Appendix F: Marathon PGM-Cu Combined Storage Area PSMF - Water/Solids Balance (Knight Piesold)

Knight Piésold
CONSULTING

File No.:NB101-446/3-A.01
Cont. No.:NB12-00153

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April 11, 2012

Ms. Tabatha LeBlanc
Environmental Manager
Stillwater Canada Inc.
Suite 1005, 715 Hewitson St.
Thunder Bay, ON, Ontario
Canada, P7B 4A3

Dear Tabatha,

Re: Marathon PGM-Cu Combined Storage Area PSMF - Water/Solids Balance

General

A detailed water/solids balance analysis was completed for Stillwater Canada Inc.'s (SCI) Marathon PGM-Cu Project. The Combined Storage Area option will include two cells for process solids storage. Cell 1 will be used for process solids storage and water management from the Process Solids Management Facility (PSMF) and the mine site. Cell 2 will be used for process solids storage and process water management. In later years of operations, two satellite pits will be used to store process solids and manage storm water runoff. The main objectives of this water balance are as follows:

1. Confirm the required embankment crest elevations.
2. Confirm the operational distribution of water within PSMF and satellite pits.
3. Provide an estimate of the volumes of water reporting to the PSMF, satellite pits and Hare Lake.
4. Estimate the required pumping capacities to discharge water to Hare Lake.

The water balance analysis was completed on a monthly basis for a pre-production period, the projected 11.5 year mine life and a 3 year post-closure period using a deterministic approach for average precipitation conditions.

This letter superseded the previous water balance letter issued on March 2, 2012 (KPL Ref. No. NB12-00080) and provides a summary of the results based on the various water management design parameters and assumptions. The site layout, design constraints, design parameters provided by others, methodology for completing the water balance analysis and results are discussed below.

Site Layout and Water Management

Figure 1 shows the general site arrangement for the Combined Storage Area including the watershed boundaries and the relevant infrastructure. The water balance flowsheet depicting the water management strategy is provided on Figure 2. The flowsheet shows the estimated volumes of water associated with the mine site water management systems and the movement of water between the systems based on average precipitation conditions for Year 6 of operations.

The Combined Storage Area includes two cells; Cell 1 to store the process solids during the first 2 years of operations, and Cell 2 to store the process solids during the first 10 years of operations. Satellite Pits #2 and #3 will also be used for storage of process solids and water management in the

last 2 years of operations. It is anticipated that the process solids deposition would start in Satellite Pit #2 and then transition to Satellite Pit #3. The sequencing will be confirmed with the mining and operations plan. For more detail on the layout and operations of the Combined Storage Area PSMF, refer to KPL letter Ref. No. NB12-00043.

Cell 1 will be used to collect and store runoff water for use in the milling operations and for monitoring prior to discharge to Hare Lake. Cell 1 will store the runoff from both Cells 1 and 2 resulting from the Environmental Design Storm (EDS). Cell 1 will also have capacity to store water from the Open Pit and mine site during the EDS. Water from the Open Pit will be pumped via a pipeline to Cell 1. For events larger than the EDS it is assumed that the Open Pit will be shut down for a period to allow the pumping system to transfer the storm water to Cell 1 at a manageable rate. A spillway will convey water from Cell 1 to the environment during the Inflow Design Flood (IDF, 1 in 10,000 24-hour rainfall event) or larger precipitation events.

In general, water will be reclaimed from Cell 2 via a pump and pipeline system. Water will be transferred from Cell 1 to Cell 2 as required for reclaim. The process solids will be kept below the water surface across the majority of the basin and a 2-3 m pond will be maintained at one end for the reclaim water pumps. Reclaim from Cell 1 will be required during the initial months of operations. In Year 11, after process solids have been deposited to the satellite pits for several months and an operating pond has been established, reclaim will be transferred to the satellite pits for the remainder of the mine life.

Design Criteria

The design criteria are based on the information provided by others, as well as work completed by KPL. The design criteria are summarized on Table 1. The following assumptions have been used in the water and solids balance and will be confirmed during detailed design.

- Process solids slurry with a solids content of 45% (by weight).
- Stage 1 of the PSMF will be completed in August of Year -1 and water will accumulate in the PSMF prior to commissioning of the plant in July of Year 1 (10 months pre-operating period).
- All process solids will be deposited to Cell 1 during the first 6 months of operations. Type 2 process solids will continue to be discharged to Cell 1 for the next 6 months, while Type 1 process solids are deposited to Cell 2. For the first half of Year 2, Type 1 process solids will be discharged to Cell 1 in order to cap the Type 2 process solids in Cell 1. After this, the Type 1 and Type 2 process solids will be discharged to Cell 2 until approximately March of Year 11. The process solids will then be discharged to the satellite pits for the remainder of the mine life.
- Water will be reclaimed from Cell 2 during normal operations.
- Process water from Cell 1 will be transferred to Cell 2 on an on-going basis, as required for reclaim.
- Estimated inflows from the Open Pit were provided by Calder.
- Sufficient pumping capacity will be in place to pump excess water from Cell 1 to Hare Lake. The peak proposed pumping capacity is 1,000 m^3/hr and will be confirmed with detailed design.
- A water treatment plant will be in place to treat water prior to discharge to Hare Lake, if required.
- The proposed discharge rate varies throughout the mine life. Table 2 summarizes the estimated pumping rates and the associated dilution ratios.

Water Management Constraints

Various water management constraints were incorporated into the water balance models, which are provided on Table 1. The constraints are summarized as follows:

- Minimum Operating Pond Volume - This is the minimum pond volume for each of the basins. There will be no discharge (or reclaim) from the basin if the volume is at or less than this amount. The minimum pond volume in Cell 1 is approximately 747,000 m³ to provide water cover above the process solids at El. 320 m. The maximum operating pond volume is based on maintaining sufficient storage within Cell 1 below the spillway invert to contain the EDS from Cells 1 and 2 and the Open Pit. Approximately 3.1 million m³ of capacity is included in Cell 1 for storm water management. For Cell 2, the minimum pond volume varies to maintain water cover over the process solids. The maximum average water cover was assumed to be 2 m.

- Maximum Operating Pond Volume - This is the maximum operating pond volume for each of the basins. Excess water above this volume will be decanted, discharged (pumped) or conveyed over a spillway. Maximum pond volumes were calculated based on a 2 m spillway invert for both Cells 1 and 2.

- Environmental Design Storm (EDS) - This is defined as the Timmins Storm (193 mm event in 24 hours). Storage will be included to contain this event above the Maximum Operating Pond volume. Water from the EDS reporting to Cells 1 and 2 will be contained in Cell 1. Storm water from the Open Pit and mine site will be pumped to Cell 1 for storage and treatment, if required. Catchment areas and appropriate runoff coefficients were taken into account when estimated the runoff volumes for the EDS.

- Freeboard - Wet and Dry Freeboard for the PSMF are included. Wet freeboard includes the height required to pass the Inflow Design Flood (IDF) (1 in 10,000 year 24 hr. event (328mm)) over the spillway. Dry Freeboard includes the height to prevent wave run-up from overtopping the crest of the embankments. Dry Freeboard was determined based on calculated wave run-up heights. Wave run-up is a function of wind pressures and was calculated based on the U.S. Army Corps of Engineer's method presented in "Shore Protection Manual (1984)".

Methodology

The water balance analysis was completed using a spreadsheet approach and was developed for a pre-production period followed by the projected 11.5 year mine life and ending with a 3 year post-closure period. The water balance model estimates the water volumes for each basin on a monthly basis, using various inputs including catchment areas, runoff coefficients, and precipitation and evaporation data. The volumes of water reporting to Cells 1 and 2 and discharge volumes to Hare Lake were also calculated on a monthly basis.

The water balance spreadsheet model incorporates elevation versus storage capacity data for each of the basins, derived from the topography of the site. The elevation versus capacity relationship allows the required operating elevations for the individual basins to be estimated for the mine life.

A deterministic analysis was completed using average precipitation and evaporation data to estimate the expected water reporting to each basin over the course of the mine life. Figures 3 through 16 represent the results for the PSMF from pre-operations through Year 15.

The anticipated solids, water and required embankment elevations for Cell 1 are included on Figure 3. Figure 4 presents the water inventory for Cell 1 over the life of the mine and including the post-closure period. Figures 5 and 6 show the inputs and outputs to Cell 1, respectively. Figure 7 provides the

estimated solids, water and required dam elevations for Cell 2. Figure 8 presents the water inventory for Cell 2. Figures 9 and 10 show the inputs and outputs to Cell 2, respectively. The estimated solids (including Type 2 mine rock and process solids) and water elevations for Satellite Pits #2 and #3 are shown on Figures 11 and 13, respectively. Figures 12 and 14 show the water inventory for Pits #2 and #3 from Year 10 through Year 15. Figure 15 summarizes the discharge of water to the environment from Cell 1. Figure 16 shows the hydrograph of Hare Lake and Stream 6 inflows over the life of the mine.

Results

The results of the water balance analysis are provided on Figures 3 through 16. The results are discussed below:

Figure 3 - Cell 1 Solids Inventory and Embankment Elevation

- The required crest elevation for the proposed embankment provides sufficient capacity to contain the process solids, maximum operating pond volume and the EDS volumes.
- Cell 1 receives process solids for 18 months at the beginning of operations, as shown by the flat line of cumulative solids volume from Year 3 onwards.
- The volume of water accumulated in Cell 1 prior to operations is approximately 1.0 million m³, which is required for reclaim water during the initial months of operations. This water will be from runoff, dewatering and other sources, as required.

Figure 4 - Cell 1 Water Inventory

- Reclaim water is required directly from Cell 1 only at the beginning and end of operations. During normal operations, water will be transferred to Cell 2 for reclaim.
- Water is transferred from Cell 2 to Cell 1 via the spillway when the pond volume in Cell 2 reaches its maximum.
- Excess water discharged to the environment is relatively minimal during normal operations but increases near the end when the pond is dewatered.
- The total pond volume fluctuates monthly generally within the operating pond volume and ranges from approximately 1,423,000 m³ to 3,751,000 m³.
- During closure and post closure periods, the water inventory in the PSMF area consists of natural runoff.

Figure 5 - Cell 1 Water Inputs

- Inflow from the Open Pit is the single largest contributor to water in Cell 1. The peak flow from the Open Pit ranges from 1,670 to 1,830 m³/hr during April. The minimum flow rate ranges from 19 to 26 m³/hr during the winter months.
- Runoff from the PSMF catchment areas ranges from zero in the winter months to 355,000 m³ in April. During the summer runoff volumes are approximately 45,000 m³.
- The total runoff from the Cell 1 basin is fairly constant through the life of the mine.
- During closure and post closure periods, water inflow to the PSMF area consists of natural runoff.

Figure 6 - Cell 1 Water Outputs

- Reclaim water from Cell 1 is required in Years 1, 2, 10 and 12 when either Cell 2 or the satellite pits have insufficient water volume to provide 100% of the process water.
- Water is pumped to Cell 2, as required, for reclaim purposes. During regular operations the transfer rate to Cell 2 will range from 47,000 to 278,000 m³ (65 to 390 m³/hr).
- Excess water discharge to the environment increases at the end of operations when the ponds are drawn down for closure.
- Seepage and evaporation from Cell 1 are fairly constant over the operational period and decrease at closure.

- The peak excess water discharge rate occurs in April and May of Year 11 at 1,000 m³/hr.
- Discharge to Stream 6 from natural runoff during post closure conditions ranges from zero in the winter months to 914,000 m³ in April.

Figure 7 - Cell 2 Solids Inventory and Embankment Elevation

- The proposed embankment stages provide sufficient capacity to contain the process solids and the maximum operating pond volume. The EDS is conveyed via the spillway to Cell 1 for storage. The required embankment crest elevation increases steadily over the life of the mine.
- During pre-operations and the first 6 months of operations, Cell 2 will accumulate runoff water from the surrounding catchment. The estimated volume of water accumulated in Cell 2 prior to process solids deposition is approximately 1,116,000 m³.

Figure 8 - Cell 2 Water Inventory

- Reclaim water is pumped back to the plant from Cell 2 at a constant rate (1,120 m³/hr) starting in Year 3 to the end of Year 10.
- The pond volume fluctuates monthly but remains fairly close to the maximum operating pond volume.
- During closure and post closure periods, water from Cell 2 is transferred to Cell 1 via the spillway.

