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ENERGY, MINES AND RESOURCES: ASSESSMENT AND ABANDONED MINES

Clinton Creek Site

Lifecycle Cost Analysis for Remediation Options

307071-00895-00-WW-REP-0001

31 March 2014

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PROJECT 307071-00895 - CLINTON CREEK SITE

REV	DESCRIPTION	ORIG	REVIEW	WORLEYPARSONS APPROVAL	DATE	CLIENT APPROVAL	DATE
A	Issued for Client Review	S. Clark	A. Timmis / F. Claridge	L. Martin	17-Jan-14		
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1	Re-issued for Use	S. Clark	A. Timmis LAM per	L. Martin	31-Mar-14		

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EXECUTIVE SUMMARY

The Clinton Creek site is a former asbestos mine located 80 km northwest of Dawson City, Yukon (YT), near where the Fortymile River joins the Yukon River (Figure A). Waste rock from the mining operation was placed along the south valley wall of Clinton Creek. Tailings from the milling operation were placed along the west valley wall of Wolverine Creek. Landslides from the waste rock dump and the tailings piles have since blocked Clinton Creek and Wolverine Creek respectively. Hudgeon Lake has formed as a result of the blockage of Clinton Creek, impounding approximately 10 million cubic metres (m^3) of water upstream of the site.

Previous studies have identified a number of potential options for addressing the risks associated with the current state of the Clinton Creek waste rock dump, the Wolverine Creek tailings pile, and Hudgeon Lake. Energy, Mines and Resource: Assessment and Abandoned Mines (AAM) retained WorleyParsons Canada Services Ltd. (WorleyParsons) to complete a life cycle cost analysis (LCCA) for 13 remediation options (eight remediation options for the Clinton Creek area and five remediation options for the Wolverine Creek area) as defined by AAM, Aboriginal Affairs and North Development Canada (AANDC) and the Tron'dëk Hwëch'in (TH) for further consideration.

Additional conceptual engineering was completed where required to achieve the requested cost estimate accuracy. Figures of the Clinton Creek and Wolverine Creek remediation options are provided in Appendix 2.

Remediation Options

The following Clinton Creek area remediation options are combinations of the specific Clinton Creek (CC-), Waste Rock Dump (WR-) and Hudgeon Lake (HL-) remediation options proposed by AECOM (2011b).

Clinton Creek Remediation Options

Option	Description
A	CC-1 / WR-1 / HL-1 Maintaining status quo
B	CC-2 / WR-3 / HL-4 Excavating and armouring a new channel; stabilizing the waste rock dump
C	CC-4 / WR-1 / HL-1 Armouring existing channel with gabion drop structures
D	CC-4 / WR-3 / HL-1 Armouring existing channel with gabion drop structures; stabilizing the waste rock dump
E	CC-5 / WR-3 / HL-1 Lowering the existing channel; stabilizing the waste rock dump

Option	Description
F	CC-6 / WR-2 / HL-2 Restoring Clinton Creek to the original valley bottom; stabilizing the waste rock dump
G	CC-10 / WR-1 / HL-1 Armouring existing channel with gabion baskets
H	CC-10 / WR-3 / HL-1 Armouring existing channel with gabion baskets; stabilizing the waste rock dump

The following Wolverine Creek area remediation options are combinations of the specific Wolverine Creek (WC-) and Tailings Pile (T-) remediation options proposed by AECOM (2011b).

Wolverine Creek Remediation Options

Option	Description
A	WC-2 / T-1 Maintaining status quo
B	WC-3 / T-1 Installing a rock drain along the toe of the tailings lobes
C	WC-7 / T-5 Providing a cover over the tailings pile base; constructing an armoured channel through the cover
D	WC-3 and WC-7 / T-5 Installing a rock drain along the toe of the tailings lobes; providing a cover over the tailings pile base; constructing an armoured channel through the cover
E	WC-3 and WC-7 / T-2 and T-3 Installing a rock drain along the toe of the tailings lobes; stabilizing the tailings pile; providing a cover over the tailings pile base; constructing an armoured channel through the cover

Detailed descriptions of all remediation options and the conceptual engineering involved are provided in Section 3.

Alternative Options

At the request of the parties and based on the preliminary findings of this study, several of the Clinton Creek and Wolverine Creek options that were originally proposed by AECOM (2011b) have been optimized or adjusted. Added Clinton Creek and Wolverine Creek alternative options are listed below.

Clinton Creek Alternative Options

Proposed Option	AECOM Options
B2	Same as Option B but replacing the eight gabion drop structures with a riprap channel.
C2	Same as Option C but replacing the eight proposed gabion drop structures with a riprap channel.
C3	Same as Option C but replacing the eight proposed and four existing gabion drop structures with a riprap channel.
D2	Same as Option D but replacing the eight proposed gabion drop structures with a riprap channel.
D3	Same as Option D but replacing the eight proposed and four existing gabion drop structures with a riprap channel.
E2	Same as Option E but shifting the section of channel being lowered to 398 m away from the north valley slope to mitigate slope stability concerns.
E3	Same as Option E2 but armouring the Clinton Creek channel for 550 m downstream of the section of lowered channel to mitigate channel erosion that could destabilize the adjacent waste rock dump.
I	Same as Option B but shifting the channel alignment north to reduce waste rock excavation.
I2	Same as Option I but replacing the eight gabion drop structures with a riprap channel.

Wolverine Creek Alternative Options

Proposed Option	AECOM Options
D2	Same as Option D but lowering the proposed waste rock cover over the tailings pile base from 422 m to 415 m, backfilling Wolverine Creek upstream with waste rock to 412 m to avoid a dam classification, and eliminating the rock drain.
E2	Same as Option E but backfilling Wolverine Creek upstream with tailings (and waste rock cover) to 419 m to avoid a dam classification and eliminating the rock drain.

Detailed descriptions of all alternative options are provided in Appendix 1.

Capital and Operational Cost Estimates

The estimates of capital and operational costs presented in this report were prepared for the concept screening of the waste rock, tailings, and creek stabilization options for the Clinton Creek site. The estimates exclude taxes and duties; these are to be added by others as appropriate.

Capital and operational cost estimates were developed using WorleyParsons Class 1 Estimate Guidelines. Values for estimate accuracy and contingency are presented below. The accuracy of this estimate is comparable to that of the Association for the Advancement of Cost Engineering (AACE) Class 5.

Estimate Classifications

Project Stage	Identify	Conceptual Engineering
Estimate Class	WorleyParsons Class 1	AACE Class 5
Estimate Type	Order of Magnitude	Order of Magnitude
Expected Estimate Accuracy	±50%	L: -20% to -50% H: +30% to +100%
Suggested Contingency Range	25%	<50%

The basis of capital and operational cost estimates is presented in Sections 4 and 5. Breakdowns of construction cost estimates are presented in Appendix 3.

Life Cycle Cost Analysis

Life cycle cost estimates were prepared for each option using the estimated capital and operational costs, a preferred real discount rate of 2.5% and life cycle durations of 50 and 100 years. Summaries of the estimated capital costs (CAPEX), operational costs (OPEX), and life cycle costs (LCC) for the Clinton Creek and Wolverine Creek remediation options are presented below.

All costs are expressed in Q1, 2014 Canadian dollars with no allowance for future price escalations. LCCs are expressed as the net present cost (NPC). OPEX estimates are expressed as the equivalent annual cost (EAC) of operation.

LCCA of Clinton Creek Remediation Options

Option	Description	CAPEX	OPEX (EAC)	50yr LCC (NPC)	100yr LCC (NPC)
A[1]	CC-1 / WR-1 / HL-1	$13M	$0.32M[1]	$22M[1]	$25M[1]
B[1]	CC-2 / WR-3 / HL-4	$38M	$0.40M[1]	$50M[1]	$53M[1]
B2	Replace all drop structures	$39M	$0.04M	$40M	$41M
C[1]	CC-4 / WR-1 / HL-1	$18M	$0.77M[1]	$40M[1]	$46M[1]
C2[1]	Replace eight drop structures	$17M	$0.34M[1]	$27M[1]	$29M[1]
C3[1]	Replace all drop structures	$18M	$0.09M[1]	$20M[1]	$21M[1]
D[1]	CC-4 / WR-3 / HL-1	$22M	$0.57M[1]	$38M[1]	$42M[1]
D2[1]	Replace eight drop structures	$21M	$0.23M[1]	$28M[1]	$30M[1]
D3	Replace all drop structures	$22M	$0.04M	$23M	$23M
E	CC-5 / WR-3 / HL-3	$29M	$0.04M	$30M	$30M
E2	Alternate channel alignment	$25M	$0.04M	$26M	$27M
E3	Alternate channel alignment; armour channel downstream	$27M	$0.04M	$28M	$29M

Option	Description	CAPEX	OPEX (EAC)	50yr LCC (NPC)	100yr LCC (NPC)
F	CC-6 / WR-2 / HL-2	$102M	$0.02M	$103M	$103M
G[1]	CC-10 / WR-1 / HL-1	$17M	$0.68M[1]	$36M[1]	$42M[1]
H[1]	CC-10 / WR-3 / HL-1	$21M	$0.50M[1]	$35M[1]	$39M[1]
I[1]	B - Alternative alignment	$27M	$0.40M[1]	$39M[1]	$42M[1]
I2	B2 - Alternative alignment	$29M	$0.04M	$30M	$31M

[1]Notes: The long-term operational requirements associated with this option necessitate maintenance of the 15 km site access road between the Fortymile River Bridge and the former Clinton Creek Mine site. These costs are not included in the OPEX and LCC estimates shown. Refer to Section 7.1 for these additional costs.

LCCA of Wolverine Creek Remediation Options

Option	Description	CAPEX	OPEX (EAC)	50yr LCC (NPC)	100yr LCC (NPC)
A	WC-2 / T-1	$0M	$0.04M	$1M	$2M
B	WC-3 / T-1	$25M	$0.08M	$27M	$28M
C[1]	WC-7 / T-5	$23M	$0.11M[1]	$26M[1]	$27M[1]
D[1]	WC-3 and WC-7 / T-5	$40M	$0.14M[1]	$44M[1]	$45M[1]
D2[1]	Lowered waste rock cover; backfill Wolverine Creek; eliminate rock drain	$17M	$0.11M[1]	$20M[1]	$21M[1]
E	WC-3 and WC-7 / T-2 and T-3	$49M	$0.08M	$52M	$52M
E2	Backfill Wolverine Creek; eliminate rock drain	$35M	$0.05M	$36M	$37M

[1]Notes: The long-term operational requirements associated with this option necessitate maintenance of the 15 km site access road between the Fortymile River Bridge and the former Clinton Creek Mine site, as well as the 1.2 km access road to the Wolverine Creek tailings pile base. These costs are not included in the OPEX and LCC estimates shown. Refer to Section 7.1 for these additional costs.

LCCA calculations and the selection of discount rates and durations are discussed in Section 6. Life cycle cost breakdowns for each remediation option are included in Appendix 4.

Cost of Maintaining Site Access

All options not indicated as walk-away solutions will require long-term maintenance of site access roads. The cost of maintaining access to the Clinton and Wolverine Creek sites is presented in below. There is a potential cost savings of approximately $5.9M based on the 100-year lifecycle, if both the Clinton and Wolverine options require site access for long term maintenance.

Cost of Maintaining Site Access

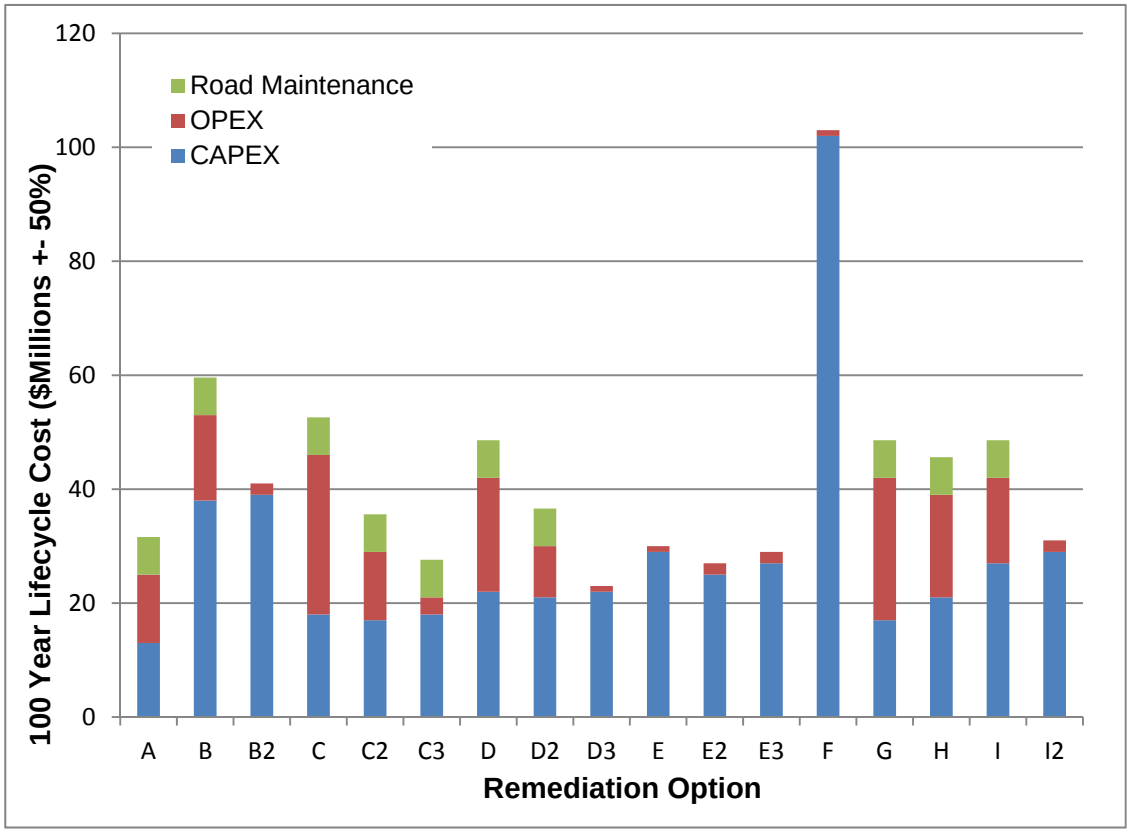
Site	OPEX (EAC)	50yr LCC (NPC)	100yr LCC (NPC)
Clinton Creek Waste Rock Dump	$0.18M	$5.1M	$6.6M
Wolverine Creek Tailings Pile Base	$0.20M	$5.6M	$7.2M
Both Sites	$0.22M	$6.1M	$7.9M

Conclusions

Clinton Creek Options

The Clinton Creek remediation lifecycle costs range from $30M (Option E) to $103M (Option F) for the eight original options. The additional options considered generally have lower lifecycle costs; ranging from $23M (Option D3) to $59.6M (Option B2).

100-year LCC Results for Clinton Creek Remediation Options

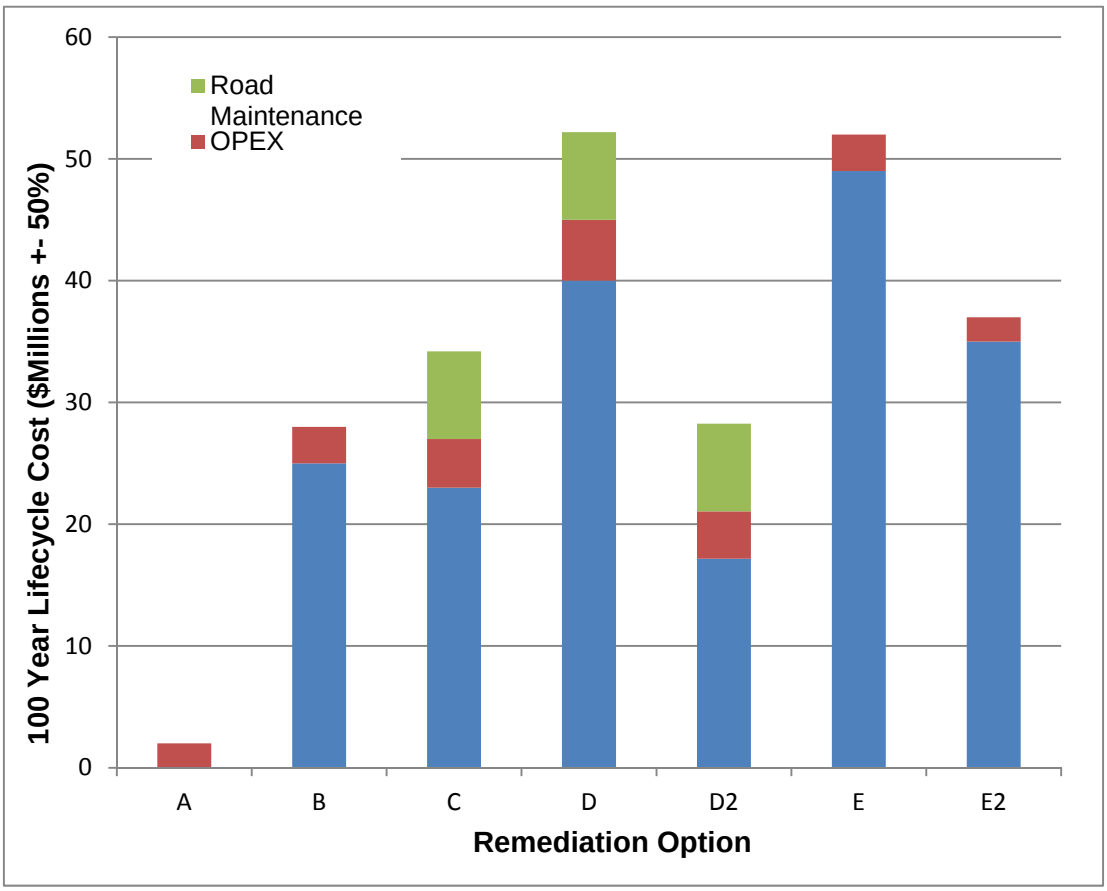


The reduction of LCC seen for the alternatives to the initial options is primarily the results of reduced earth work quantities (reduction in CAPEX) and/or the replacement of gabion drop structures with riprap lined channels (reduction in OPEX).

Wolverine Creek Options

The Wolverine Creek remediation lifecycle costs range from $2M (Option A) to $52M (Option D), with lower costs estimated for the additional options considered: $31M (Option D2) and $37M (Option E2). The reduction of LCC for the alternatives compared to the initial options (D2 and E2) is primarily the results of reduced earth work quantities resulting in a reduction in CAPEX.

100-year LCC Results for Wolverine Creek Remediation Options



LCC Analysis Duration

While both 50-year and 100-year durations for operational costs were considered for the original options, WorleyParsons recommends that the 100-year lifecycle costs are used for the selection of the remediation options to move forward. A comparison of the 50-year and 100-year lifecycle durations shows that the selection of 50-year or 100-year does not significantly change the lifecycle cost rankings.

The OPEX costs are approximately 30% higher for the 100-year duration versus the 50-year, but as the OPEX costs are generally a smaller percentage of the total LCC costs than CAPEX, the overall costs difference in LCC is relatively small. Using the 100-year duration there is an average increase of 6% for Clinton Creek options over the 50-year duration, and 2% average increase for Wolverine Creek options.

LCC Sensitivity to Aggregate Source Location

The sensitivity of the results to the assumption that a suitable source of aggregate would be available within 15 km was assessed as part of the LCC analysis; with the results showing that the ranking of options by lifecycle cost was not significantly changed if the aggregate source was in fact 60 km or 100 km distance from the site. The sensitivity analysis shows the lifecycle costs were on average 3.3% to 4.6% higher when the source was assumed to be within 60 km, and 5.9% to 8% higher when the source was within 100 km, well within the accuracy range for the cost estimates (AACE Class 5, ±50%).

Common Elements Potential Cost Savings

Opportunities for CAPEX costs savings on common elements between remediation at both sites are not included in the LCCA results but would include: partial shared cost of equipment mobilization / demobilization (mob / demob), asbestos washdown facilities and camp facilities. For options where waste rock is excavated from Clinton Creek, and deposited in Wolverine Creek, there is potential for additional savings as material would not need to be double handled.

The current estimates have separate road maintenance costs included for both the Clinton Creek and Wolverine Creek OPEX costs where ongoing maintenance will be required, but site access to both locations is largely on the same road, so if maintenance work is required for both options, these costs would not need to be duplicated.

Recommendations

WorleyParsons recommends collection of the following data prior to undertaking detailed design of the selected remediation options:

- Acquisition of LiDAR data to allow for a more accurate 3D model of waste rock, tailings, and existing ground surfaces;
- Bathymetry of the Porcupine Pit lake to confirm the volume of waste that could be deposited back into the pit;
- Ongoing water quality data collection within Hudgeon Lake, specifically dissolved oxygen (DO) concentration with depth profiles; continuous DO data collection should be considered; the depth at which the lake will naturally ‘turn over’ should be assessed;
- Continuous flow monitoring on Clinton and Wolverine Creeks; if possible, flows should be monitored both upstream and downstream of Hudgeon Lake, so that peak discharge flow at the post-remediation depth of Hudgeon Lake can be estimated;

- Development of area-discharge hydrologic equations for Clinton Creek and Wolverine Creek based on measured peak discharges over the last 15 years;
- Desktop study and field program to identify suitable source of aggregate material; and
- Geotechnical stability analyses of both the waste dump adjacent to Clinton Creek and the tailings pile adjacent to Wolverine Creek.

Following selection by the parties of the preferred remediation options the following should be considered:

- Advancement of the selected remediation designs to allow for Class 2 (±20%) lifecycle cost estimates to be prepared;
- Inclusion in the lifecycle cost estimate of any potential costs savings from undertaking the selected remediation works at the two locations simultaneously;
- Identification of a suitable camp location, with capacity for the workforce required for the selected options;
- Confirmation by a structural engineer of the existing maximum load rating for the Fortymile Bridge; and
- Initiation of permitting activities required for the construction of the selected remediation options.

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APPENDIX 3 CONSTRUCTION COST ESTIMATE BREAKDOWNS

APPENDIX 4 LIFE CYCLE COST BREAKDOWNS

APPENDIX 5 SITE ACCESS LETTER

ABBREVIATIONS

Abbreviation	Description
200-year	An event (e.g., flood) that would occur, on average, once every 200 years
AAM	Energy, Mines and Resources: Assessment and Abandoned Mines
AANDC	Aboriginal Affairs and Northern Development Council
CAPEX	Capital expenditures
CC-X	Clinton Creek Remediation Option No. X
EAC	Equivalent annual cost
EPCM	Engineering, procurement, and construction management
HL-X	Hudgeon Lake Remediation Option No. X
LCC	Life cycle cost
LCCA	Life cycle cost analysis
LOA	Living out allowance
NPC	Net present cost
OPEX	Operational expenditures
Q1	First quarter of the specified year
SDR	Social discount rate
T-X	Tailings Pile Remediation Option No. X
TH	Tron'dëk Hwëch'in
WC-X	Wolverine Creek Remediation Option No. X
WR-X	Clinton Creek Waste Rock Dump Remediation Option No. X
YT	Yukon Territory

1. INTRODUCTION

The Clinton Creek site is a former asbestos mine located 80 km northwest of Dawson City, Yukon (YT), near where the Fortymile River joins the Yukon River (Figure A). The mine operated between 1968 and 1978. Clinton Creek runs in an easterly direction through the site and receives Wolverine Creek before discharging into the Fortymile River. Waste rock from the mining operation was placed along the south valley wall of Clinton Creek. Tailings from the milling operation was placed along the west valley wall of Wolverine Creek. Landslides from the waste rock dump and the tailings piles have since blocked Clinton Creek and Wolverine Creek respectively. Hudgeon Lake has formed as a result of the blockage of Clinton Creek, impounding approximately 10 million cubic metres (m^3) of water upstream of the site.

Previous studies have identified a number of potential options for addressing the risks associated with the current state of the Clinton Creek waste rock dump, the Wolverine Creek tailings pile, and Hudgeon Lake. Conceptual designs and order of magnitude capital cost estimates have been completed by others for these options.

Energy, Mines and Resource: Assessment and Abandoned Mines (AAM) retained WorleyParsons Canada Services Ltd. (WorleyParsons) to complete a life cycle cost analysis (LCCA) for 13 remediation options selected by AAM, Aboriginal Affairs and North Development Canada (AANDC) and the Tron'dëk Hwëch'in First Nations (TH) for further consideration. The scope of work for the project included the following:

1. Reviewing previous studies and background information;
2. Visiting the site to verify existing conditions;
3. Providing additional conceptual engineering as necessary to generate capital and operational cost estimates;
4. Estimating life cycle costs for the 13 remediation options;
5. Presenting and discussing results of the LCCA at a workshop with AAM; and
6. Preparing a final report summarizing the results of the LCCA.

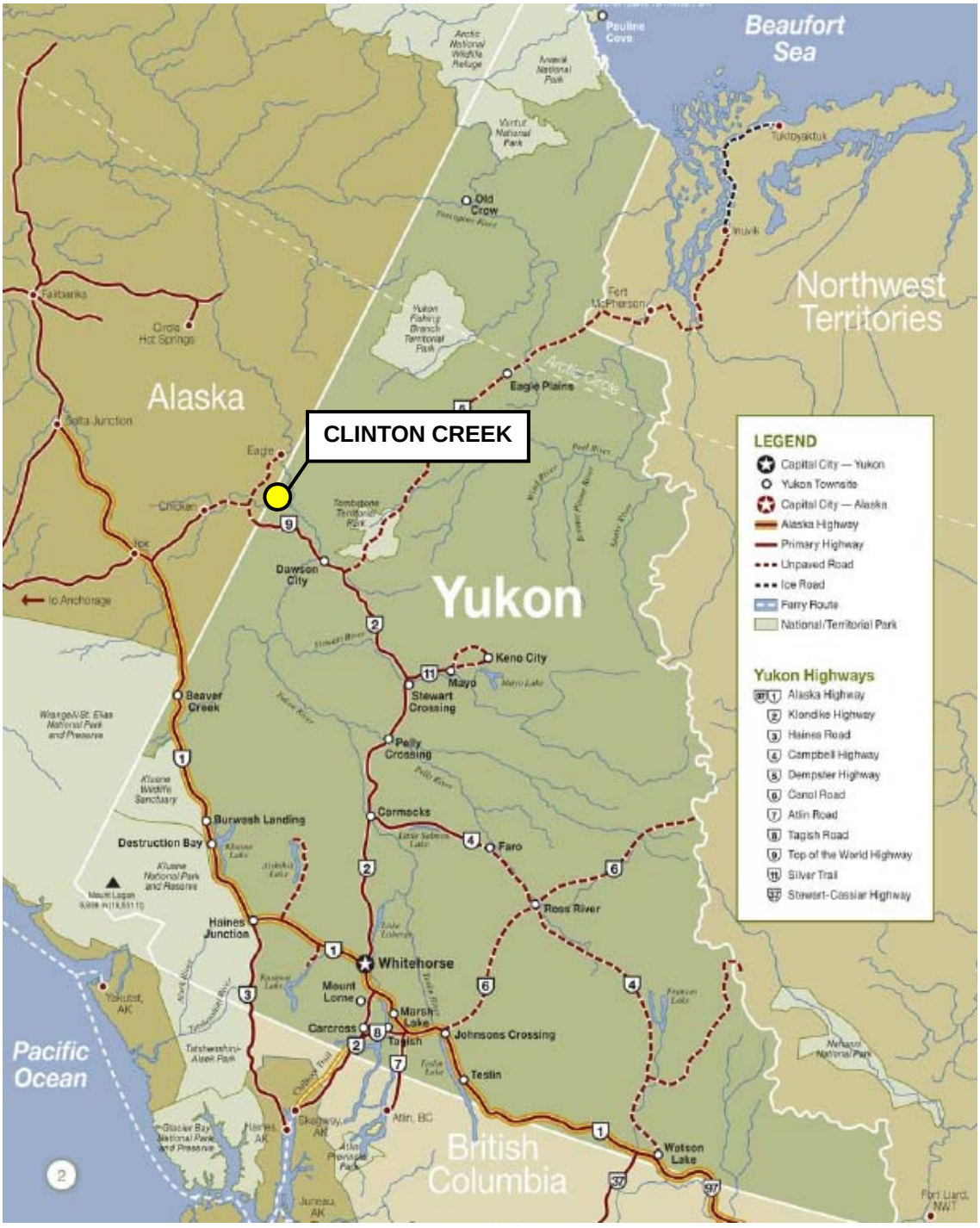


Figure A Site Location Map

2. BACKGROUND INFORMATION

Three open pits were developed while the asbestos mine was in operation, the largest of which is Porcupine Pit. Between 1968 and mine closure in 1978, waste rock from open pit mining was placed along the south slope of the Clinton Creek valley and the west slope of the Porcupine Creek valley. Asbestos ore was processed at the mill site and tailings from the operation were placed on the west slope of the Wolverine Creek valley.

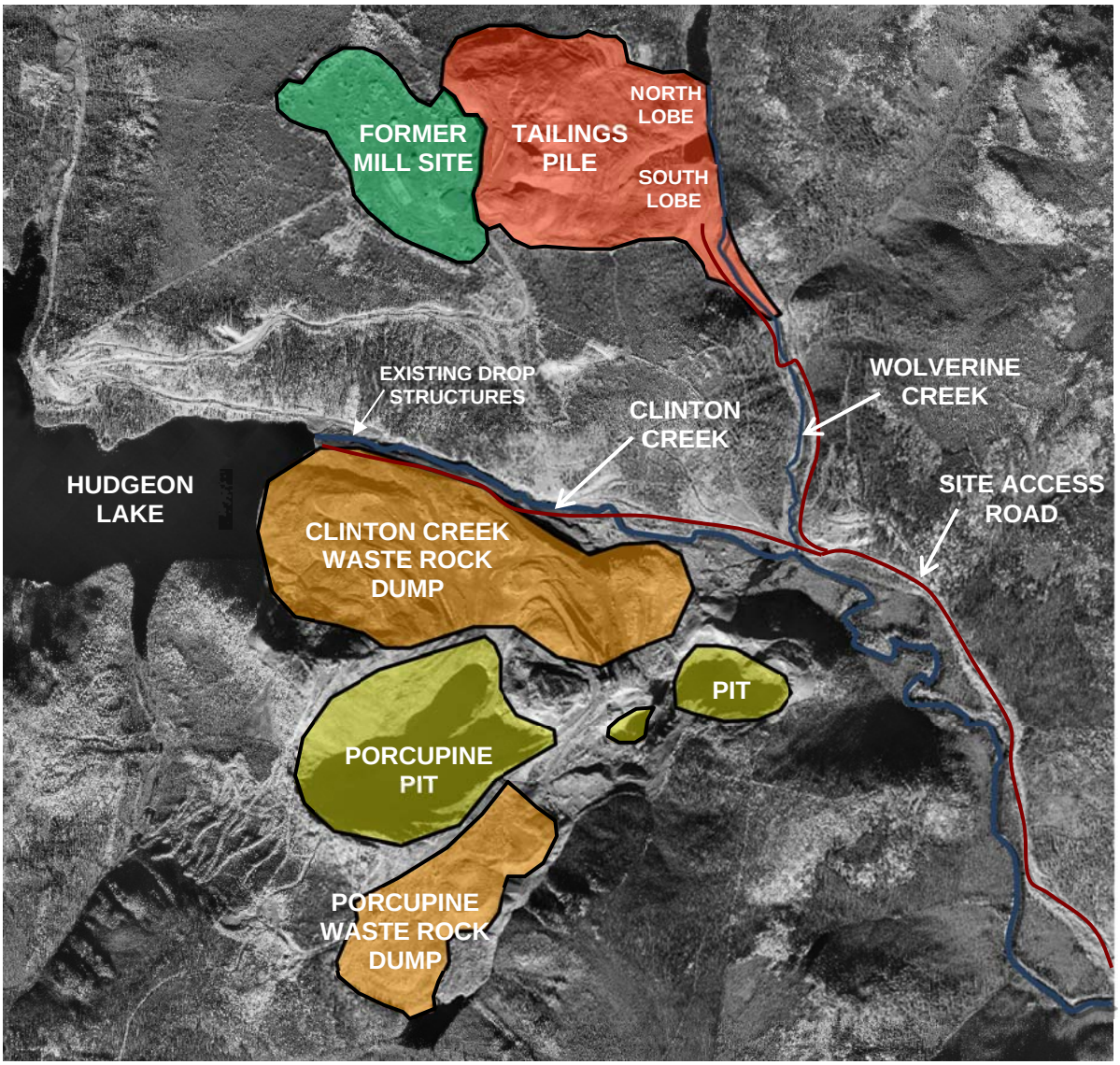


Figure B Clinton Creek Site

2.1 Existing Conditions

2.1.1 Clinton Creek Waste Dump

The waste rock is weak argillite material and is composed of primarily sand and gravel sized rock fragments with some cobbles and boulders. A landslide resulting from a significant slope failure of the Clinton Creek waste rock dump in 1974 blocked the Clinton Creek valley, impounding approximately 10M m^3 of water in the newly formed Hudgeon Lake (UMA Engineering 2002). Due to concerns of Clinton Creek downcutting into the mass of waste rock that is damming the valley, which could lead to a sudden failure and release of anoxic water from Hudgeon Lake, a series of four gabion drop structures were installed at the lake outlet between 2002 and 2004. Construction of the drop structures in Clinton Creek are documented in the following reports:

- R03: “Clinton Creek Channel Stabilization (Stage 2) Construction Report” prepared by UMA Engineering (2003);
- R07: “Clinton Creek Channel Stabilization (Stage 3) Construction Report” prepared by UMA Engineering (2005); and
- R10: “Clinton Creek Channel Stabilization (Stage 1) Construction Report” prepared by UMA Engineering (2003).

During the 2010 freshet, high flows in Clinton Creek caused severe erosion of approximately 150 m of channel downstream of the fourth drop structure. Over-steepening of the channel banks as a result of this erosion has created tension cracks in the access road to the south and inhibits safe access to the channel for repair.

2.1.2 Wolverine Creek Tailings Pile

The tailings on the west slope of the Wolverine Creek valley are a silty sand reject from the crushing operation and are much coarser than traditional tailings at other mine processing operations. In 1974, the south lobe of the tailings failed and slid into Wolverine Creek. Later that year, water impounded in Wolverine Creek breached the failed tailings lobe. Eroded tailings from the failed lobe were deposited in the Wolverine Creek valley for several hundred meters downstream of the breach. After 1974, new tailings were deposited to the north of the failed lobe. This north lobe showed signs of instability and by 1988 had crept down the west valley wall to block Wolverine Creek upstream of the south lobe failure (UMA Engineering 2003b). Water is currently impounded upstream of both the failed north and south lobes of the Wolverine Creek tailings pile.

A rock-lined channel along the downstream face of the south lobe was constructed in 1978 and is still operational. The channel has a measured width of 9 m and a lined depth of 1.2 m. The rock armouring has a measured median diameter of approximately 0.9 m as summarized in the following report:

- R21: “Abandoned Clinton Creek Asbestos Mine - Environmental Liability Report” prepared by UMA Engineering (2003b).

2.2 Waste Rock and Tailings Stability

The results of a stability analysis of the Clinton Creek waste rock dump are discussed in the following report:

- R47: "Abandoned Clinton Creek Asbestos Mine - Conceptual Design Report" prepared by UMA Engineering (2002).

