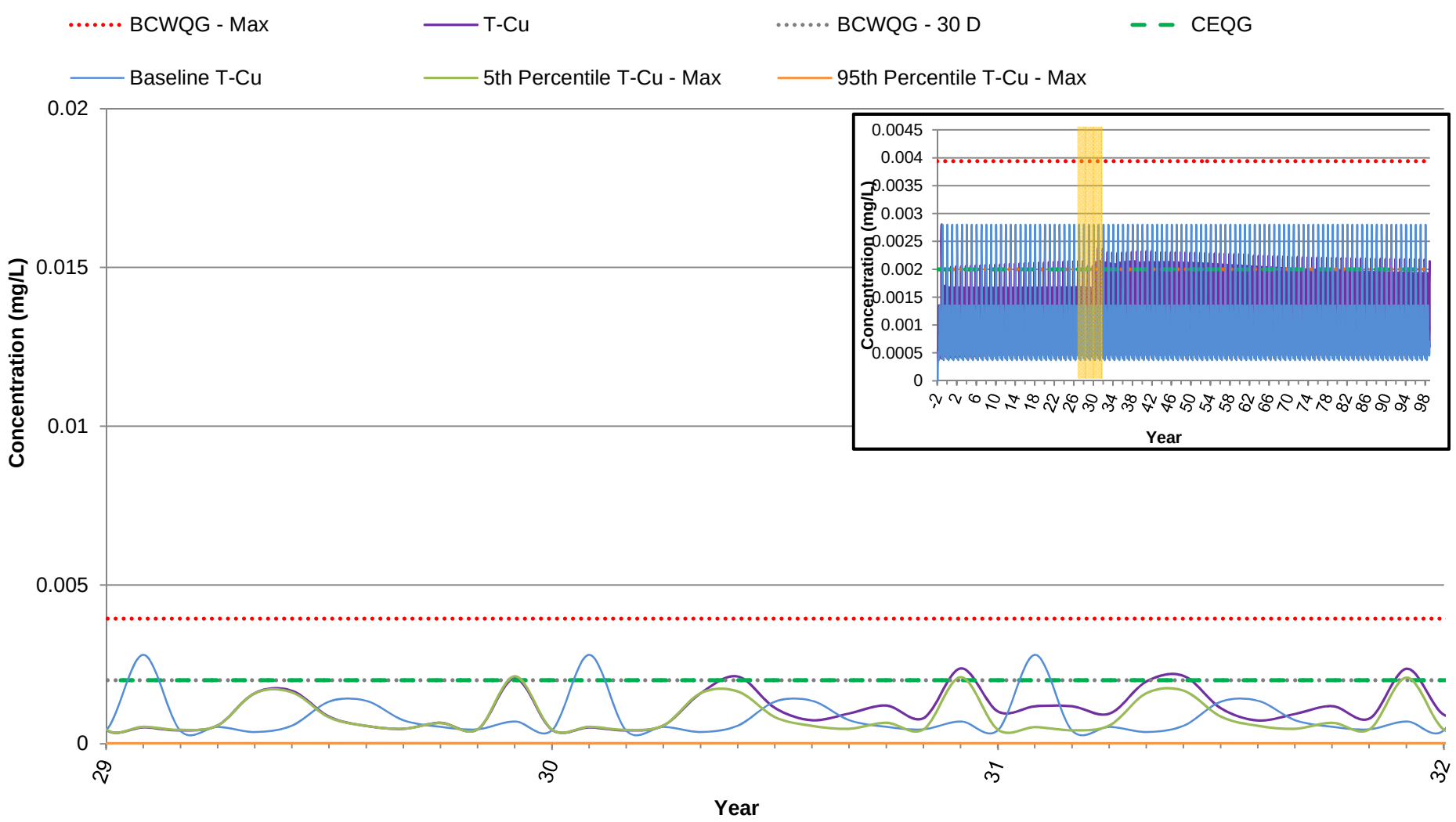
HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

**VARIABLE CASE WATER QUALITY MODEL
PREDICTED TOTAL COPPER CONCENTRATIONS
HB - OPERATIONS II**

Knight Piésold CONSULTING

P/A NO. VA101-458/14 | REF. NO. 3

FIGURE F3.Cu-B | REV 0



NOTES:

1. THE BCWQG-30 DAY AVERAGE, BCWQG-MAX AND CEQG GUIDELINES ARE HARDNESS DEPENDENT GUIDELINES.
2. THE BASELINE DATA PLOTTED AND USED FOR GUIDELINES CALCULATIONS IS FROM H2 (BASELINE HARDNESS EQUALS 38 mg/L)
3. VARIABLE CASE CLIMATE INPUTS RUN FOR YEARS 29 THROUGH 30 - SEE INSET FOR RELATIVE TIME FRAME (HIGHLIGHTED IN ORANGE).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	18JUL'14	ISSUED WITH REPORT	LA	JEM	KJB

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

VARIABLE CASE WATER QUALITY MODEL
PREDICTED TOTAL COPPER CONCENTRATIONS
HB - CLOSURE

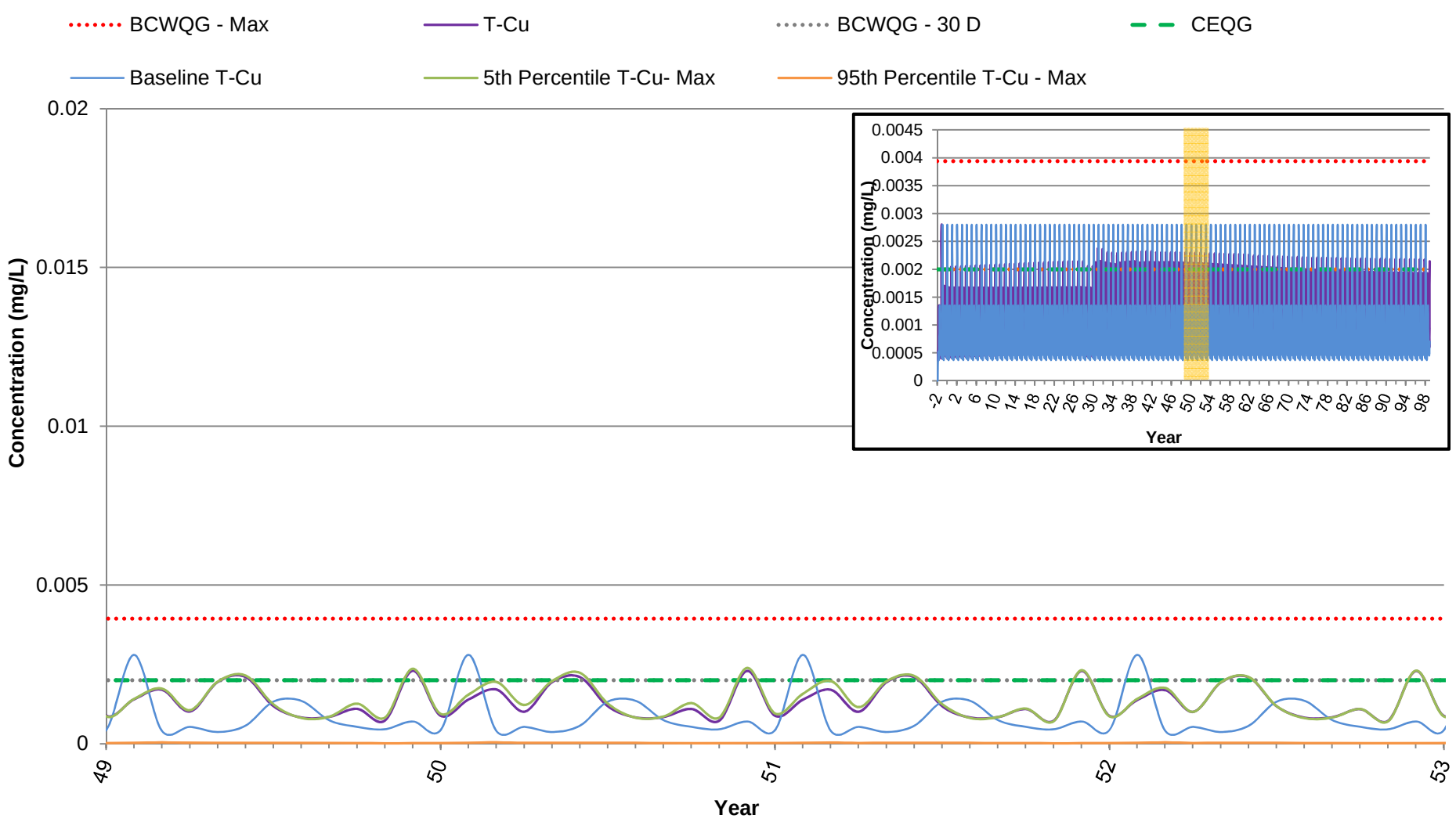
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE F3.Cu-C

REV 0



NOTES:

1. THE BCWQG-30 DAY AVERAGE, BCWQG-MAX AND CEQG GUIDELINES ARE HARDNESS DEPENDENT GUIDELINES.
2. THE BASELINE DATA PLOTTED AND USED FOR GUIDELINES CALCULATIONS IS FROM H2 (BASELINE HARDNESS EQUALS 38 mg/L)
3. VARIABLE CASE CLIMATE INPUTS RUN FOR YEARS 50 THROUGH 51 - SEE INSET FOR RELATIVE TIME FRAME (HIGHLIGHTED IN ORANGE).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	18JUL'14	ISSUED WITH REPORT	LA	JEM	KJB

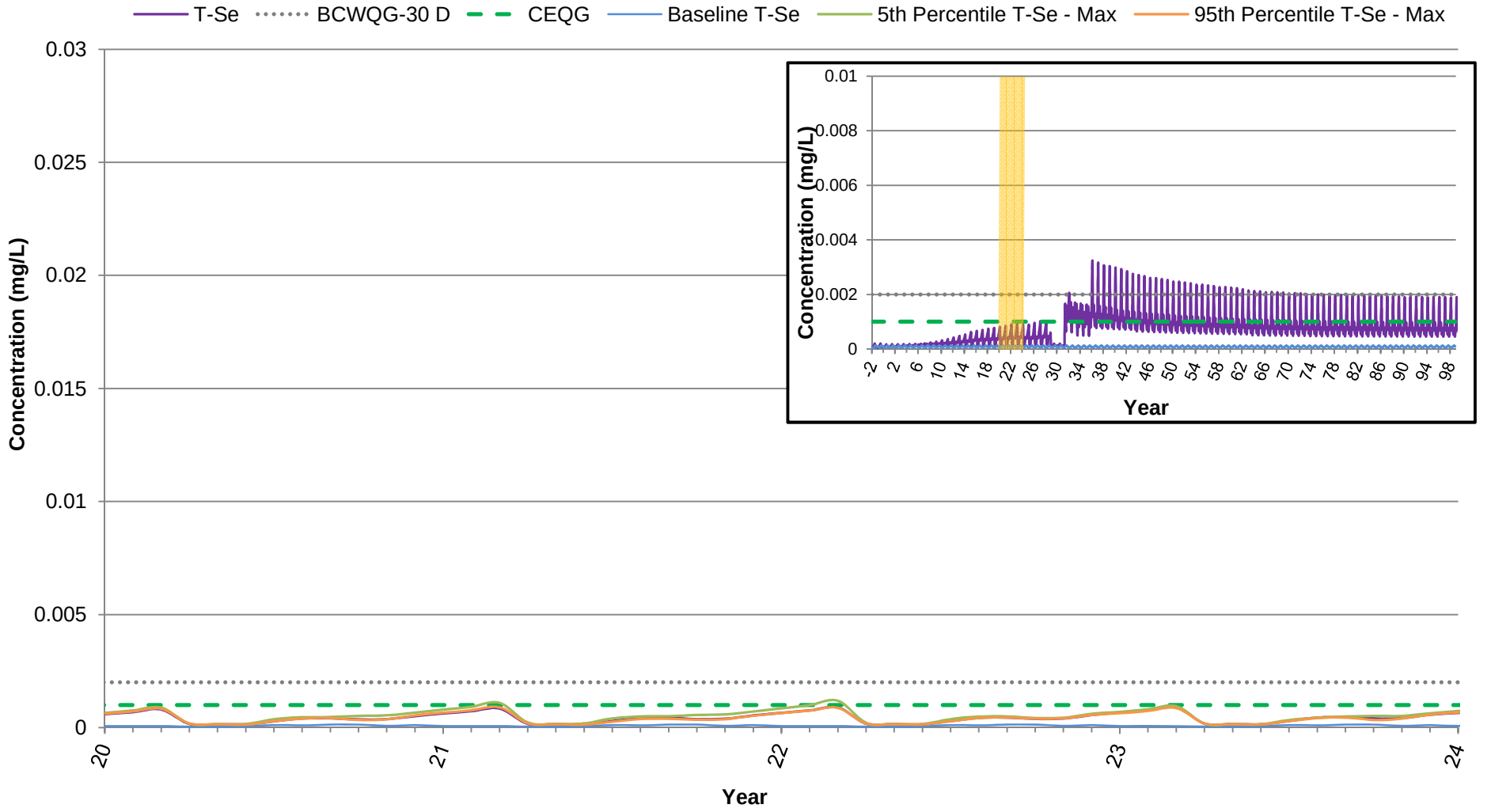
HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

VARIABLE CASE WATER QUALITY MODEL
PREDICTED TOTAL COPPER CONCENTRATIONS
HB - POST CLOSURE

Knight Piésold CONSULTING

P/A NO. VA101-458/14 | REF. NO. 3

FIGURE F3.Cu-D | REV 0



NOTES:

1. THE BCWQG-MAX AND CEQG GUIDELINES ARE FIXED VALUES.
2. VARIABLE CASE CLIMATE INPUTS RUN FOR YEARS 21 THROUGH 22 - SEE INSET FOR RELATIVE TIME FRAME (HIGHLIGHTED IN ORANGE).

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

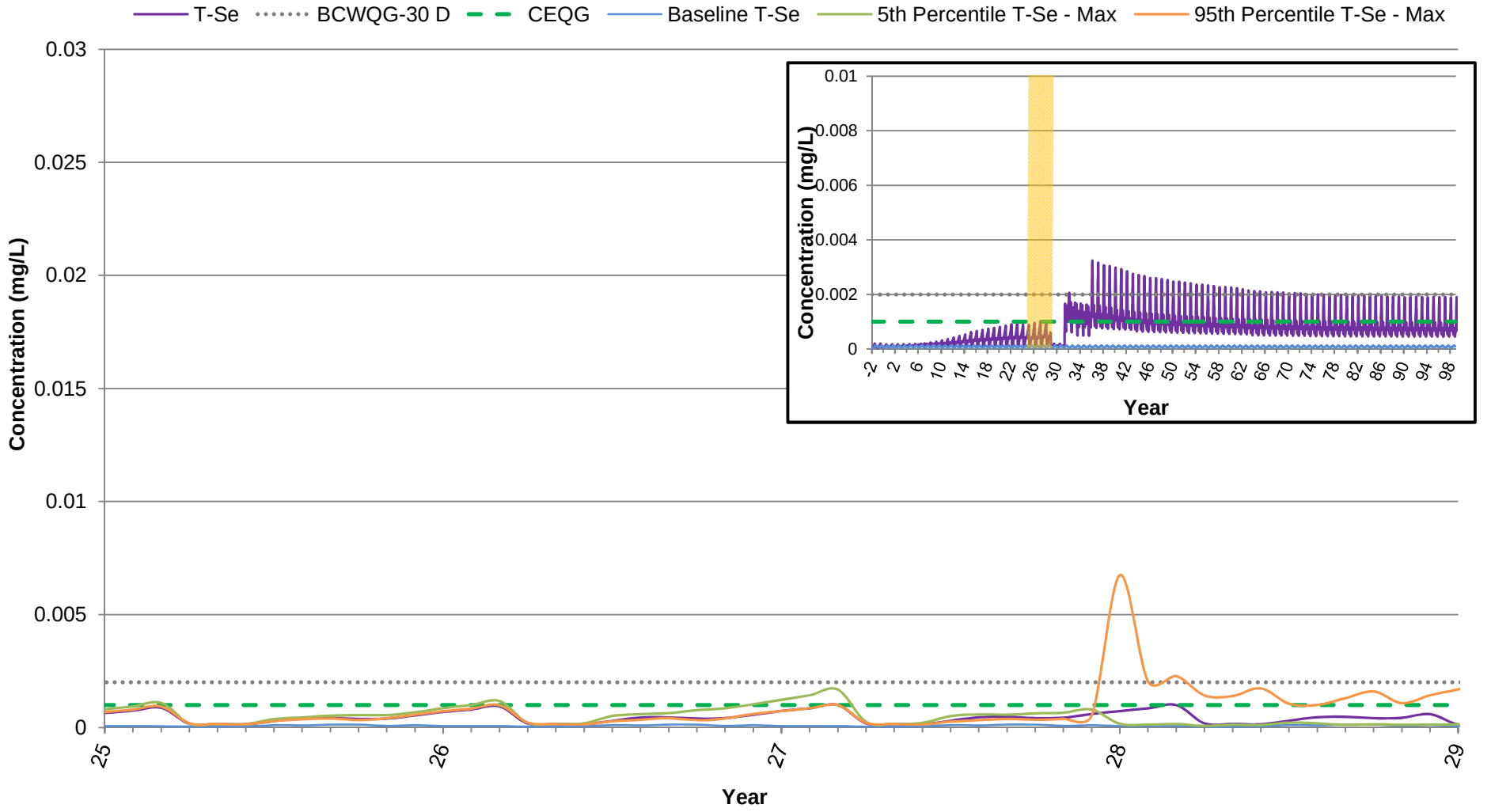
VARIABLE CASE WATER QUALITY MODEL
PREDICTED TOTAL SELENIUM CONCENTRATIONS
HB - OPERATIONS I

Knight Piésold CONSULTING

P/A NO. VA101-458/14 | REF. NO. 3

FIGURE F3.Se-A | REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	18JUL'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG GUIDELINES ARE FIXED VALUES.
2. VARIABLE CASE CLIMATE INPUTS RUN FOR YEARS 26 THROUGH 27 - SEE INSET FOR RELATIVE TIME FRAME (HIGHLIGHTED IN ORANGE).

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

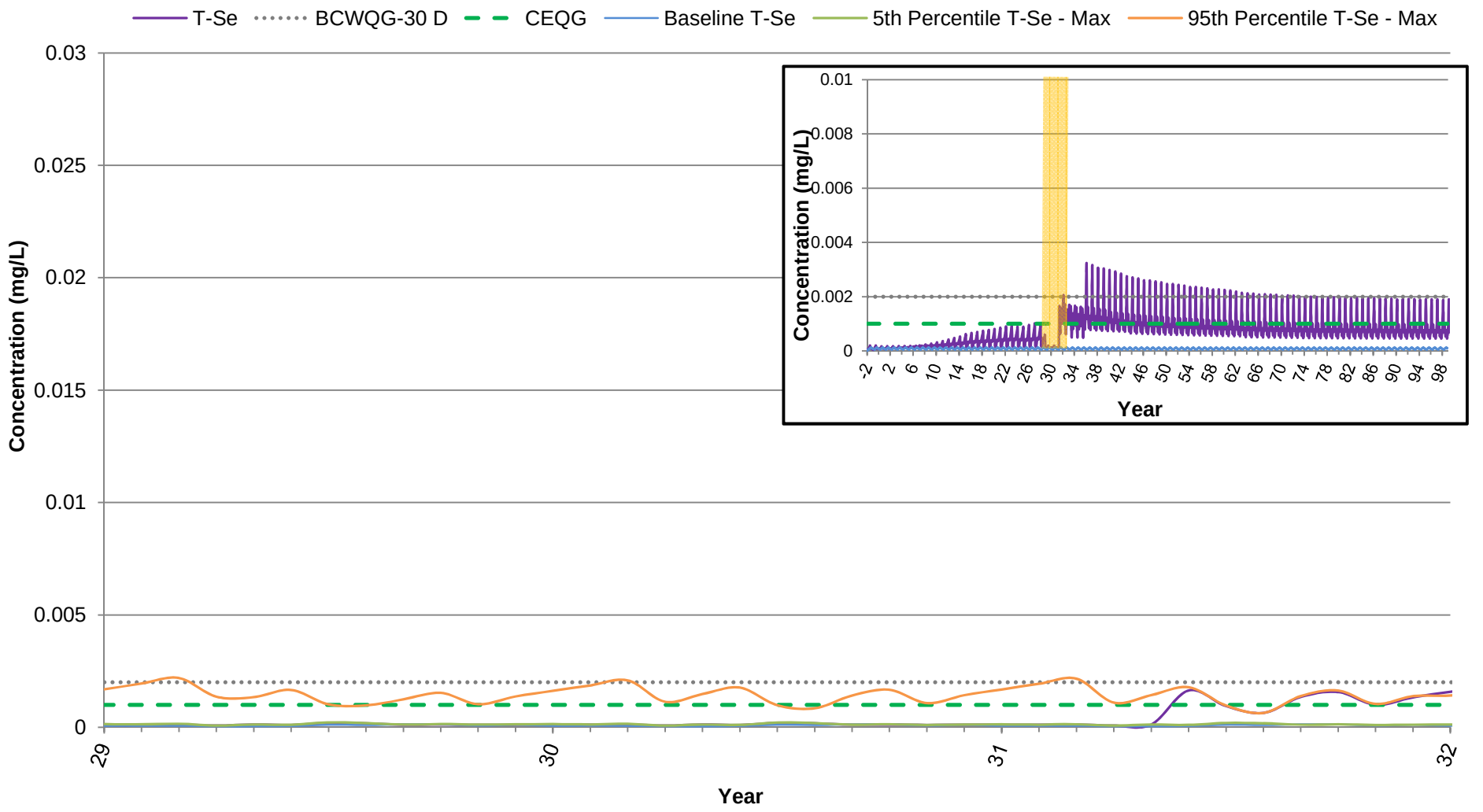
**VARIABLE CASE WATER QUALITY MODEL
PREDICTED TOTAL SELENIUM CONCENTRATIONS
HB - OPERATIONS II**

Knight Piésold CONSULTING

P/A NO. VA101-458/14 | REF. NO. 3

FIGURE F3.Se-B | REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	18JUL'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG GUIDELINES ARE FIXED VALUES.
2. VARIABLE CASE CLIMATE INPUTS RUN FOR YEARS 29 THROUGH 30 - SEE INSET FOR RELATIVE TIME FRAME (HIGHLIGHTED IN ORANGE).

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

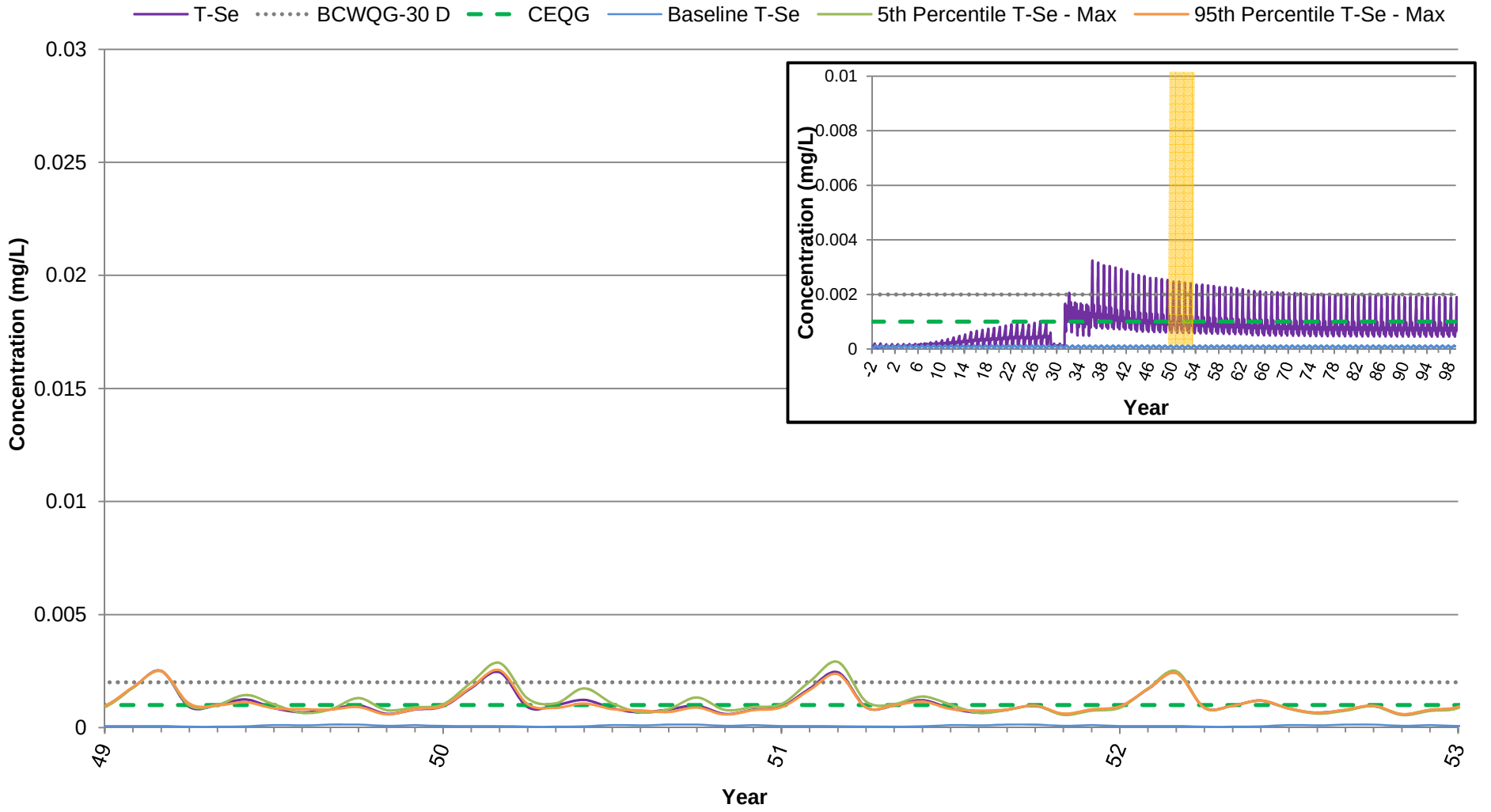
VARIABLE CASE WATER QUALITY MODEL
PREDICTED TOTAL SELENIUM CONCENTRATIONS
HB - CLOSURE

Knight Piésold CONSULTING

P/A NO. VA101-458/14 | REF. NO. 3

FIGURE F3.Se-C | REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	18JUL'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG GUIDELINES ARE FIXED VALUES.
2. VARIABLE CASE CLIMATE INPUTS RUN FOR YEARS 50 THROUGH 51 - SEE INSET FOR RELATIVE TIME FRAME (HIGHLIGHTED IN ORANGE).

HARPER CREEK MINING CORP.
HARPER CREEK PROJECT

VARIABLE CASE WATER QUALITY MODEL
PREDICTED TOTAL SELENIUM CONCENTRATIONS
HB - POST CLOSURE

Knight Piésold CONSULTING

P/A NO. VA101-458/14 | REF. NO. 3

FIGURE F3.Se-D | REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	18JUL'14	ISSUED WITH REPORT	EJA	JEM	KJB

APPENDIX G

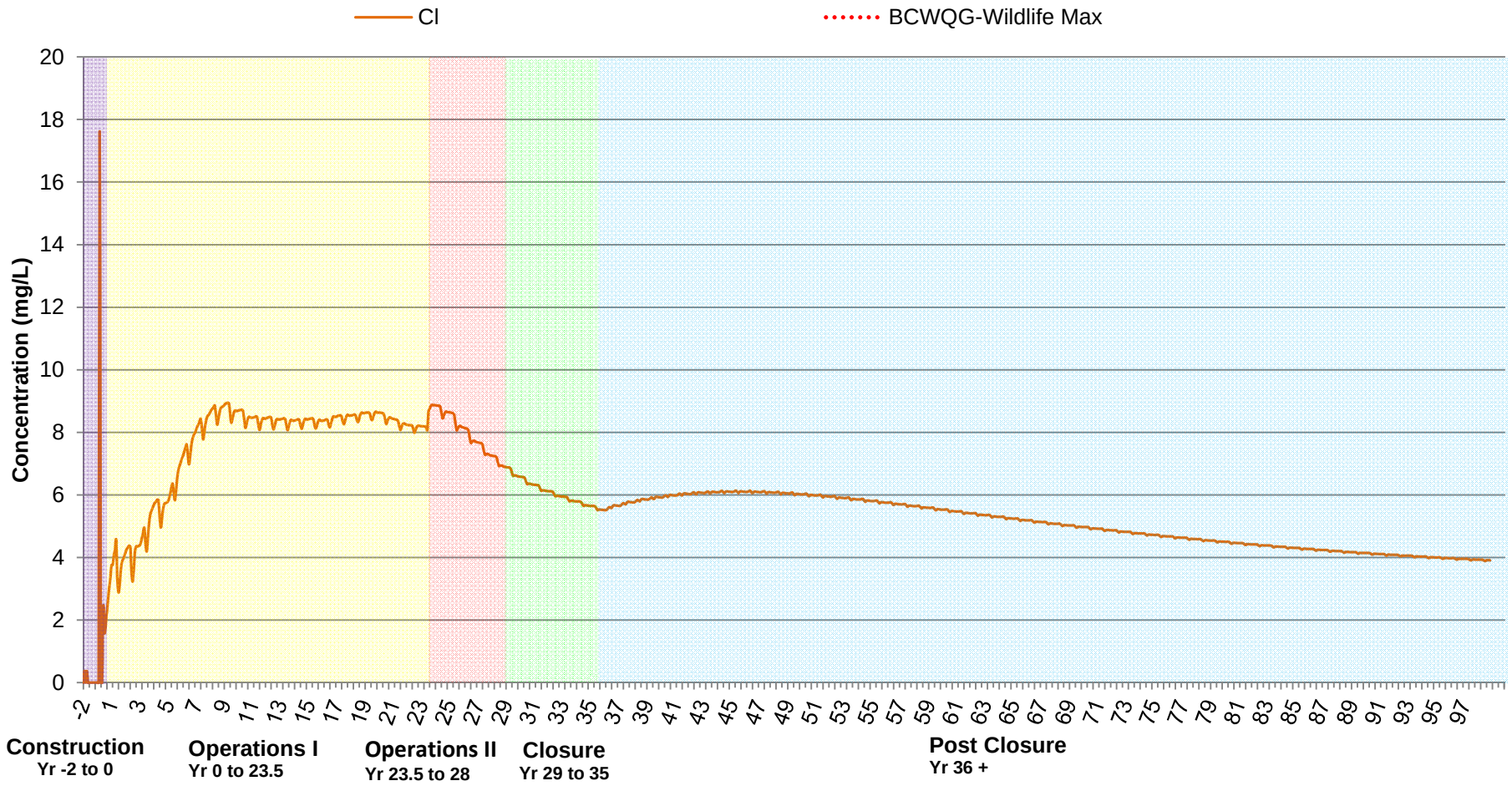
UPPER BOUND CASE PREDICTIONS

Appendix G1 Tailings Management Facility (TMF)
Appendix G2 Open Pit (OP)
Appendix G3 P-Creek
Appendix G4 T-Creek
Appendix G5 Harper Creek Below P-Creek (HT)
Appendix G6 Mid Harper Creek (HM)
Appendix G7 Harper Creek Below T-Creek (HT)
Appendix G8 Harper Creek Above Barrière River (HB)
Appendix G9 Mid Baker Creek (BK1)
Appendix G10 Baker Creek Above North Thompson River (BK0)
Appendix G11 Jones Creek Above North Thompson River (J1)

APPENDIX G1

TAILINGS MANAGEMENT FACILITY (TMF)

(Pages G1-1 to G1-27)



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.
3. ALL GUIDELINES ARE FIXED VALUES.
4. THE BCWQG-WILDLIFE MAX GUIDELINE (600 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE CHLORIDE CONCENTRATIONS - TMF

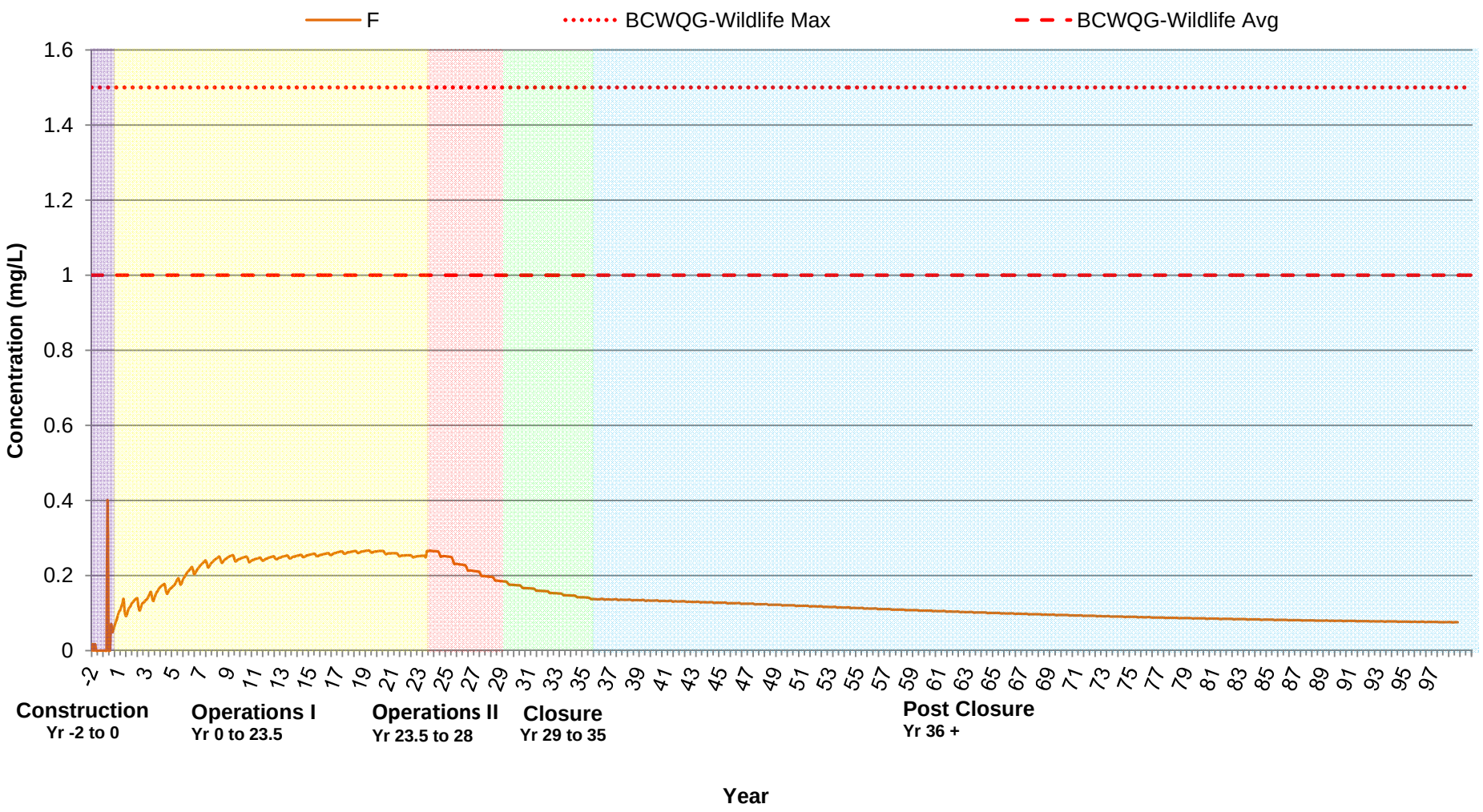
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G1.Cl

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.
3. ALL GUIDELINES ARE FIXED VALUES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE FLUORIDE CONCENTRATIONS - TMF

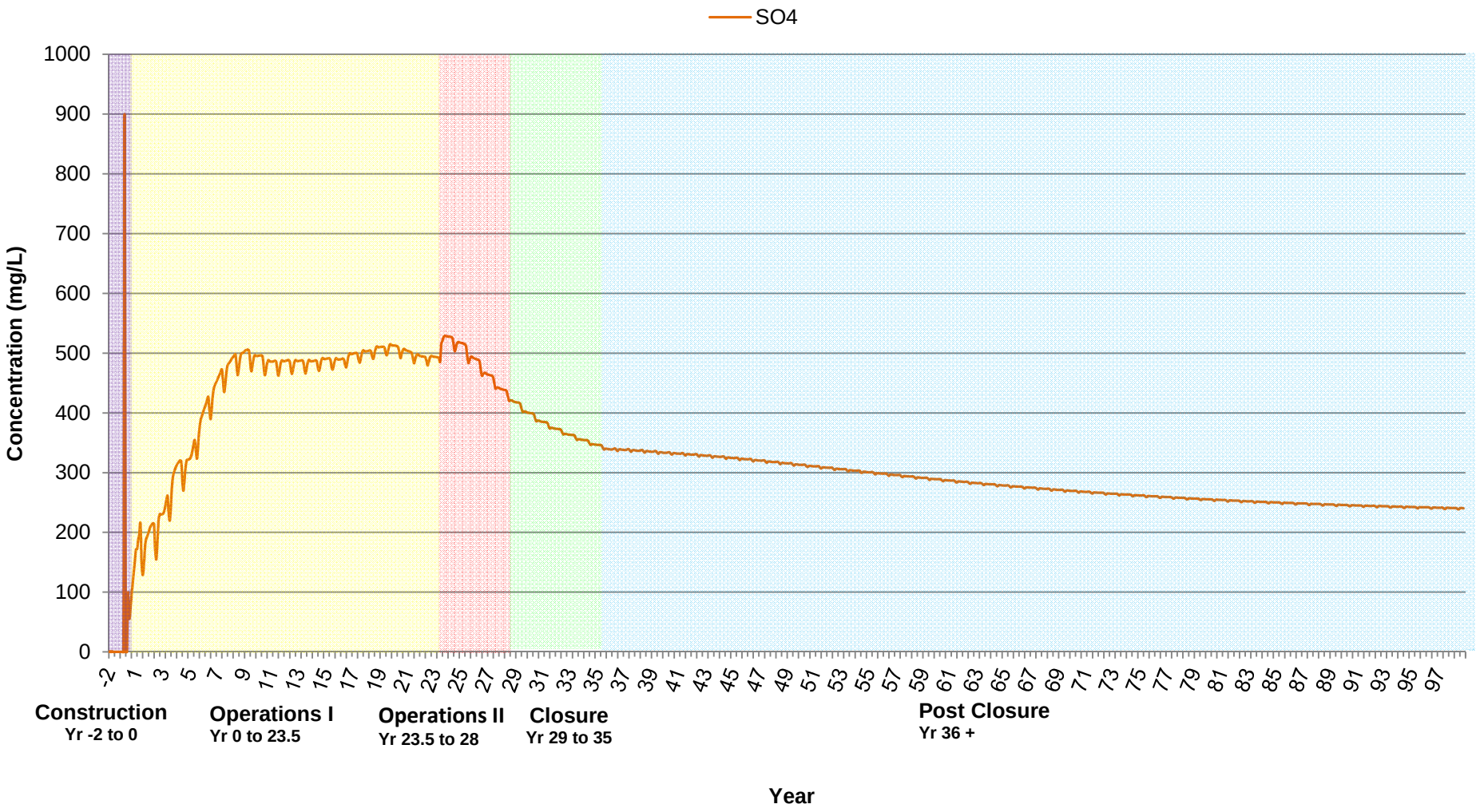
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G1.F

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE SULPHATE CONCENTRATIONS - TMF

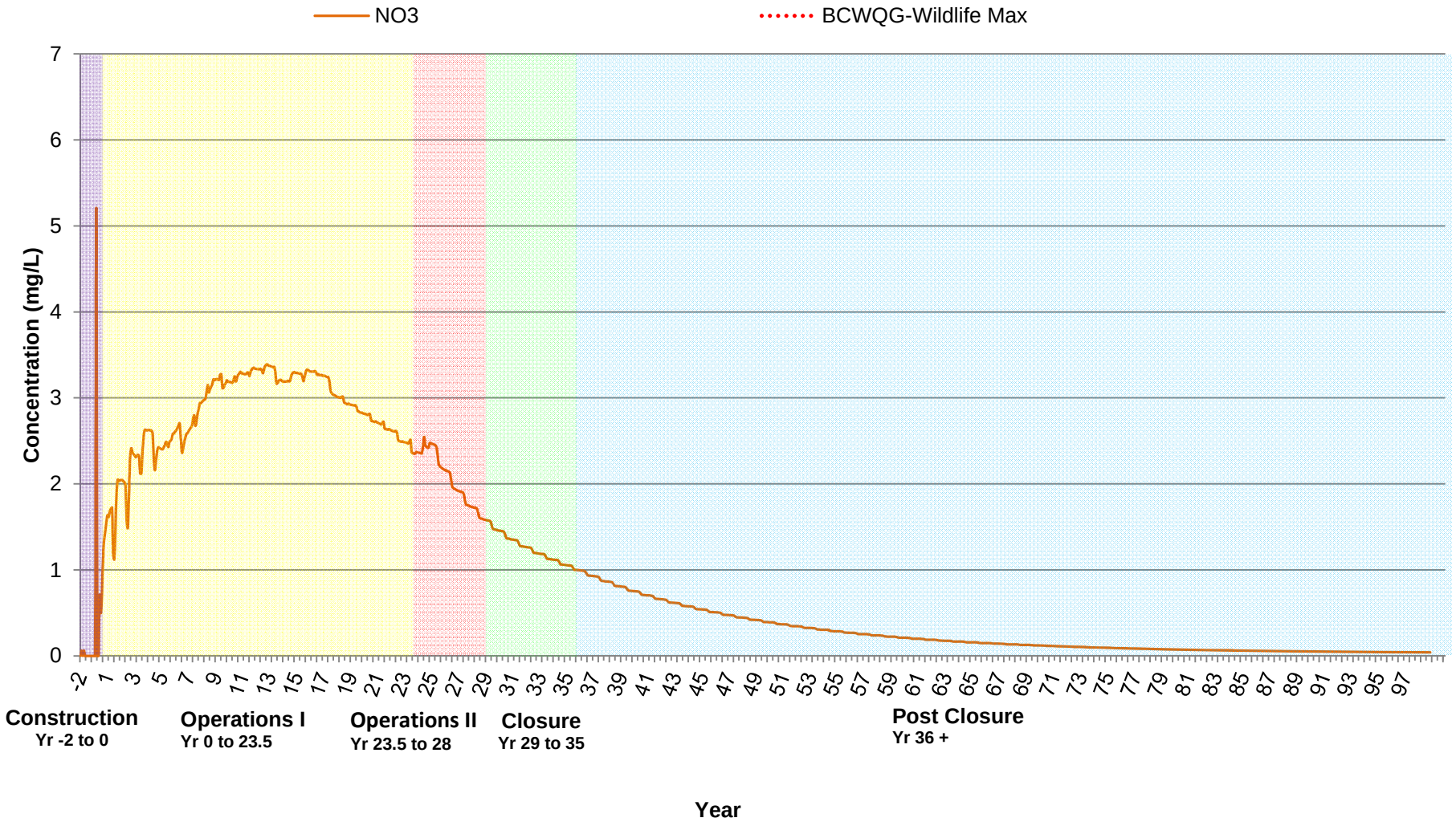
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G1.S04

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.
3. ALL GUIDELINES ARE FIXED VALUES.
4. THE BCWQG-WILDLIFE MAX GUIDELINE (100 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE NITRATE CONCENTRATIONS - TMF

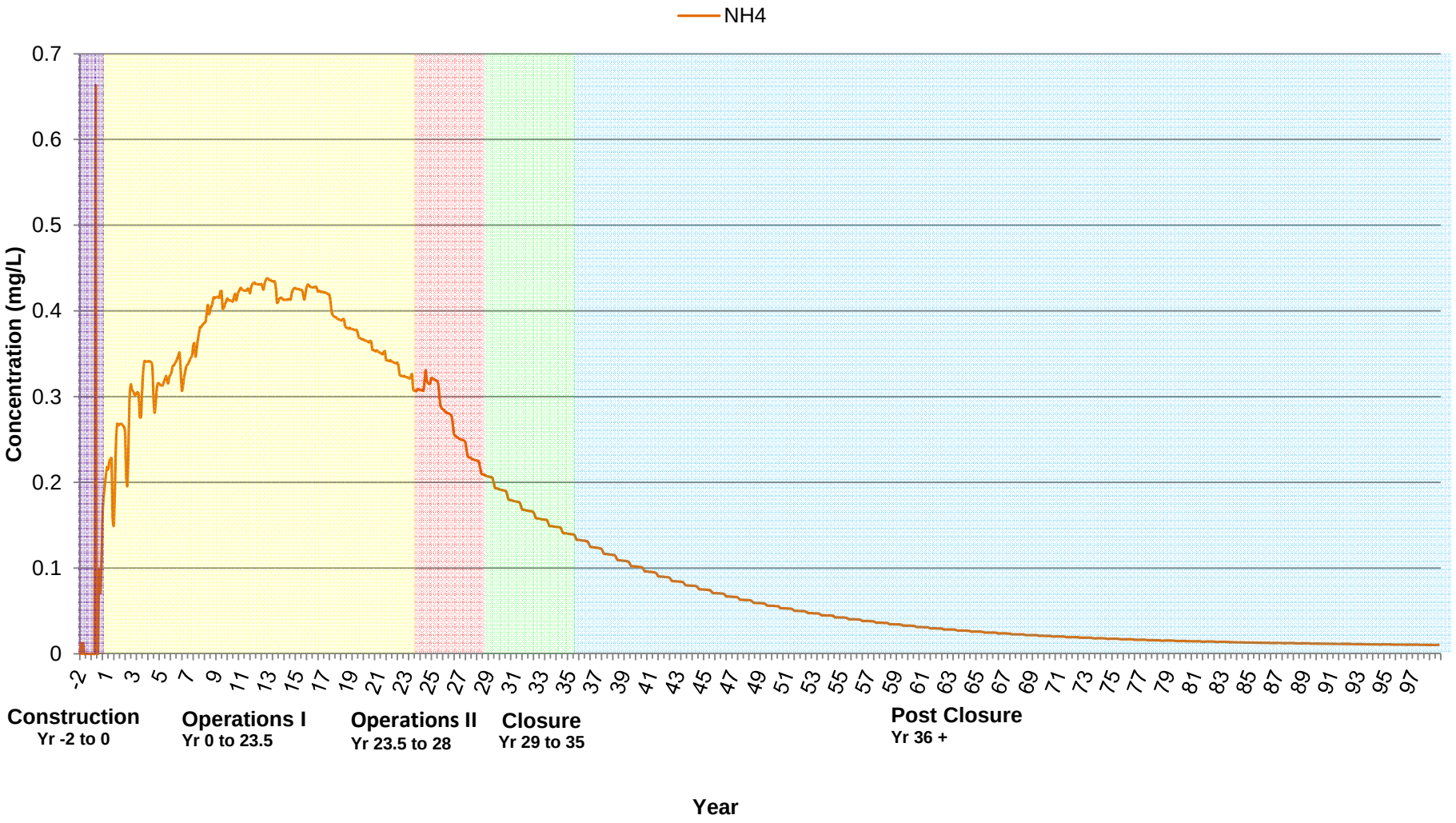
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G1.NO3

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE AMMONIA CONCENTRATIONS - TMF

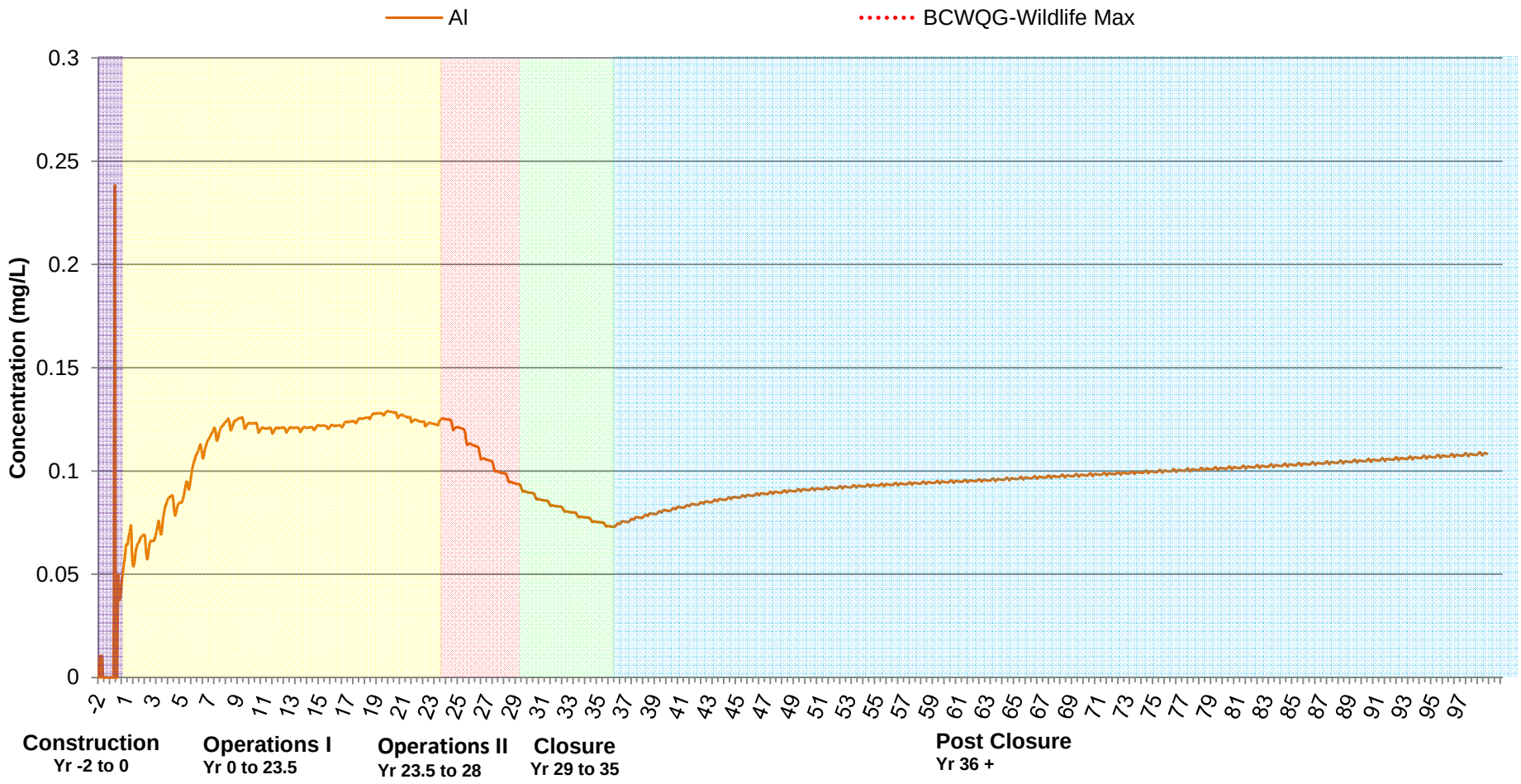
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G1.NH4

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.
3. ALL GUIDELINES ARE FIXED VALUES.
4. THE BCWQG-WILDLIFE MAX GUIDELINE (5 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE ALUMINUM CONCENTRATIONS - TMF

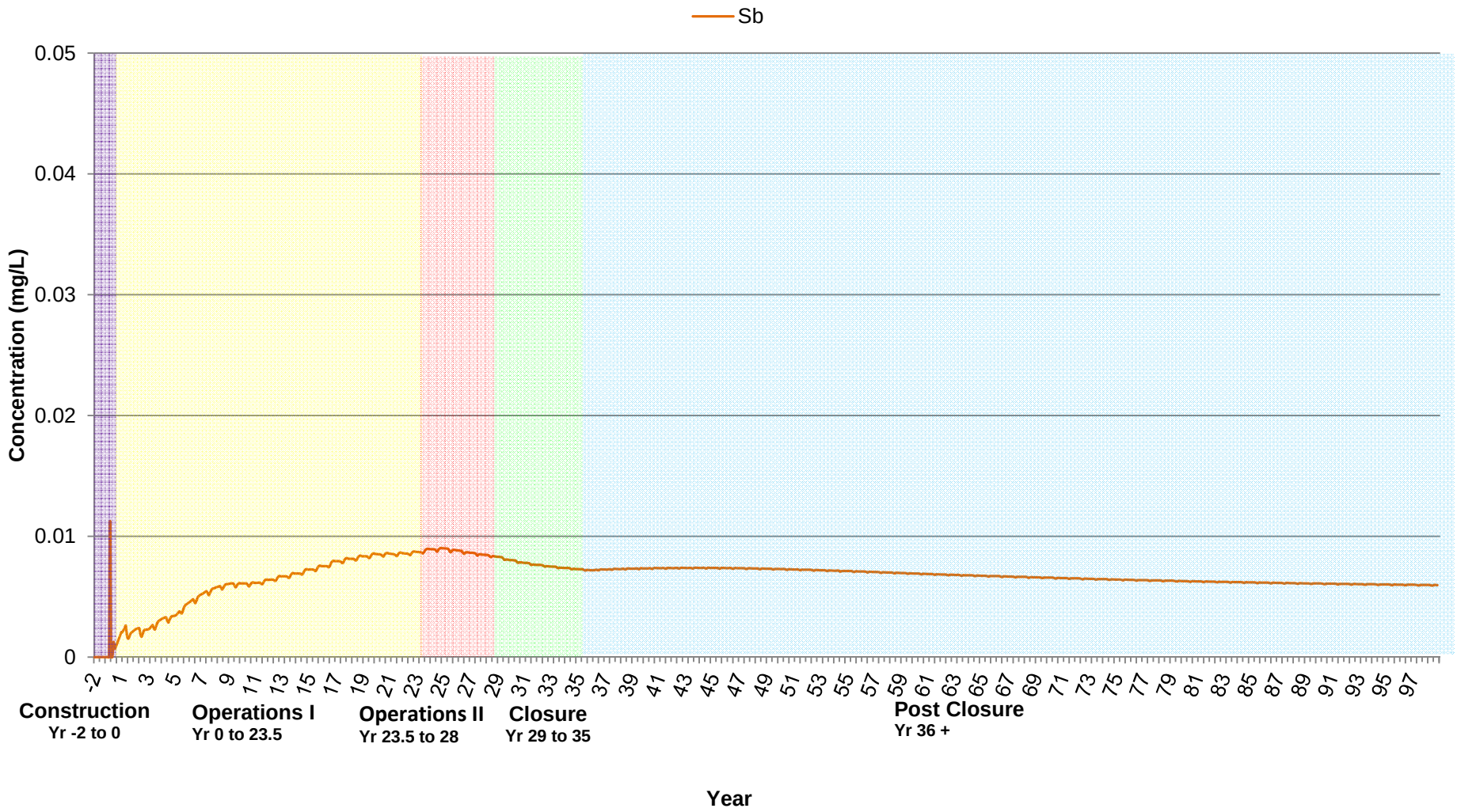
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G1.Al

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE ANTIMONY CONCENTRATIONS - TMF

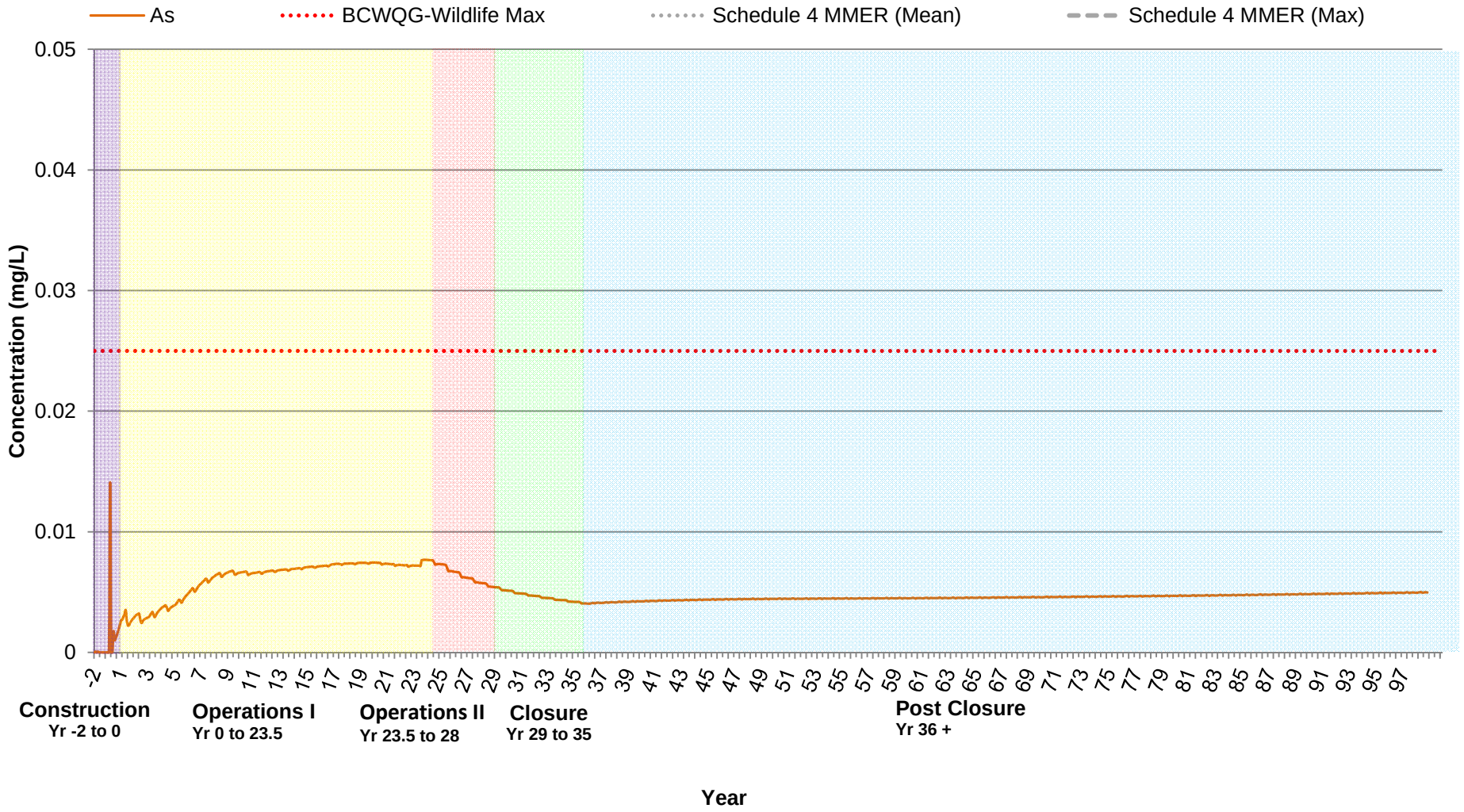
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G1.Sb

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.
3. ALL GUIDELINES ARE FIXED VALUES.
4. THE MMER MAX (1 mg/L) AND MMER MEAN (0.5 mg/L) ARE NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE ARSENIC CONCENTRATIONS - TMF

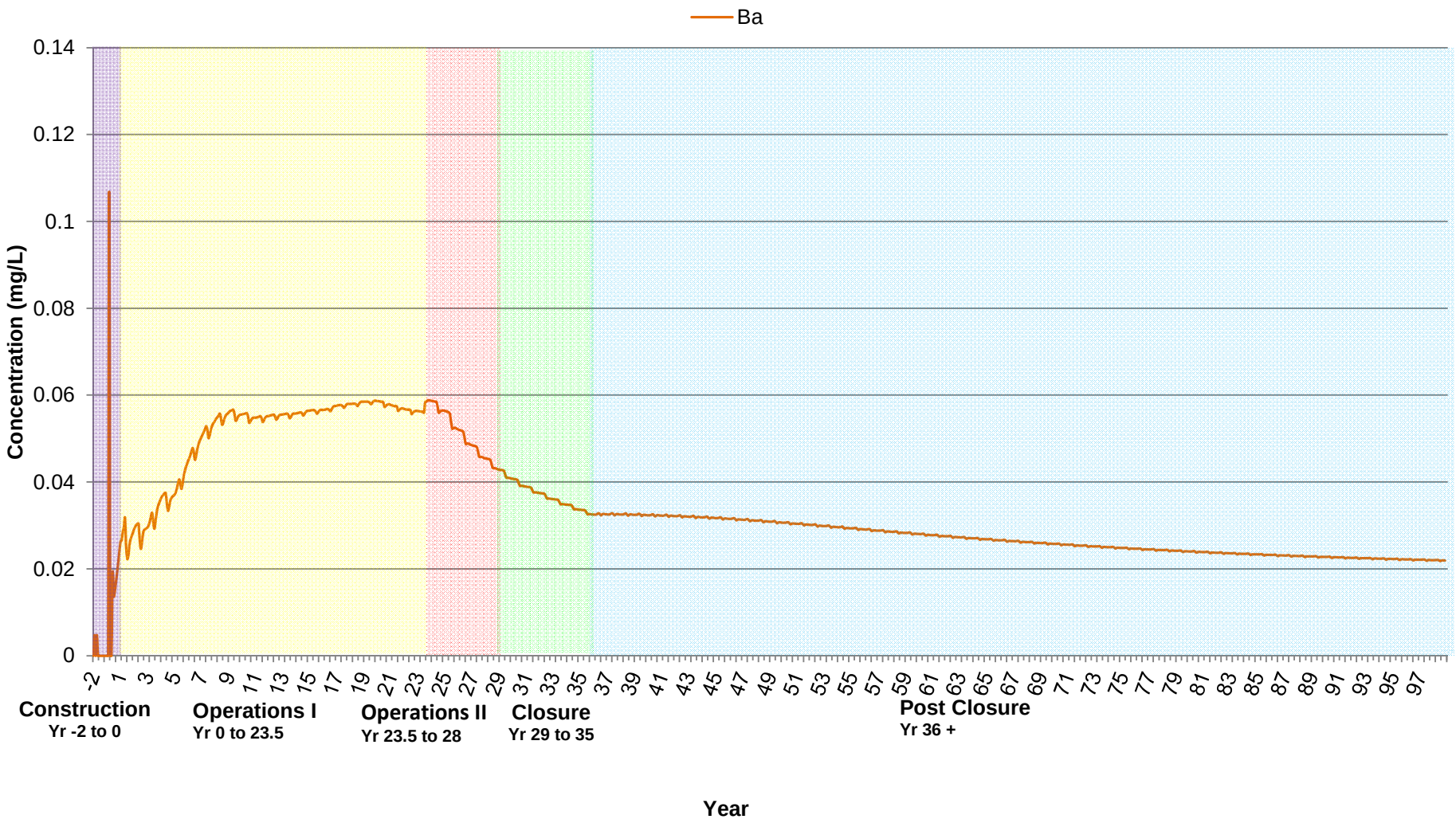
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G1.As

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE BARIUM CONCENTRATIONS - TMF

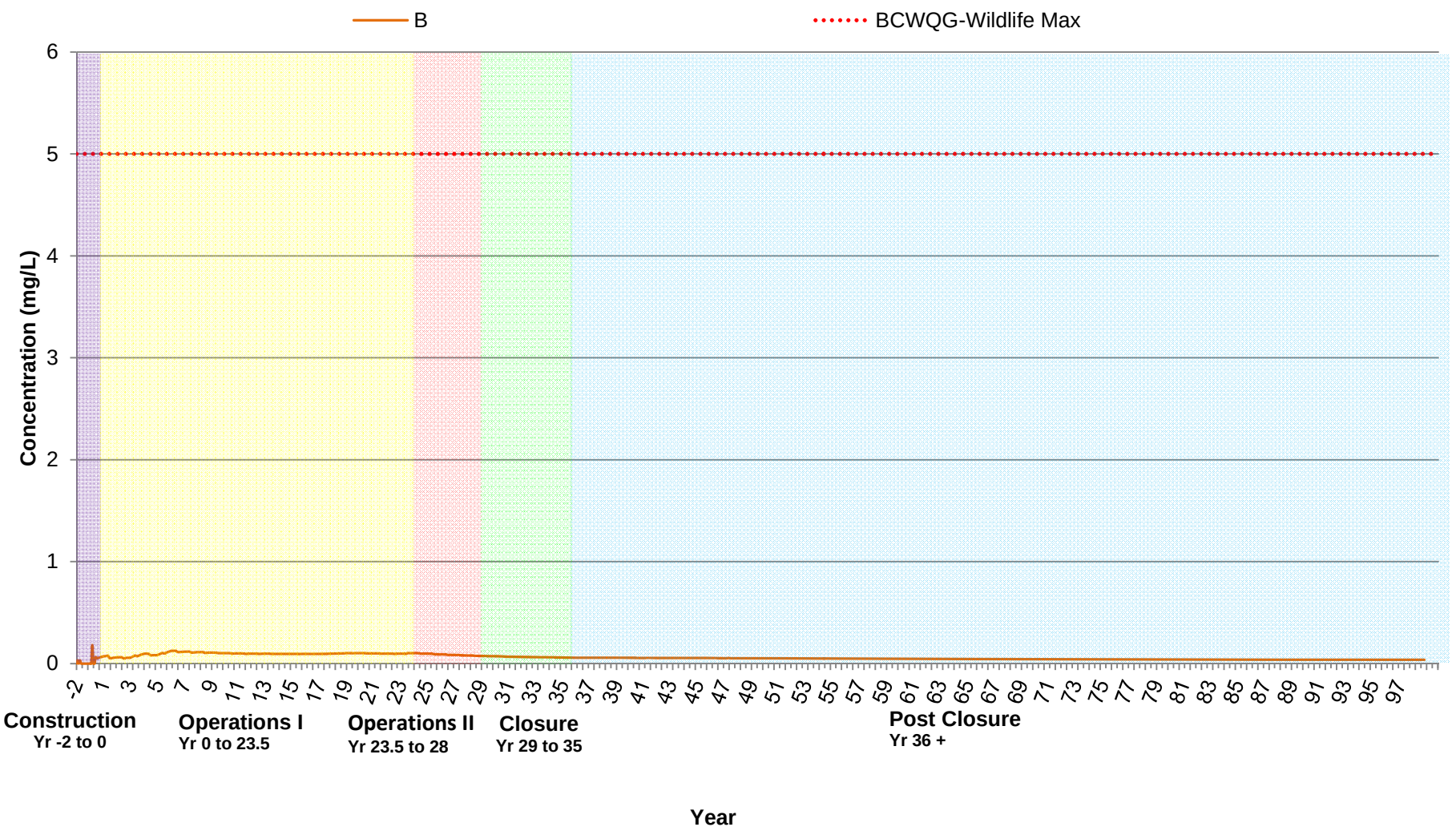
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G1.Ba

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE BORON CONCENTRATIONS - TMF

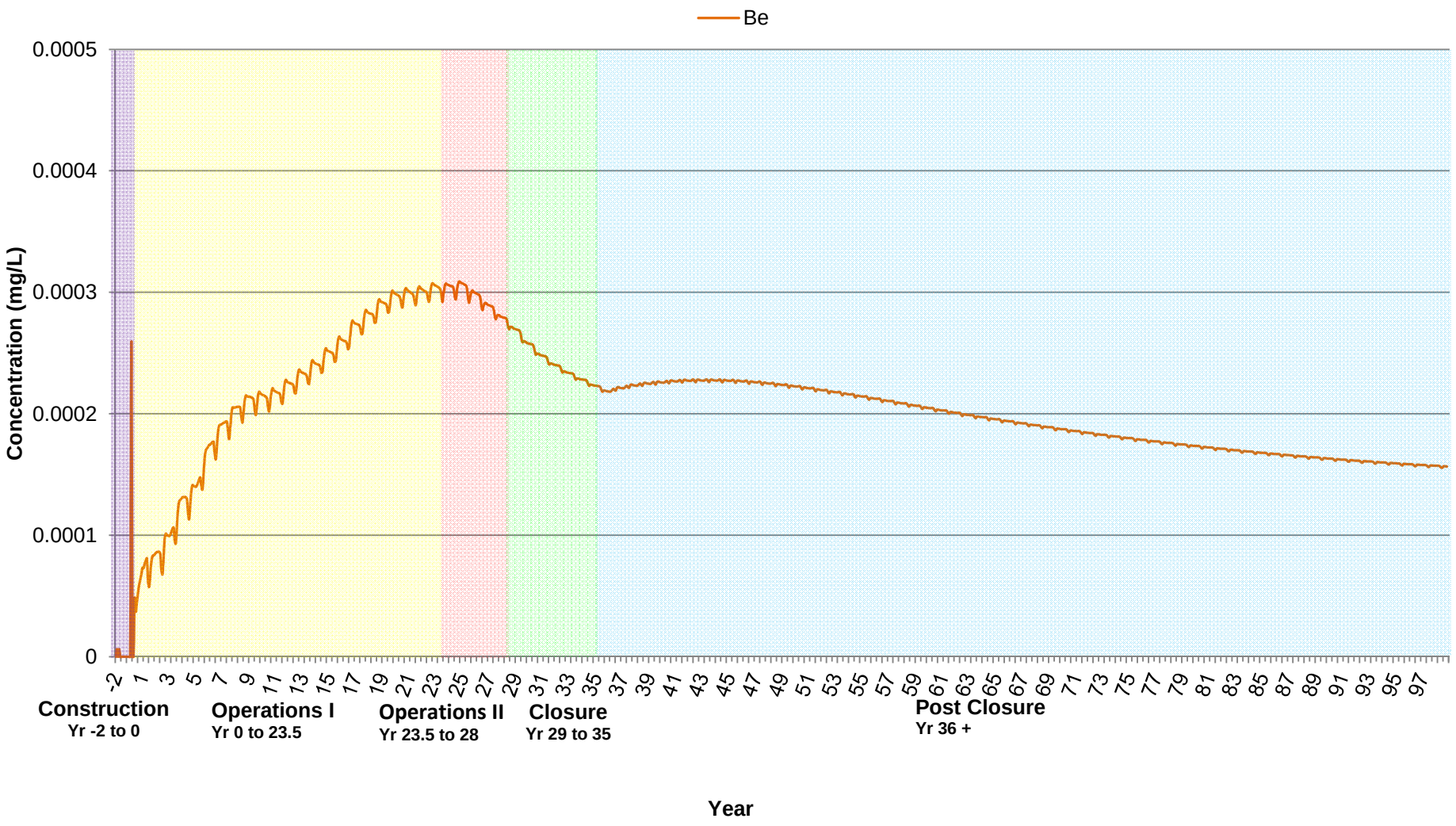
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G1.B

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE BERYILLIUM CONCENTRATIONS - TMF

Knight Piésold CONSULTING

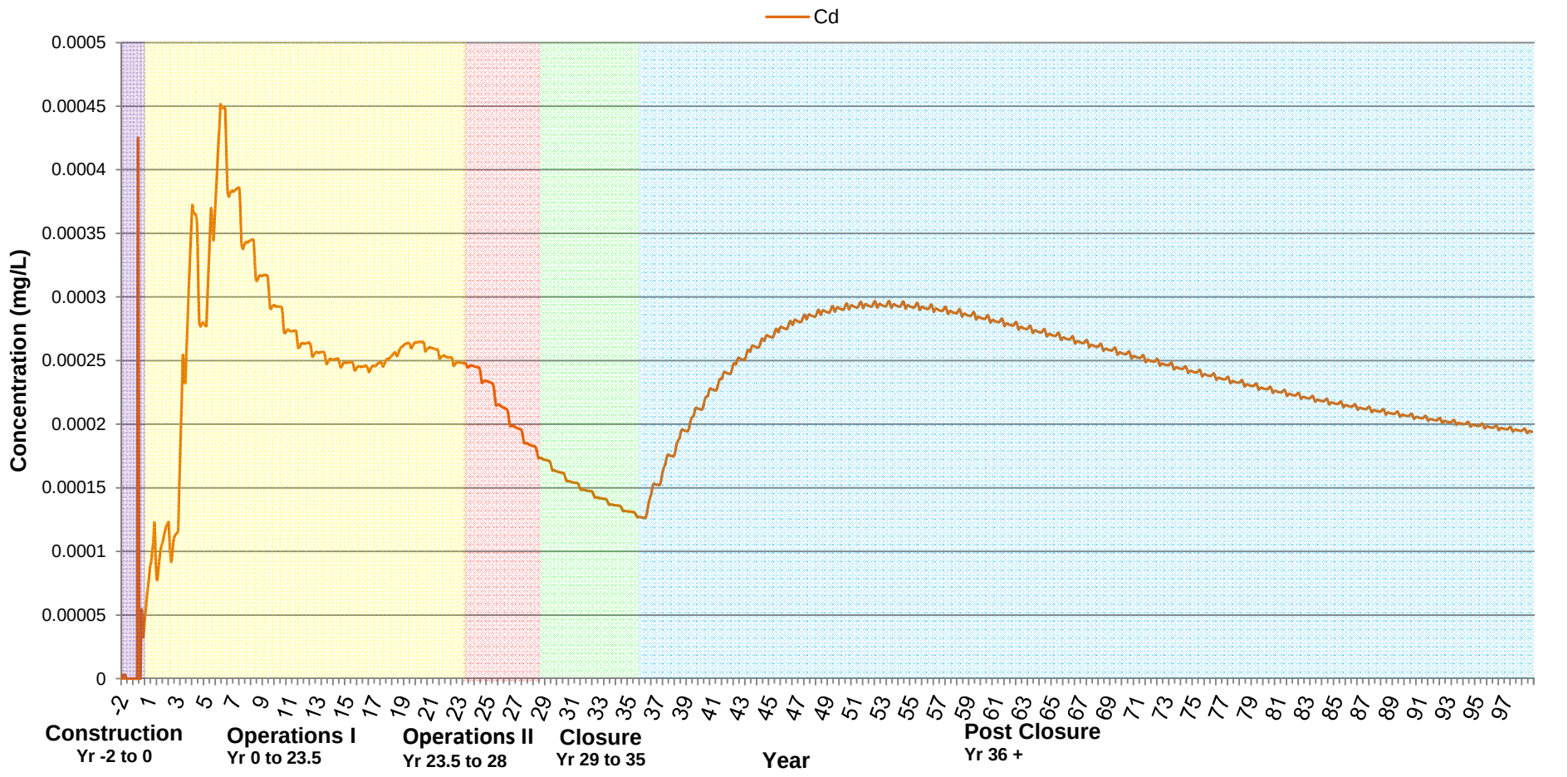
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G1.Be

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE CADMIUM CONCENTRATIONS - TMF

Knight Piésold CONSULTING

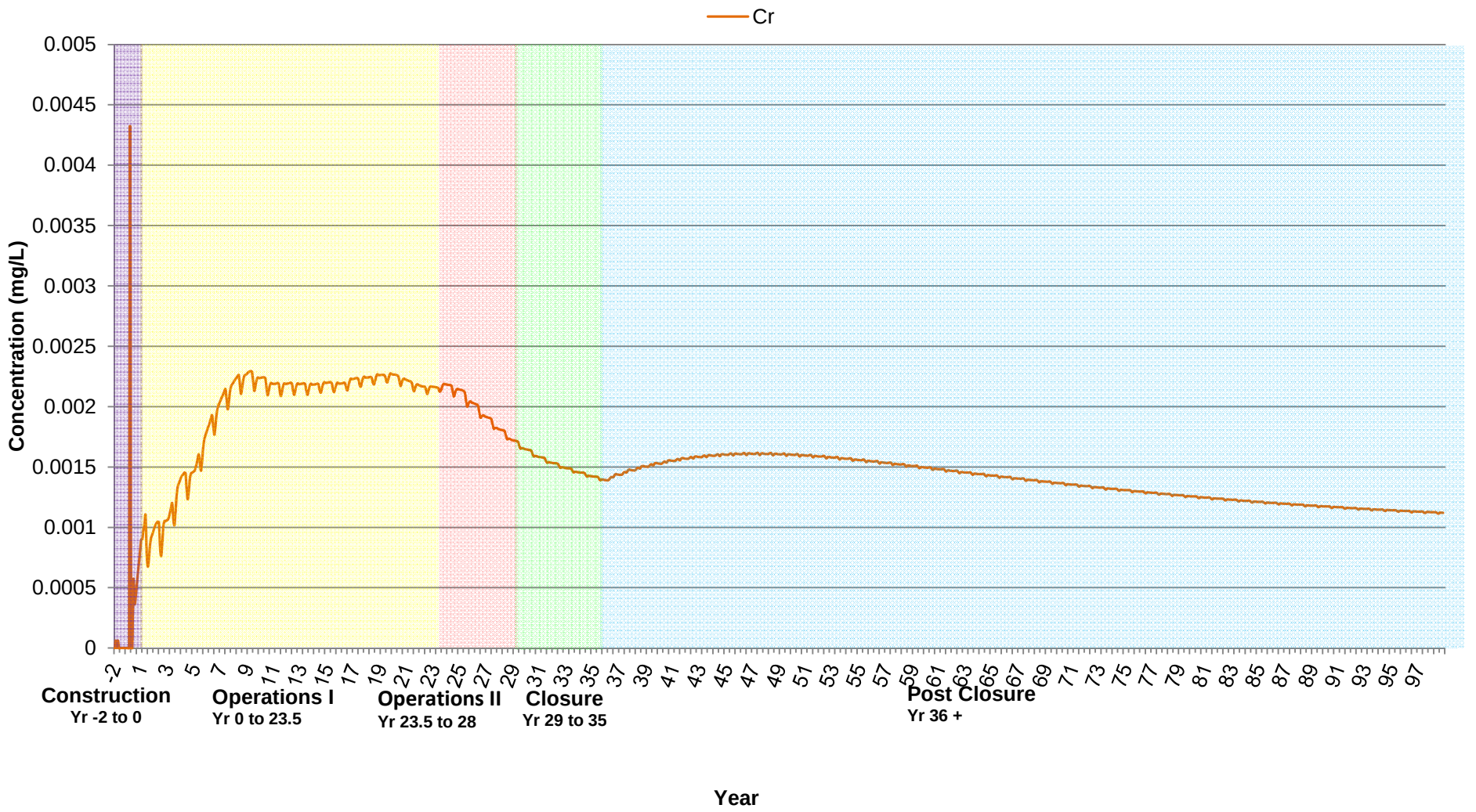
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G1.Cd-D

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE CHROMIUM CONCENTRATIONS - TMF

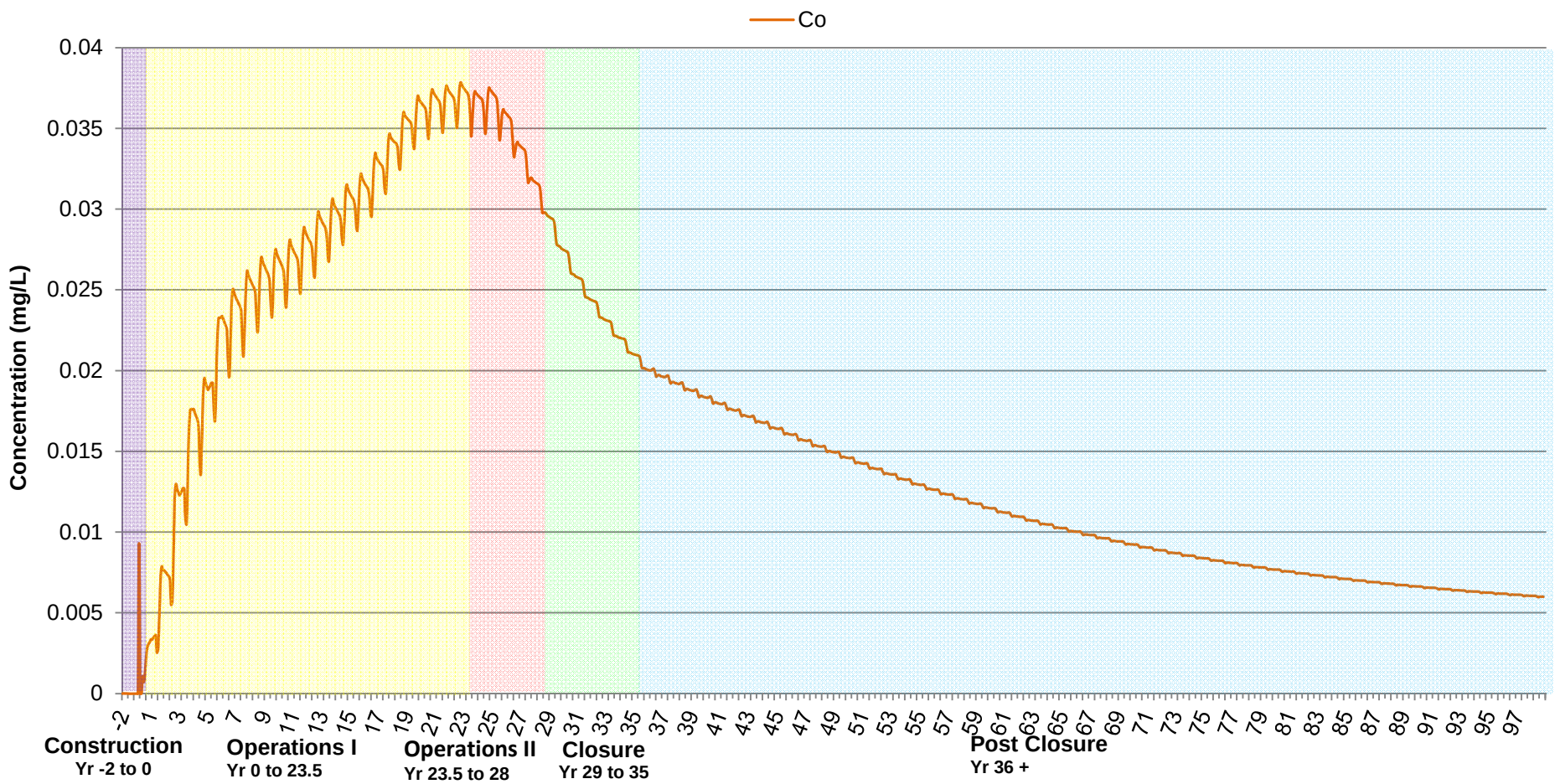
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G1.Cr

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE COBALT CONCENTRATIONS - TMF

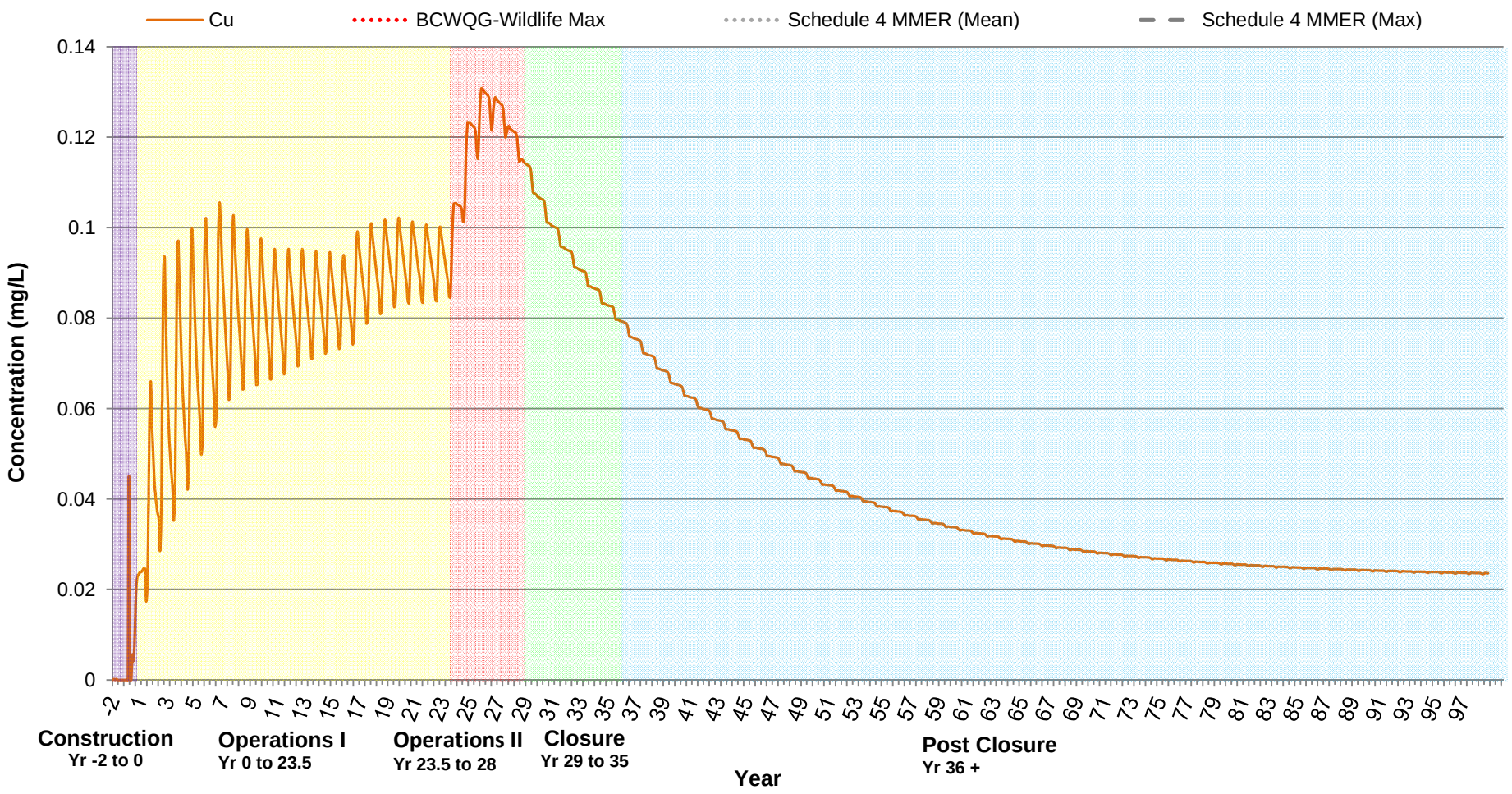
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G1.Co

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.
3. ALL GUIDELINES ARE FIXED VALUES.
4. BCWQG-WILDLIFE MAX (0.3 mg/L), MMER MEAN (0.3 mg/L) AND MMER MAX (0.6 mg/L) ARE NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE COPPER CONCENTRATIONS - TMF

Knight Piésold CONSULTING

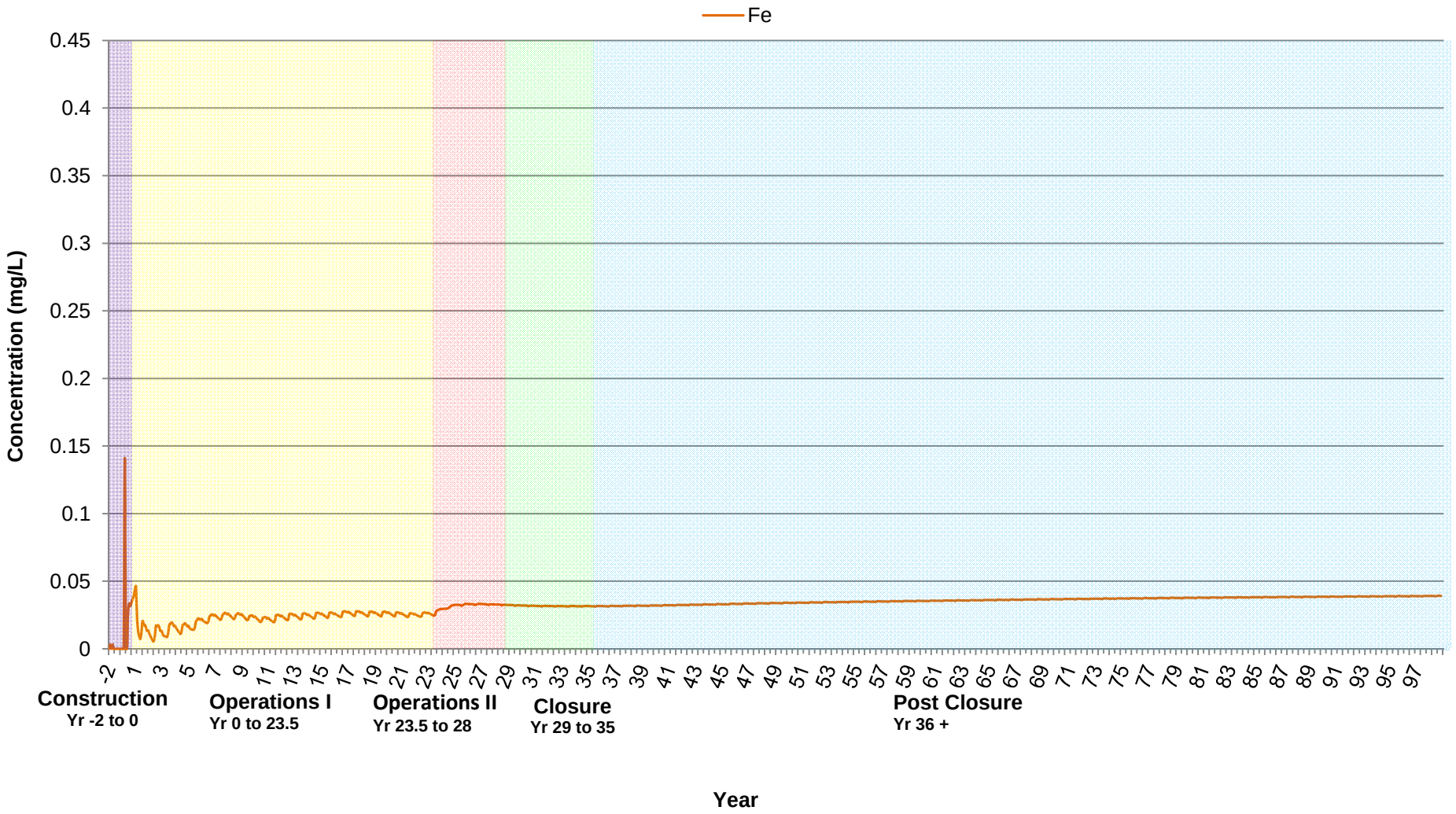
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G1.Cu-T

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE IRON CONCENTRATIONS - TMF

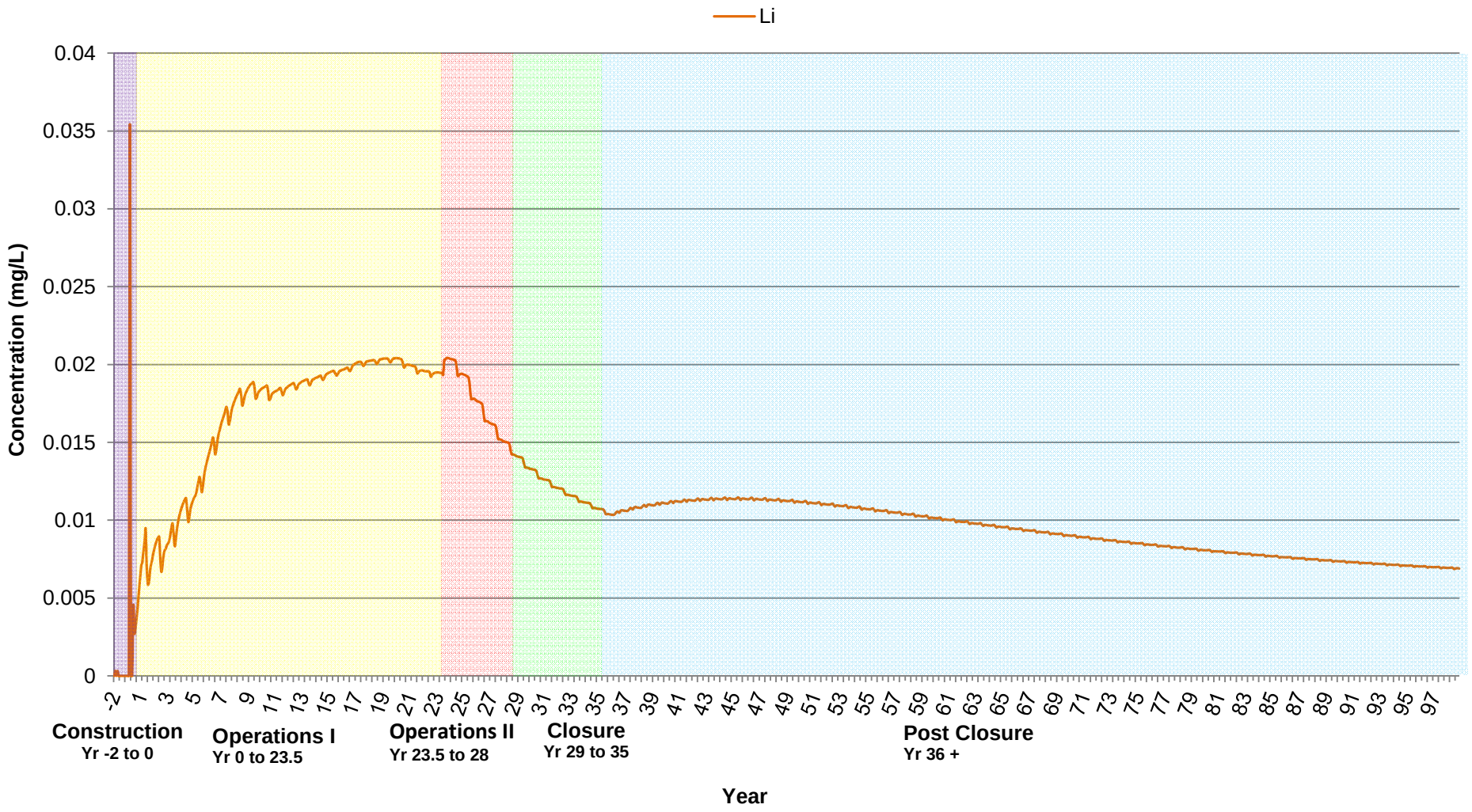
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G1.Fe

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE ZINC CONCENTRATIONS - TMF

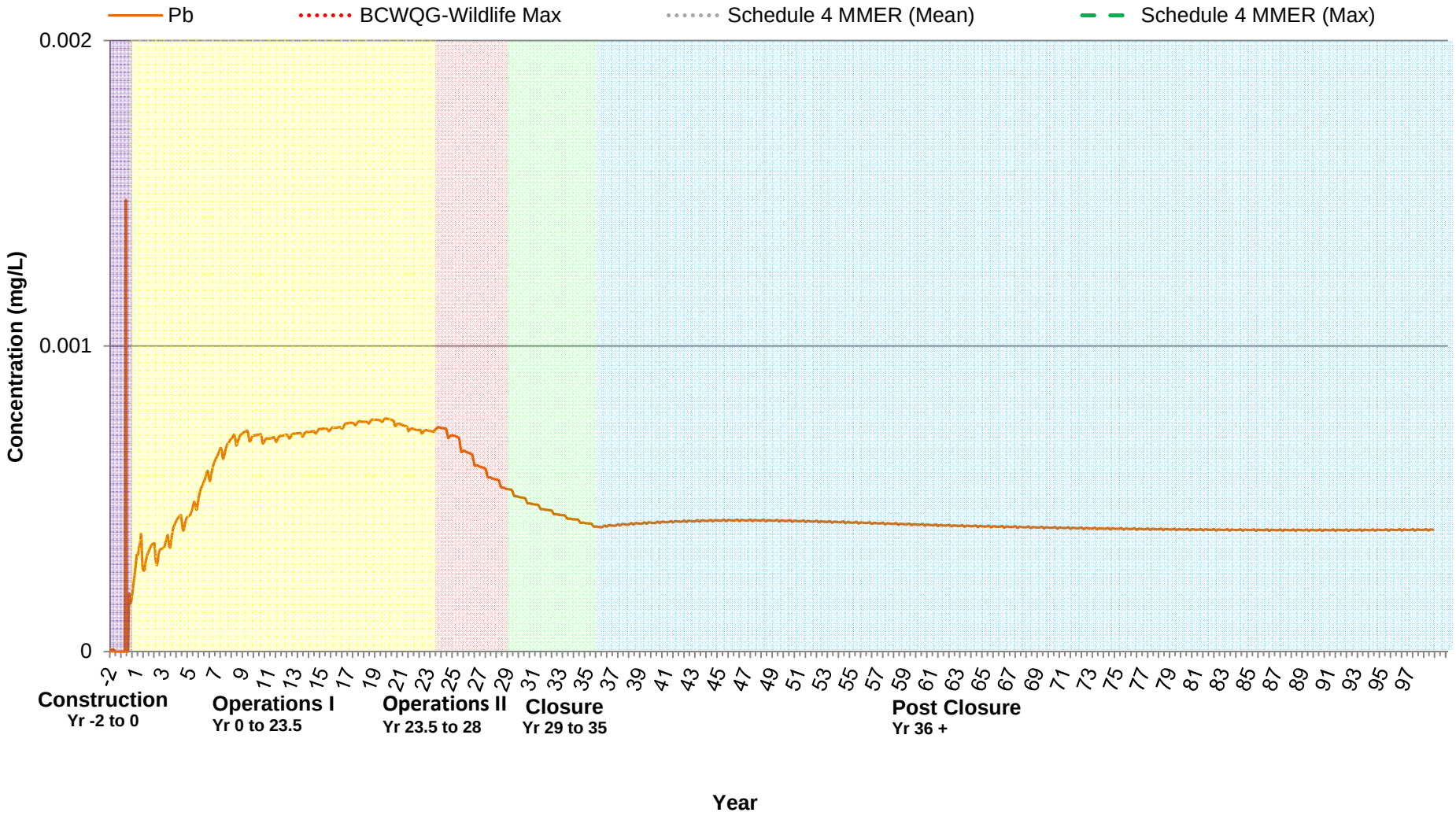
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G1.Zn

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.
3. ALL GUIDELINES ARE FIXED VALUES.
4. BCWQG-WILDLIFE MAX (0.1 mg/L), MMER MEAN (0.2 mg/L) AND MMER MAX (0.4 mg/L) GUIDELINES ARE NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE LEAD CONCENTRATIONS - TMF

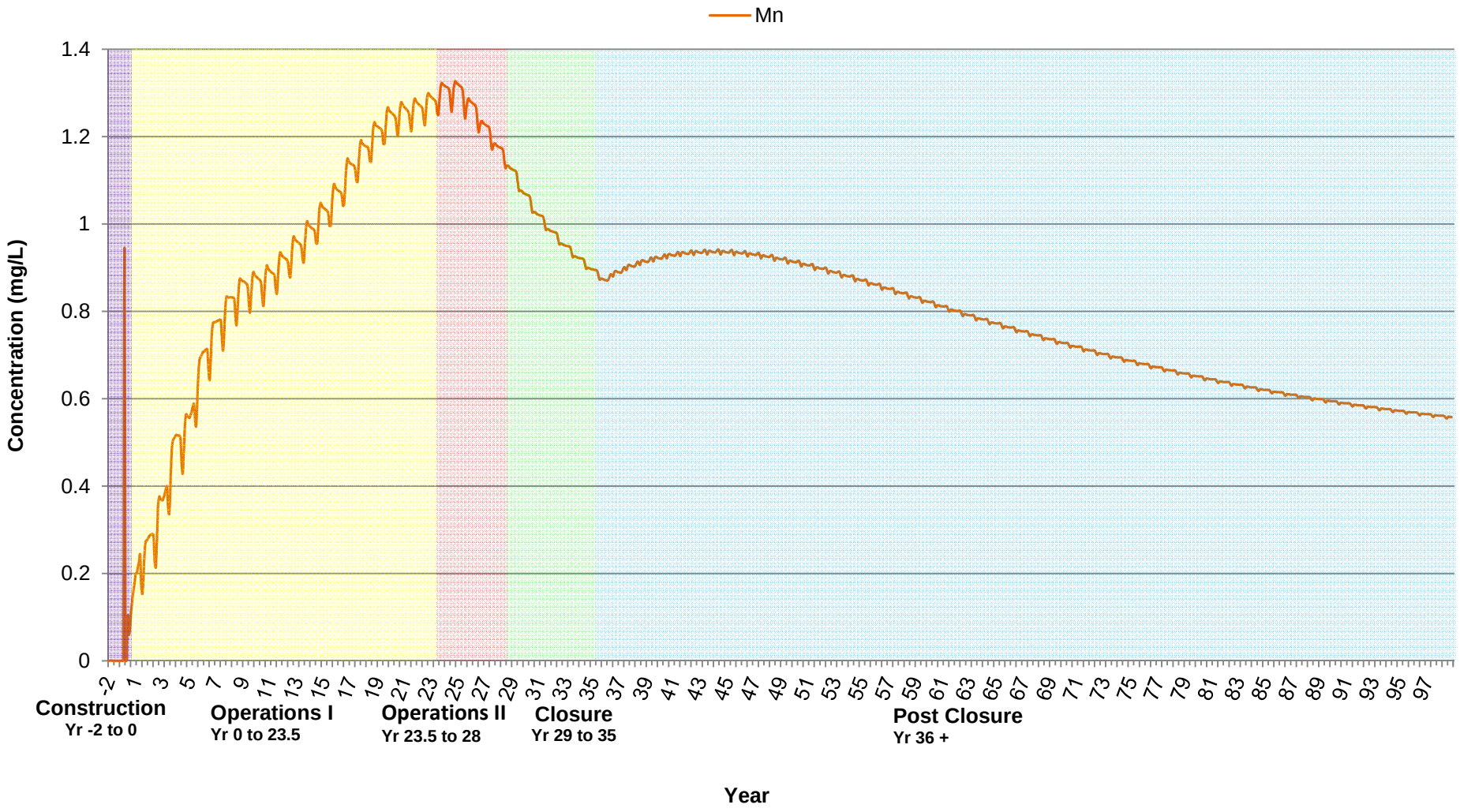
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G1.Pb

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE MANGANESE CONCENTRATIONS - TMF

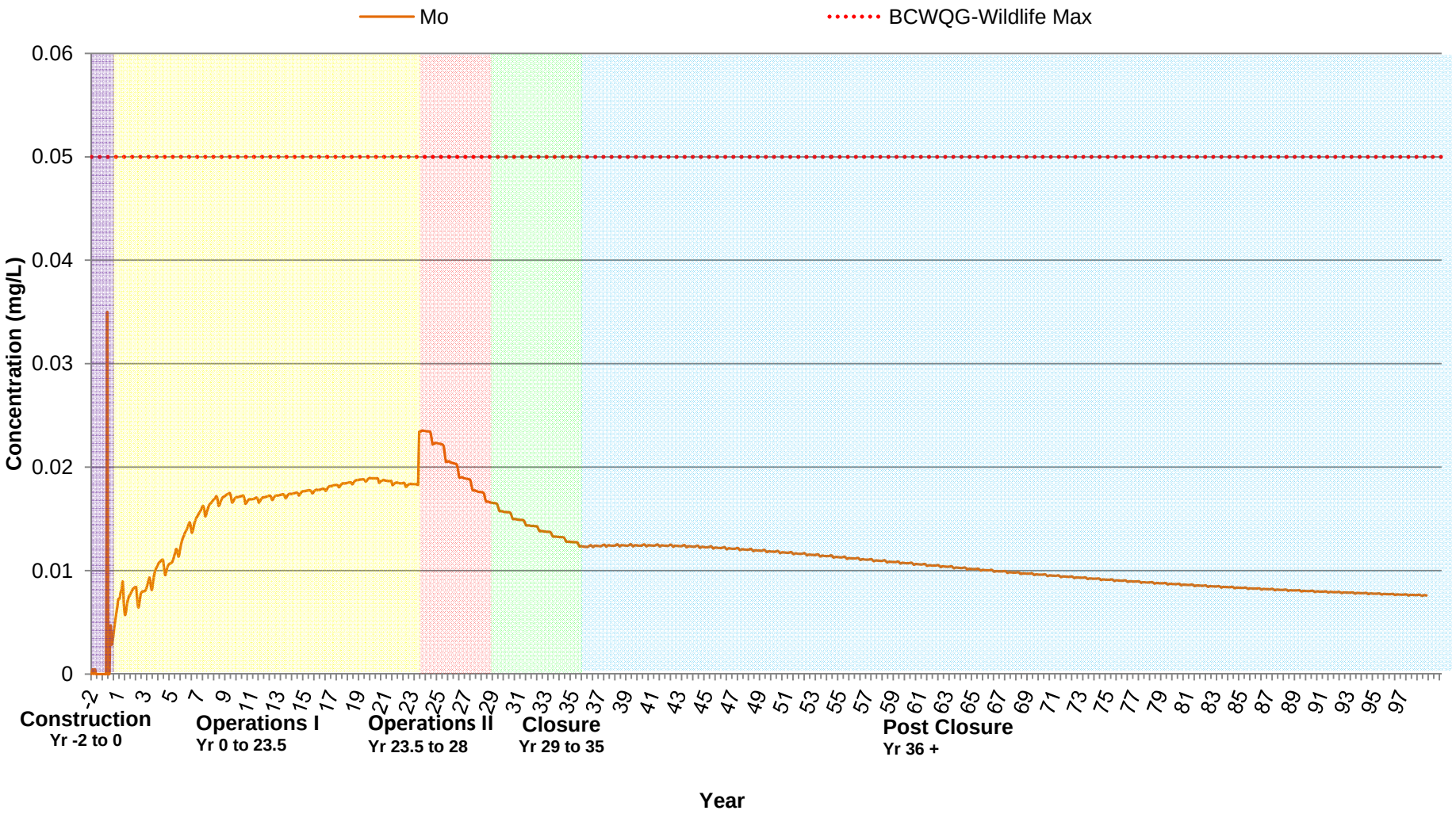
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G1.Mn

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.
3. ALL GUIDELINES ARE FIXED VALUES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE MOLYDBENUM CONCENTRATIONS - TMF

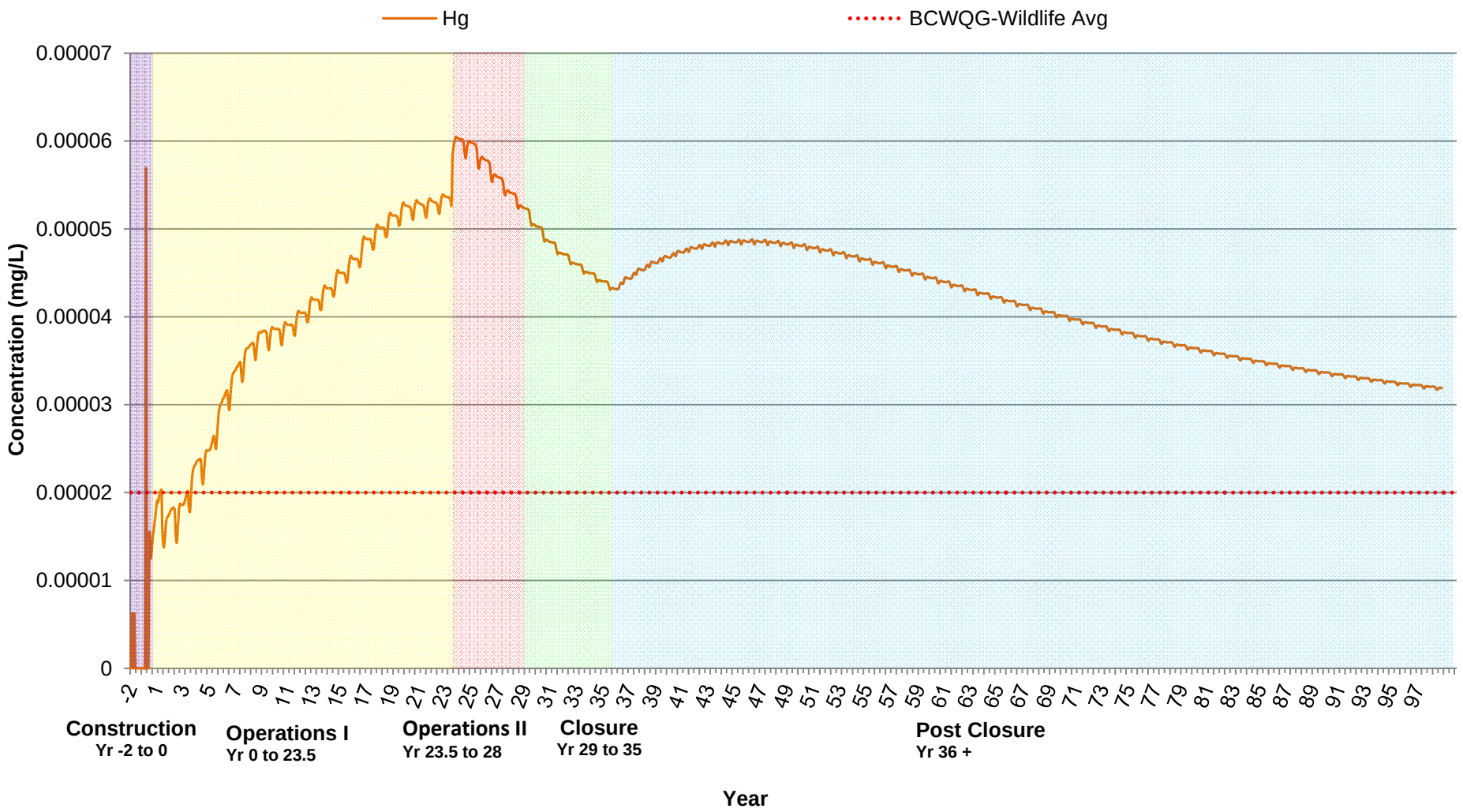
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G1.Mo

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.
3. ALL GUIDELINES ARE FIXED VALUES.
4. GUIDELINE VALUE APPLIED ON ASSUMPTION THAT METHYL-Hg IS EQUAL TO 0.5% OF T-Hg.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE MERCURY CONCENTRATIONS - TMF

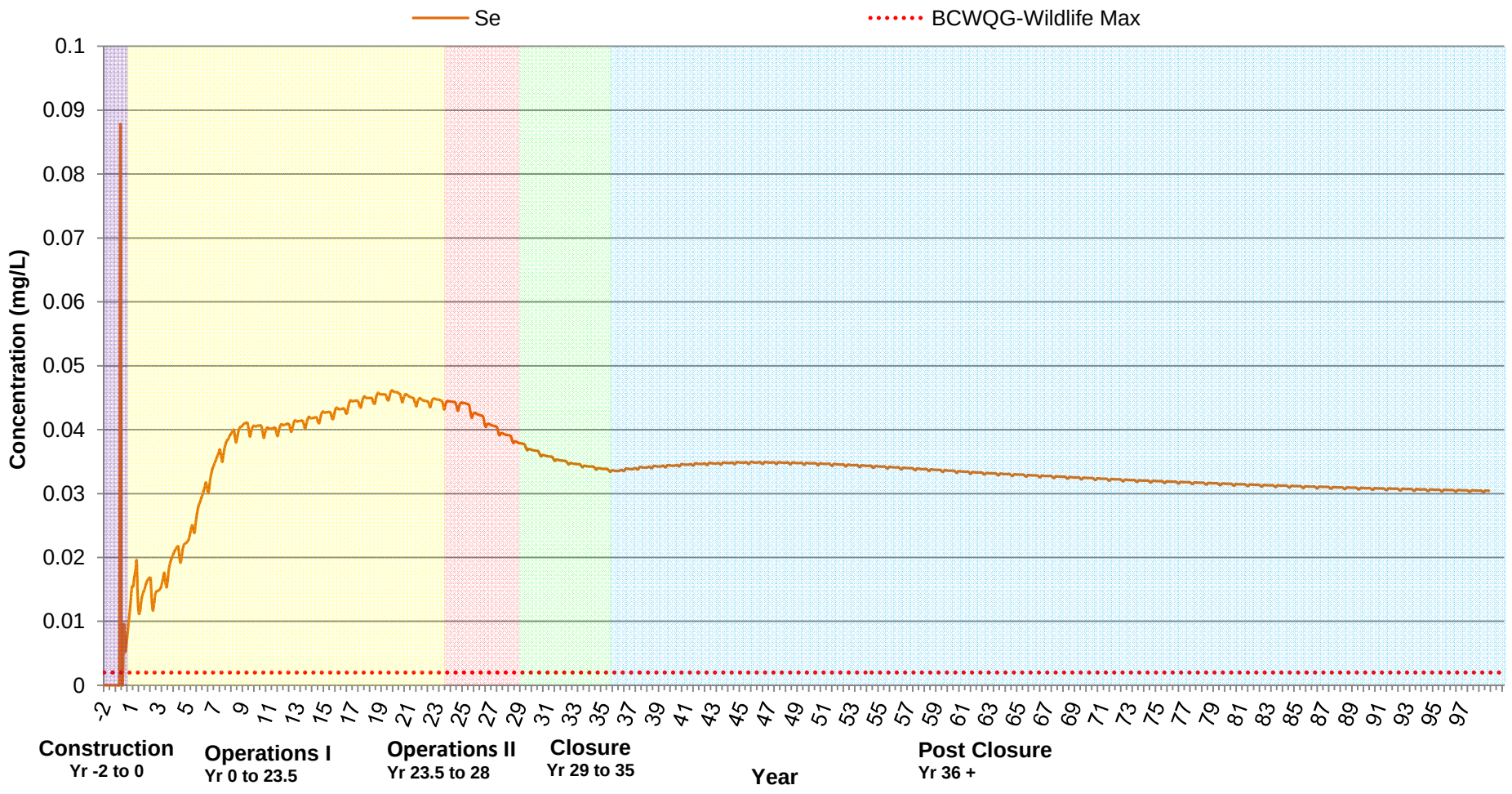
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G1.Hg

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.
3. ALL GUIDELINES ARE FIXED VALUES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE SELENIUM CONCENTRATIONS - TMF

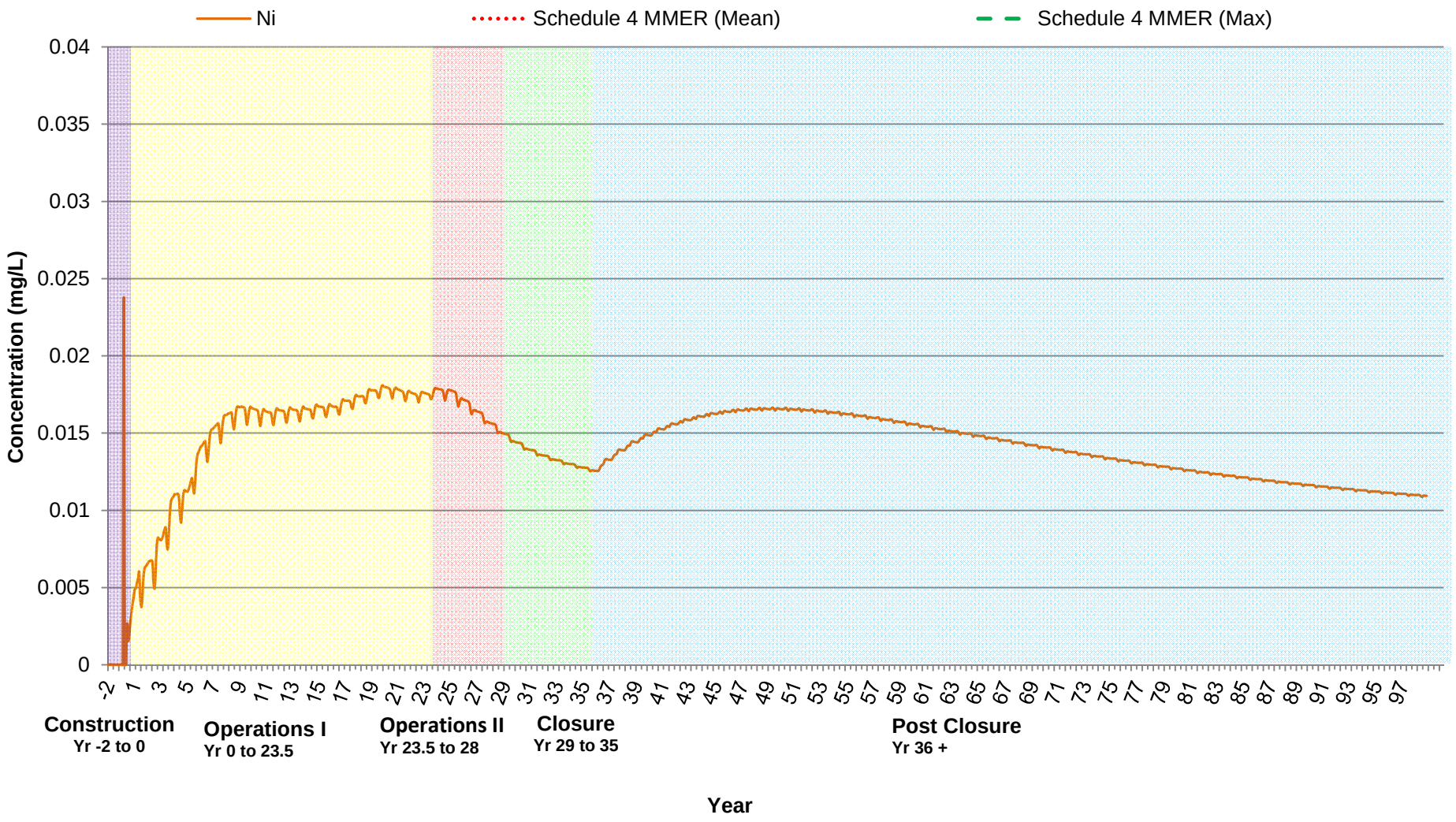
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G1.Se

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.
3. ALL GUIDELINES ARE FIXED VALUES.
4. THE MMER MEAN (0.5 mg/L) AND MMER MAX (1.0 mg/L) ARE NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE NICKEL CONCENTRATIONS - TMF

Knight Piésold CONSULTING

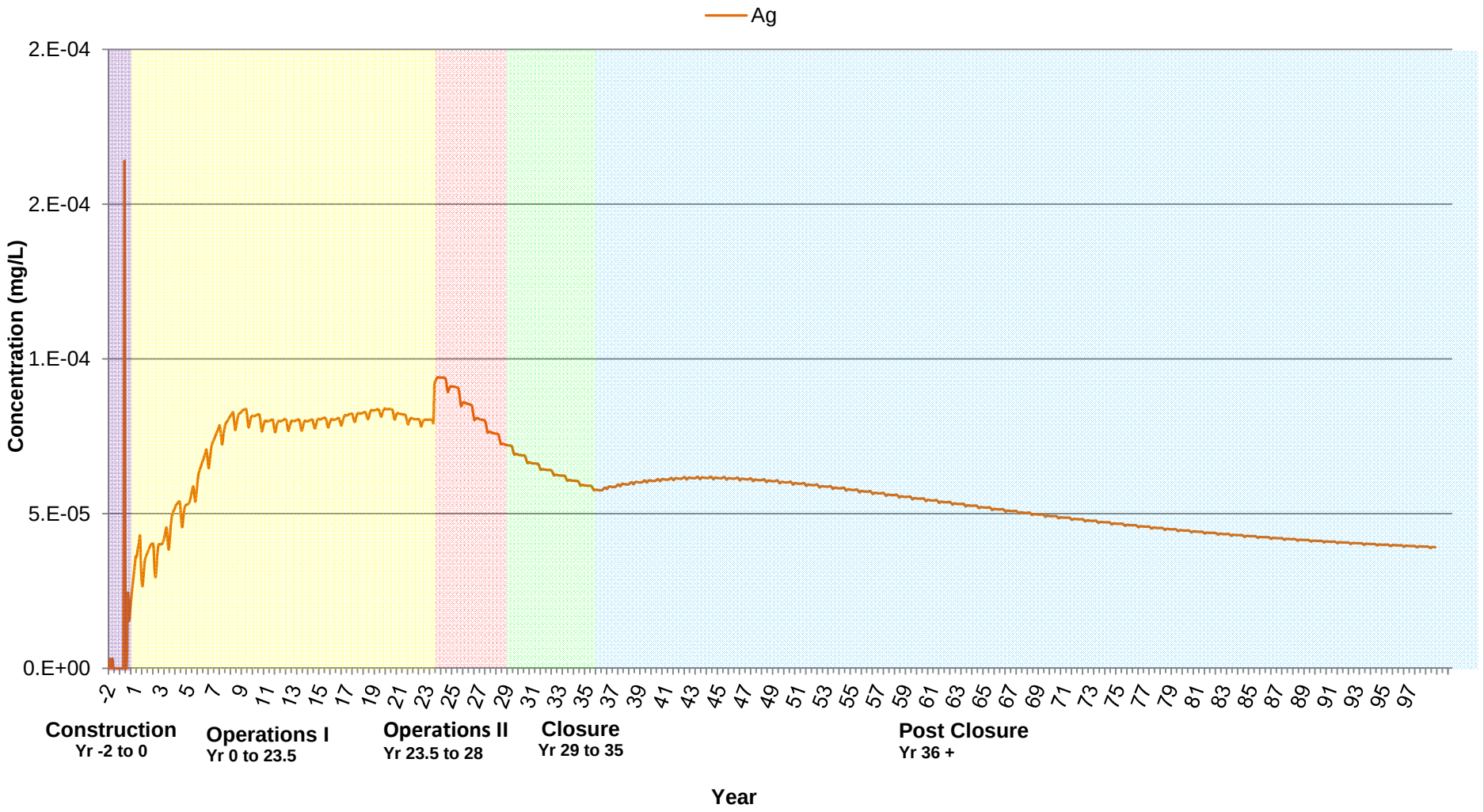
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G1.Ni

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE SILVER CONCENTRATIONS - TMF

Knight Piésold CONSULTING

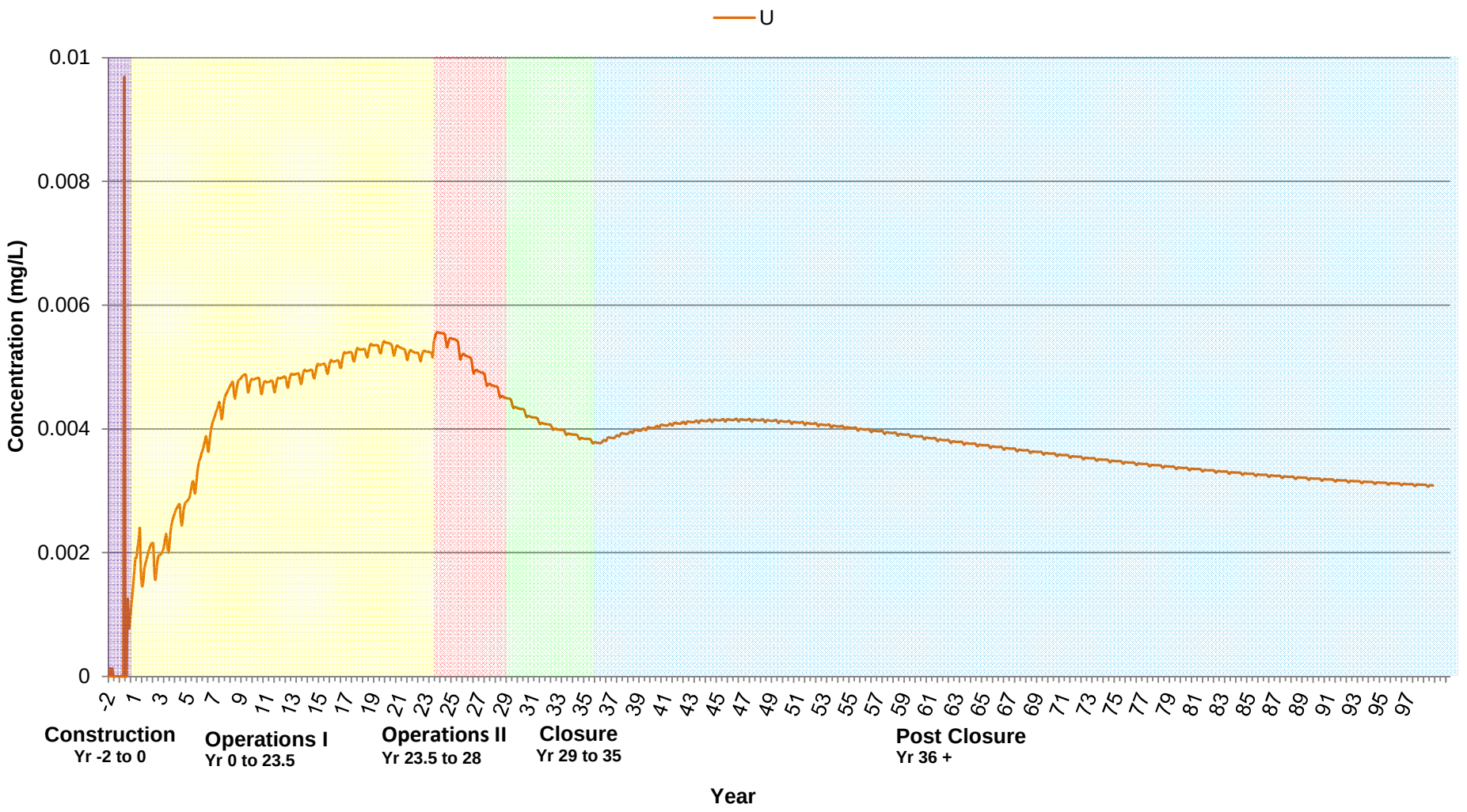
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G1.Ag

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE URANIUM CONCENTRATIONS - TMF

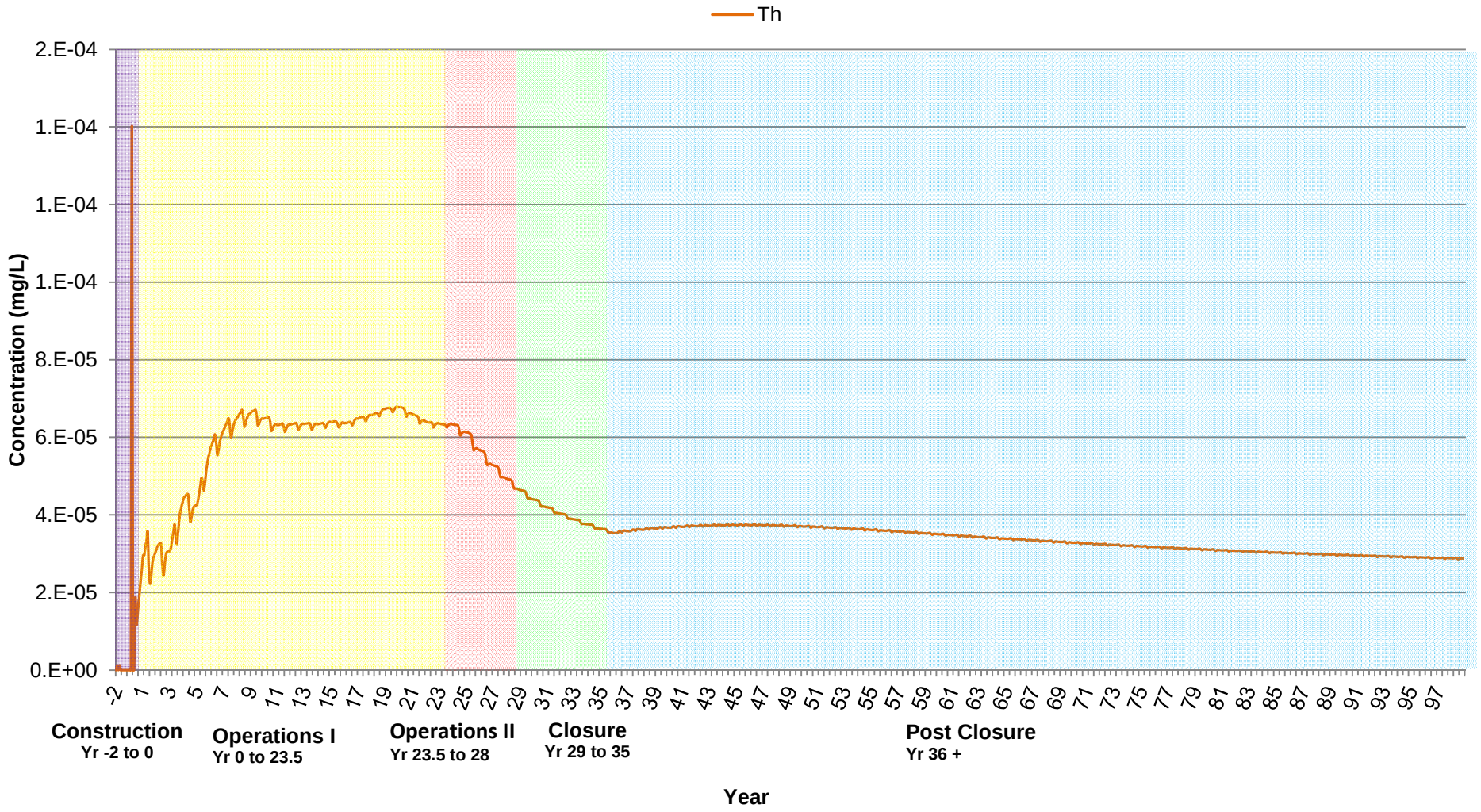
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G1.U

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE THALLIUM CONCENTRATIONS - TMF

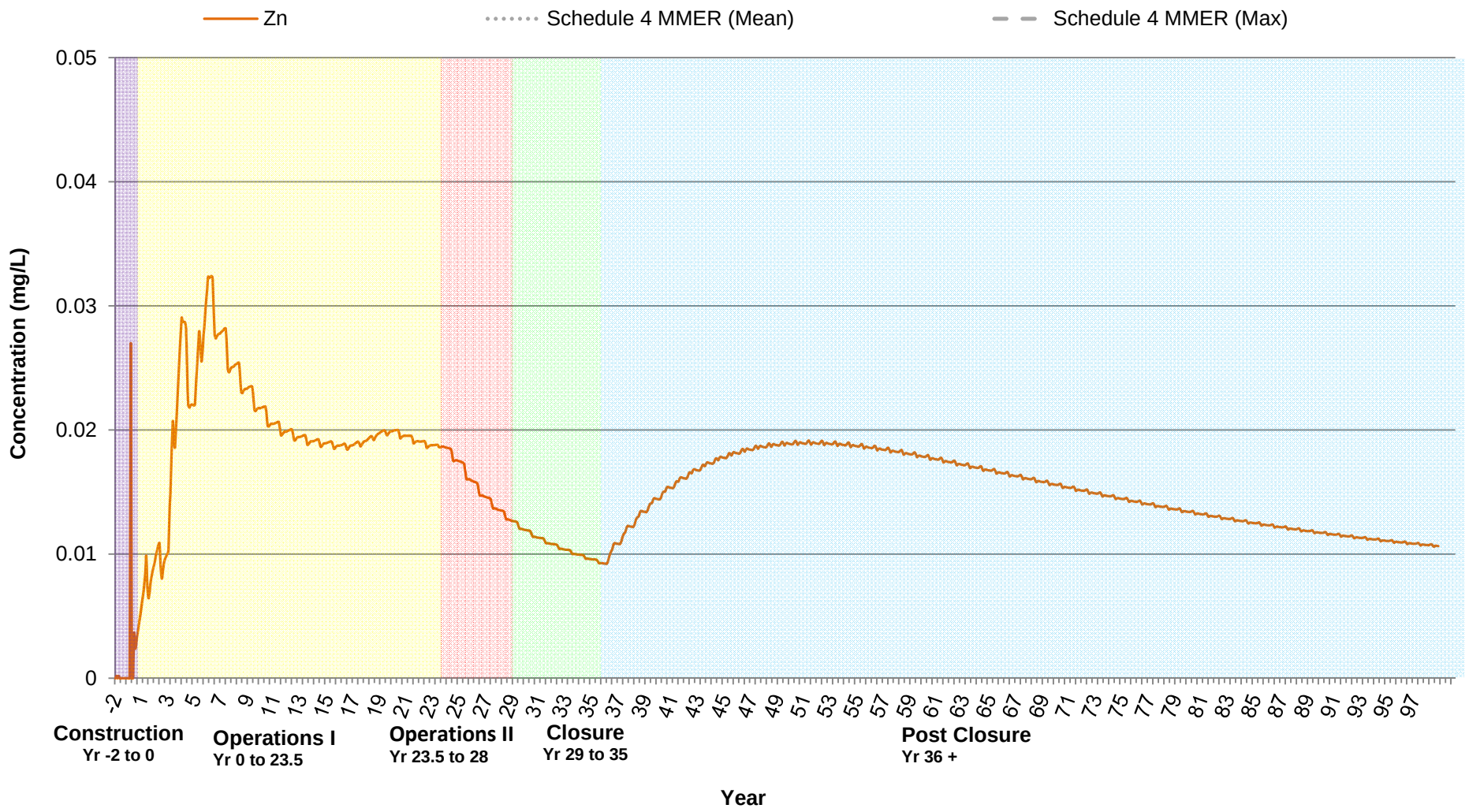
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G1.Th

REV 0



NOTES:

1. THE TMF SPILLWAY COMMENCES DISCHARGE AT YEAR 29.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.
3. ALL GUIDELINES ARE FIXED VALUES.
4. THE MMER MEAN (0.5 mg/L) AND MMER MAX (1.0 mg/L) ARE NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE ZINC CONCENTRATIONS - TMF

Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

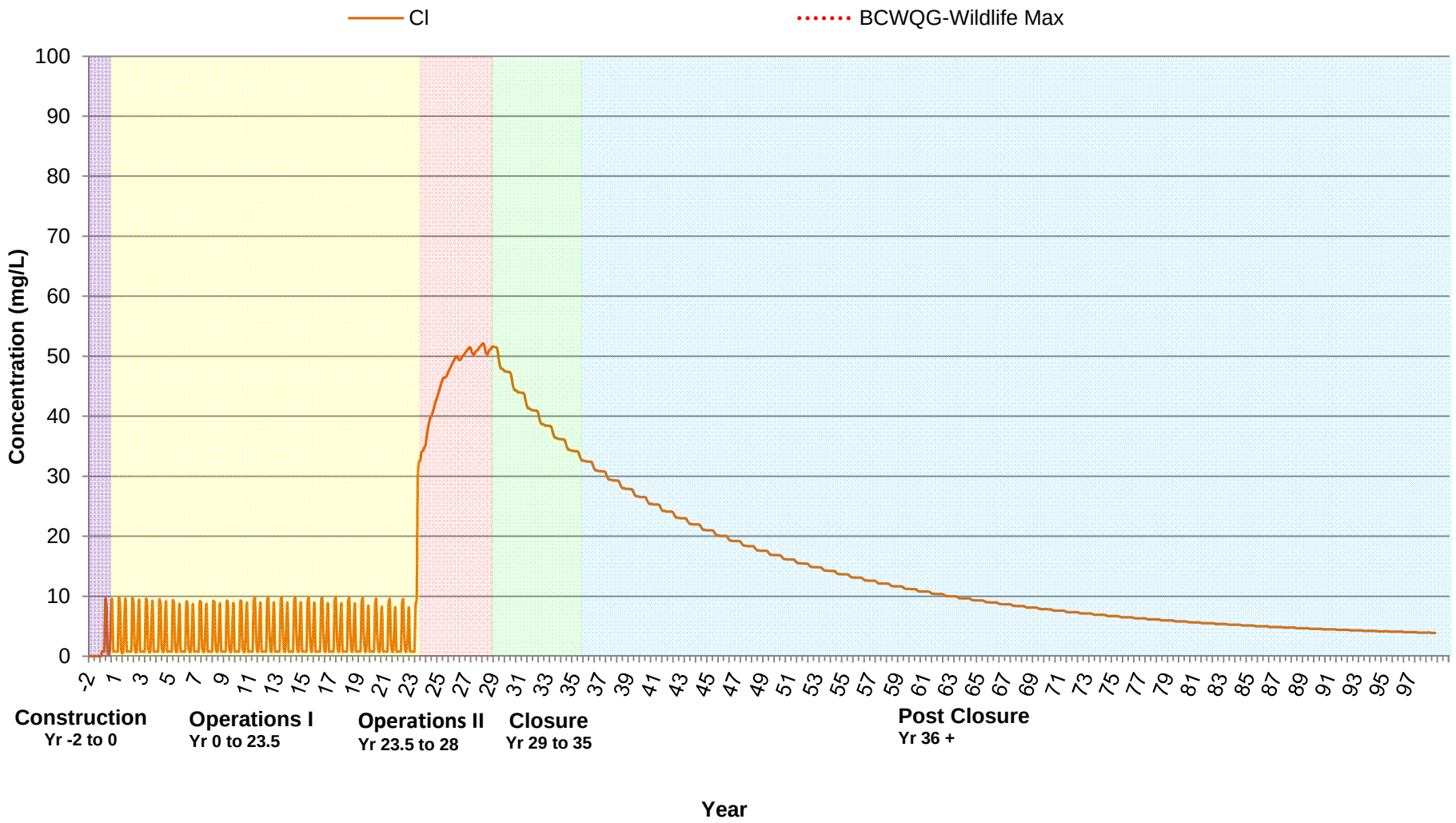
FIGURE G1.Zn

REV 0

APPENDIX G2

OPEN PIT (OP)

(Pages G2-1 to G2-27)



NOTES:

1. DURING OPERATIONS II WATER BEGINS ACCUMULATING IN THE OPEN PIT.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.
3. ALL GUIDELINES ARE FIXED VALUES.
4. THE BCWQG-WILDLIFE MAX GUIDELINE (600 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE CHLORIDE CONCENTRATIONS - OPEN PIT

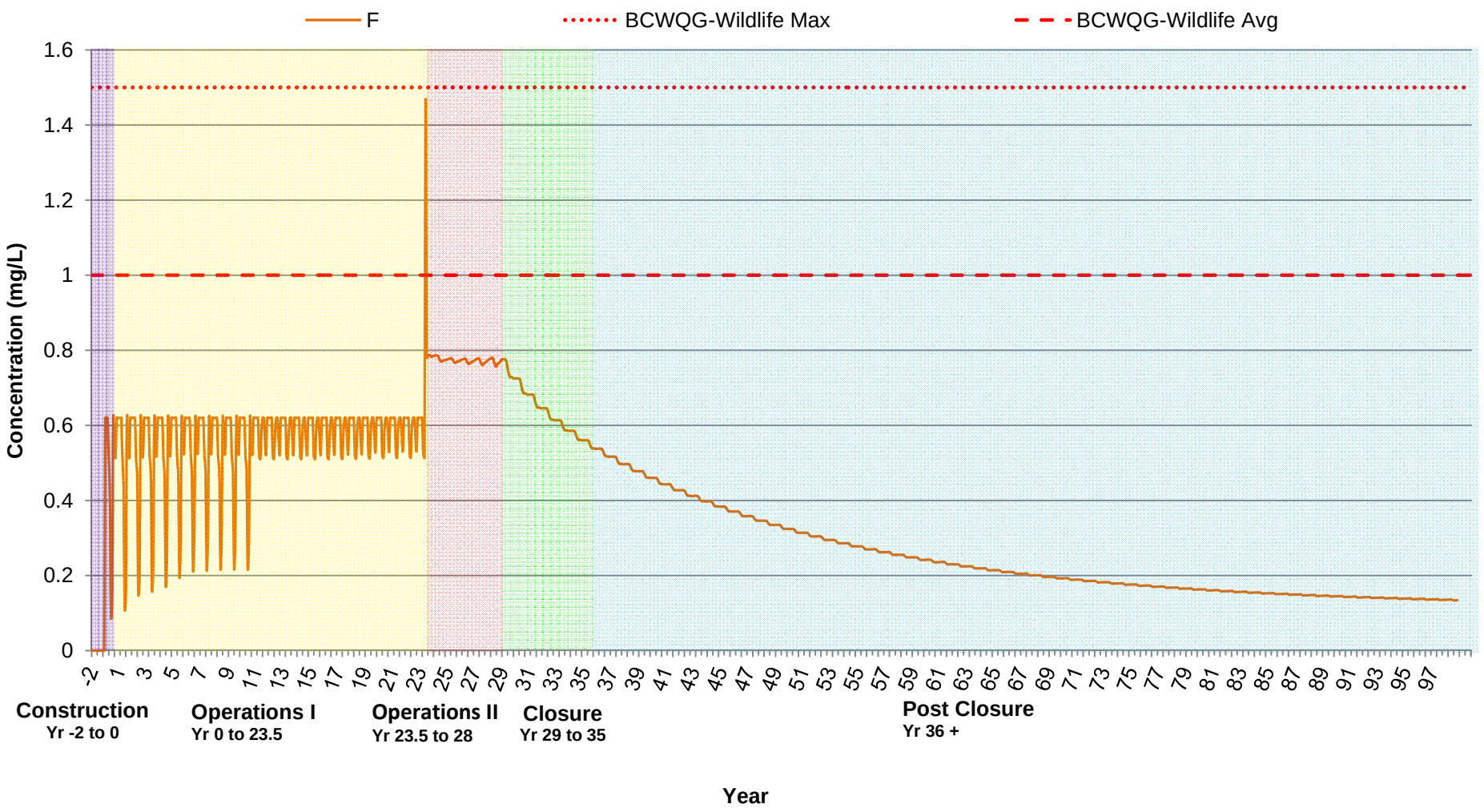
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G2.Cl

REV 0



NOTES:

1. DURING OPERATIONS II WATER BEGINS ACCUMULATING IN THE OPEN PIT.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.
3. ALL GUIDELINES ARE FIXED VALUES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE FLUORIDE CONCENTRATIONS - OPEN PIT

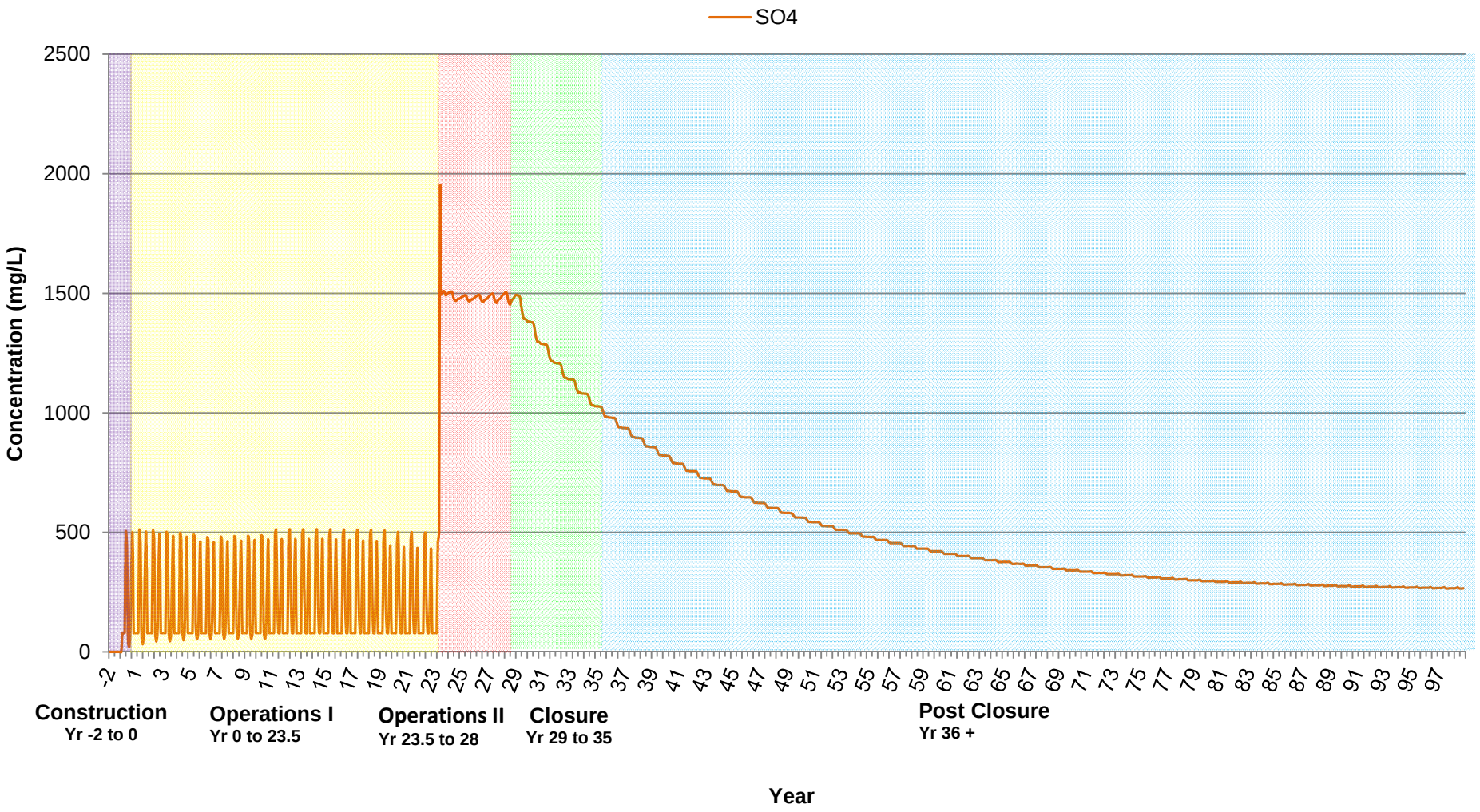
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G2.F

REV 0



NOTES:

1. DURING OPERATIONS II WATER BEGINS ACCUMULATING IN THE OPEN PIT.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE SULPHATE CONCENTRATIONS - OPEN PIT

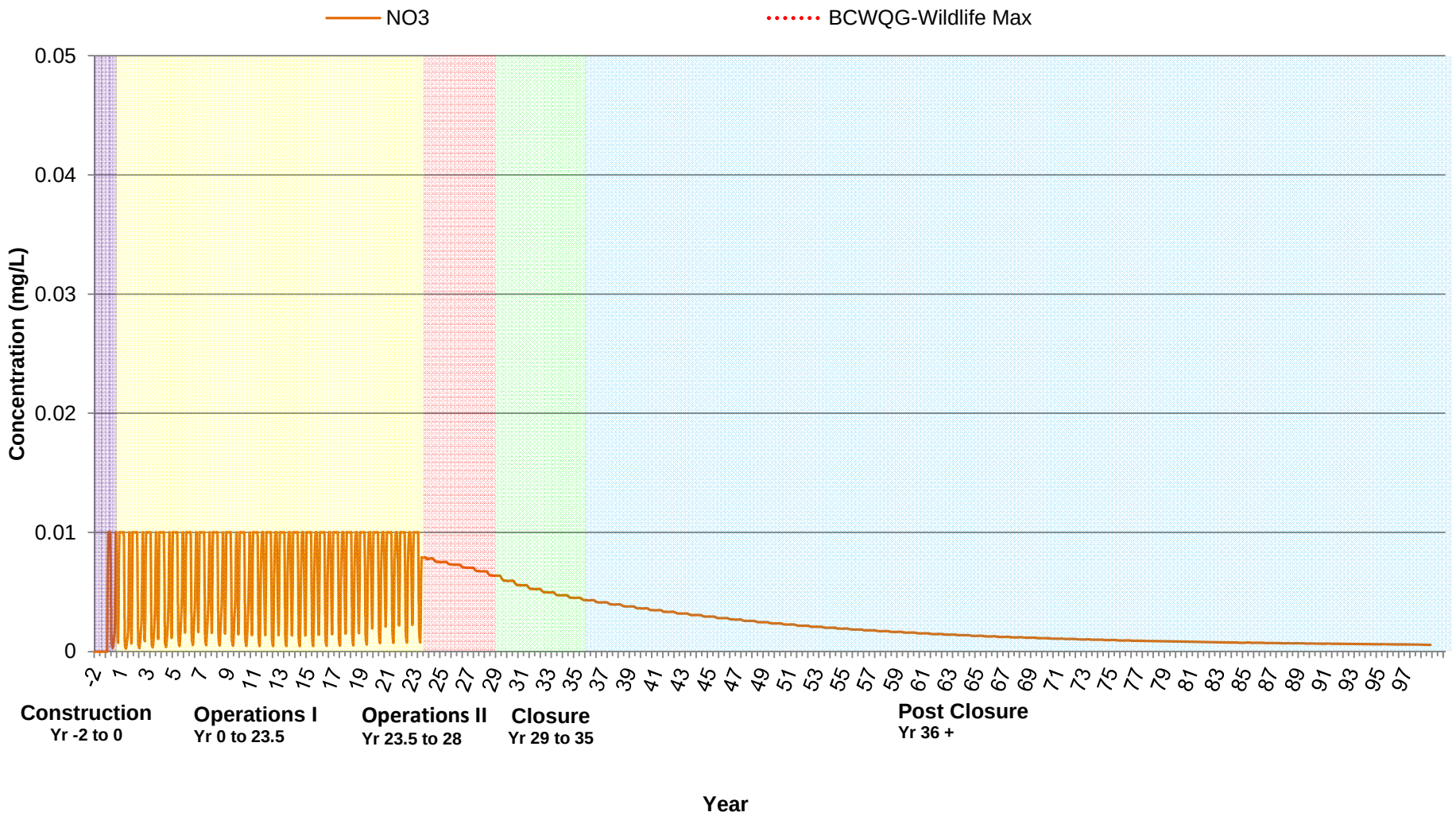
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G2.S04

REV 0



NOTES:

1. DURING OPERATIONS II WATER BEGINS ACCUMULATING IN THE OPEN PIT.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.
3. ALL GUIDELINES ARE FIXED VALUES.
4. THE BCWQG-WILDLIFE MAX GUIDELINE (100 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE NITRATE CONCENTRATIONS - OPEN PIT

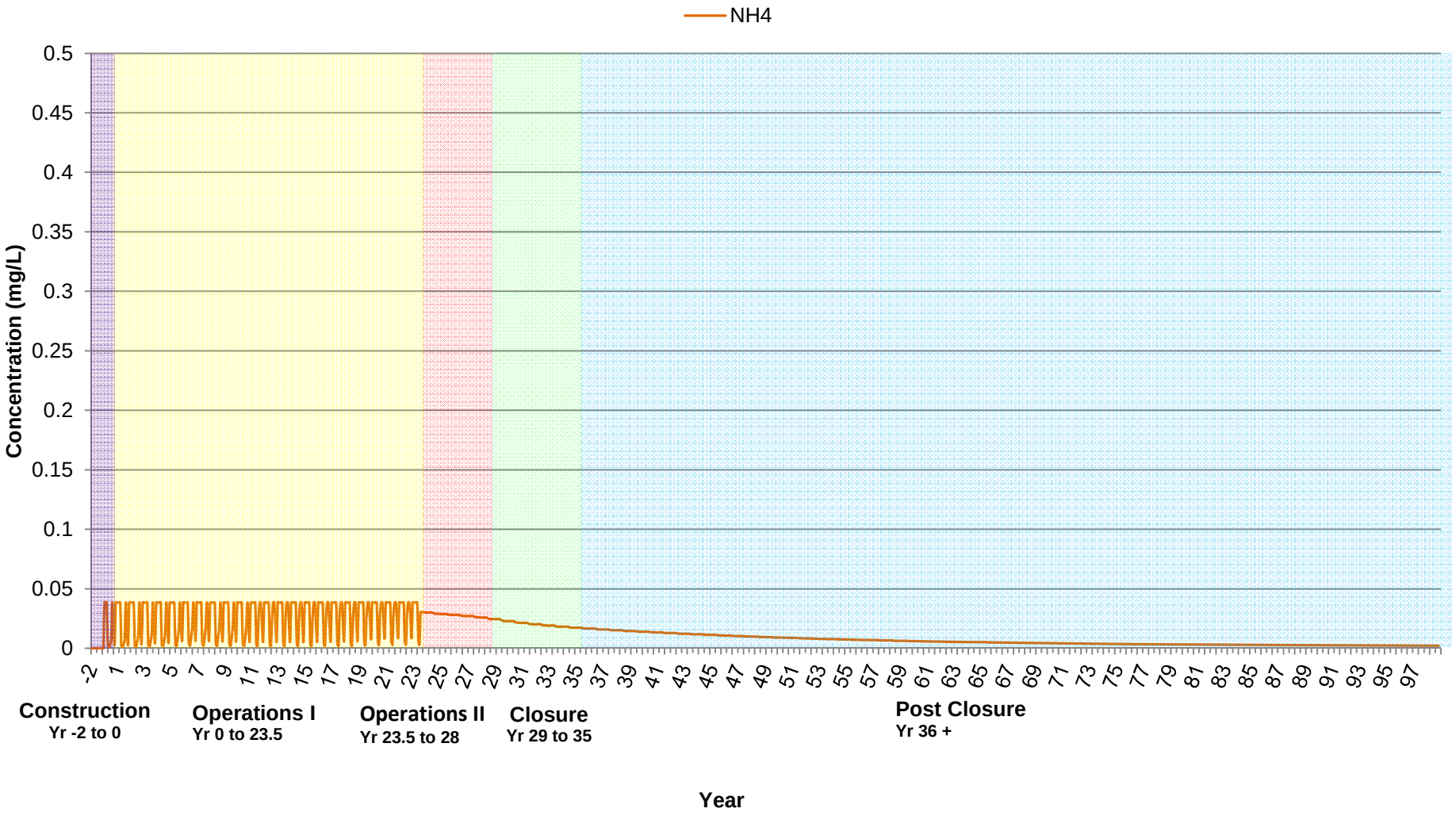
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G2.NO3

REV 0



NOTES:

1. DURING OPERATIONS II WATER BEGINS ACCUMULATING IN THE OPEN PIT.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE AMMONIA CONCENTRATIONS - OPEN PIT

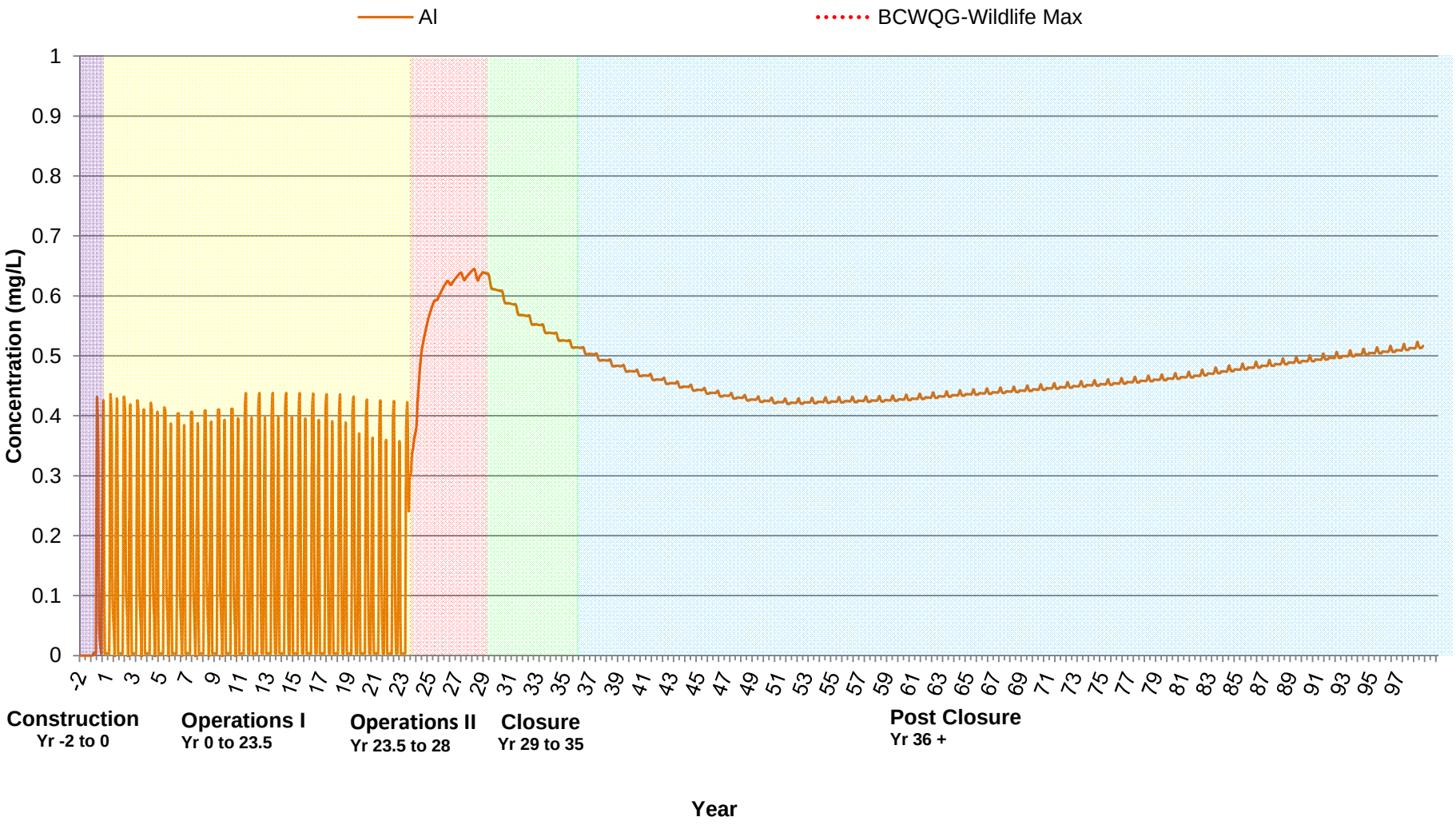
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G2.NH4

REV 0



NOTES:

1. DURING OPERATIONS II WATER BEGINS ACCUMULATING IN THE OPEN PIT.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.
3. ALL GUIDELINES ARE FIXED VALUES.
4. THE BCWQG-WILDLIFE MAX GUIDELINE (5 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE ALUMINUM CONCENTRATIONS - OPEN PIT

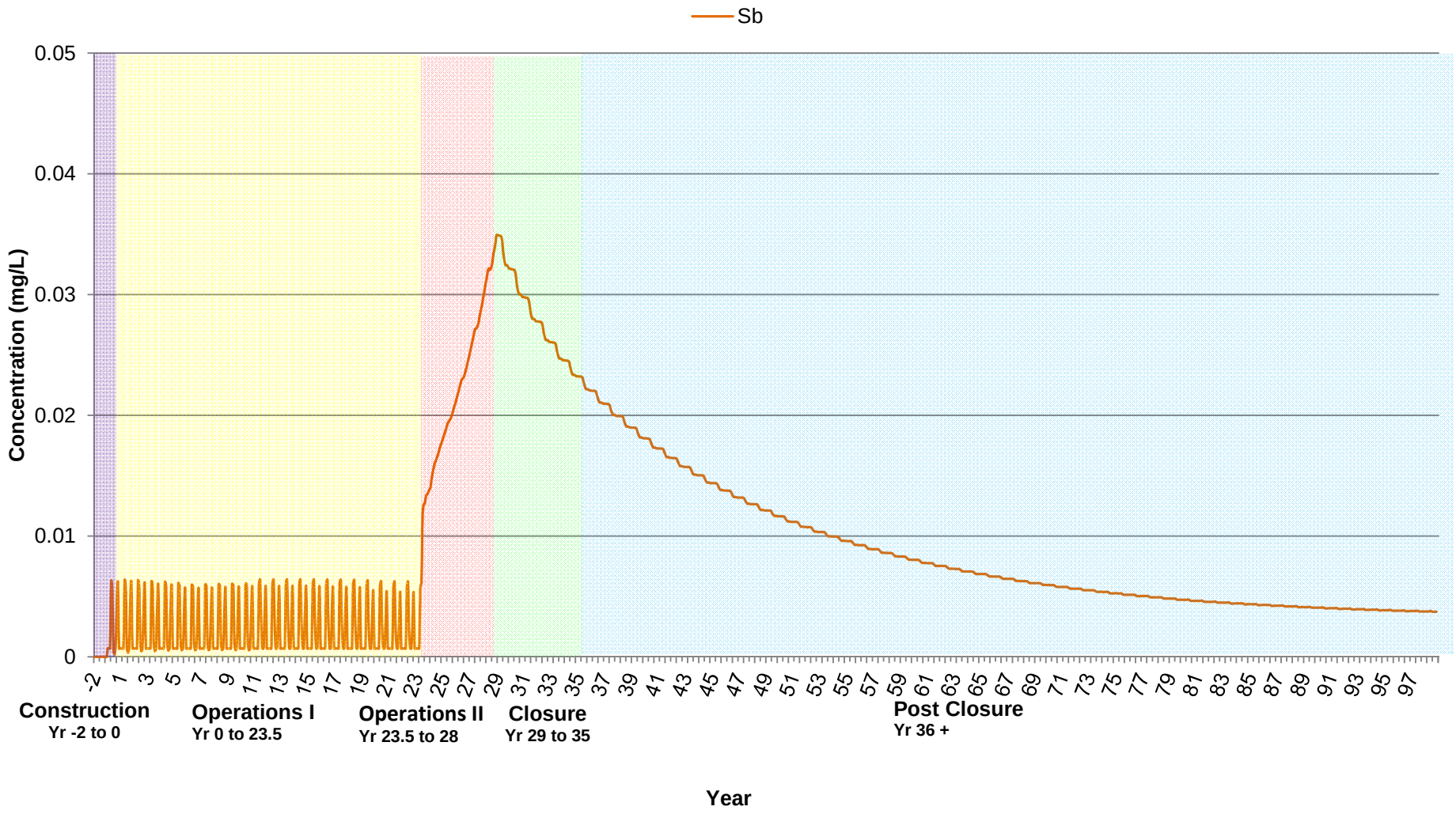
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G2.Al

REV 0



NOTES:

1. DURING OPERATIONS II WATER BEGINS ACCUMULATING IN THE OPEN PIT.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE ANTIMONY CONCENTRATIONS - OPEN PIT

Knight Piésold CONSULTING

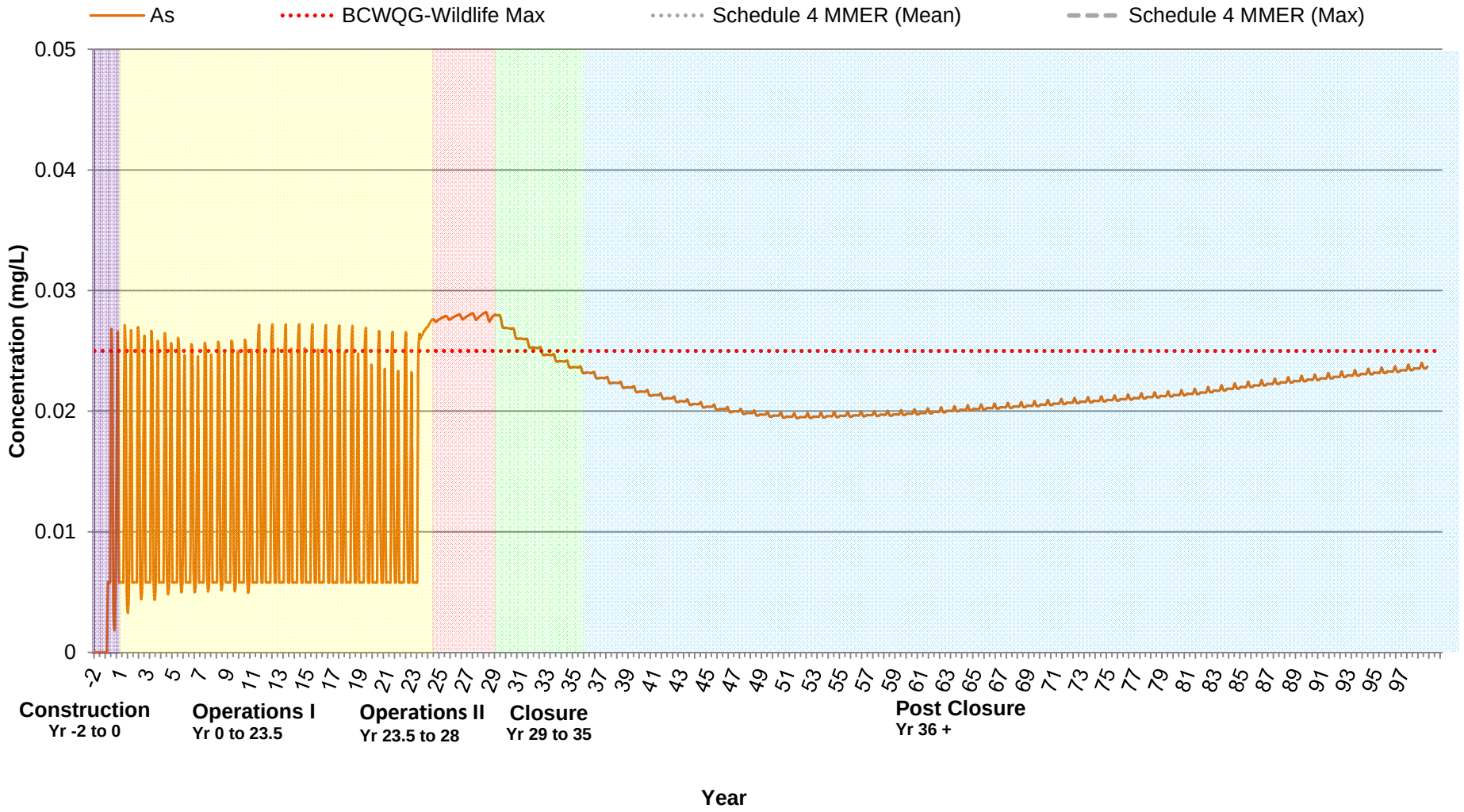
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G2.Sb