Figure 9 - Cell 2 Water Inputs

- Water from the process solids deposition comprises the majority of the water in the Cell 2 basin.
- Runoff volumes are significant in April and fairly consistent from May through October.
- Water pumped from Cell 1 is greatest during the winter of Year 4. As discussed under Figure 6, the pumping rate from Cell 1 to Cell 2 ranges from approximately 47,000 to 278,000 m³ (65 to 390 m³/hr) during normal operations.
- During closure and post closure periods, inflows to Cell 2 consist of natural runoff from the catchment areas.

Figure 10 - Cell 2 Water Outputs

- The majority of the water is reclaimed back to the Plant for use in the operations. A smaller portion is stored in the process solids voids.
- Seepage and evaporation from the facility steadily increase during operations as the supernatant pond area increases. At the end of operations, when the pond is drawn down, there is less evaporation as the pond area is significantly smaller.
- When the pond water elevation reaches the spillway invert, water is transferred to Cell 1.
- During closure and post closure periods, flows to Cell 1 range from zero in the winter months to approximately 600,000 m³ in April.

Figure 11 - Satellite Pit #2 Solids Inventory and Elevations

- Approximately 425,000 m³ of Type 2 mine rock is assumed to be deposited in Satellite Pit #2 prior to process solids deposition.
- Process solids deposition is assumed to occur from April of Year 11 to March of Year 12 with little to no water accumulated prior to deposition.
- Type 1 and Type 2 process solids will be deposited in Satellite Pit #2 to an estimated elevation of 258 m, leaving 4 m of water cover over the solids.
- Process solids will be deposited into Pit #2 until end of September Year 11.

Figure 12 - Satellite Pit #2 - Water Inventory

- Water will be reclaimed for operations from Satellite Pit #2 once process solids deposition begins and sufficient water has accumulated. Make-up water will be obtained from Cell 1 for several months of deposition during the winter when there may be insufficient reclaim water from Satellite Pit #2.
- The maximum reclaim rate is 1,120 m³/hr.
- Water that overflows the pit will be directed to the Primary Pit during closure and post closure periods.

Figure 13 - Satellite Pit #3 Solids Inventory and Elevations
- Approximately 1,768,000 m³ of Type 2 mine rock is assumed to be deposited in Satellite Pit #3 prior to process solids deposition.
- Process solids deposition is assumed to occur from April to the end of December in Year 12 with little or no water accumulated prior to deposition.
- Type 1 and Type 2 process solids will be deposited in Satellite Pit #3 to an estimated elevation of 286 m, leaving 4 m of water cover over the solids.

Figure 14 - Satellite Pit #3 Water Inventory
- Water will be reclaimed for processes from Satellite Pit #3 once process solids deposition begins. Make-up water will be obtained from Satellite Pit #2 for initial months of deposition when there may be a deficit of reclaim water from Satellite Pit #3.
- Water that overflows the pit will be directed to the Primary Pit during closure and post closure periods.

Figure 15 - Excess Water Discharge
- During normal operations, the discharge rate from Cell 1 ranges from 497,000 m³ to 1,490,000 m³ per year.
- In Years 10 and 11, Cells 1 and 2 are dewatered so the discharge rate is significantly higher at 2.24 million m³ to 2.61 million m³.
- The maximum estimated annual discharge to the environment was estimated based on the Hare Lake inflow hydrograph using the assumption that the minimum (volumetric) dilution ratio of natural flow to discharge is 2.0:1.

Figure 16 - Hare Lake and Stream 6 Inflows
- The total monthly inflow ranges from approximately 308,000 m³ in February to a maximum of 3.57 million m³ in April of Year 11.
- The total monthly discharge to Hare Lake from the mine ranges from zero during the winter months to a maximum of 744,000 m³.
- The dilution ratio of Hare Lake inflow to mine discharge is a minimum of 2.0:1.
- During the post-closure period, water (consisting of runoff from Cells 1 and 2) is discharged via the spillway to Stream 6.

Conclusions and Recommendations

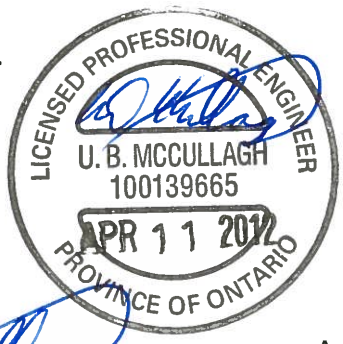
Based on the design criteria used in this analysis, it is expected that there will be minimal discharge to the environment (Hare Lake) during normal operations and increased discharge at the end of operations when the ponds are drawn down. Drawdown of the Cell 1 operating pond could also potentially be completed at closure and discharged to the Primary Pit. This remains to be confirmed with the site closure plan. The maximum annual discharge from Cell 1 is estimated to be approximately 2,610,000 m³ for April through November. The peak discharge rate occurs in April and is a maximum of 1,000 m³/hr. Excess water to be discharged from Cell 1 during operations may require treatment prior to being released to Hare Lake.

Pumping rates throughout the facility vary by year and month. The transfer rate from Cell 1 to Cell 2 depends on the water required for reclaim. The maximum transfer rate is approximately 390 m³/hr. Runoff from the mine site and Open Pit is pumped to Cell 1 at a maximum rate ranging from 1,670 to 1,830 m³/hr in April to a minimum of 19 m³/hr during winter months.

Some of the input parameters, assumptions and design criteria are preliminary and may be optimized during later stages of design. All assumptions and design criteria for the water balance should be reviewed and confirmed with all parties involved.

If you have any questions with regards to the water/solids balance, please contact us.

Yours truly,
KNIGHT PIESOLD LTD.



Signed: _____ Approved: _____

Una McCullagh, P.Eng.
Project Engineer

Ken D. Embree, P.Eng.
Managing Director

Attachments:

Table 1 Rev 0	Design Criteria
Table 2 Rev 0	Estimated Maximum Discharge Rates to Hare Lake
Figure 1 Rev 0	Combined Storage Area PSMF - General Site Layout
Figure 2 Rev 0	Water Balance Flowsheet - Average Conditions - Year 6 of Operations
Figure 3 Rev 0	Cell 1 - Solids Inventory and Embankment Elevation - Average Conditions
Figure 4 Rev 0	Cell 1 - Water Inventory - Average Conditions
Figure 5 Rev 0	Cell 1 - Water Inputs - Average Conditions
Figure 6 Rev 0	Cell 1 - Water Outputs - Average Conditions
Figure 7 Rev 0	Cell 2 - Solids Inventory and Embankment Elevation - Average Conditions
Figure 8 Rev 0	Cell 2 - Water Inventory - Average Conditions
Figure 9 Rev 0	Cell 2 - Water Inputs - Average Conditions
Figure 10 Rev 0	Cell 2 - Water Outputs - Average Conditions
Figure 11 Rev 0	Satellite Pit #2 - Solids Inventory and Elevations - Average Conditions
Figure 12 Rev 0	Satellite Pit #2 - Water Inventory - Average Conditions
Figure 13 Rev 0	Satellite Pit #3 - Solids Inventory and Elevations - Average Conditions
Figure 14 Rev 0	Satellite Pit #3 - Water Inventory - Average Conditions
Figure 15 Rev 0	Excess Water Discharge - Average Conditions
Figure 16 Rev 0	Hare Lake and Stream 6 Inflows - Average Conditions

Copy To: Stan Emms, SCI
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Dan Turk, SCI
Kevin McCarthy, SCI
Brian Fraser, Ecometrix
Ron Nicholson, Ecometrix
Rob Whyte, Calder
Leif Nelson, TGCL

/ubm

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TABLE 1

STILLWATER CANADA INC.
MARATHON PGM-Cu PROJECT

COMBINED STORAGE AREA PSMF - WATER/SOLIDS BALANCE
DESIGN CRITERIA

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Parameter	Unit	Area	Value	Source	Comments
Nominal milling rate	t/d	Cells 1 & 2 & Pits	22,000	SCI	
Dry Density of Deposited Tailings	t/m³	Cells 1 & 2 & Pits	1.48	AMEC	
Specific Gravity		Cells 1 & 2 & Pits	3.1	Golder Associates	
Slurry Percent Solids	%	Cells 1 & 2 & Pits	45	SCI	
Type 1 Process Solids	%	Cells 1 & 2 & Pits	85	SCI	
Type 2 Process Solids	%	Cells 1 & 2 & Pits	15	SCI	
Pond/Beach Ratio	%	Cell 1	100	Assumption	
		Cell 2	85	Assumption	
Dry Beach/Active Beach Ratio	%	Cell 2	25	Assumption	
Average Reclaim Rate	m³/day	Cell 2 and Satellite Pits	26,900	Calculation	100% of process water
Discharge from Pit	m³/day	Cell 1	varies	Calder Engineering Ltd.	
Seepage	m³/day	Cell 1	0	Seepage analysis (NB11-00455)	Pre-operations
			366	Seepage analysis (NB11-00455)	For Stage 1 embankment (Year 1)
			347	Seepage analysis (NB11-00455)	Years 3-11.5
		Cell 2	0	Seepage analysis (NB11-00455)	Pre-operations
			13	Seepage analysis (NB11-00455)	For Stage 1 embankment (Year 1)
			63	Seepage analysis (NB11-00455)	Year 3
			varies	Interpolated	Years 2, 4-10
			233	Seepage analysis (NB11-00455)	For final embankment crest (Year 11)
Basin Area	ha	Cell 1	115.5	AutoCAD model	
		Cell 2	209.6	AutoCAD model	
		Satellite Pit #2	10.6	AutoCAD model	
		Satellite Pit #3	14.7	AutoCAD model	
Minimum Pond Volume	m³	Cell 1	747,000	Calculation	2 m water cover over process solids at El. 320 m
		Cell 2	varies	Calculation	1 m water cover over process solids
		Satellite Pit #2	423,800	Calculation	4 m water cover over process solids
		Satellite Pit #3	549,000	Calculation	4 m water cover over process solids
Maximum Operating Pond Volume	m³	Cell 1	3,100,000	Calculation	Capacity above solids to spillway minus EDS
		Cell 2	varies	Calculation	2 m water cover over process solids
		Satellite Pit #2	varies	Calculation	Volume to top of pit elevation minus EDS
		Satellite Pit #3	varies	Calculation	Volume to top of pit elevation minus EDS
Environmental Design Storm (EDS)	m³	Cell 1	214,000	Calculation - Ultimate Footprint	Timmins Storm = 193 mm
		Cell 2	405,000	Calculation - Ultimate Footprint	Timmins Storm = 193 mm
		Open Pit	623,000	Calder Engineering Ltd.	Timmins Storm = 193 mm
Inflow Design Flood Freeboard (Wet Freeboard)	m	Cell 1	1.0	Calculation	PMP = 328 mm
		Cell 2	1.0	Calculation	PMP = 328 mm
Wave Run-up Freeboard (Dry Freeboard)	m	Cell 1	1.0	Calculation	
		Cell 2	1.2	Calculation	
Effective Precipitation	mm	All	varies	Calder Engineering Ltd.	
Evaporation	mm	All	varies by month	Calder Engineering Ltd.	
Runoff Coefficients	%	All	varies	Calder Engineering Ltd.	

I:\1\01\00446\03\A\Correspondence\NB12-00153 - Updated Combined Storage Area Water Balance\[Table 1 - Design Criteria.xlsx]Table 1 - Design Criteria

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
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TABLE 2

STILLWATER CANADA INC.
MARATHON PGM-Cu PROJECT

COMBINED STORAGE AREA PSMF - WATER/SOLIDS BALANCE
ESTIMATED MAXIMUM DISCHARGE RATES TO HARE LAKE

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Month	Hare Lake Inflow (m^3)	Maximum Discharge (m^3)	Net Flow (m^3)	Dilution Ratio (Hare Lake Inflow / Maximum Discharge)
January	465,186		465,200	
February	308,154		308,200	
March	356,469		356,500	
April	2,850,120	720,000	3,570,100	4.0
May	2,688,072	744,000	3,432,100	3.6
June	529,680	265,000	794,700	2.0
July	912,361	372,000	1,284,400	2.5
August	1,621,362	420,000	2,041,400	3.9
September	1,460,220	720,000	2,180,200	2.0
October	1,025,294	510,000	1,535,300	2.0
November	1,646,460	720,000	2,366,500	2.3
December	873,207		873,200	
Annual Totals	14,736,585	4,471,000	19,207,800	3.3

I:\1\01\00446\03\A\Correspondence\NB12-00153 - Updated Combined Storage Area Water Balance\[Table 2 - Maximum Design Flows.xlsx]Table 2

NOTES:

1. HARE LAKE INFLOWS PROVIDED BY CALDER ENGINEERING LTD. (NOVEMBER 24, 2011).
2. ESTIMATED DISCHARGE RATES ARE BASED ON AVERAGE PRECIPITATION CONDITIONS.