The report suggests that the presence of a very weak foundation layer and the thawing of permafrost underneath the waste rock were the primary factors contributing to the ongoing dump movement. The failure plane is assumed to be located within the weathered argillite and overlying soil colluvium. Conceptual designs for stabilization of the waste rock were presented on the basis of providing a minimum factor of safety of 1.25. The proposed stabilization measures generally include grading the waste rock to a maximum slope of 2.5H:1V and removing material from the top of the pile to achieve the desired stability rating.

The results of a stability analysis of the Wolverine Creek tailings pile are discussed in the following report:

- R21: "Abandoned Clinton Creek Asbestos Mine - Environmental Liability Report" prepared by UMA Engineering (2003b).

The report suggests that a steep foundation slope and build-up of pore water pressure contributed to the multiple tailings pile failures. The mode of failure is thought to be a translational slide, with the failure plane located within the overburden and/or weathered argillite layers. Similar to the waste rock dump, a minimum factor of safety of 1.25 is used for tailings stabilization. The proposed stabilization measures require moving tailings from the top of the valley slope to the toe, regrading the north lobe to approximately 3.5H:1V, and regrading the south lobe to approximately 3.75H:1V.

Table A summarizes the recent rates of waste rock and tailings movement as presented in the following report:

- R104: "Former Clinton Creek Asbestos Mine - Long-term performance monitoring, 2012", Revision 2, prepared by Associated Engineering (2013).

Table A Summary of Recent Measured Waste Rock and Tailings Pile Movements

Location	July 2006 to Aug 2012	Sept 2010 to Aug 2012
Clinton Creek Waste Rock Dump (Lower)	0.03 m/yr	0.04 m/yr
Wolverine Creek Tailings Pile North Lobe (Lower)	0.06 m/yr	0.04 m/yr
Wolverine Creek Tailings Pile South Lobe (Lower)	0.25 m/yr	0.22 m/yr

The results of the waste rock and tailings stability assessments completed by UMA Engineering are the basis for all waste rock stabilization measures considered in this study. The average movement rate of waste rock and tailings between July 2006 and August 2012 are the basis for the frequency of replacement of hydraulic structures when stabilization measures are not provided.

2.3 Development of Remediation Options

Remediation options for the Clinton Creek site have been developed by UMA Engineering and AECOM to address:

- The ongoing movement of the Clinton Creek waste rock dump (WR-);
- The ongoing movement of the Wolverine Creek tailings pile (T-);
- The ongoing erosion of waste rock and tailings in Clinton Creek (CC-) and Wolverine Creek (WC-) respectively; and
- The potential for an uncontrolled release of water from Hudgeon Lake (HL-).

Remediation options are presented and evaluated in the following reports:

- R21: “Abandoned Clinton Creek Asbestos Mine - Environmental Liability Report” prepared by UMA Engineering (2003b).
- R47: “Abandoned Clinton Creek Asbestos Mine - Conceptual Design Report” prepared by UMA Engineering (2002).
- R97: “Clinton Creek Technical Options Assessment” prepared by AECOM (2011b).

Lists and brief descriptions of the options included in the most recent conceptual design study (AECOM 2011b) are provided in Table B, Table C, Table D, Table E, and Table F.

Table B AECOM (2011b) Clinton Creek Options and Descriptions

Option	Description
CC-1	Status quo - maintain gabion drop structures
CC-2	Armoured channel over the waste rock
CC-3	Tunnel through bedrock
CC-4	Armour existing channel
CC-5	Lower existing channel
CC-6	Restore to valley bottom
CC-7	Leave as is - no annual maintenance
CC-8	Rock trench and overflow channel
CC-9	Tunnel through waste rock
CC-10	Gabion chute along existing channel (variation of CC-4)
CC-11	Concrete along existing channel (variation of CC-4)
CC-12	Pressure grouting along existing channel (variation of CC-4)

Table C AECOM (2011b) Clinton Creek Waste Rock Dump Options and Descriptions

Option	Description
WR-1	Leave as is - no remediation measures
WR-2	Remove to expose valley bottom
WR-3	Stabilize waste rock dump

Table D AECOM (2011b) Hudgeon Lake Options and Descriptions

Option	Description
HL-1	Leave as is - no remediation measures
HL-2	Fully drain lake (in combination with WR-2)
HL-3	Lower lake water level
HL-4	Partially backfill lake (as it relates to WR-3)

Table E AECOM (2011b) Wolverine Creek Options and Descriptions

Option	Description
WC-1	Leave as is - no annual maintenance
WC-2	Status quo - maintain armoured channel
WC-3	Rock drain along toe of tailings lobe(s)
WC-4	Culvert along toe of each lobe
WC-5	Armoured channel over tailings
WC-6	Armoured channel around tailings

Table F AECOM (2011b) Wolverine Creek Tailings Pile Options and Descriptions

Option	Description
T-1	Leave as is - no remediation measures
T-2	Stabilize tailings
T-3	Provide cover and armouring
T-4	Remove tailings to pit

The following remediation options are considered in this life cycle cost analysis but were not presented in the AECOM (2011b) report:

- WC-7: Armoured channel through cover to existing rock channel; and
- T-5: Provide cover over tailings pile base.

3. REMEDIATION OPTIONS CONSIDERED IN LCCA

A number of the specific remediation options proposed by AECOM (2011b) were defined by the parties (AAM, AANDC and TH) for further consideration. These specific options were integrated by WorleyParsons and AAM into eight general remediation options for the Clinton Creek area and five general remediation options for the Wolverine Creek area.

The following Clinton Creek area remediation options are combinations of the specific Clinton Creek (CC-), Waste Rock Dump (WR-) and Hudgeon Lake (HL-) remediation options proposed by AECOM (2011b).

Table G Clinton Creek Remediation Options

Proposed Option	AECOM Options
A	CC-1 / WR-1 / HL-1
B	CC-2 / WR-3 / HL-1
C	CC-4 / WR-1 / HL-1
D	CC-4 / WR-3 / HL-1
E	CC-5 / WR-3 / HL-3
F	CC-6 / WR-2 / HL-2
G	CC-10 / WR-1 / HL-1
H	CC-10 / WR-3 / HL-1

In addition to these eight options, alternative to options B, C and D were considered (Options B2, C2, and D2); these alternatives replaced the proposed gabion drop structures with riprap lined channels which will have significantly less long-term maintained requirements.

The following Wolverine Creek area remediation options are combinations of the specific Wolverine Creek (WC-) and Tailings Pile (T-) remediation options proposed by AECOM (2011b).

Table H Wolverine Creek Remediation Options

Proposed Option	AECOM Options
A	WC-2 / T-1
B	WC-3 / T-1
C	WC-7 / T-5
D	WC-3 and WC-7 / T-5
E	WC-3 and WC-7 / T-2 and T-3

3.1 Alternative Options

At the request of the parties and based on the preliminary findings of this study, several of the Clinton Creek and Wolverine Creek options that were originally proposed by AECOM (2011b) have been optimized or adjusted. A total of nine alternative options for Clinton Creek and two alternative options for Wolverine Creek were added to the LCCA.

Descriptions and lifecycle costs of these alternatives are in Appendix 1. Conceptual figures, construction cost estimate breakdowns and life cycle cost breakdowns for these alternatives are in Appendices 2, 3 and 4 respectively. Additional Clinton Creek alternative options are listed in Table I.

Table I Clinton Creek Alternative Options

Proposed Option	AECOM Options
B2	Same as Option B but replacing the eight gabion drop structures with a riprap channel.
C2	Same as Option C but replacing the eight proposed gabion drop structures with a riprap channel.
C3	Same as Option C but replacing the eight proposed and four existing gabion drop structures with a riprap channel.
D2	Same as Option D but replacing the eight proposed gabion drop structures with a riprap channel.
D3	Same as Option D but replacing the eight proposed and four existing gabion drop structures with a riprap channel.
E2	Same as Option E but shifting the section of channel being lowered to 398 m away from the north valley slope to mitigate slope stability concerns.
E3	Same as Option E2 but armouring the Clinton Creek channel for 550 m downstream of the section of lowered channel to mitigate channel erosion that could destabilize the adjacent waste rock dump.
I	Same as Option B but shifting the channel alignment north to reduce waste rock excavation.
I2	Same as Option I but replacing the eight gabion drop structures with a riprap channel.

Additional Wolverine Creek alternative options are listed in Table J.

Table J Wolverine Creek Alternative Options

Proposed Option	AECOM Options
D2	Same as Option D but lowering the proposed waste rock cover over the tailings pile base from 422 m to 415 m, backfilling Wolverine Creek upstream with waste rock to 412 m to avoid a dam classification, and eliminating the rock drain.
E2	Same as Option E but backfilling Wolverine Creek upstream with tailings (and waste rock cover) to 419 m to avoid a dam classification and eliminating the rock drain.

3.2 Post Remediation Public Site Access

The anticipated approach to public access of the site following construction of the Clinton Creek and Wolverine Creek remediation options is presented in Appendix 5.

3.3 Conceptual Engineering

Additional engineering was completed by WorleyParsons where insufficient or no design had been presented by UMA Engineering (2002, 2003b) or AECOM (2011b). The level of engineering was limited to the minimum level required to achieve the requested overall cost estimate accuracy. Where engineering designs were presented by UMA Engineering or AECOM in sufficient detail for costing, WorleyParsons did not undertaken additional engineering to confirm the appropriateness of the design.

3.3.1 Clinton Creek Design Basis

Additional engineering design for the Clinton Creek remediation options was completed based on the following design criteria:

- Creek stabilization was designed for the estimated 200-year peak discharge rate of 44.5 m^3/s (UMA Engineering 2003b);
- The maximum unreinforced slope on the north valley wall of Clinton Creek is assumed to be 2H:1V;
- Stabilized waste rock will have a maximum slope of 2.5H:1V and height no greater than that indicated on the drawings produced by AECOM (2011b); and
- A two-lane service road will be provided along one side of Clinton Creek through the waste rock dump to facilitate future channel maintenance.

3.3.2 Wolverine Creek Design Basis

Additional engineering design for the Wolverine Creek remediation options was completed based on the following design criteria:

- Creek stabilization was designed for the estimated 200-year peak discharge rate of 17.3 m^3/s (UMA Engineering 2003b);
- The rock drain cross-sectional area and slope were increased from 10 m^2 and 0.8% as suggested by AECOM (2011b) to 56 m^2 and 1.8%; this would increase the designed capacity of the rock drain from less than 0.1 m^3/s, which would operate predominantly flooded, to approximately 0.6 m^3/s, which would operate predominantly drained, based on the monthly average discharge rates presented in Table O;
- Stable slopes for temporary excavations in the tailings were assumed to be 1.5H:1V;
- Stabilized tailings will have a maximum slope of 3.5H:1V on the north lobe and a maximum slope of 3.75H:1V on the south lobe, based on the drawings produced by AECOM (2011b); and

- The tailings cover (T-5) consists of filling Wolverine Creek at the toe of the tailings pile with waste rock to an elevation of approximately 422 m to prevent erosion due to wind and runoff.

3.3.3 Capacity of Existing Hydraulic Structures

Four existing gabion drop structures are located in Clinton Creek at the outlet of Hudgeon Lake. Based on our calculations, as designed these structures should be capable of conveying the 200-year peak discharge from Hudgeon Lake. Gabions baskets should also capable of withstanding the hydraulic forces that would be generated by this event. It is our opinion that the damage to Drop Structure No. 4 in the 2010 extreme flood event was caused by erosion of the channel downstream, more so than a failure of the drop structure itself. This is corroborated by the fact that Drop Structure Nos. 1 to 3 sustained relatively little damage in the same event.

An approximately 200 m long rock-lined channel exists in Wolverine Creek downstream of the south tailings lobe. Based on a reported median rock diameter of 900 mm, bottom width of 9 m and depth of 1.2 m (Klohn-Leonoff, 1984), this rock-lined channel should be able to convey the 200-year peak discharge in Wolverine Creek without significant damage to the structure.

3.3.4 Design Capacity of Proposed Hydraulic Structures

A severe flood occurred on Clinton Creek in June, 2009, caused in part by heavy snowpack from that winter. A forensic field study completed later that year (Stilwell, 2009) reported an estimated peak discharge rate of 57 m^3/s. While it is not clearly specified in the report, these measurements seem to have been taken either near the gabion drop structures located at the outlet of Hudgeon Lake, or at the existing flow gauging station several kilometres downstream. At the gabion drop structures, Clinton Creek drains approximately 117 km^2. At the flow gauging station, which is assumed to be located near the town site based on recently reported hydrometric data (Environment Yukon, 2005), Clinton Creek drains approximately 179 km^2.

A regional hydrology study completed by UMA (2000) developed the following area-discharge relationships for 100-year and 200-year flood events:

$$Q_{100} = 1.47A^{0.6883}$$

$$Q_{200} = 1.75A^{0.6798}$$

Based on these equations, a 200-year flood event would have an estimated peak discharge rate of 44.5 m^3/s at the gabion drop structures and 59.5 m^3/s at the town site gauging station. This suggests that the June 2009 flood in Clinton Creek met or exceeded the 200-year peak discharge estimates for the region.

In August, 2010, Clinton Creek experienced a second severe flood event, this time caused by heavy rainfall (AECOM 2011a). Given the proximity of these two severe flood events and inconsistent hydrometric data for Clinton Creek, it is suggested that all hydraulic structures be designed to convey, at a minimum, the estimated 200-year peak discharge of 44.5 m^3/s on Clinton Creek and 17.3 m^3/s on Wolverine Creek. The area-discharge equations proposed by UMA (2000) should be checked to ensure that they are still valid based on measured peak discharges in Clinton Creek over the last 15 years.

3.3.5 Site Access

The final 15 km of the site access road between the Fortymile River bridge and the former mine site will need to be upgraded and repaired for both the safety of personnel travelling frequently to the site and the safe transport of heavy equipment and materials to site. We have assumed that the road will need to be widened by three metres on average and surfaced with crushed gravel. One 15 m-long bridge is required across Clinton Creek at an existing ford located several hundred metres west of Wolverine Creek.

For remediation options that require ongoing construction activities as part of their operational requirements (i.e., maintenance and replacement), site access will need to be maintained. We have assumed that this maintenance would include resurfacing the site access road with crushed gravel every 20 years and replacing the bridge across Clinton Creek every 50 years.

It is assumed that the upgrading and maintenance of the site access road would be completed as part of the Clinton Creek remediation options. Note that we have assumed that any repairs or upgrades on the existing Fortymile River bridge, if required, will be completed by Yukon Highways; no cost for any work on the Fortymile Bridge have been included in this assessment.

The 1.2 km access road from the site access road along Clinton Creek to the Wolverine Creek tailings pile should be upgraded in order to safely transport equipment and materials to the Wolverine Creek area. The road would be widened by three metres and surfaced with crushed gravel. One 15 m-long bridge is required across Wolverine Creek. Maintenance requirements for the Wolverine access road would be the same as those for the site access road. It is assumed that these upgrades would be completed as part of the Wolverine Creek remediation options.

3.3.6 Bulk Earthworks

As bulk earthworks are expected to drive both the CAPEX and schedule for most remediation options considered in this LCCA, optimal excavator and haul truck pairings were generated based on estimated material quantities and haul distances.

Productivity rates were calculated from assumed general equipment mechanical availability rates and labor efficiency rates that incorporate scheduled delays (shift change inspection time and breaks). A swell factor of 30% for all materials along with a 90% fill factor is included when calculating excavator productivity. Trucks and excavators were paired on the basis of ensuring four to six bucket passes to fill each truck.

Haulage cycle times were estimated using interpolated haul profiles and equipment specifications supplied by the original equipment manufacturer (OEM). The number of haul trucks was selected to ensure maximum productivity of the excavator.

Rates for major earthworks for the Clinton Creek options are based on the equipment and productivity listed in Table K.

Table K Clinton Creek - Bulk Excavation Equipment and Productivity

Option	Clinton Creek Options B, D, E, F, and H
200-ton Excavator (Komatsu PC2000)	1
90-ton Haul Trucks (CAT 777F)	4 to 5
Dozer (CAT D9)	1
Productivity	Approximately 10,500 m^3 / 12-h shift

Rates for major earthworks for the Wolverine Creek options are based on the equipment and productivity listed in Table L.

Table L Wolverine Creek - Bulk Excavation Equipment and Productivity

Option	Wolverine Creek Tailings Cover	Wolverine Creek Tailings Stabilization
200-ton Excavator (Komatsu PC2000)	1	---
90-ton Haul Trucks (CAT 777F)	9	---
Dozer (CAT D11)	---	6
Dozer (CAT D9)	1	---
Productivity	Approximately 8,500 m^3 / 12-h shift	Approximately 18,000 m^3 / 12-h shift

Conventional earthworks equipment (e.g., 40- to 70-ton excavators and 40-ton rock trucks) were used to develop rates for minor earthworks quantities.

3.3.7 Sourcing Aggregates

A source of quality aggregates would be developed near the site to supply riprap, gabion rock, granular filter material, and road gravel for construction. We have assumed that the aggregate source will be within a 15 km haul distance from the site and will require no additional road construction. This potential quarry site location has not been identified at this stage of the design.

Rock would be removed using conventional drilling and blasting procedures. A mobile crushing plant would be used to produce the fine aggregates.

Riprap for erosion protection in the Clinton Creek and Wolverine Creek channels was divided into three classes, which are referenced in the drawings in Appendix 2. Rock size gradations associated with these riprap classes are listed in Table M.

Table M Riprap Classes - Rock Size Gradations

Class	Gradation
I	100% smaller than 450 mm 50% to 80% smaller than 350 mm 20% to 50% smaller than 300 mm (Riprap D_{50}) None smaller than 200 mm
II	100% smaller than 800 mm 50% to 80% smaller than 600 mm 20% to 50% smaller than 500 mm (Riprap D_{50}) None smaller than 300 mm
III	100% smaller than 1100 mm 50% to 80% smaller than 900 mm 20% to 50% smaller than 800 mm (Riprap D_{50}) None smaller than 500 mm

3.3.8 Construction Water Management

Month-averaged discharge rates from Hudgeon Lake and Wolverine Creek, which have drainage areas of approximately 117 km^2 and 29 km^2 respectively, were estimated using hydrometric data recorded at the following gauging stations:

- 29EC001: Clinton Creek above Fortymile River (drainage area of 206 km^2, sampled between 1978 and 1991);
- 29EC001 A: Clinton Creek near Mine (drainage area of 150 km^2, sample between 1992 and 1998); and
- 29EC001 B: Clinton Creek Middle (drainage area of 179 km^2, sampled between 1999 and 2004).

Clinton Creek

Estimated month-averaged discharge rates from Hudgeon Lake are listed in Table N.

Table N Average Discharge Rates from Hudgeon Lake

Month	Month-averaged Discharge Rate
May	1.93 m^3/s
June	0.89 m^3/s

Month	Month-averaged Discharge Rate
July	0.56 m^3/s
August	0.49 m^3/s
September	0.67 m^3/s
October	0.41 m^3/s

Diversion of water from Hudgeon Lake during construction should be designed for an average discharge rate of 0.6 m^3/s between July and October. Prior to construction, the water level in Hudgeon Lake should be drawn down to enhance peak flow attenuation.

For options requiring that the water level in Hudgeon Lake be lowered (Options E and F), water would be drained from the lake at a rate of approximately 1.5 m^3/s. A siphon system is proposed in Options E and F. This rate would depend on the final construction schedule, consideration of the environmental impact of discharging anoxic water from the lake and consideration of slope stability around Hudgeon Lake. It is assumed that at this rate of discharge no water treatment will be required and slopes around Hudgeon Lake will be stable.

Wolverine Creek

Estimated month-averaged discharge rates in Wolverine Creek are listed in Table O.

Table O Average Discharge Rates in Wolverine Creek

Month	Month-averaged Discharge Rate
May	0.48 m^3/s
June	0.22 m^3/s
July	0.14 m^3/s
August	0.12 m^3/s
September	0.17 m^3/s
October	0.10 m^3/s

Diversion of water from Wolverine Creek during construction should be designed for an average discharge rate of 0.15 m^3/s between July and October. Prior to construction, the water level in the pond upstream of the tailings should be drawn down to enhance peak flow attenuation.

3.3.9 Control of Airborne Asbestos Fibres

Airborne asbestos fibres pose a health risk to personnel working in the Clinton Creek site. The following health and safety provisions were included in the construction costs of all remediation options:

- One temporary washdown building large enough to accommodate two CAT 777 haul trucks end to end;
- Four pressure washers, plus labour and fuel, to clean asbestos fibres from equipment;
- Tyvek overalls, respirators, and standard PPE for all persons on-site; and
- HEPA filters for all vehicles and equipment on-site.

3.3.10 Replacement of Hydraulic Structures

Hydraulic structures will need to be replaced after either of the following:

- Excessive deformations due to waste rock or tailings movement; or
- Excessive corrosion, abrasion or tearing of gabion baskets.

If high quality aggregates are used for riprap and gabion rock, the effects of weathering on the design life of the structure are negligible. Therefore, riprap-lined channels constructed on stabilized waste rock or tailings should not need to be replaced.

We have assumed that gabion structures will need to be replaced after 0.5 m of horizontal waste rock movement due to excessive deformations and damage to the gabion basket mesh. Similarly, we have assumed that riprap channels will need to be replaced after 1.5 m of horizontal waste rock movement due to excessive deformations, which would reduce channel capacity and destabilize the rock.

Clinton Creek

Based on the assumptions noted above, for Clinton Creek options where no waste rock stabilization is provided (WR-1), the following maintenance cycles are used:

- Gabion drop structures replaced on average every 15 years, based on recorded movement rates between 2006 and 2012 of approximately 0.03 m/yr; and
- Riprap channels replaced on average every 45 years, based on recorded movement rates between 2006 and 2012 of approximately 0.03 m/yr.

For Clinton Creek options where waste rock stabilization is provided (WR-3), we have assumed that gabion drop structures will be replaced on average every 25 years based on the following information:

- PVC-coated gabion baskets have an estimated lifespan of 35 years;
- Abrasion and tearing of gabion mesh due to ice and large woody debris reduces the lifespan of gabion baskets; and

- Gabion drop structures will likely require replacement after a flood exceeding the 1-in-200-year event.

Wolverine Creek

Similarly, the maintenance cycles for Wolverine Creek are based on the following:

- It is assumed that the majority of tailings movement occurs at the surface; therefore, a rock drain constructed below the surface should not need to be replaced.
- It is assumed that when a cover over the tailings pile base is provided, movements are reduced by 50%. This assumption has not been validated by any slope stability modelling, which is outside the scope of this study.
- Where no cover over the tailings pile base is provided (T-1):
  - Riprap channels through the north lobe would be replaced on average every 22 years based on assumed future movement rates of approximately 0.06 m/yr; and
  - Riprap channels through the south lobe would be replaced on average every six years based on assumed future movement rates of approximately 0.25 m/yr.
- Where a cover over the tailings pile base is provided (T-5):
  - Riprap channels through the north lobe would be replaced on average every 45 years based on assumed future movement rates of approximately 0.03 m/yr (50% less than recorded movement rates between 2006 and 2012); and
  - Riprap channels through the south lobe would be replaced on average every 12 years based on assumed future movement rates of approximately 0.12 m/yr (50% less than recorded movement rates between 2006 and 2012).

3.4 Clinton Creek

3.4.1 Option A - CC-1 / WR-1 / HL-1

Clinton Creek Remediation Option A scope of work is as shown on Drawing CC-A01 in Appendix 2 and is based on the following works proposed in the report prepared by AECOM (2011b):

- CC-1: Status quo - maintain gabion drop structures;
- WR-1: Leave as is - no remediation measures; and
- HL-1: Leave as is - no remediation measures.

Some repairs to the existing Drop Structure No. 4 are required as a result of the 2010 flood. A 100 m-long rock ramp will be constructed downstream of Drop Structure No. 4 to provide support and mitigate future erosion that would undercut the structure. The ramp would be 7 m-wide, running at an 8% grade, surfaced with a granular filter and 1.2 m of heavy riprap with a median diameter of 800 mm, and able to convey an estimated 200-year peak discharge of 44.5 m^3/s.

Construction and Scheduling

The final 15 km of the site access road would first be upgraded in order to safely mobilize equipment and materials to site. A 40-person construction camp would then be brought in and assembled at the Clinton Creek town site.

Prior to commencing work in Clinton Creek, the oversteepened channel banks near Drop Structure No 4 would be regraded to a safe slope. A temporary dam would then be constructed at the outlet of Hudgeon Lake. A 500 m-long, 24 in. dia. high-density polyethylene (HDPE) pipe would be installed to divert water from Hudgeon Lake to downstream of the construction area.

It should be noted that with no diversion, the water level in Hudgeon Lake was measured to rise by around 5 cm per day during construction in late September (UM 2003a).

The bottom of the creek would be filled with waste rock from the adjacent dump and compacted. All necessary granular filter layers would be placed over the compacted waste rock using a dozer. The heavy rock riprap would then be placed, starting at the downstream end and working up, using an excavator with a hydraulic thumb.

A source of quality aggregates for riprap, granular filters, and road gravel would be developed near the site.

Improvements to the site access road and development of the aggregate source would be completed over a two-month period from mid-June to mid-August. The rock ramp repair would be completed from mid-August to the end of September when flows in Clinton Creek are low. All equipment and personnel would be demobilized prior to mid-October when ferry access over the Yukon River ends for the season.

Operations and Maintenance

Annual visual inspections of the gabion drop structures and the waste rock dump would be required. A survey of the drop structures and movement monitors in the Clinton Creek waste rock dump would be completed every two years.

Gabion structures would require regular maintenance to replace rock and repair baskets that have been damaged from ice and debris. Historically, gabion structures at the Clinton Creek site have been repaired nearly every two years to replace rock and repair flood damage; however, with higher quality aggregate for gabion rock, it is predicted that this maintenance would be needed on average every five years.

The ongoing movement of the waste rock dump would deform or crush the baskets, necessitating their replacement every 15 years, as discussed in Section 3.3.10. Based on the history of construction at the Clinton Creek site, it is expected that two drop structures could be replaced with one crew in one summer. To maintain the four existing drop structures, two would need to be replaced on average every seven to eight years.

During initial construction, additional riprap and gabion rock would be stockpiled at the site for regular maintenance. For the purposes of estimating life cycle costs, additional rock is assumed to be stockpiled in 5,000 m^3 at a time and replaced as necessary.

3.4.2 Option B - CC-2 / WR-3 / HL-1

Clinton Creek Remediation Option B scope of work is as shown on Drawings CC-B01 and CC-B02 in Appendix 2 and is based on the following works proposed in the report prepared by AECOM (2011b):

- CC-2: Armoured channel over the waste rock;
- WR-3: Stabilize waste rock dump; and
- HL-1: Leave as is - no remediation measures.

A new channel alignment for Clinton Creek would be constructed through the Clinton Creek waste rock dump. Around 1,500,000 m^3 of waste rock would be excavated from the new channel. An additional 450,000 m^3 of waste rock would be removed to stabilize the Clinton Creek waste rock dump. This volume was estimated assuming a maximum waste rock slope of 2.5H:1V and maximum height of approximately 40 m, as derived from Drawing No. 09 prepared by AECOM (2011b) and Drawing No. 07 prepared by UMA Engineering (2002). 700,000 m^3 of the excavated waste rock would be used to fill the existing Clinton Creek channel. The remaining 1,250,000 m^3 would be moved to the abandoned Porcupine Pit.

The new channel would be 7 m wide, 2 m deep, and able to convey an estimated 200-year peak discharge of 44.5 m^3/s. The upper 450 m reach of the new channel would be lined with heavy rock riprap with a median diameter of 500 mm. The lower 350 m reach would be stabilized using a series of eight gabion drop structures, similar to those constructed in the upper reach of the existing Clinton Creek channel.

Construction and Scheduling

The final 15 km of the site access road would first be upgraded in order to safely mobilize equipment and materials to site. A 60-person construction camp would then be brought in and assembled at the Clinton Creek town site.

Prior to infilling the existing Clinton Creek channel, a temporary dam would be constructed using waste rock material at the upstream end of the existing channel. With no diversion, the water level in Hudgeon Lake was measured to rise by around 5 cm per day during construction in late September (UMA Engineering 2003a). A small diversion pumping system may be required to maintain minimum flow rates in Clinton Creek downstream of the site during construction.

Gabion baskets and riprap in the new channel would be constructed with a backhoe, wheel loader, and crew of labourers. A source of quality aggregates for riprap, gabion rock, and gravel would be developed near the site.

Improvements to the site access road and development of the aggregate source would be completed over a two month period in the summer. Equipment for the new channel construction and waste rock stabilization would be mobilized in May of the following year when ferry access over the Yukon River becomes available. Bulk earthworks would be completed over three months, starting in the first week of June. Construction of gabion drop structures and then riprap would follow the channel excavation, being completed over a three to four month period starting in the last week of June. The new channel is expected to be commissioned in October. All equipment and personnel should be demobilized prior to mid-October when ferry access over the Yukon River ends for the season.

Operations and Maintenance

Annual visual inspections of the hydraulic structures, particularly the gabion baskets, and the waste rock dump would be required. A survey of hydraulic structures and movement monitors in the Clinton Creek waste rock dump would be completed every two years.

Gabion structures would require regular maintenance to replace rock and repair baskets that have been damaged from ice and debris. Historically, gabion structures at the Clinton Creek site have been repaired nearly every two years to replace rock and repair flood damage; however, with higher quality aggregate for gabion rock, it is predicted that this maintenance would be needed on average every five years.

The gabion drop structures would need to be replaced approximately every 25 years, as discussed in Section 3.3.10. It is assumed that the stabilization' of waste rock will reduce movements of the Clinton Creek waste rock dump such that they do not affect the life of the gabion drop structures. Based on the history of construction at Clinton Creek site, it is expected that two drop structures could be replaced with one crew in one summer. To maintain the eight proposed drop structures, two would need to be replaced on average every six to seven years.

The riprap-lined channel is designed for the 1-in-200 year flood event and would experience little damage from ice and debris. Regular visual inspections and surveys of the riprap-lined channel would be required; however, no regular maintenance or replacement of the channel is expected, assuming that the waste rock is adequately stabilized and the channel is properly constructed using high quality, durable riprap.

During initial construction, additional riprap and gabion rock would be stockpiled at the site for regular maintenance. For the purposes of estimating life cycle costs, additional rock is assumed to be stockpiled in 5,000 m^3 at a time and replaced as necessary.

3.4.3 Option C - CC-4 / WR-1 / HL-1

Clinton Creek Remediation Option C scope of work is as shown on Drawings CC-C01 and CC-C02 in Appendix 2 and is based on the following works proposed in the report prepared by AECOM (2011b):

- CC-4: Armour existing channel;
- WR-1: Leave as is - no remediation measures; and
- HL-1: Leave as is - no remediation measures.

The existing Clinton Creek channel downstream of Drop Structure No. 4 would be filled several metres with approximately 25,000 m^3 of waste rock to the pre-2010 elevations. A series of eight additional gabion drop structures would be constructed downstream of Drop Structure No. 4 over a distance of approximately 550 m where the channel runs through waste rock.

An additional 150,000 m^3 of waste rock would be removed to achieve stable cut slopes of 2.5H:1V in the waste rock dump. This material would be moved to Porcupine Pit.

Construction and Scheduling

The final 15 km of the site access road would first be upgraded in order to safely mobilize equipment and materials to site. A 40-person construction camp would then be brought in and assembled at the Clinton Creek town site.

Prior to commencing work in Clinton Creek, the oversteepened channel banks near Drop Structure No. 4 would be regraded to a safe slope. A temporary dam would then be constructed at the outlet of Hudgeon Lake. A 900 m-long, 24 in. dia. HDPE pipe would be installed to divert water from Hudgeon Lake to downstream of the construction area. It should be noted that with no diversion, the water level in Hudgeon Lake was measured to rise by approximately 5 cm per day during construction in late September (UMA Engineering 2003a).

Gabion baskets and riprap in the existing channel would be constructed with a backhoe, wheel loader, and crew of labourers. A source of quality aggregates for riprap, gabion rock, and gravel would be developed near the site.

Improvements to the site access road and development of the aggregate source would be completed over a two month period in the summer. The gabion drop structures would be constructed from July to September of the following year when flows in Clinton Creek are low. All equipment and personnel would be demobilized prior to mid-October when ferry access over the Yukon River ends for the season.

Operations and Maintenance

Annual visual inspections of the gabion drop structures and the waste rock dump would be required. A survey of the drop structures and movement monitors in the Clinton Creek waste rock dump would be completed every two years.

Gabion structures would require regular maintenance to replace rock and repair baskets that have been damaged from ice and debris. Historically, gabion structures at the Clinton Creek site have been repaired nearly every two years to replace rock and repair flood damage; however, with higher quality aggregate for gabion rock, it is predicted that maintenance of the new drop structures would be needed on average every five years.

The ongoing movement of the waste rock dump would deform or crush the baskets, necessitating their replacement approximately every 15 years, as discussed in Section 3.3.10. Based on the history of construction at the Clinton Creek site, it is expected that two drop structures could be replaced with one crew in one summer. To maintain the four existing and eight proposed drop structures, two would need to be replaced on average every two to three years.

During initial construction, additional riprap and gabion rock would be stockpiled at the site for regular maintenance. For the purposes of estimating life cycle costs, additional rock is assumed to be stockpiled in 5,000 m^3 at a time and replaced as necessary.

3.4.4 Option D - CC-4 / WR-3 / HL-1

Clinton Creek Remediation Option D scope of work is as shown on Drawings CC-D01 and CC-D02 in Appendix 2 and is based on the following works proposed in the report prepared by AECOM (2011b):

- CC-4: Armour existing channel;
- WR-3: Stabilize waste rock dump; and
- HL-1: Leave as is - no remediation measures.

The existing Clinton Creek channel downstream of Drop Structure No. 4 would be filled several metres with approximately 25,000 m^3 of waste rock to the pre-2010 elevations. A series of eight additional gabion drop structures would be constructed downstream of Drop Structure No. 4 over a distance of approximately 550 m where the channel runs through waste rock.

An additional 425,000 m^3 of waste rock would be removed to stabilize the Clinton Creek waste rock dump. This volume was estimated assuming a maximum waste rock slope of 2.5H:1V and maximum height of approximately 40 m, as derived from Drawing No. 09 prepared by AECOM (2011b) and Drawing No. 07 prepared by UMA Engineering (2002). The material removed from the waste rock dump would be moved to the abandoned Porcupine Pit.

Construction and Scheduling

The final 15 km of the site access road would first be upgraded in order to safely mobilize equipment and materials to site. A 40-person construction camp would then be brought in and assembled at the Clinton Creek town site.

Prior to commencing work in Clinton Creek, the oversteepened channel banks near Drop Structure No. 4 would be regraded to a safe slope. A temporary dam would then be constructed at the outlet of Hudgeon Lake. A 900 m-long, 24 in. dia. HDPE pipe would be installed to divert water from Hudgeon Lake to downstream of the construction area. It should be noted that with no diversion, the water level in Hudgeon Lake was measured to rise by approximately 5 cm per day during construction in late September (UMA Engineering 2003a).

Gabion baskets and riprap in the existing channel would be constructed with a backhoe, wheel loader, and crew of labourers. A source of quality aggregates for riprap, gabion rock, and gravel would be developed near the site.