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. DURING OPERATIONS II WATER BEGINS ACCUMULATING IN THE OPEN PIT.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.
3. ALL GUIDELINES ARE FIXED VALUES.
4. THE MMER MAX (1 mg/L) AND MMER MEAN (0.5 mg/L) ARE NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE ARSENIC CONCENTRATIONS - OPEN PIT

Knight Piésold CONSULTING

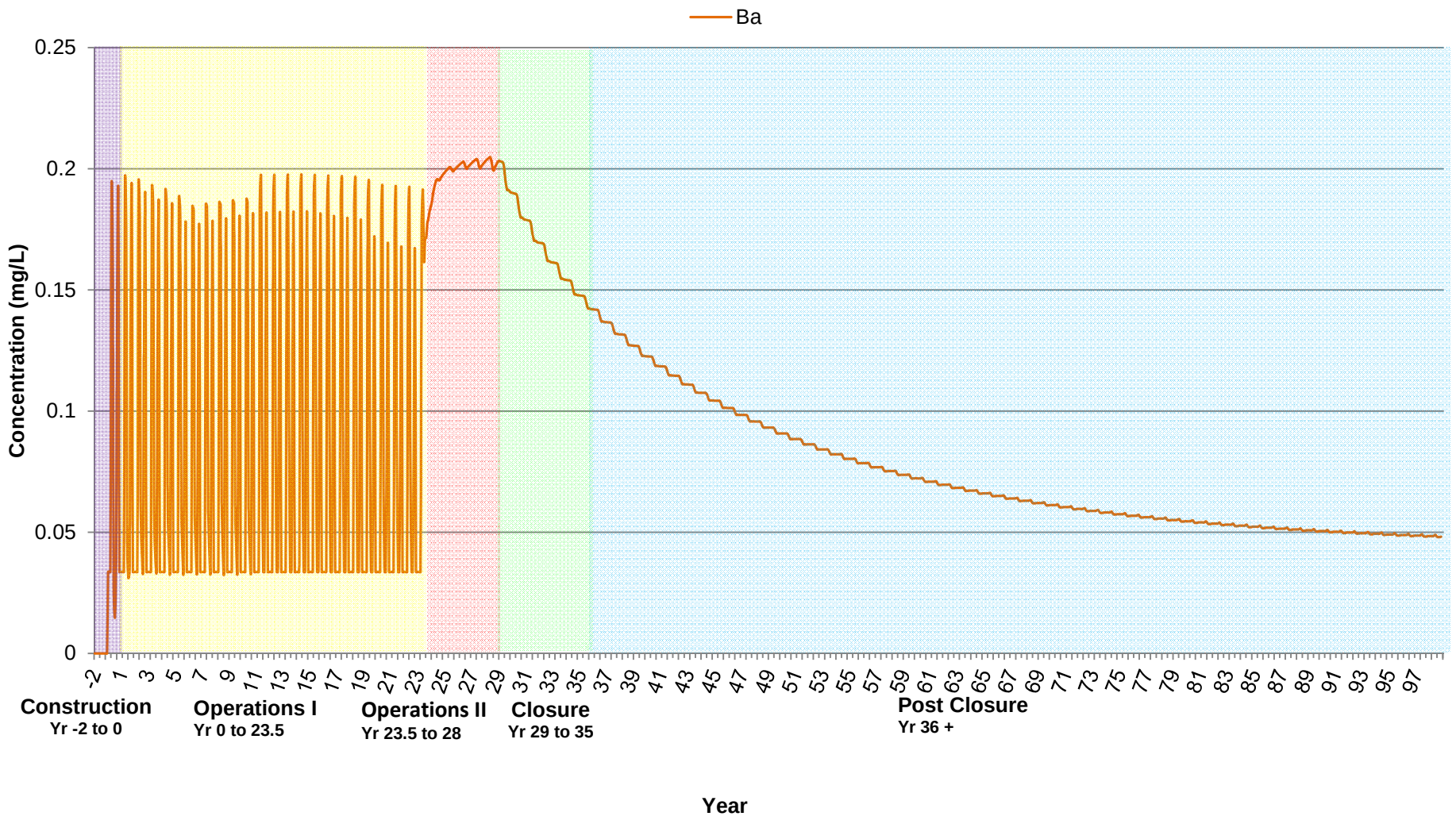
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G2.As

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. DURING OPERATIONS II WATER BEGINS ACCUMULATING IN THE OPEN PIT.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE BARIUM CONCENTRATIONS - OPEN PIT

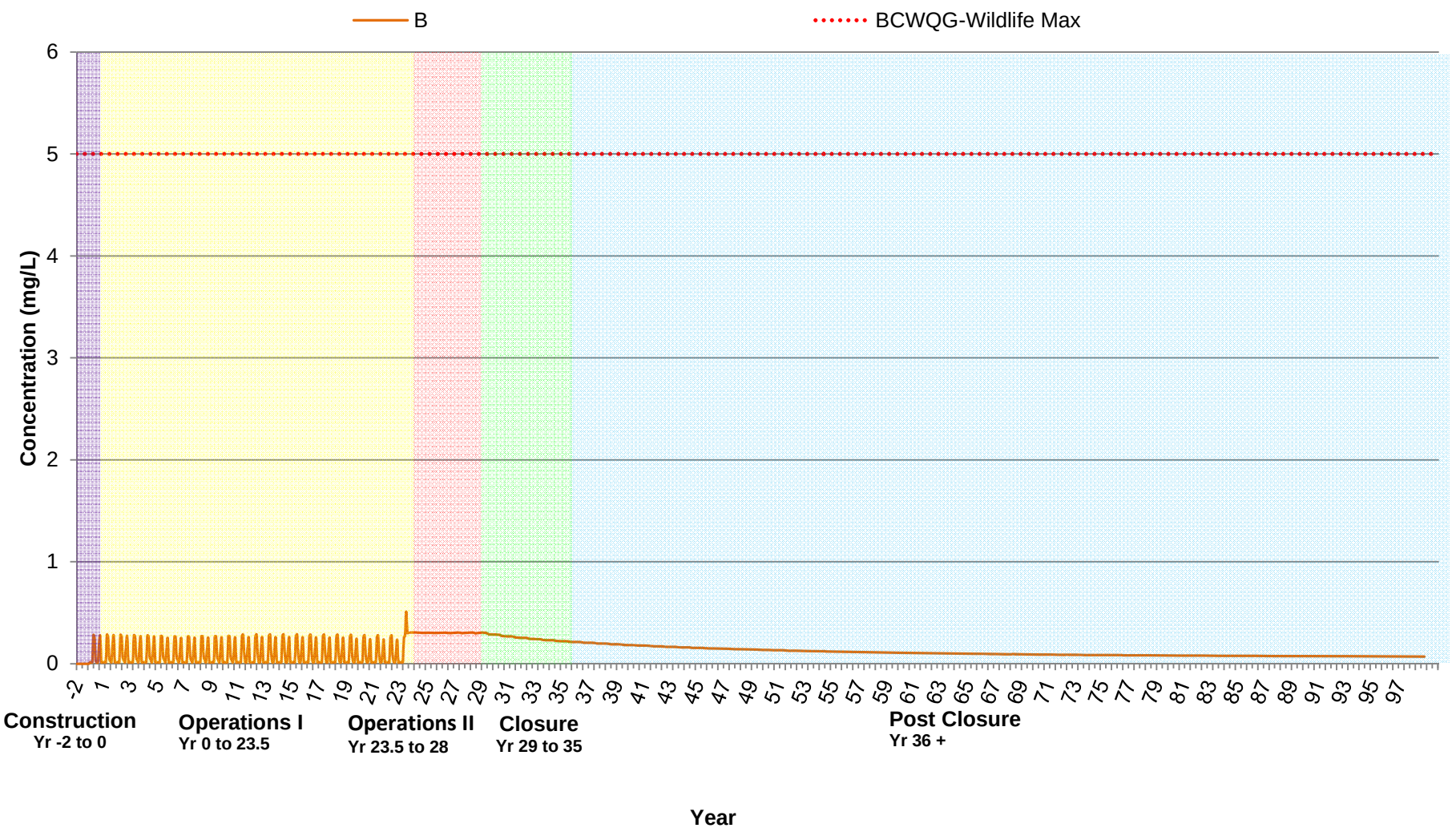
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G2.Ba

REV 0



NOTES:

1. DURING OPERATIONS II WATER BEGINS ACCUMULATING IN THE OPEN PIT.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE BORON CONCENTRATIONS - OPEN PIT

Knight Piésold CONSULTING

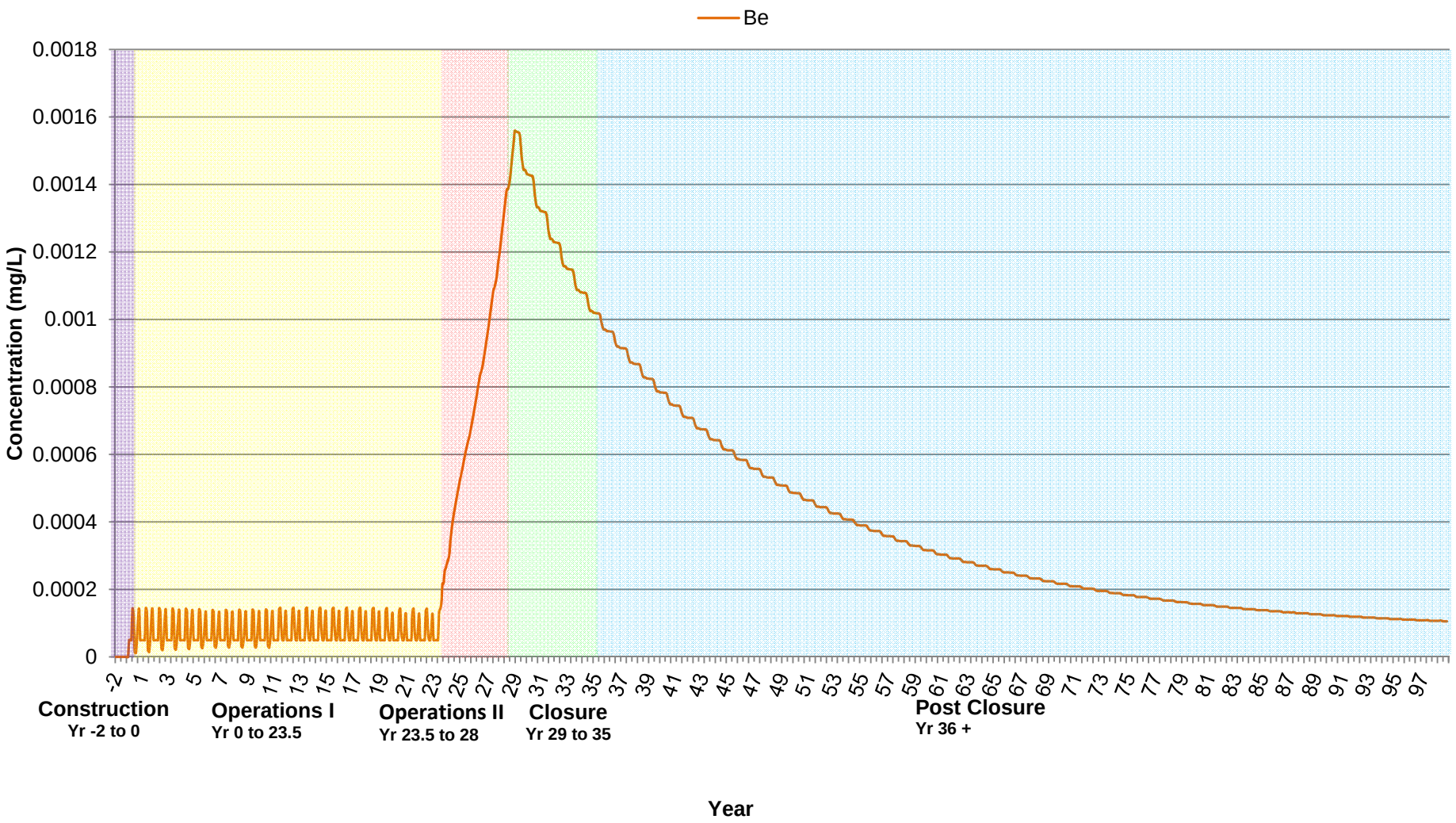
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G2.B

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. DURING OPERATIONS II WATER BEGINS ACCUMULATING IN THE OPEN PIT.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE BERYILLIUM CONCENTRATIONS - OPEN PIT

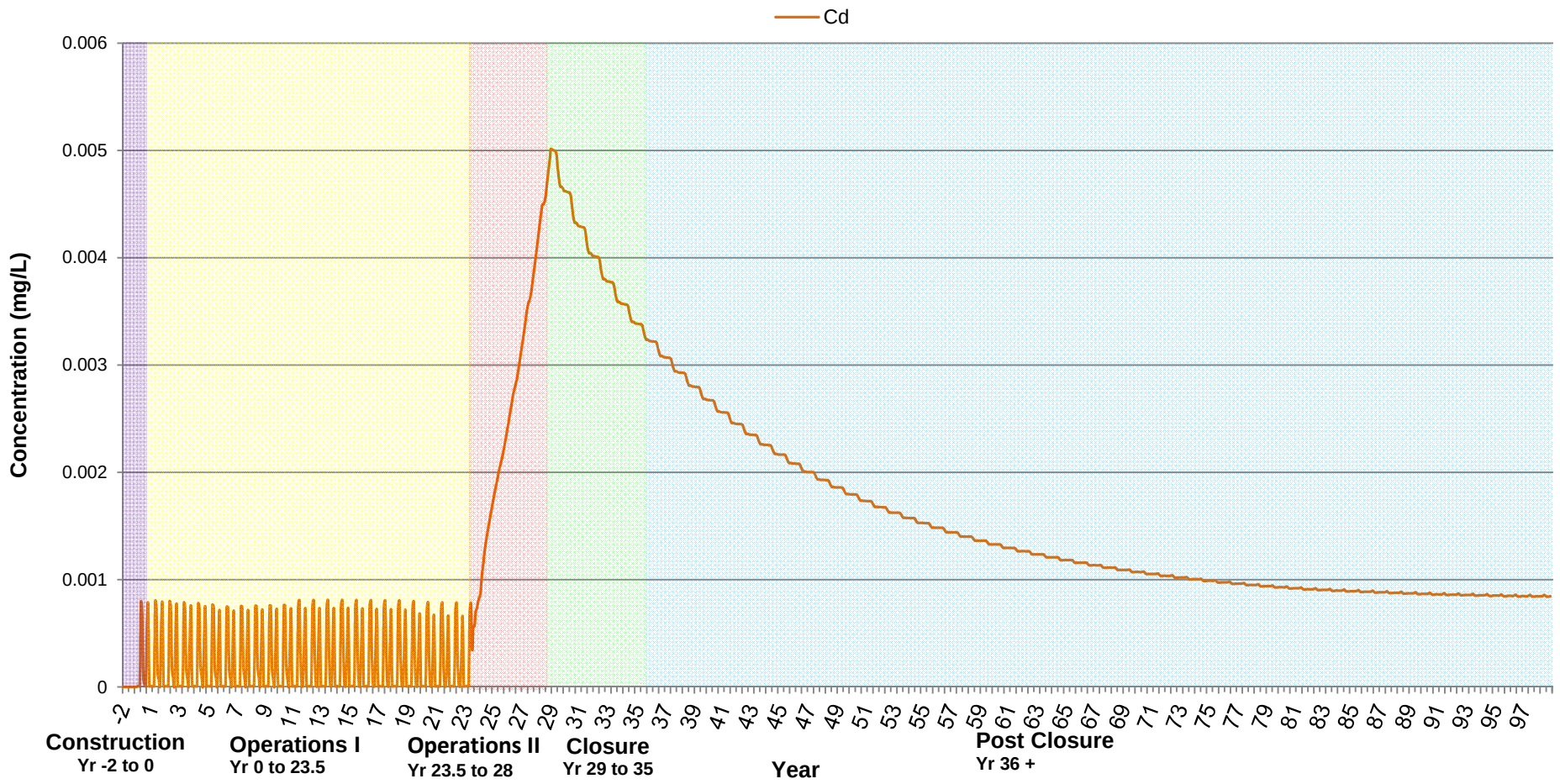
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G2.Be

REV 0



NOTES:

1. DURING OPERATIONS II WATER BEGINS ACCUMULATING IN THE OPEN PIT.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE CADMIUM CONCENTRATIONS - OPEN PIT

Knight Piésold CONSULTING

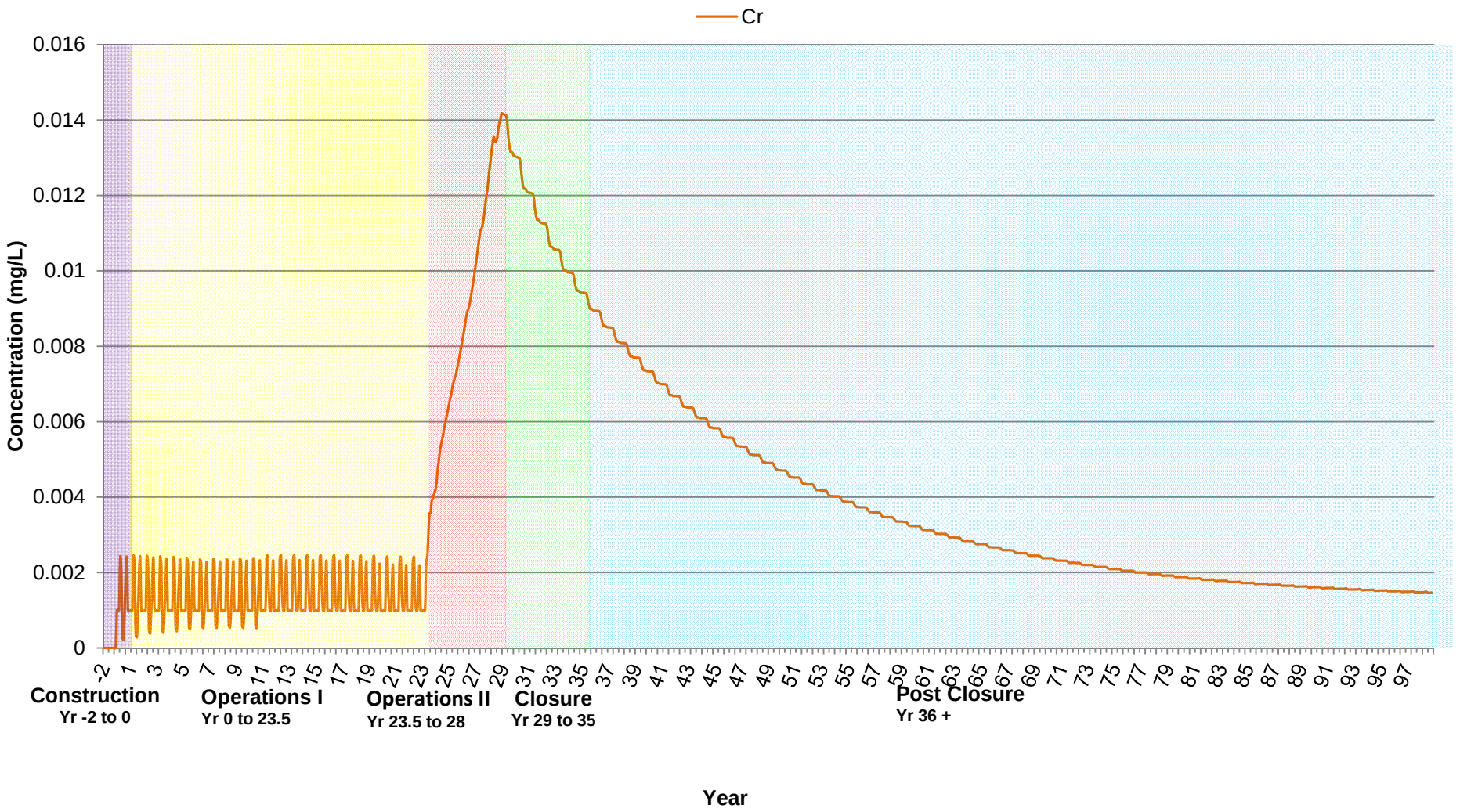
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G2.Cd-D

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. DURING OPERATIONS II WATER BEGINS ACCUMULATING IN THE OPEN PIT.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE CHROMIUM CONCENTRATIONS - OPEN PIT

Knight Piésold CONSULTING

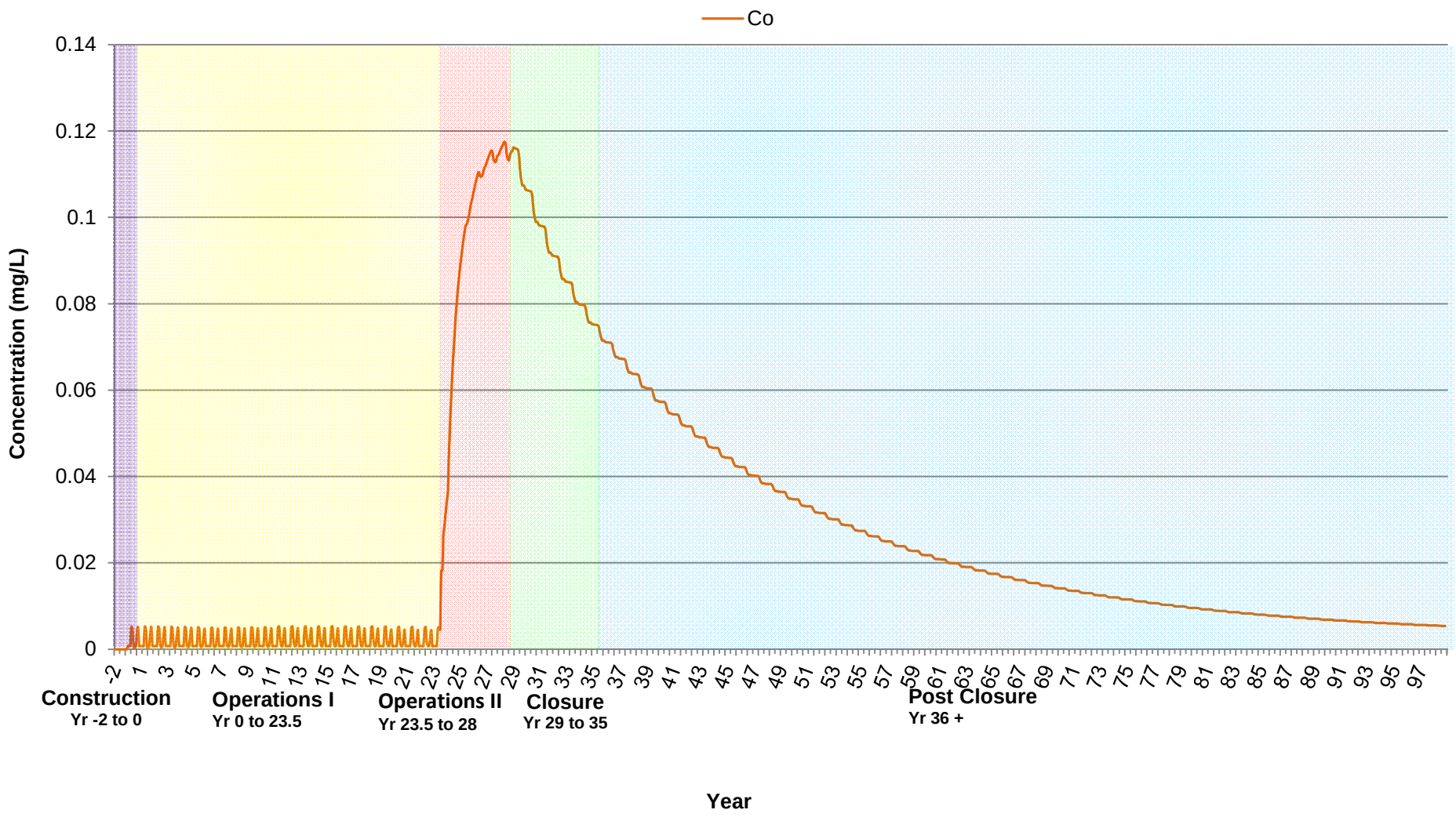
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G2.Cr

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. DURING OPERATIONS II WATER BEGINS ACCUMULATING IN THE OPEN PIT.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE COBALT CONCENTRATIONS - OPEN PIT

Knight Piésold CONSULTING

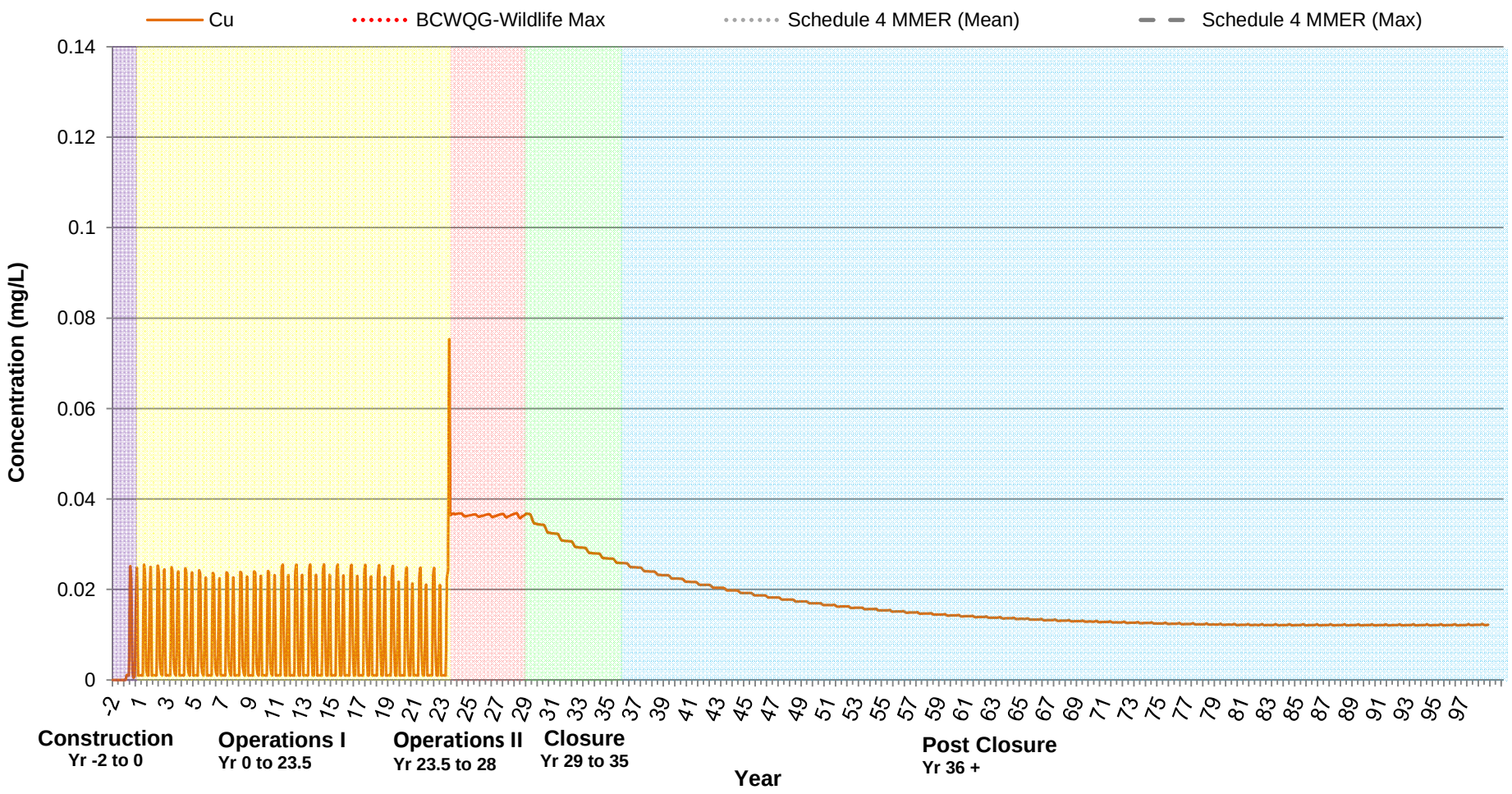
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G2.Co

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. DURING OPERATIONS II WATER BEGINS ACCUMULATING IN THE OPEN PIT.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.
3. ALL GUIDELINES ARE FIXED VALUES.
4. BCWQG-WILDLIFE MAX (0.3 mg/L), MMER MEAN (0.3 mg/L) AND MMER MAX (0.6 mg/L)

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE COPPER CONCENTRATIONS - OPEN PIT

Knight Piésold CONSULTING

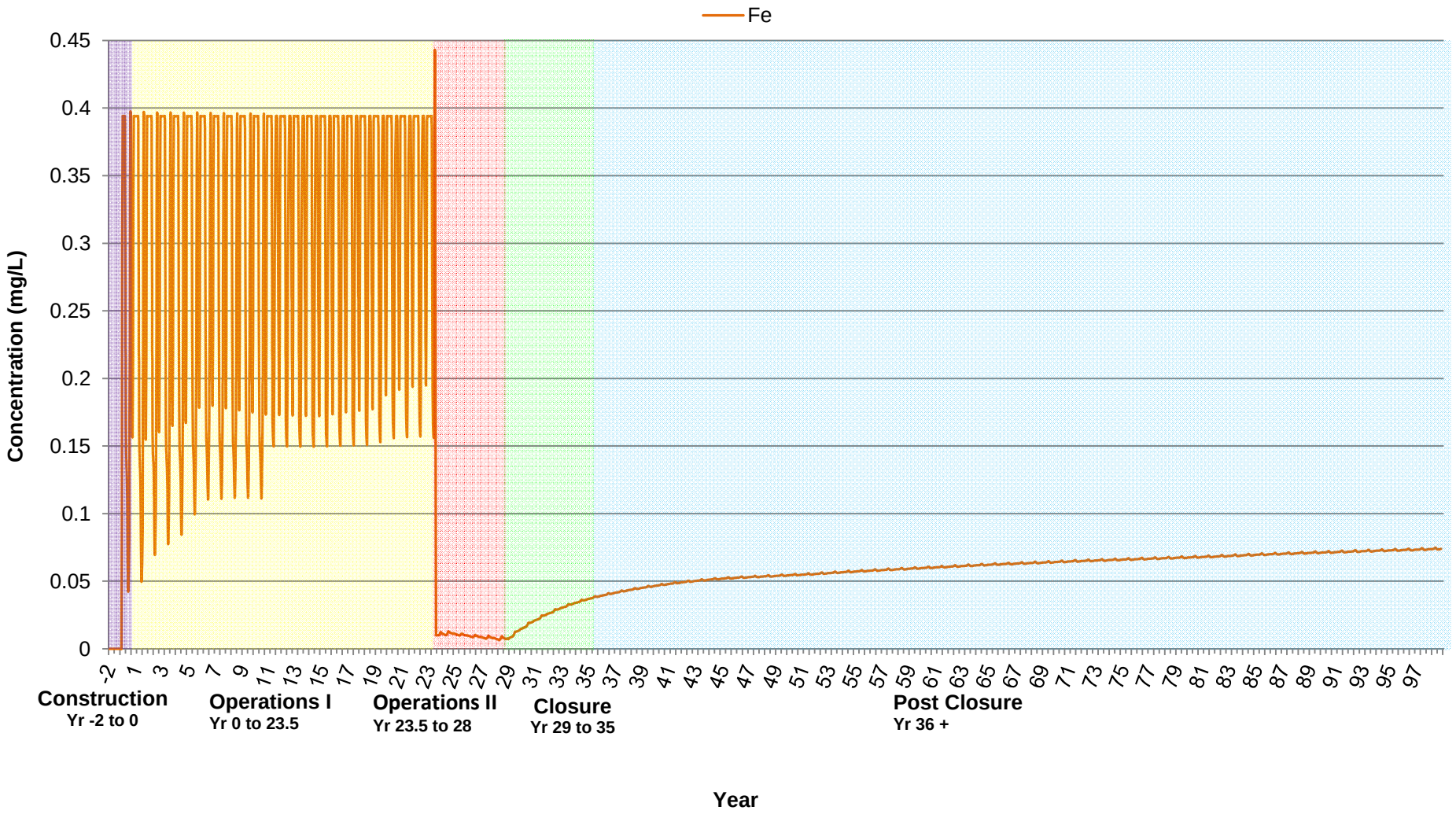
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G2.Cu-T

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. DURING OPERATIONS II WATER BEGINS ACCUMULATING IN THE OPEN PIT.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE IRON CONCENTRATIONS - OPEN PIT

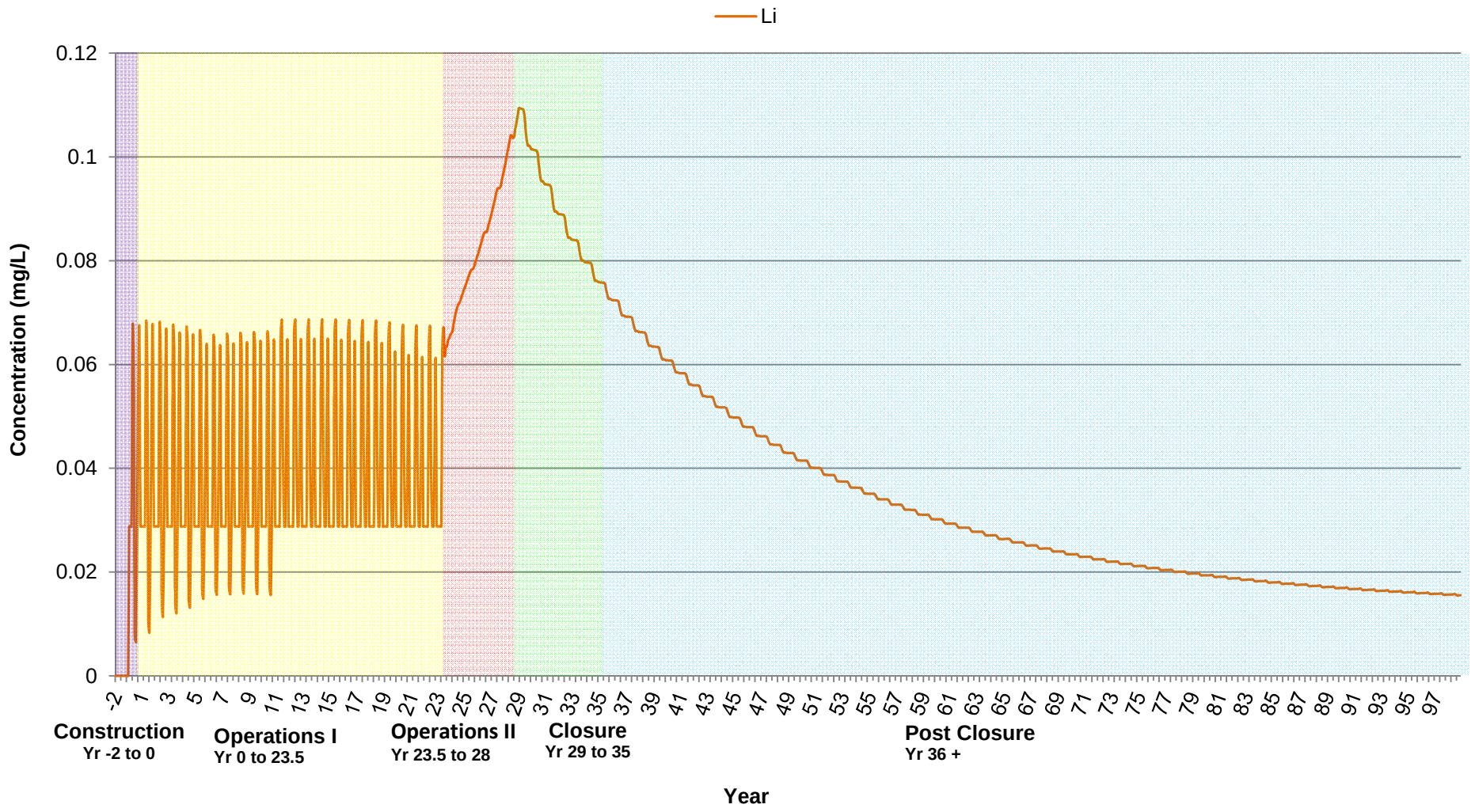
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G2.Fe

REV 0



NOTES:

1. DURING OPERATIONS II WATER BEGINS ACCUMULATING IN THE OPEN PIT.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE ZINC CONCENTRATIONS - OPEN PIT

Knight Piésold CONSULTING

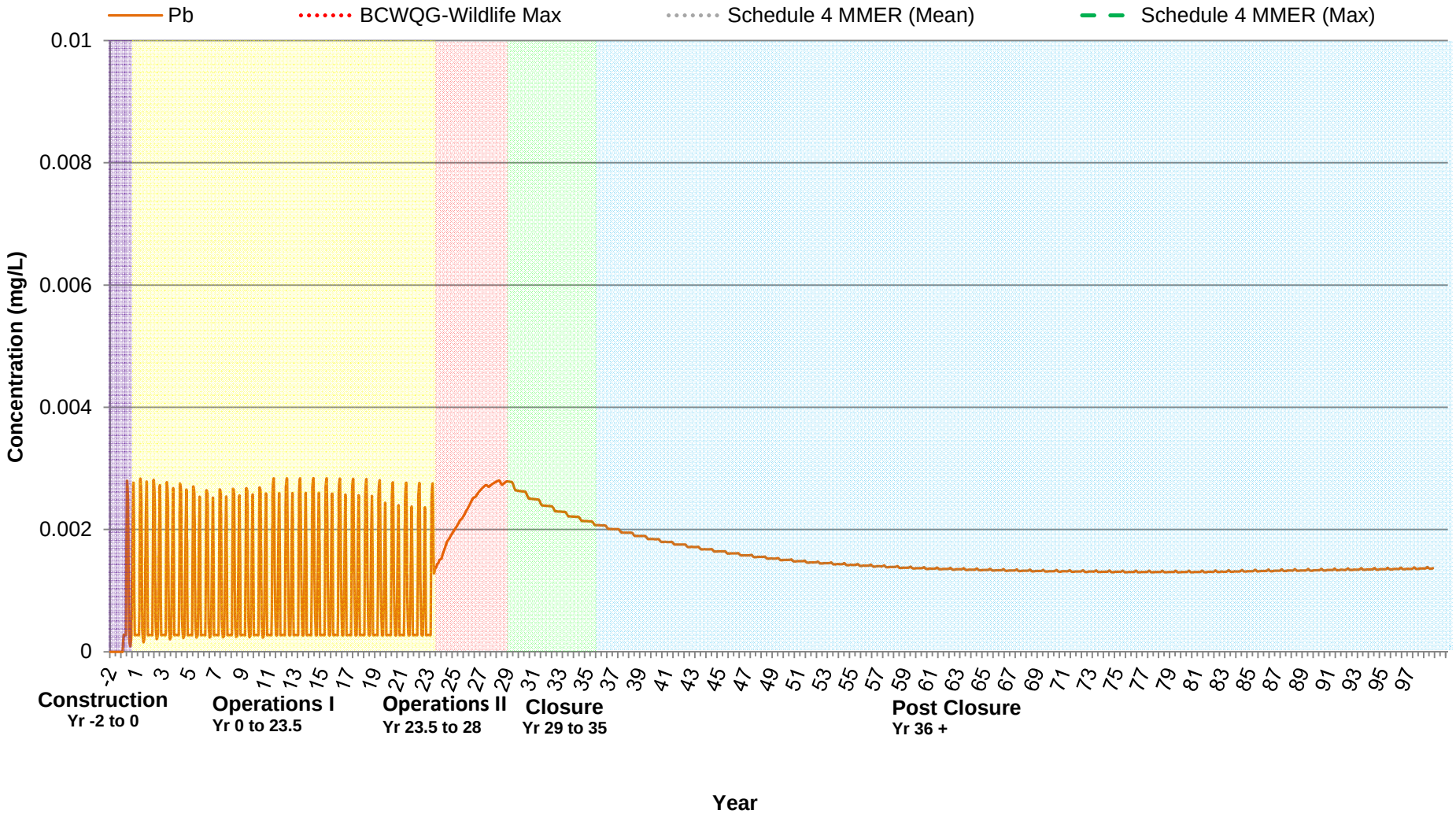
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G2.Zn

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. DURING OPERATIONS II WATER BEGINS ACCUMULATING IN THE OPEN PIT.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.
3. ALL GUIDELINES ARE FIXED VALUES.
4. BCWQG-WILDLIFE MAX (0.1 mg/L), MMER MEAN (0.2 mg/L) AND MMER MAX (0.4 mg/L) GUIDELINES ARE NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE LEAD CONCENTRATIONS - OPEN PIT

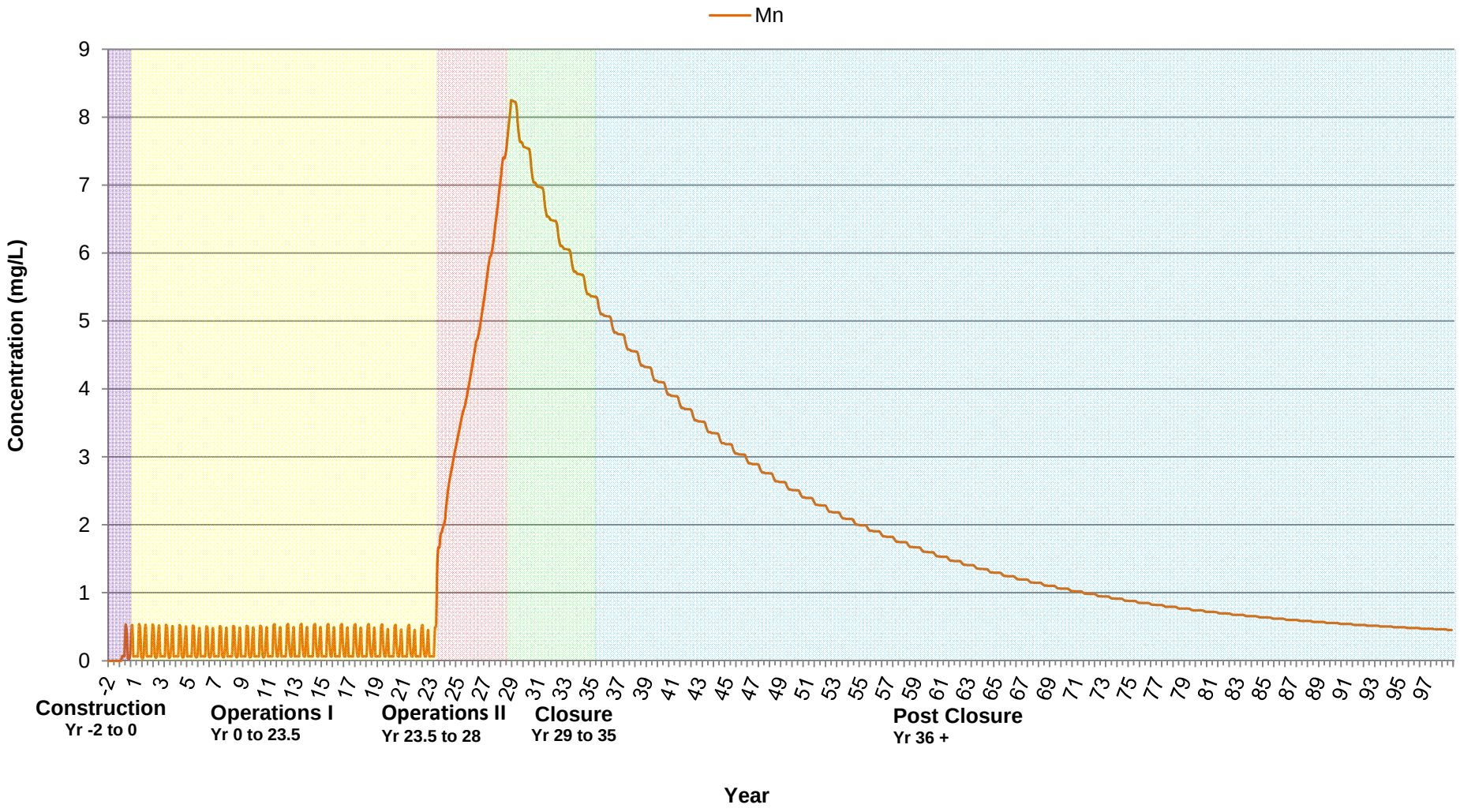
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G2.Pb

REV 0



NOTES:

1. DURING OPERATIONS II WATER BEGINS ACCUMULATING IN THE OPEN PIT.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE MANGANESE CONCENTRATIONS - OPEN PIT

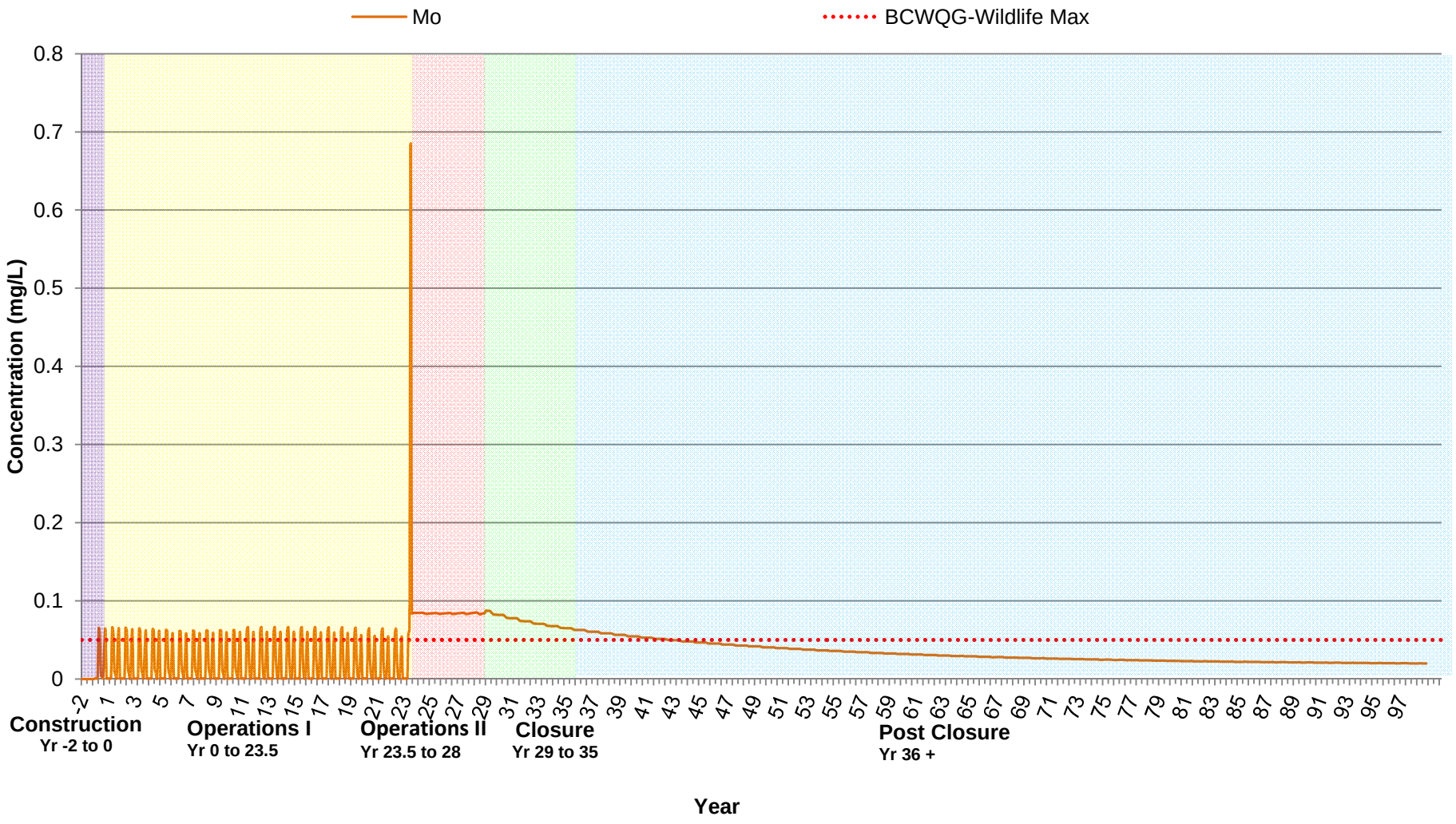
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G2.Mn

REV 0



NOTES:

1. DURING OPERATIONS II WATER BEGINS ACCUMULATING IN THE OPEN PIT.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.
3. ALL GUIDELINES ARE FIXED VALUES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE MOLYDBENUM CONCENTRATIONS - OPEN PIT

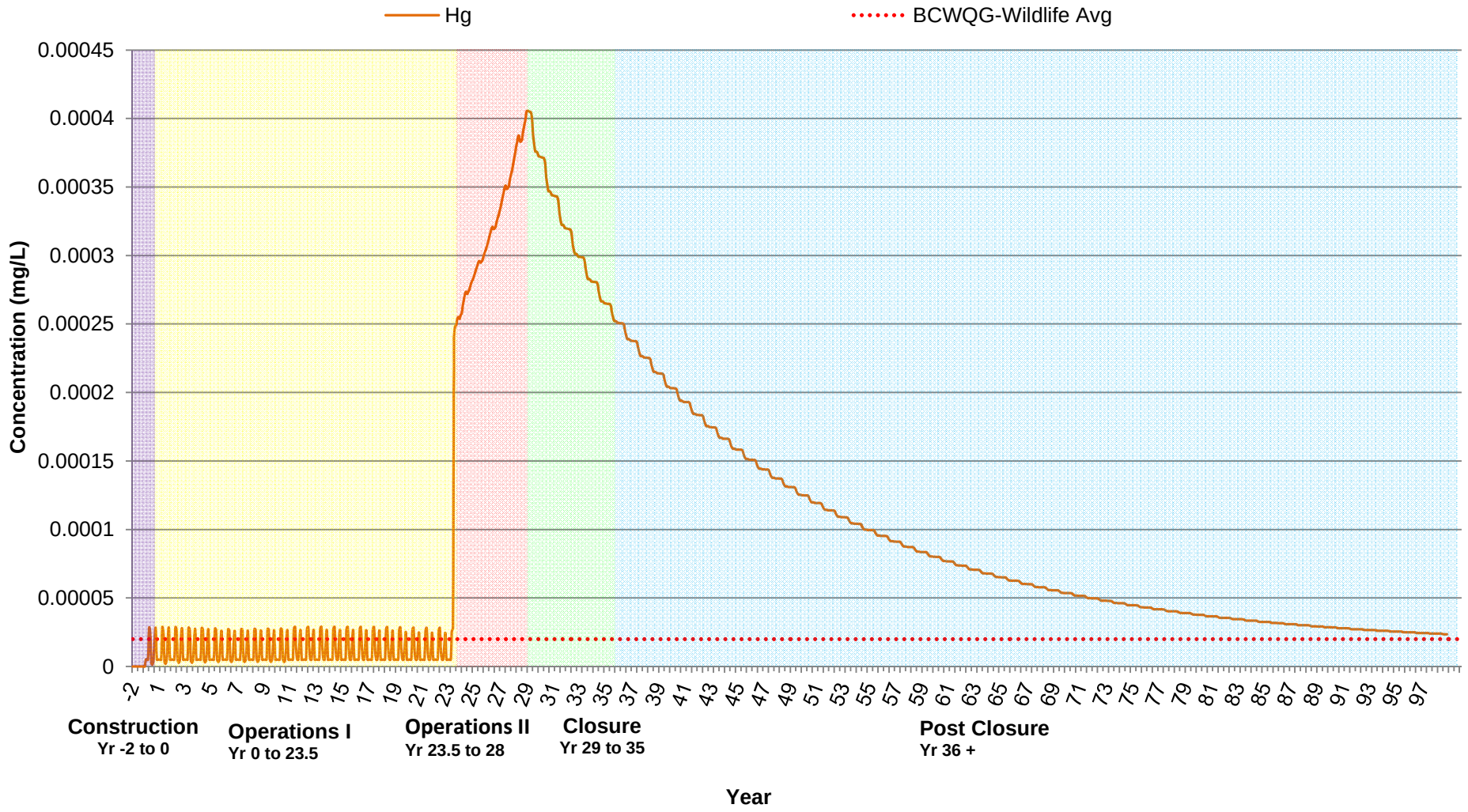
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G2.Mo

REV 0



NOTES:

1. DURING OPERATIONS II WATER BEGINS ACCUMULATING IN THE OPEN PIT.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.
3. ALL GUIDELINES ARE FIXED VALUES.
4. GUIDELINE VALUE APPLIED ON ASSUMPTION THAT METHYL-Hg IS EQUAL TO 0.5% OF T-H

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE MERCURY CONCENTRATIONS - OPEN PIT

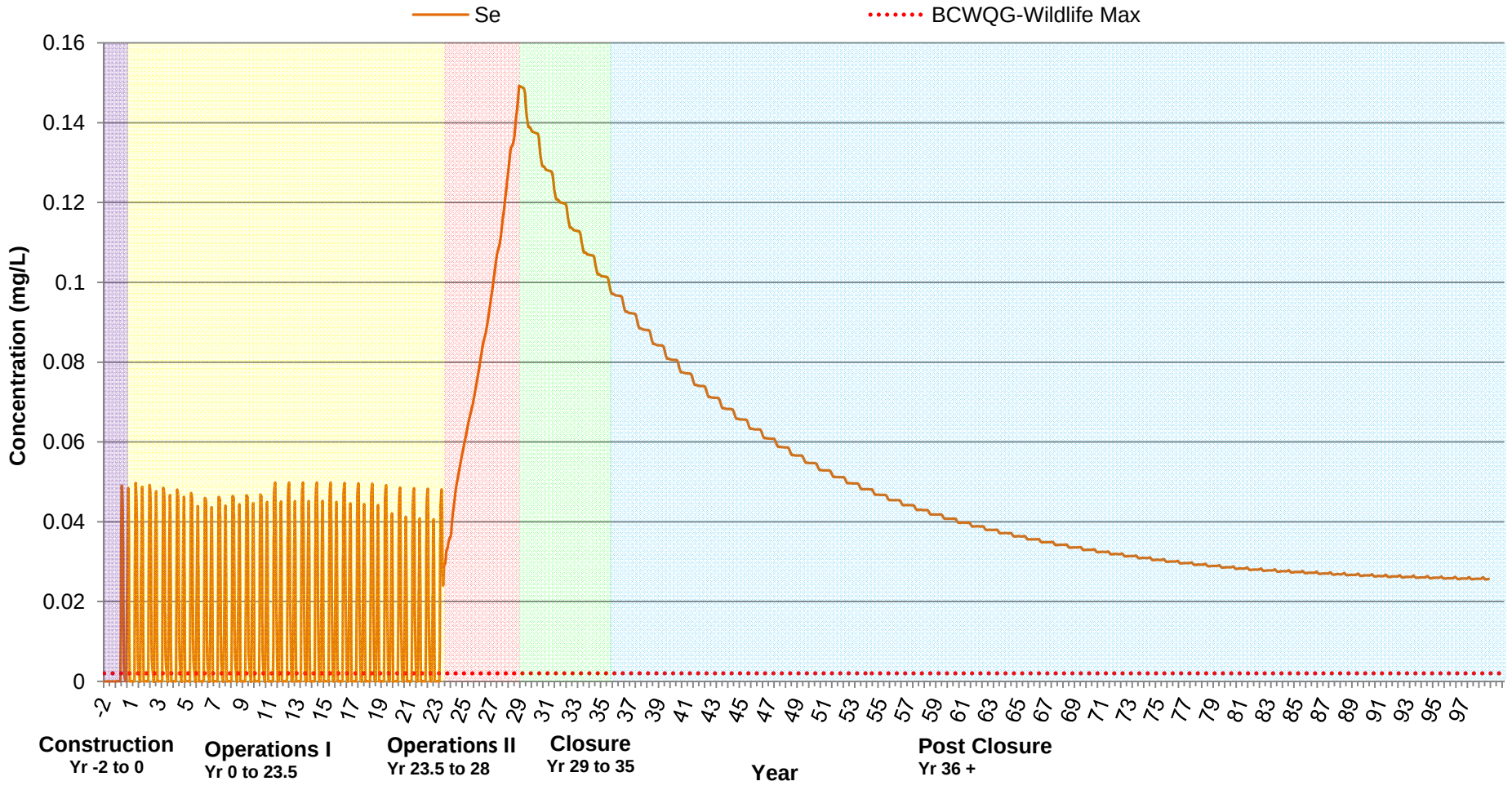
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G2.Hg

REV 0



NOTES:

1. DURING OPERATIONS II WATER BEGINS ACCUMULATING IN THE OPEN PIT.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.
3. ALL GUIDELINES ARE FIXED VALUES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE SELENIUM CONCENTRATIONS - OPEN PIT

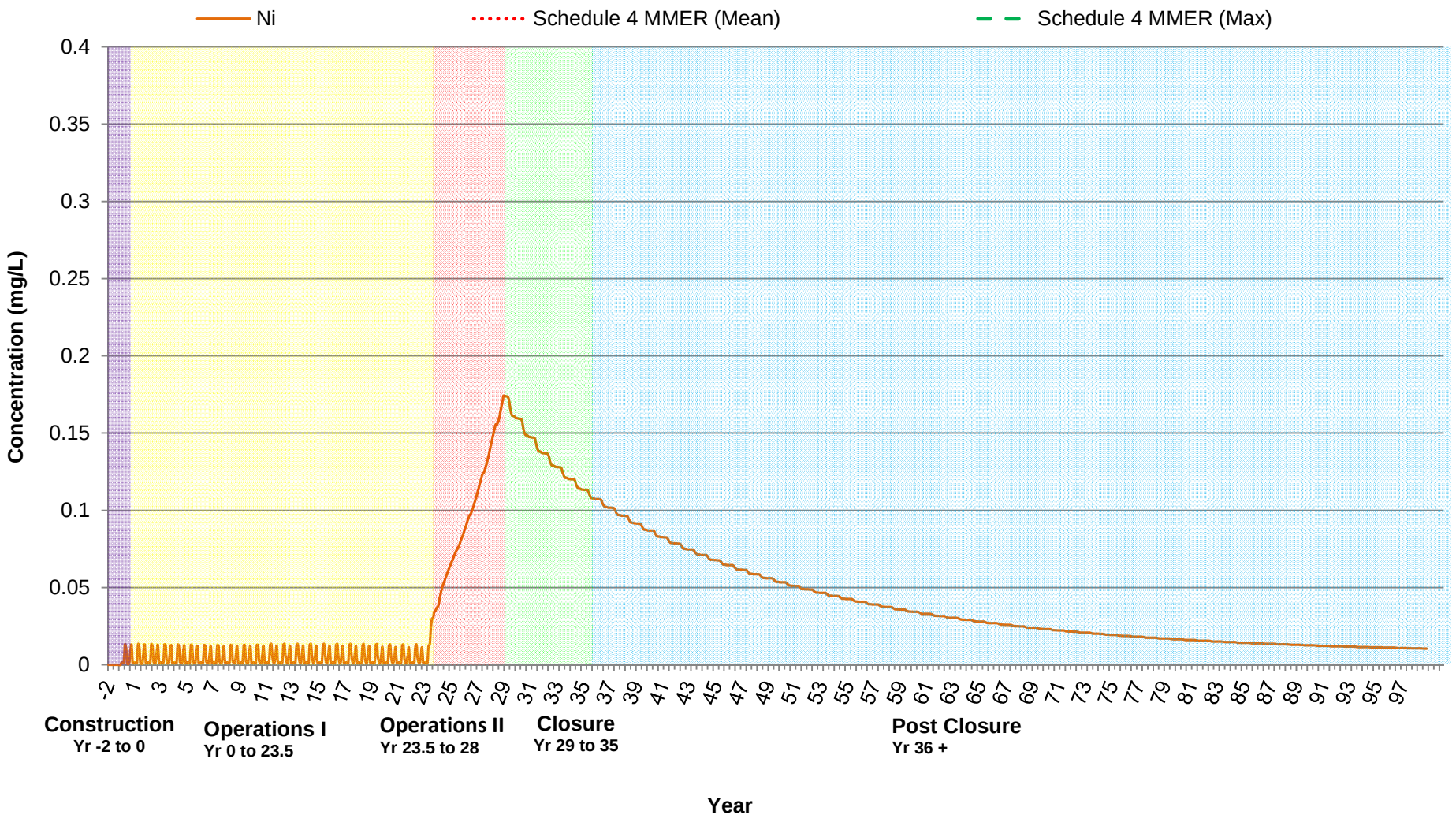
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G2.Se

REV 0



NOTES:

1. DURING OPERATIONS II WATER BEGINS ACCUMULATING IN THE OPEN PIT.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.
3. ALL GUIDELINES ARE FIXED VALUES.
4. THE MMER MEAN (0.5 mg/L) AND MMER MAX (1.0 mg/L) ARE NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE NICKEL CONCENTRATIONS - OPEN PIT

Knight Piésold CONSULTING

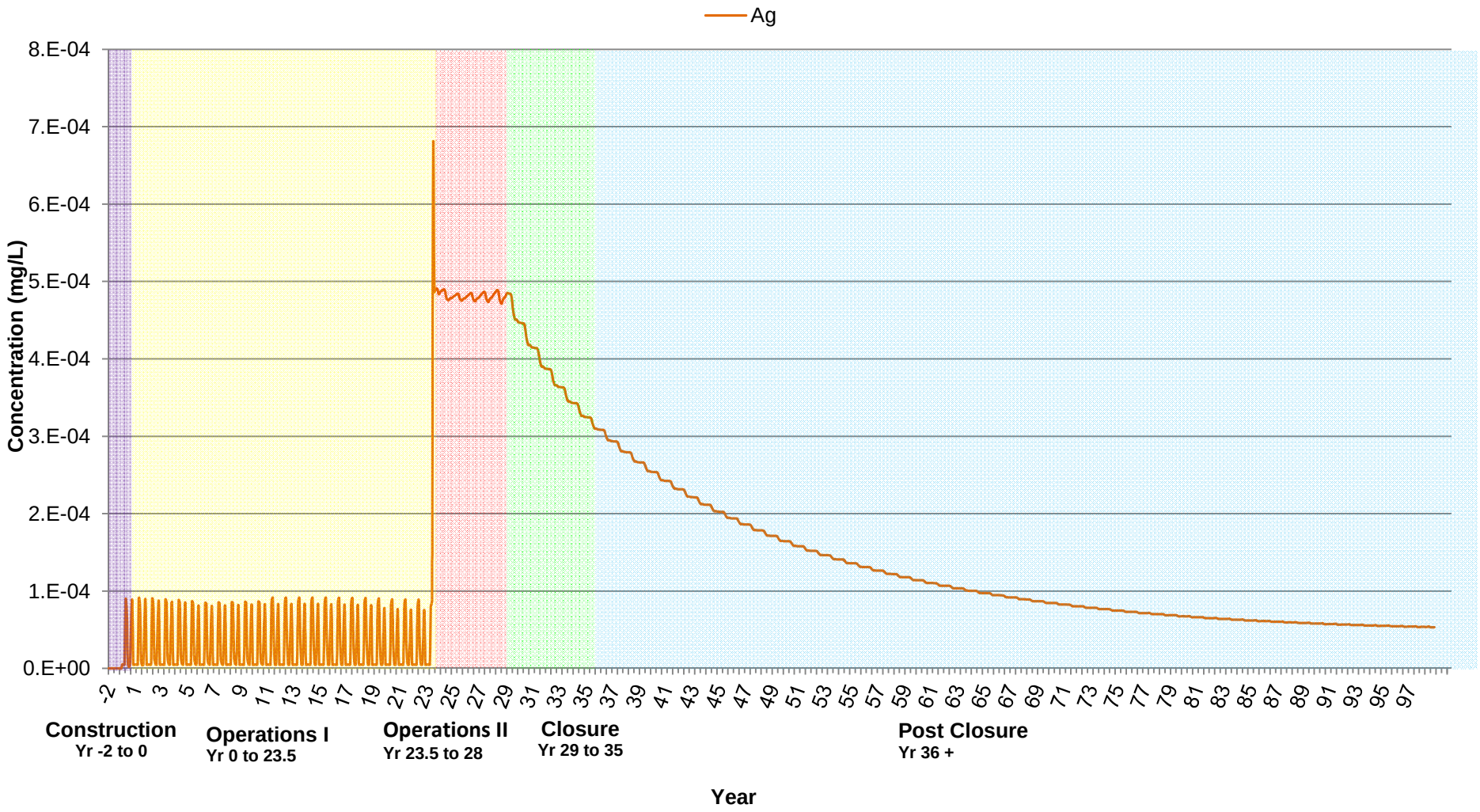
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G2.Ni

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. DURING OPERATIONS II WATER BEGINS ACCUMULATING IN THE OPEN PIT.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE SILVER CONCENTRATIONS - OPEN PIT

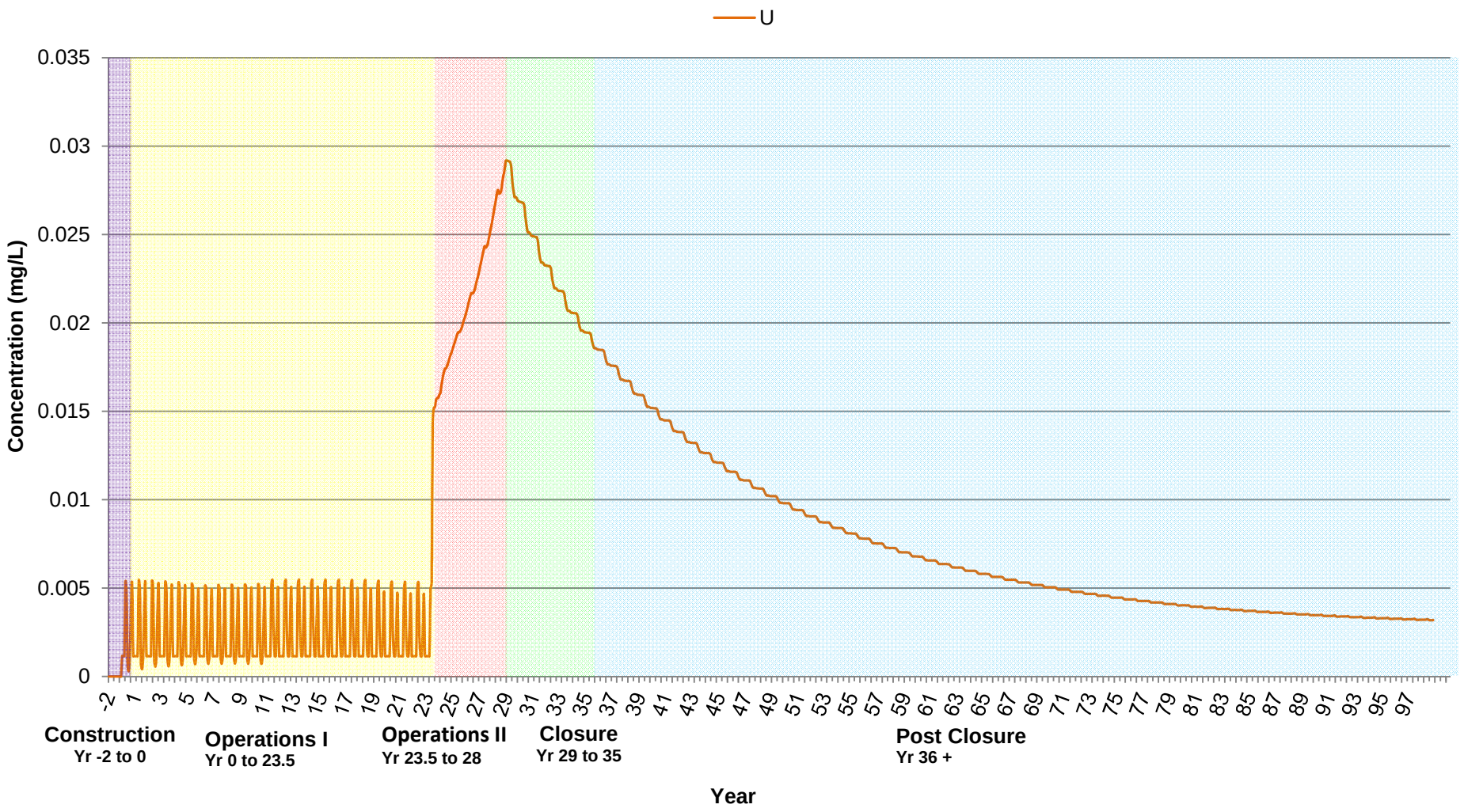
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G2.Ag

REV 0



NOTES:

1. DURING OPERATIONS II WATER BEGINS ACCUMULATING IN THE OPEN PIT.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE URANIUM CONCENTRATIONS - OPEN PIT

Knight Piésold CONSULTING

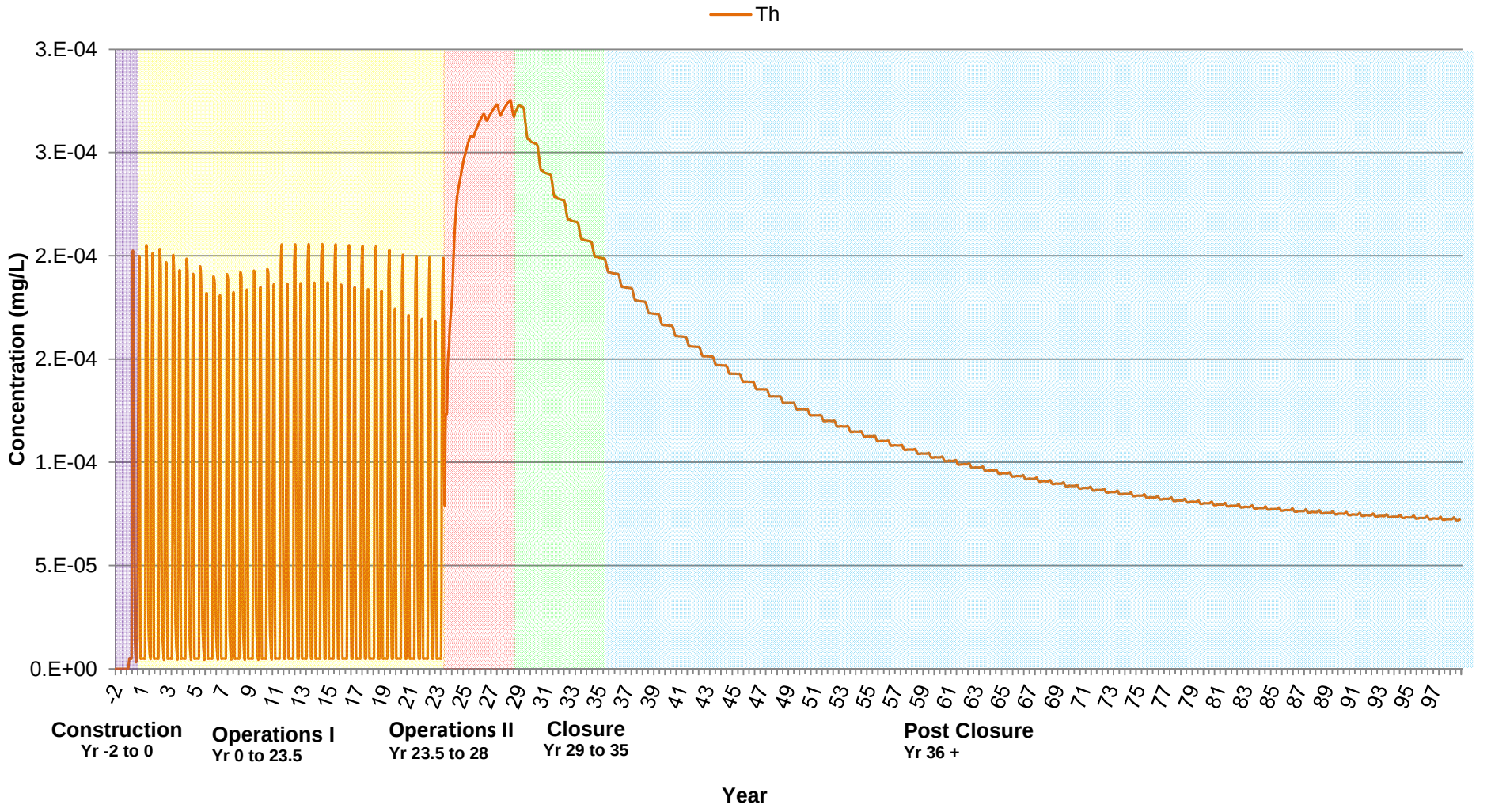
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G2.U

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. DURING OPERATIONS II WATER BEGINS ACCUMULATING IN THE OPEN PIT.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE THALLIUM CONCENTRATIONS - OPEN PIT

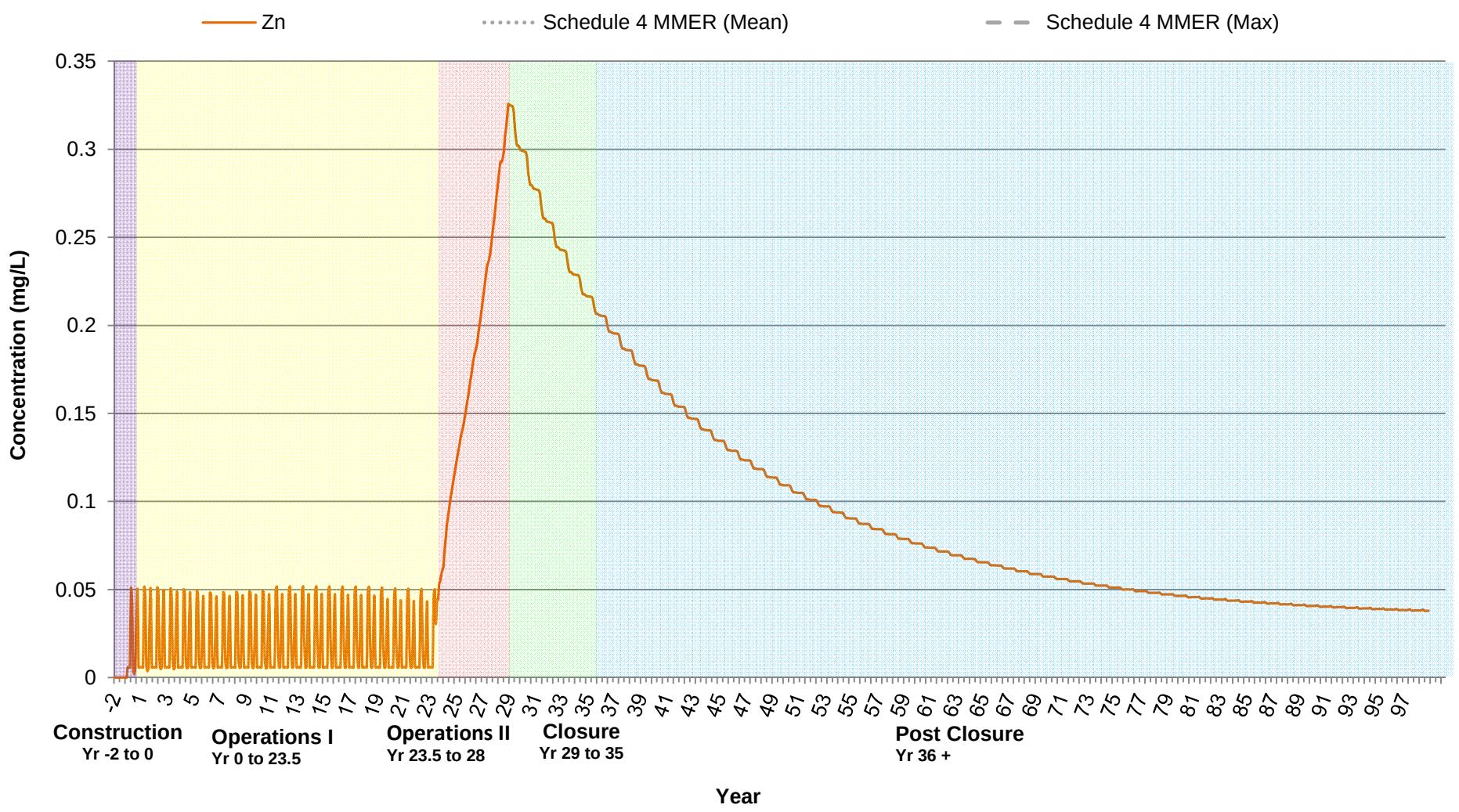
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G2.Th

REV 0



NOTES:

1. DURING OPERATIONS II WATER BEGINS ACCUMULATING IN THE OPEN PIT.
2. WATER IS PUMPED FROM THE OPEN PIT TO THE TMF STARTING AT YEAR 36.
3. ALL GUIDELINES ARE FIXED VALUES.
4. THE MMER MEAN (0.5 mg/L) AND MMER MAX (1.0 mg/L) ARE NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE ZINC CONCENTRATIONS - OPEN PIT

Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

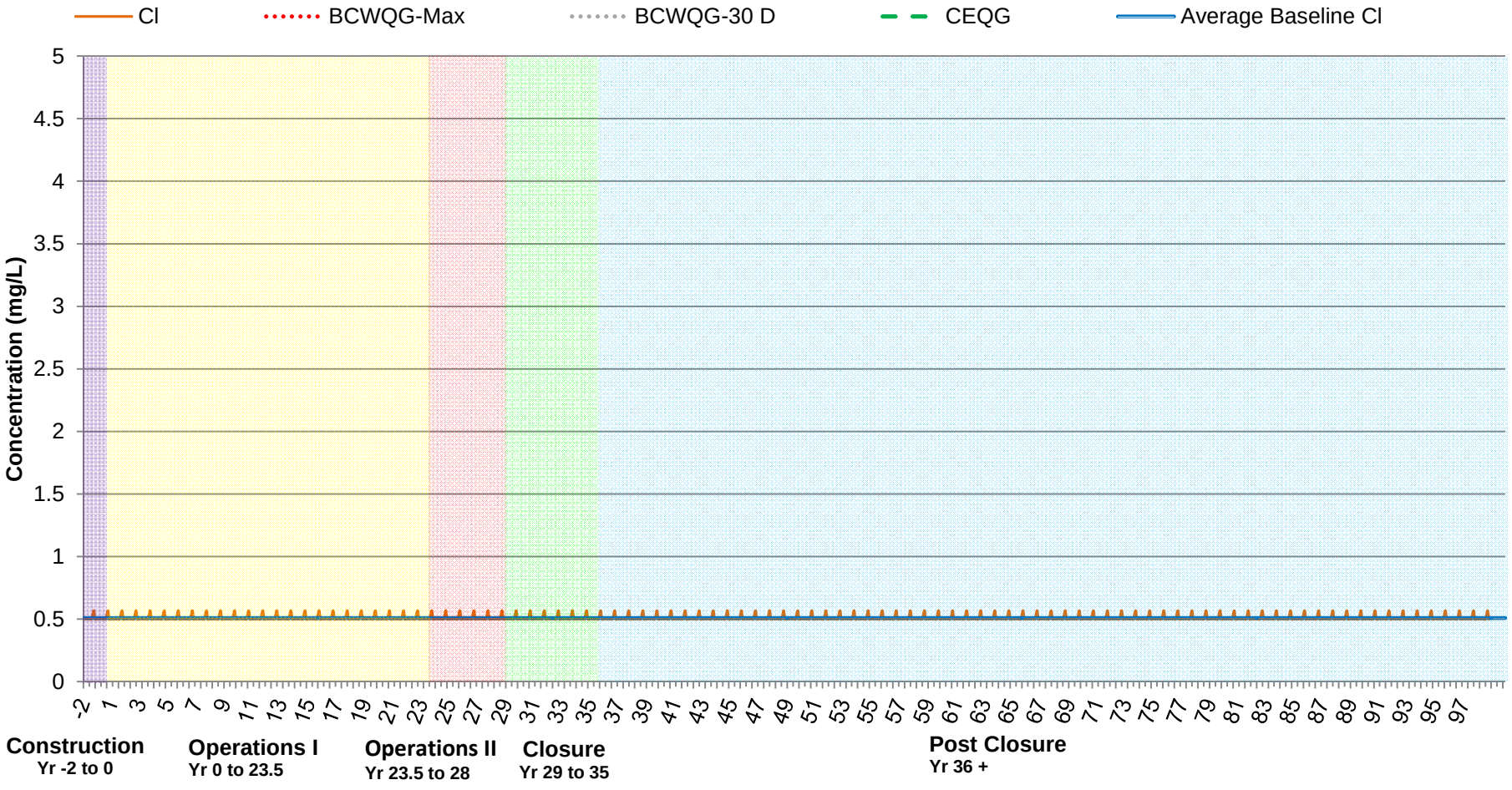
FIGURE G2.Zn

REV 0

APPENDIX G3

P-CREEK

(Pages G3-1 to G3-30)



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. ALL GUIDELINES ARE NOT SHOWN: BCWQG-30 D (150 mg/L); BCWQG-MAX (600 mg/L); CEQG (120 mg/L AND 640 mg/L).

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE CHLORIDE CONCENTRATIONS - P-CREEK

Knight Piésold CONSULTING

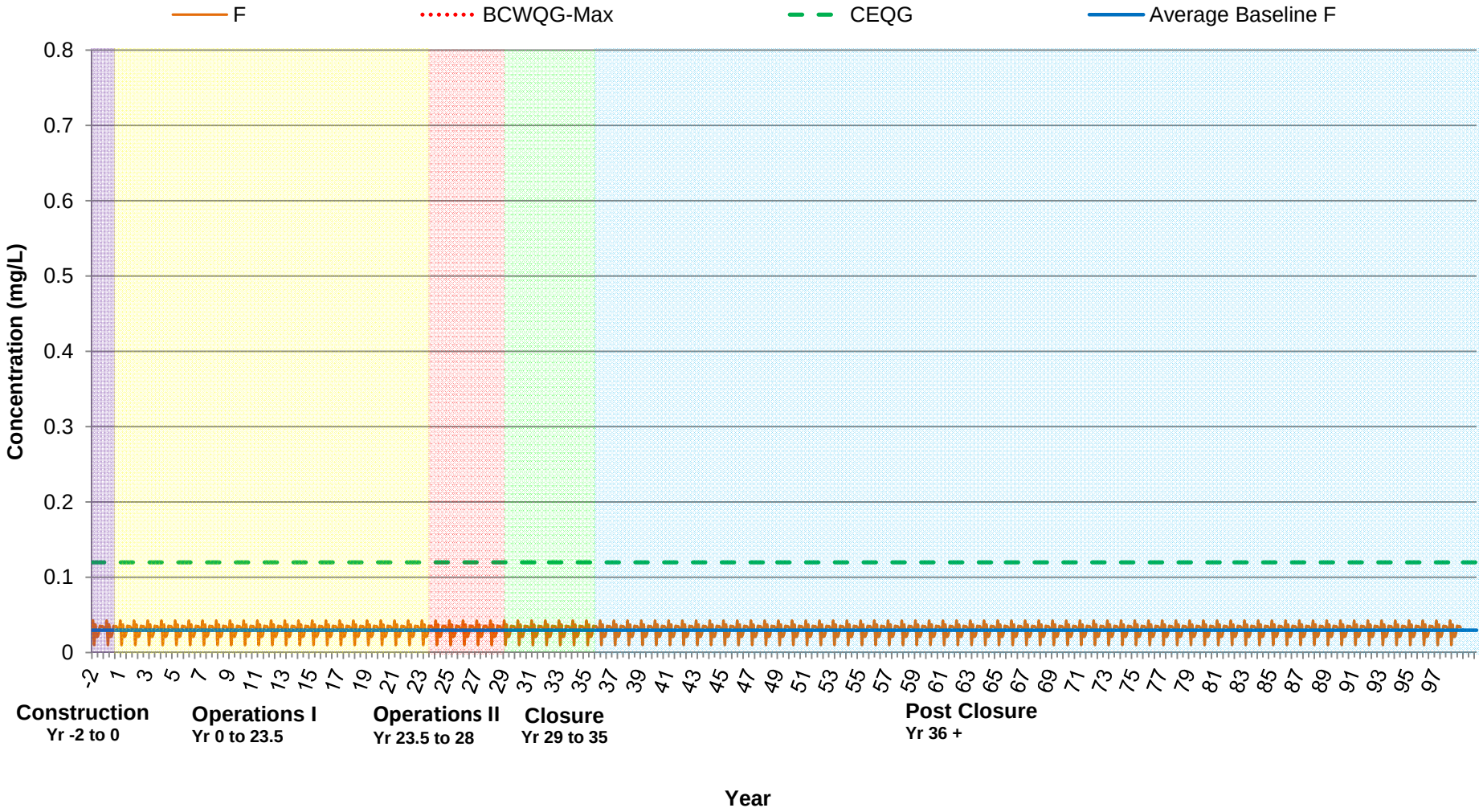
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G3.Cl

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX IS HARNDESS DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE FLUORIDE CONCENTRATIONS - P-CREEK

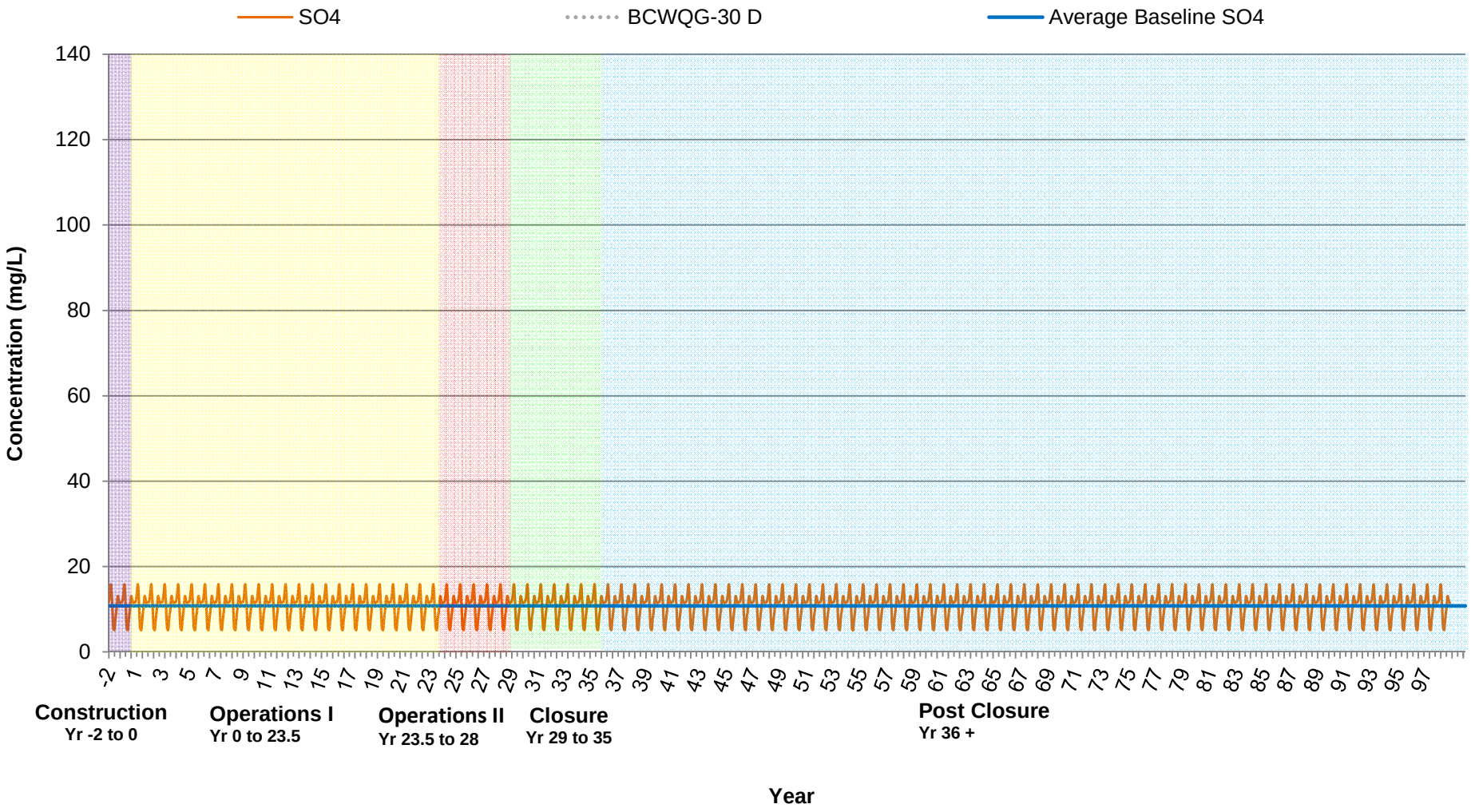
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G3.F

REV 0



NOTES:

1. BCWQG-30 D IS HARDNESS DEPEDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE SULPHATE CONCENTRATIONS - P-CREEK

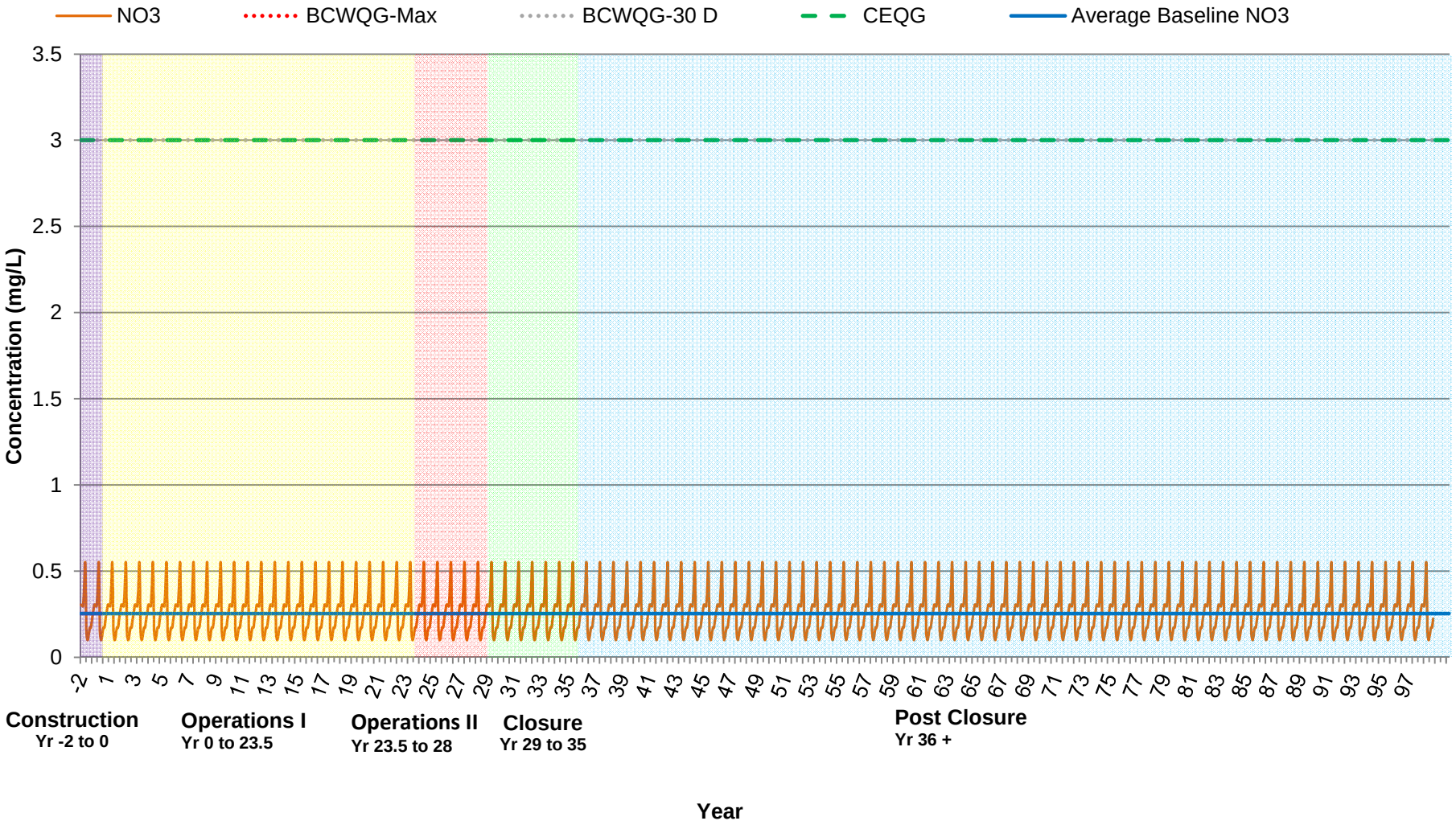
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G3.S04

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. THE BCWQG-MAX (32.8 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE NITRATE CONCENTRATIONS - P-CREEK

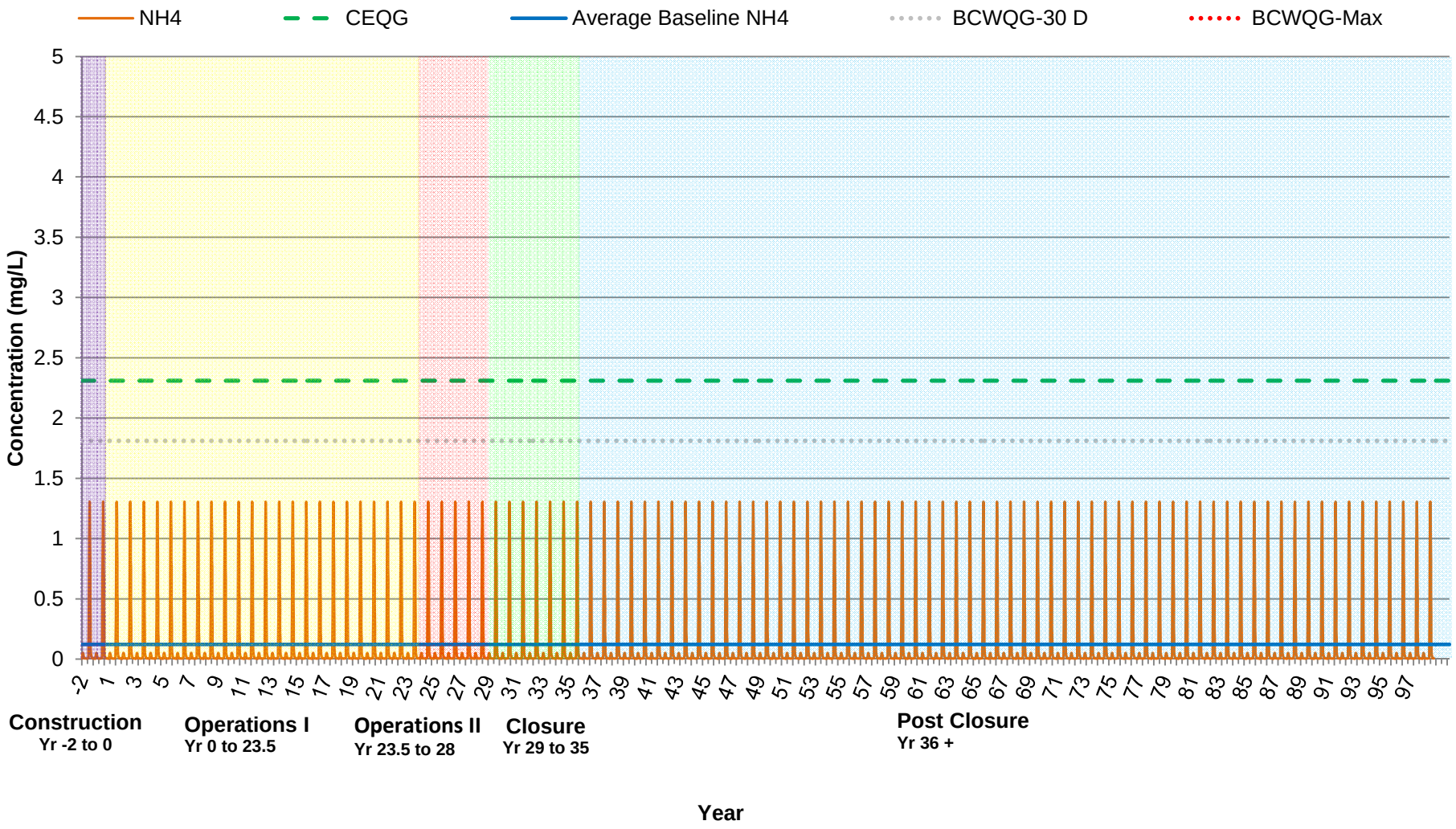
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P/A NO. VA101-458/14

REF. NO. 3

FIGURE G3.NO3

REV 0



NOTES:

1. THE BCWQG-30 D IS VALID FOR ONLY 6.5≤pH<9 AND 0°C≤T≤20°C.
2. THE BCWQG-MAX (20.15 mg/L) VALID FOR 6.5≤pH<9 IS NOT SHOWN.
3. THE CEQG IS TO BE USED WITH CAUTION FOR WATER WITH T<5°C AND pH>9.
4. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE AMMONIA CONCENTRATIONS - P-CREEK

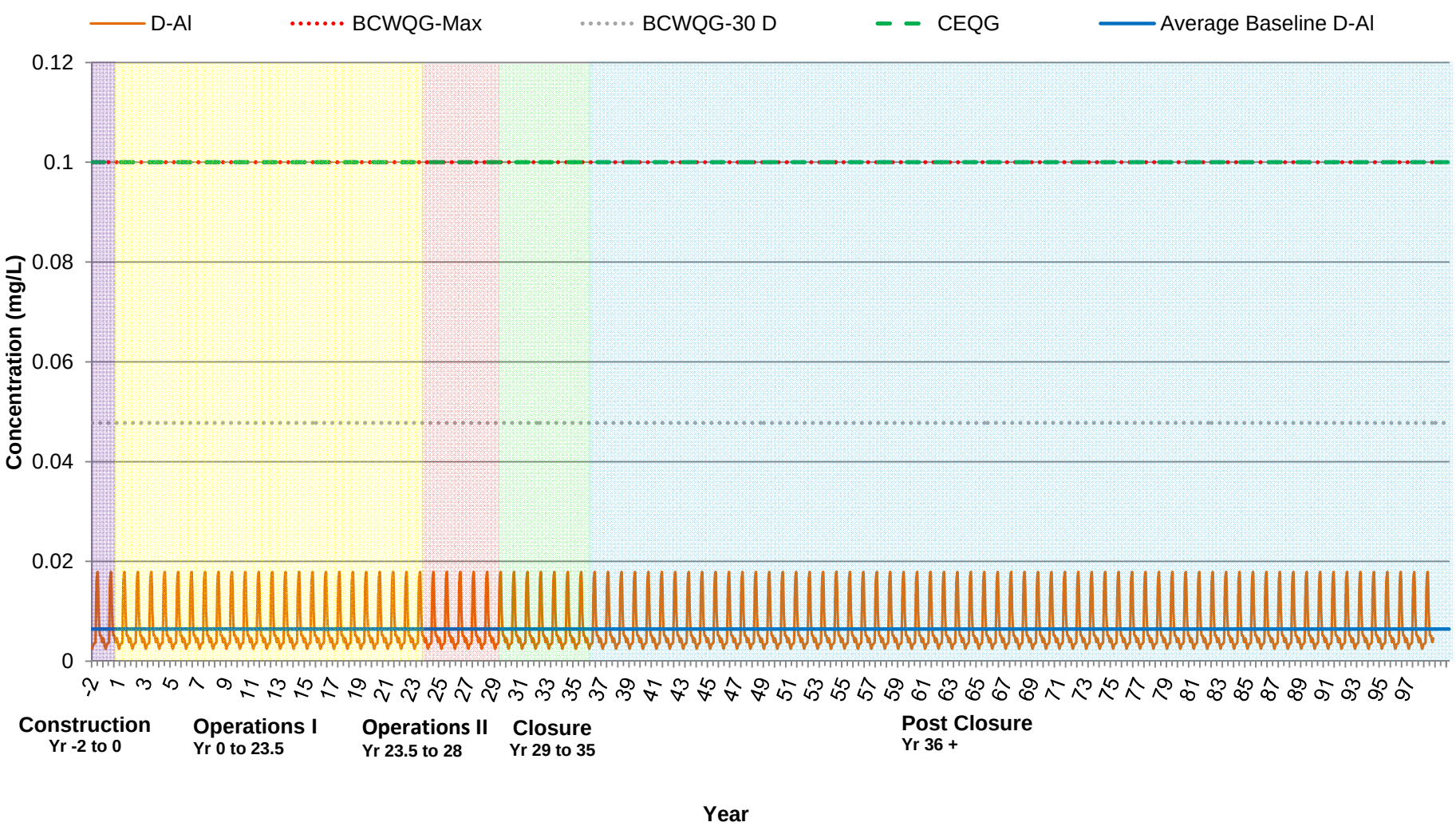
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G3.NH4

REV 0



NOTES:

1. ALL GUIDELINES ARE pH-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. AVERAGE BASELINE pH USED TO CALCULATE GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE DISSOLVED ALUMINUM CONCENTRATIONS - P-CREEK

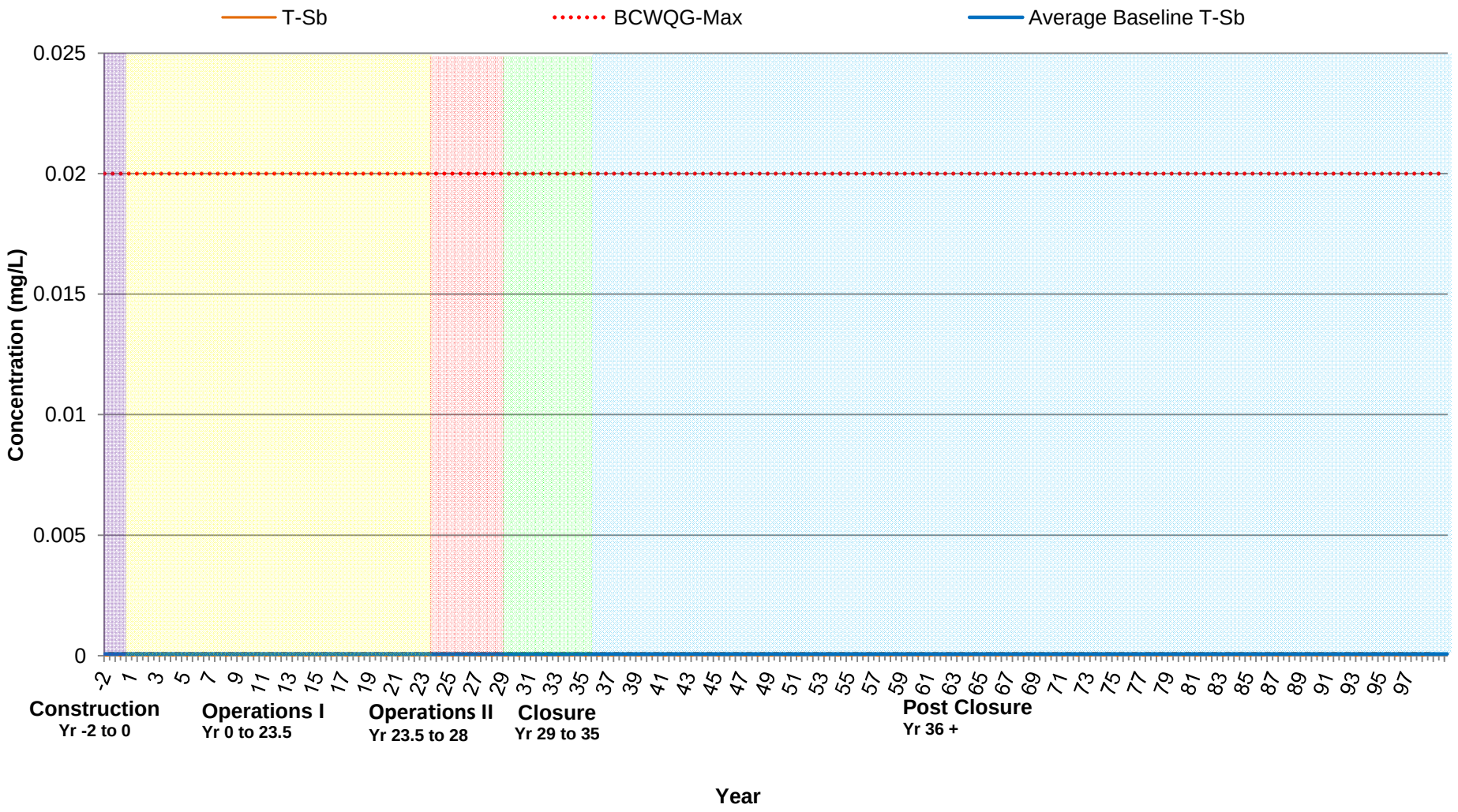
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G3.Al

REV 0



NOTES:

1. THE BCWQG IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE ANTIMONY CONCENTRATIONS - P-CREEK

Knight Piésold CONSULTING

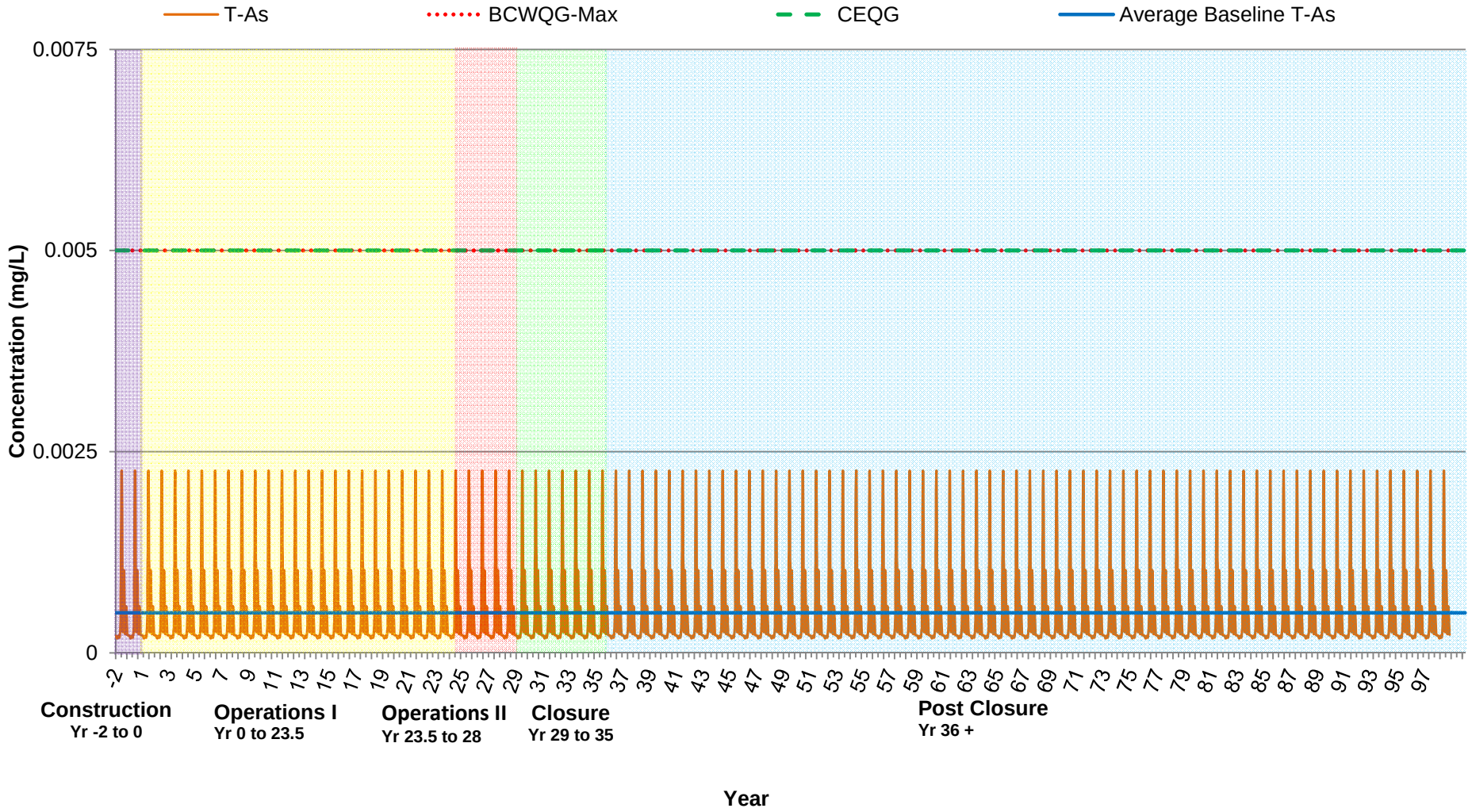
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G3.Sb

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE ARSENIC CONCENTRATIONS - P-CREEK

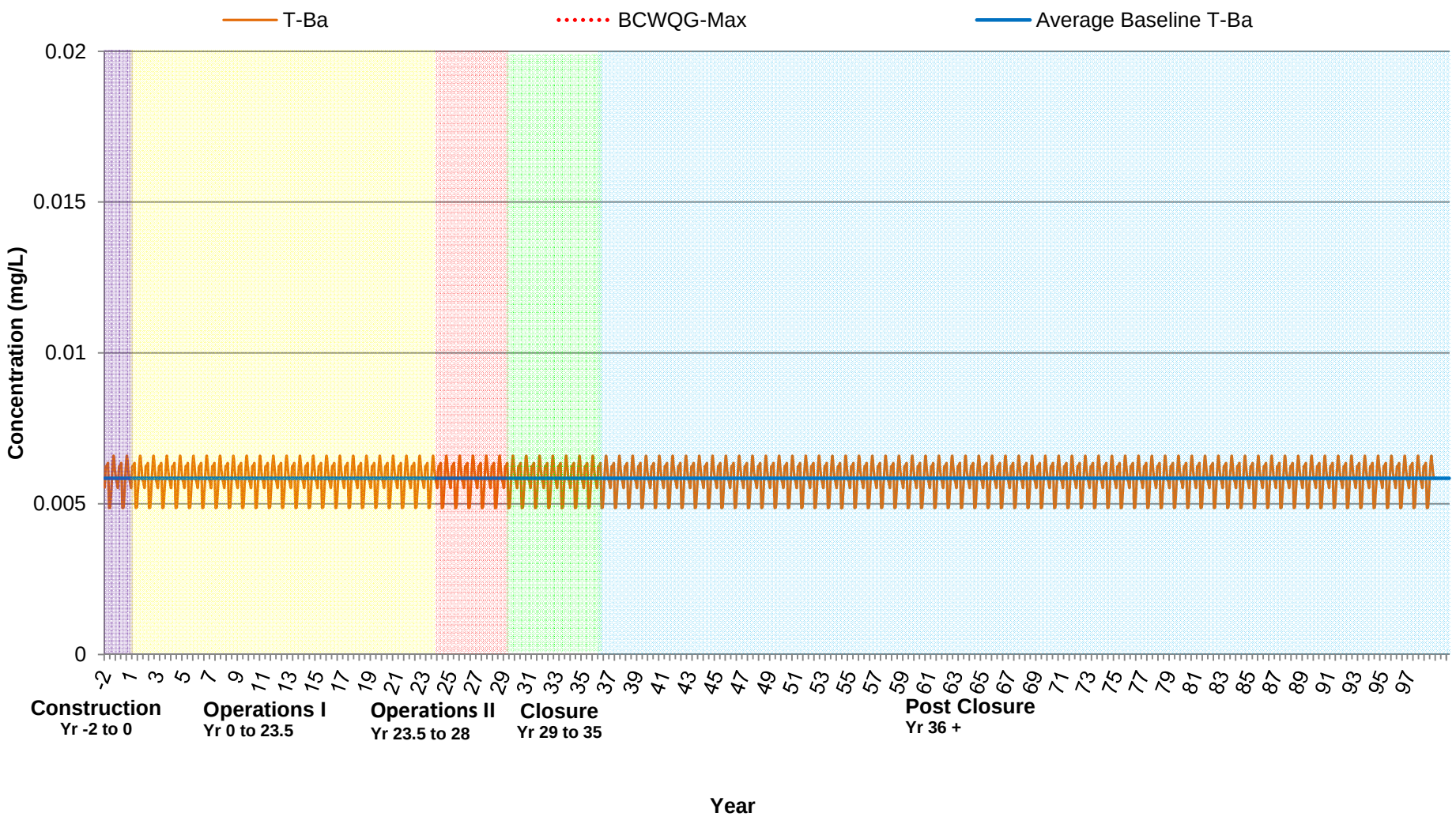
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G3.As

REV 0



NOTES:

1. THE BCWQG-MAX IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. THE BCWQG-30 D (1 mg/L) AND BCWQG-MAX (5 mg/L) ARE NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE BARIUM CONCENTRATIONS - P-CREEK

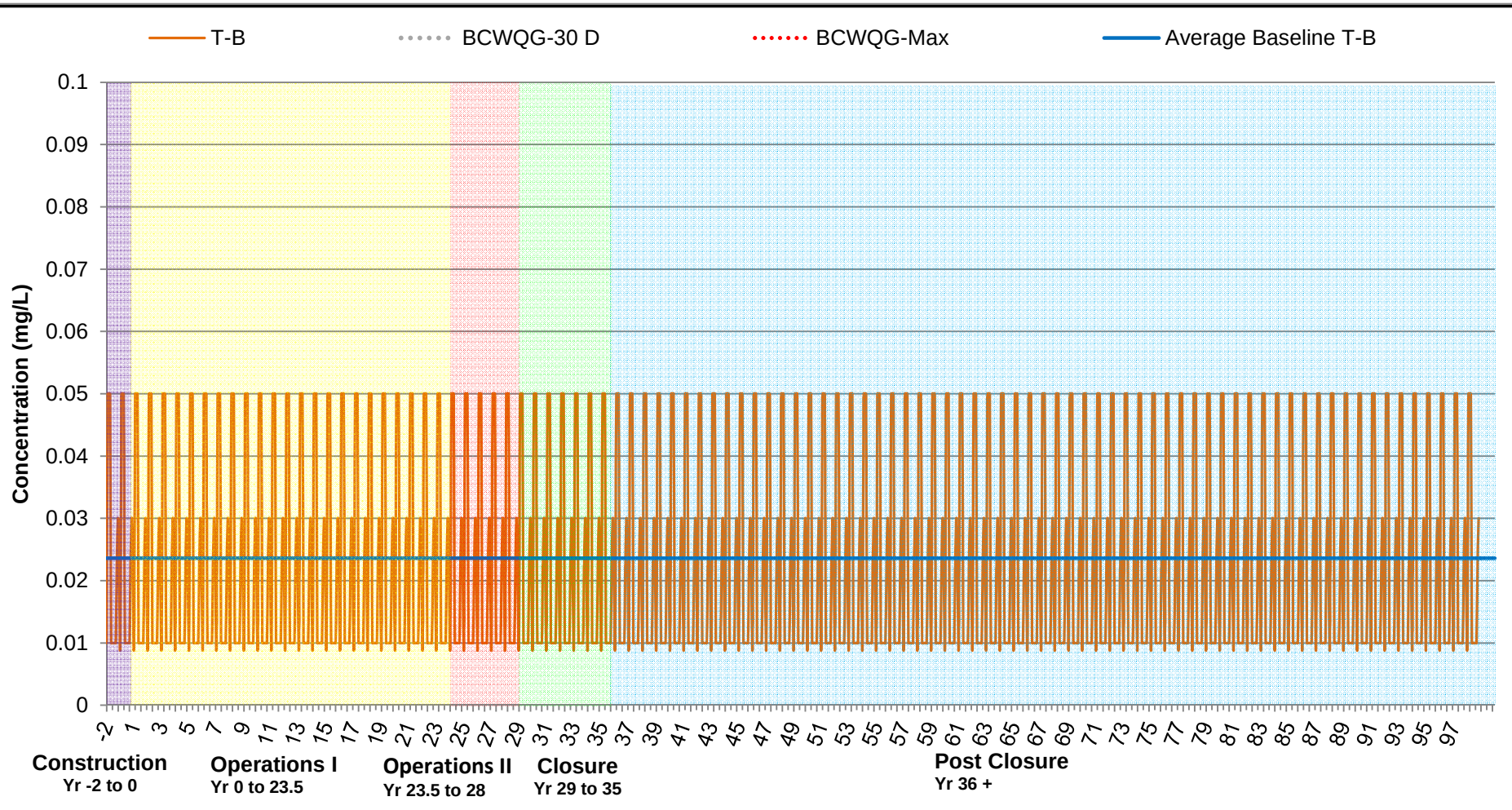
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G3.Ba

REV 0



NOTES:

1. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.
3. THE BCWQG-MAX (1.2 mg/L) IS NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE BORON CONCENTRATIONS - P-CREEK

Knight Piésold CONSULTING

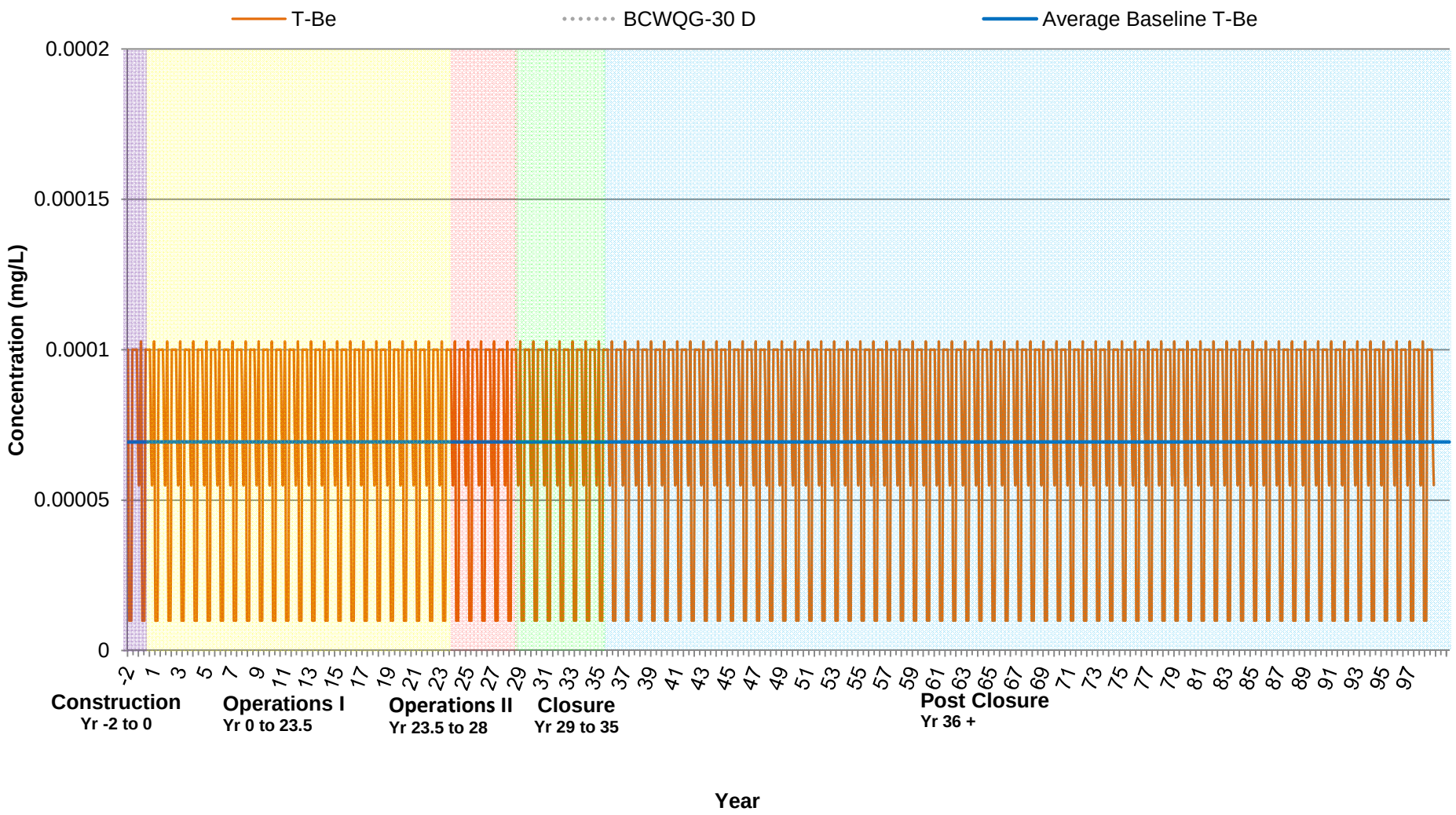
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G3.B

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. THE BCWQG-30 D (0.0053 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE BERYILLIUM CONCENTRATIONS - P-CREEK

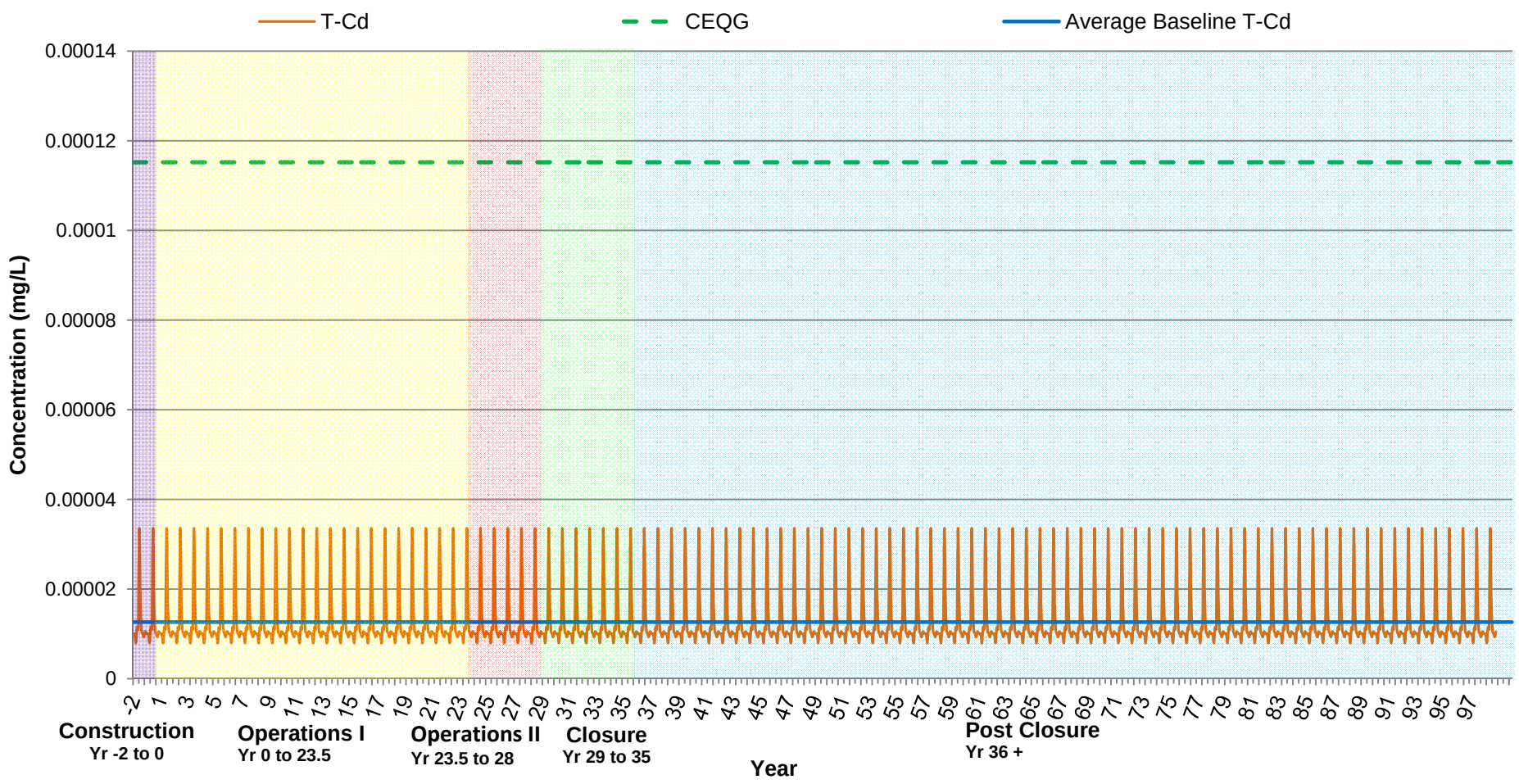
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G3.Be

REV 0



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. THE BCWQG ARE DRAFT GUIDELINES UNDER REVIEW (JUNE 2014).
3. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
4. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE CADMIUM CONCENTRATIONS - P-CREEK

Knight Piésold CONSULTING

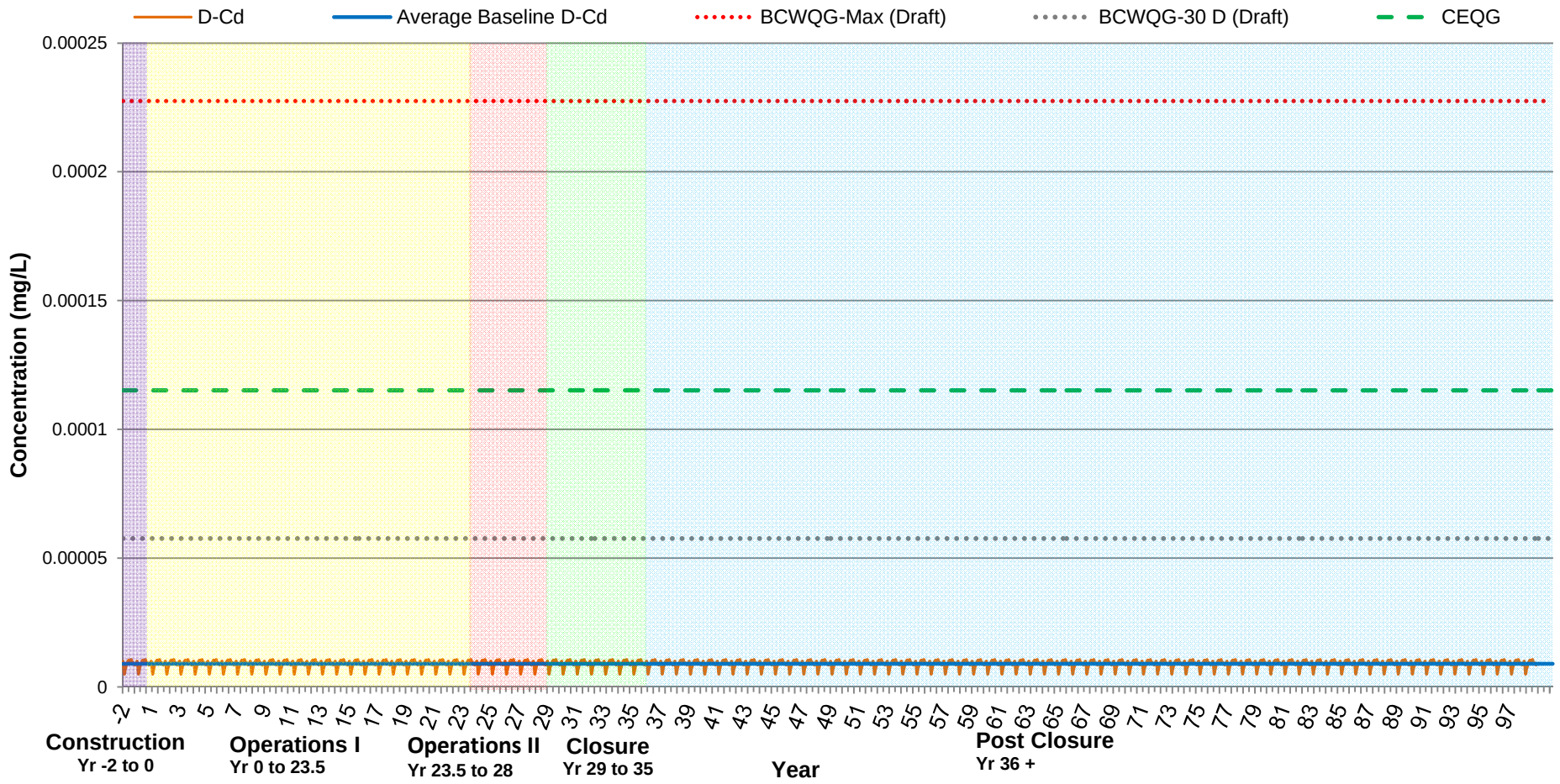
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G3.Cd-T

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE CADMIUM CONCENTRATIONS - P-CREEK

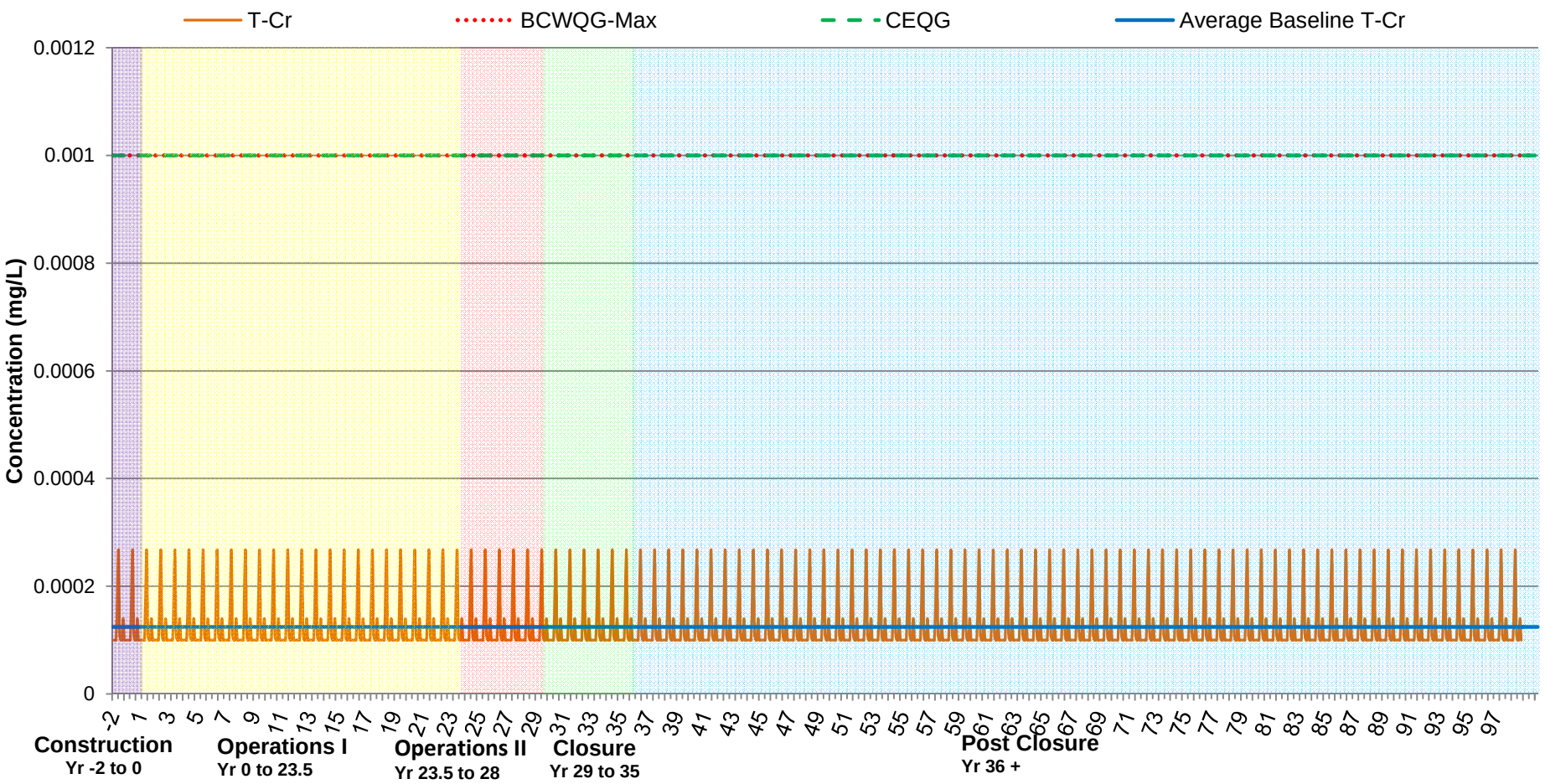
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G3.Cd-D

REV 0



NOTES:

1. GUIDELINES ARE FOR CHROMIUM (IV), THE SPECIES MOST COMMON IN WELL OXYGENATED SURFACE WATERS.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE CHROMIUM CONCENTRATIONS - P-CREEK

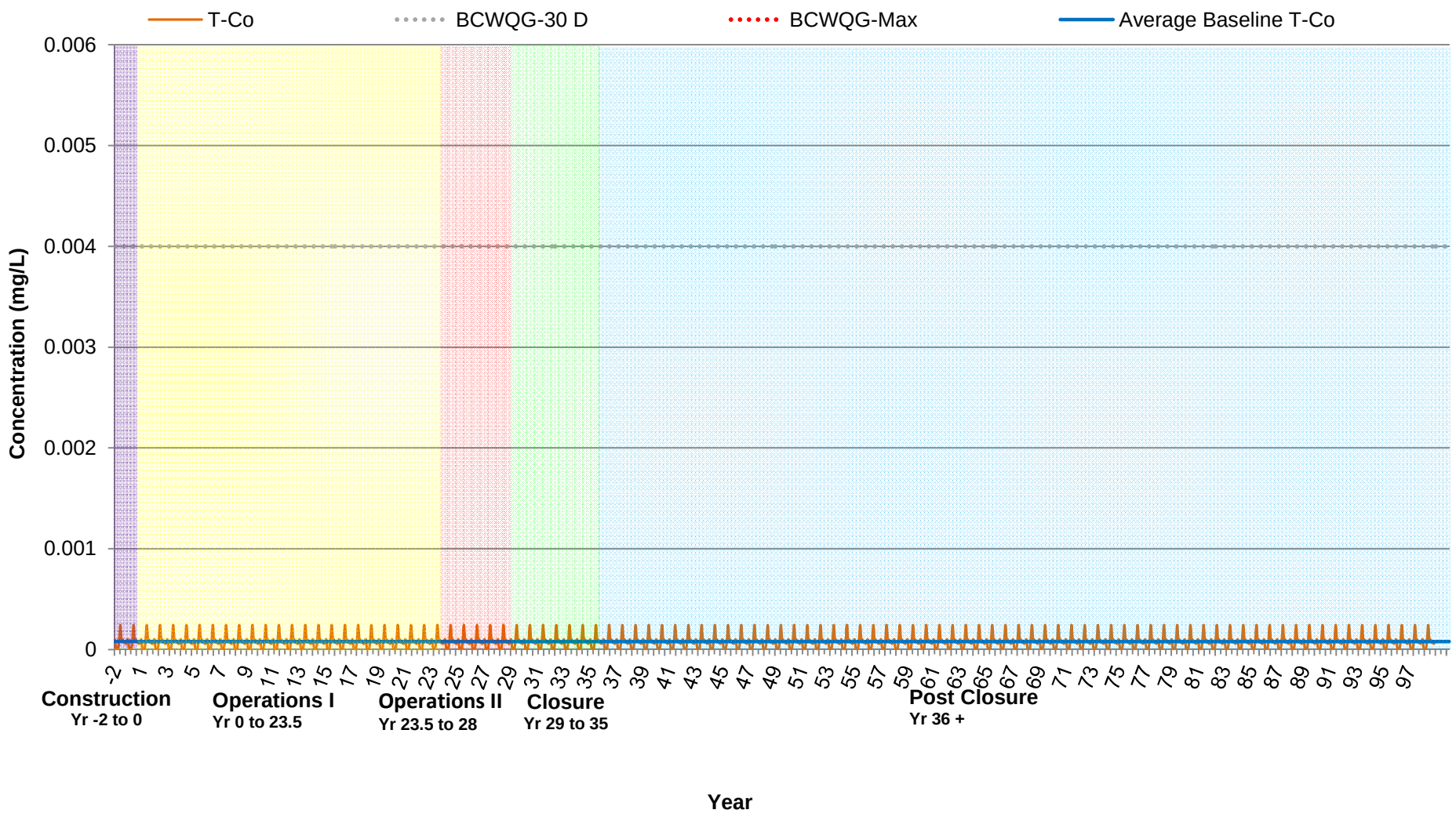
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G3.Cr

REV 0



NOTES:

1. THE BCWQG-30 D AND BCWQG-MAX ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. THE BCWQG-MAX GUIDELINE (0.11 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE COBALT CONCENTRATIONS - P-CREEK

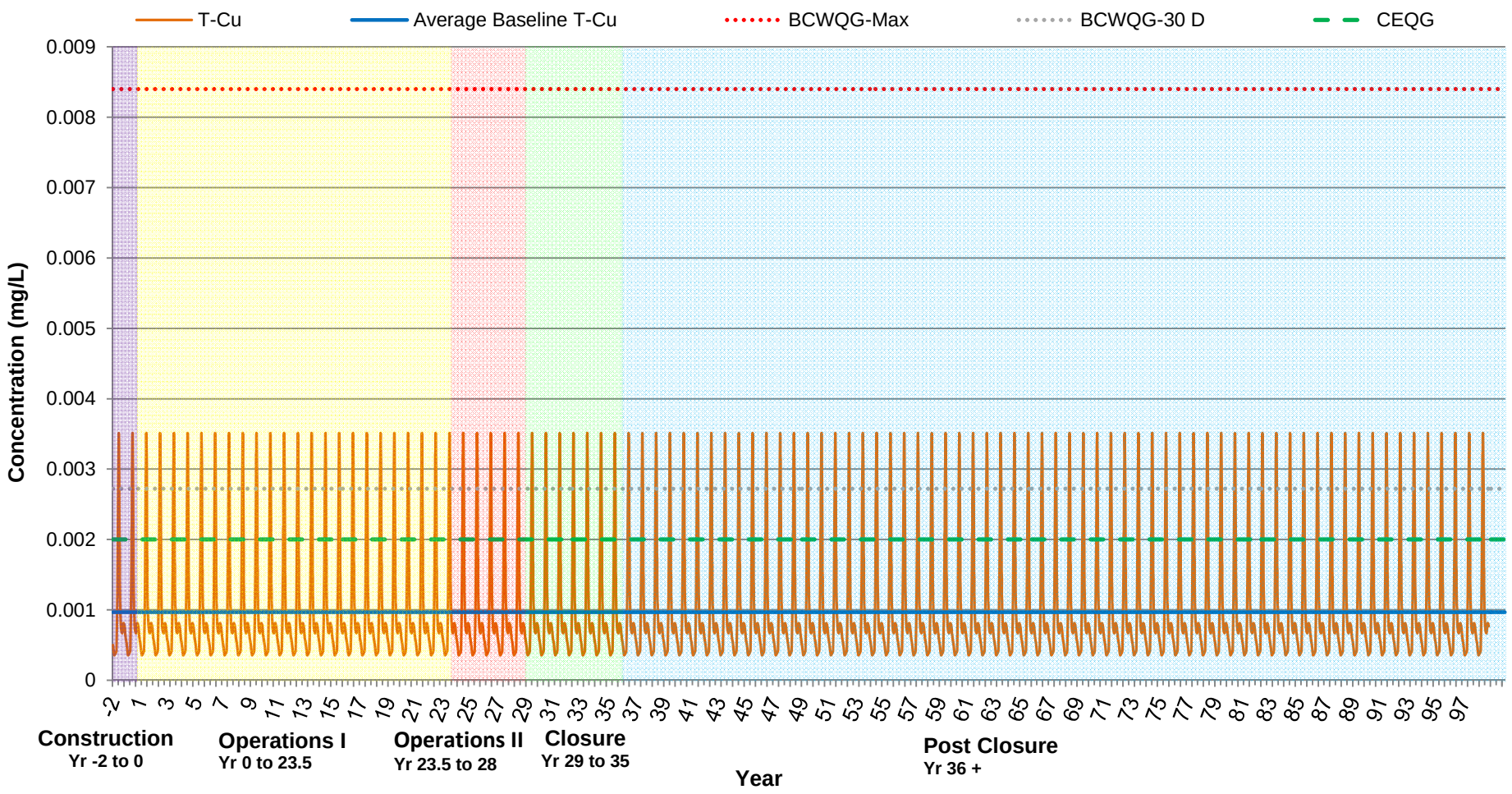
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G3.Co

REV 0



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE COPPER CONCENTRATIONS - P-CREEK

Knight Piésold CONSULTING

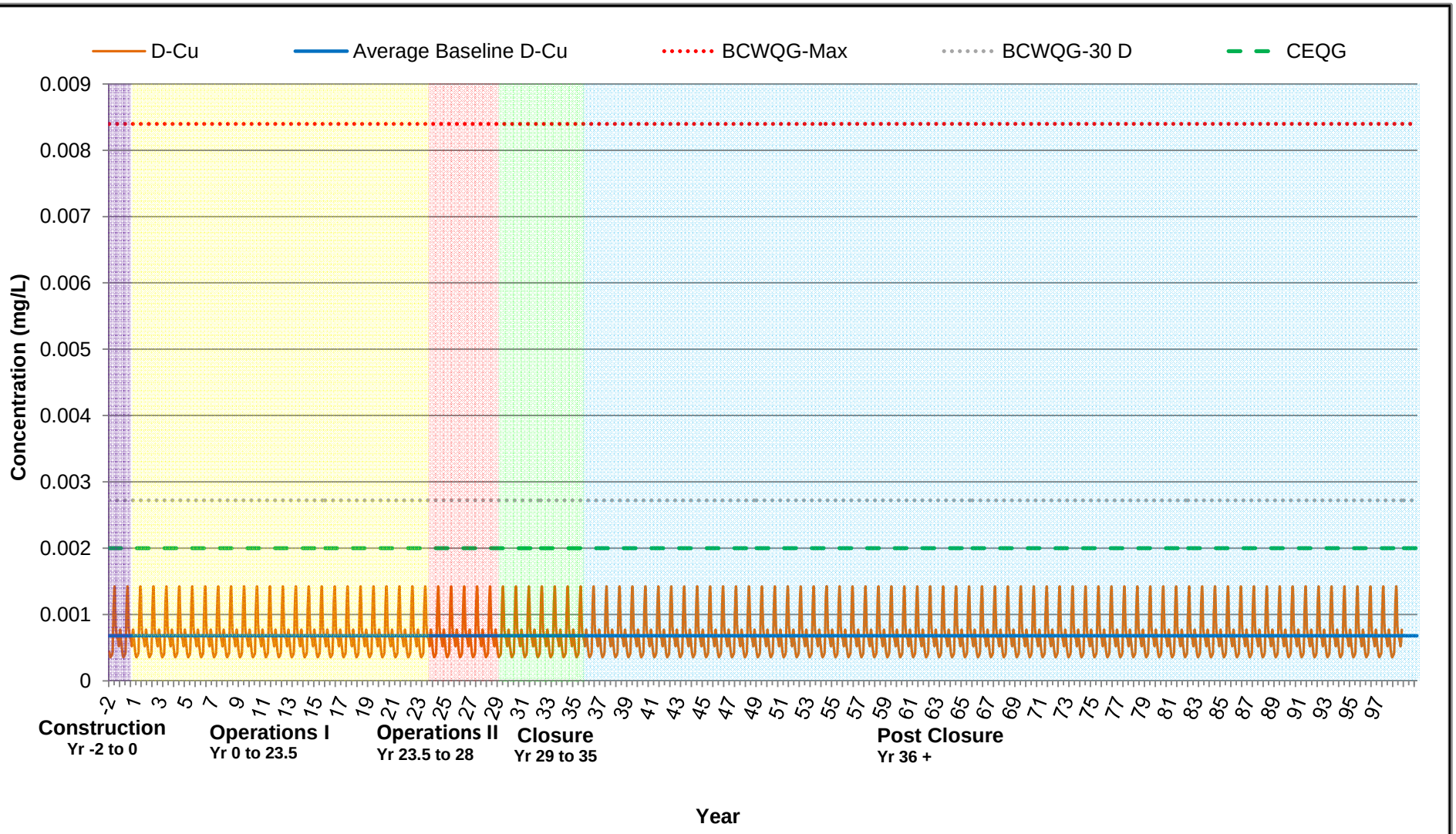
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G3.Cu-T

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE COPPER CONCENTRATIONS - P-CREEK

Knight Piésold CONSULTING

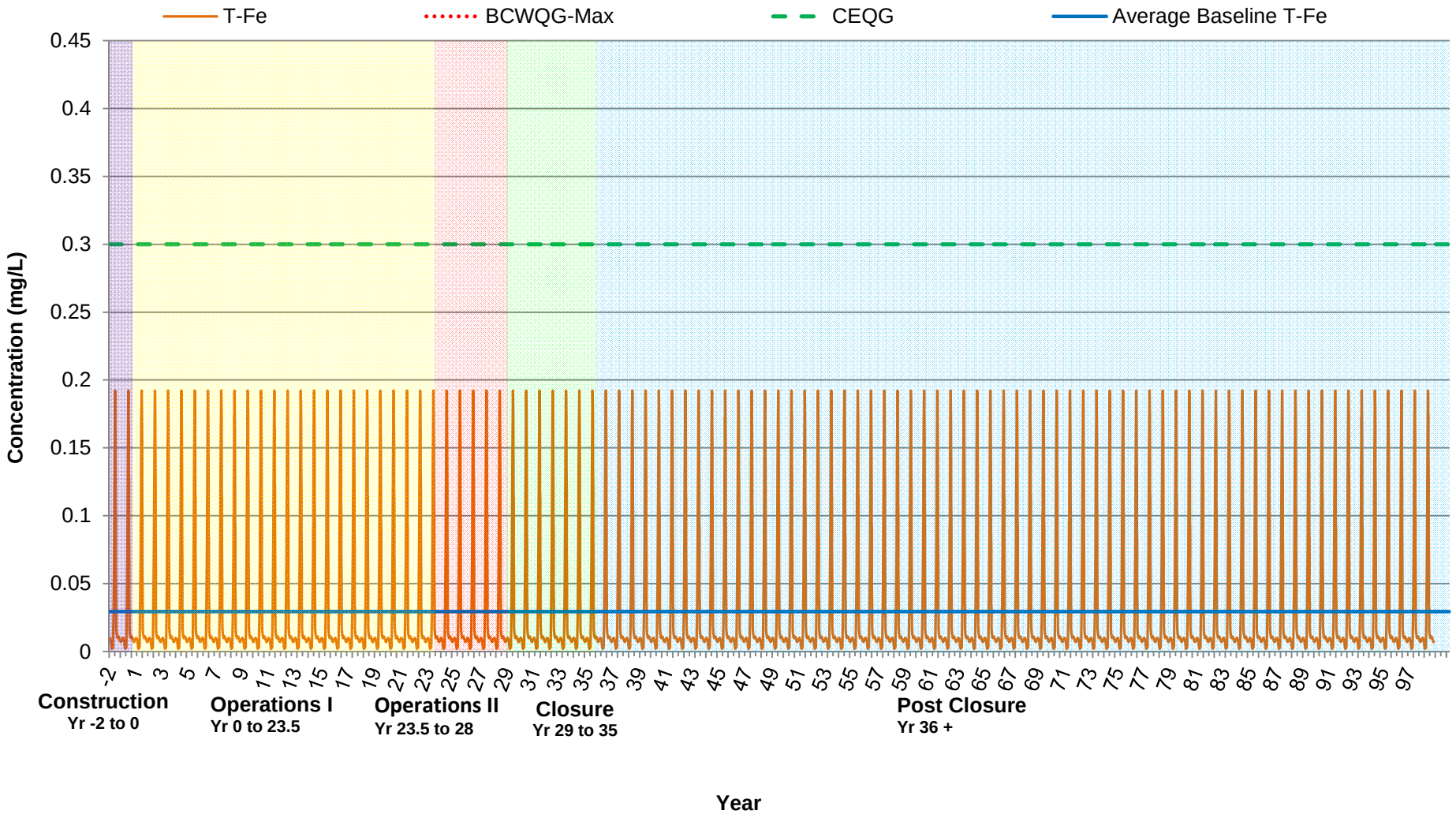
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G3.Cu-D

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. BCWQG-MAX 1.0 mg/L IS NOT SHOWN ON GRAPH.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE TOTAL IRON CONCENTRATIONS - P-CREEK

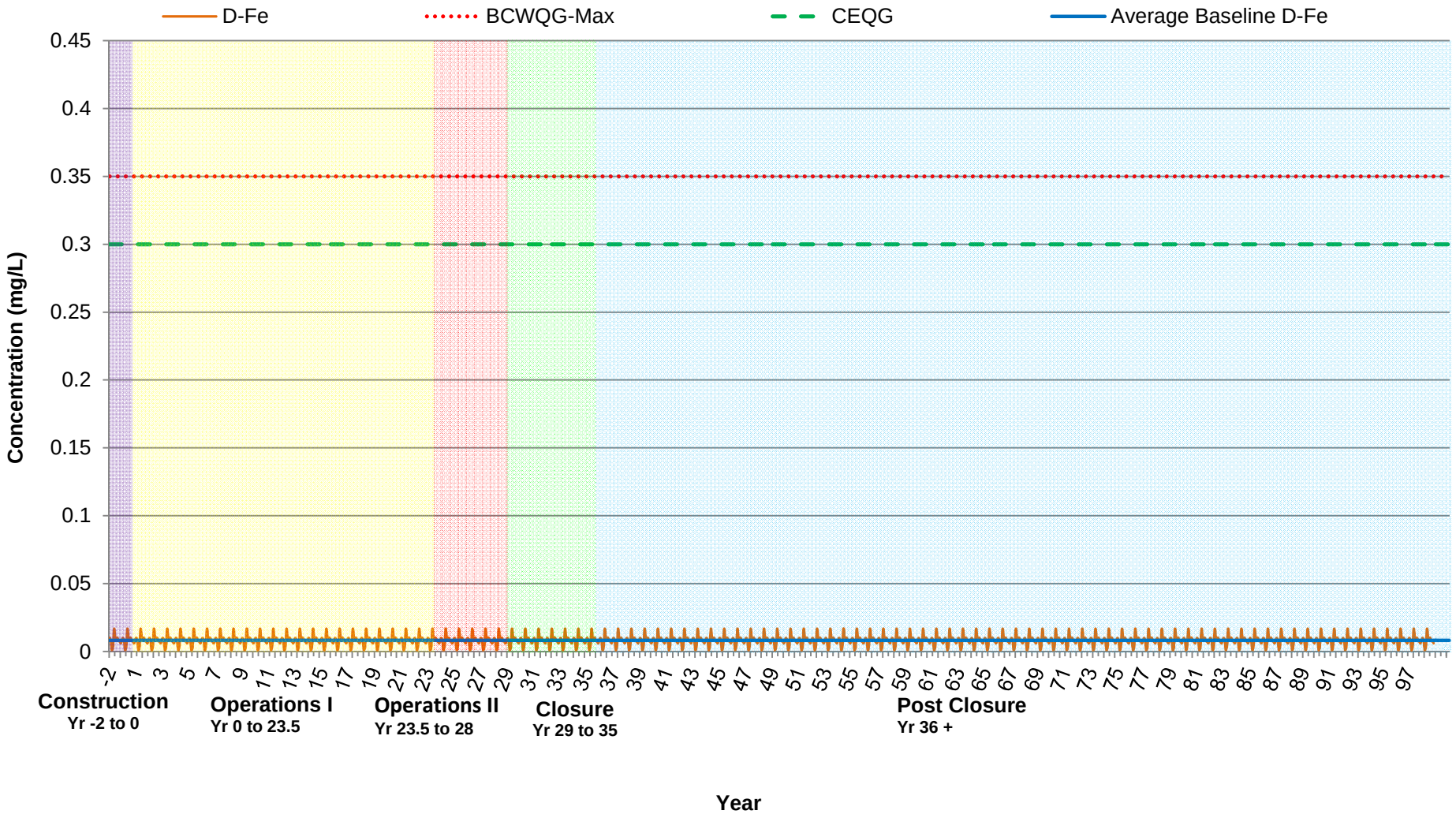
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G3.Fe-T

REV 0



NOTES:

1. THE BCWQG-MAX AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE DISSOLVED IRON CONCENTRATIONS - P-CREEK

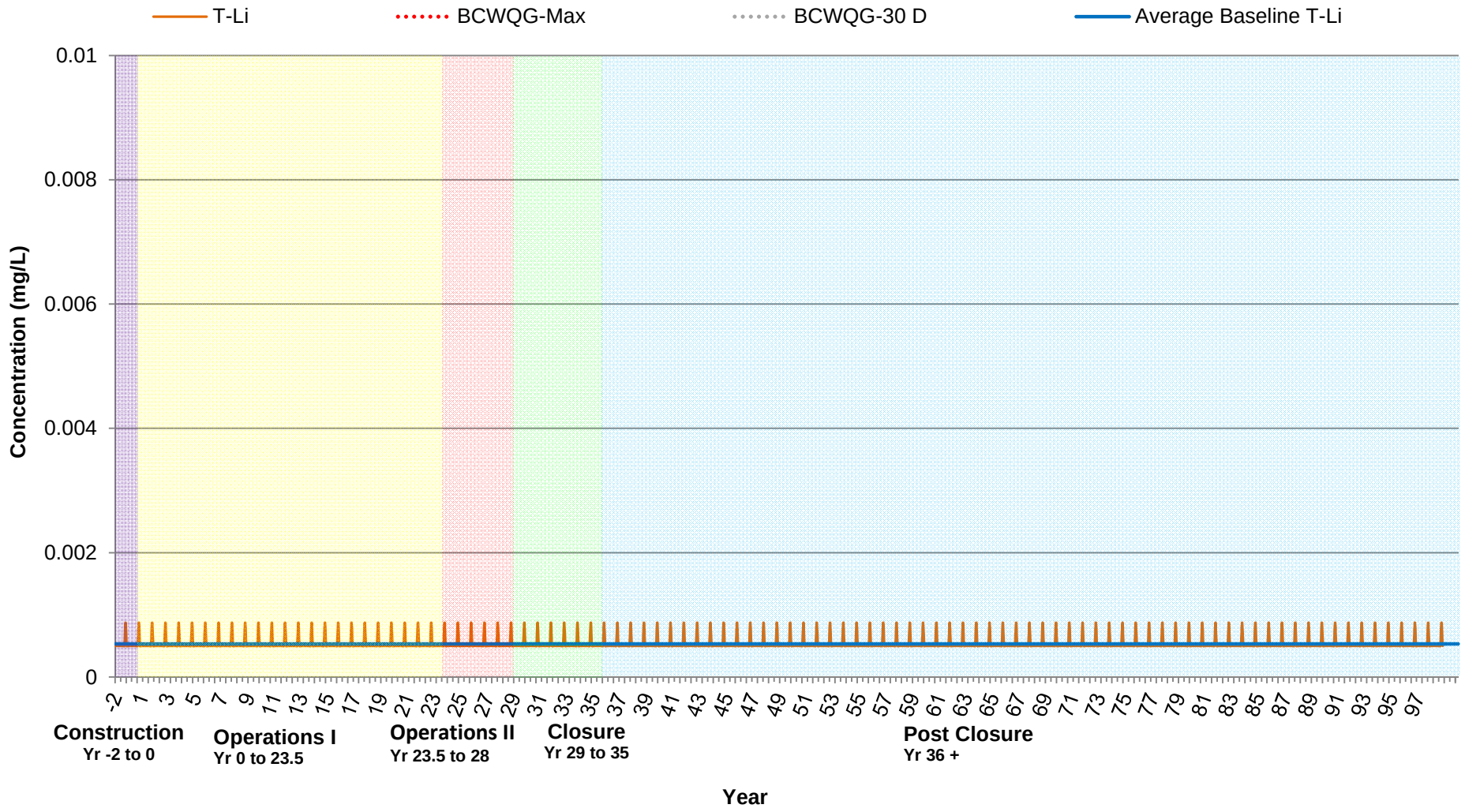
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G3.Fe-D

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. THE BCWQG-30 D (0.096 mg/L) AND BCWQG-MAX (0.87 mg/L) ARE INTERIM (WORKING) AND ARE NOT SHOWN ON GRAPH.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE LITHIUM CONCENTRATIONS - P-CREEK

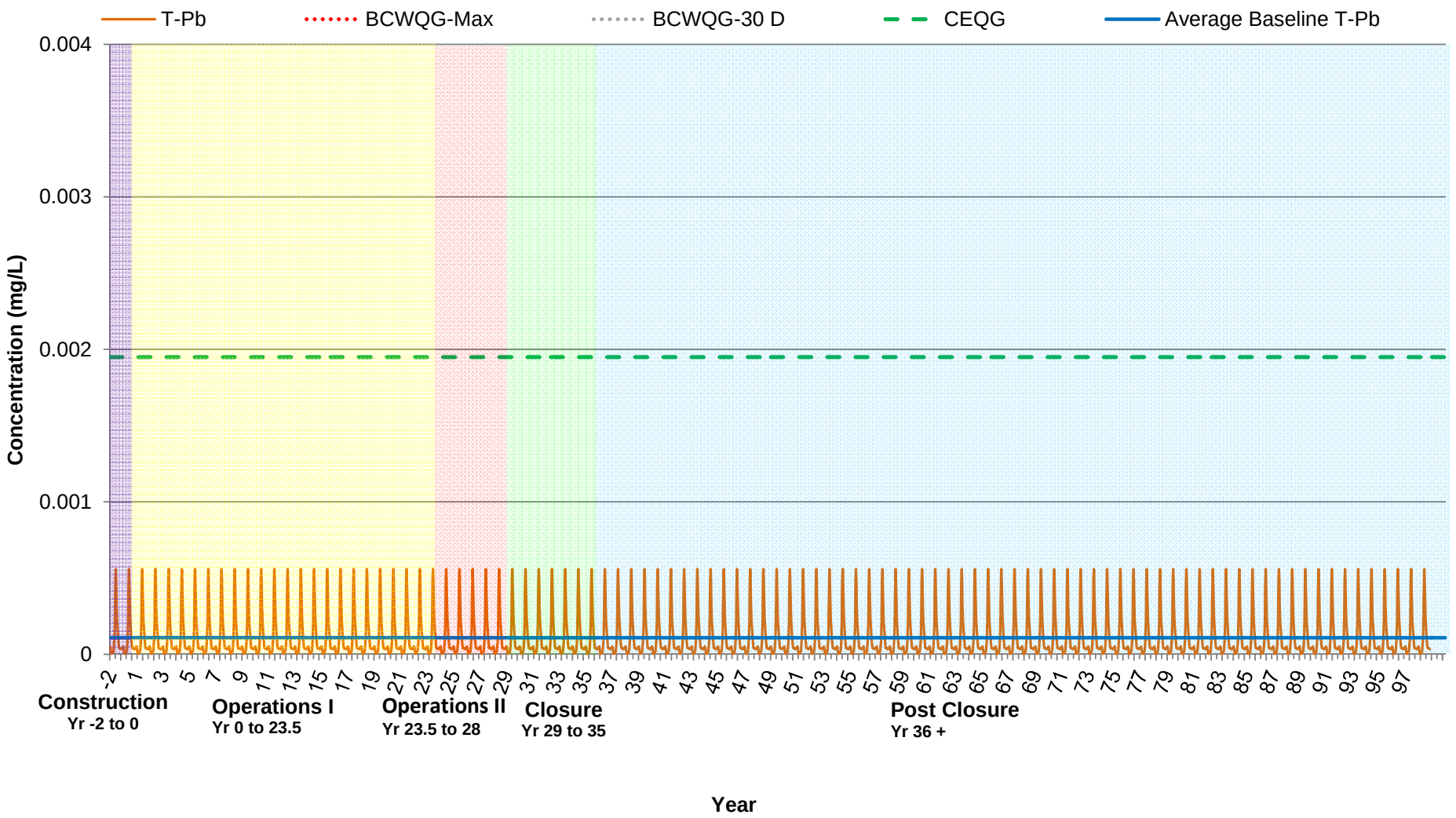
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G3.Li

REV 0



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.
4. THE BCWQG-MAX (CALCULATED AT 0.011 mg/L) IS NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE LEAD CONCENTRATIONS - P-CREEK

Knight Piésold CONSULTING

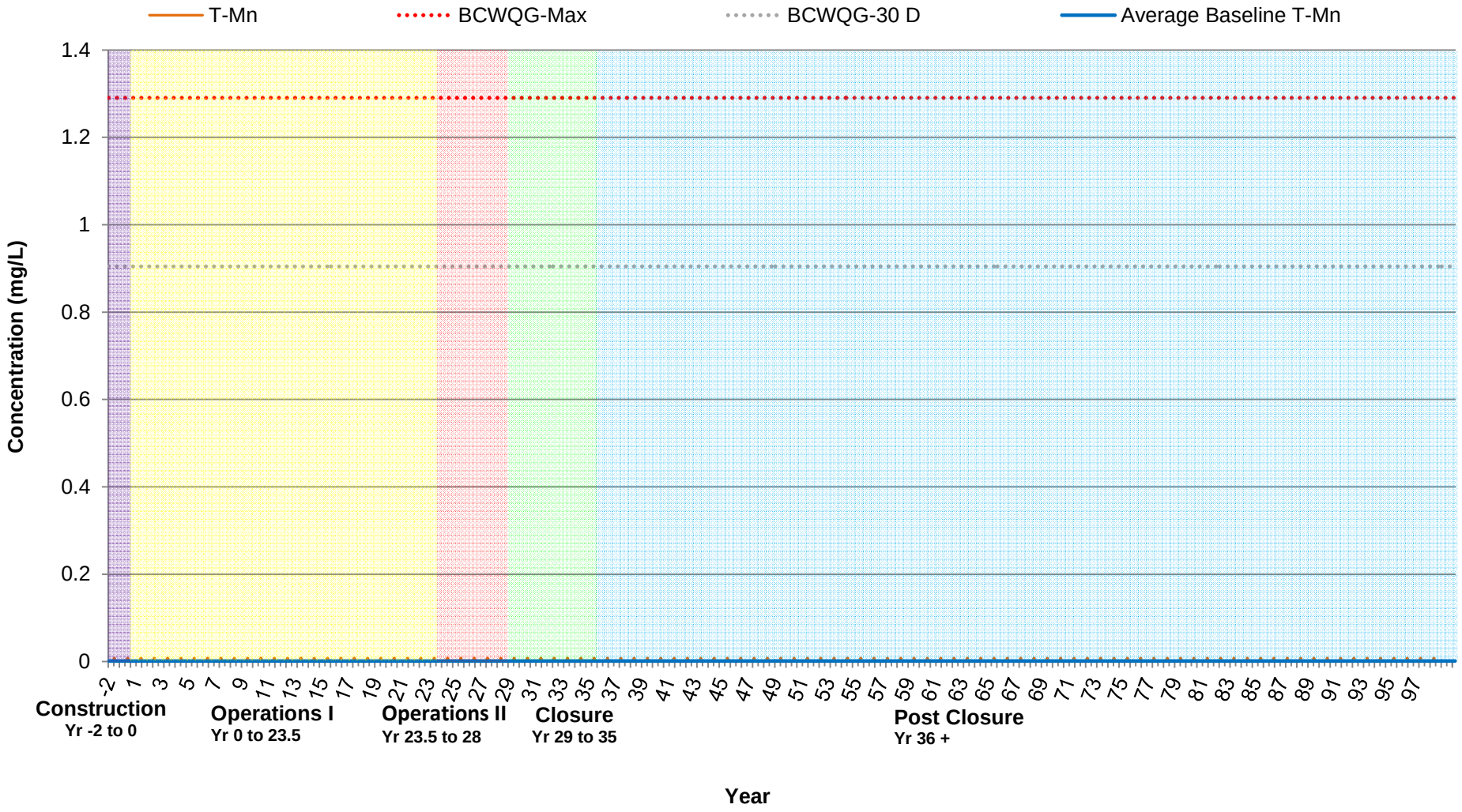
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G3.Pb

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE MANGANESE CONCENTRATIONS - P-CREEK