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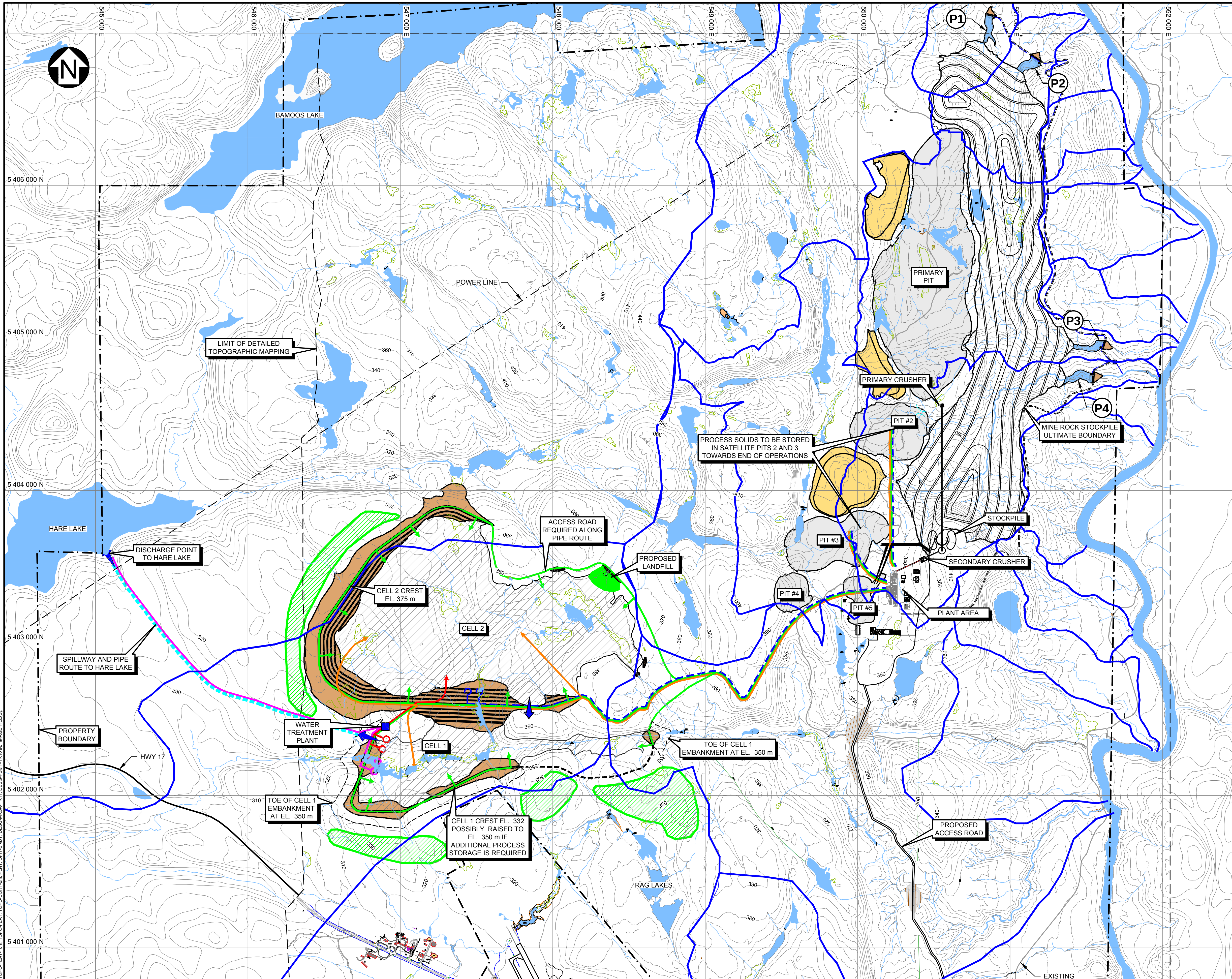

LEGEND:

- WATER
- PROPOSED LANDFILL
- EMBANKMENT
- PROCESS SOLIDS/WATER
- SURFACE SOIL STOCKPILE
- PROPERTY BOUNDARY
- ROAD
- TYPE 1 PROCESS SOLIDS PIPELINE
- TYPE 2 PROCESS SOLIDS PIPELINE
- RECLAIM WATER PIPELINE
- WATER TRANSFER PIPELINE
- EXCESS WATER DISCHARGE PIPELINE
- SPILLWAY TO HARE LAKE
- WATER TREATMENT PLANT
- TYPE 1 PROCESS SOLIDS DISCHARGE POINT
- TYPE 2 PROCESS SOLIDS DISCHARGE POINT
- SPILLWAY / DISCHARGE LOCATION
- WATERSHED BOUNDARY (SEE NOTE 5)

NOTES:

1. COORDINATE GRID IS UTM (NAD27) ZONE 16N AND IS IN METRES.
2. PLAN BASED ON INFORMATION PROVIDED BY STILLWATER CANADA INC.
3. CONTOURS ARE IN METRES. CONTOUR INTERVAL IS 10 METRES.
4. ACCESS ROAD CONSTRUCTION REQUIRED ALONG PROPOSED PIPE ROUTES.
5. WATERSHED BOUNDARIES AROUND THE PIT AND MINE ROCK STOCKPILE FROM CALDER DRAWING DATED SEPTEMBER 2011. ALL OTHER WATERSHED BOUNDARIES FROM ECOMETRIX DRAWING (DATED DEC. 2009).

SCALE A 250 125 0 250 500 750 1000 1250 m

STILLWATER CANADA INC.

MARATHON PGM-Cu PROJECT

COMBINED STORAGE AREA PSMF GENERAL SITE LAYOUT

Knight Piésold CONSULTING

P/A NO.	REF NO.
NB101-446/3	NB12-00153

FIGURE 1 — REV 0

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
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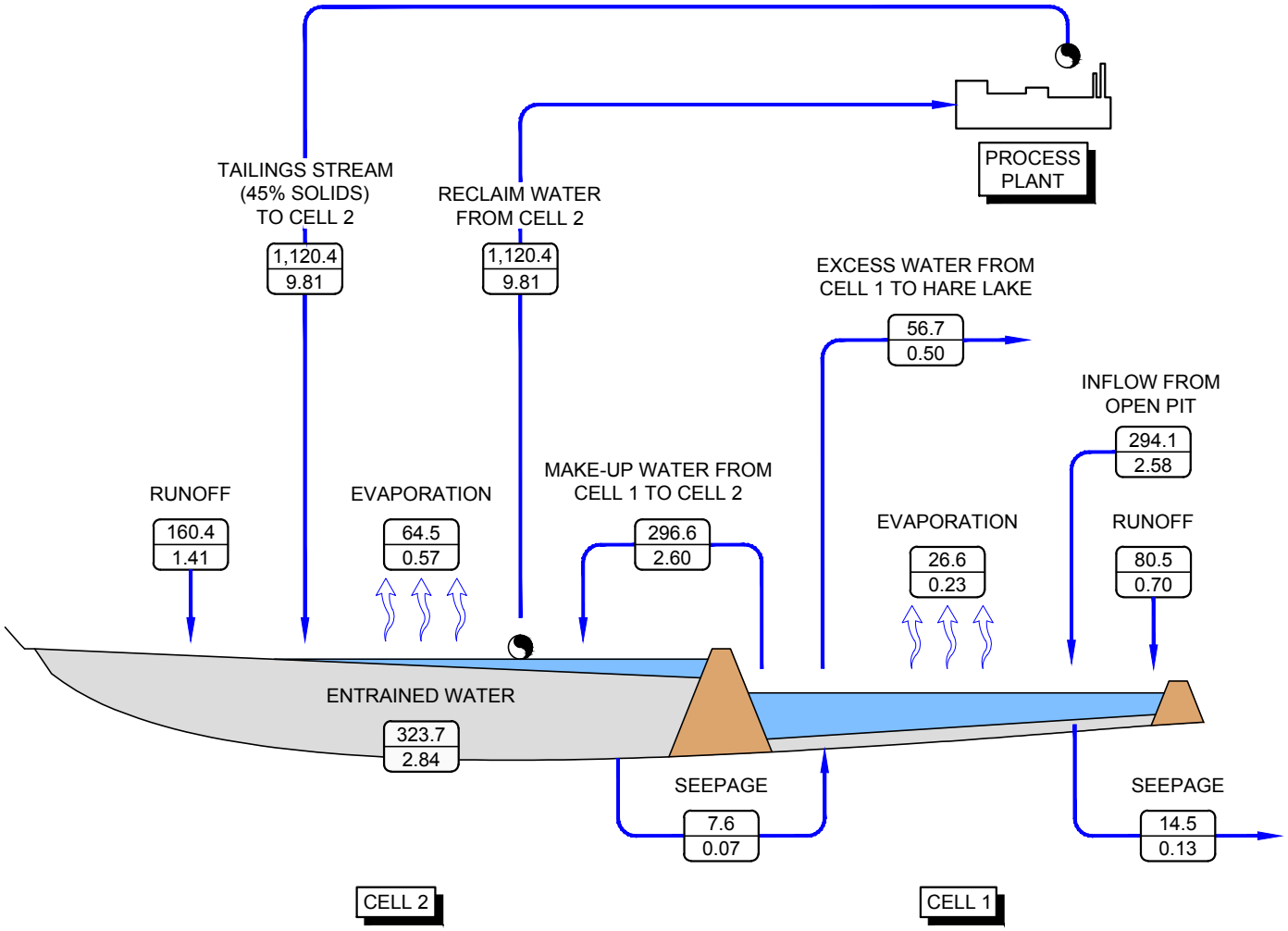
NOTES:

1. VALUES ARE BASED ON AVERAGE WATER BALANCE RESULTS.

LEGEND:

196.0 / 1.72 — m³ / HOUR (AVERAGE OVER THE YEAR) / MILLION m³ / YEAR



REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
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STILLWATER CANADA INC.

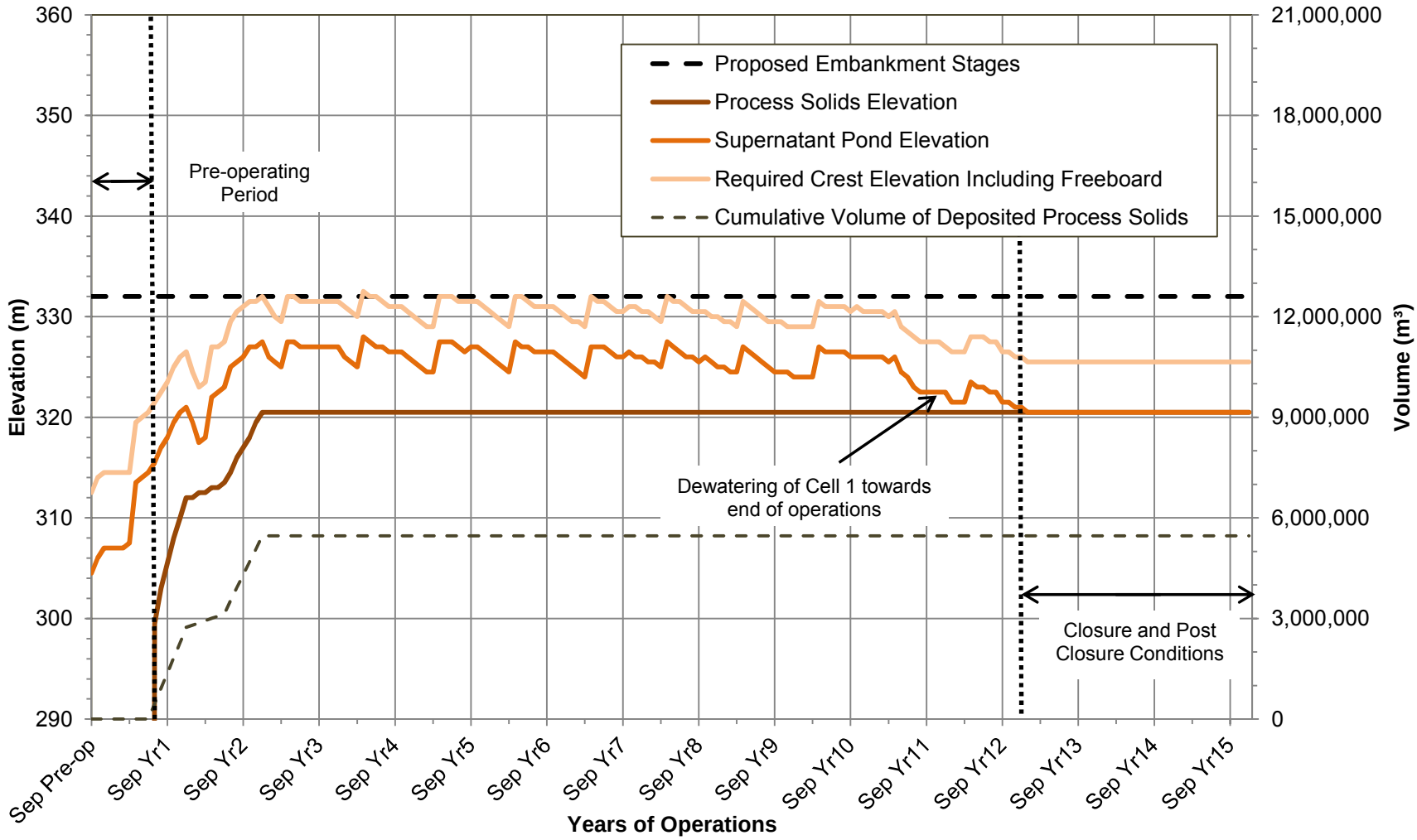
MARATHON PGM-Cu PROJECT

WATER BALANCE FLOWSHEET
AVERAGE CONDITIONS
YEAR 6 OF OPERATIONS

Knight Piésold CONSULTING

P/A NO. NB101-446/3 | REF NO. NB12-00153

FIGURE 2 | REV 0



NOTES:

1. PROJECTED SOLIDS ELEVATION IS BASED ON A PRODUCTION RATE OF 22,000 dtpd AND A SETTLED DRY DENSITY OF 1.48 t/m³.
2. CELL 1 PROVIDES STORAGE OF THE ENVIRONMENTAL DESIGN STORM (EDS - TIMMINS STORM) RUNOFF VOLUMES FOR CELL 1, CELL 2 AND THE MINE SITE (INCLUDING THE PITS).
3. STAGE 1 CONSTRUCTION TO BE COMPLETED BY SEPTEMBER YEAR-1 AND TAILINGS DEPOSITION TO CELL 2 TO BEGIN JANUARY YEAR 2.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	11APR'12	ISSUED WITH LETTER	UBM	CNH	KDE

STILLWATER CANADA INC.

MARATHON PGM-Cu PROJECT

CELL 1
SOLIDS INVENTORY AND EMBANKMENT ELEVATION
AVERAGE CONDITIONS

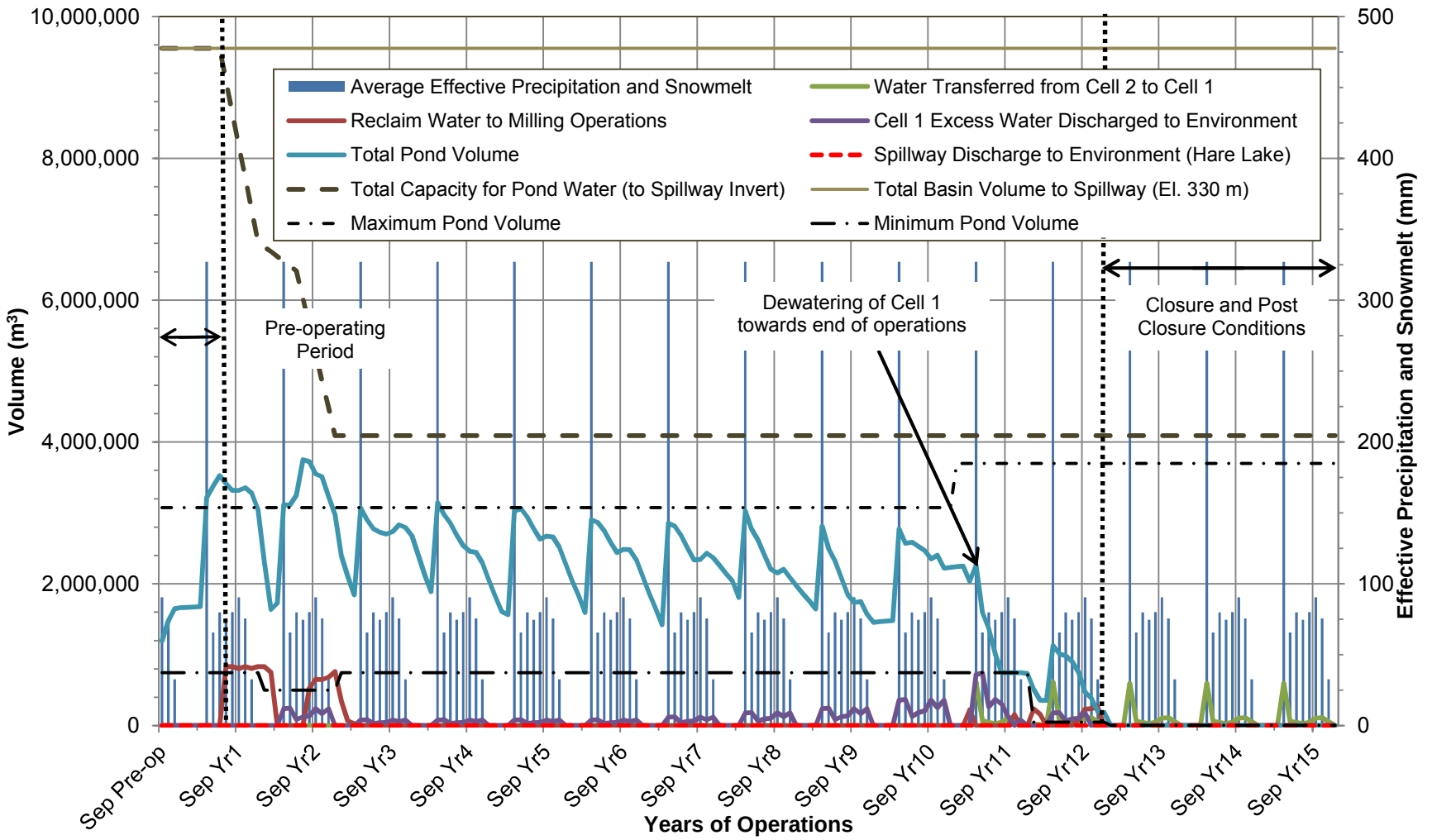
Knight Piésold CONSULTING

P/A NO. NB101-446/3

REF. NO. NB12-00153

FIGURE 3

REV 0



NOTES:

1. PRECIPITATION DATA WAS OBTAINED FROM CALDER ENGINEERING LTD. TECHNICAL MEMORANDUM 09-115 DATED NOVEMBER 23rd, 2011.
2. CELL 1 PROVIDES STORAGE OF THE ENVIRONMENTAL DESIGN STORM (EDS - TIMMINS STORM) RUNOFF VOLUMES FOR CELL 1, CELL 2 AND THE MINE SITE (INCLUDING THE PITS).

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	11APR'12	ISSUED WITH LETTER	UBM	CNH	KDE

STILLWATER CANADA INC.

MARATHON PGM-Cu PROJECT

CELL 1
WATER INVENTORY
AVERAGE CONDITIONS

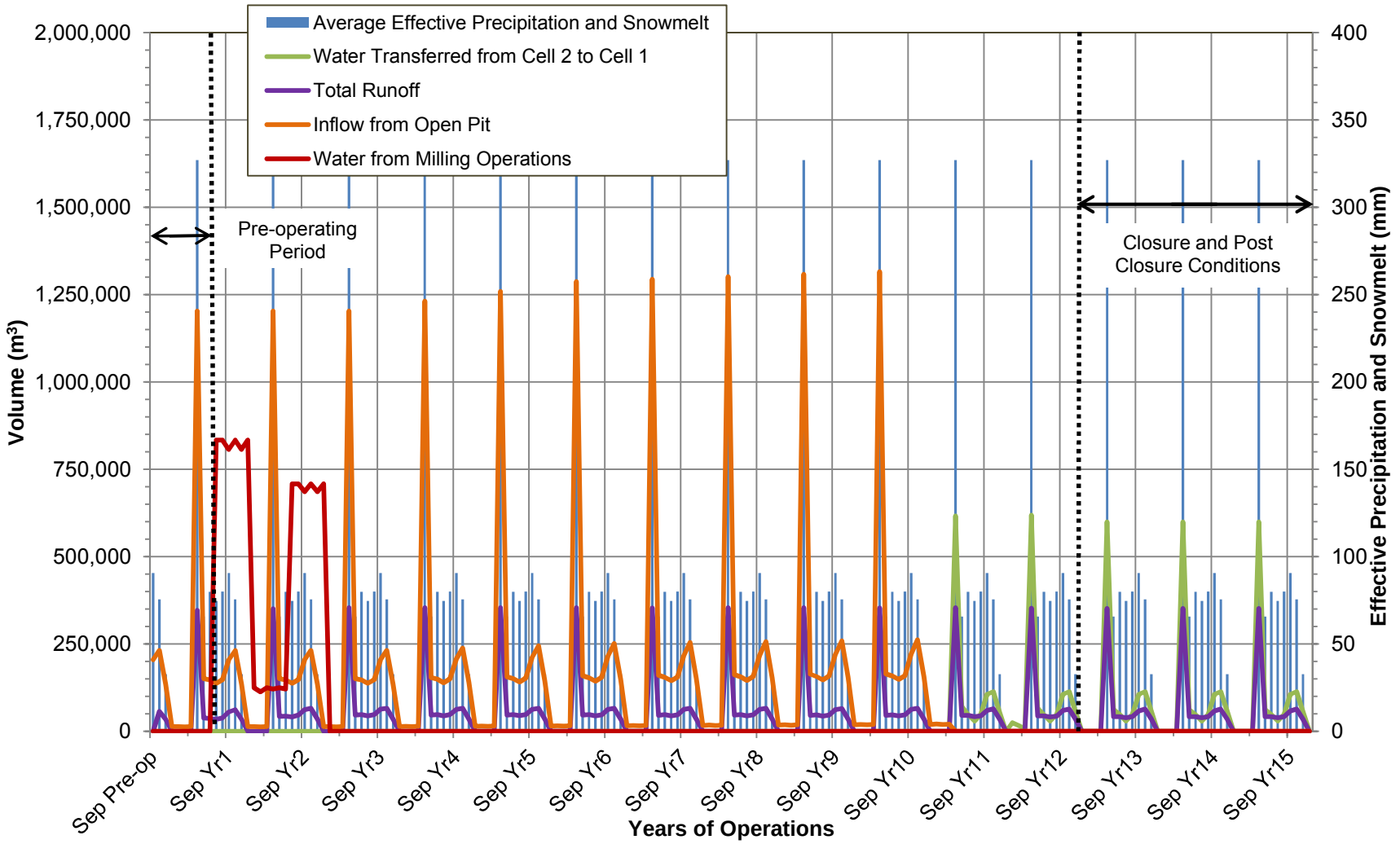
Knight Piésold CONSULTING

P/A NO. NB101-446/3

REF. NO. NB12-00153

FIGURE 4

REV 0



NOTES:

1. PRECIPITATION DATA WAS OBTAINED FROM CALDER ENGINEERING LTD. TECHNICAL MEMORANDUM 09-115 DATED NOVEMBER 23rd, 2011.
2. RUNOFF WATER TO THE OPEN PITS WILL BE PUMPED TO CELL 1 DURING THE FIRST 10 YEARS OF OPERATIONS. DURING THE LAST 2 YEARS OF OPERATIONS, RUNOFF WATER WILL BE MANAGED IN THE SATELLITE PITS AND USED AS RECLAIM WATER FOR THE PLANT.
3. CAPACITY TO STORE RUNOFF VOLUMES FROM THE OPEN PIT RESULTING FROM THE TIMMINS STORM WILL BE MAINTAINED WITHIN CELL 1.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	11APR'12	ISSUED WITH LETTER	UBM	CNH	KDE

STILLWATER CANADA INC.