Improvements to the site access road and development of the aggregate source would be completed over a two-month period starting in mid-June. Bulk earthworks for waste rock stabilization would be completed in August and September. The gabion drop structures would be constructed from July to September of the following year when flows in Clinton Creek are low. All equipment and personnel would be demobilized prior to mid-October when ferry access over the Yukon River ends for the season.

Operations and Maintenance

Annual visual inspections of the gabion drop structures and the waste rock dump would be required. A survey of the drop structures and movement monitors in the Clinton Creek waste rock dump would be completed every two years.

Gabion structures would require regular maintenance to replace rock and repair baskets that have been damaged from ice and debris. Historically, gabion structures at the Clinton Creek site have been repaired nearly every two years to replace rock and repair flood damage; however, with higher quality aggregate for gabion rock, it is predicted that maintenance of the new drop structures would be needed on average every five years.

The gabion drop structures would need to be replaced approximately every 25 years, as discussed in Section 3.3.10. It is assumed that the ‘stabilization’ of waste rock will reduce movements of the Clinton Creek waste rock dump such that they do not affect the life of the gabion drop structures. Based on the history of construction at Clinton Creek site, it is expected that two drop structures could be replaced with one crew in one summer. To maintain the four existing and eight proposed drop structures, two would need to be replaced on average every four to five years.

During initial construction, additional riprap and gabion rock would be stockpiled at the site for regular maintenance. For the purposes of estimating life cycle costs, additional rock is assumed to be stockpiled in 5,000 m^3 at a time and replaced as necessary.

3.4.5 Option E - CC-5 / WR-3 / HL-3

Clinton Creek Remediation Option E scope of work is as shown on Drawings CC-E01 and CC-E02 in Appendix 2 and is based on the following works proposed in the report prepared by AECOM (2011b):

- CC-5: Lower existing channel;
- WR-3: Stabilize waste rock dump; and
- HL-3: Lower lake water level.

The 250 m-long reach of the existing Clinton Creek channel between the outlet of Hudgeon Lake and the end of Drop Structure No. 4 would be lowered to an elevation of approximately 398 m (AECOM 2011b). All existing drop structures would be removed. No new erosion protection would be provided on the basis that bedrock will partially cover the bottom of the creek, slowing the rate of erosion.

Approximately 450,000 m^3 of material would be excavated from the bottom of the creek and adjacent cut slopes. An additional 500,000 m^3 of waste rock would be removed to stabilize the Clinton Creek waste rock dump. These volumes were estimated assuming a maximum waste rock slope of 2.5H:1V and maximum height of approximately 40 m, as derived from Drawing No. 09 prepared by AECOM (2011b) and Drawing No. 07 prepared by UMA Engineering (2002). All material removed from the channel and waste rock dump would be moved to the abandoned Porcupine Pit.

Construction and Scheduling

The final 15 km of the site access road would first be upgraded in order to safely mobilize equipment and materials to site. A 60-person construction camp would then be brought in and assembled at the Clinton Creek town site.

As waste rock is excavated, the water level in Hudgeon Lake would be drawn down using a siphon. 450 m of twin 24 in. dia. HDPE pipes would be used to siphon water from the lake to downstream of the construction area. At an average siphon discharge rate of 1.5 m^3/s, Hudgeon Lake would be drained to an elevation of 398 m over a period of approximately two months.

Improvements to the site access road and development of the aggregate source would be completed over a two-month period in the summer. Equipment for the waste rock stabilization would be mobilized in July of the following year. Waste rock stabilization and channel excavation would be completed over two months, starting in mid-July when flows in Clinton Creek are low.

Operations and Maintenance

Annual visual inspections of Clinton Creek and the waste rock dump would be required. A survey of the creek and movement monitors in the Clinton Creek waste rock dump would be completed every two years.

As the waste rock dump toe erodes, additional stabilization measures may be required to mitigate movement of the dump; however, as the rate of erosion is unknown and is outside the scope of this study to predict, this operational cost has been excluded from the estimate.

This option is considered to be a “walk-away” solution for the purposes of this study. Therefore, ongoing maintenance of the site access road would not be required.

3.4.6 Option F - CC-6 / WR-2 / HL-2

Clinton Creek Remediation Option F scope of work is as shown on Drawings CC-F01 and CC-F02 in Appendix 2 and is based on the following works proposed in the report prepared by AECOM (2011b):

- CC-6: Restore to valley bottom;
- WR-2: Remove to expose valley bottom; and
- HL-2: Fully drain lake.

The reach of Clinton Creek that passes through the failed waste rock dump would be restored to its original valley bottom. Approximately 9,500,000 m^3 of waste rock would be removed from Clinton Creek to stabilize the dump and expose a 100 m-wide section of the valley floor. 5,000,000 m^3 of that waste rock would be moved to Porcupine Pit and the remaining 4,500,000 m^3 would be placed along the south side of Hudgeon Lake. Once completed, the valley bottom would be revegetated.

The re-instated Clinton Creek channel would have a grade of approximately 1%, width of 11 m and capacity to convey the 25-year flood. A smaller design flood event was used for this channel to support natural channel morphology, with the end goal of the channel developing a meandering pattern. The channel bottom would be lined with coarse gravel and cobbles, similar to the natural creek bed material. The channel banks would be seeded and lined with turf reinforcement matting to promote the growth of a natural vegetated cover. Channel construction is not a significant portion of the cost of this option, so it has not been considered in detail. If this option is selected, a more rigorous creek rehabilitation assessment will be required.

Construction and Scheduling

The final 15 km of the site access road would first be upgraded in order to safely mobilize equipment and materials to site. An 80-person construction camp would then be brought in and assembled at the Clinton Creek town site.

As waste rock is excavated, the water level in Hudgeon Lake would be drawn down using a siphon. 900 m of twin 24 in. dia. HDPE pipes would be used to siphon water from the lake to downstream of the construction area. The siphon would be lowered several times as the water level in the lake drops. At an average siphon discharge rate of 1.5 m^3/s, Hudgeon Lake would be drained over a period of approximately four to five months.

Armouring in the new channel would be constructed with a backhoe, wheel loader, and crew of labourers. A source of quality aggregates for riprap would be developed near the site.

Improvements to the site access road would be completed over a two month period starting in mid-June. Bulk excavation of waste rock would be completed over seven months, starting in the last week of August and finishing in March of the following year. Construction of the natural channel would be completed in April. Maintenance of both the Top of the World Highway and the Clinton Creek site access road would be required from November to April to maintain all-season access to the site.

Operations and Maintenance

Visual inspections of Clinton Creek and the waste rock dump would be required every two years for around 10 years post-construction to ensure that the re-instated Clinton Creek is operating as intended and the waste rock dump is stable. No operational costs associated with maintenance or replacement would be required.

This option is considered to be a "walk-away" solution for the purposes of this study. Therefore, ongoing maintenance of the site access road would not be required.

3.4.7 Option G - CC-10 / WR-1 / HL-1

Clinton Creek Remediation Option G scope of work is as shown on Drawings CC-G01 and CC-G02 in Appendix 2 and is based on the following works proposed in the report prepared by AECOM (2011b):

- CC-10: Gabion chute along existing channel (variation of CC-4);
- WR-1: Leave as is - no remediation measures; and
- HL-1: Leave as is - no remediation measures.

The existing Clinton Creek channel downstream of Drop Structure No. 4 would be filled several metres with approximately 25,000 m^3 of waste rock to the pre-2010 elevations. A gabion chute would be constructed downstream of Drop Structure No. 4 over a distance of approximately 550 m where the channel runs through waste rock. The gabion chute would be 7 m wide, 2 m deep, and able to convey an estimated 200-year peak discharge of 44.5 m^3/s.

An additional 150,000 m^3 of waste rock would be removed to achieve stable cut slopes of 2.5H:1V in the waste rock dump. This material would be moved to Porcupine Pit.

Construction and Scheduling

The final 15 km of the site access road would first be upgraded in order to safely mobilize equipment and materials to site. A 40-person construction camp would then be brought in and assembled at the Clinton Creek town site.

Prior to commencing work in Clinton Creek, the oversteepened channel banks near Drop Structure No. 4 would be regraded to a safe slope. A temporary dam would then be constructed at the outlet of Hudgeon Lake. A 900 m-long, 24 in. dia. HDPE pipe would be installed to divert water from Hudgeon Lake to downstream of the construction area. It should be noted that with no diversion, the water level in Hudgeon Lake was measured to rise by approximately 5 cm per day during construction in late September (UMA Engineering 2003a).

Gabions would be constructed with a backhoe, wheel loader, and crew of labourers. A source of quality aggregates for riprap, gabion rock, and gravel would be developed near the site.

Improvements to the site access road and development of the aggregate source would be completed over a two-month period from mid-June to mid-August. The gabion chute would be constructed from mid-August to the end of September when flows in Clinton Creek are low. All equipment and personnel would be demobilized prior to mid-October when ferry access over the Yukon River ends for the season.

Operations and Maintenance

Annual visual inspections of the gabion chute and the waste rock dump would be required. A survey of the gabion chute and movement monitors in the Clinton Creek waste rock dump would be completed every two years.

The gabion chute and gabion drop structures would require regular maintenance to replace rock and repair baskets that have been damaged from ice and debris. Historically, gabion structures at the Clinton Creek site have been repaired nearly every two years to replace rock and repair flood damage; however, with higher quality aggregate for gabion rock, it is predicted that maintenance of the gabion chute would be needed on average every five years.

The ongoing movement of the waste rock dump would deform or crush the gabion baskets, necessitating replacement of the constructed channel approximately every 15 years, as discussed in Section 3.3.10.

During initial construction, additional gabion rock would be stockpiled at the site for regular maintenance. For the purposes of estimating life cycle costs, additional rock is assumed to be stockpiled in 5,000 m^3 at a time and replaced as necessary.

3.4.8 Option H - CC-10 / WR-3 / HL-1

Clinton Creek Remediation Option H scope of work is as shown on Drawings CC-H01 and CC-H02 in Appendix 2 and is based on the following works proposed in the report prepared by AECOM (2011b):

- CC-10: Gabion chute along existing channel (variation of CC-4);
- WR-3: Stabilize waste rock dump; and
- HL-1: Leave as is - no remediation measures.

The existing Clinton Creek channel downstream of Drop Structure No. 4 would be filled several metres with approximately 25,000 m^3 of waste rock to the pre-2010 elevations. A gabion chute would be constructed downstream of Drop Structure No. 4 over a distance of approximately 550 m where the channel runs through waste rock. The gabion chute would be 7 m wide, 2 m deep, and able to convey an estimated 200-year peak discharge of 44.5 m^3/s.

An additional 425,000 m^3 of waste rock would be removed to stabilize the Clinton Creek waste rock dump. This volume was estimated assuming a maximum waste rock slope of 2.5H:1V and maximum height of approximately 40 m, as derived from Drawing No. 09 prepared by AECOM (2011b) and Drawing No. 07 prepared by UMA Engineering (2002). The material removed from the waste rock dump would be moved to the abandoned Porcupine Pit.

Construction and Scheduling

The final 15 km of the site access road would first be upgraded in order to safely mobilize equipment and materials to site. A 40-person construction camp would then be brought in and assembled at the Clinton Creek town site.

Prior to commencing work in Clinton Creek, the oversteepened channel banks near Drop Structure No. 4 would be regraded to a safe slope. A temporary dam would then be constructed at the outlet of Hudgeon Lake. A 900 m-long, 24 in. dia. HDPE pipe would be installed to divert water from Hudgeon Lake to downstream of the construction area. It should be noted that with no diversion, the water level in Hudgeon Lake was measured to rise by approximately 5 cm per day during construction in late September (UMA Engineering 2003a).

Gabions would be constructed with a backhoe, wheel loader, and crew of labourers. A source of quality aggregates for riprap, gabion rock, and gravel would be developed near the site.

Improvements to the site access road and development of the aggregate source would be completed over a two-month period starting in mid-June. Bulk earthworks for waste rock stabilization would be completed in August and September. The gabion chute would be constructed in July and August of the following year when flows in Clinton Creek are low. All equipment and personnel would be demobilized prior to mid-October when ferry access over the Yukon River ends for the season.

Operations and Maintenance

Annual visual inspections of the gabion chute and the waste rock dump would be required. A survey of the gabion chute and movement monitors in the Clinton Creek waste rock dump would be completed every two years.

The gabion chute and gabion drop structures would require regular maintenance to replace rock and repair baskets that have been damaged from ice and debris. Historically, gabion structures at the Clinton Creek site have been repaired nearly every two years to replace rock and repair flood damage; however, with higher quality aggregate for gabion rock, it is predicted that maintenance of the gabion chute would be needed on average every five years.

The gabion chute would need to be replaced approximately every 25 years, as discussed in Section 3.3.10. It is assumed that the 'stabilization' of waste rock will reduce movements of the Clinton Creek waste rock dump such that they do not affect the life of the gabion chute.

During initial construction, additional gabion rock would be stockpiled at the site for regular maintenance. For the purposes of estimating life cycle costs, additional rock is assumed to be stockpiled in 5,000 m^3 at a time and replaced as necessary.

3.5 Wolverine Creek

3.5.1 Option A - WC-2/T-1

Wolverine Creek Remediation Option A scope of work is based on the following works proposed in the report prepared by AECOM (2011b):

- WC-2: Status quo - maintain armoured channel; and
- T-1: Leave as is - no remediation measures.

Annual visual inspections of the armoured channel and the tailings pile would be required. A survey of hydraulic structures and movement monitors in the tailings pile would be completed every two years. Since the armoured channel appears to have been designed for a flood magnitude greater than the 200-year event and is located in a region of the tailings pile showing minimal movement, no regular maintenance or replacement of the channel is expected.

3.5.2 Option B - WC-3/T-1

Wolverine Creek Remediation Option B scope of work is as shown on Drawings WC-B01 and WC-B02 in Appendix 2 and is based on the following works proposed in the report prepared by AECOM (2011b):

- WC-3: Rock drain along toe of tailings lobe(s); and
- T-1: Leave as is - no remediation measures.

A 550 m-long rock drain would be constructed along Wolverine Creek through the toe of the tailings lobes. The drain would have a grade of 1.8%, depth of 4 m, bottom width of 8 m and top width of 20 m. The design discharge capacity of the drain is 0.6 m^3/s. Typical freshet flows in Wolverine Creek are estimated at approximately 0.2 m^3/s to 1.0 m^3/s. Flows exceeding 0.6 m^3/s would initially be stored in the ponded area upstream of the north lobe before spilling over into an unlined channel through the tailings, similar to the existing conditions. The rock drain's capacity will likely be exceeded in excess of 20 days each year. The rock drain would not significantly reduce peak flows in Wolverine Creek.

Approximately 200,000 m^3 of tailings would be excavated to install the rock drain. These tailings would then be replaced over the drain.

The permanent ponded area upstream of the north tailings lobe would be eliminated by installing the rock drain; however, in high flow events the water level would rise to a maximum elevation of approximately 410 m at the inlet of the drain before spilling over the toe of the tailings pile.

Construction and Scheduling

A 45-person construction camp would be brought in and assembled at the Clinton Creek town site prior to starting work. The 1.2 km access road from Clinton Creek to the Wolverine Creek tailings pile would then be upgraded in order to safely transport equipment and materials to the site.

Prior to commencing work in Wolverine Creek, the ponded area upstream of the north tailings lobe would be pumped down and a temporary dam would be constructed. A pumping diversion around the work area would be established and maintained for the duration of construction.

A source of quality aggregates for granular filters, coarse blast rock and riprap would be developed near the site.

Tailings would be excavated along the proposed rock drain alignment and placed a safe distance from the edge of the excavation. The bottom of the drain would be lined with a 0.5 m-thick granular filter layer. Coarse blast rock screened for particles smaller than 100 mm dia. would be placed over the granular filter. The drain would then be capped with another 0.5 m-thick granular filter and backfilled with tailings.

Development of the aggregate source and blasting, crushing and hauling of aggregate would be completed in over a three-month period in the summer. Equipment for construction of the road and rock drain would be mobilized in June of the following year. The 1.2 km-long access road upgrades and bridge would be completed over a four-week period in June. Bulk excavation of tailings and installation of the rock drain would be completed over a three-month period starting in July.

Operations and Maintenance

Annual visual inspections of the rock drain, Wolverine Creek tailings piles and the channel through the tailings would be required. A survey of the tailings pile toe and channel through the tailings would be completed every two years.

The rock drain will require regular maintenance to dredge sediment from the sediment trap upstream of the drain. It is assumed that approximately 2,000 m^3 of sediment would be removed every 10 years. As discussed in Section 3.3.10, it is not expected that the rock drain will require replacement because tailings movement occurs primarily at the ground surface, above the drain.

While minor maintenance is required, this option is considered to be essentially a “walk-away” solution for the purposes of this study. Therefore, ongoing maintenance of the site access road would not be required.

3.5.3 Option C - WC-7 / T-5

Wolverine Creek Remediation Option C scope of work is as shown on Drawings WC-C01 and WC-C02 in Appendix 2 and is based on the following works proposed in the report prepared by AECOM (2011b):

- Option WC-7: Armoured channel through cover to existing rock channel; and
- Option T-5: Provide cover over tailings pile base.

700,000 m^3 of waste rock would be placed over the tailings pile base to an elevation of 422 m to provide stability and protect against erosion.

A new channel for Wolverine Creek would be constructed over the tailings pile base. The new channel would be 5 m wide and able to convey an estimated 200-year peak discharge rate of approximately 17.1 m^3/s. The upper 450-m reach of the new channel, running at a 0.1% grade, would be 2.5 m deep and lined with rock ranging from 25 mm to 100 mm in diameter. The lower 200-m reach, running at a 15% grade, would be lined with heavy riprap with a median diameter of 800 mm with a granular filter. At the downstream end, the new channel would tie into the existing rock-lined channel.

The depth and volume of ponded water upstream of the north tailings lobe would be increased by installing the waste rock cover over the tailings pile base. The operating water elevation would be approximately 420 m at the inlet of the constructed channel. It should be noted that since the water level would be raised by 10 m, Canadian Dam Safety Regulations may apply.

Construction and Scheduling

A 45-person construction camp would be brought in and assembled at the Clinton Creek town site prior to starting work. The 1.2 km access road from Clinton Creek to the Wolverine Creek tailings pile would then be upgraded in order to safely transport equipment and materials to the site.

Prior to commencing work in Wolverine Creek, the ponded area upstream of the north tailings lobe would be pumped down and a temporary dam would be constructed. A pumping diversion around the work area would be established and maintained for the duration of construction.

A source of quality aggregates for granular filters, coarse blast rock and riprap would be developed near the site.

Waste rock for the tailings cover would be hauled from the Clinton Creek waste rock dump and placed over the tailings pile base up to an elevation of 422 m. The new Wolverine Creek channel would be constructed through the waste rock cover with a backhoe, wheel loader and crew of labourers using riprap from the aggregate source.

Improvements to the site access road and development of the aggregate source would be completed in over a two-month period in the summer. Equipment for construction of the cover over the tailings pile base and the armoured channel would be mobilized in June of the following year.

Waste rock would be excavated from Clinton Creek and hauled to the Wolverine Creek tailings pile over a three-month period starting in June. Construction of the armoured channel would be completed over a one-month period starting at the end of August.

Operations and Maintenance

Annual visual inspections of the hydraulic structures and the tailings pile would be required. A survey of hydraulic structures and movement monitors in the tailings pile would be completed every two years.

The riprap-lined channel is designed for the 1-in-200 year flood event and would likely experience little damage from ice and debris. Due to ongoing tailings movement, the sections of channel over the north and south tailings lobes would need replacement approximately every 45 years and every 12 years respectively, as discussed in Section 3.3.10. This is based on the assumption that the tailings cover would reduce future tailings movement by 50%.

3.5.4 Option D - WC-3 & WC-7 / T-5

Wolverine Creek Remediation Option D scope of work is as shown on Drawings WC-D01 and WC-D02 in Appendix 2 and is based on the following works proposed in the report prepared by AECOM (2011b):

- Option WC-3: Rock drain along toe of tailings lobe(s);
- Option WC-7: Armoured channel through cover to existing rock channel; and
- Option T-5: Provide cover over tailings pile base.

A 550 m-long rock drain would be constructed along Wolverine Creek through the toe of the tailings lobes. The drain would have a grade of 1.8%, depth of 4 m, and width of 14 m. The design discharge capacity of the drain is 0.6 m^3/s. Typical freshet flows in Wolverine Creek are estimated at approximately 0.2 m^3/s to 1.0 m^3/s. Flows exceeding 0.6 m^3/s would initially be stored in the ponded area upstream of the north lobe before spilling over into the armoured channel through the tailings. The rock drain would not significantly reduce peak flows in Wolverine Creek.

Approximately 200,000 m^3 of tailings would be excavated to install the rock drain. These excavated tailings plus an additional 700,000 m^3 of waste rock hauled from Clinton Creek would be placed in a cover over the toe of the tailings up to an elevation of 422 m to provide stability and protect against erosion.

A new channel for Wolverine Creek would be constructed over the tailings pile base. The new channel would be 5 m wide and able to convey an estimated 200-year peak discharge rate of approximately 17.1 m^3/s. The upper 450-m reach of the new channel, running at a 0.1% grade, would be 2.5 m deep and lined with rock ranging from 25 to 100 mm in diameter. The lower 200-m reach, running at a 15% grade, would be lined with heavy riprap with a median diameter of 800 mm with a granular filter. At the downstream end, the new channel would tie into the existing rock-lined channel.

The permanent ponded area upstream of the north tailings lobe would be eliminated by installing the rock drain; however, in high flow events the water level would rise to a maximum elevation of approximately 420 m at the inlet of the drain before spilling into the constructed channel over the toe of the tailings pile.

It should be noted that since the maximum water level would be raised by 10 m and the rock drain is not sized to convey peak flows, dam safety guidelines and regulations may apply.

Construction and Scheduling

A 60-person construction camp would be brought in and assembled at the Clinton Creek town site prior to starting work. The 1.2 km access road from Clinton Creek to the Wolverine Creek tailings pile would then be upgraded in order to safely transport equipment and materials to the site.

Prior to commencing work in Wolverine Creek, the ponded area upstream of the north tailings lobe would be pumped down and a temporary dam would be constructed. A pumping diversion around the work area would be established and maintained for the duration of construction.

A source of quality aggregates for granular filters, coarse blast rock and riprap would be developed near the site.

Tailings would be excavated along the proposed rock drain alignment and placed a safe distance from the edge of the excavation. The bottom of the drain would be lined with a 0.5 m-thick granular filter layer. Coarse blast rock screened for particles smaller than 100 mm dia. would be placed over the granular filter. The drain would then be capped with another 0.5 m-thick granular filter and backfilled with tailings.

Waste rock for the tailings cover would be hauled from the Clinton Creek waste rock dump and placed over the tailings pile base up to an elevation of 422 m. The new Wolverine Creek channel would be constructed through the waste rock cover with a backhoe, wheel loader and crew of labourers using riprap from the aggregate source.

Improvements to the site access road and development of the aggregate source would be completed in over a three-month period in the summer. Bulk excavation of tailings and installation of the rock drain would be completed over a three-month period between July and September of the following year. Construction of the cover over the tailings pile base and the armoured channel would be completed over a three-month period between July and September of the third year.

Operations and Maintenance

Annual visual inspections of the rock drain, Wolverine Creek tailings piles and the channel through the tailings would be required. A survey of the tailings pile toe and channel through the tailings would be completed every two years.

The rock drain will require regular maintenance to dredge sediment from the sediment trap upstream of the drain. It is assumed that approximately 2,000 m^3 of sediment would be removed every 10 years. As discussed in Section 3.3.10, it is not expected that the rock drain will require replacement because tailings movement occurs primarily at the ground surface, above the drain.

The riprap-lined channel is designed for the 1-in-200 year flood event and would likely experience little damage from ice and debris. Due to ongoing tailings movement, the sections of channel over the north and south tailings lobes would need to replaced approximately every 45 years and every 12 years respectively, as discussed in Section 3.3.10. This is based on the assumption that the tailings cover would reduce future tailings movement by 50%.

3.5.5 Option E - WC-3 & WC-7 / T-2 & T-3

Wolverine Creek Remediation Option E scope of work is as shown on Drawings WC-B01 and WC-B02 in Appendix 2 and is based on the following works proposed in the report prepared by AECOM (2011b):

- Option WC-3: Rock drain along toe of tailings lobe(s);
- Option WC-7: Armoured channel through cover to existing rock channel;
- Option T-2: Stabilize tailings; and
- Option T-3: Provide cover and armouring.

A 550 m-long rock drain would be constructed along Wolverine Creek through the toe of the tailings lobes. The drain would have a grade of 1.8%, depth of 4 m, and width of 14 m. The design discharge capacity of the drain is 0.6 m^3/s. Typical freshet flows in Wolverine Creek are estimated at approximately 0.2 m^3/s to 1.0 m^3/s. Flows exceeding 0.6 m^3/s would initially be stored in the ponded area upstream of the north lobe before spilling over into the armoured channel through the tailings. The rock drain would not significantly reduce peak flows in Wolverine Creek. Approximately 200,000 m^3 of tailings would be excavated to install the rock drain. These tailings would then be replaced once the rock drain is completed.

To stabilize the tailings pile, the north and south lobes would be re-sloped to 3.5H:1V and 3.75H:1V respectively and the base of the tailings pile in Wolverine Creek would be filled to an elevation of 421 m. An estimated 3,000,000 m^3 of tailings would be moved from the upper slope to the lower slope and tailings pile base. 500,000 m^3 of waste rock would then be placed over the tailings pile in a 1 m-thick cover to protect against erosion.

A new channel for Wolverine Creek would be constructed over the tailings pile base. The new channel would be 5 m wide and able to convey an estimated 200-year peak discharge rate of approximately 17.1 m^3/s. The upper 450-m reach of the new channel, running at a 0.1% grade, would be 2.5 m deep and lined with rock ranging from 25 to 100 mm in diameter. The lower 200-m reach, running at a 15% grade, would be lined with heavy riprap with a median diameter of 800 mm with a granular filter.
At the downstream end, the new channel would tie into the existing rock-lined channel.

The permanent ponded area upstream of the north tailings lobe would be eliminated by installing the rock drain; however, in high flow events the water level would rise to a maximum elevation of approximately 420 m at the inlet of the drain before spilling into the constructed channel over the toe of the tailings pile. It should be noted that since the maximum water level would be raised by 10 m and the rock drain is not sized to convey peak flows, Canadian Dam Safety Regulations may apply.

Construction and Scheduling

A 60-person construction camp would be brought in and assembled at the Clinton Creek town site prior to starting work. The 1.2 km access road from Clinton Creek to the Wolverine Creek tailings pile would then be upgraded in order to safely transport equipment and materials to the site.

Prior to commencing work in Wolverine Creek, the ponded area upstream of the north tailings lobe would be pumped down and a temporary dam would be constructed. A pumping diversion around the work area would be established and maintained for the duration of construction.

A source of quality aggregates for granular filters, coarse blast rock and riprap would be developed near the site.

Tailings would be excavated along the proposed rock drain alignment and placed a safe distance from the edge of the excavation. The bottom of the drain would be lined with a 0.5 m-thick granular filter layer. Coarse blast rock screened for particles smaller than 100 mm dia. would be placed over the granular filter. The drain would then be capped with another 0.5 m-thick granular filter and backfilled with tailings.

The tailings pile would be regraded and the base of the tailings pile would be filled to an elevation of 421 m. Waste rock for the tailings cover would then be hauled from the Clinton Creek waste rock dump and placed over the tailings pile. The new Wolverine Creek channel would be constructed through the waste rock cover with a backhoe, wheel loader and crew of labourers using riprap from the aggregate source.

Improvements to the site access road and development of the aggregate source would be completed in over a three-month period in the summer. Bulk excavation of tailings and installation of the rock drain would be completed over a three-month period between July and September of the following year. Stabilization of the tailings would be completed over a three-month period starting in June of the third year. This would be followed by construction of the cover over the tailings pile base and the armoured channel, completed over a two-month period in August and September of the third year.

Operations and Maintenance

Annual visual inspections of the rock drain, Wolverine Creek tailings piles and the channel through the tailings would be required. A survey of the tailings pile toe and channel through the tailings would be completed every two years.

The rock drain will require regular maintenance to dredge sediment from the sediment trap upstream of the drain. It is assumed that approximately 2,000 m^3 of sediment would be removed every 10 years. No regular replacement of the rock drain is expected.

The riprap-lined channel is designed for the 1-in-200 year flood event and would likely experience little damage from ice and debris. Regular visual inspections and surveys of the riprap-lined channel would be required; however, no regular maintenance or replacement of the channel is expected, assuming that the waste rock is adequately stabilized and the channel is properly constructed using high quality, durable riprap.

While minor maintenance is required, this option is considered to be essentially a “walk-away” solution for the purposes of this study. Therefore, ongoing maintenance of the site access road would not be required.

4. BASIS OF CAPITAL COST ESTIMATES

Capital cost estimates include all equipment and material supply, and contracting services to construct the works described in this report.

The unit prices reflect WorleyParsons' best estimates of crew sizes, productivity and material costs and are subject to the validity of the assumptions stated in the following sections. Actual tendered costs would depend on factors such as market conditions generally, the time of year, contractors' workloads, perceived risk exposure associated with the project, scope changes, and unknown site conditions.

All capital cost estimates were developed using WorleyParsons Class 1 Estimate Guidelines. Values for accuracy and contingency are presented in Table P. The accuracy of this estimate is comparable to that of the Association for the Advancement of Cost Engineering (AACE) Class 5.

Table P Estimate Classifications

Project Stage	Identify	Conceptual Engineering
Estimate Class	WorleyParsons Class 1	AACE Class 5
Estimate Type	Order of Magnitude	Order of Magnitude
Expected Estimate Accuracy	±50%	L: -20% to -50% H: +30% to +100%
Suggested Contingency Range	25%	<50%

4.1 Scope of Work

In general, the scope of work for capital cost estimates presented in this report includes:

- Mobilization and demobilization of equipment and personnel;
- Improvements to the existing site access road;
- Stabilization of Clinton Creek and the adjacent waste rock dump;
- Stabilization of Wolverine Creek and the adjacent tailings pile;
- All indirect costs associated with construction (incl. construction camps, temporary facilities, snow removal, environmental monitoring, living out allowance [LOA] and travel); and
- Engineering, procurement and construction management (EPCM).

Detailed scopes of work for each remediation option are defined by the conceptual design figures and construction cost estimate breakdowns in Appendices 1 and 2.

4.1.1 Concept Designs

Capital cost estimates were prepared using WorleyParsons' current understanding of the potential scope and available site information, and are based on the information provided in the following reports:

- R47: "Abandoned Clinton Creek Asbestos Mine - Conceptual Design Report" prepared by UMA Engineering (2002); and
- R97: "Clinton Creek Technical Options Assessment prepared" by AECOM (2011b).

Additional engineering was completed by WorleyParsons where insufficient or no design had been presented in the aforementioned reports. The level of engineering was limited to the minimum level required to achieve the desired overall cost estimate accuracy. Where engineering designs were presented by UMA Engineering or AECOM, WorleyParsons did not undertaken additional engineering to confirm the appropriateness of the design.

Conceptual engineering provided by WorleyParsons is described in the Section 3.1.

4.2 Assumptions

Estimated capital costs are subject to the validity of the engineering designs completed by others, the basis of conceptual engineering as described in Section 3.1, and the key assumptions listed below.

4.2.1 General

- All costs are presented in 1st quarter 2014 Canadian dollars.
- Land right-of-ways have been established for construction.
- All major works will be performed by a workforce from Edmonton, AB, due to availability of cost information. As this assumption is the same for all options, it should not affect the results of the life cycle cost comparison.
- A camp will be established at the Clinton Creek site to accommodate all on-site personnel. All camp facilities will be brought in from Edmonton, AB.
- Sufficient site preparations (clearing, grubbing, topsoil stripping and subgrade preparation) have been completed previously at the Clinton Creek site to accommodate camp and site facilities.
- All on-site personnel will be on a "two weeks on, two weeks off" rotation schedule.
- One grader will be allocated full-time for road maintenance during construction in the summer (May to September)
- Two graders and one dozer will be allocated full-time for snow removal and road maintenance during construction in the winter (October to April).
- Diesel fuel costs $1.60/L plus the cost of transportation from Dawson City to site.

- All heavy equipment, camps, facilities and materials are able to be transported across:
  - The Yukon River via the existing ferry or ice bridge; and
  - The Fortymile River via the existing bridge.

4.2.2 Aggregates

- A source for quality aggregate materials (road gravel, gabion rock and riprap) can be developed within 15 km of the site and will require no additional road construction. This potential quarry site location has not been identified at this stage of the design.
- Aggregates will be produced by conventional drilling and blasting; a mobile crushing plant will be used to produce smaller aggregates.

4.2.3 Earthworks

- All earthworks will be performed in two shifts of 12 hours per day; no down time has been factored into costs.
- Direct haulage roads for the transport of excavated waste rock will be used and constructed where necessary; it is assumed that existing roads will be used or will require minimal effort to construct over the existing waste dump.
- No allowances for switchbacks or extensive road developments are provided. It is assumed that since the waste rock is mildly sloped that roads can be constructed at grades not exceeding 8%, which would necessitate the use of switchbacks and would increase material haul distances.
- All surplus waste material will be dumped in the Porcupine Pit for Clinton Creek or the Mill Area for Wolverine Creek.

4.2.4 Allowances

The following allowances were added to the capital cost estimates based on experience with similar projects.

- Temporary Facilities 3%
- Environmental Monitoring and Testing 2%
- Geotechnical Investigations and Recommendations 2%
- EPCM 10%

These allowances are added as a percentage of the total capital cost of construction as per the following example calculation:

Estimated Capital Cost (before allowances)	=	$1,000,000
Temporary Facilities = ($1,000,000) x 3%	=	$30,000
Environmental Monitoring and Testing = ($1,000,000) x 2%	=	$20,000
Geotechnical Investigations and Recommendations = ($1,000,000) x 2%	=	$20,000
EPCM = ($1,000,000) x 10%	=	$100,000
Total Capital Cost	=	$1,170,000

Contingency

An additional allowance for contingency should be included in the estimate to account for design unknowns, unforeseeable site conditions and minor works not directly accounted for in the estimate. Contingency is part of the estimate and should be expected to be spent. The amount of contingency added is based on the level of detail of the estimate and the degree of uncertainty involved in the construction work. Estimates with less detail and a higher degree of uncertainty should have a higher contingency allowance.

A contingency allowance of 25% of the total estimated capital cost (after allowances) is recommended for all remediation options except for Clinton Creek Option E.

A contingency of 50% is recommended for Option E to account for potentially extensive slope stabilization works that would be required. Previously collected geological data from the vicinity of the potentially unstable north valley wall along Clinton Creek provide an indication of the materials that may be encountered during the excavation to lower the Clinton Creek channel; however, the slope stability analysis required to reduce this 50% contingency allowance has not been completed. Moving the creek south to reduce the potential for extensive slope stability works should be considered (see Alternative E2 in Appendix 1).

The recommended contingencies are included in the estimates. Contingency is added as per the following sample calculation:

Estimated Capital Cost (after other allowances)	=	$1,170,000
Contingency = ($1,170,000) x 25%	=	$292,500
Total Capital Cost	=	$1,462,500

4.3 Quantity Derivation and Cost Basis

The basis for deriving the construction quantities and unit prices presented in this report is described below.