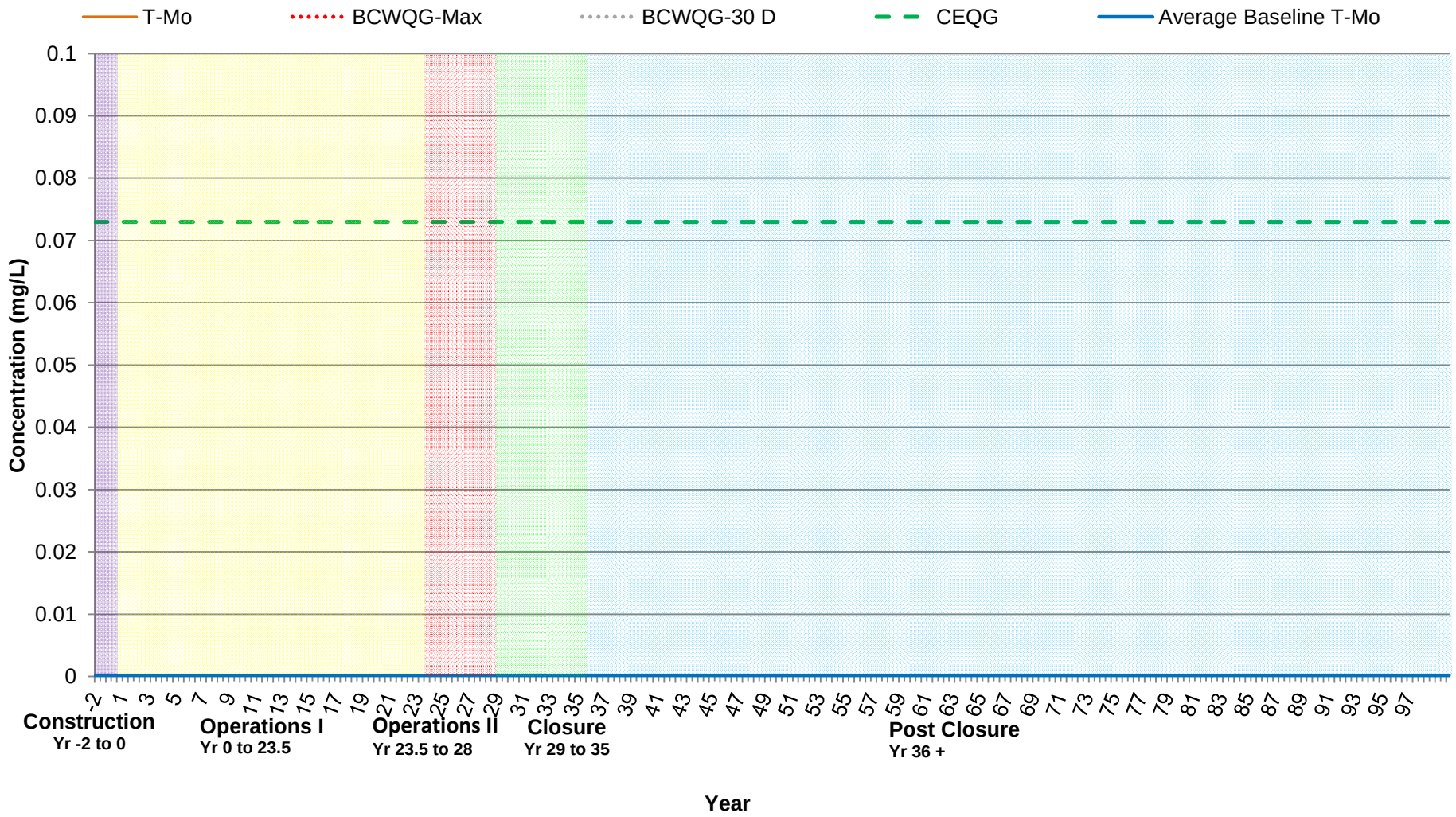
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G3.Mn

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. THE BCWQG-MAX (2 mg/L) AND BCWQG-30 D (1 mg/L) ARE NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE MOLYDBENUM CONCENTRATIONS - P-CREEK

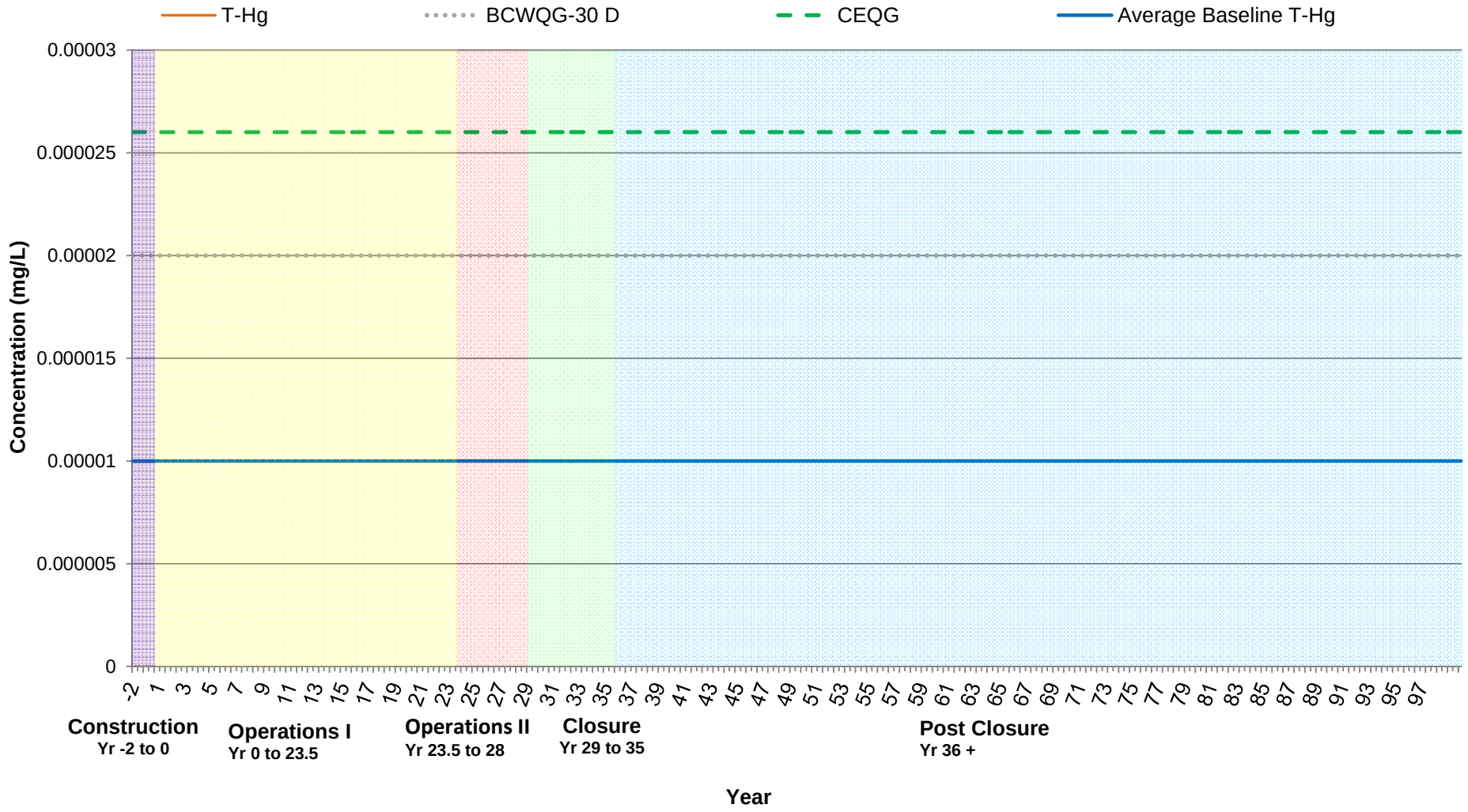
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G3.Mo

REV 0



NOTES:

1. THE BCWQG-30 D AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. BCWQG-30 D VALUE APPLIED ON ASSUMPTION THAT METHYL-Hg IS EQUAL TO 0.5% OF T-Hg.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE MERCURY CONCENTRATIONS - P-CREEK

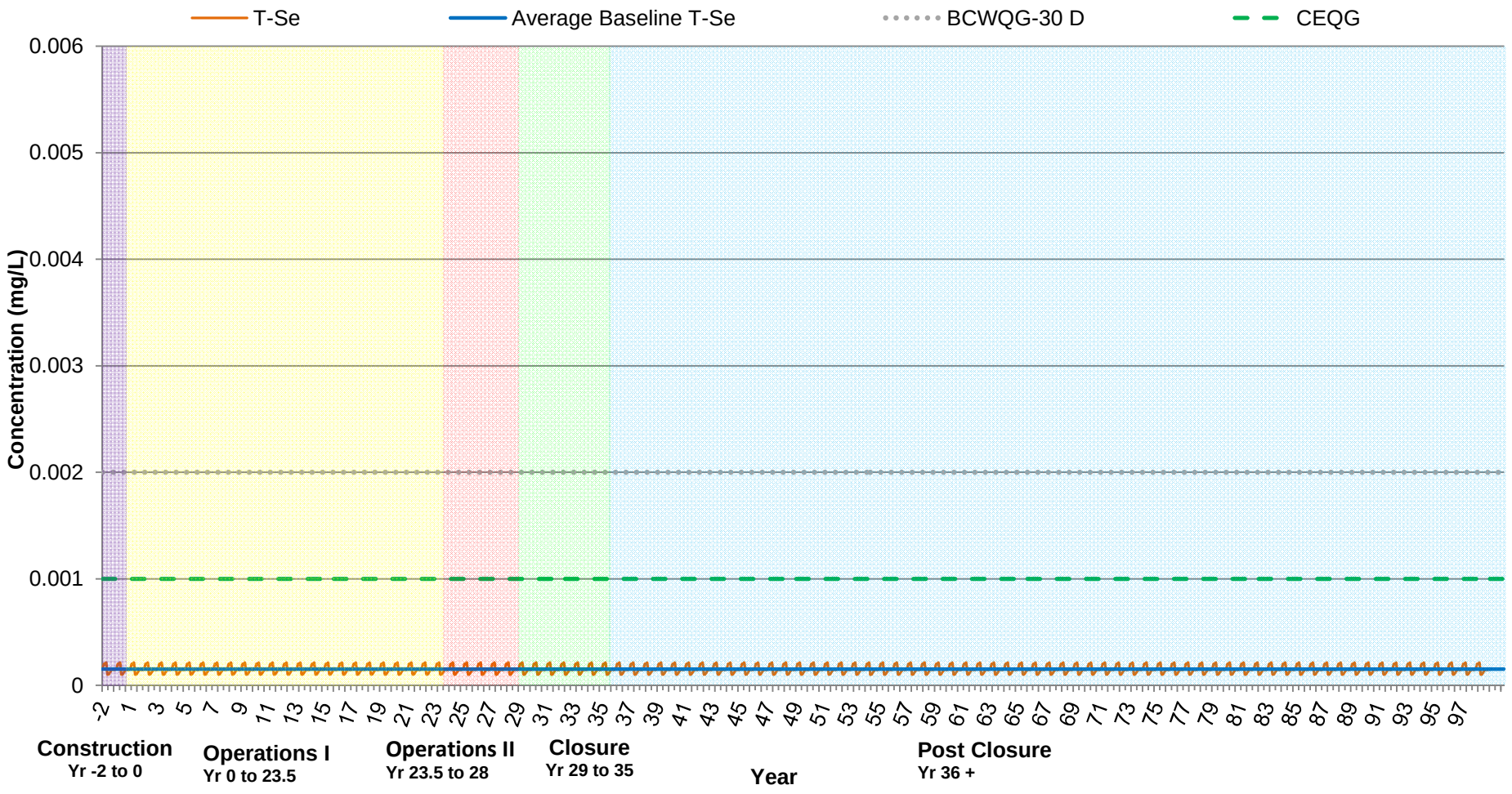
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G3.Hg

REV 0



NOTES:

1. THE BCWQG-30 D AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE SELENIUM CONCENTRATIONS - P-CREEK

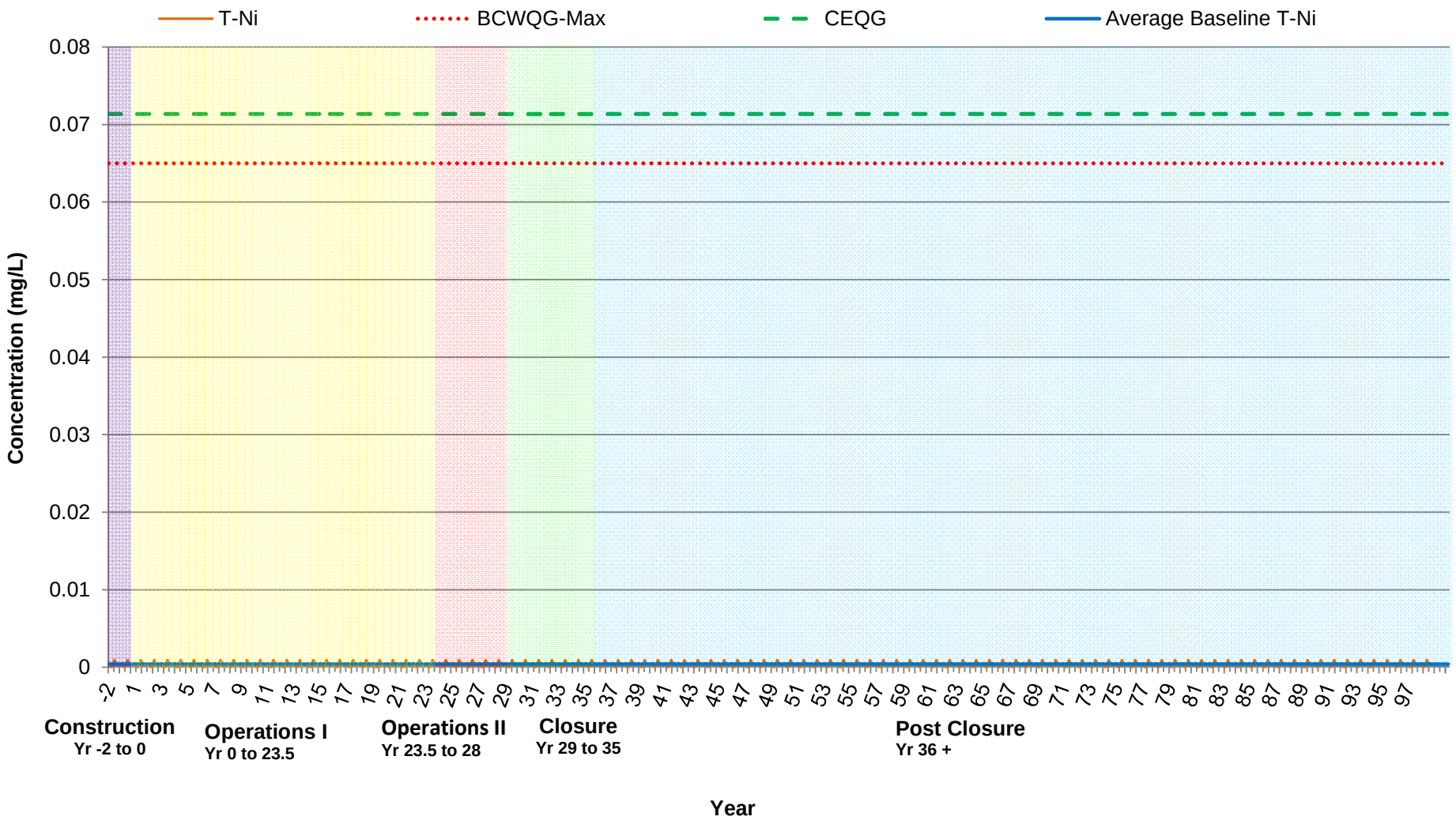
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G3.Se

REV 0



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE NICKEL CONCENTRATIONS - P-CREEK

Knight Piésold CONSULTING

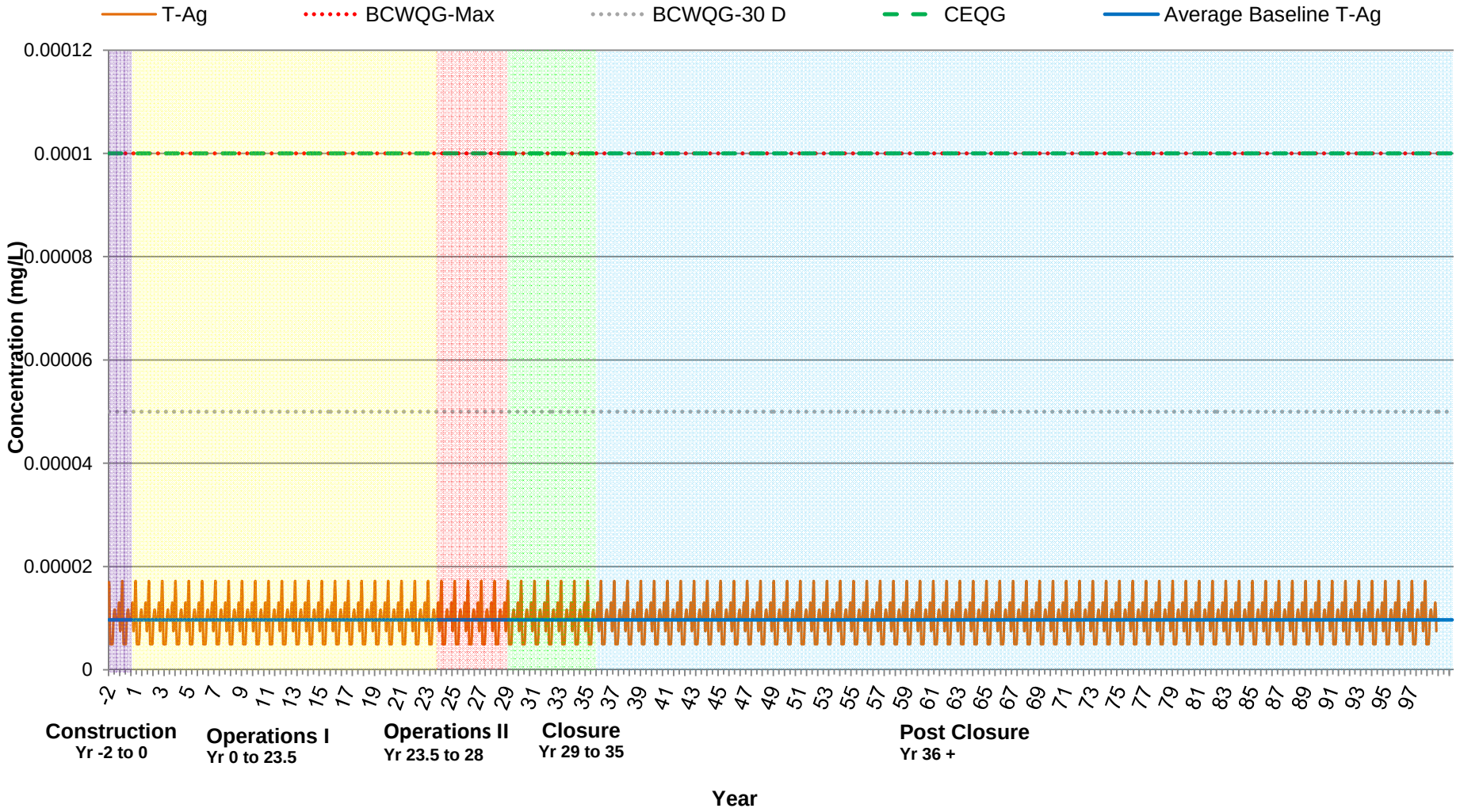
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G3.Ni

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-30 D AND BCWQG-MAX ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE SILVER CONCENTRATIONS - P-CREEK

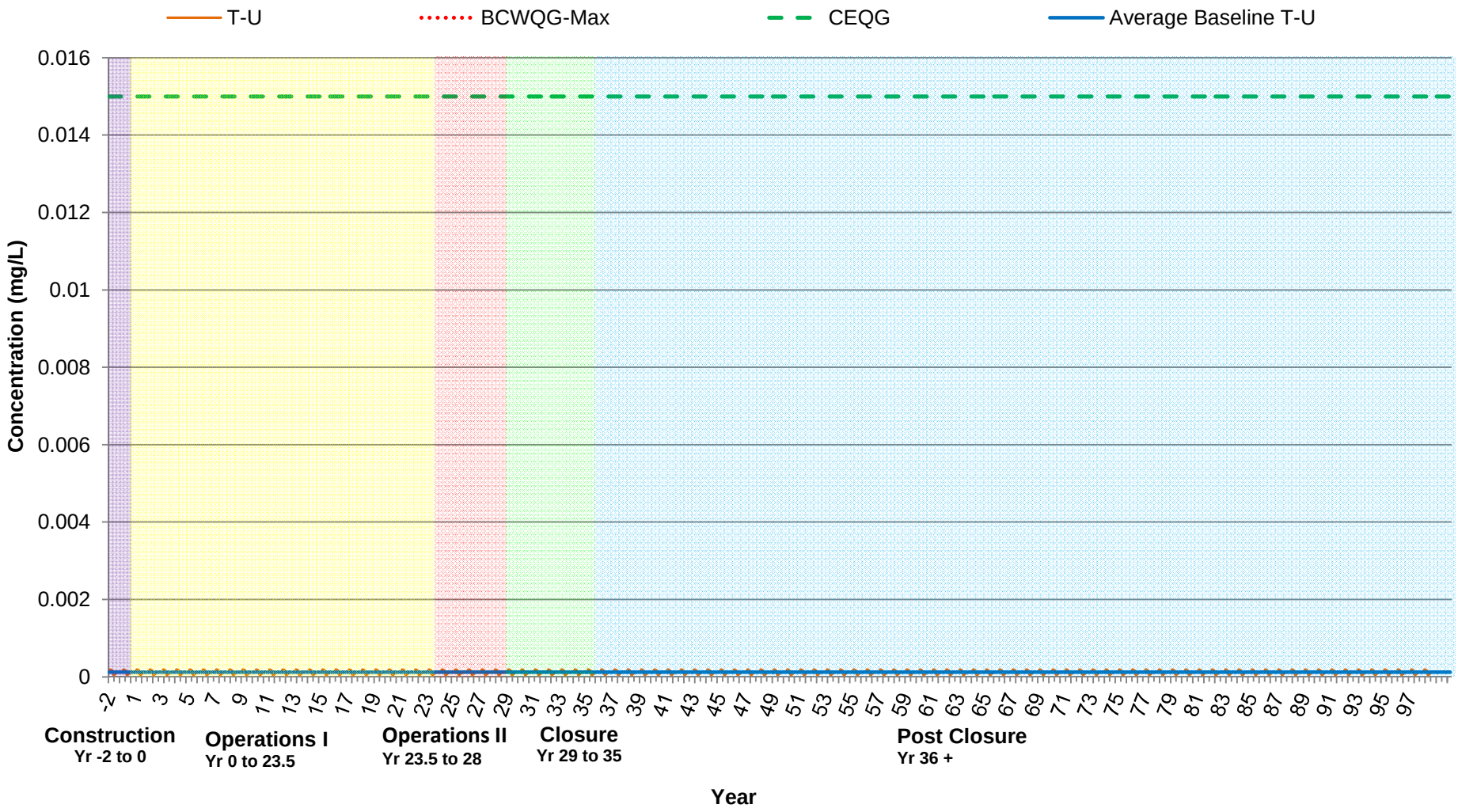
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G3.Ag

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. THE BCWQG-MAX (0.3 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE URANIUM CONCENTRATIONS - P-CREEK

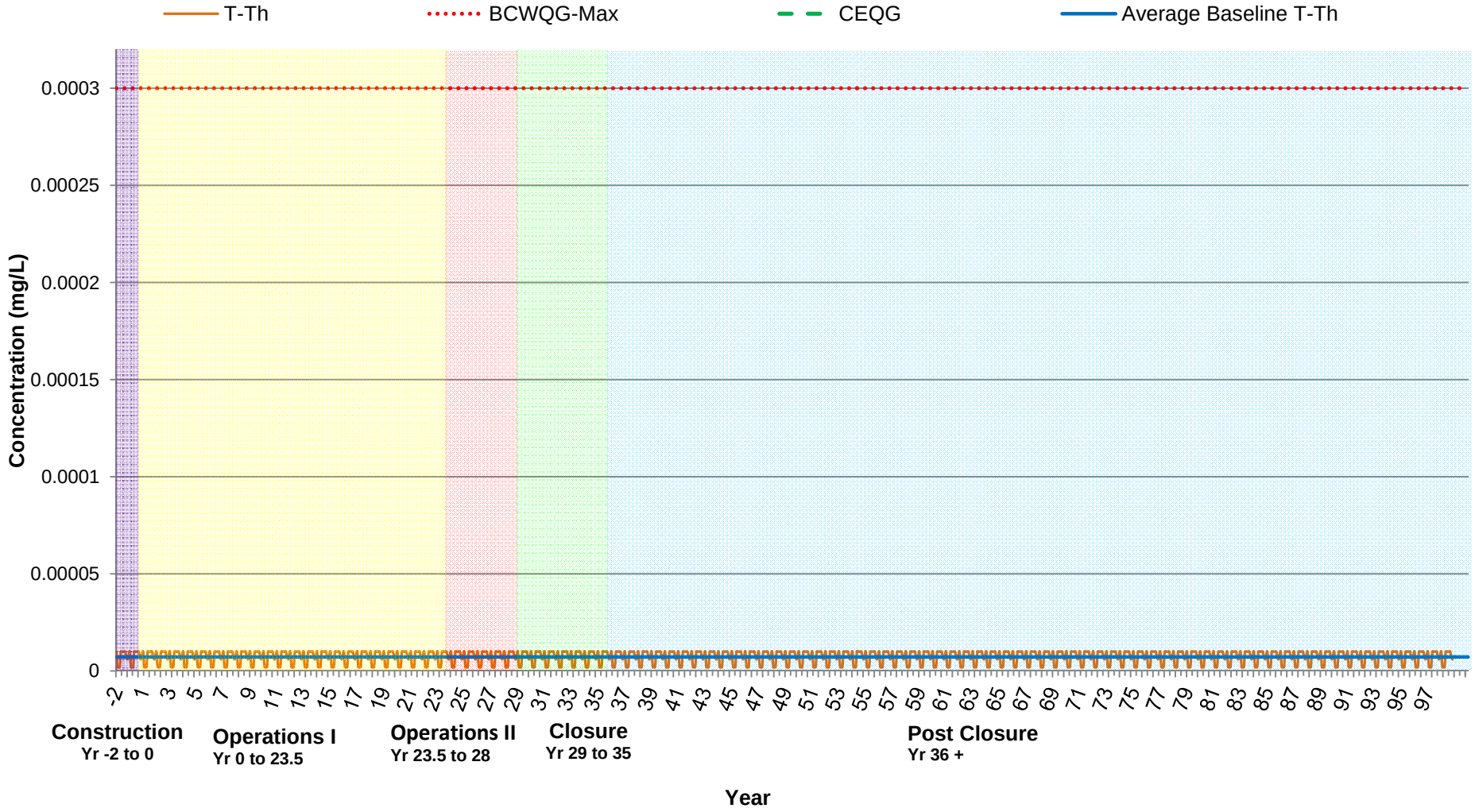
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G3.U

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. THE CEQG (0.0008 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE THALLIUM CONCENTRATIONS - P-CREEK

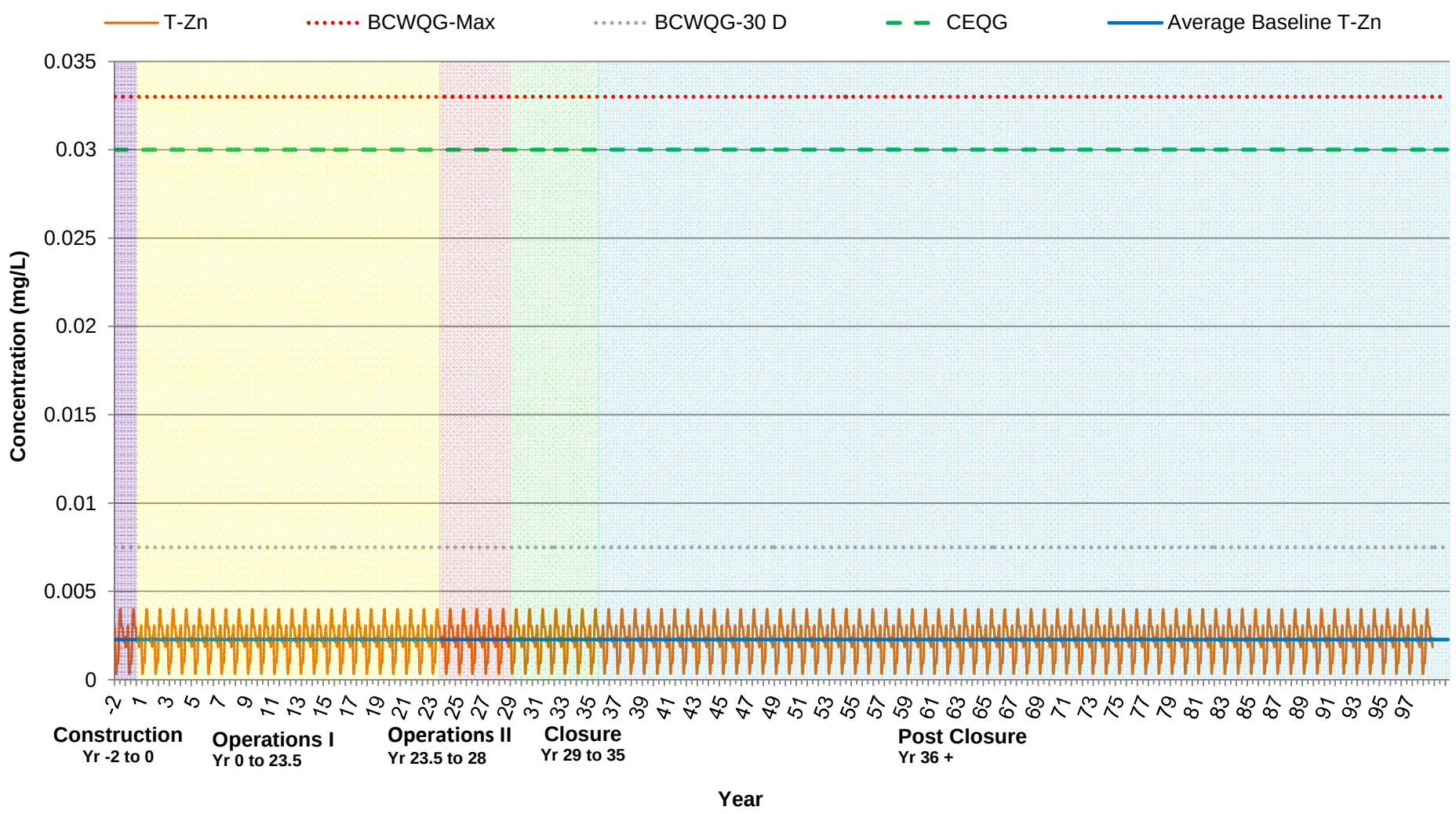
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G3.Th

REV 0



NOTES:

1. BCWQG-30 D AND BCWQG-MAX ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE ZINC CONCENTRATIONS - P-CREEK

Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G3.Zn

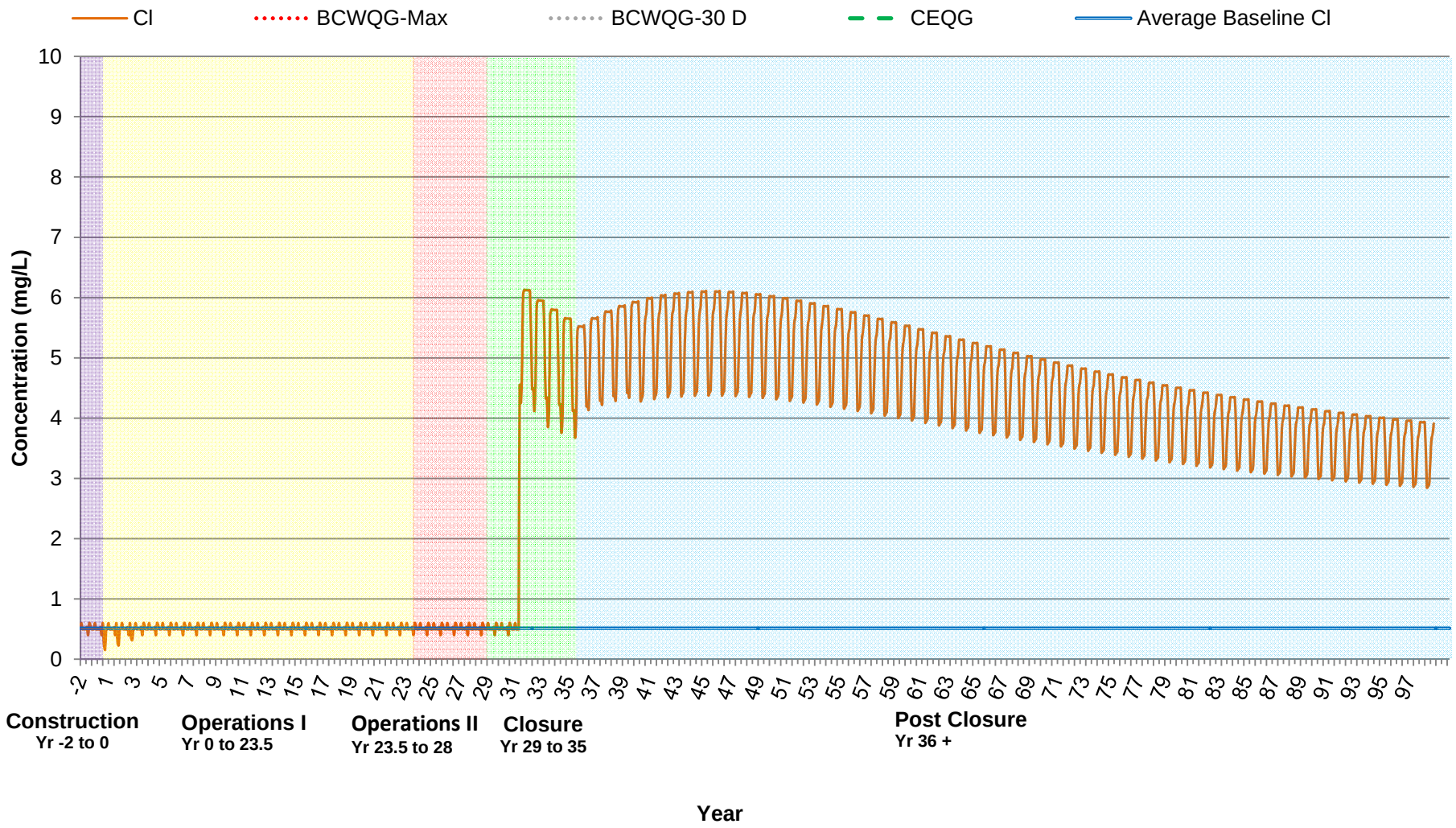
REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

APPENDIX G4

T-CREEK

(Pages G4-1 to G4-30)



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).
3. ALL GUIDELINES ARE NOT SHOWN: BCWQG-30 D (150 mg/L); BCWQG-MAX (600 mg/L); CEQG (120 mg/L AND 640 mg/L).

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE CHLORIDE CONCENTRATIONS - T-CREEK

Knight Piésold CONSULTING

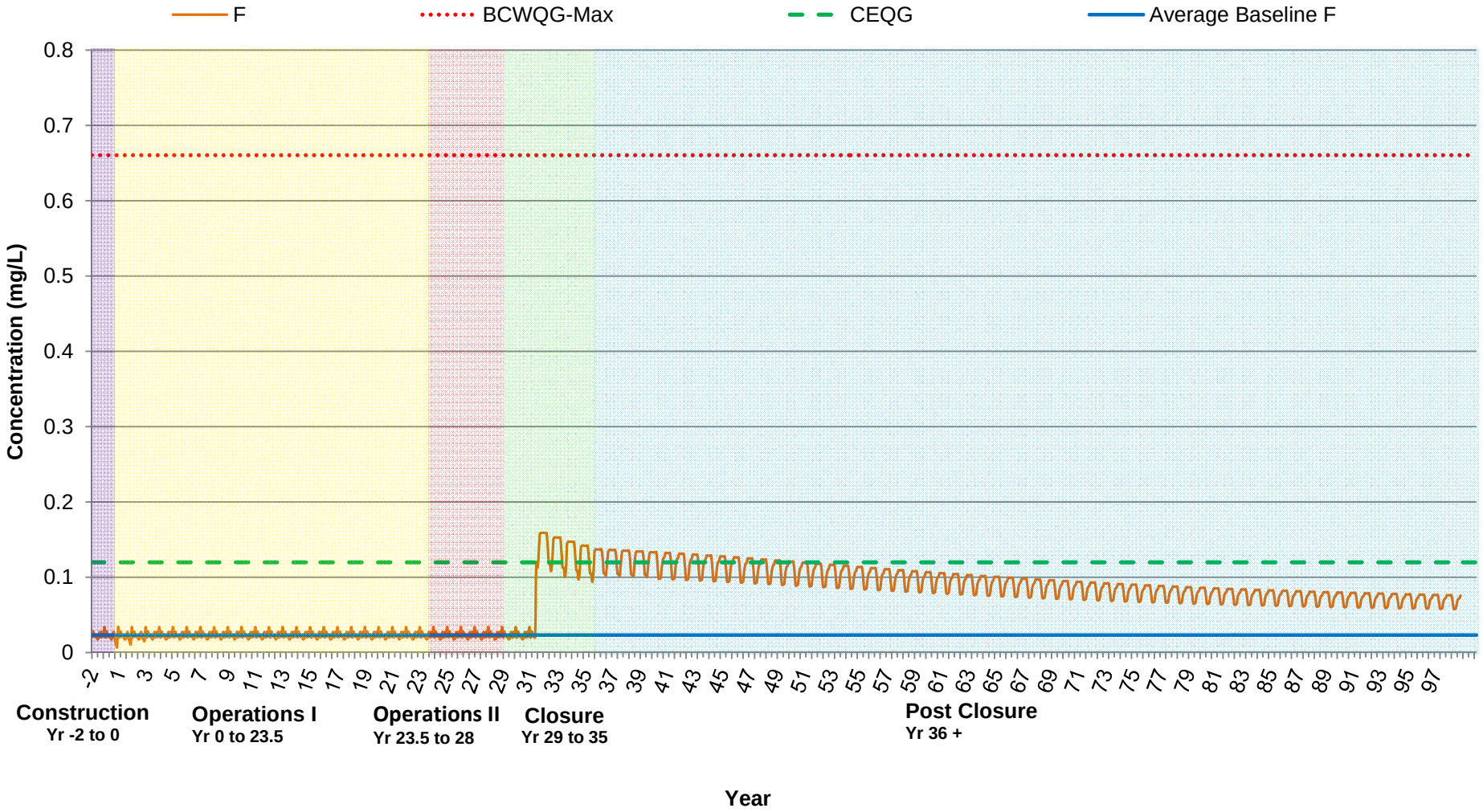
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G4.Cl

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX IS HARNDESS DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE FLUORIDE CONCENTRATIONS - T-CREEK

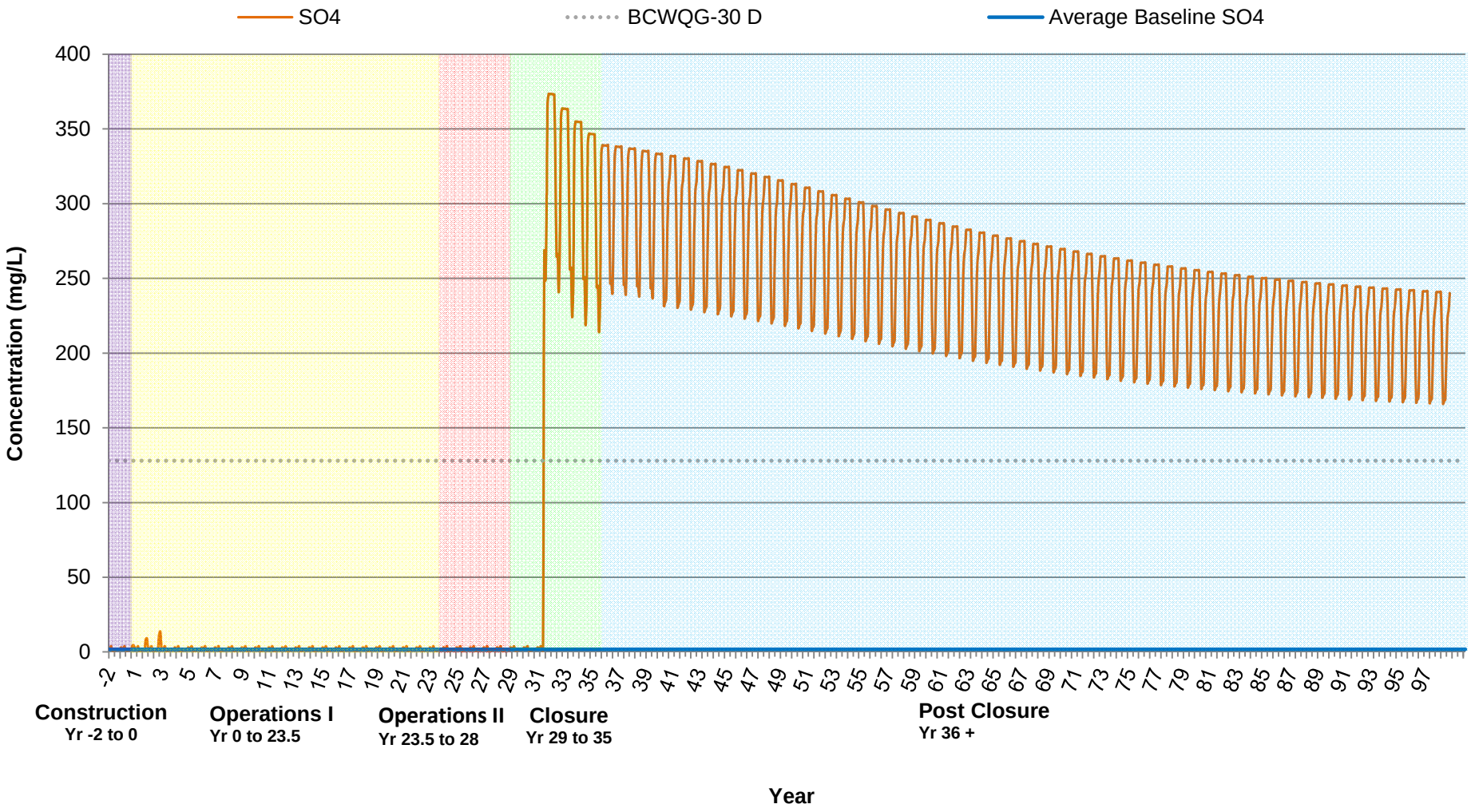
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G4.F

REV 0



NOTES:

1. BCWQG-30 D IS HARDNESS DEPEDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE SULPHATE CONCENTRATIONS - T-CREEK

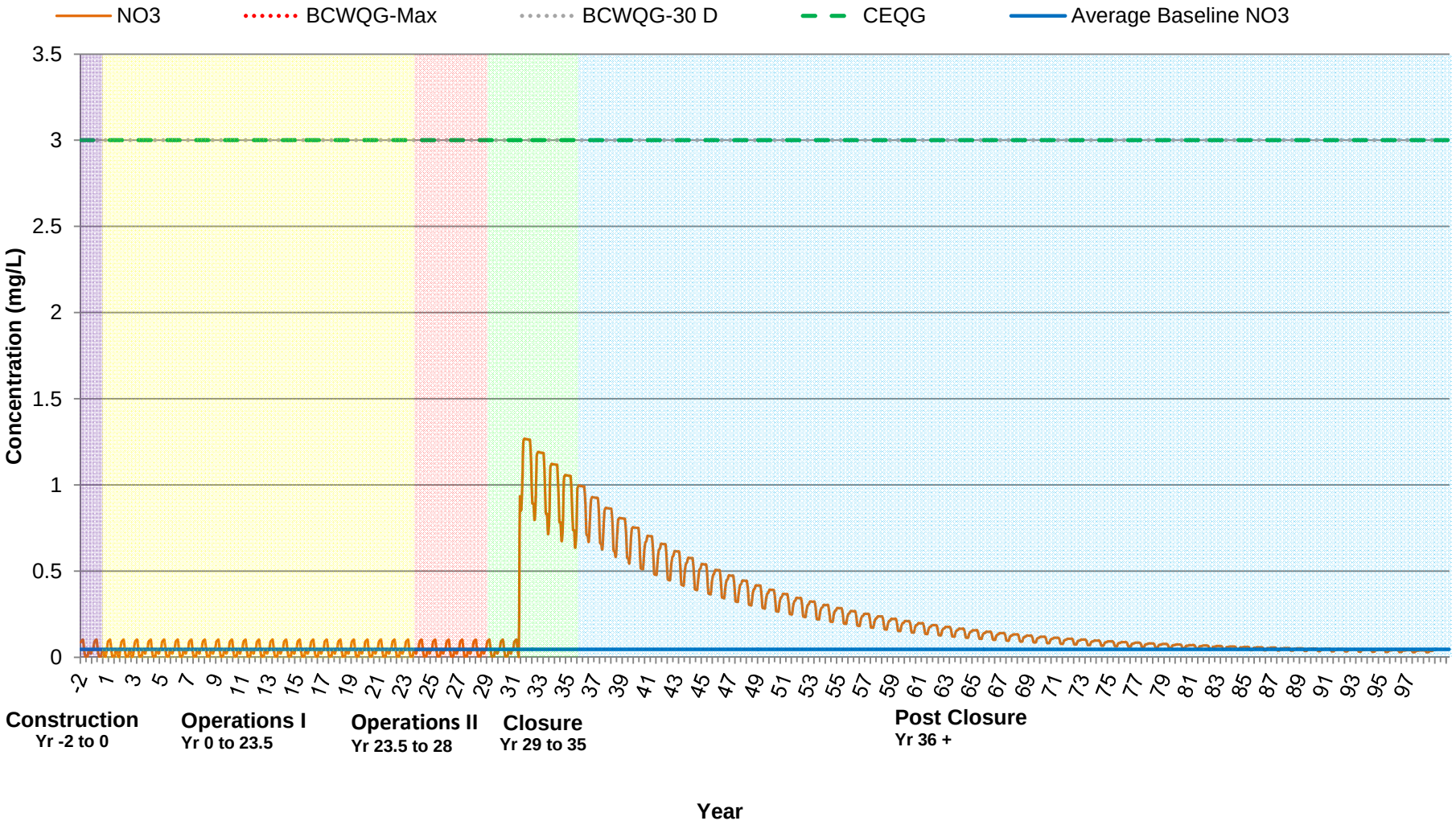
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G4.S04

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).
3. THE BCWQG-MAX (32.8 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE NITRATE CONCENTRATIONS - T-CREEK

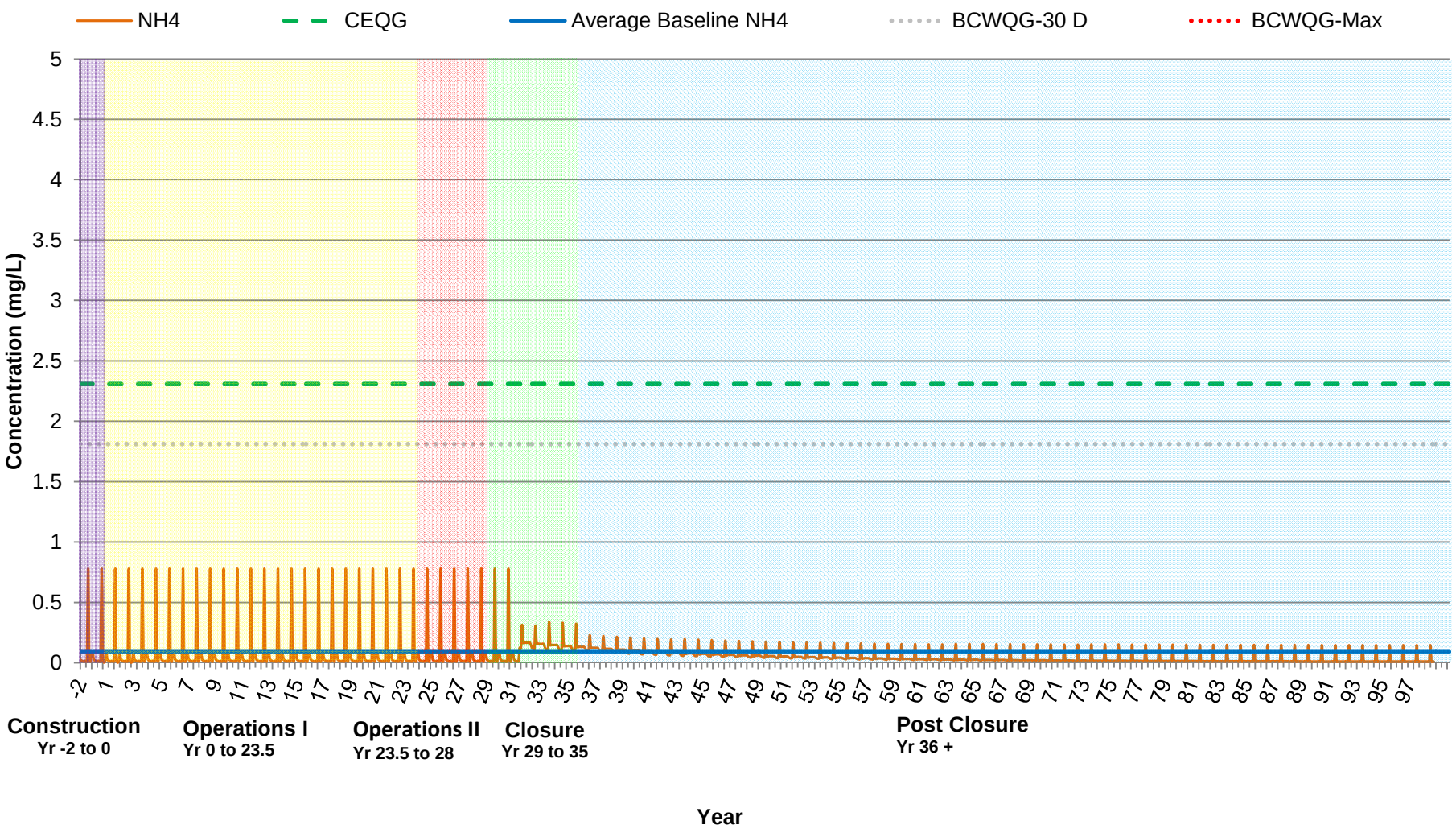
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G4.NO3

REV 0



NOTES:

1. THE BCWQG-30 D IS VALID FOR ONLY 6.5≤pH<9 AND 0°C≤T≤20°C.
2. THE BCWQG-MAX (20.15 mg/L) VALID FOR 6.5≤pH<9 IS NOT SHOWN.
3. THE CEQG IS TO BE USED WITH CAUTION FOR WATER WITH T<5°C AND pH>9.
4. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE AMMONIA CONCENTRATIONS - T-CREEK

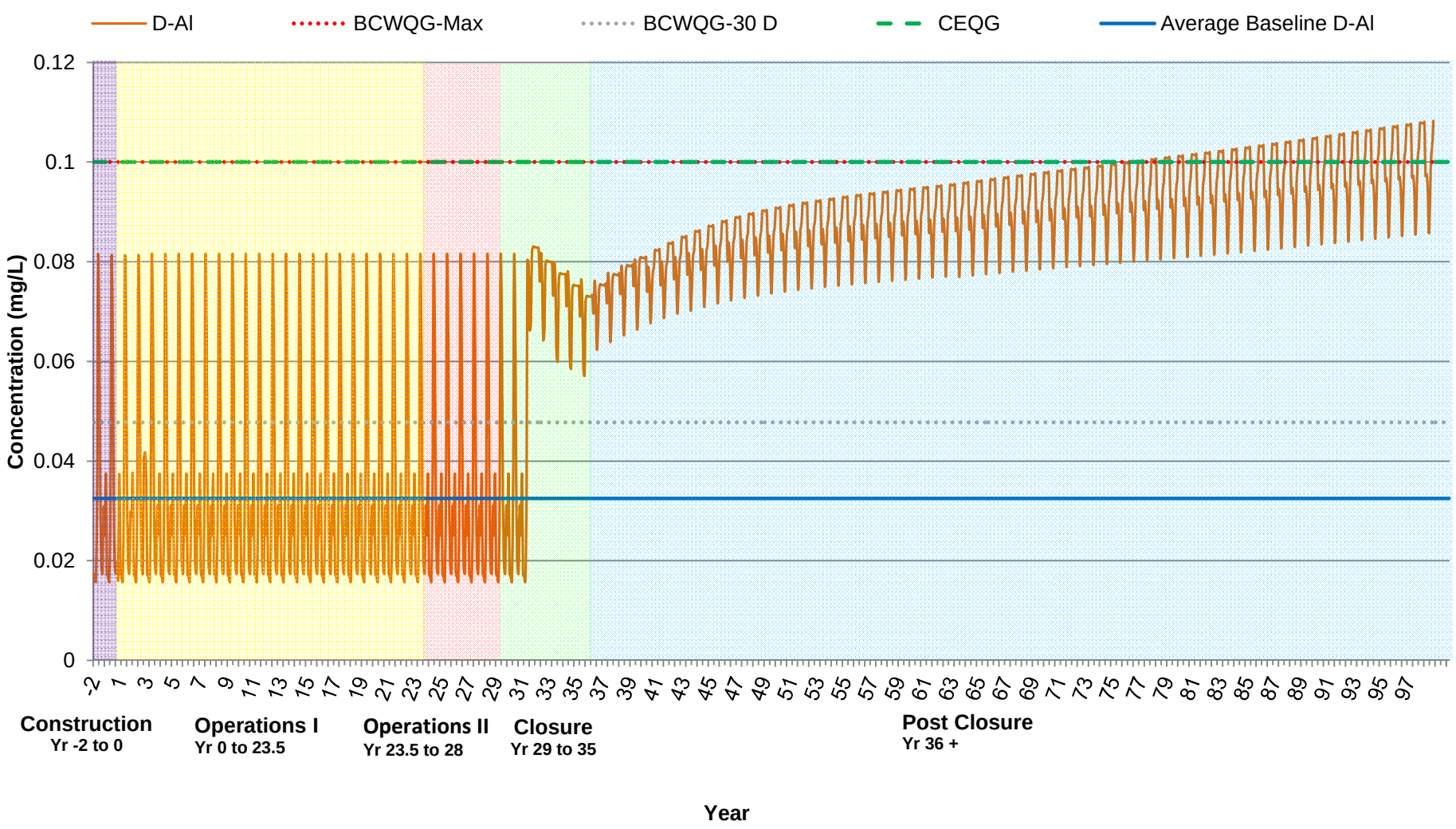
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G4.NH4

REV 0



NOTES:

1. ALL GUIDELINES ARE pH-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).
3. AVERAGE BASELINE pH USED TO CALCULATE GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE DISSOLVED ALUMINUM CONCENTRATIONS - T-CREEK

Knight Piésold CONSULTING

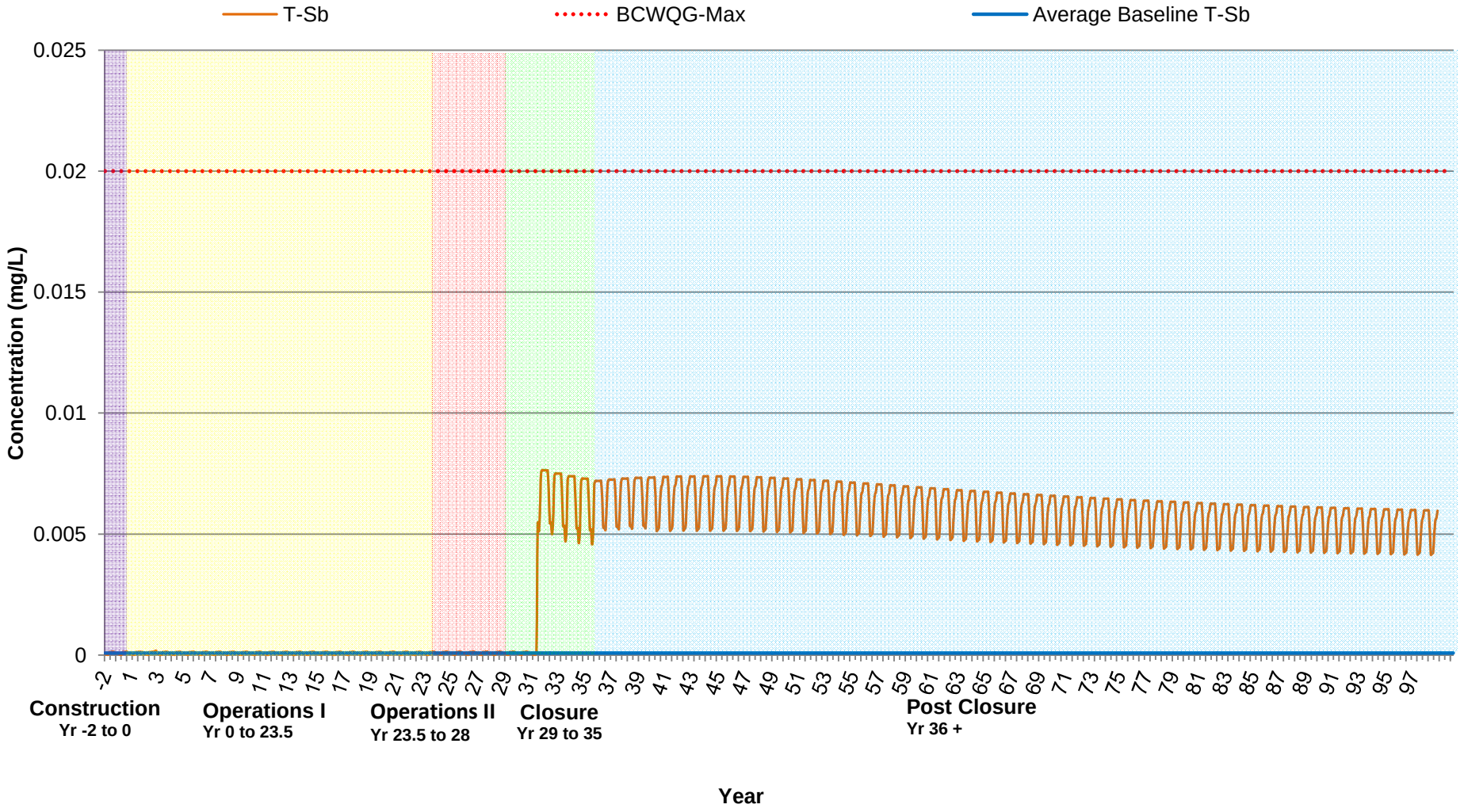
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G4.Al

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE ANTIMONY CONCENTRATIONS - T-CREEK

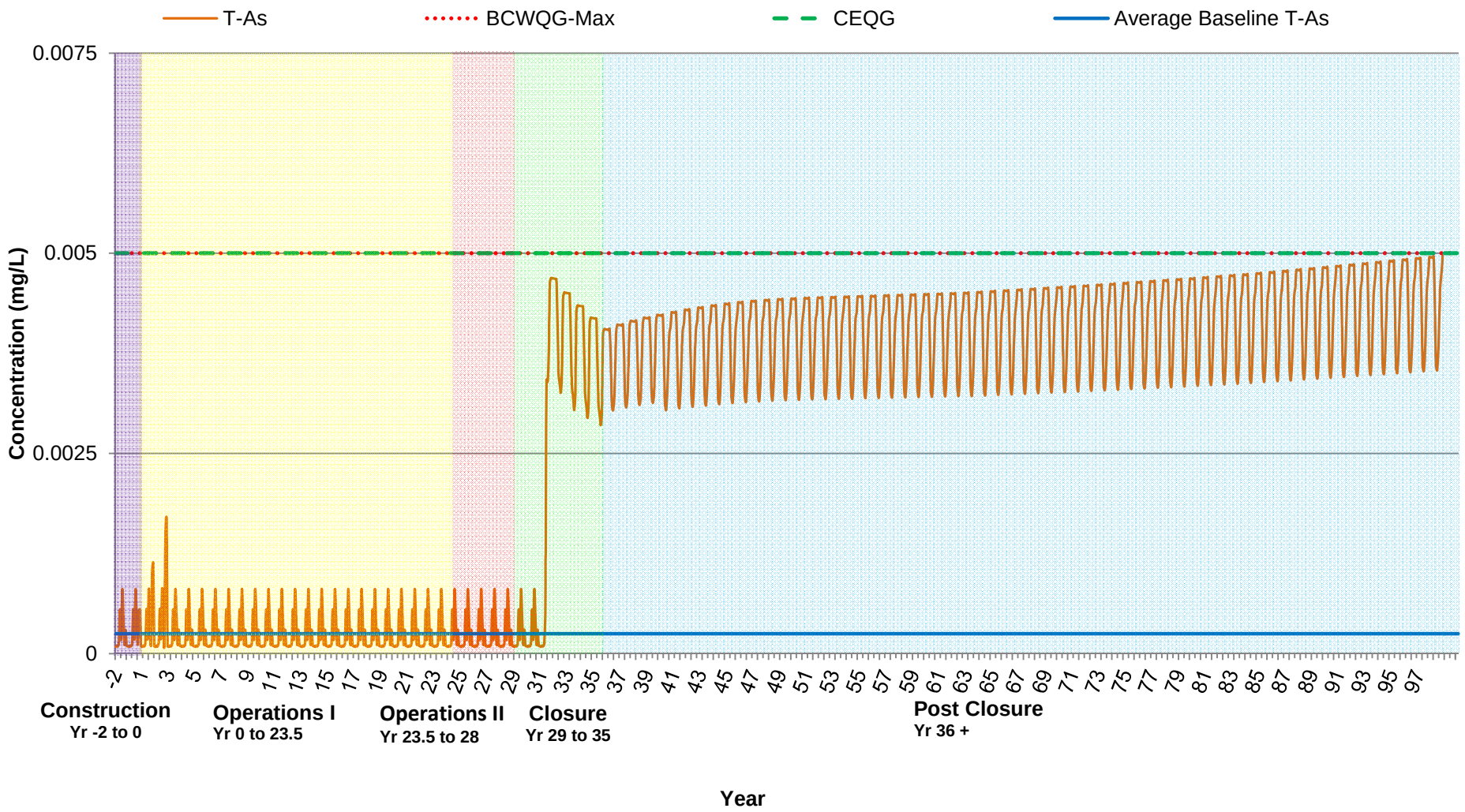
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G4.Sb

REV 0



NOTES:

1. THE BCWQG AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE ARSENIC CONCENTRATIONS - T-CREEK

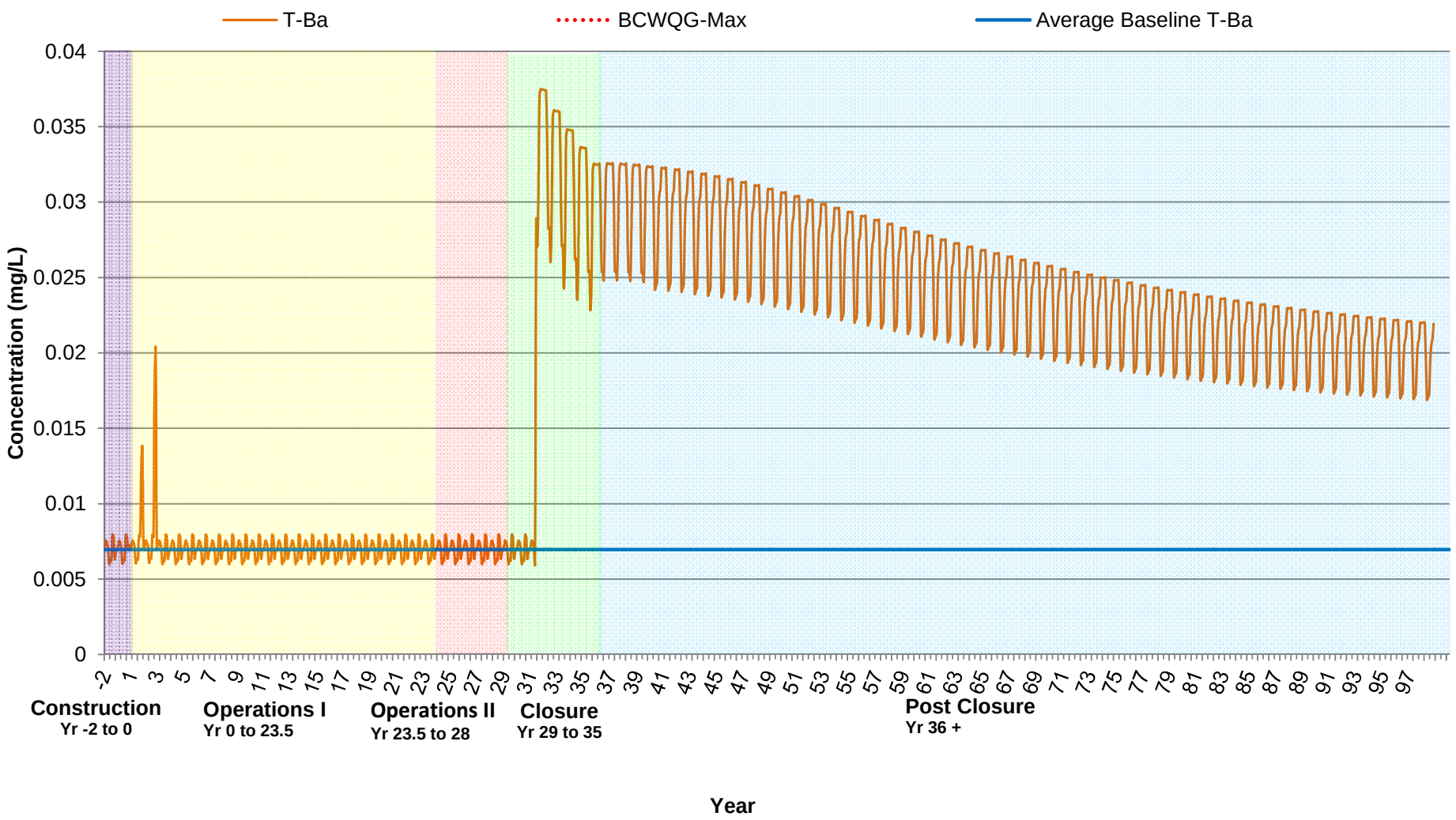
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G4.As

REV 0



NOTES:

1. THE BCWQG-MAX IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).
3. THE BCWQG-30 D (1 mg/L) AND BCWQG-MAX (5 mg/L) ARE NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE BARIUM CONCENTRATIONS - T-CREEK

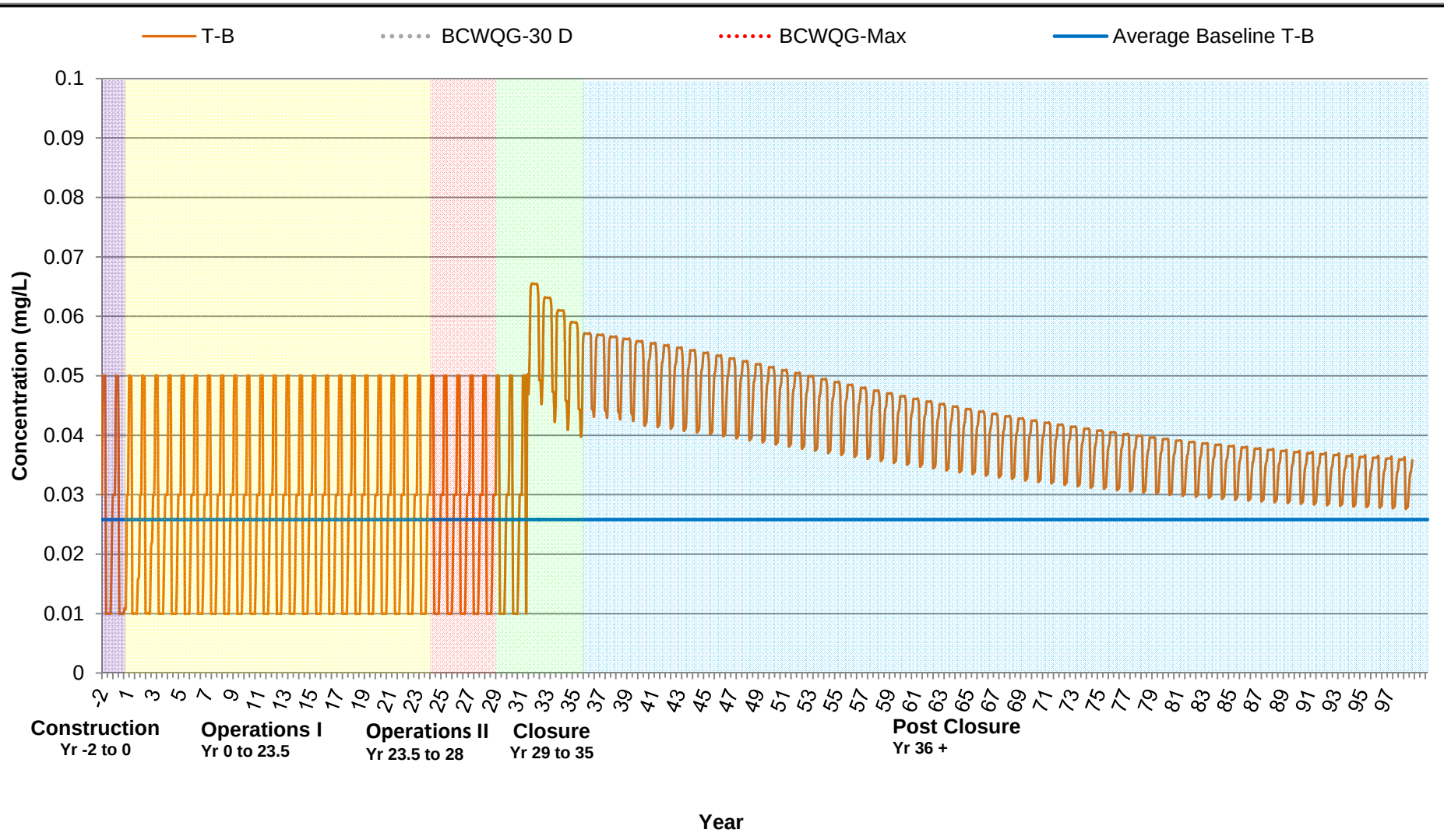
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G4.Ba

REV 0



NOTES:

1. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.
3. THE BCWQG-MAX (1.2 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE BORON CONCENTRATIONS - T-CREEK

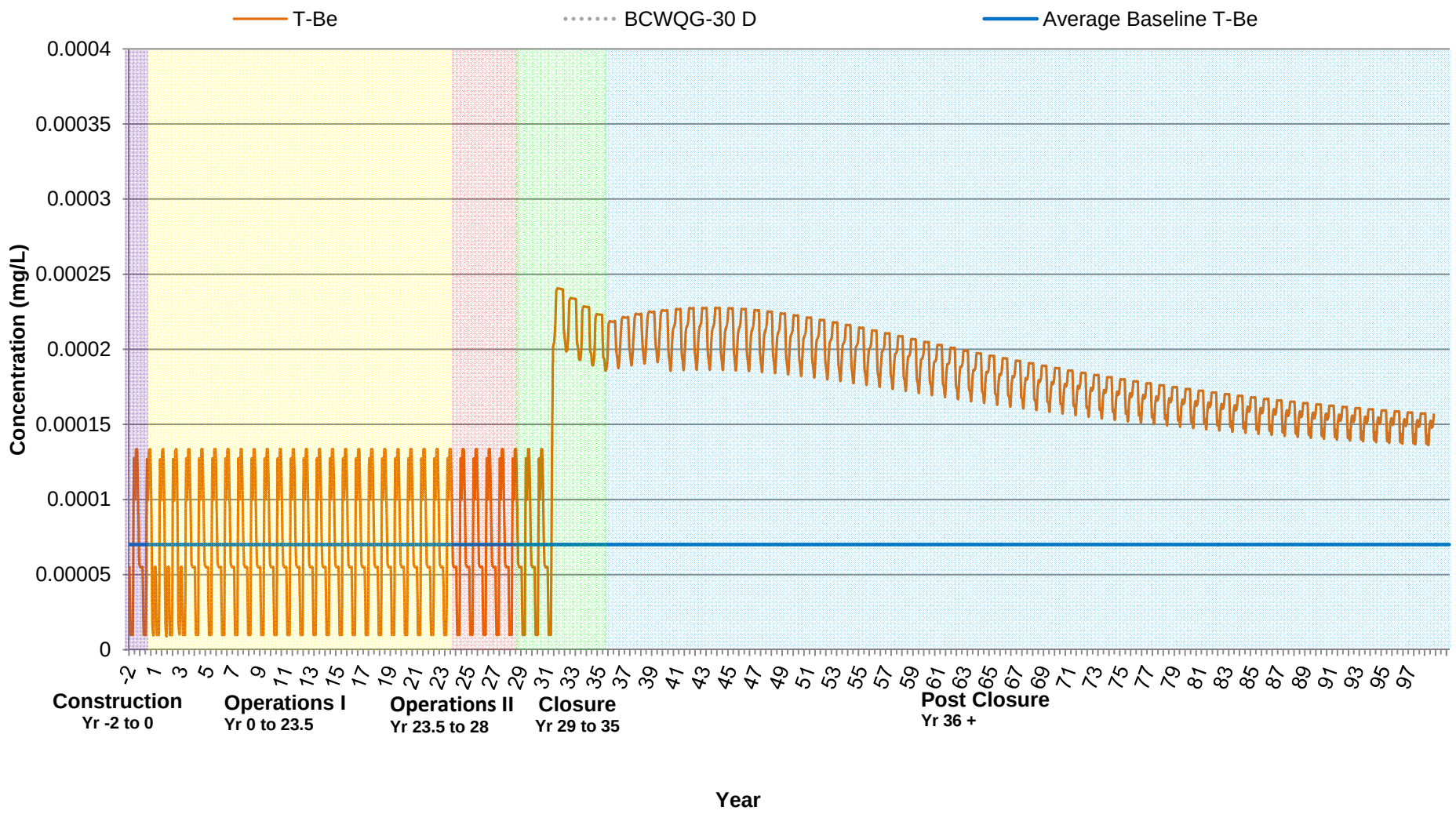
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G4.B

REV 0



NOTES:

1. THE BCWQG-MAX IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).
3. THE BCWQG-30 D (0.0053 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE BERYILLIUM CONCENTRATIONS - T-CREEK

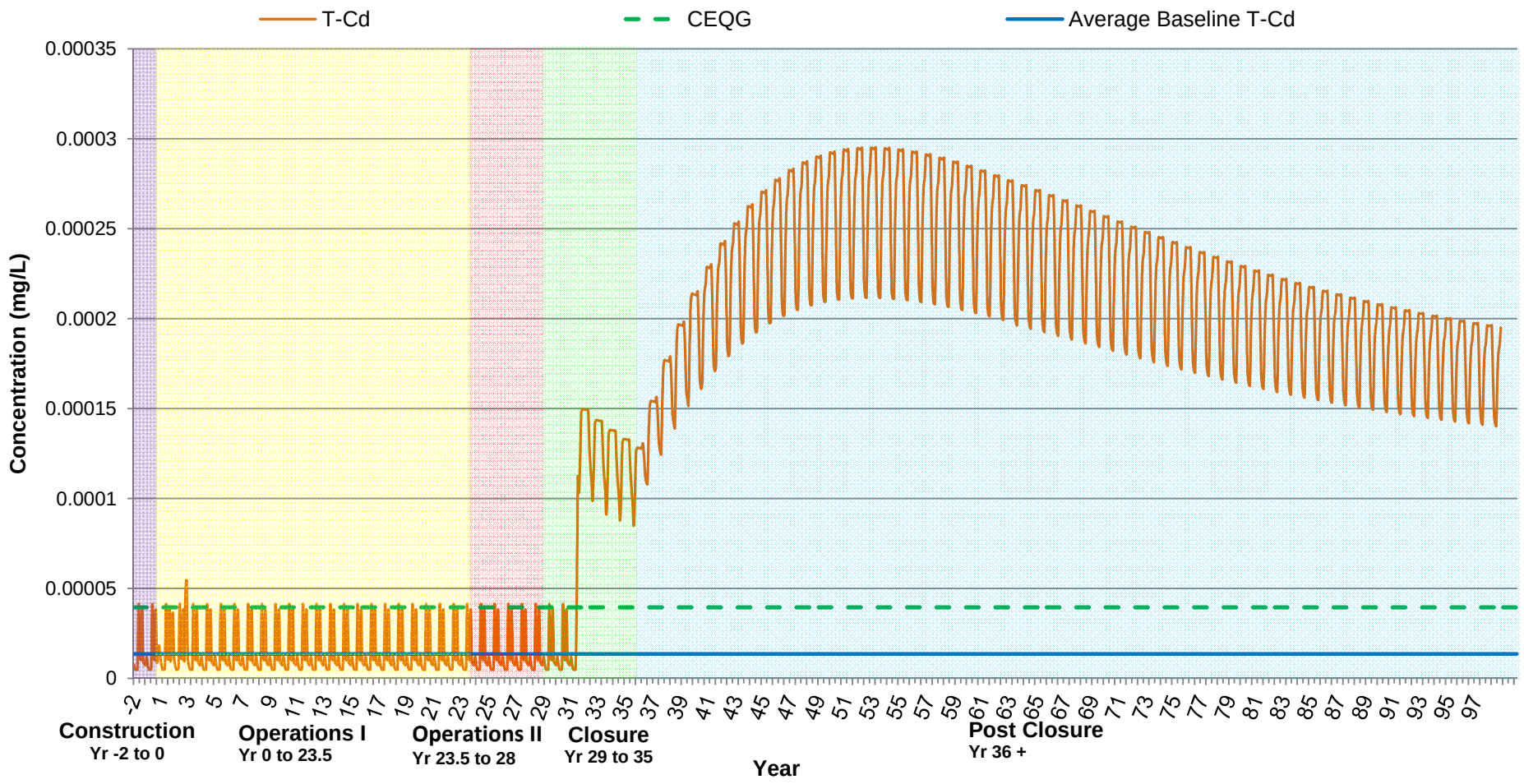
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G4.Be

REV 0



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. THE BCWQG ARE DRAFT GUIDELINES UNDER REVIEW (JUNE 2014).
3. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).
4. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE CADMIUM CONCENTRATIONS - T-CREEK

Knight Piésold CONSULTING

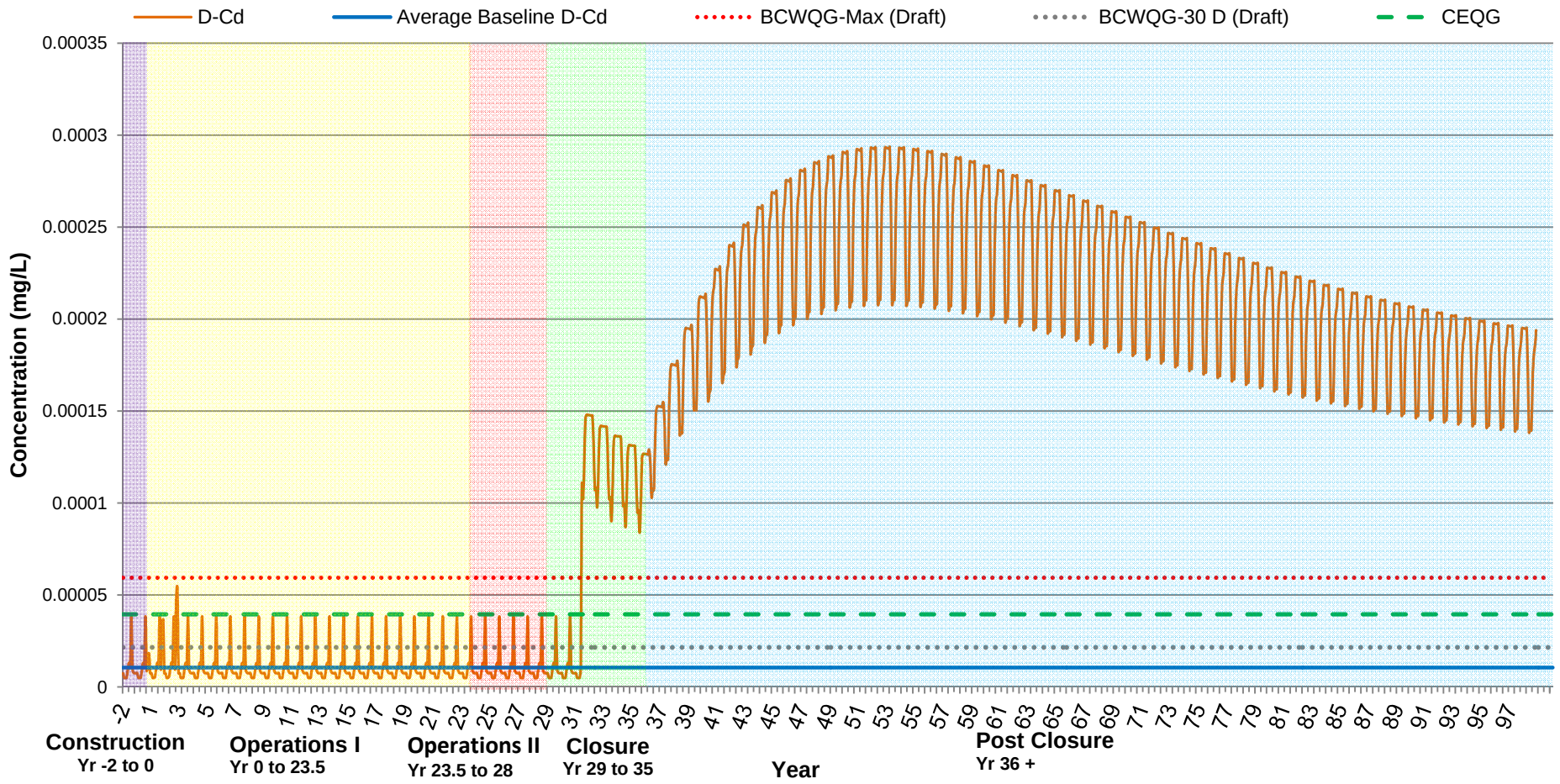
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G4.Cd-T

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE CADMIUM CONCENTRATIONS - T-CREEK

Knight Piésold CONSULTING

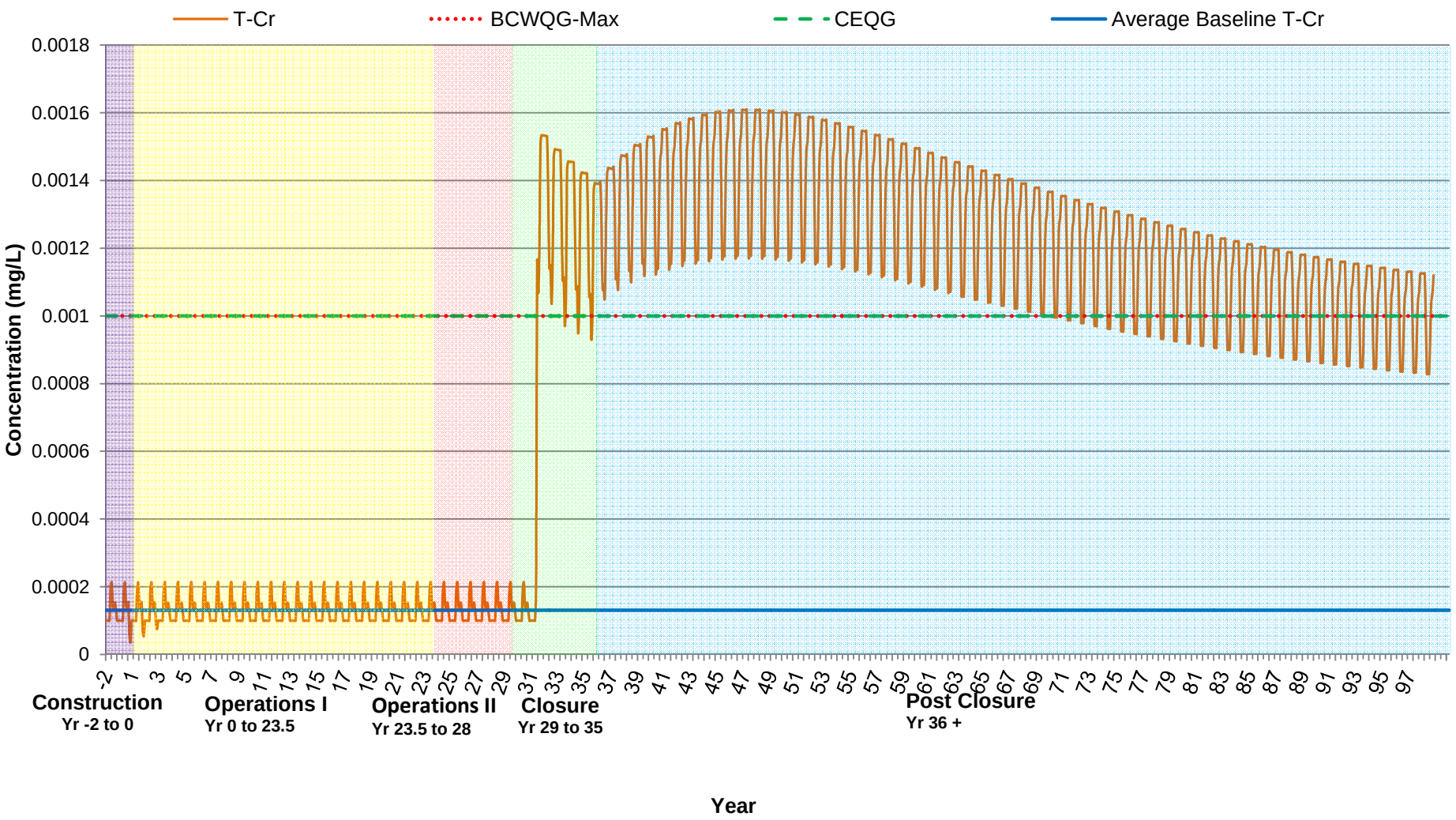
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G4.Cd-D

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. GUIDELINES ARE FOR CHROMIUM (IV), THE SPECIES MOST COMMON IN WELL OXYGENATED SURFACE WATERS.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE CHROMIUM CONCENTRATIONS - T-CREEK

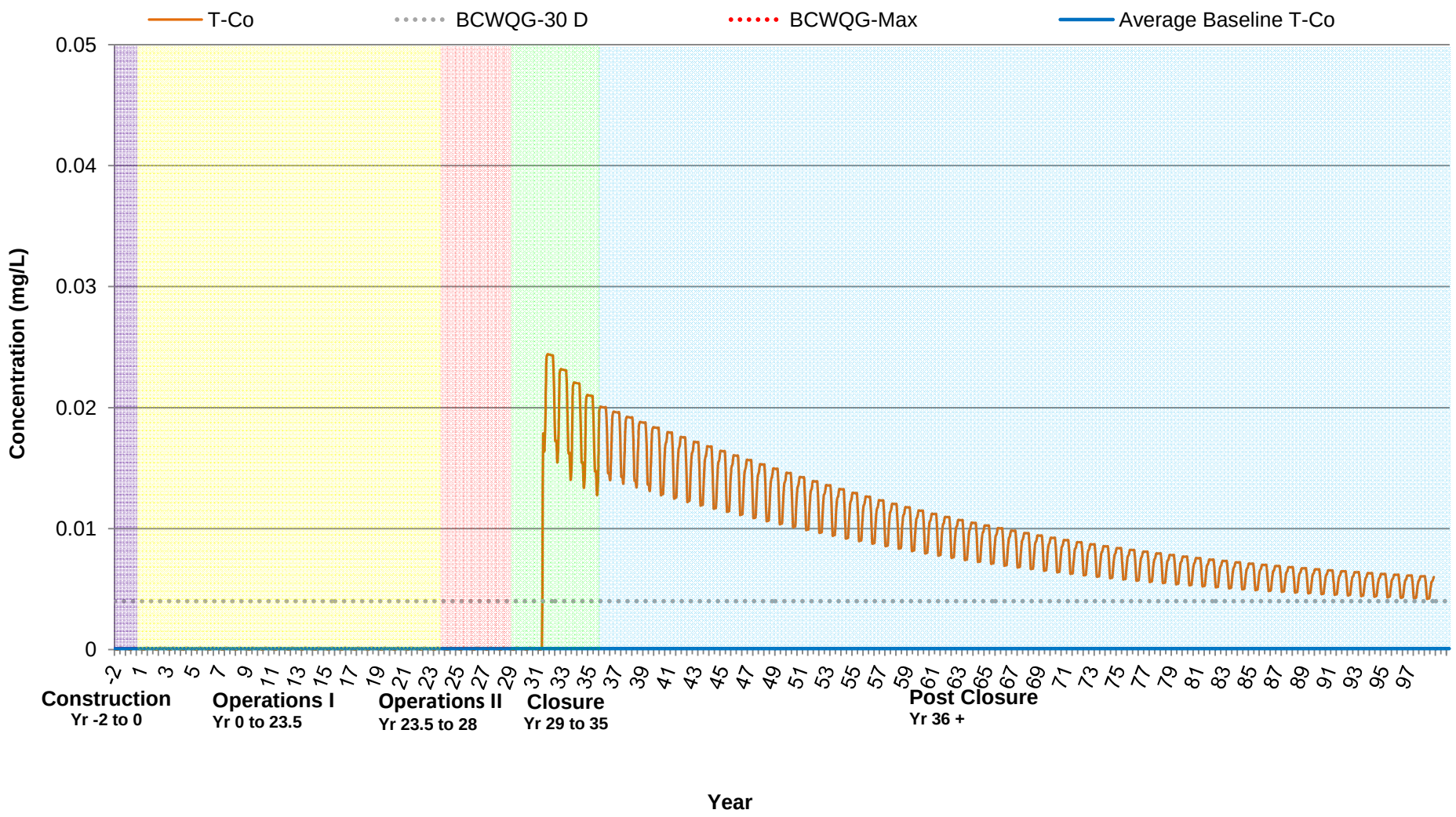
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G4.Cr

REV 0



NOTES:

1. THE BCWQG-30 D AND BCWQG-MAX ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).
3. THE BCWQG-MAX GUIDELINE (0.11 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE COBALT CONCENTRATIONS - T-CREEK

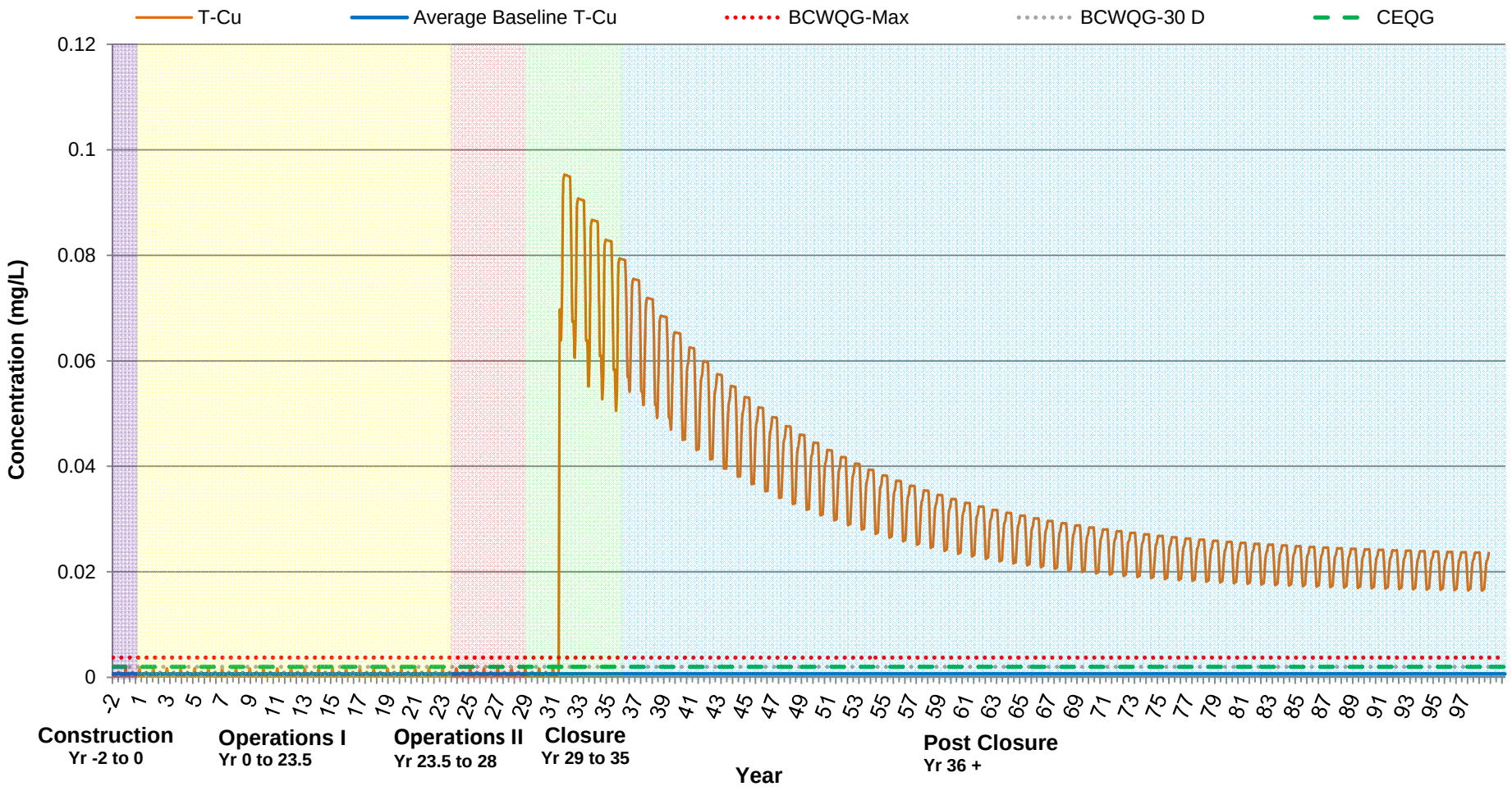
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G4.Co

REV 0



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE COPPER CONCENTRATIONS - T-CREEK

Knight Piésold CONSULTING

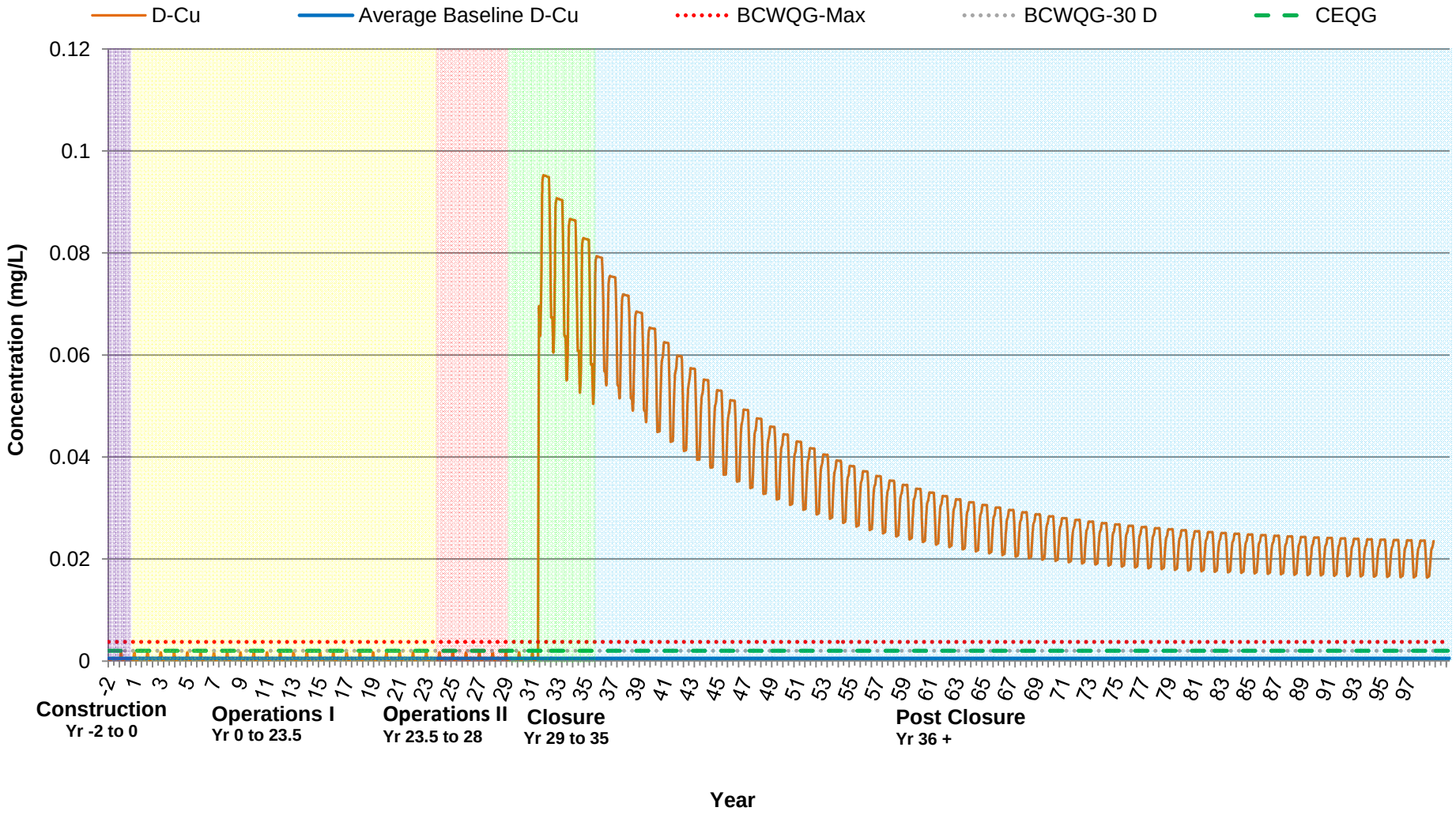
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G4.Cu-T

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE COPPER CONCENTRATIONS - T-CREEK

Knight Piésold CONSULTING

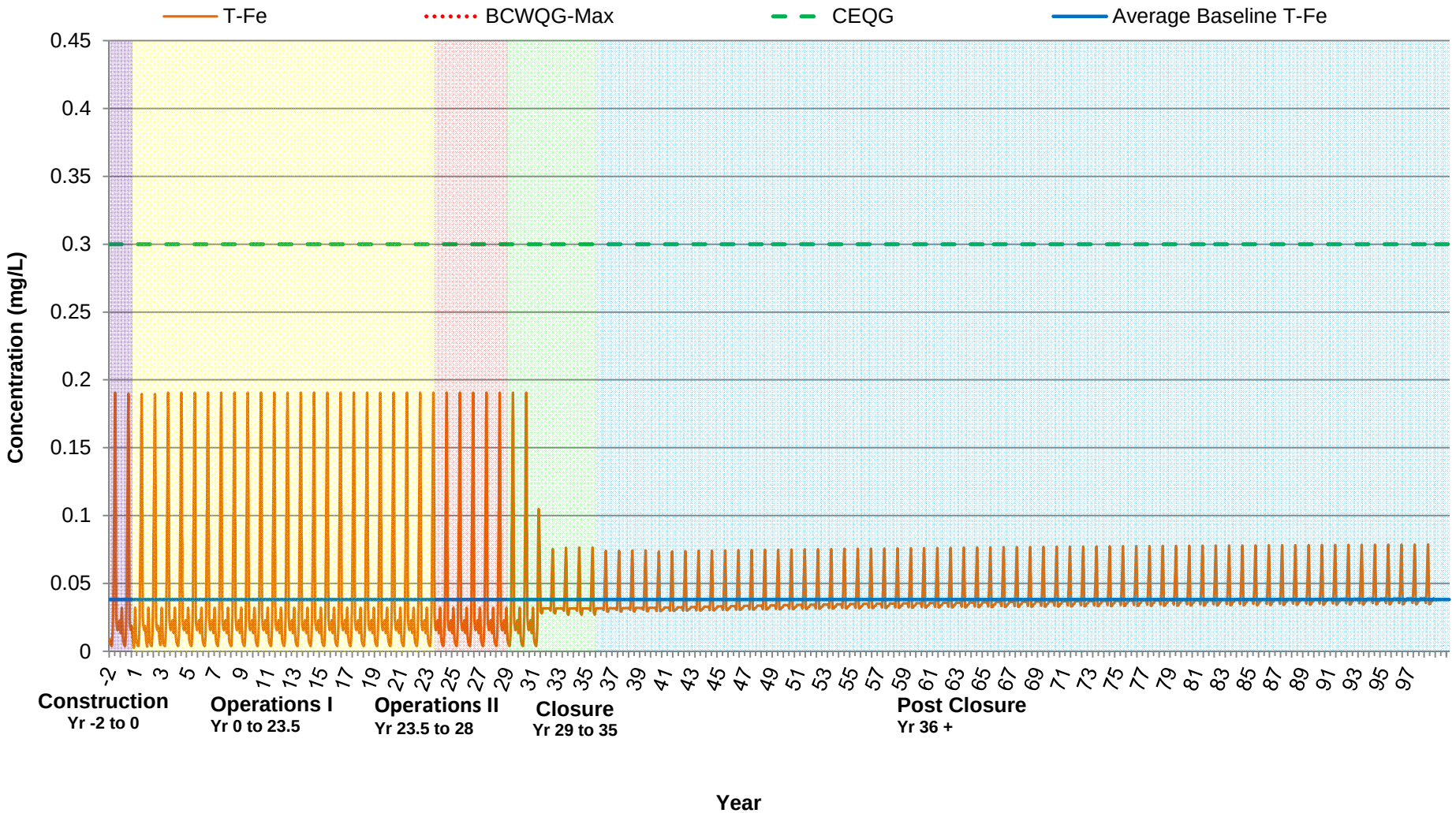
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G4.Cu-D

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).
3. BCWQG-MAX 1.0 mg/L IS NOT SHOWN ON GRAPH.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE TOTAL IRON CONCENTRATIONS - T-CREEK

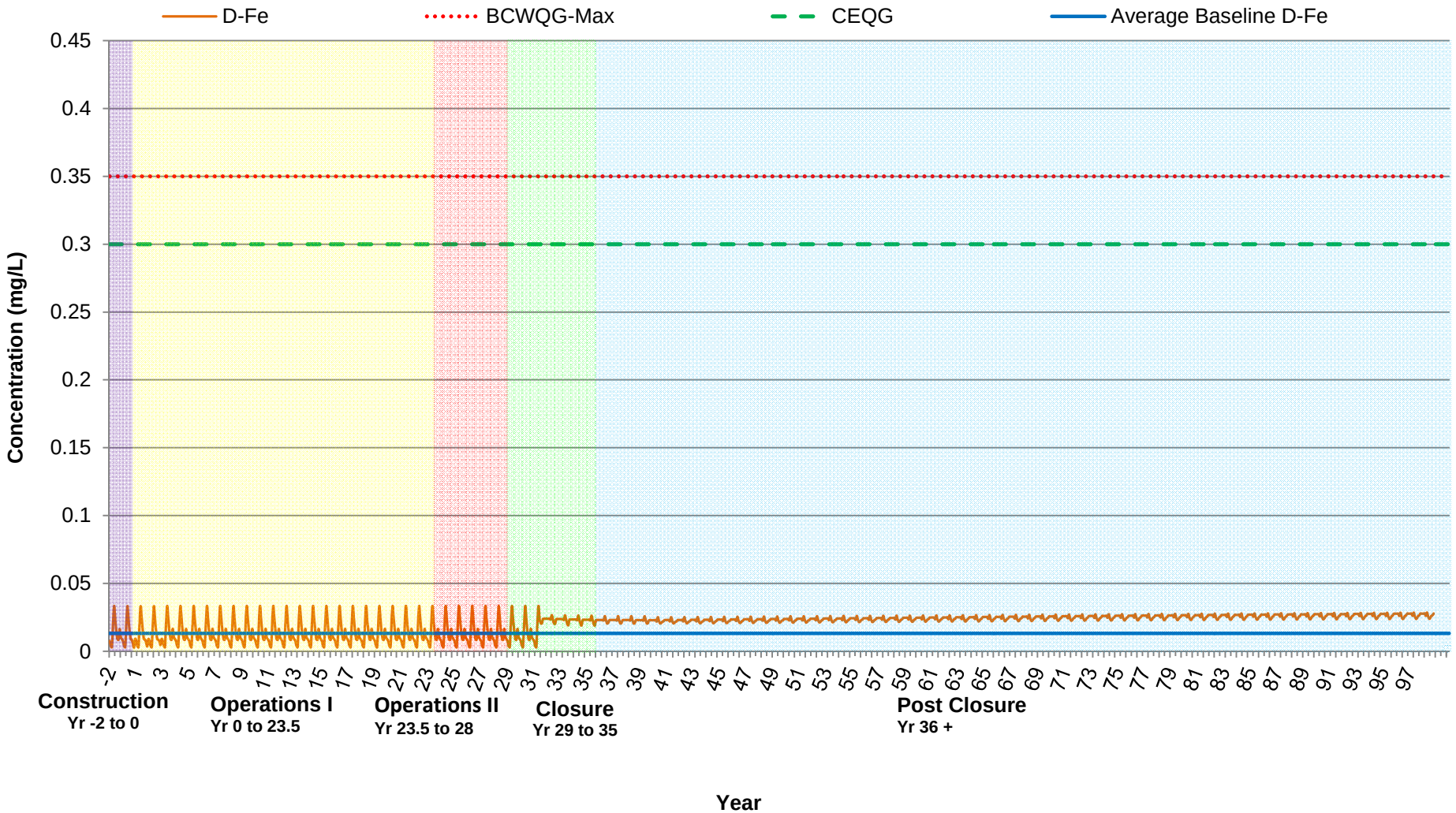
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G4.Fe-T

REV 0



NOTES:

1. THE BCWQG-MAX AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE DISSOLVED IRON CONCENTRATIONS - T-CREEK

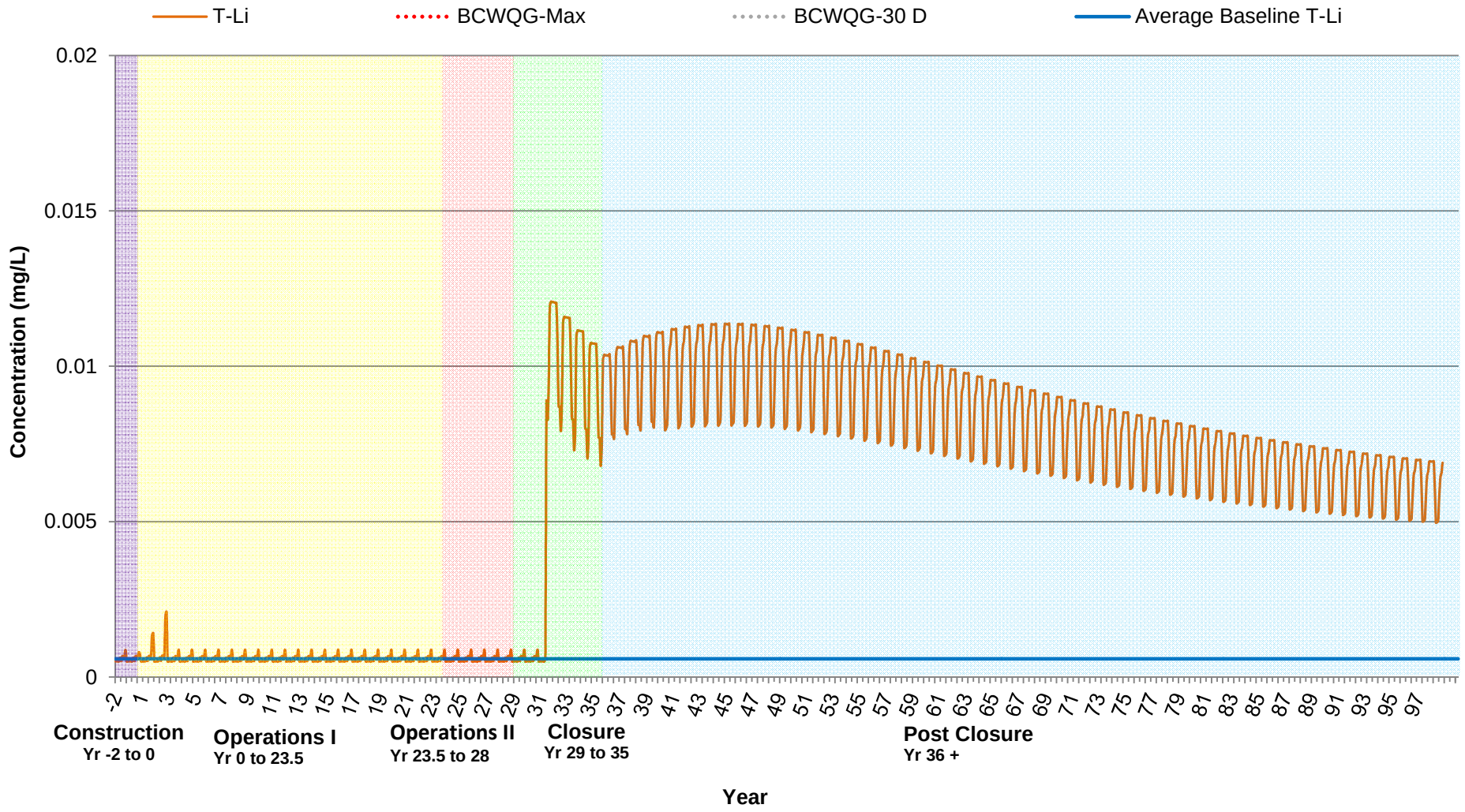
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P/A NO. VA101-458/14

REF. NO. 3

FIGURE G4.Fe-D

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).
3. THE BCWQG-30 D (0.096 mg/L) AND BCWQG-MAX (0.87 mg/L) ARE INTERIM (WORKING) AND ARE NOT SHOWN ON GRAPH.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE LITHIUM CONCENTRATIONS - T-CREEK

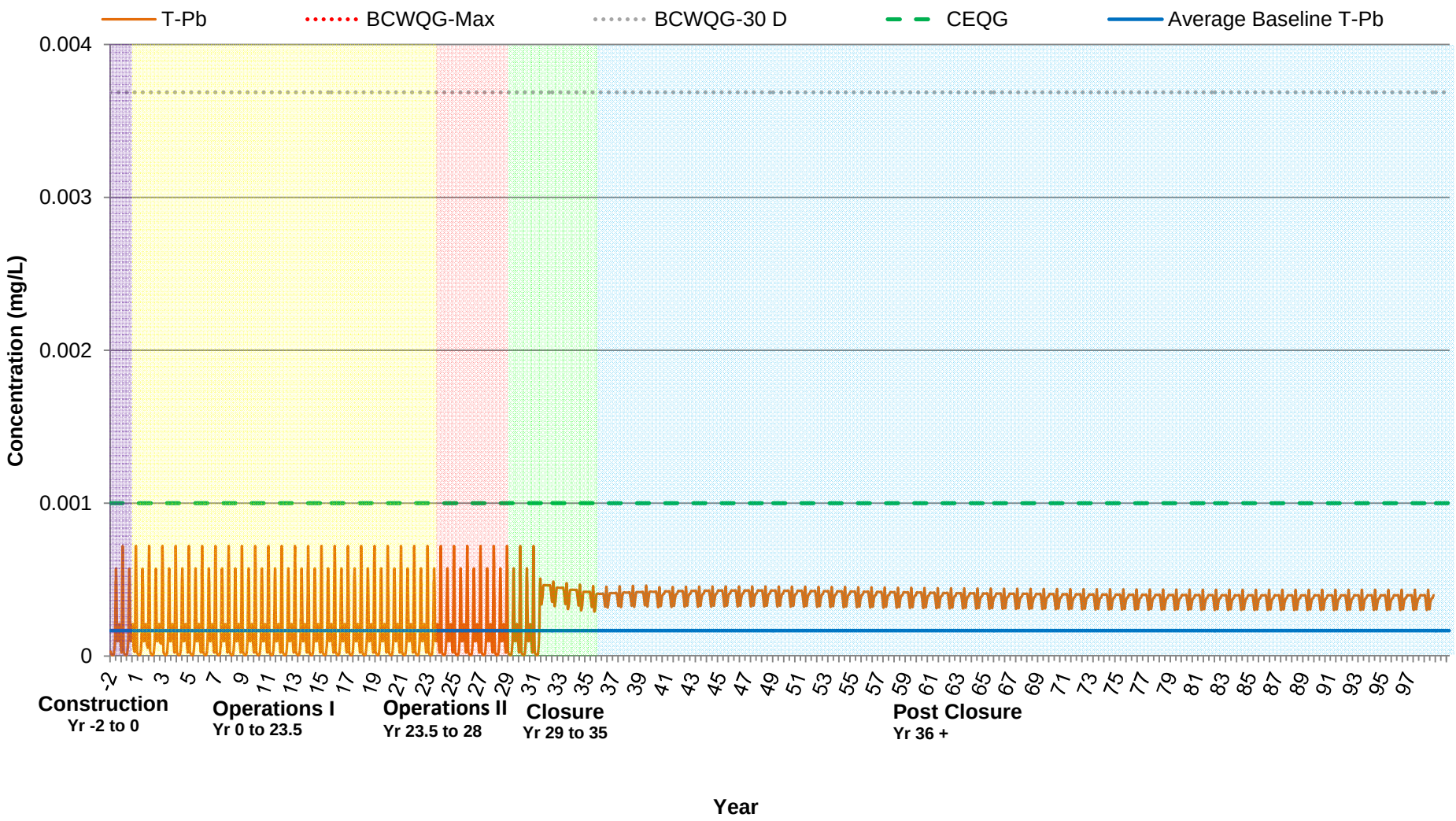
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G4.Li

REV 0



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.
4. THE BCWQG-MAX (CALCULATED AT 0.011 mg/L) IS NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE LEAD CONCENTRATIONS - T-CREEK

Knight Piésold CONSULTING

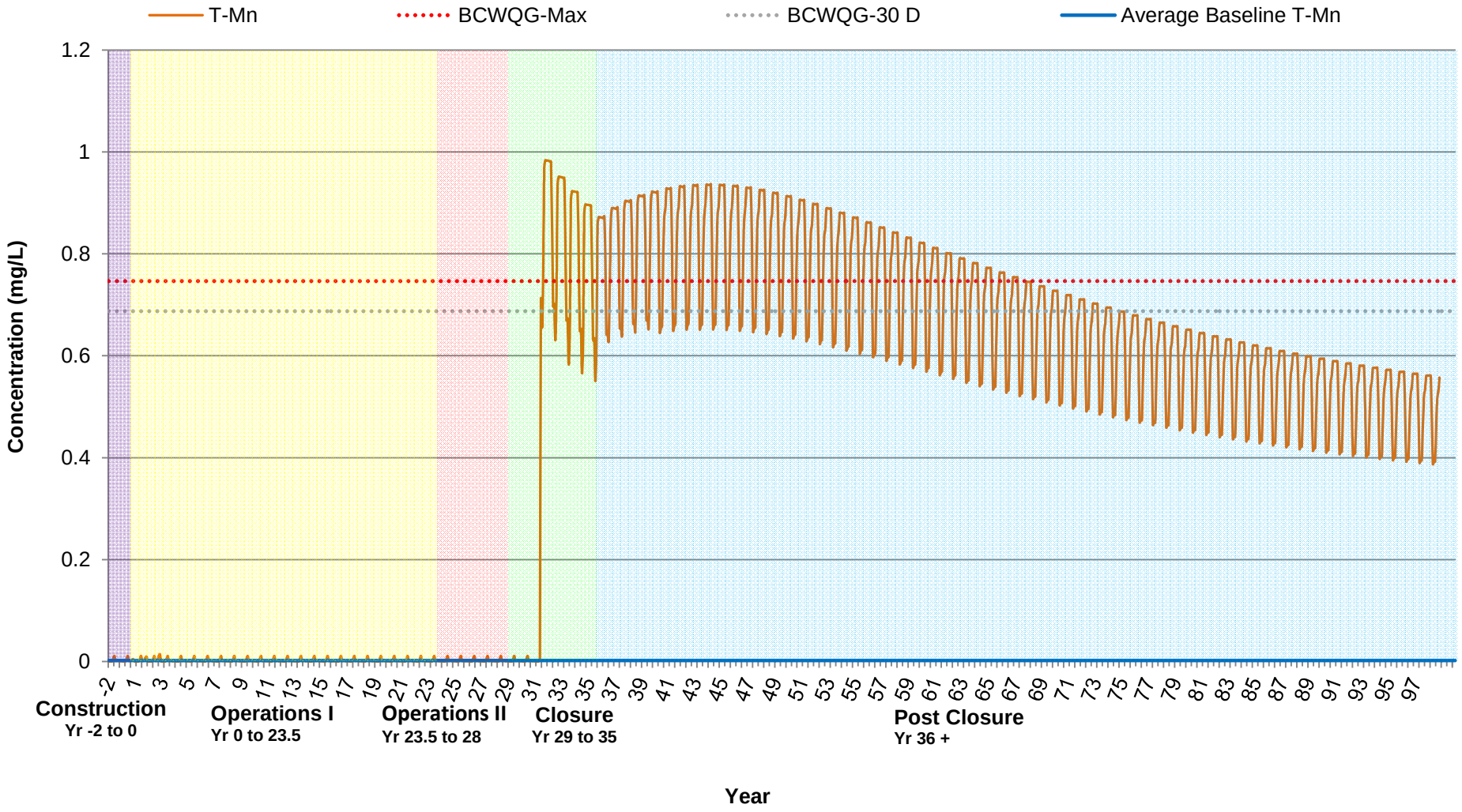
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G4.Pb

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE MANGANESE CONCENTRATIONS - T-CREEK

Knight Piésold CONSULTING

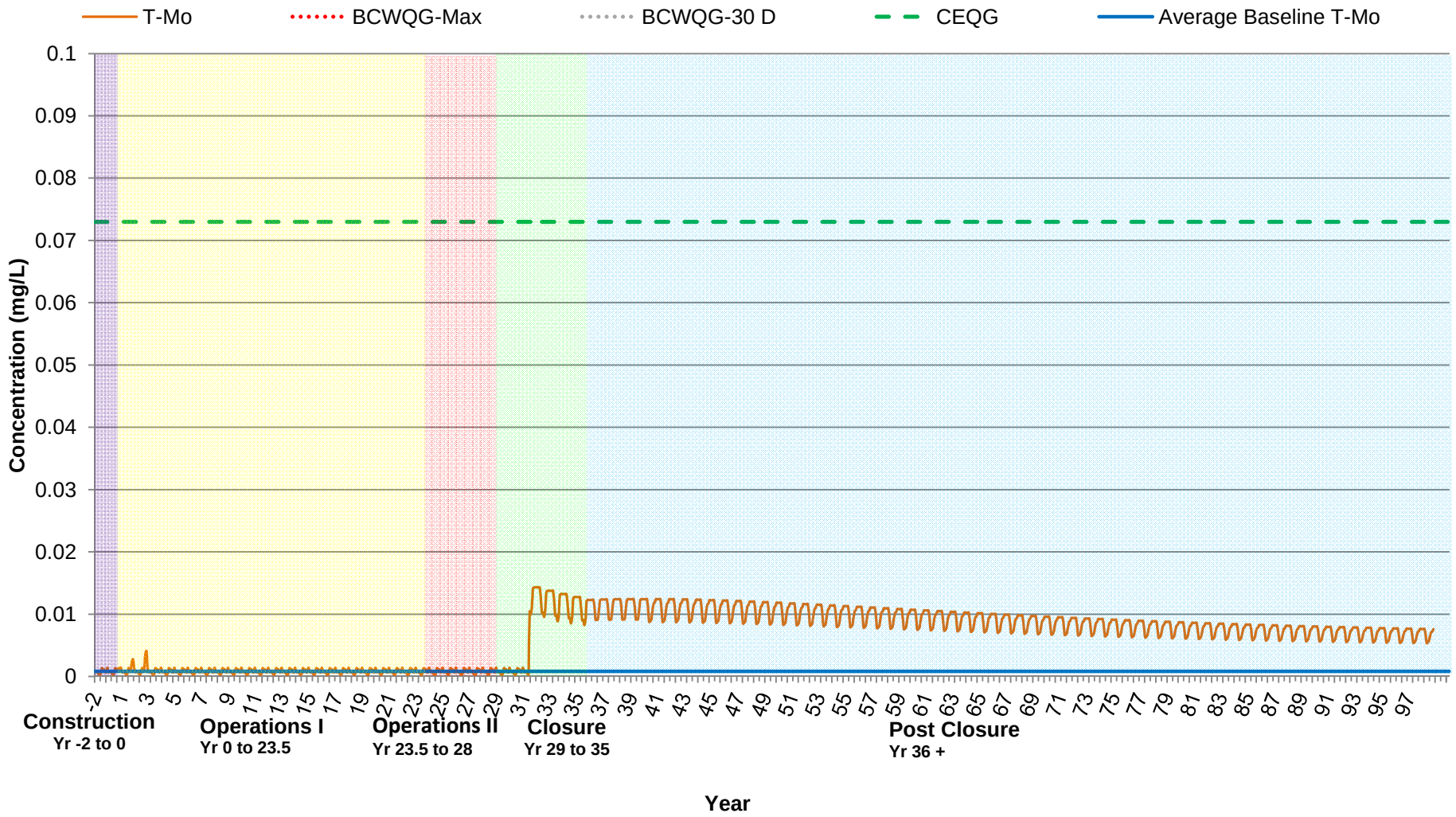
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G4.Mn

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).
3. THE BCWQG-MAX (2 mg/L) AND BCWQG-30 D (1 mg/L) ARE NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE MOLYDBENUM CONCENTRATIONS - T-CREEK

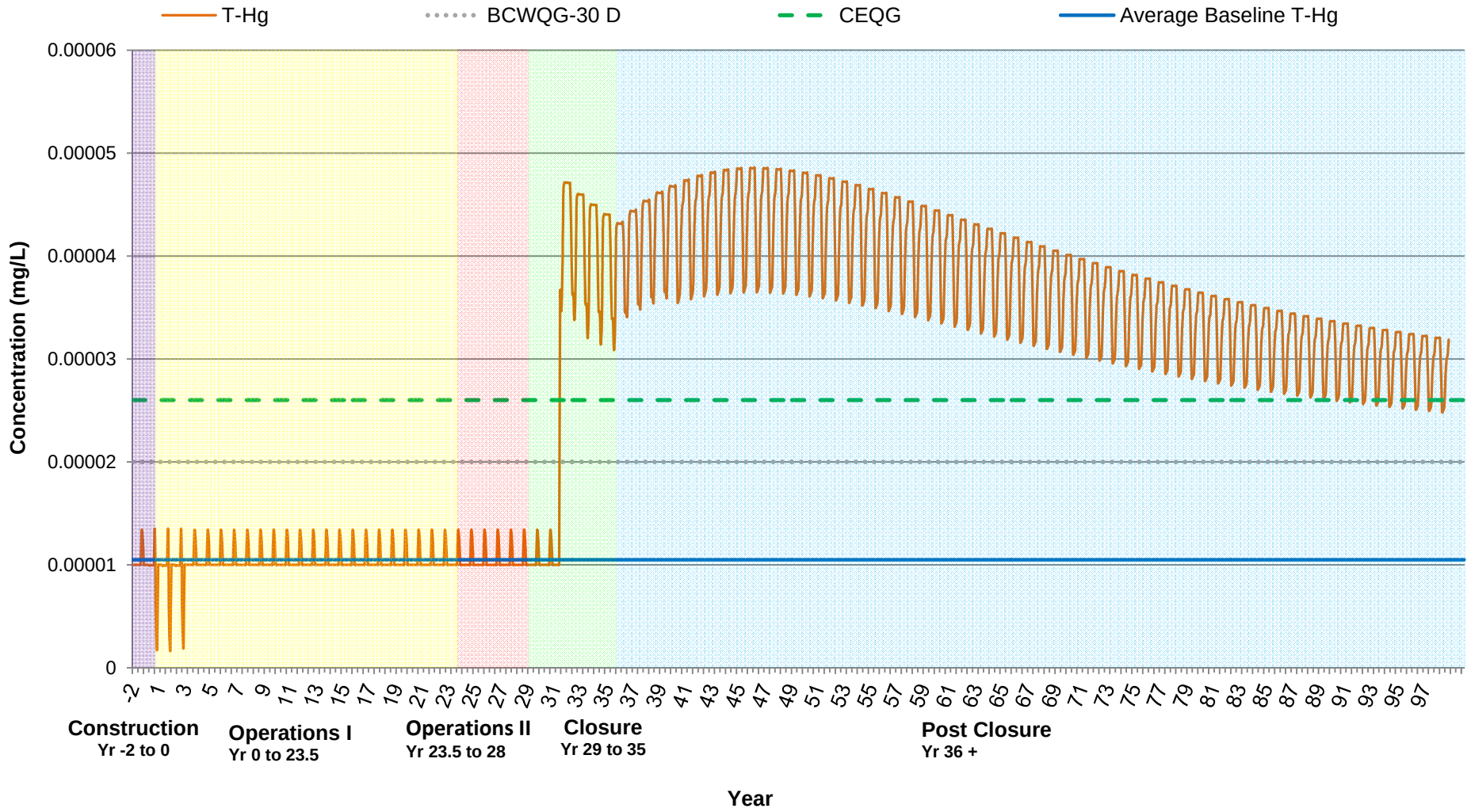
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G4.Mo

REV 0



NOTES:

1. THE BCWQG-30 D AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).
3. BCWQG-30 D VALUE APPLIED ON ASSUMPTION THAT METHYL-Hg IS EQUAL TO 0.5% OF T-Hg.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE MERCURY CONCENTRATIONS - T-CREEK

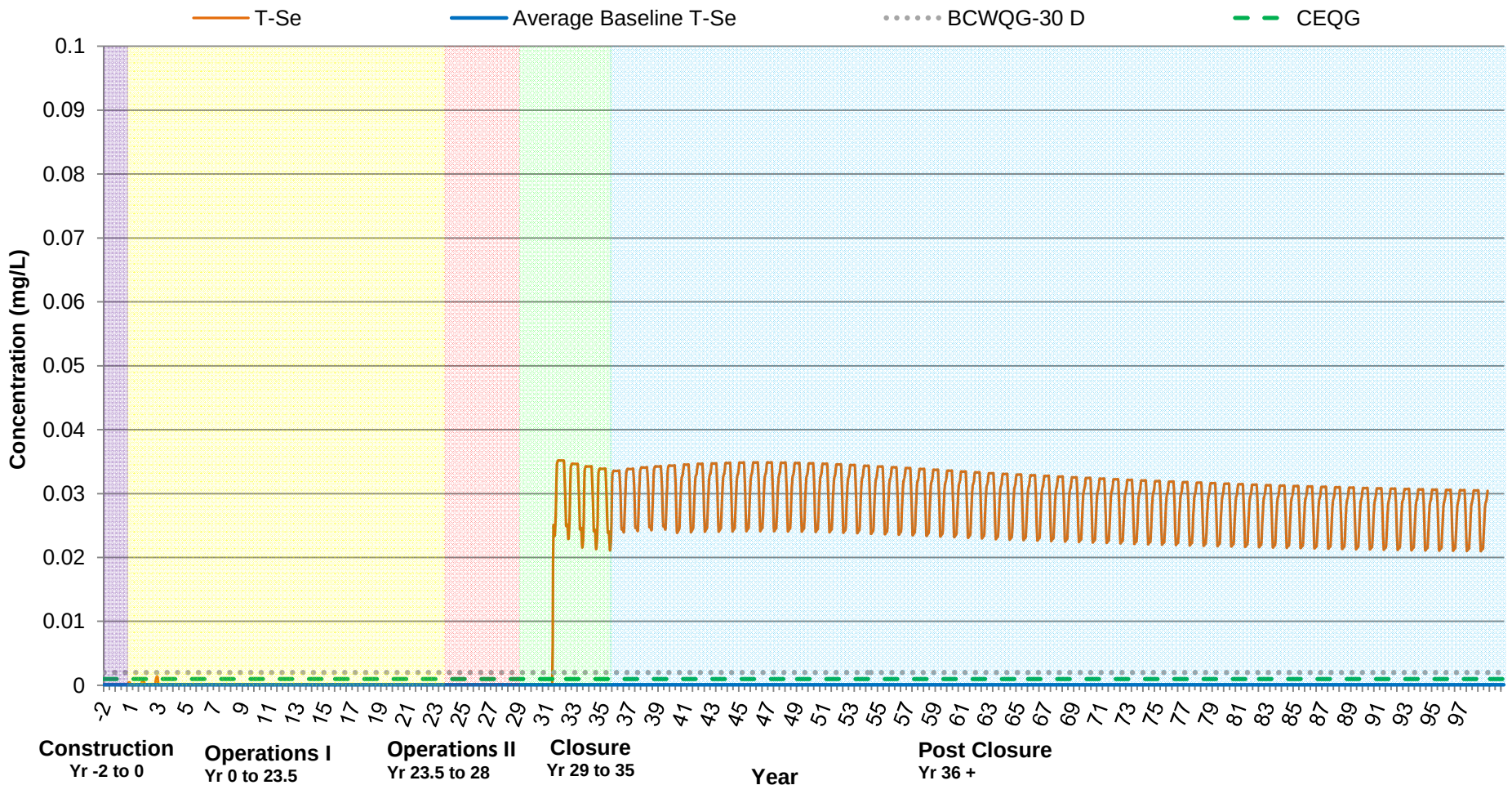
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G4.Hg

REV 0



NOTES:

1. THE BCWQG-30 D AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE SELENIUM CONCENTRATIONS - T-CREEK

Knight Piésold CONSULTING

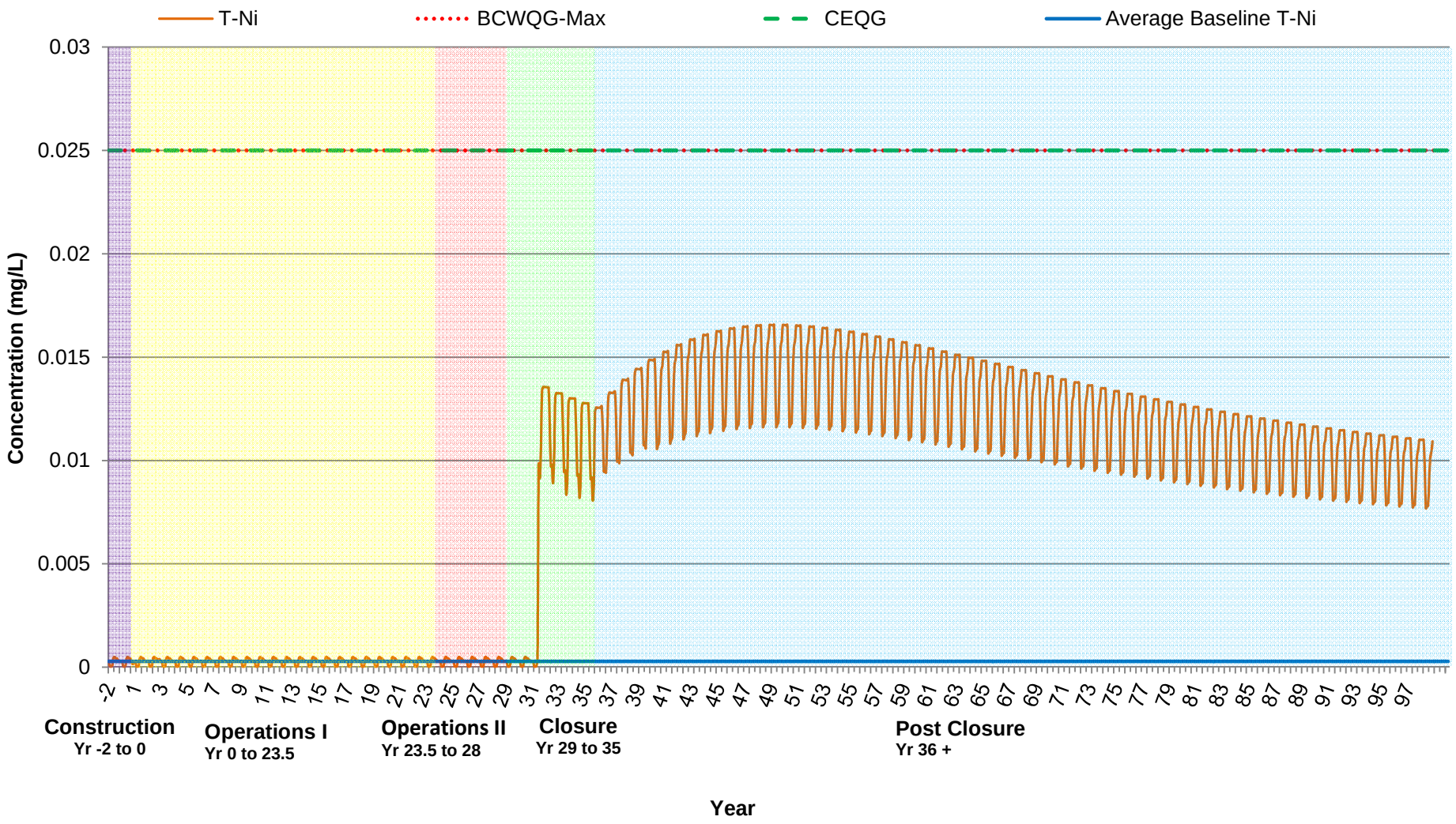
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G4.Se

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE NICKEL CONCENTRATIONS - T-CREEK

Knight Piésold CONSULTING

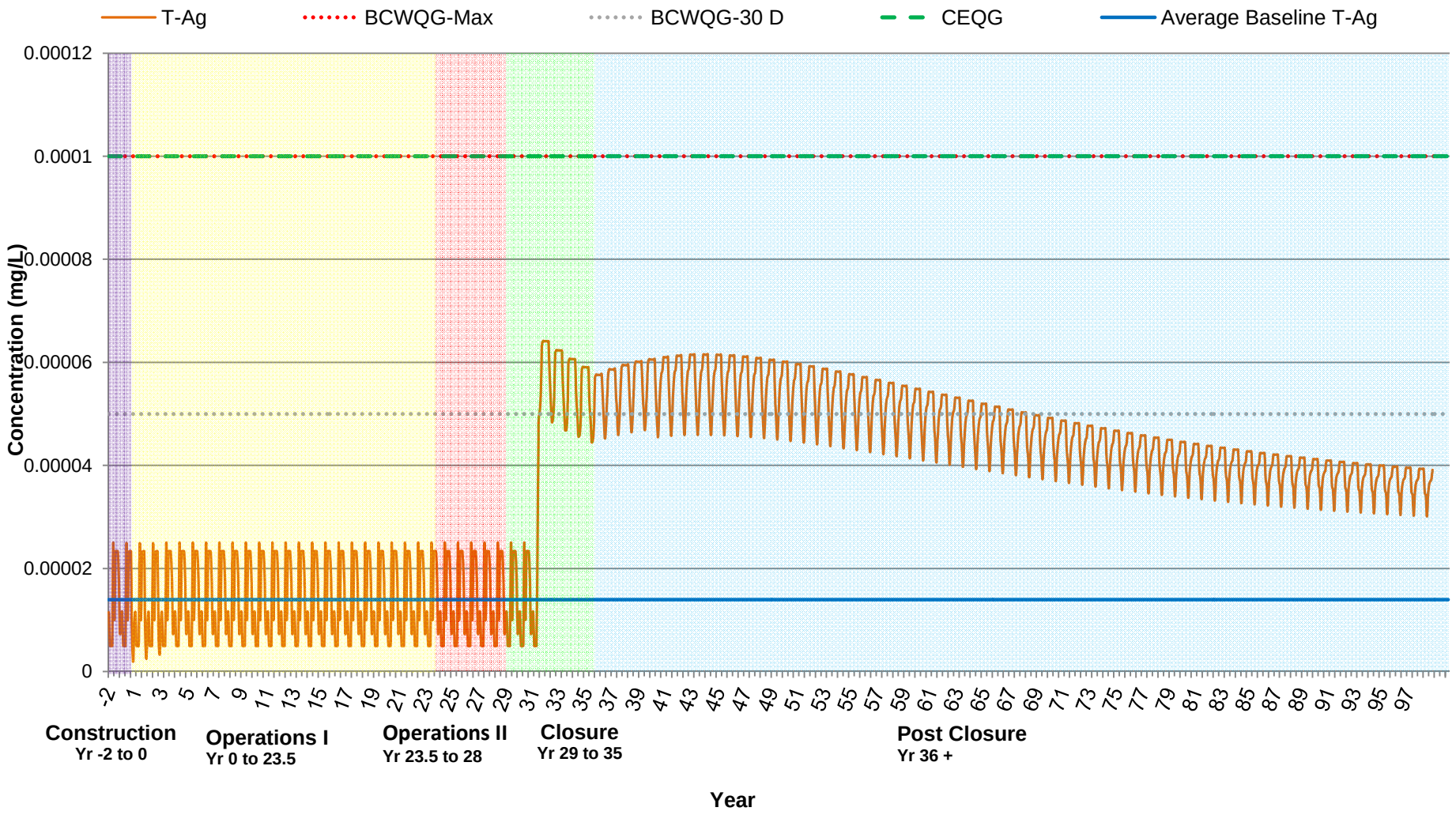
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G4.Ni

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-30 D AND BCWQG-MAX ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE SILVER CONCENTRATIONS - T-CREEK

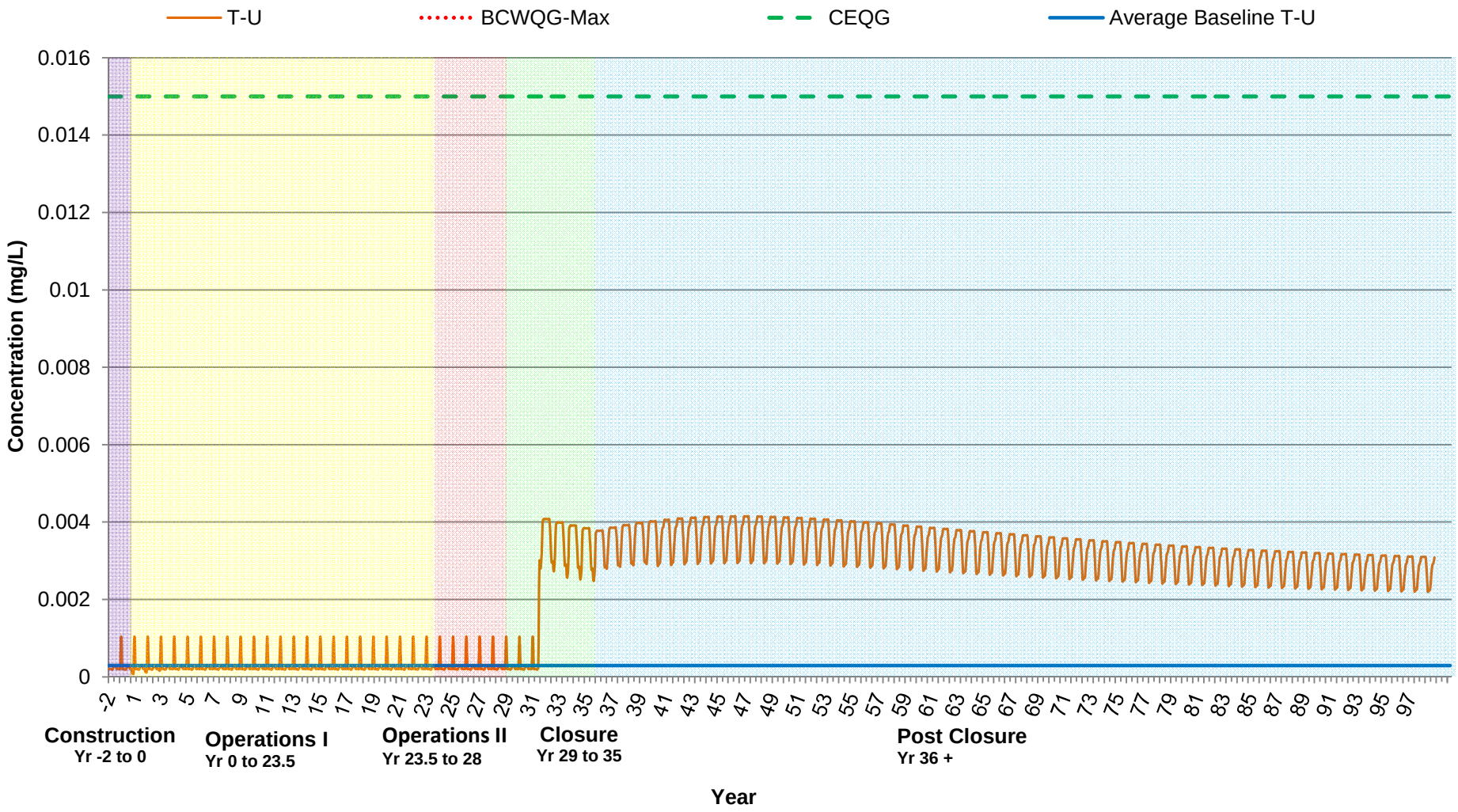
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P/A NO. VA101-458/14

REF. NO. 3

FIGURE G4.Ag

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).
3. THE BCWQG-MAX (0.3 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE URANIUM CONCENTRATIONS - T-CREEK

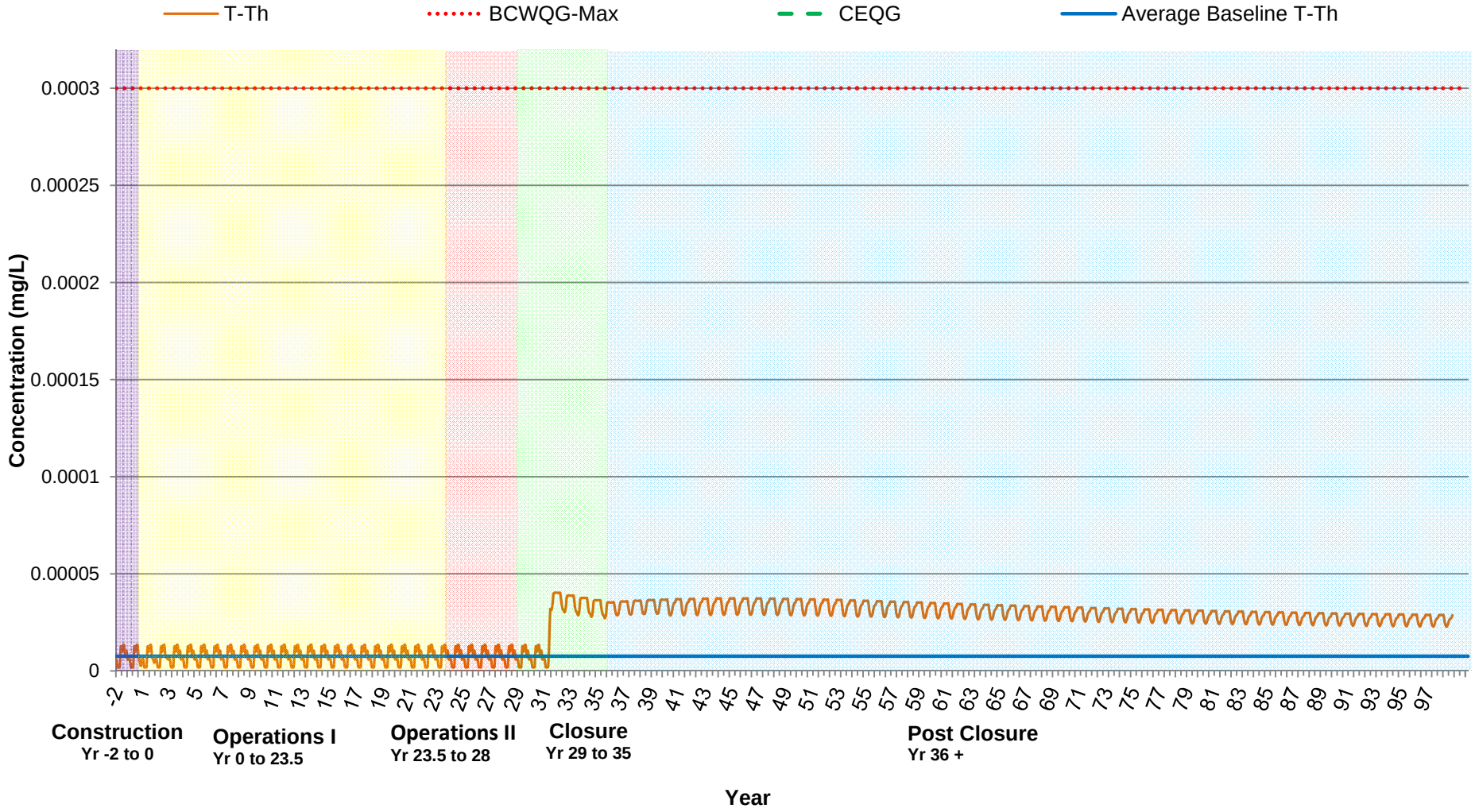
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G4.U

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).
3. THE CEQG (0.0008 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE THALLIUM CONCENTRATIONS - T-CREEK

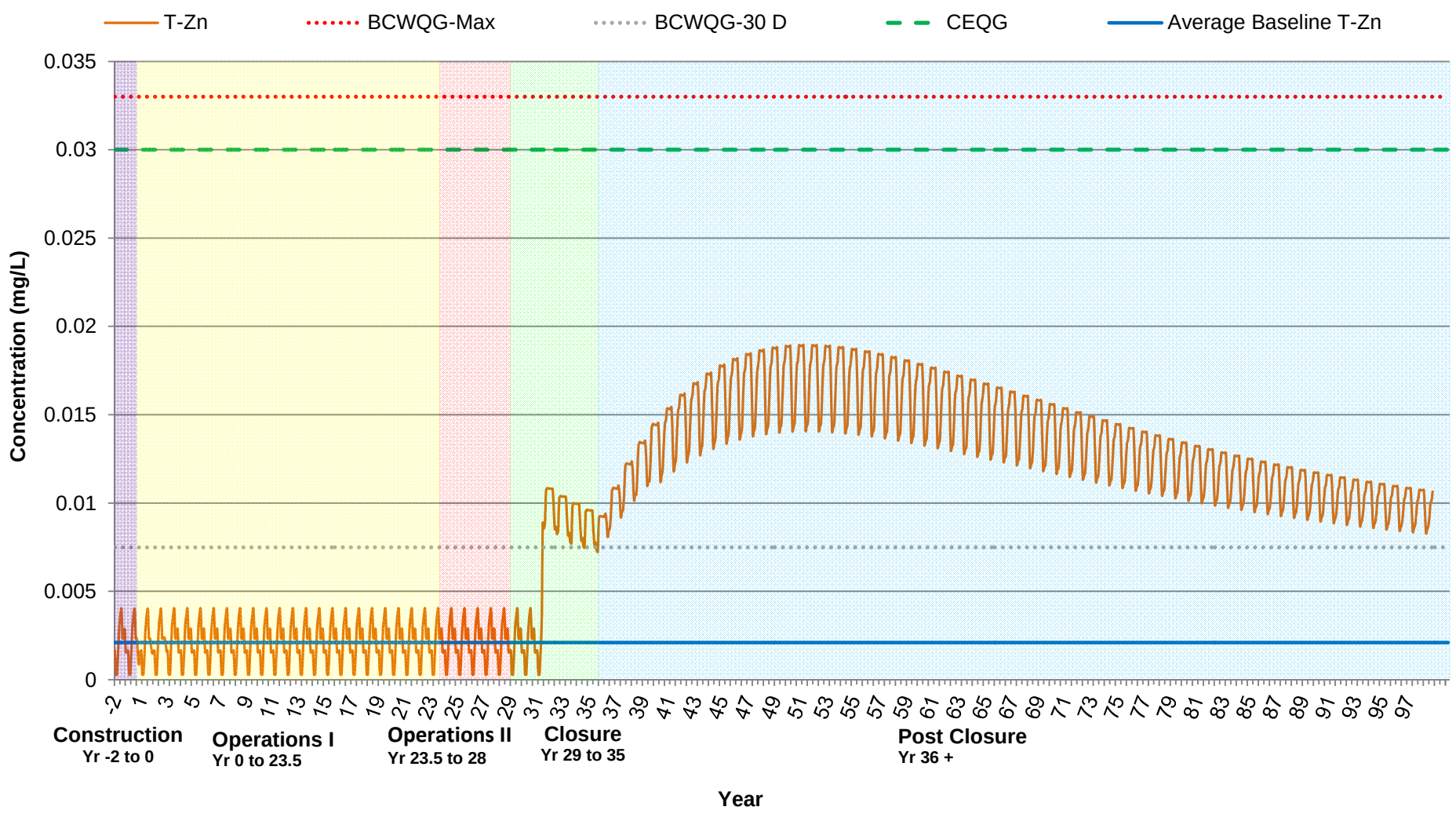
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G4.Th

REV 0



NOTES:

1. BCWQG-30 D AND BCWQG-MAX ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H3T (AVERAGE HARDNESS OF 19 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE ZINC CONCENTRATIONS - T-CREEK

Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

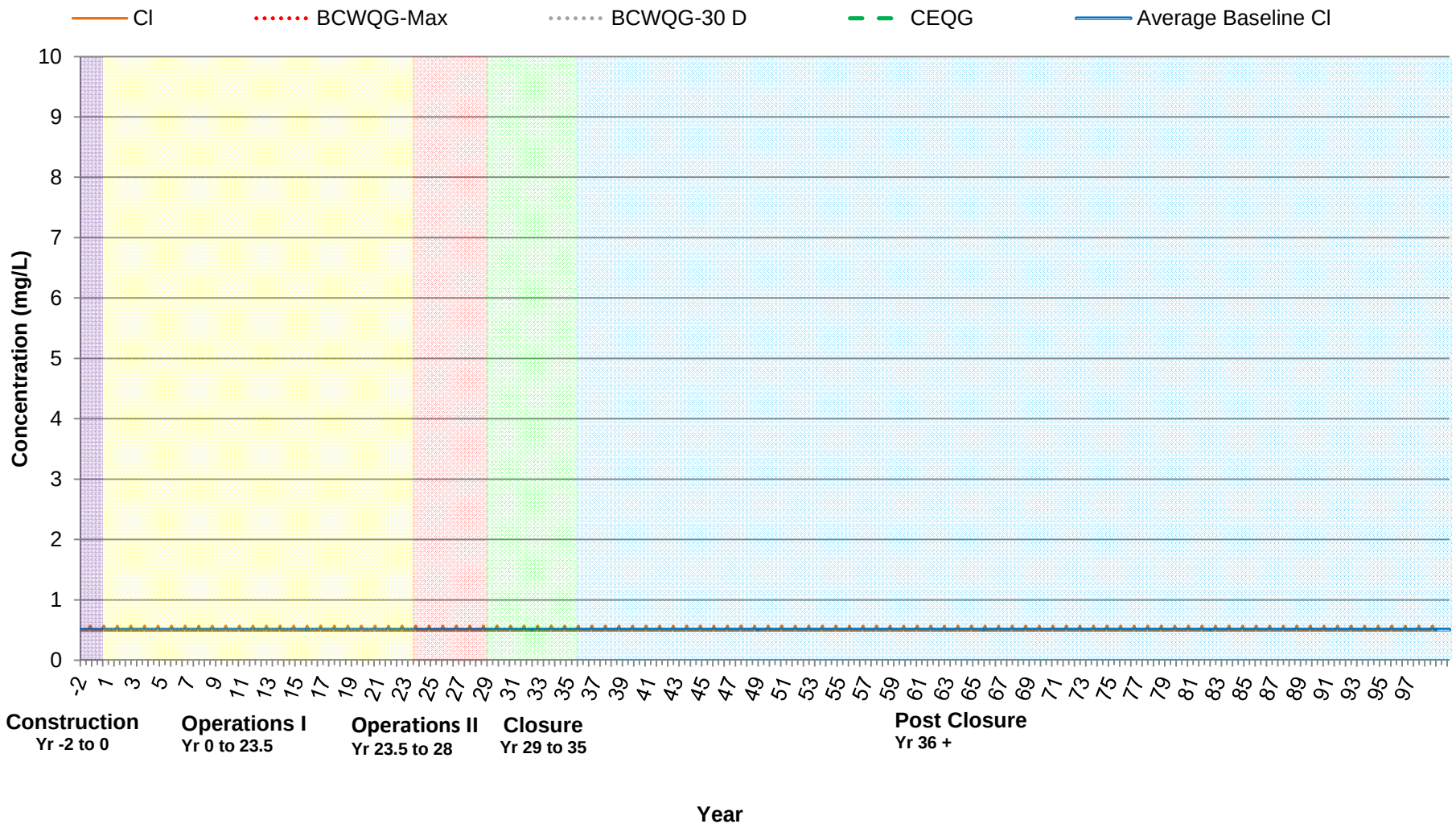
FIGURE G4.Zn

REV 0

APPENDIX G5

HARPER CREEK BELOW P-CREEK (HP)

(Pages G5-1 to G5-30)



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. ALL GUIDELINES ARE NOT SHOWN: BCWQG-30 D (150 mg/L); BCWQG-MAX (600 mg/L); CEQG (120 mg/L AND 640 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE CHLORIDE CONCENTRATIONS - HARPER CREEK BELOW P-CREEK

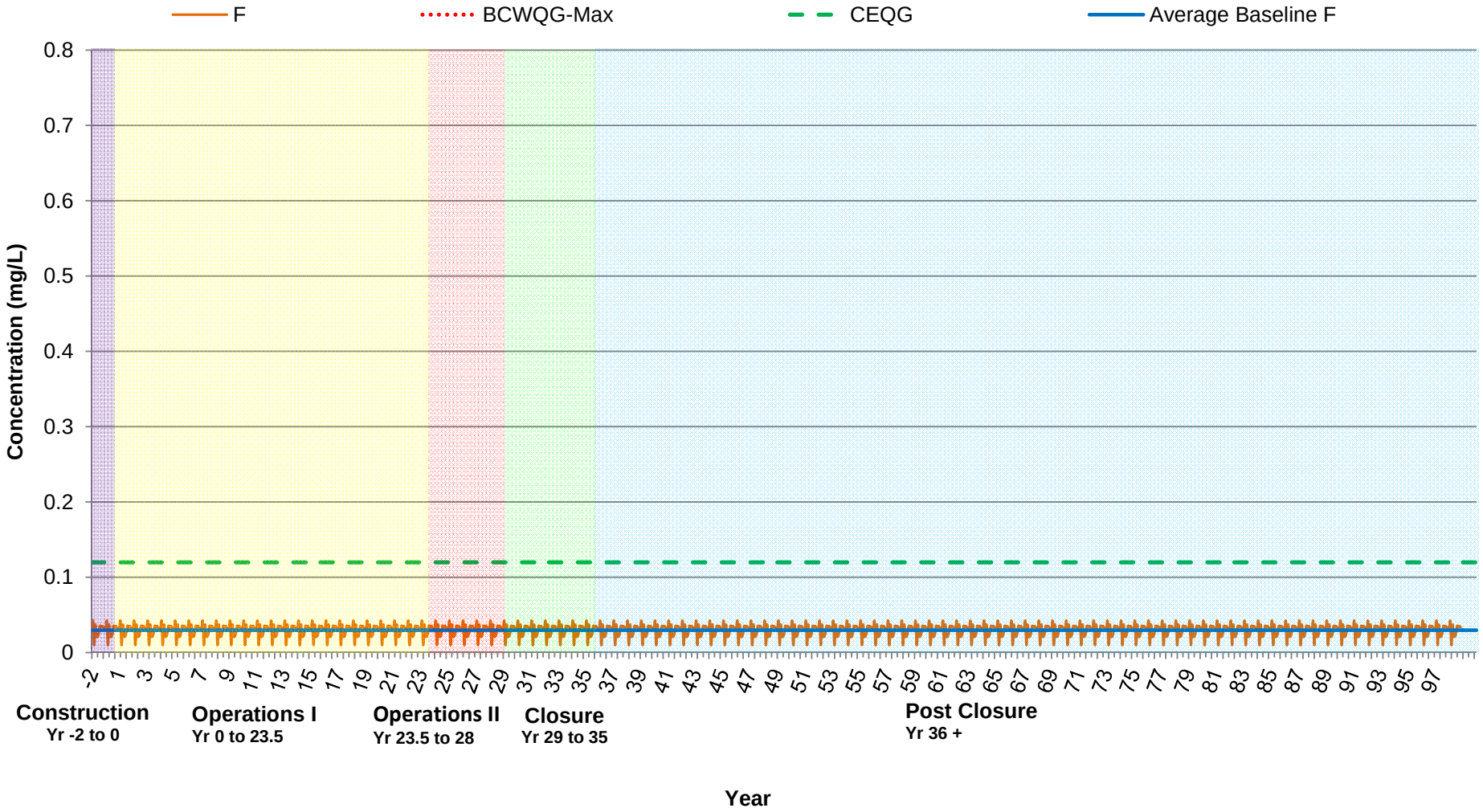
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G5.Cl

REV 0



NOTES:

1. THE BCWQG-MAX IS HARNDESS DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE FLUORIDE CONCENTRATIONS - HARPER CREEK BELOW P-CREEK

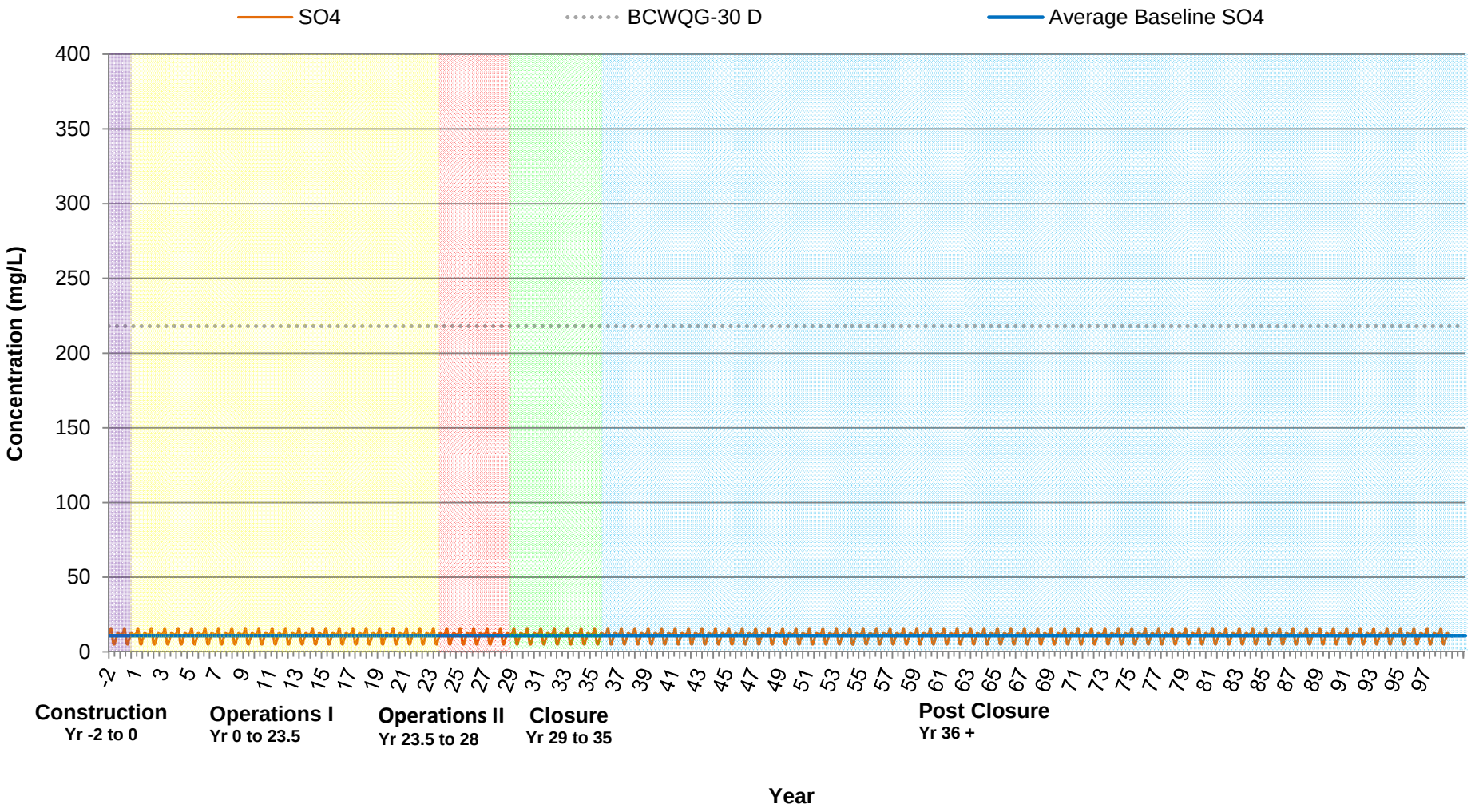
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G5.F

REV 0



NOTES:

1. BCWQG-30 D IS HARDNESS DEPEDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE SULPHATE CONCENTRATIONS - HARPER CREEK BELOW P-CREEK

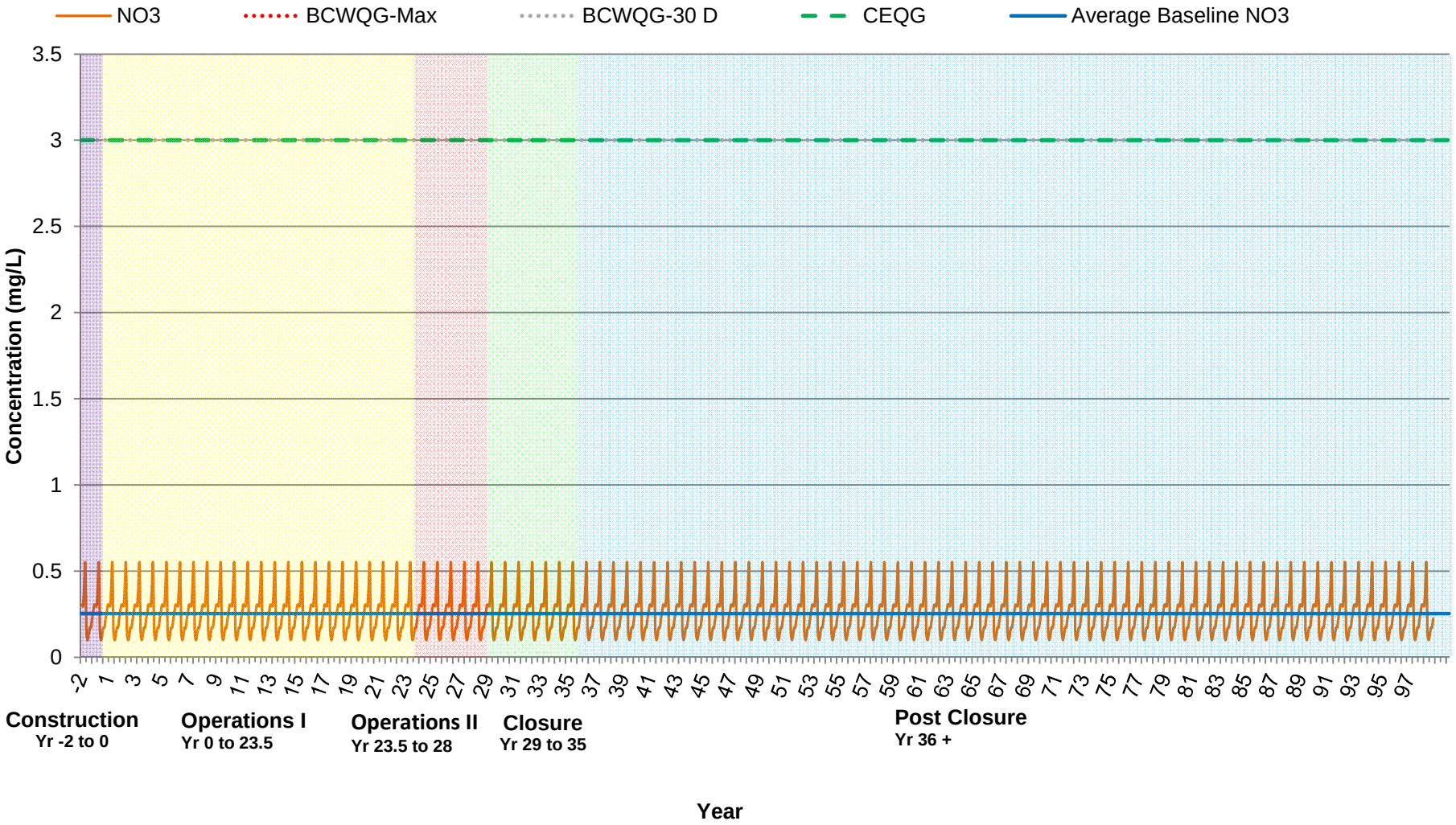
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P/A NO. VA101-458/14

REF. NO. 3

FIGURE G5.S04

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. THE BCWQG-MAX (32.8 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE NITRATE CONCENTRATIONS - HARPER CREEK BELOW P-CREEK