MARATHON PGM-Cu PROJECT

CELL 1
WATER INPUTS
AVERAGE CONDITIONS

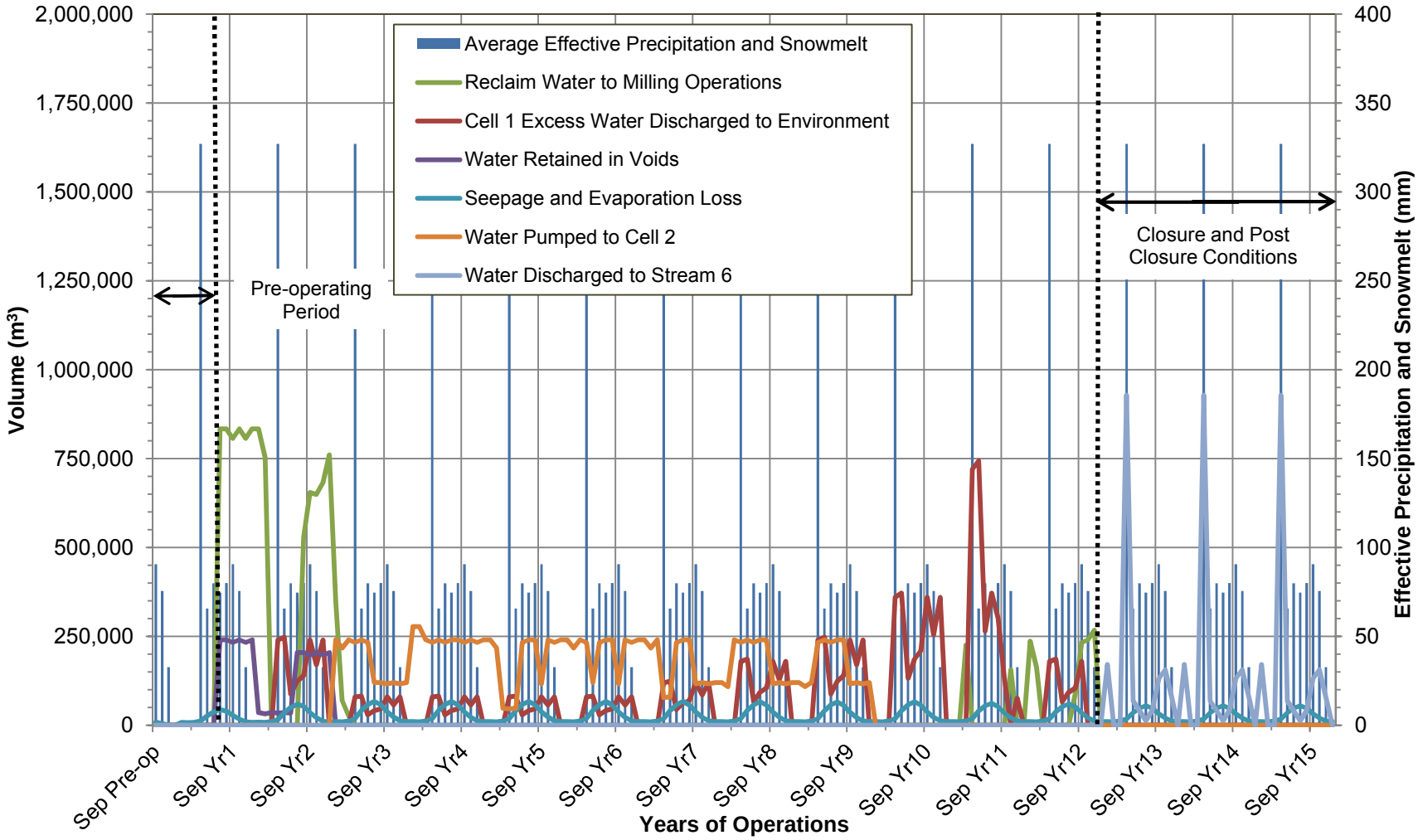
Knight Piésold CONSULTING

P/A NO. NB101-446/3

REF. NO. NB12-00153

FIGURE 5

REV 0



NOTES:

1. PRECIPITATION DATA WAS OBTAINED FROM CALDER ENGINEERING LTD. TECHNICAL MEMORANDUM 09-115 DATED NOVEMBER 23rd, 2011.
2. WATER WILL BE PUMPED FROM CELL 1 TO CELL 2 TO PROVIDE SUFFICIENT RECLAIM WATER BACK TO THE PLANT FROM CELL 2.
3. AFTER CLOSURE, EXCESS WATER (RUNOFF) WILL BE DISCHARGED FROM CELL 1 TO STREAM 6 VIA THE SPILLWAY.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	11APR'12	ISSUED WITH LETTER	UBM	CNH	KDE

STILLWATER CANADA INC.

MARATHON PGM-Cu PROJECT

CELL 1
WATER OUTPUTS
AVERAGE CONDITIONS

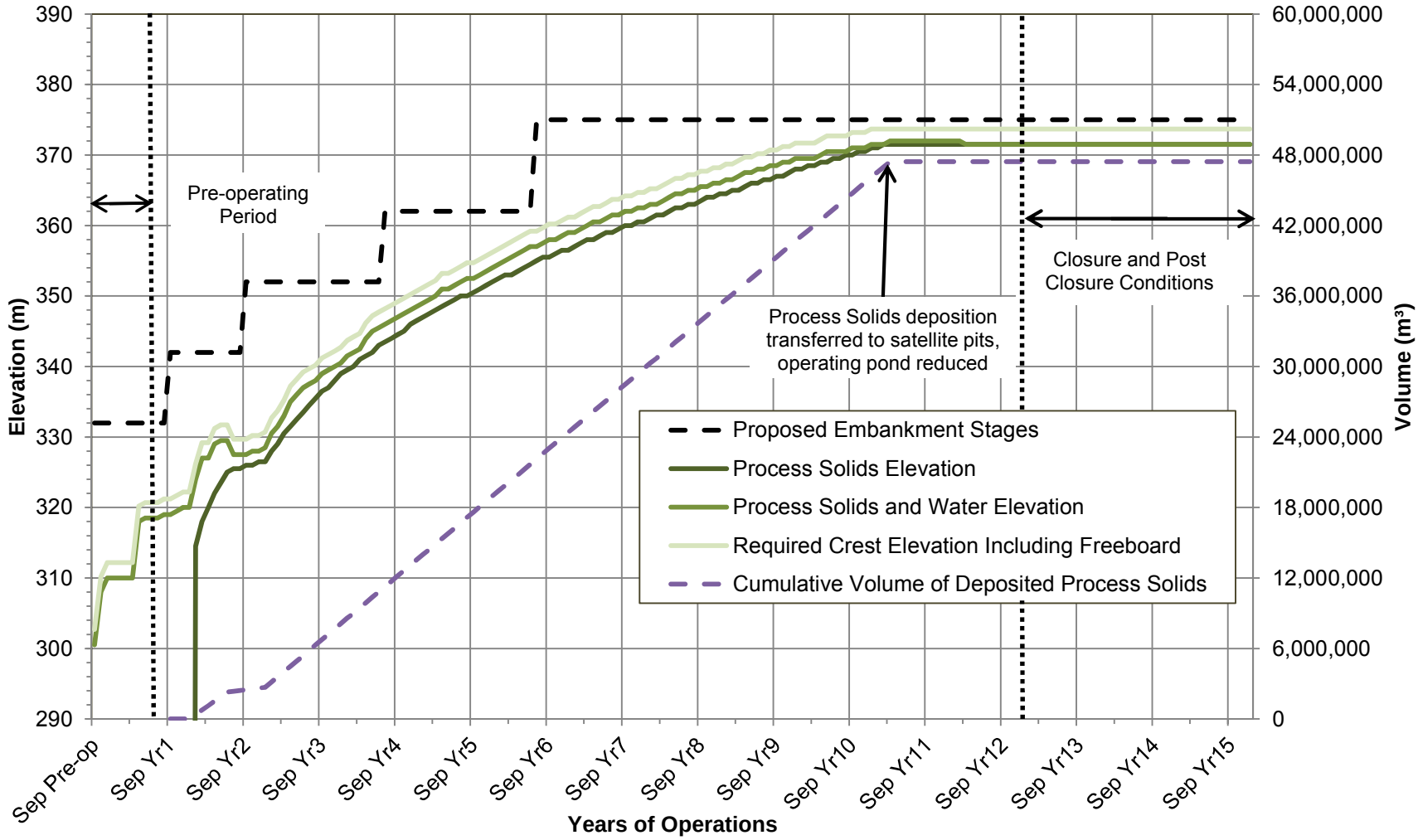
Knight Piésold CONSULTING

P/A NO. NB101-446/3

REF. NO. NB12-00153

FIGURE 6

REV 0



NOTES:

1. PROJECTED SOLIDS ELEVATION IS BASED ON A PRODUCTION RATE OF 22,000 dtpd AND A SETTLED DRY DENSITY OF 1.48 t/m³.
2. THE ENVIRONMENTAL DESIGN STORM (EDS) FROM CELL 2 IS CONVEYED TO CELL 1 THROUGH THE DECANT STRUCTURE AND SPILLWAY.
3. STAGE 1 CONSTRUCTION TO BE COMPLETED BY SEPTEMBER YEAR-1 AND TAILINGS DEPOSITIONS TO CELL 2 TO BEGIN JANUARY YEAR 2.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	11APR'12	ISSUED WITH LETTER	UBM	CNH	KDE

STILLWATER CANADA INC.

MARATHON PGM-Cu PROJECT

CELL 2
SOLIDS INVENTORY AND EMBANKMENT ELEVATION AVERAGE CONDITIONS

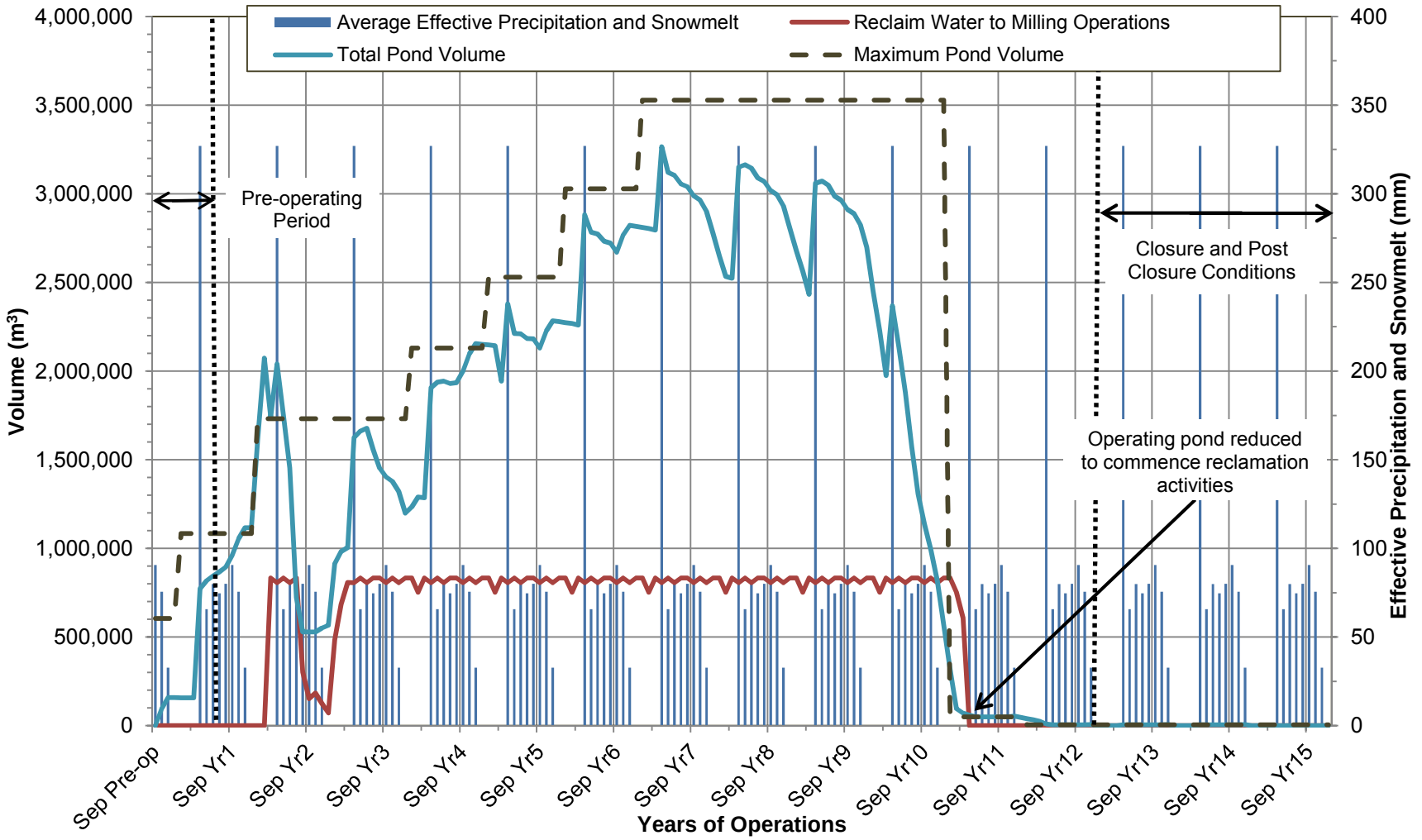
Knight Piésold CONSULTING

P/A NO. NB101-446/3

REF. NO. NB12-00153

FIGURE 7

REV 0



NOTES:

1. PRECIPITATION DATA WAS OBTAINED FROM CALDER ENGINEERING LTD. TECHNICAL MEMORANDUM 09-115 DATED NOVEMBER 23rd, 2011.
2. RECLAIM WATER WILL BE PUMPED FROM CELL 2 TO THE PLANT DURING THE FIRST YEARS OF OPERATIONS. RECLAIM WATER WILL COME FROM THE SATELLITE PITS DURING THE LAST 2 YEARS OF OPERATIONS.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	11APR'12	ISSUED WITH LETTER	UBM	CNH	KDE

STILLWATER CANADA INC.