4.3.1 Quantity Derivation

The material take-off quantities for the project options were developed using:

- Civil 3D design models compared with existing ground elevation data for bulk earthworks quantities;
- Site maps and aerial photos to estimate lengths of road upgrades, channels, and rock drains and material haul distances; and
- Design cross-sections and lengths for channel armouring and road upgrade materials.

4.3.2 Cost Basis

Costs were built-up using a variety of estimating methods, utilizing hourly rates, capital costs, and productivities. Construction methods, productivities and hourly rates were sourced from estimating publications, WorleyParsons engineering & estimating databases and vendor quotes.

4.3.3 Direct Rates

All direct unit costs have been built-up as “all-in” unit costs, These rates include all labour, equipment, materials, maintenance, fuel, supervision, contractor overhead and mark-up.

- Unit costs for drill & blast and bulk earthwork quantities over 150,000 m^3 were derived using mining models.
- Road improvements, access road construction, channel armouring, drop structures, rock drain, construction water management and asbestos control unit costs were built-up using common earthwork estimating models combining BC Road Builder rates, built-up labour rates, productivities, historical data and standard construction practices.
- Costs to crush aggregates and haul to site are included where aggregate material is required. Crushing costs are based on typical crushing practices, productivities and equipment. Rates are based on BC Road Builder rates and past projects of similar scope and remoteness.
- The bridge construction cost was built-up from a vendor-supplied bridge deck quote and WorleyParsons’ concrete unit costs for abutments, railings and deck. It should be noted that mobile batch plants are available in area but unable to solicit pricing at this time. As such, pre-mixed concrete bags of one cubic yard were allowed for to batch all concrete onsite using transit mix trucks.

- Diesel fuel rate of $1.60/L was built into all earthwork based on Yukon Government - Energy, Mines and Resources, surveyed October 30, 2013. Equipment fuel consumption rates and maintenance costs were obtained from historic data, past projects, models, online sources and interpolations.
- Mobilization costs allow for mobilizing and demobilizing all equipment from Edmonton to site through Dawson City.

4.3.4 Labour Rates

- Contractor on-site labour was assumed to consist of predominantly equipment operators and labourers. An average operator rate of approximately $100/h was built-up on this basis. Wages and burdened rates were based on AB CLRA Collective Agreements (2011 - 2015).

4.3.5 Indirect Rates

- Construction camp costs were based on a construction manpower schedule and a budgetary vendor quote for:
  - Mobilization and demobilization;
  - Set-up and tear-down;
  - Dorm, kitchen / mess, laundry and recreation room trailers; and
  - Equipment rental.
- An allowance was included for camp operation & maintenance costs per man-day based on typical camp costs in remote northern regions.
- RVs and worker per diems were assumed to accommodate small sized crews performing regular maintenance work.
- Travel costs to and from site consist of an allowance based on round-trip flights from Edmonton to Dawson City and a chartered passenger bus from Dawson City to site. Flight costs were solicited from Air North and the chartered bus allowance was sourced from BC Road Builder rates.
- Freight costs from Edmonton to site were applied to the following items: Aquadams, pipe, pumps, lock blocks, concrete mix, forms and geo-synthetics. Freight costs were supplied by vendors and built-up using maps, highway speeds and BC Road Builder labour and equipment rates.

4.4 Excluded Costs

The scope of capital costs includes only those items noted on the conceptual design figures and construction cost estimate breakdowns in Appendices 1 and 2 and specifically excludes the following:

- Traffic safety and control to existing site road and road improvements;
- Lost time to severe weather or force majeure;

- Costs related to environmental habitat compensation and social impacts;
- Extended periods of industrial / labour unrest;
- All permitting and associated costs;
- Construction insurance;
- Escalation in costs after the Q1 2014 base date for the estimate;
- All owner's time and expenses (e.g. spent towards project management and obtaining regulatory and stakeholder approvals);
- Taxes, duties, and royalties;
- Scope changes;
- Any additional work that is required as a result of conditions that were not known as of the base date of the estimate (e.g., geotechnical conditions);
- Costs incurred as a result of the acceleration or deceleration of the work; and
- Sunk costs (any costs incurred in connection to the project prior to the commencement of the EPCM phase of the Project, including site acquisition costs, the cost of this study and the cost of past and future studies [e.g., further options assessment, pre-feasibility and feasibility] completed prior to EPCM).

5. BASIS OF OPERATIONAL COST ESTIMATES

The operational cost estimates include all monitoring, maintenance and replacement of the works described in this report over a 100-year period.

All operational cost estimates were developed using WorleyParsons Class 1 Estimate Guidelines. Values for accuracy and contingency are presented in Table Q. The accuracy of this estimate is comparable to that of the Association for the Advancement of Cost Engineering (AACE) Class 5.

Table Q Estimate Classifications

Project Stage	Identify	Conceptual Engineering
Estimate Class	WorleyParsons Class 1	AACE Class 5
Estimate Type	Order of Magnitude	Order of Magnitude
Expected Estimate Accuracy	±50%	L: -20% to -50% H: +30% to +100%
Suggested Contingency Range	25%	<50%

5.1 Scope of Work

In general, the scope of work for operational cost estimates presented in this report includes:

- Mobilization and demobilization of equipment and personnel;
- Monitoring costs including regular visual inspection and survey of all creeks, hydraulic structures, and movement monitors;
- Maintenance of hydraulic structures including debris removal and minor repairs;
- Replacement of hydraulic structures;
- All indirect costs (including construction camps, temporary facilities, environmental monitoring, LOA and travel); and
- EPCM.

Detailed scopes of work for each remediation option are defined by the conceptual design figures and construction cost estimate breakdowns in Appendices 1 and 2.

5.1.1 Concept Designs

Operational cost estimates were prepared using WorleyParsons' current understanding of the potential scope and available site information, and are based on the information provided in the following reports:

- R03: "Clinton Creek Channel Stabilization (Stage 2) Construction Report" prepared by UMA Engineering (2003);
- R07: "Clinton Creek Channel Stabilization (Stage 3) Construction Report" prepared by UMA Engineering (2005);
- R10: "Clinton Creek Channel Stabilization (Stage 1) Construction Report" prepared by UMA Engineering (2003);
- R14: "Former Clinton Creek Asbestos Mine Overview Report" prepared by AECOM (2009);
- R22: "Former Clinton Creek Asbestos Mine - Long Term Performance Monitoring Program 2005" prepared by UMA Engineering (2006);
- R47: "Abandoned Clinton Creek Asbestos Mine - Conceptual Design Report" prepared by UMA Engineering (2002);
- R93: "Former Clinton Creek Mine Emergency Drop Structure Repairs - Construction Activity Report - 2009" prepared by AECOM (2010);
- R94: "Former Clinton Creek Mine Emergency Drop Structure Repairs - Construction Activity Report - 2011" prepared by AECOM (2012); and
- R97: "Clinton Creek Technical Options Assessment prepared" by AECOM (2011).

Conceptual engineering provided by WorleyParsons is described in the Section 3.1.

5.2 Assumptions

Estimated operational costs are subject to the validity of the engineering designs completed by others and the key assumptions listed below.

5.2.1 General

- All major works will be performed by a workforce from Whitehorse, YT.
- Initial construction is completed in 2014.
- Life cycle costs are estimated over 50-year and 100-year periods of operation.
- NPCs are calculated using:
  - An average annual inflation rate of 2.5%;
  - A nominal annual discount rate of 5%; and

  - A real annual discount rate of 2.5%.

- The cost of supplying the rock used to maintain and replace hydraulic structures is estimated on the basis that it is drilled and blasted, sorted, hauled and stockpiled at site in quantities of 5,000 m^3 at a time.

5.2.2 Monitoring, Maintenance, and Replacement

- Waste rock dumps, tailings piles, and hydraulic structures will be visually inspected every year.
- Waste rock movement monitors and hydraulic structures will be surveyed every two years.
- Gabion drop structures will require maintenance every five years to remove debris, replace rock that has fractured and washed away, and repair damaged wire on gabion baskets:
  - 10% of rock is assumed to be replaced in the gabion drop structures during maintenance.
- Hydraulic structures are replaced in late summer, from early July to end of September, while the rate of water discharged from Hudgeon Lake is low; one crew is assumed to replace two drop structures at a time.

5.2.3 Allowances

The following allowances were added to the operational cost estimates based on experience with similar projects.

- Temporary Facilities 3%
- Environmental Monitoring and Testing 2%
- EPCM 10%
- Contingency 25%

5.3 Excluded Costs

Costs excluded from all operational cost estimates are the same as those excluded for capital costs.

6. LIFE CYCLE COST ANALYSIS

The estimates of capital, operational and life cycle costs presented herein were prepared for the concept screening of the waste rock, tailings and creek stabilization options developed by others. These estimates are indicative, prepared with limited site information and based on inferred conditions affecting the project. They represent the summation of all identified project component costs.

All costs are expressed in Q1, 2014 Canadian dollars with no allowance for future price escalations. The estimates exclude taxes and duties; these are to be added by others as appropriate.

6.1 LCCA Methodology and Calculations

Life cycle cost analyses are critical to the decision making process as they include both capital costs and operational costs over the life of a project. A remediation option with relatively high capital costs but relatively low operational costs would be seen more favourably in an analysis of life cycle costs than an analysis of capital costs alone.

When initial construction spans multiple years, costs occurring after the first year can be discounted in the same way that operational costs are discounted; however, for simplicity all capital expenditures in this study are assumed to occur in a single year. This assumption does not significantly affect the costs presented in this report.

Explanations, procedures and sample calculations for net present costs, life cycle costs and equivalent annual operational costs are presented in the following sections.

6.1.1 Net Present Costs

Net present cost (NPC) analyses factor the time value of money into the overall cost of the option. Theoretically, the NPC is the amount of money that would be required to be invested today to meet all future capital and operational costs over the life of the option. The NPC can be used to effectively compare remediation options with costs occurring over a long period of time.

Each NPC calculation is based on:

- An inflation rate;
- A nominal discount rate; and
- A future sum of money.

The inflation rate increases the value of future payments. Inflation is generally steady and is assumed here to be 2.5%. It is also assumed that the escalation of costs of all goods and services involved to this project match the overall rate of inflation.

The nominal discount rate decreases the value of future payments. The inherent assumption is that all funds that are not immediately spent are invested elsewhere. Therefore, the nominal discount rate should reflect the interest rate that can be expected on investments. When NPCs are calculated over a long period of time, the nominal discount rate should be selected based on long-term trends rather than current economic conditions. The nominal discount rate is often somewhat subjective and may also consider factors such as project financing and perceived risk. A nominal discount rate of 5% is used here.

A real discount rate is the rate used to calculate the NPC and is the nominal discount rate net of inflation. For small nominal discount and inflation rates, the real discount rate can be calculated approximately as the following:

$$i^*_{disc} = i_{disc} - i_{infl} = 5\% - 2.5\% = 2.5\%$$

where:

i^*_{disc} is the real annual discount rate

i_{disc} is the nominal annual discount rate

i_{infl} is the annual inflation rate

Figure C illustrates the application of inflation and discount rates to future payments.

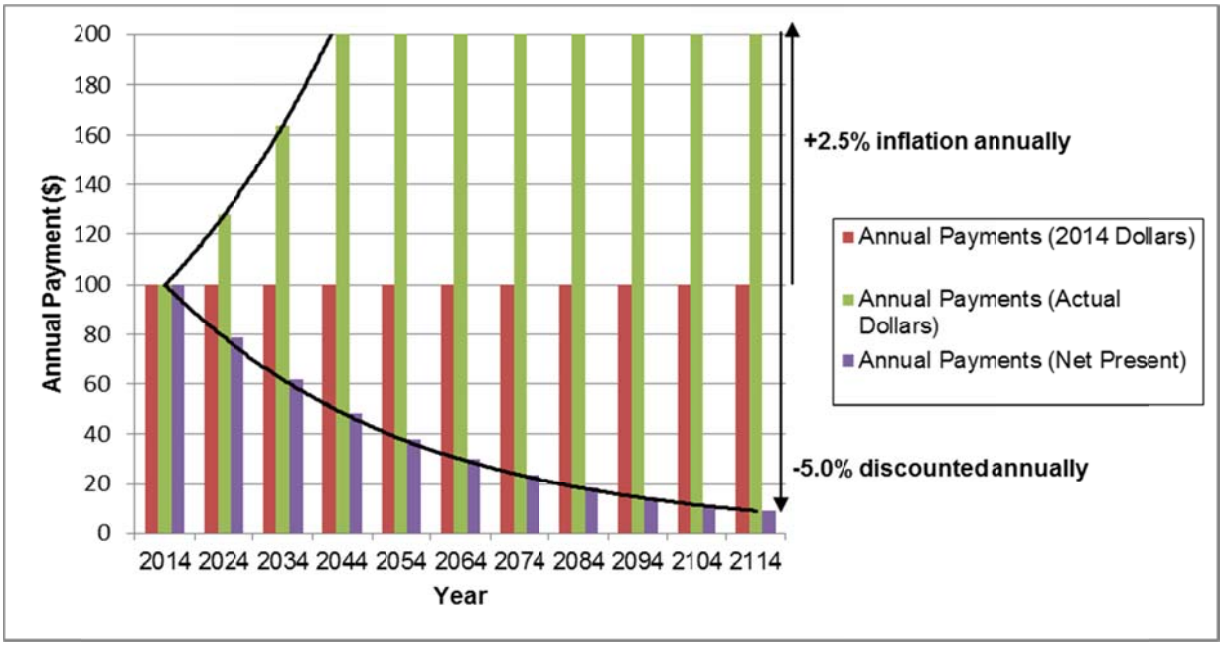


Figure C Example: Inflation and Discount Rates Applied to Annual Payments of $100

The NPC of a future payment, in today's dollars (i.e., before inflation), is then calculated based on the real annual discount rate, the number of years until payment and the value of the payment in today's dollars using the following equation:

$$NPC = \frac{P}{(1 + i^*_{disc})^n}$$

where:

P is the value of the payment in today's dollars (before inflation)

i^*_{disc} is the real annual discount rate

n is the number of years until payment

The NPC of constructing a remediation option costing $5M in 10 years' time using a real discount rate of 2.5% is calculated as follows:

$$NPC = \frac{\$5{,}000{,}000}{(1 + 0.025)^{10}}$$

$$NPC = \$3{,}910{,}000\ (approximately)$$

Therefore, the NPC of constructing that remediation option in 10 years' time is approximately 78% of its actual cost in today's dollars.

6.1.2 Life Cycle Costs

The life cycle cost of a remediation option is calculated as the sum of the NPCs of all future estimated costs associated with that project.

The NPC of a series of payments occurring every year over the LCCA duration is calculated using a variation of the "Series Present Worth" equation.

$$NPC = P * \frac{(1 + i^*_{disc})^n - 1}{((1 + i^*_{disc})^x - 1) * (1 + i^*_{disc})^n}$$

where:

P is the value of the payment in today's dollars (before inflation)

i^*_{disc} is the real annual discount rate

n is the LCCA duration in years

x is the time between payments in years (i.e., a payment every x years)

6.1.3 Equivalent Annual Costs

The equivalent annual operational cost of a remediation option is the amount, in today's dollars, that would need to be reserved each year to pay for all estimated costs associated with the operation of that option. EACs are presented to improve the understanding of the magnitude of operational costs and to be used for budgetary purposes.

An EAC is a series of yearly payments that result in a given NPC. To calculate the EAC for operational costs, we equate the costs of monitoring, maintenance and replacement, paid at varying frequencies, to a single operational cost paid every year. The EAC is calculated using the "Capital Recovery" equation.

$$P = NPC * \frac{(i^*_{disc}) * (1 + i^*_{disc})^n}{(1 + i^*_{disc})^n - 1}$$

The real annual discount rate does factor into the EAC; however, the effect is very small.

6.2 Selection and Sensitivity of LCCA Parameters

As discussed in Section 6.1, the two parameters affecting life cycle costs, aside from estimates of CAPEX and OPEX, are the real discount rate and the life cycle analysis duration.

6.2.1 Discount Rate Selection

Normally, a discount rate is selected based on opportunity costs (i.e., the rate of return on other investments) and the specific risks involved; however, for projects where there are minimal resources involving opportunity costs, such as human health and environmental management projects, a social discount rate is used instead (Treasury Board of Canada 2007). The real social discount rate of 3% recommended by the Treasury Board of Canada (TBC) reflects the rate at which individuals discount future consumption and projected growth rate in consumption. Social discount rates are normally much lower than discount rates for projects involving opportunity costs.

According to the US National Institute of Standards and Technology (Schultz 2003), environmental projects sponsored by government agencies are required to use the discount rates published by the Office of Management and Budget (OMB). The discount rates recommended by OMB (2003) follow the interest rates of US Treasury bonds. Table R lists the nominal and real interest rates of 30-year bonds issued over the past five years.

Table R US Treasury 30-year Bond Interest Rates

Year	Nominal Interest Rate	Real Interest Rate	Implied Inflation Rate
2009	4.5%	2.7%	1.8%
2010	4.5%	2.7%	1.8%
2011	4.2%	2.3%	1.9%
2012	3.8%	2.0%	1.8%
2013	3.0%	1.1%	1.9%
Average	**4.0%**	**2.2%**	**1.8%**

Boardman (2008) recommends a time-declining scale of social discount rates for intergenerational projects (i.e., duration exceeding approximately 50 years). A real social discount rate of 3.5% for years 1 to 50, followed by a reduced rate of 2.5% for years 51 to 100 is suggested.

Based on these rates and the general downward trend in interest rates from US Treasury bonds, WorleyParsons recommends a real discount rate of 2.5%. The social discount rates suggested by the Treasury Board of Canada (2007), OMB (2003) and Boardman (2008) are shown graphically versus time in Figure D.

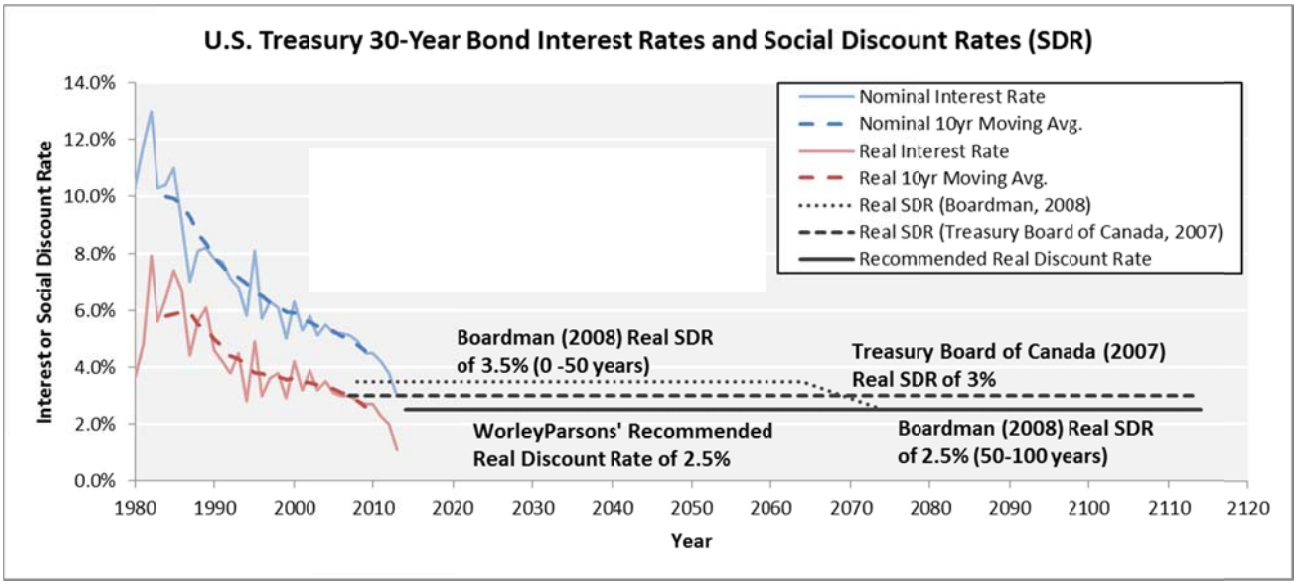


Figure D US Treasury 30-Year Bond Interest Rates and Social Discount Rates (SDR)

6.2.2 Life Cycle Duration

The life cycle duration must be the same for all options being compared. The duration is typically equal to either the longest design life of any option, or to the least common multiple of the design lives of several recurring options (e.g., to compare two structures that would be replaced every 20 and 30 years, the life cycle duration would be 60 years).

Some remediation options for the Clinton Creek site are intended to last in perpetuity without replacement. This would require LCCs to be calculated to infinite; however, since future costs become increasingly uncertain and less impactful on the overall NPC, the life cycle duration should be limited to a reasonable number that captures the majority of operational costs. For a real discount rate of 2.5%, the NPC of an expense in 50 years' time would be 29% of its actual cost in today's dollars. The NPC of an expense in 100 years' time would be only 8.5% of its actual cost in today's dollars. Therefore a reasonable LCCA duration would be 100 years.

For this study, LCCs have been calculated over 50-year and 100-year periods to show the sensitivity of the costs of options to life cycle duration; however, options should be evaluated using the 100-year LCC as this this scenario better represents the expected long-term operational costs.

7. RESULTS

Summaries of the estimated capital costs (CAPEX), operational costs (OPEX) and life cycle costs (LCC) for the Clinton Creek and Wolverine Creek remediation options are presented in Table S and Table T respectively. Life cycle cost breakdowns for each remediation option are included in Appendix 4. Potential cost savings from constructing and maintaining remediation options at both Clinton Creek and Wolverine Creek simultaneously are not included.

OPEX estimates are expressed as the equivalent annual cost (EAC) of operation. The equivalent annual cost is the amount, in 2014 Canadian dollars, that would need to be reserved each year to pay for all estimated costs associated with the operation of that remediation option. LCCs are expressed as the NPC of construction and operation over 50-year and 100-year durations at the preferred real discount rate of 2.5% per year.

Upgrades to the 15 km site access road between the Fortymile River Bridge and the former Clinton Creek Mine site are included in the Clinton Creek CAPEX estimates. Upgrades to the 1.2 km access road to the Wolverine Creek tailings pile base are included in the Wolverine Creek CAPEX estimates. Long-term maintenance of these access roads is required for some options, as indicated in Table S and Table T. Since access road maintenance costs are potentially a significant shared cost between Clinton and Wolverine Creek remediation options, they are not included in the OPEX and LCC estimates, but are instead presented separately in Section 7.1.

Table S Clinton Creek Remediation Options - LCCA Summary

Option	Description	CAPEX	OPEX (EAC)	50yr LCC (NPC)	100yr LCC (NPC)
A[1]	CC-1 / WR-1 / HL-1 Maintaining status quo	$13M	$0.32M[1]	$22M[1]	$25M[1]
B[1]	CC-2 / WR-3 / HL-4 Excavating and armouring a new channel; stabilizing the waste rock dump	$38M	$0.40M[1]	$50M[1]	$53M[1]
C[1]	CC-4 / WR-1 / HL-1 Armouring existing channel with gabion drop structures	$18M	$0.77M[1]	$40M[1]	$46M[1]
D[1]	CC-4 / WR-3 / HL-1 Armouring existing channel with gabion drop structures; stabilizing the waste rock dump	$22M	$0.57M[1]	$38M[1]	$42M[1]
E	CC-5 / WR-3 / HL-3 Lowering the existing channel; stabilizing the waste rock dump	$29M	$0.04M	$30M	$30M

Option	Description	CAPEX	OPEX (EAC)	50yr LCC (NPC)	100yr LCC (NPC)
F	CC-6 / WR-2 / HL-2 Restoring Clinton Creek to the original valley bottom; stabilizing the waste rock dump	$102M	$0.02M	$103M	$103M
G[1]	CC-10 / WR-1 / HL-1 Armouring existing channel with gabion baskets	$17M	$0.68M[1]	$36M[1]	$42M[1]
H[1]	CC-10 / WR-3 / HL-1 Armouring existing channel with gabion baskets; stabilizing the waste rock dump	$21M	$0.50M[1]	$35M[1]	$39M[1]

[1]Notes: The long-term operational requirements associated with this option necessitate maintenance of the 15 km site access road between the Fortymile River Bridge and the former Clinton Creek Mine site. These costs are not included in the OPEX and LCC estimates shown. Refer to Section 7.1 for these additional costs.

Table T Wolverine Creek Remediation Options - LCCA Summary

Option	Description	CAPEX	OPEX (EAC)	50yr LCC (NPC)	100yr LCC (NPC)
A	WC-2 / T-1 Maintaining status quo	$0M	$0.04M	$1M	$2M
B	WC-3 / T-1 Installing a rock drain along the toe of the tailings lobes	$25M	$0.08M	$27M	$28M
C[1]	WC-7 / T-5 Providing a cover over the tailings pile base; constructing an armoured channel through the cover	$23M	$0.11M[1]	$26M[1]	$27M[1]
D[1]	WC-3 & WC-7 / T-5 Installing a rock drain along the toe of the tailings lobes; providing a cover over the tailings pile base; constructing an armoured channel through the cover	$40M	$0.14M[1]	$44M[1]	$45M[1]
E	WC-3 & WC-7 / T-2 & T-3 Installing a rock drain along the toe of the tailings lobes; stabilizing the tailings pile; providing a cover over the tailings pile base; constructing an armoured channel through the cover	$49M	$0.08M	$52M	$52M

[1]Notes: The long-term operational requirements associated with this option necessitate maintenance of the 15 km site access road between the Fortymile River Bridge and the former Clinton Creek Mine site, as well as the 1.2 km access road to the Wolverine Creek tailings pile base. These costs are not included in the OPEX and LCC estimates shown. Refer to Section 7.1 for these additional costs.

7.1 Cost of Maintaining Site Access

For all options indicated in Table S and Table T as requiring long-term maintenance of site access roads, refer to Table U for this additional cost.

Table U Cost of Maintaining Site Access

Site	Description of Work	OPEX (EAC)	50yr LCC (NPC)	100yr LCC (NPC)
Clinton Creek Waste Rock Dump	• Grading and resurfacing the 15 km site access road • Replacing the 15 m-long bridge over Clinton Creek	$0.18M	$5.1M	$6.6M
Wolverine Creek Tailings Pile Base	• Grading and resurfacing the 15 km site access road and 1.2 km Wolverine Creek access road • Replacing the 15 m-long bridge over Wolverine Creek	$0.20M	$5.6M	$7.2M
Both Sites	• Grading and resurfacing the 15 km site access road and 1.2 km Wolverine Creek access road • Replacing the 15 m-long bridges over Clinton Creek and Wolverine Creek	$0.22M	$6.1M	$7.9M

7.2 Manpower Breakdowns

To facilitate socio-economic discussions, manpower breakdowns for the capital cost estimates were estimated by allocating portions of the project cost to tasks performed by several distinct labour groups. Labour associated with the supply of materials and equipment is excluded.

Manpower breakdown estimates are presented in Table V. The labour distributions are very approximate and generally do not vary significantly between the options.

Table V Manpower Breakdown

Option	Minimum	Maximum	Average
Equipment operators (incl. haul truck drivers)	30%	39%	35%
Truck drivers	3%	14%	7%
Labourers and equipment maintenance	15%	24%	18%
Camp support staff	6%	14%	11%
Engineering, environmental and administration staff	26%	31%	29%

7.3 Alternative Options

CAPEX, OPEX and LCCs for the alternative options added to this study, which are described in Appendix 1, are presented in Table W (Clinton Creek) and Table X (Wolverine Creek).

These results show that there is still considerable scope for reducing the cost of the originally proposed remediation options.

Table W Clinton Creek Remediation Options and Alternatives - LCCA Summary

Option	Description	CAPEX	OPEX (EAC)	50yr LCC (NPC)	100yr LCC (NPC)
A[1]	CC-1 / WR-1 / HL-1	$13M	$0.32M[1]	$22M[1]	$25M[1]
B[1]	CC-2 / WR-3 / HL-4	$38M	$0.40M[1]	$50M[1]	$53M[1]
B2	Replace all drop structures	$39M	$0.04M	$40M	$41M
C[1]	CC-4 / WR-1 / HL-1	$18M	$0.77M[1]	$40M[1]	$46M[1]
C2[1]	Replace eight drop structures	$17M	$0.34M[1]	$27M[1]	$29M[1]
C3[1]	Replace all drop structures	$18M	$0.09M[1]	$20M[1]	$21M[1]
D[1]	CC-4 / WR-3 / HL-1	$22M	$0.57M[1]	$38M[1]	$42M[1]
D2[1]	Replace eight drop structures	$21M	$0.23M[1]	$28M[1]	$30M[1]
D3	Replace all drop structures	$22M	$0.04M	$23M	$23M
E	CC-5 / WR-3 / HL-3	$29M	$0.04M	$30M	$30M
E2	Alternate channel alignment	$25M	$0.04M	$26M	$27M
E3	Alternate channel alignment; armour channel downstream	$27M	$0.04M	$28M	$29M
F	CC-6 / WR-2 / HL-2	$102M	$0.02M	$103M	$103M
G[1]	CC-10 / WR-1 / HL-1	$17M	$0.68M[1]	$36M[1]	$42M[1]
H[1]	CC-10 / WR-3 / HL-1	$21M	$0.50M[1]	$35M[1]	$39M[1]
I[1]	B - Alternative alignment	$27M	$0.40M[1]	$39M[1]	$42M[1]
I2	B2 - Alternative alignment	$29M	$0.04M	$30M	$31M

[1]Notes The long-term operational requirements associated with this option necessitate maintenance of the 15 km site access road between the Fortymile River Bridge and the former Clinton Creek Mine site. These costs are not included in the OPEX and LCC estimates shown. Refer to Section 7.1 for these additional costs.

Table X Wolverine Creek Remediation Options and Alternatives - LCCA Summary

Option	Description	CAPEX	OPEX (EAC)	50yr LCC (NPC)	100yr LCC (NPC)
A	WC-2 / T-1	$0M	$0.04M	$1M	$2M
B	WC-3 / T-1	$25M	$0.08M	$27M	$28M

Option	Description	CAPEX	OPEX (EAC)	50yr LCC (NPC)	100yr LCC (NPC)
C[1]	WC-7 / T-5	$23M	$0.11M[1]	$26M[1]	$27M[1]
D[1]	WC-3 and WC-7 / T-5	$40M	$0.14M[1]	$44M[1]	$45M[1]
D2[1]	Lowered waste rock cover; backfill Wolverine Creek; eliminate rock drain	$17M	$0.11M[1]	$20M[1]	$21M[1]
E	WC-3 and WC-7 / T-2 and T-3	$49M	$0.08M	$52M	$52M
E2	Backfill Wolverine Creek; eliminate rock drain	$35M	$0.05M	$36M	$37M

[1]Notes: The long-term operational requirements associated with this option necessitate maintenance of the 15 km site access road between the Fortymile River Bridge and the former Clinton Creek Mine site, as well as the 1.2 km access road to the Wolverine Creek tailings pile base. These costs are not included in the OPEX and LCC estimates shown. Refer to Section 7.1 for these additional costs.

7.4 Sensitivity of Costs to Aggregate Source Distance

A suitable, high quality aggregate source has not been located at the time of this study, but was assumed to be located within 15 km from site. In this study, aggregates include road surfacing gravel, granular filters, blast rock, gabion rock, cobbles, and riprap. In order to determine the potential impact of this assumption on the estimated LCCs, a sensitivity analysis was completed.

Increasing the aggregate haul distance to 60 km was estimated to add $\$50/m^3$ to the final construction cost. Similarly, an increasing the haul distance to 100 km was estimated to add $\$90/m^3$. These rates were added to all construction and operational costs associated with the options. Comparisons of 100-year LCCs for Clinton Creek Options, Wolverine Creek Options and site access maintenance are presented in Table Y, Table Z and Table AA.

Table Y Clinton Creek Options - Sensitivity of 100-year LCC to Aggregate Source Distance

Option	Description	15 km Haul Distance	60 km Haul Distance (% increase from 15 km Haul)	100 km Haul Distance (% increase from 15 km Haul)
A[1]	CC-1 / WR-1 / HL-1	$25M[1]	$26M[1] (3.6%)	$26M[1] (6.4%)
B[1]	CC-2 / WR-3 / HL-4	$53M[1]	$54M[1] (2.2%)	$55M[1] (4.0%)
B2	Replace all drop structures	$41M	$42M (3.9%)	$44M (7.1%)
C[1]	CC-4 / WR-1 / HL-1	$46M[1]	$47M[1] (2.2%)	$48M[1] (3.9%)
C2[1]	Replace eight drop structures	$29M[1]	$31M[1] (3.8%)	$31M[1] (6.8%)
C3[1]	Replace all drop structures	$21M[1]	$22M[1] (6.1%)	$23M[1] (11.1%)
D[1]	CC-4 / WR-3 / HL-1	$42M[1]	$43M[1] (2.2%)	$42M[1] (4.0%)

Option	Description	15 km Haul Distance	60 km Haul Distance (% increase from 15 km Haul)	100 km Haul Distance (% increase from 15 km Haul)
D2[1]	Replace eight drop structures	$30M[1]	$31M[1] (3.3%)	$31M[1] (5.9%)
D3	Replace all drop structures	$23M	$24M (4.7%)	$25M (8.4%)
E	CC-5 / WR-3 / HL-3	$30M	$31M (2.2%)	$31M (4.0%)
E2	Alternate channel alignment	$27M	$27M (2.5%)	$28M (4.5%)
E3	Alternate channel alignment; armour channel downstream	$29M	$30M (3.4%)	$31M (6.1%)
F	CC-6 / WR-2 / HL-2	$103M	$104M (0.8%)	$105M (1.4%)
G[1]	CC-10 / WR-1 / HL-1	$42M[1]	$43M[1] (3.8%)	$44M[1] (6.8%)
H[1]	CC-10 / WR-3 / HL-1	$39M[1]	$41M[1] (3.3%)	$42M[1] (5.9%)
I[1]	B - Alternative alignment	$42M[1]	$43M[1] (2.8%)	$44M[1] (5.0%)
I2	B2 - Alternative alignment	$31M	$32M (5.1%)	$34M (9.2%)

[1]Notes: The long-term operational requirements associated with this option necessitate maintenance of the 15 km site access road between the Fortymile River Bridge and the former Clinton Creek Mine site. These costs are not included in the OPEX and LCC estimates shown. Refer to Section 7.1 for these additional costs.

Table Z Wolverine Creek Options - Sensitivity of 100yr LCC to Aggregate Source Distance

Option	Description	15 km Haul Distance	60 km Haul Distance	100 km Haul Distance
A	WC-2 / T-1	$2M	$2M (0.0%)	$2M (0.0%)
B	WC-3 / T-1	$28M	$30M (8.0%)	$32M (14.4%)
C[1]	WC-7 / T-5	$27M[1]	$28M[1] (2.1%)	$28M[1] (3.7%)
D[1]	WC-3 and WC-7 / T-5	$45M[1]	$48M[1] (6.1%)	$50M[1] (10.9%)
D2[1]	Lowered waste rock cover; backfill Wolverine Creek; eliminate rock drain	$21M[1]	$22M[1] (2.4%)	$22M[1] (4.4%)
E	WC-3 and WC-7 / T-2 and T-3	$52M	$55M (5.0%)	$57M (8.9%)
E2	Backfill Wolverine Creek; eliminate rock drain	$37M	$37M (1.1%)	$37M (1.9%)

[1]Notes: The long-term operational requirements associated with this option necessitate maintenance of the 15 km site access road between the Fortymile River Bridge and the former Clinton Creek Mine site, as well as the 1.2 km access road to the Wolverine Creek tailings pile base. These costs are not included in the OPEX and LCC estimates shown. Refer to Section 7.1 for these additional costs.