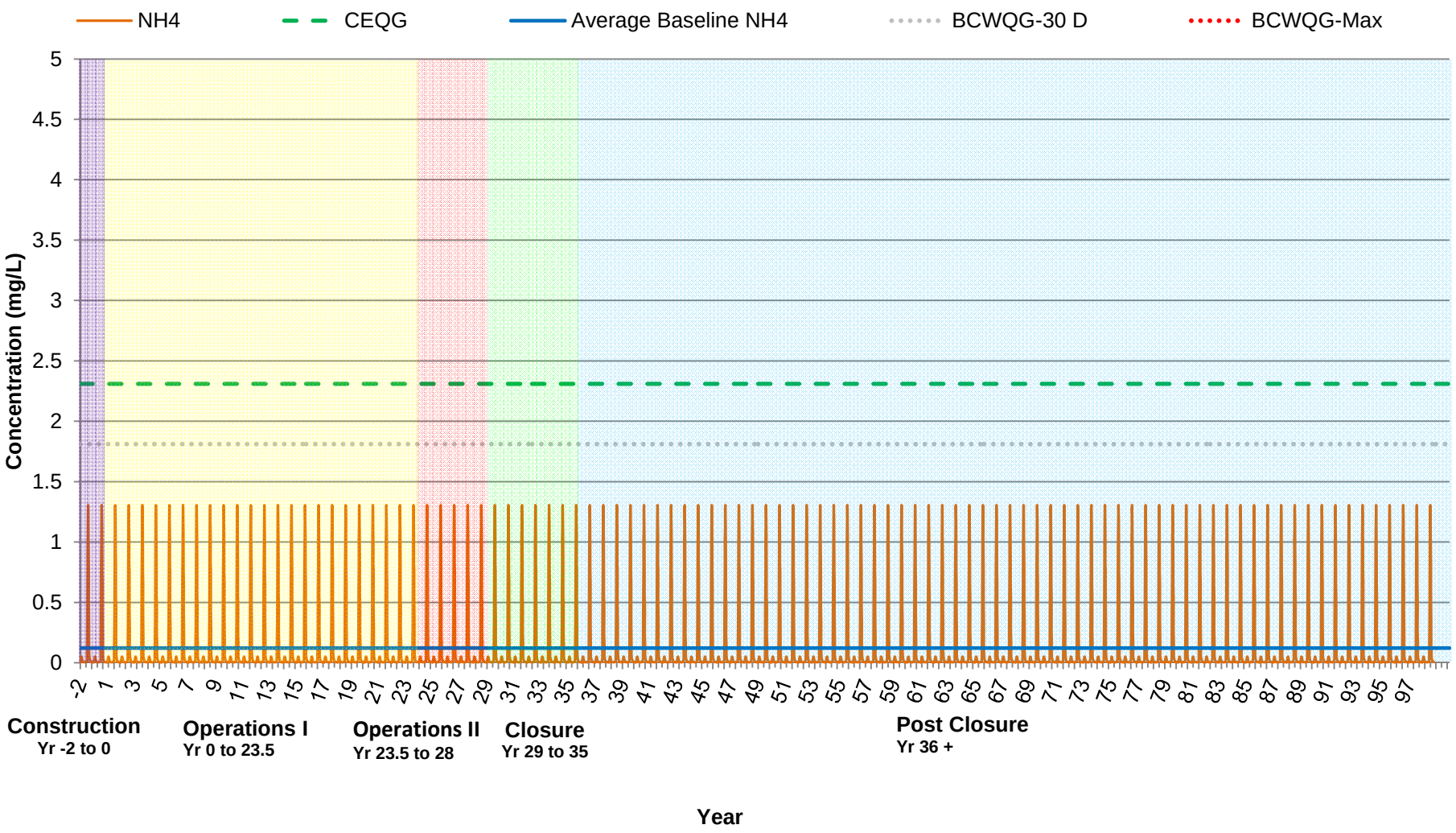
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G5.NO3

REV 0



NOTES:

1. THE BCWQG-30 D IS VALID FOR ONLY 6.5≤pH<9 AND 0°C≤T≤20°C.
2. THE BCWQG-MAX (20.15 mg/L) VALID FOR 6.5≤pH<9 IS NOT SHOWN.
3. THE CEQG IS TO BE USED WITH CAUTION FOR WATER WITH T<5°C AND pH>9.
4. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE AMMONIA CONCENTRATIONS - HARPER CREEK BELOW P-CREEK

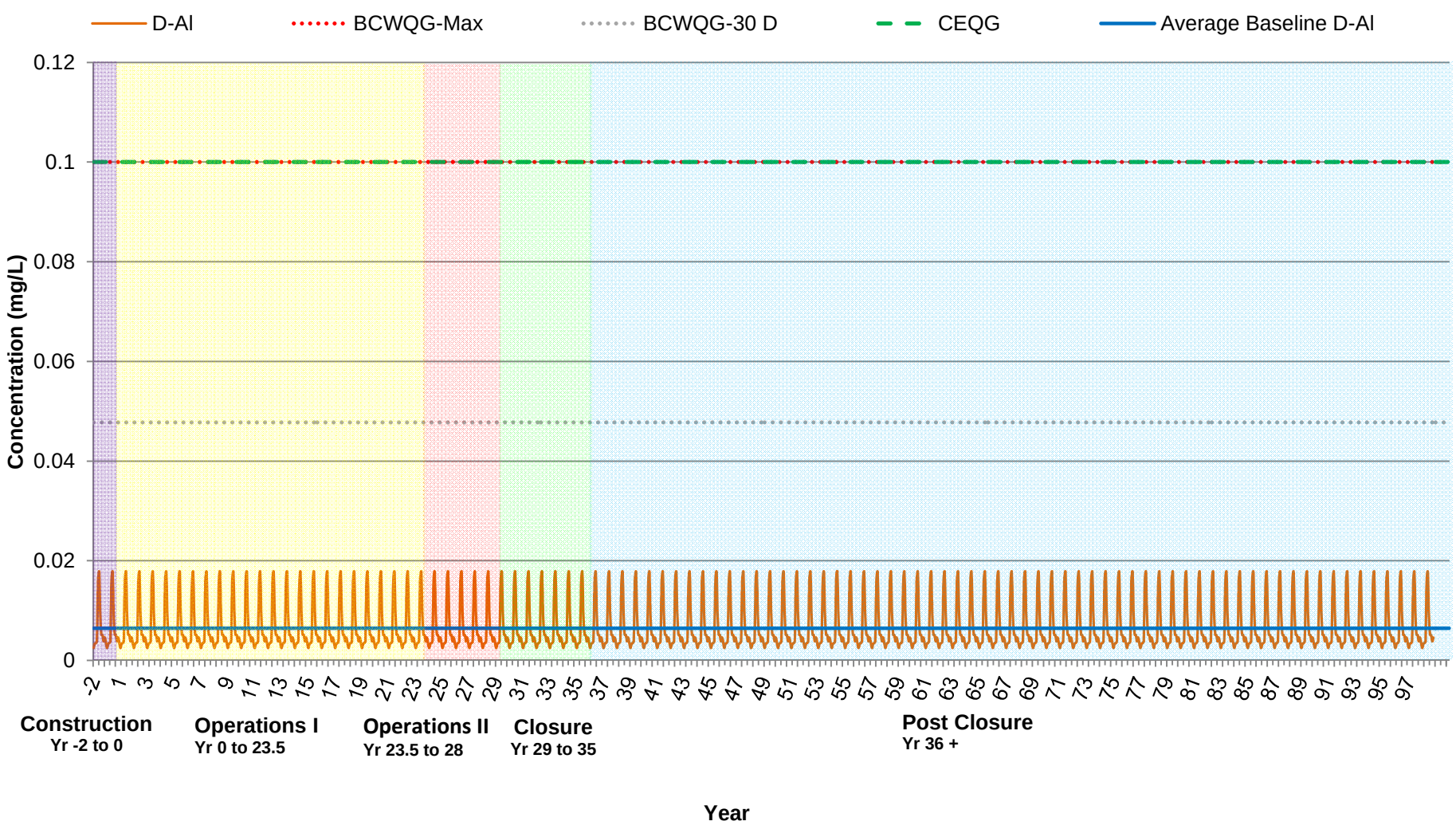
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G5.NH4

REV 0



NOTES:

1. ALL GUIDELINES ARE pH-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. AVERAGE BASELINE pH USED TO CALCULATE GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE DISSOLVED ALUMINUM CONCENTRATIONS - HARPER CREEK BELOW P-CREEK

Knight Piésold CONSULTING

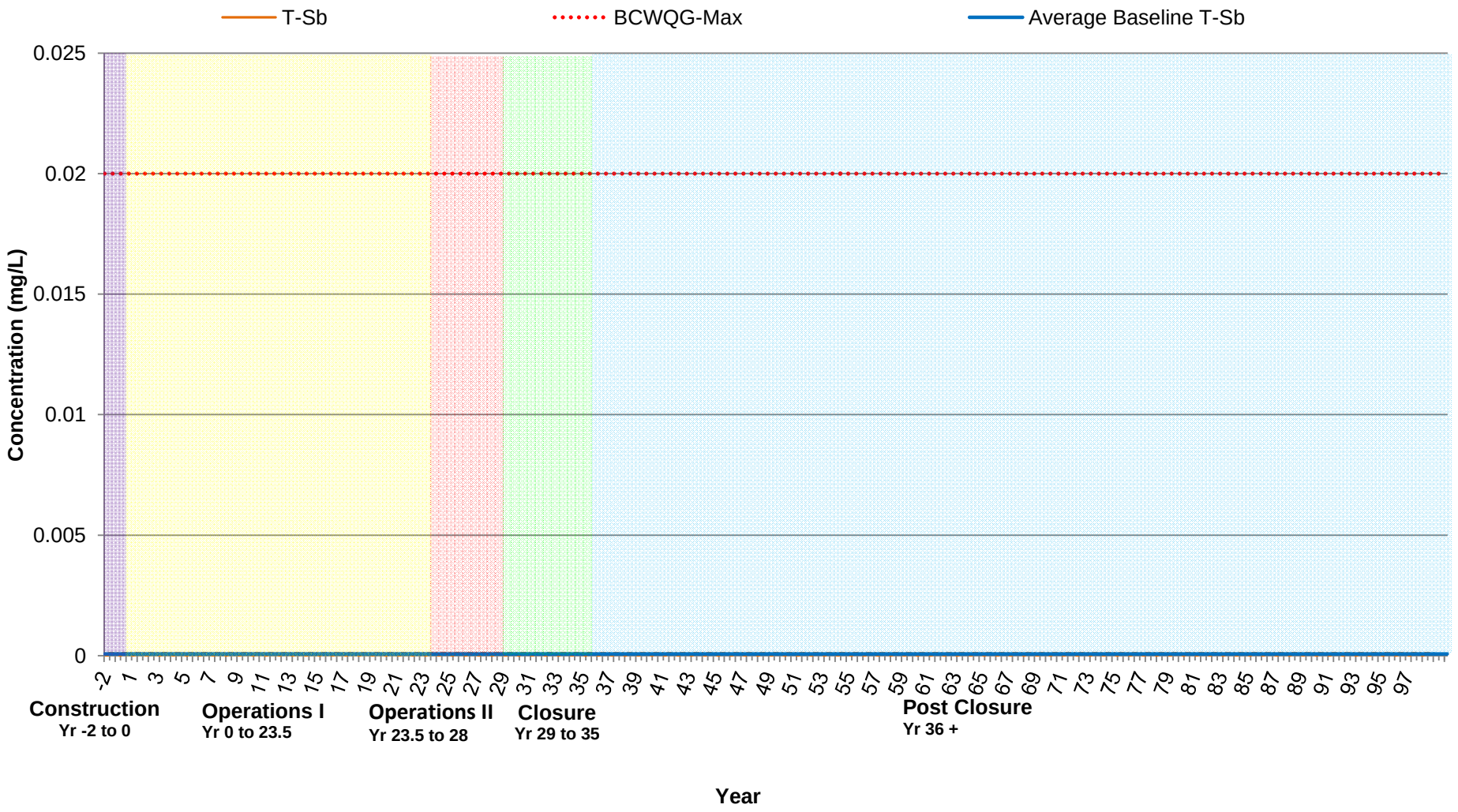
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G5.Al

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE ANTIMONY CONCENTRATIONS - HARPER CREEK BELOW P-CREEK

Knight Piésold CONSULTING

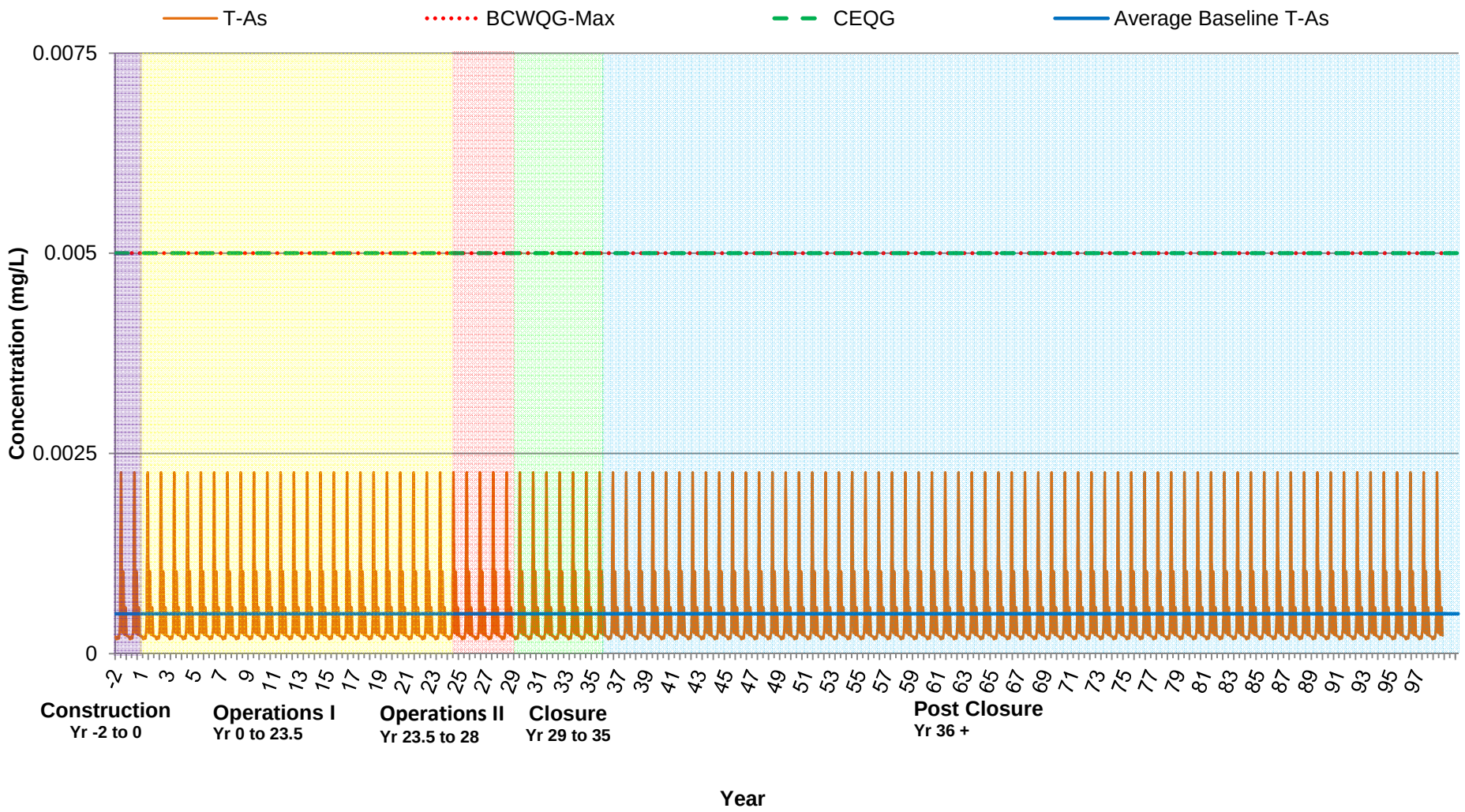
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G5.Sb

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE ARSENIC CONCENTRATIONS - HARPER CREEK BELOW P-CREEK

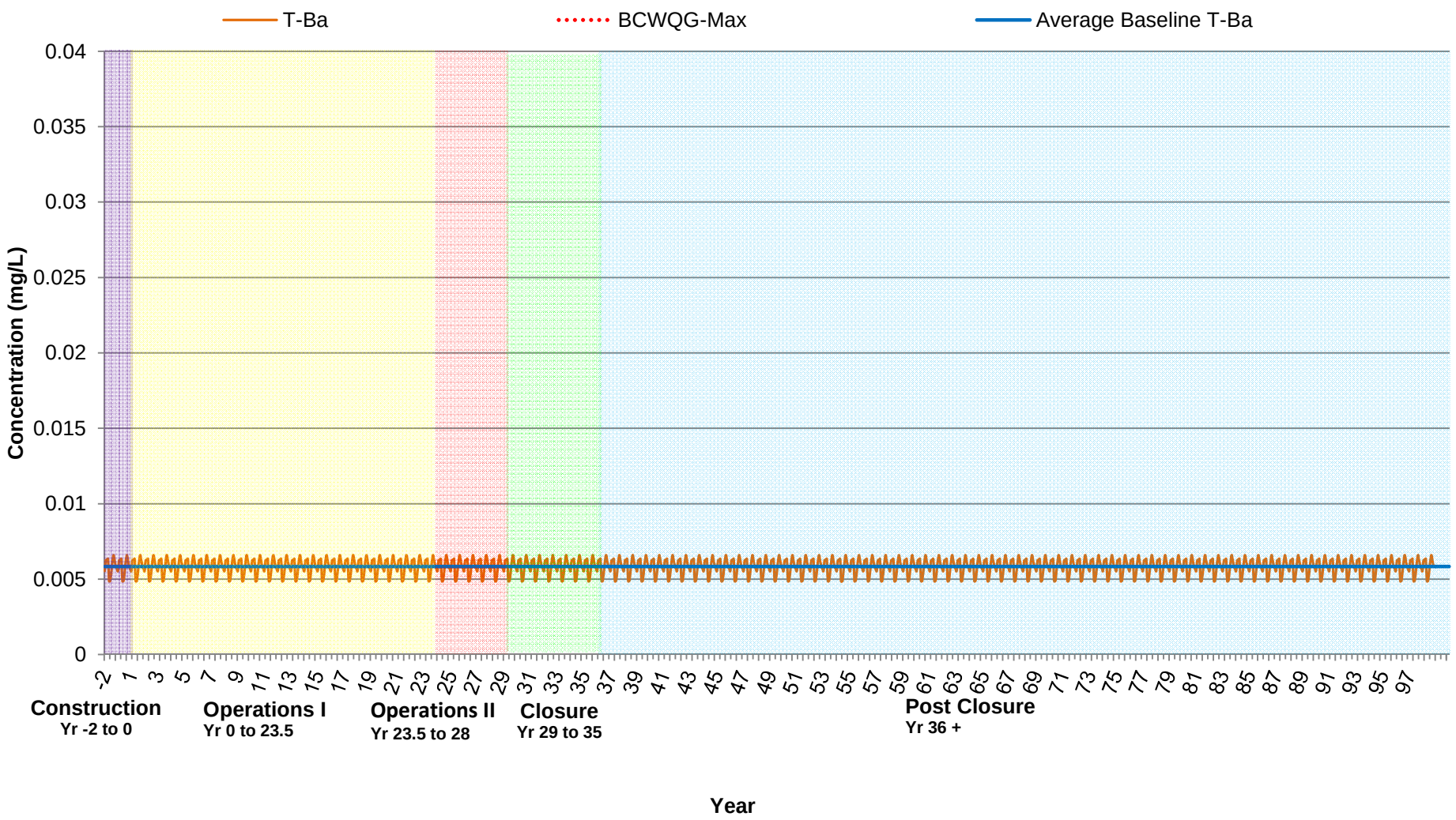
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G5.As

REV 0



NOTES:

1. THE BCWQG-MAX IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. THE BCWQG-30 D (1 mg/L) AND BCWQG-MAX (5 mg/L) ARE NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE BARIUM CONCENTRATIONS - HARPER CREEK BELOW P-CREEK

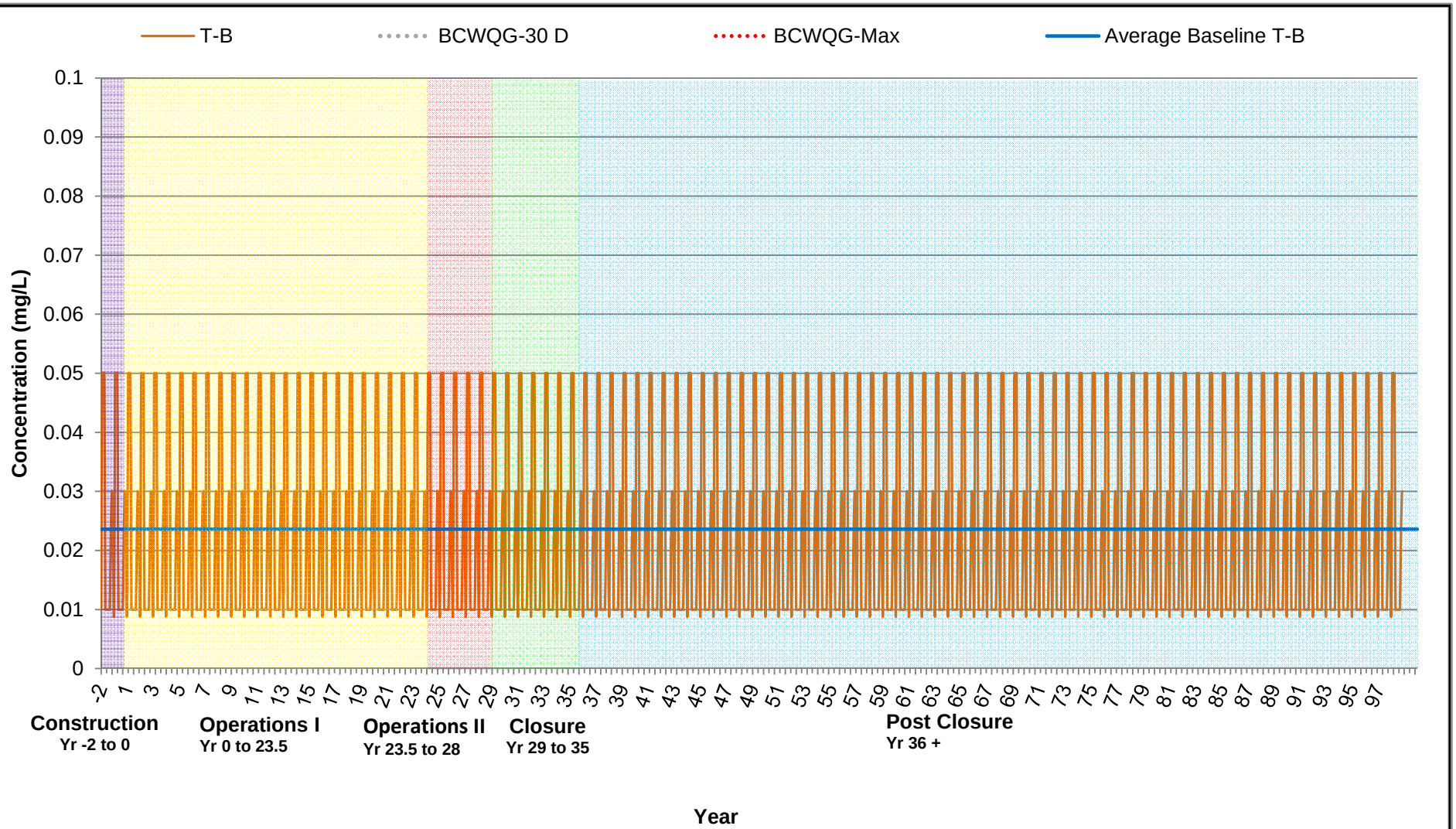
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G5.Ba

REV 0



NOTES:

1. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.
3. THE BCWQG-MAX (1.2 mg/L) IS NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE BORON CONCENTRATIONS - HARPER CREEK BELOW P-CREEK

Knight Piésold CONSULTING

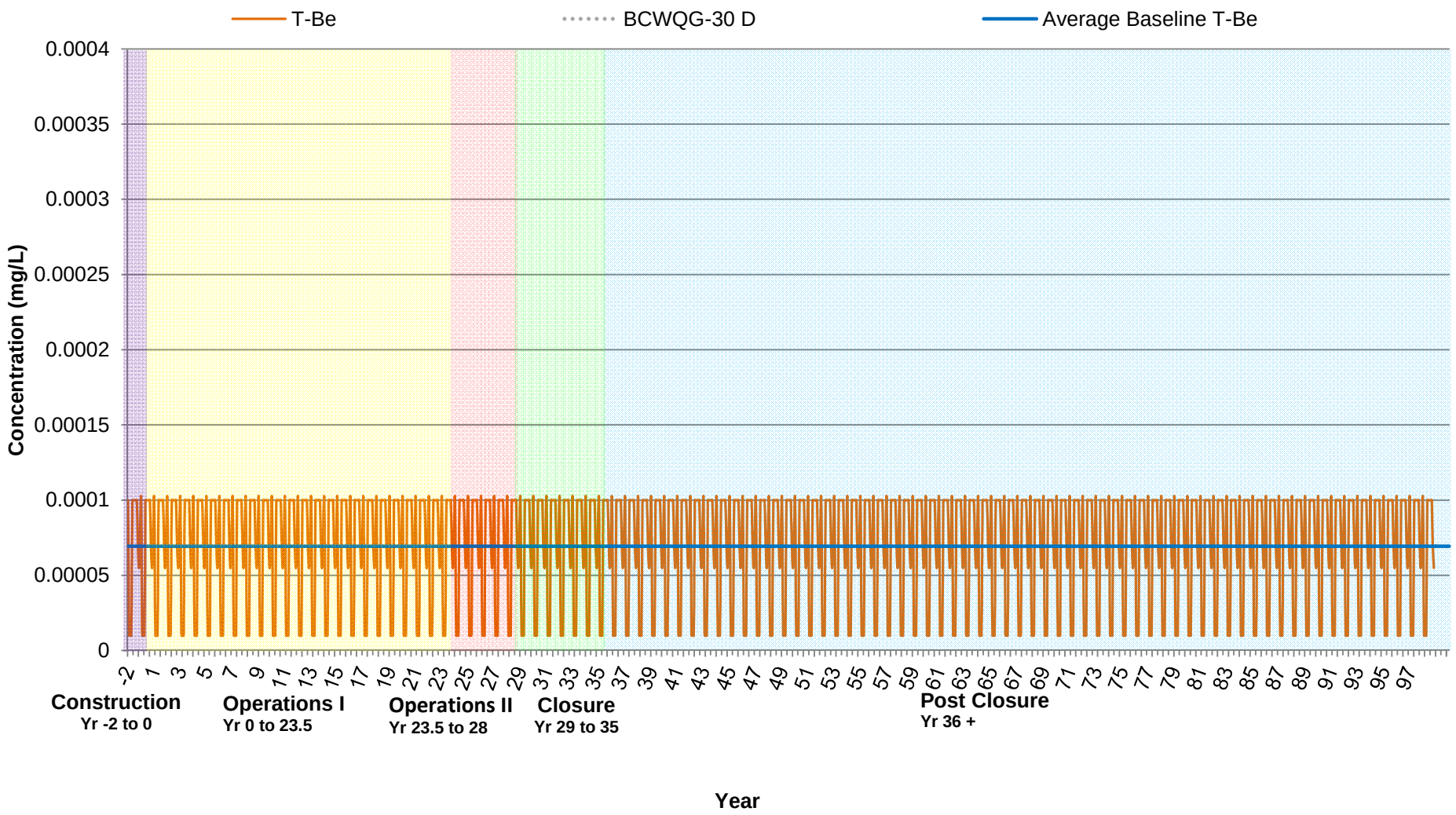
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G5.B

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. THE BCWQG-30 D (0.0053 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE BERYILLIUM CONCENTRATIONS - HARPER CREEK BELOW P-CREEK

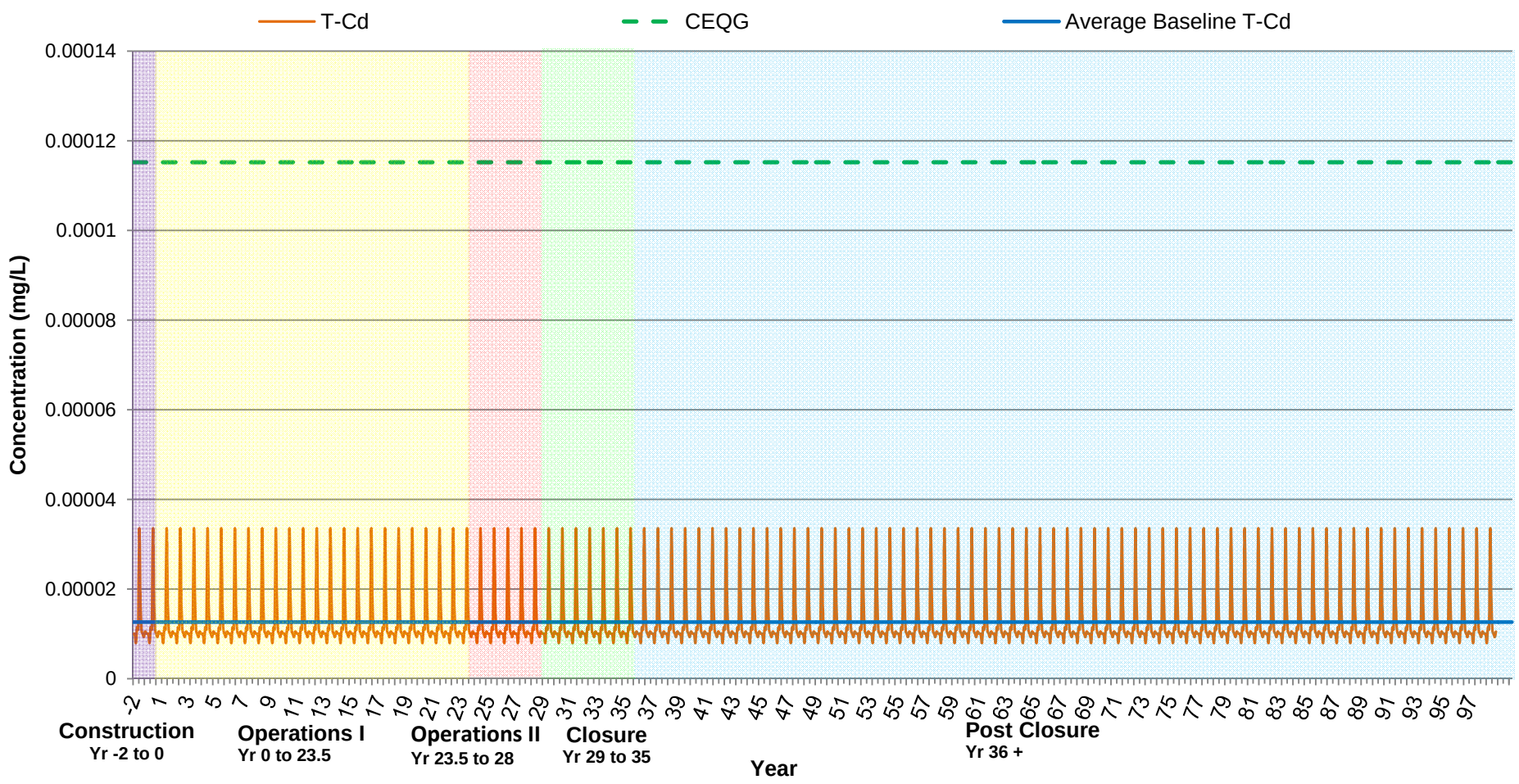
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G5.Be

REV 0



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. THE BCWQG ARE DRAFT GUIDELINES UNDER REVIEW (JUNE 2014).
3. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
4. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE CADMIUM CONCENTRATIONS - HARPER CREEK BELOW P-CREEK

Knight Piésold CONSULTING

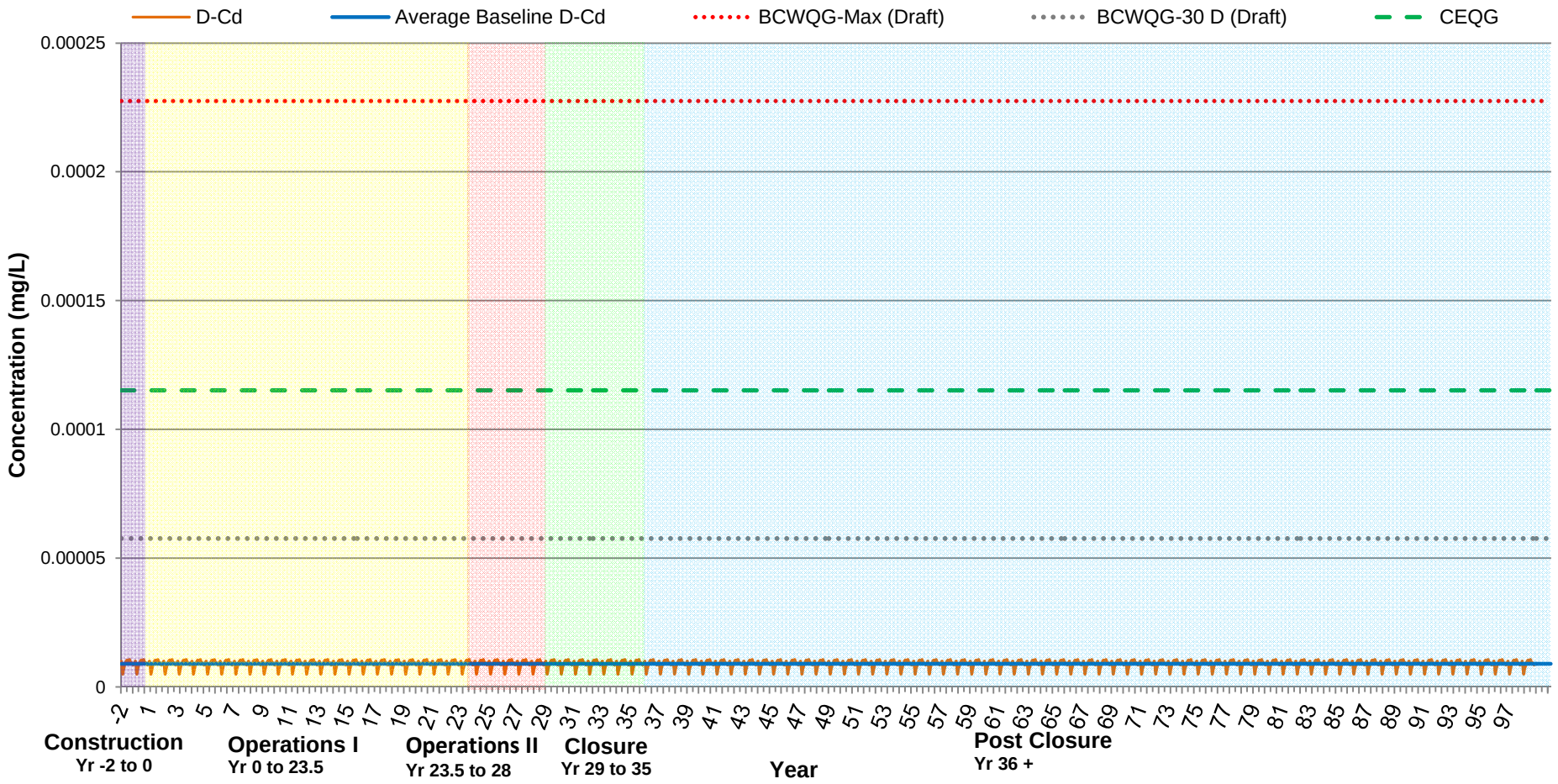
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G5.Cd-T

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE CADMIUM CONCENTRATIONS - HARPER CREEK BELOW P-CREEK

Knight Piésold CONSULTING

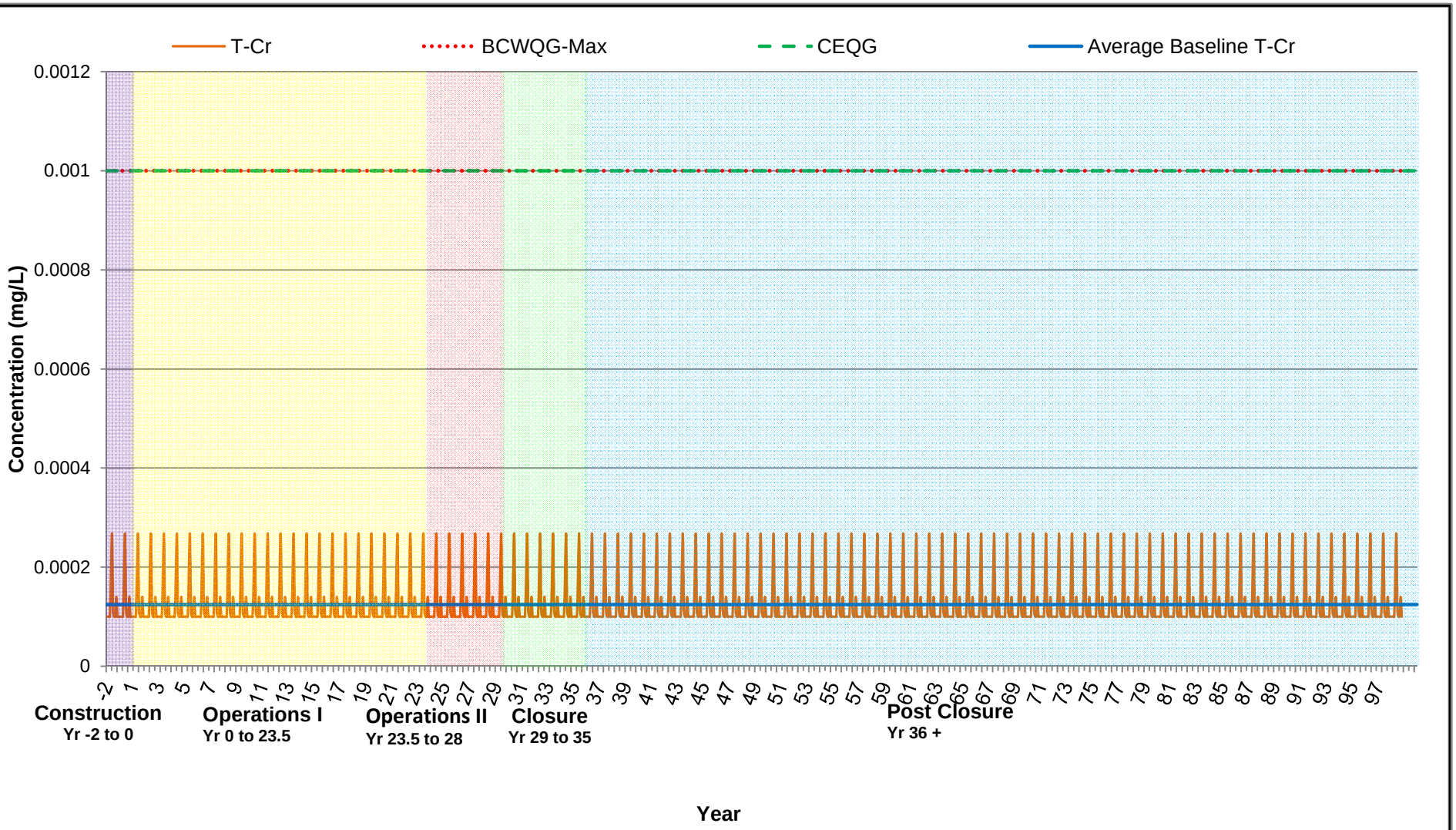
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G5.Cd-D

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. GUIDELINES ARE FOR CHROMIUM (IV), THE SPECIES MOST COMMON IN WELL OXYGENATED SURFACE WATERS.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE CHROMIUM CONCENTRATIONS - HARPER CREEK BELOW P-CREEK

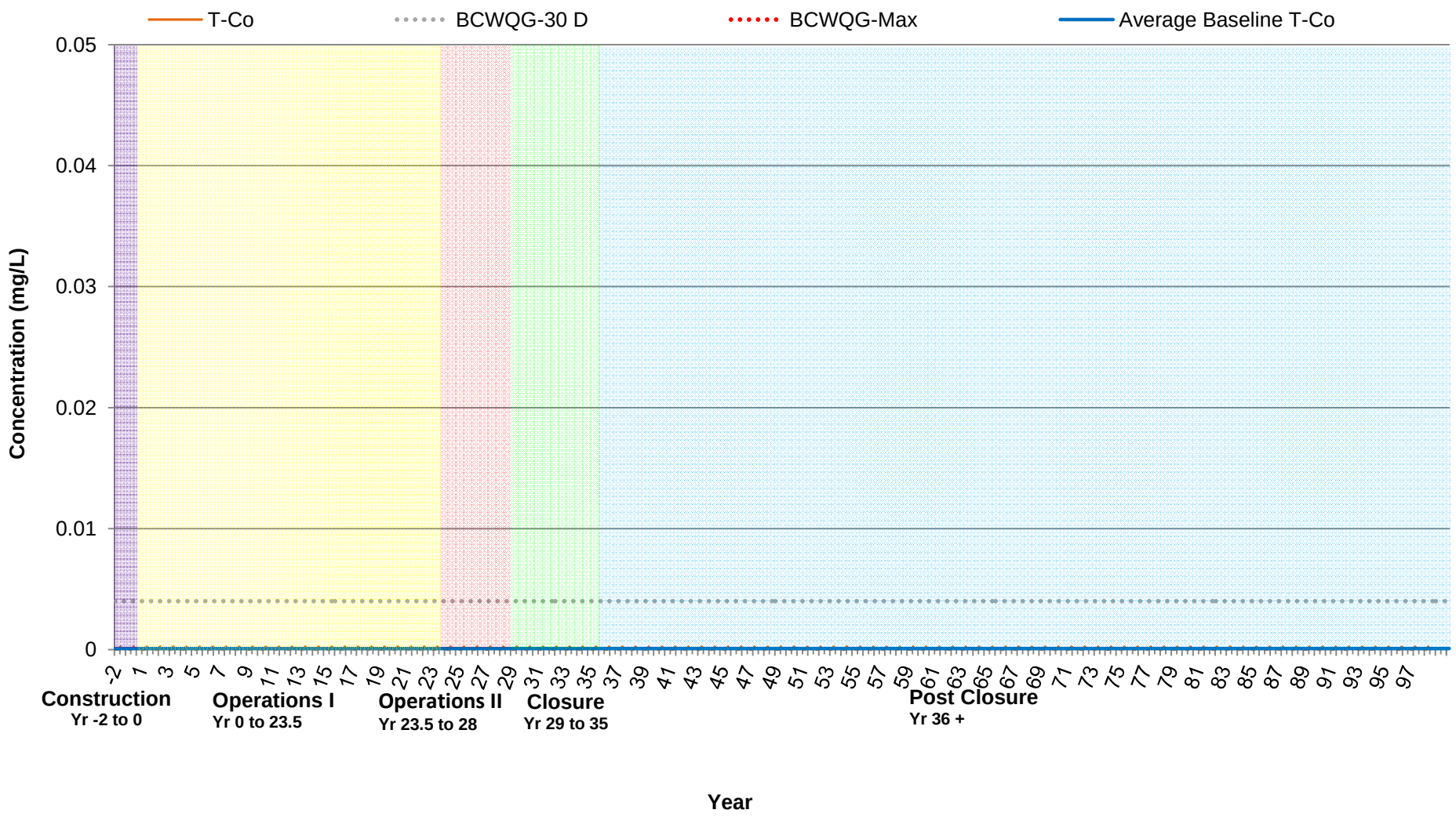
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G5.Cr

REV 0



NOTES:

1. THE BCWQG-30 D AND BCWQG-MAX ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. THE BCWQG-MAX GUIDELINE (0.11 mg/L) IS NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE COBALT CONCENTRATIONS - HARPER CREEK BELOW P-CREEK

Knight Piésold CONSULTING

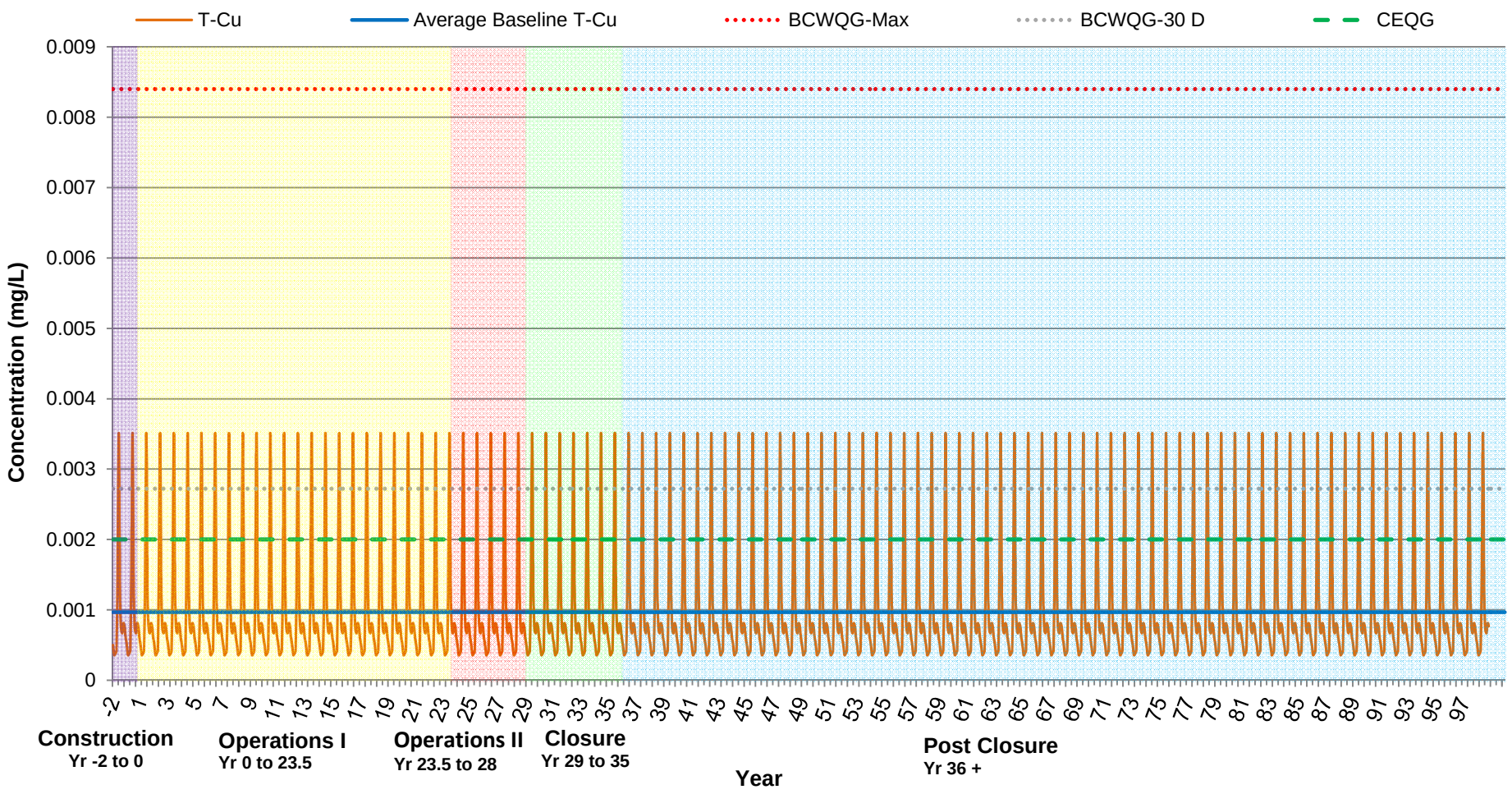
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G5.Co

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE COPPER CONCENTRATIONS - HARPER CREEK BELOW P-CREEK

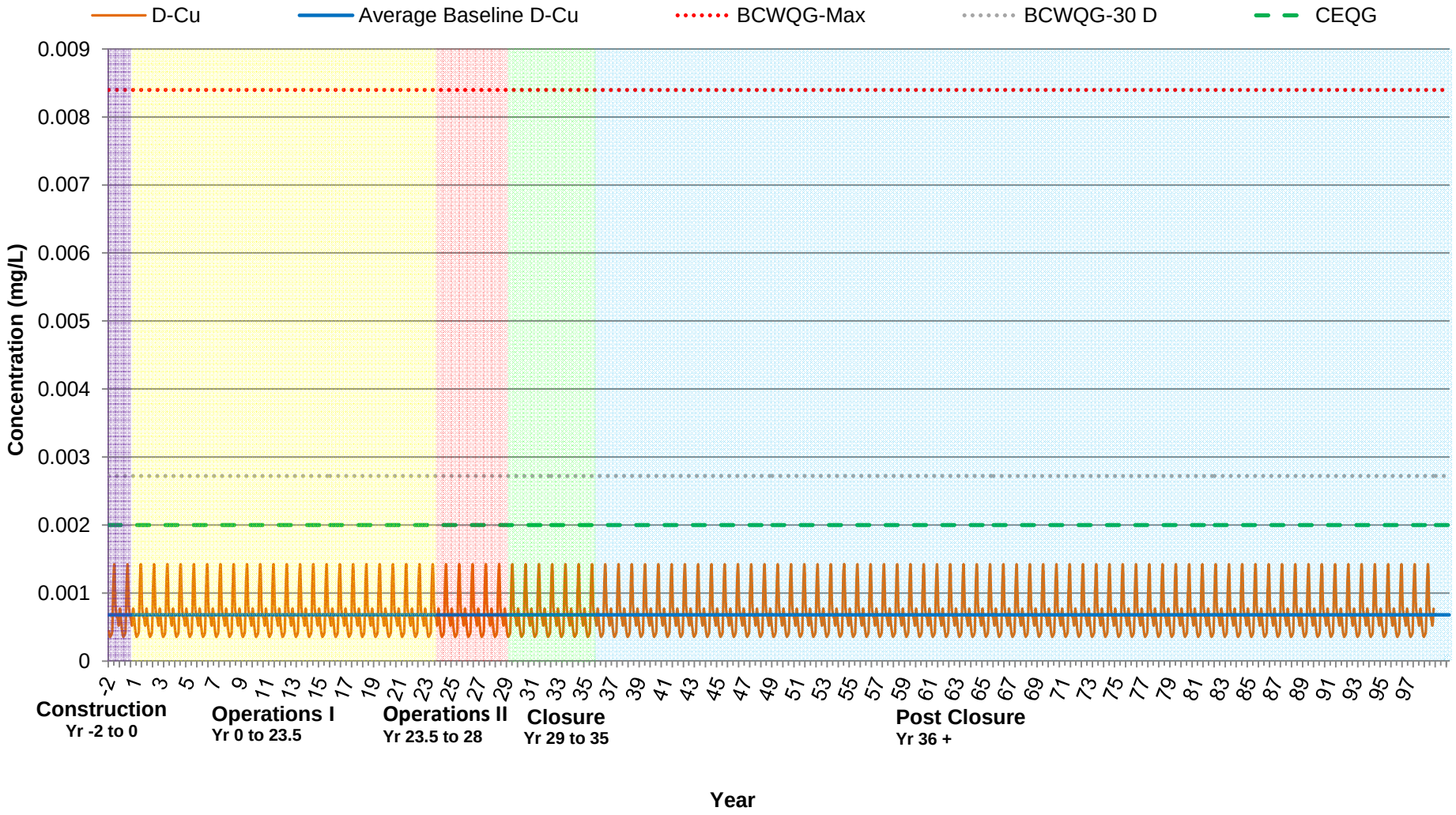
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G5.Cu-T

REV 0



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE COPPER CONCENTRATIONS - HARPER CREEK BELOW P-CREEK

Knight Piésold CONSULTING

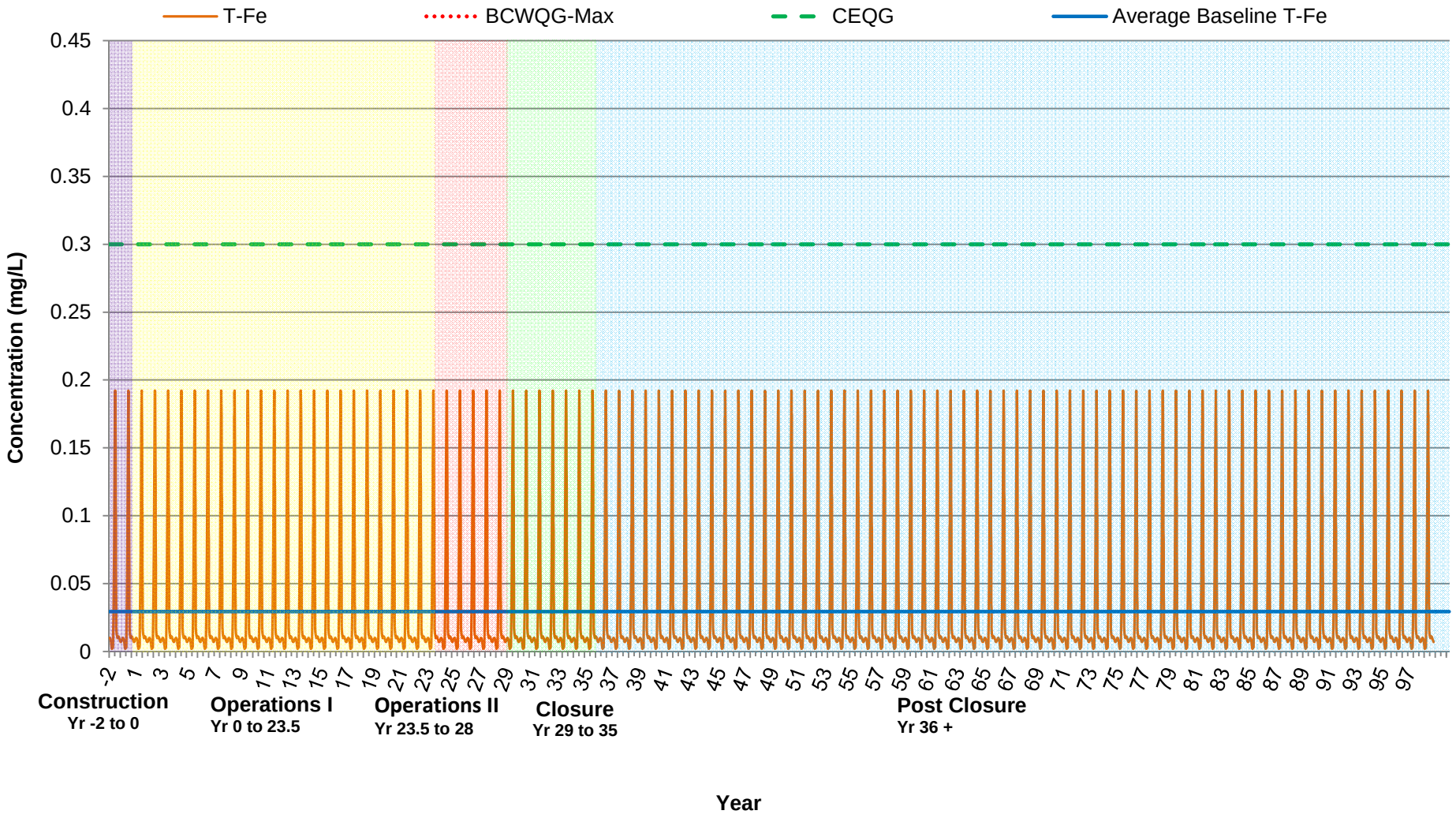
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G5.Cu-D

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. BCWQG-MAX 1.0 mg/L IS NOT SHOWN ON GRAPH.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE TOTAL IRON CONCENTRATIONS - HARPER CREEK BELOW P-CREEK

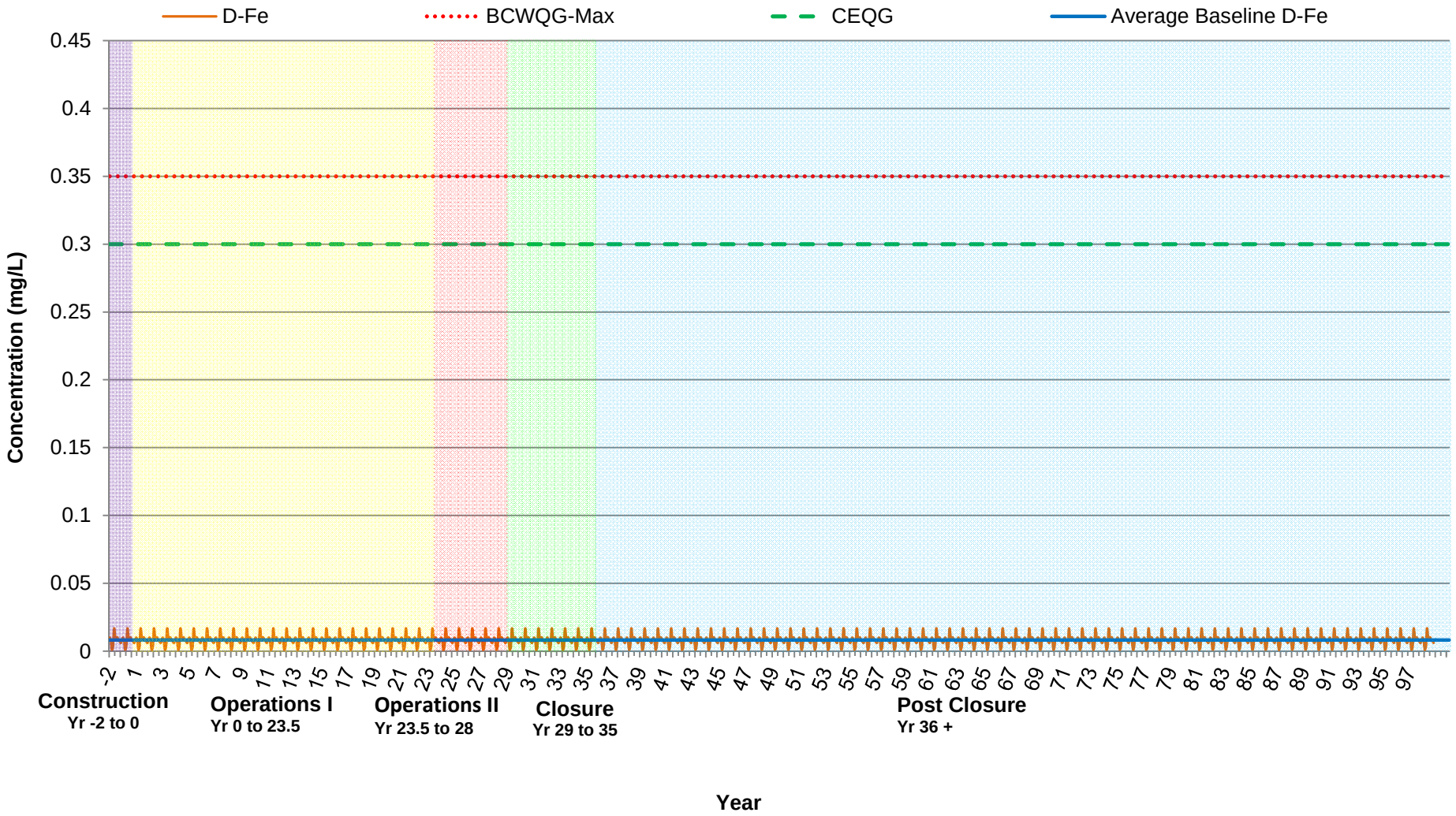
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G5.Fe-T

REV 0



NOTES:

1. THE BCWQG-MAX AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE DISSOLVED IRON CONCENTRATIONS - HARPER CREEK BELOW P-CREEK

Knight Piésold CONSULTING

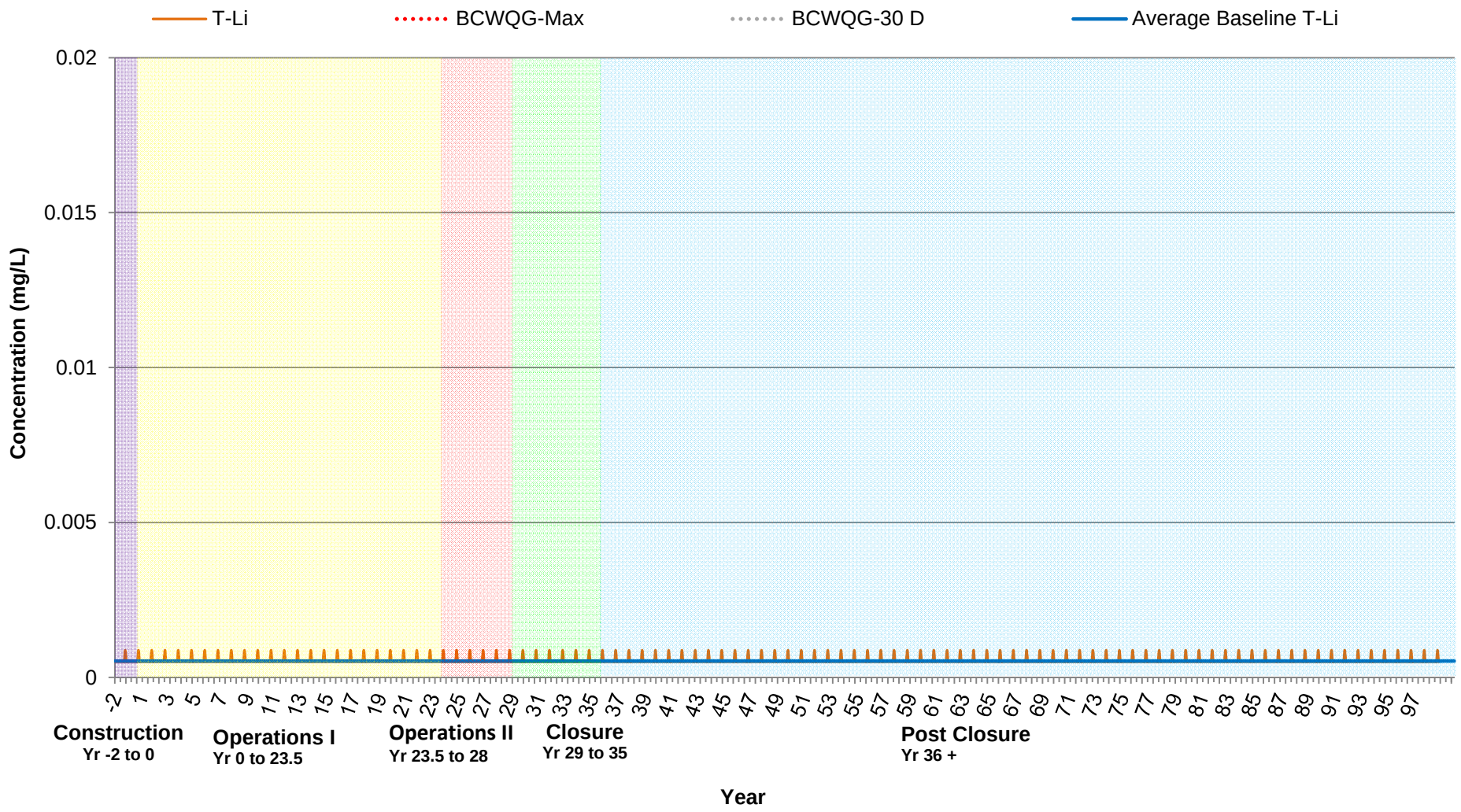
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G5.Fe-D

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. THE BCWQG-30 D (0.096 mg/L) AND BCWQG-MAX (0.87 mg/L) ARE INTERIM (WORKING) AND ARE NOT SHOWN ON GRAPH.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE LITHIUM CONCENTRATIONS - HARPER CREEK BELOW P-CREEK

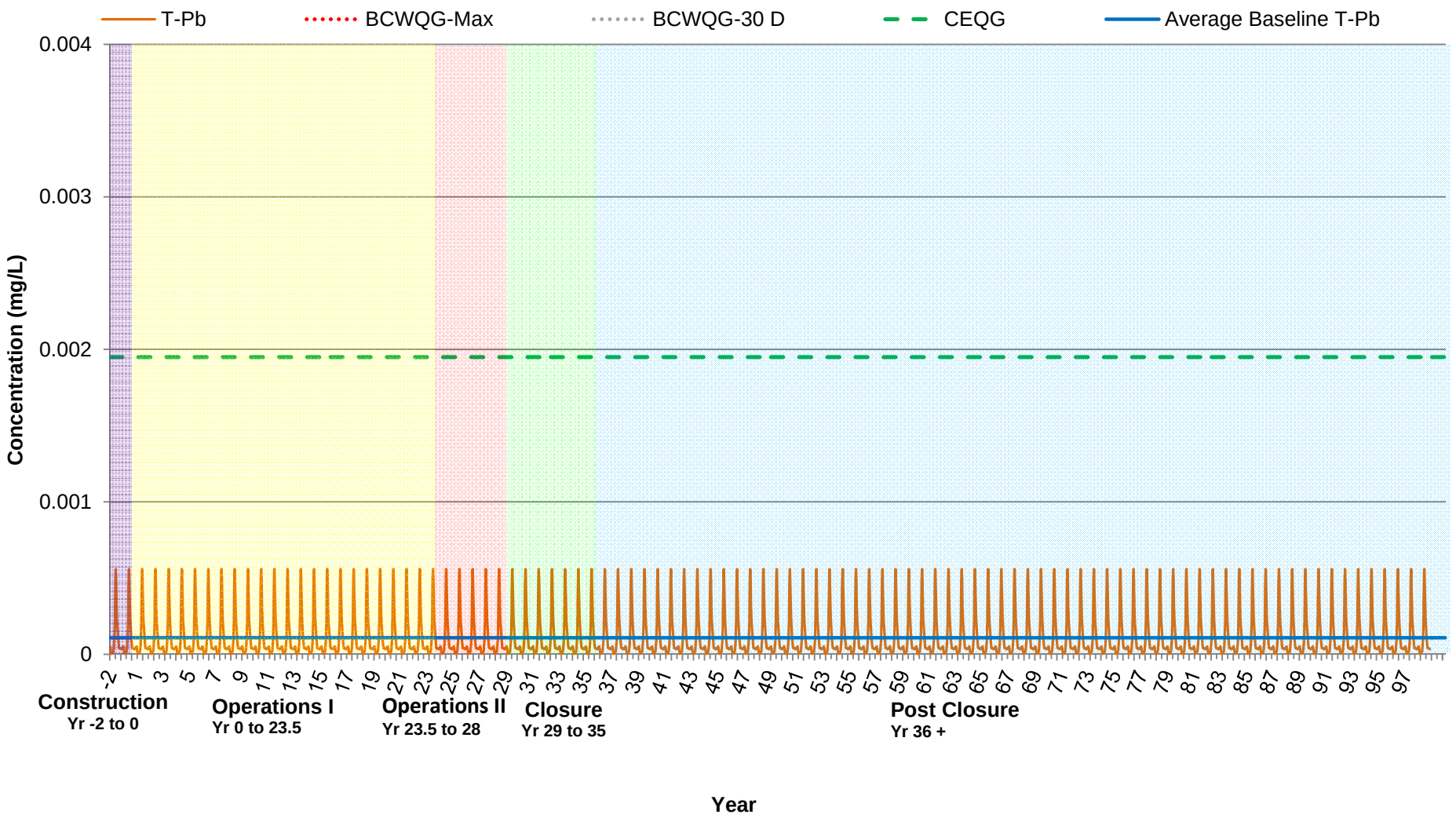
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G5.Li

REV 0



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.
4. THE BCWQG-MAX (CALCULATED AT 0.011 mg/L) IS NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE LEAD CONCENTRATIONS - HARPER CREEK BELOW P-CREEK

Knight Piésold CONSULTING

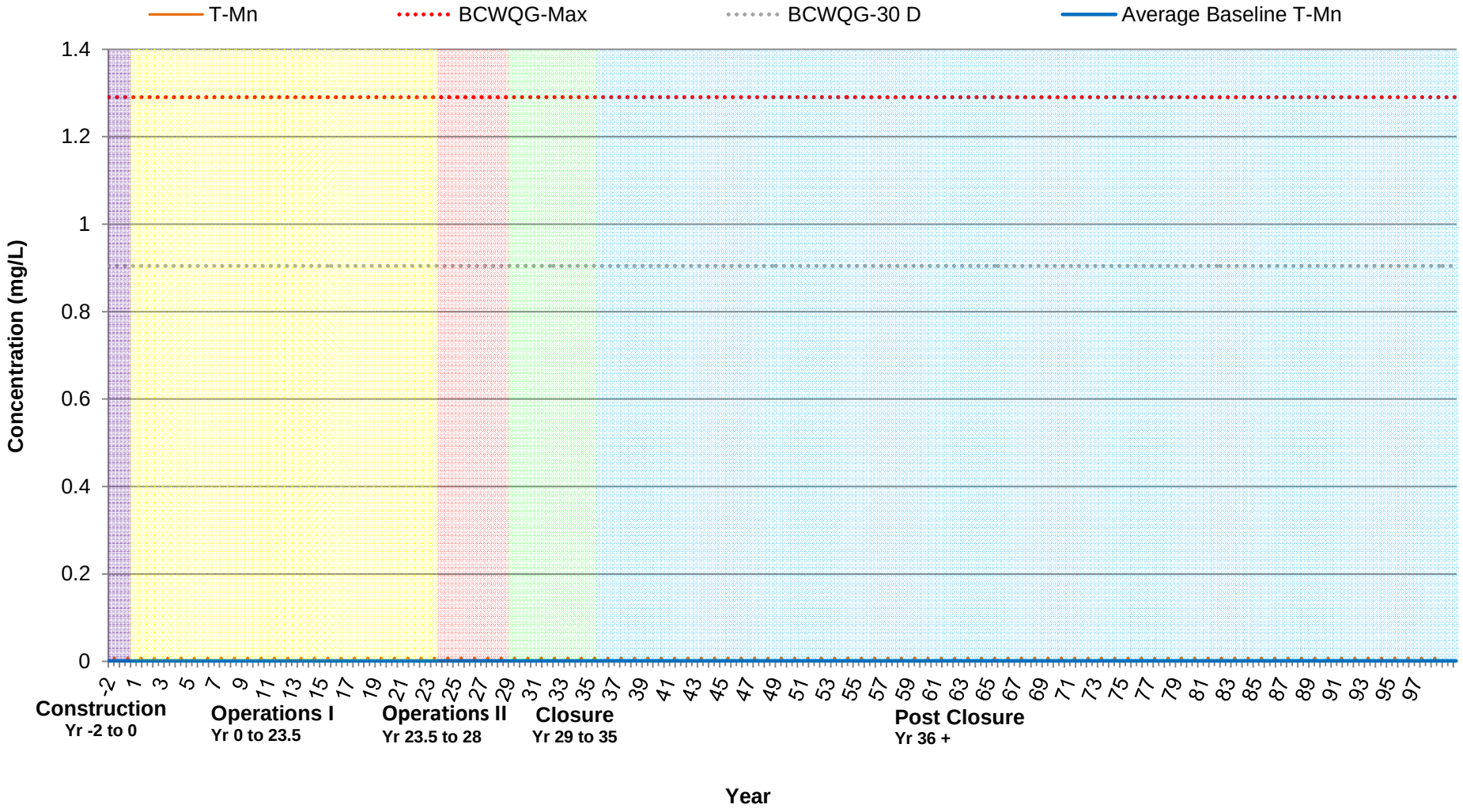
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G5.Pb

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE MANGANESE CONCENTRATIONS - HARPER CREEK BELOW P-CREEK

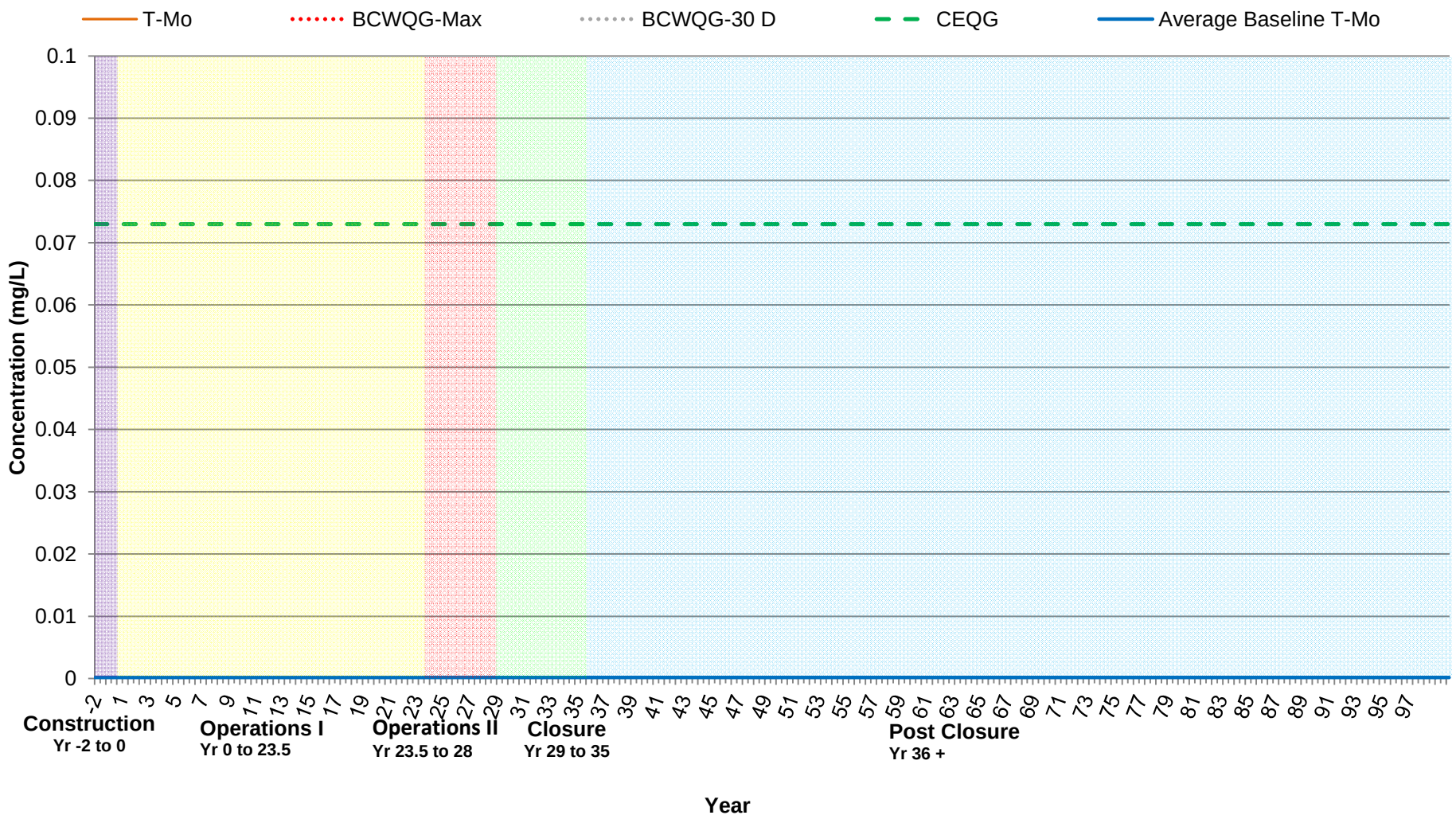
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G5.Mn

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. THE BCWQG-MAX (2 mg/L) AND BCWQG-30 D (1 mg/L) ARE NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE MOLYDBENUM CONCENTRATIONS - HARPER CREEK BELOW P-CREEK

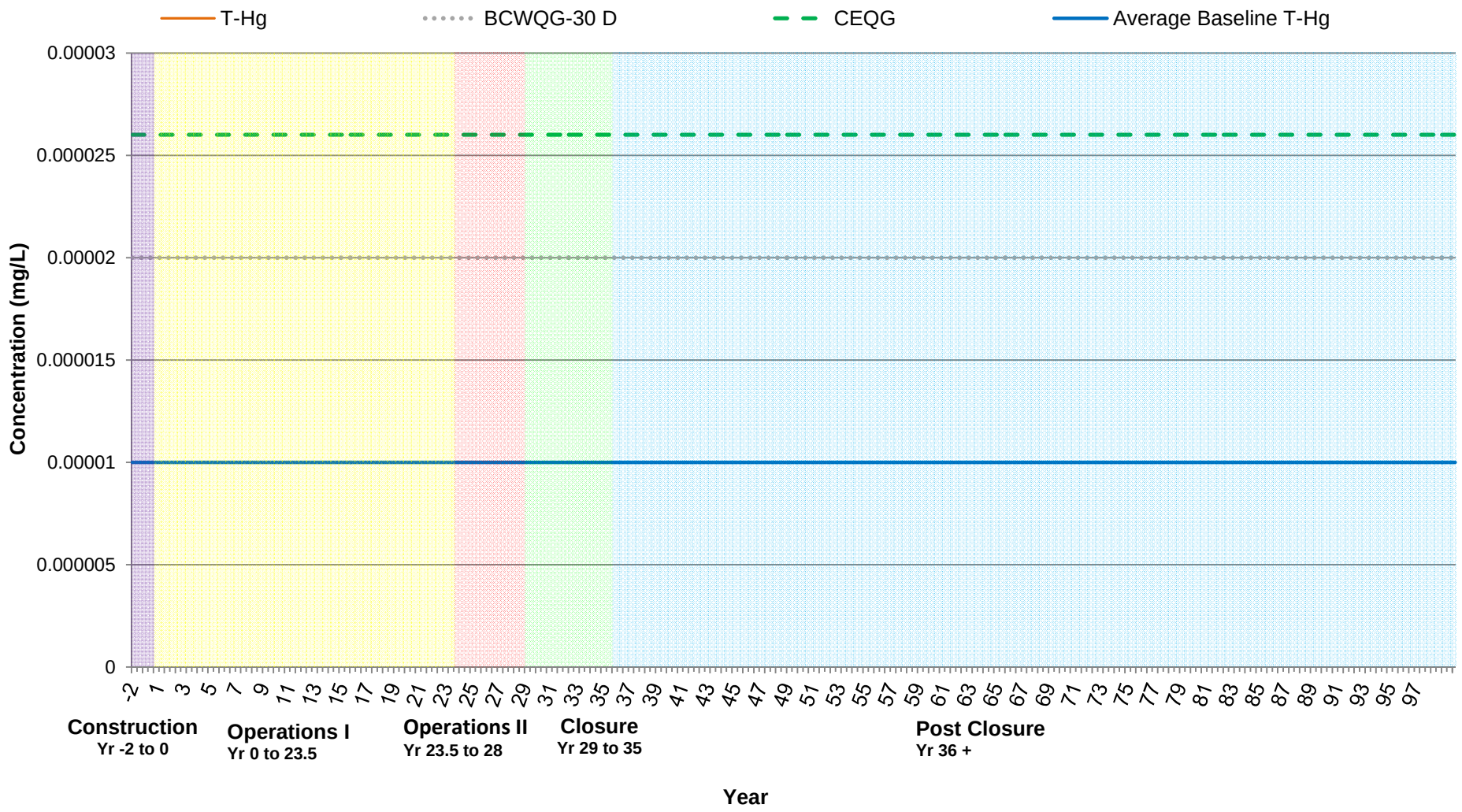
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G5.Mo

REV 0



NOTES:

1. THE BCWQG-30 D AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. BCWQG-30 D VALUE APPLIED ON ASSUMPTION THAT METHYL-Hg IS EQUAL TO 0.5% OF T-Hg.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE MERCURY CONCENTRATIONS - HARPER CREEK BELOW P-CREEK

Knight Piésold CONSULTING

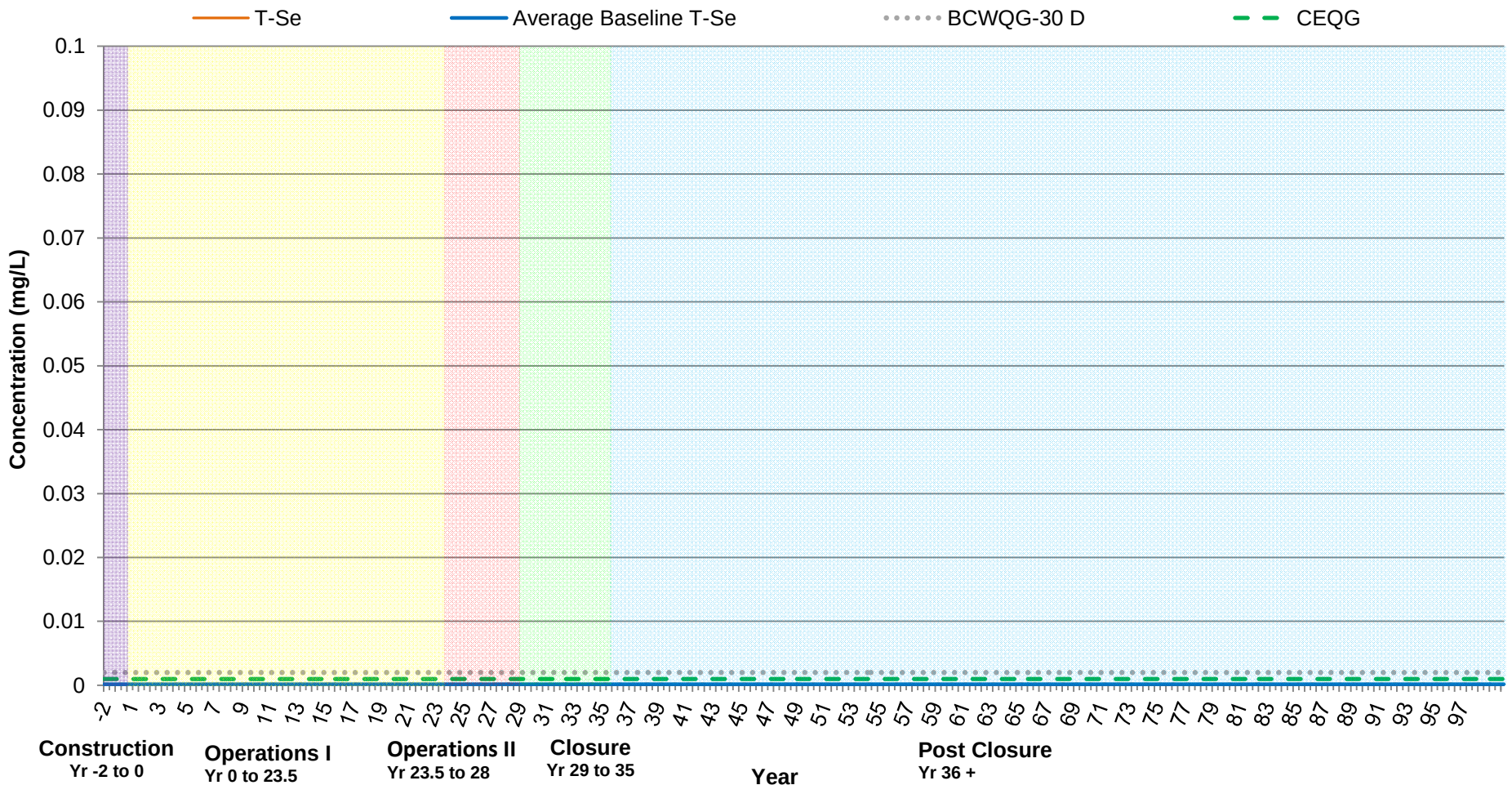
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G5.Hg

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-30 D AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE SELENIUM CONCENTRATIONS - HARPER CREEK BELOW P-CREEK

Knight Piésold CONSULTING

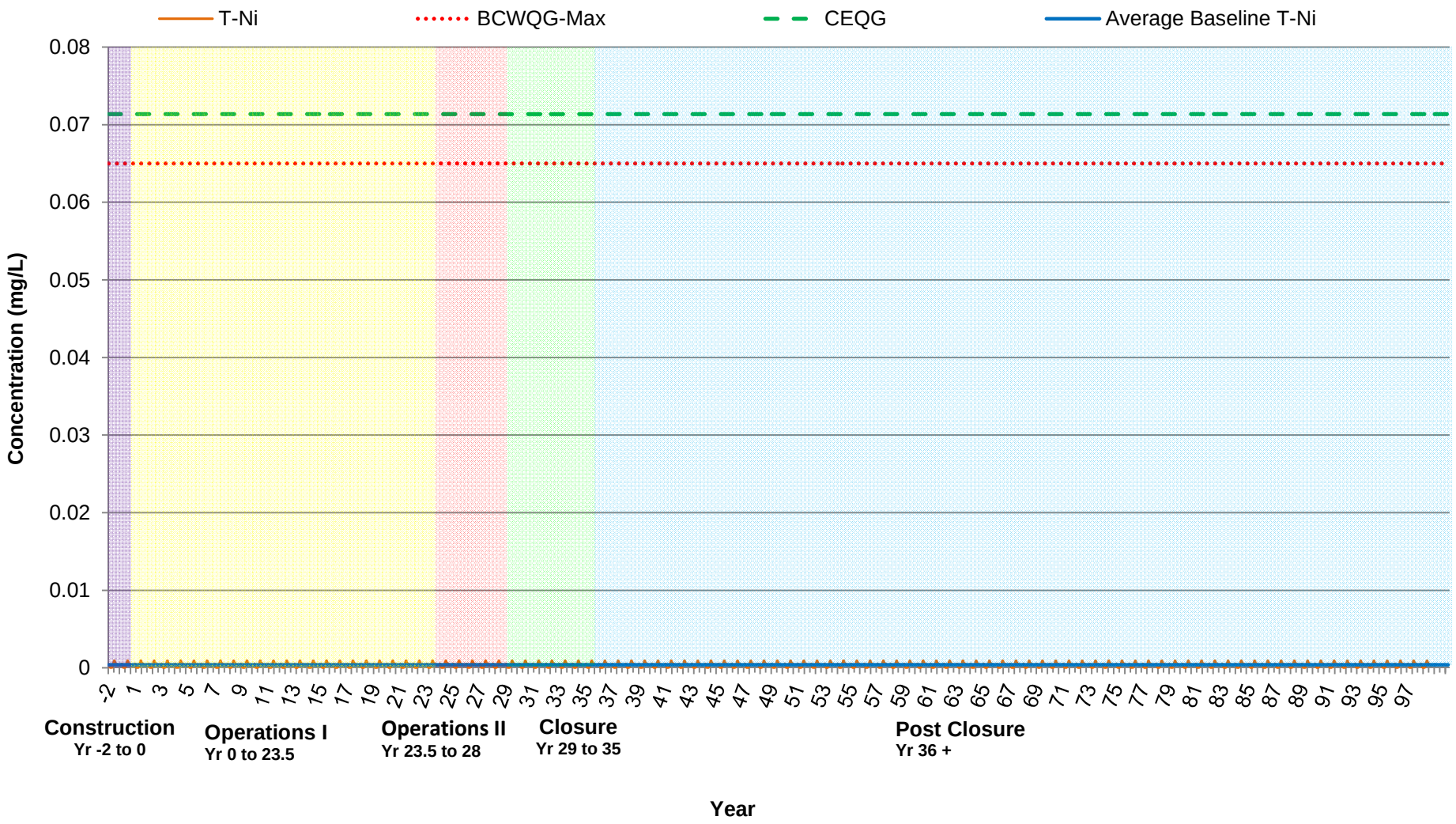
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G5.Se

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE NICKEL CONCENTRATIONS - HARPER CREEK BELOW P-CREEK

Knight Piésold CONSULTING

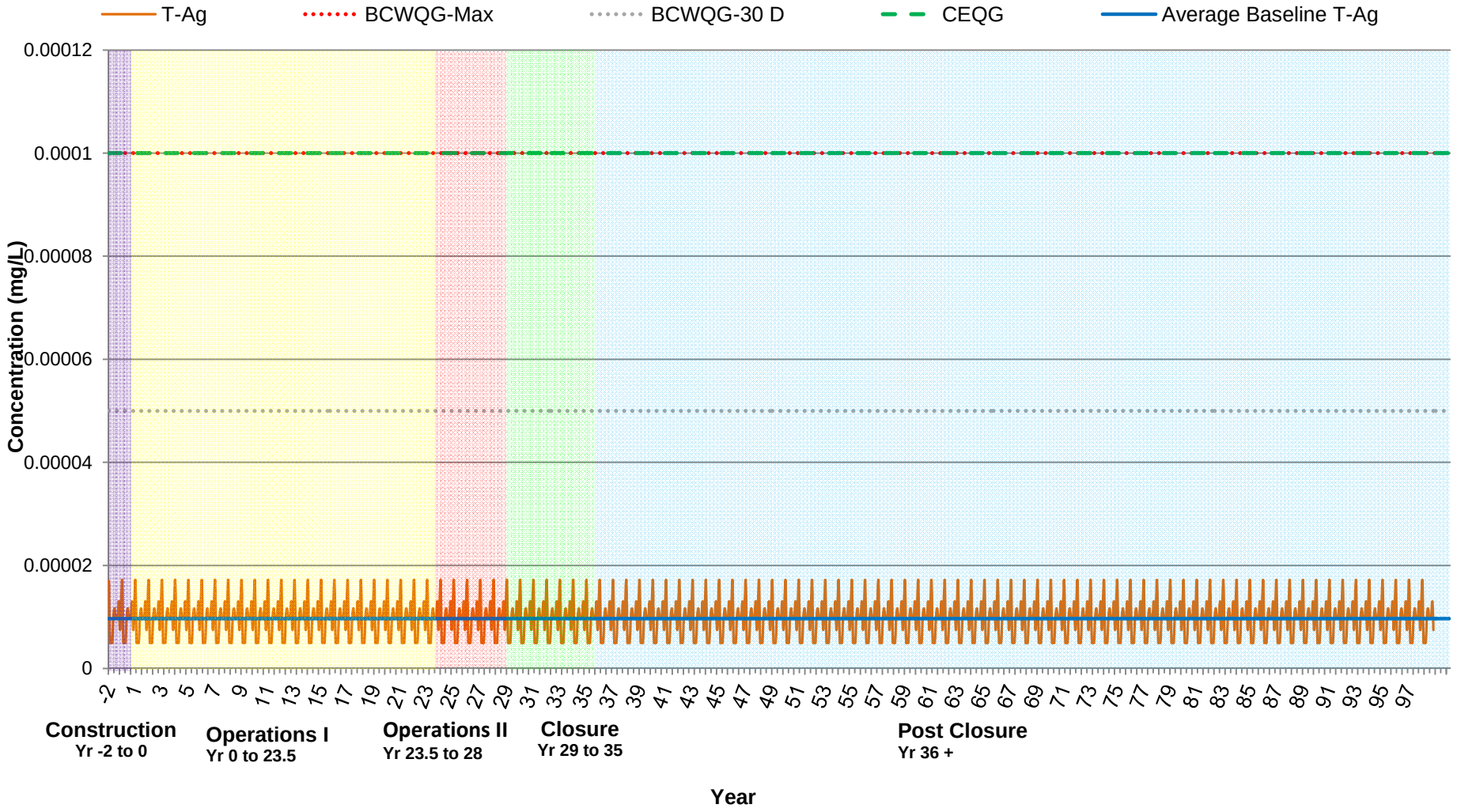
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G5.Ni

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-30 D AND BCWQG-MAX ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE SILVER CONCENTRATIONS - HARPER CREEK BELOW P-CREEK

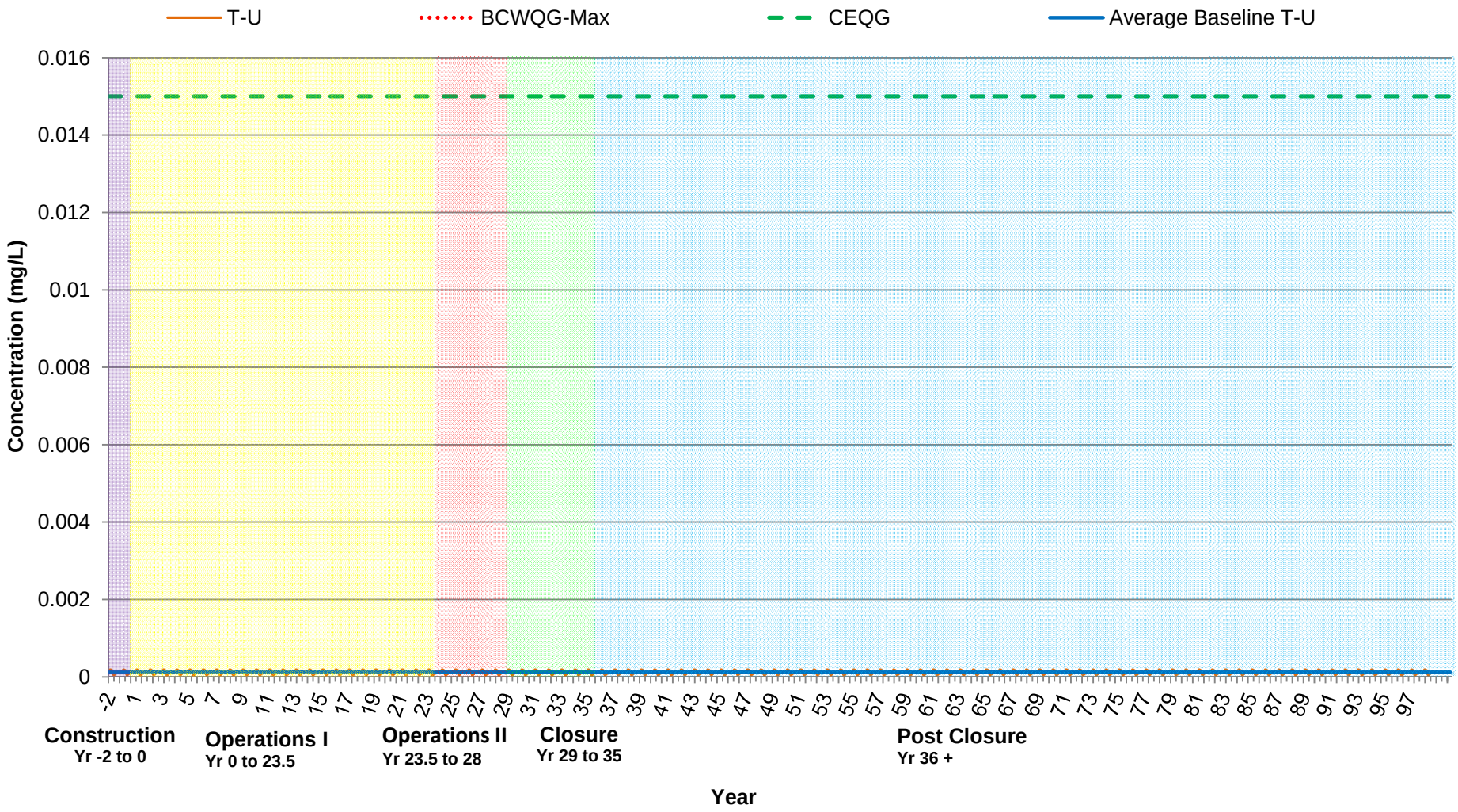
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G5.Ag

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. THE BCWQG-MAX (0.3 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE URANIUM CONCENTRATIONS - HARPER CREEK BELOW P-CREEK

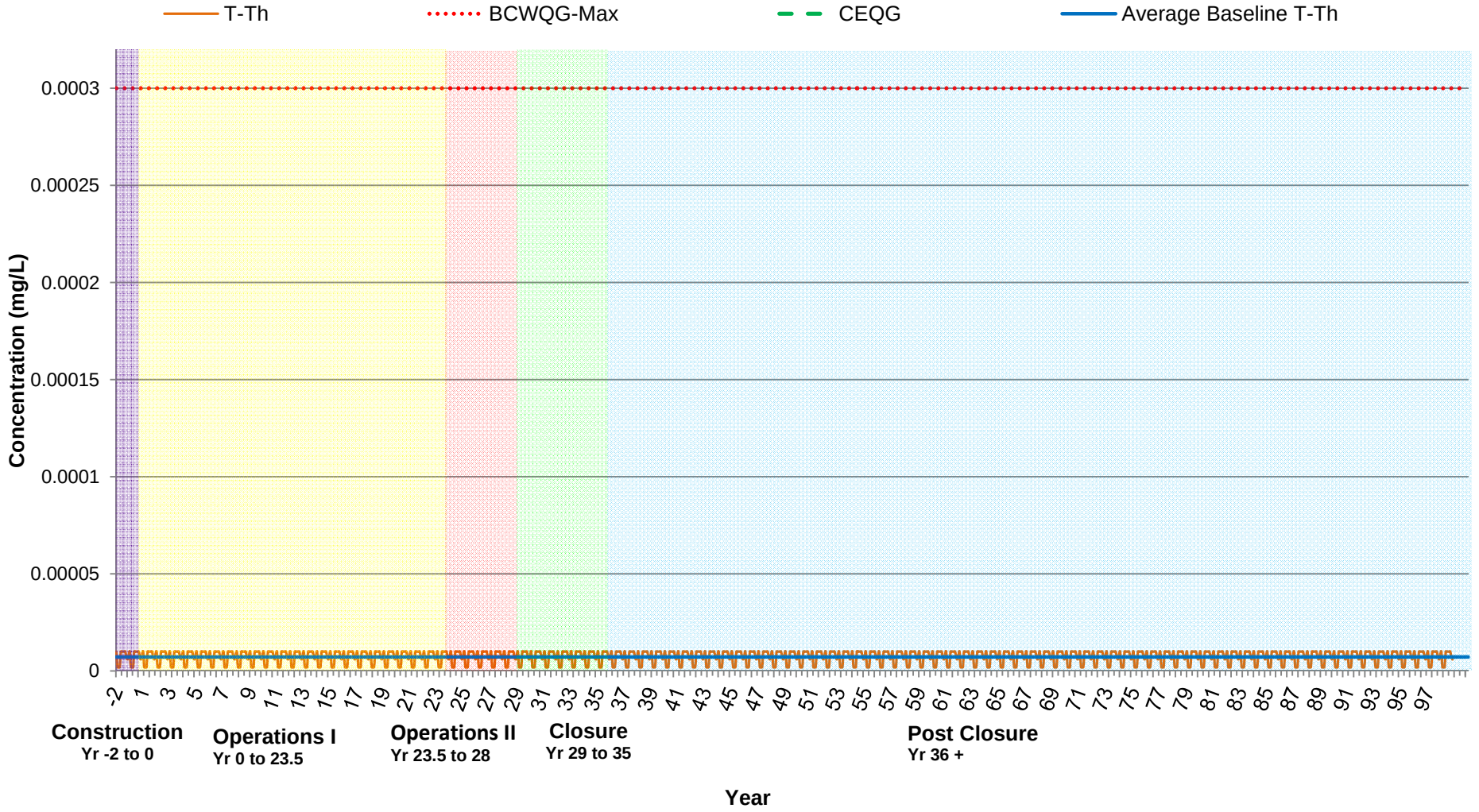
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G5.U

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. THE CEQG (0.0008 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE THALLIUM CONCENTRATIONS - HARPER CREEK BELOW P-CREEK

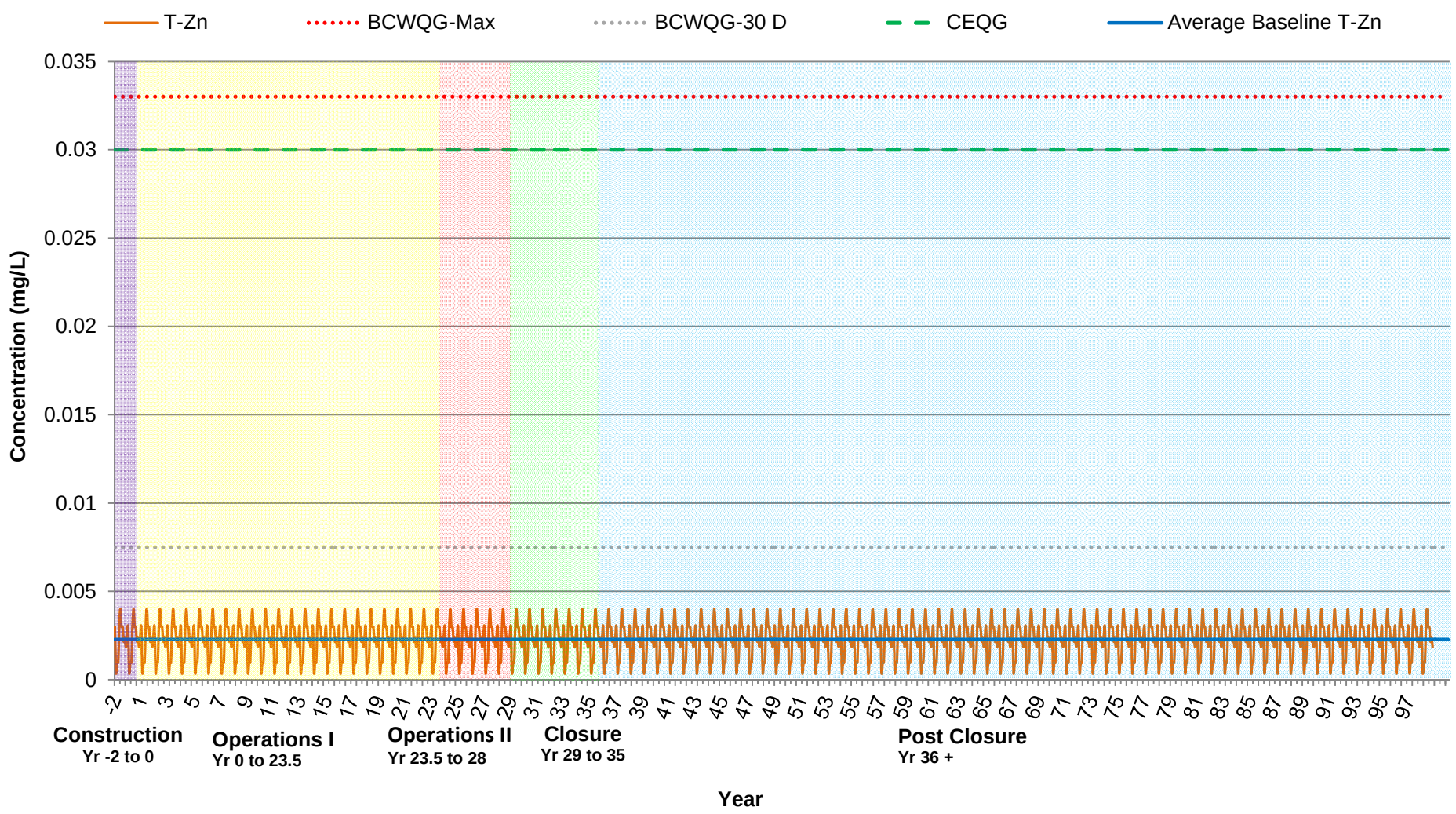
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G5.Th

REV 0



NOTES:

1. BCWQG-30 D AND BCWQG-MAX ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H4P (AVERAGE HARDNESS OF 68 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE ZINC CONCENTRATIONS - HARPER CREEK BELOW P-CREEK

Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G5.Zn

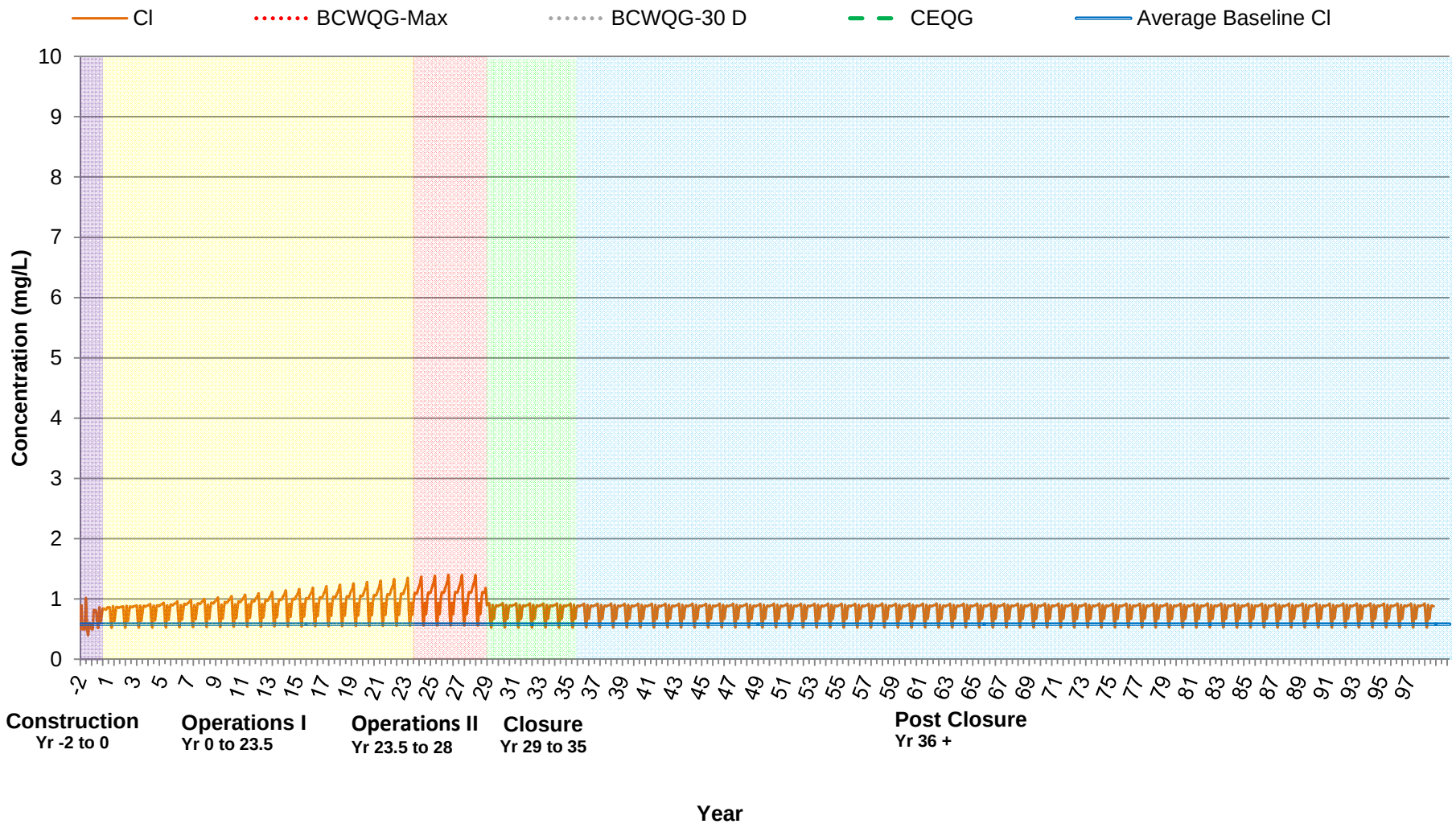
REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

APPENDIX G6

MID HARPER CREEK (HM)

(Pages G6-1 to G6-30)



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).
3. ALL GUIDELINES ARE NOT SHOWN: BCWQG-30 D (150 mg/L); BCWQG-MAX (600 mg/L); CEQG (120 mg/L AND 640 mg/L).

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE CHLORIDE CONCENTRATIONS - MID HARPER CREEK

Knight Piésold CONSULTING

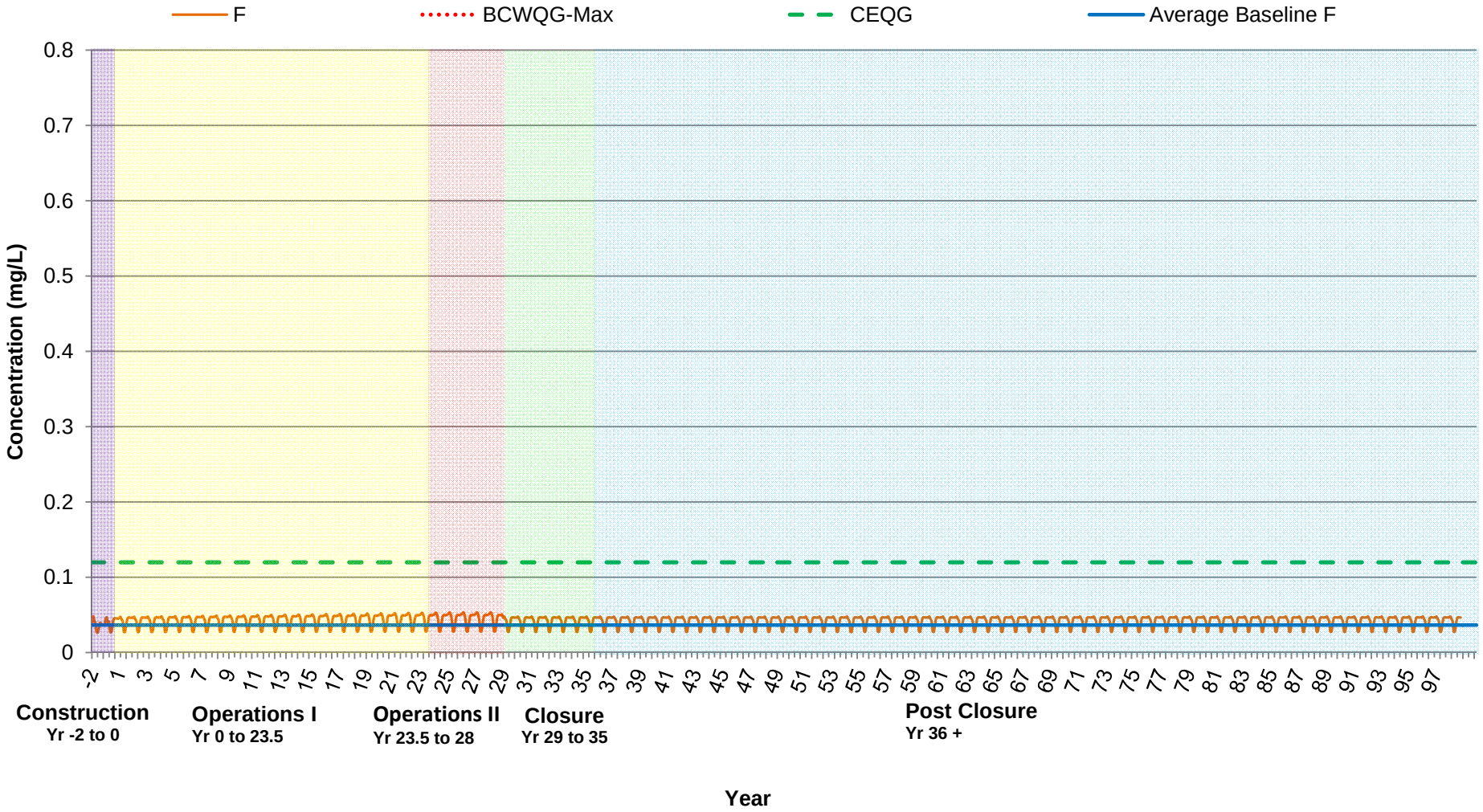
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G6.Cl

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX IS HARNDESS DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE FLUORIDE CONCENTRATIONS - MID HARPER CREEK

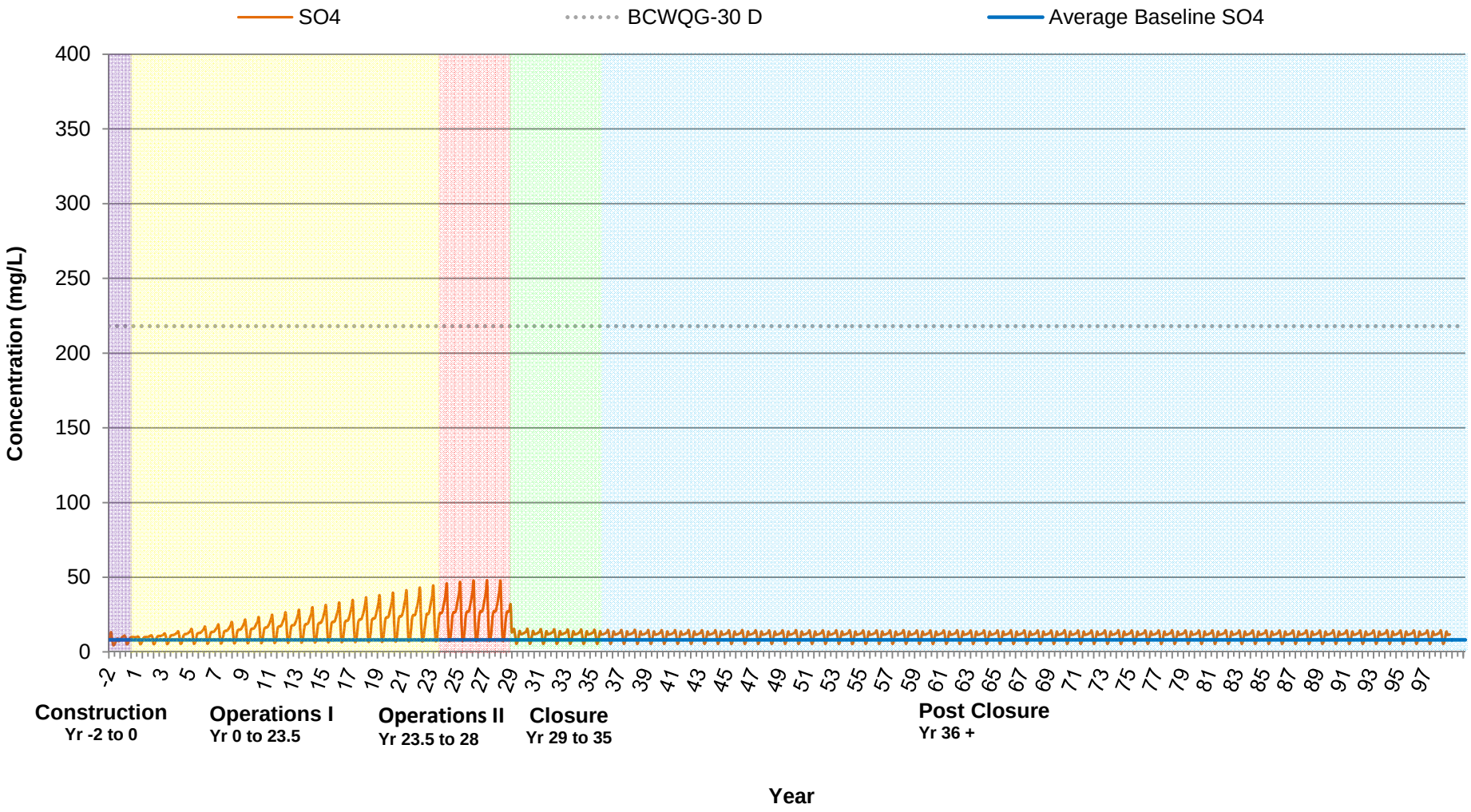
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P/A NO. VA101-458/14

REF. NO. 3

FIGURE G6.F

REV 0



NOTES:

1. BCWQG-30 D IS HARDNESS DEPEDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE SULPHATE CONCENTRATIONS - MID HARPER CREEK

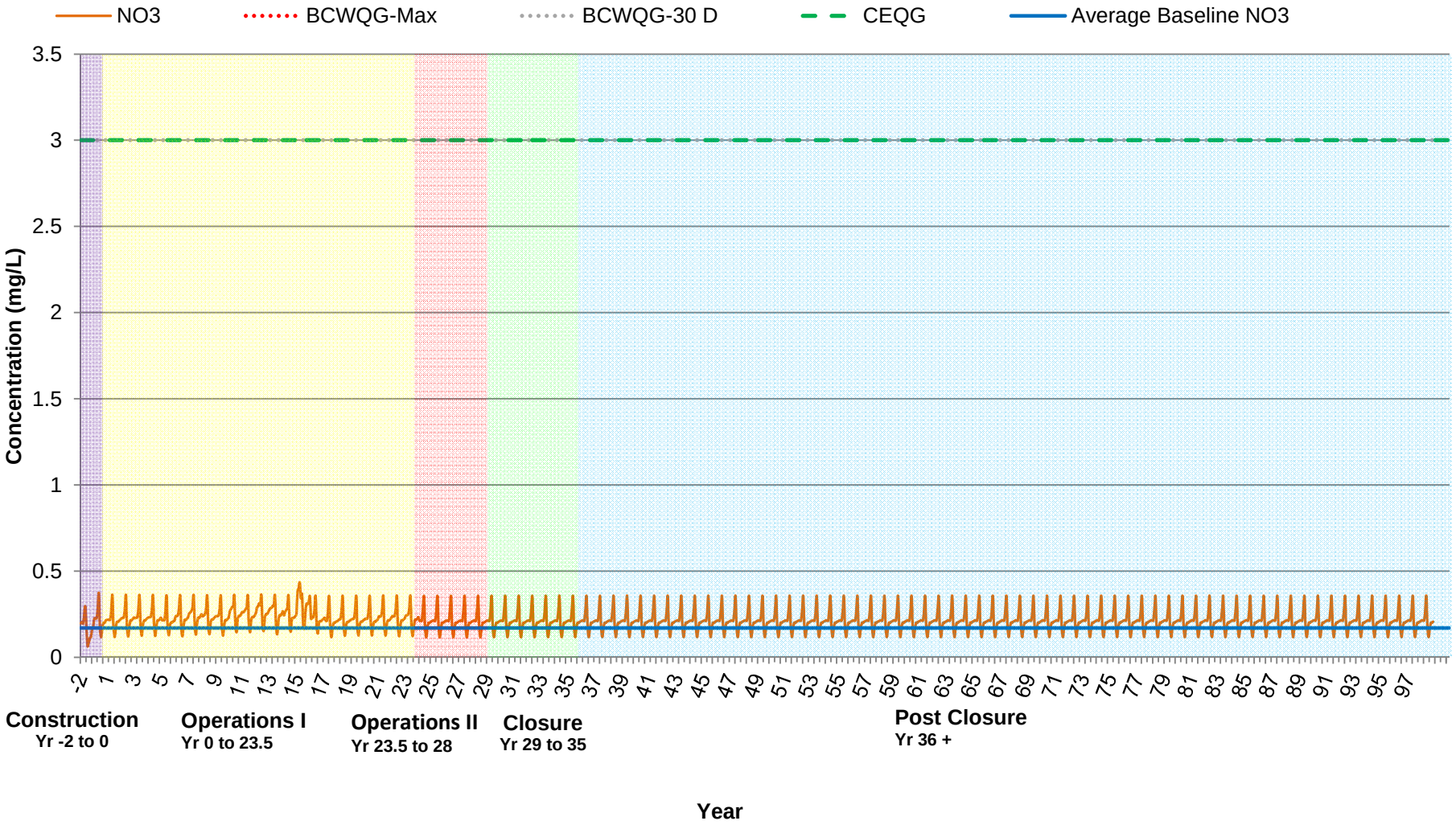
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G6.S04

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).
3. THE BCWQG-MAX (32.8 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE NITRATE CONCENTRATIONS - MID HARPER CREEK

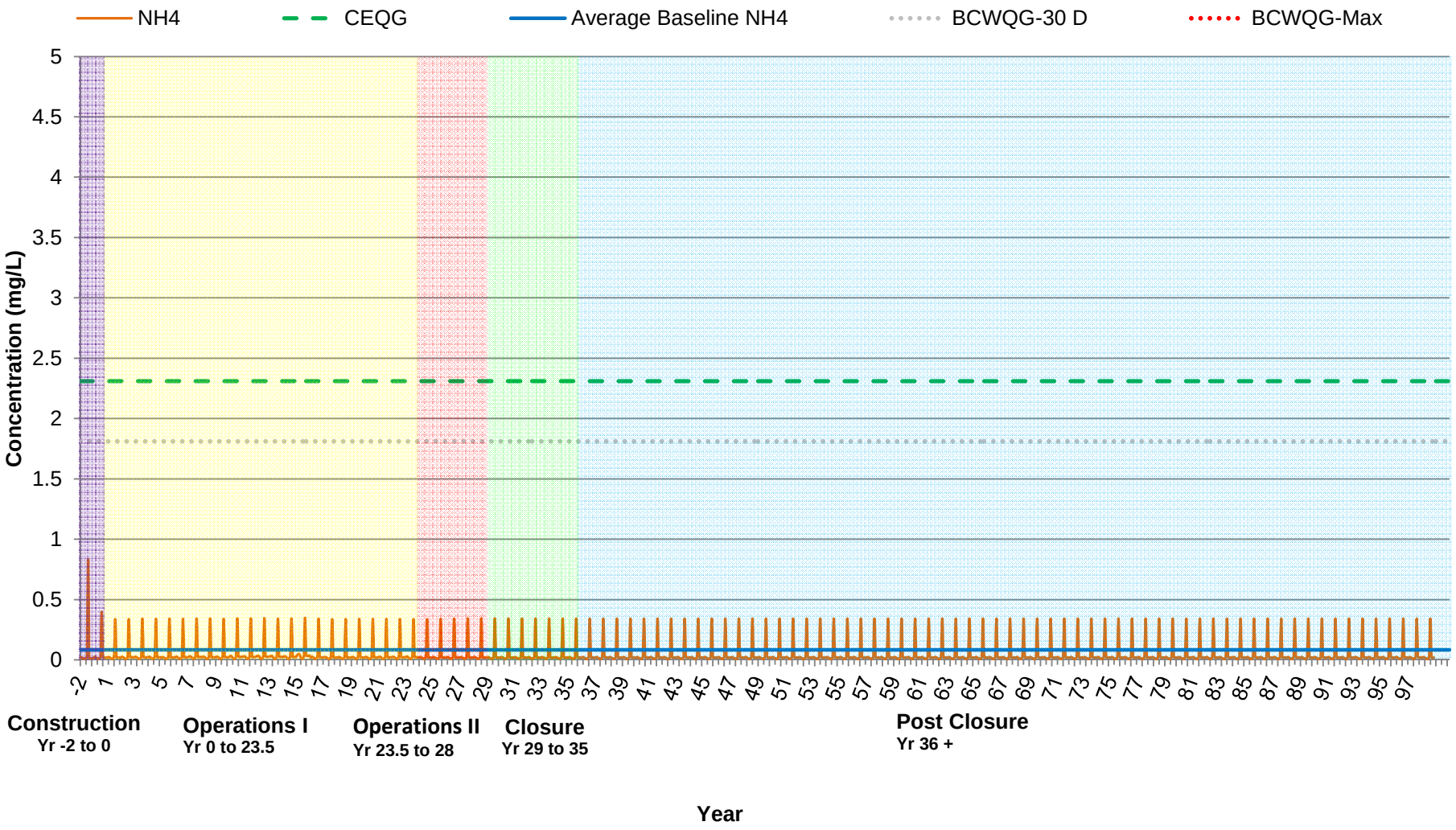
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G6.NO3

REV 0



NOTES:

1. THE BCWQG-30 D IS VALID FOR ONLY 6.5≤pH<9 AND 0°C≤T≤20°C.
2. THE BCWQG-MAX (20.15 mg/L) VALID FOR 6.5≤pH<9 IS NOT SHOWN.
3. THE CEQG IS TO BE USED WITH CAUTION FOR WATER WITH T<5°C AND pH>9.
4. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE AMMONIA CONCENTRATIONS - MID HARPER CREEK

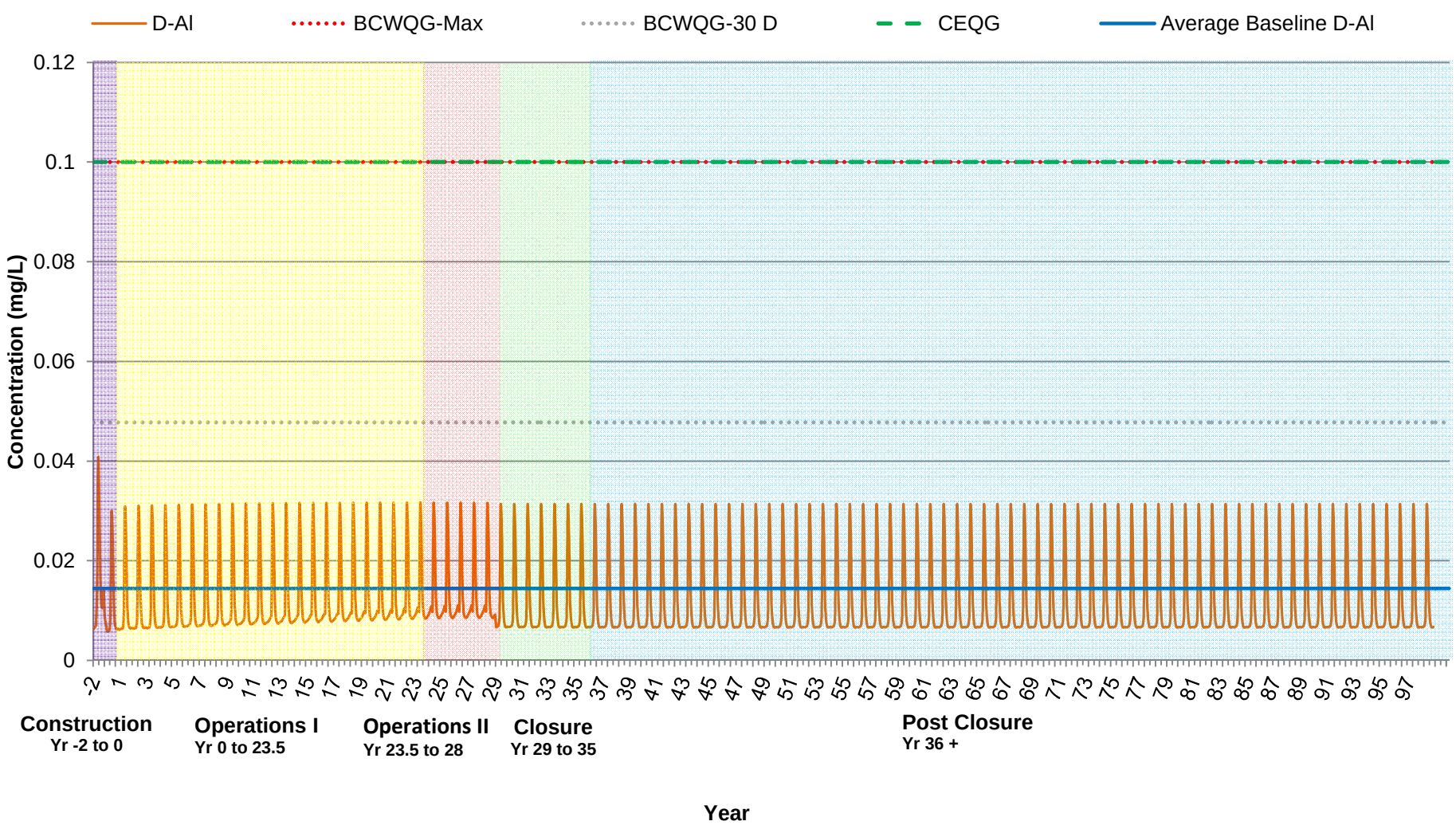
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G6.NH4

REV 0



NOTES:

1. ALL GUIDELINES ARE pH-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).
3. AVERAGE BASELINE pH USED TO CALCULATE GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE DISSOLVED ALUMINUM CONCENTRATIONS - MID HARPER CREEK

Knight Piésold CONSULTING

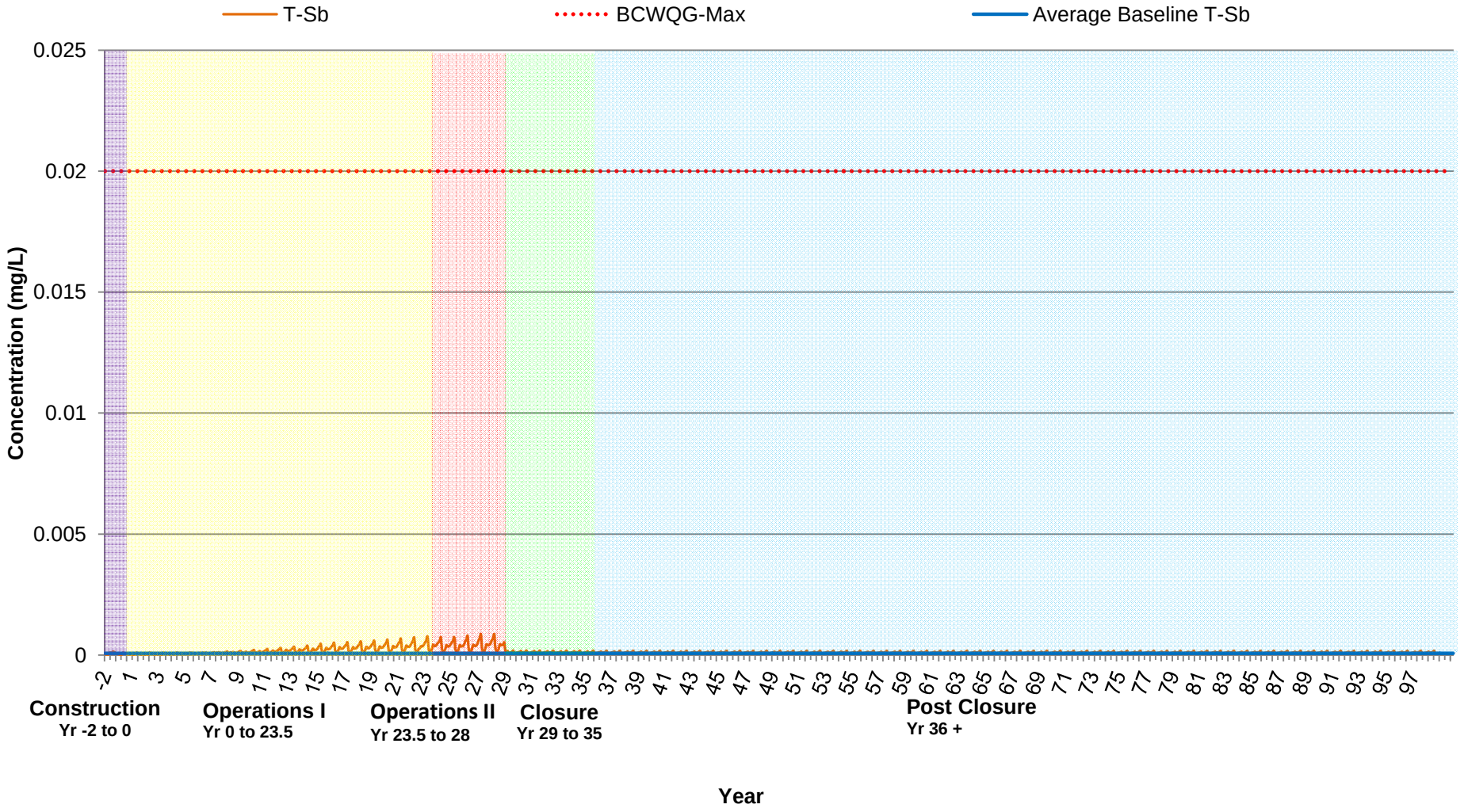
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G6.Al

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE ANTIMONY CONCENTRATIONS - MID HARPER CREEK

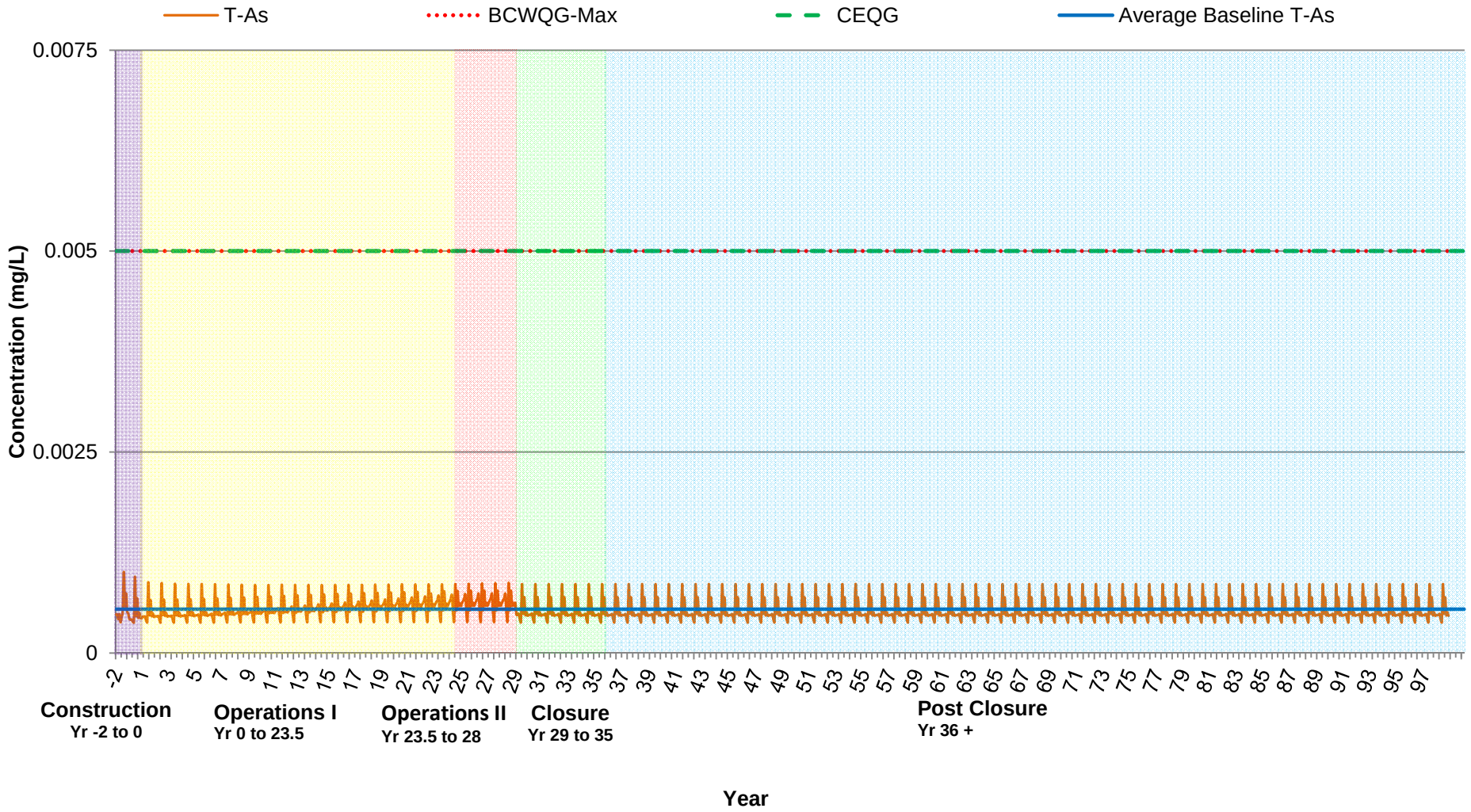
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G6.Sb

REV 0



NOTES:

1. THE BCWQG AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE ARSENIC CONCENTRATIONS - MID HARPER CREEK

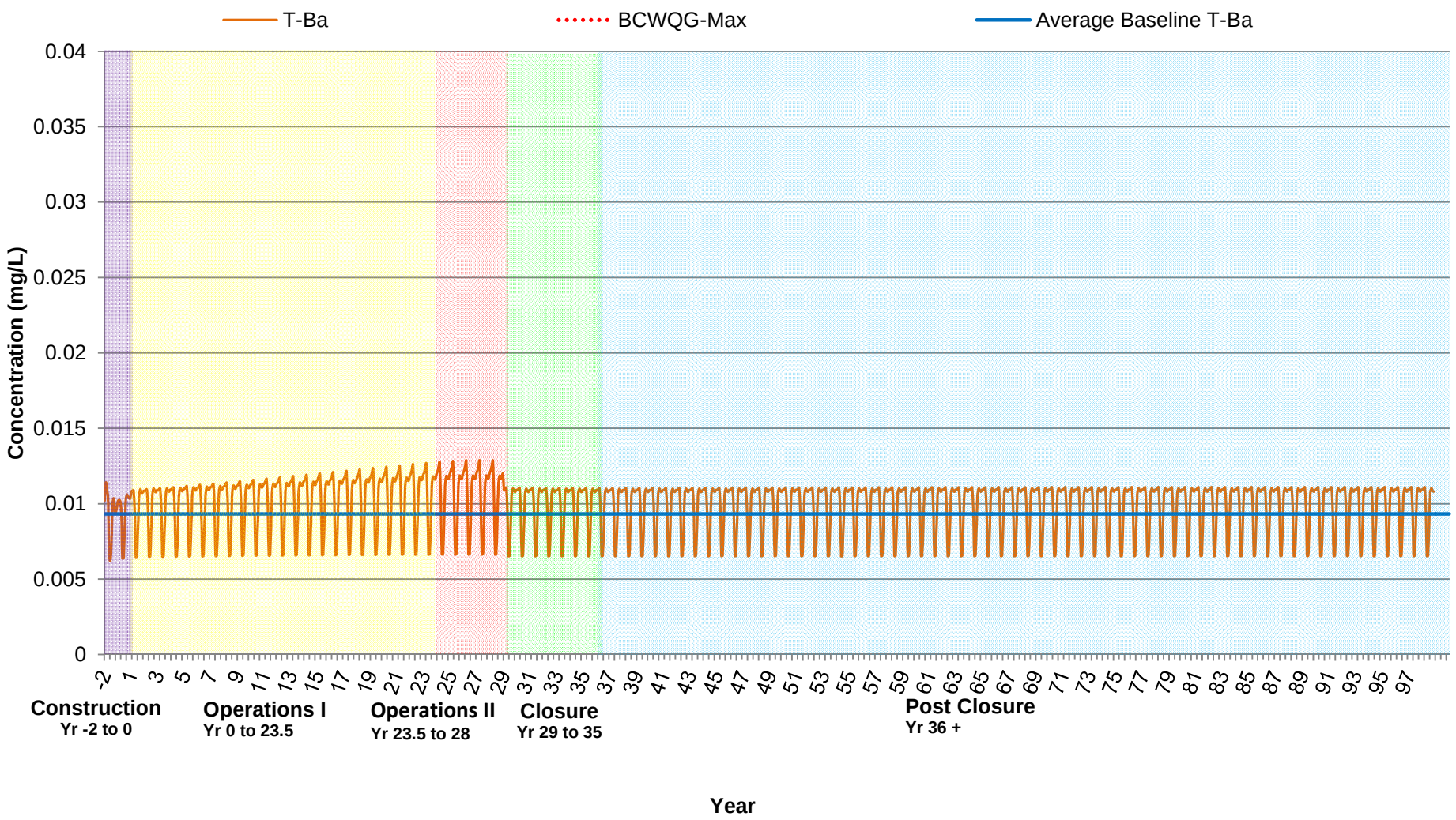
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G6.As

REV 0



NOTES:

1. THE BCWQG-MAX IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).
3. THE BCWQG-30 D (1 mg/L) AND BCWQG-MAX (5 mg/L) ARE NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE BARIUM CONCENTRATIONS - MID HARPER CREEK

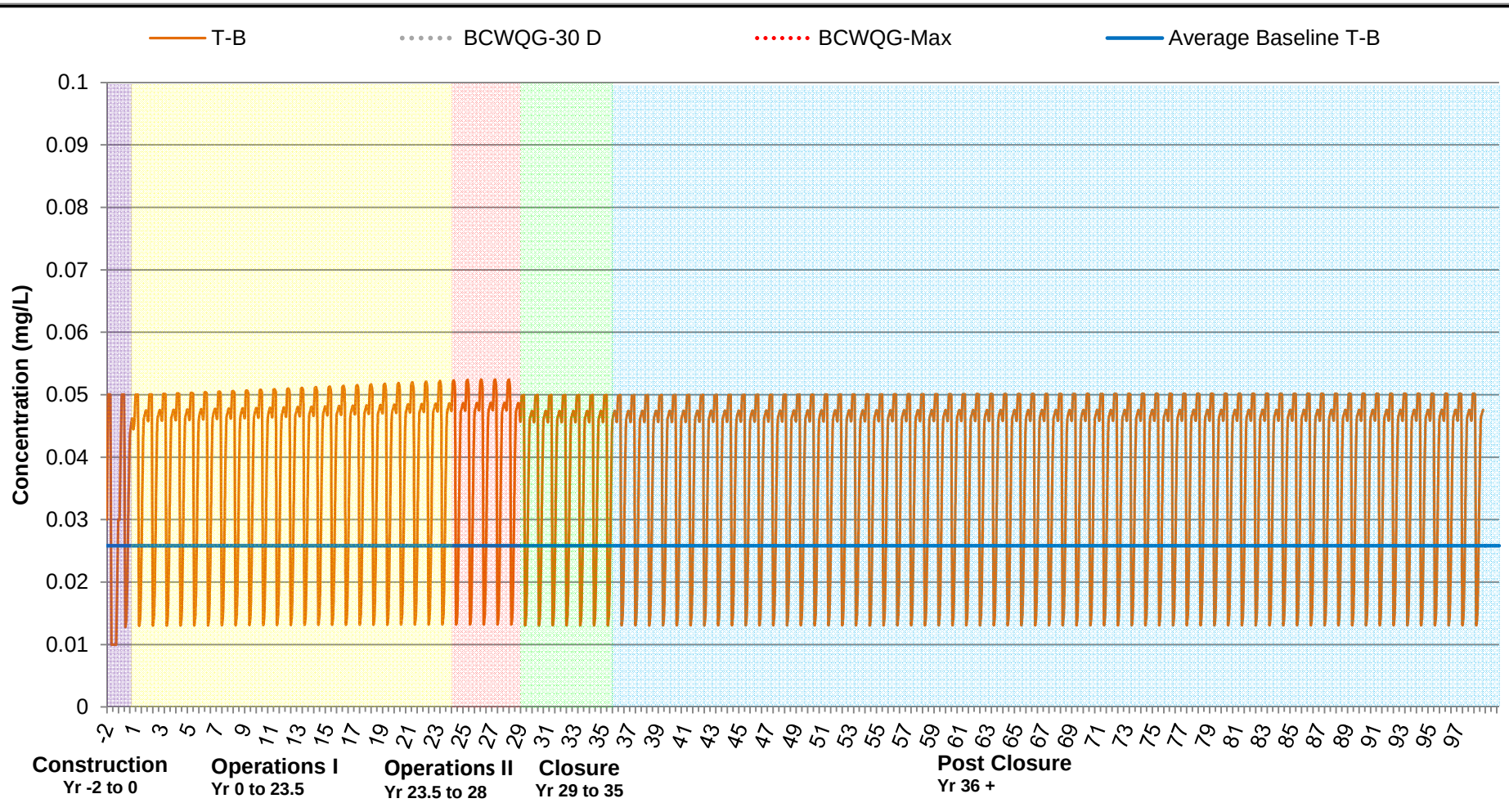
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G6.Ba

REV 0



NOTES:

1. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.
3. THE BCWQG-MAX (1.2 mg/L) IS NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE BORON CONCENTRATIONS - MID HARPER CREEK

Knight Piésold CONSULTING

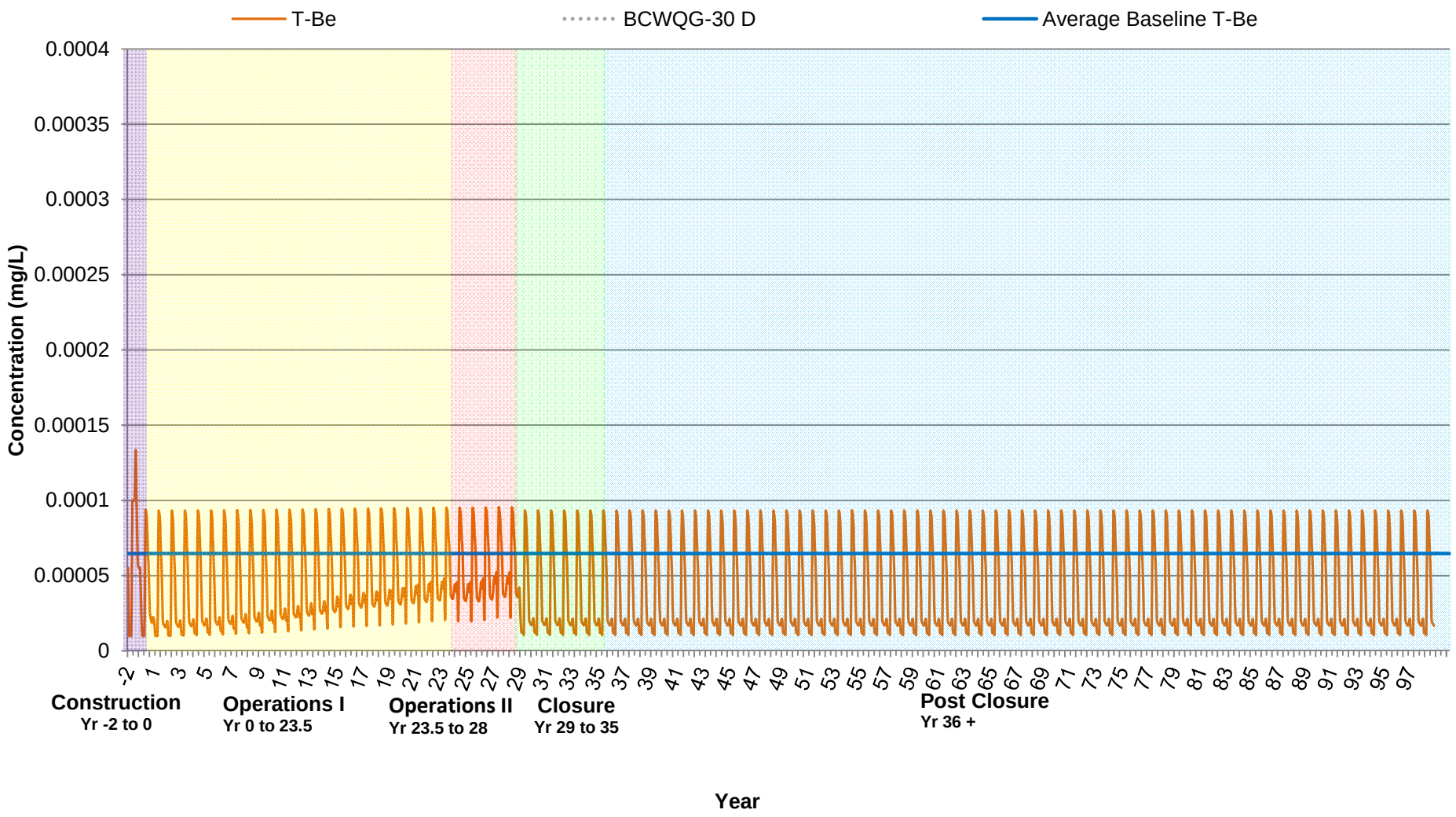
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G6.B

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).
3. THE BCWQG-30 D (0.0053 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE BERYILLIUM CONCENTRATIONS - MID HARPER CREEK

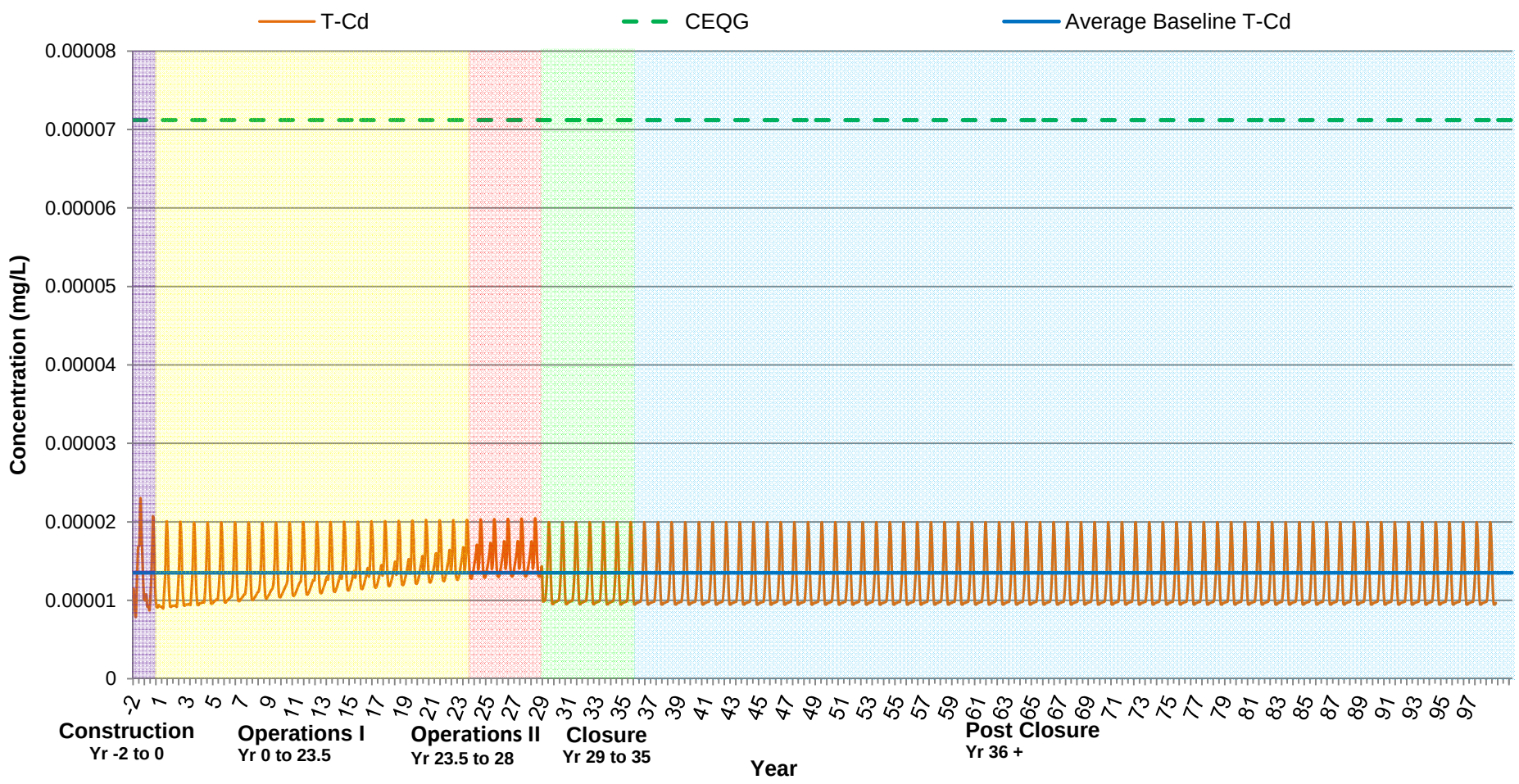
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G6.Be

REV 0



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. THE BCWQG ARE DRAFT GUIDELINES UNDER REVIEW (JUNE 2014).
3. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).
4. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE CADMIUM CONCENTRATIONS - MID HARPER CREEK

Knight Piésold CONSULTING

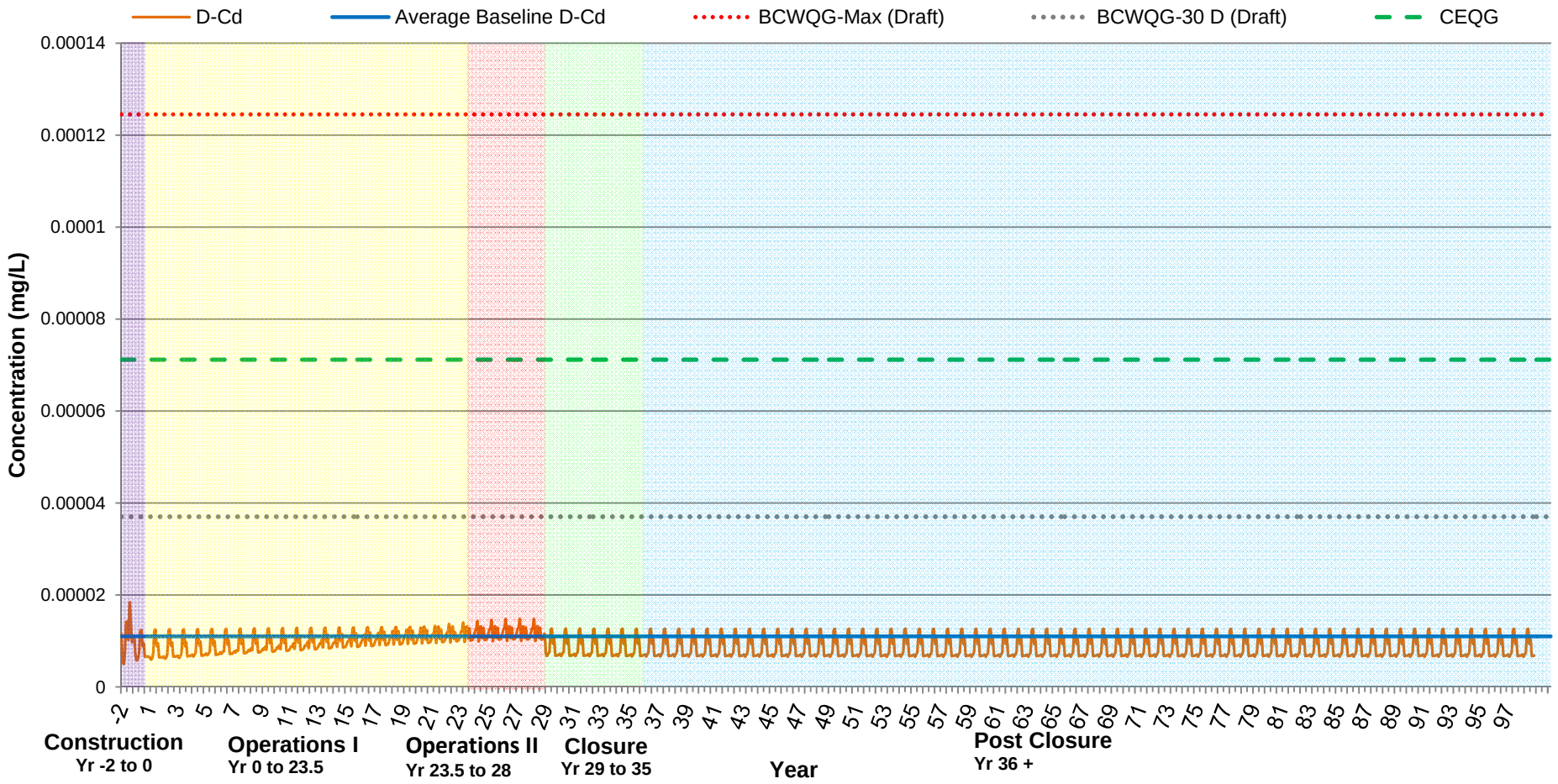
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G6.Cd-T

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE CADMIUM CONCENTRATIONS - MID HARPER CREEK

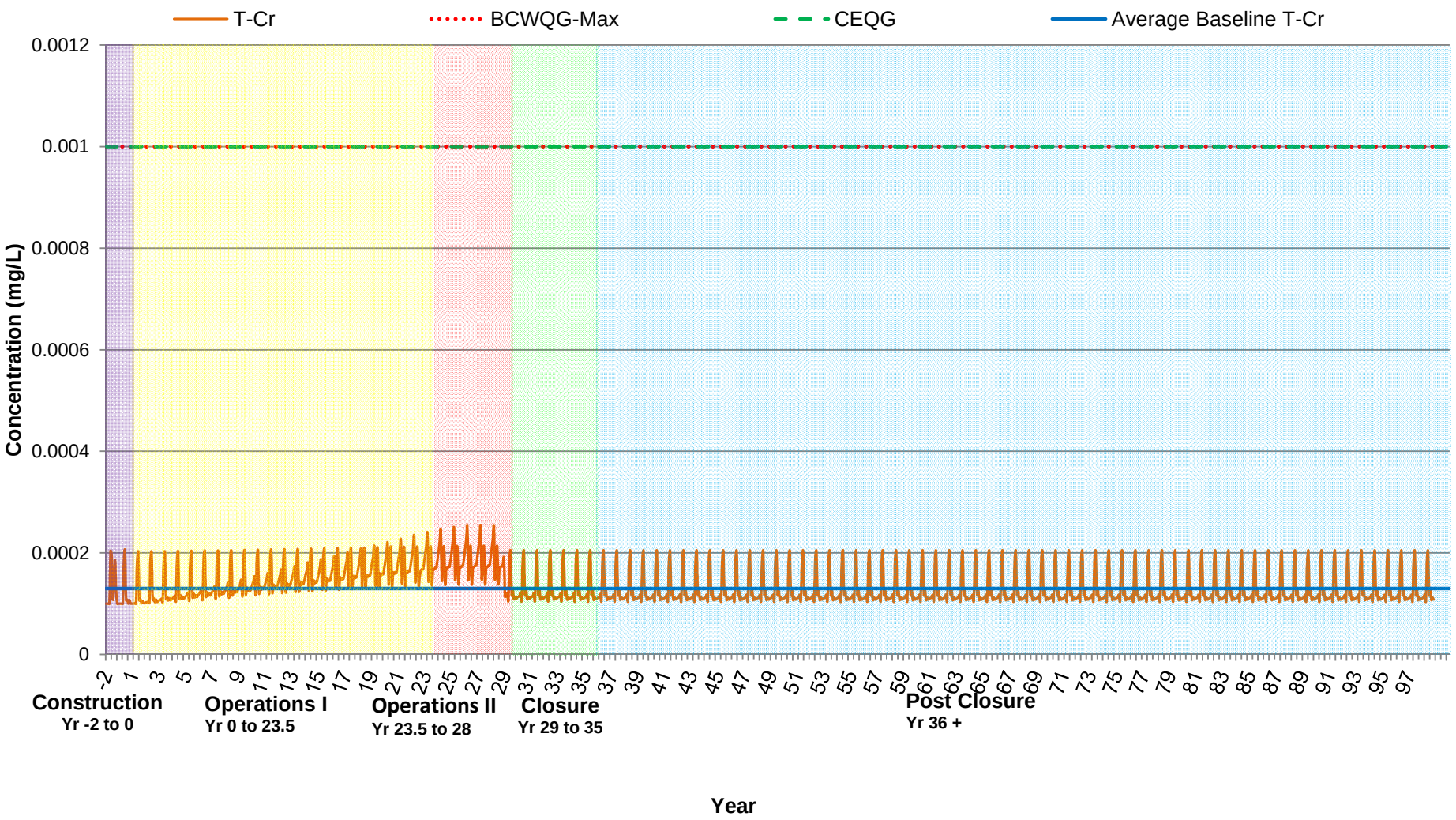
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G6.Cd-D

REV 0



NOTES:

1. GUIDELINES ARE FOR CHROMIUM (IV), THE SPECIES MOST COMMON IN WELL OXYGENATED SURFACE WATERS.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE CHROMIUM CONCENTRATIONS - MID HARPER CREEK

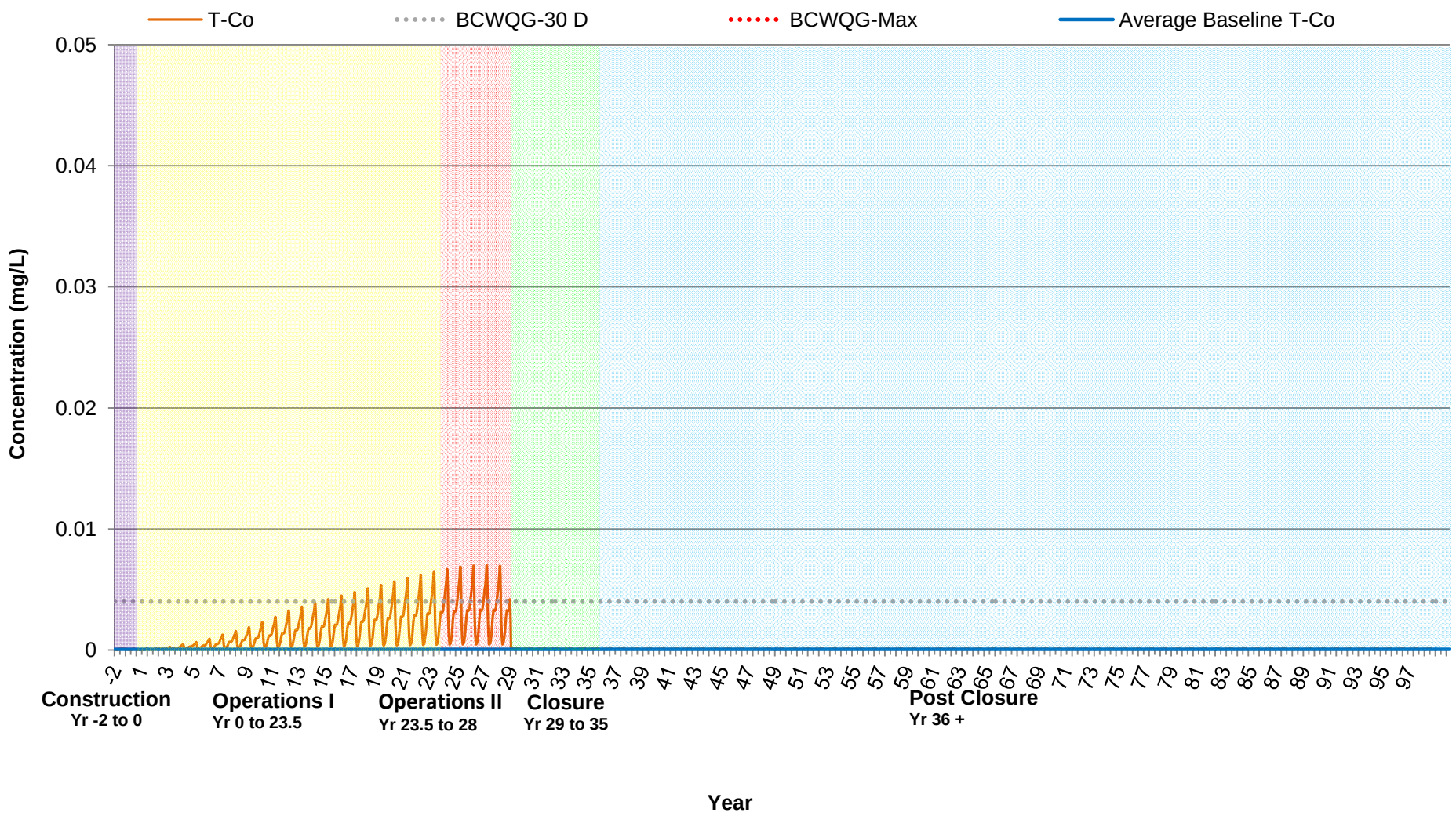
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G6.Cr

REV 0



NOTES:

1. THE BCWQG-30 D AND BCWQG-MAX ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).
3. THE BCWQG-MAX GUIDELINE (0.11 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE COBALT CONCENTRATIONS - MID HARPER CREEK

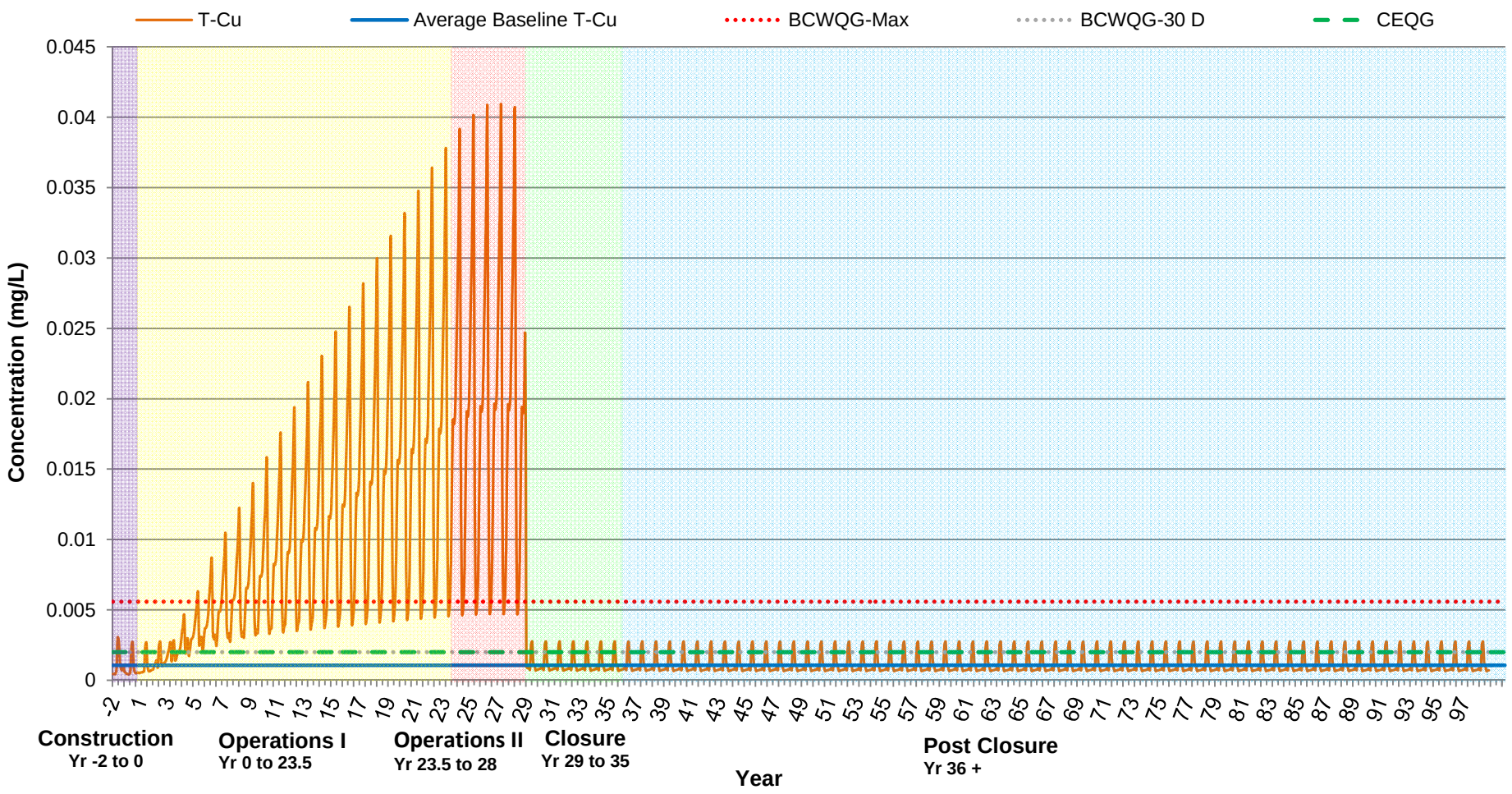
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G6.Co