MARATHON PGM-Cu PROJECT

CELL 2
WATER INVENTORY
AVERAGE CONDITIONS

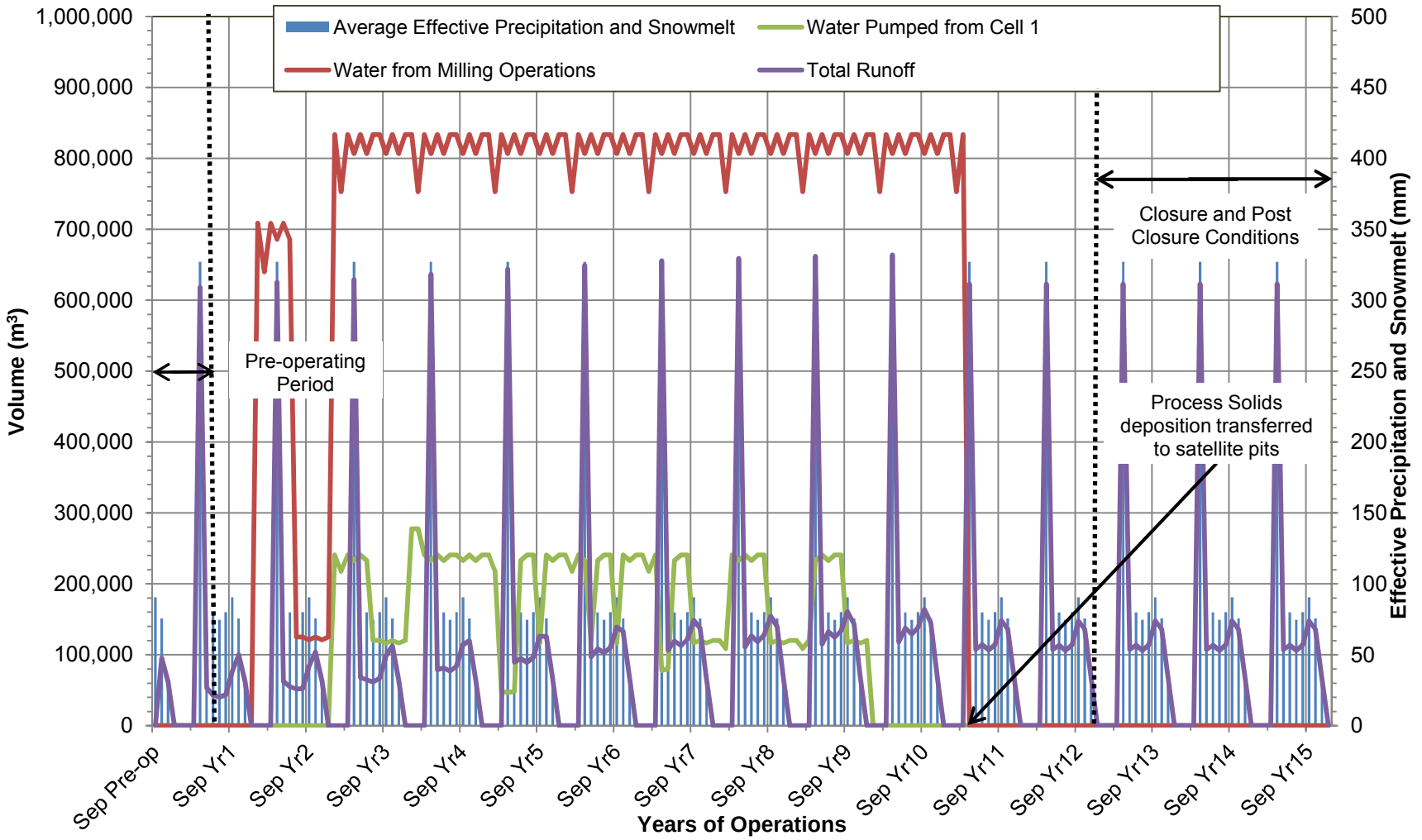
Knight Piésold CONSULTING

P/A NO. NB101-446/3

REF. NO. NB12-00153

FIGURE 8

REV 0



NOTES:

1. PRECIPITATION DATA WAS OBTAINED FROM CALDER ENGINEERING LTD. TECHNICAL MEMORANDUM 09-115 DATED NOVEMBER 23rd, 2011.
2. WATER WILL BE PUMPED FROM CELL 1 TO CELL 2 TO PROVIDE SUFFICIENT RECLAIM WATER BACK TO THE PLANT FROM CELL 2.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	11APR'12	ISSUED WITH LETTER	UBM	CNH	KDE

STILLWATER CANADA INC.

MARATHON PGM-Cu PROJECT

CELL 2
WATER INPUTS
AVERAGE CONDITIONS

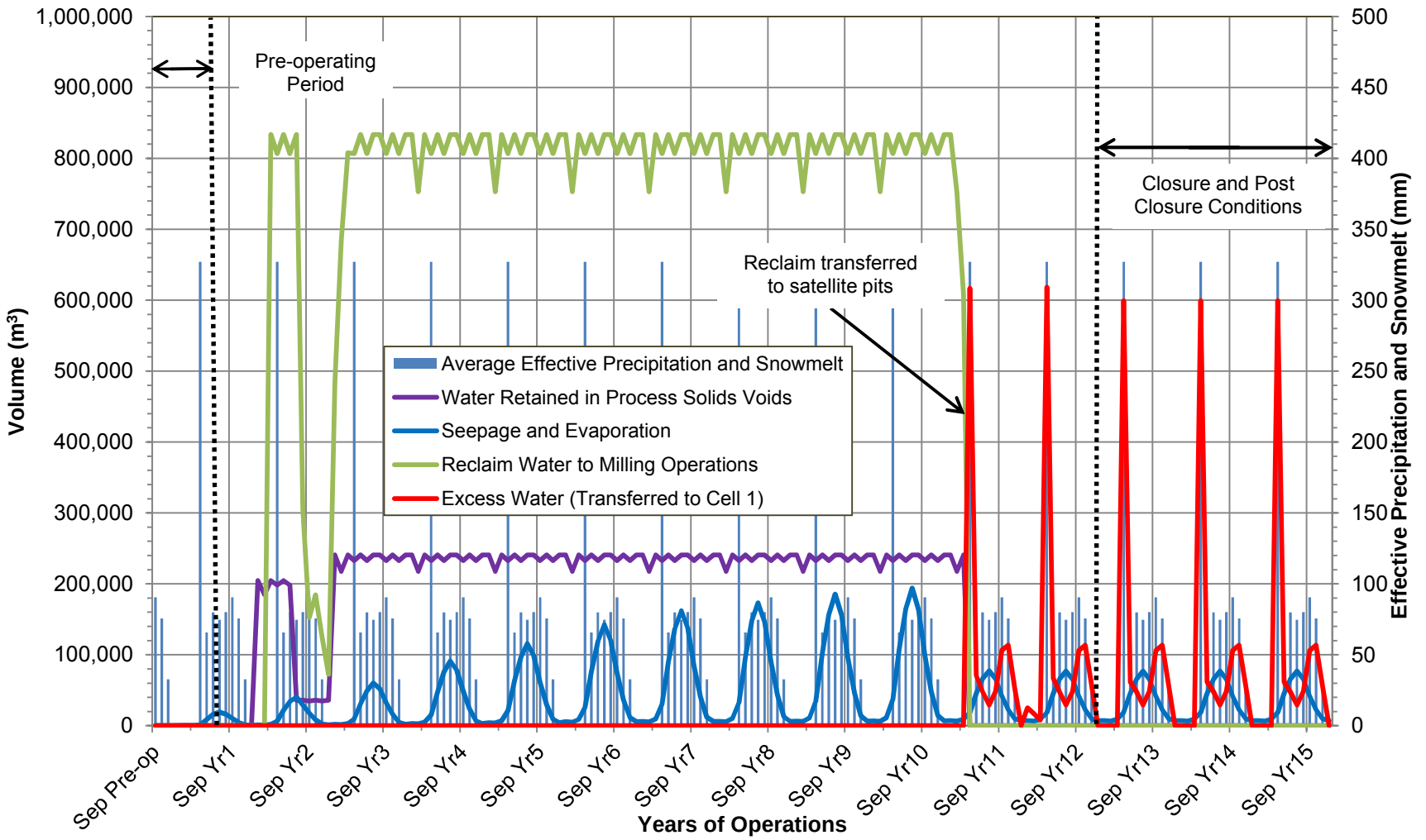
Knight Piésold CONSULTING

P/A NO. NB101-446/3

REF. NO. NB12-00153

FIGURE 9

REV 0



NOTES:

1. PRECIPITATION DATA WAS OBTAINED FROM CALDER ENGINEERING LTD. TECHNICAL MEMORANDUM 09-115 DATED NOVEMBER 23rd, 2011.
2. EXCESS WATER FROM YEAR 10 ONWARDS WILL CONSIST OF RUNOFF WATER AND BE TRANSFERRED TO CELL 1 FROM CELL 2 VIA THE SPILLWAY.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	11APR'12	ISSUED WITH LETTER	UBM	CNH	KDE

STILLWATER CANADA INC.

MARATHON PGM-Cu PROJECT

CELL 2
WATER OUTPUTS
AVERAGE CONDITIONS

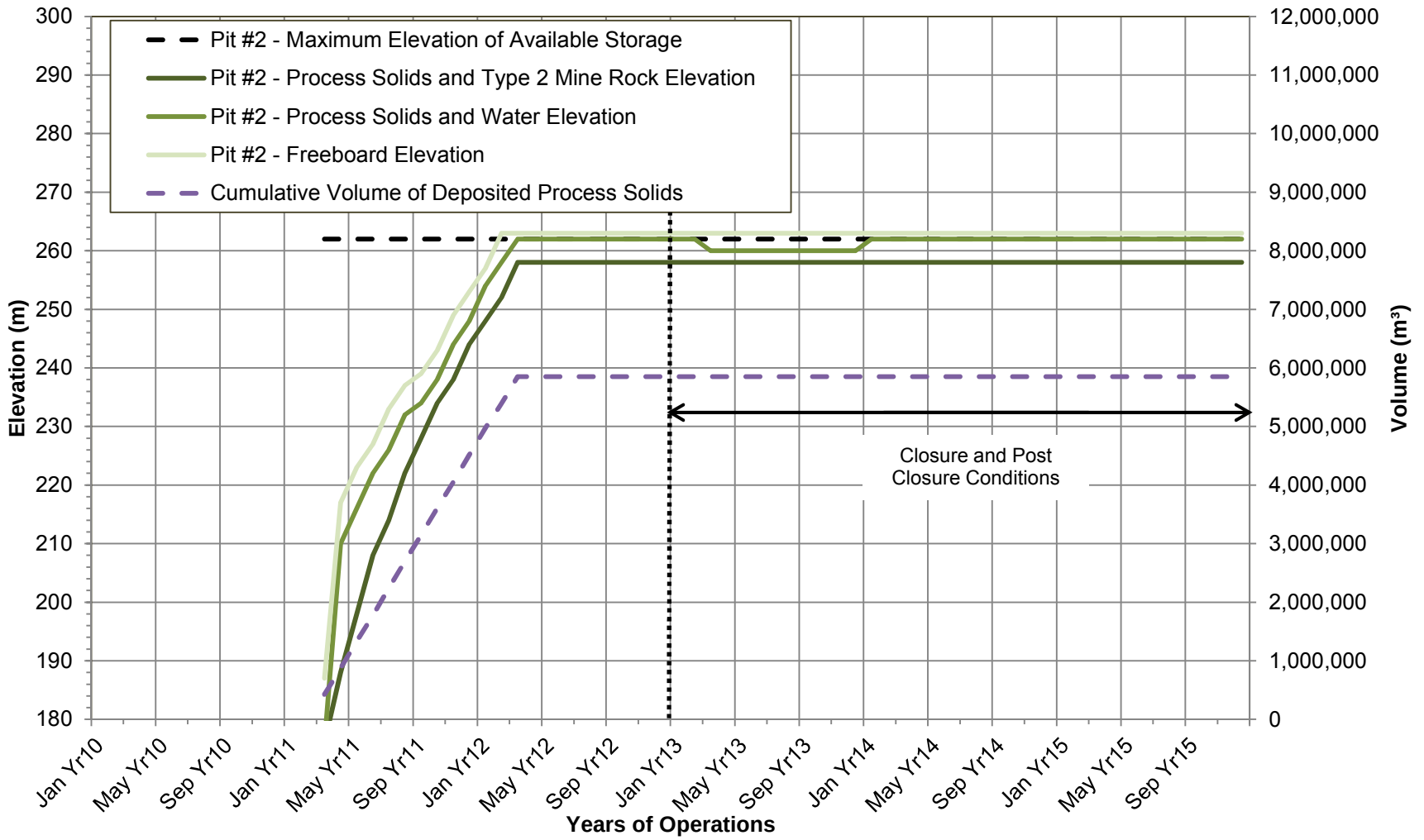
Knight Piésold CONSULTING

P/A NO. NB101-446/3

REF. NO. NB12-00153

FIGURE 10

REV 0



NOTES:

1. PROJECTED SOLIDS ELEVATION IS BASED ON A PRODUCTION RATE OF 22,000 dtpd AND A SETTLED DRY DENSITY OF 1.48 t/m³.
2. THE PIT WALL INTERSECTS THE SURFACE TOPOGRAPHY AT EL. 262 m. A 4 m ALLOWANCE HAS BEEN INCLUDED FOR WATER COVER OVER THE TYPE 2 MATERIALS.
3. APPROXIMATELY 425,000 m³ OF MINE ROCK WILL BE DEPOSITED TO SATELLITE PIT #2 PRIOR TO PROCESS SOLIDS DEPOSITION.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	11APR'12	ISSUED WITH LETTER	UBM	CNH	KDE

STILLWATER CANADA INC.

MARATHON PGM-Cu PROJECT

SATELLITE PIT #2
SOLIDS INVENTORY AND ELEVATIONS
AVERAGE CONDITIONS

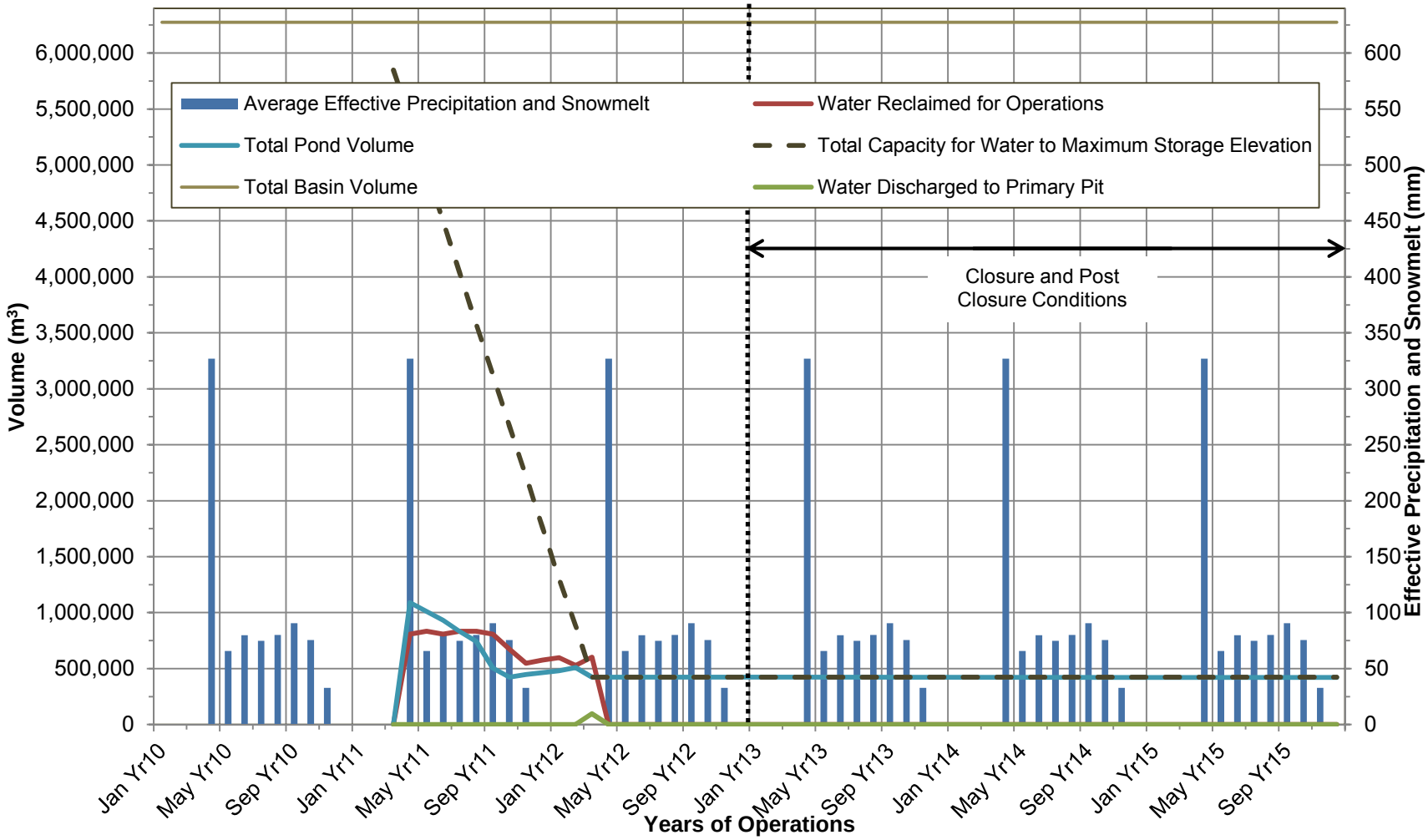
Knight Piésold CONSULTING

P/A NO. NB101-446/3

REF. NO. NB12-00153

FIGURE 11

REV 0



NOTES:

1. PRECIPITATION DATA WAS OBTAINED FROM CALDER ENGINEERING LTD. TECHNICAL MEMORANDUM 09-115 DATED NOVEMBER 23rd, 2011
2. RUNOFF WATER WILL BE DISCHARGED TO THE PRIMARY PIT STARTING IN YEAR 13.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	11APR'12	ISSUED WITH LETTER	UBM	CNH	KDE

STILLWATER CANADA INC.

MARATHON PGM-Cu PROJECT

SATELLITE PIT #2
WATER INVENTORY
AVERAGE CONDITIONS

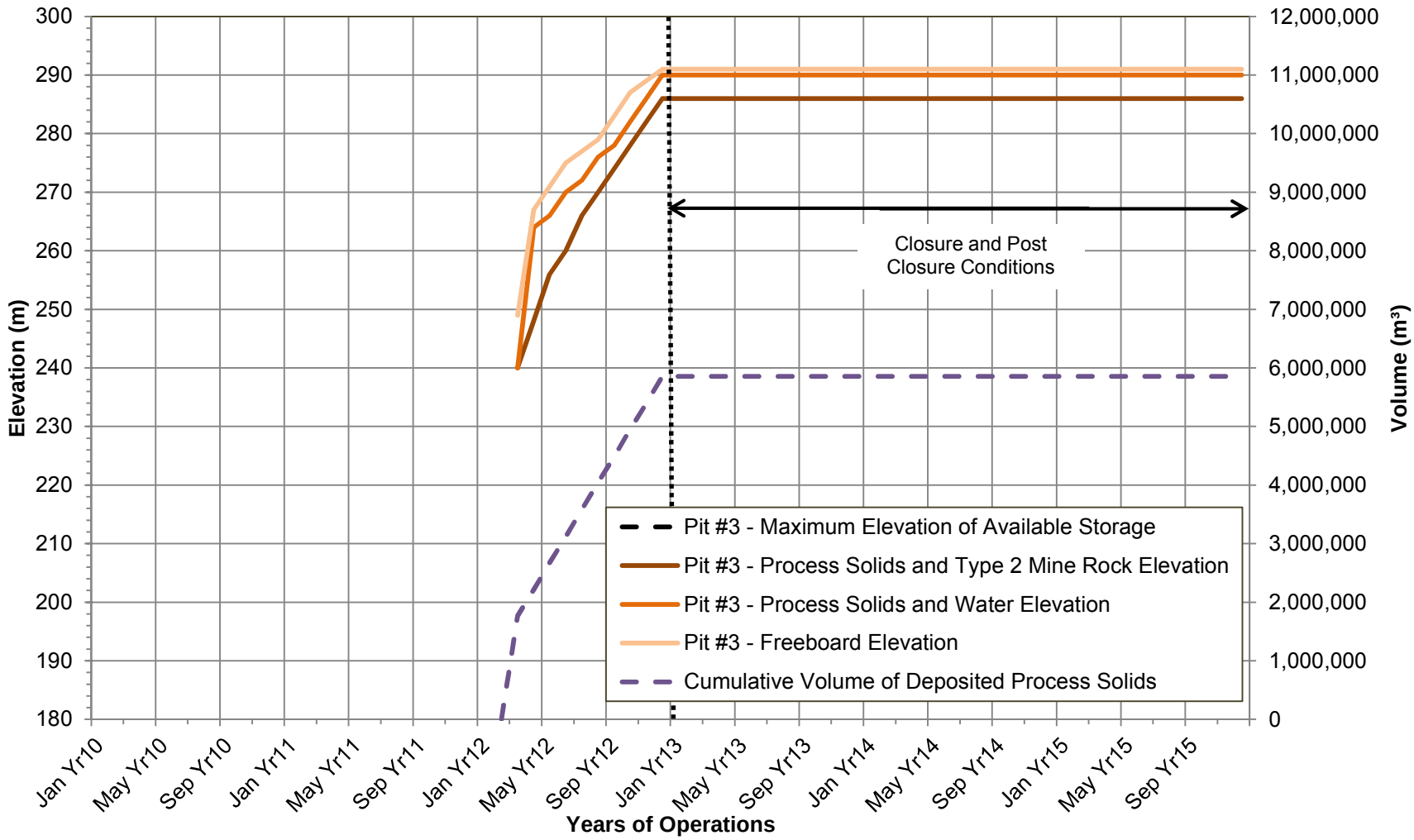
Knight Piésold CONSULTING

P/A NO. NB101-446/3

REF. NO. NB12-00153

FIGURE 12

REV 0



NOTES:

1. PROJECTED SOLIDS ELEVATION IS BASED ON A PRODUCTION RATE OF 22,000 dtpd AND A SETTLED DRY DENSITY OF 1.48 t/m³.
2. THE PIT WALL INTERSECTS THE SURFACE TOPOGRAPHY AT EL. 290 m. A 4 m ALLOWANCE HAS BEEN INCLUDED FOR WATER COVER OVER THE TYPE 2 MATERIALS.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	11APR'12	ISSUED WITH LETTER	UBM	CNH	KDE

STILLWATER CANADA INC.