Table AA Maintaining Site Access - Sensitivity of 100yr LCC to Aggregate Source Distance

Site	Description of Work	15 km Haul Distance	60 km Haul Distance	100 km Haul Distance
Clinton Creek Waste Rock Dump	• Grading and resurfacing the 15 km site access road • Replacing the 15 m-long bridge over Clinton Creek	$6.6M	$7.5M (13%)	$8.2M (23%)
Wolverine Creek Tailings Pile Base	• Grading and resurfacing the 15 km site access road and 1.2 km Wolverine Creek access road • Replacing the 15 m-long bridge over Wolverine Creek	$7.2M	$8.1M (13%)	$8.9M (23%)
Both Sites	• Grading and resurfacing the 15 km site access road and 1.2 km Wolverine Creek access road • Replacing the 15 m-long bridges over Clinton Creek and Wolverine Creek	$7.9M	$8.8M (12%)	$9.57M (21%)

7.5 Integration of Clinton and Wolverine Creek Options

There is considerable scope for reducing construction costs by integrating Clinton Creek and Wolverine Creek options. Specifically, the following costs could be shared or eliminated by combining certain options:

- Equipment mobilization: some equipment could be shared between Clinton Creek and Wolverine Creek operations, eliminating the cost of transporting additional equipment to site;
- Asbestos control: washdown facilities, which comprise the majority of asbestos control costs, could be shared;
- Camp facilities: camp space and facilities could be shared between Clinton Creek and Wolverine Creek operations, reducing the setup and teardown costs;
- Waste rock double-handling: for Wolverine Creek options requiring a waste rock cover, material that would already be excavated from the Clinton Creek waste rock dump could be taken directly to the Wolverine Creek tailings pile, rather than dumping it into Porcupine Pit first; and
- Site access road maintenance: grading and gravel resurfacing of the 15 km long site access road could be shared between Clinton Creek and Wolverine Creek options that both require long-term site access.

Table BB Cost Sharing Opportunities between Clinton and Wolverine Creek Options

Clinton Creek Options	Wolverine Creek Options						
	A	B	C	D	D2	E	E2
A		a	a, b*, c	a, b*, c	a, b*, c	a, b*	a, b*
B		a	a, b, c	a, b, c	a, b, c	a, b	a, b
B2		a	a, b	a, b	a, b	a, b	a, b
C		a	a, b*, c	a, b*, c	a, b*, c	a, b*	a, b*
C2		a	a, b*, c	a, b*, c	a, b*, c	a, b*	a, b*
C3		a	a, b*, c	a, b*, c	a, b*, c	a, b*	a, b*
D		a	a, b, c	a, b, c	a, b, c	a, b	a, b
D2		a	a, b, c	a, b, c	a, b, c	a, b	a, b
D3		a	a, b	a, b	a, b	a, b	a, b
E		a	a, b	a, b	a, b	a, b	a, b
E2		a	a, b	a, b	a, b	a, b	a, b
E3		a	a, b	a, b	a, b	a, b	a, b
F		a	a, b	a, b	a, b	a, b	a, b
G		a	a, b*, c	a, b*, c	a, b*, c	a, b*	a, b*
H		a	a, b	a, b	a, b	a, b	a, b
I		a	a, b*, c	a, b*, c	a, b, c	a, b	a, b
I2		a	a, b*	a, b*	a, b	a, b	a, b

Items ‘a’, ‘b’ and ‘c’ noted in the table above correspond to the following shared costs:

a) Partial shared cost of equipment mob/demob, asbestos washdown facilities and camp facilities.

b) Elimination of “double-handling” costs by transporting excavated waste rock from Clinton Creek directly to the Wolverine Creek tailings pile base; **b*** denotes elimination of less than half of “double-handling”

c) Shared cost of 15 km site access road maintenance (see Section 7.1)

8. CONCLUSIONS

Initially, lifecycle costs (Class 5, ±50%) were prepared for eight remediation options for Clinton Creek (Options A through H) and five remediation options for Wolverine Creek (Options A through E). The options considered range from walk-away solutions, to options that will require significant ongoing maintenance. At the request of the parties, variations on the original options were also considered. An additional nine for Clinton Creek and two for Wolverine Creek (Appendix 1).

LCC Duration

Both the 50-year and 100-year durations for operational costs were considered for the original options; however, WorleyParsons recommend that the 100-year lifecycle costs are used for the selection of the remediation options to move forward. A comparison of the 50-year and 100-year lifecycle durations shows that the selection of the 50-year or 100-year duration does not significantly change the lifecycle cost rankings. The OPEX costs are approximately 30% higher for the 100-year duration versus the 50-year, but as the OPEX costs are generally a smaller percentage of the total LCC costs than CAPEX, the overall costs difference in LCC is relatively small. Using the 100-year duration there is an average of increase in 6% for Clinton Creek options over the 50-year duration, and 2% average increase for Wolverine Creek options.

Common Elements - Potential Cost Savings

The lifecycle costs presented assume the remediation works at the Clinton Creek and Wolverine Creek sites are conducted independently; however, there may be opportunities for cost savings depending on the combination of options selected, by undertaking the remediation construction at the two locations during the same construction period, and carrying out maintenance work (if required) at the two locations during the same site visit.

Opportunities for CAPEX costs savings on common elements between remediation at both sites are not included in the LCCA results but would include: partial shared cost of equipment mob/demob, asbestos washdown facilities and camp facilities. For options where waste rock is excavated from Clinton Creek, and deposited in Wolverine Creek, there is potential for additional savings as material would not need to be double handled.

The current estimates have separate road maintenance costs included for both the Clinton Creek and Wolverine Creek OPEX costs where ongoing maintenance will be required, but site access to both locations is largely on the same road, so if maintenance work is required for both options, these costs would not need to be duplicated. There is a potential cost savings of approximately $5.9M based on the 100-year lifecycle, if both the Clinton and Wolverine options require site access for long-term maintenance.

Distance to Suitable Source of Aggregate

The sensitivity of the results to the assumption that a suitable source of aggregate would be available within 15 km was assessed as part of the LCC analysis; with the results showing that the ranking of options by lifecycle cost was not significantly changed if the aggregate source was in fact 60 km or 100 km distance from the site. The sensitivity analysis shows the lifecycle costs were on average 3.3% (Clinton Creek) and 4.6% (Wolverine Creek) higher when the source was assumed to be within 60 km, and 5.9% (Clinton Creek) and 8% (Wolverine Creek) higher, respectively, when the source was assumed to be within 100 km. These increases are all well within the accuracy range for the cost estimates (Class 5, ±50%).

8.1 Clinton Creek

The Clinton Creek remediation lifecycle costs range from $24.76M (Option A) to $103.03M (Option F), with the lower costs for the addition options considered: $20.86M (Option D3) to $41.91M (Option I2). The additional options considered generally have lower lifecycle costs; ranging from $23M (Option D3) to $59.6M (Option B2).

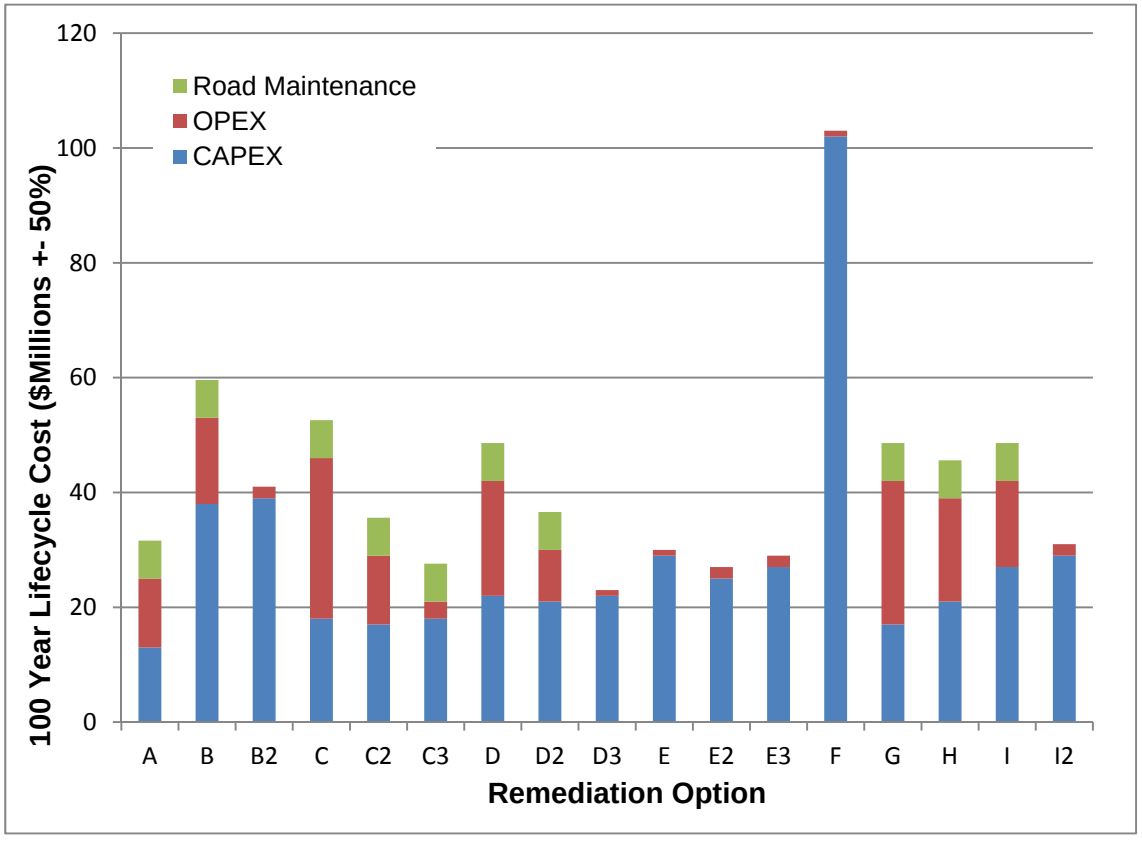


Figure E 100-year LCC for Clinton Creek Remediation Options

The reduction of LCC seen for the alternatives to the initial options, is primarily the results of reduced earth work quantities (reduction in CAPEX) and/or the replacement of gabion drop structures with riprap lined channels (reduction in OPEX).

8.2 Wolverine Creek

The Wolverine Creek remediation lifecycle costs range from $2M (Option A) to $52M (Option D), with lower costs estimated for the additional options considered: $31M (Option D2) and $37M (Option E2). The reduction of LCC seen for the alternatives to the initial options considered (D2 and E2) is primarily the results of reduced earth work quantities resulting in a reduction in CAPEX.

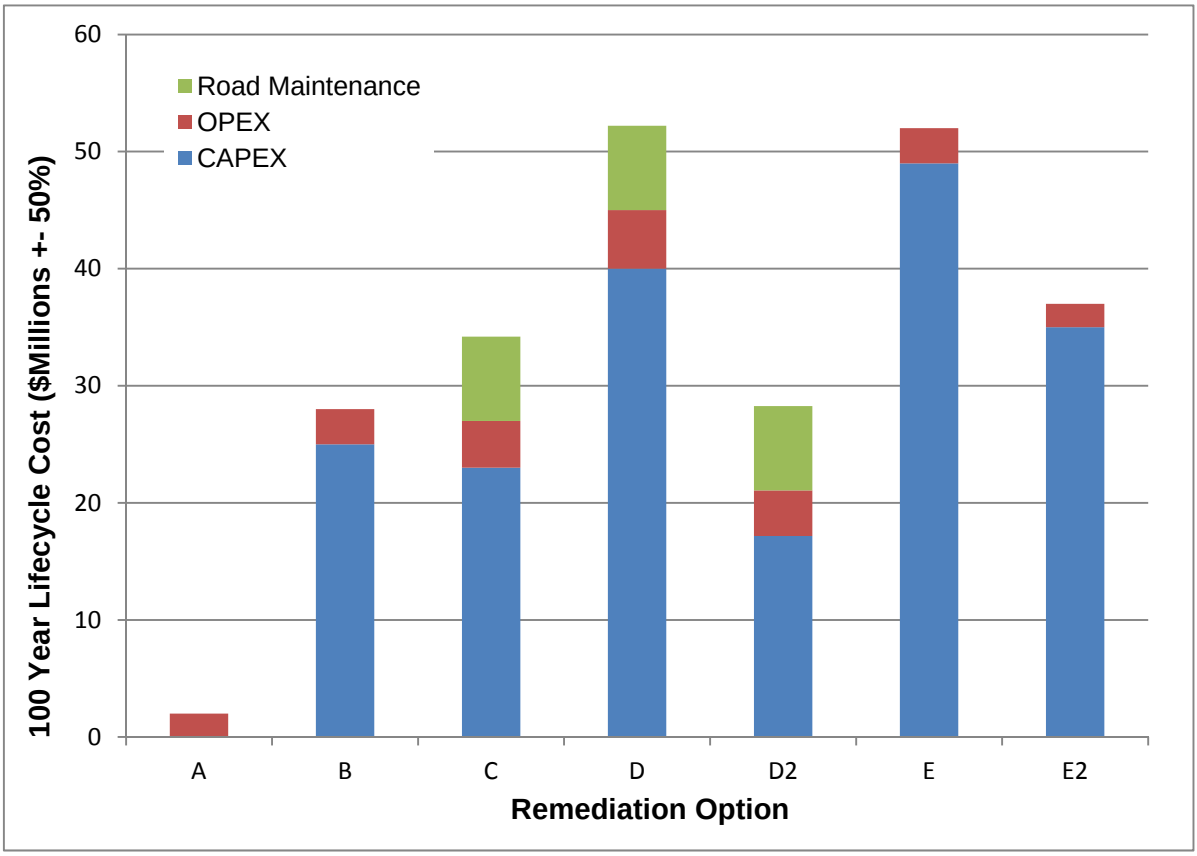


Figure F 100-year LCC for Wolverine Creek Remediation Options

9. RECOMMENDATIONS

WorleyParsons recommends collection of the following data prior to detailed design of the selected remediation options:

- Acquisition of LiDAR data to allow for a more accurate 3D model of waste rock, tailings and existing ground surfaces;
- Bathymetry of the Porcupine Pit lake to confirm the volume of waste that could be deposited back into the pit;
- Ongoing water quality data collection within Hudgeon Lake, specifically dissolved oxygen (DO) concentration with depth profiles; continuous DO data collection should be considered; the depth at which the lake will naturally 'turn over' should be assessed;
- Continuous flow monitoring on Clinton Creek and Wolverine Creek; if possible, flows should be monitored both upstream and downstream of Hudgeon Lake, so that peak discharge flow at the post-remediation depth of Hudgeon Lake can be estimated;
- Development of area-discharge hydrologic equations for Clinton Creek and Wolverine Creek based on measured peak discharges over the last 15 years;
- Desktop study and field program to identify suitable source of aggregate material; and
- Geotechnical stability analyses of both the waste dump adjacent to Clinton Creek and the tailings pile adjacent to Wolverine Creek.

Following selection by the parties of the preferred remediation options, the following should be considered:

- Advancement of the selected remediation designs to allow for Class 2 (±20%) lifecycle cost estimates to be prepared;
- Inclusion in the lifecycle cost estimate of any potential costs savings from undertaking the selected remediation works at the two locations simultaneously;
- Identification of a suitable camp location, with capacity for the workforce required for the selected options;
- Confirmation by a structural engineer of the maximum load rating for the Fortymile Bridge; and
- Initiation of permitting activities required for the construction of the selected remediation options.

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Appendix 1 Alternative Options

APPENDIX 1
ALTERNATIVE OPTIONS

The remediation option alternatives discussed in this appendix were refined from the following primary remediation options summarized in Table 1.

Table 1 Primary Remediation Options with Alternatives

Primary Option	Components	Alternatives
Clinton Creek		
B	CC-2 / WR-3 / HL-1	B2: Replace eight proposed gabion drop structures with riprap channel
C	CC-4 / WR-1 / HL-1	C2: Replace eight proposed gabion drop structures with riprap channel
		C3: Replace eight proposed and four existing gabion drop structures with riprap channel
D	CC-4 / WR-3 / HL-1	D2: Replace eight proposed gabion drop structures with riprap channel
		D3: Replace eight proposed and four existing gabion drop structures with riprap channel
E	CC-G / WR-3 / HL-3	E2: Shift alignment away from north valley wall to mitigate slope stability concerns
		E3: Shift alignment away from north valley wall and armour channel
I	CC-2 / WR-3 / HL-1	I2: Replace eight proposed gabion drop structures with riprap channel
Wolverine Creek		
D	WC-3 and WC-7 / T-5	D2: Lower waste rock cover of tailings pile base to 415 m, backfill Wolverine Creek upstream of tailings to 412 m, and eliminate rock drain
E	WC-3 and WC-7 / T-2 and T-3	E2: Backfill Wolverine Creek upstream of tailings to 419 m, and eliminate rock drain

The remediation option alternative designs are shown on drawings in Appendix 2 and described in the following sections.

1. CLINTON CREEK REMEDIATION OPTION ALTERNATIVES

1.1 Option B2 - CC-2 / WR-3 / HL-1

The scope of work for Clinton Creek Remediation Option B2 is the same as for Option B except that the eight gabion drop structures would be replaced with a 300-m long riprap channel. The channel would be 7 m wide, 2 m deep, and be able to convey an estimated 200-year peak discharge of 44.5 m³/s. The channel would have a grade of approximately 8% and would be armoured with heavy rock riprap with a median diameter of 800 mm. Figure 1 shows a typical channel section.

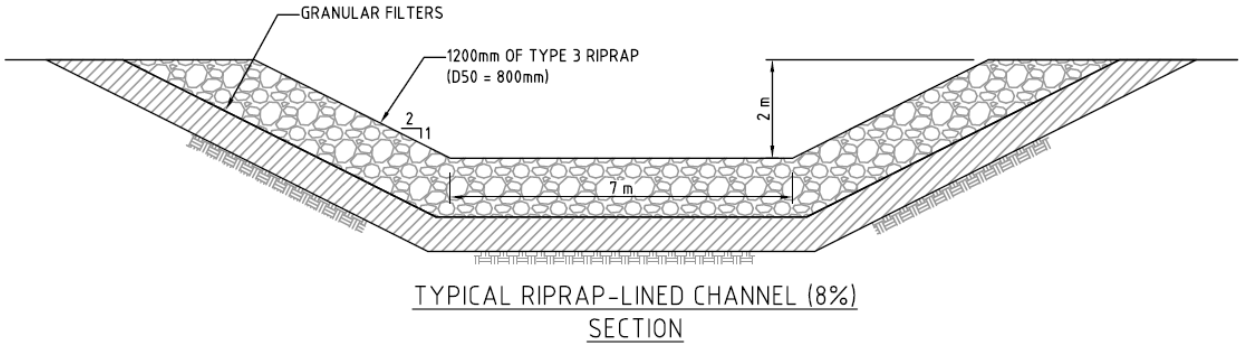


Figure 1 Clinton Creek Option B2 - Typical 8% Grade Riprap-Lined Channel

The construction schedule of the riprap-lined channel is expected to be similar to that provided for the gabion drop structures from Option B.

Regular visual inspections and surveys of the riprap-lined channel would be required; however, no regular maintenance or replacement of the channel is expected, assuming that the waste rock is adequately stabilized and the channel is properly constructed using high quality, durable riprap.

1.2 Option C2 - CC-4 / WR-1 / HL-1

The scope of work for Clinton Creek Remediation Option is the same as for Option C except that the eight proposed gabion drop structures (i.e., downstream of Drop Structure No. 4) would be replaced with a 550 m-long riprap channel. The channel would be 7 m wide, 2 m deep, and be able to convey an estimated 200-year peak discharge of 44.5 m³/s. The channel would have a grade of approximately 4.5% and would be armoured with heavy rock riprap with a median diameter of 500 mm. Figure 2 shows a typical channel section.

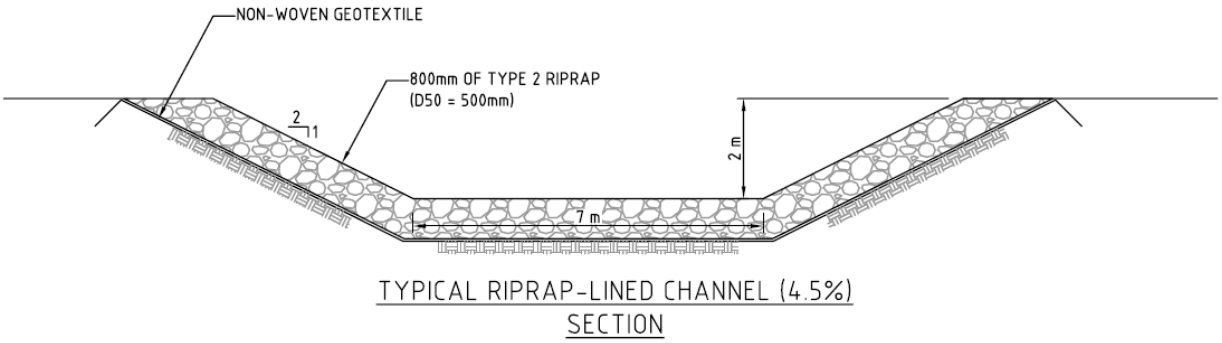


Figure 2 Clinton Creek Option C2 - Typical 4.5% Grade Riprap-Lined Channel

The construction schedule of the riprap-lined channel is expected to be similar to that provided for the gabion drop structures from Option C.

Regular visual inspections and surveys of the riprap-lined channel would be required. The ongoing movement of the waste rock dump would deform the channel, necessitating its replacement approximately every 45 years, as discussed in Section 3.3.10 of the report.

1.3 Option C3 - CC-4 / WR-1 / HL-1

The scope of work for Clinton Creek Remediation Option is the same as for Option C except that the eight proposed and four existing gabion drop structures would be replaced with a 750 m long riprap channel. The channel would be 7 m wide, 2 m deep, and be able to convey an estimated 200-year peak discharge of 44.5 m³/s. The channel would have a grade of approximately 4.5% and would be armoured with heavy rock riprap with a median diameter of 500 mm. Figure 3 shows a typical channel section.

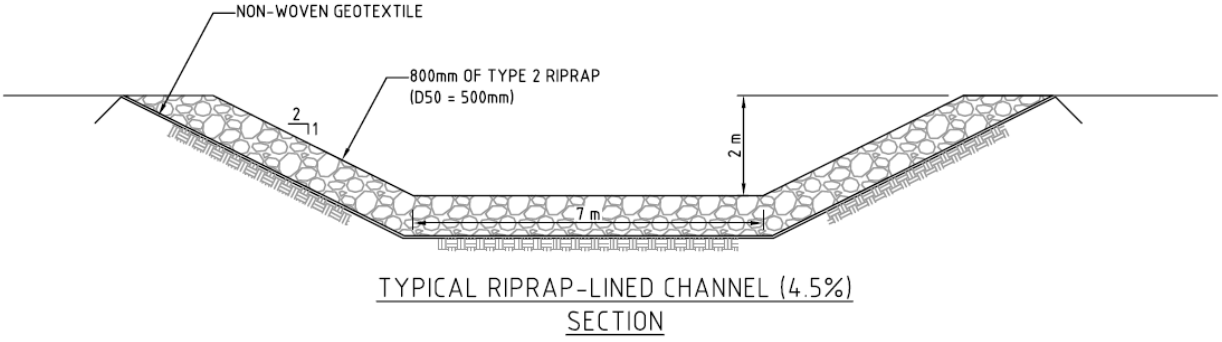


Figure 3 Clinton Creek Option C2 - Typical 4.5% Grade Riprap-Lined Channel

The construction schedule of the riprap-lined channel is expected to be similar to that provided for the gabion drop structures from Option C.

Regular visual inspections and surveys of the riprap-lined channel would be required. The ongoing movement of the waste rock dump would deform the channel, necessitating its replacement approximately every 45 years, as discussed in Section 3.3.10 of the report.

1.4 Option D2 - CC-4 / WR-3 / HL-1

The scope of work for Clinton Creek Remediation Option D2 is the same as for Option D except that the eight proposed gabion drop structures (i.e., downstream of Drop Structure No. 4) would be replaced with a 550 m-long riprap channel. The channel would be 7 m wide, 2 m deep, and be able to convey an estimated 200-year peak discharge of 44.5 m³/s. The channel would have a grade of approximately 4.5% and would be armoured with heavy rock riprap with a median diameter of 500 mm. Figure 4 shows a typical channel section.

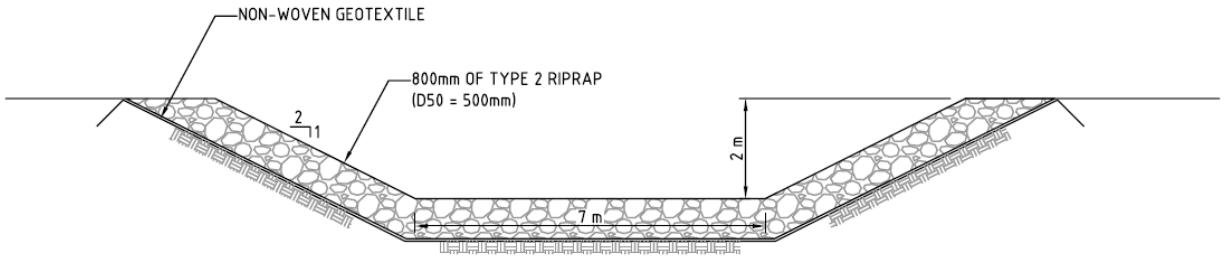


Figure 4 Clinton Creek Option D2 - Typical 4.5% Grade Riprap-Lined Channel

The construction schedule of the riprap-lined channel is expected to be similar to that provided for the gabion drop structures from Option D.

Regular visual inspections and surveys of the riprap-lined channel would be required; however, no regular maintenance or replacement of the channel is expected, assuming that the waste rock is adequately stabilized and the channel is properly constructed using high quality, durable riprap.

1.5 Option D3 - CC-4 / WR-3 / HL-1

The scope of work for Clinton Creek Remediation Option D3 is the same as for Option D except that the eight proposed and four existing gabion drop structures would be replaced with a 750 m-long riprap channel. The channel would be 7 m wide, 2 m deep, and be able to convey an estimated 200-year peak discharge of 44.5 m³/s. The channel would have a grade of approximately 4.5% and would be armoured with heavy rock riprap with a median diameter of 500 mm. Figure 5 shows a typical channel section.

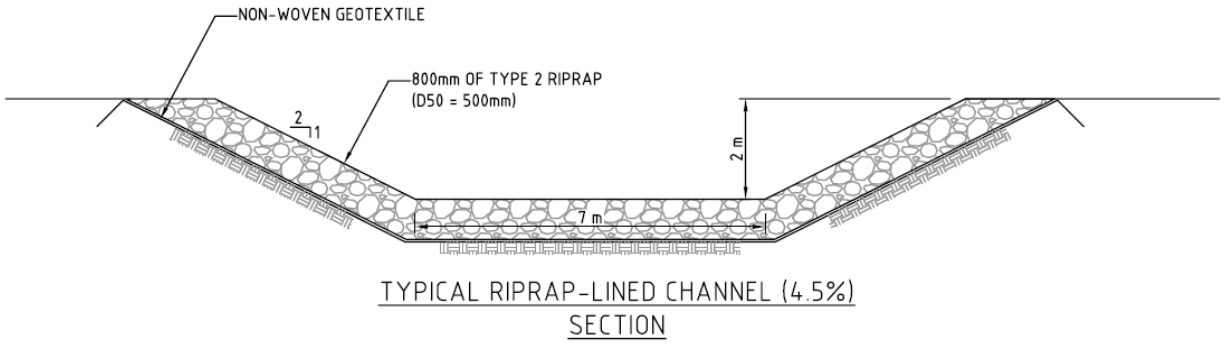


Figure 5 Clinton Creek Option D3 - Typical 4.5% Grade Riprap-Lined Channel

The construction schedule of the riprap-lined channel is expected to be similar to that provided for the gabion drop structures from for Option D.

Regular visual inspections and surveys of the riprap-lined channel would be required; however, no regular maintenance or replacement of the channel is expected, assuming that the waste rock is adequately stabilized and the channel is properly constructed using high quality, durable riprap.

1.6 Option E2 - CC-4 / WR-3 / HL-1

The scope of work for Clinton Creek Remediation Option E2 is the same as for Option E except that the upstream portion of the channel alignment is shifted further to the south, away from the north valley wall. The channel was shifted horizontally approximately 2.5 m for each 1 m that the channel is lowered. The intent of this change is to mitigate potential slope stability concerns of Option E, and thereby reduce the contingency allowance from 50% to 25%. Figure 6 shows the revised alignment of the lowered section of channel.

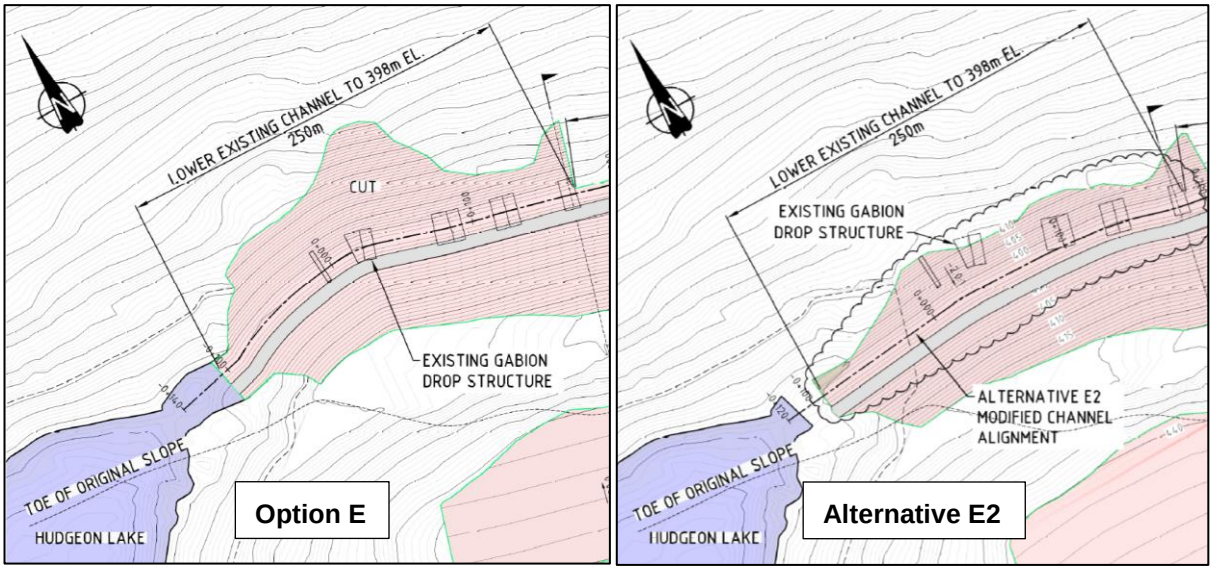


Figure 6 Clinton Creek Option E2 - Modified Channel Alignment

It should be noted that, while a significant portion of the lowered channel is expected to be in bedrock for Option E, almost none of the lowered channel is expected to be in bedrock for Option E2; however, this is not considered to be an issue as channel erosion in the lowered section should be negligible due to the very mild longitudinal slope.

The construction schedule and maintenance requirements will be similar to those provided for Option E.

1.7 Option E3 - CC-4 / WR-3 / HL-1

The scope of work for Clinton Creek Remediation Option E3 is the same as for Option E2 except that the 550 m of channel downstream of the lowered channel (i.e. the existing Drop Structure No. 4 location) would be armoured with riprap. The intent of this alternative is to mitigate long-term channel erosion that could destabilize the adjacent waste rock dump.

The channel would be 7 m wide, 2 m deep, and be able to convey an estimated 200-year peak discharge of 44.5 m^3/s. The channel would have a grade of approximately 4.5% and would be armoured with heavy rock riprap with a median diameter of 500 mm. Figure 7 shows a typical channel section.

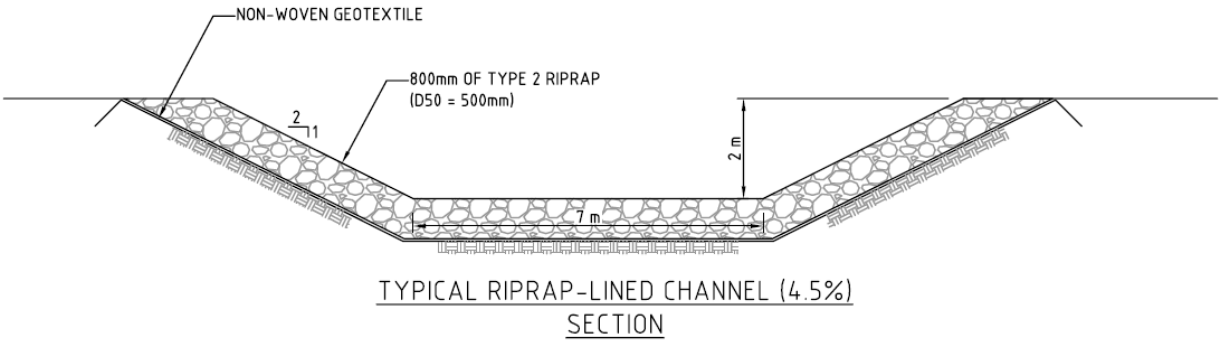


Figure 7 Clinton Creek Option E3 - Typical 4.5% Grade Riprap-Lined Channel

The construction schedule of the riprap-lined channel is expected to be similar to that provided for the channel excavated to bedrock from Option E.

Regular visual inspections and surveys of the riprap-lined channel would be required; however, no regular maintenance or replacement of the channel is expected, assuming that the waste rock is adequately stabilized and the channel is properly constructed using high quality, durable riprap.

1.8 Option I - CC-2 / WR-3 / HL-1

The scope of work for Clinton Creek Remediation Option I is the same as for Option B except that the new channel alignment would be shifted further north to reduce waste rock excavation volumes. The revised alignment is approximately 50 m south of the existing Clinton Creek channel alignment. The total estimated waste rock excavation volume for Option I is between that for Option D (maintain existing channel alignment) and Option B.

The earthworks component of the construction schedule is considerably shorter than that provided for Option B due to the elimination of approximately 1,300,000 m^3 of waste rock excavation. Construction of the riprap channel and gabion drop structures in Option I would be essentially the same as in Option B.

Regular visual inspections and surveys of the riprap-lined channel would be required; however, no regular maintenance or replacement of the channel is expected, assuming that the waste rock is adequately stabilized and the channel is properly constructed using high quality, durable riprap.