REV 0



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE COPPER CONCENTRATIONS - MID HARPER CREEK

Knight Piésold CONSULTING

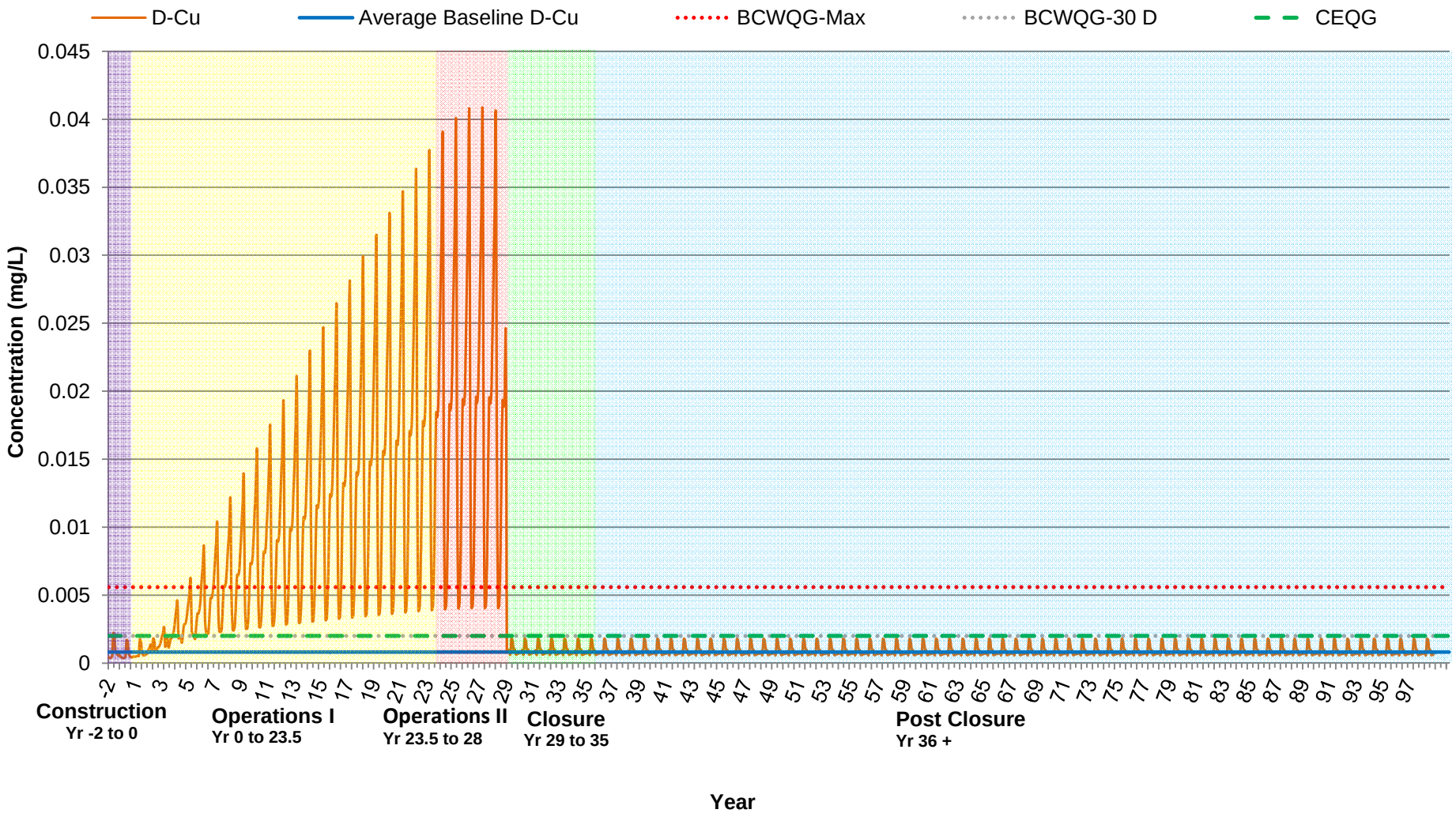
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G6.Cu-T

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE COPPER CONCENTRATIONS - MID HARPER CREEK

Knight Piésold CONSULTING

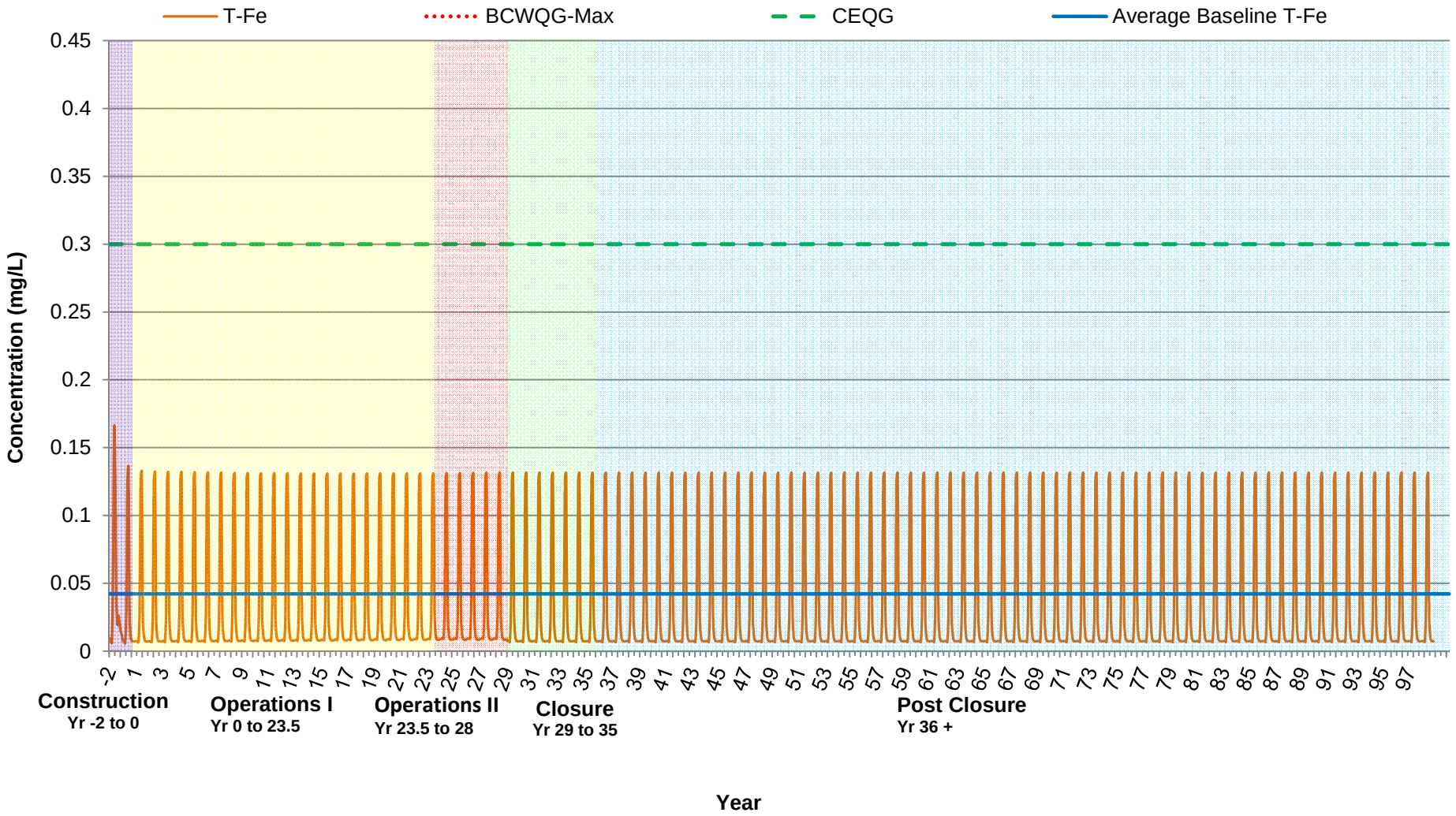
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G6.Cu-D

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).
3. BCWQG-MAX 1.0 mg/L IS NOT SHOWN ON GRAPH.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE TOTAL IRON CONCENTRATIONS - MID HARPER CREEK

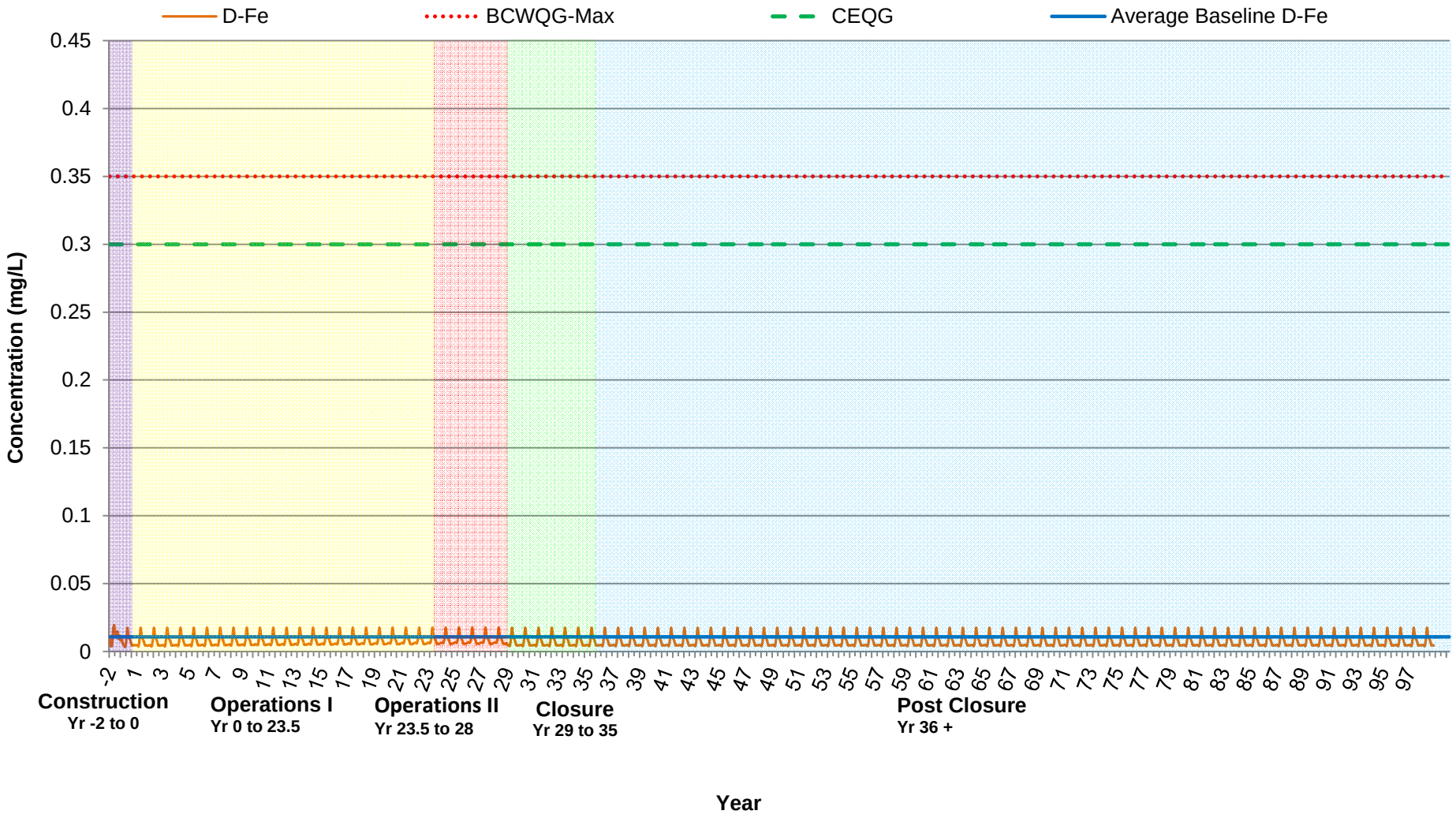
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G6.Fe-T

REV 0



NOTES:

1. THE BCWQG-MAX AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE DISSOLVED IRON CONCENTRATIONS - MID HARPER CREEK

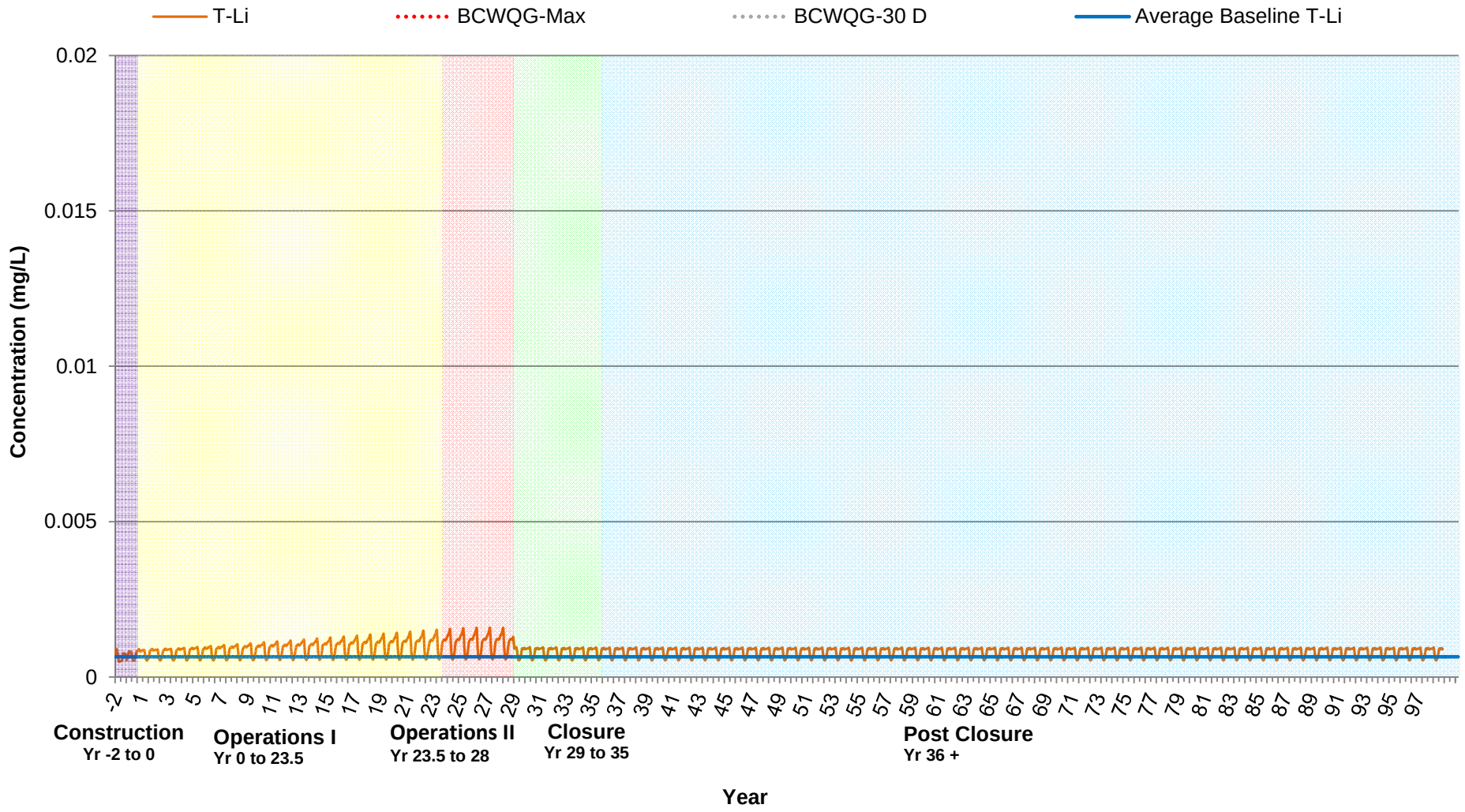
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G6.Fe-D

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).
3. THE BCWQG-30 D (0.096 mg/L) AND BCWQG-MAX (0.87 mg/L) ARE INTERIM (WORKING) AND ARE NOT SHOWN ON GRAPH.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE LITHIUM CONCENTRATIONS - MID HARPER CREEK

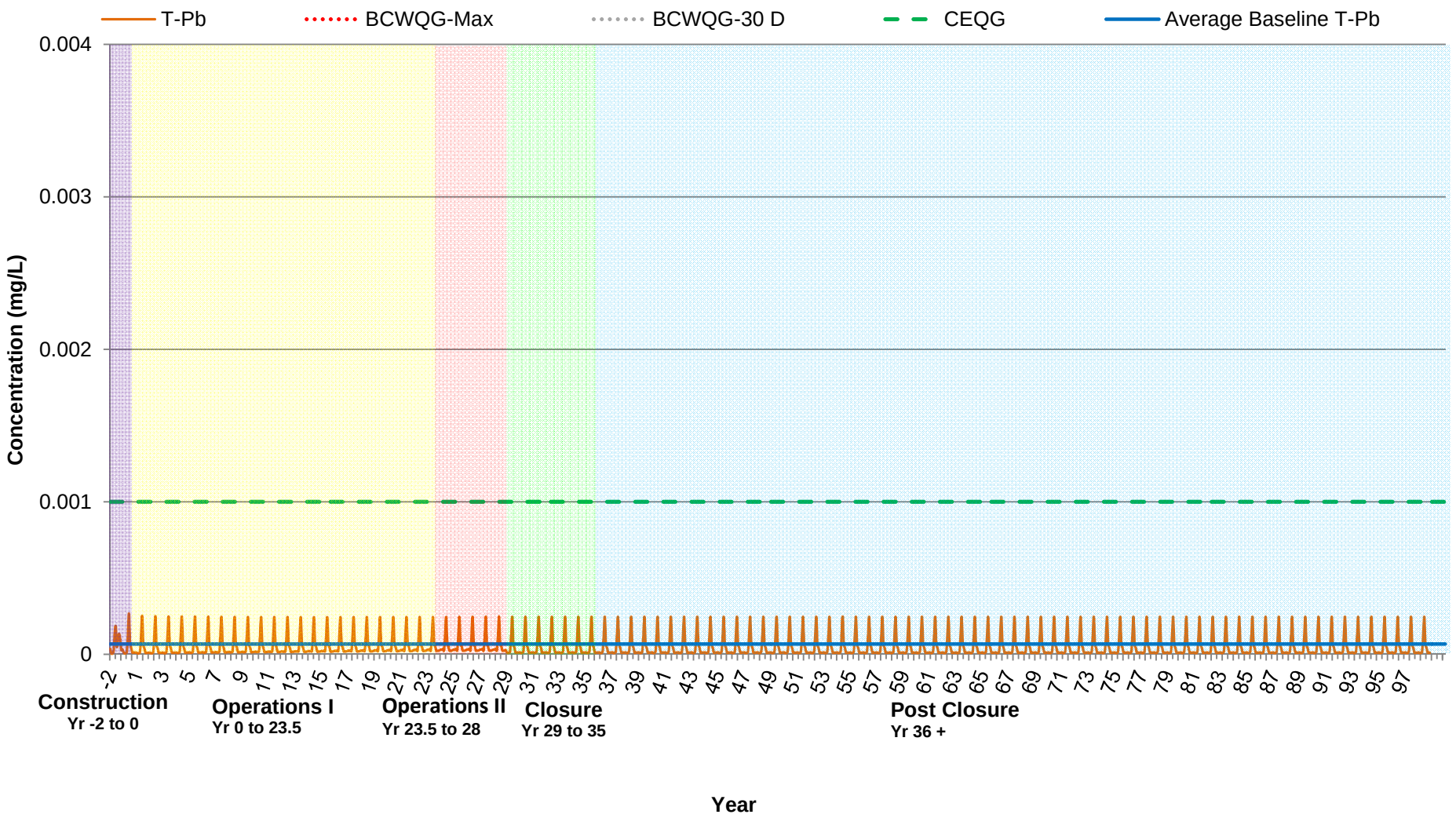
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G6.Li

REV 0



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.
4. THE BCWQG-MAX (CALCULATED AT 0.011 mg/L) IS NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE LEAD CONCENTRATIONS - MID HARPER CREEK

Knight Piésold CONSULTING

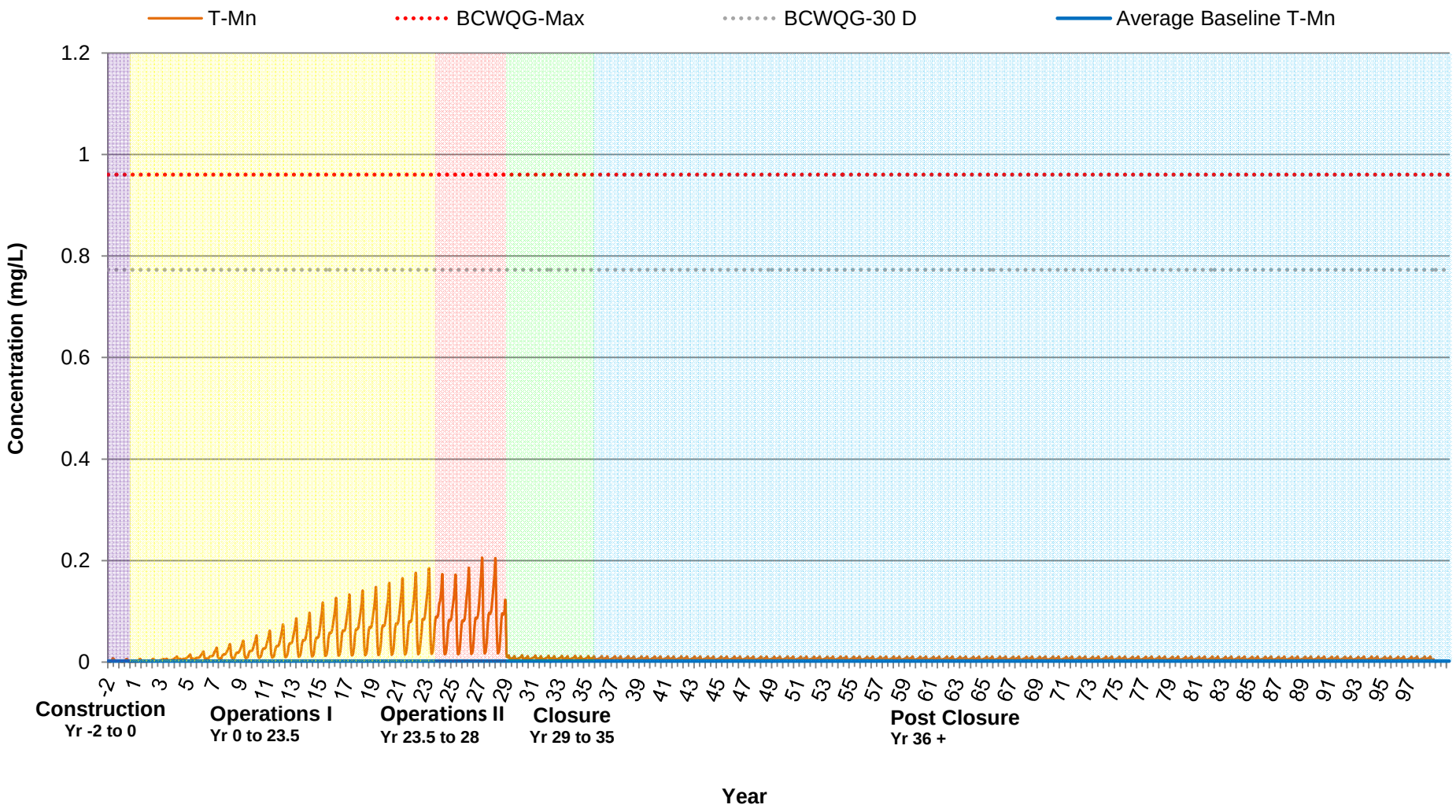
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G6.Pb

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE MANGANESE CONCENTRATIONS - MID HARPER CREEK

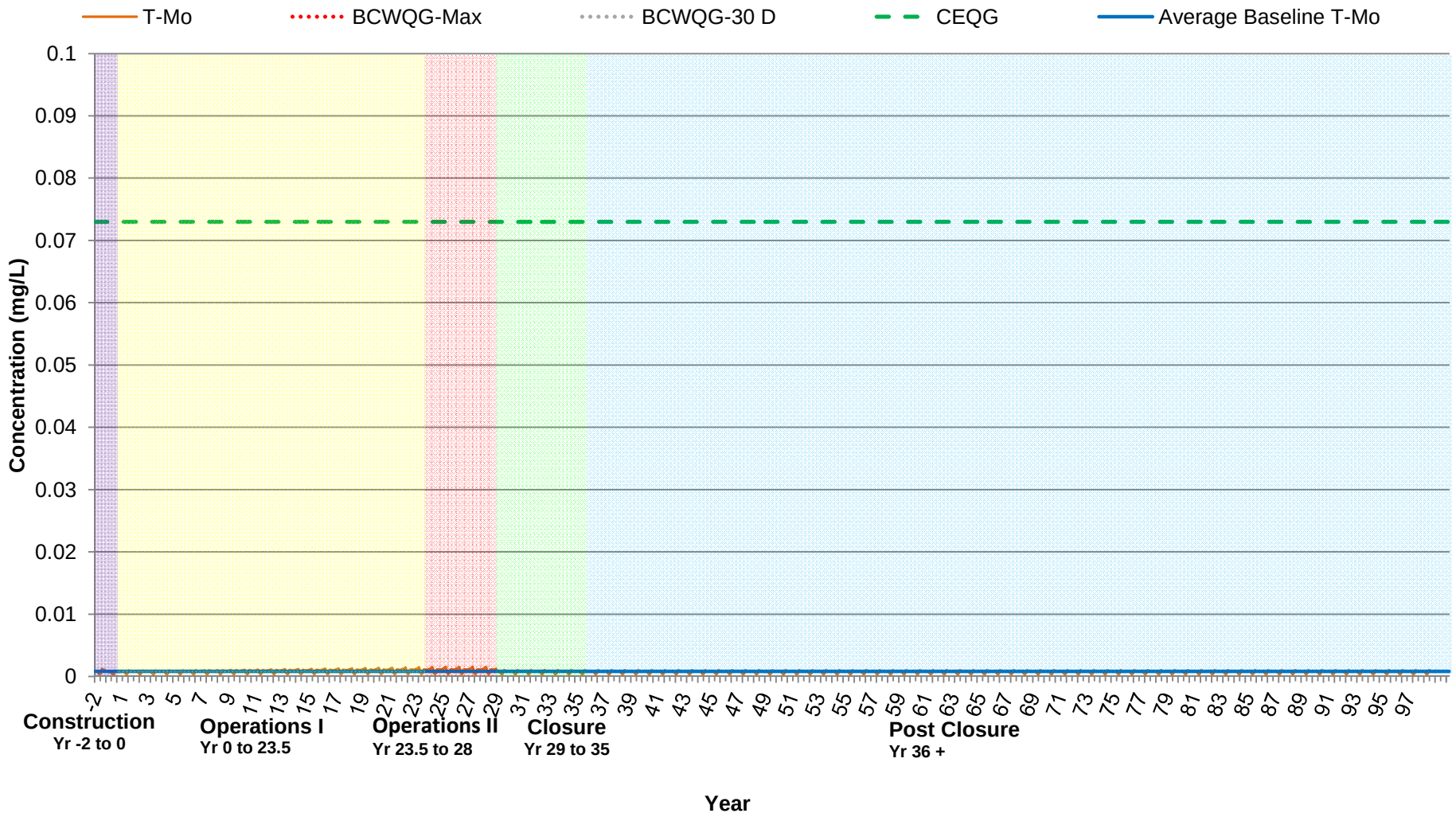
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G6.Mn

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).
3. THE BCWQG-MAX (2 mg/L) AND BCWQG-30 D (1 mg/L) ARE NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE MOLYDBENUM CONCENTRATIONS - MID HARPER CREEK

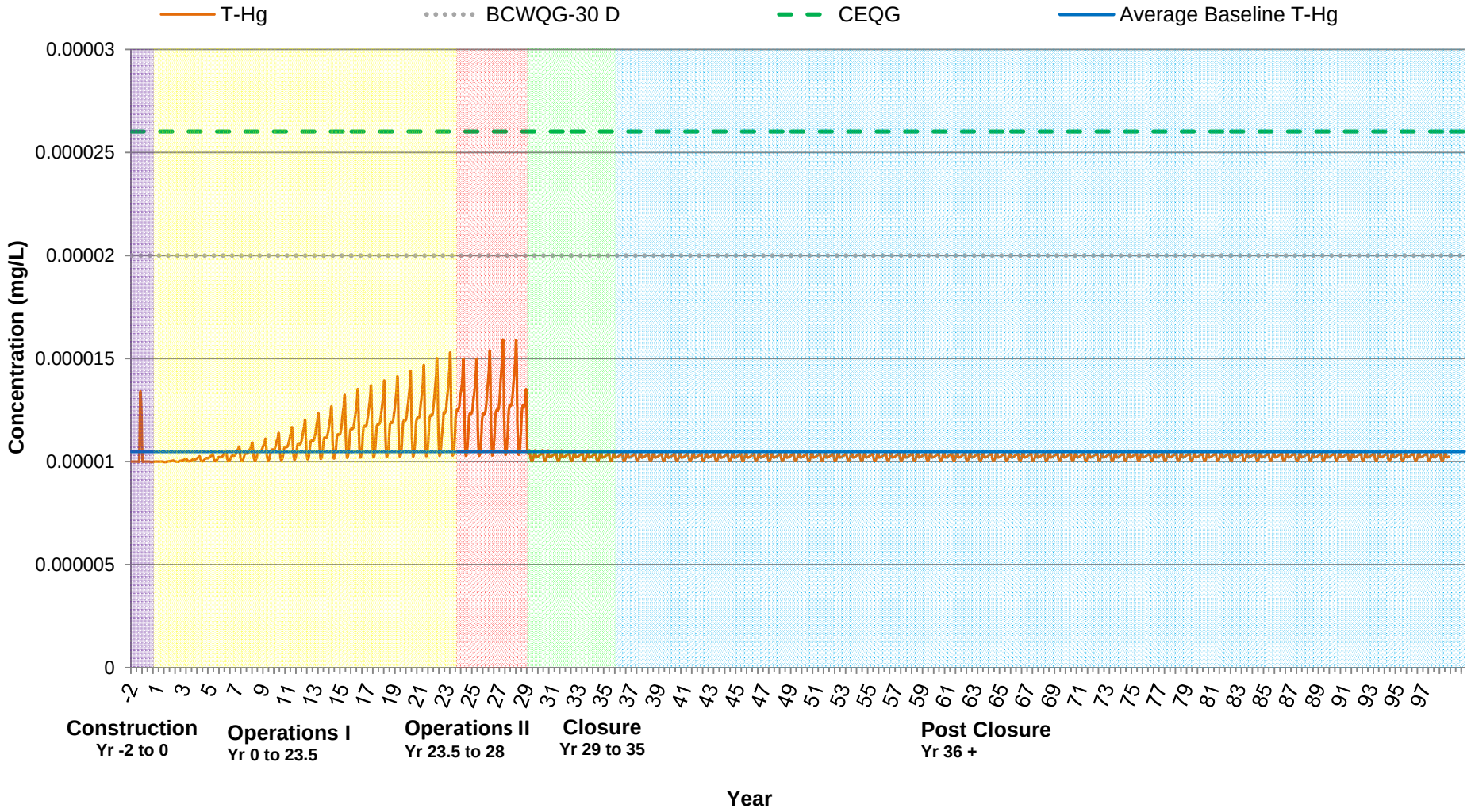
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G6.Mo

REV 0



NOTES:

1. THE BCWQG-30 D AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).
3. BCWQG-30 D VALUE APPLIED ON ASSUMPTION THAT METHYL-Hg IS EQUAL TO 0.5% OF T-Hg.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE MERCURY CONCENTRATIONS - MID HARPER CREEK

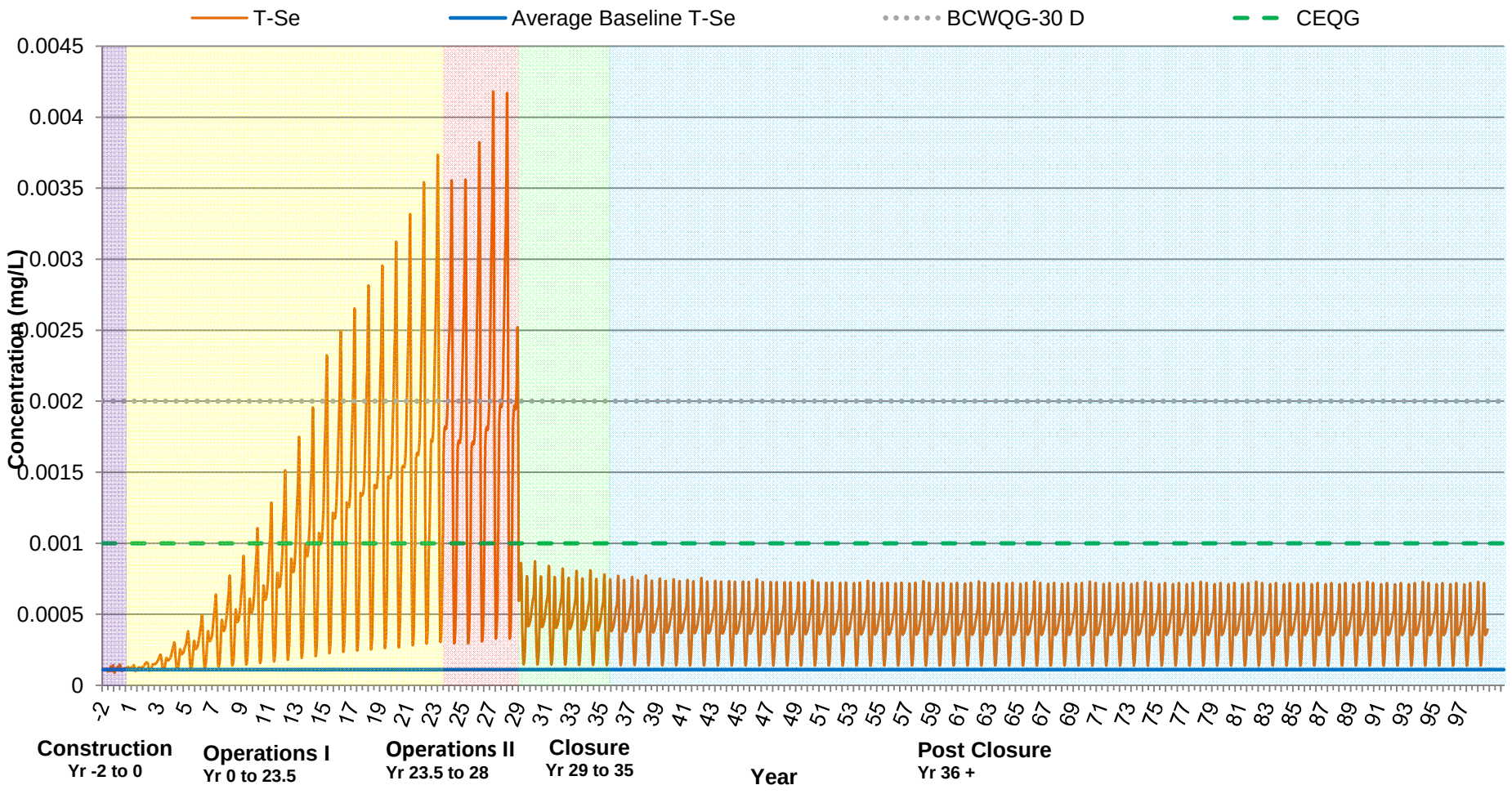
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G6.Hg

REV 0



NOTES:

1. THE BCWQG-30 D AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE SELENIUM CONCENTRATIONS - MID HARPER CREEK

Knight Piésold CONSULTING

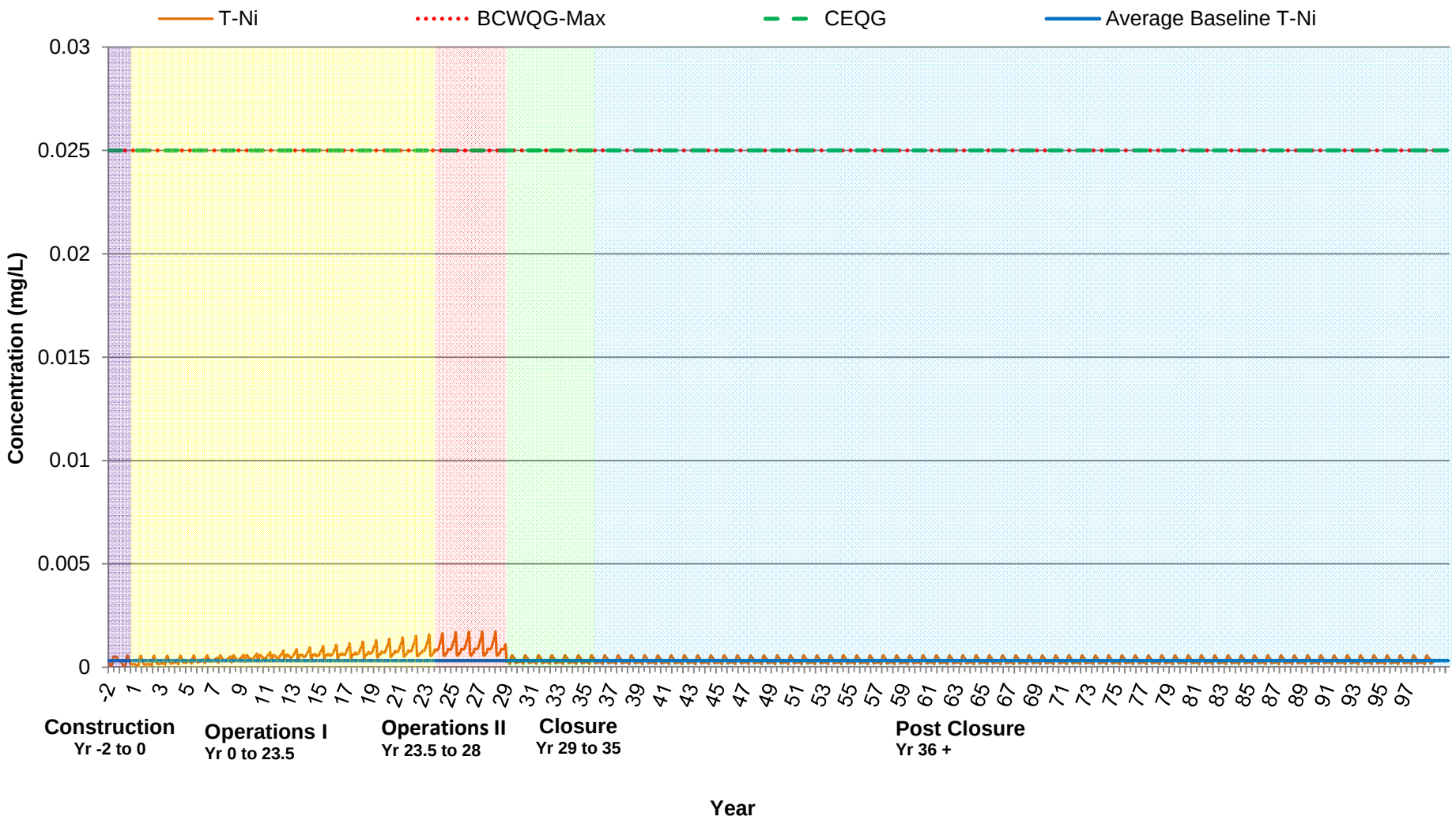
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G6.Se

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE NICKEL CONCENTRATIONS - MID HARPER CREEK

Knight Piésold CONSULTING

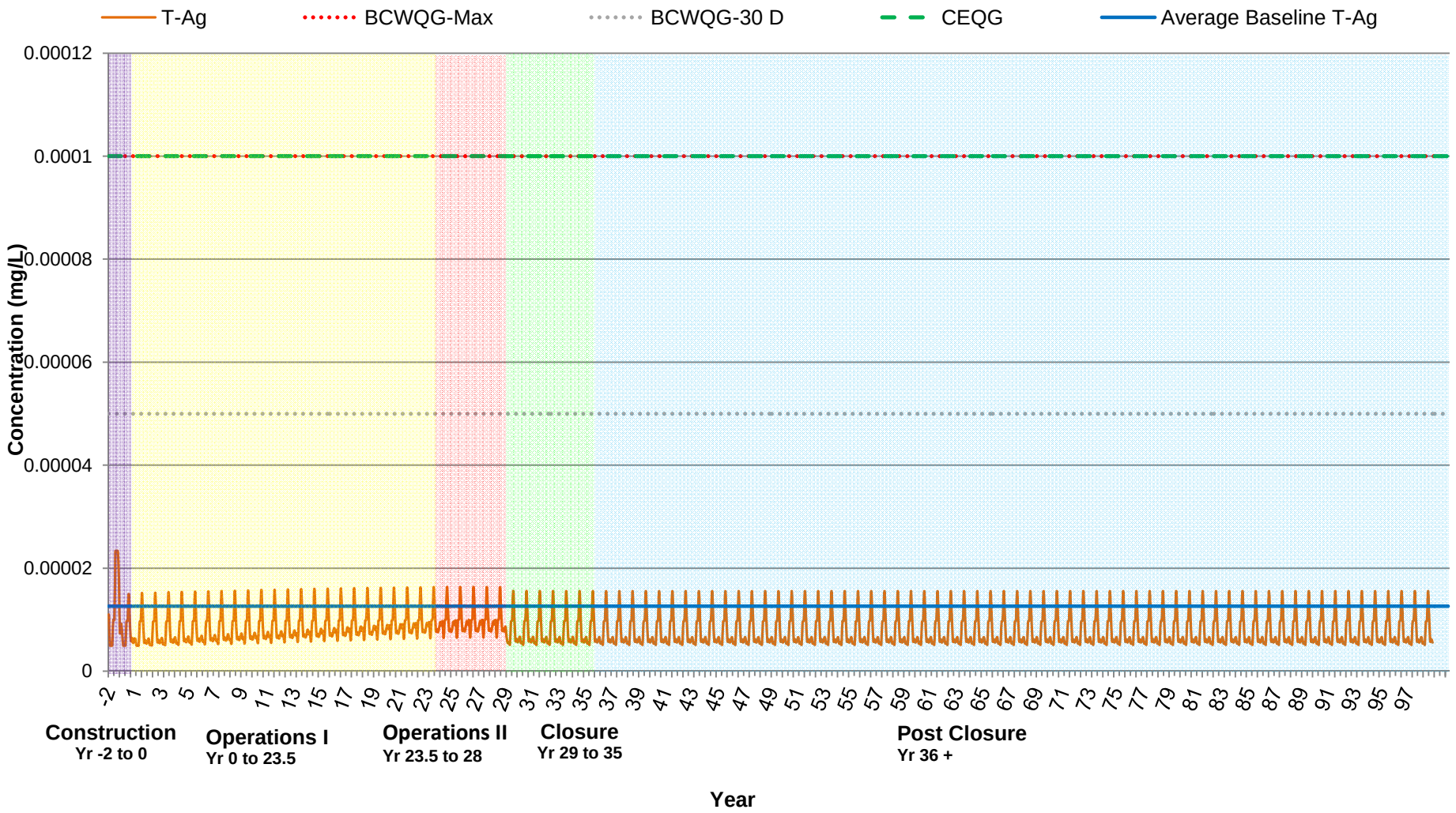
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G6.Ni

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-30 D AND BCWQG-MAX ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE SILVER CONCENTRATIONS - MID HARPER CREEK

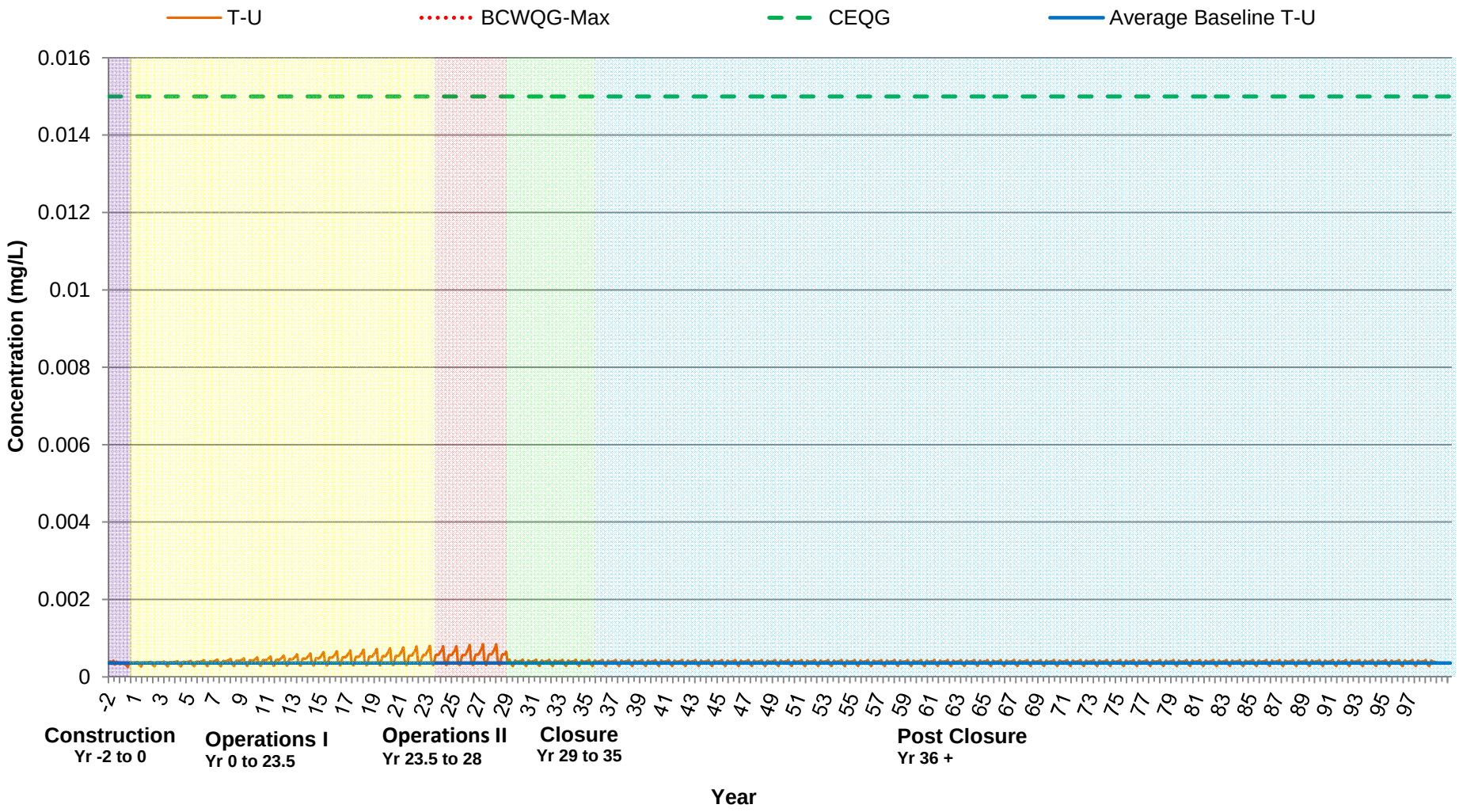
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G6.Ag

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).
3. THE BCWQG-MAX (0.3 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE URANIUM CONCENTRATIONS - MID HARPER CREEK

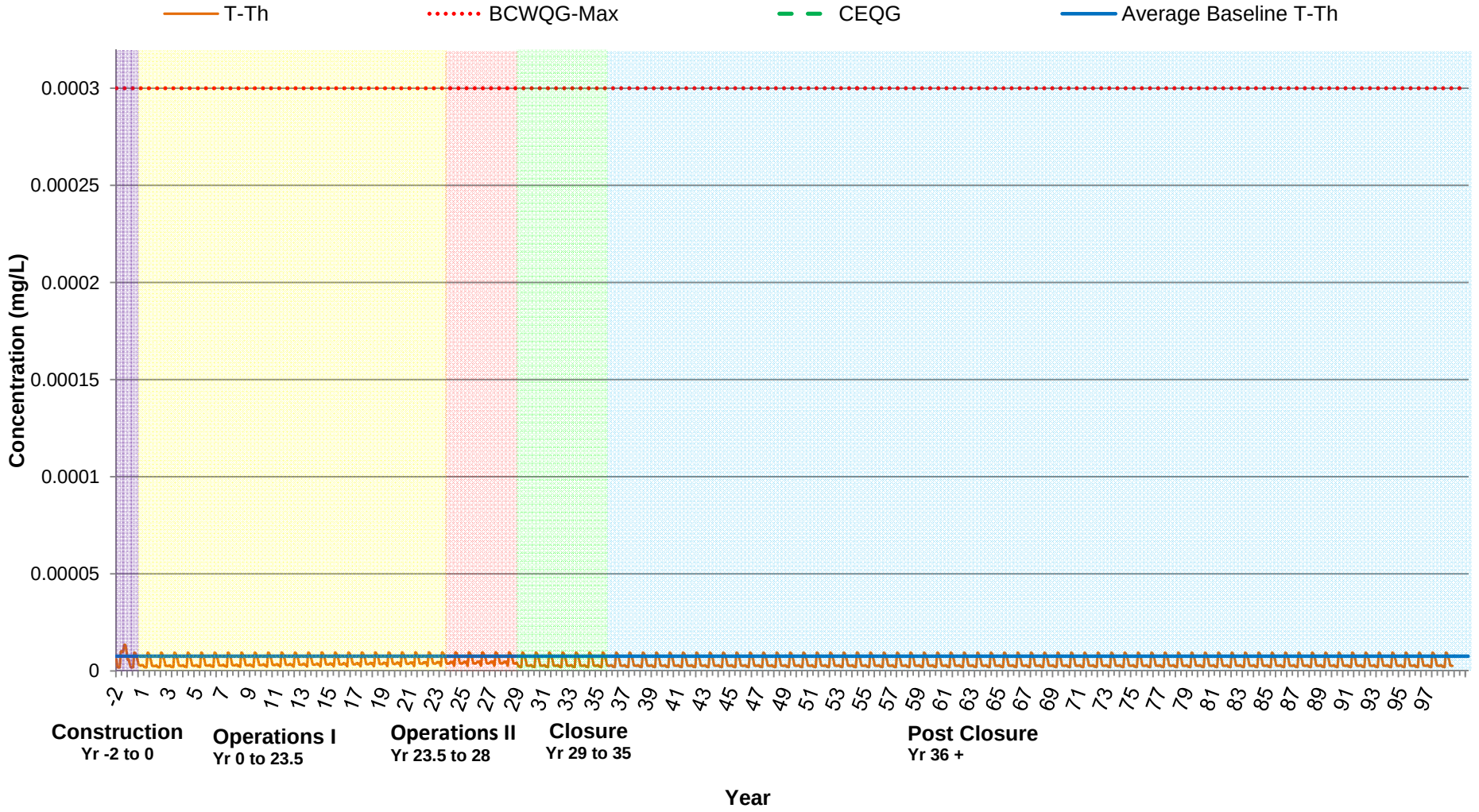
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G6.U

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).
3. THE CEQG (0.0008 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE THALLIUM CONCENTRATIONS - MID HARPER CREEK

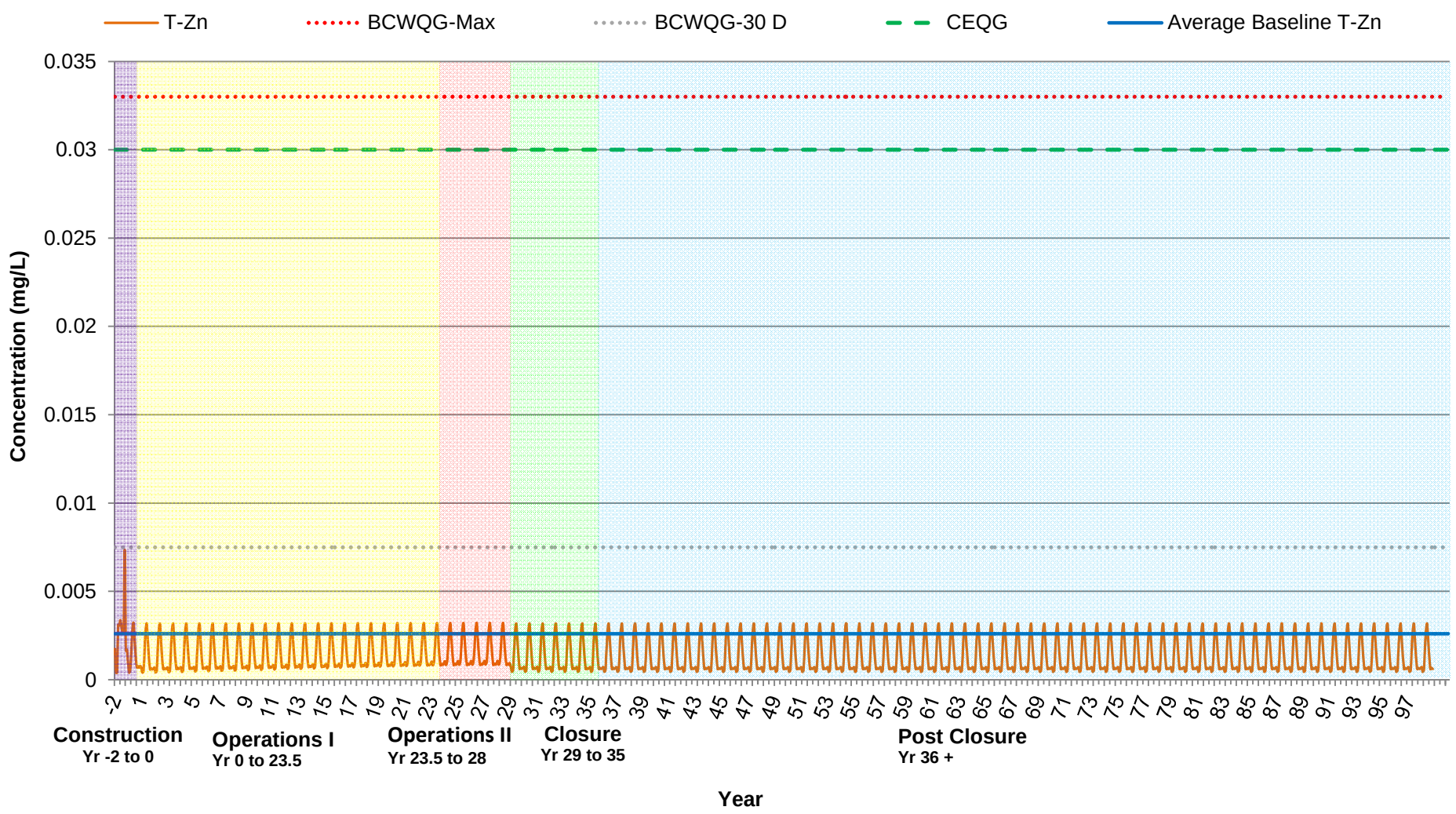
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G6.Th

REV 0



NOTES:

1. BCWQG-30 D AND BCWQG-MAX ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H2 (AVERAGE HARDNESS OF 38 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE ZINC CONCENTRATIONS - MID HARPER CREEK

Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

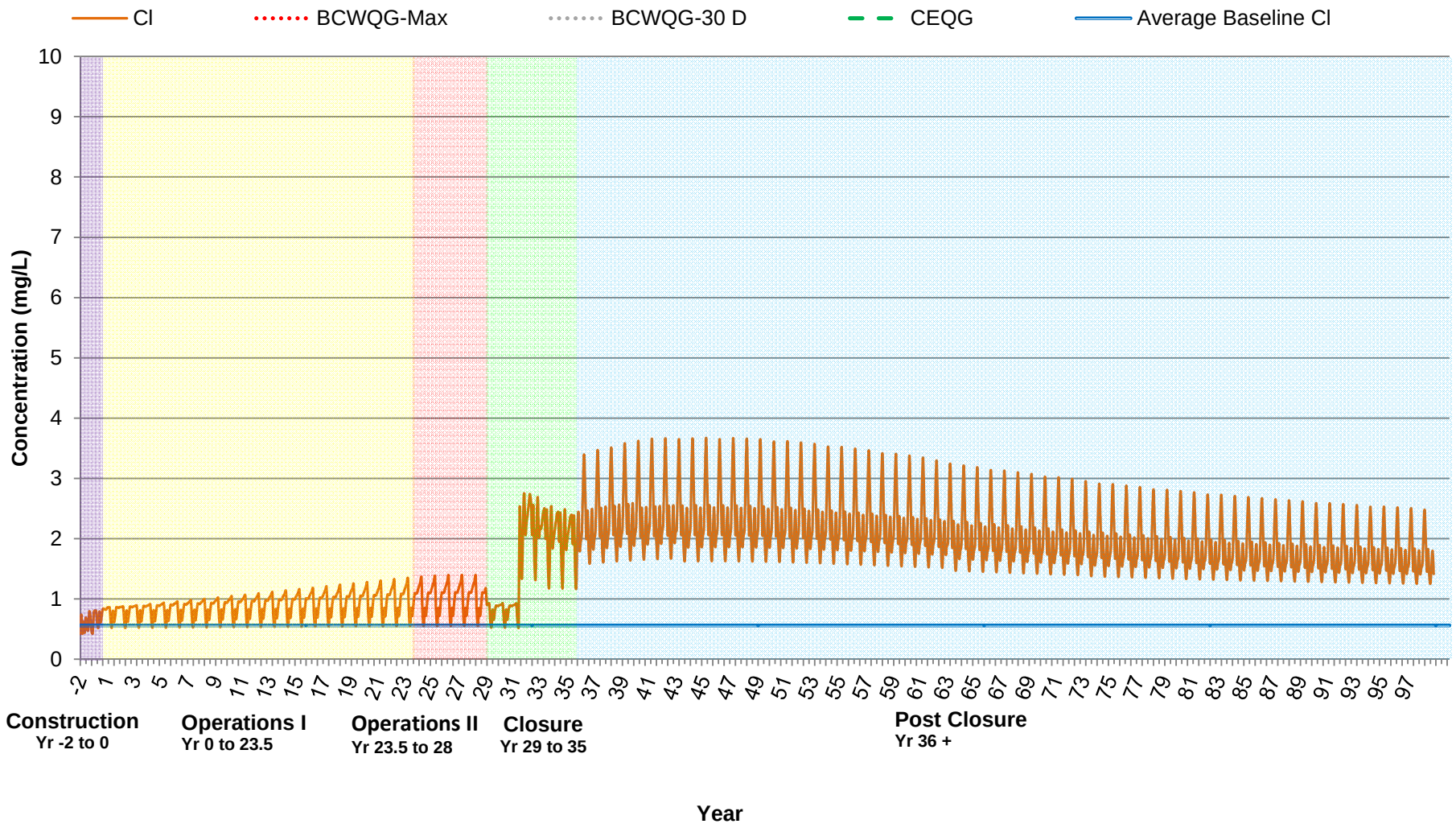
FIGURE G6.Zn

REV 0

APPENDIX G7

HARPER CREEK BELOW T-CREEK (HT)

(Pages G7-1 to G7-30)



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 21 mg/L).
3. ALL GUIDELINES ARE NOT SHOWN: BCWQG-30 D (150 mg/L); BCWQG-MAX (600 mg/L); CEQG (120 mg/L AND 640 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE CHLORIDE CONCENTRATIONS - HARPER CREEK BELOW T-CREEK

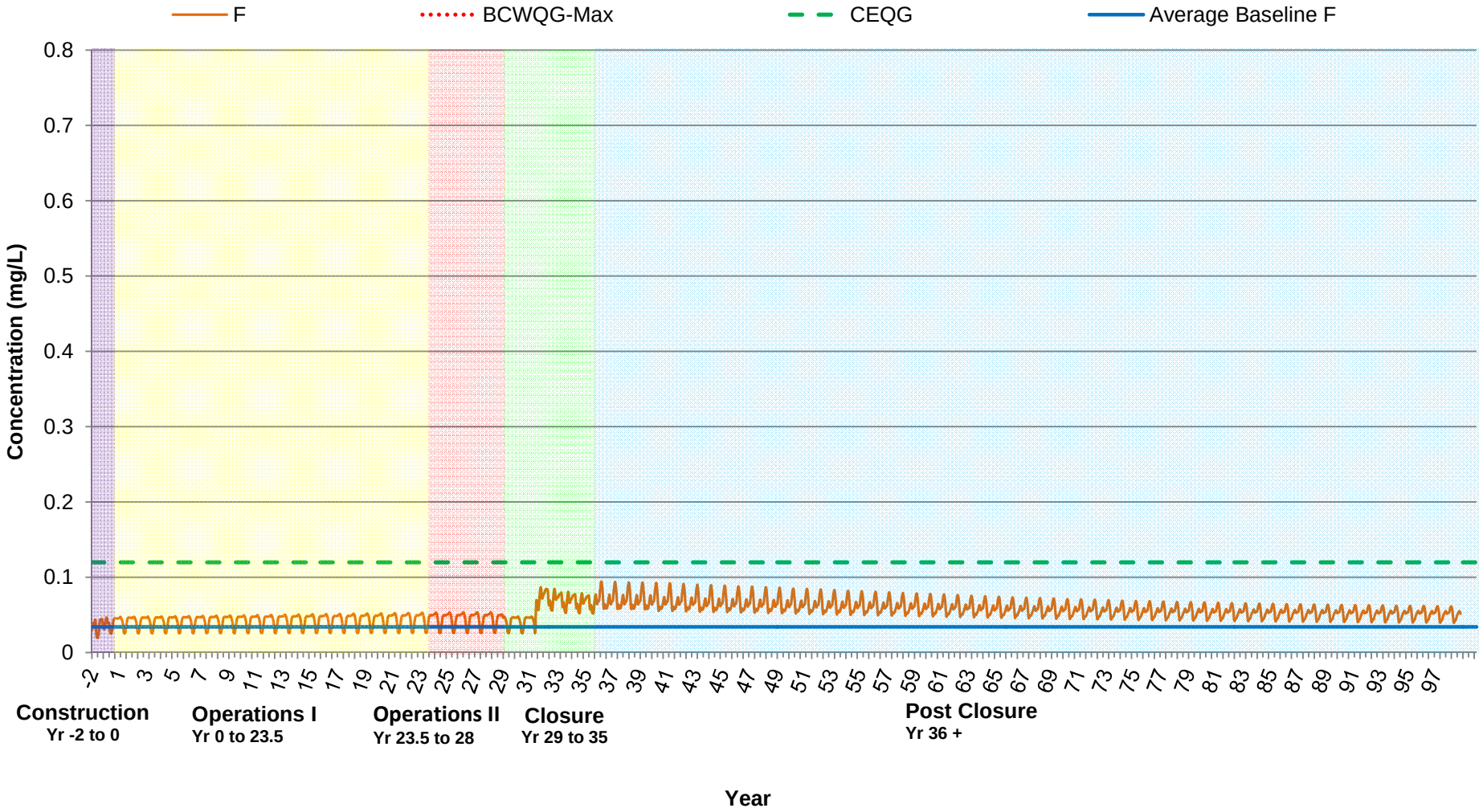
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G7.Cl

REV 0



NOTES:

1. THE BCWQG-MAX IS HARNDESS DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 21 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE FLUORIDE CONCENTRATIONS - HARPER CREEK BELOW T-CREEK

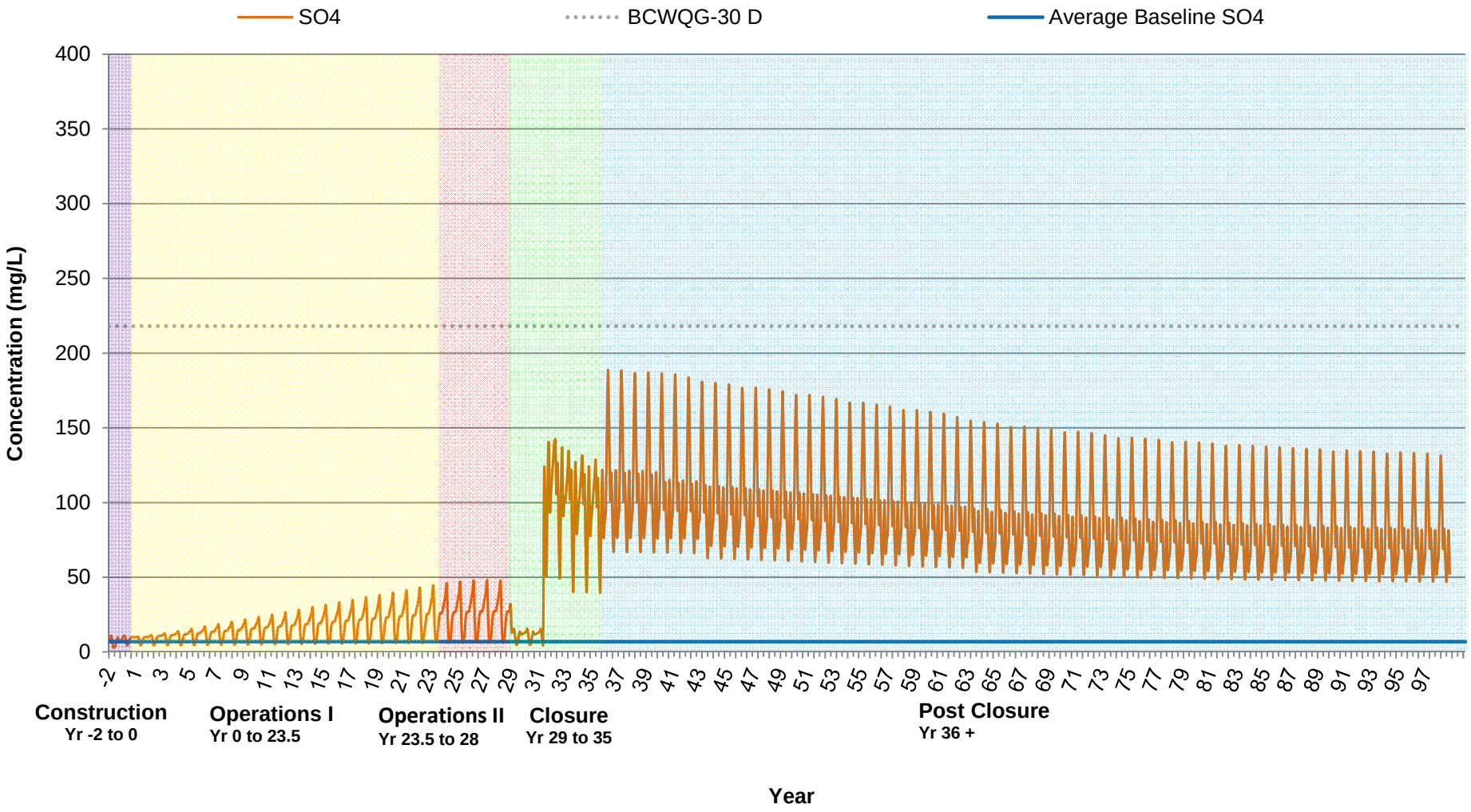
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G7.F

REV 0



NOTES:

1. BCWQG-30 D IS HARDNESS DEPEDENT.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 21 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE SULPHATE CONCENTRATIONS - HARPER CREEK BELOW T-CREEK

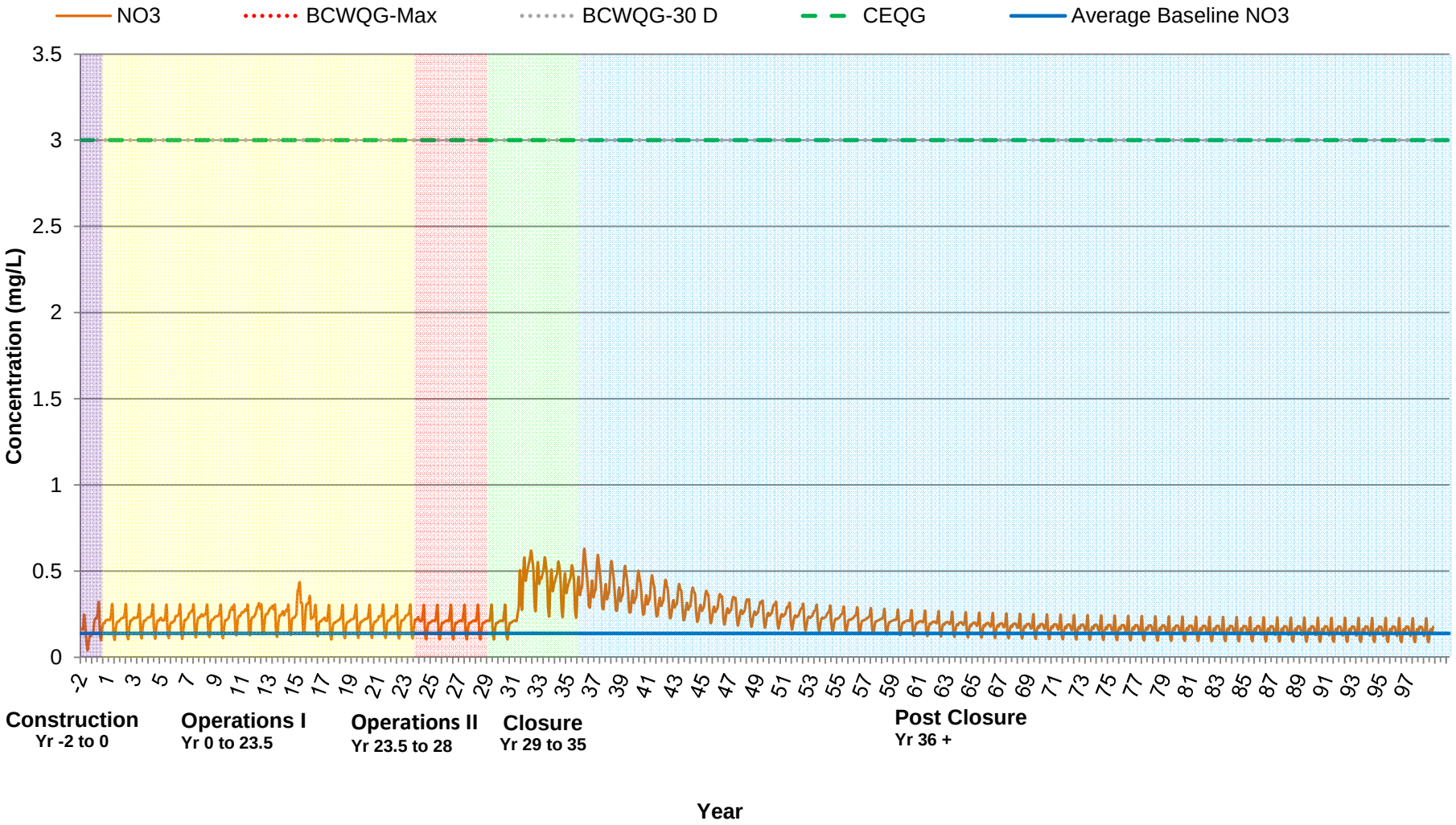
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G7.S04

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 21 mg/L).
3. THE BCWQG-MAX (32.8 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE NITRATE CONCENTRATIONS - HARPER CREEK BELOW T-CREEK

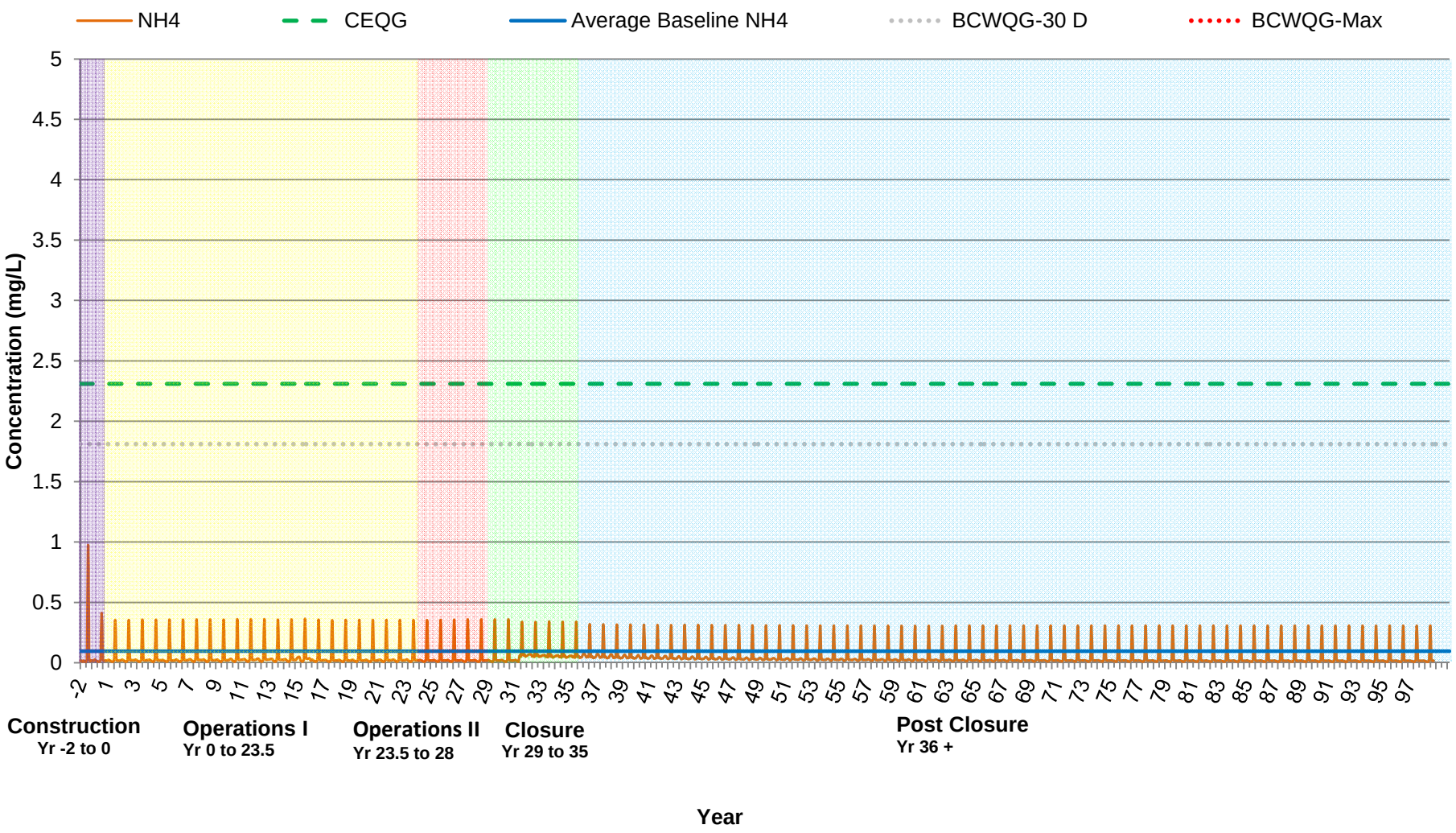
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G7.NO3

REV 0



NOTES:

1. THE BCWQG-30 D IS VALID FOR ONLY 6.5≤pH<9 AND 0°C≤T≤20°C.
2. THE BCWQG-MAX (20.15 mg/L) VALID FOR 6.5≤pH<9 IS NOT SHOWN.
3. THE CEQG IS TO BE USED WITH CAUTION FOR WATER WITH T<5°C AND pH>9.
4. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 21 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE AMMONIA CONCENTRATIONS - HARPER CREEK BELOW T-CREEK

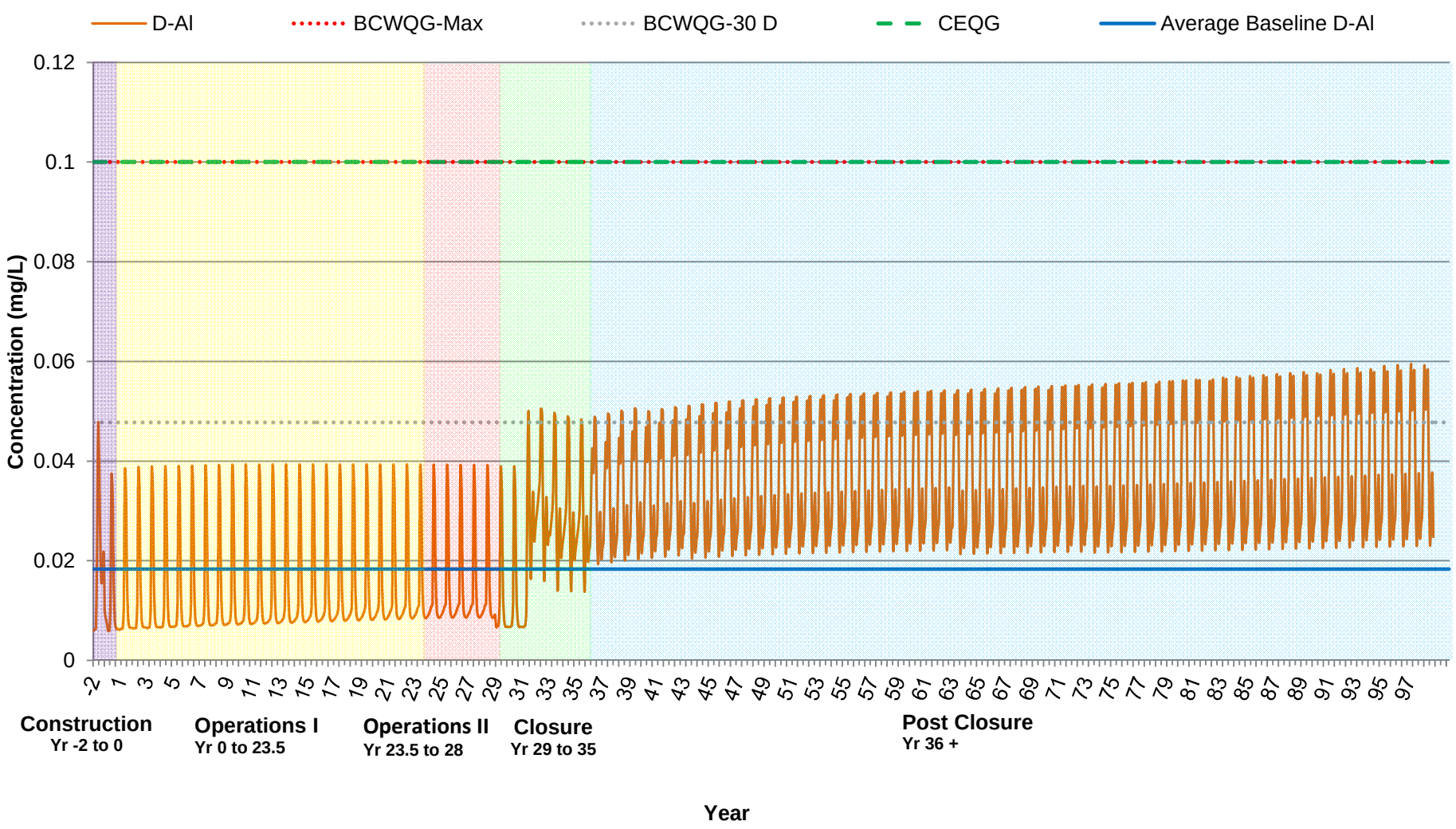
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G7.NH4

REV 0



NOTES:

1. ALL GUIDELINES ARE pH-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 21 mg/L).
3. AVERAGE BASELINE pH USED TO CALCULATE GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE DISSOLVED ALUMINUM CONCENTRATIONS - HARPER CREEK BELOW T-CREEK

Knight Piésold CONSULTING

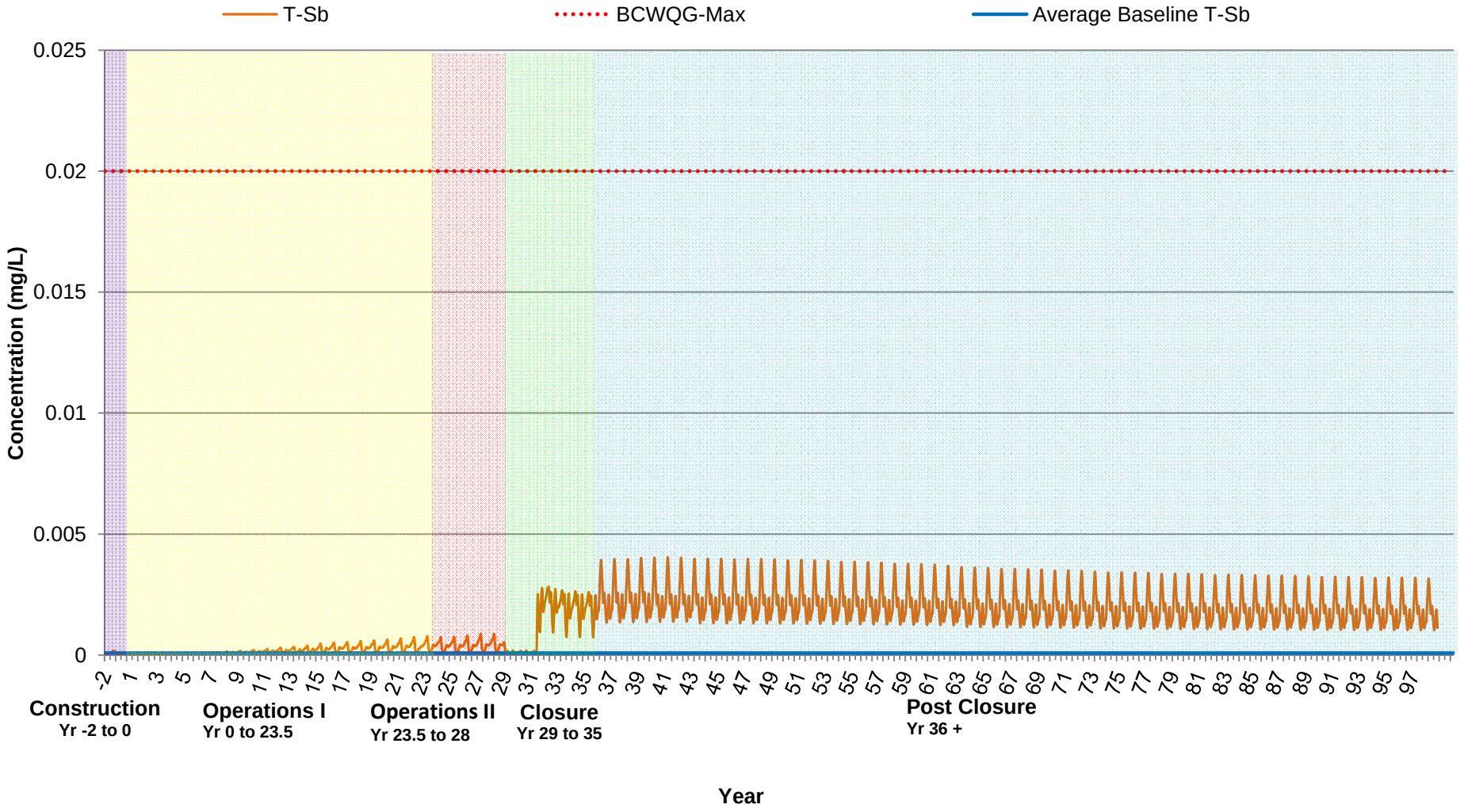
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G7.Al

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 21 mg/L).

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE ANTIMONY CONCENTRATIONS - HARPER CREEK BELOW T-CREEK

Knight Piésold CONSULTING

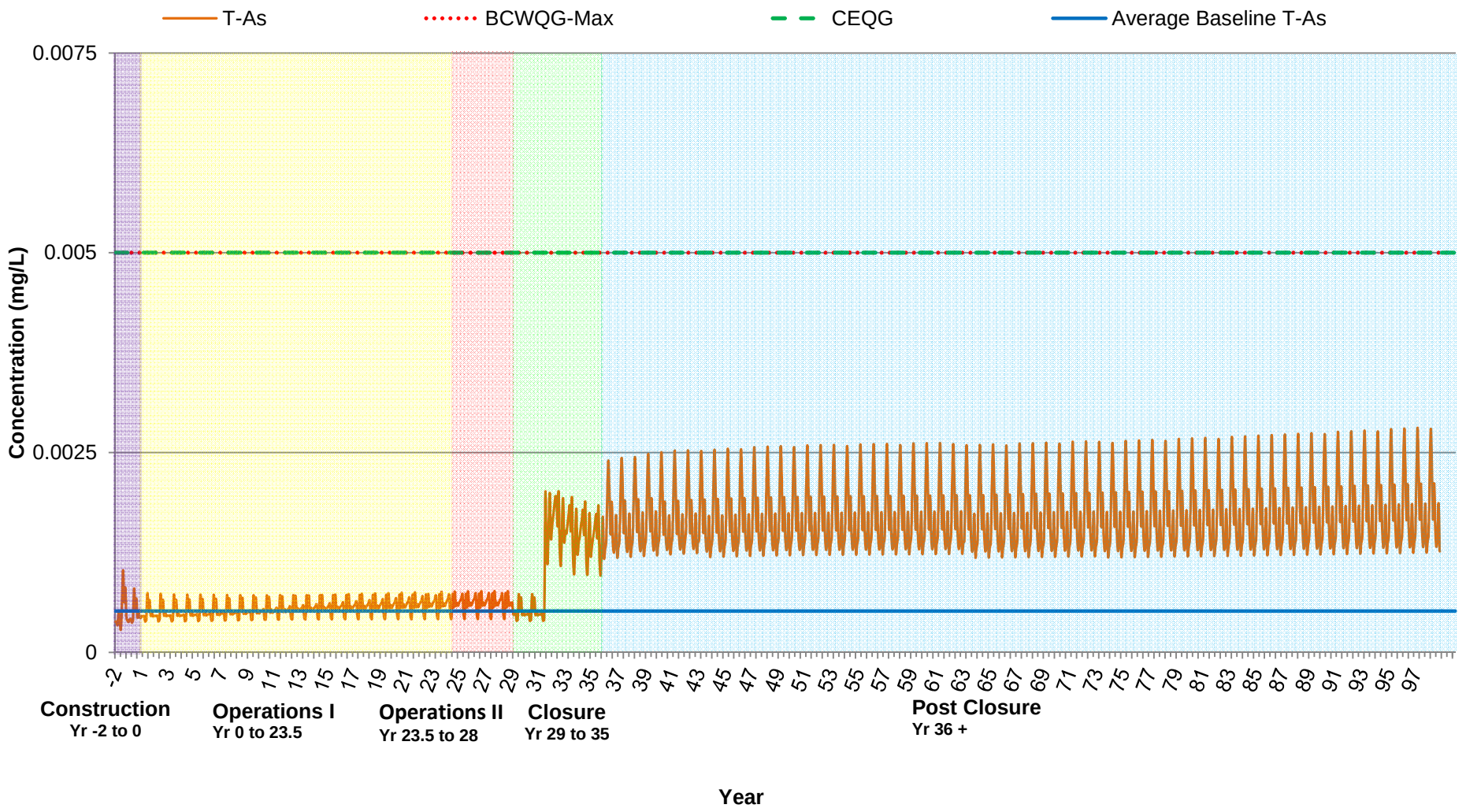
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G7.Sb

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 21 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE ARSENIC CONCENTRATIONS - HARPER CREEK BELOW T-CREEK

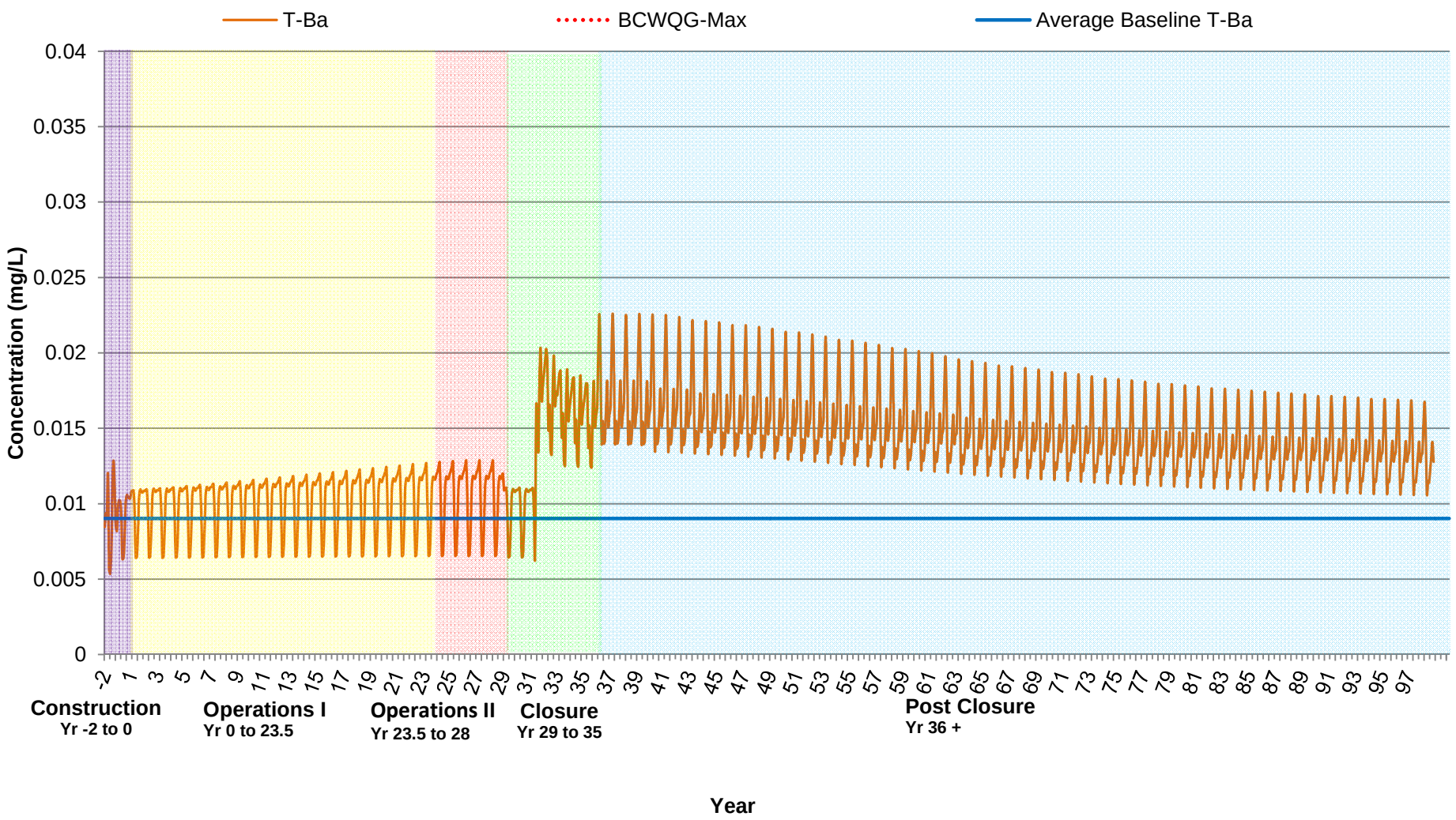
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G7.As

REV 0



NOTES:

1. THE BCWQG-MAX IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 21 mg/L).
3. THE BCWQG-30 D (1 mg/L) AND BCWQG-MAX (5 mg/L) ARE NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE BARIUM CONCENTRATIONS - HARPER CREEK BELOW T-CREEK

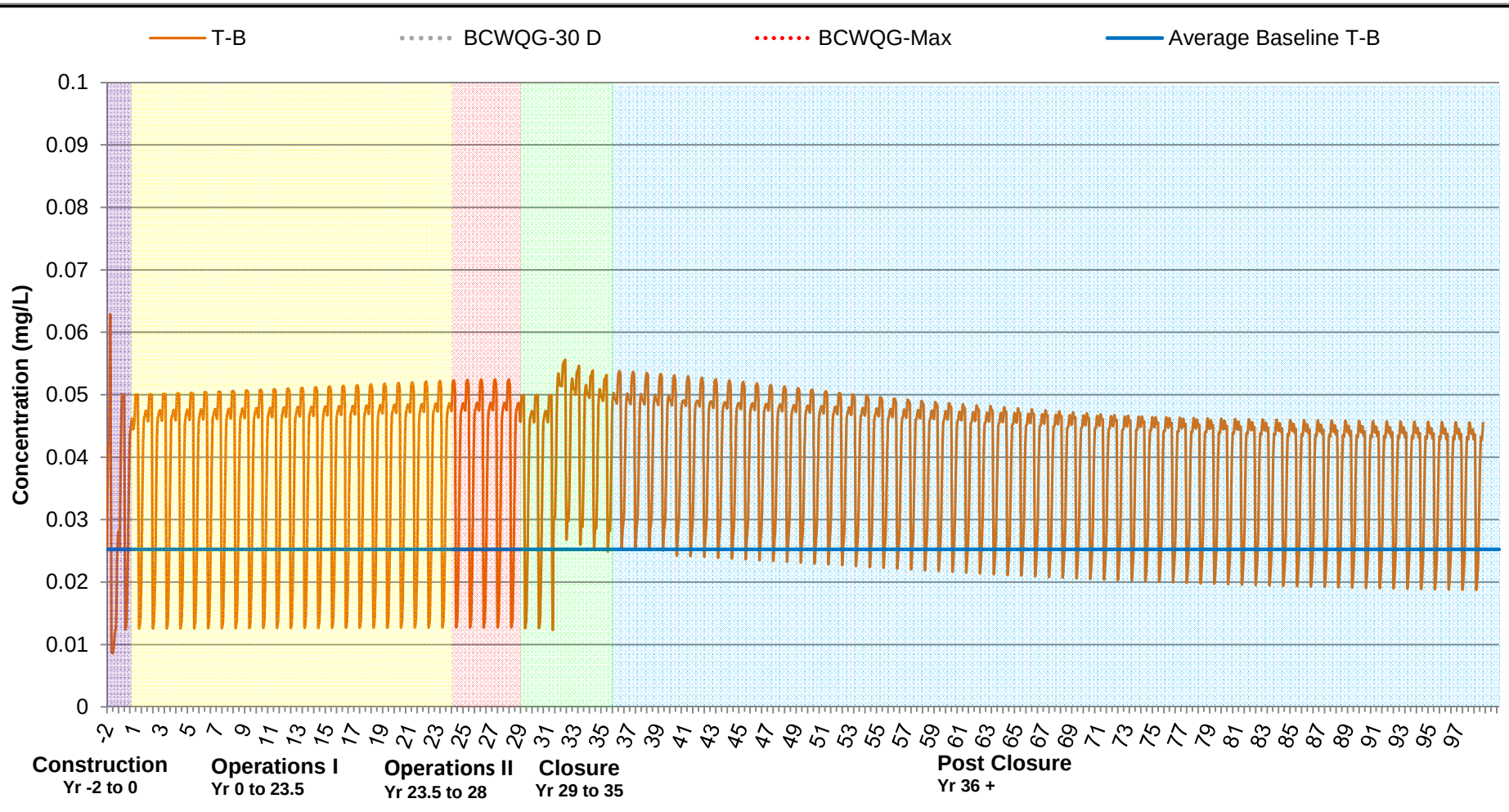
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G7.Ba

REV 0



NOTES:

1. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 21 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.
3. THE BCWQG-MAX (1.2 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE BORON CONCENTRATIONS - HARPER CREEK BELOW T-CREEK

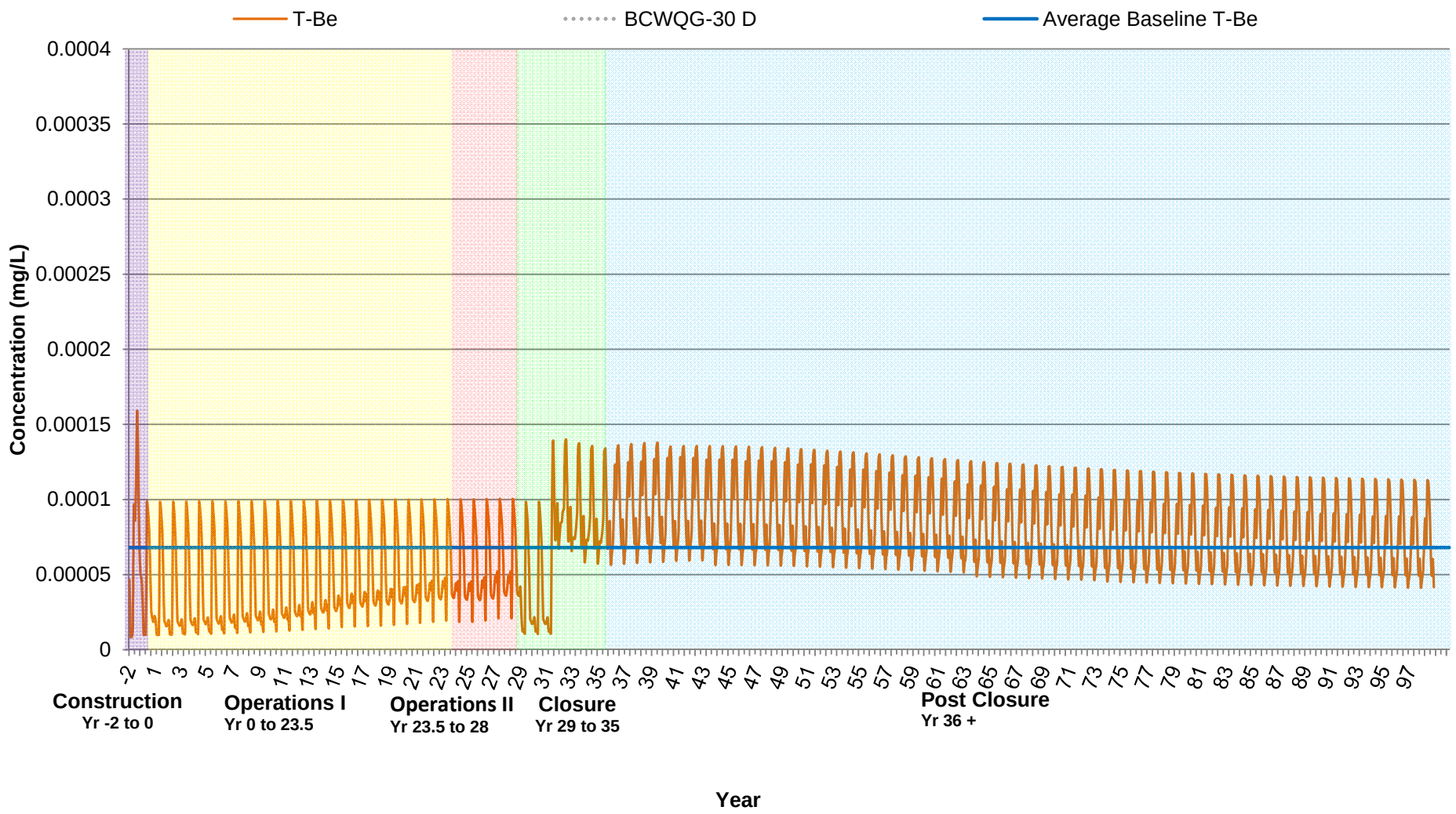
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G7.B

REV 0



NOTES:

1. THE BCWQG-MAX IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 21 mg/L).
3. THE BCWQG-30 D (0.0053 mg/L) IS NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE BERYILLIUM CONCENTRATIONS - HARPER CREEK BELOW T-CREEK

Knight Piésold CONSULTING

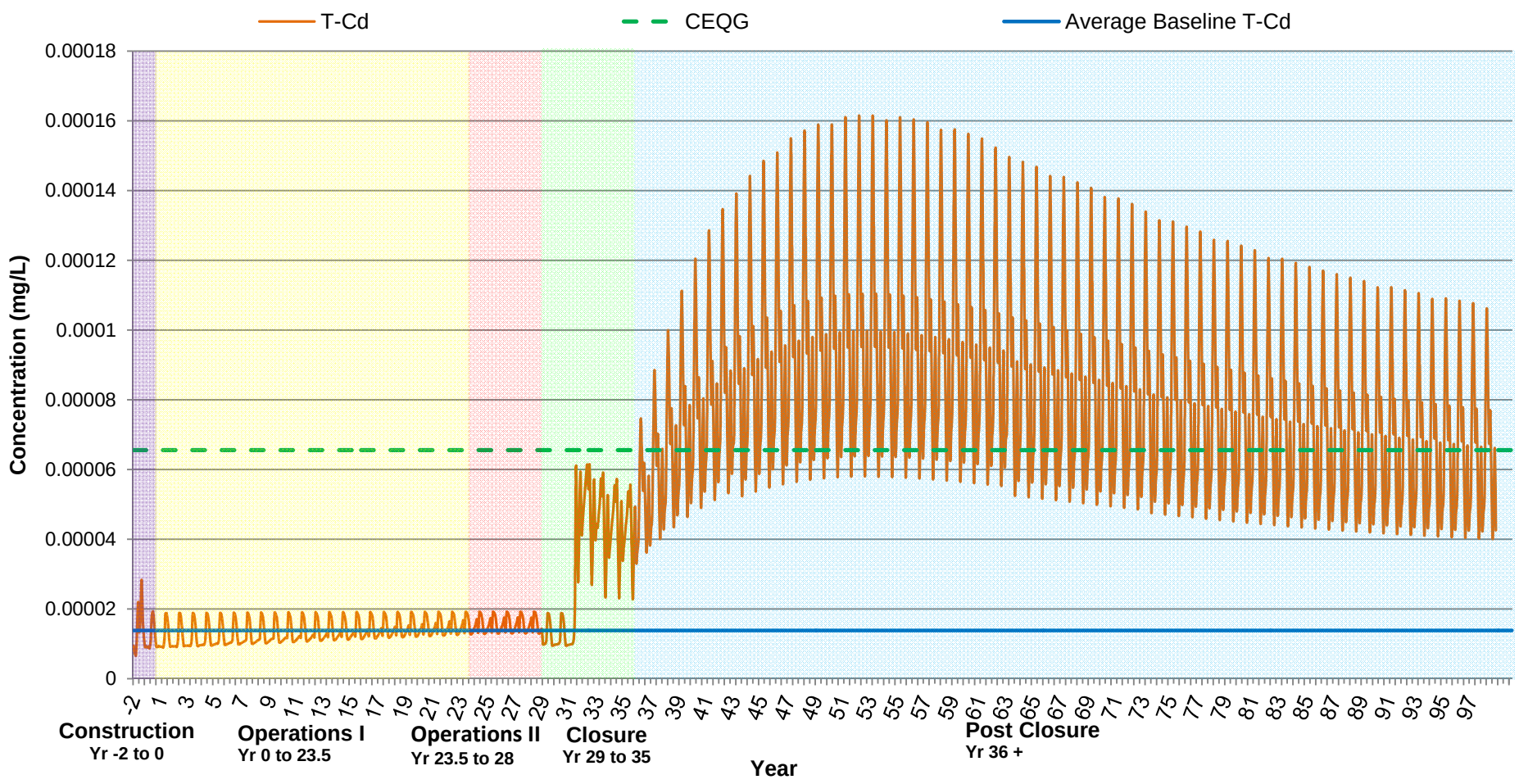
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G7.Be

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. THE BCWQG ARE DRAFT GUIDELINES UNDER REVIEW (JUNE 2014).
3. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 21 mg/L).
4. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE CADMIUM CONCENTRATIONS - HARPER CREEK BELOW T-CREEK

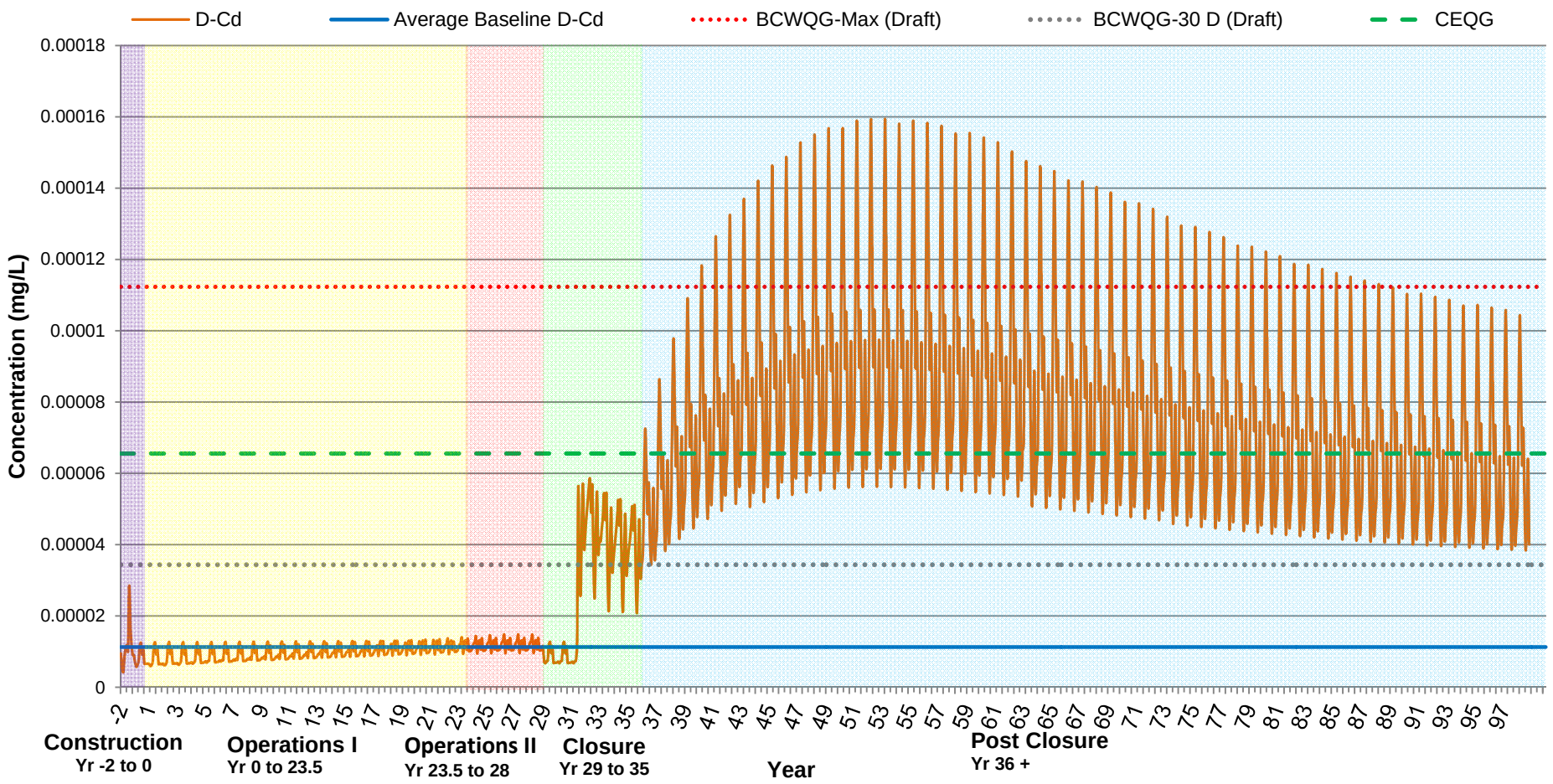
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G7.Cd-T

REV 0



NOTES:

1. BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 21 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE CADMIUM CONCENTRATIONS - HARPER CREEK BELOW T-CREEK

Knight Piésold CONSULTING

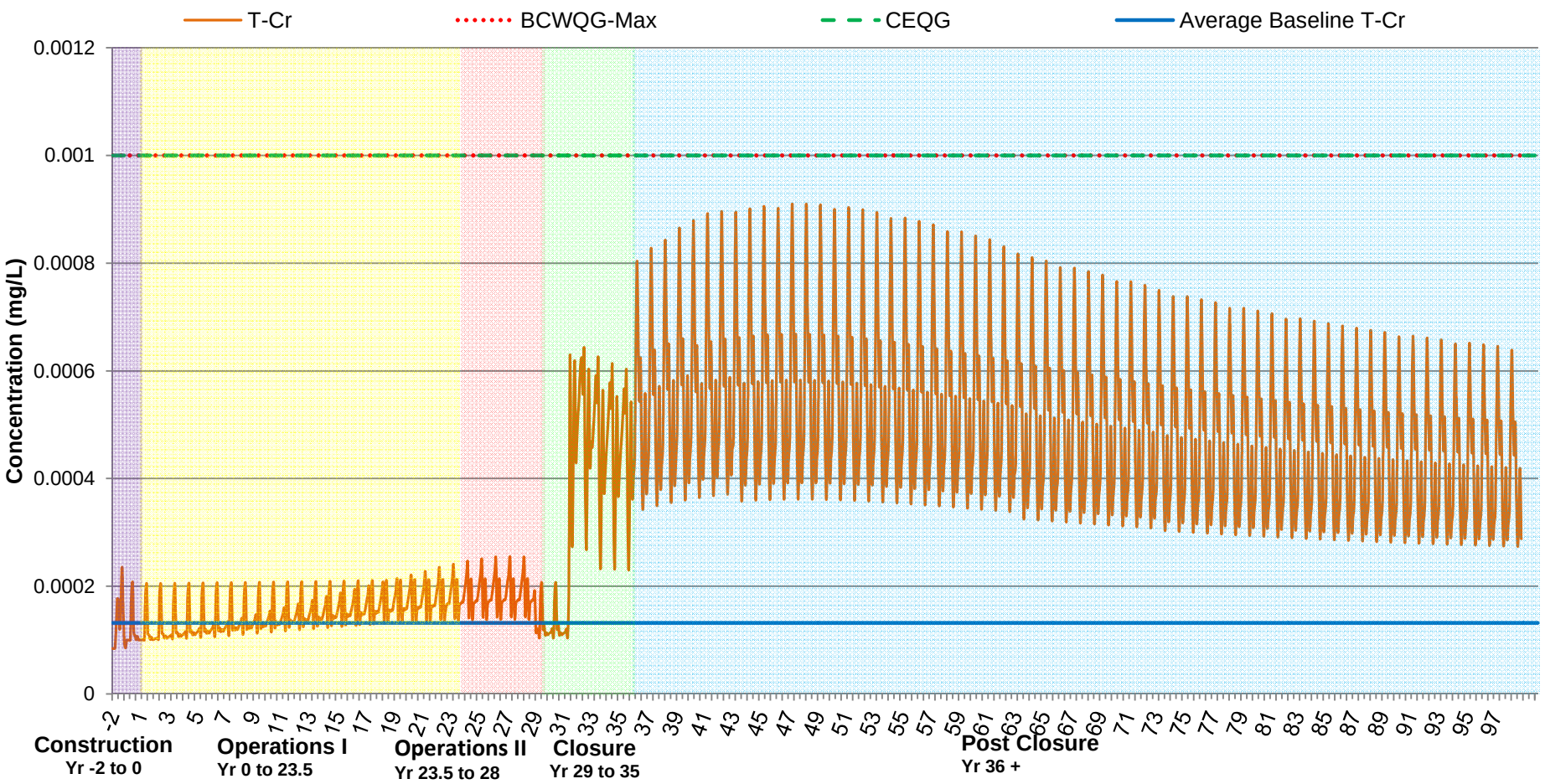
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G7.Cd-D

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. GUIDELINES ARE FOR CHROMIUM (IV), THE SPECIES MOST COMMON IN WELL OXYGENATED SURFACE WATERS.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 21 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE CHROMIUM CONCENTRATIONS - HARPER CREEK BELOW T-CREEK

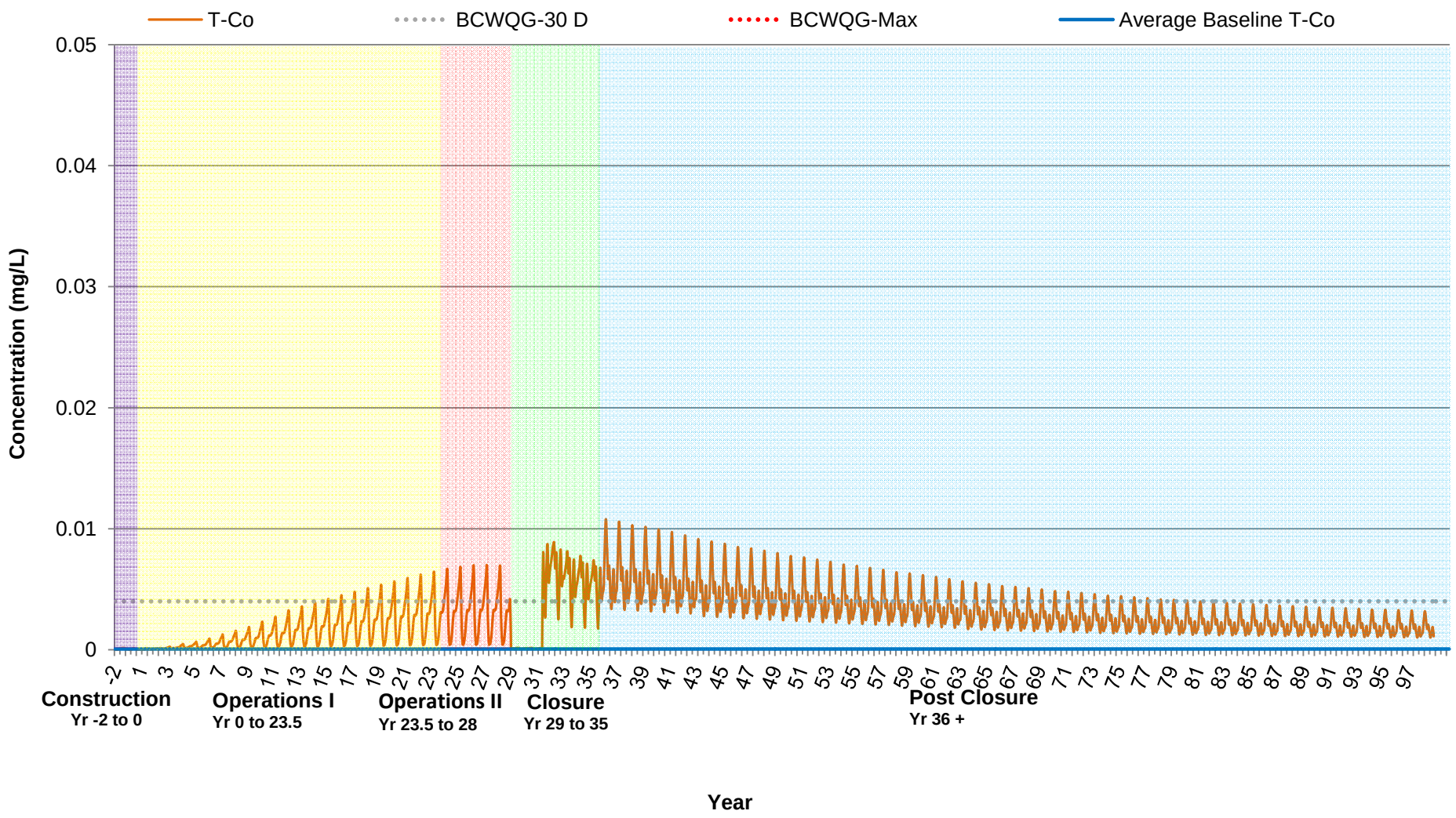
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G7.Cr

REV 0



NOTES:

1. THE BCWQG-30 D AND BCWQG-MAX ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 21 mg/L).
3. THE BCWQG-MAX GUIDELINE (0.11 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE COBALT CONCENTRATIONS - HARPER CREEK BELOW T-CREEK

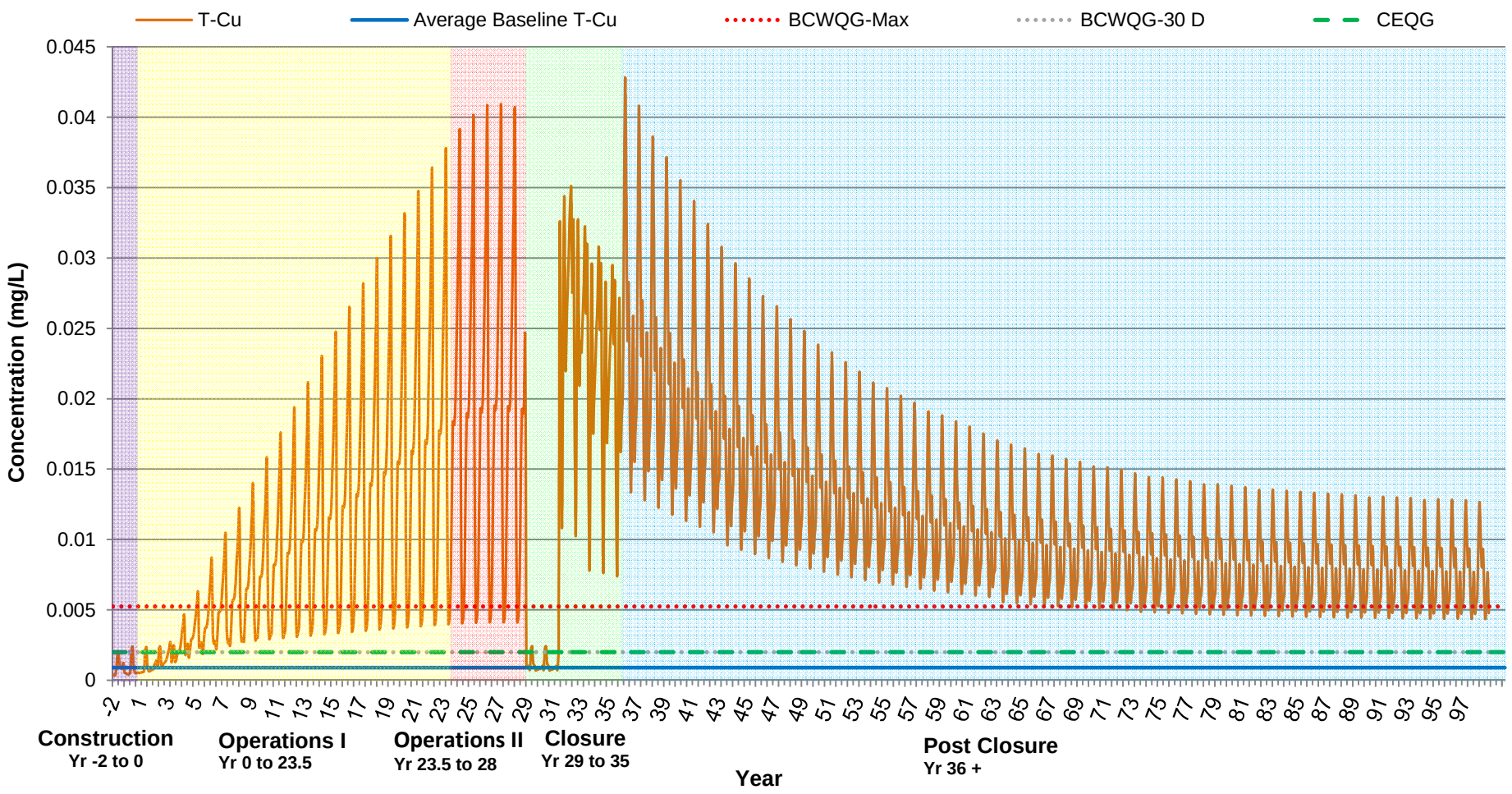
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G7.Co

REV 0



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 21 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE COPPER CONCENTRATIONS - HARPER CREEK BELOW T-CREEK

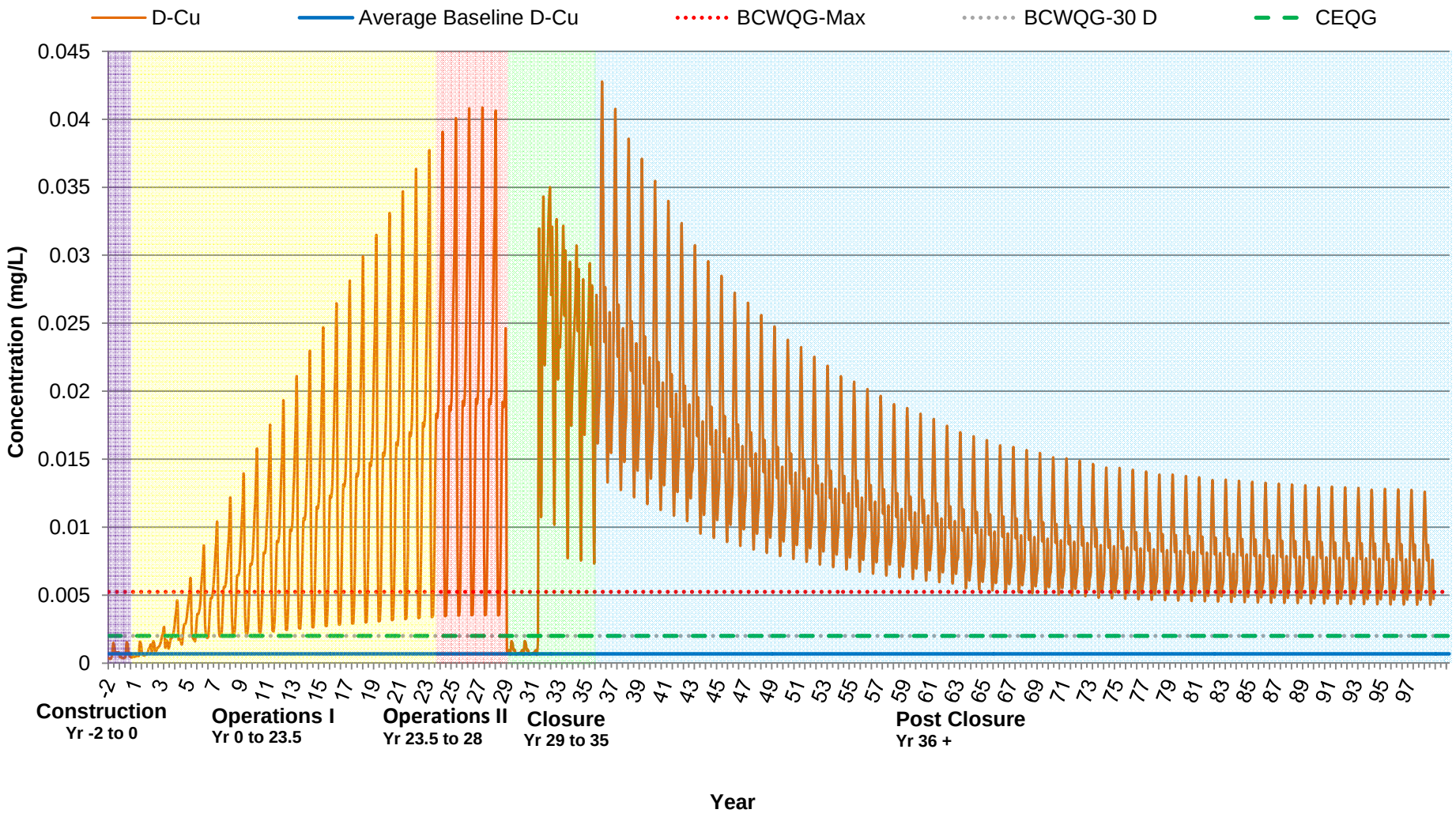
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G7.Cu-T

REV 0



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 21 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE COPPER CONCENTRATIONS - HARPER CREEK BELOW T-CREEK

Knight Piésold CONSULTING

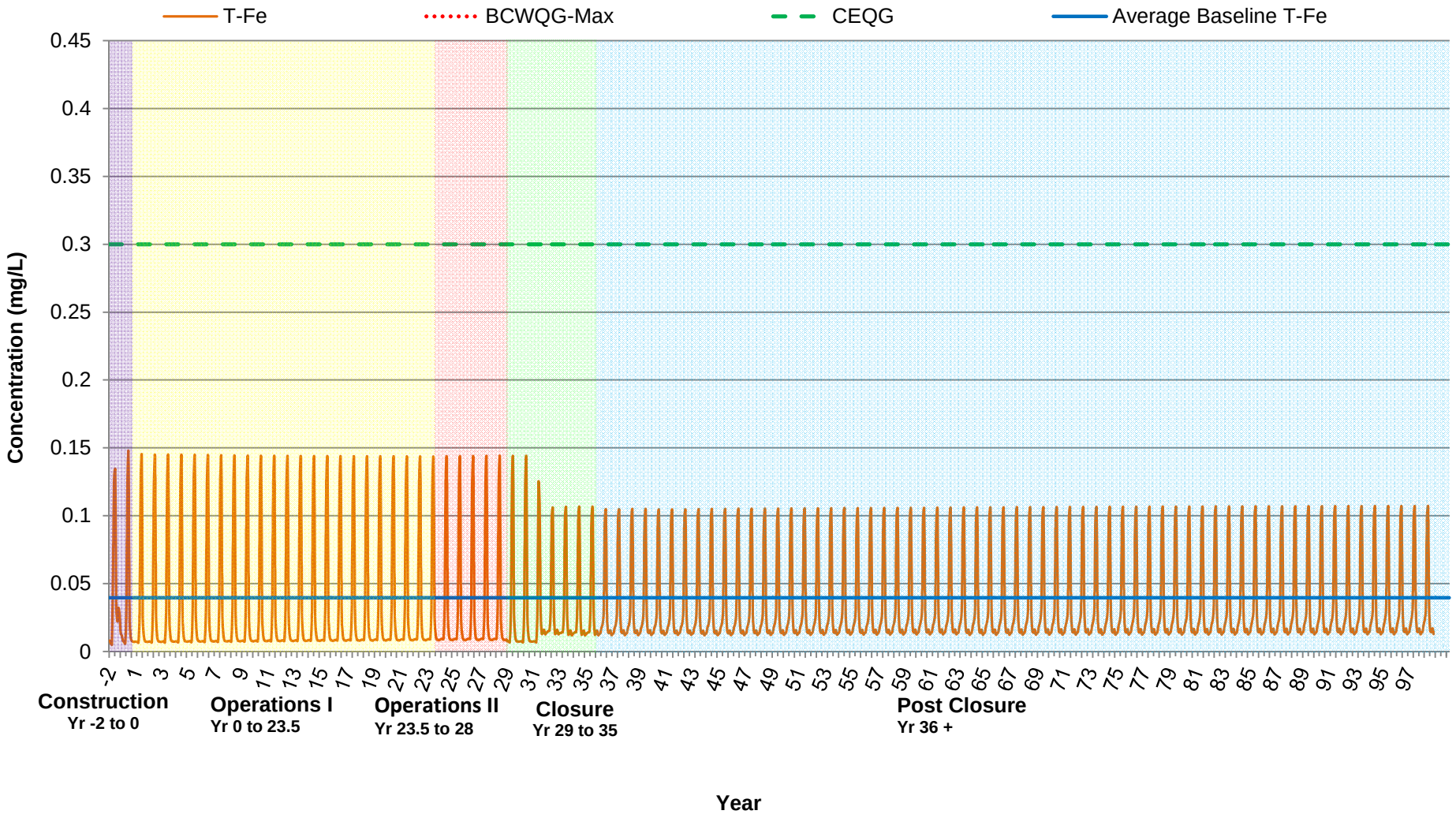
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G7.Cu-D

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 21 mg/L).
3. BCWQG-MAX 1.0 mg/L IS NOT SHOWN ON GRAPH.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE TOTAL IRON CONCENTRATIONS - HARPER CREEK BELOW T-CREEK

Knight Piésold CONSULTING

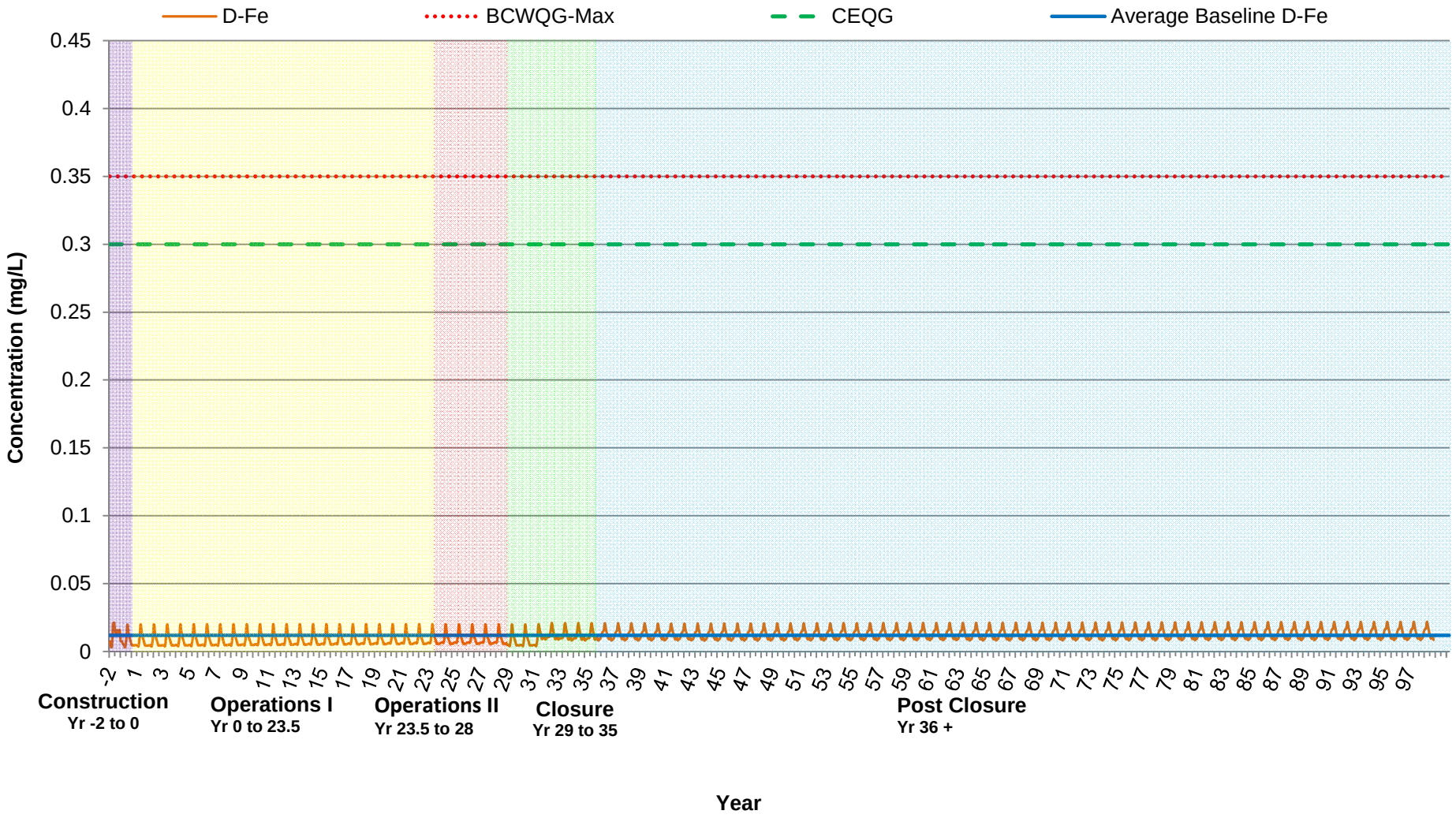
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G7.Fe-T

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 21 mg/L).

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE DISSOLVED IRON CONCENTRATIONS - HARPER CREEK BELOW T-CREEK

Knight Piésold CONSULTING

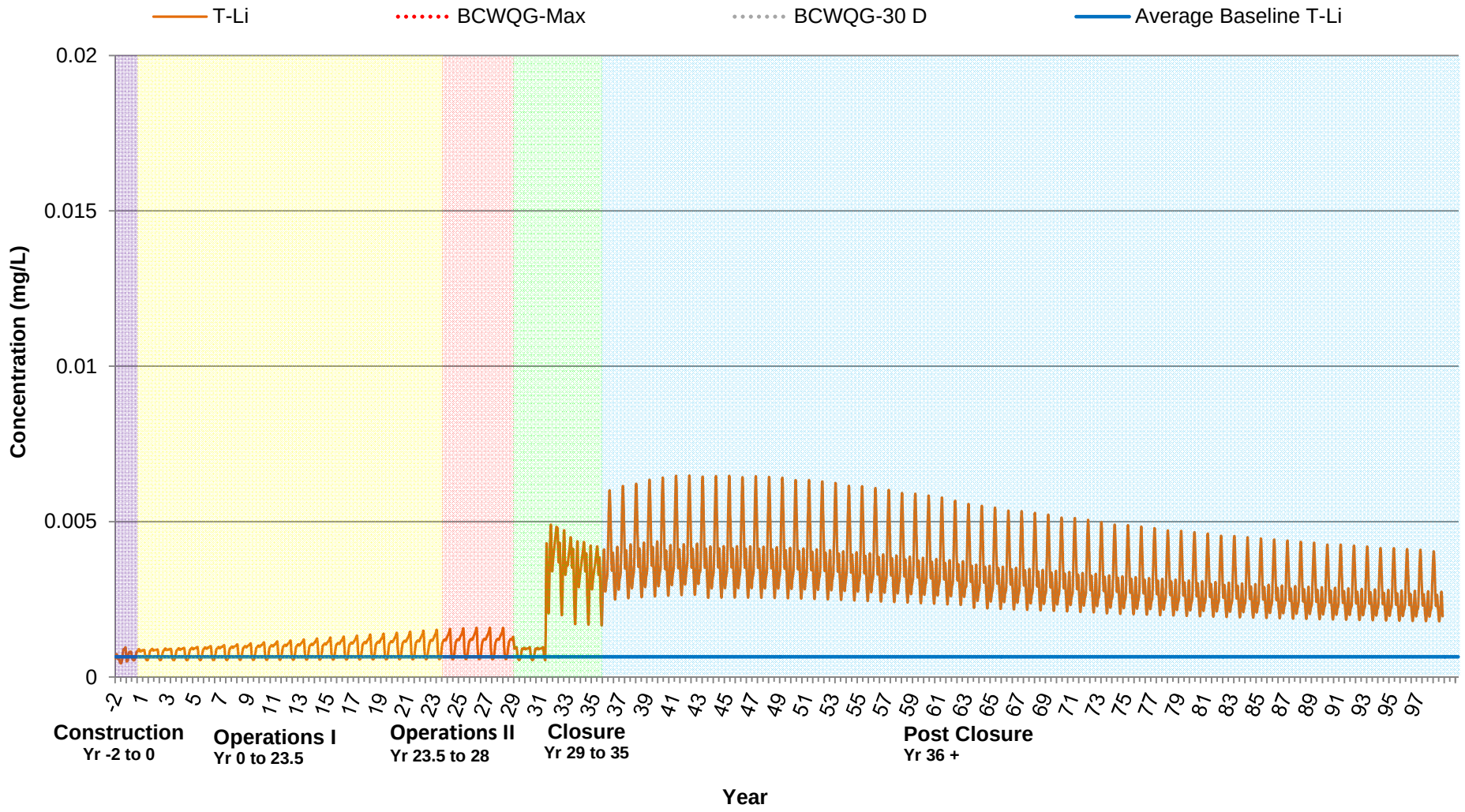
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G7.Fe-D

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 21 mg/L).
3. THE BCWQG-30 D (0.096 mg/L) AND BCWQG-MAX (0.87 mg/L) ARE INTERIM (WORKING) AND ARE NOT SHOWN ON GRAPH.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE LITHIUM CONCENTRATIONS - HARPER CREEK BELOW T-CREEK

Knight Piésold CONSULTING

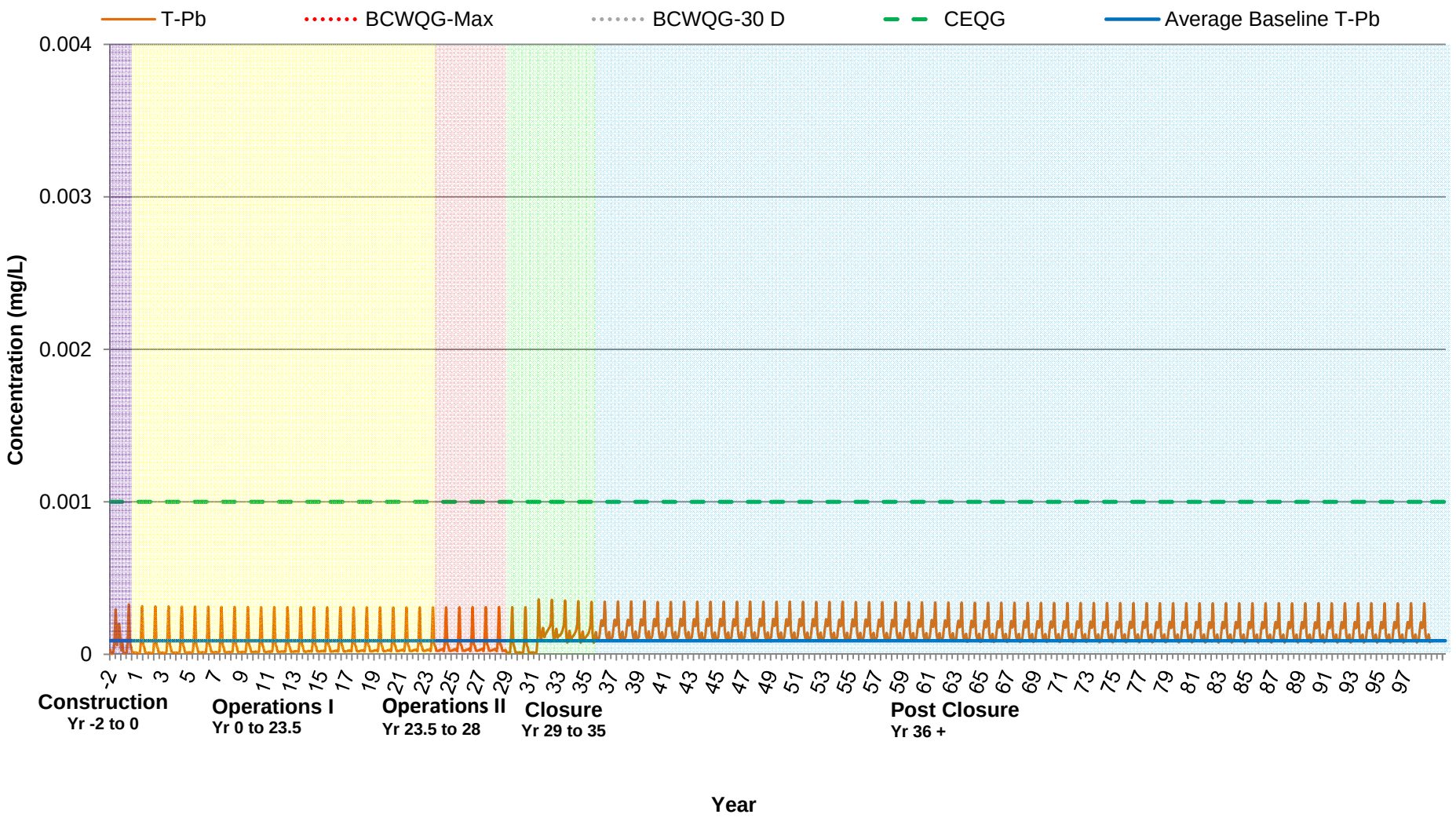
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G7.Li

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 21 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.
4. THE BCWQG-MAX (CALCULATED AT 0.011 mg/L) IS NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE LEAD CONCENTRATIONS - HARPER CREEK BELOW T-CREEK

Knight Piésold CONSULTING

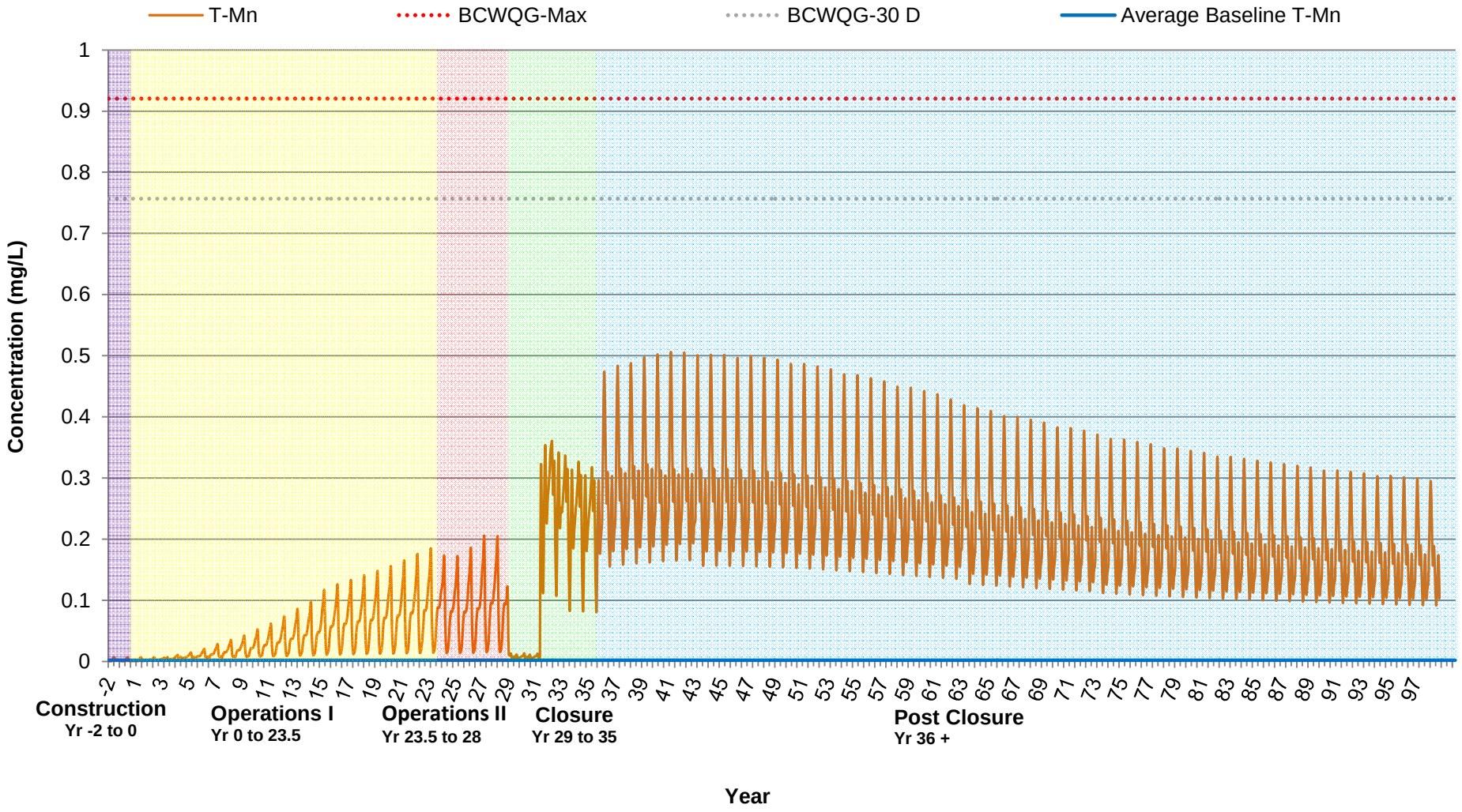
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G7.Pb

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 21 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE MANGANESE CONCENTRATIONS - HARPER CREEK BELOW T-CREEK

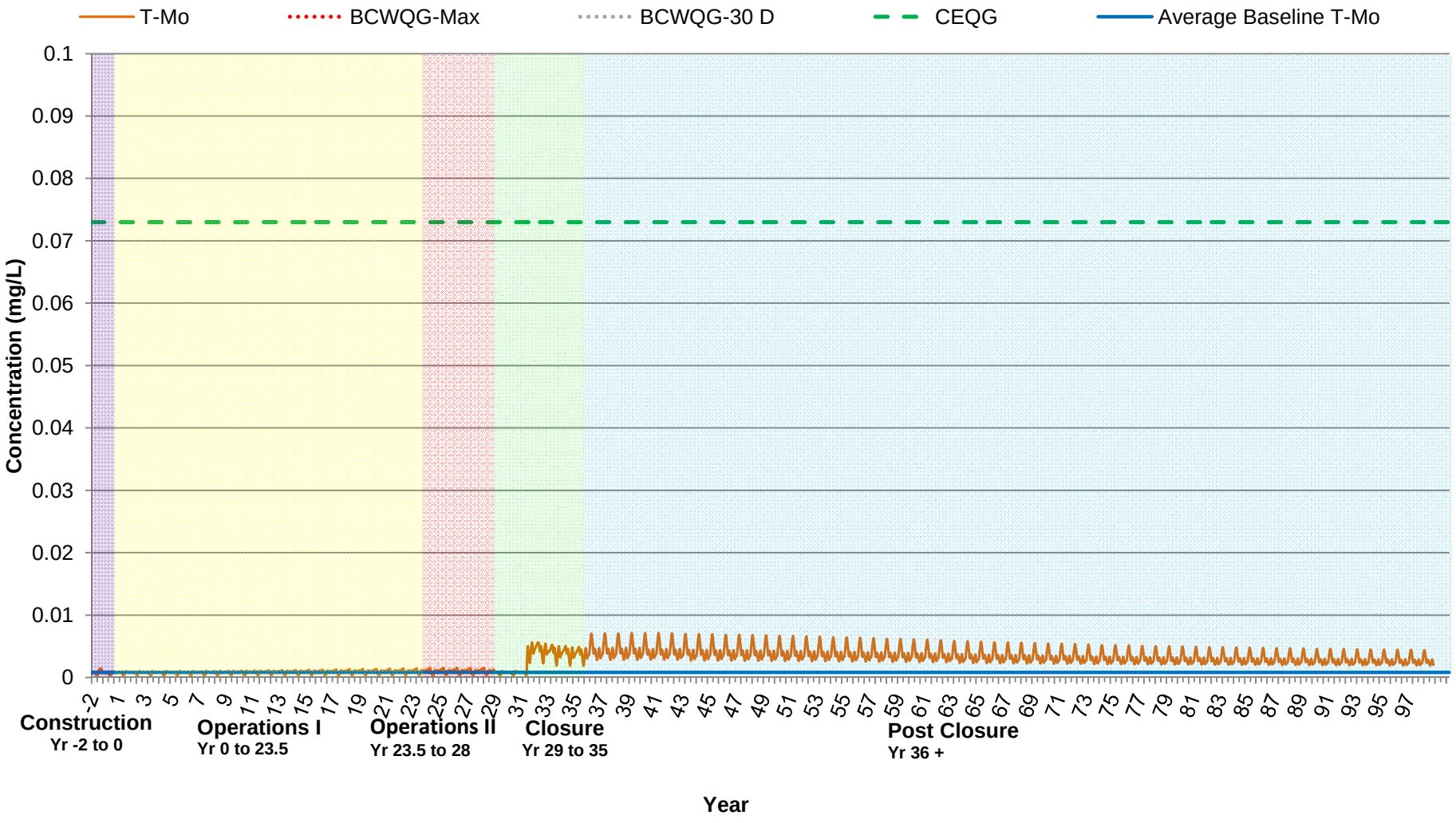
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G7.Mn

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 21 mg/L).
3. THE BCWQG-MAX (2 mg/L) AND BCWQG-30 D (1 mg/L) ARE NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE MOLYDBENUM CONCENTRATIONS - HARPER CREEK BELOW T-CREEK

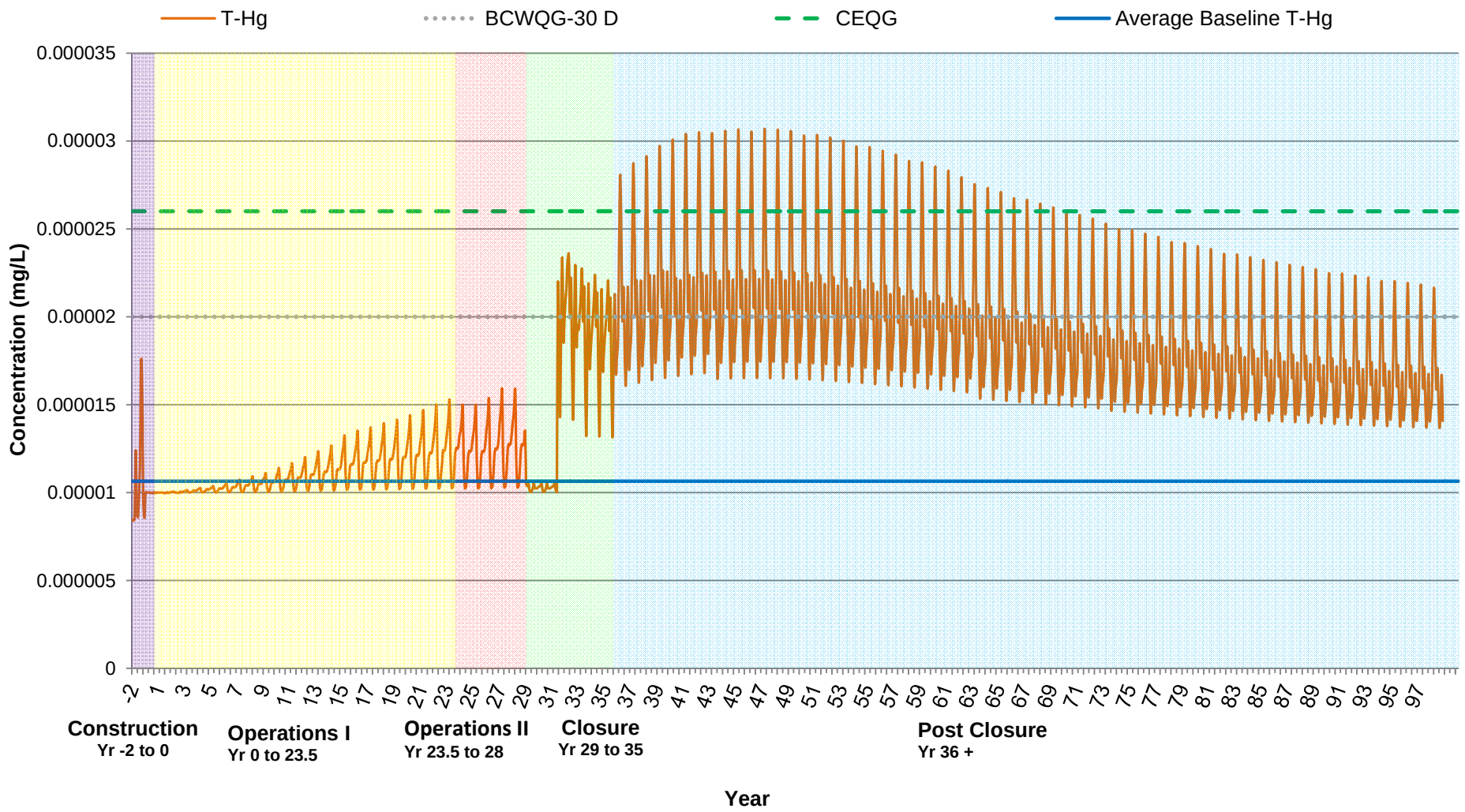
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G7.Mo

REV 0



NOTES:

1. THE BCWQG-30 D AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 21 mg/L).
3. BCWQG-30 D VALUE APPLIED ON ASSUMPTION THAT METHYL-Hg IS EQUAL TO 0.5% OF T-Hg.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE MERCURY CONCENTRATIONS - HARPER CREEK BELOW T-CREEK

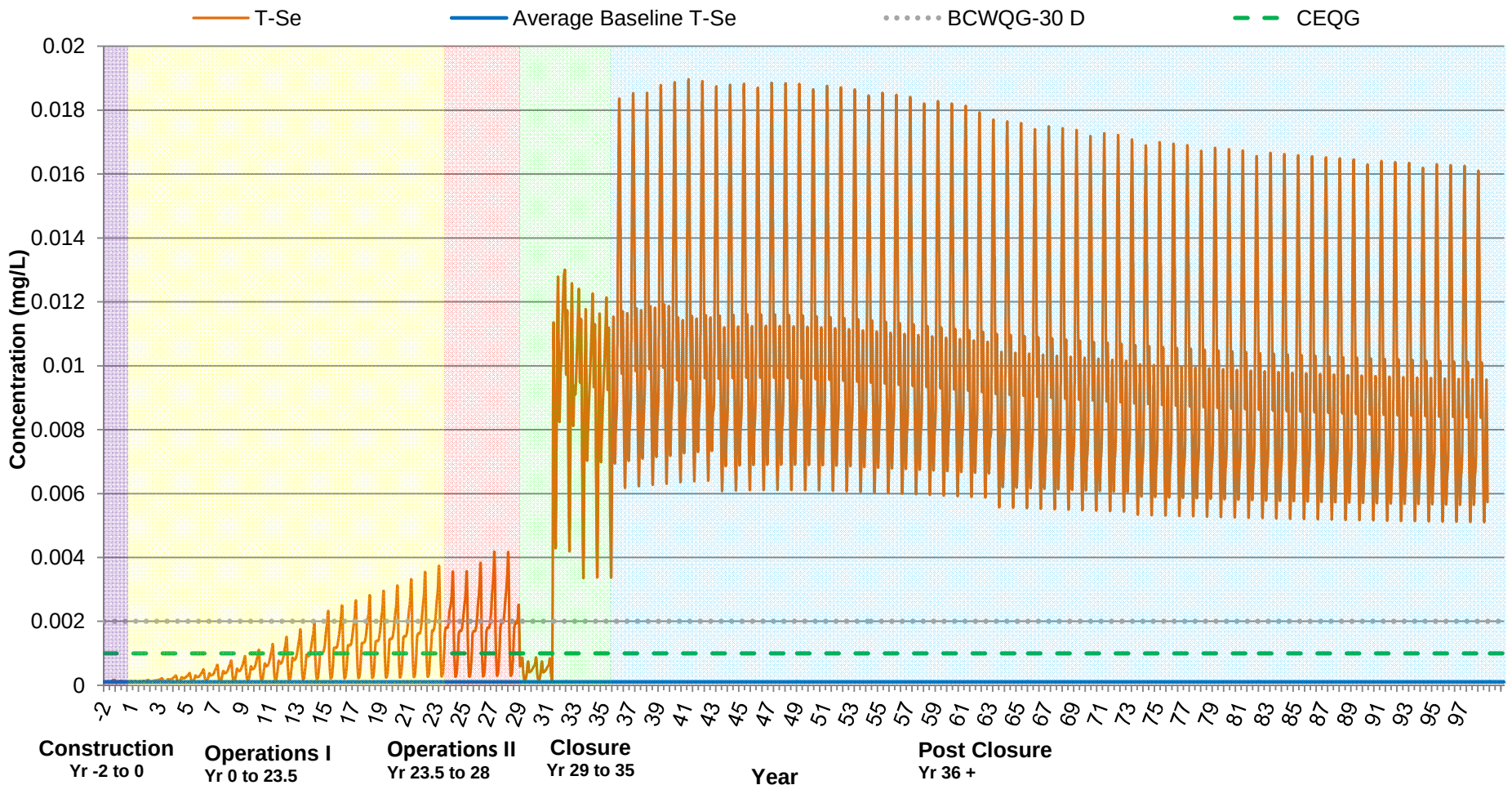
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G7.Hg

REV 0



NOTES:

1. THE BCWQG-30 D AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 21 mg/L).

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE SELENIUM CONCENTRATIONS - HARPER CREEK BELOW T-CREEK

Knight Piésold CONSULTING

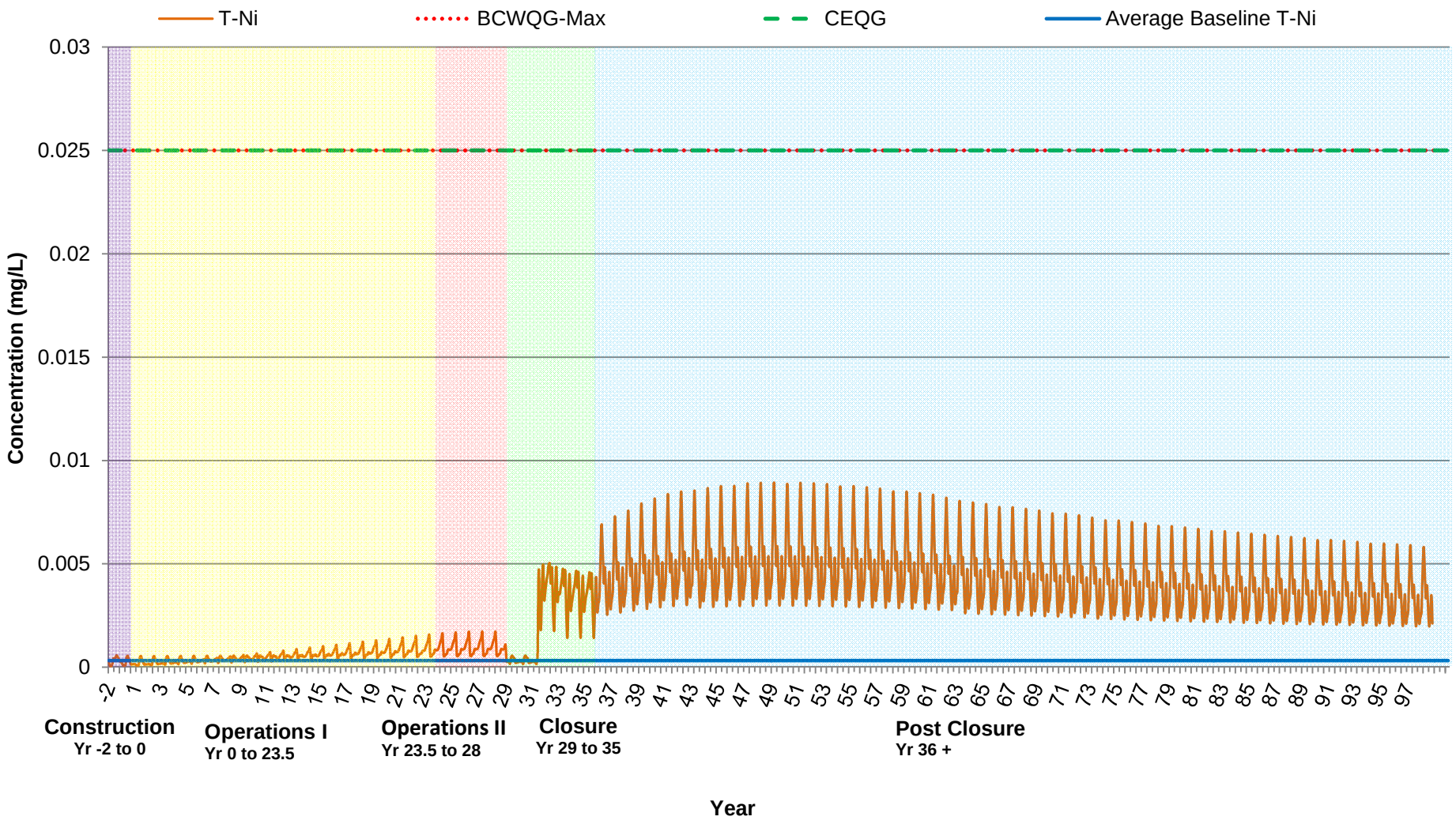
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G7.Se

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 21 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE NICKEL CONCENTRATIONS - HARPER CREEK BELOW T-CREEK

Knight Piésold CONSULTING

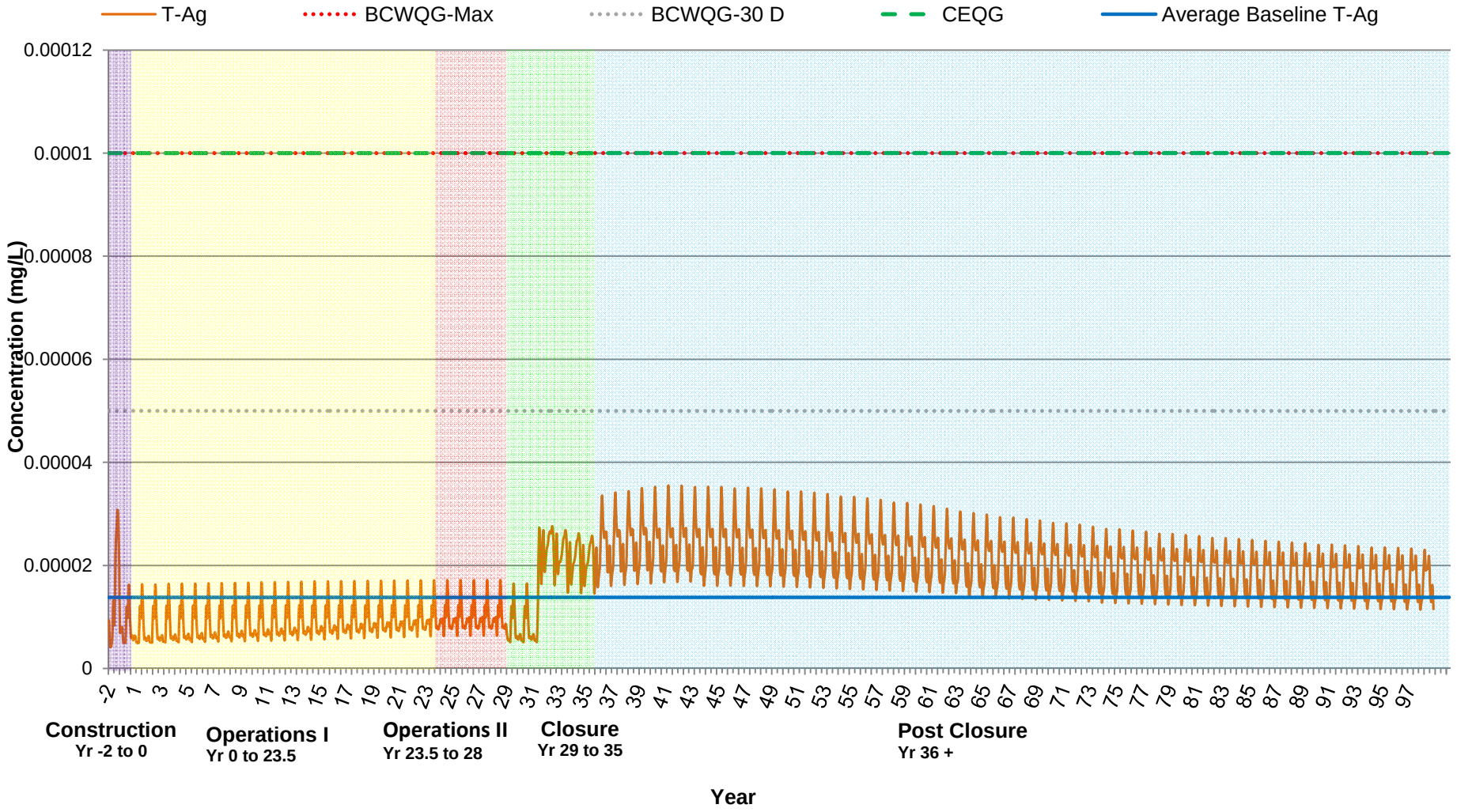
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G7.Ni

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-30 D AND BCWQG-MAX ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 21 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE SILVER CONCENTRATIONS - HARPER CREEK BELOW T-CREEK

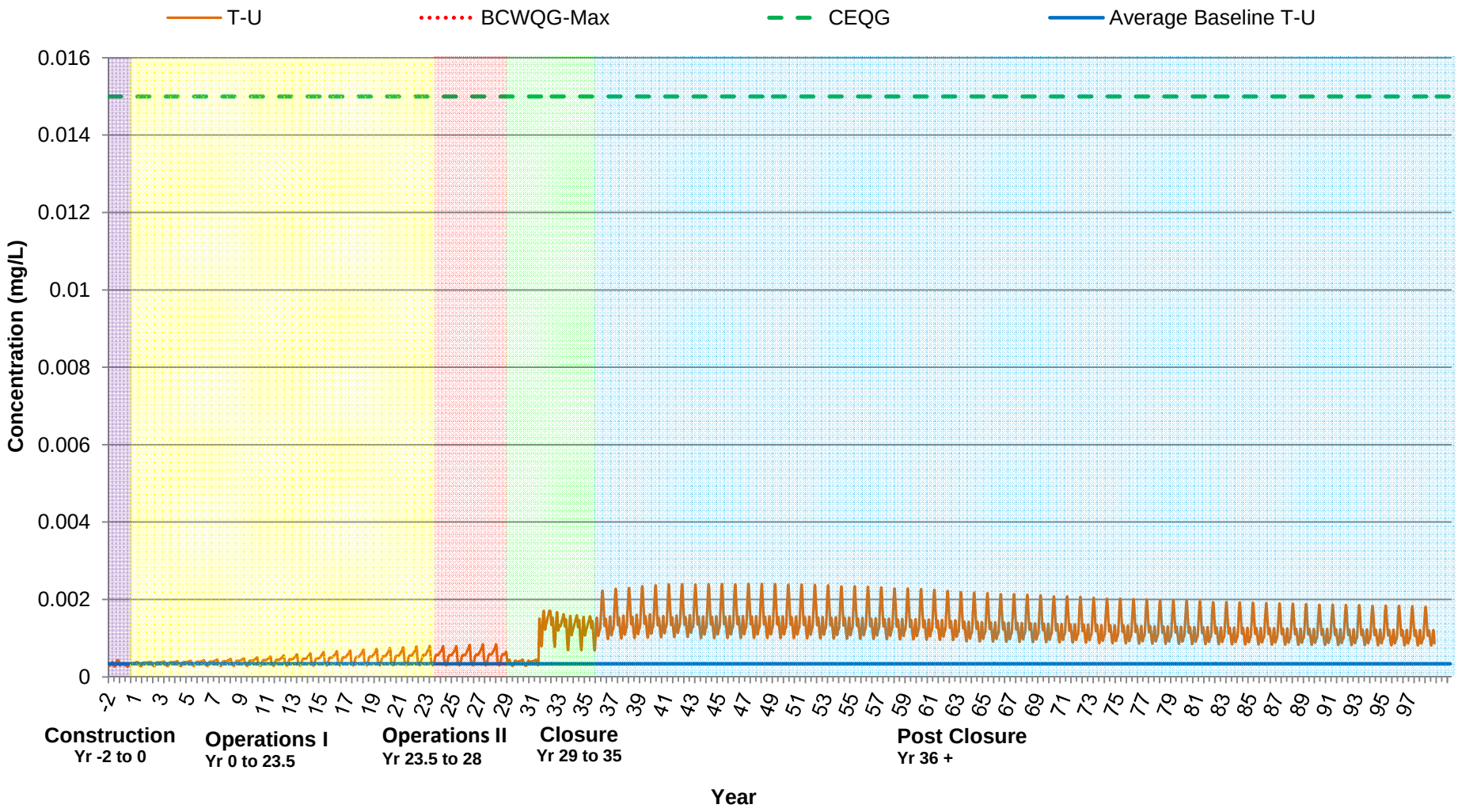
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G7.Ag

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 21 mg/L).
3. THE BCWQG-MAX (0.3 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE URANIUM CONCENTRATIONS - HARPER CREEK BELOW T-CREEK

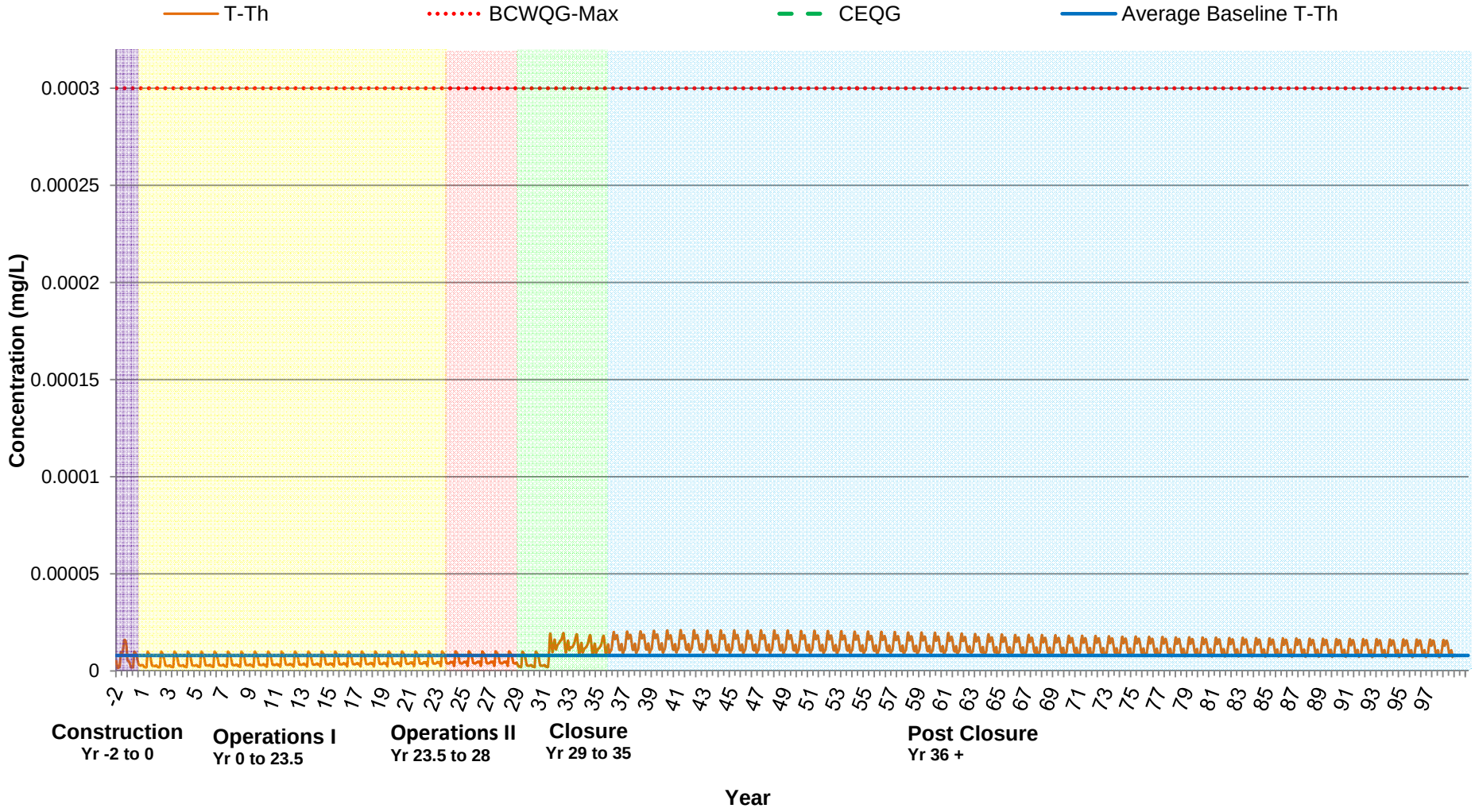
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G7.U

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 21 mg/L).
3. THE CEQG (0.0008 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE THALLIUM CONCENTRATIONS - HARPER CREEK BELOW T-CREEK

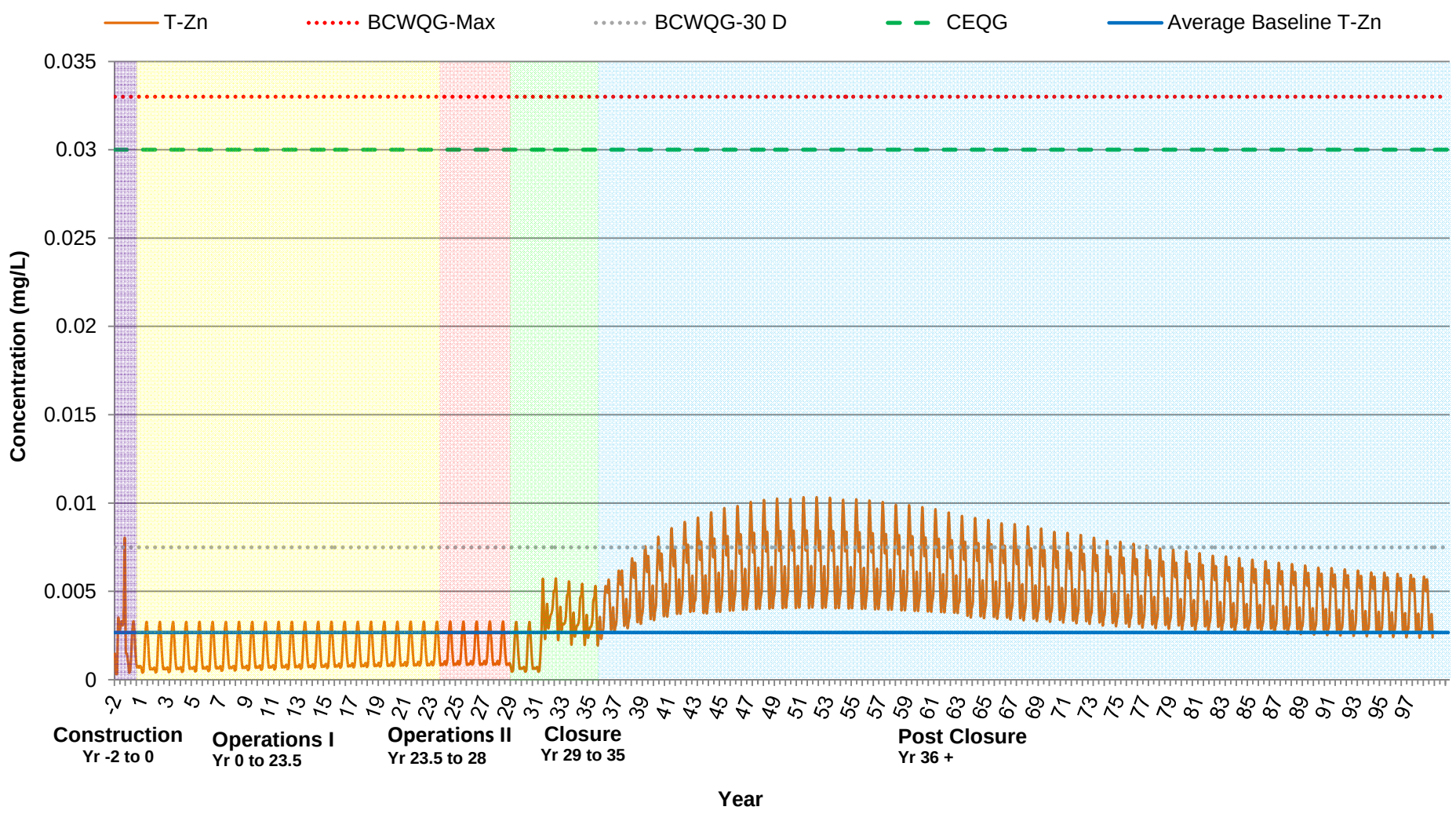
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G7.Th

REV 0



NOTES:

1. BCWQG-30 D AND BCWQG-MAX ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS HT MODELLED BASELINE (AVERAGE HARDNESS OF 21 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE ZINC CONCENTRATIONS - HARPER CREEK BELOW T-CREEK

Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

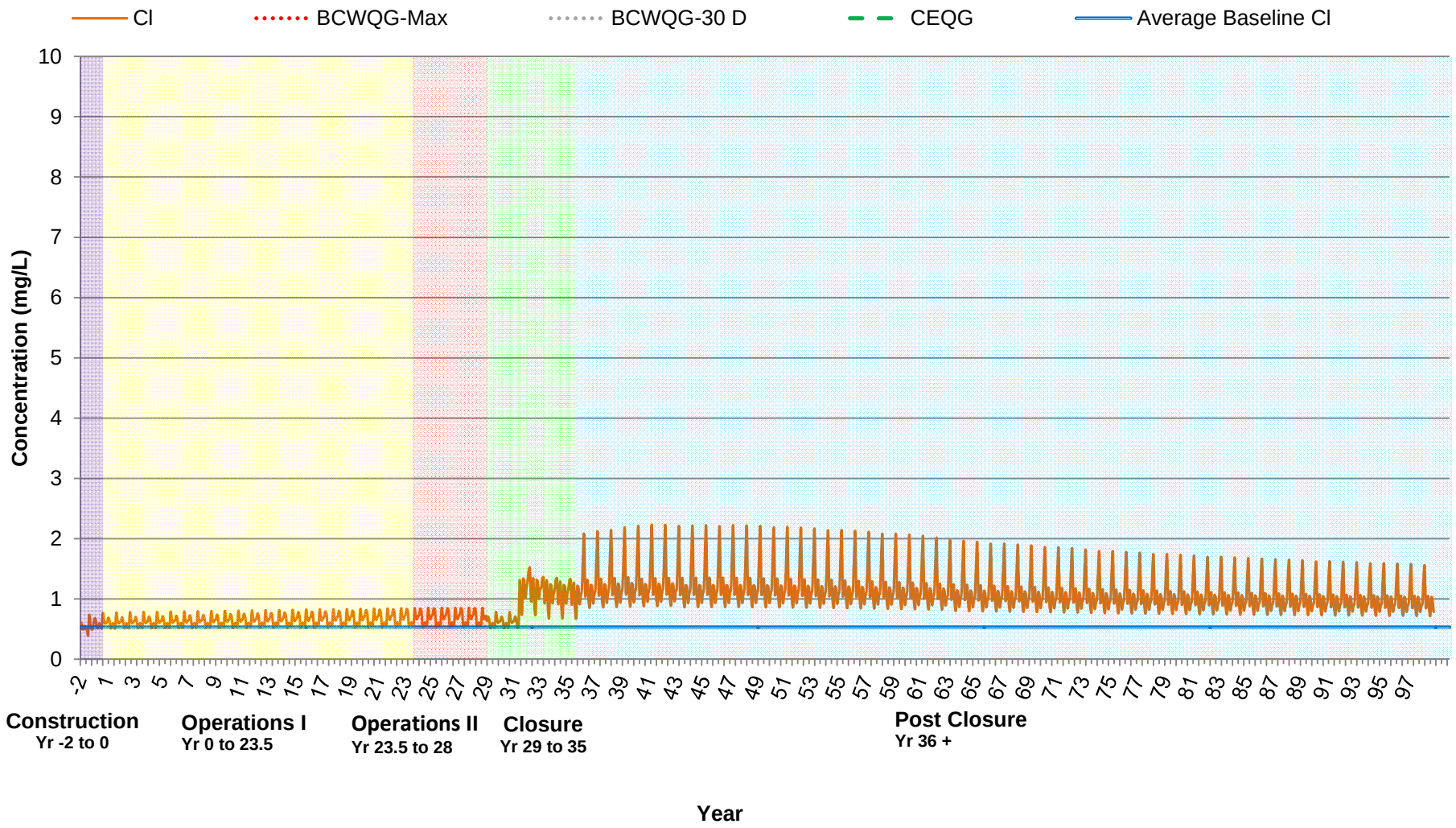
FIGURE G7.Zn

REV 0

APPENDIX G8

HARPER CREEK ABOVE BARRIÈRE RIVER (HB)

(Pages G8-1 to G8-30)



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).
3. ALL GUIDELINES ARE NOT SHOWN: BCWQG-30 D (150 mg/L); BCWQG-MAX (600 mg/L); CEQG (120 mg/L AND 640 mg/L).