MARATHON PGM-Cu PROJECT

SATELLITE PIT #3
SOLIDS INVENTORY AND ELEVATIONS
AVERAGE CONDITIONS

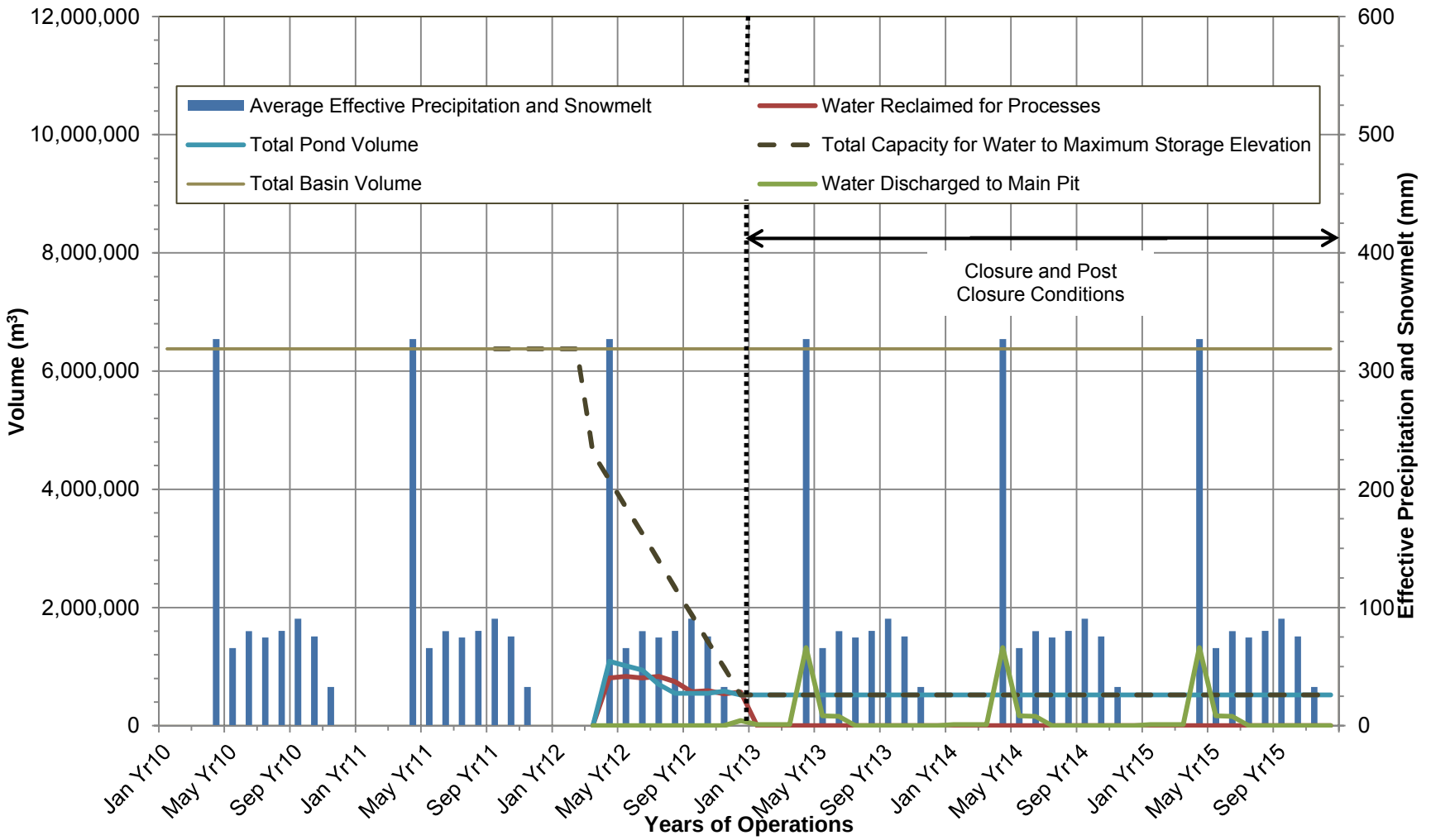
Knight Piésold CONSULTING

P/A NO. NB101-446/3

REF. NO. NB12-00153

FIGURE 13

REV 0



NOTES:

1. PRECIPITATION DATA WAS OBTAINED FROM CALDER ENGINEERING LTD. TECHNICAL MEMORANDUM 09-115 DATED NOVEMBER 23rd, 2011.
2. RUNOFF WATER WILL BE DISCHARGED TO THE PRIMARY PIT STARTING IN YEAR 13.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	11APR'12	ISSUED WITH LETTER	UBM	CNH	KDE

STILLWATER CANADA INC.

MARATHON PGM-Cu PROJECT

SATELLITE PIT #3
WATER INVENTORY
AVERAGE CONDITIONS

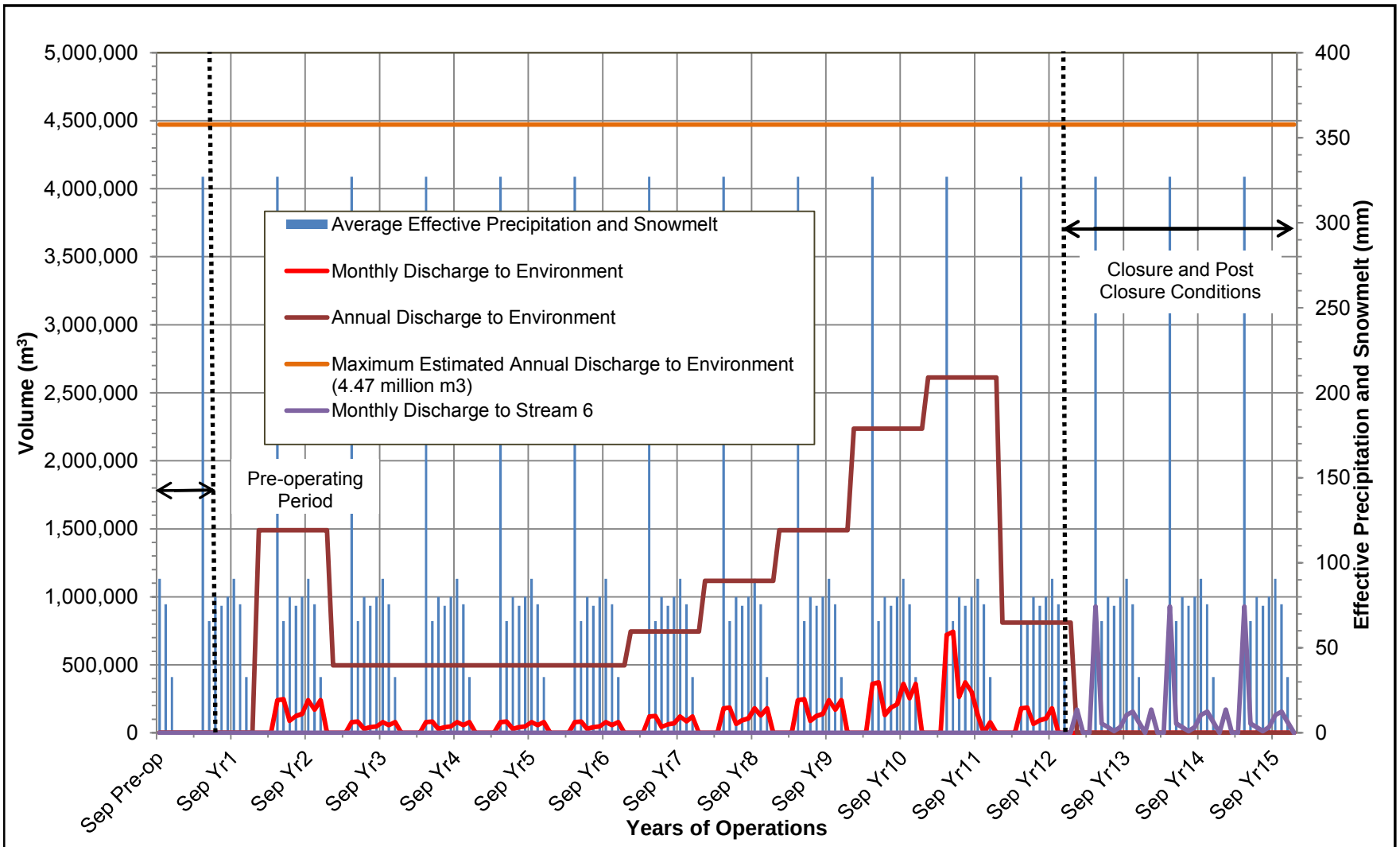
Knight Piésold CONSULTING

P/A NO. NB101-446/3

REF. NO. NB12-00153

FIGURE 14

REV 0



NOTES:

1. PRECIPITATION DATA WAS OBTAINED FROM CALDER ENGINEERING LTD. TECHNICAL MEMORANDUM 09-115 DATED NOVEMBER 23rd, 2011.
2. AFTER CLOSURE EXCESS WATER (RUNOFF) WILL BE DISCHARGED FROM CELL 1 TO STREAM 6 VIA THE SPILLWAY.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	11APR'12	ISSUED WITH LETTER	UBM	CNH	KDE

STILLWATER CANADA INC.

MARATHON PGM-Cu PROJECT

EXCESS WATER DISCHARGE AVERAGE CONDITIONS

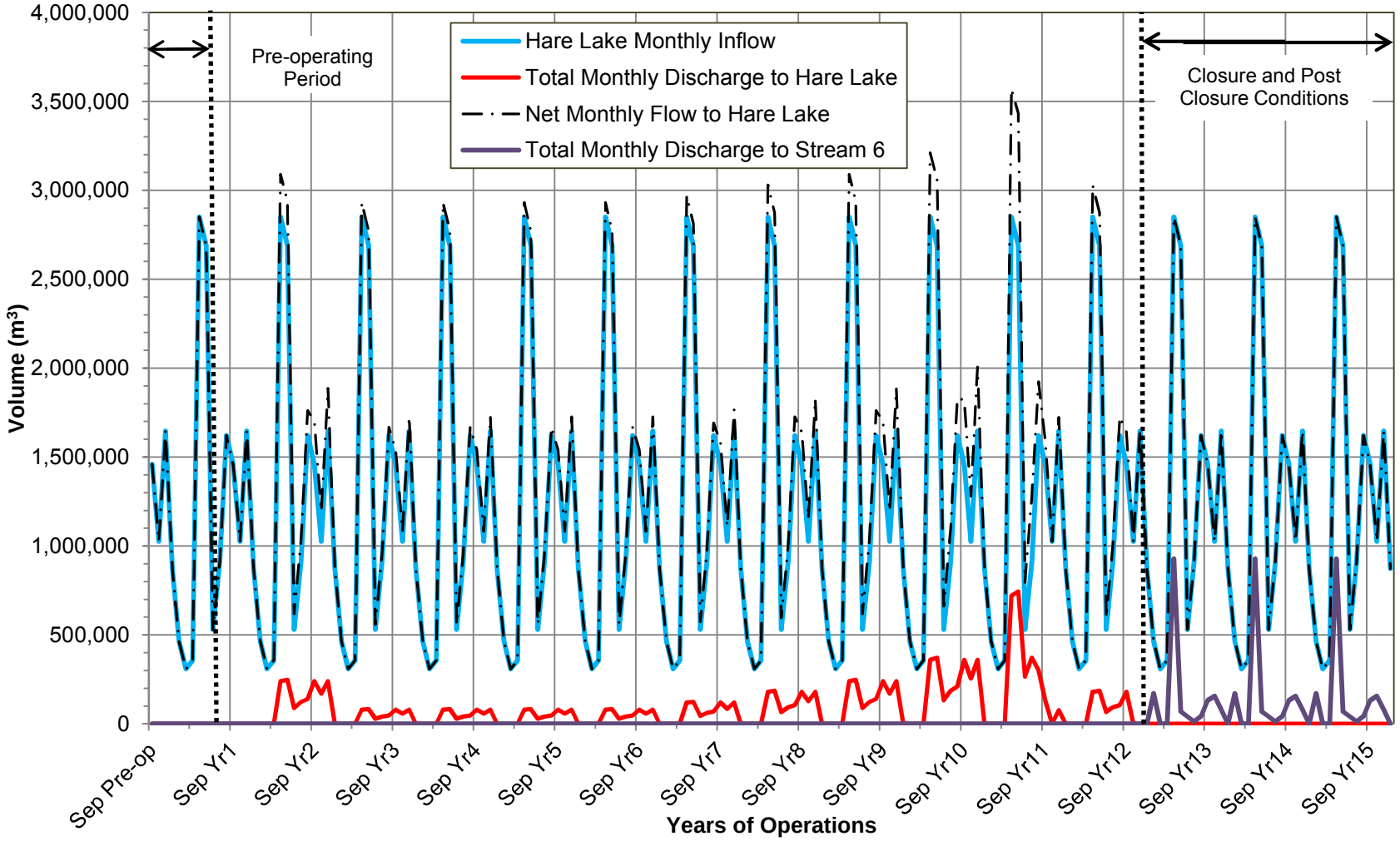
Knight Piésold CONSULTING

P/A NO. NB101-446/3

REF. NO. NB12-00153

FIGURE 15

REV 0



NOTES:

1. HARE LAKE INFLOWS PROVIDED BY CALDER ENGINEERING LTD.
2. DISCHARGE RATE TO HARE LAKE BASED ON A MAXIMUM PUMPING RATE OF 1,000 m³/hr AND A MAXIMUM DILUTION RATION OF 2.0:1.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	11APR'12	ISSUED WITH LETTER	UBM	CNH	KDE

STILLWATER CANADA INC.

MARATHON PGM-Cu PROJECT

HARE LAKE AND STREAM 6 INFLOWS AVERAGE CONDITIONS

Knight Piésold CONSULTING

P/A NO. NB101-446/3

REF. NO. NB12-00153

FIGURE 16

REV 0