1.9 Option I2 - CC-2 / WR-3 / HL-1

The scope of work for Clinton Creek Remediation Option I2 is the same as for Option I except that the eight gabion drop structures would be replaced with a 300 m-long riprap channel. The channel would be 7 m wide, 2 m deep, and be able to convey an estimated 200-year peak discharge of 44.5 m³/s. The channel would have a grade of approximately 8% and would be armoured with heavy rock riprap with a median diameter of 800 mm. Figure 8 shows a typical channel section.

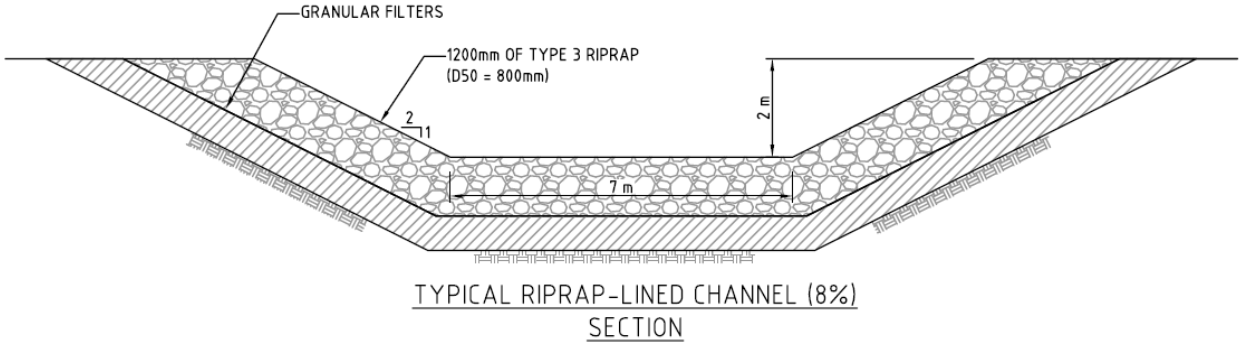


Figure 8 Clinton Creek Option I2 - Typical 8% Grade Riprap-Lined Channel

The construction schedule of the riprap-lined channel is expected to be similar to that provided for the gabion drop structures from Option I.

Regular visual inspections and surveys of the riprap-lined channel would be required; however, no regular maintenance or replacement of the channel is expected, assuming that the waste rock is adequately stabilized and the channel is properly constructed using high quality, durable riprap.

2. WOLVERINE CREEK REMEDIATION OPTION ALTERNATIVES

2.1 Option D2 - WC-7 / T-5

The scope of work for Wolverine Creek Remediation Option D2 is the same as for Option D except for the following changes:

- The waste rock cover over the tailings pile base would be lowered from a top elevation of 422 m to a top elevation of 415 m;
- Wolverine Creek upstream of the tailings would be backfilled to an elevation of 412 m to reduce the ponded water depth, mitigating the potential for a dam classification under the Canadian Dam Association (CDA); and
- The rock drain would be eliminated.

The intent of Wolverine Creek Option D2 is to estimate impact to the Option D LCC of reducing the elevation of the waste rock cover over the tailings pile base and to backfilling Wolverine Creek instead of constructing a rock drain. The reduced waste rock cover elevation of 415 m was not optimized, since no stability analysis was completed. However, it is the suggested minimum elevation in order to achieve a meaningful reduction in tailings movement.

It should be noted that Wolverine Creek was backfilled to one metre below the invert elevation of the armoured channel through the waste rock cover. This is based on the assumption that some ponding of water upstream is acceptable, as long as a dam classification under the CDA is avoided.

The construction schedule of and operational requirements of Option D2 are similar to those of Option C.

2.2 Option E2 - WC-7 / T-2 & T-3

The scope of work for Wolverine Creek Remediation Option D2 is the same as for Option D except for the following changes:

- Wolverine Creek upstream of the tailings would be backfilled with tailings and capped with waste rock to an elevation of 419 m to reduce the ponded water depth, mitigating the potential for a dam classification under the CDA; and
- The rock drain would be eliminated.

The intent of Wolverine Creek Option E2 is to estimate impact to the Option E LCC of backfilling Wolverine Creek instead of constructing a rock drain. Unlike Option D2, the originally proposed tailings pile base elevation of 422 m was maintained to comply with UMA's (2003b) recommendations for tailings stabilization.

It should be noted that Wolverine Creek was backfilled to one metre below the invert elevation of the armoured channel through the waste rock cover. This is based on the assumption that some ponding of water upstream is acceptable, as long as a dam classification under the CDA is avoided.

The construction schedule of Option E2 is shorter than that of Option E due to elimination of the rock drain.

Regular visual inspections and surveys of the riprap-lined channel would be required; however, no regular maintenance or replacement of the channel is expected, assuming that the waste rock is adequately stabilized and the channel is properly constructed using high quality, durable riprap.

3. REMEDIATION OPTION ALTERNATIVES - ESTIMATED LIFE CYCLE COSTS

The life cycle cost estimates, including estimated capital costs (CAPEX); operational costs (OPEX), and life cycle costs are summarized in Table 2 and Table 3. Operational costs are presented as the equivalent annual cost (EAC) of operation. Life cycle costs are presented as the net present cost (NPC) of construction and operation over 50-year and 100-year durations at the preferred real discount rate of 2.5% per year.

Table 2 Clinton Creek Remediation Option Alternatives - Estimated Life Cycle Costs

Option	Description	CAPEX	OPEX (EAC)	50-year LCC (NPC)	100-year LCC (NPC)
B2	CC-2 / WR-3 / HL-4 Same as Option B but replacing the eight proposed gabion drop structures with a riprap channel	$39M	$0.04M	$40M	$41M
C2[1]	CC-4 / WR-1 / HL-1 Same as Option C but replacing the eight proposed gabion drop structures with a riprap channel	$17M	$0.03M	$27M	$29M
C3[1]	CC-4 / WR-1 / HL-1 Same as Option C but replacing the eight proposed and four existing gabion drop structures with a riprap channel	$18M	$0.09	$20M	$21M
D2[1]	CC-4 / WR-3 / HL-1 Same as Option D but replacing the eight proposed gabion drop structures with a riprap channel	$21M	$0.02M	$28M	$30M
D3	CC-4 / WR-3 / HL-1 Same as Option D but replacing the eight proposed and four existing gabion drop structures with a riprap channel	$22M	$0.04M	$23M	$23M
E2	CC-5 / WR-3 / HL-3 Same as Option E with upstream channel re-alignment	$25M	$0.04M	$26M	$27M
E3	CC-5 / WR-3 / HL-3 Same as Option E2 but constructing a riprap channel downstream of the lowered section	$27M	$0.04M	$28M	$29M
I[1]	CC-4 / WR-3 / HL-1 Same as Option B but shifting the new channel north to reduce excavation	$27M	$0.40M	$39M	$42M

Option	Description	CAPEX	OPEX (EAC)	50-year LCC (NPC)	100-year LCC (NPC)
I2	CC-4 / WR-3 / HL-1 Same as Option I but replacing gabion drop structures with a riprap channel	$29M	$0.04M	$30M	$31M

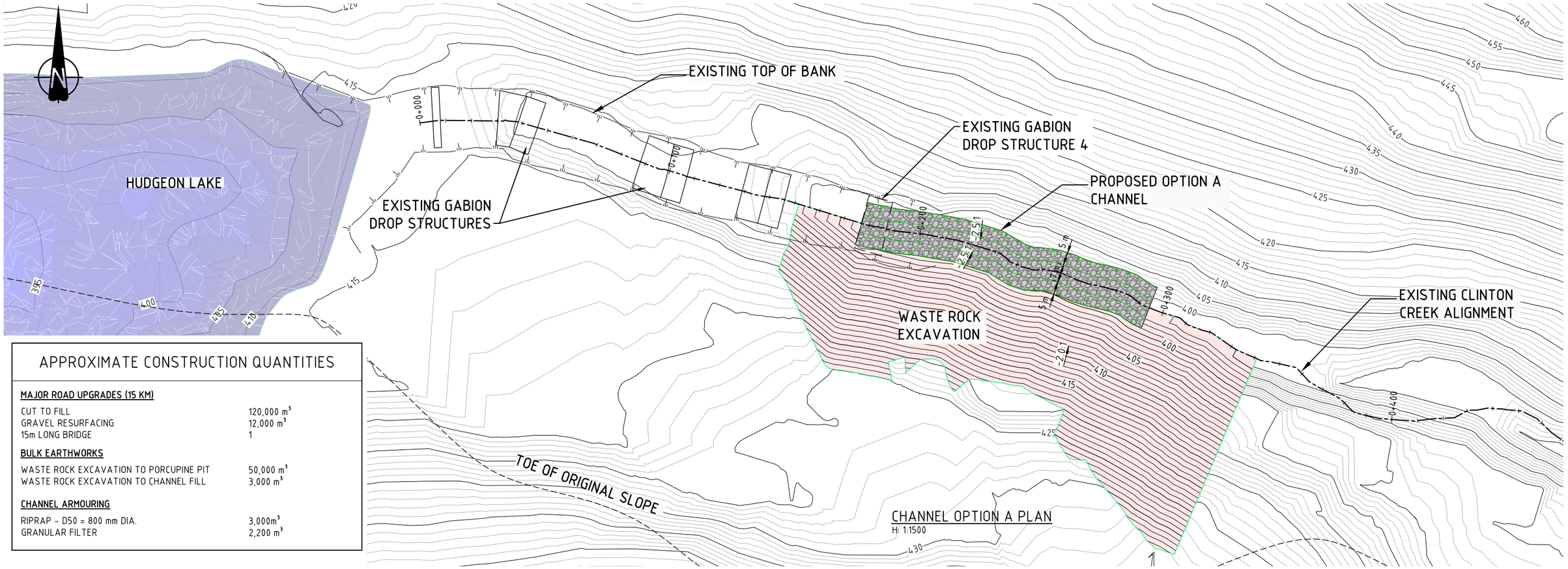
[1]Note: The long-term operational requirements associated with this option necessitate maintenance of the 15 km site access road between the Fortymile River Bridge and the former Clinton Creek Mine site. These costs are not included in the OPEX and LCC estimates shown. Refer to Section 7.1 of the main report for these additional costs.

Table 3 Wolverine Creek Remediation Option Alternatives - Estimated Life Cycle Costs

Option	Description	CAPEX	OPEX (EAC)	50-year LCC (NPC)	100-year LCC (NPC)
D2[1]	WC-7 / T-5 Providing a cover over the tailings pile base; constructing an armoured channel through the cover	$17M	$0.11M	$20M	$21M
E2	WC-7 / T-2 & T-3 Stabilizing the tailings pile; providing a cover over the tailings pile base; constructing an armoured channel through the cover	$35M	$0.05M	$36M	$37M

[1]Note: The long-term operational requirements associated with this option necessitate maintenance of the 15 km site access road between the Fortymile River Bridge and the former Clinton Creek Mine site. These costs are not included in the OPEX and LCC estimates shown. See section below for the cost of maintaining site access.

Appendix 2 Concept Figures for Remediation Options



APPROXIMATE CONSTRUCTION QUANTITIES

MAJOR ROAD UPGRADES (15 KM)

CUT TO FILL	120,000 m^3
GRAVEL RESURFACING	12,000 m^3
15m LONG BRIDGE	1

BULK EARTHWORKS

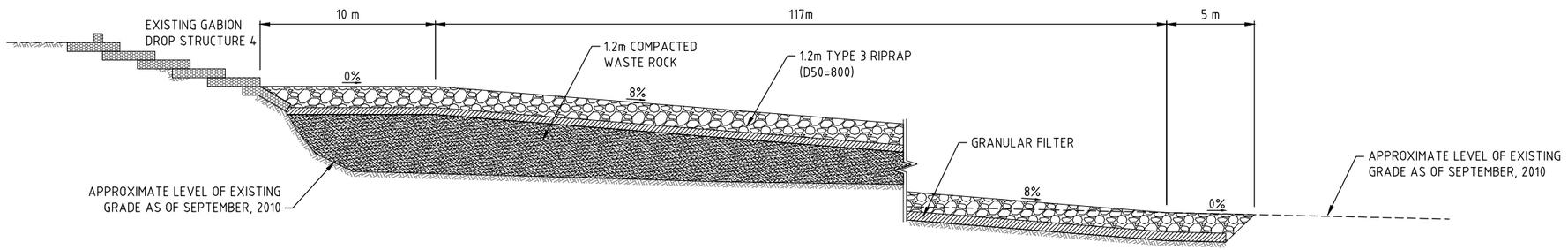
WASTE ROCK EXCAVATION TO PORCUPINE PIT	50,000 m^3
WASTE ROCK EXCAVATION TO CHANNEL FILL	3,000 m^3

CHANNEL ARMOURING

RIPRAP - D50 = 800 mm DIA.	3,000m^3
GRANULAR FILTER	2,200 m^3

CHANNEL OPTION A PLAN

H: 1:1500



GABION DROP STRUCTURE NO. 4 REPAIR PROFILE

1:300

PRELIMINARY
DO NOT USE FOR CONSTRUCTION
Last Saved: Mar. 28/14 2:01pm

m 0 1 2 3 4 5 10 m
1:300

m 0 10 20 30 40 m
1:1500

NOTES:

1. DIMENSIONS AND ELEVATIONS ARE IN METRES.

REV	DATE (DD-MMM-YY)	REVISION DESCRIPTION	DRAWN	DRAFT CHK	DESIGNED	ENG CHK	APPROVED	CUSTOMER	REF DRAWING No	REFERENCE DRAWING TITLE
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B	17-MAR-14	RE-ISSUED FOR CLIENT REVIEW	JH		SJC	AT				
A	14-JAN-14	ISSUED FOR DISCUSSION	JH		SJC	AT				

D SHEET | SCALE AS SHOWN

OneWay

WORLEYPARSONS PROJECT No
307071-00895

ENGINEERING AND PERMIT STAMPS (As Required)

CUSTOMER

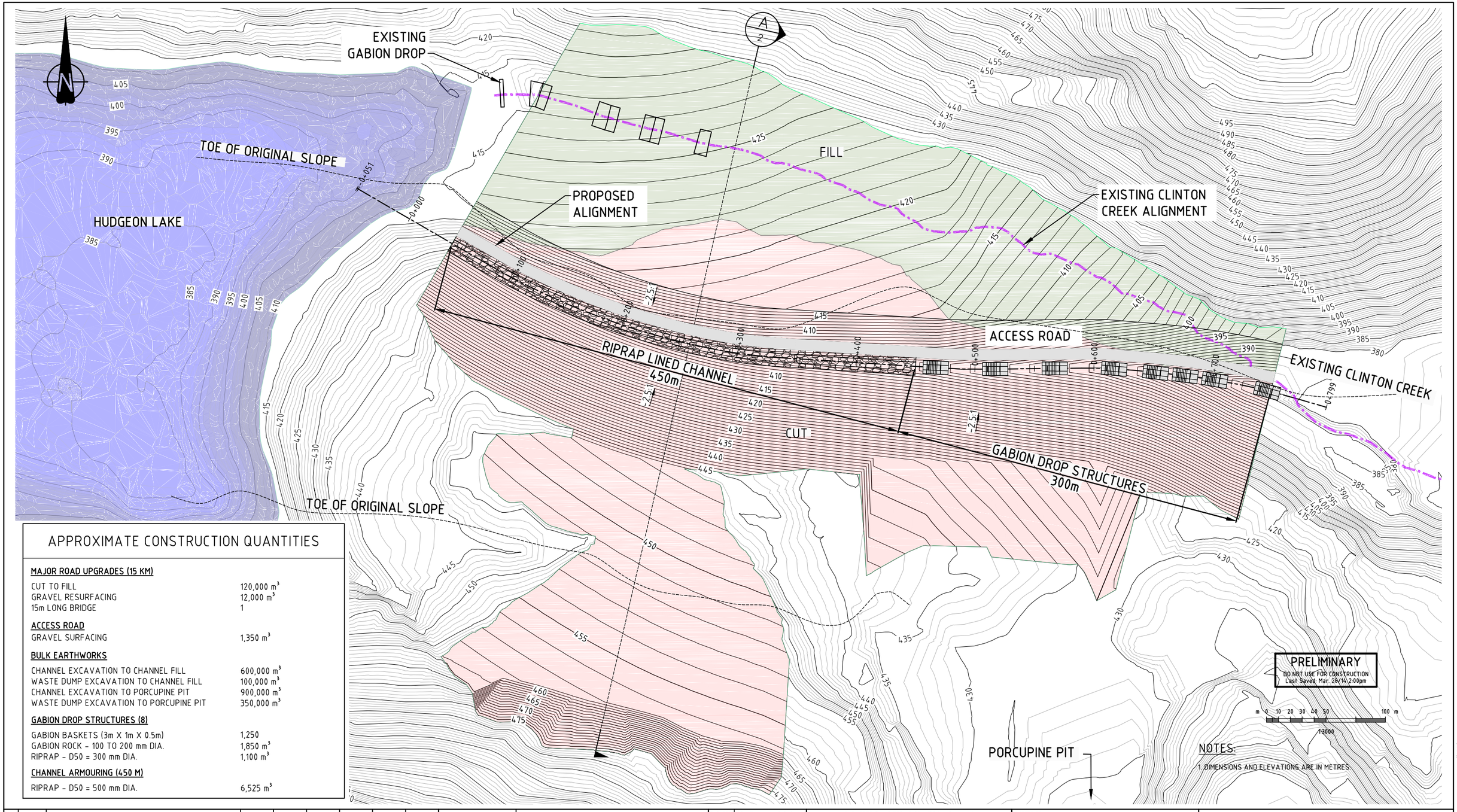
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resources & energy

CLINTON CREEK SITE LIFECYCLE
COST ANALYSIS FOR REMEDIAL OPTIONS
CLINTON CREEK OPTION A
PLAN AND PROFILE

DRG No 307071-00895-00-CI-DGA-CC_A01 | REV 0

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PLOT DATE & TIME: 28/3/2014 2:13:36 PM
SAVE DATE & TIME: 28/3/2014 2:01:13 PM



APPROXIMATE CONSTRUCTION QUANTITIES

MAJOR ROAD UPGRADES (15 KM)

CUT TO FILL	120,000 m^3
GRAVEL RESURFACING	12,000 m^3
15m LONG BRIDGE	1

ACCESS ROAD

GRAVEL SURFACING	1,350 m^3

BULK EARTHWORKS

CHANNEL EXCAVATION TO CHANNEL FILL	600,000 m^3
WASTE DUMP EXCAVATION TO CHANNEL FILL	100,000 m^3
CHANNEL EXCAVATION TO PORCUPINE PIT	900,000 m^3
WASTE DUMP EXCAVATION TO PORCUPINE PIT	350,000 m^3

GABION DROP STRUCTURES (8)

GABION BASKETS (3m X 1m X 0.5m)	1,250
GABION ROCK - 100 TO 200 mm DIA.	1,850 m^3
RIPRAP - D50 = 300 mm DIA.	1,100 m^3

CHANNEL ARMOURING (450 M)

RIPRAP - D50 = 500 mm DIA.	6,525 m^3

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C	17-MAR-14	RE-ISSUED FOR CLIENT REVIEW	JH		SJC	AT				
B	14-JAN-14	RE-ISSUED FOR CLIENT REVIEW	JH		SJC	AT				
A	28-NOV-13	ISSUED FOR DISCUSSION	JH		SJC	AT	LM			

D SHEET | SCALE AS SHOWN

OneWay

WORLEYPARSONS PROJECT No
307071-00895

ENGINEERING AND PERMIT STAMPS (As Required)

CUSTOMER

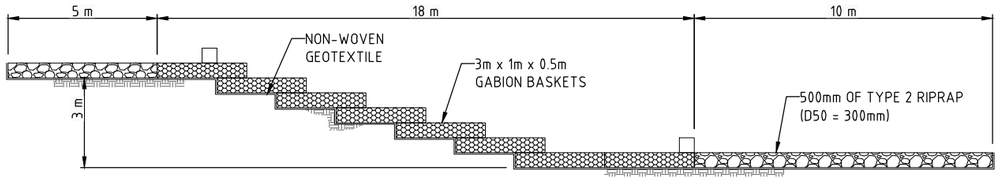
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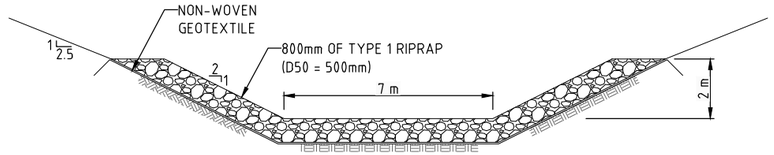
CLINTON CREEK SITE LIFECYCLE
COST ANALYSIS FOR REMEDIAL OPTIONS
CLINTON CREEK OPTION B
PLAN

DRG No 307071-00895-00-CI-DGA-CC_B01 | REV 0

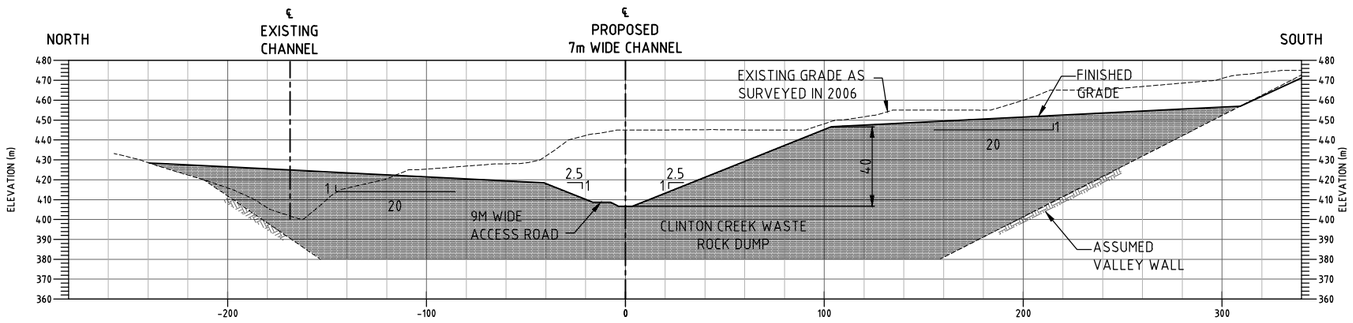
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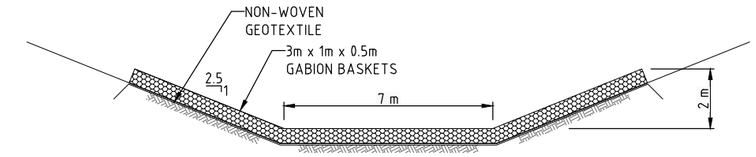
TYPICAL GABION DROP STRUCTURE PROFILE
1:200



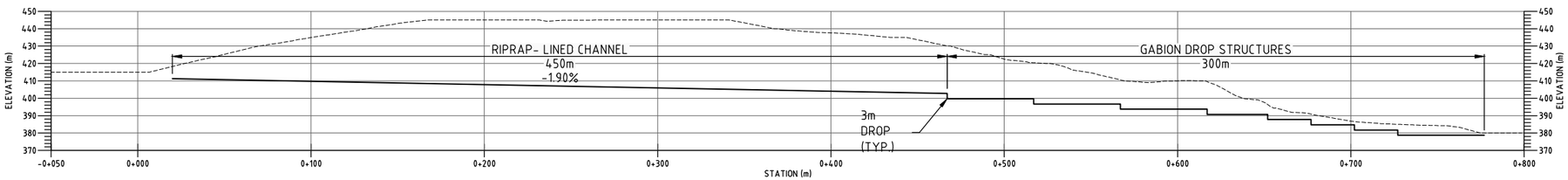
TYPICAL RIPRAP-LINED CHANNEL SECTION
1:200



SECTION A
1:3000



TYPICAL GABION DROP STRUCTURE SECTION
1:200



PROFILE - CLINTON CREEK PROPOSED ALIGNMENT
1:3000

PRELIMINARY
DO NOT USE FOR CONSTRUCTION
Last Saved: Mar. 28/14 2:00pm

m 0 1 2 3 4 5 m
1:200

m 0 10 20 30 40 50 100 m
1:3000

NOTES:

1. DIMENSIONS AND ELEVATIONS ARE IN METRES.

REV	DATE (DD-MMM-YY)	REVISION DESCRIPTION	DRAWN	DRAFT CHK	DESIGNED	ENG CHK	APPROVED	CUSTOMER	REF DRAWING No	REFERENCE DRAWING TITLE
0	28-MAR-14	ISSUED FOR USE	JH		SJC	AT				
C	17-MAR-14	RE-ISSUED FOR CLIENT REVIEW	JH		SJC	AT				
B	14-JAN-14	RE-ISSUED FOR CLIENT REVIEW	JH		SJC	AT				
A	28-NOV-13	ISSUED FOR DISCUSSION	JH	AT	SJC		LM			

D SHEET | SCALE AS SHOWN

OneWay

WORLEYPARSONS PROJECT No
307071-00895

ENGINEERING AND PERMIT STAMPS (As Required)

CUSTOMER

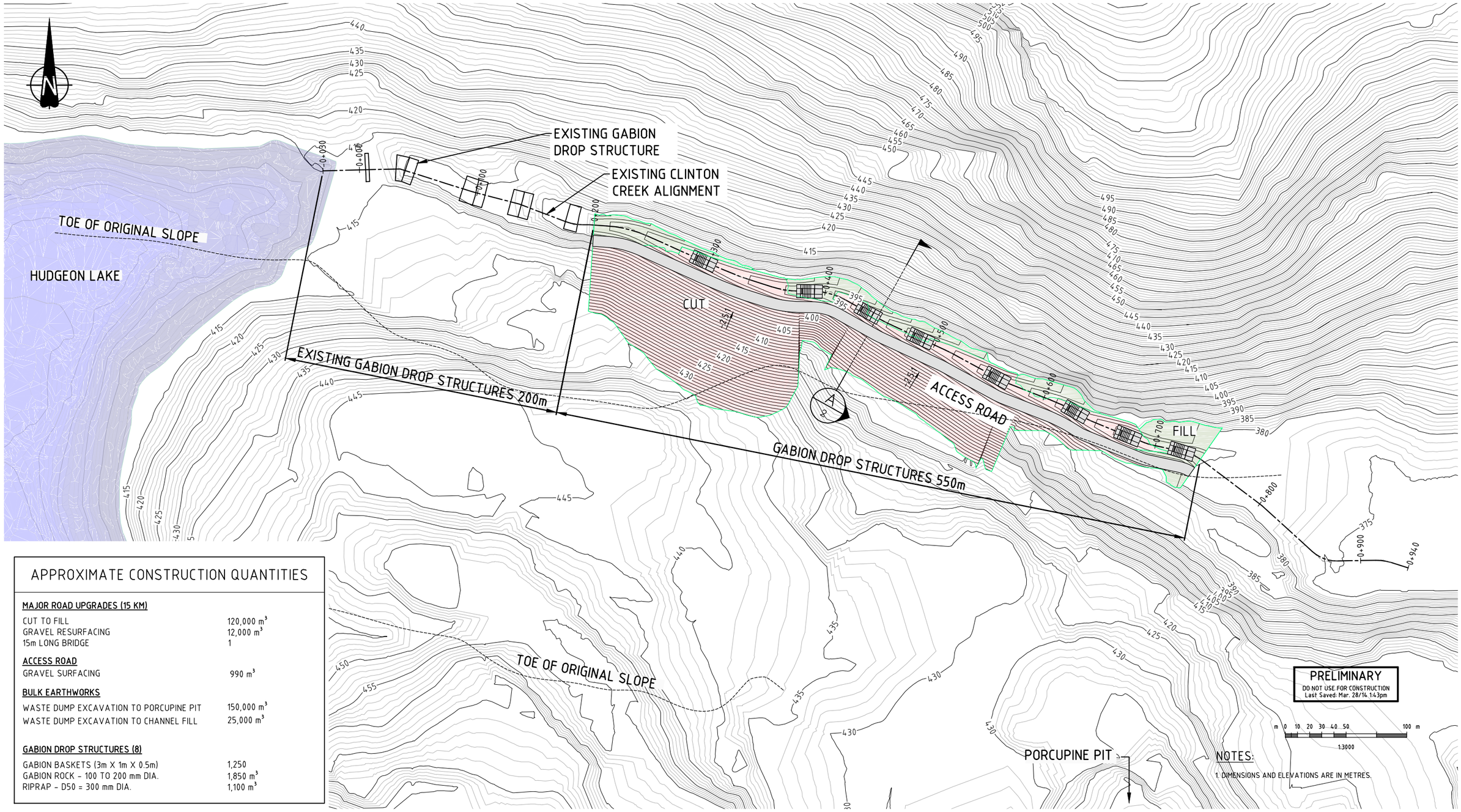
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CLINTON CREEK SITE LIFECYCLE
COST ANALYSIS FOR REMEDIAL OPTIONS
CLINTON CREEK OPTION B
PROFILE AND SECTIONS

DRG No 307071-00895-00-CI-DGA-CC_B02 | REV 0

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USER NAME: jiang.hu
PLOT DATE & TIME: 28/3/2014 2:14:27 PM
SAVE DATE & TIME: 28/3/2014 2:00:50 PM



APPROXIMATE CONSTRUCTION QUANTITIES

MAJOR ROAD UPGRADES (15 KM)

CUT TO FILL	120,000 m^3
GRAVEL RESURFACING	12,000 m^3
15m LONG BRIDGE	1

ACCESS ROAD

GRAVEL SURFACING	990 m^3

BULK EARTHWORKS

WASTE DUMP EXCAVATION TO PORCUPINE PIT	150,000 m^3
WASTE DUMP EXCAVATION TO CHANNEL FILL	25,000 m^3

GABION DROP STRUCTURES (8)

GABION BASKETS (3m X 1m X 0.5m)	1,250
GABION ROCK – 100 TO 200 mm DIA.	1,850 m^3
RIPRAP – D50 = 300 mm DIA.	1,100 m^3

NOTES:

1. DIMENSIONS AND ELEVATIONS ARE IN METRES.

REV	DATE (DD-MMM-YY)	REVISION DESCRIPTION	DRAWN	DRAFT CHK	DESIGNED	ENG CHK	APPROVED	CUSTOMER	REF DRAWING No	REFERENCE DRAWING TITLE
0	28-MAR-14	ISSUED FOR USE	JH		SJC	AT				
B	17-MAR-14	RE-ISSUED FOR CLIENT REVIEW	JH		SJC	AT				
A	14-JAN-14	ISSUED FOR DISCUSSION	JH		SJC	AT				

D SHEET | SCALE AS SHOWN

OneWay

WORLEYPARSONS PROJECT No 307071-00895

ENGINEERING AND PERMIT STAMPS (As Required)

CUSTOMER

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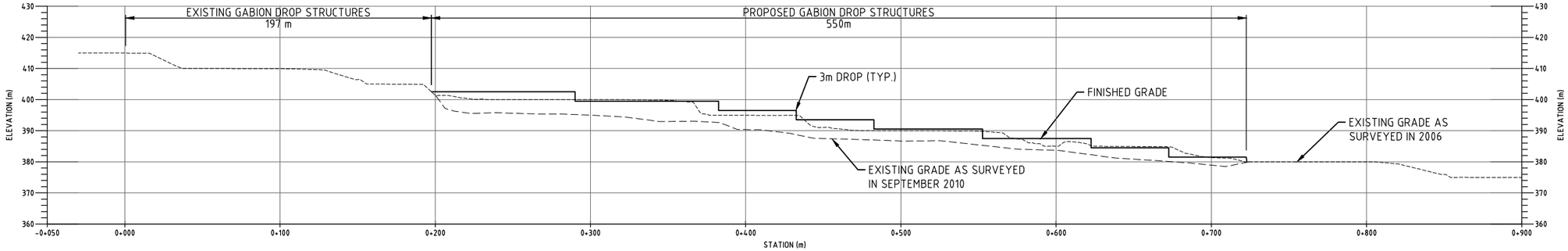
CLINTON CREEK SITE LIFECYCLE
COST ANALYSIS FOR REMEDIAL OPTIONS
CLINTON CREEK OPTION C
PLAN

DRG No 307071-00895-00-CI-DGA-CC_C01 | REV 0

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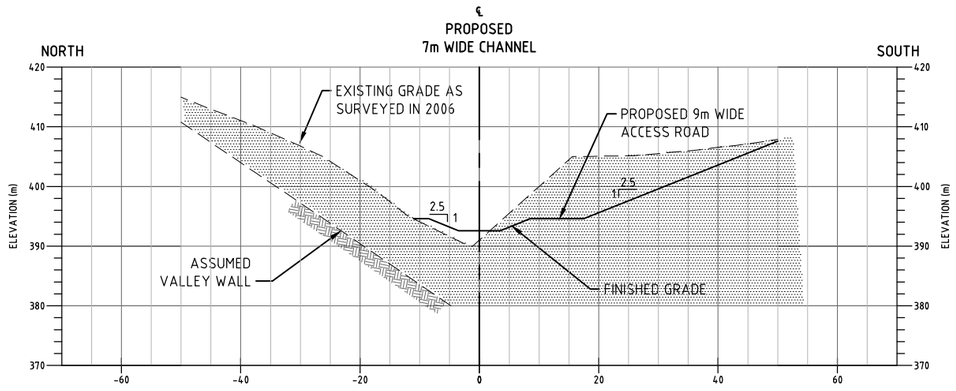
USER NAME: jiangh

PLOT DATE & TIME: 28/3/2014 2:14:53 PM
SAVE DATE & TIME: 28/3/2014 1:43:46 PM



PROFILE - CLINTON CREEK PROPOSED ALIGNMENT

H:1:3000
V:1:1500



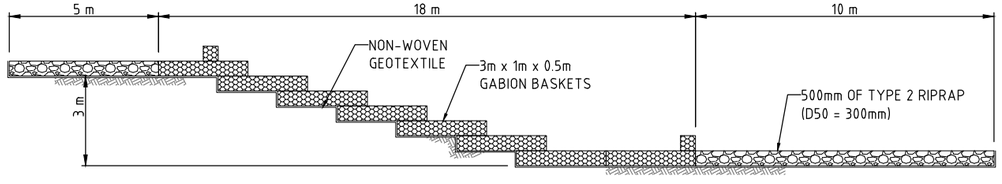
SECTION A

1:1000



TYPICAL GABION DROP STRUCTURE SECTION

1:200



TYPICAL GABION DROP STRUCTURE PROFILE

1:200

PRELIMINARY
DO NOT USE FOR CONSTRUCTION
Last Saved: Mar. 28/14 1:43pm

m 0 1 2 3 4 5 m
1:200

m 0 5 10 15 20 25 m
1:1000

m 0 10 20 30 40 50 100 m
1:3000

NOTES:

1. DIMENSIONS AND ELEVATIONS ARE IN METRES.

REV	DATE (DD-MMM-YY)	REVISION DESCRIPTION	DRAWN	DRAFT CHK	DESIGNED	ENG CHK	APPROVED	CUSTOMER	REF DRAWING No	REFERENCE DRAWING TITLE
0	28-MAR-14	ISSUED FOR USE	JH		SJC	AT				
B	17-MAR-14	RE-ISSUED FOR CLIENT REVIEW	JH		SJC	AT				
A	14-JAN-14	ISSUED FOR DISCUSSION	JH		SJC	AT				

D SHEET | SCALE AS SHOWN

OneWay

WORLEYPARSONS PROJECT No
307071-00895

ENGINEERING AND PERMIT STAMPS (As Required)

CUSTOMER

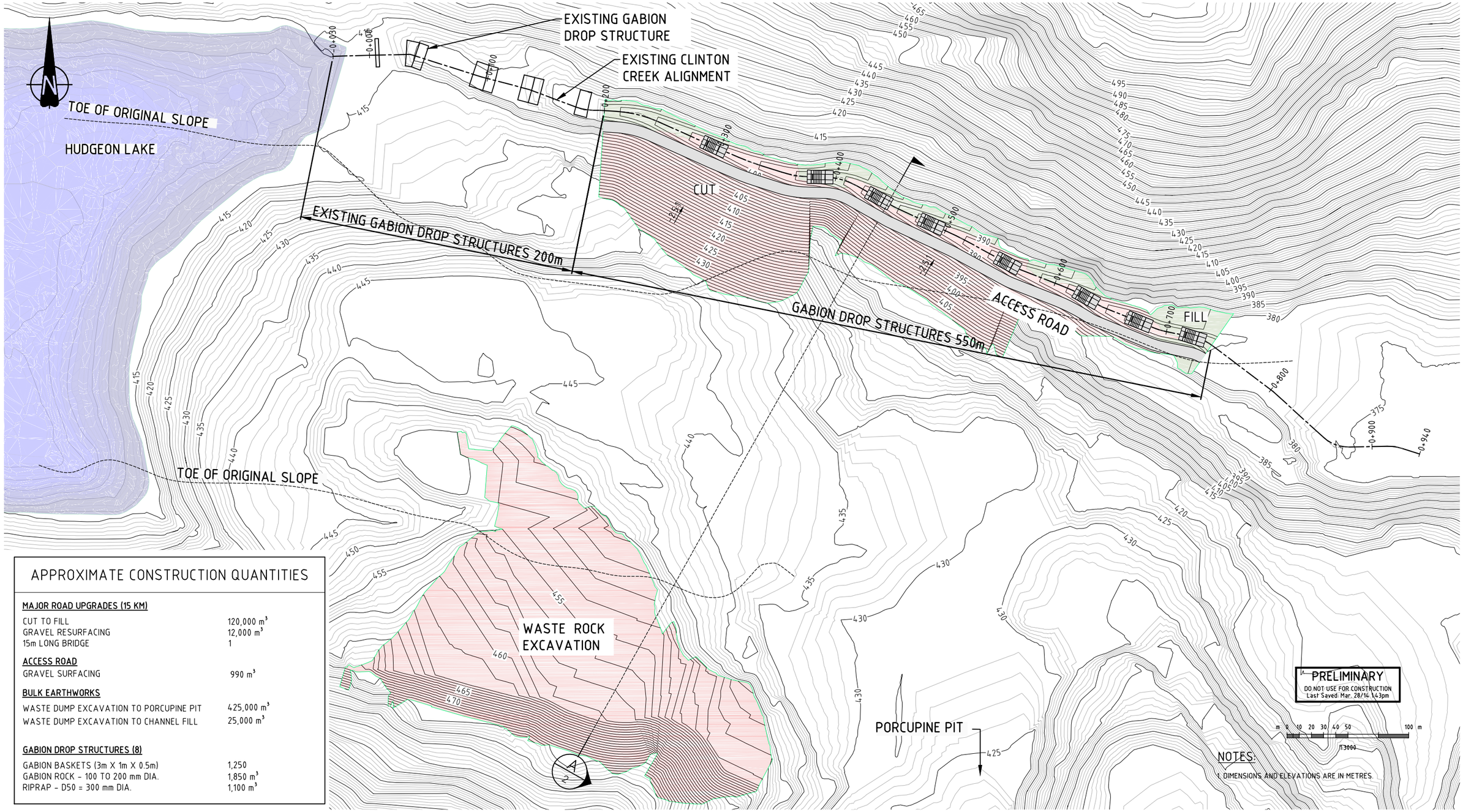
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CLINTON CREEK SITE LIFECYCLE
COST ANALYSIS FOR REMEDIAL OPTIONS
CLINTON CREEK OPTION C
PROFILE AND SECTIONS

DRG No 307071-00895-00-CI-DGA-CC_C02 | REV 0

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USER NAME: jiang.hu
PLOT DATE & TIME: 28/3/2014 2:14:59 PM
SAVE DATE & TIME: 28/3/2014 1:43:46 PM



APPROXIMATE CONSTRUCTION QUANTITIES

MAJOR ROAD UPGRADES (15 KM)

CUT TO FILL	120,000 m^3
GRAVEL RESURFACING	12,000 m^3
15m LONG BRIDGE	1

ACCESS ROAD

GRAVEL SURFACING	990 m^3

BULK EARTHWORKS

WASTE DUMP EXCAVATION TO PORCUPINE PIT	425,000 m^3
WASTE DUMP EXCAVATION TO CHANNEL FILL	25,000 m^3

GABION DROP STRUCTURES (8)

GABION BASKETS (3m X 1m X 0.5m)	1,250
GABION ROCK - 100 TO 200 mm DIA.	1,850 m^3
RIPRAP - D50 = 300 mm DIA.	1,100 m^3

PRELIMINARY
DO NOT USE FOR CONSTRUCTION
Last Saved: Mar. 28/14 1:43pm

m 0 10 20 30 40 50 100 m
1:3000

NOTES:
1. DIMENSIONS AND ELEVATIONS ARE IN METRES.