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE CHLORIDE CONCENTRATIONS - HARPER CREEK ABOVE BARRIÈRE RIVER (HB)

Knight Piésold CONSULTING

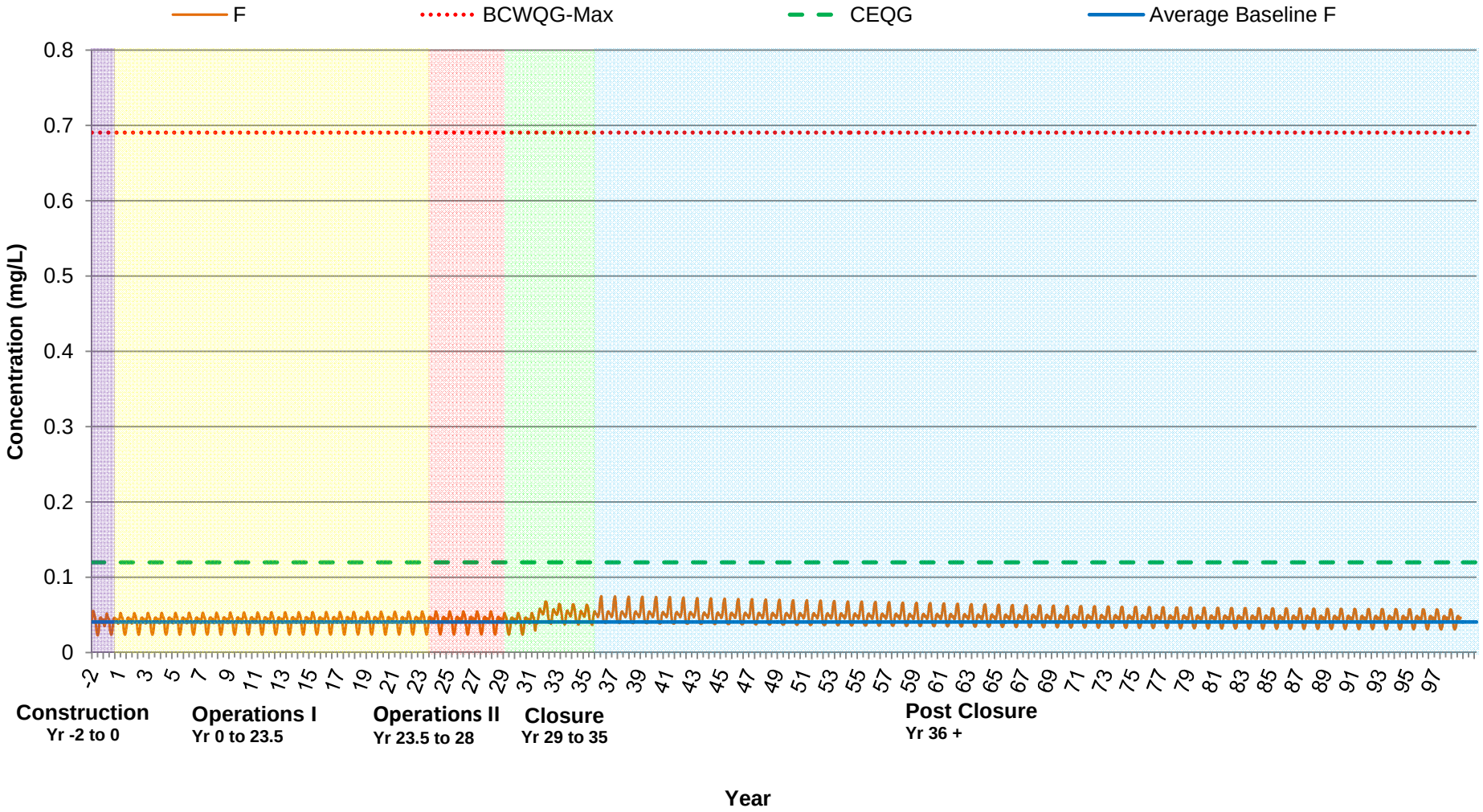
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G8.Cl

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX IS HARNDESS DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE FLUORIDE CONCENTRATIONS - HARPER CREEK ABOVE BARRIÈRE RIVER (HB)

Knight Piésold CONSULTING

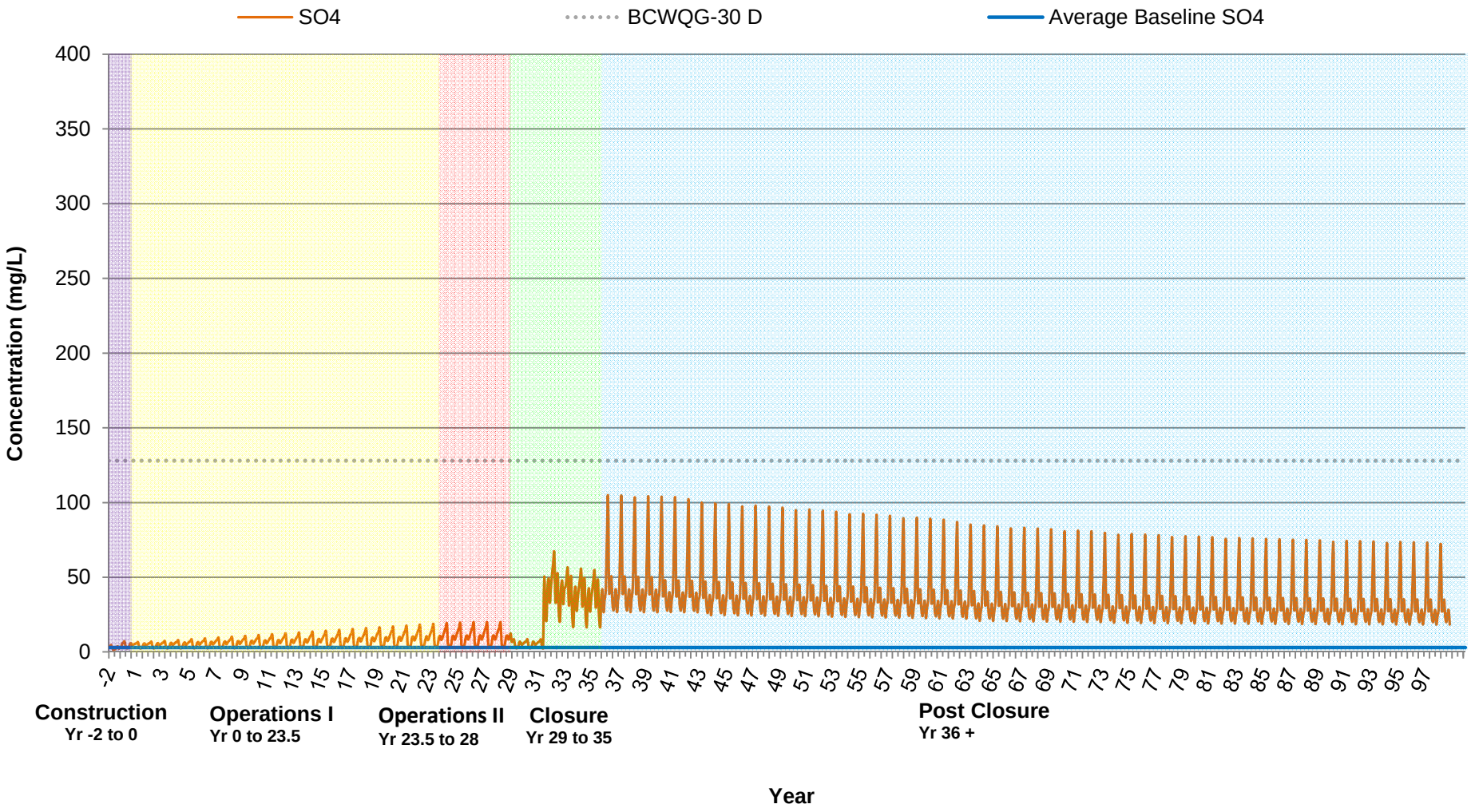
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G8.F

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. BCWQG-30 D IS HARDNESS DEPEDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE SULPHATE CONCENTRATIONS - HARPER CREEK ABOVE BARRIÈRE RIVER (HB)

Knight Piésold CONSULTING

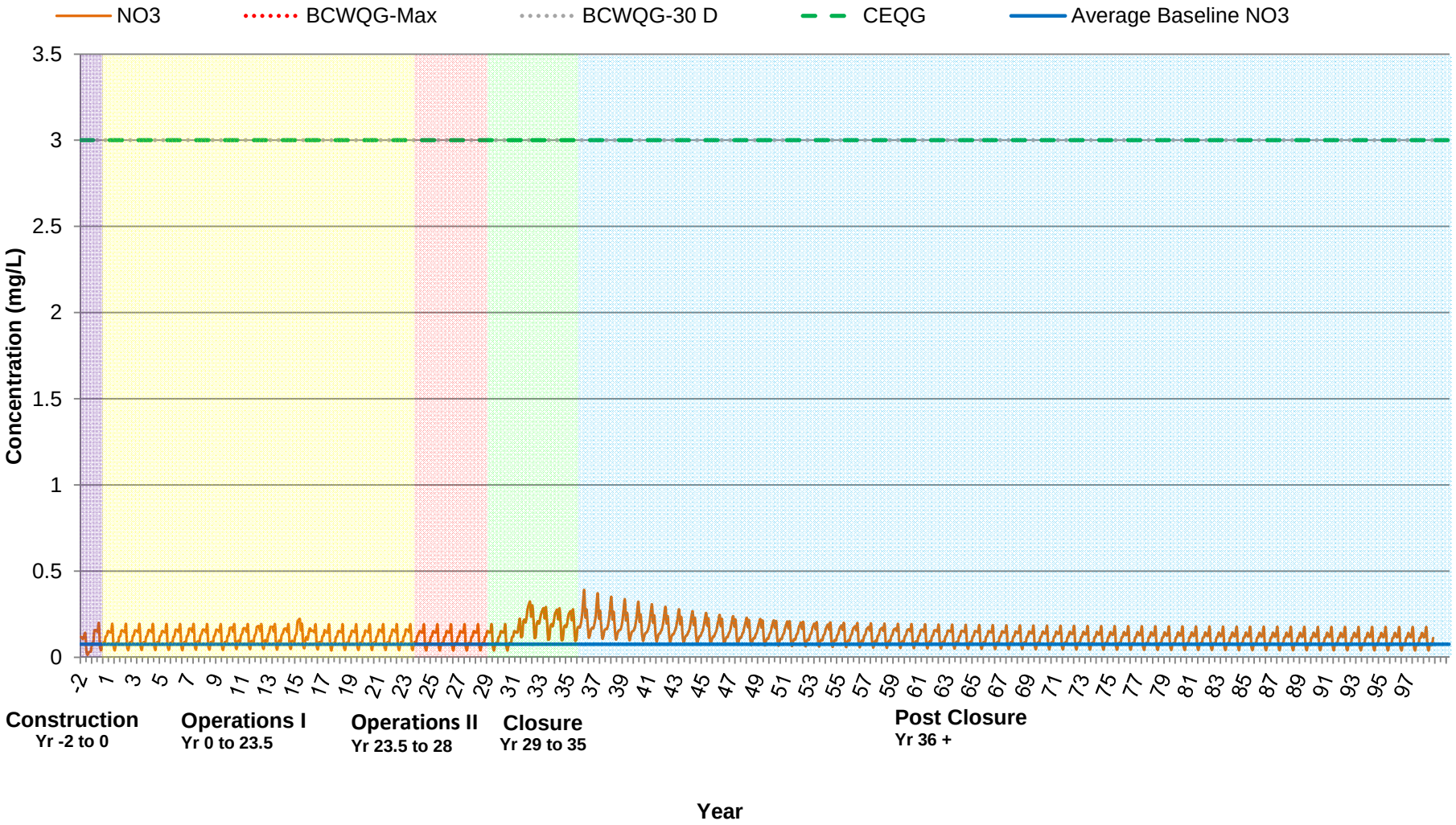
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G8.S04

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).
3. THE BCWQG-MAX (32.8 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE NITRATE CONCENTRATIONS - HARPER CREEK ABOVE BARRIÈRE RIVER (HB)

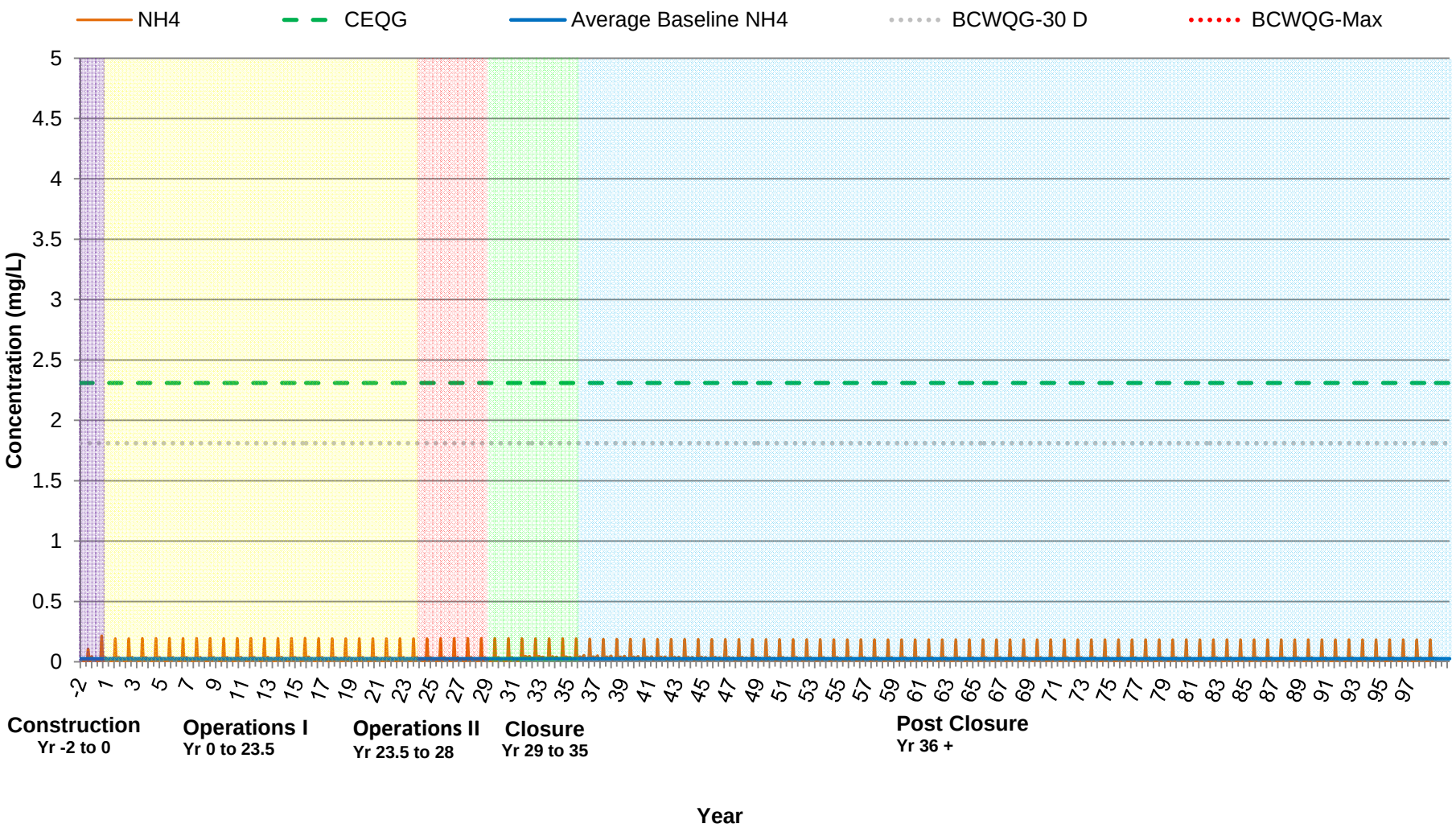
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G8.NO3

REV 0



NOTES:

1. THE BCWQG-30 D IS VALID FOR ONLY 6.5≤pH<9 AND 0°C≤T≤20°C.
2. THE BCWQG-MAX (20.15 mg/L) VALID FOR 6.5≤pH<9 IS NOT SHOWN.
3. THE CEQG IS TO BE USED WITH CAUTION FOR WATER WITH T<5°C AND pH>9.
4. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE AMMONIA CONCENTRATIONS - HARPER CREEK ABOVE BARRIÈRE RIVER (HB)

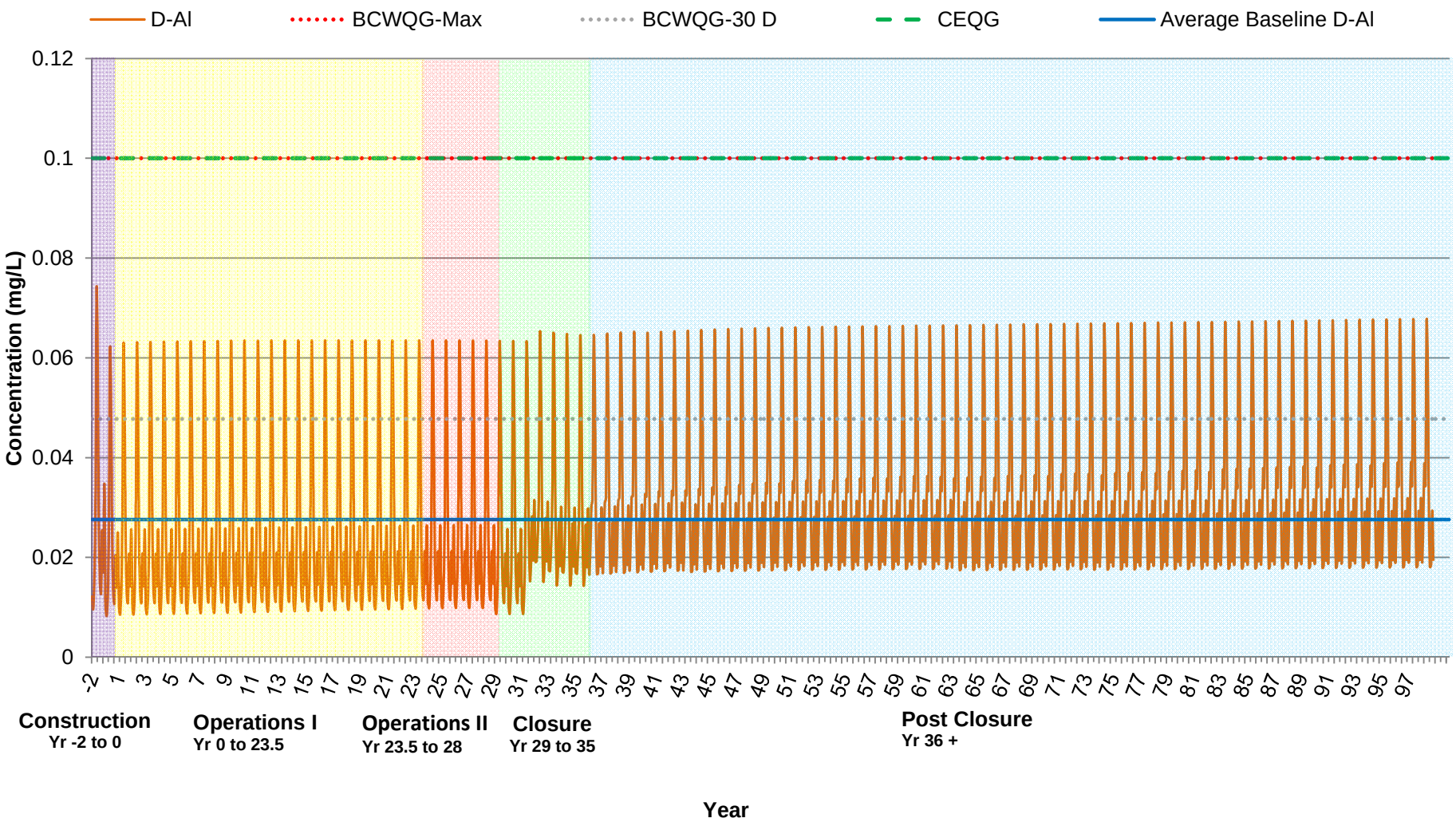
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G8.NH4

REV 0



NOTES:

1. ALL GUIDELINES ARE pH-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).
3. AVERAGE BASELINE pH USED TO CALCULATE GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE DISSOLVED ALUMINUM CONCENTRATIONS - HARPER CREEK ABOVE BARRIÈRE RIVER (HB)

Knight Piésold CONSULTING

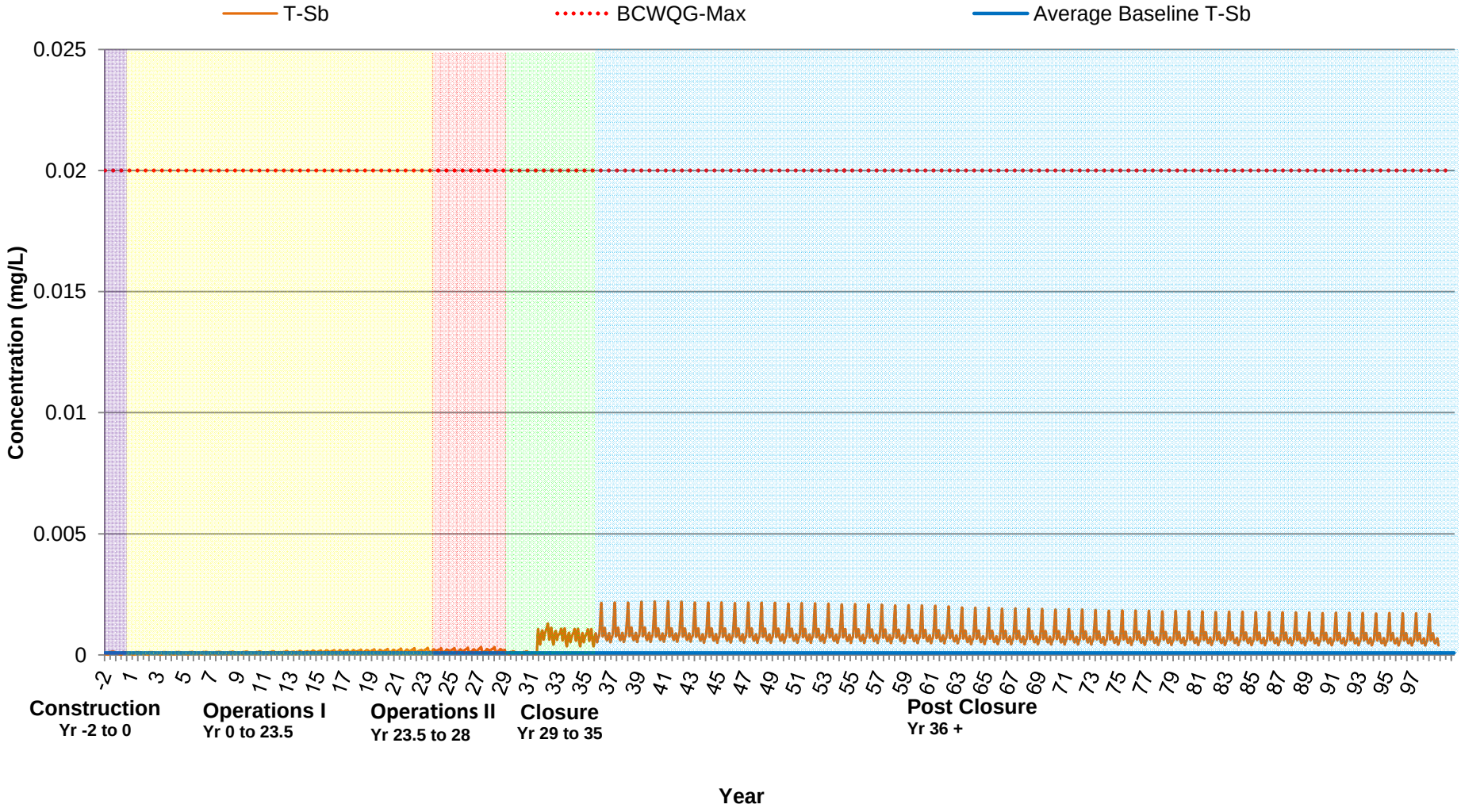
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G8.Al

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE ANTIMONY CONCENTRATIONS - HARPER CREEK ABOVE BARRIÈRE RIVER (HB)

Knight Piésold CONSULTING

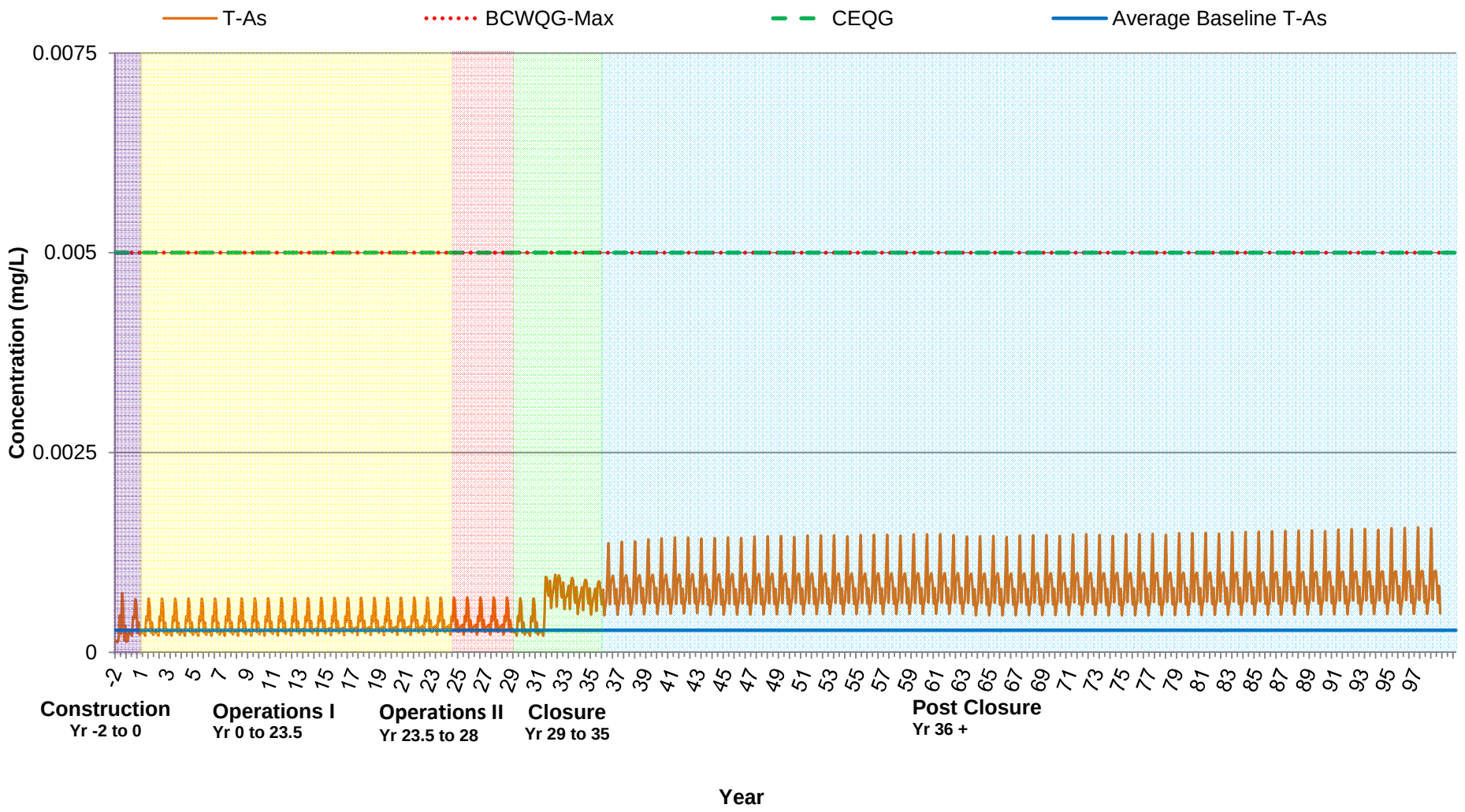
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G8.Sb

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE ARSENIC CONCENTRATIONS - HARPER CREEK ABOVE BARRIÈRE RIVER (HB)

Knight Piésold CONSULTING

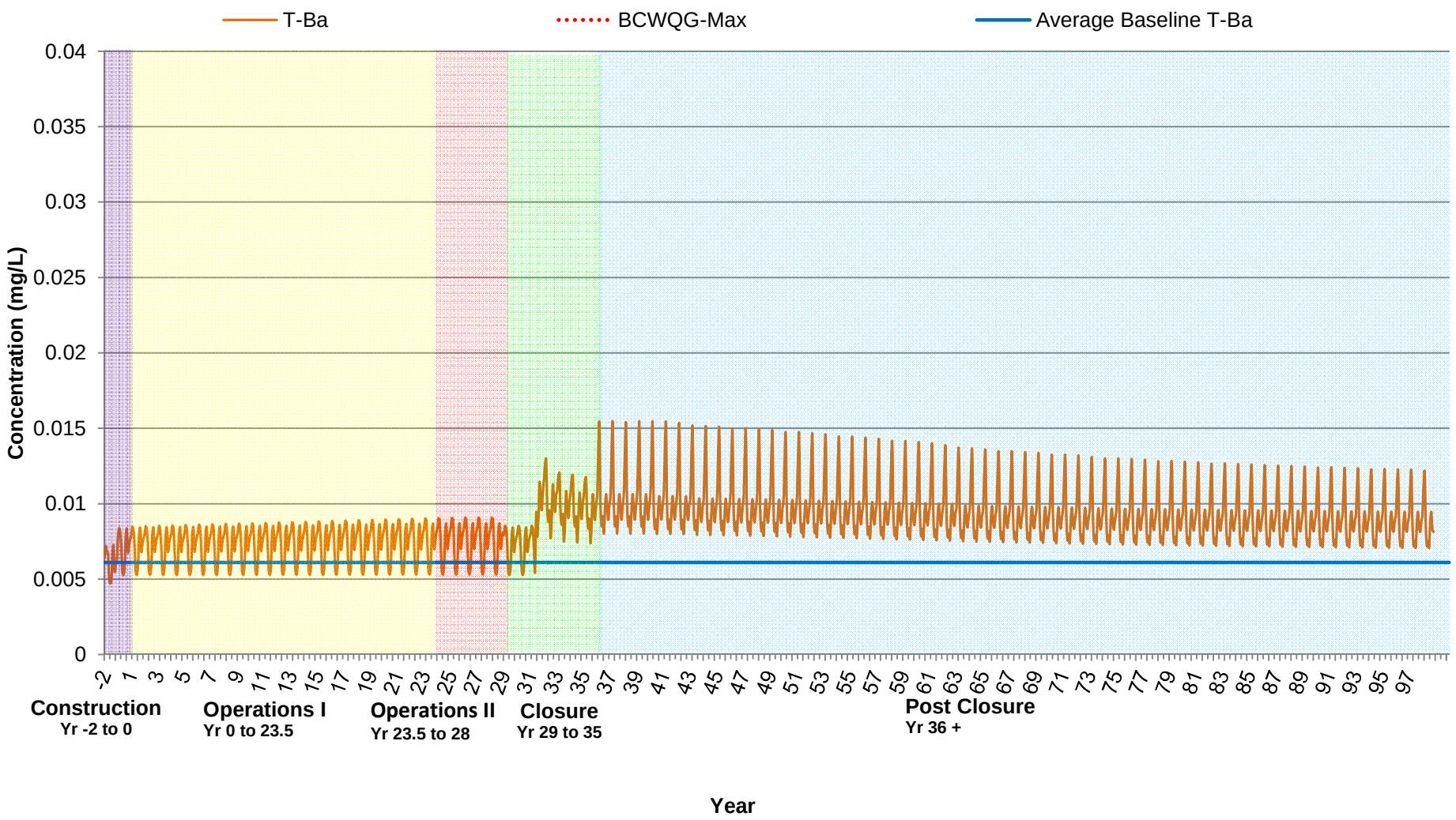
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G8.As

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).
3. THE BCWQG-30 D (1 mg/L) AND BCWQG-MAX (5 mg/L) ARE NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE BARIUM CONCENTRATIONS - HARPER CREEK ABOVE BARRIÈRE RIVER (HB)

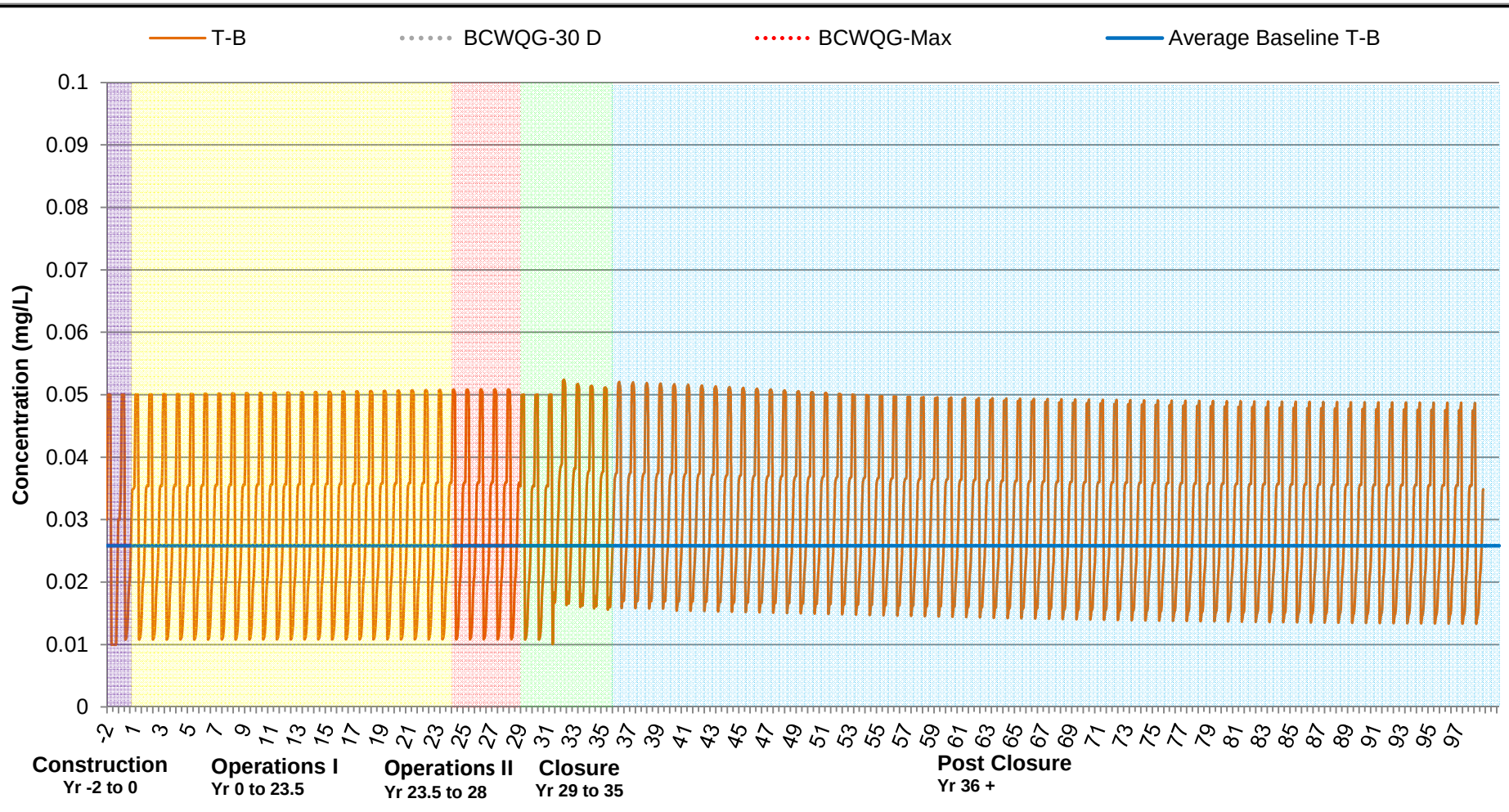
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G8.Ba

REV 0



NOTES:

1. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.
3. THE BCWQG-MAX (1.2 mg/L) IS NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE BORON CONCENTRATIONS - HARPER CREEK ABOVE BARRIÈRE RIVER (HB)

Knight Piésold CONSULTING

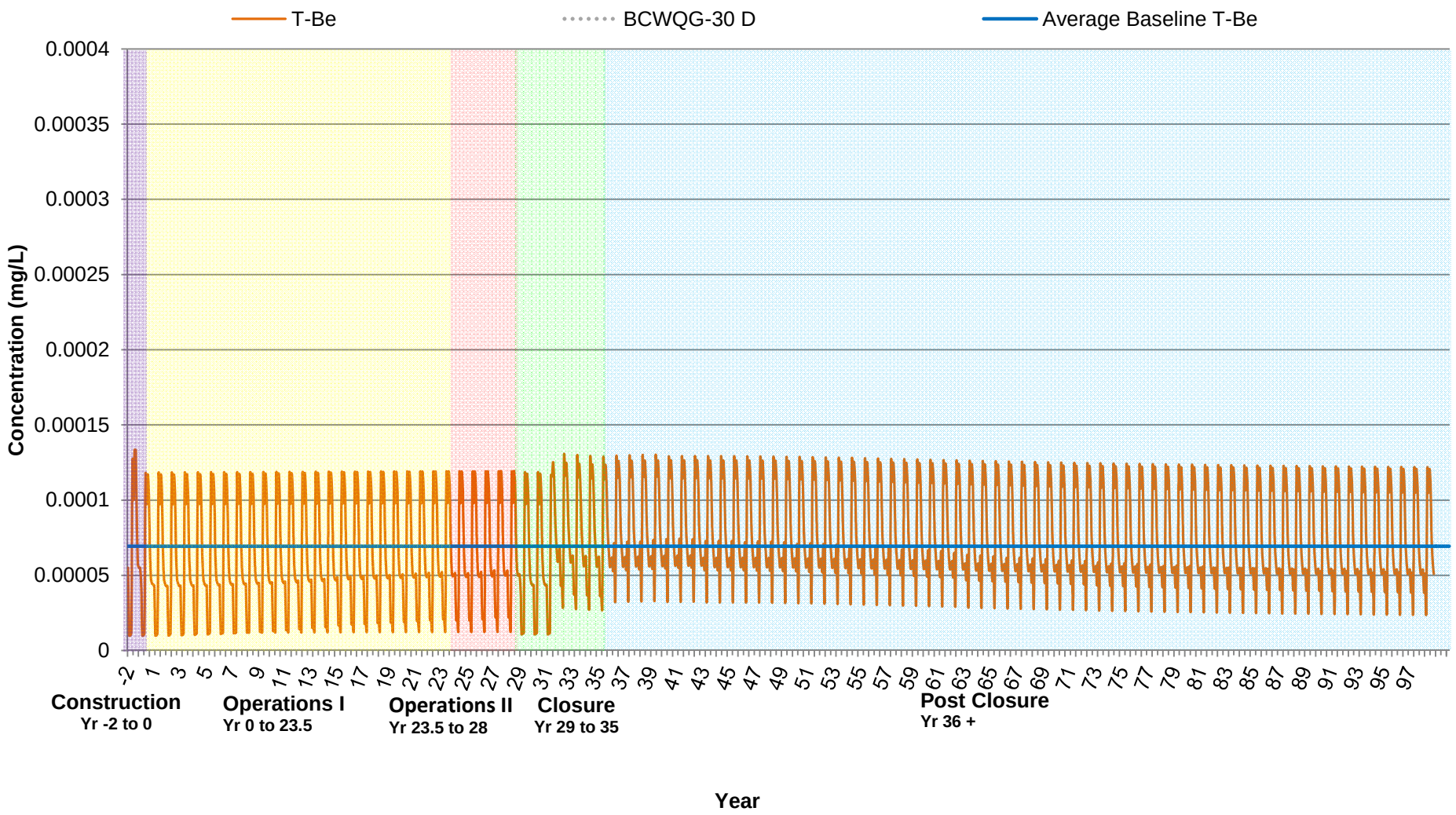
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G8.B

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).
3. THE BCWQG-30 D (0.0053 mg/L) IS NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE BERYILLIUM CONCENTRATIONS - HARPER CREEK ABOVE BARRIÈRE RIVER (HB)

Knight Piésold CONSULTING

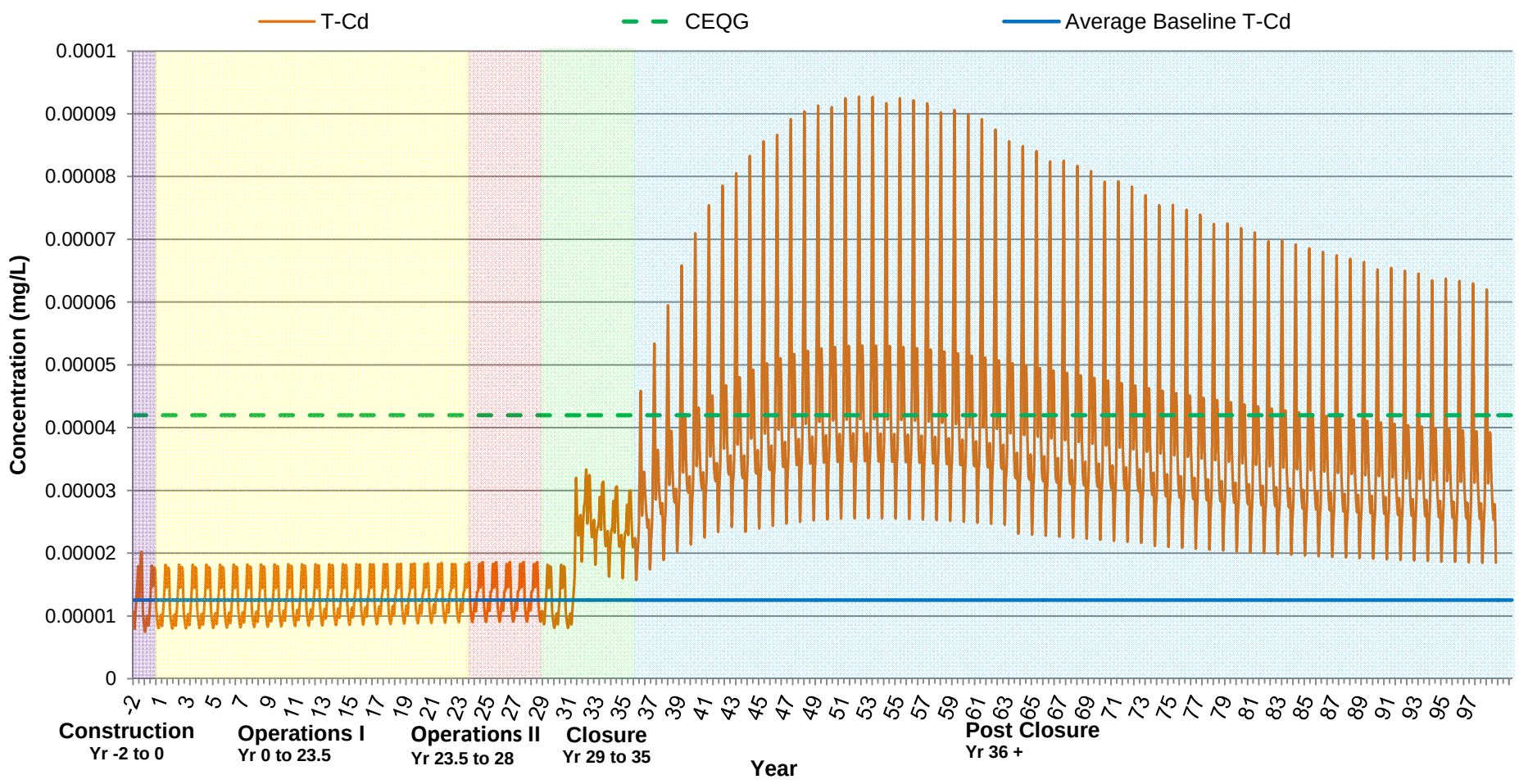
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G8.Be

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. THE BCWQG ARE DRAFT GUIDELINES UNDER REVIEW (JUNE 2014).
3. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).
4. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE CADMIUM CONCENTRATIONS - HARPER CREEK ABOVE BARRIÈRE RIVER (HB)

Knight Piésold CONSULTING

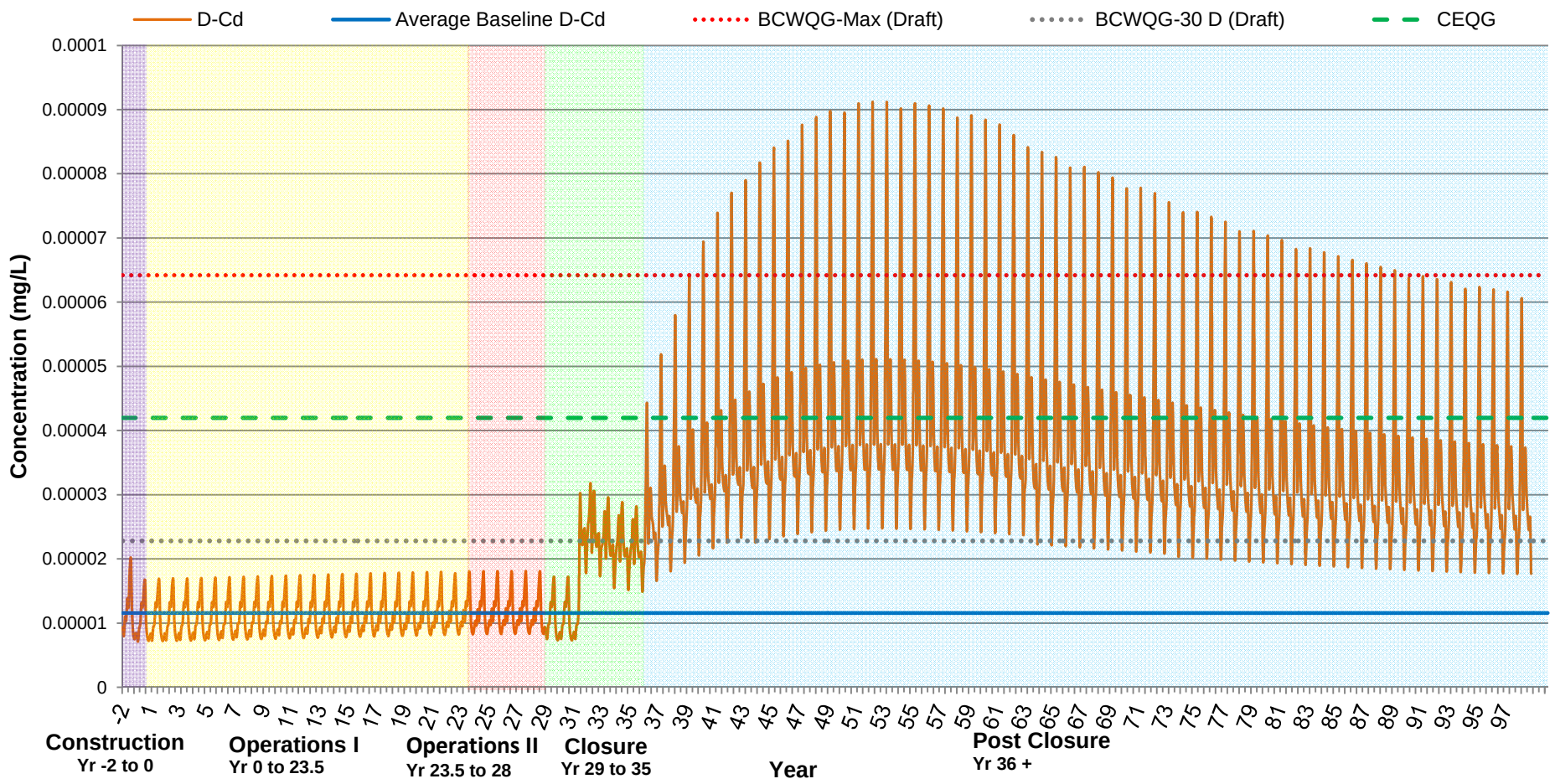
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G8.Cd-T

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE CADMIUM CONCENTRATIONS - HARPER CREEK ABOVE BARRIÈRE RIVER (HB)

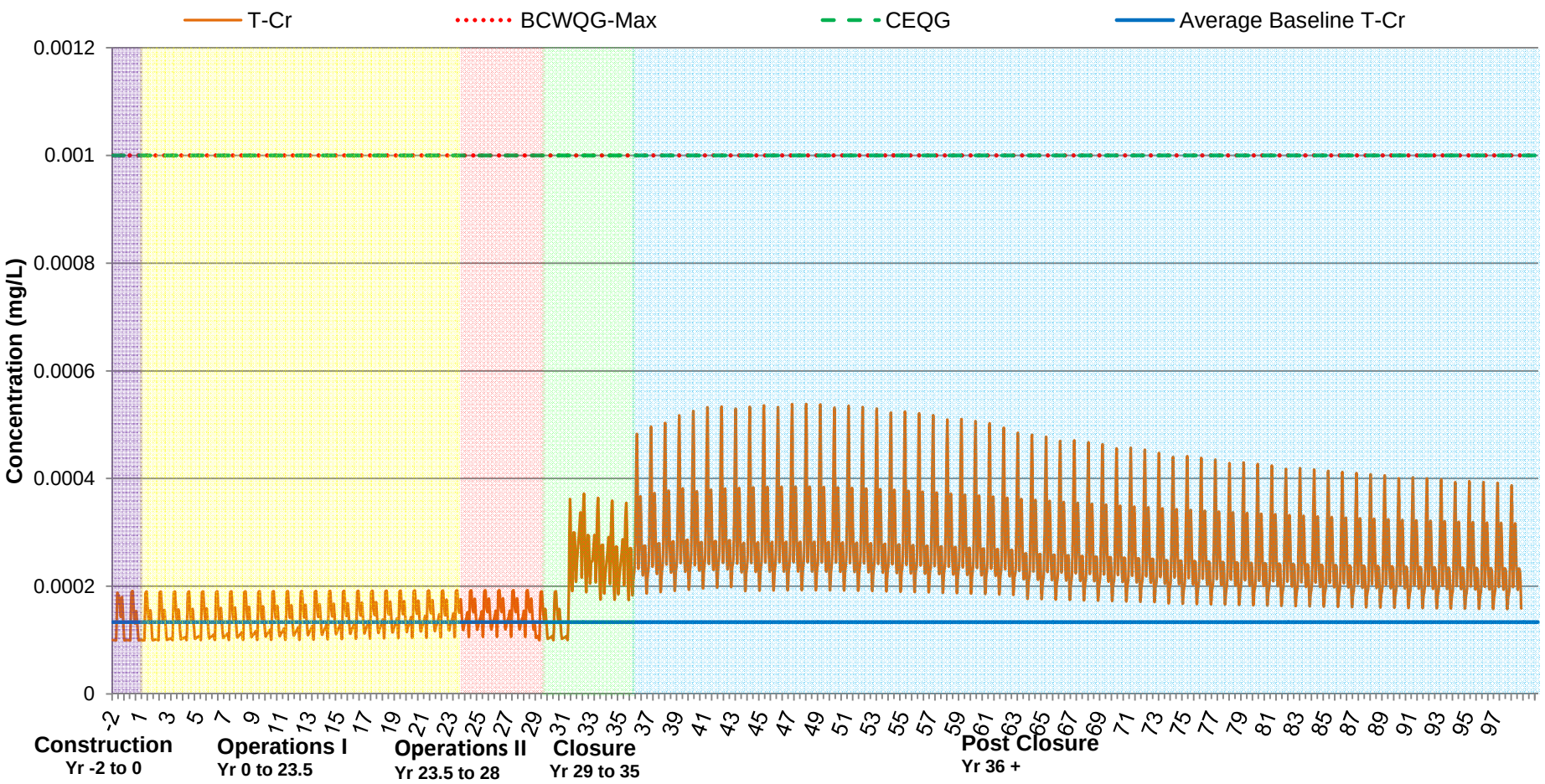
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G8.Cd-D

REV 0



NOTES:

1. GUIDELINES ARE FOR CHROMIUM (IV), THE SPECIES MOST COMMON IN WELL OXYGENATED SURFACE WATERS.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE CHROMIUM CONCENTRATIONS - HARPER CREEK ABOVE BARRIÈRE RIVER (HB)

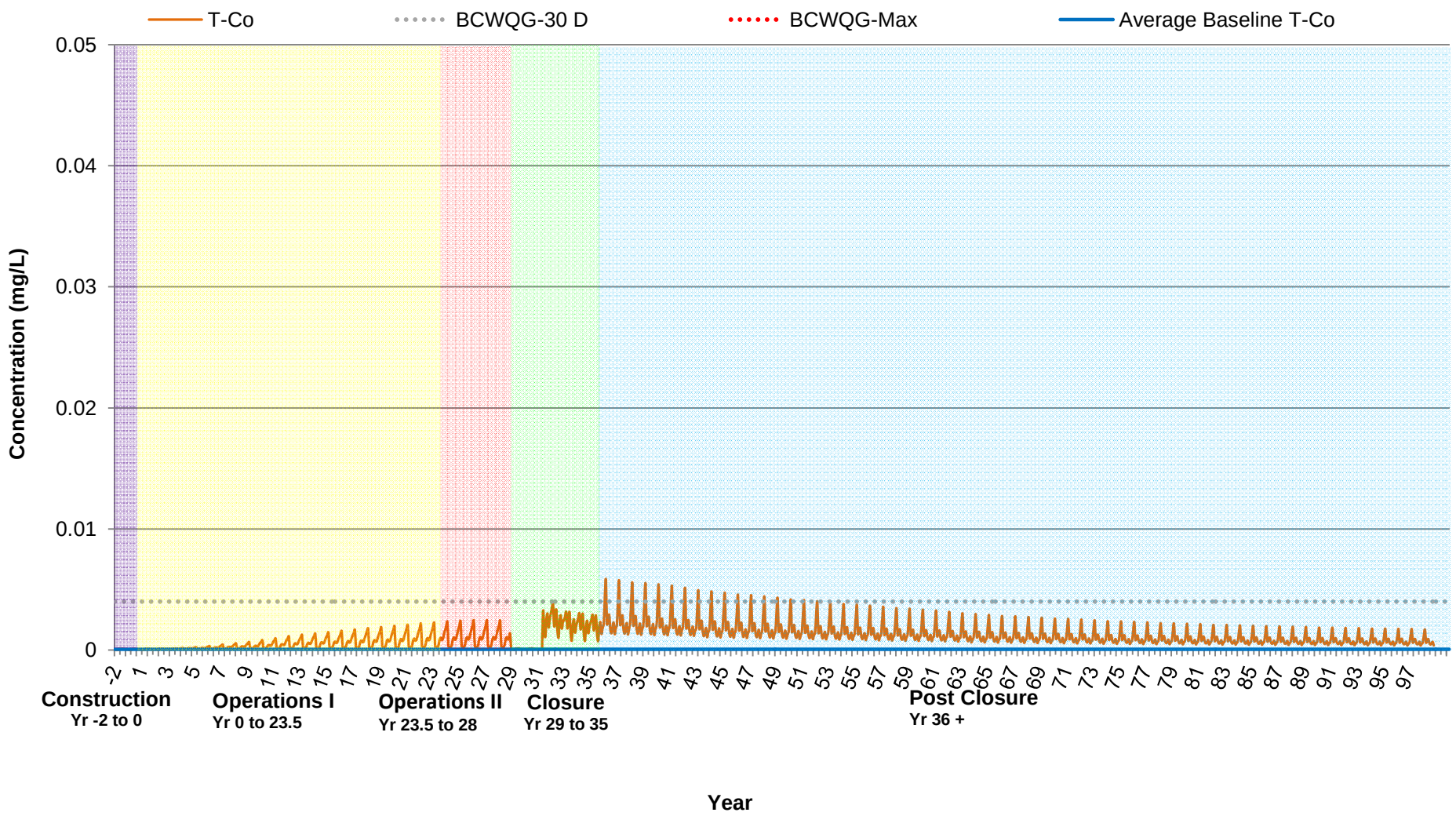
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G8.Cr

REV 0



NOTES:

1. THE BCWQG-30 D AND BCWQG-MAX ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).
3. THE BCWQG-MAX GUIDELINE (0.11 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE COBALT CONCENTRATIONS - HARPER CREEK ABOVE BARRIÈRE RIVER (HB)

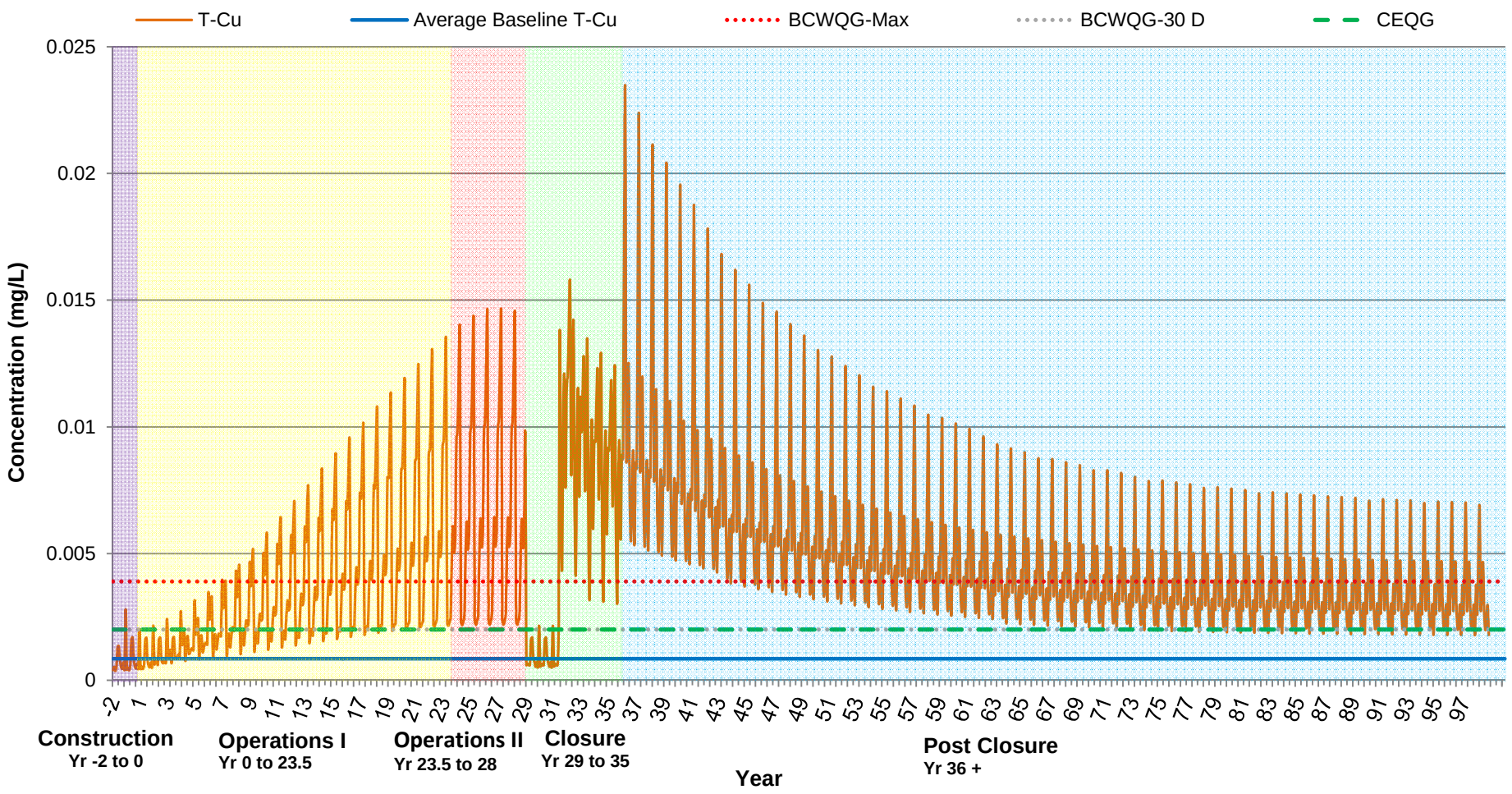
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G8.Co

REV 0



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE COPPER CONCENTRATIONS - HARPER CREEK ABOVE BARRIÈRE RIVER (HB)

Knight Piésold CONSULTING

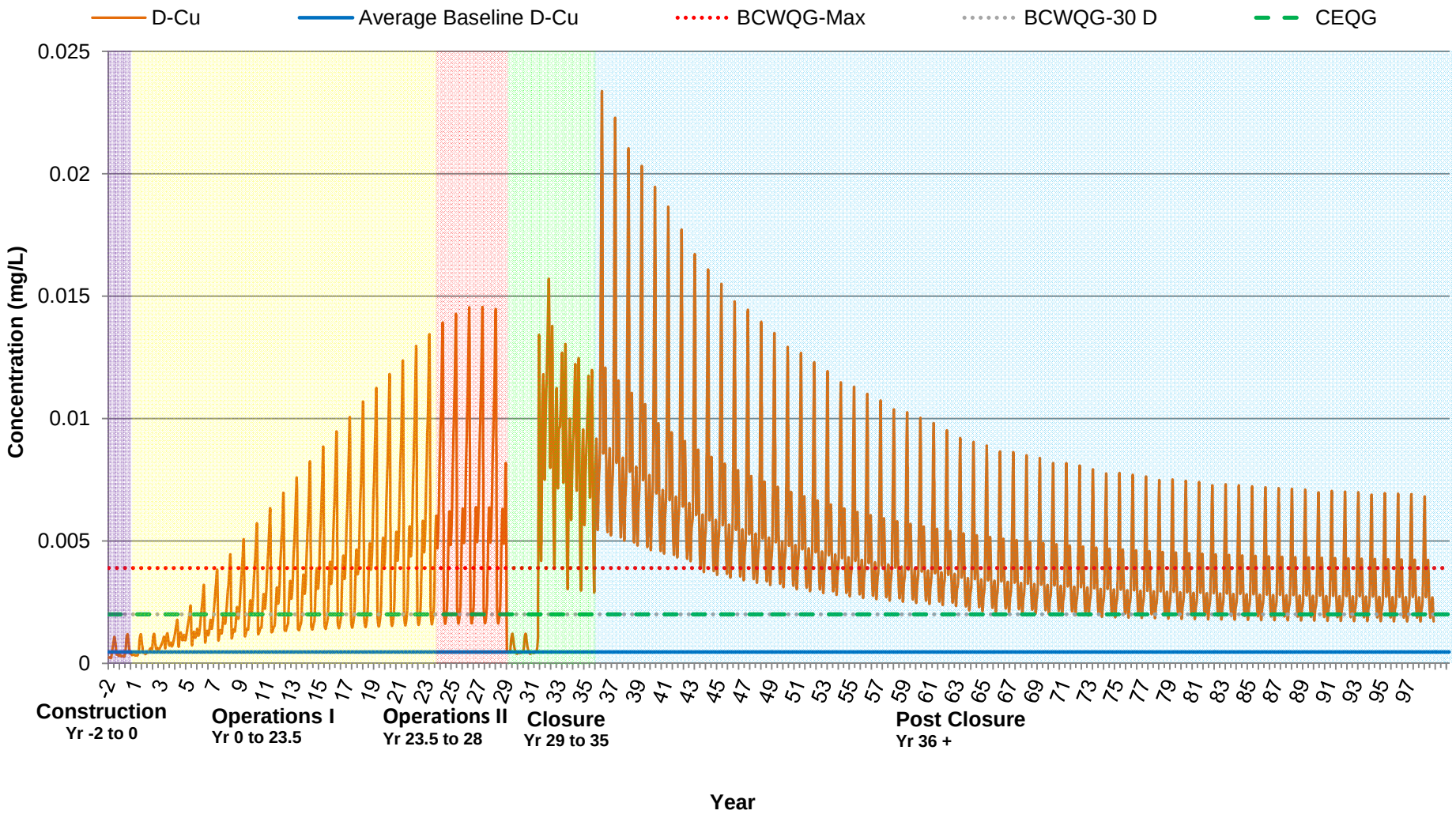
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G8.Cu-T

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE COPPER CONCENTRATIONS - HARPER CREEK ABOVE BARRIÈRE RIVER (HB)

Knight Piésold CONSULTING

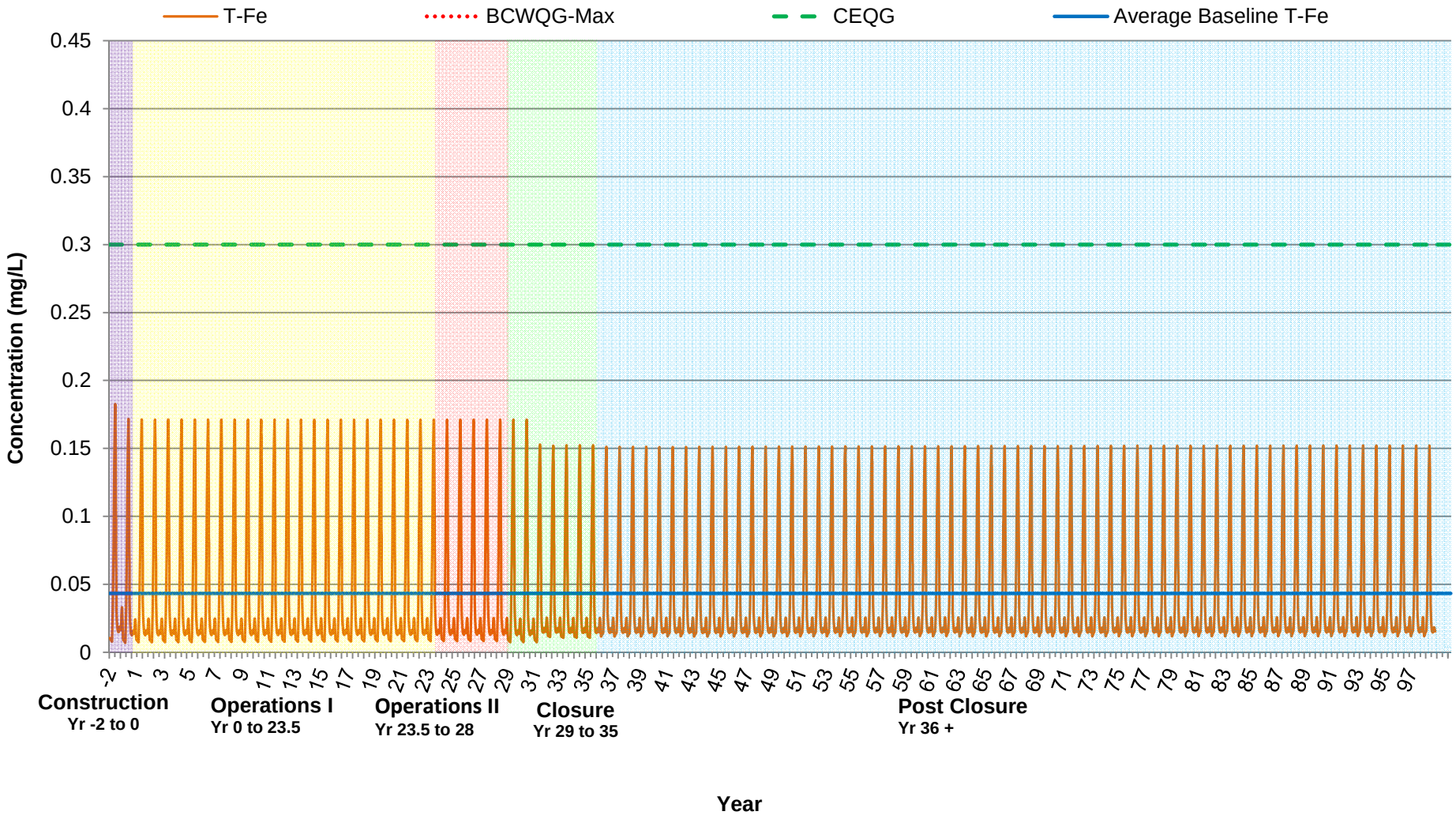
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G8.Cu-D

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).
3. BCWQG-MAX 1.0 mg/L IS NOT SHOWN ON GRAPH.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE TOTAL IRON CONCENTRATIONS - HARPER CREEK ABOVE BARRIÈRE RIVER (HB)

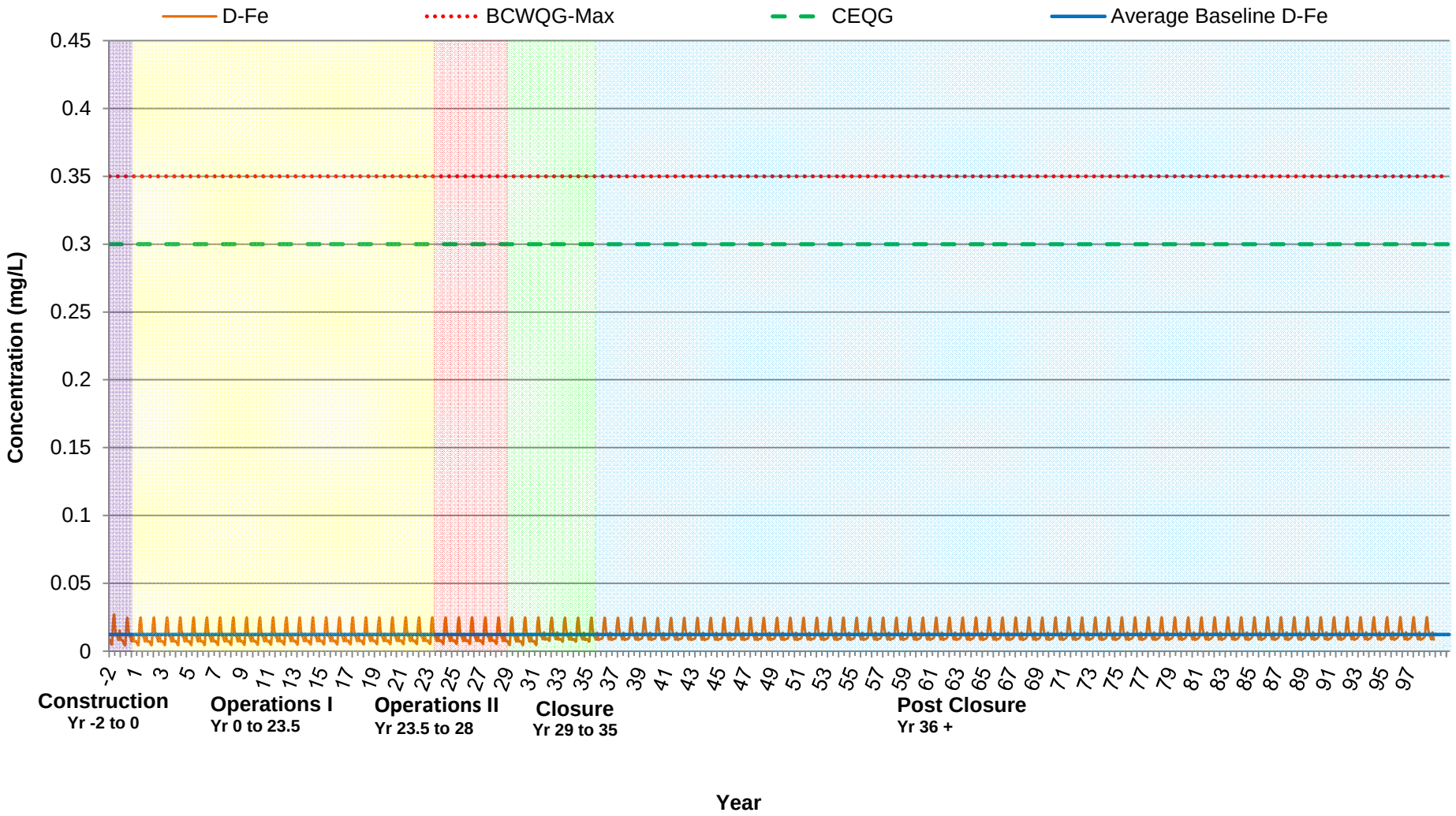
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G8.Fe-T

REV 0



NOTES:

1. THE BCWQG-MAX AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE DISSOLVED IRON CONCENTRATIONS - HARPER CREEK ABOVE BARRIÈRE RIVER (HB)

Knight Piésold CONSULTING

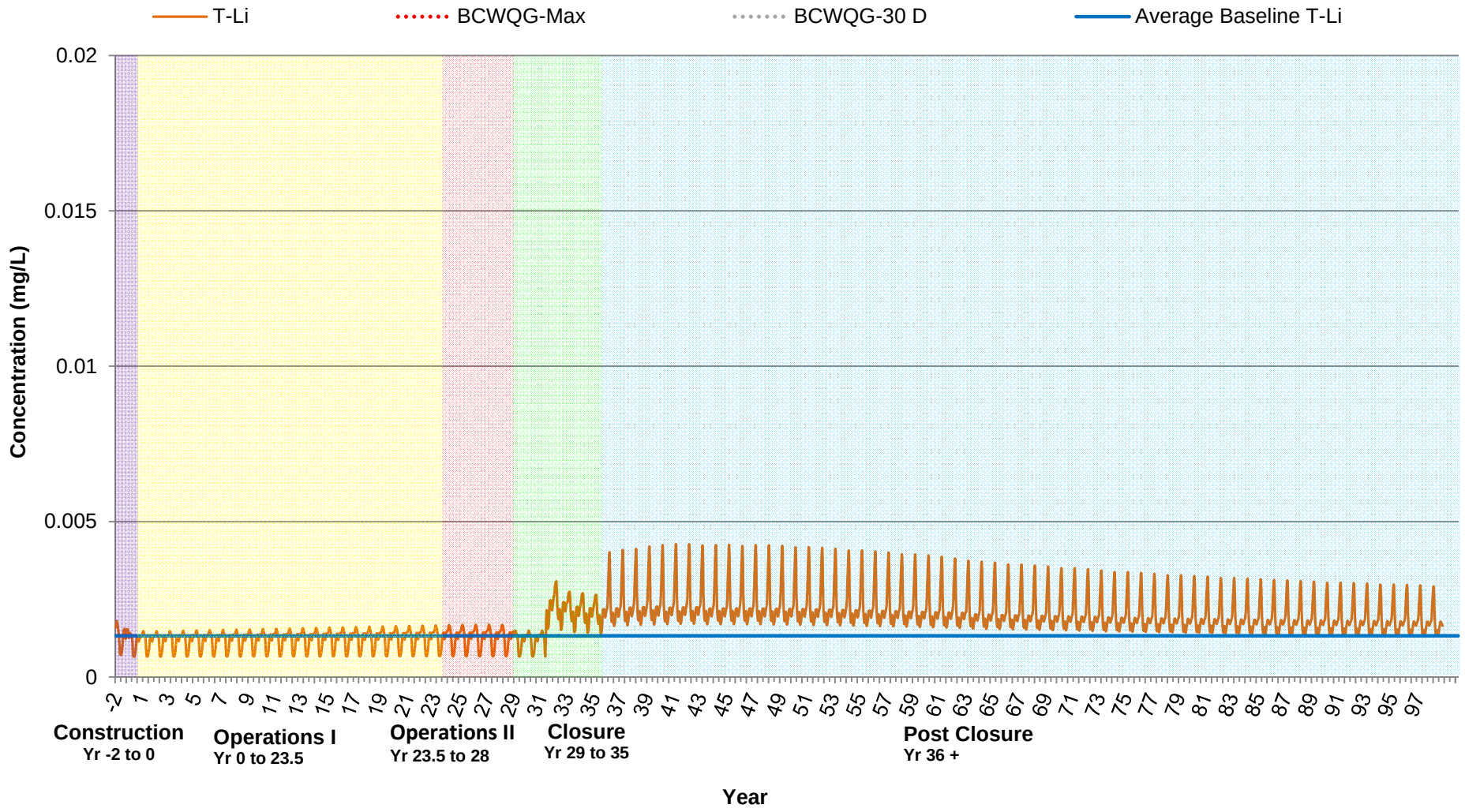
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G8.Fe-D

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).
3. THE BCWQG-30 D (0.096 mg/L) AND BCWQG-MAX (0.87 mg/L) ARE INTERIM (WORKING) AND ARE NOT SHOWN ON GRAPH.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE LITHIUM CONCENTRATIONS - HARPER CREEK ABOVE BARRIÈRE RIVER (HB)

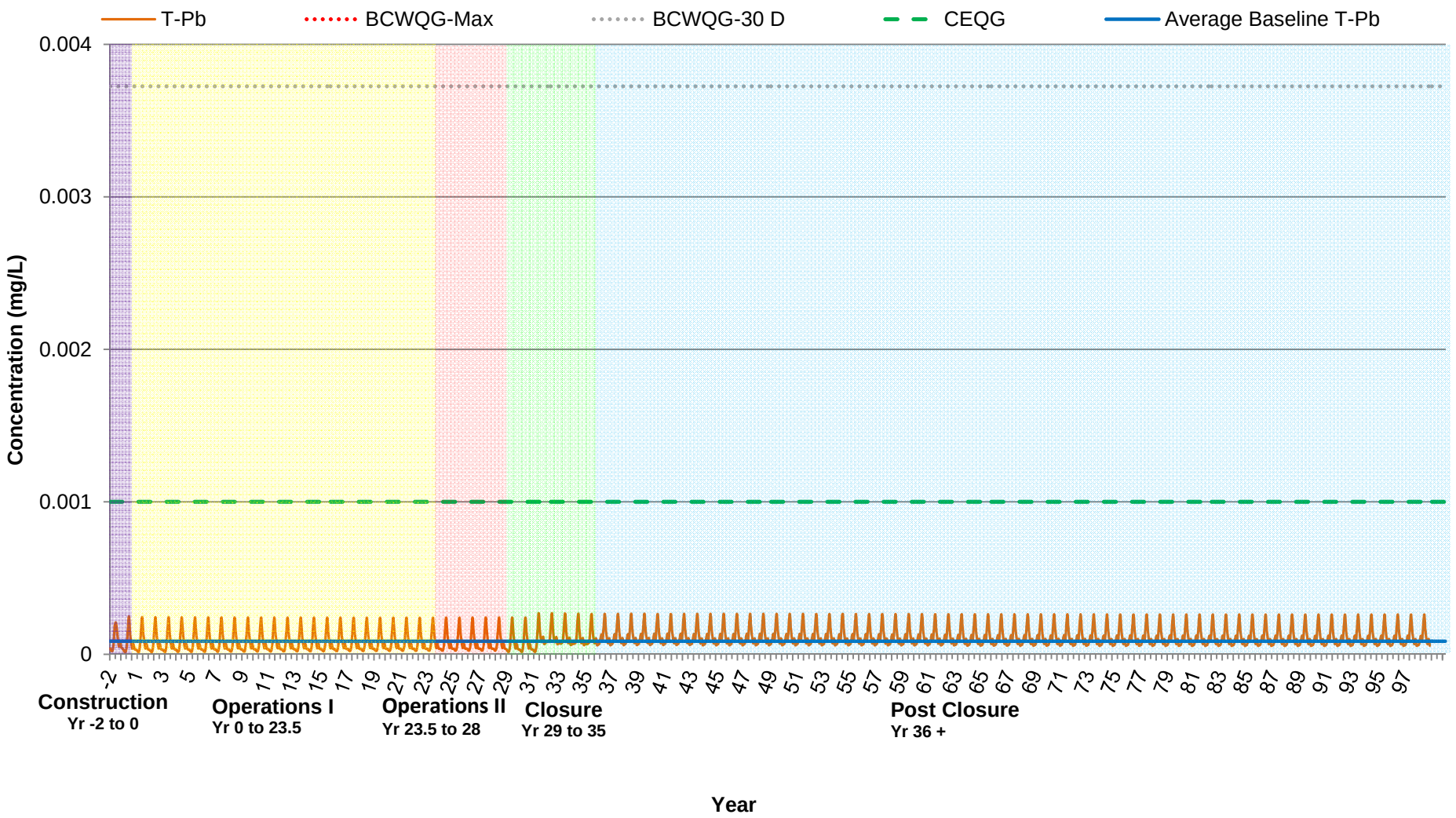
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G8.Li

REV 0



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.
4. THE BCWQG-MAX (CALCULATED AT 0.011 mg/L) IS NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE LEAD CONCENTRATIONS - HARPER CREEK ABOVE BARRIÈRE RIVER (HB)

Knight Piésold CONSULTING

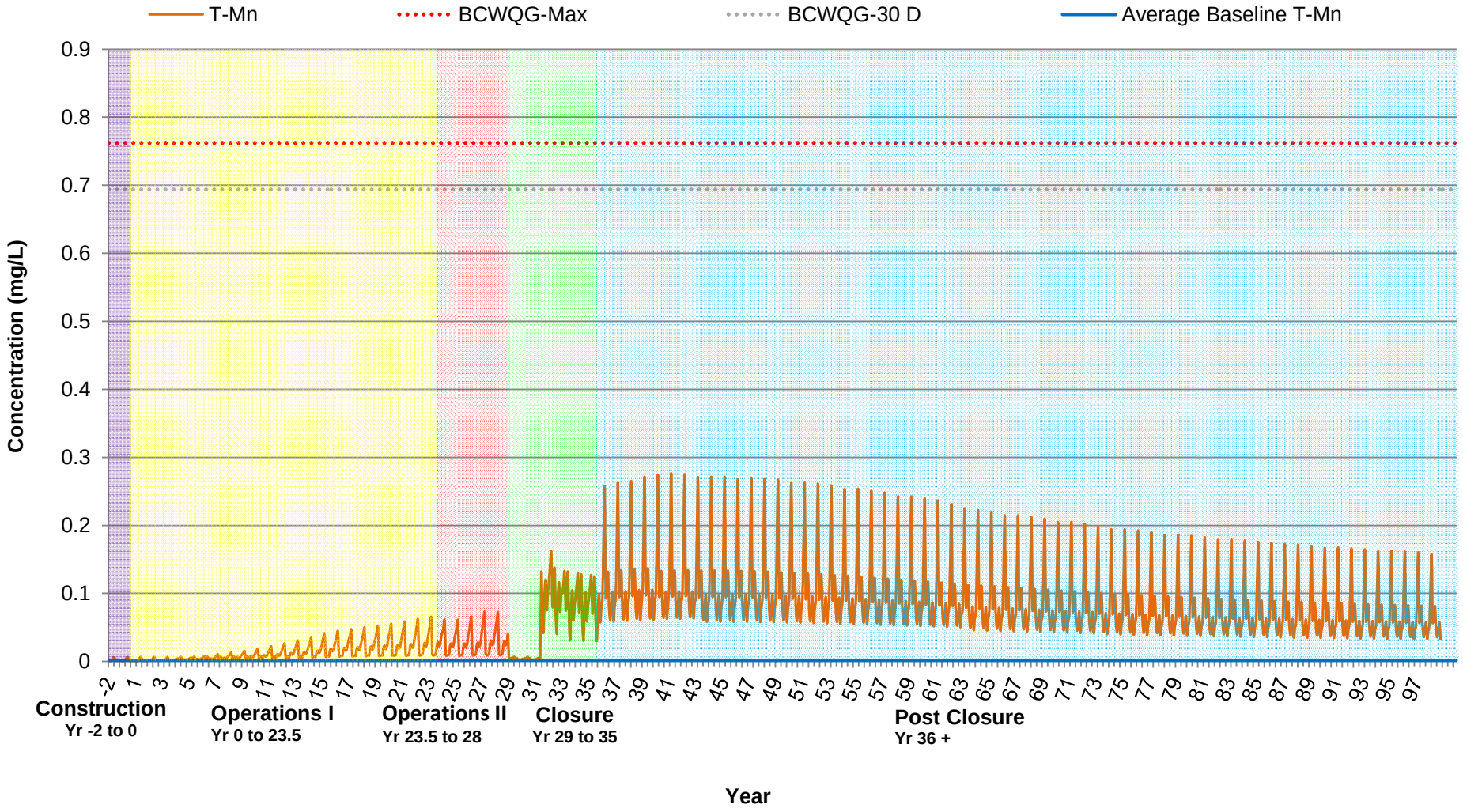
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G8.Pb

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE MANGANESE CONCENTRATIONS - HARPER CREEK ABOVE BARRIÈRE RIVER (HB)

Knight Piésold CONSULTING

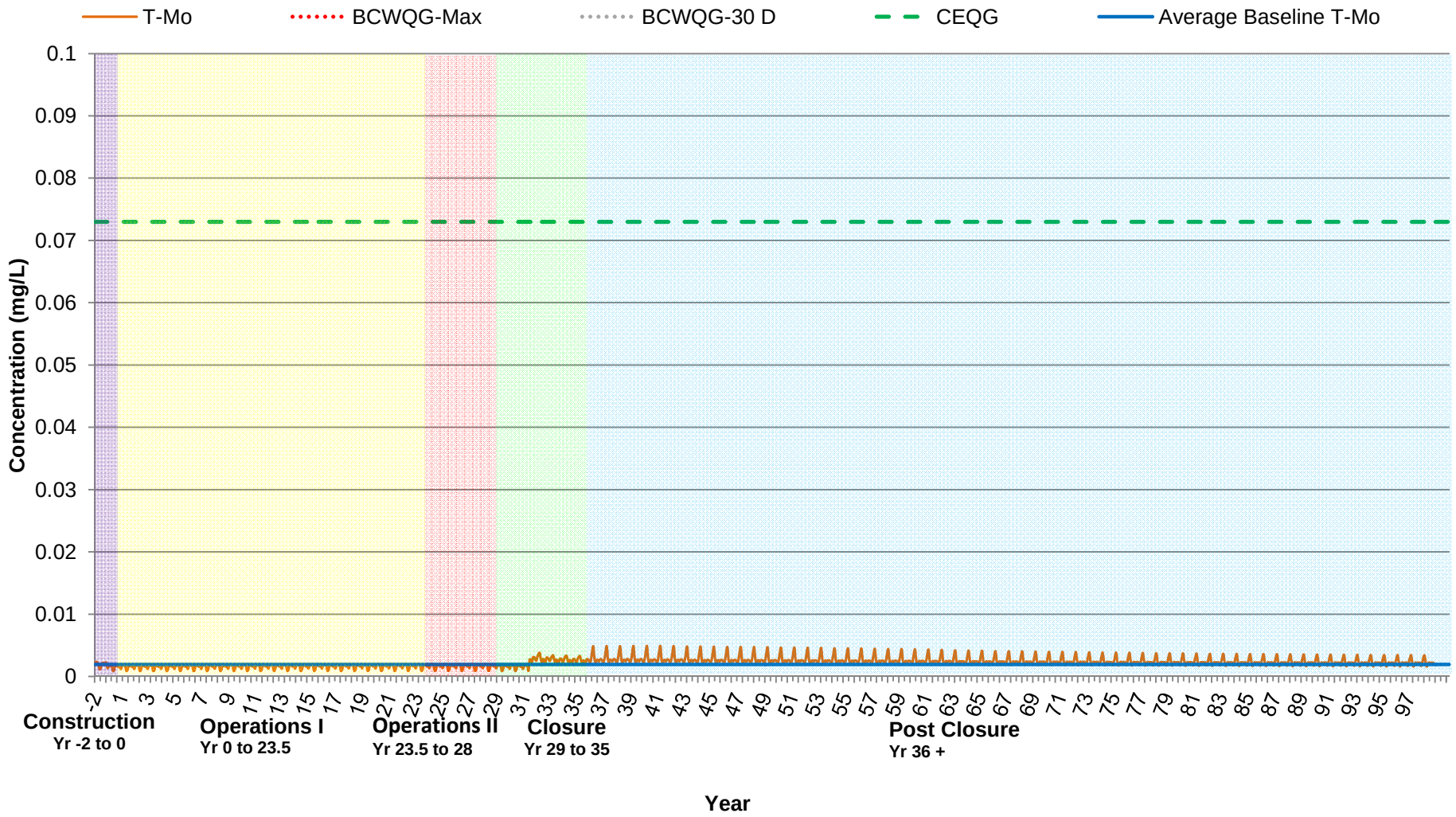
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G8.Mn

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).
3. THE BCWQG-MAX (2 mg/L) AND BCWQG-30 D (1 mg/L) ARE NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE MOLYDBENUM CONCENTRATIONS - HARPER CREEK ABOVE BARRIÈRE RIVER (HB)

Knight Piésold CONSULTING

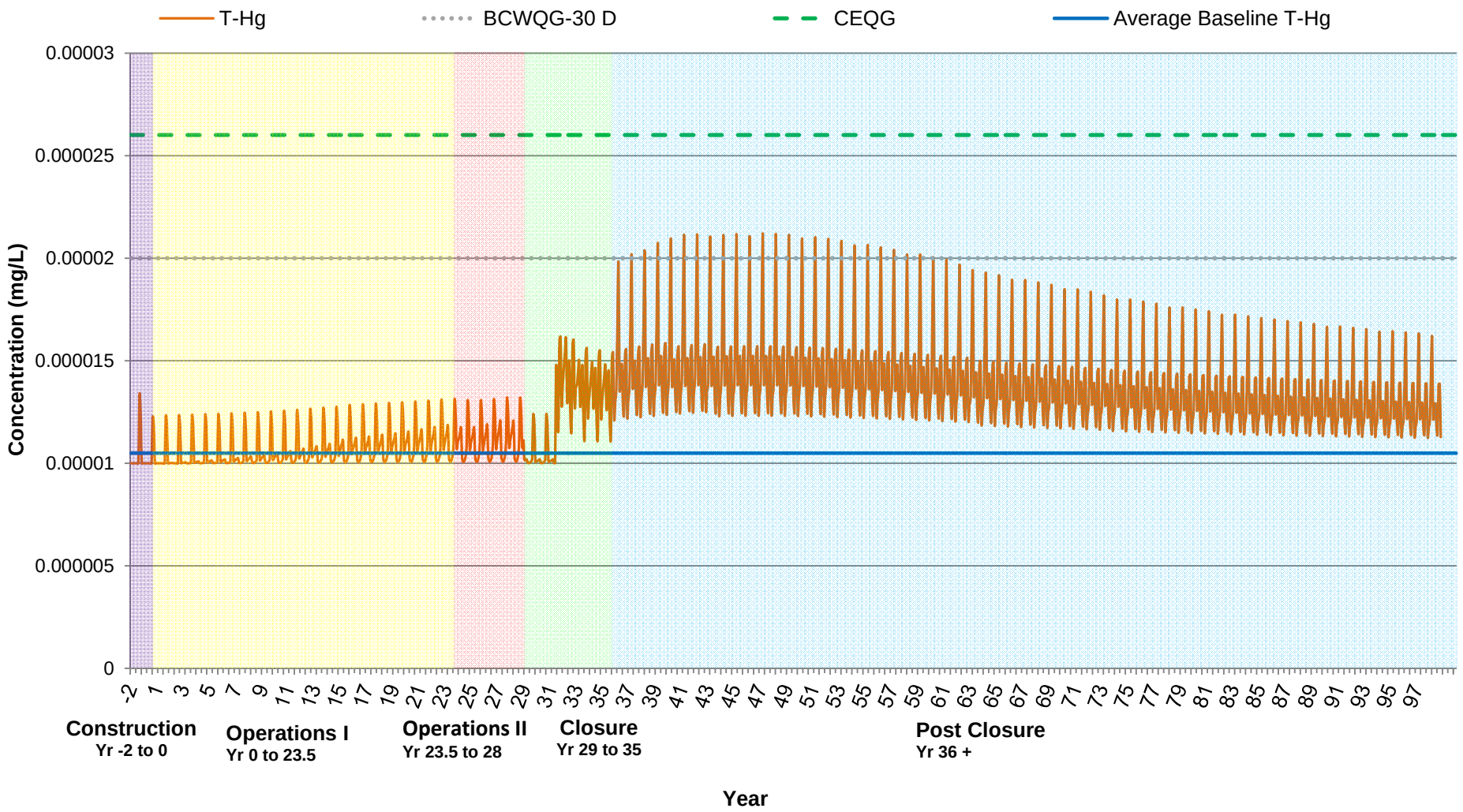
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G8.Mo

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-30 D AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).
3. BCWQG-30 D VALUE APPLIED ON ASSUMPTION THAT METHYL-Hg IS EQUAL TO 0.5% OF T-Hg.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE MERCURY CONCENTRATIONS - HARPER CREEK ABOVE BARRIÈRE RIVER (HB)

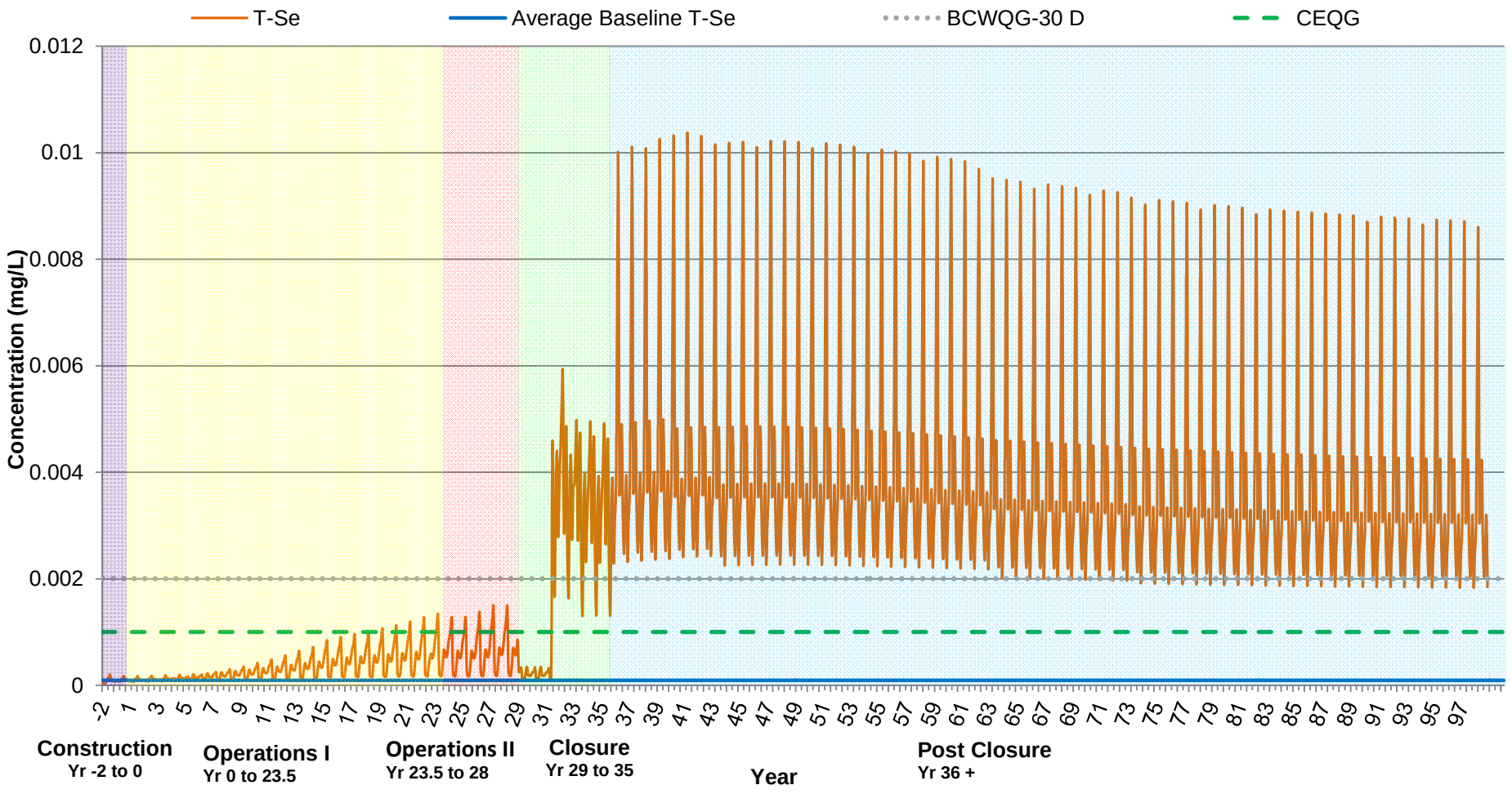
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G8.Hg

REV 0



NOTES:

1. THE BCWQG-30 D AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE SELENIUM CONCENTRATIONS - HARPER CREEK ABOVE BARRIÈRE RIVER (HB)

Knight Piésold CONSULTING

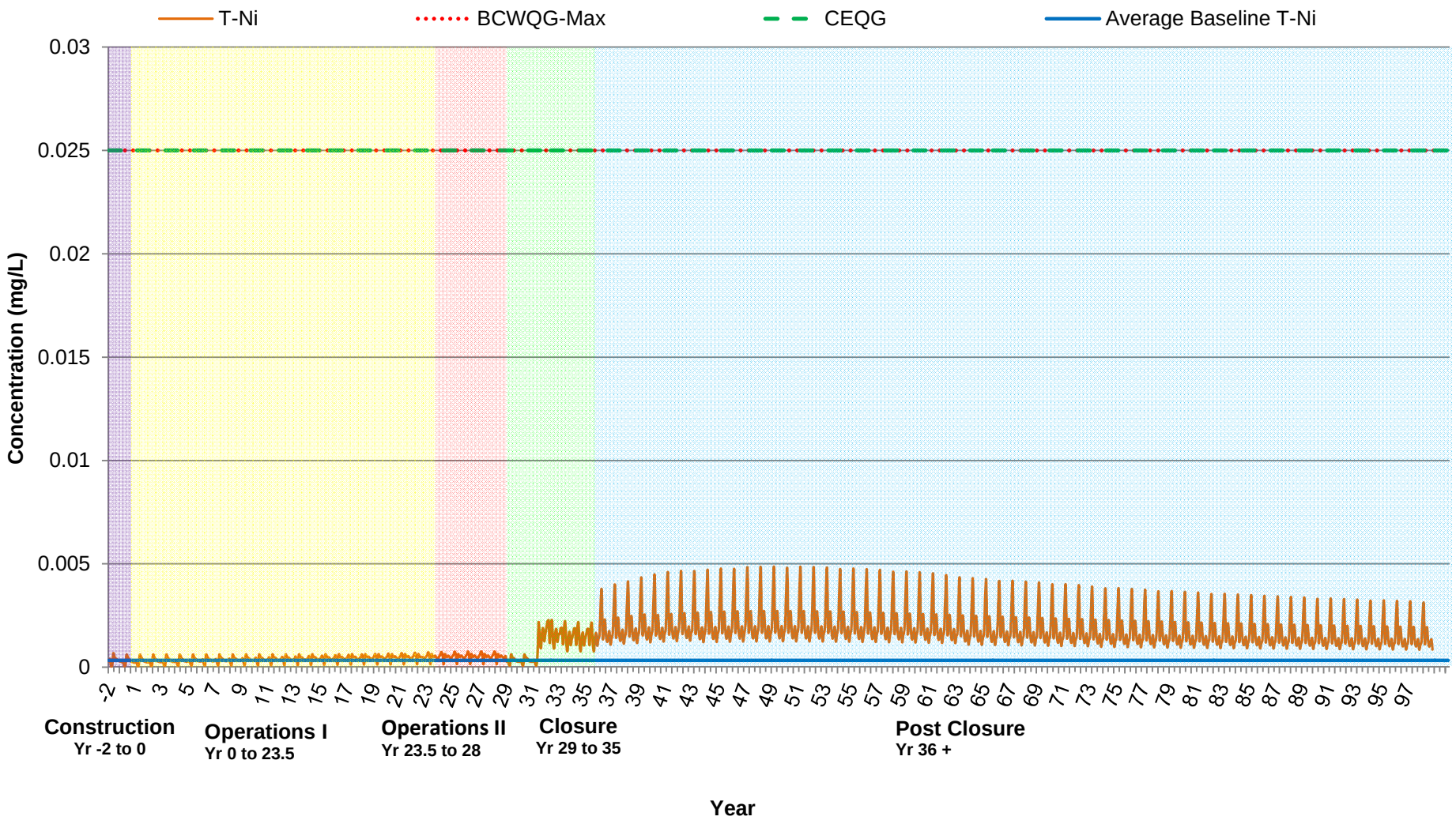
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G8.Se

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE NICKEL CONCENTRATIONS - HARPER CREEK ABOVE BARRIÈRE RIVER (HB)

Knight Piésold CONSULTING

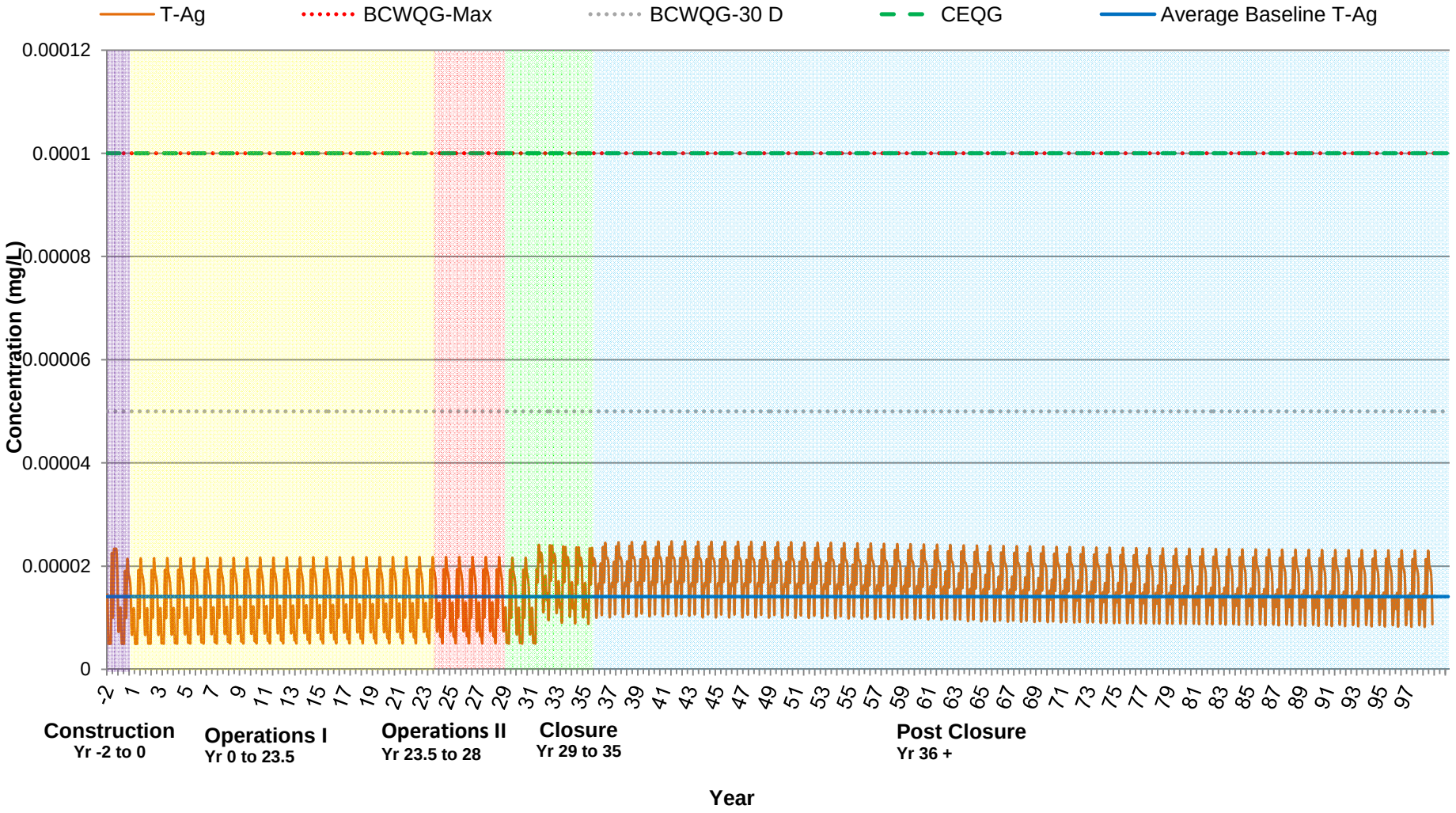
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G8.Ni

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-30 D AND BCWQG-MAX ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE SILVER CONCENTRATIONS - HARPER CREEK ABOVE BARRIÈRE RIVER (HB)

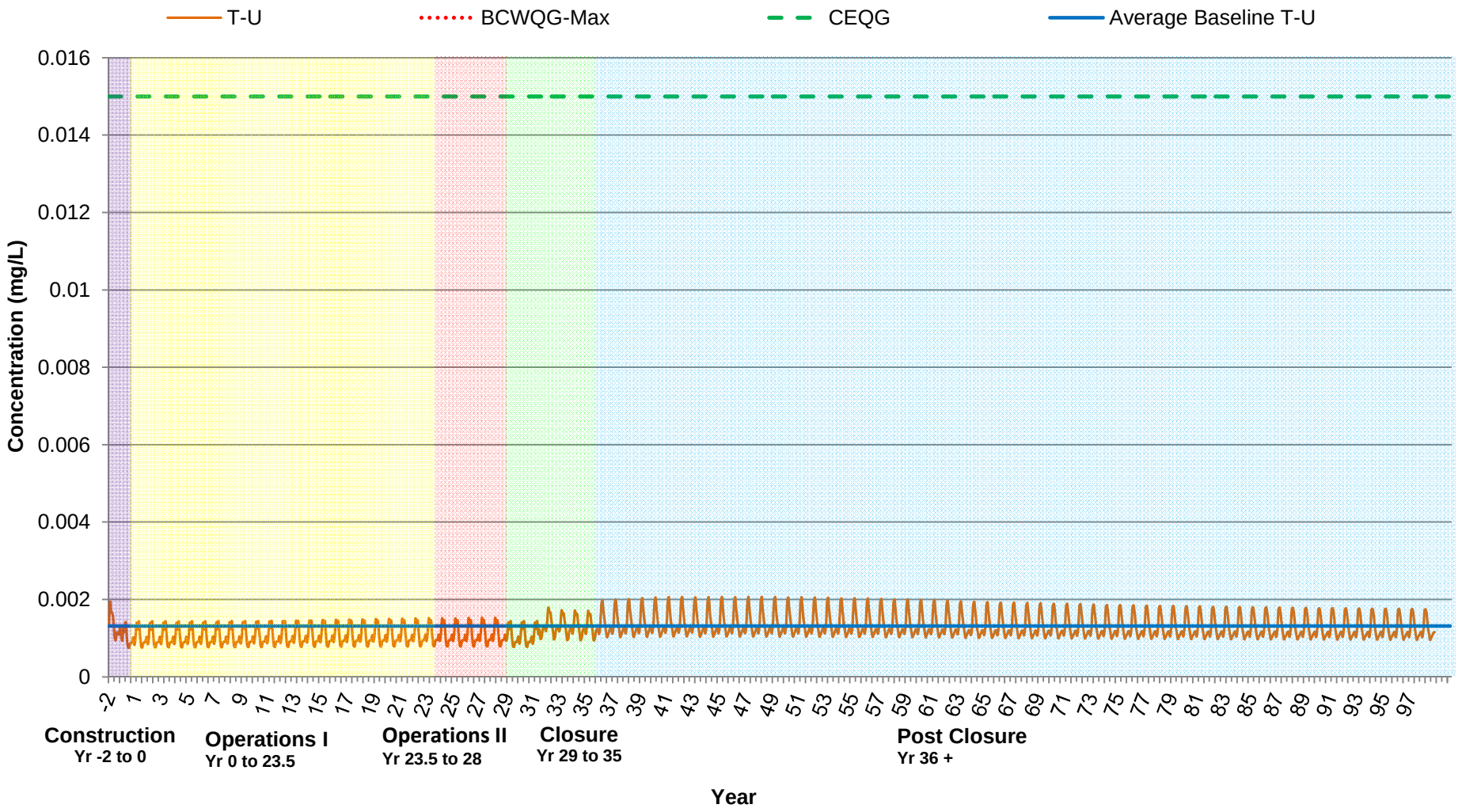
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G8.Ag

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).
3. THE BCWQG-MAX (0.3 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE URANIUM CONCENTRATIONS - HARPER CREEK ABOVE BARRIÈRE RIVER (HB)

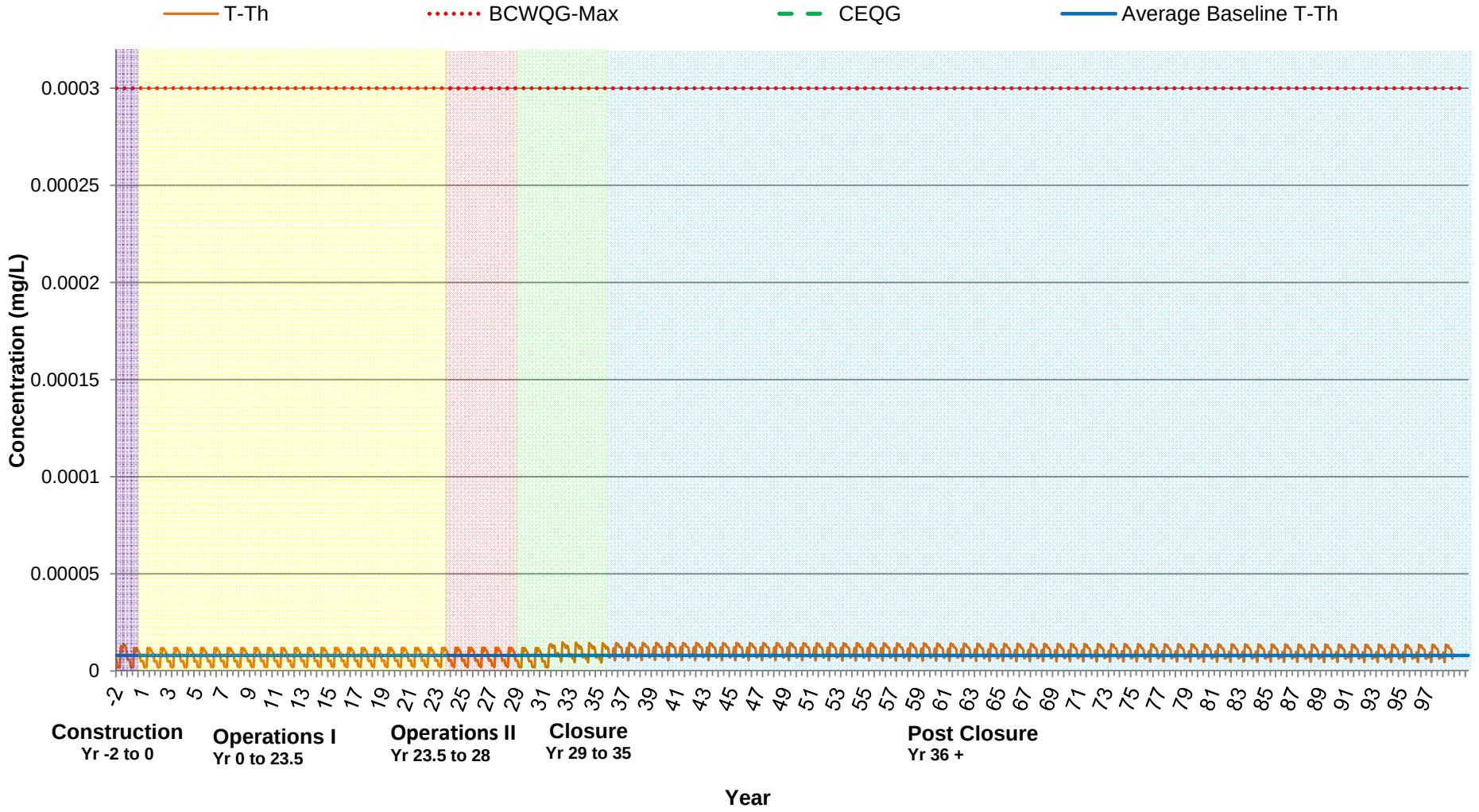
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G8.U

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).
3. THE CEQG (0.0008 mg/L) IS NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE THALLIUM CONCENTRATIONS - HARPER CREEK ABOVE BARRIÈRE RIVER (HB)

Knight Piésold CONSULTING

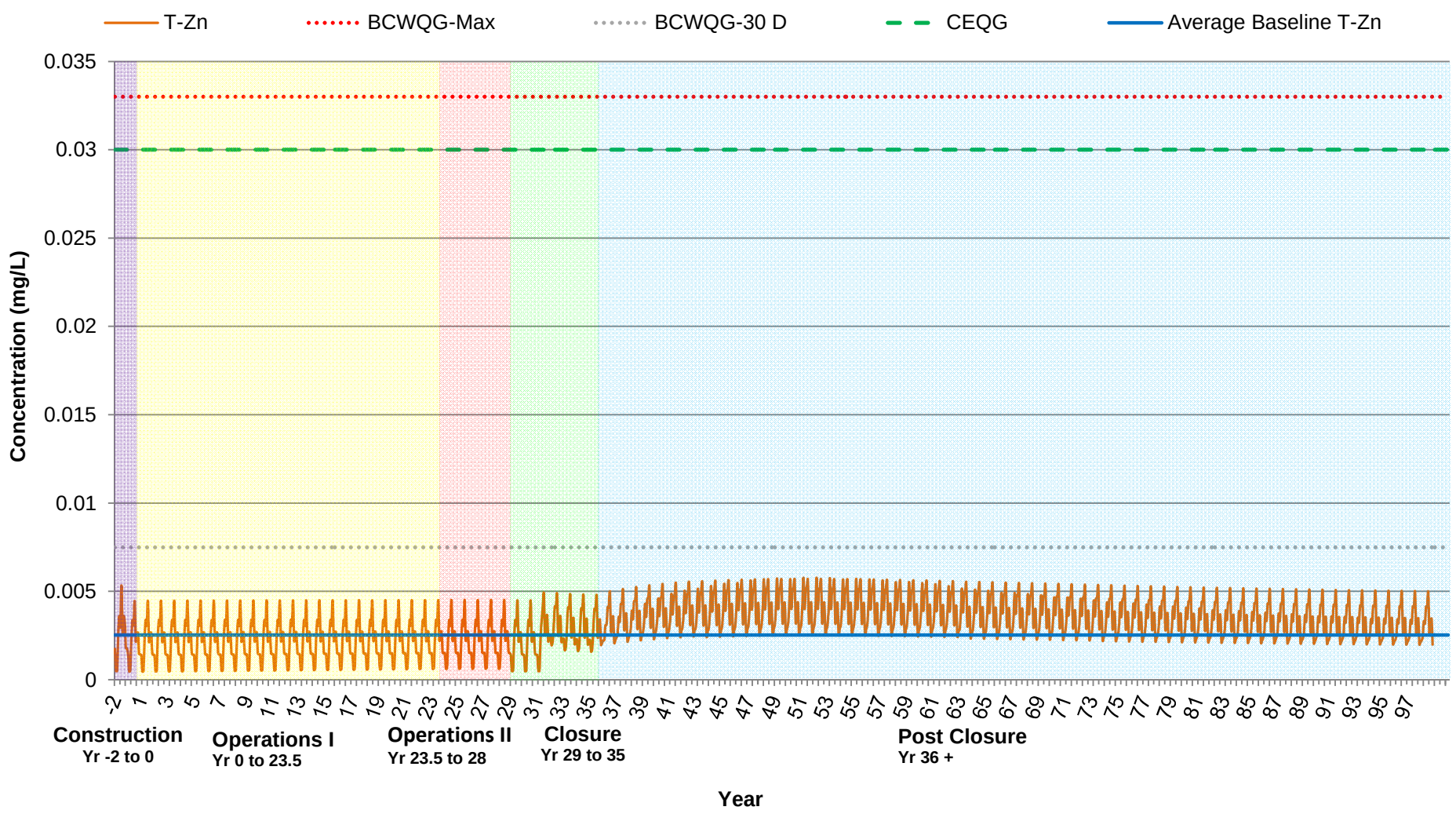
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G8.Th

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. BCWQG-30 D AND BCWQG-MAX ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE H1 (AVERAGE HARDNESS OF 20 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE ZINC CONCENTRATIONS - HARPER CREEK ABOVE BARRIÈRE RIVER (HB)

Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

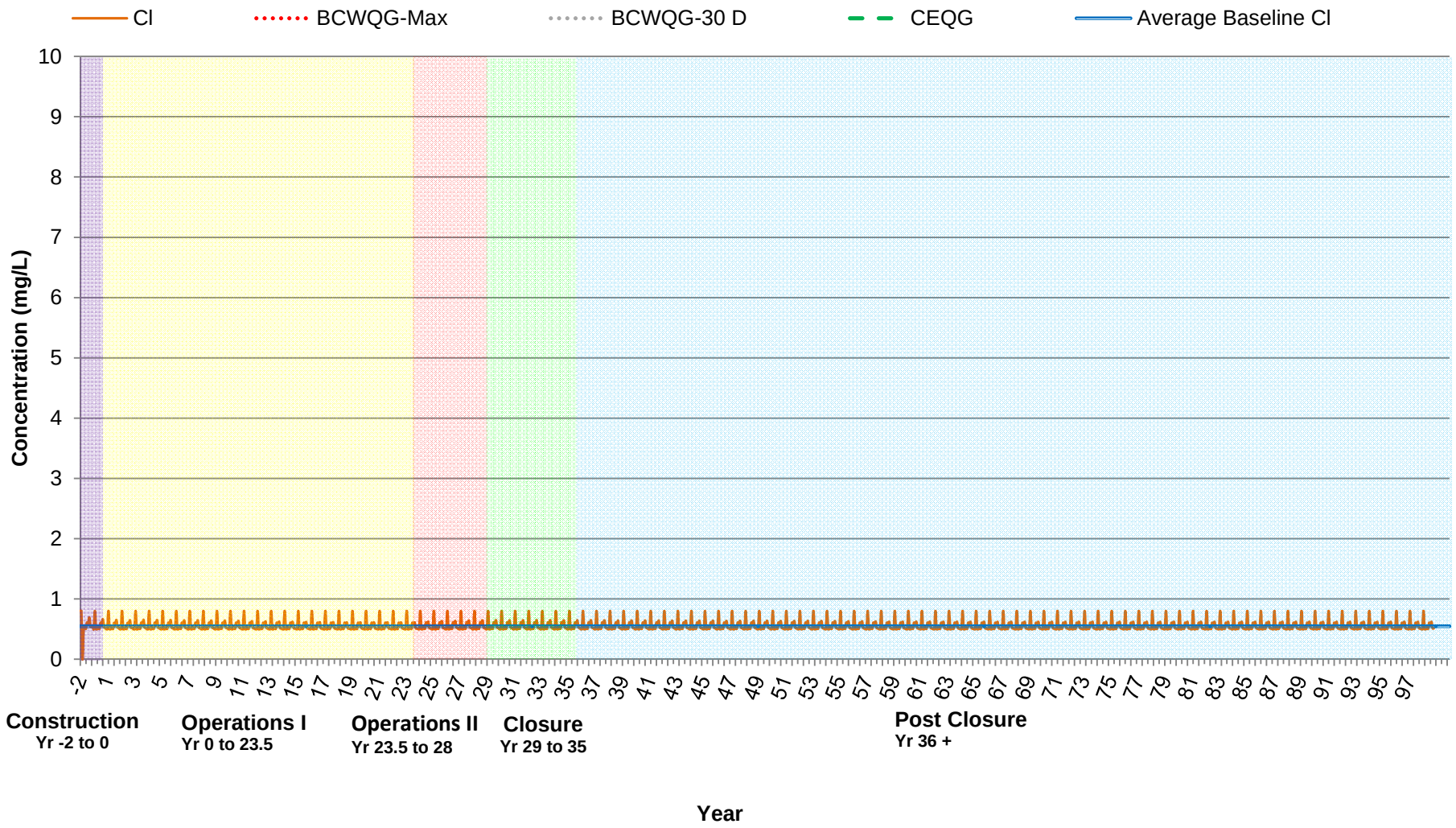
FIGURE G8.Zn

REV 0

APPENDIX G9

MID BAKER CREEK (BK1)

(Pages G3-9 to G9-30)



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK1 (AVERAGE HARDNESS OF 101 mg/L).
3. ALL GUIDELINES ARE NOT SHOWN: BCWQG-30 D (150 mg/L); BCWQG-MAX (600 mg/L); CEQG (120 mg/L AND 640 mg/L).

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE CHLORIDE CONCENTRATIONS - MID BAKER CREEK (BK1)

Knight Piésold CONSULTING

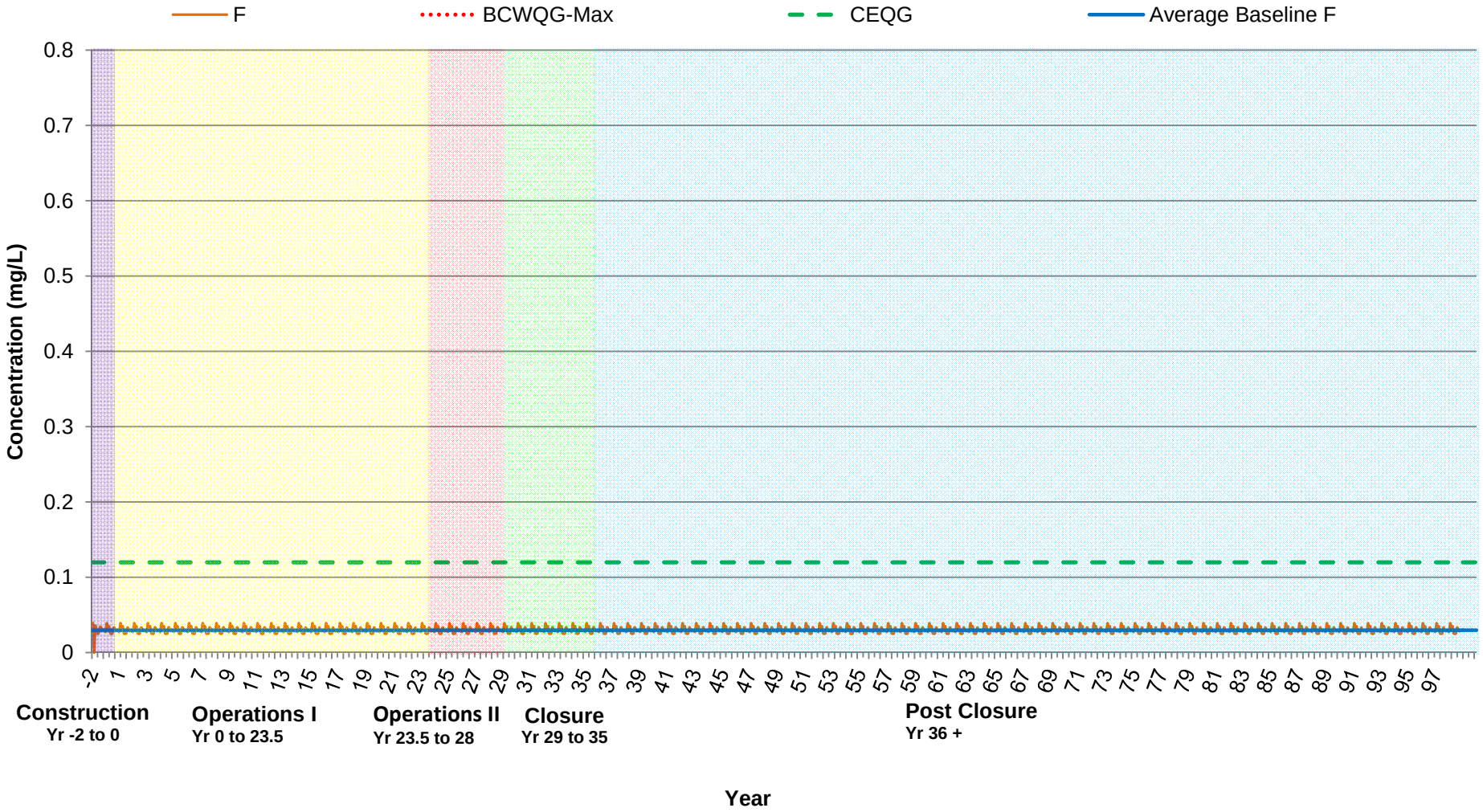
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G9.Cl

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX IS HARNDESS DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK1 (AVERAGE HARDNESS OF 101 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE FLUORIDE CONCENTRATIONS - MID BAKER CREEK (BK1)

Knight Piésold CONSULTING

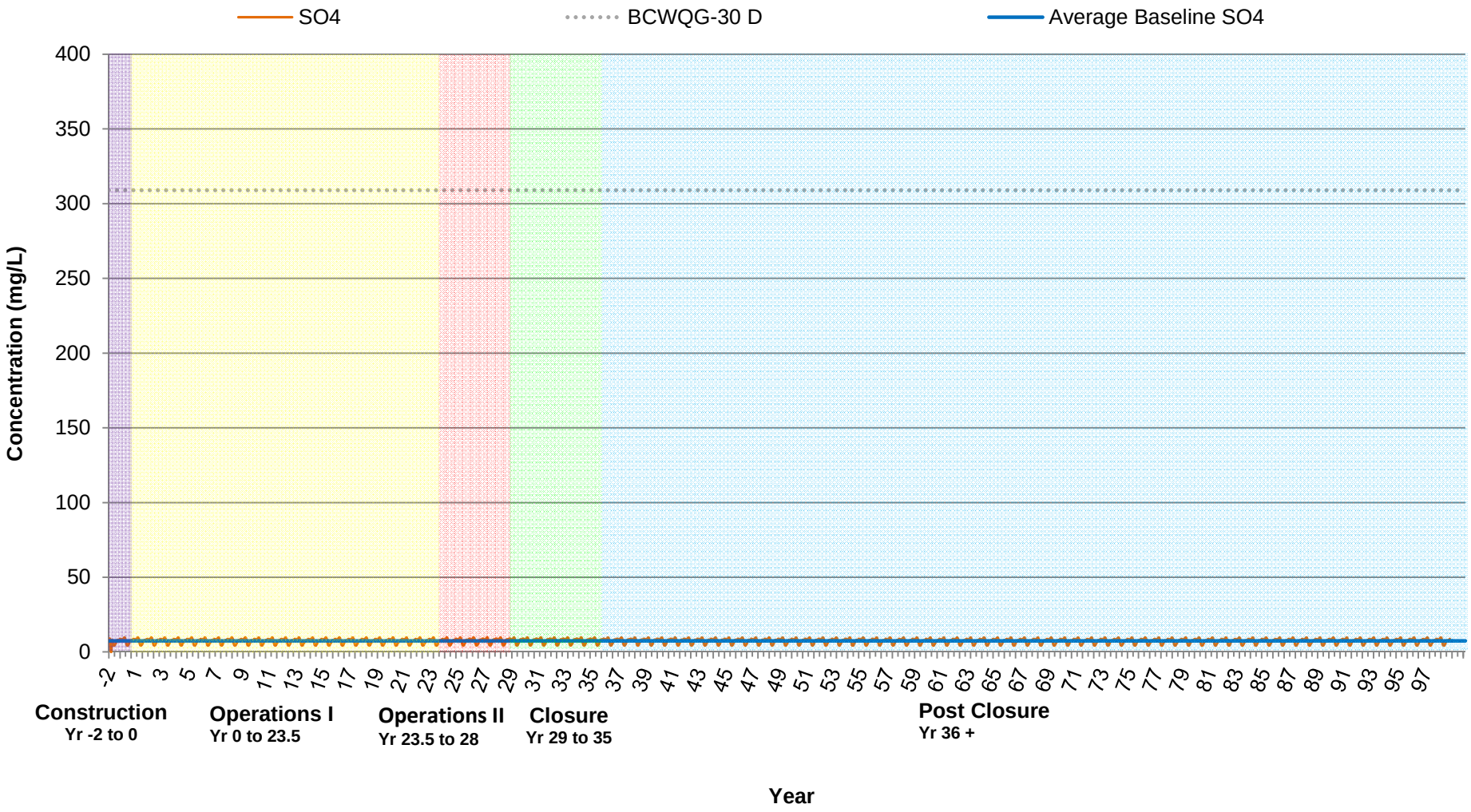
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G9.F

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. BCWQG-30 D IS HARDNESS DEPEDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK1 (AVERAGE HARDNESS OF 101 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE SULPHATE CONCENTRATIONS - MID BAKER CREEK (BK1)

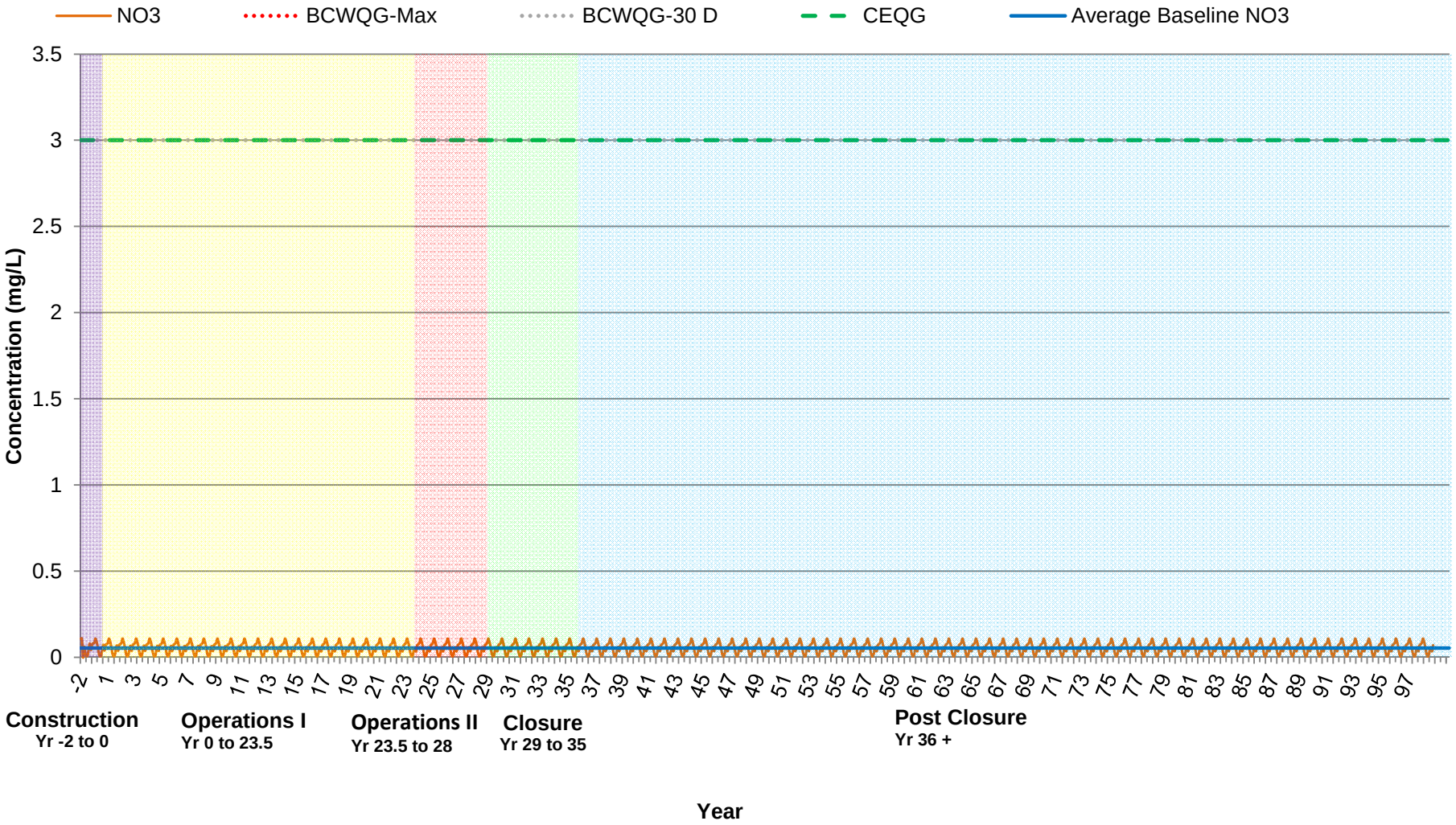
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G9.S04

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK1 (AVERAGE HARDNESS OF 101 mg/L).
3. THE BCWQG-MAX (32.8 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE NITRATE CONCENTRATIONS - MID BAKER CREEK (BK1)

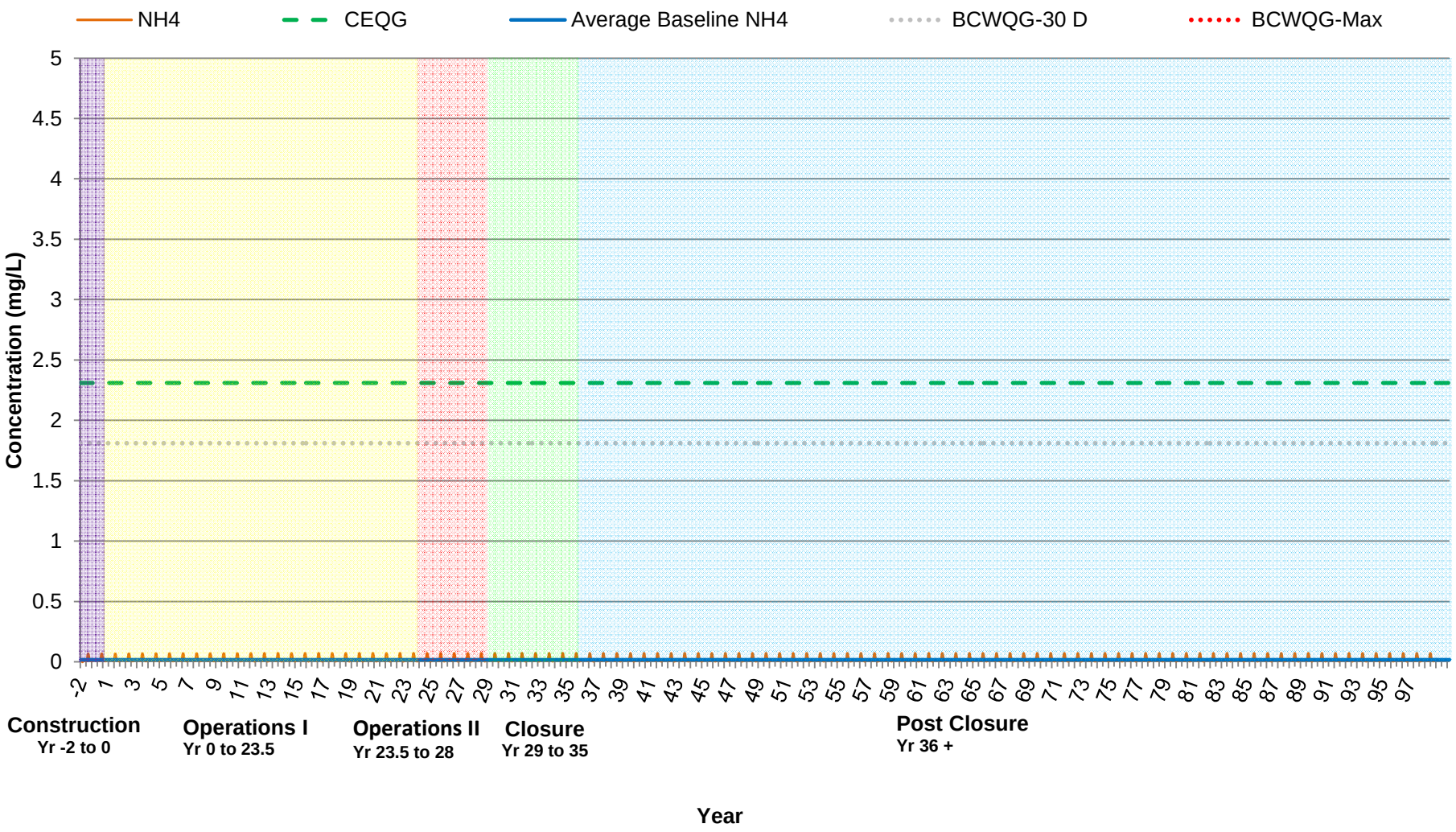
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G9.NO3

REV 0



NOTES:

1. THE BCWQG-30 D IS VALID FOR ONLY 6.5≤pH<9 AND 0°C≤T≤20°C.
2. THE BCWQG-MAX (20.15 mg/L) VALID FOR 6.5≤pH<9 IS NOT SHOWN.
3. THE CEQG IS TO BE USED WITH CAUTION FOR WATER WITH T<5°C AND pH>9.
4. BASELINE SITE USED FOR COMPARISON IS SITE BK1 (AVERAGE HARDNESS OF 101 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE AMMONIA CONCENTRATIONS - MID BAKER CREEK (BK1)

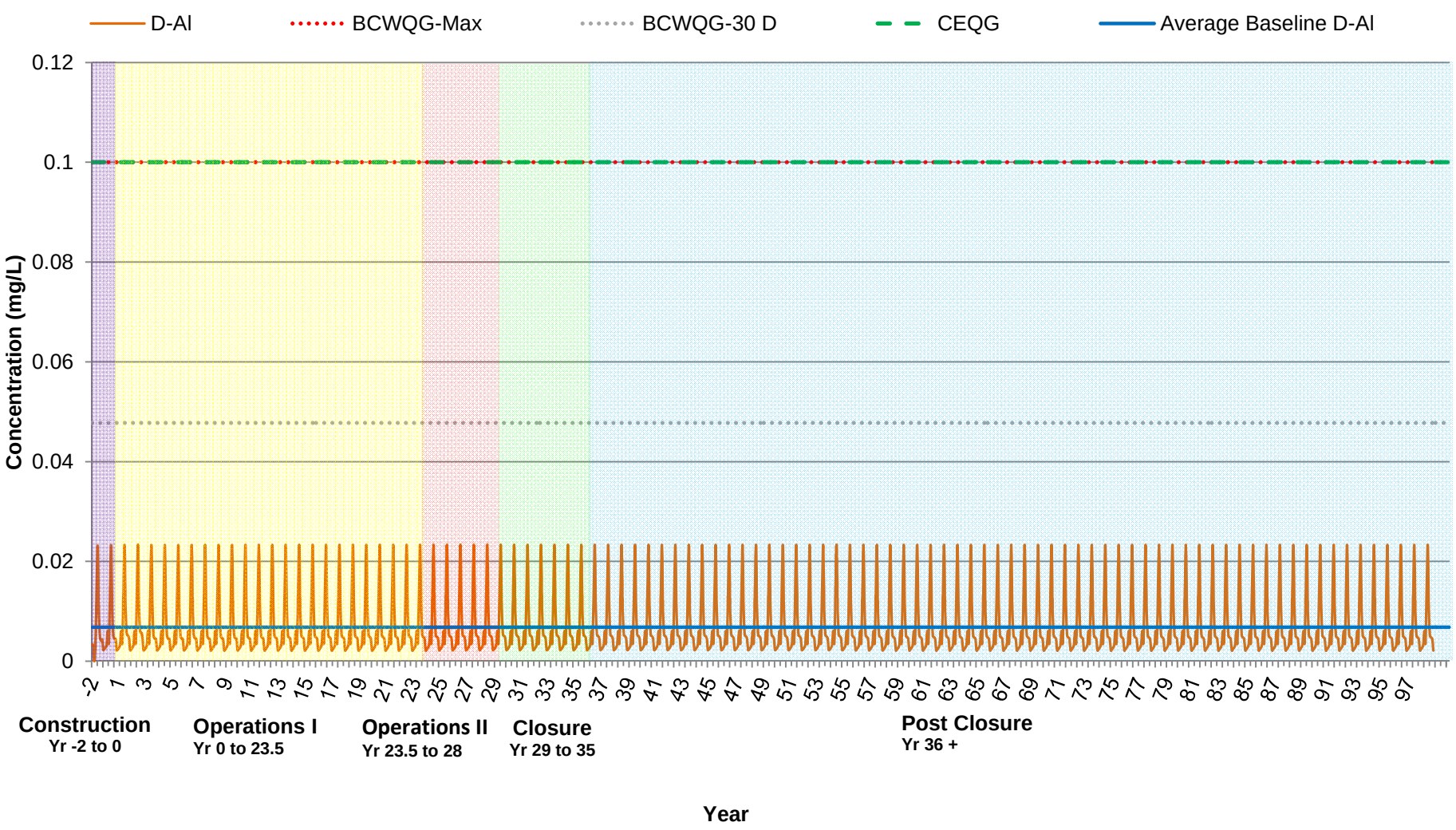
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G9.NH4

REV 0



NOTES:

1. ALL GUIDELINES ARE pH-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK1 (AVERAGE HARDNESS OF 101 mg/L).
3. AVERAGE BASELINE pH USED TO CALCULATE GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE DISSOLVED ALUMINUM CONCENTRATIONS - MID BAKER CREEK (BK1)

Knight Piésold CONSULTING

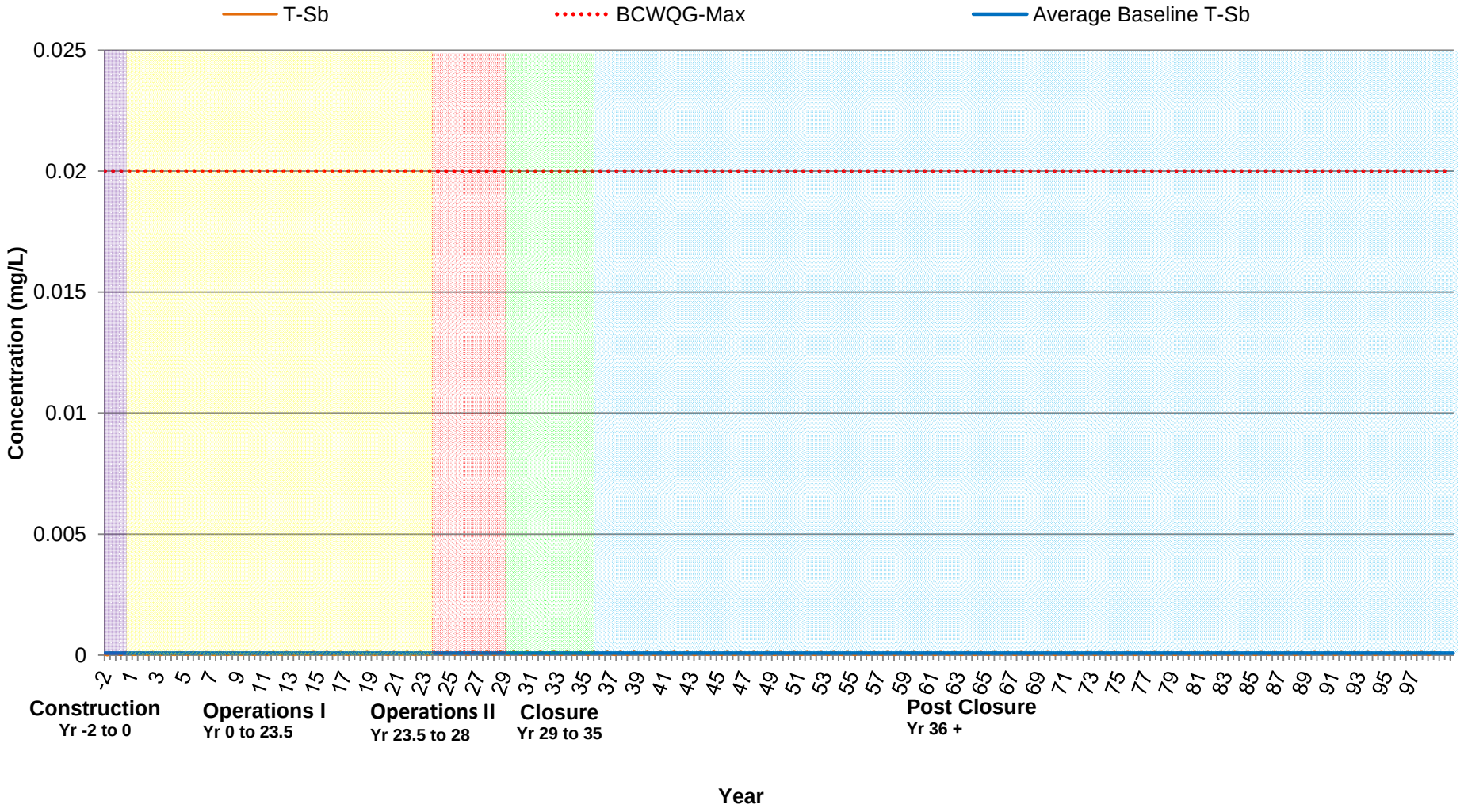
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G9.Al

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK1 (AVERAGE HARDNESS OF 101 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE ANTIMONY CONCENTRATIONS - MID BAKER CREEK (BK1)

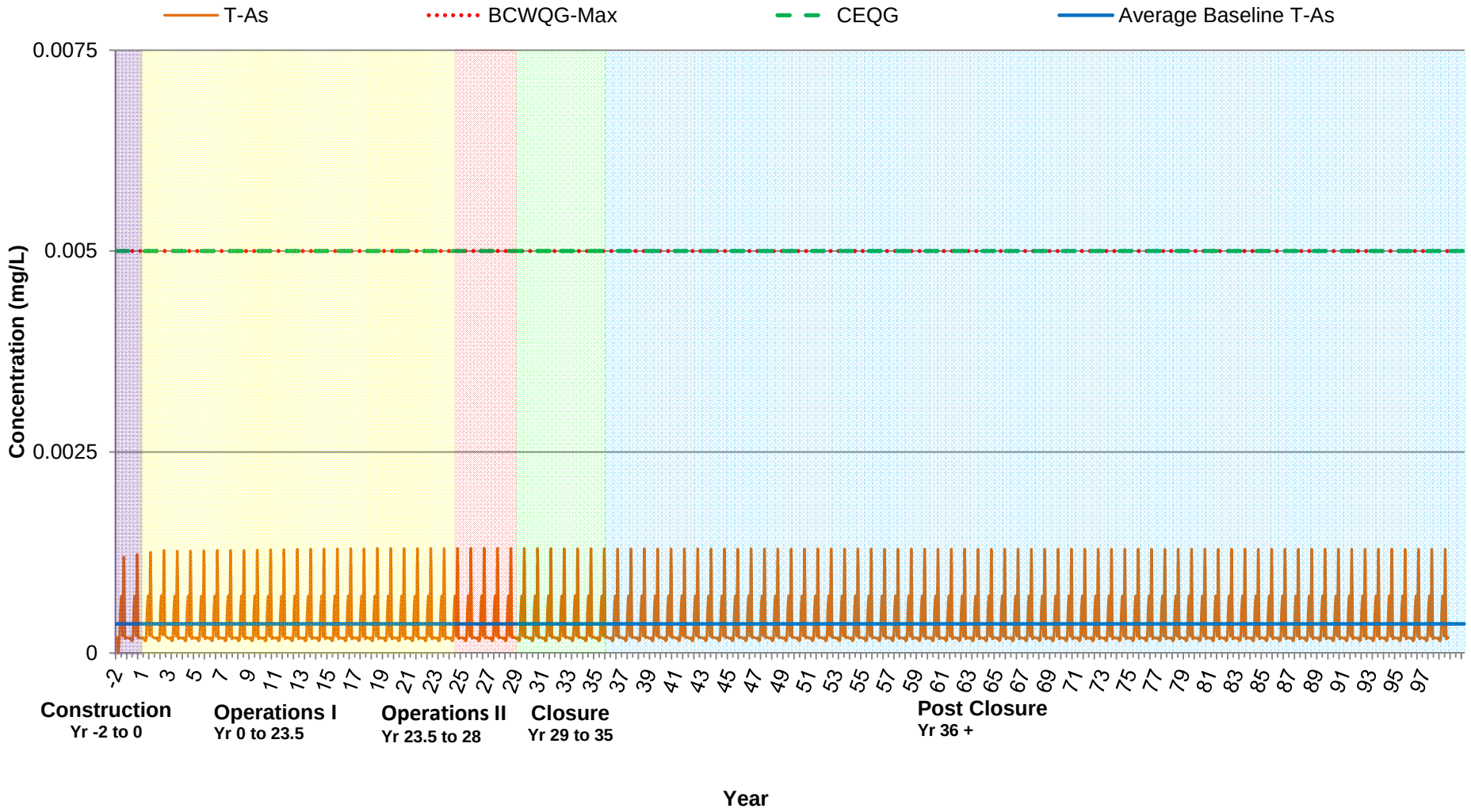
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G9.Sb

REV 0



NOTES:

1. THE BCWQG AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK1 (AVERAGE HARDNESS OF 101 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE ARSENIC CONCENTRATIONS - MID BAKER CREEK (BK1)

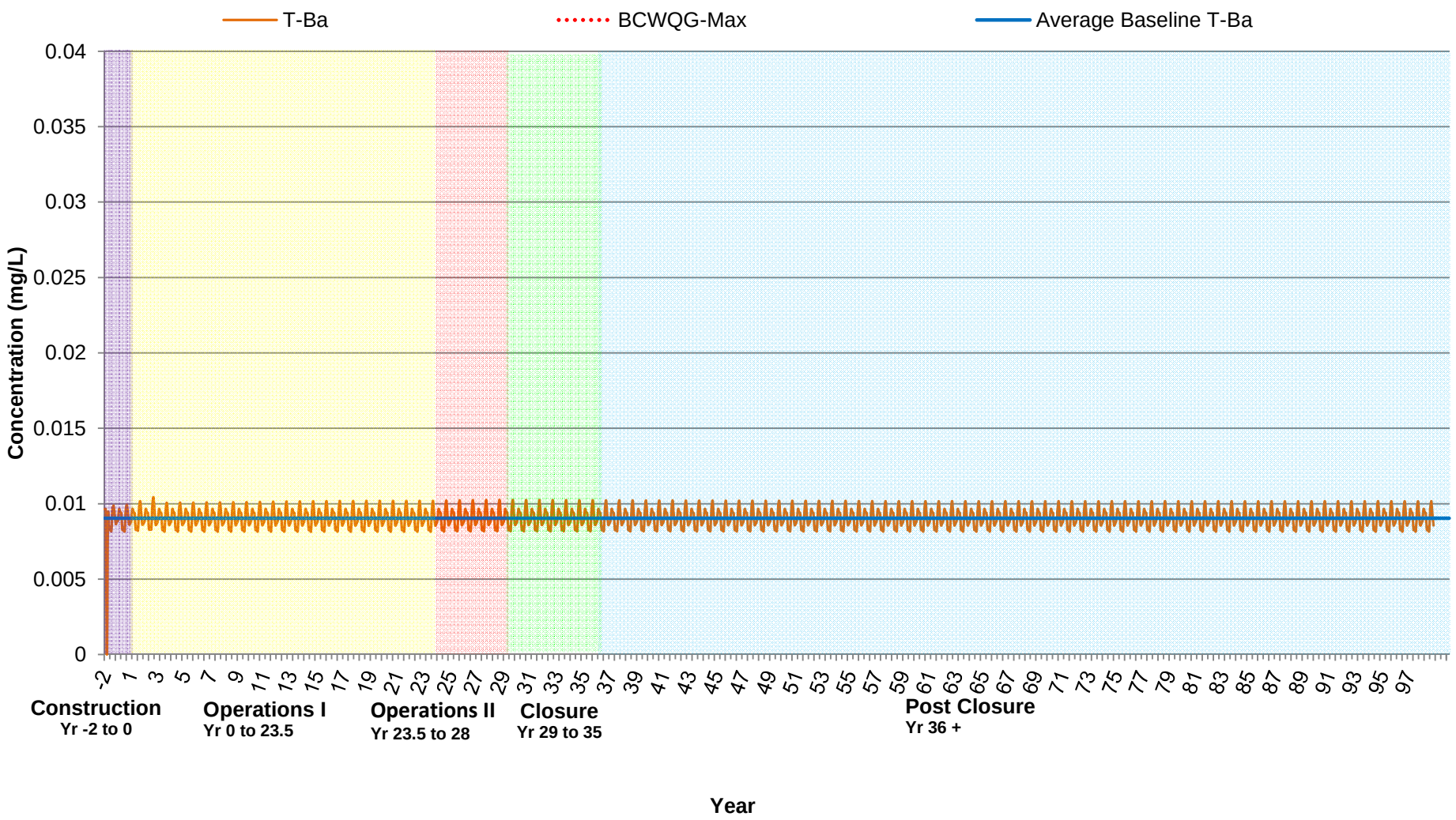
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G9.As

REV 0



NOTES:

1. THE BCWQG-MAX IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK1 (AVERAGE HARDNESS OF 101 mg/L).
3. THE BCWQG-30 D (1 mg/L) AND BCWQG-MAX (5 mg/L) ARE NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE BARIUM CONCENTRATIONS - MID BAKER CREEK (BK1)

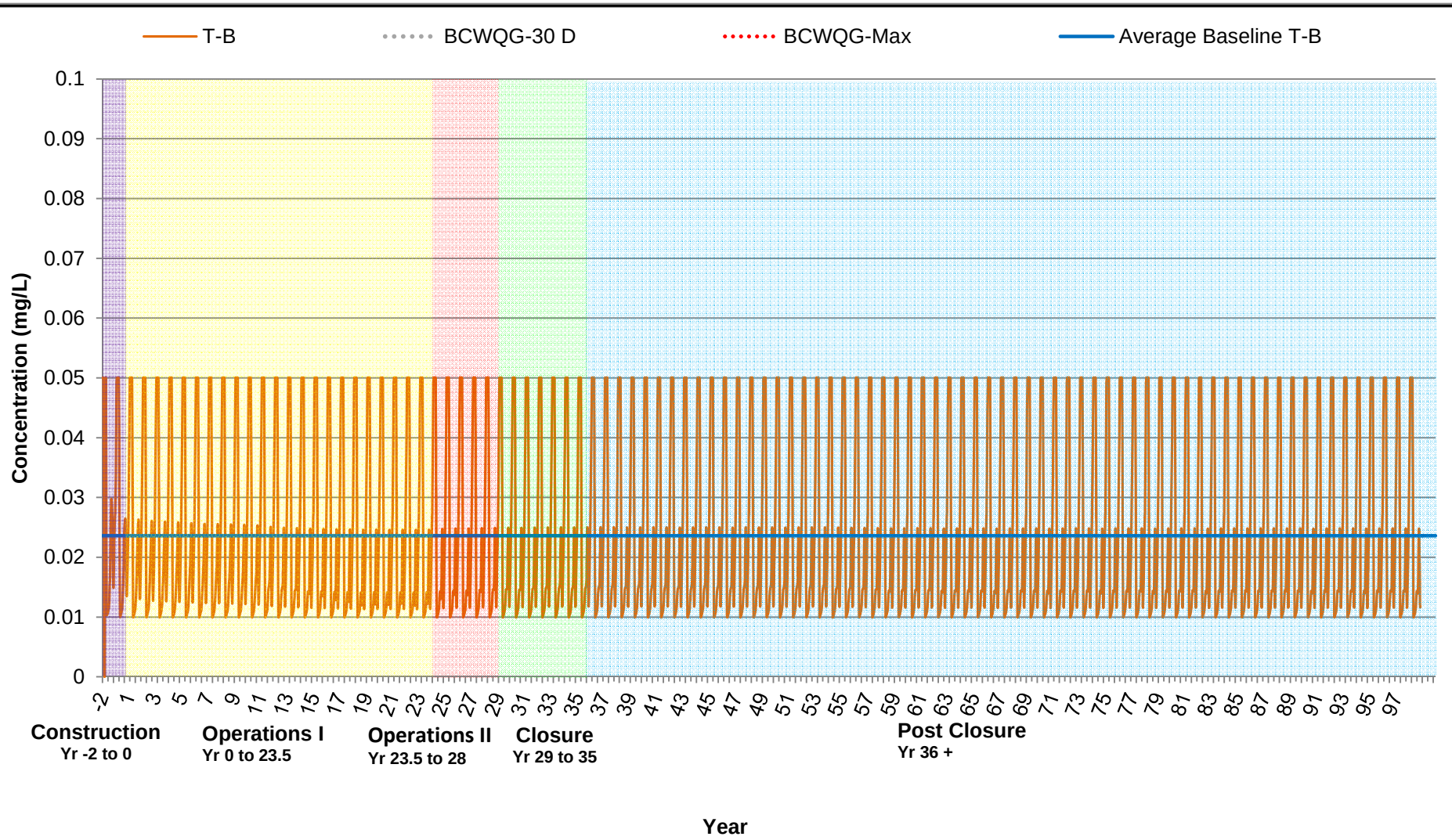
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G9.Ba

REV 0



NOTES:

1. BASELINE SITE USED FOR COMPARISON IS SITE BK1 (AVERAGE HARDNESS OF 101 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.
3. THE BCWQG-MAX (1.2 mg/L) IS NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE BORON CONCENTRATIONS - MID BAKER CREEK (BK1)

Knight Piésold CONSULTING

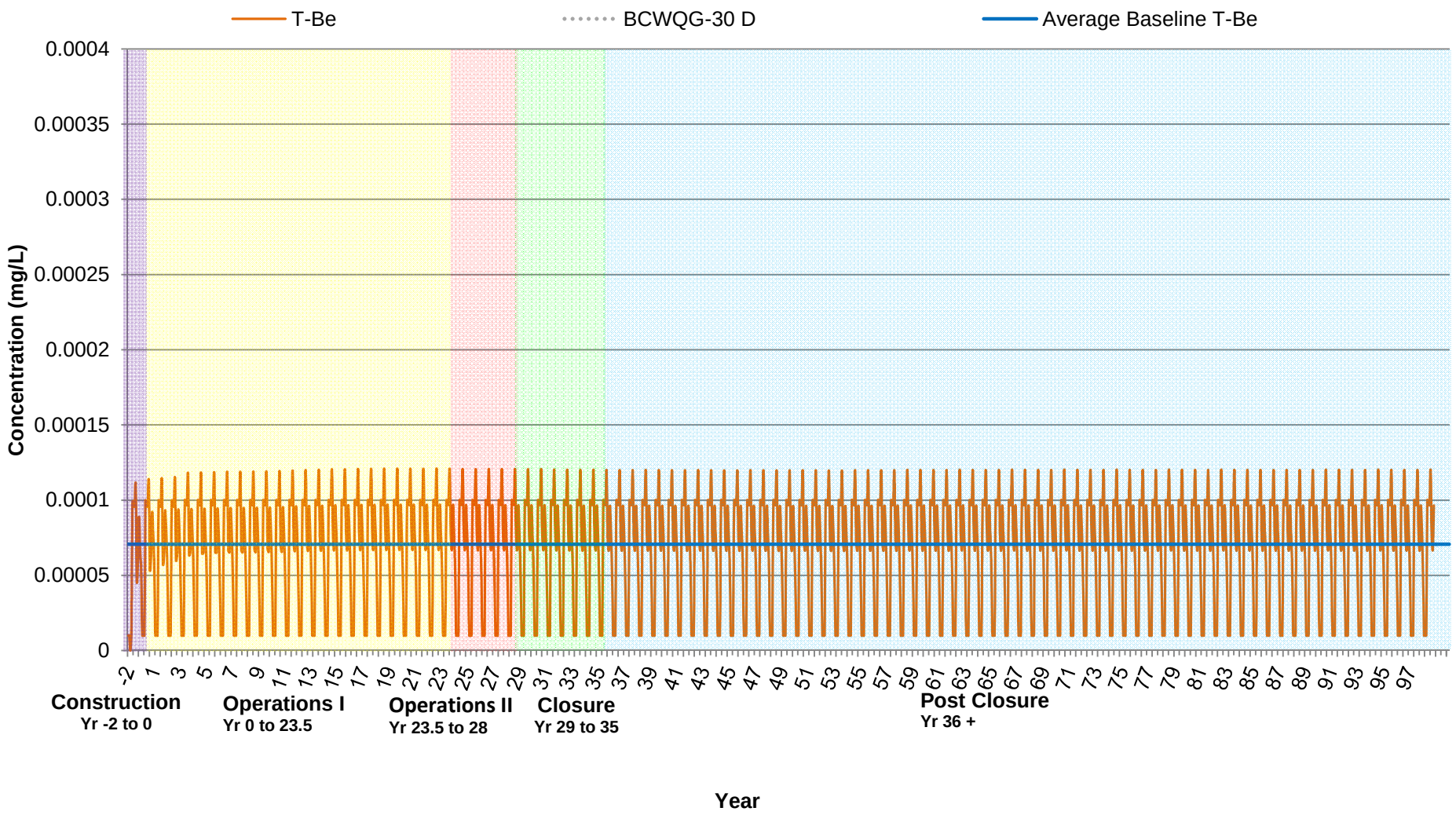
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G9.B

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK1 (AVERAGE HARDNESS OF 101 mg/L).
3. THE BCWQG-30 D (0.0053 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE BERYILLIUM CONCENTRATIONS - MID BAKER CREEK (BK1)

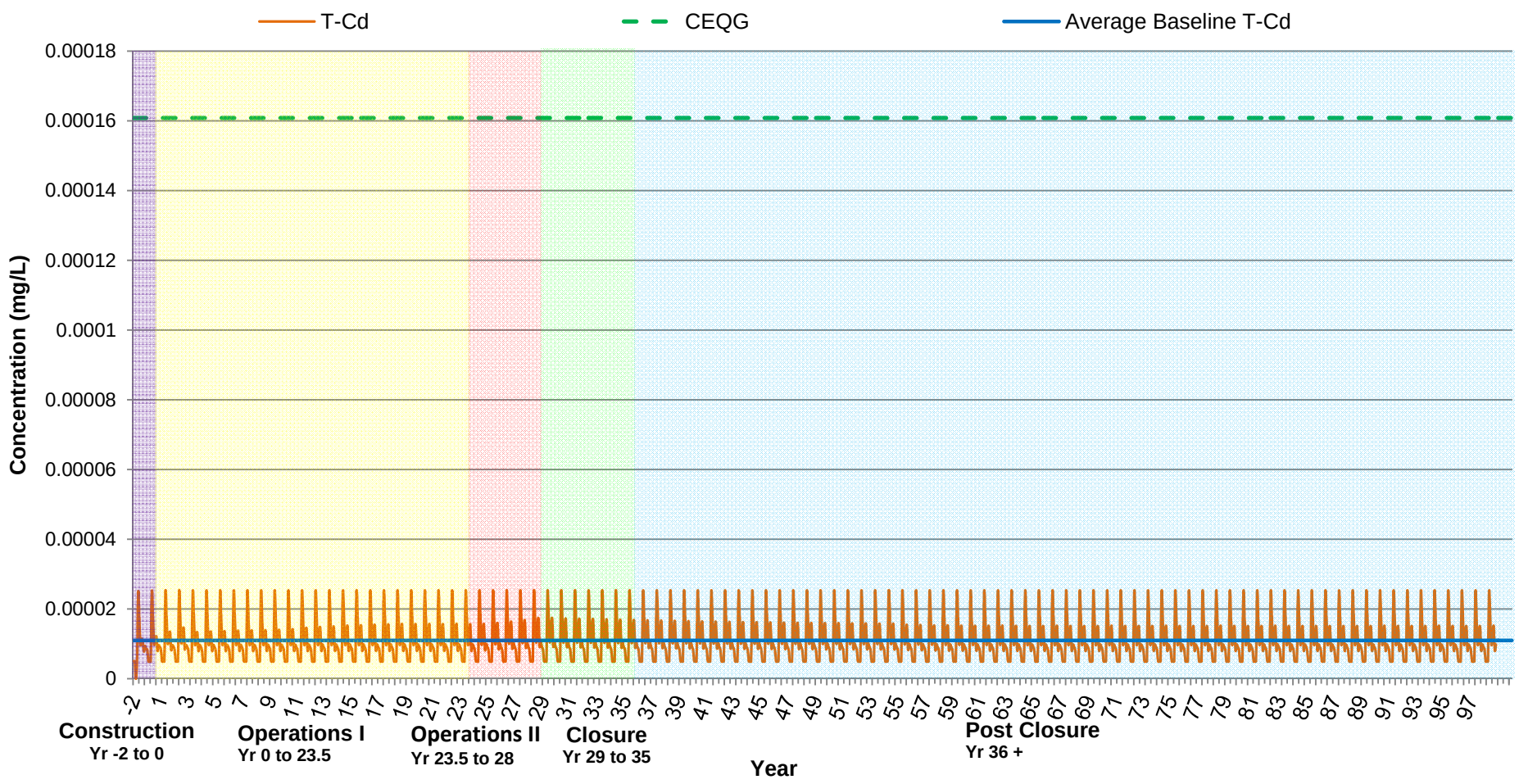
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G9.Be

REV 0



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. THE BCWQG ARE DRAFT GUIDELINES UNDER REVIEW (JUNE 2014).
3. BASELINE SITE USED FOR COMPARISON IS SITE BK1 (AVERAGE HARDNESS OF 101 mg/L).
4. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE CADMIUM CONCENTRATIONS - MID BAKER CREEK (BK1)

Knight Piésold CONSULTING

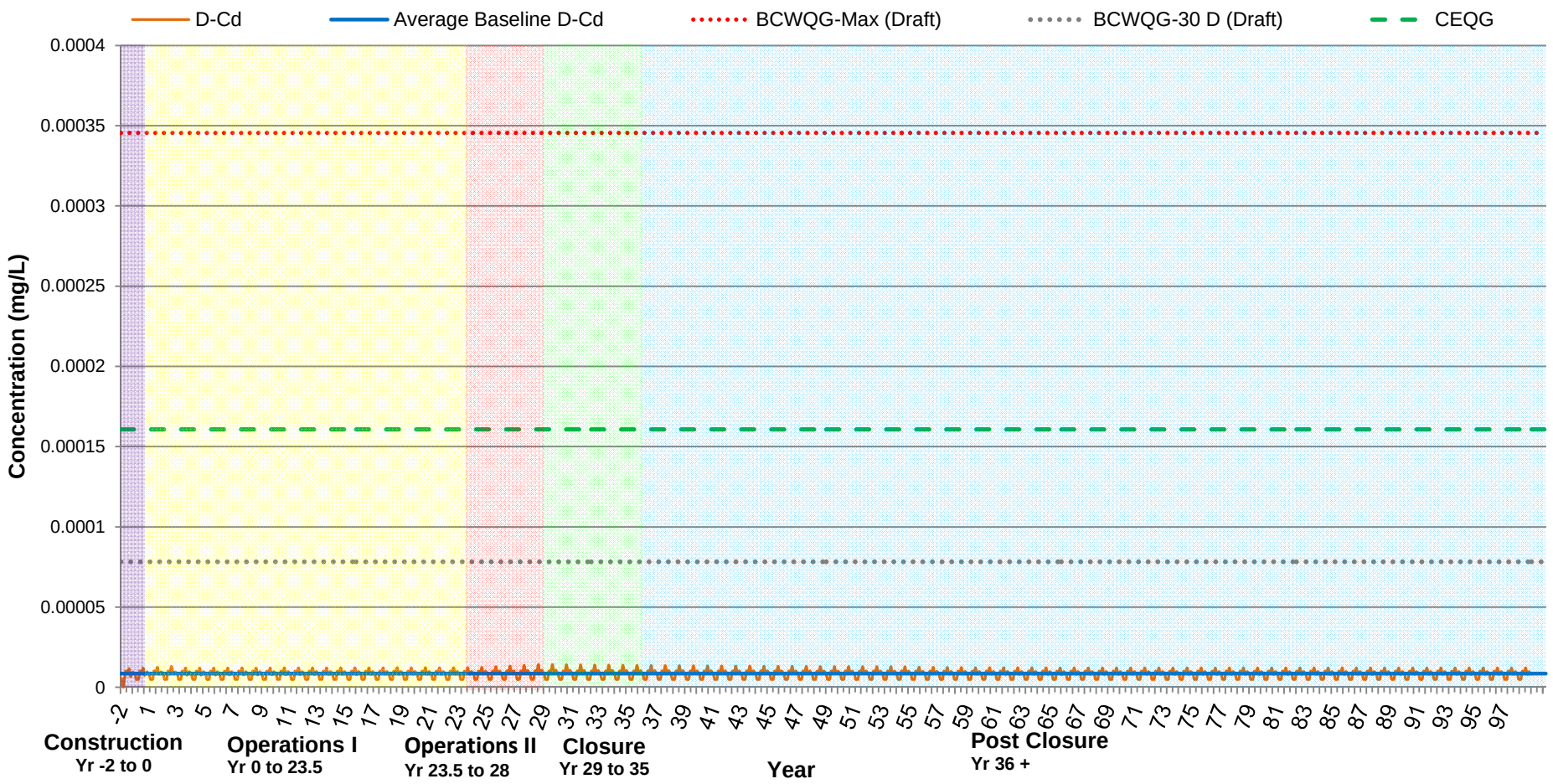
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G9.Cd-T

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK1 (AVERAGE HARDNESS OF 101 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE CADMIUM CONCENTRATIONS - MID BAKER CREEK (BK1)

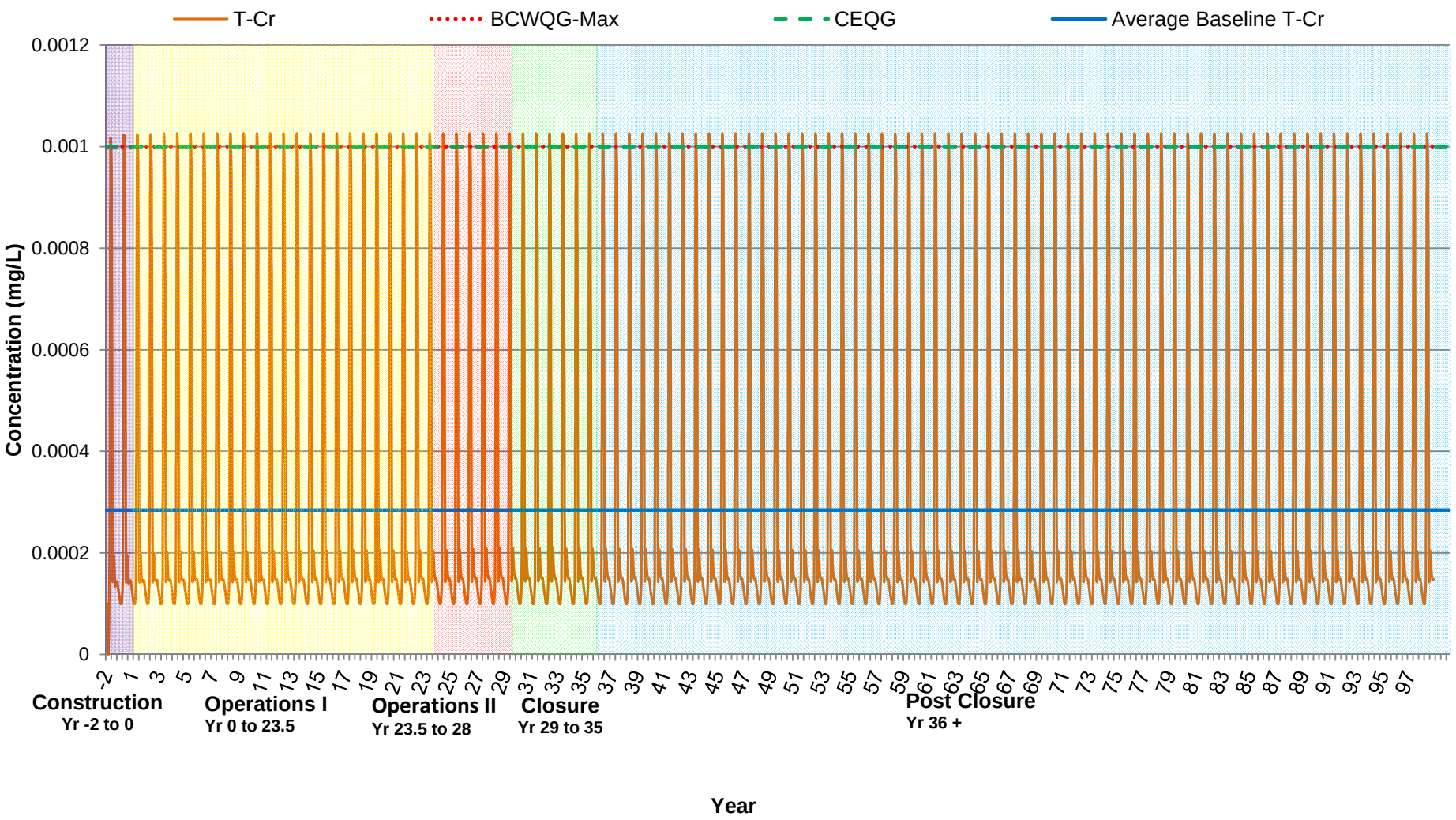
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G9.Cd-D

REV 0



NOTES:

1. GUIDELINES ARE FOR CHROMIUM (IV), THE SPECIES MOST COMMON IN WELL OXYGENATED SURFACE WATERS.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK1 (AVERAGE HARDNESS OF 101 mg/L).