REV	DATE (DD-MMM-YY)	REVISION DESCRIPTION	DRAWN	DRAFT CHK	DESIGNED	ENG CHK	APPROVED	CUSTOMER	REF DRAWING No	REFERENCE DRAWING TITLE
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B	17-MAR-14	RE-ISSUED FOR CLIENT REVIEW	JH		SJC	AT				
A	14-JAN-14	ISSUED FOR DISCUSSION	JH		SJC	AT				

D SHEET | SCALE AS SHOWN

OneWay

WORLEYPARSONS PROJECT No
307071-00895

ENGINEERING AND PERMIT STAMPS (As Required)

CUSTOMER

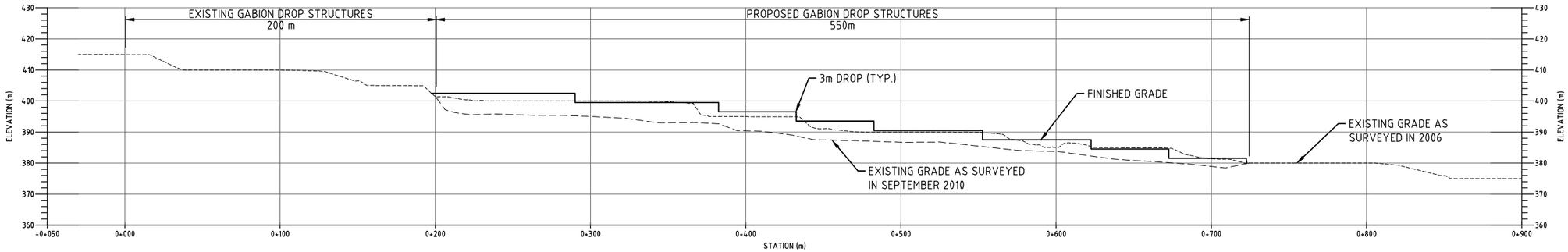
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CLINTON CREEK SITE LIFECYCLE
COST ANALYSIS FOR REMEDIAL OPTIONS
CLINTON CREEK OPTION D
PLAN

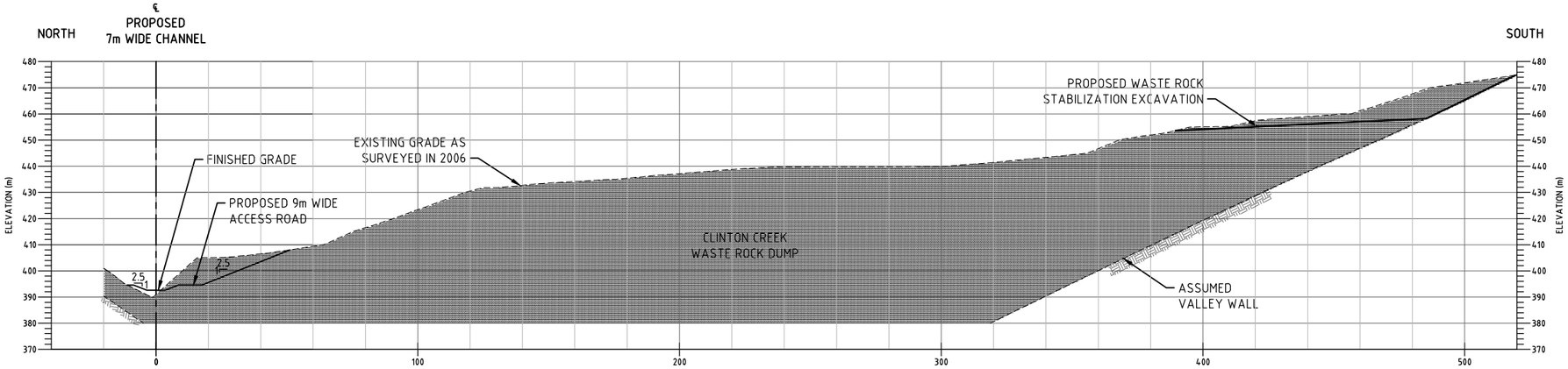
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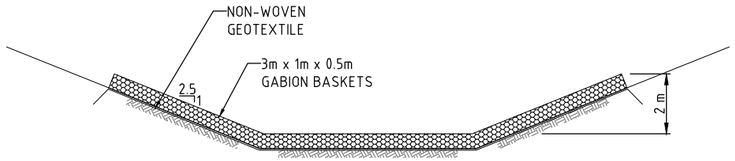
PROFILE - CLINTON CREEK PROPOSED ALIGNMENT

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V:1:1500



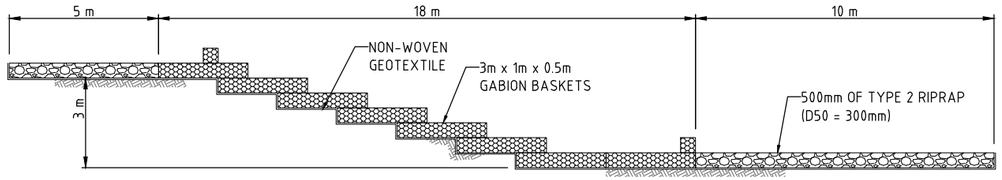
SECTION A

1:2000



TYPICAL GABION DROP STRUCTURE SECTION

1:200



TYPICAL GABION DROP STRUCTURE PROFILE

1:200

PRELIMINARY

DO NOT USE FOR CONSTRUCTION
Last Saved: Mar. 28/14 1:43pm

m 0 1 2 3 4 5 m
1:200

m 0 10 20 30 40 50 m
1:2000

m 0 10 20 30 40 50 100 m
1:3000

NOTES:

1. DIMENSIONS AND ELEVATIONS ARE IN METRES.

REV	DATE (DD-MMM-YY)	REVISION DESCRIPTION	DRAWN	DRAFT CHK	DESIGNED	ENG CHK	APPROVED	CUSTOMER	REF DRAWING No	REFERENCE DRAWING TITLE
0	28-MAR-14	ISSUED FOR USE	JH		SJC	AT				
B	17-MAR-14	RE-ISSUED FOR CLIENT REVIEW	JH		SJC	AT				
A	14-JAN-14	ISSUED FOR DISCUSSION	JH		SJC	AT				

D SHEET SCALE AS SHOWN

OneWay

WORLEYPARSONS PROJECT No
307071-00895

ENGINEERING AND PERMIT STAMPS (As Required)

CUSTOMER

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CLINTON CREEK SITE LIFECYCLE
COST ANALYSIS FOR REMEDIAL OPTIONS
CLINTON CREEK OPTION D
PROFILE AND SECTIONS

DRG No 307071-00895-00-CI-DGA-CC_D02

REV 0

LOCATION: U:\YVR\307071\00895_YEMR_CLINTONCRK\11_DRAWINGS\01_CIVIL\02_CIVIL\3D\OPTIONS\CLINTON CREEK\FIGURE FILES\307071-00895-00-CI-DGA-1000_OPTION D.DWG
USER NAME: jiangh
PLOT DATE & TIME: 28/3/2014 2:15:41 PM
SAVE DATE & TIME: 28/3/2014 1:43:20 PM



APPROXIMATE CONSTRUCTION QUANTITIES

MAJOR ROAD UPGRADES (15 KM)

CUT TO FILL	120,000 m^3
GRAVEL RESURFACING	12,000 m^3
15m LONG BRIDGE	1

ACCESS ROAD

GRAVEL SURFACING	1,350 m^3

BULK EARTHWORKS

WASTE DUMP EXCAVATION TO PORCUPINE PIT	450,000 m^3
WASTE DUMP EXCAVATION TO CHANNEL FILL	500,000 m^3

PRELIMINARY
DO NOT USE FOR CONSTRUCTION
Last Saved: Mar 31/14 2:19pm

m 0 10 20 30 40 50 100 m
1:3000

NOTES:
1. DIMENSIONS AND ELEVATIONS ARE IN METRES.

REV	DATE DD-MMM-YY	REVISION DESCRIPTION	DRAWN	DRAFT CHK	DESIGNED	ENG CHK	APPROVED	CUSTOMER	REF DRAWING No	REFERENCE DRAWING TITLE
0	28-MAR-14	ISSUED FOR USE	JH		SJC	AT				
B	17-MAR-14	RE-ISSUED FOR CLIENT REVIEW	JH		SJC	AT				
A	14-JAN-14	ISSUED FOR DISCUSSION	JH		SJC	AT				

D SHEET | SCALE AS SHOWN

OneWay to zero harm

WORLEYPARSONS PROJECT No
307071-00895

ENGINEERING AND PERMIT STAMPS (As Required)

CUSTOMER

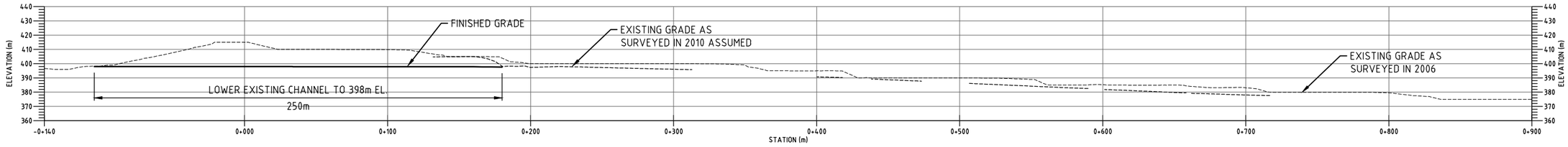
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WorleyParsons resources & energy

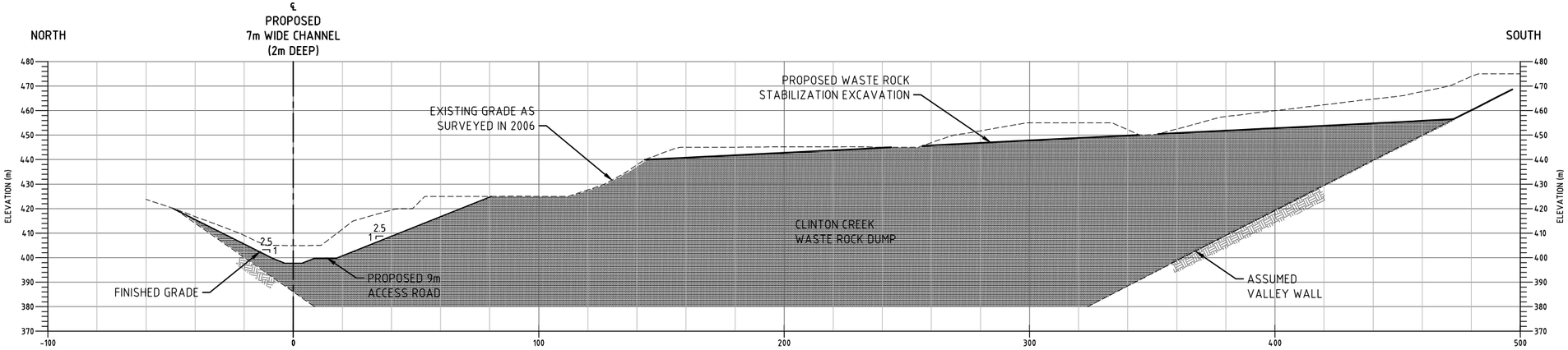
CLINTON CREEK SITE LIFECYCLE
COST ANALYSIS FOR REMEDIAL OPTIONS
CLINTON CREEK OPTION E
PLAN

DRG No 307071-00895-00-CI-DGA-CC_E01 | REV 0

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PROFILE - CLINTON CREEK PROPOSED ALIGNMENT
1:3000



SECTION A
1:2000

PRELIMINARY
DO NOT USE FOR CONSTRUCTION
Last Saved: Mar. 28/14 1:44pm

m 0 10 20 30 40 50 m
1:2000

m 0 10 20 30 40 50 100 m
1:3000

NOTES:

1. DIMENSIONS AND ELEVATIONS ARE IN METRES.

REV	DATE (DD-MMM-YY)	REVISION DESCRIPTION	DRAWN	DRAFT CHK	DESIGNED	ENG CHK	APPROVED	CUSTOMER	REF DRAWING No	REFERENCE DRAWING TITLE
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B	17-MAR-14	RE-ISSUED FOR CLIENT REVIEW	JH		SJC	AT				
A	14-JAN-14	ISSUED FOR DISCUSSION	JH		SJC	AT				

D SHEET | SCALE AS SHOWN

OneWay

WORLEYPARSONS PROJECT No
307071-00895

ENGINEERING AND PERMIT STAMPS (As Required)

CUSTOMER

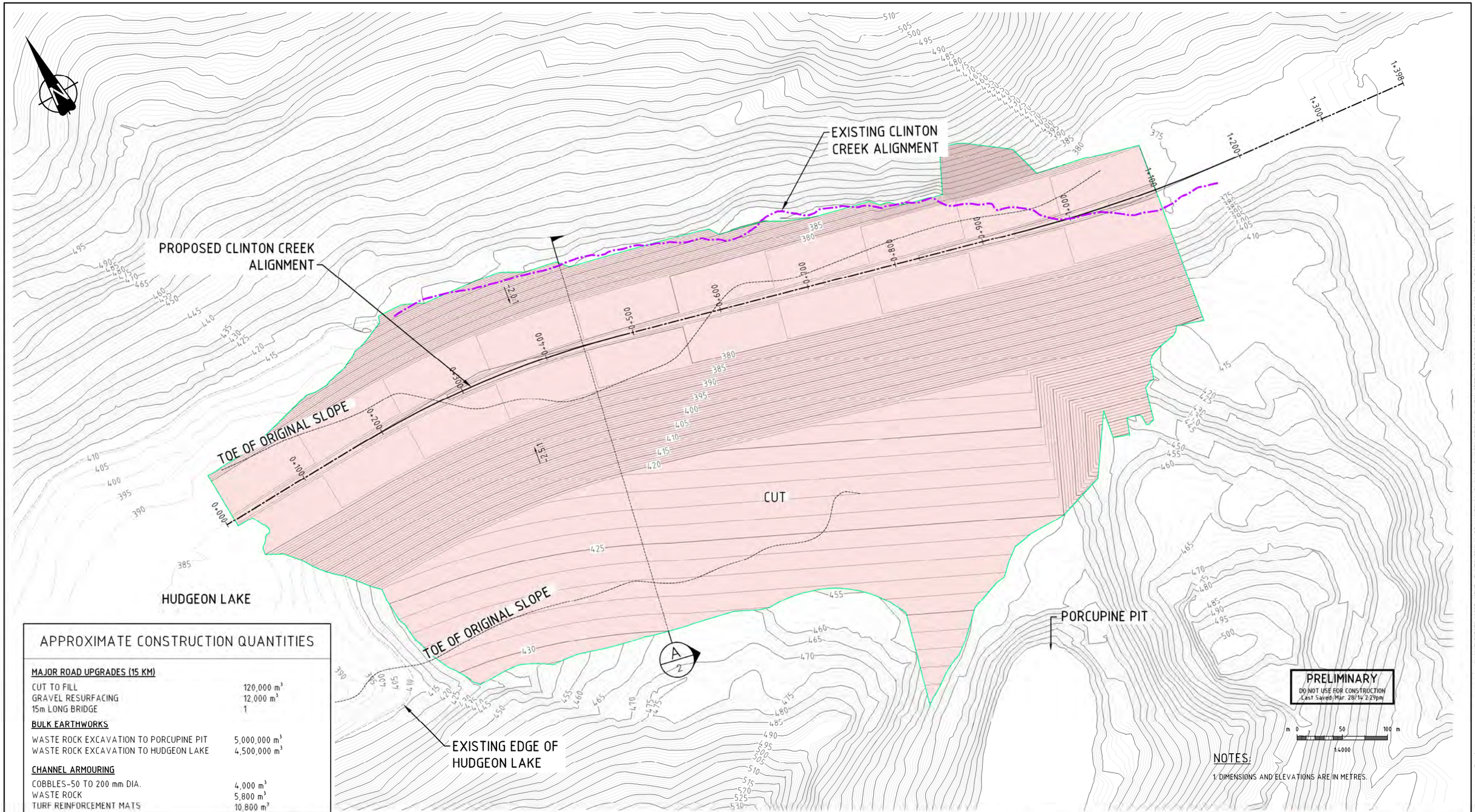
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CLINTON CREEK SITE LIFECYCLE
COST ANALYSIS FOR REMEDIAL OPTIONS
CLINTON CREEK OPTION E
PROFILE AND SECTIONS

DRG No 307071-00895-00-CI-DGA-CC_E02 | REV 0

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USER NAME: jiang.hu
PLOT DATE & TIME: 28/3/2014 2:16:28 PM
SAVE DATE & TIME: 28/3/2014 1:44:22 PM



APPROXIMATE CONSTRUCTION QUANTITIES

MAJOR ROAD UPGRADES (15 KM)

CUT TO FILL	120,000 m^3
GRAVEL RESURFACING	12,000 m^3
15m LONG BRIDGE	1

BULK EARTHWORKS

WASTE ROCK EXCAVATION TO PORCUPINE PIT	5,000,000 m^3
WASTE ROCK EXCAVATION TO HUDGEON LAKE	4,500,000 m^3

CHANNEL ARMOURING

COBBLES-50 TO 200 mm DIA.	4,000 m^3
WASTE ROCK	5,800 m^3
TURF REINFORCEMENT MATS	10,800 m^3

NOTES:

1. DIMENSIONS AND ELEVATIONS ARE IN METRES.

REV	DATE dd-mmm-yy	REVISION DESCRIPTION	DRAWN	DRAFT CHK	DESIGNED	ENG CHK	APPROVED	CUSTOMER	REF DRAWING No	REFERENCE DRAWING TITLE
0	28-MAR-14	ISSUED FOR USE	JH		SJC	AT				
B	17-MAR-14	RE-ISSUED FOR CLIENT REVIEW	JH		SJC	AT				
A	14-JAN-14	ISSUED FOR DISCUSSION	JH		SJC	AT				

D SHEET SCALE AS SHOWN

OneWay to zero harm

WORLEYPARSONS PROJECT No 307071-00895

ENGINEERING AND PERMIT STAMPS (As Required)

CUSTOMER

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CLINTON CREEK SITE LIFECYCLE COST ANALYSIS FOR REMEDIAL OPTIONS CLINTON CREEK OPTION F PLAN

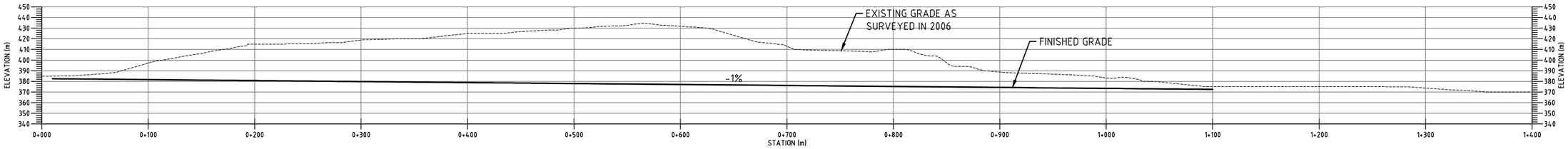
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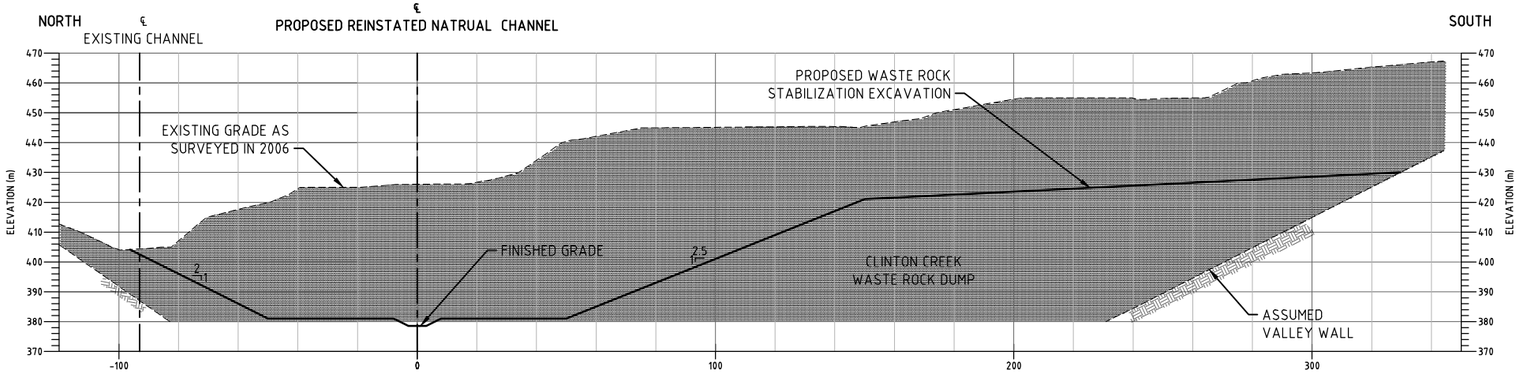
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PLOT DATE & TIME: 31/3/2014 2:34:24 PM

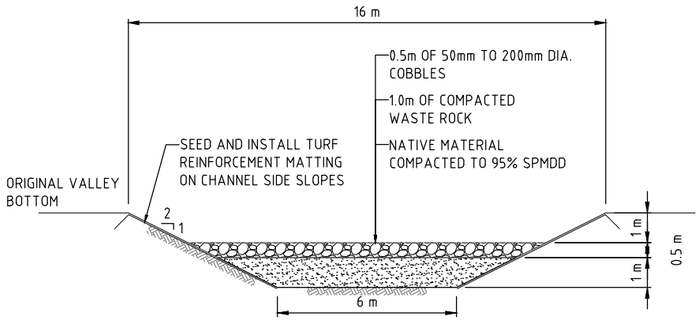
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PROFILE - CLINTON CREEK PROPOSED ALIGNMENT
1:4000



SECTION A
1:2000



TYPICAL RE-INSTATED NATURAL CHANNEL SECTION
1:200

PRELIMINARY
DO NOT USE FOR CONSTRUCTION
Last Saved: Mar. 28/14 1:44pm

m 0 1 2 3 4 5 m
1:200

m 0 10 20 30 40 50 m
1:2000

m 0 50 100 m
1:4000

NOTES:

1. DIMENSIONS AND ELEVATIONS ARE IN METRES.

REV	DATE (DD-MMM-YY)	REVISION DESCRIPTION	DRAWN	DRAFT CHK	DESIGNED	ENG CHK	APPROVED	CUSTOMER	REF DRAWING No	REFERENCE DRAWING TITLE
0	28-MAR-14	ISSUED FOR USE	JH		SJC	AT				
B	17-MAR-14	RE-ISSUED FOR CLIENT REVIEW	JH		SJC	AT				
A	14-JAN-14	ISSUED FOR DISCUSSION	JH		SJC	AT				

D SHEET | SCALE AS SHOWN

OneWay

WORLEYPARSONS PROJECT No
307071-00895

ENGINEERING AND PERMIT STAMPS (As Required)

CUSTOMER

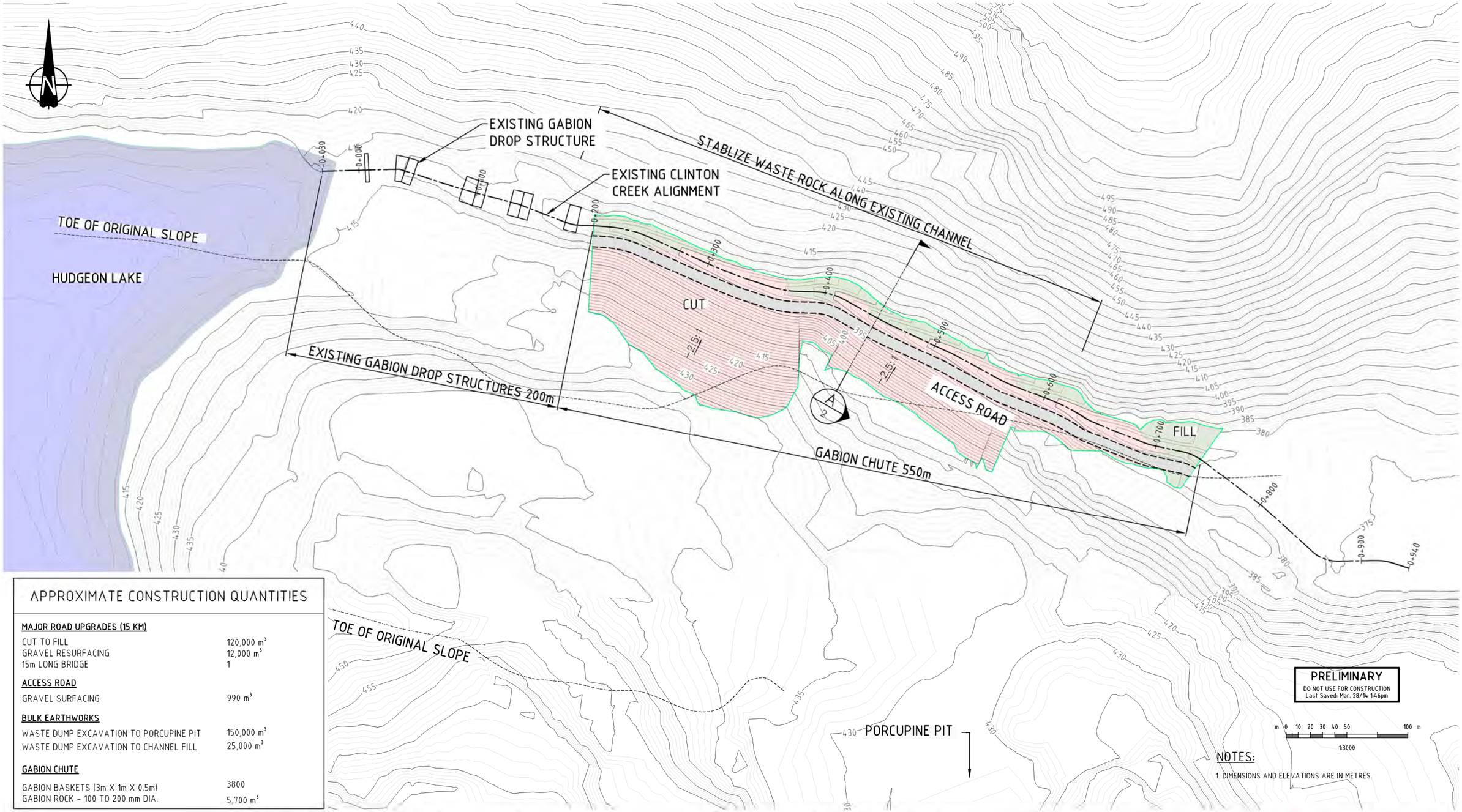
"This drawing is prepared for the use of the contractual customer of WorleyParsons Canada Services Ltd. and WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

WorleyParsons
resources & energy

CLINTON CREEK SITE LIFECYCLE
COST ANALYSIS FOR REMEDIAL OPTIONS
CLINTON CREEK OPTION F
PROFILE AND SECTIONS

DRG No 307071-00895-00-CI-DGA-CC__F02 | REV 0

LOCATION: U:\YVR\307071\00895_YEMR_CLINTONCRK\11_DRAWINGS\01_CIVIL\02_CIVIL3D\OPTIONS\CLINTON CREEK\FIGURE FILES\307071-00895-00-CI-DGA-1000_OPTION F.DWG
USER NAME: jiang.hu
PLOT DATE & TIME: 28/3/2014 2:16:50 PM
SAVE DATE & TIME: 28/3/2014 1:44:39 PM



APPROXIMATE CONSTRUCTION QUANTITIES

MAJOR ROAD UPGRADES (15 KM)	
CUT TO FILL	120,000 m^3
GRAVEL RESURFACING	12,000 m^3
15m LONG BRIDGE	1
ACCESS ROAD	
GRAVEL SURFACING	990 m^3
BULK EARTHWORKS	
WASTE DUMP EXCAVATION TO PORCUPINE PIT	150,000 m^3
WASTE DUMP EXCAVATION TO CHANNEL FILL	25,000 m^3
GABION CHUTE	
GABION BASKETS (3m X 1m X 0.5m)	3800
GABION ROCK - 100 TO 200 mm DIA.	5,700 m^3

NOTES:

1. DIMENSIONS AND ELEVATIONS ARE IN METRES.

REV	DATE dd-mmm-yy	REVISION DESCRIPTION	DRAWN	DRAFT CHK	DESIGNED	ENG CHK	APPROVED	CUSTOMER	REF DRAWING No	REFERENCE DRAWING TITLE
0	28-MAR-14	ISSUED FOR USE	JH		SJC	AT				
B	17-MAR-14	RE-ISSUED FOR CLIENT REVIEW	JH		SJC	AT				
A	14-JAN-14	ISSUED FOR DISCUSSION	JH		SJC	AT				

D SHEET SCALE AS SHOWN

OneWay to zero harm

WORLEYPARSONS PROJECT No 307071-00895

ENGINEERING AND PERMIT STAMPS (As Required)

CUSTOMER

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WorleyParsons resources & energy

CLINTON CREEK SITE LIFECYCLE
COST ANALYSIS FOR REMEDIAL OPTIONS
CLINTON CREEK OPTION G
PLAN

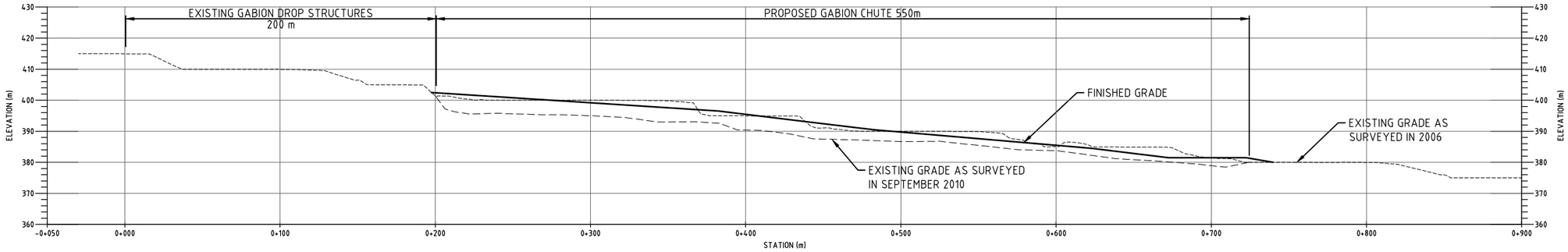
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USER NAME: jiang.hu