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE CHROMIUM CONCENTRATIONS - MID BAKER CREEK (BK1)

Knight Piésold CONSULTING

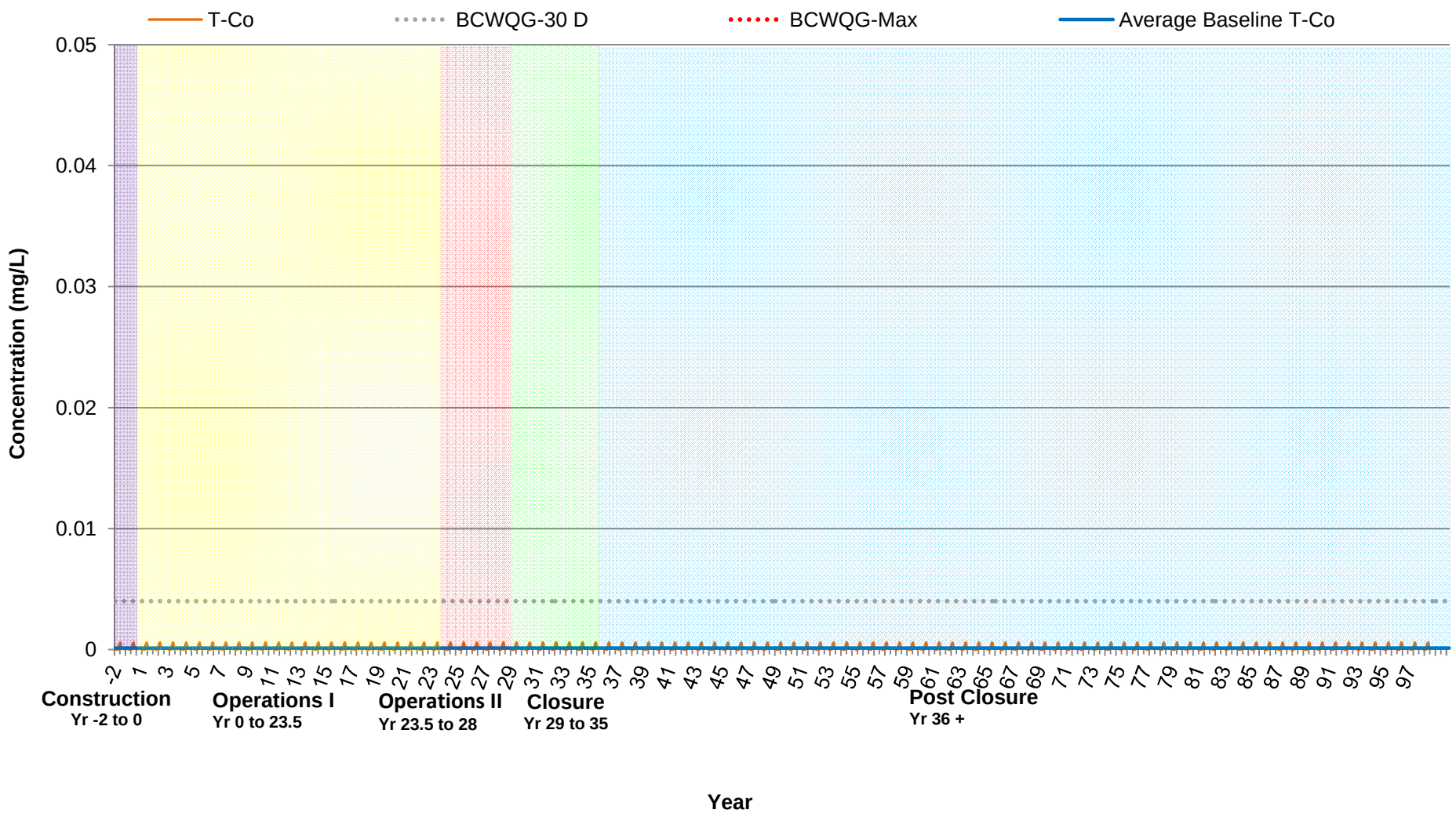
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G9.Cr

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-30 D AND BCWQG-MAX ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK1 (AVERAGE HARDNESS OF 101 mg/L).
3. THE BCWQG-MAX GUIDELINE (0.11 mg/L) IS NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE COBALT CONCENTRATIONS - MID BAKER CREEK (BK1)

Knight Piésold CONSULTING

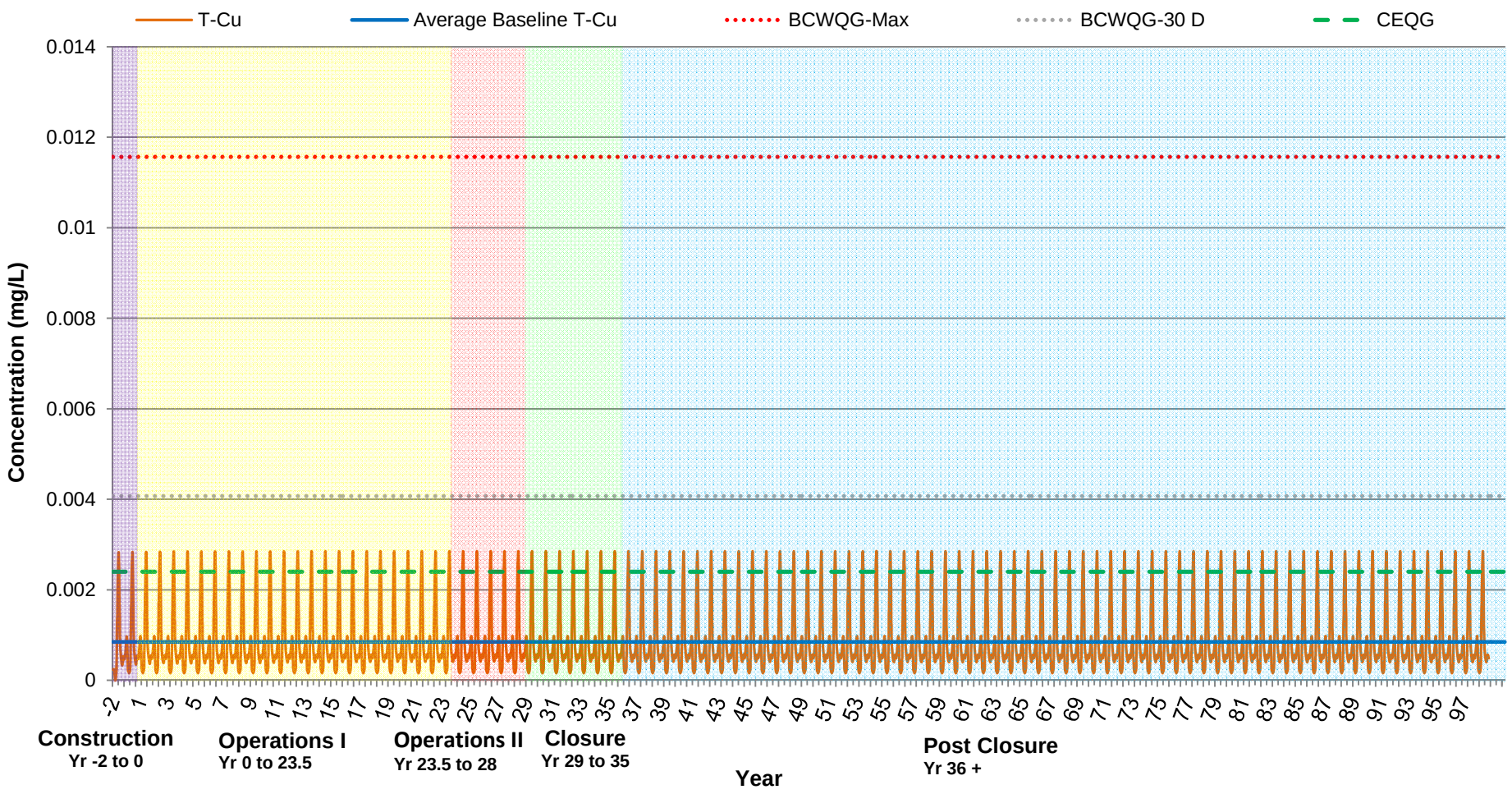
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G9.Co

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK1 (AVERAGE HARDNESS OF 101 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE COPPER CONCENTRATIONS - MID BAKER CREEK (BK1)

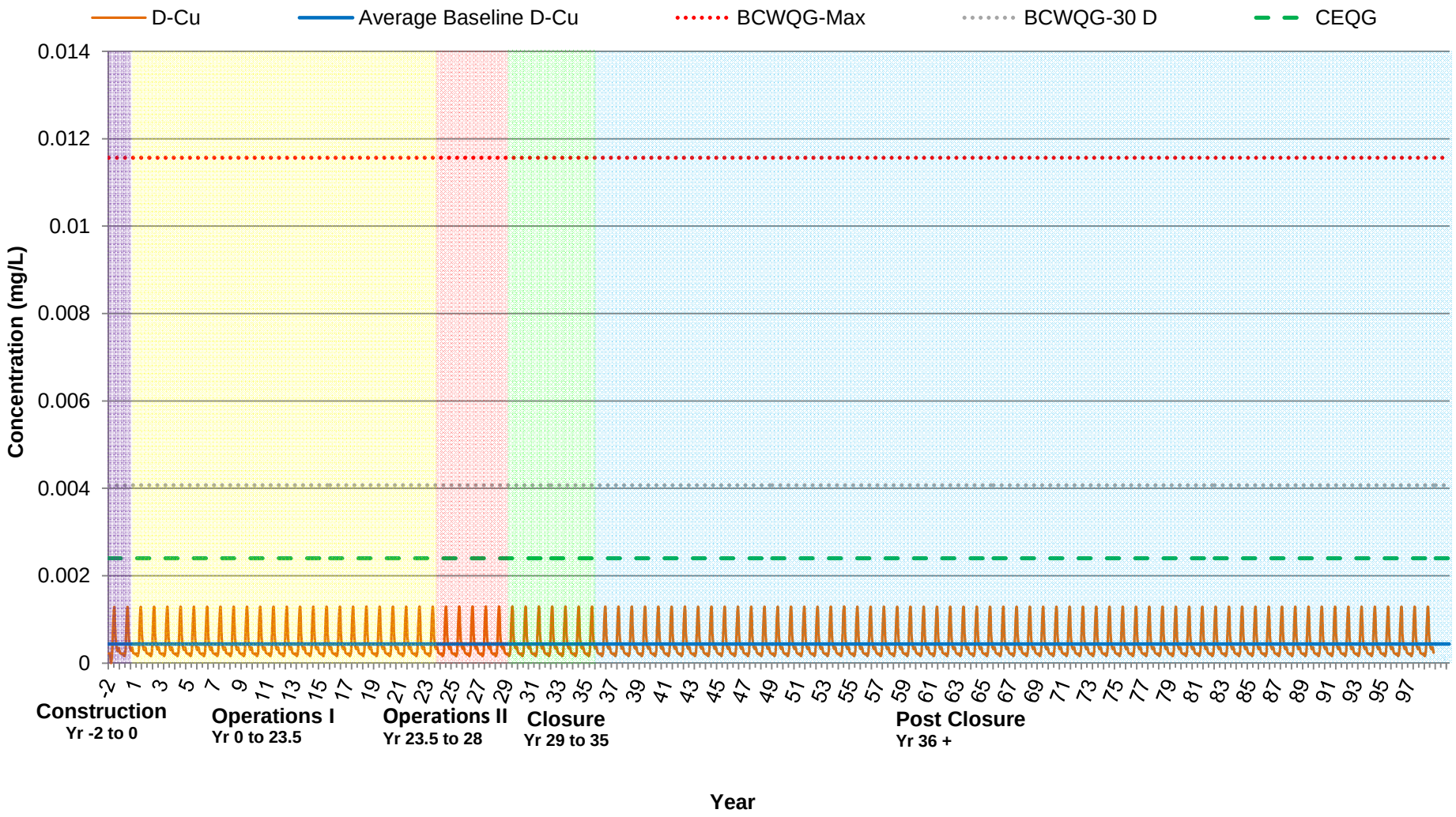
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G9.Cu-T

REV 0



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK1 (AVERAGE HARDNESS OF 101 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE COPPER CONCENTRATIONS - MID BAKER CREEK (BK1)

Knight Piésold CONSULTING

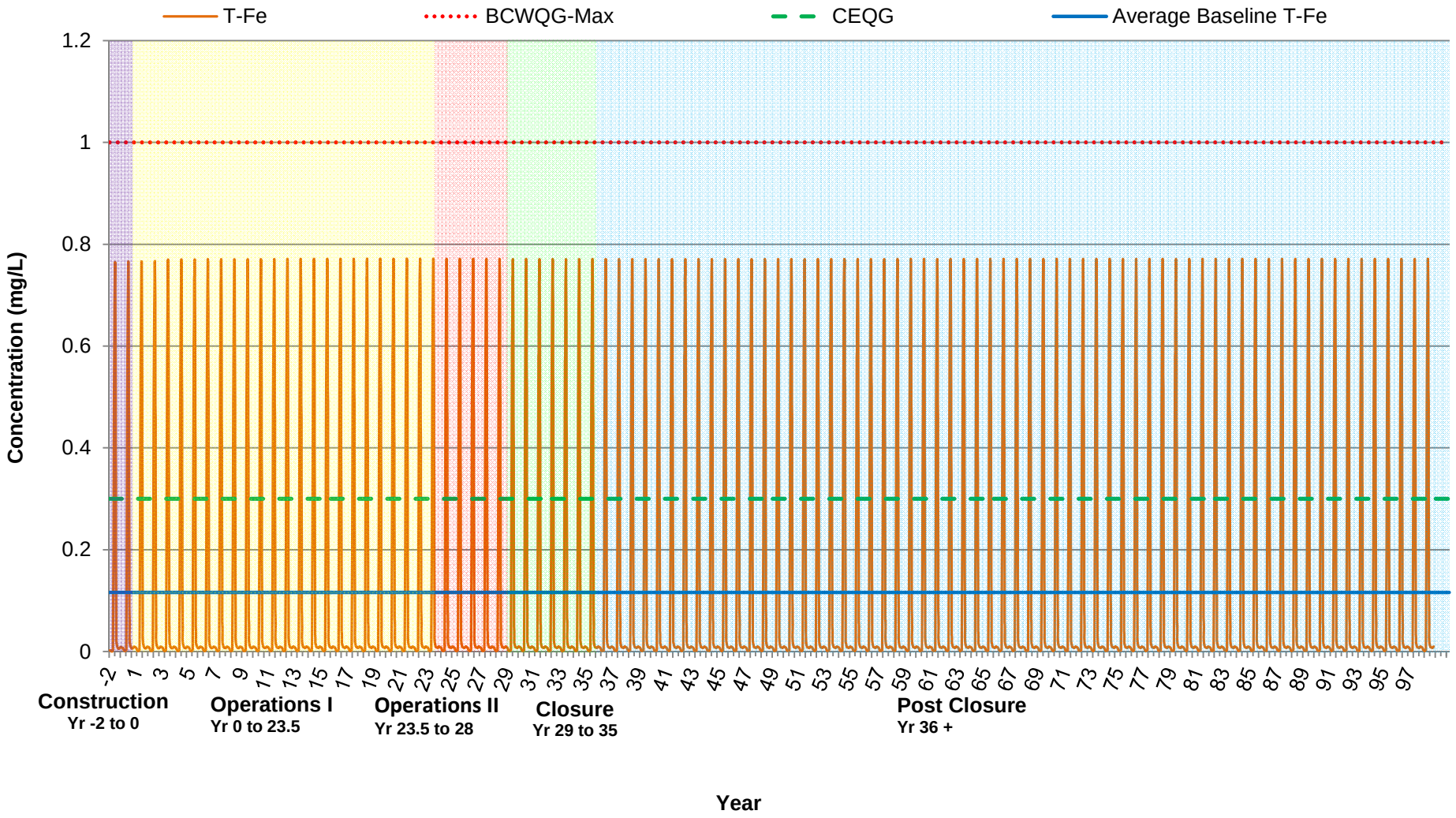
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G9.Cu-D

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK1 (AVERAGE HARDNESS OF 101 mg/L).
3. BCWQG-MAX 1.0 mg/L IS NOT SHOWN ON GRAPH.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE TOTAL IRON CONCENTRATIONS - MID BAKER CREEK (BK1)

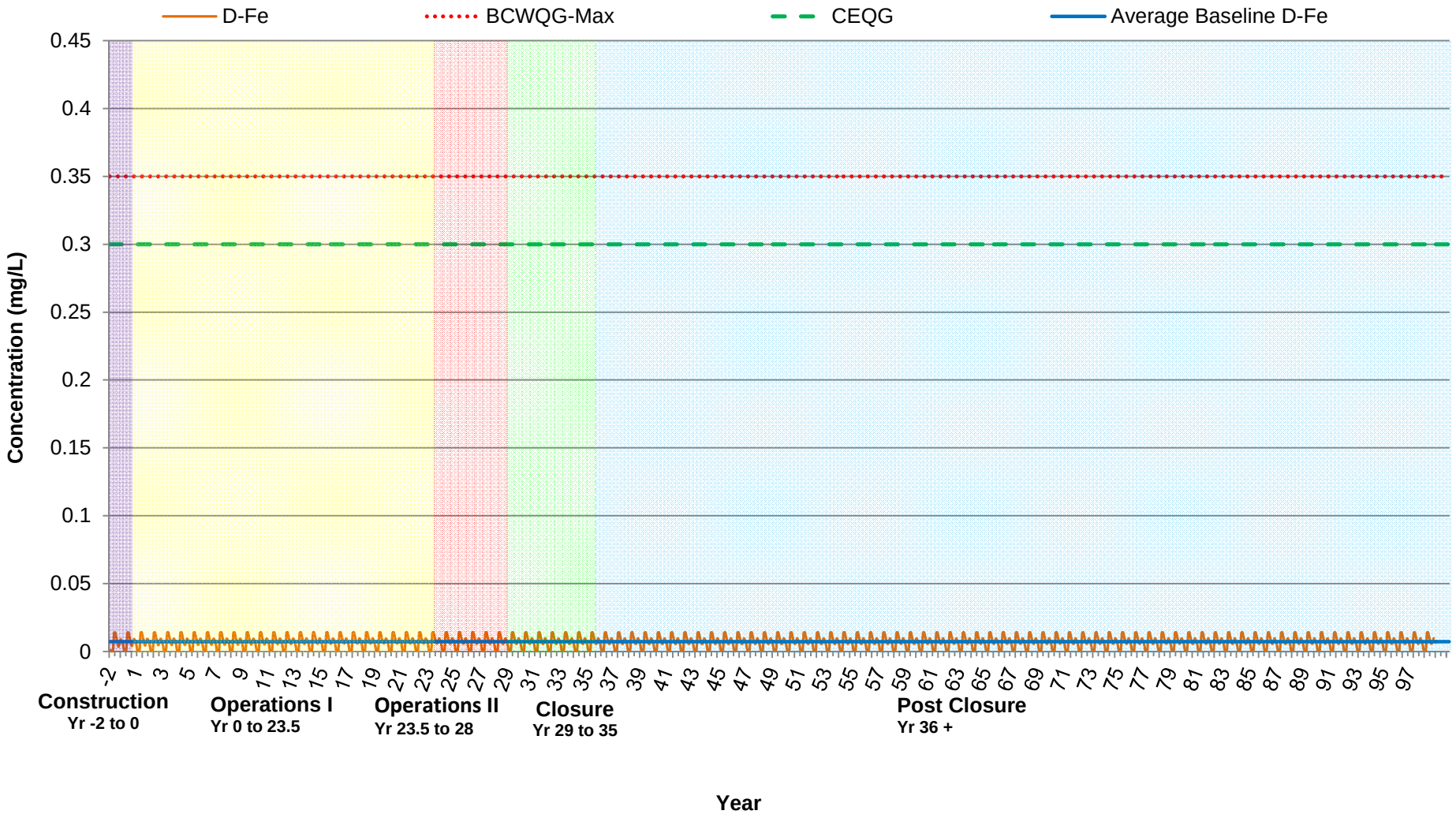
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G9.Fe-T

REV 0



NOTES:

1. THE BCWQG-MAX AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK1 (AVERAGE HARDNESS OF 101 mg/L).

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE DISSOLVED IRON CONCENTRATIONS - MID BAKER CREEK (BK1)

Knight Piésold CONSULTING

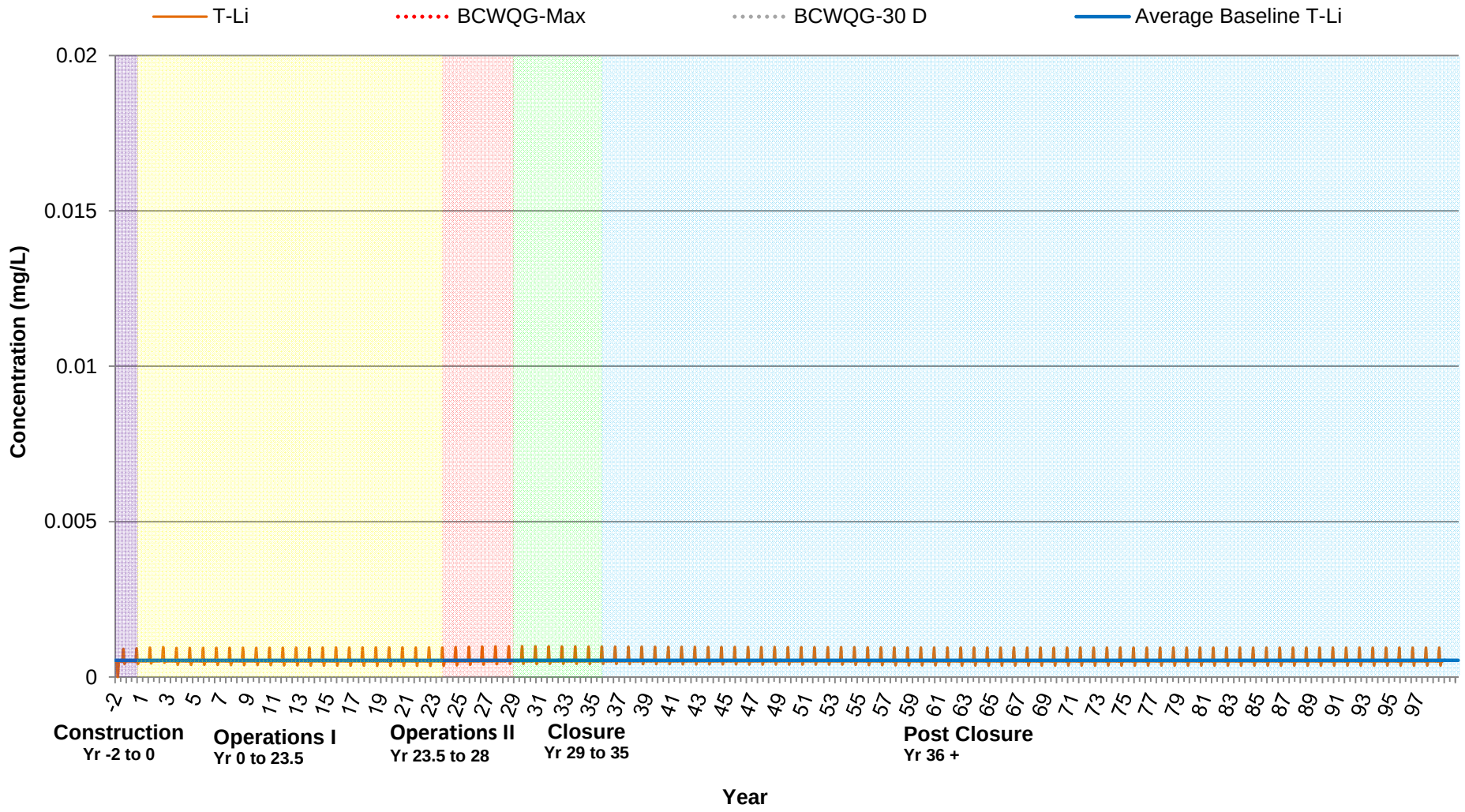
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G9.Fe-D

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK1 (AVERAGE HARDNESS OF 101 mg/L).
3. THE BCWQG-30 D (0.096 mg/L) AND BCWQG-MAX (0.87 mg/L) ARE INTERIM (WORKING) AND ARE NOT SHOWN ON GRAPH.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

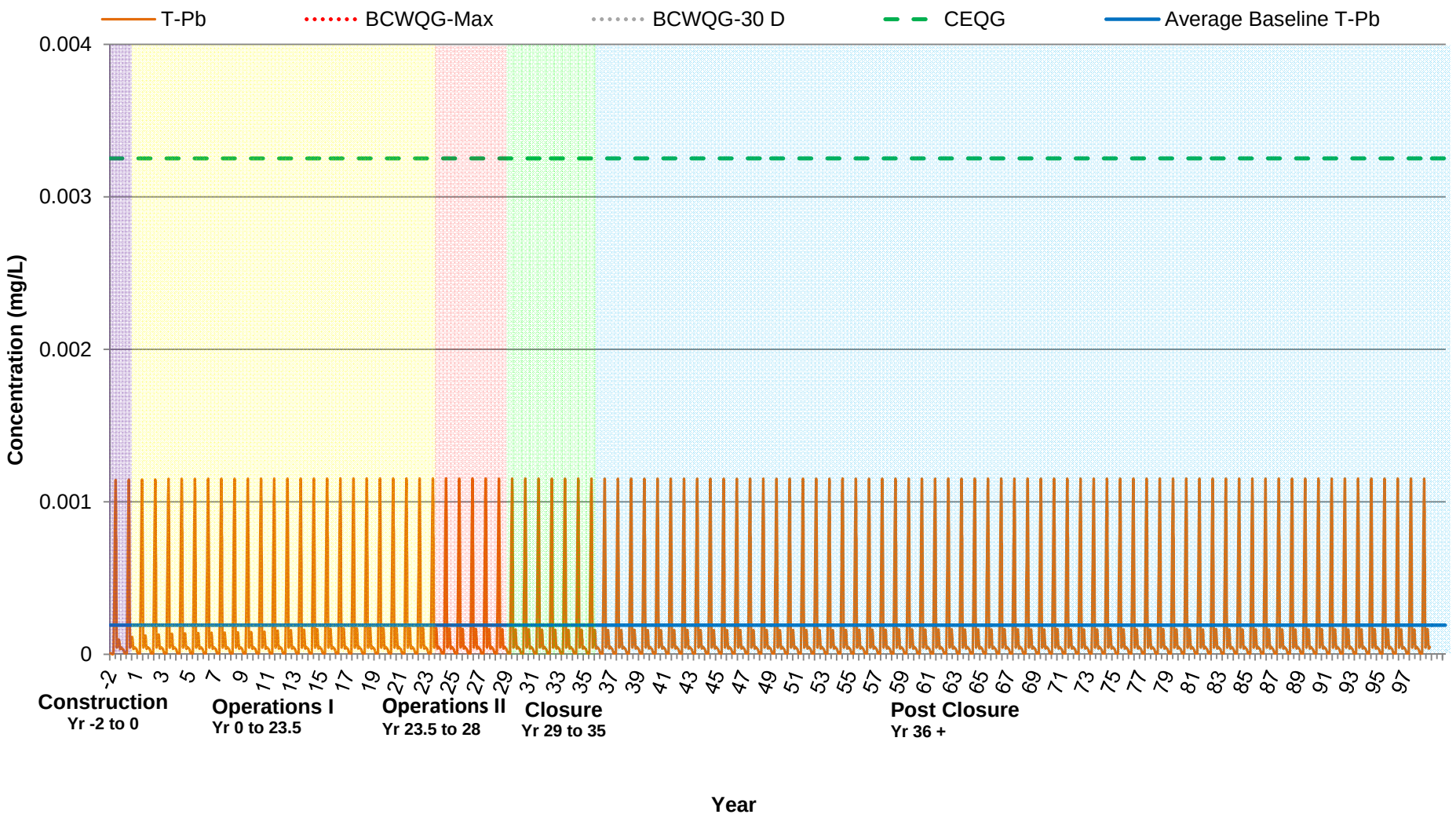
PREDICTED UPPER BOUND CASE LITHIUM CONCENTRATIONS - MID BAKER CREEK (BK1)

Knight Piésold CONSULTING

P/A NO. VA101-458/14 | REF. NO. 3

FIGURE G9.Li | REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK1 (AVERAGE HARDNESS OF 101 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.
4. THE BCWQG-MAX (CALCULATED AT 0.011 mg/L) IS NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE LEAD CONCENTRATIONS - MID BAKER CREEK (BK1)

Knight Piésold CONSULTING

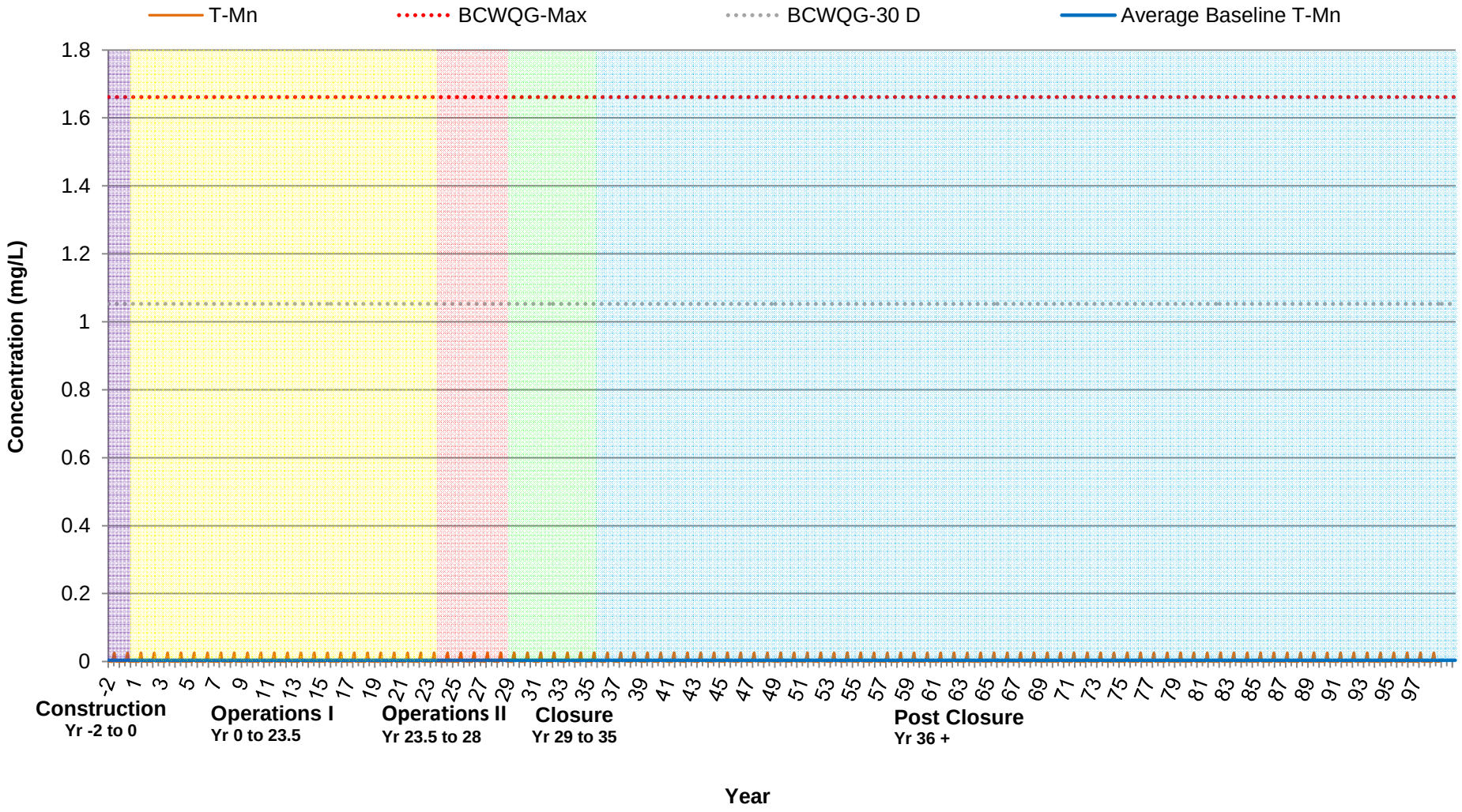
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G9.Pb

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK1 (AVERAGE HARDNESS OF 101 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE MANGANESE CONCENTRATIONS - MID BAKER CREEK (BK1)

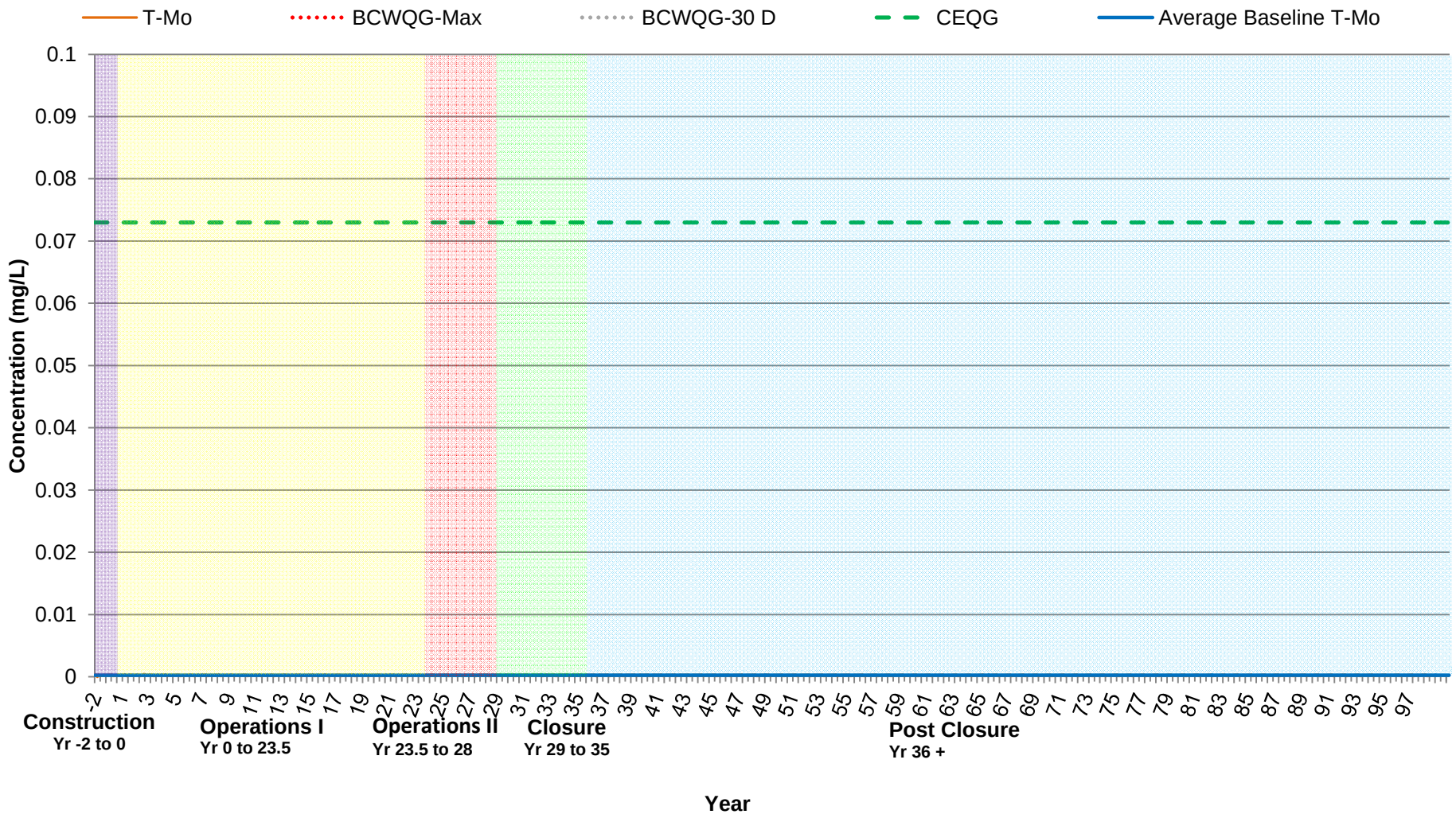
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G9.Mn

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK1 (AVERAGE HARDNESS OF 101 mg/L).
3. THE BCWQG-MAX (2 mg/L) AND BCWQG-30 D (1 mg/L) ARE NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE MOLYDBENUM CONCENTRATIONS - MID BAKER CREEK (BK1)

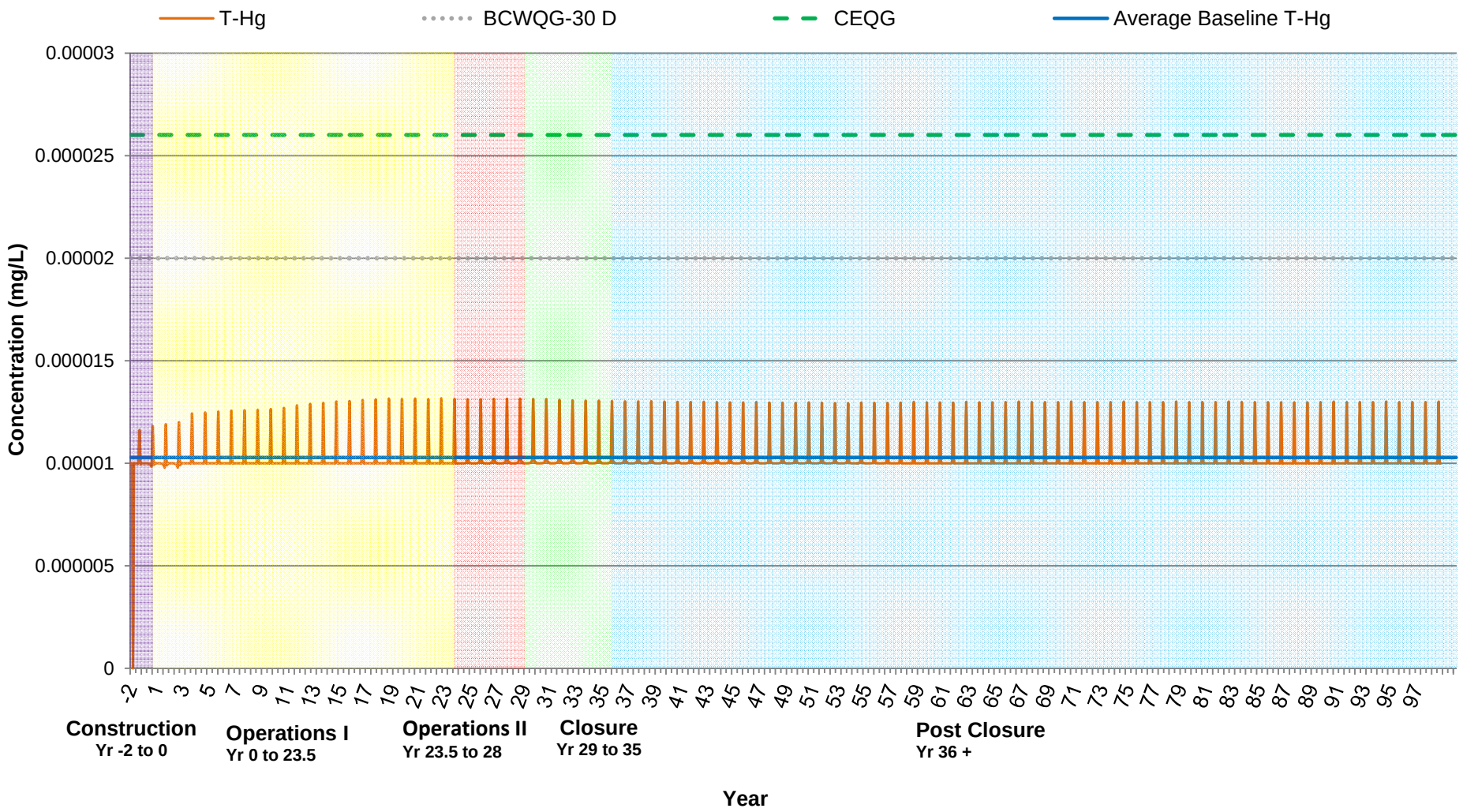
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G9.Mo

REV 0



NOTES:

1. THE BCWQG-30 D AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK1 (AVERAGE HARDNESS OF 101 mg/L).
3. BCWQG-30 D VALUE APPLIED ON ASSUMPTION THAT METHYL-Hg IS EQUAL TO 0.5% OF T-Hg.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE MERCURY CONCENTRATIONS - MID BAKER CREEK (BK1)

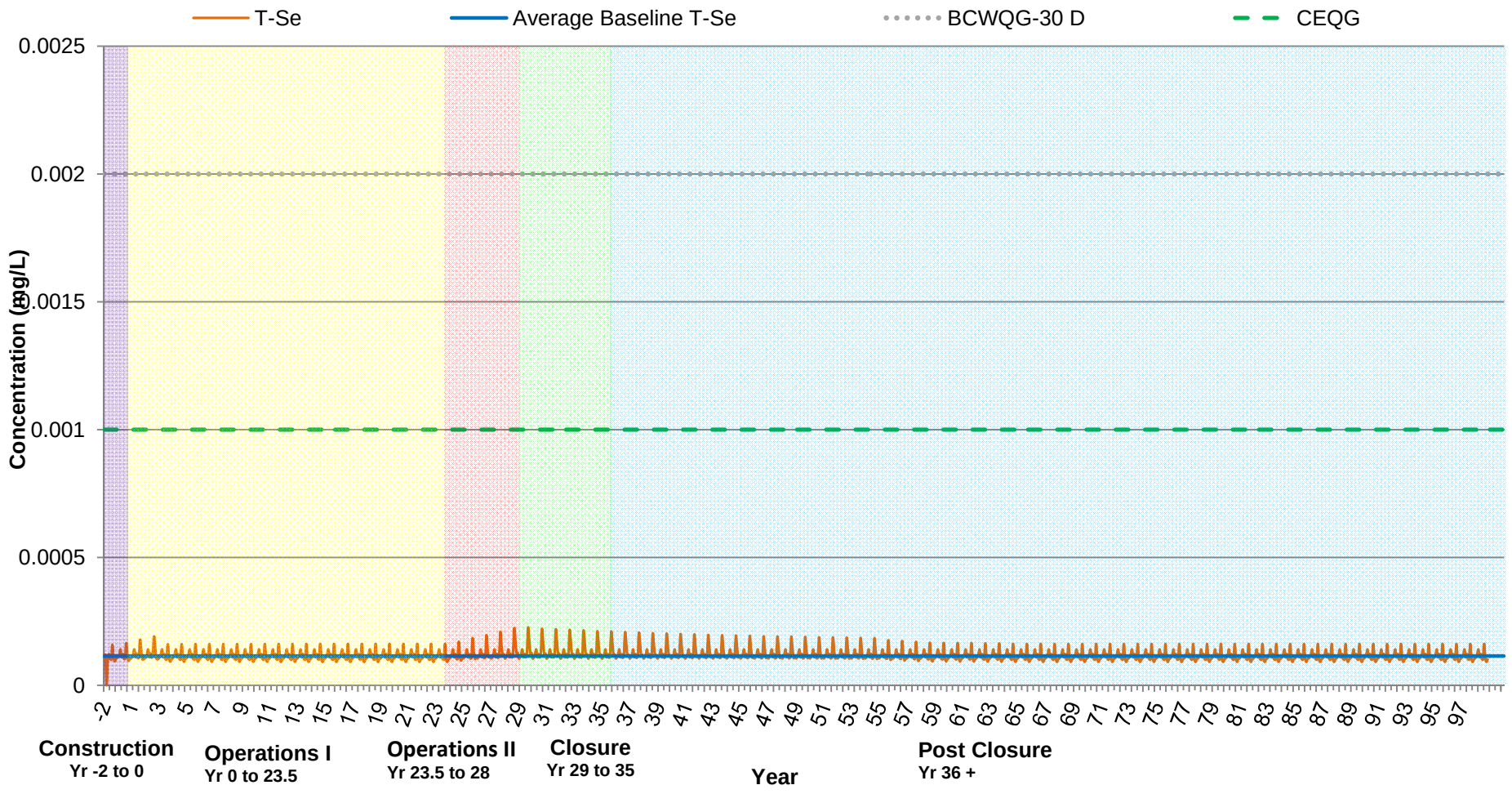
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G9.Hg

REV 0



NOTES:

1. THE BCWQG-30 D AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK1 (AVERAGE HARDNESS OF 101 mg/L).

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE SELENIUM CONCENTRATIONS - MID BAKER CREEK (BK1)

Knight Piésold CONSULTING

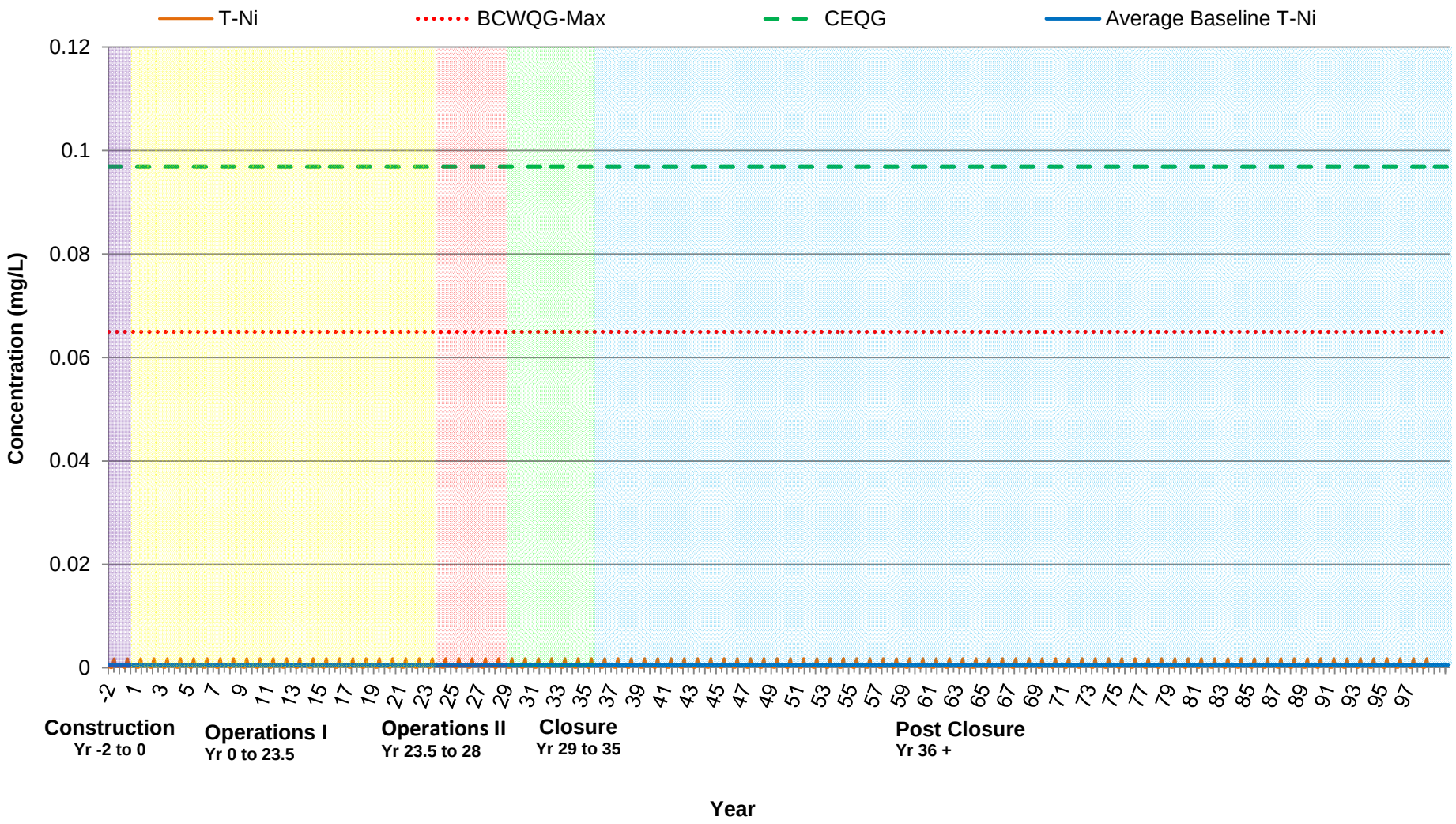
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G9.Se

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK1 (AVERAGE HARDNESS OF 101 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE NICKEL CONCENTRATIONS - MID BAKER CREEK (BK1)

Knight Piésold CONSULTING

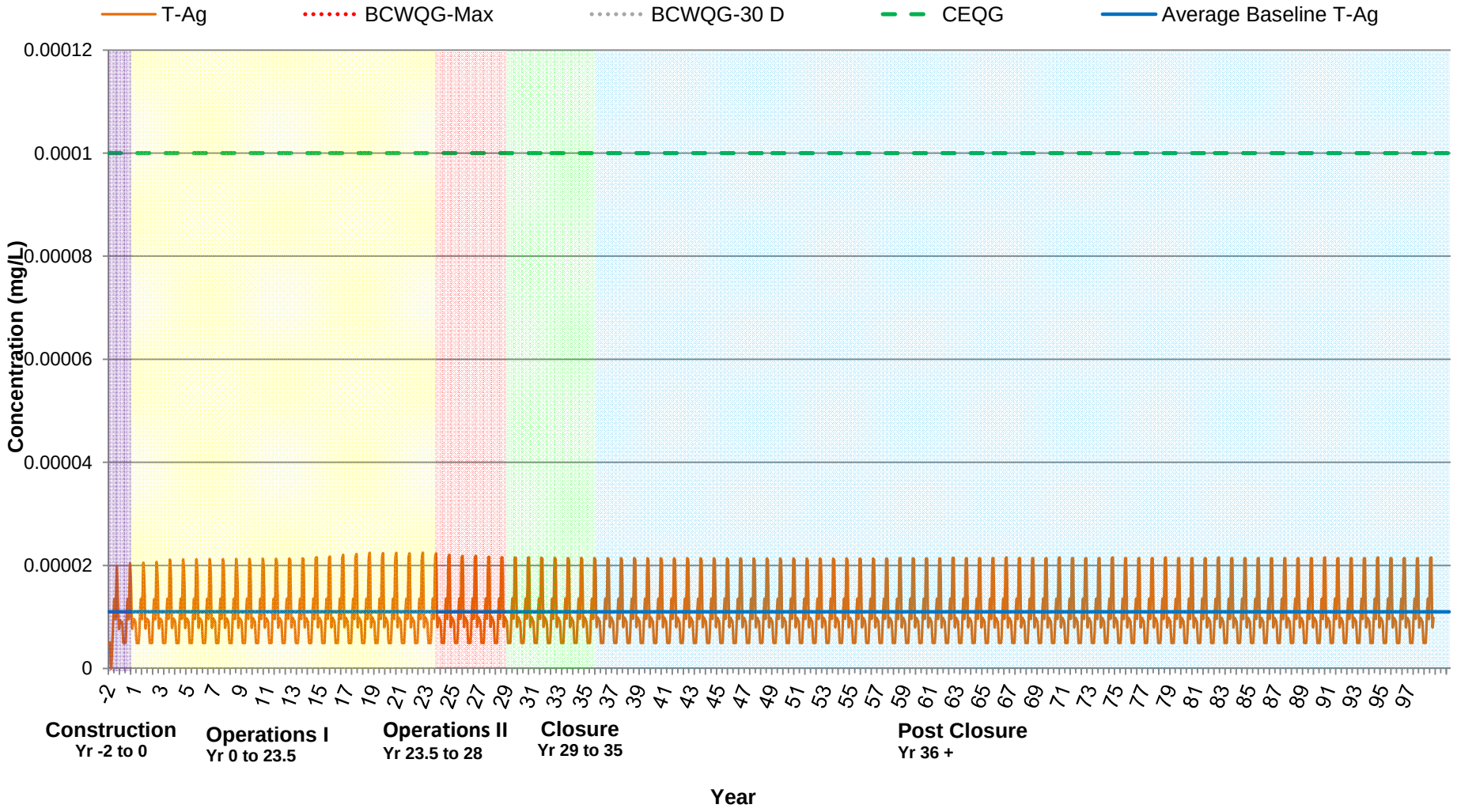
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G9.Ni

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-30 D AND BCWQG-MAX ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK1 (AVERAGE HARDNESS OF 101 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE SILVER CONCENTRATIONS - MID BAKER CREEK (BK1)

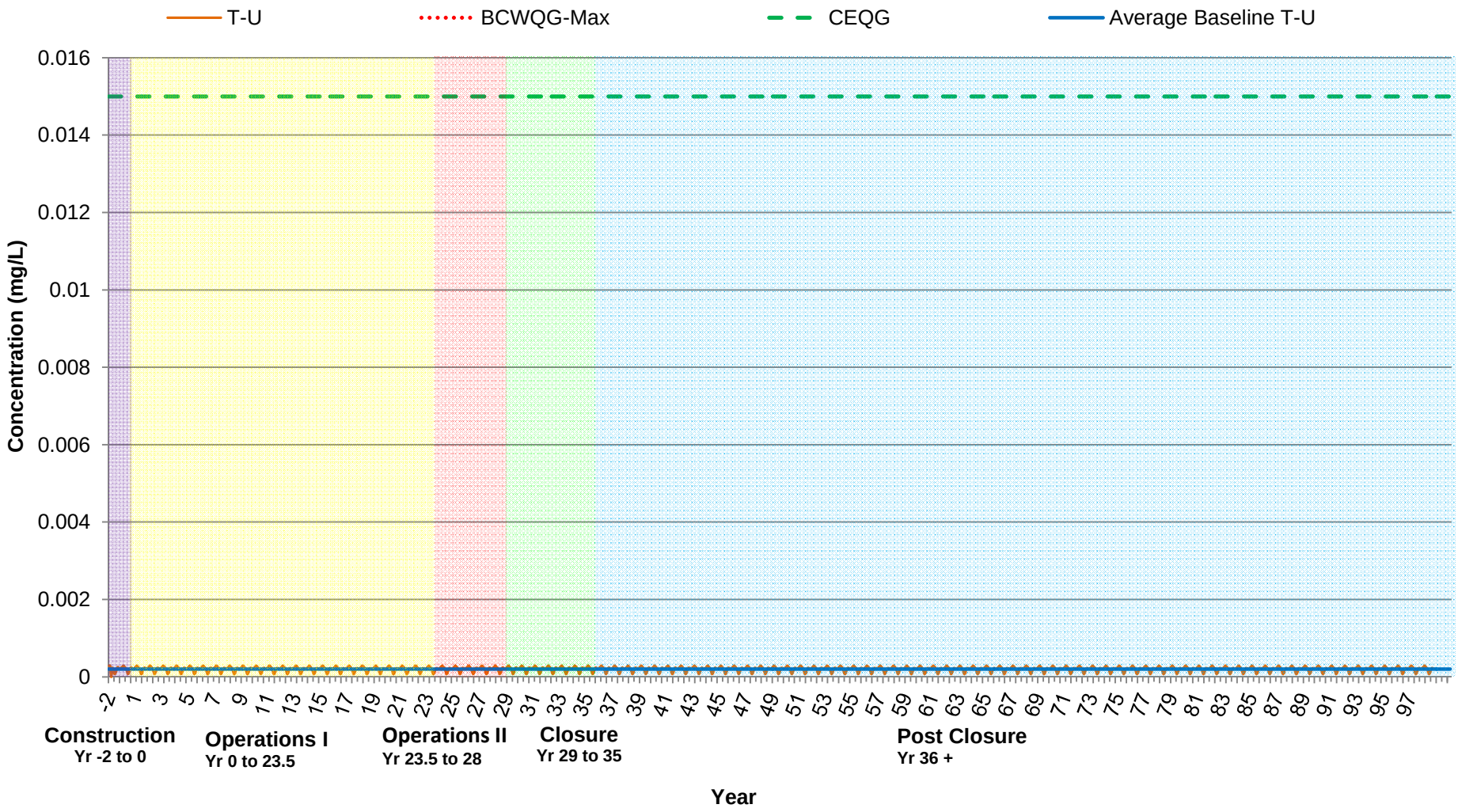
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G9.Ag

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK1 (AVERAGE HARDNESS OF 101 mg/L).
3. THE BCWQG-MAX (0.3 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE URANIUM CONCENTRATIONS - MID BAKER CREEK (BK1)

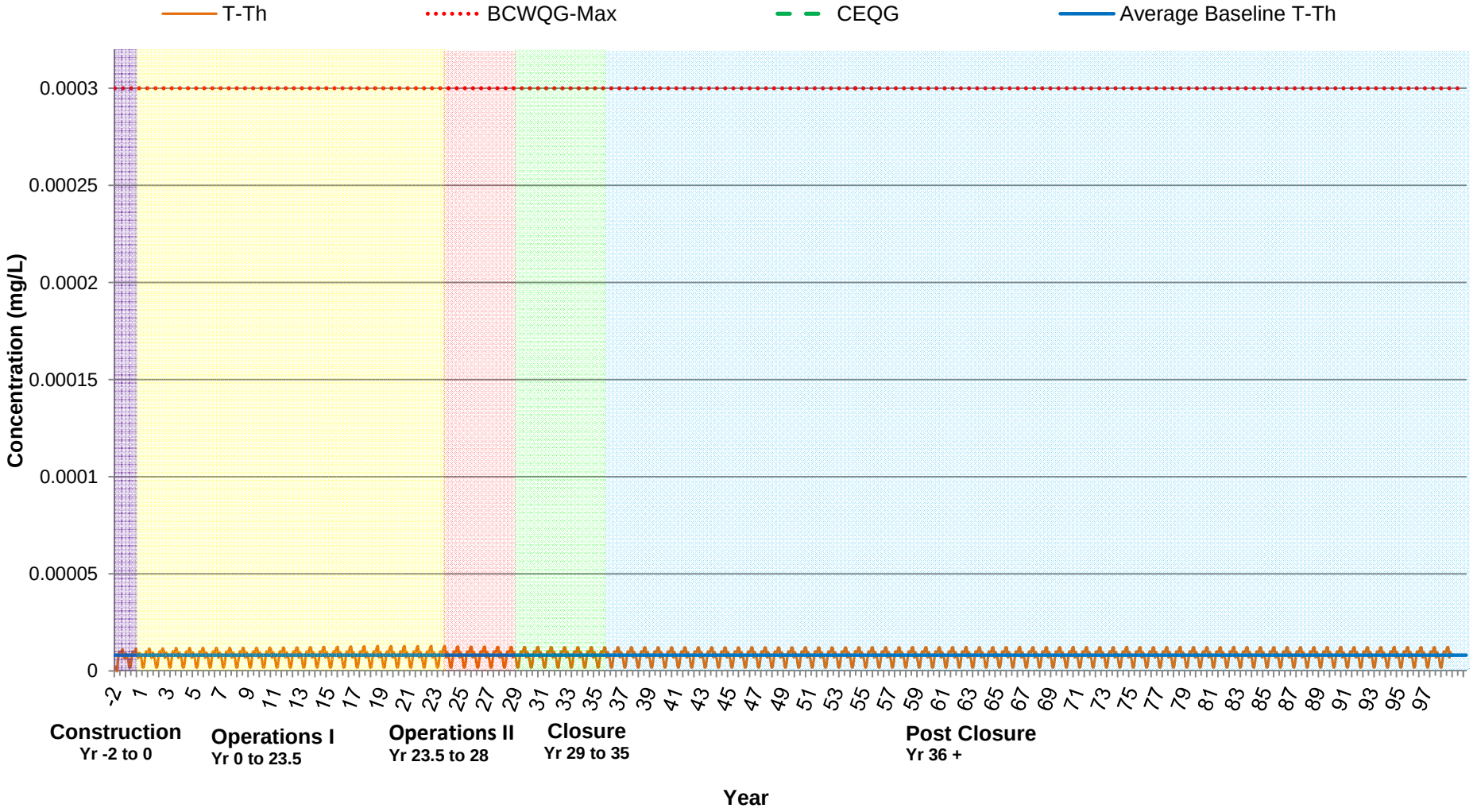
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G9.U

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK1 (AVERAGE HARDNESS OF 101 mg/L).
3. THE CEQG (0.0008 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE THALLIUM CONCENTRATIONS - MID BAKER CREEK (BK1)

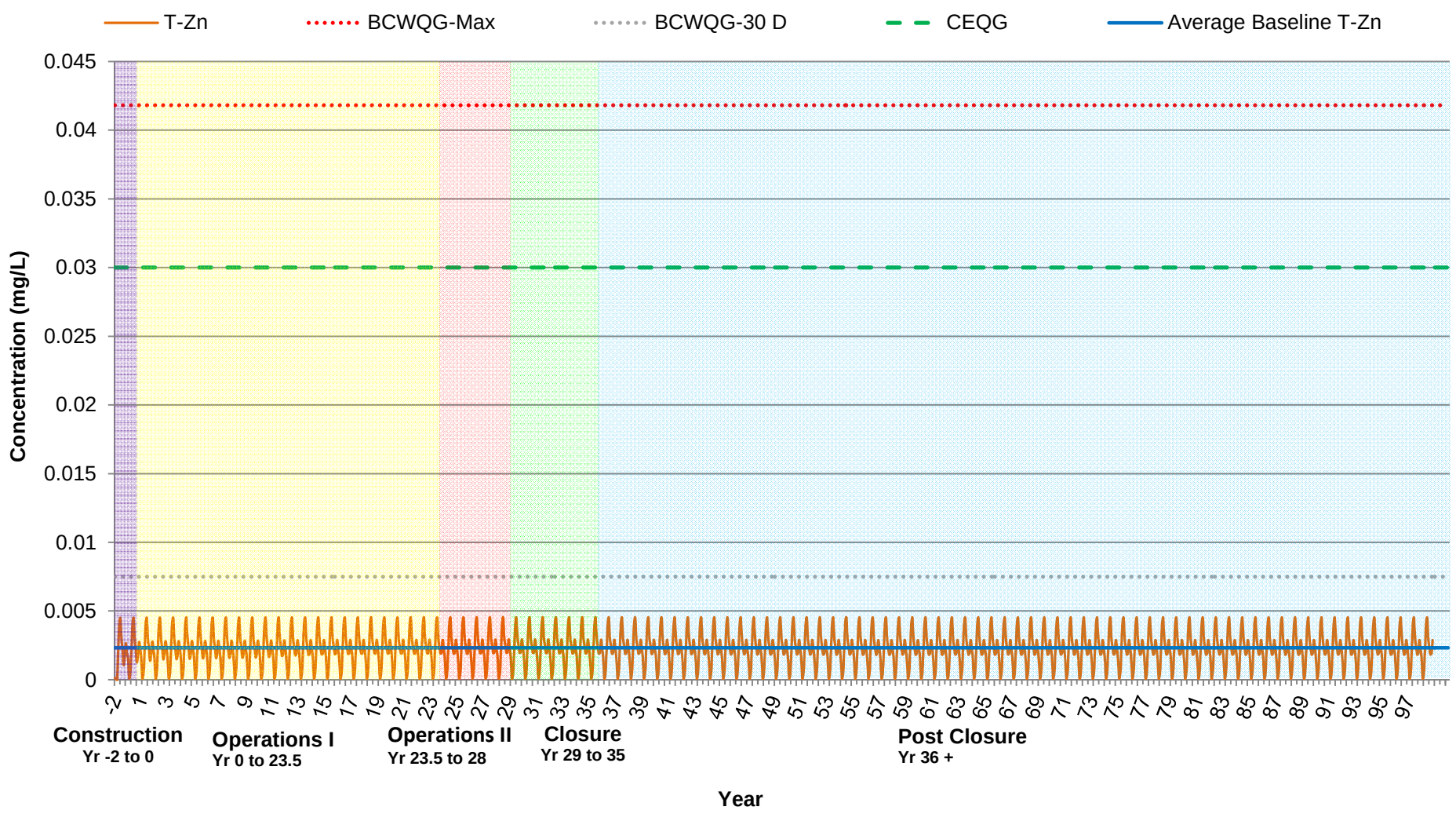
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G9.Th

REV 0



NOTES:

1. BCWQG-30 D AND BCWQG-MAX ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK1 (AVERAGE HARDNESS OF 101 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE ZINC CONCENTRATIONS - MID BAKER CREEK (BK1)

Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

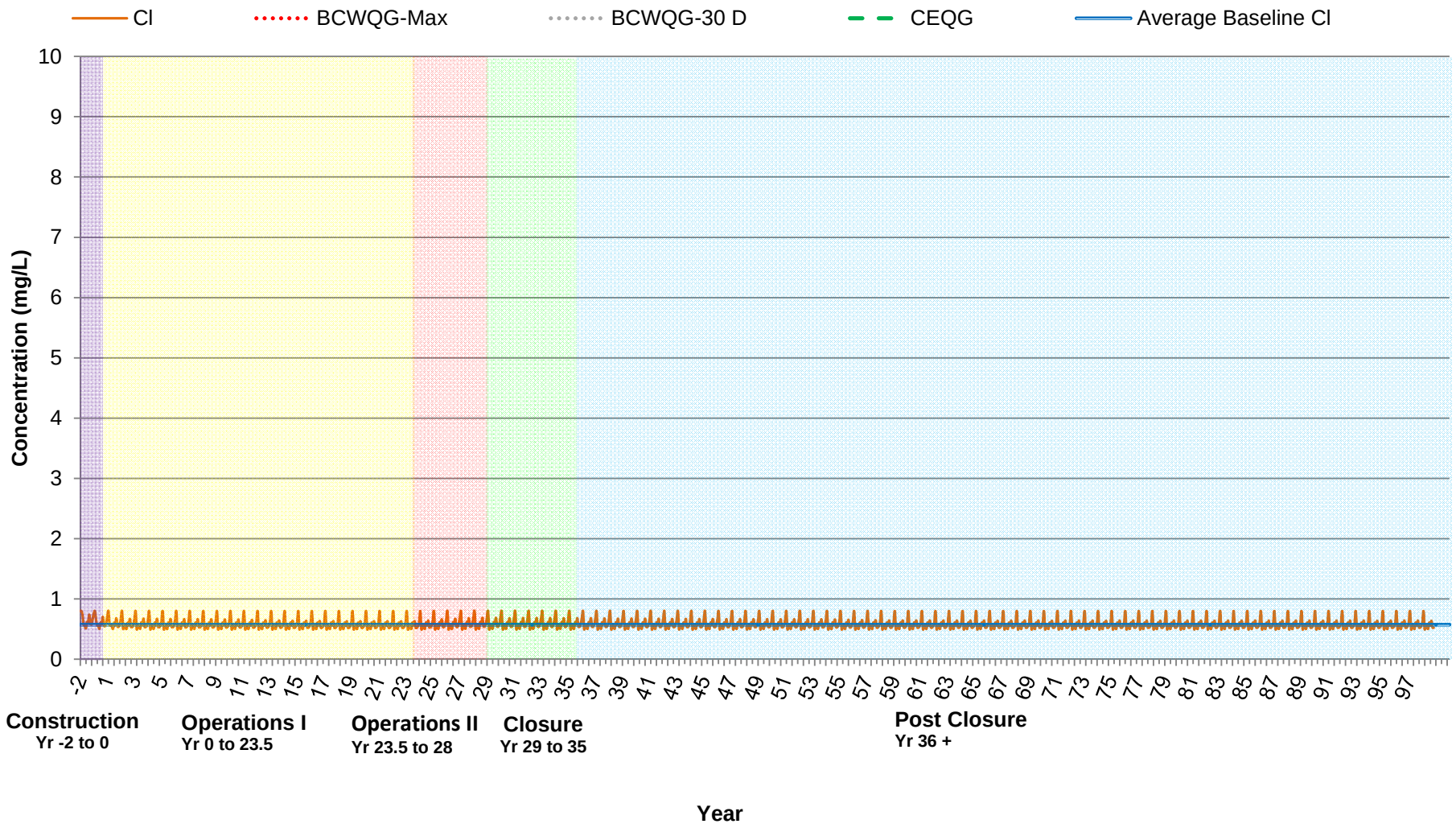
FIGURE G9.Zn

REV 0

APPENDIX G10

BAKER CREEK ABOVE NORTH THOMPSON RIVER (BK0)

(Pages G10-1 to G10-30)



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK0 (AVERAGE HARDNESS OF 140 mg/L).
3. ALL GUIDELINES ARE NOT SHOWN: BCWQG-30 D (150 mg/L); BCWQG-MAX (600 mg/L); CEQG (120 mg/L AND 640 mg/L).

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE CHLORIDE CONCENTRATIONS - LOWER BAKER CREEK (BK0)

Knight Piésold CONSULTING

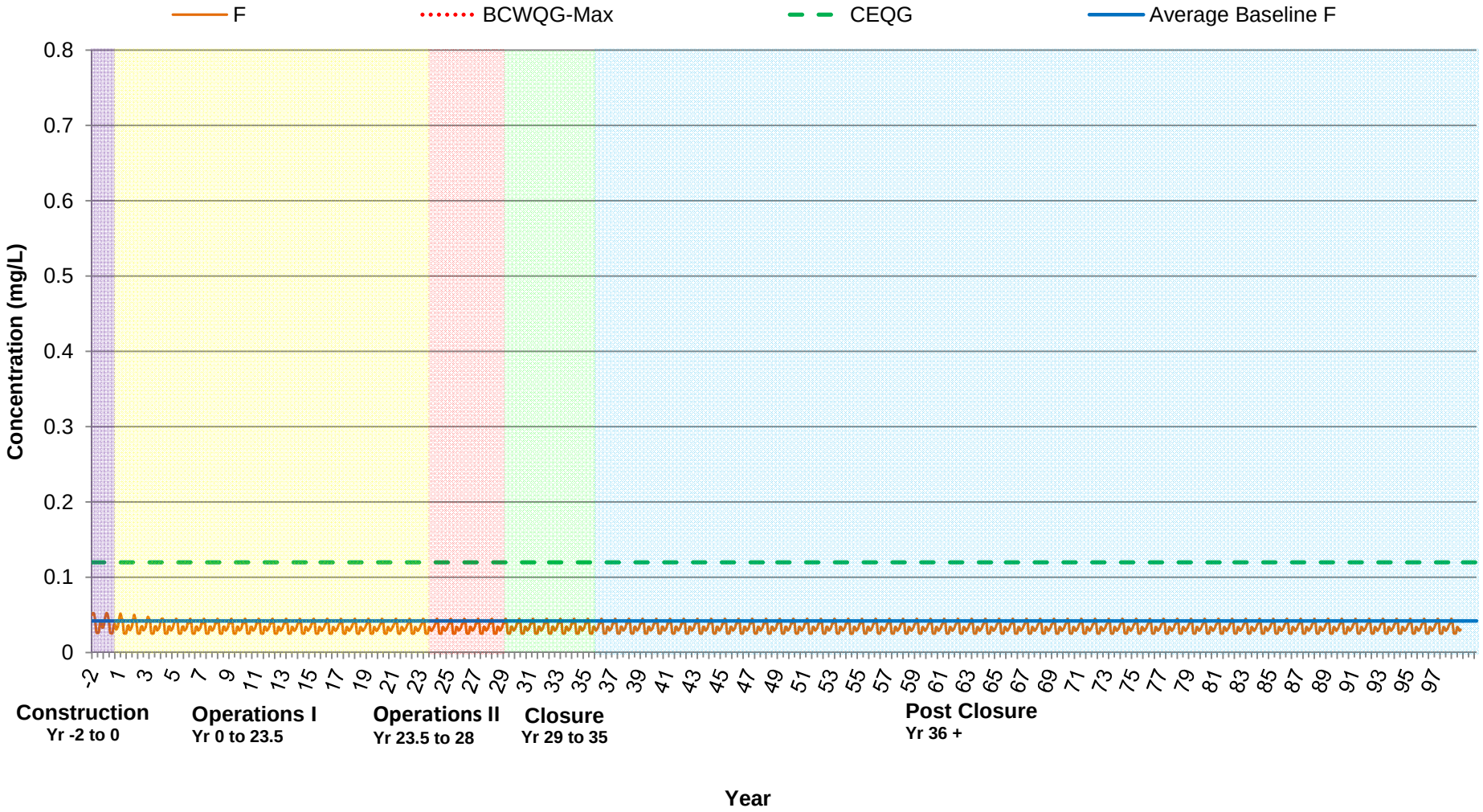
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G10.Cl

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX IS HARNDESS DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK0 (AVERAGE HARDNESS OF 140 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE FLUORIDE CONCENTRATIONS - LOWER BAKER CREEK (BK0)

Knight Piésold CONSULTING

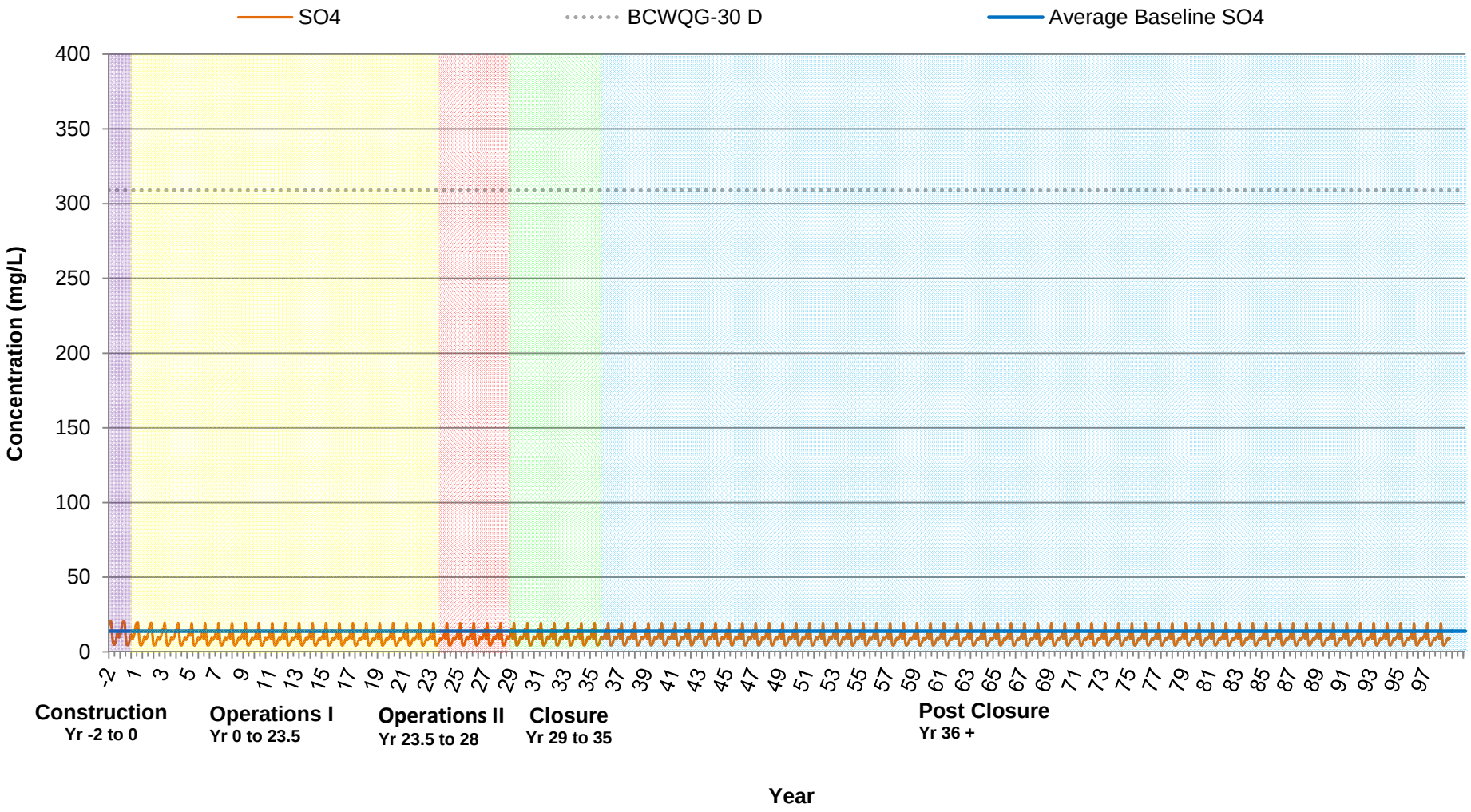
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G10.F

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. BCWQG-30 D IS HARDNESS DEPEDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK0 (AVERAGE HARDNESS OF 140 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE SULPHATE CONCENTRATIONS - LOWER BAKER CREEK (BK0)

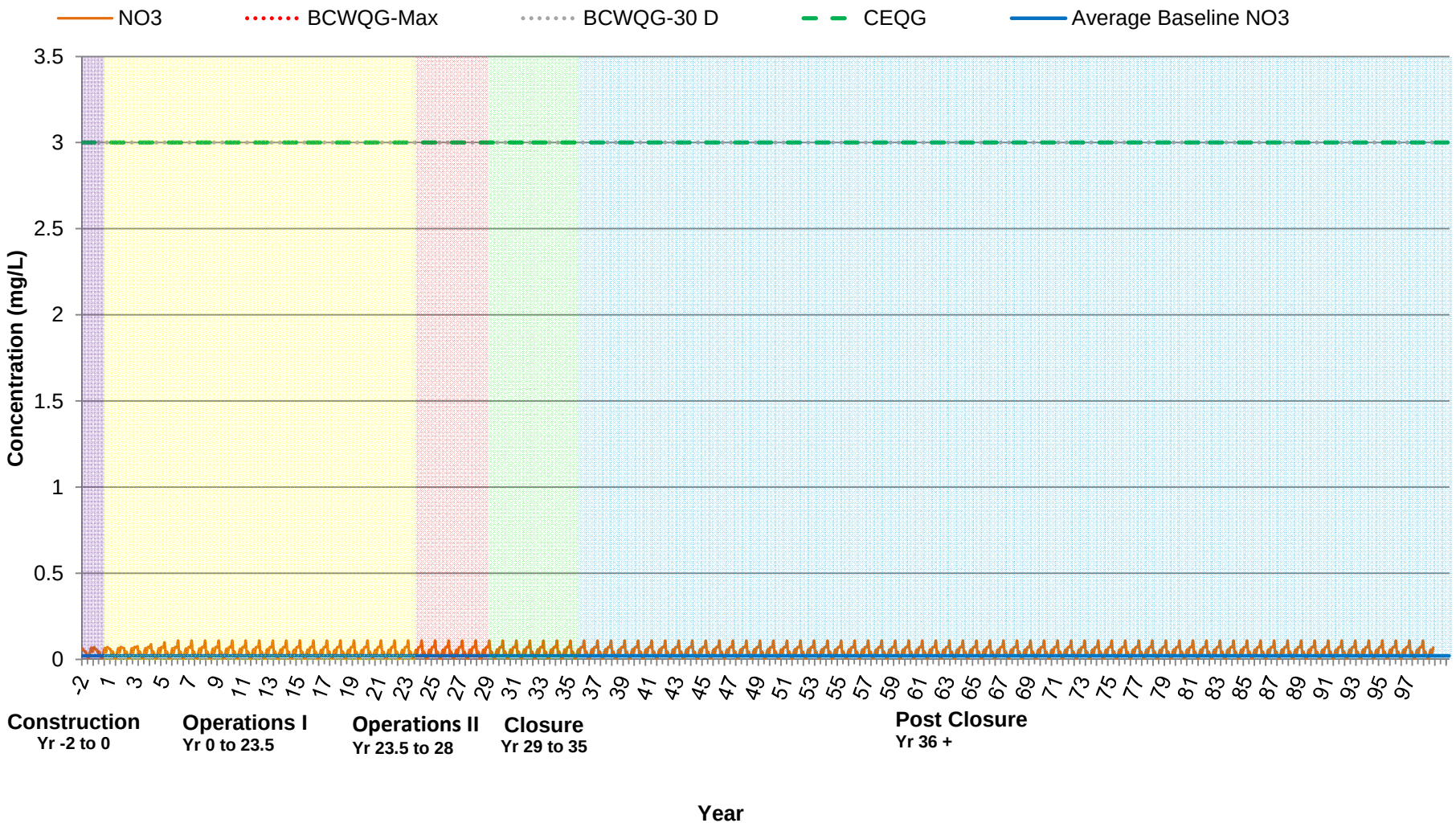
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G10.S04

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK0 (AVERAGE HARDNESS OF 140 mg/L).
3. THE BCWQG-MAX (32.8 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE NITRATE CONCENTRATIONS - LOWER BAKER CREEK (BK0)

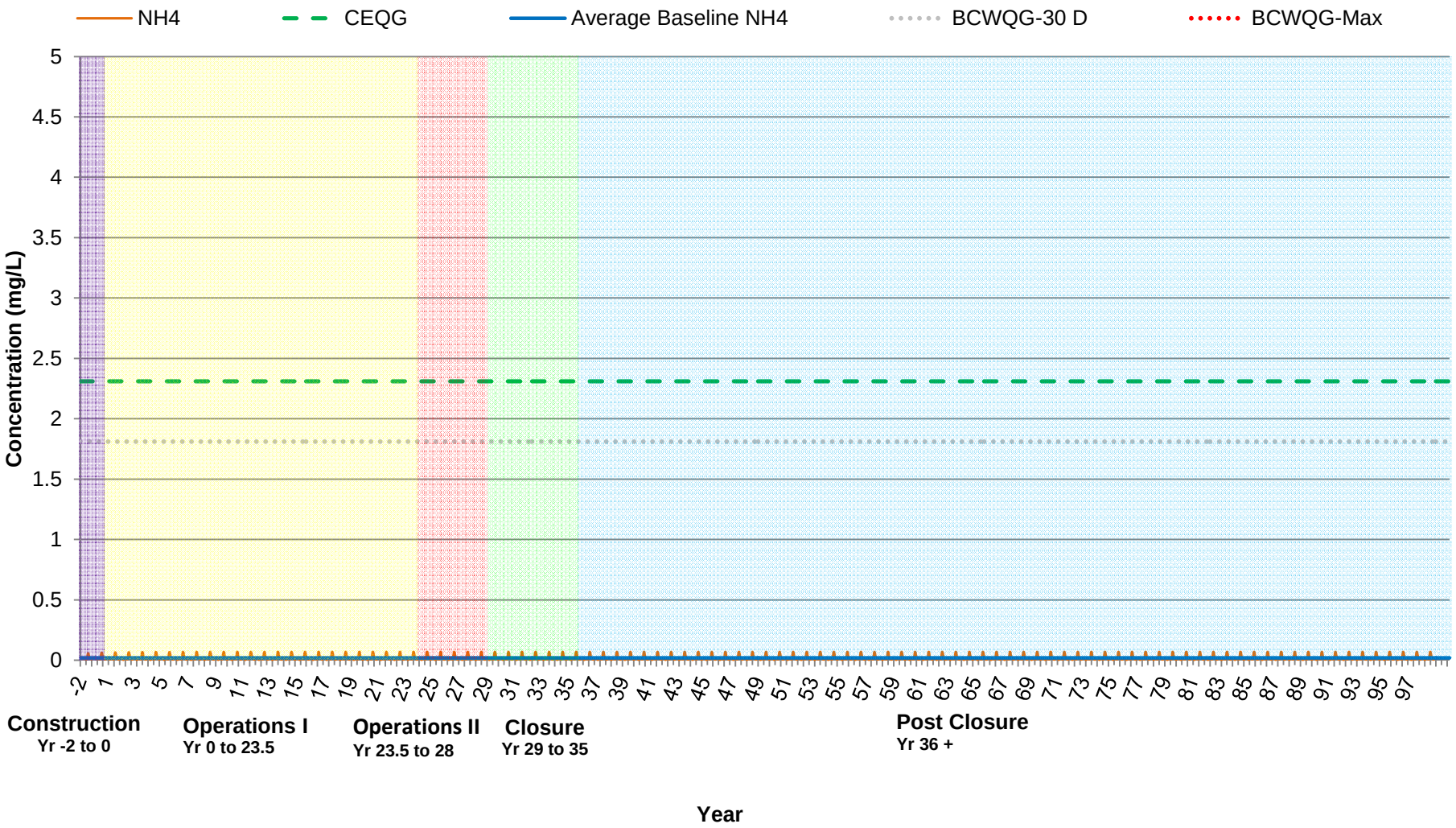
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G10.NO3

REV 0



NOTES:

1. THE BCWQG-30 D IS VALID FOR ONLY 6.5≤pH<9 AND 0°C≤T≤20°C.
2. THE BCWQG-MAX (20.15 mg/L) VALID FOR 6.5≤pH<9 IS NOT SHOWN.
3. THE CEQG IS TO BE USED WITH CAUTION FOR WATER WITH T<5°C AND pH>9.
4. BASELINE SITE USED FOR COMPARISON IS SITE BK0 (AVERAGE HARDNESS OF 140 mg/L).

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE AMMONIA CONCENTRATIONS - LOWER BAKER CREEK (BK0)

Knight Piésold CONSULTING

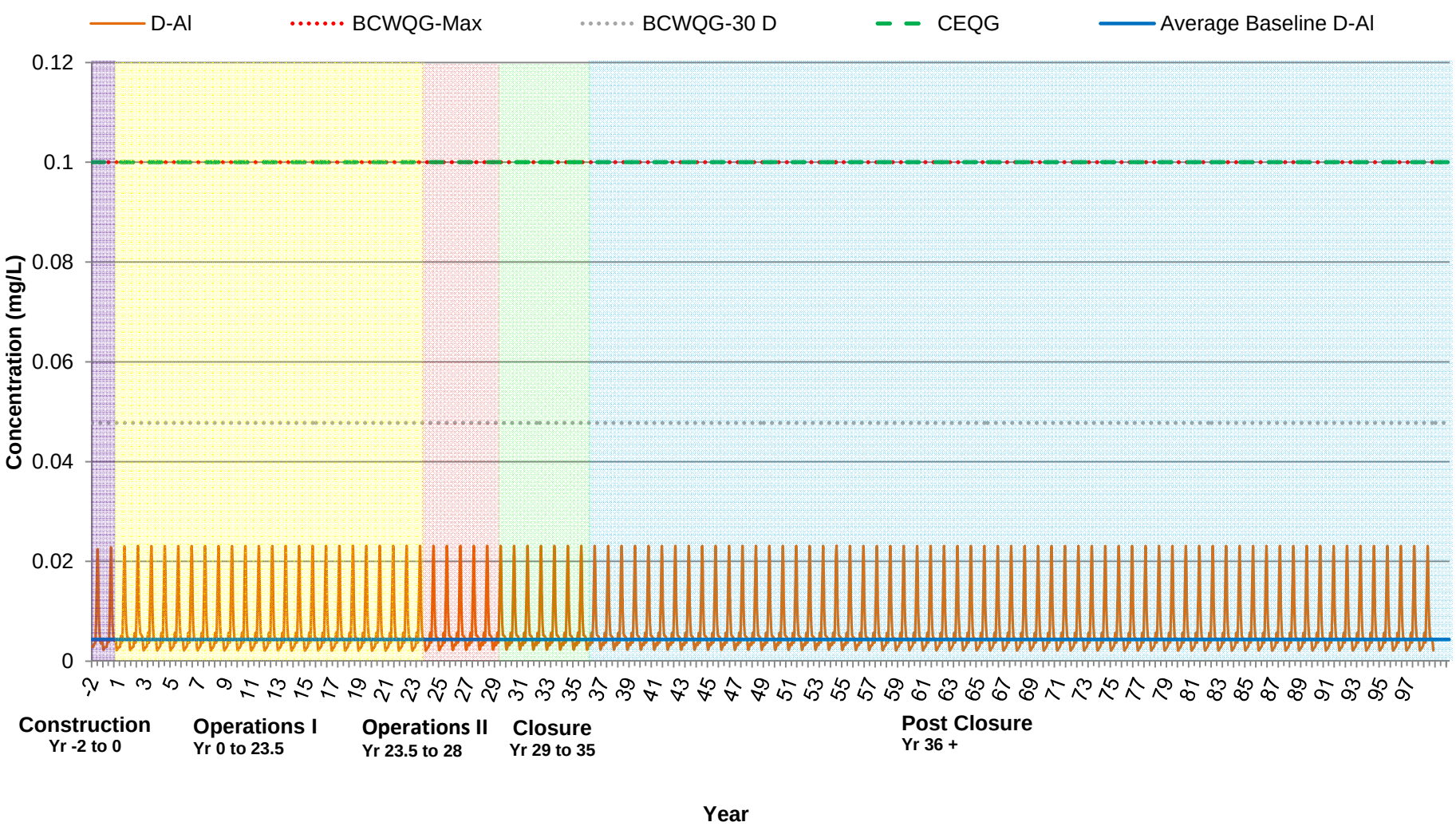
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G10.NH4

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE pH-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK0 (AVERAGE HARDNESS OF 140 mg/L).
3. AVERAGE BASELINE pH USED TO CALCULATE GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE DISSOLVED ALUMINUM CONCENTRATIONS - LOWER BAKER CREEK (BK0)

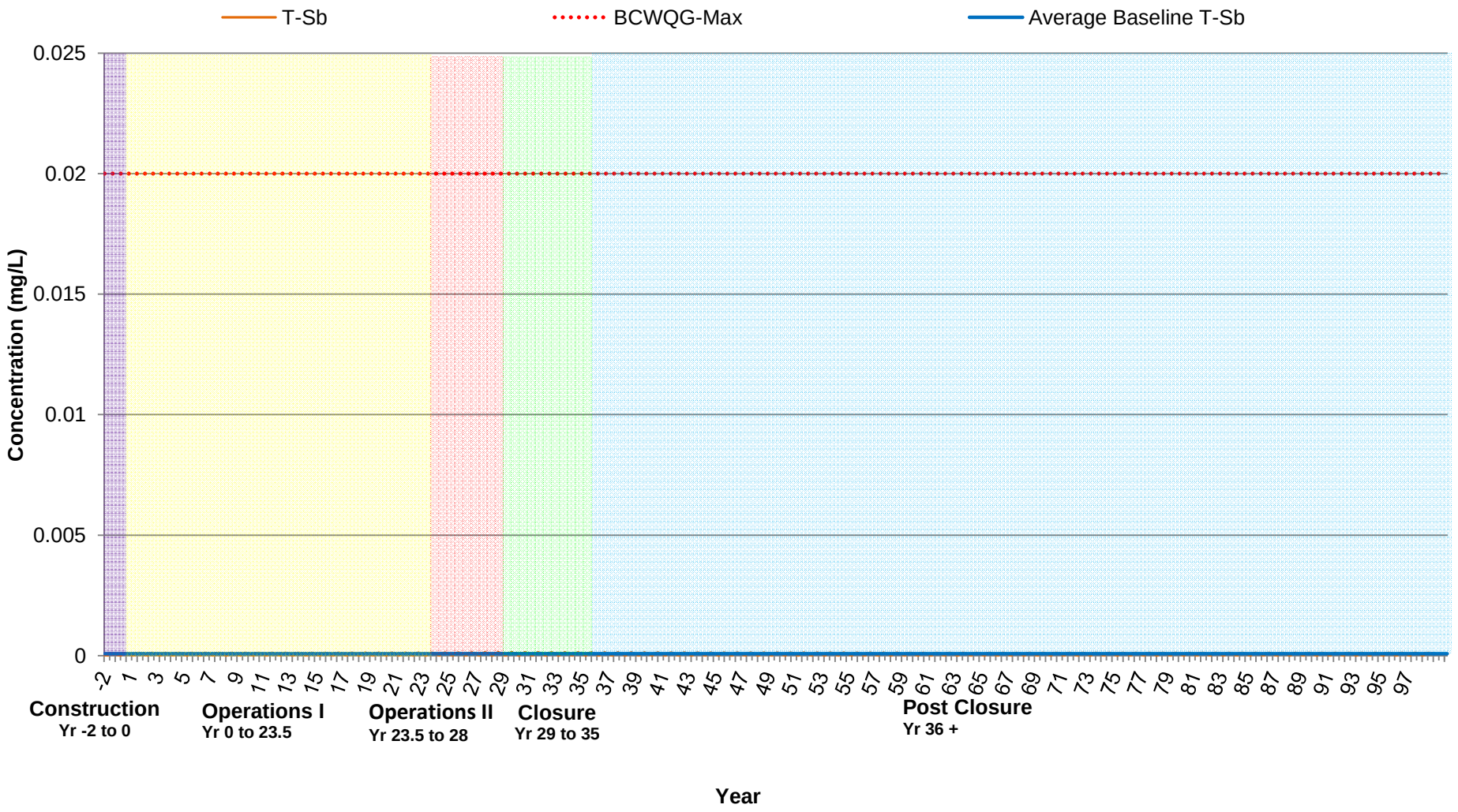
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G10.Al

REV 0



NOTES:

1. THE BCWQG IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK0 (AVERAGE HARDNESS OF 140 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE ANTIMONY CONCENTRATIONS - LOWER BAKER CREEK (BK0)

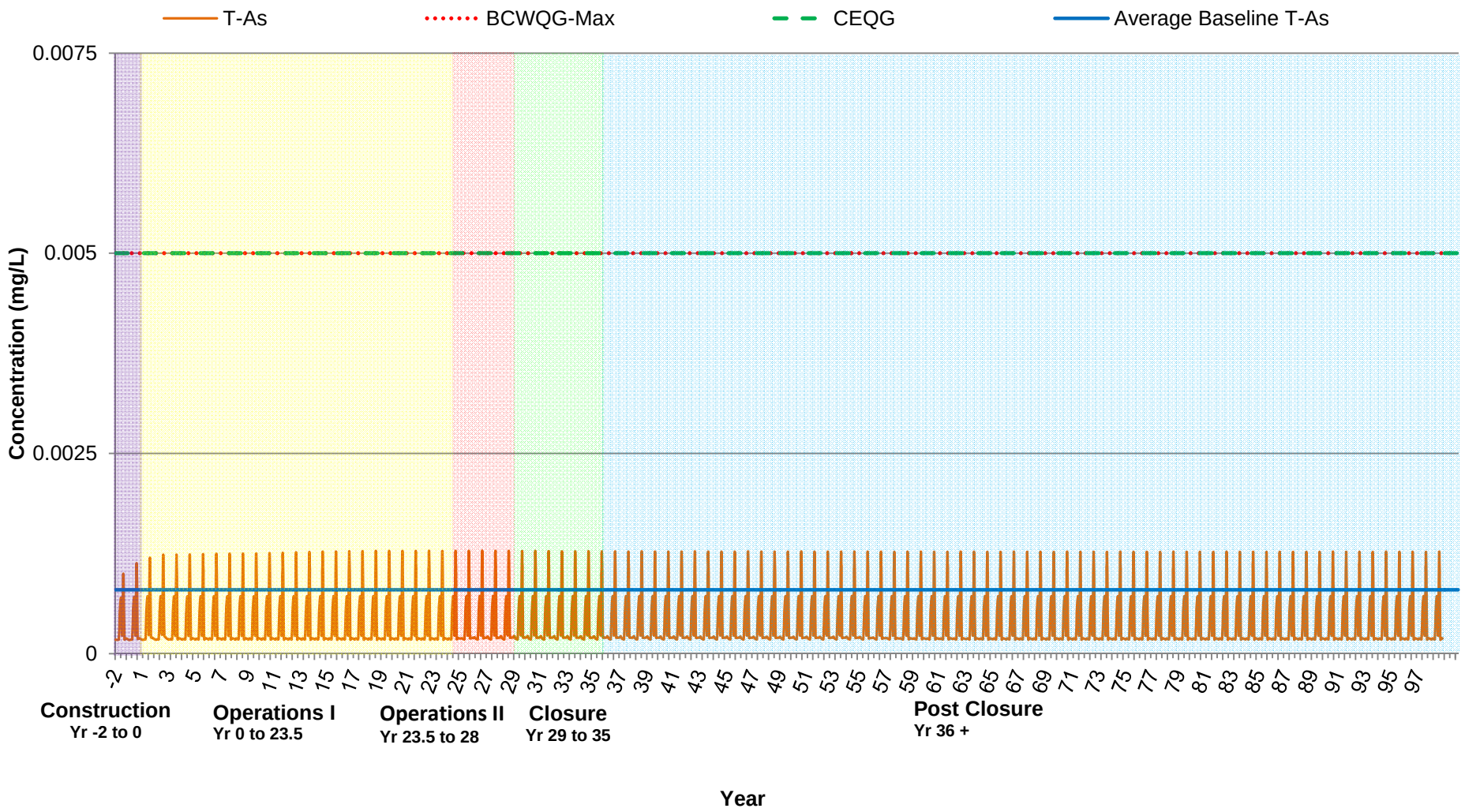
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G10.Sb

REV 0



NOTES:

1. THE BCWQG AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK0 (AVERAGE HARDNESS OF 140 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE ARSENIC CONCENTRATIONS - LOWER BAKER CREEK (BK0)

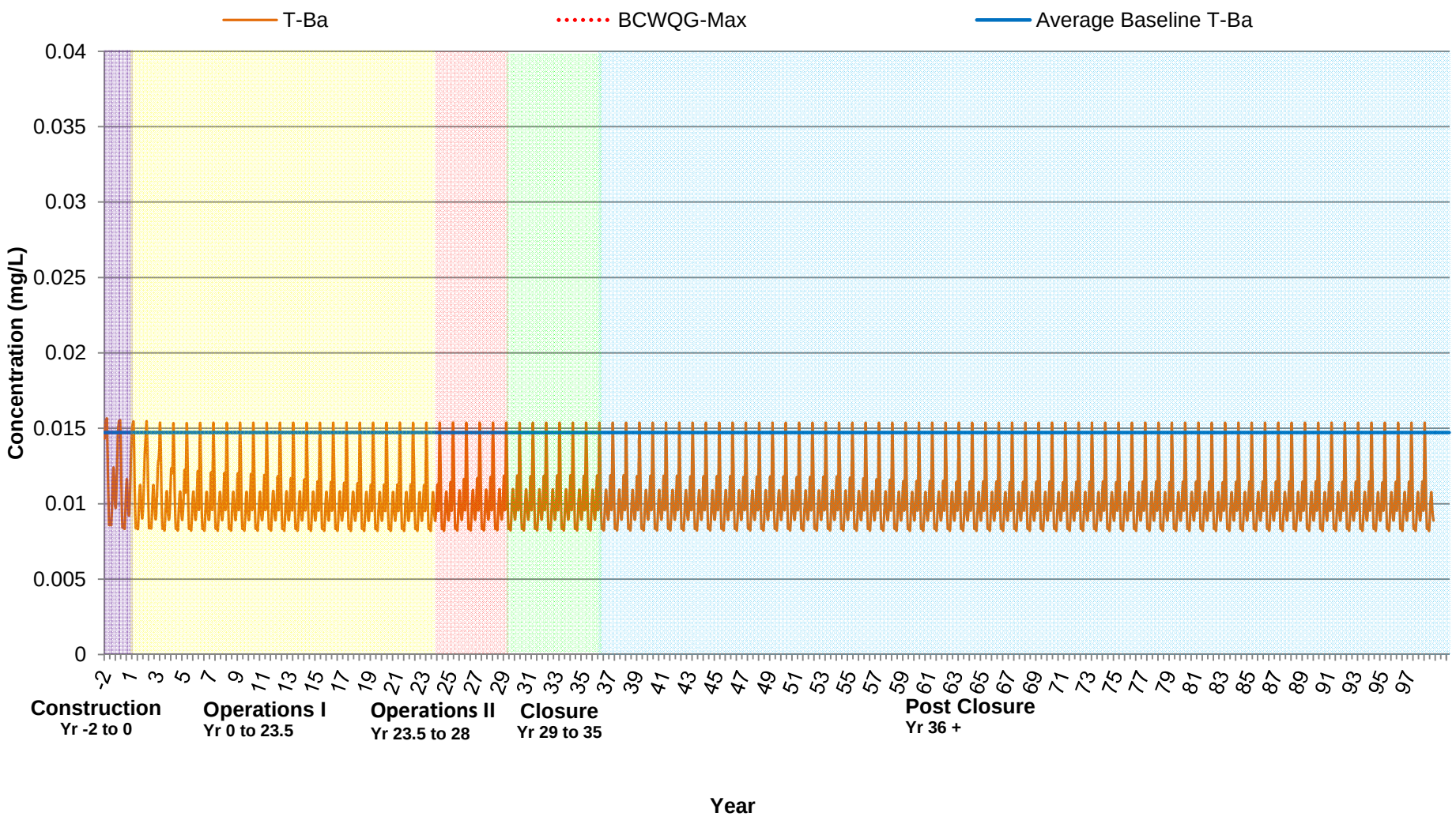
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G10.As

REV 0



NOTES:

1. THE BCWQG-MAX IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK0 (AVERAGE HARDNESS OF 140 mg/L).
3. THE BCWQG-30 D (1 mg/L) AND BCWQG-MAX (5 mg/L) ARE NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE BARIUM CONCENTRATIONS - LOWER BAKER CREEK (BK0)

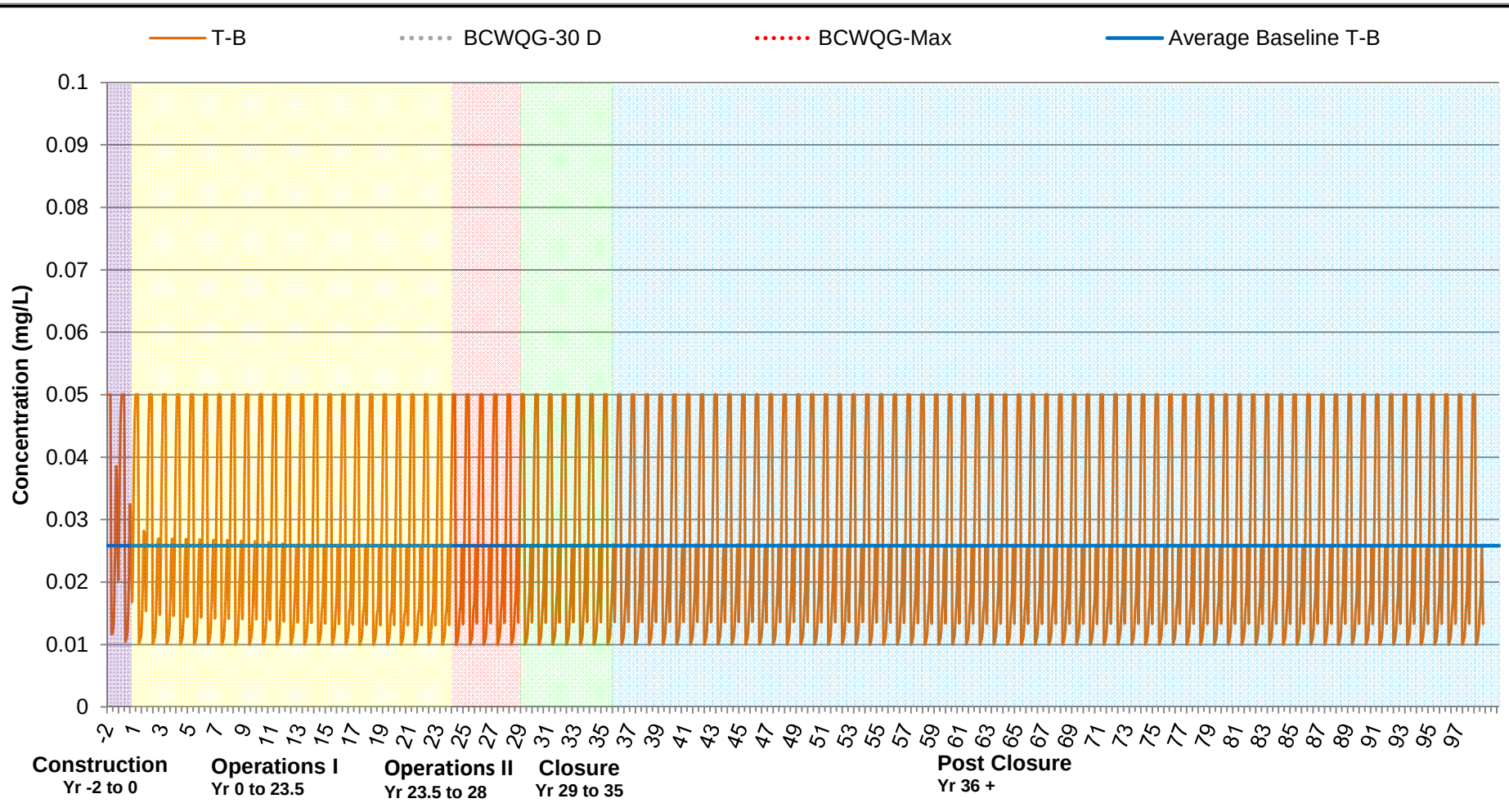
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G10.Ba

REV 0



NOTES:

1. BASELINE SITE USED FOR COMPARISON IS SITE BK0 (AVERAGE HARDNESS OF 140 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.
3. THE BCWQG-MAX (1.2 mg/L) IS NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE BORON CONCENTRATIONS - LOWER BAKER CREEK (BK0)

Knight Piésold CONSULTING

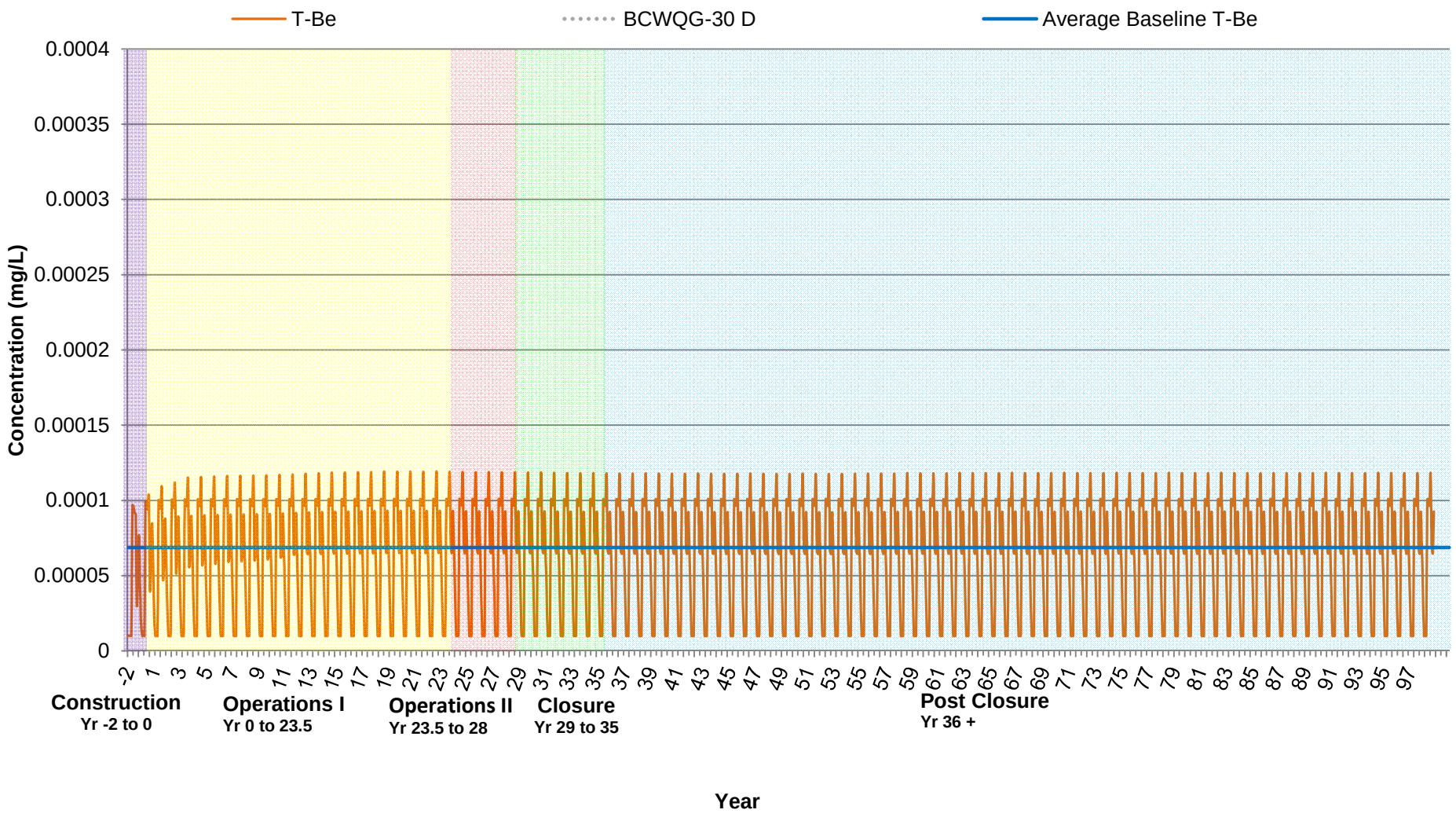
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G10.B

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK0 (AVERAGE HARDNESS OF 140 mg/L).
3. THE BCWQG-30 D (0.0053 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE BERYILLIUM CONCENTRATIONS - LOWER BAKER CREEK (BK0)

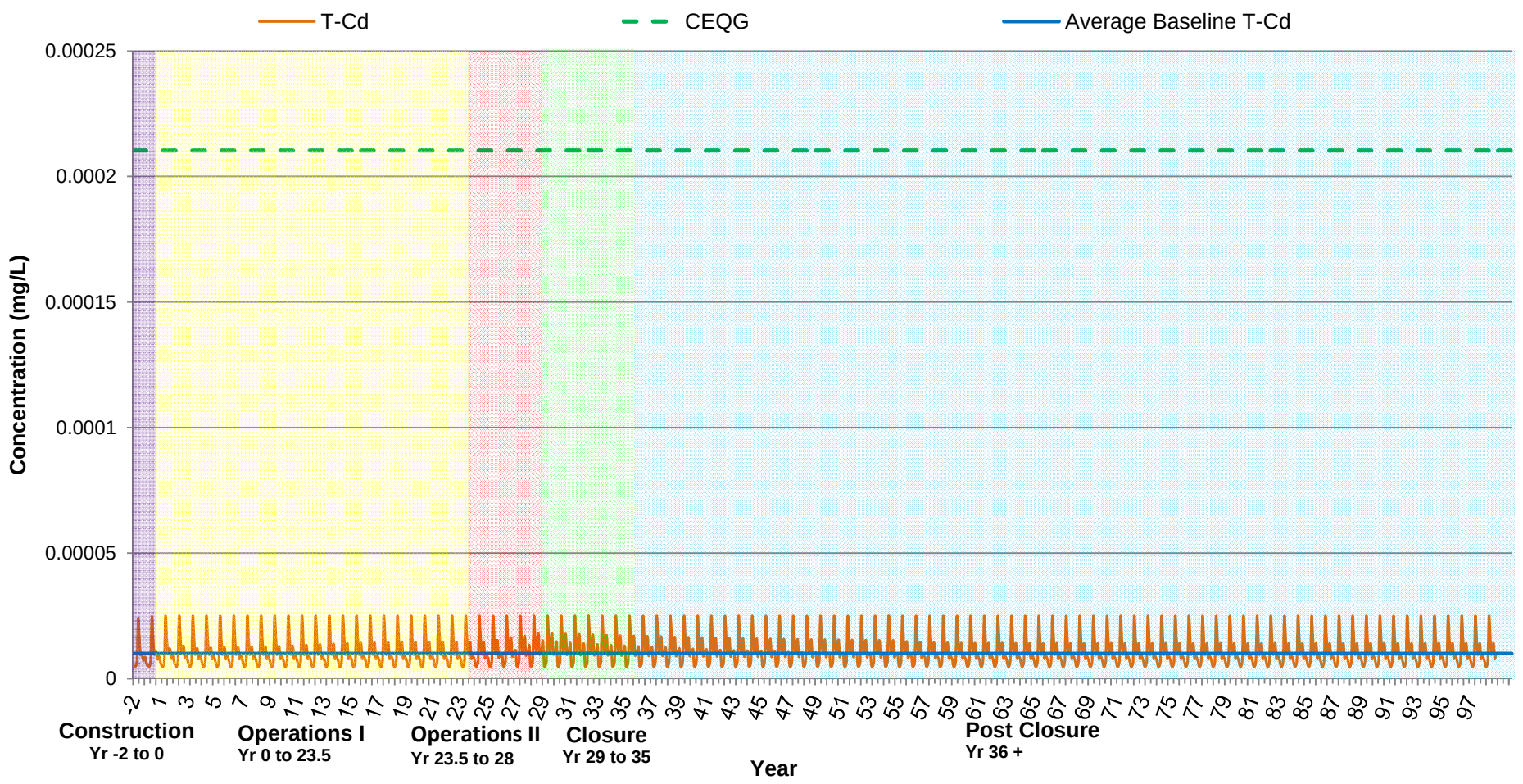
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G10.Be

REV 0



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. THE BCWQG ARE DRAFT GUIDELINES UNDER REVIEW (JUNE 2014).
3. BASELINE SITE USED FOR COMPARISON IS SITE BK0 (AVERAGE HARDNESS OF 140 mg/L).
4. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE CADMIUM CONCENTRATIONS - LOWER BAKER CREEK (BK0)

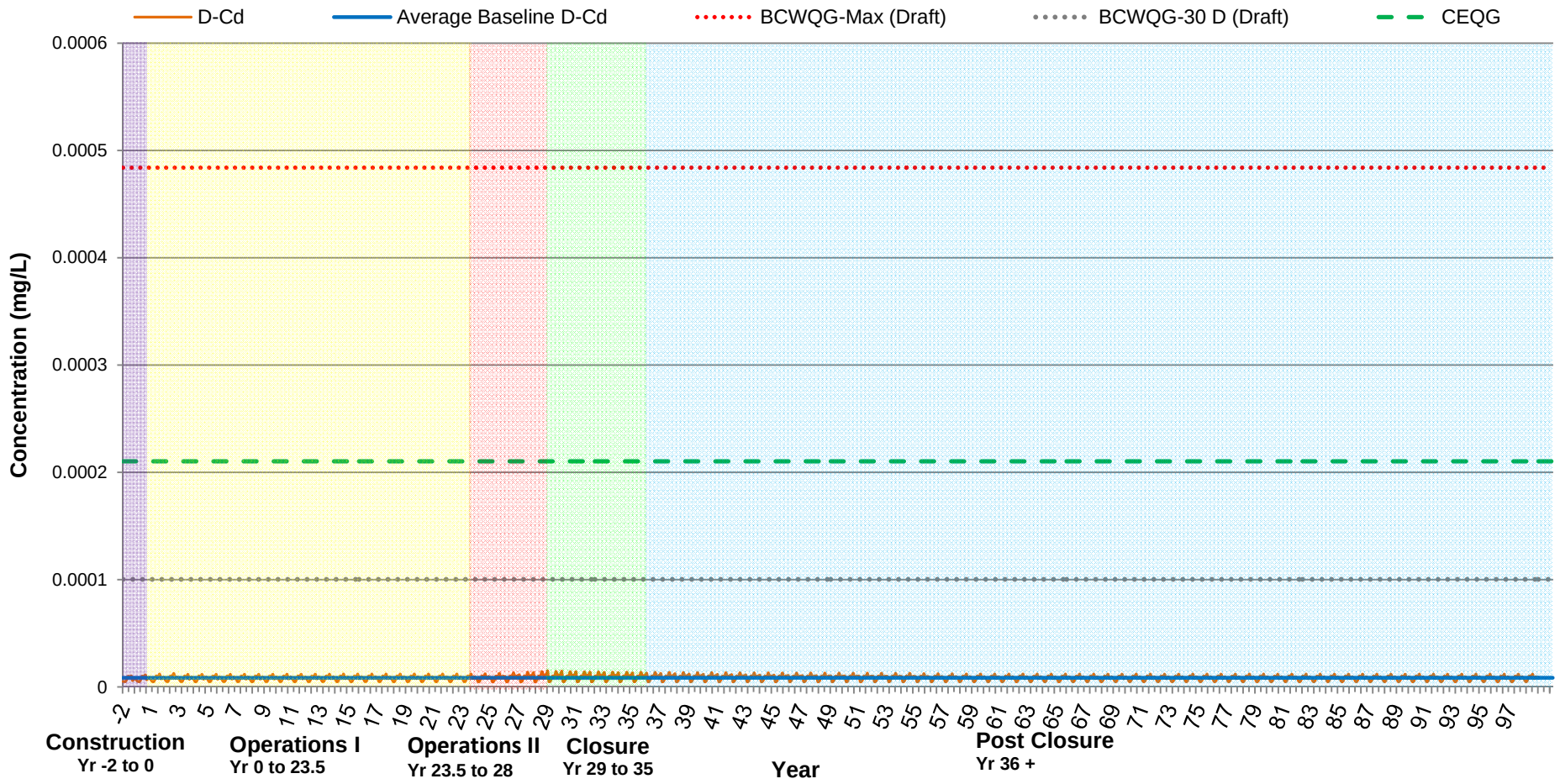
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G10.Cd-T

REV 0



NOTES:

1. BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK0 (AVERAGE HARDNESS OF 140 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE CADMIUM CONCENTRATIONS - LOWER BAKER CREEK (BK0)

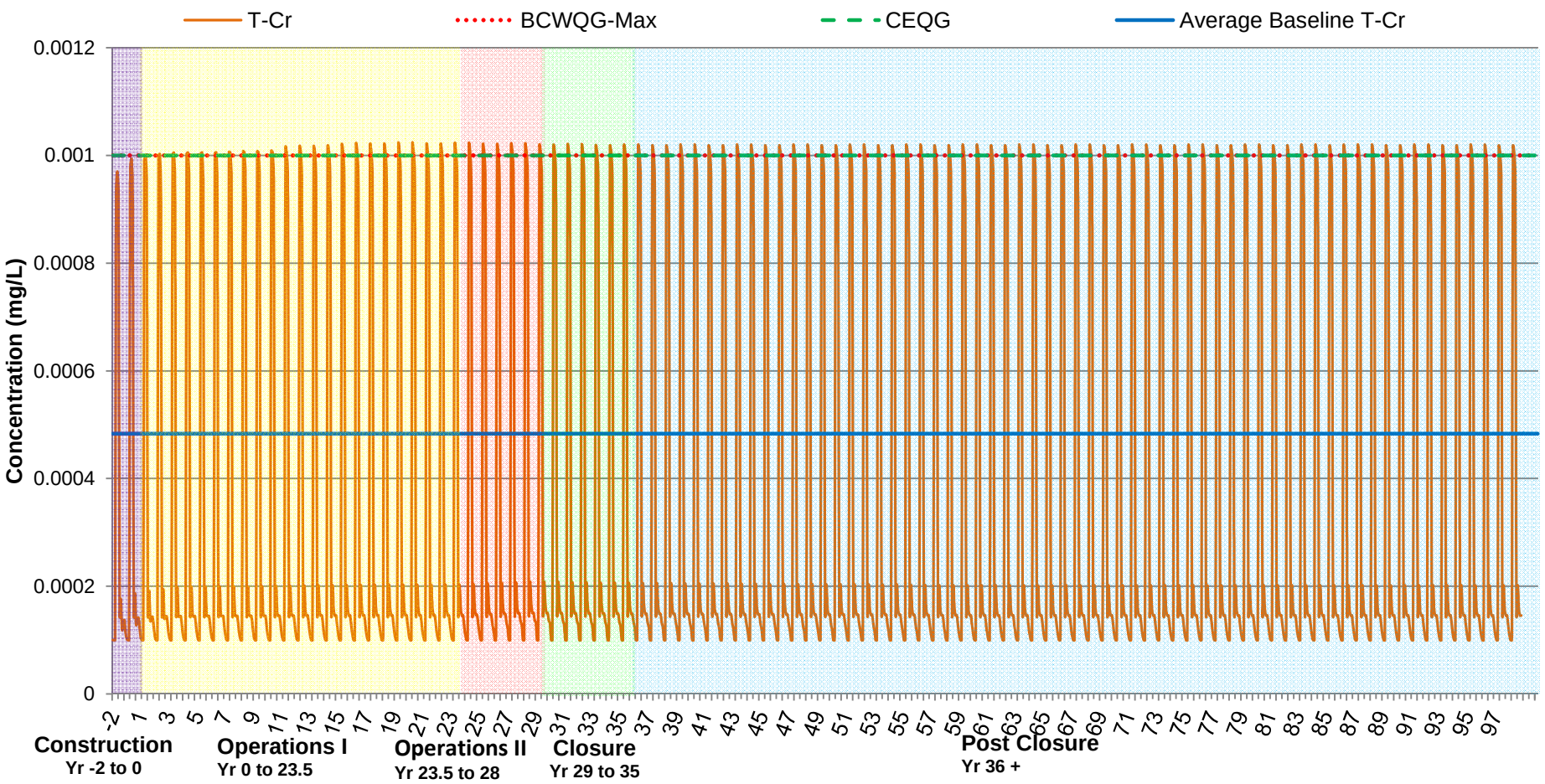
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G10.Cd-D

REV 0



NOTES:

1. GUIDELINES ARE FOR CHROMIUM (IV), THE SPECIES MOST COMMON IN WELL OXYGENATED SURFACE WATERS.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK0 (AVERAGE HARDNESS OF 140 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE CHROMIUM CONCENTRATIONS - LOWER BAKER CREEK (BK0)

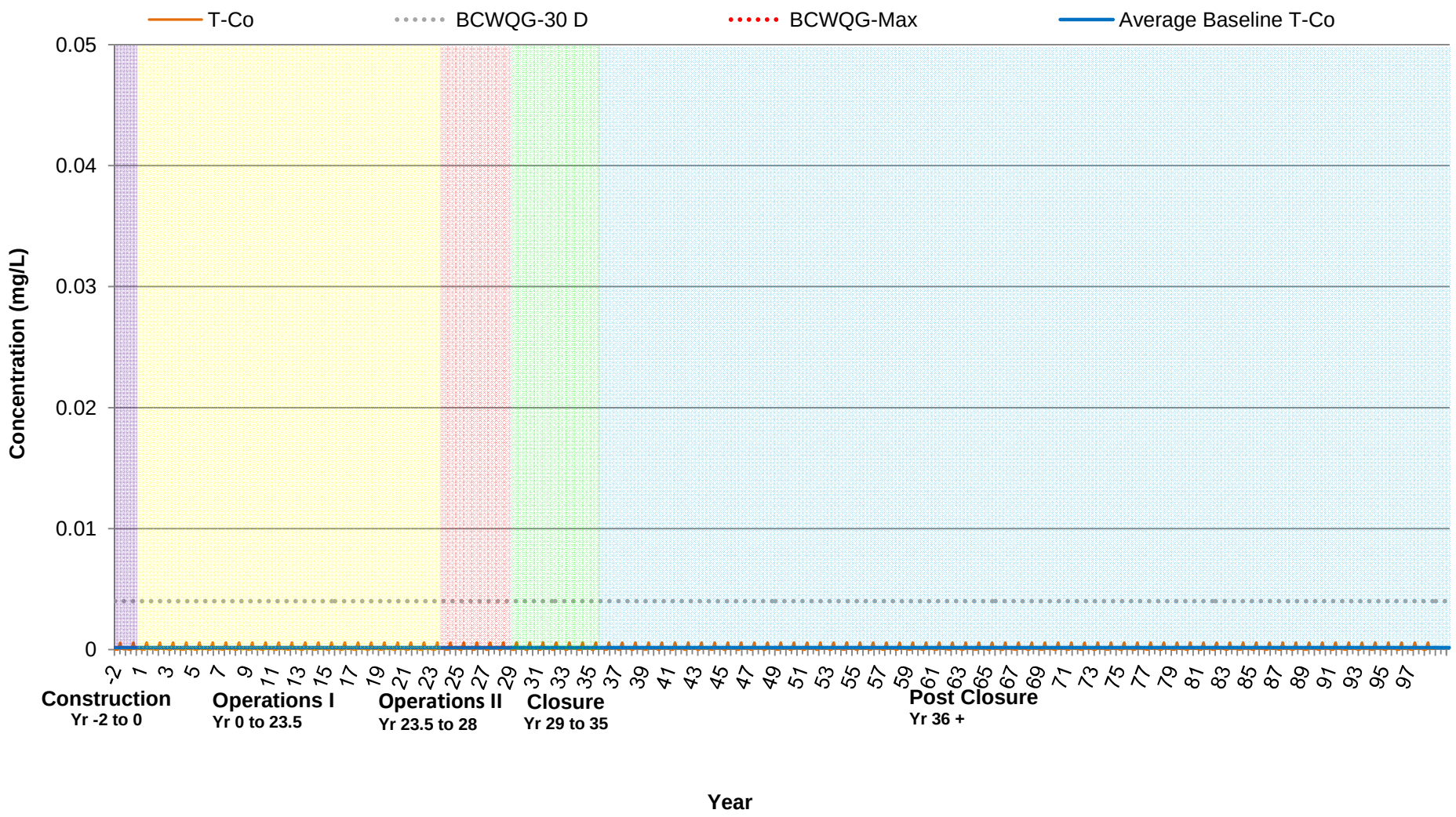
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G10.Cr

REV 0



NOTES:

1. THE BCWQG-30 D AND BCWQG-MAX ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK0 (AVERAGE HARDNESS OF 140 mg/L).
3. THE BCWQG-MAX GUIDELINE (0.11 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE COBALT CONCENTRATIONS - LOWER BAKER CREEK (BK0)

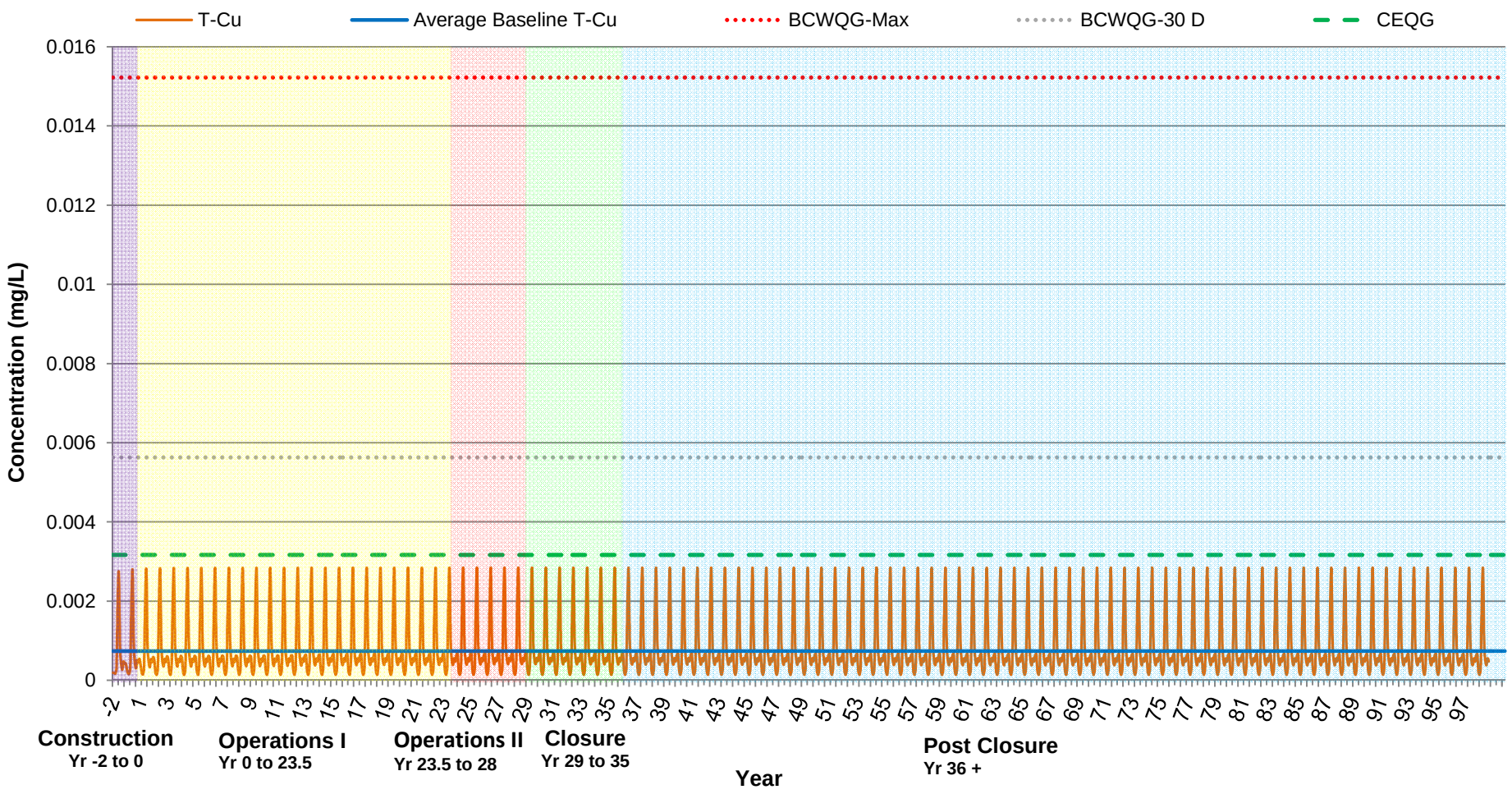
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G10.Co

REV 0



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK0 (AVERAGE HARDNESS OF 140 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE COPPER CONCENTRATIONS - LOWER BAKER CREEK (BK0)

Knight Piésold CONSULTING

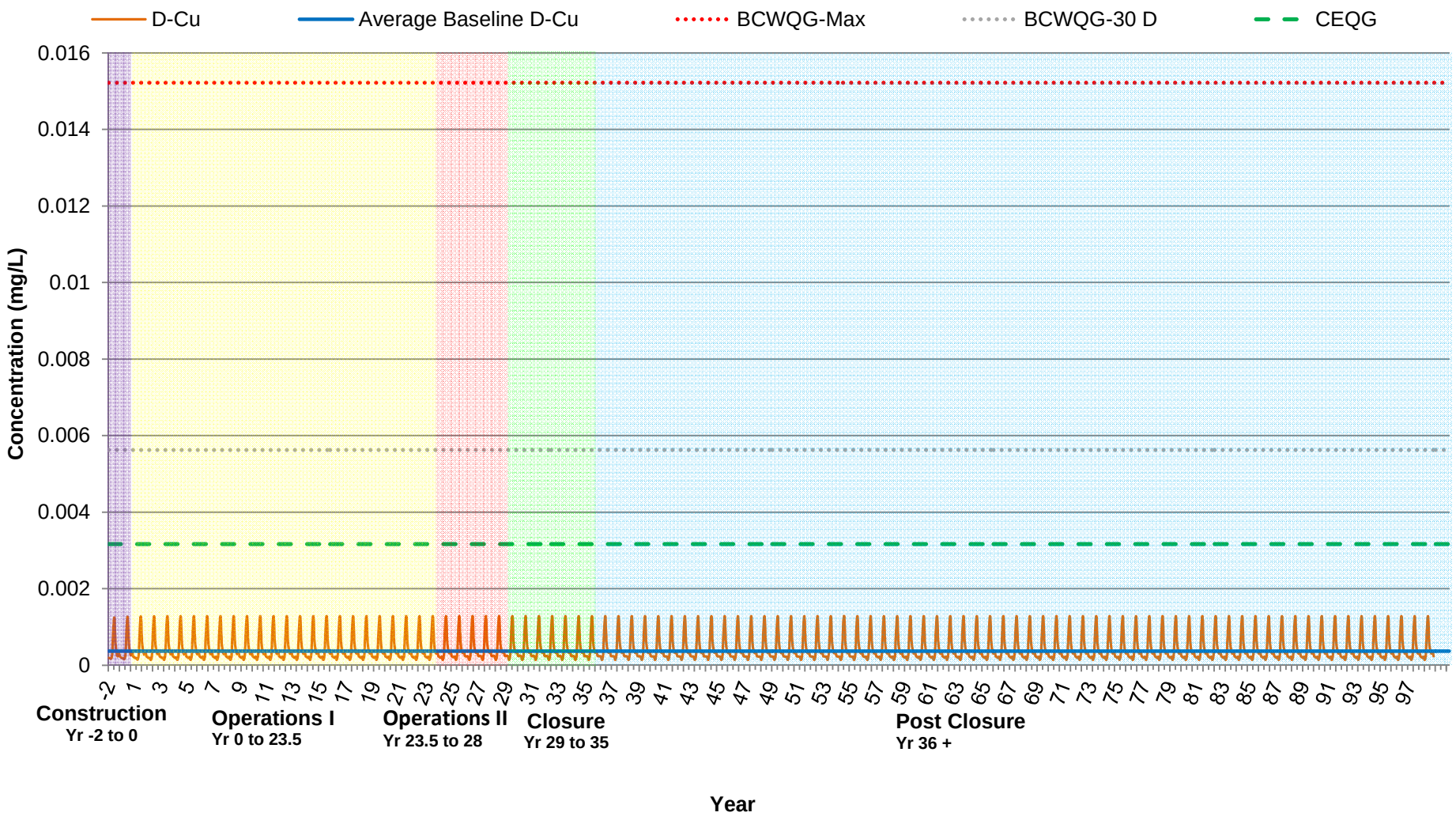
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G10.Cu-T

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK0 (AVERAGE HARDNESS OF 140 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE COPPER CONCENTRATIONS - LOWER BAKER CREEK (BK0)

Knight Piésold CONSULTING

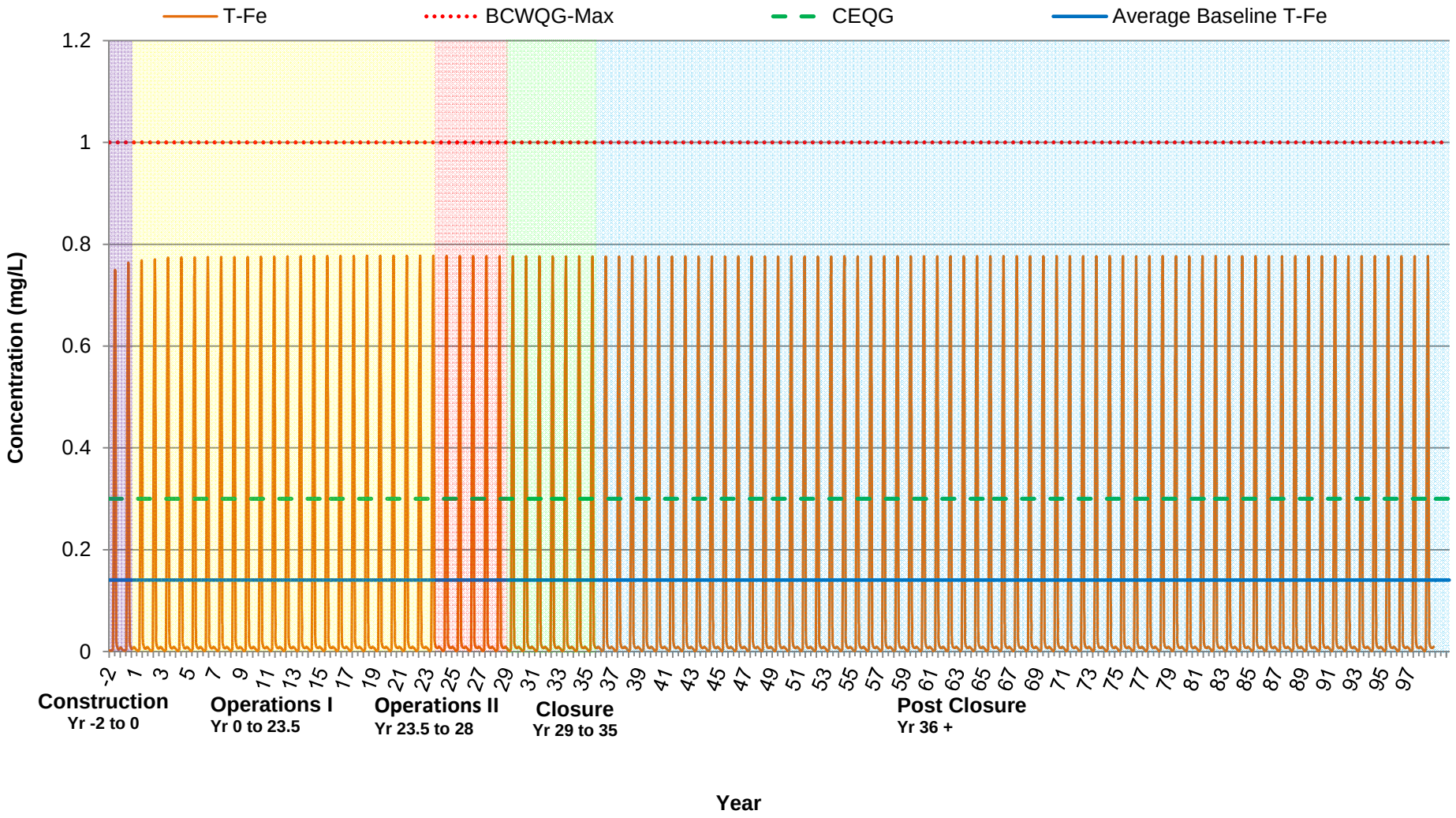
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G10.Cu-D

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK0 (AVERAGE HARDNESS OF 140 mg/L).
3. BCWQG-MAX 1.0 mg/L IS NOT SHOWN ON GRAPH.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE TOTAL IRON CONCENTRATIONS - LOWER BAKER CREEK (BK0)

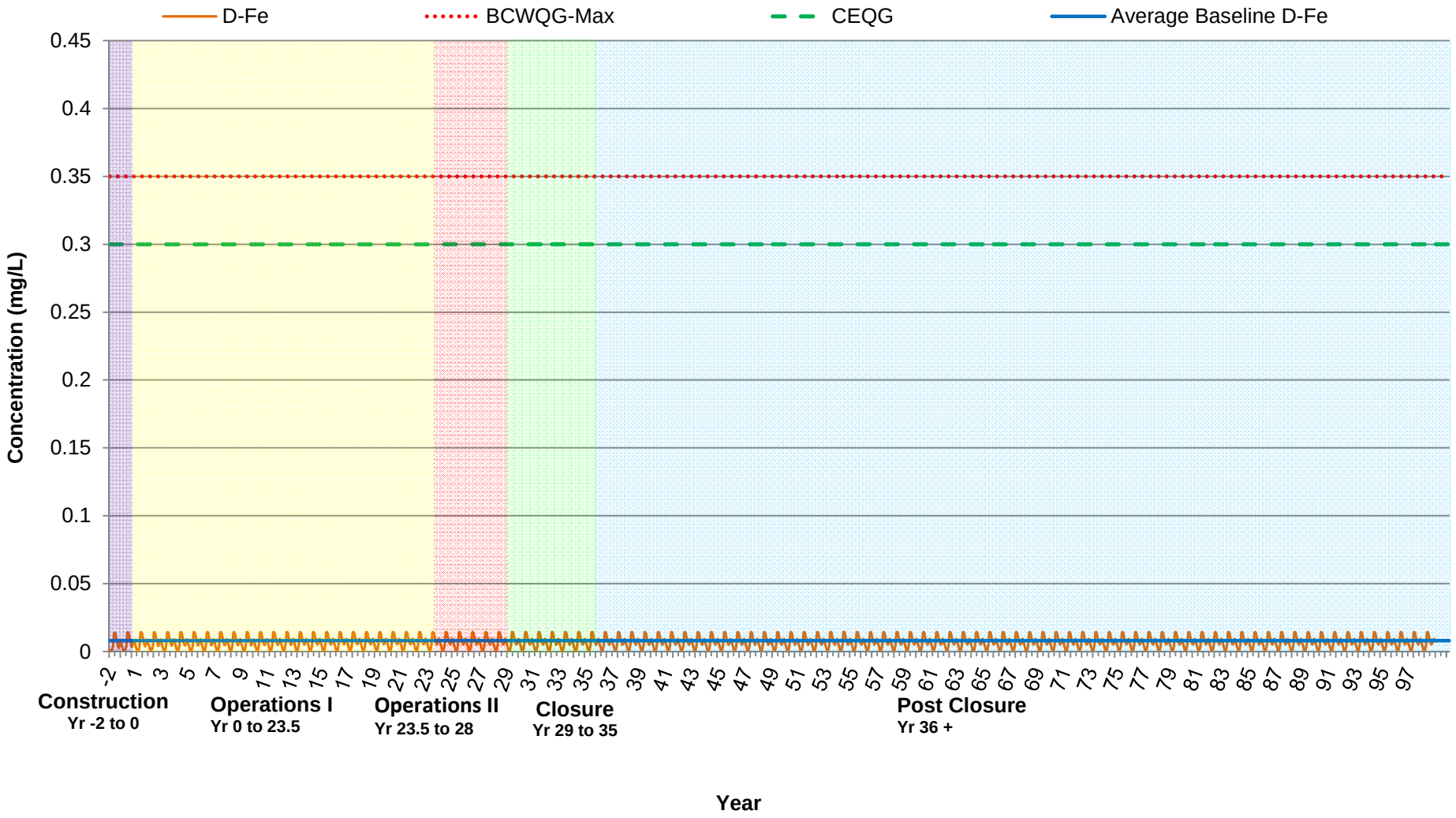
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G10.Fe-T

REV 0



NOTES:

1. THE BCWQG-MAX AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK0 (AVERAGE HARDNESS OF 140 mg/L).

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE DISSOLVED IRON CONCENTRATIONS - LOWER BAKER CREEK (BK0)

Knight Piésold CONSULTING

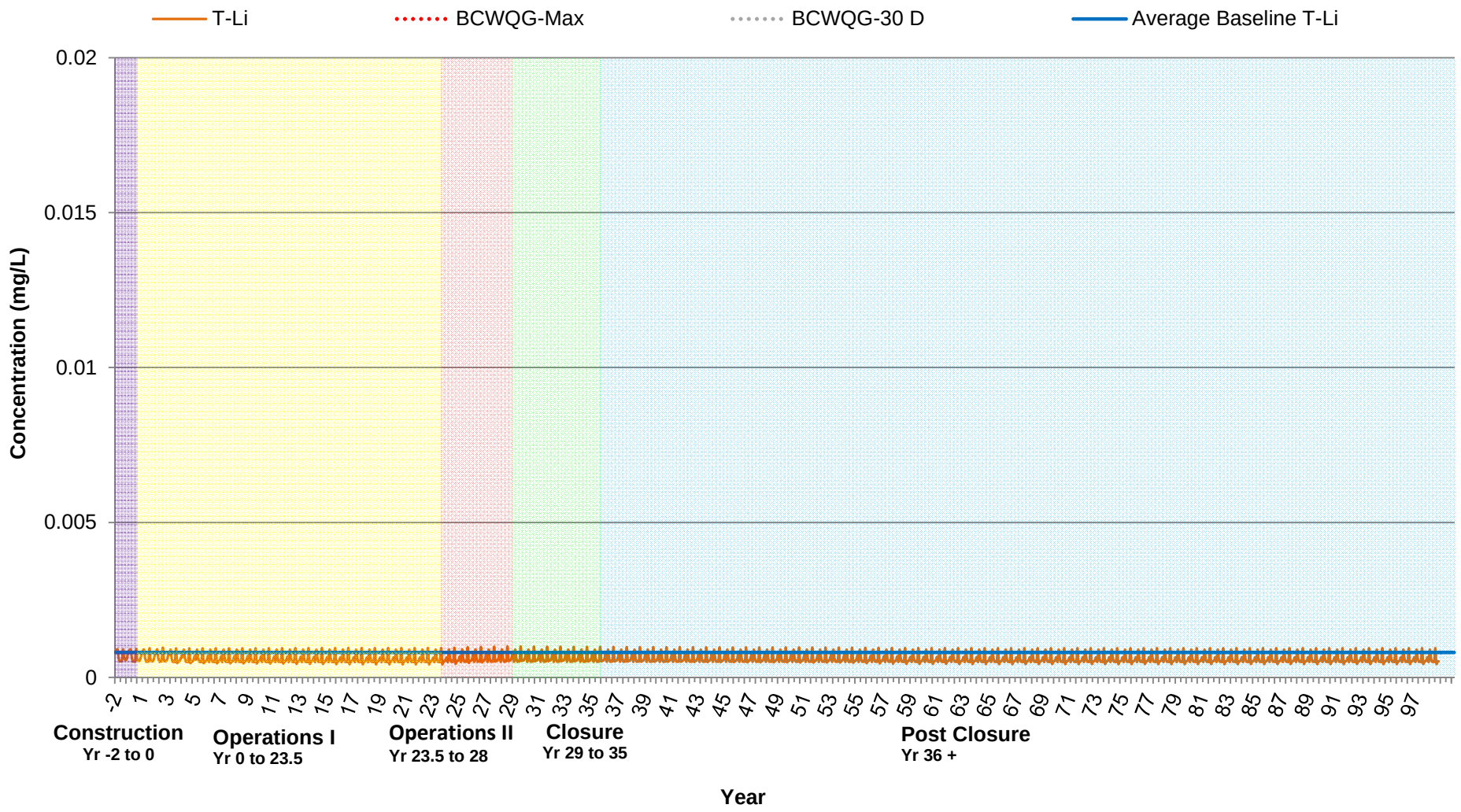
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G10.Fe-D

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK0 (AVERAGE HARDNESS OF 140 mg/L).
3. THE BCWQG-30 D (0.096 mg/L) AND BCWQG-MAX (0.87 mg/L) ARE INTERIM (WORKING) AND ARE NOT SHOWN ON GRAPH.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE LITHIUM CONCENTRATIONS - LOWER BAKER CREEK (BK0)

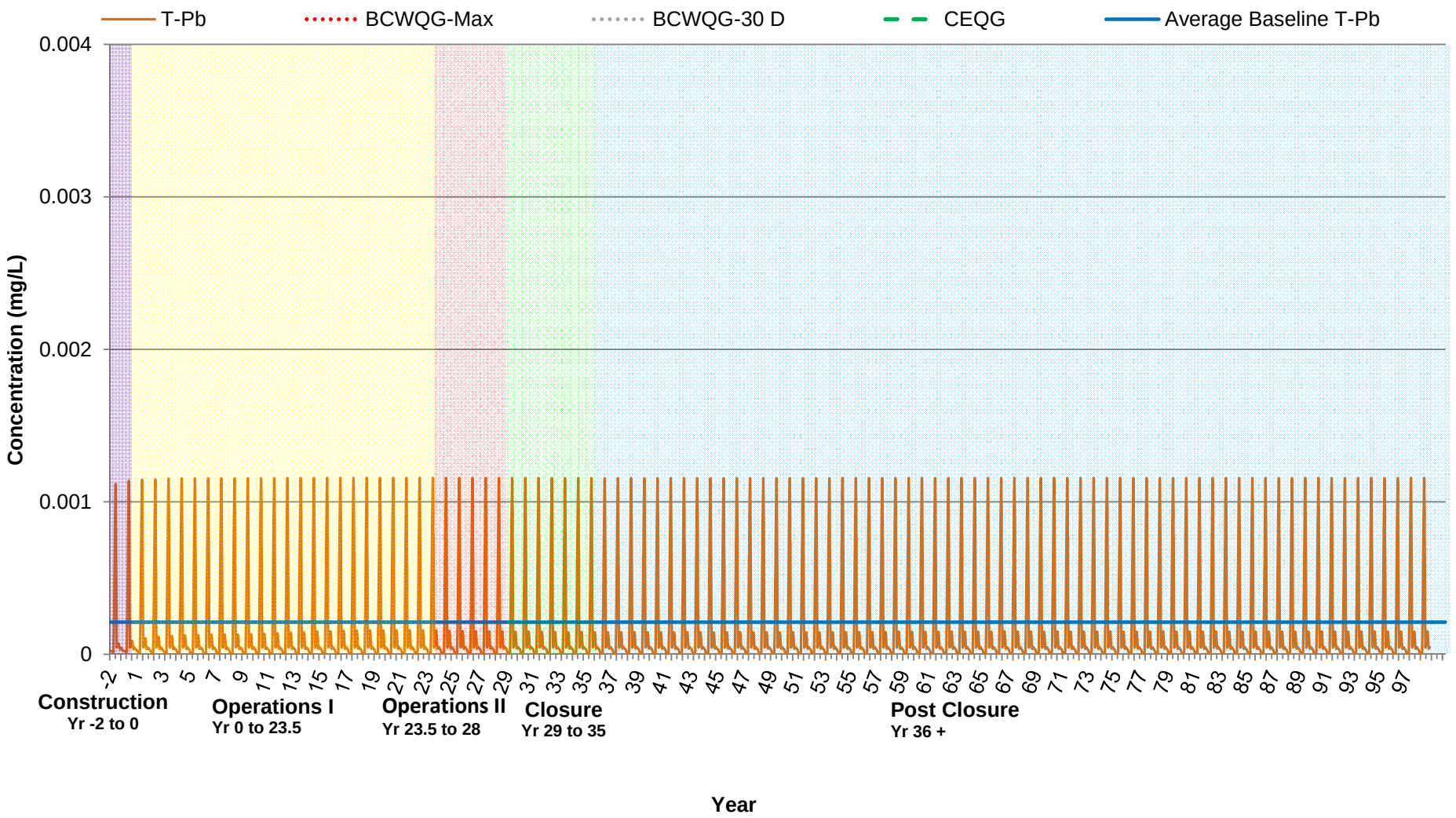
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G10.Li

REV 0



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK0 (AVERAGE HARDNESS OF 140 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.
4. THE BCWQG-MAX (CALCULATED AT 0.011 mg/L) IS NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE LEAD CONCENTRATIONS - LOWER BAKER CREEK (BK0)

Knight Piésold CONSULTING

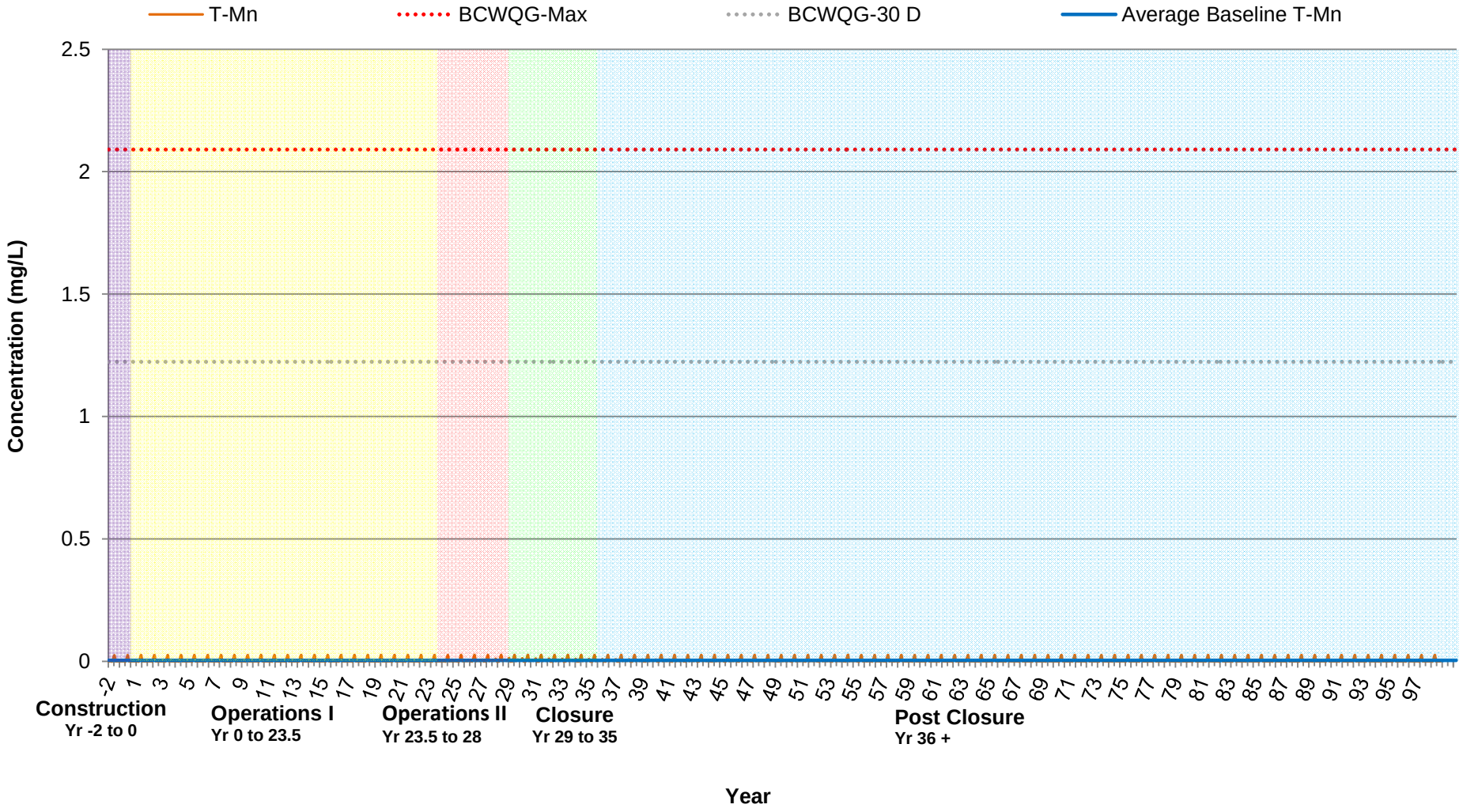
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G10.Pb

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK0 (AVERAGE HARDNESS OF 140 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE MANGANESE CONCENTRATIONS - LOWER BAKER CREEK (BK0)

Knight Piésold CONSULTING

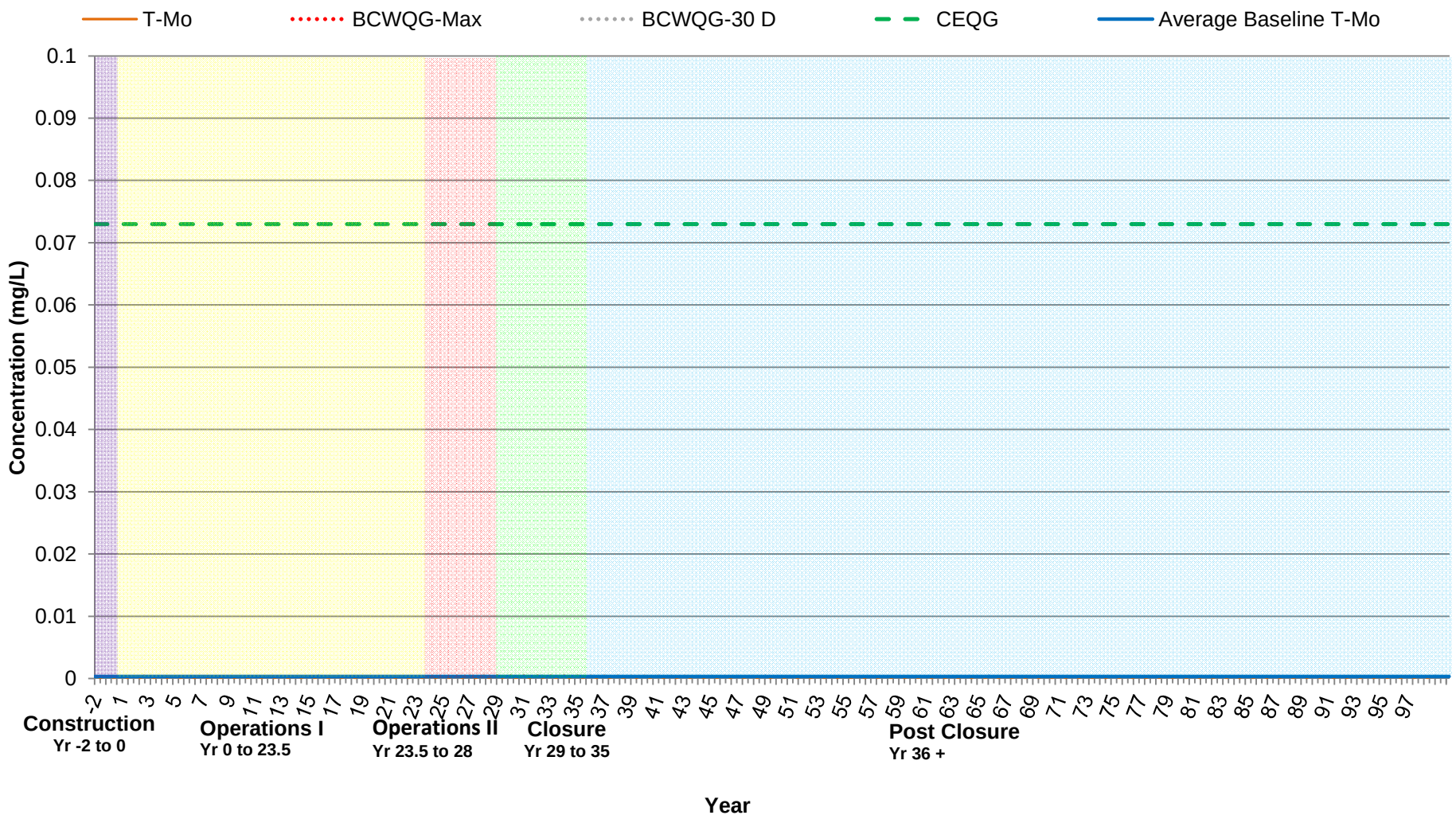
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G10.Mn

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK0 (AVERAGE HARDNESS OF 140 mg/L).
3. THE BCWQG-MAX (2 mg/L) AND BCWQG-30 D (1 mg/L) ARE NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE MOLYDBENUM CONCENTRATIONS - LOWER BAKER CREEK (BK0)

Knight Piésold CONSULTING

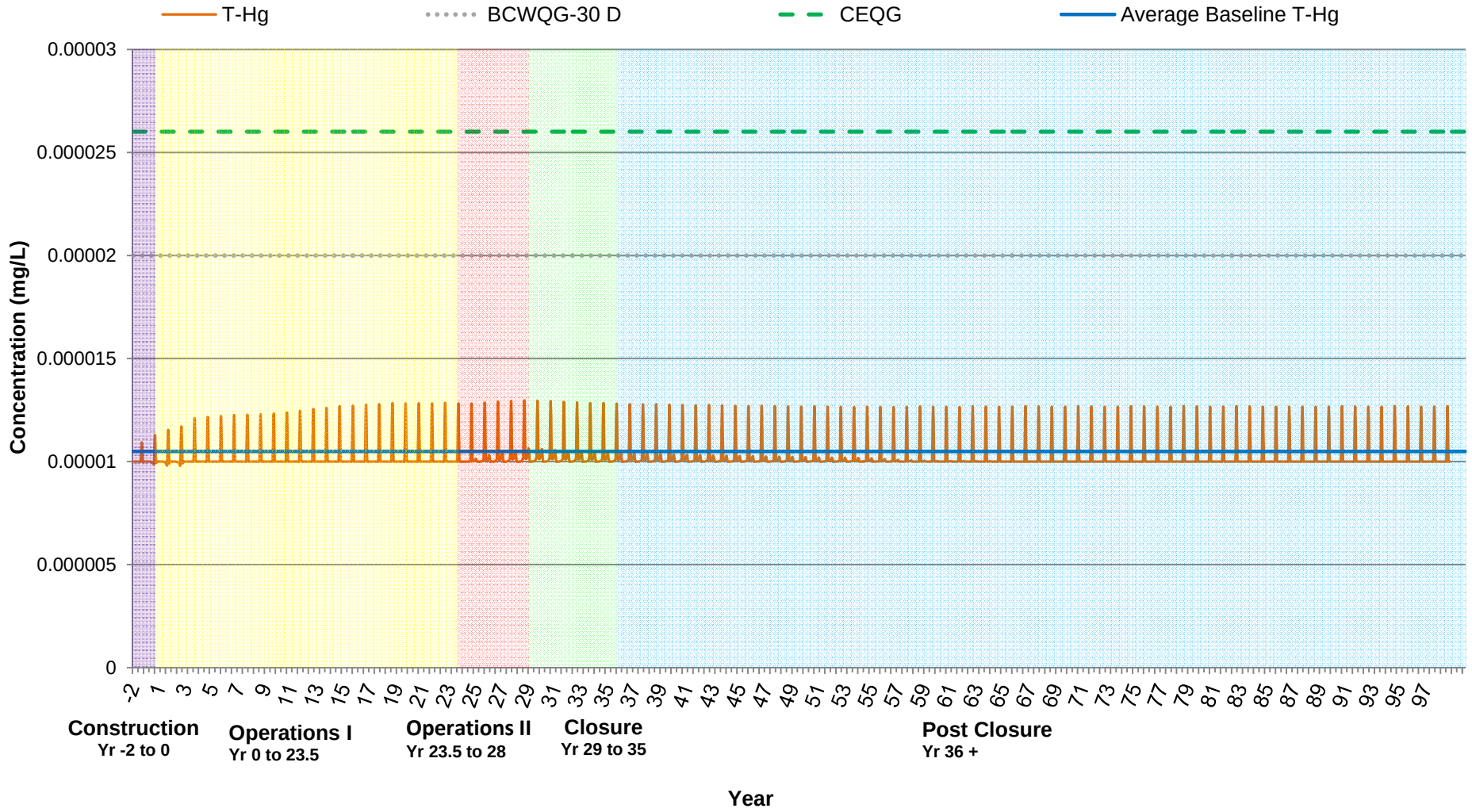
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G10.Mo

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-30 D AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK0 (AVERAGE HARDNESS OF 140 mg/L).
3. BCWQG-30 D VALUE APPLIED ON ASSUMPTION THAT METHYL-Hg IS EQUAL TO 0.5% OF T-Hg.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE MERCURY CONCENTRATIONS - LOWER BAKER CREEK (BK0)

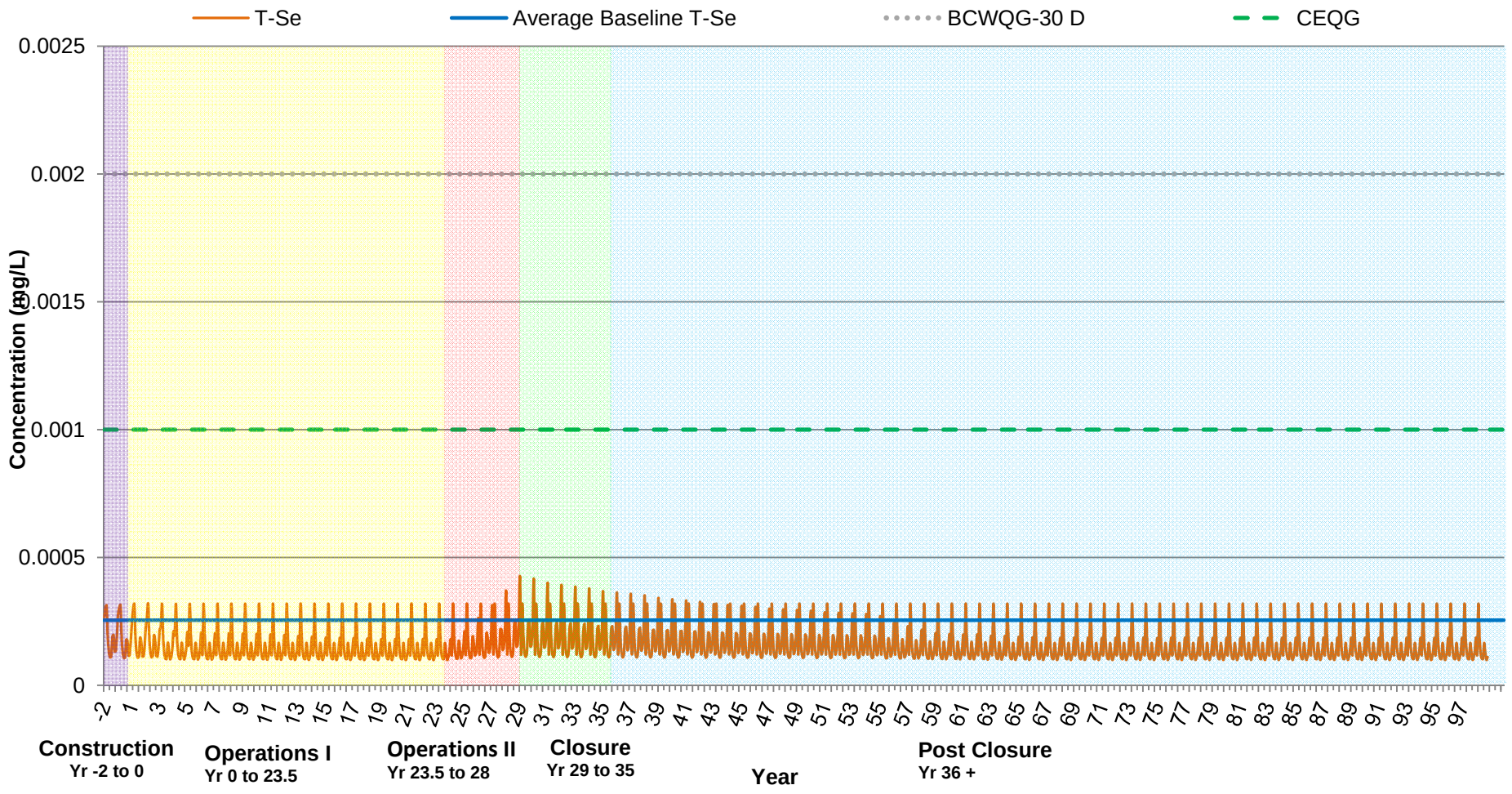
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G10.Hg

REV 0



NOTES:

1. THE BCWQG-30 D AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK0 (AVERAGE HARDNESS OF 140 mg/L).

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE SELENIUM CONCENTRATIONS - LOWER BAKER CREEK (BK0)

Knight Piésold CONSULTING

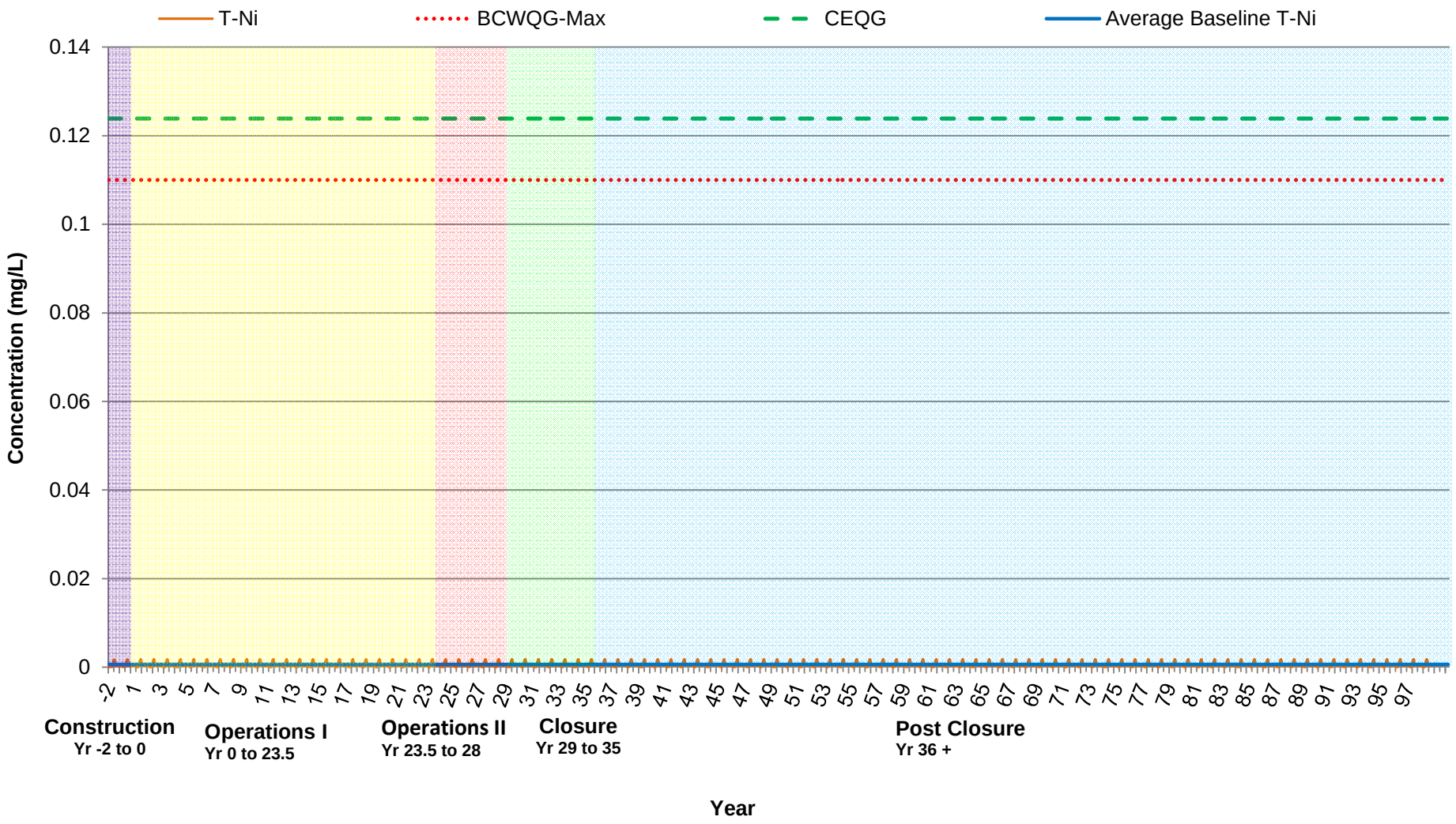
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G10.Se

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK0 (AVERAGE HARDNESS OF 140 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE NICKEL CONCENTRATIONS - LOWER BAKER CREEK (BK0)

Knight Piésold CONSULTING

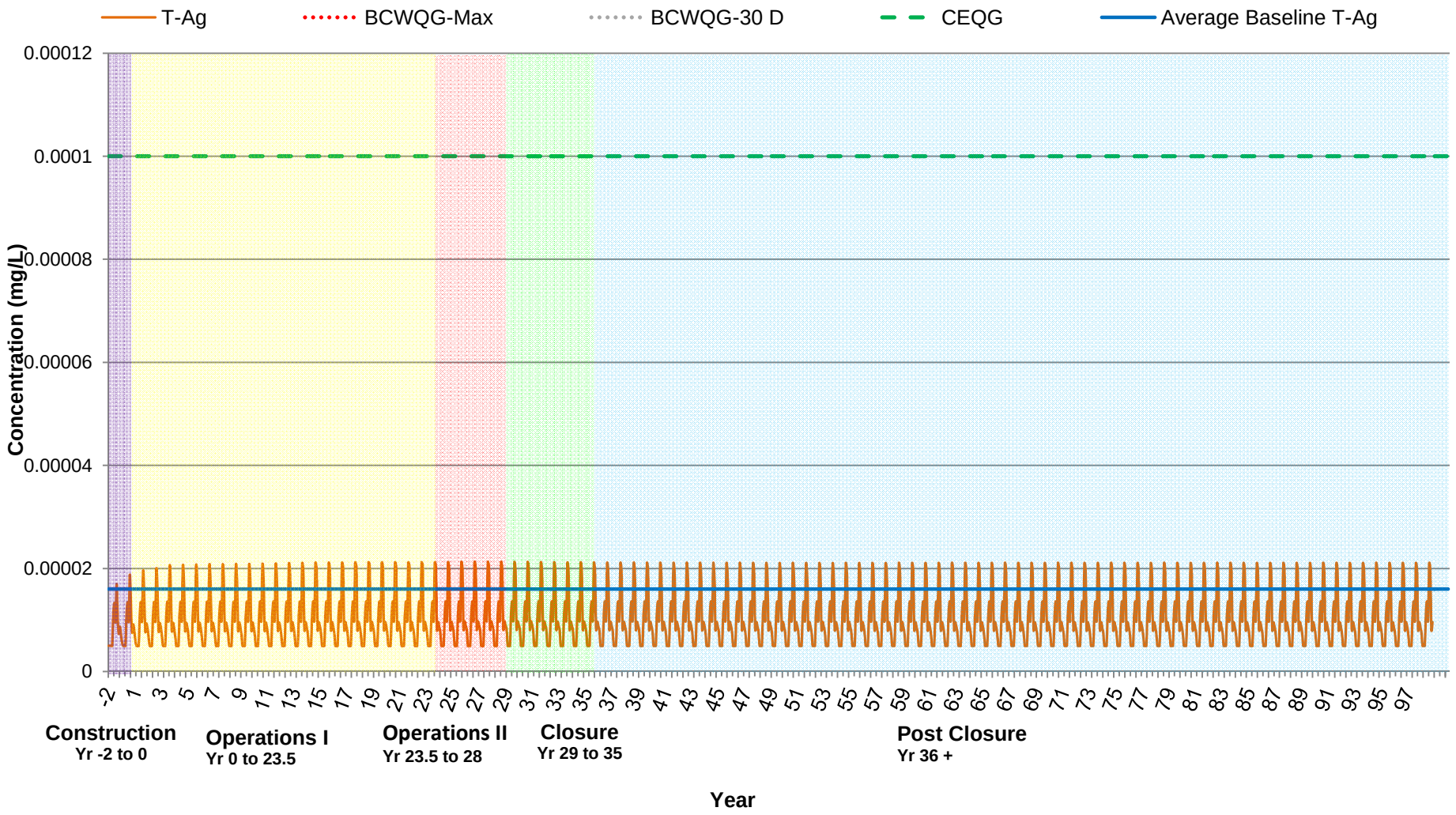
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G10.Ni

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-30 D AND BCWQG-MAX ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK0 (AVERAGE HARDNESS OF 140 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE SILVER CONCENTRATIONS - LOWER BAKER CREEK (BK0)

Knight Piésold CONSULTING

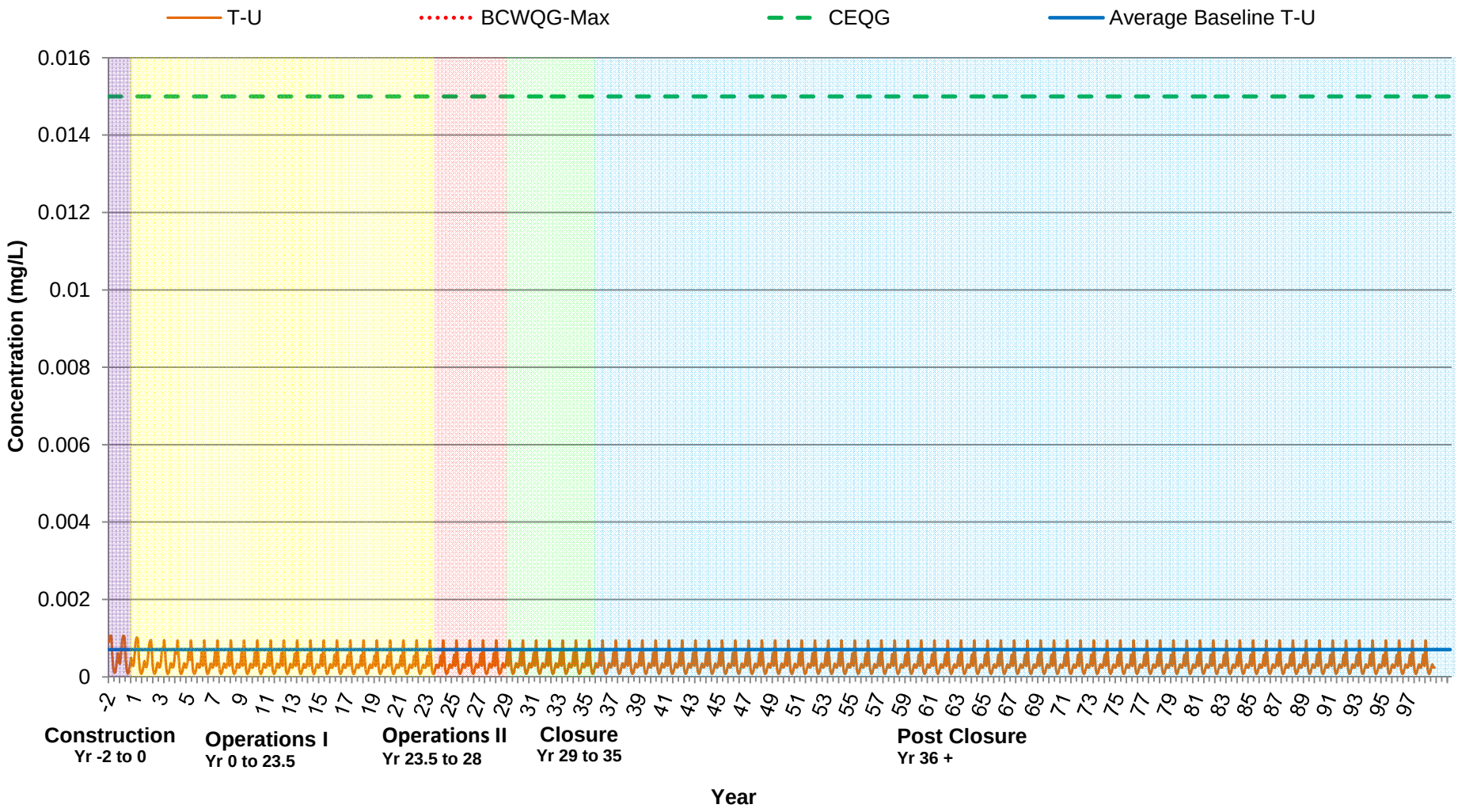
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G10.Ag

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK0 (AVERAGE HARDNESS OF 140 mg/L).
3. THE BCWQG-MAX (0.3 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE URANIUM CONCENTRATIONS - LOWER BAKER CREEK (BK0)

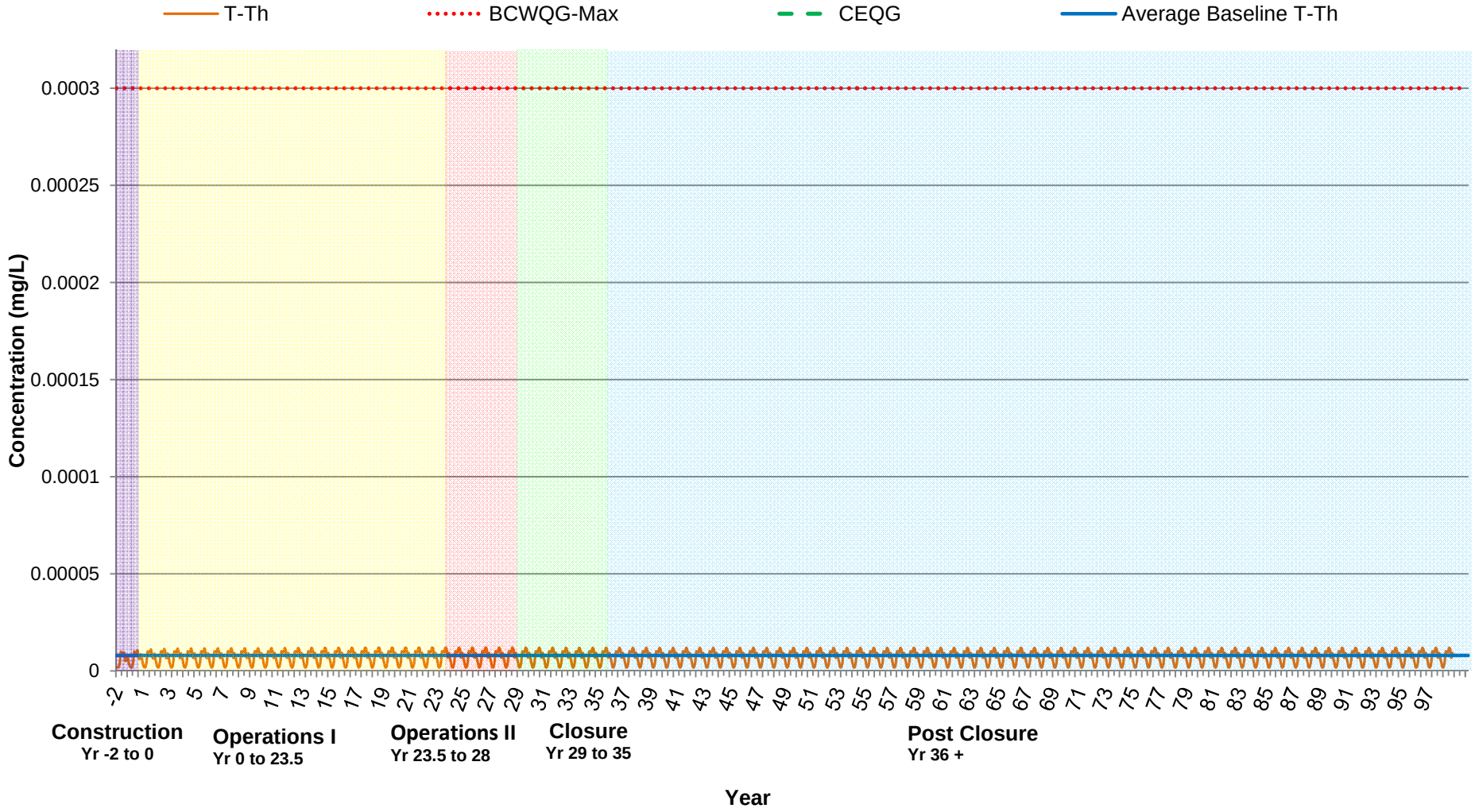
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G10.U

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK0 (AVERAGE HARDNESS OF 140 mg/L).
3. THE CEQG (0.0008 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE THALLIUM CONCENTRATIONS - LOWER BAKER CREEK (BK0)

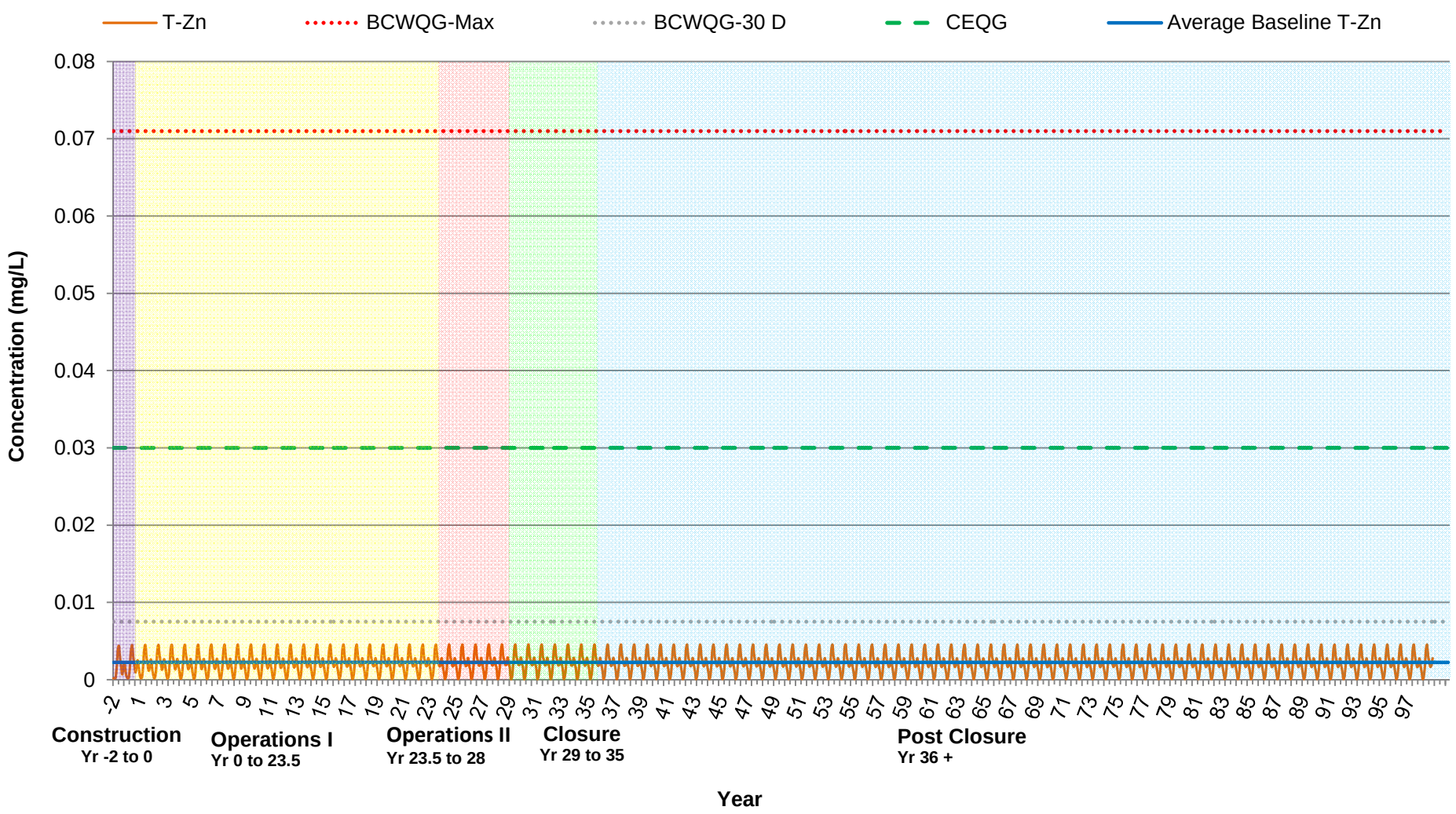
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G10.Th

REV 0



NOTES:

1. BCWQG-30 D AND BCWQG-MAX ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE BK0 (AVERAGE HARDNESS OF 140 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE ZINC CONCENTRATIONS - LOWER BAKER CREEK (BK0)

Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G10.Zn

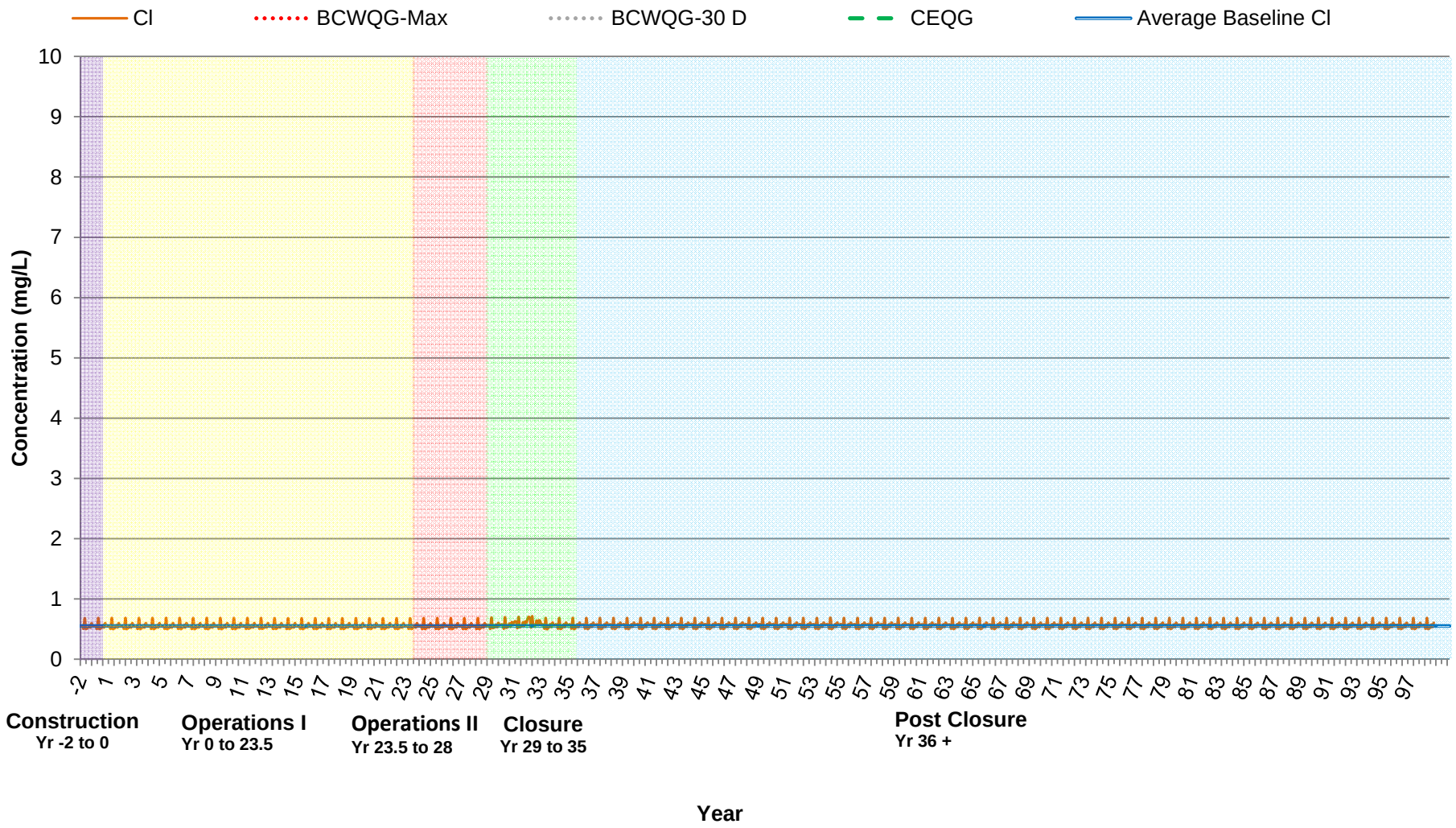
REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

APPENDIX G11

JONES CREEK ABOVE NORTH THOMPSON RIVER (J1)

(Pages G11-1 to G11-30)



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE J1 (AVERAGE HARDNESS OF 121 mg/L).
3. ALL GUIDELINES ARE NOT SHOWN: BCWQG-30 D (150 mg/L); BCWQG-MAX (600 mg/L); CEQG (120 mg/L AND 640 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE CHLORIDE CONCENTRATIONS - JONES CREEK (J1)

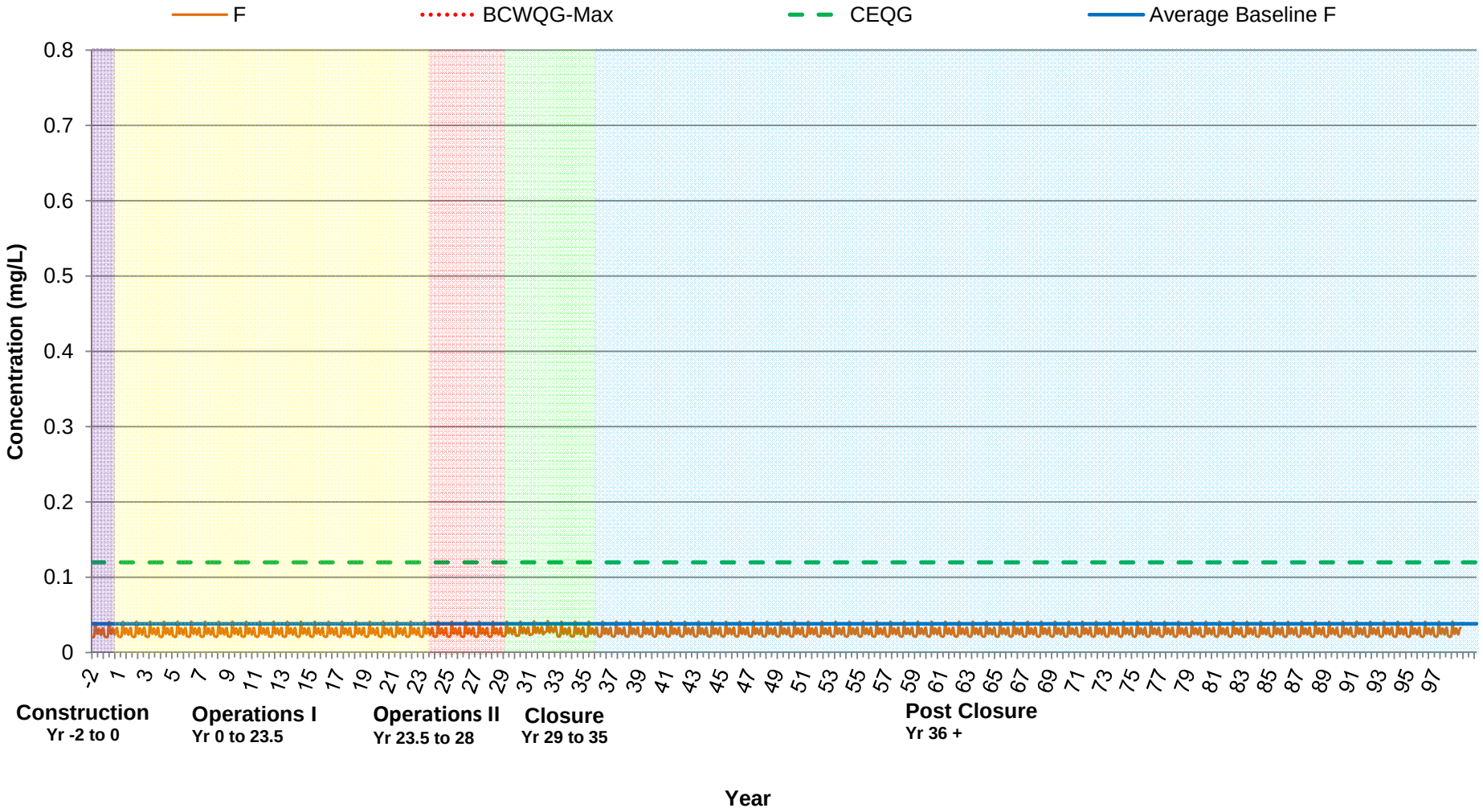
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G11.Cl

REV 0



NOTES:

1. THE BCWQG-MAX IS HARNDESS DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE J1 (AVERAGE HARDNESS OF 121 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE FLUORIDE CONCENTRATIONS - JONES CREEK (J1)

Knight Piésold CONSULTING

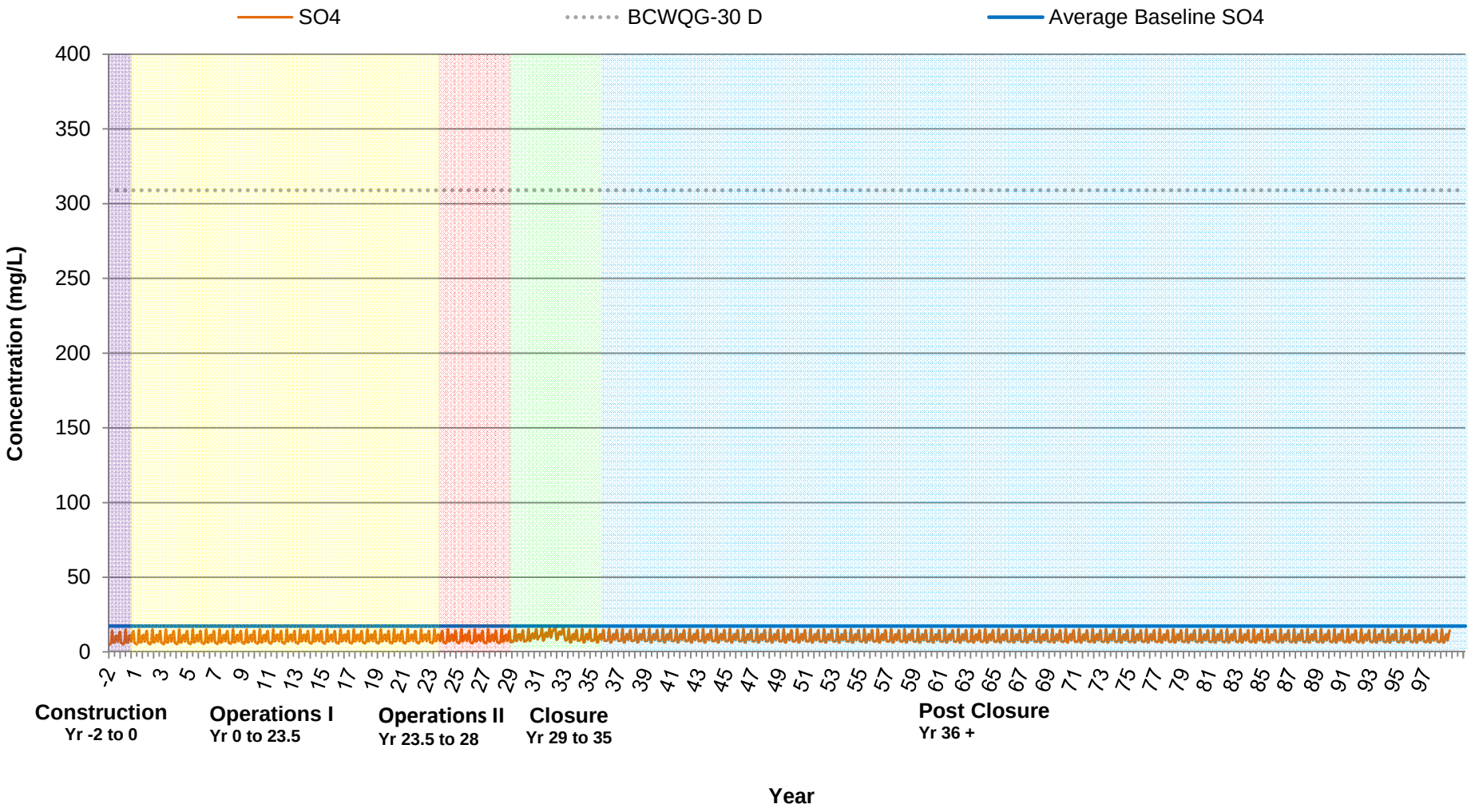
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G11.F

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. BCWQG-30 D IS HARDNESS DEPEDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE J1 (AVERAGE HARDNESS OF 121 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE SULPHATE CONCENTRATIONS - JONES CREEK (J1)

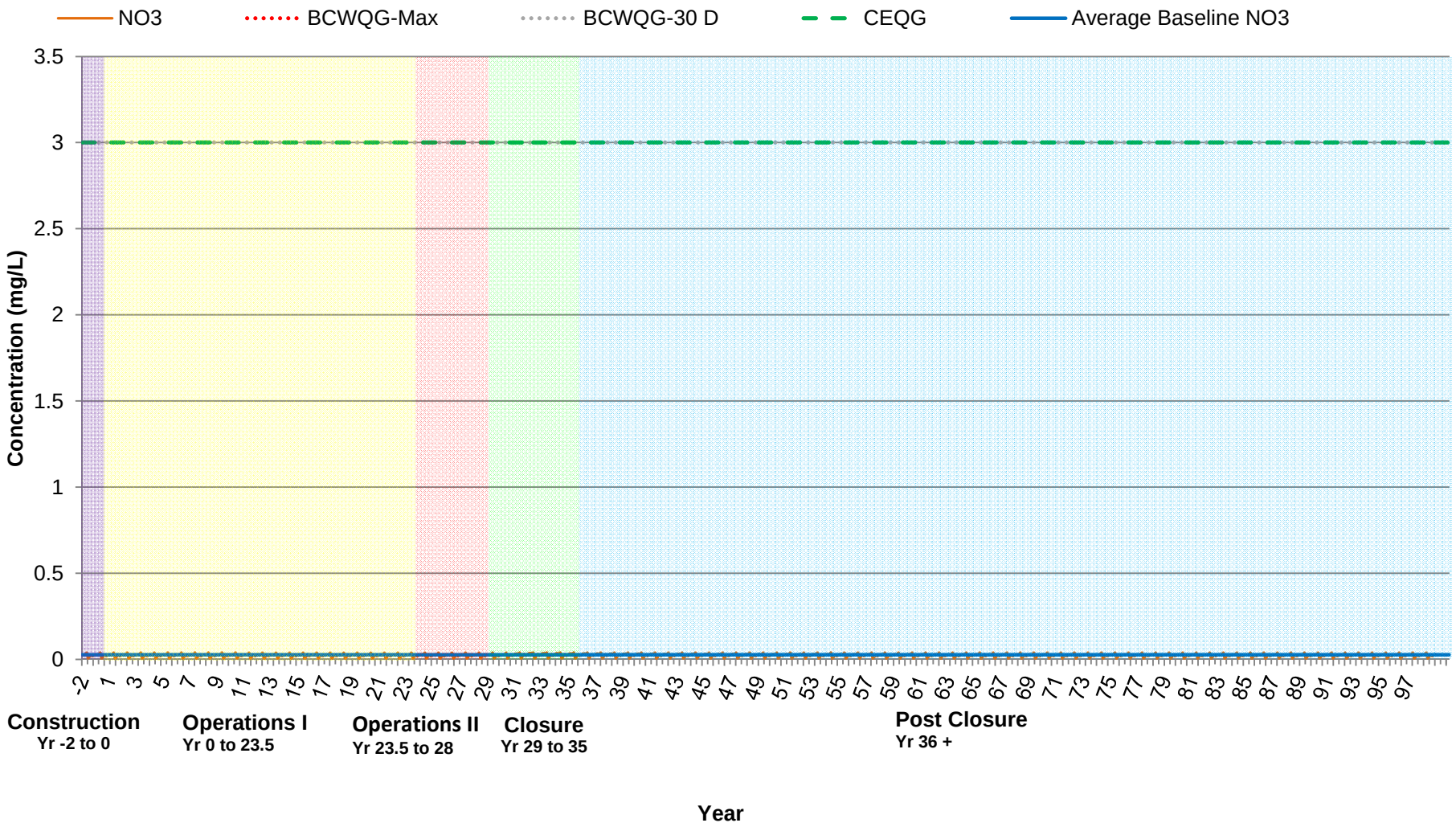
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G11.S04

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE J1 (AVERAGE HARDNESS OF 121 mg/L).
3. THE BCWQG-MAX (32.8 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE NITRATE CONCENTRATIONS - JONES CREEK (J1)

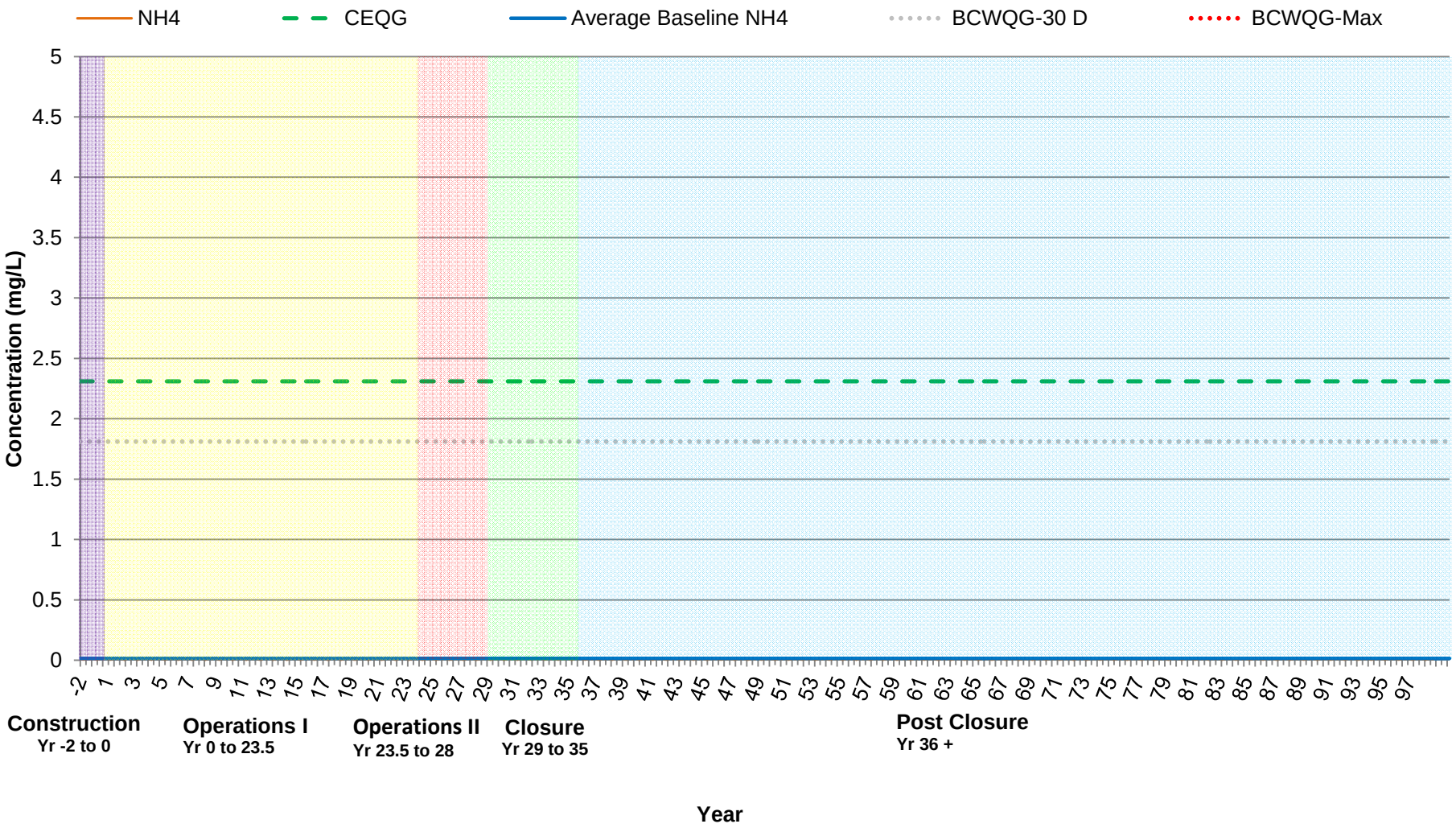
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G11.NO3

REV 0



NOTES:

1. THE BCWQG-30 D IS VALID FOR ONLY 6.5≤pH<9 AND 0°C≤T≤20°C.
2. THE BCWQG-MAX (20.15 mg/L) VALID FOR 6.5≤pH<9 IS NOT SHOWN.
3. THE CEQG IS TO BE USED WITH CAUTION FOR WATER WITH T<5°C AND pH>9.
4. BASELINE SITE USED FOR COMPARISON IS SITE J1 (AVERAGE HARDNESS OF 121 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE AMMONIA CONCENTRATIONS - JONES CREEK (J1)

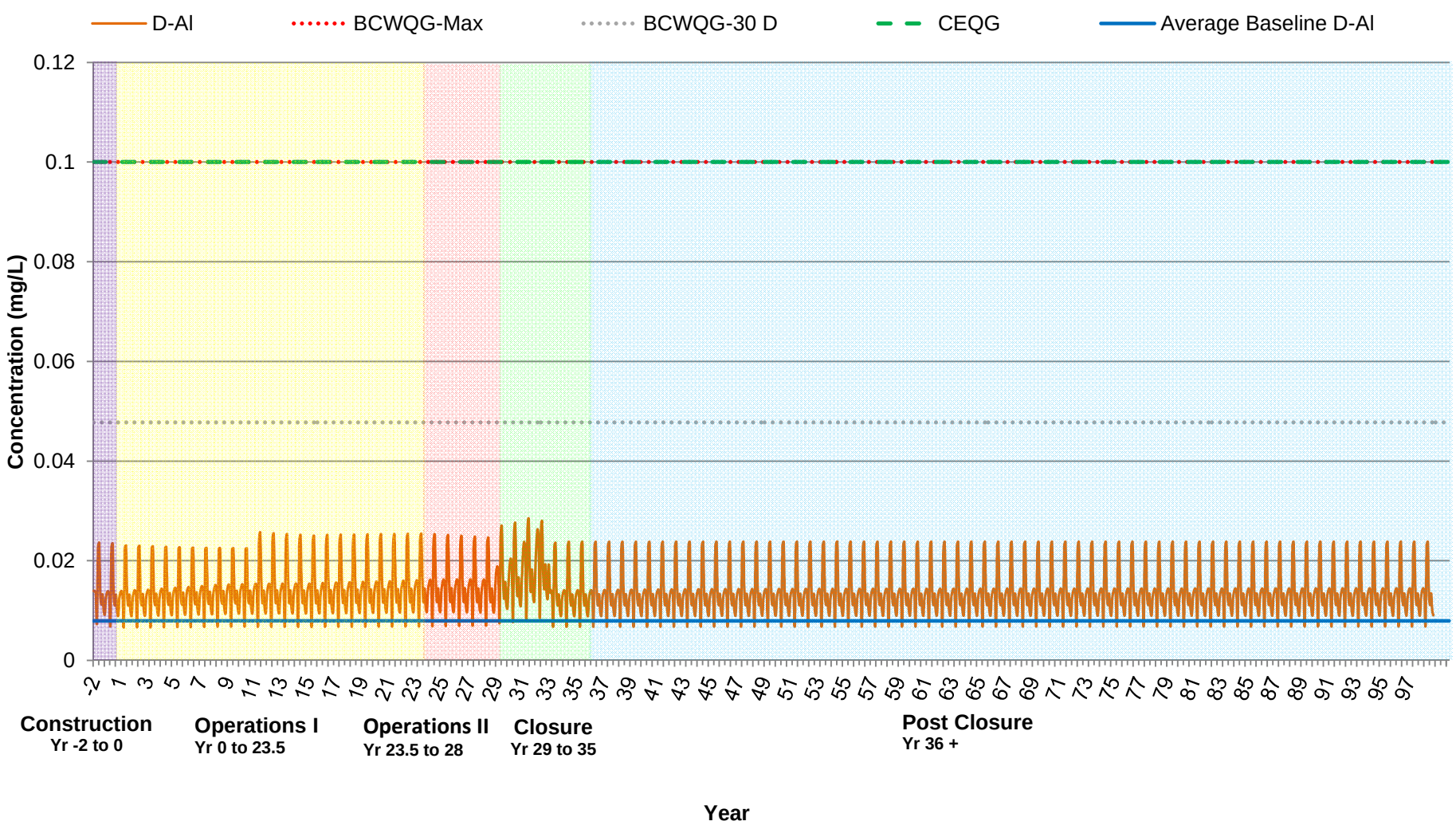
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G11.NH4

REV 0



NOTES:

1. ALL GUIDELINES ARE pH-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE J1 (AVERAGE HARDNESS OF 121 mg/L).
3. AVERAGE BASELINE pH USED TO CALCULATE GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE DISSOLVED ALUMINUM CONCENTRATIONS - JONES CREEK (J1)

Knight Piésold CONSULTING

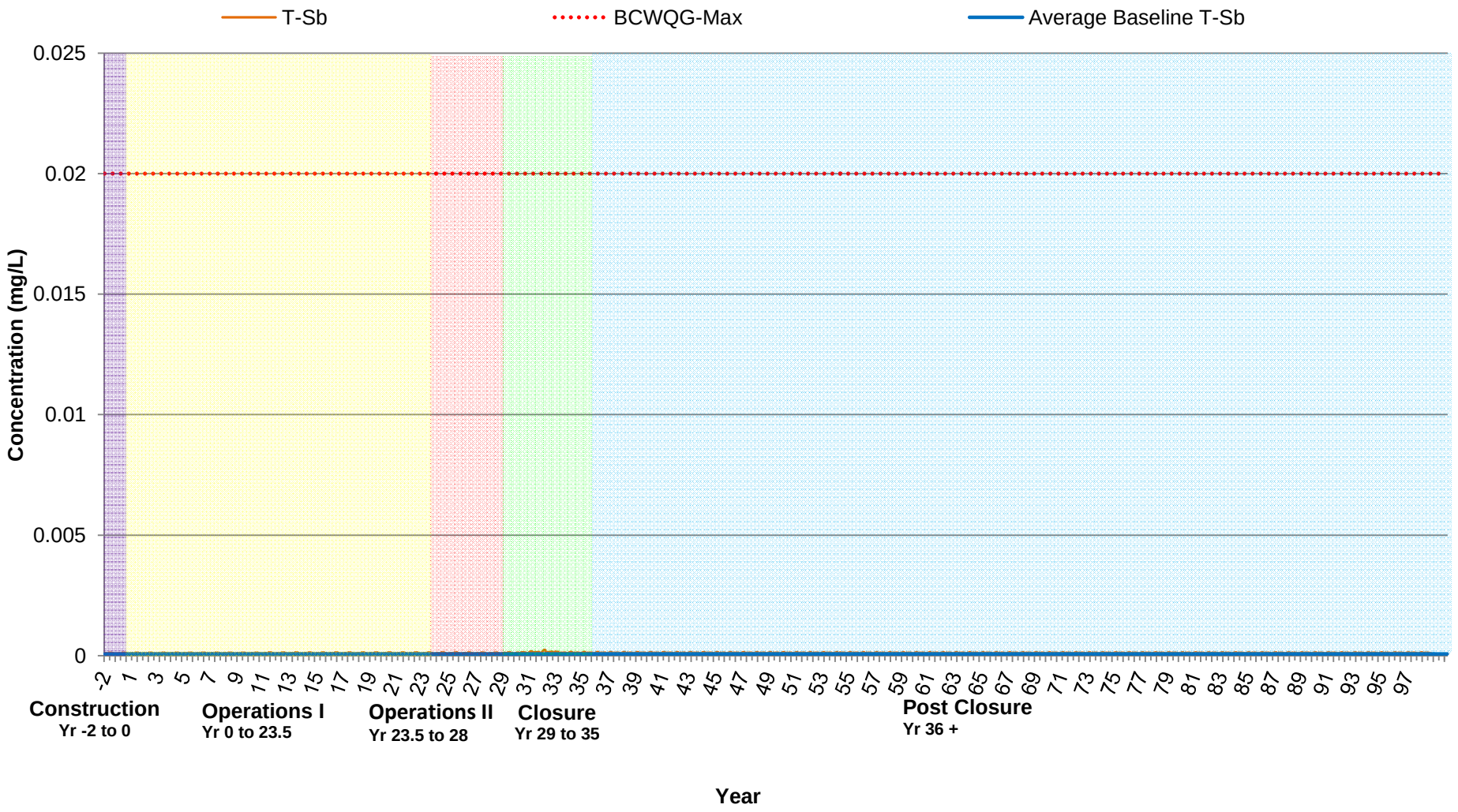
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G11.Al

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS SITE J1 (AVERAGE HARDNESS OF 121 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE ANTIMONY CONCENTRATIONS - JONES CREEK (J1)

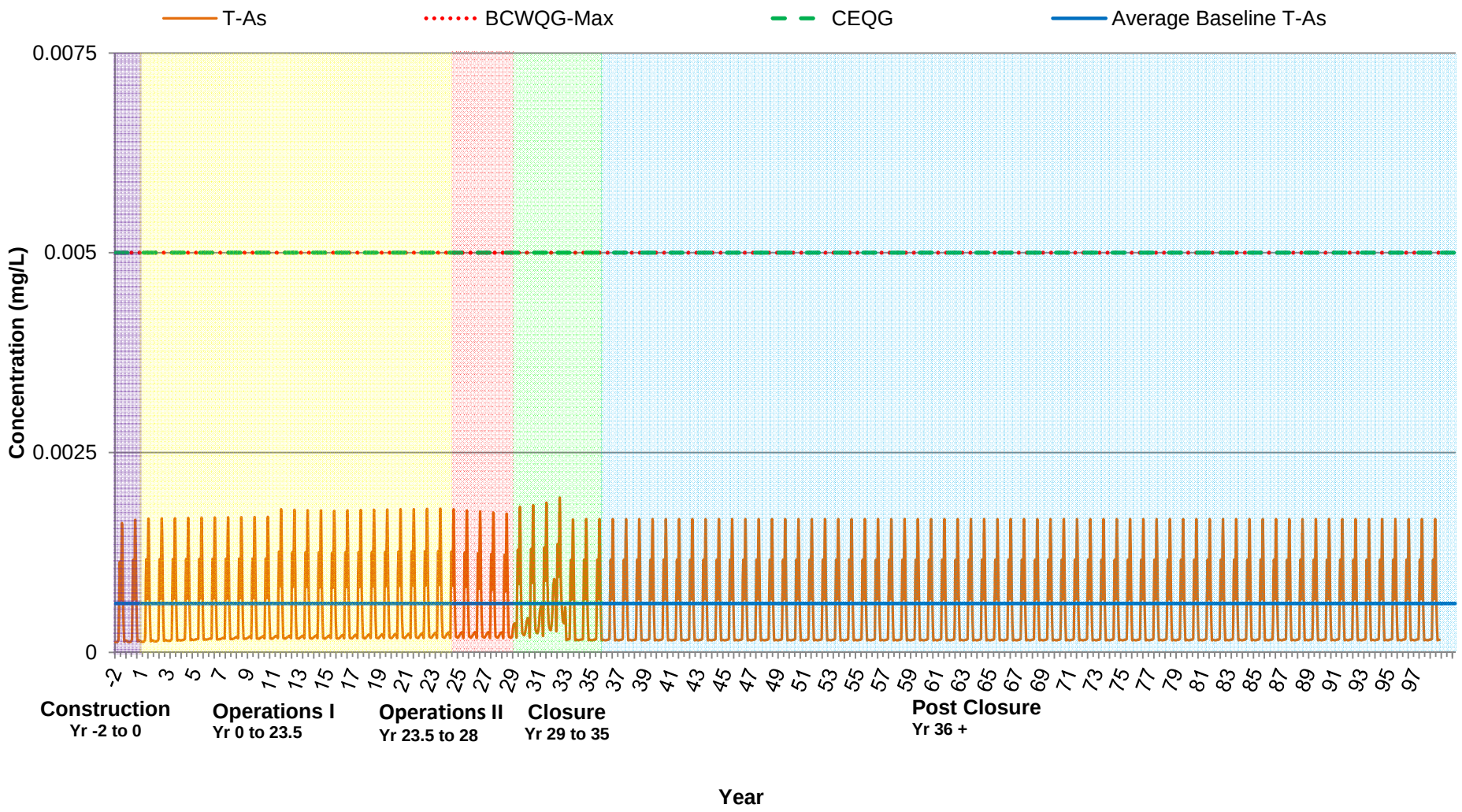
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G11.Sb

REV 0



NOTES:

1. THE BCWQG AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE J1 (AVERAGE HARDNESS OF 121 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE ARSENIC CONCENTRATIONS - JONES CREEK (J1)

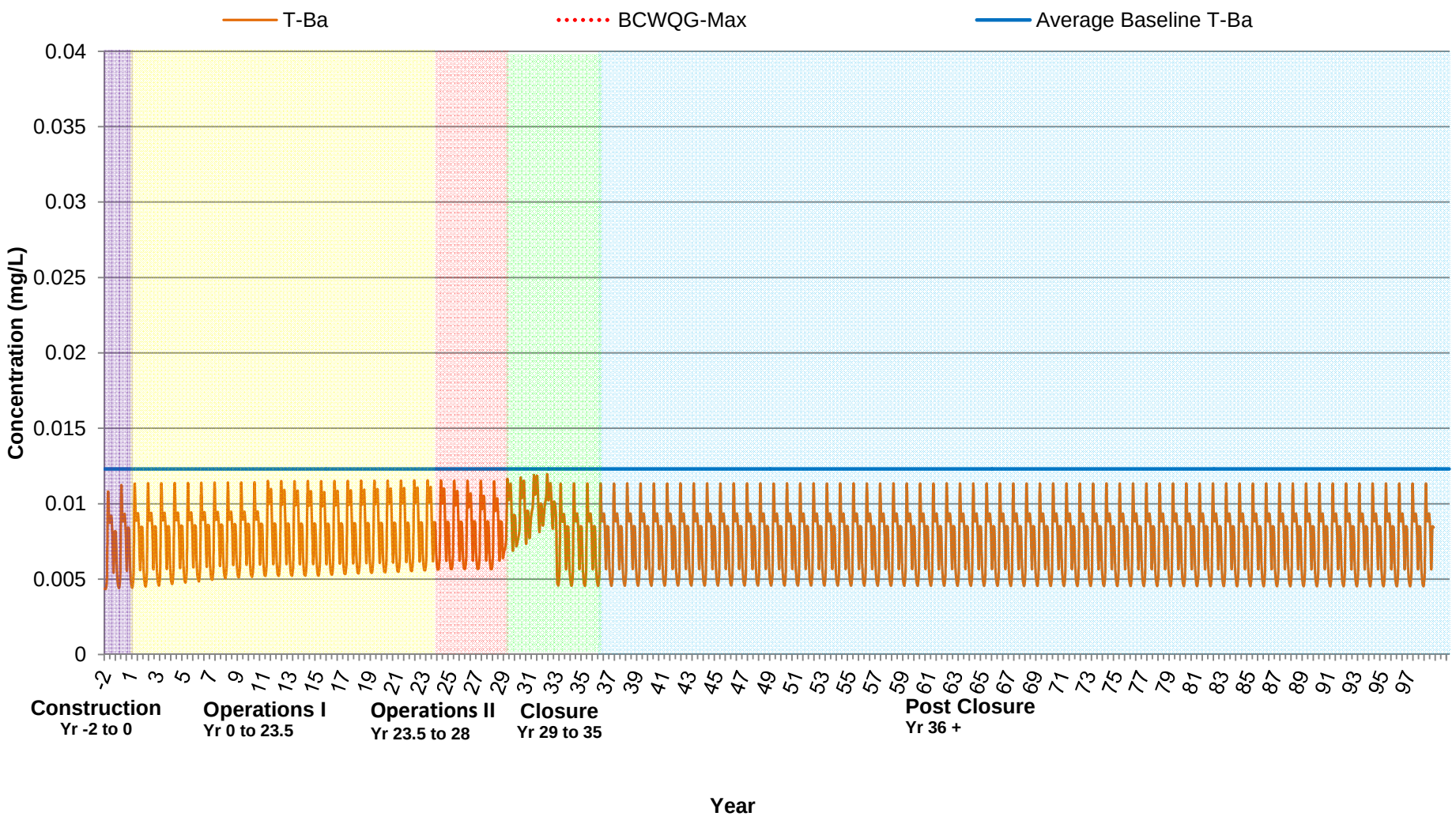
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G11.As

REV 0



NOTES:

1. THE BCWQG-MAX IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS SITE J1 (AVERAGE HARDNESS OF 121 mg/L).
3. THE BCWQG-30 D (1 mg/L) AND BCWQG-MAX (5 mg/L) ARE NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE BARIUM CONCENTRATIONS - JONES CREEK (J1)

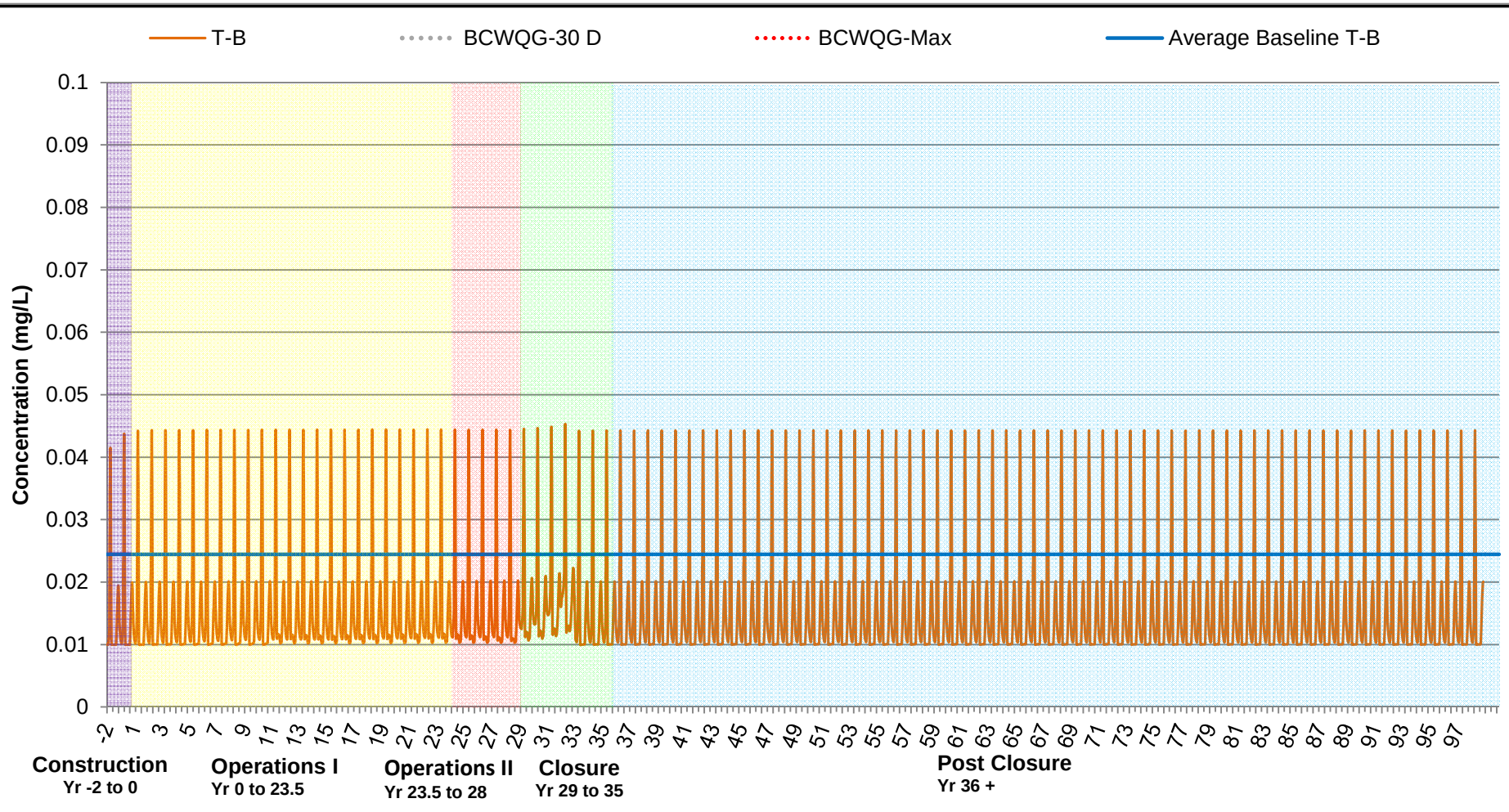
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G11.Ba

REV 0



NOTES:

1. BASELINE SITE USED FOR COMPARISON IS SITE J1 (AVERAGE HARDNESS OF 121 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.
3. THE BCWQG-MAX (1.2 mg/L) IS NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE BORON CONCENTRATIONS - JONES CREEK (J1)

Knight Piésold CONSULTING

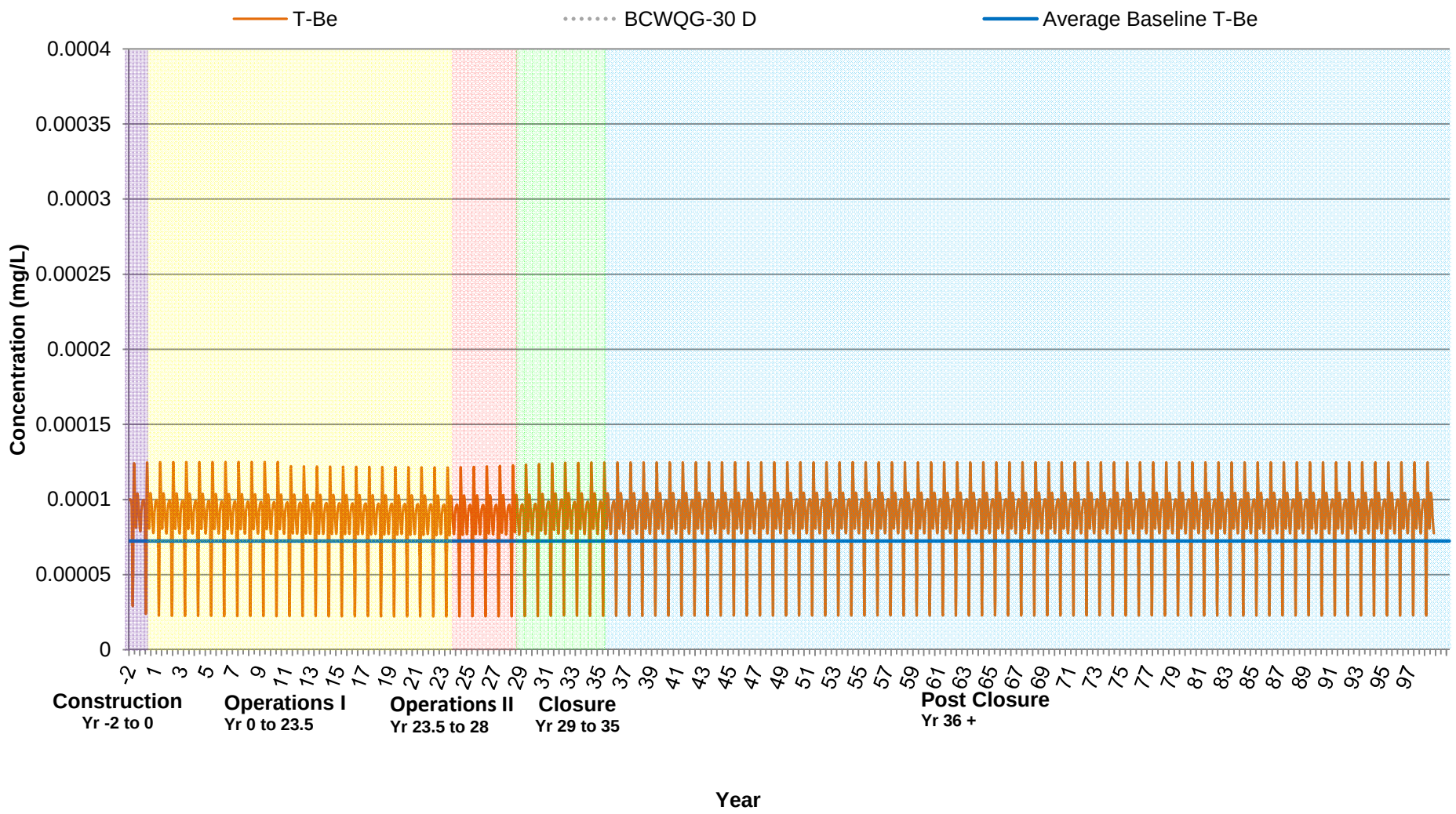
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G11.B

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX IS A FIXED VALUE.
2. BASELINE SITE USED FOR COMPARISON IS SITE J1 (AVERAGE HARDNESS OF 121 mg/L).
3. THE BCWQG-30 D (0.0053 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE BERYILLIUM CONCENTRATIONS - JONES CREEK (J1)

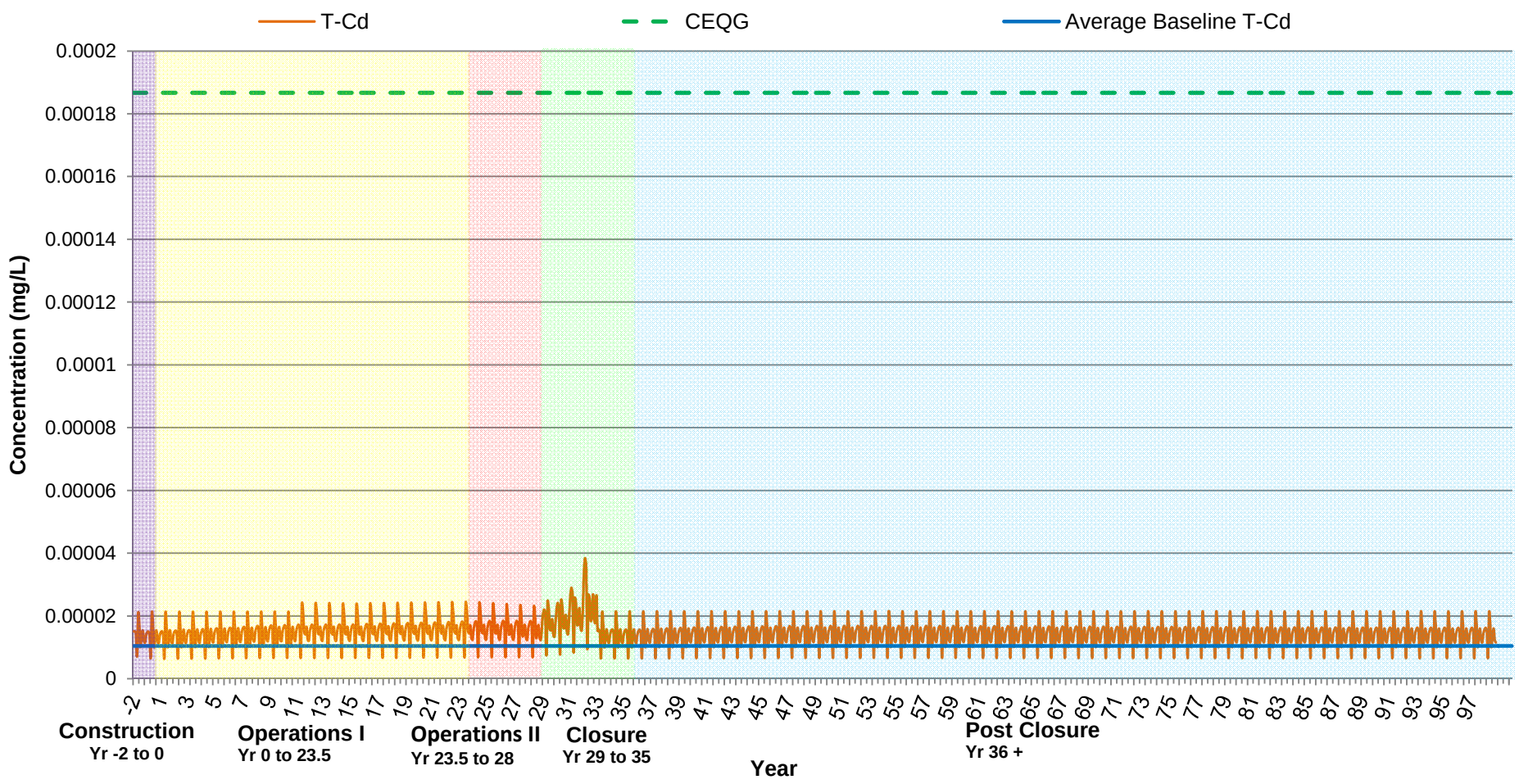
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G11.Be

REV 0



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. THE BCWQG ARE DRAFT GUIDELINES UNDER REVIEW (JUNE 2014).
3. BASELINE SITE USED FOR COMPARISON IS SITE J1 (AVERAGE HARDNESS OF 121 mg/L).
4. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE CADMIUM CONCENTRATIONS - JONES CREEK (J1)

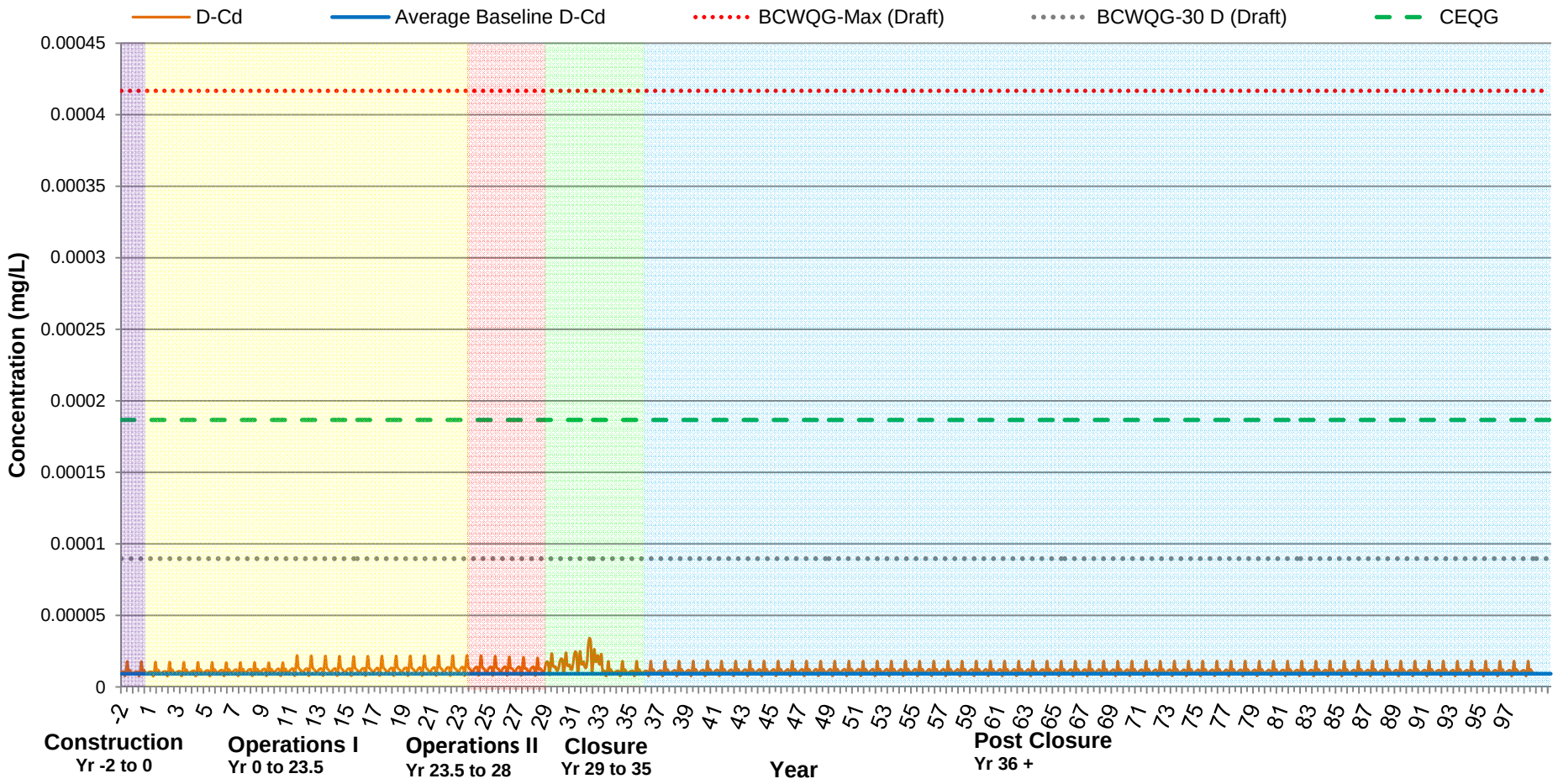
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G11.Cd-T

REV 0



NOTES:

1. BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE J1 (AVERAGE HARDNESS OF 121 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE CADMIUM CONCENTRATIONS - JONES CREEK (J1)

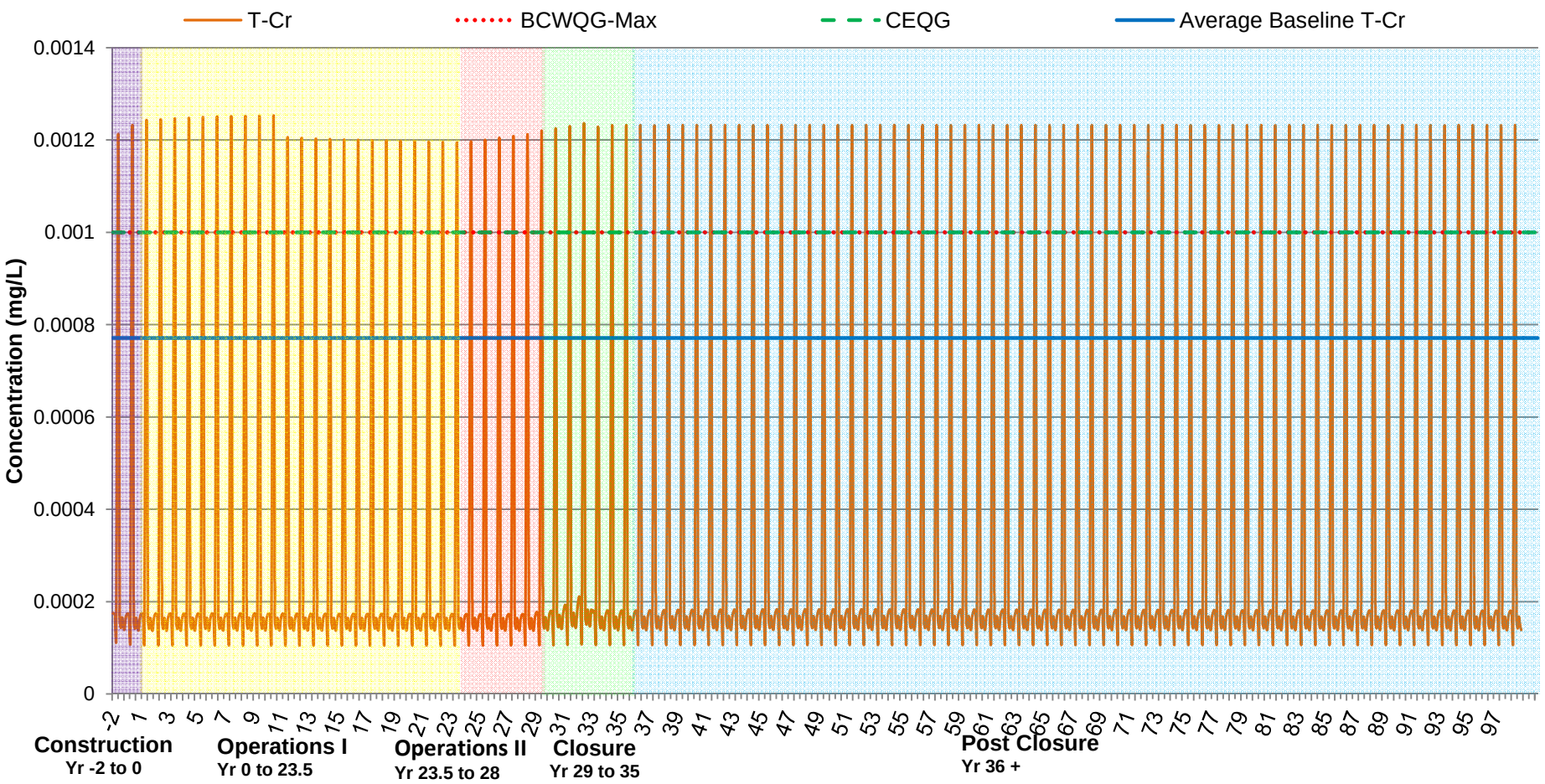
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G11.Cd-D

REV 0



NOTES:

1. GUIDELINES ARE FOR CHROMIUM (IV), THE SPECIES MOST COMMON IN WELL OXYGENATED SURFACE WATERS.
2. BASELINE SITE USED FOR COMPARISON IS SITE J1 (AVERAGE HARDNESS OF 121 mg/L).

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE CHROMIUM CONCENTRATIONS - JONES CREEK (J1)

Knight Piésold CONSULTING

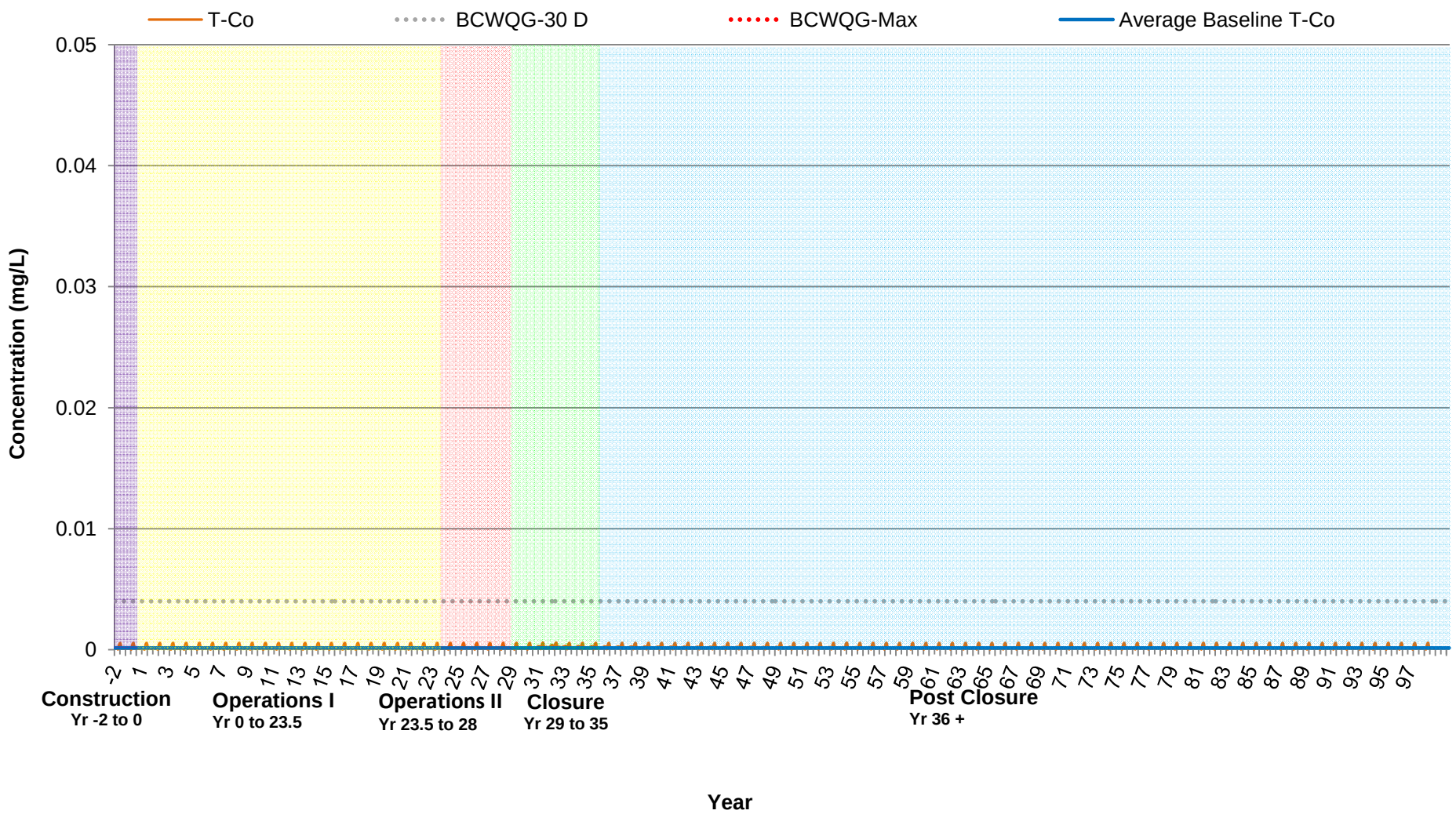
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G11.Cr

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-30 D AND BCWQG-MAX ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE J1 (AVERAGE HARDNESS OF 121 mg/L).
3. THE BCWQG-MAX GUIDELINE (0.11 mg/L) IS NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE COBALT CONCENTRATIONS - JONES CREEK (J1)

Knight Piésold CONSULTING

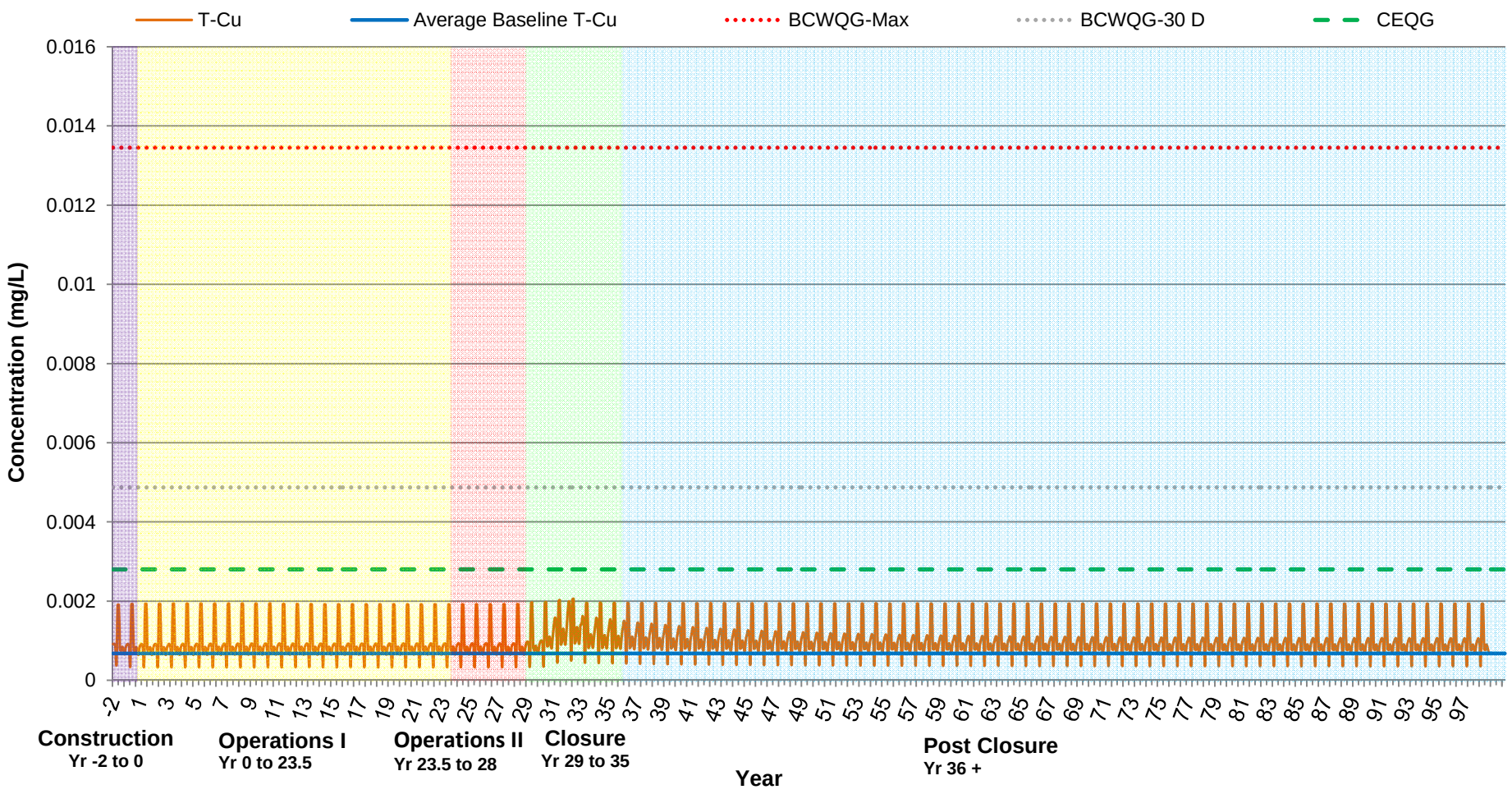
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G11.Co

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE J1 (AVERAGE HARDNESS OF 121 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE COPPER CONCENTRATIONS - JONES CREEK (J1)

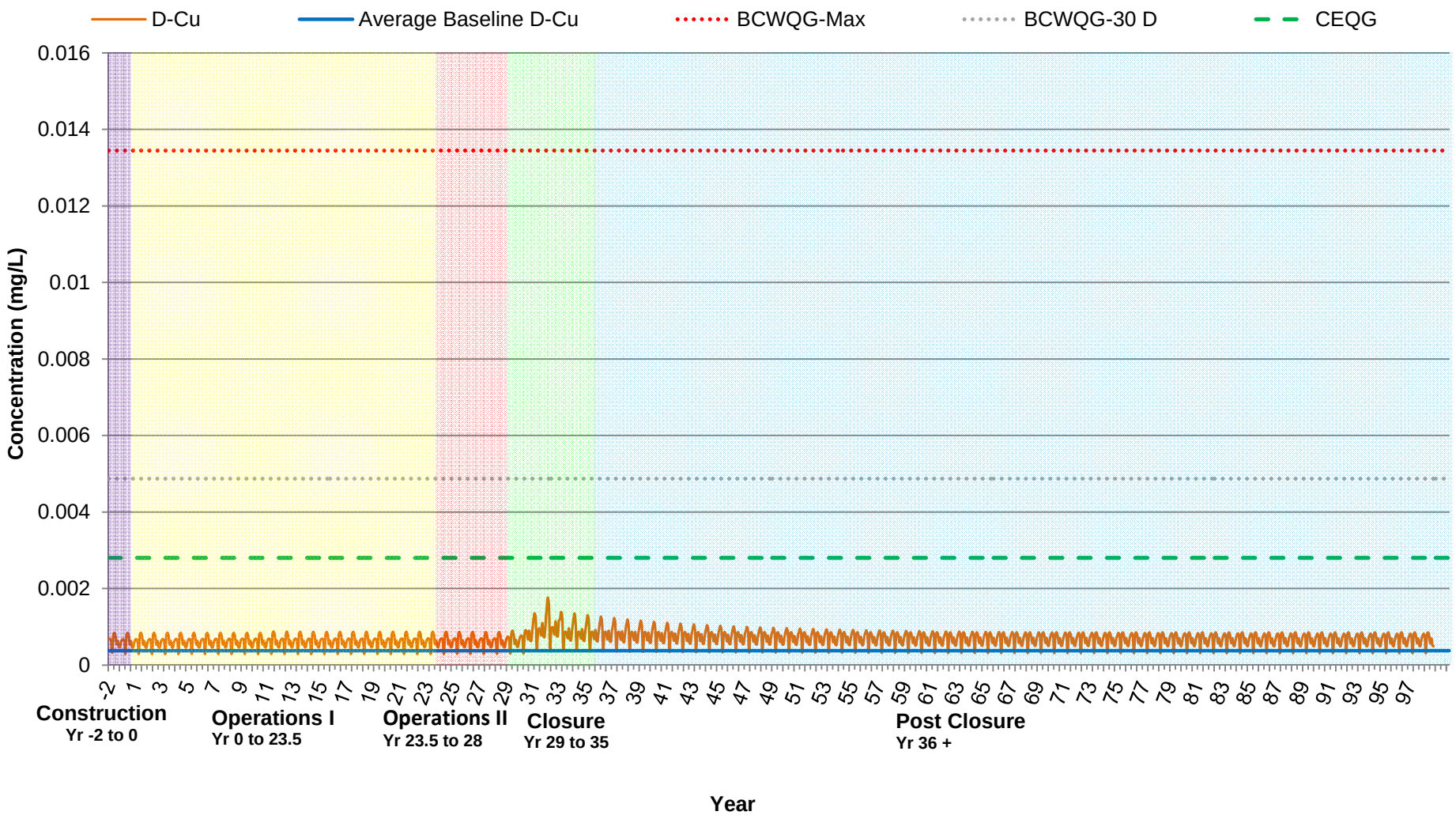
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G11.Cu-T

REV 0



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE J1 (AVERAGE HARDNESS OF 121 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE COPPER CONCENTRATIONS - JONES CREEK (J1)

Knight Piésold CONSULTING

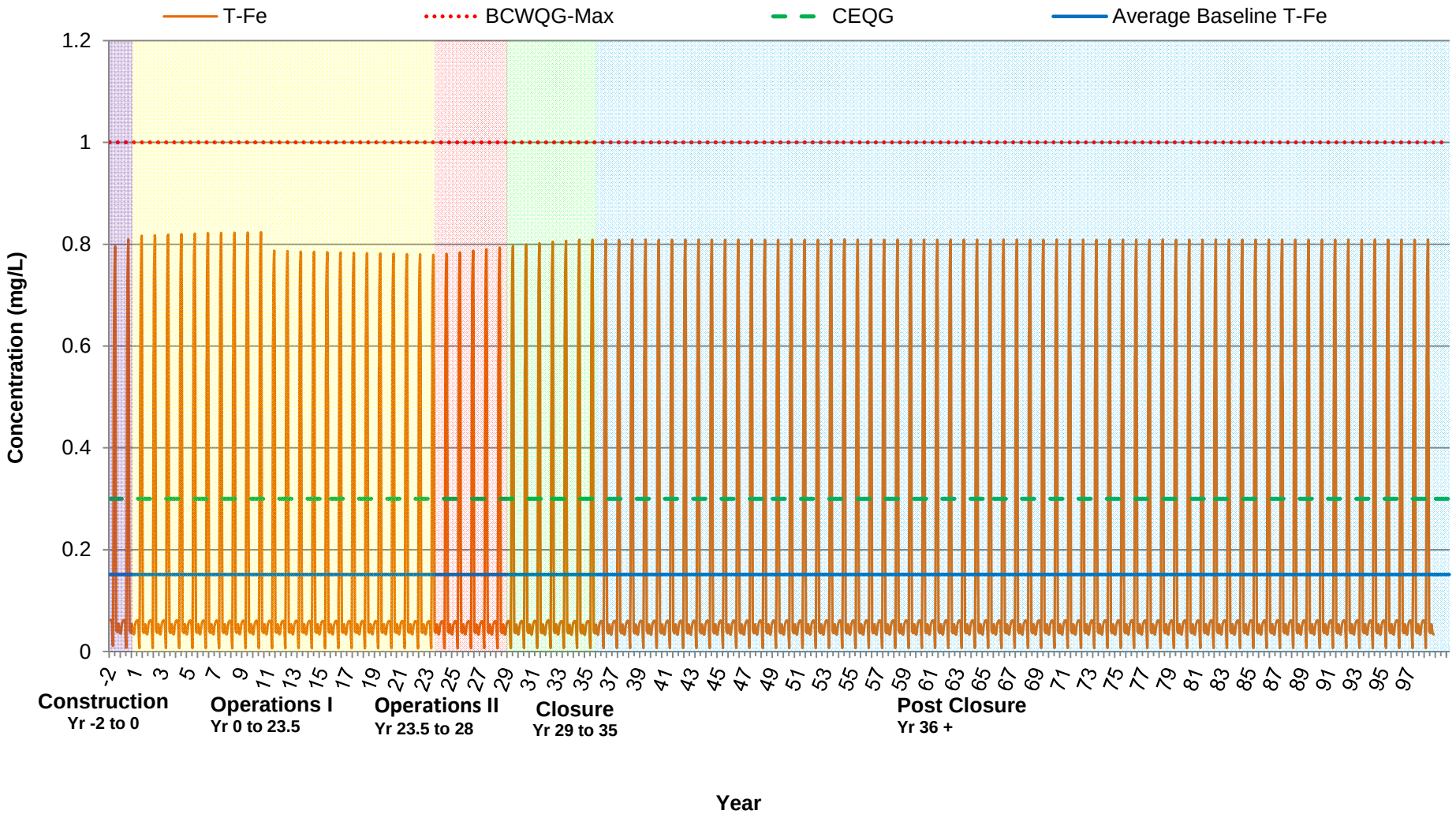
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G11.Cu-D

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE J1 (AVERAGE HARDNESS OF 121 mg/L).
3. BCWQG-MAX 1.0 mg/L IS NOT SHOWN ON GRAPH.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE TOTAL IRON CONCENTRATIONS - JONES CREEK (J1)

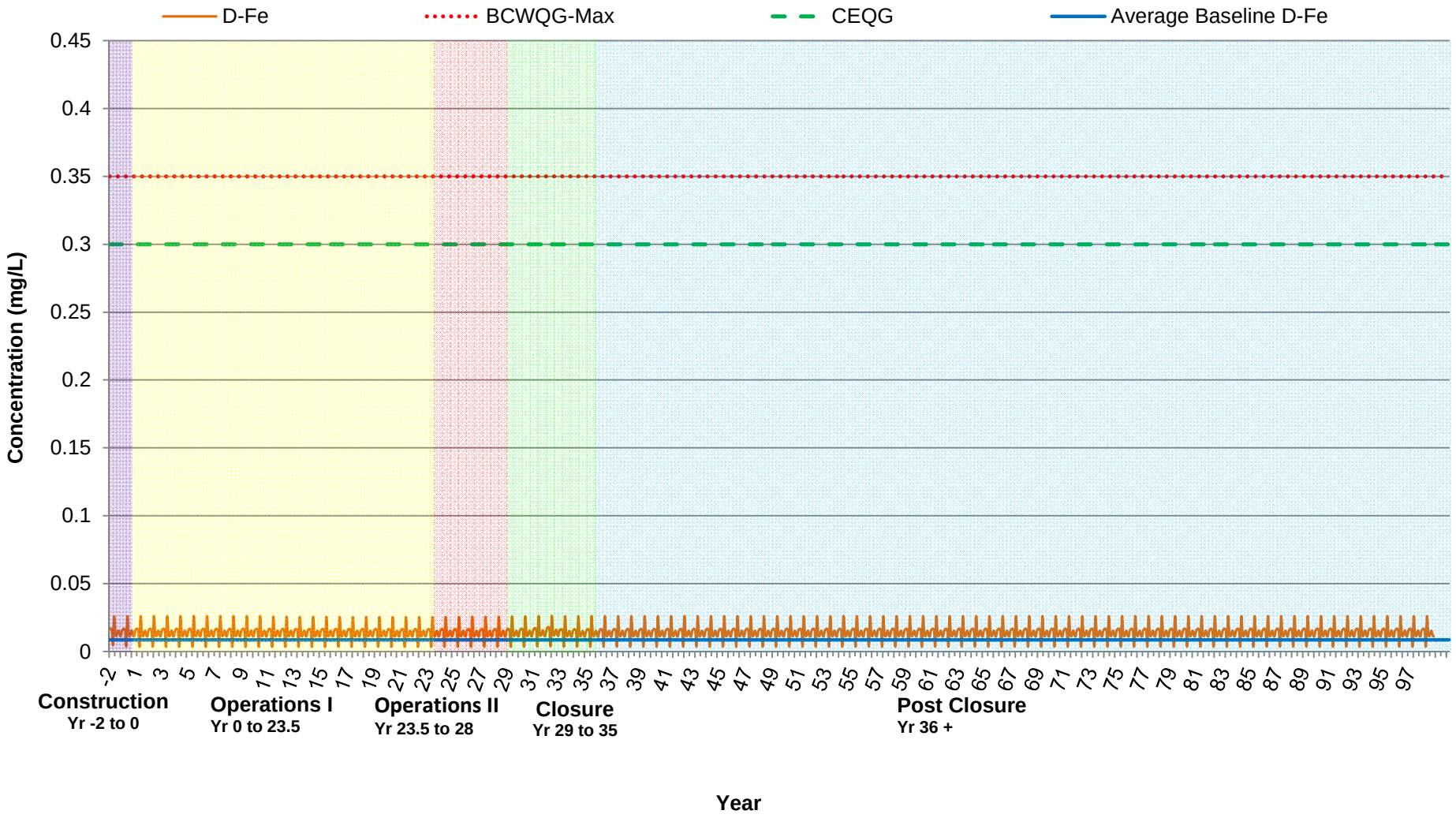
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G11.Fe-T

REV 0



NOTES:

1. THE BCWQG-MAX AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE J1 (AVERAGE HARDNESS OF 121 mg/L).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE DISSOLVED IRON CONCENTRATIONS - JONES CREEK (J1)

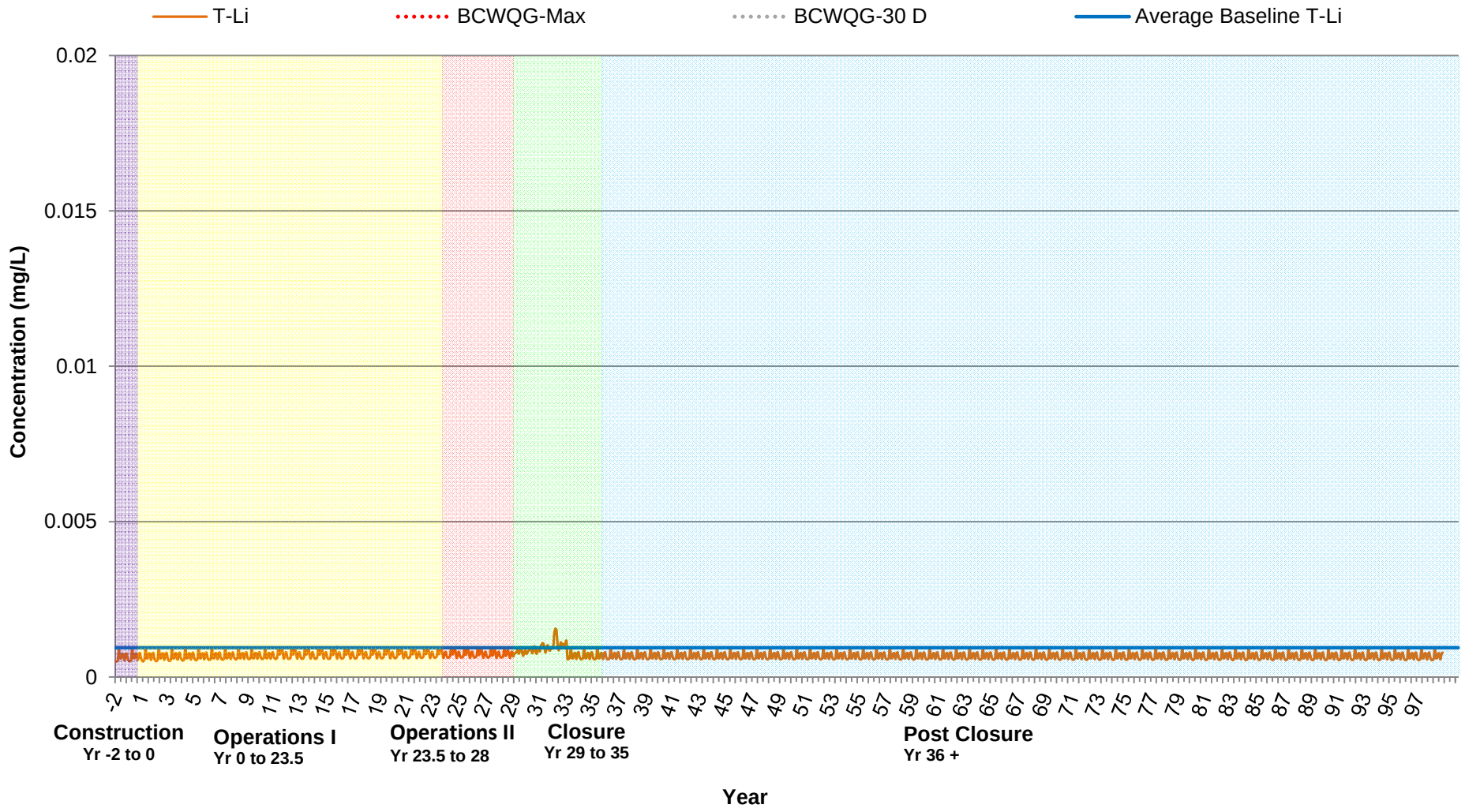
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G11.Fe-D

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE J1 (AVERAGE HARDNESS OF 121 mg/L).
3. THE BCWQG-30 D (0.096 mg/L) AND BCWQG-MAX (0.87 mg/L) ARE INTERIM (WORKING) AND ARE NOT SHOWN ON GRAPH.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE LITHIUM CONCENTRATIONS - JONES CREEK (J1)

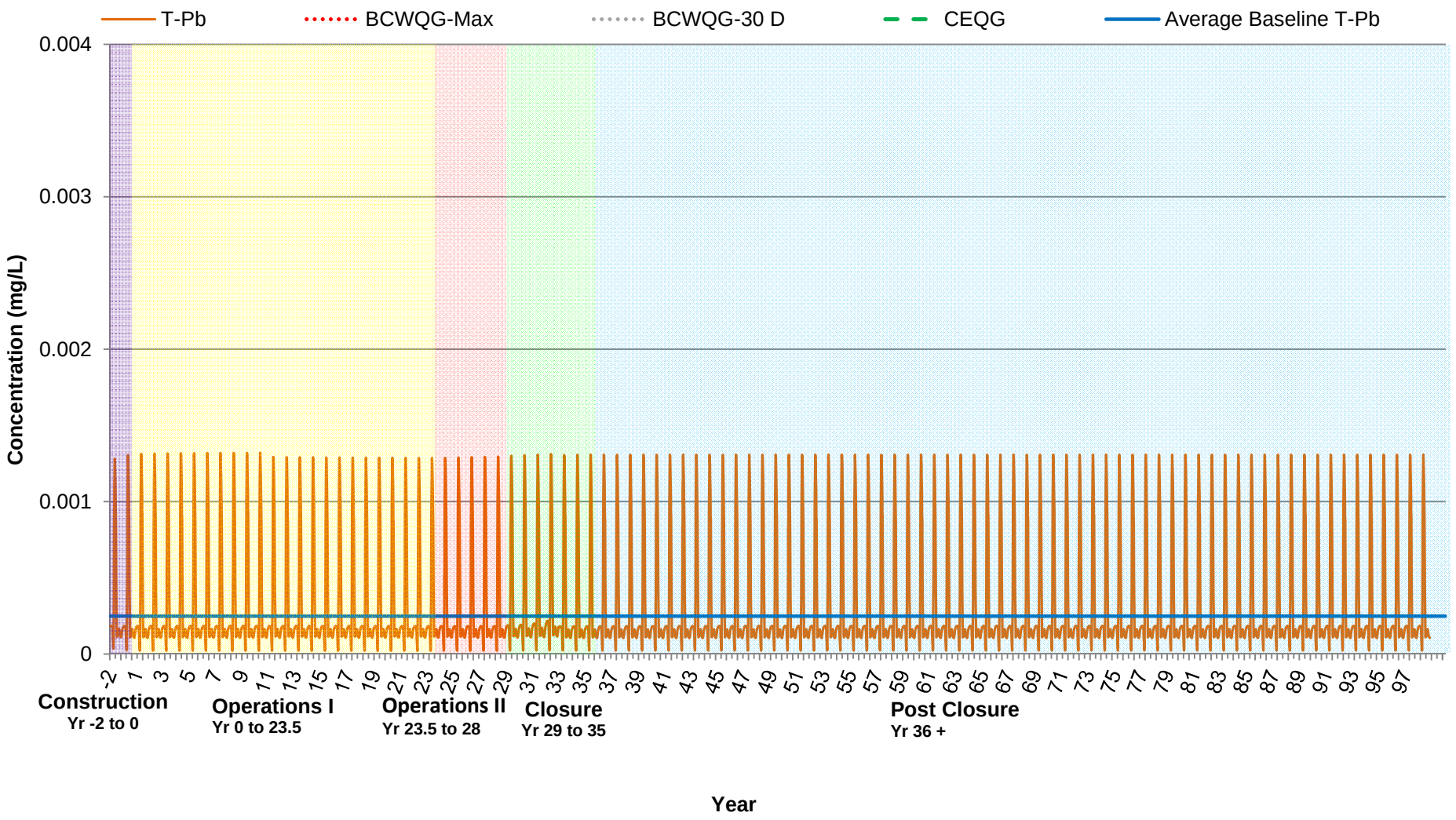
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G11.Li

REV 0



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE J1 (AVERAGE HARDNESS OF 121 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.
4. THE BCWQG-MAX (CALCULATED AT 0.011 mg/L) IS NOT SHOWN.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE LEAD CONCENTRATIONS - JONES CREEK (J1)

Knight Piésold CONSULTING

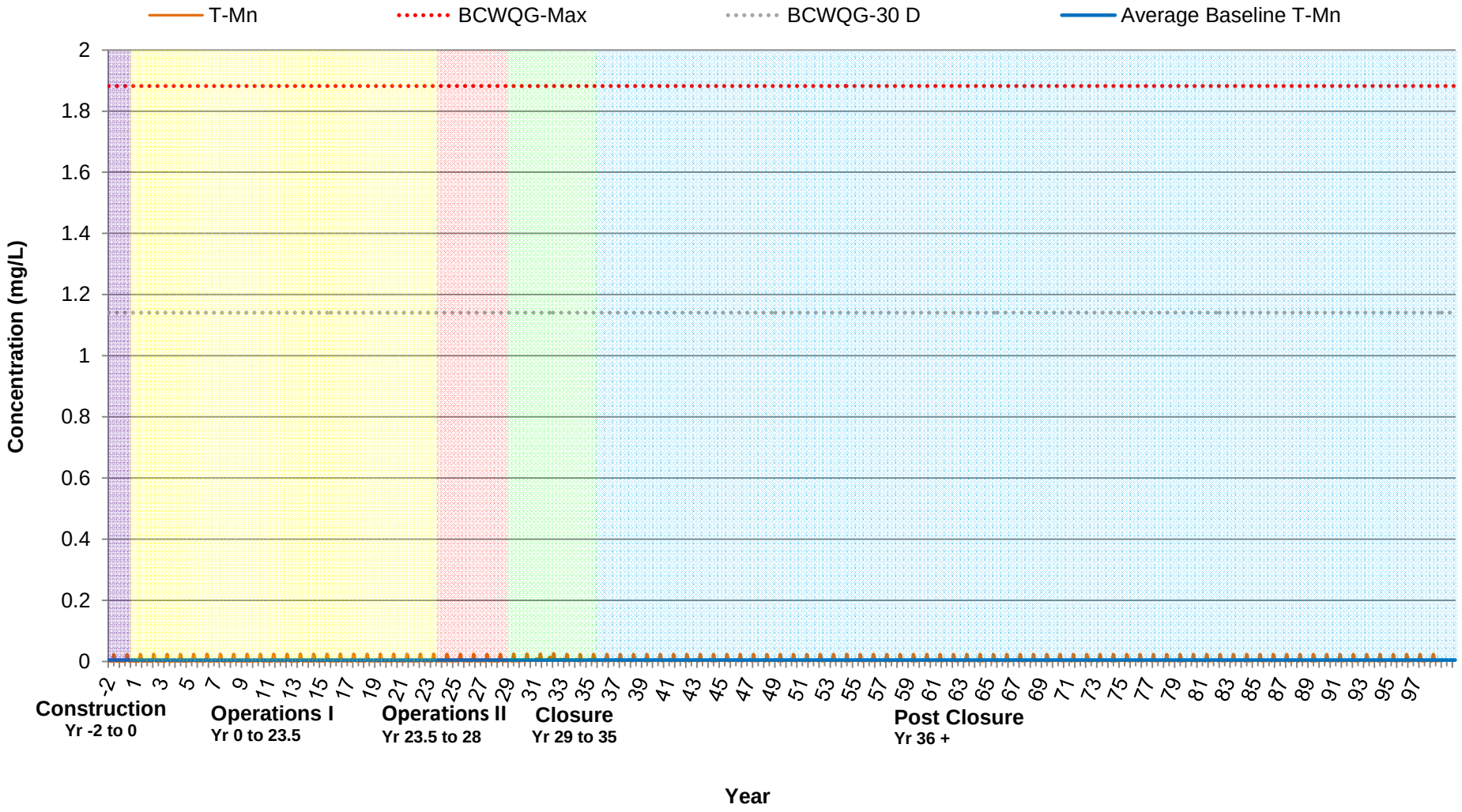
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G11.Pb

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. ALL GUIDELINES ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE J1 (AVERAGE HARDNESS OF 121 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE MANGANESE CONCENTRATIONS - JONES CREEK (J1)

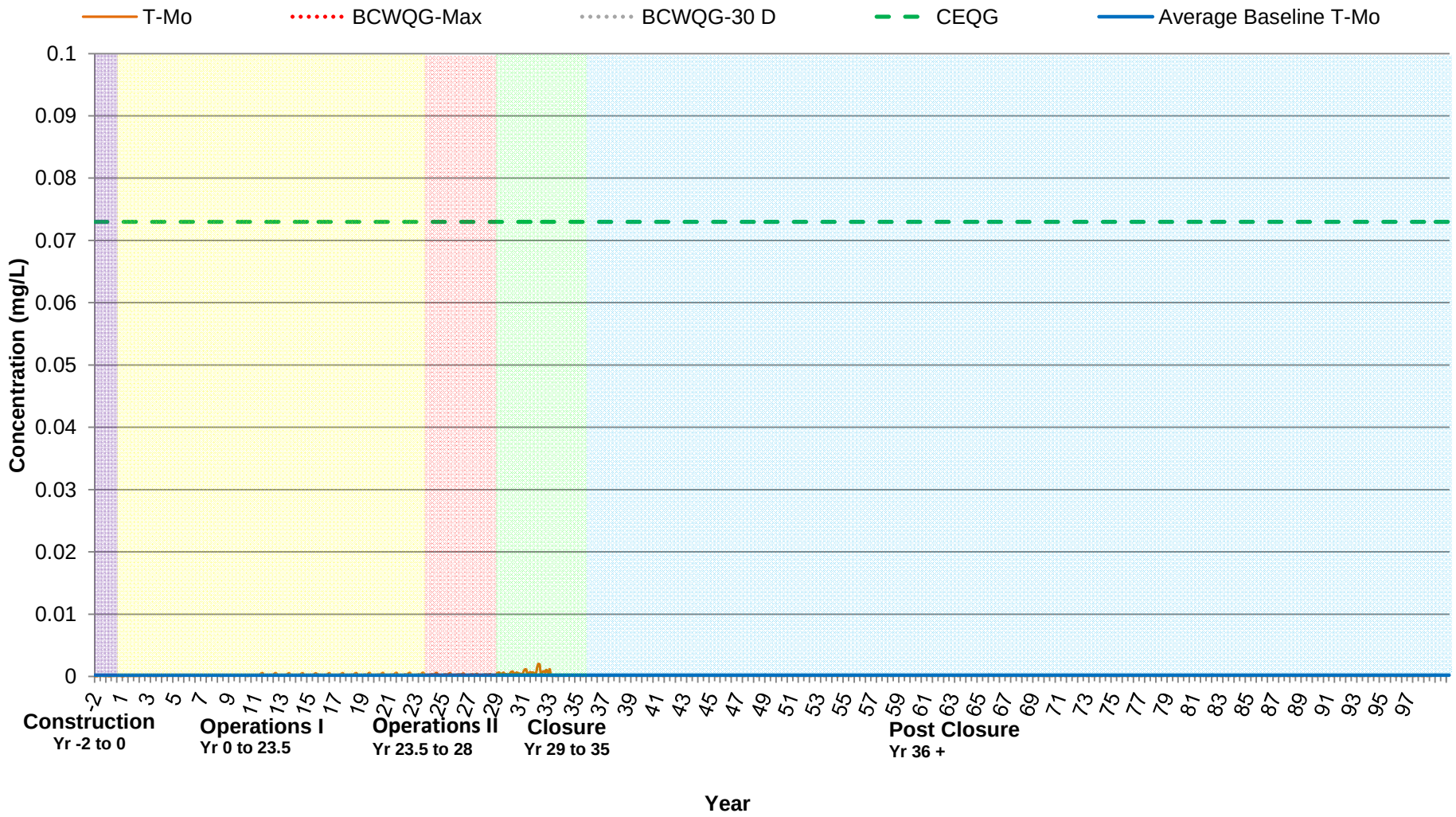
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G11.Mn

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE J1 (AVERAGE HARDNESS OF 121 mg/L).
3. THE BCWQG-MAX (2 mg/L) AND BCWQG-30 D (1 mg/L) ARE NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE MOLYDBENUM CONCENTRATIONS - JONES CREEK (J1)

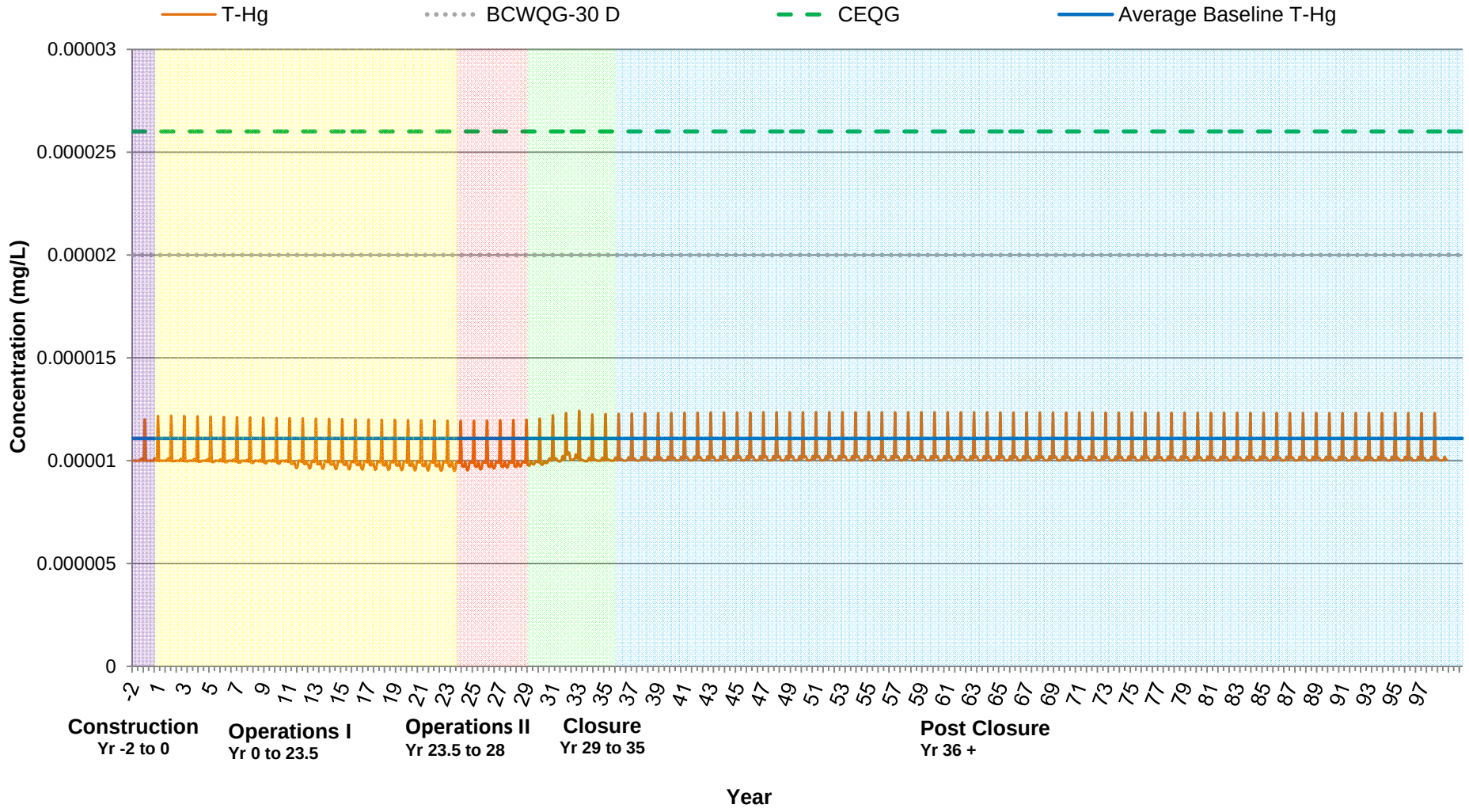
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G11.Mo

REV 0



NOTES:

1. THE BCWQG-30 D AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE J1 (AVERAGE HARDNESS OF 121 mg/L).
3. BCWQG-30 D VALUE APPLIED ON ASSUMPTION THAT METHYL-Hg IS EQUAL TO 0.5% OF T-Hg.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE MERCURY CONCENTRATIONS - JONES CREEK (J1)

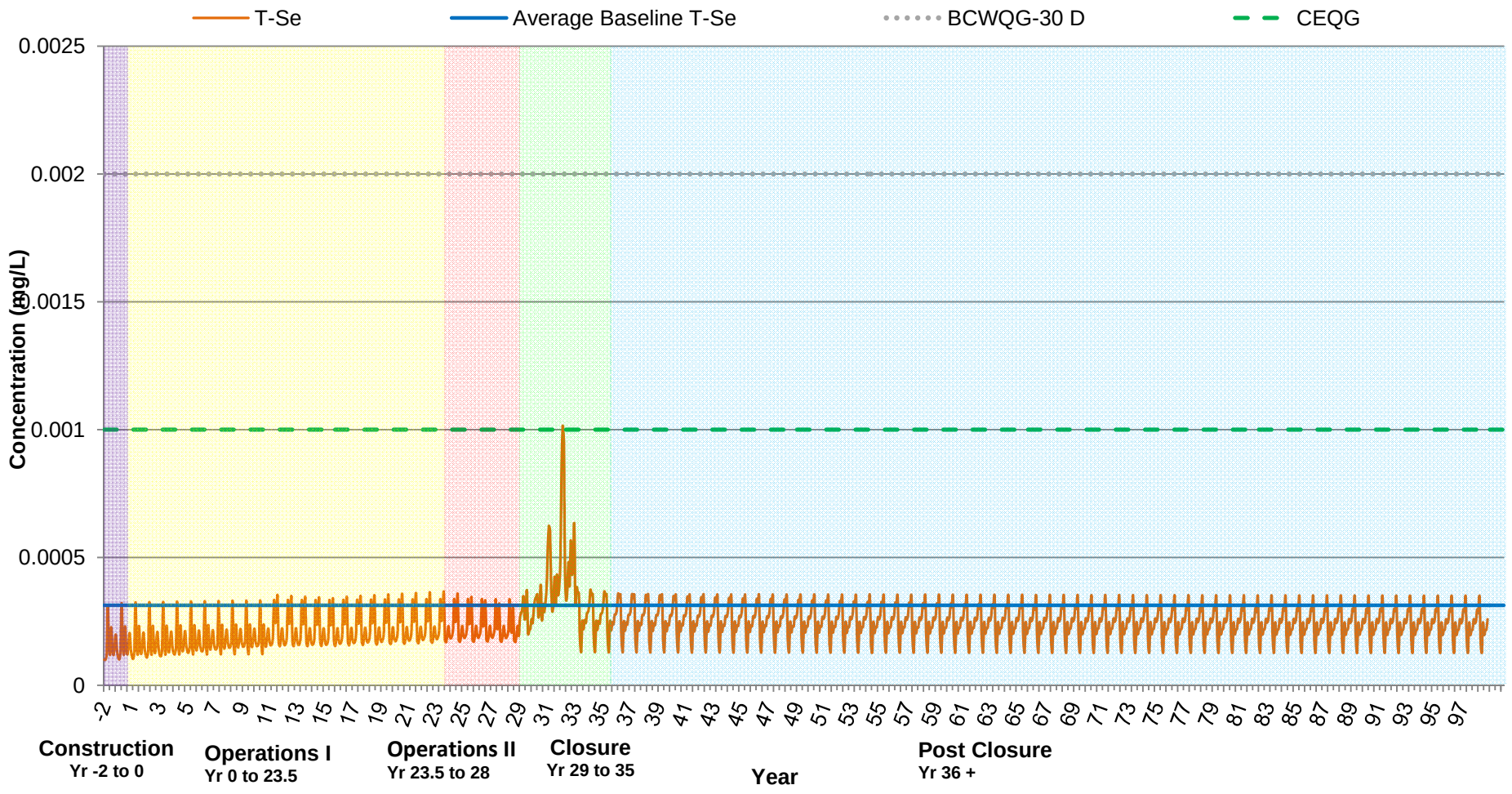
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G11.Hg

REV 0



NOTES:

1. THE BCWQG-30 D AND CEQG ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE J1 (AVERAGE HARDNESS OF 121 mg/L).

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE SELENIUM CONCENTRATIONS - JONES CREEK (J1)

Knight Piésold CONSULTING

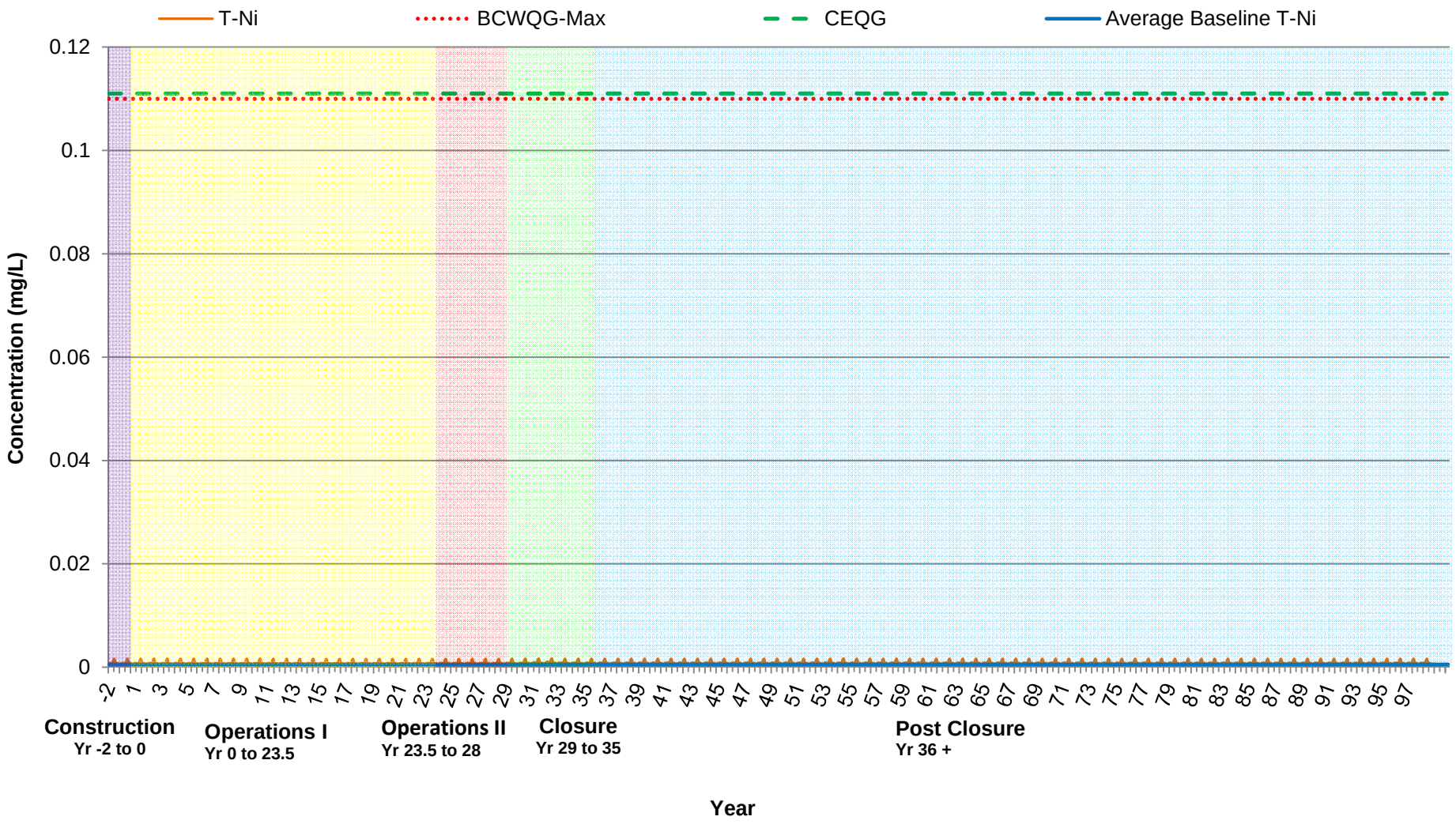
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G11.Se

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-MAX AND CEQG ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE J1 (AVERAGE HARDNESS OF 121 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE NICKEL CONCENTRATIONS - JONES CREEK (J1)

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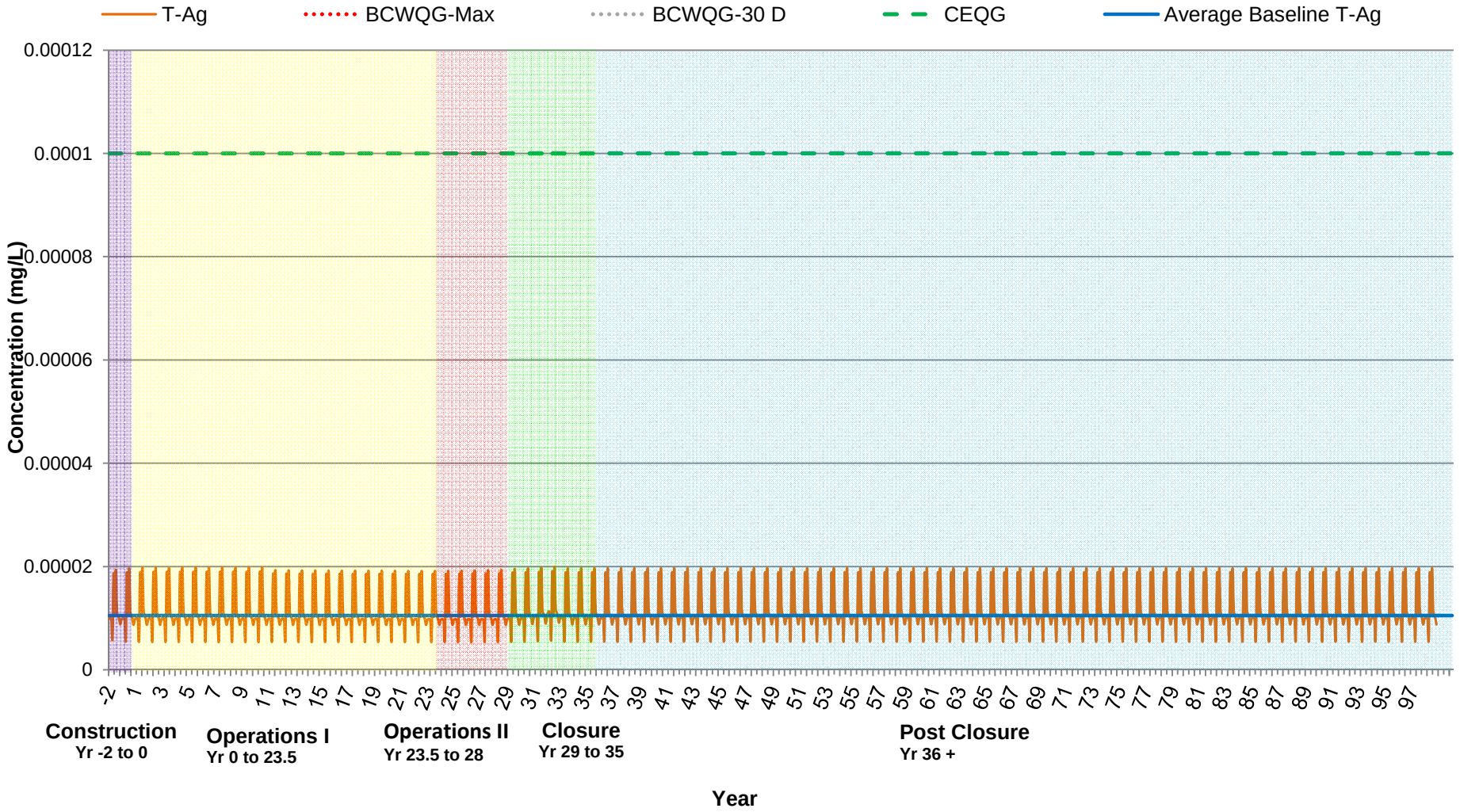
P/A NO. VA101-458/14

REF. NO. 3

FIGURE G11.Ni

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB



NOTES:

1. THE BCWQG-30 D AND BCWQG-MAX ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE J1 (AVERAGE HARDNESS OF 121 mg/L).
2. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE SILVER CONCENTRATIONS - JONES CREEK (J1)

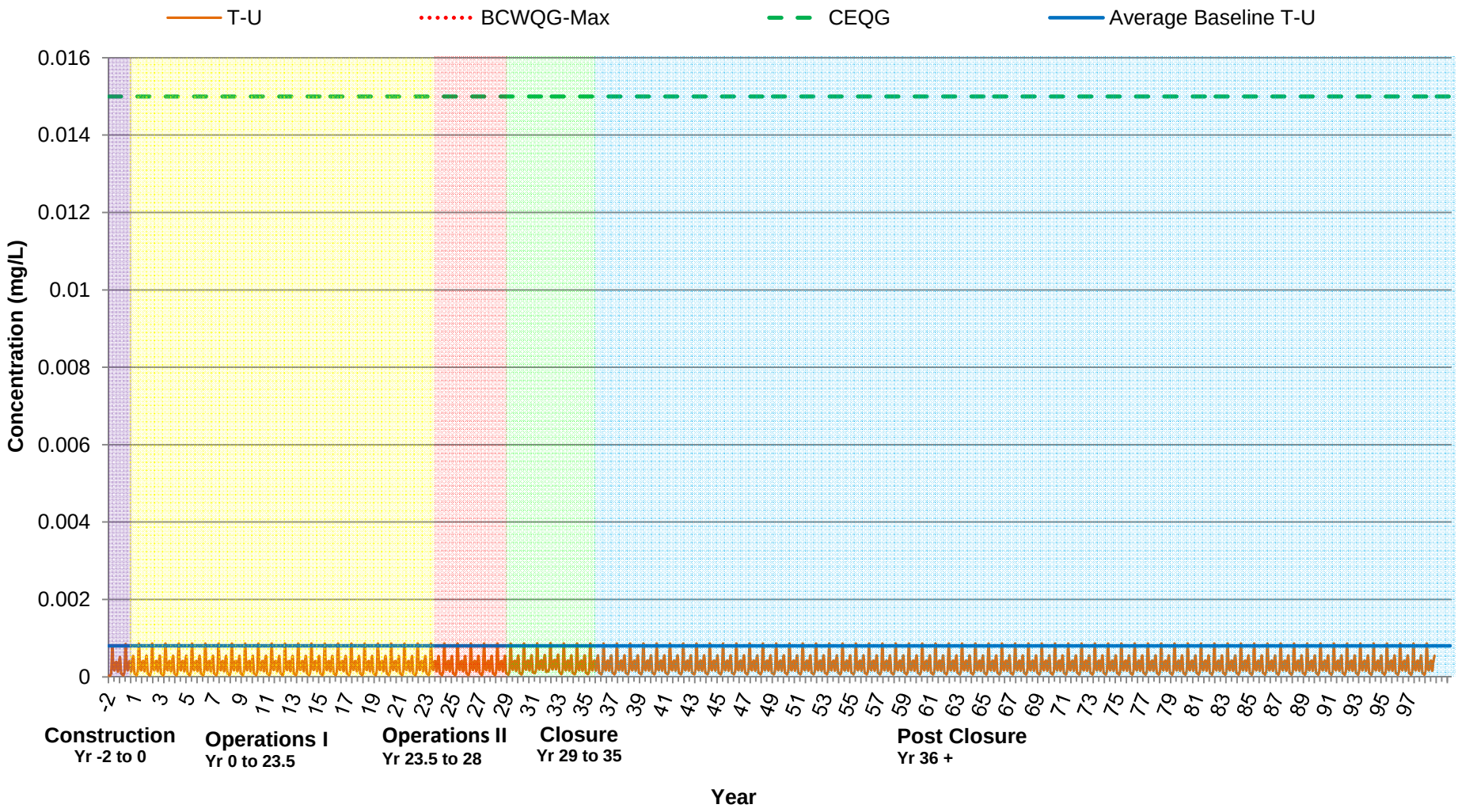
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P/A NO. VA101-458/14

REF. NO. 3

FIGURE G11.Ag

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE J1 (AVERAGE HARDNESS OF 121 mg/L).
3. THE BCWQG-MAX (0.3 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE URANIUM CONCENTRATIONS - JONES CREEK (J1)

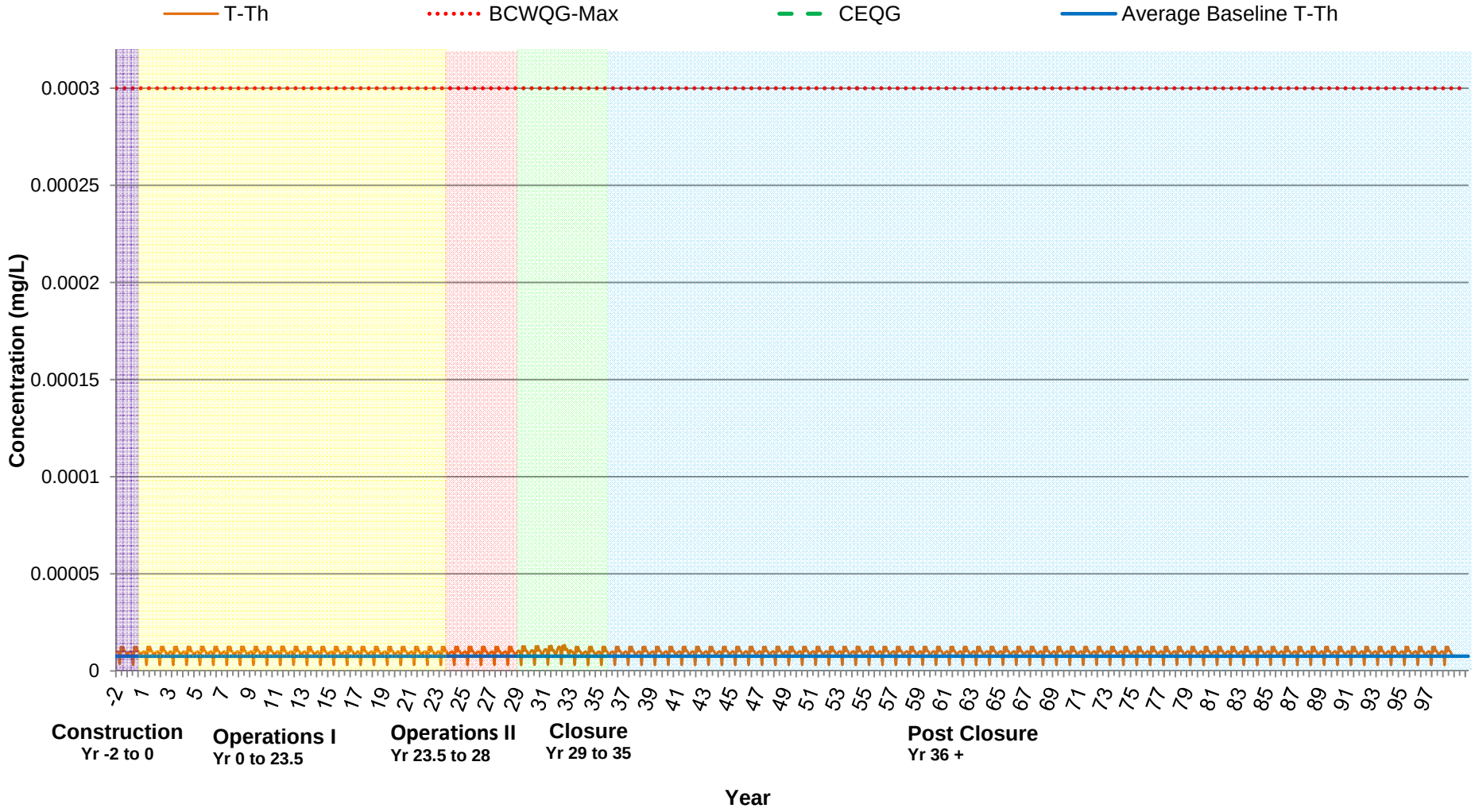
Knight Piésold CONSULTING

P/A NO. VA101-458/14

REF. NO. 3

FIGURE G11.U

REV 0



NOTES:

1. ALL GUIDELINES ARE FIXED VALUES.
2. BASELINE SITE USED FOR COMPARISON IS SITE J1 (AVERAGE HARDNESS OF 121 mg/L).
3. THE CEQG (0.0008 mg/L) IS NOT SHOWN.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE THALLIUM CONCENTRATIONS - JONES CREEK (J1)

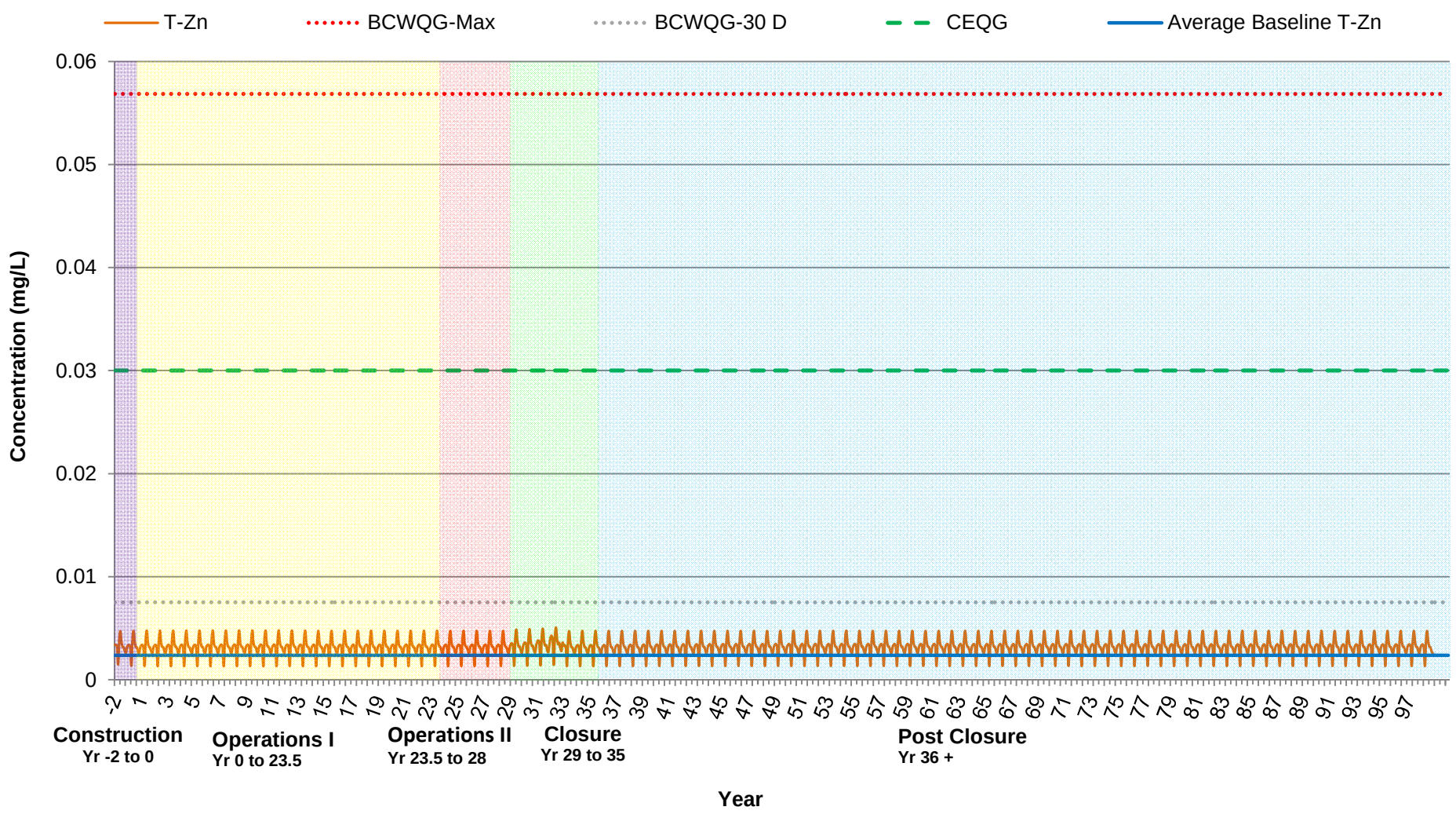
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P/A NO. VA101-458/14

REF. NO. 3

FIGURE G11.Th

REV 0



NOTES:

1. BCWQG-30 D AND BCWQG-MAX ARE HARDNESS-DEPENDENT.
2. BASELINE SITE USED FOR COMPARISON IS SITE J1 (AVERAGE HARDNESS OF 121 mg/L).
3. AVERAGE BASELINE HARDNESS IS USED TO CALCULATE HARDNESS-DEPENDENT GUIDELINES.

HARPER CREEK MINING CORP.

HARPER CREEK PROJECT

PREDICTED UPPER BOUND CASE ZINC CONCENTRATIONS - JONES CREEK (J1)

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P/A NO. VA101-458/14

REF. NO. 3

FIGURE G11.Zn

REV 0

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10OCT'14	ISSUED WITH REPORT	EJA	JEM	KJB