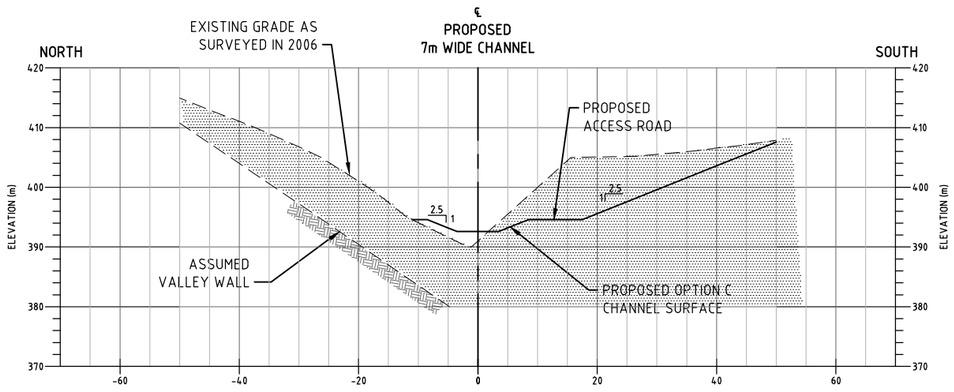
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SAVE DATE & TIME: 28/3/2014 4:46:07 PM



PROFILE - CLINTON CREEK PROPOSED ALIGNMENT

H:1:3000
V:1:1500



SECTION A

1:1000



TYPICAL GABION LINED CHANNEL SECTION

1:200

PRELIMINARY
DO NOT USE FOR CONSTRUCTION
Last Saved: Mar. 28/14 1:46pm

m 0 1 2 3 4 5 m
1:200

m 0 5 10 15 20 25 m
1:1000

m 0 10 20 30 40 50 100 m
1:3000

NOTES:

1. DIMENSIONS AND ELEVATIONS ARE IN METRES.

REV	DATE (DD-MMM-YY)	REVISION DESCRIPTION	DRAWN	DRAFT CHK	DESIGNED	ENG CHK	APPROVED	CUSTOMER	REF DRAWING No	REFERENCE DRAWING TITLE
0	28-MAR-14	ISSUED FOR USE	JH		SJC	AT				
B	17-MAR-14	RE-ISSUED FOR CLIENT REVIEW	JH		SJC	AT				
A	14-JAN-14	ISSUED FOR DISCUSSION	JH		SJC	AT				

D SHEET | SCALE AS SHOWN

OneWay

WORLEYPARSONS PROJECT No
307071-00895

ENGINEERING AND PERMIT STAMPS (As Required)

CUSTOMER

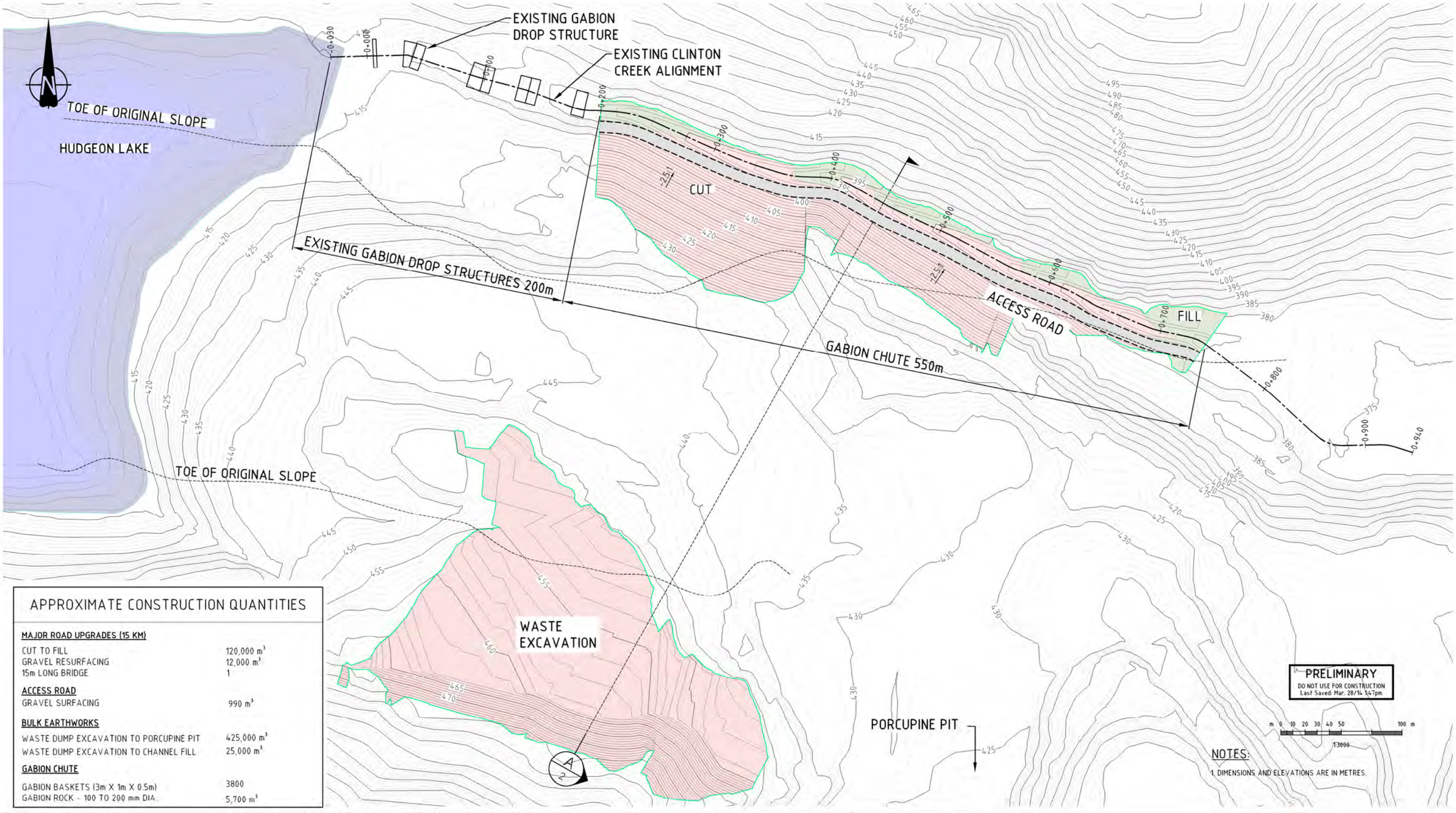
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WorleyParsons resources&energy

CLINTON CREEK SITE LIFECYCLE
COST ANALYSIS FOR REMEDIAL OPTIONS
CLINTON CREEK OPTION G
PROFILE AND SECTIONS

DRG No 307071-00895-00-CI-DGA-CC_G02 | REV 0

LOCATION: U:\YVR\307071\00895_YEMR_CLINTONCRK\1I_DRAWINGS\01_CIVIL\02_CIVIL3D\OPTIONS\CLINTON CREEK\FIGURE FILES\307071-00895-00-CI-DGA-1000_OPTION G.DWG
USER NAME: jiang.hu
PLOT DATE & TIME: 28/3/2014 2:17:13 PM
SAVE DATE & TIME: 28/3/2014 1:46:07 PM



APPROXIMATE CONSTRUCTION QUANTITIES

MAJOR ROAD UPGRADES (15 KM)	
CUT TO FILL	120,000 m^3
GRAVEL RESURFACING	12,000 m^3
15m LONG BRIDGE	1
ACCESS ROAD	
GRAVEL SURFACING	990 m^3
BULK EARTHWORKS	
WASTE DUMP EXCAVATION TO PORCUPINE PIT	425,000 m^3
WASTE DUMP EXCAVATION TO CHANNEL FILL	25,000 m^3
GABION CHUTE	
GABION BASKETS (3m X 1m X 0.5m)	3800
GABION ROCK - 100 TO 200 mm DIA.	5,700 m^3

REV	DATE (DD-MMM-YY)	REVISION DESCRIPTION	DRAWN	DRAFT CHK	DESIGNED	ENG CHK	APPROVED	CUSTOMER	REF DRAWING No	REFERENCE DRAWING TITLE
0	28-MAR-14	ISSUED FOR USE	JH		SJC	AT				
B	17-MAR-14	RE-ISSUED FOR CLIENT REVIEW	JH		SJC	AT				
A	14-JAN-14	ISSUED FOR DISCUSSION	JH		SJC	AT				

D SHEET SCALE AS SHOWN

OneWay to zero harm

WORLEYPARSONS PROJECT No
307071-00895

ENGINEERING AND PERMIT STAMPS (As Required)

CUSTOMER

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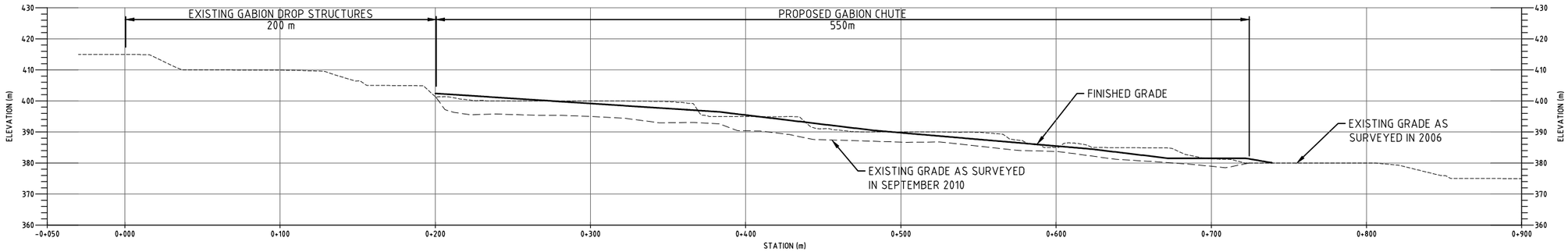
WorleyParsons resources & energy

CLINTON CREEK SITE LIFECYCLE
COST ANALYSIS FOR REMEDIAL OPTIONS
CLINTON CREEK OPTION H
PLAN

DRG No 307071-00895-00-CI-DGA-CC_H01

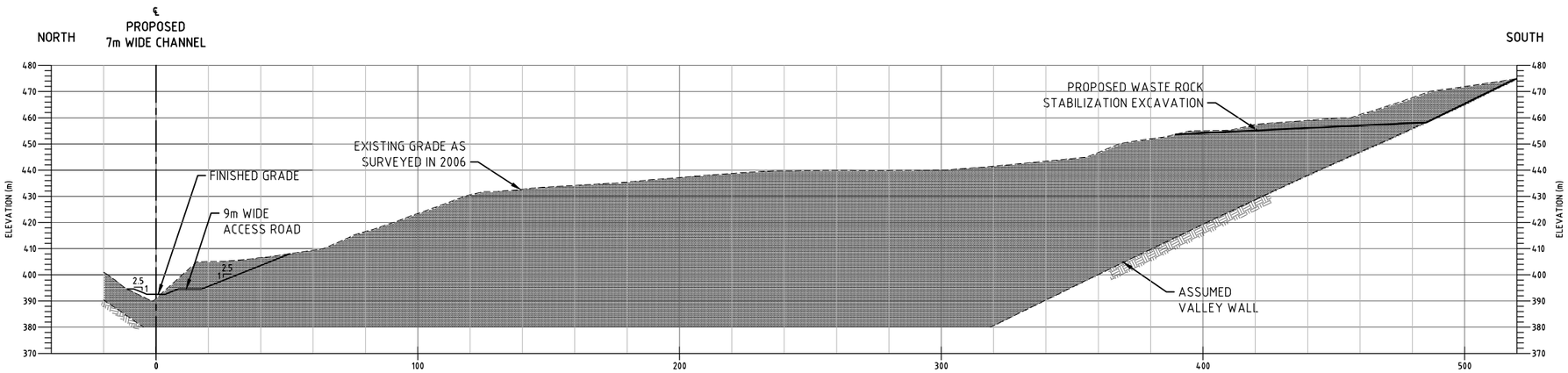
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USER NAME: jiang.hu
PLOT DATE & TIME: 31/3/2014 2:39:45 PM
SAVE DATE & TIME: 28/3/2014 1:47:24 PM



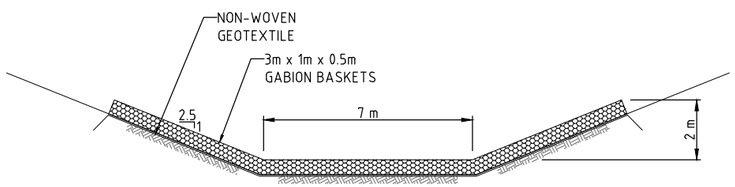
PROFILE - CLINTON CREEK PROPOSED ALIGNMENT

H:1:3000
V:1:1500



SECTION A

1:2000



TYPICAL GABION-LINED CHANNEL SECTION

1:200

PRELIMINARY
DO NOT USE FOR CONSTRUCTION
Last Saved: Mar. 28/14 1:47pm

m 0 1 2 3 4 5 m
1:200

m 0 10 20 30 40 50 m
1:2000

m 0 10 20 30 40 50 100 m
1:3000

NOTES:

1. DIMENSIONS AND ELEVATIONS ARE IN METRES.

REV	DATE (DD-MMM-YY)	REVISION DESCRIPTION	DRAWN	DRAFT CHK	DESIGNED	ENG CHK	APPROVED	CUSTOMER	REF DRAWING No	REFERENCE DRAWING TITLE
0	28-MAR-14	ISSUED FOR USE	JH		SJC	AT				
B	17-MAR-14	RE-ISSUED FOR CLIENT REVIEW	JH		SJC	AT				
A	14-JAN-14	ISSUED FOR DISCUSSION	JH		SJC	AT				

D SHEET | SCALE AS SHOWN

OneWay

WORLEYPARSONS PROJECT No
307071-00895

ENGINEERING AND PERMIT STAMPS (As Required)

CUSTOMER

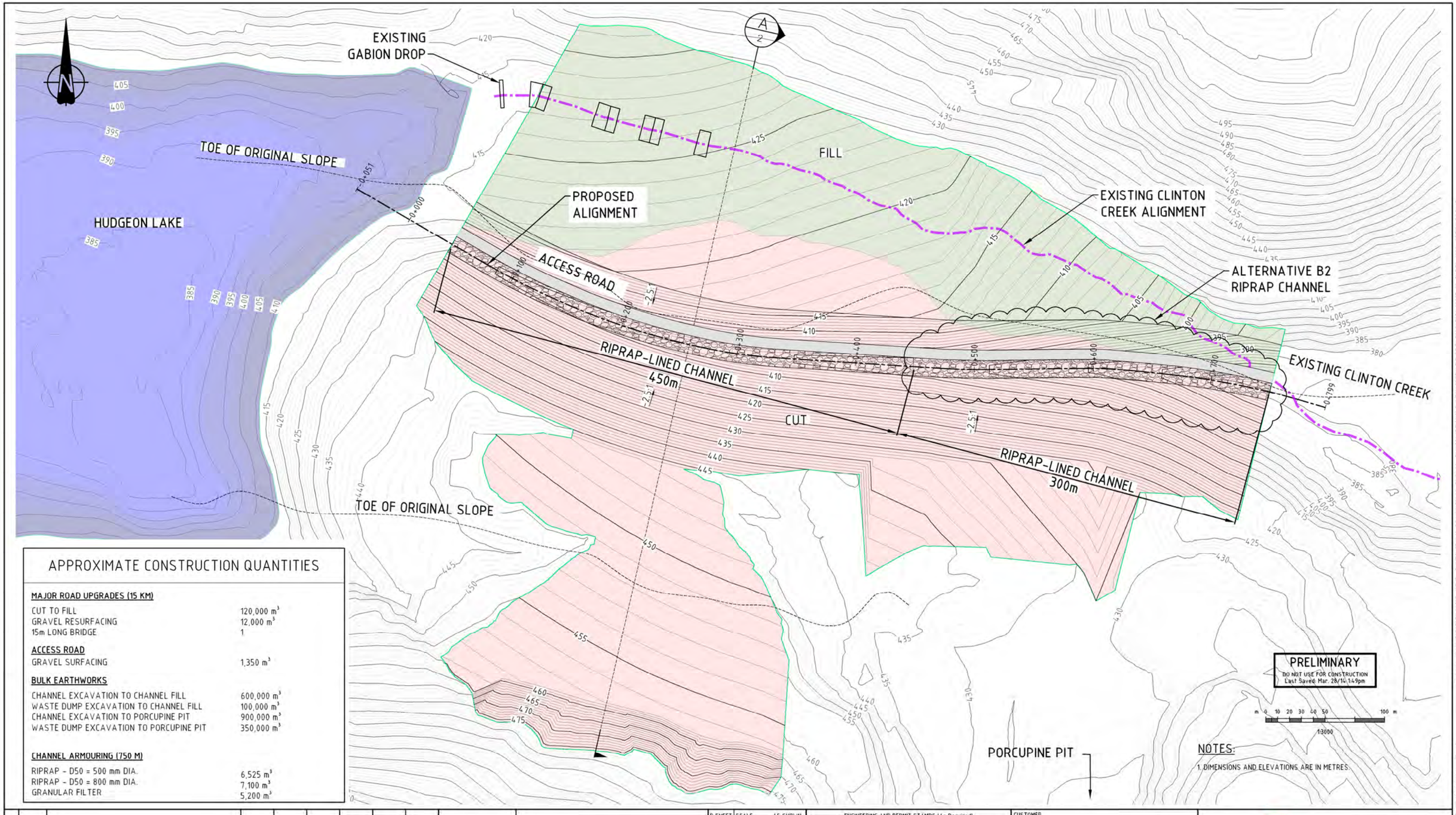
"This drawing is prepared for the use of the contractual customer of WorleyParsons Canada Services Ltd. and WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

WorleyParsons
resources & energy

CLINTON CREEK SITE LIFECYCLE
COST ANALYSIS FOR REMEDIAL OPTIONS
CLINTON CREEK OPTION H
PROFILE AND SECTIONS

DRG No 307071-00895-00-CI-DGA-CC_H02 | REV 0

LOCATION: U:\YVR\307071\00895_YEMR_CLINTONCRK\11_DRAWINGS\01_CIVIL\02_CIVIL3D\OPTIONS\CLINTON CREEK\FIGURE FILES\307071-00895-00-CI-DGA-1000_OPTION H.DWG
USER NAME: jiang.hu
PLOT DATE & TIME: 28/3/2014 2:17:41 PM
SAVE DATE & TIME: 28/3/2014 1:47:24 PM



APPROXIMATE CONSTRUCTION QUANTITIES

MAJOR ROAD UPGRADES (15 KM)

CUT TO FILL	120,000 m^3
GRAVEL RESURFACING	12,000 m^3
15m LONG BRIDGE	1

ACCESS ROAD

GRAVEL SURFACING	1,350 m^3

BULK EARTHWORKS

CHANNEL EXCAVATION TO CHANNEL FILL	600,000 m^3
WASTE DUMP EXCAVATION TO CHANNEL FILL	100,000 m^3
CHANNEL EXCAVATION TO PORCUPINE PIT	900,000 m^3
WASTE DUMP EXCAVATION TO PORCUPINE PIT	350,000 m^3

CHANNEL ARMOURING (750 M)

RIPRAP - D50 = 500 mm DIA.	6,525 m^3
RIPRAP - D50 = 800 mm DIA.	7,100 m^3
GRANULAR FILTER	5,200 m^3

REV	DATE (DD-MMM-YY)	REVISION DESCRIPTION	DRAWN	DRAFT CHK	DESIGNED	ENG CHK	APPROVED	CUSTOMER	REF DRAWING No	REFERENCE DRAWING TITLE
0	28-MAR-14	ISSUED FOR USE	JH		SJC	AT				
A	17-MAR-14	RE-ISSUED FOR CLIENT REVIEW	JH		SJC	AT				

D SHEET | SCALE AS SHOWN

OneWay to zero harm

WORLEYPARSONS PROJECT No 307071-00895

ENGINEERING AND PERMIT STAMPS (As Required)

CUSTOMER

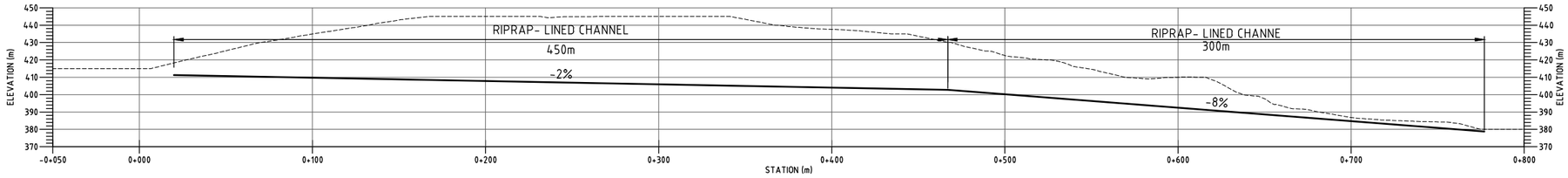
"This drawing is prepared for the use of the contractual customer of WorleyParsons Canada Services Ltd. and WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

WorleyParsons resources & energy

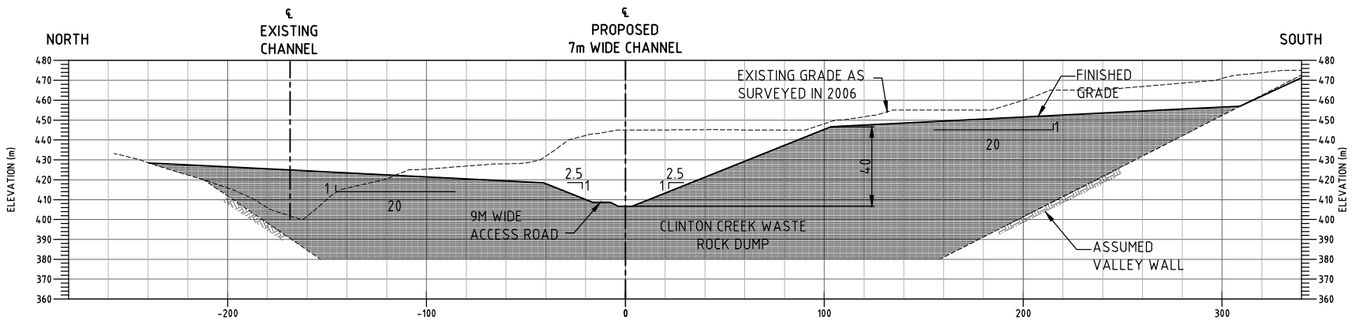
CLINTON CREEK MINE LIFECYCLE
COST ANALYSIS FOR CLOSURE OPTIONS
CLINTON CREEK OPTION B2 (ALTERNATIVE)
PLAN

DRG No 307071-00895-00-CI-DGA-CC_ B201 | REV 0

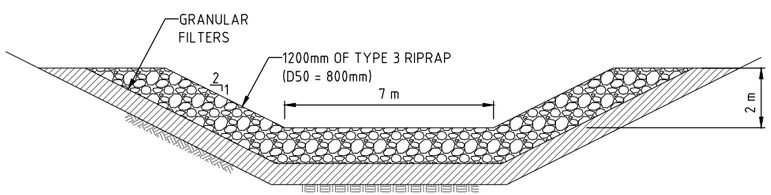
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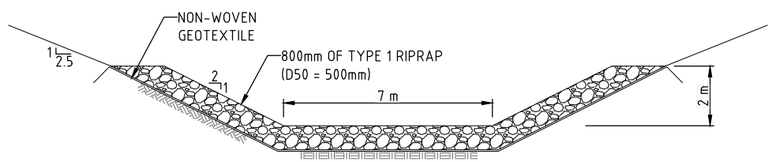
PROFILE - CLINTON CREEK PROPOSED ALIGNMENT
1:3000



SECTION A
1:3000



TYPICAL RIPRAP-LINED CHANNEL (8%) SECTION
1:200



TYPICAL RIPRAP-LINED CHANNEL (2%) SECTION
1:200

PRELIMINARY
DO NOT USE FOR CONSTRUCTION
Last Saved: Mar. 28/14 1:49pm

1:200

1:3000

NOTES:

1. DIMENSIONS AND ELEVATIONS ARE IN METRES.

REV	DATE (DD-MMM-YY)	REVISION DESCRIPTION	DRAWN	DRAFT CHK	DESIGNED	ENG CHK	APPROVED	CUSTOMER	REF DRAWING No	REFERENCE DRAWING TITLE
0	28-MAR-14	ISSUED FOR USE	JH		SJC	AT				
A	17-MAR-14	RE-ISSUED FOR CLIENT REVIEW	JH		SJC	AT				

D SHEET | SCALE AS SHOWN

OneWay

WORLEYPARSONS PROJECT No
307071-00895

ENGINEERING AND PERMIT STAMPS (As Required)

CUSTOMER

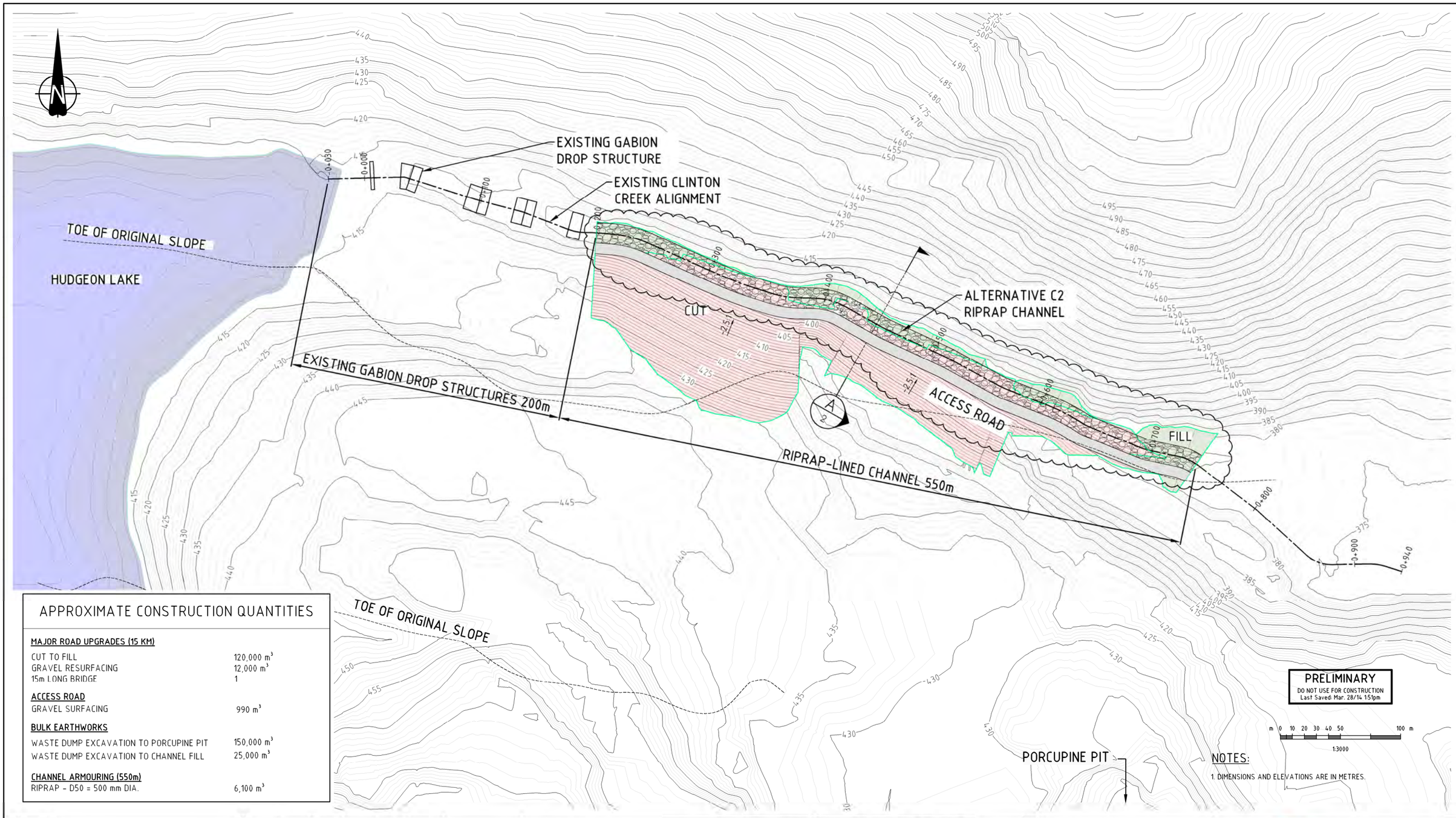
"This drawing is prepared for the use of the contractual customer of WorleyParsons Canada Services Ltd. and WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

WorleyParsons
resources & energy

CLINTON CREEK MINE LIFECYCLE
COST ANALYSIS FOR CLOSURE OPTIONS
CLINTON CREEK OPTION B2 (ALTERNATIVE)
PROFILE AND SECTIONS

DRG No 307071-00895-00-CI-DGA-CC- B202 | REV 0

LOCATION: U:\YVR\307071\00895_YEMR_CLINTONCRK\11_DRAWINGS\01_CIVIL\02_CIVIL3D\OPTIONS\CLINTON CREEK\FIGURE FILES\307071-00895-00-CI-DGA-1000_OPTION B2.DWG
USER NAME: jiang.hu
PLOT DATE & TIME: 28/3/2014 2:18:17 PM
SAVE DATE & TIME: 28/3/2014 1:49:51 PM



APPROXIMATE CONSTRUCTION QUANTITIES

MAJOR ROAD UPGRADES (15 KM)

CUT TO FILL	120,000 m^3
GRAVEL RESURFACING	12,000 m^3
15m LONG BRIDGE	1

ACCESS ROAD

GRAVEL SURFACING	990 m^3

BULK EARTHWORKS

WASTE DUMP EXCAVATION TO PORCUPINE PIT	150,000 m^3
WASTE DUMP EXCAVATION TO CHANNEL FILL	25,000 m^3

CHANNEL ARMOURING (550m)

RIPRAP - D50 = 500 mm DIA.	6,100 m^3

NOTES:

1. DIMENSIONS AND ELEVATIONS ARE IN METRES.

REV	DATE dd-mmm-yy	REVISION DESCRIPTION	DRAWN	DRAFT CHK	DESIGNED	ENG CHK	APPROVED	CUSTOMER	REF DRAWING No	REFERENCE DRAWING TITLE
0	28-MAR-14	ISSUED FOR USE	JH		SJC	AT				
A	17-MAR-14	RE-ISSUED FOR CLIENT REVIEW	JH		SJC	AT				

D SHEET SCALE AS SHOWN

OneWay to zero harm

WORLEYPARSONS PROJECT No 307071-00895

ENGINEERING AND PERMIT STAMPS (As Required)

CUSTOMER

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WorleyParsons resources & energy

CLINTON CREEK MINE LIFECYCLE
COST ANALYSIS FOR CLOSURE OPTIONS
CLINTON CREEK OPTION C2 (ALTERNATIVE)
PLAN

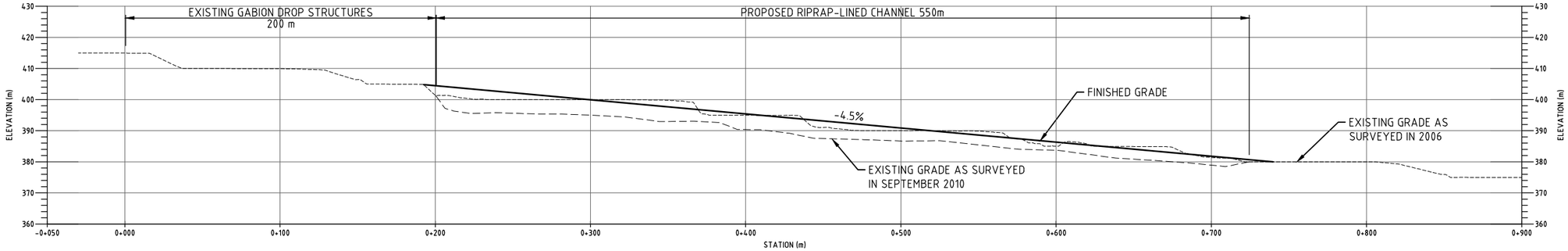
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USER NAME: jiang.hu

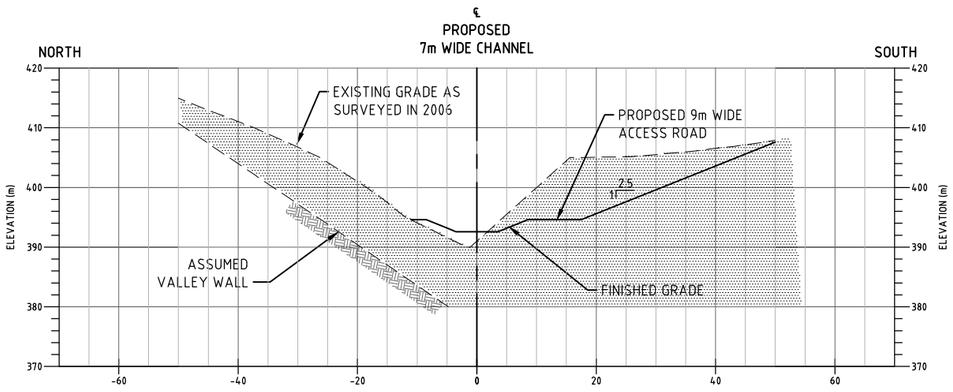
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SAVE DATE & TIME: 28/3/2014 15:32 PM



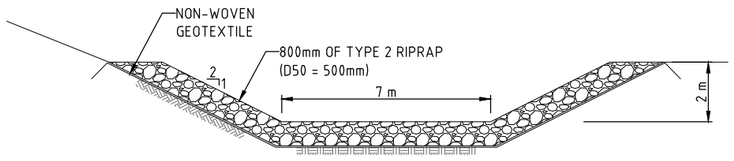
PROFILE - CLINTON CREEK PROPOSED ALIGNMENT

H:1:3000
V:1:1500



SECTION A

1:1000



TYPICAL RIPRAP-LINED CHANNEL (4.5%) SECTION

1:200

PRELIMINARY
DO NOT USE FOR CONSTRUCTION
Last Saved: Mar. 28/14 1:51pm

m 0 1 2 3 4 5 m
1:200

m 0 5 10 15 20 25 m
1:1000

m 0 10 20 30 40 50 100 m
1:3000

NOTES:

1. DIMENSIONS AND ELEVATIONS ARE IN METRES.

REV	DATE (DD-MMM-YY)	REVISION DESCRIPTION	DRAWN	DRAFT CHK	DESIGNED	ENG CHK	APPROVED	CUSTOMER	REF DRAWING No	REFERENCE DRAWING TITLE
0	28-MAR-14	ISSUED FOR USE	JH		SJC	AT				
A	17-MAR-14	RE-ISSUED FOR CLIENT REVIEW	JH		SJC	AT				

D SHEET | SCALE AS SHOWN

OneWay

WORLEYPARSONS PROJECT No
307071-00895

ENGINEERING AND PERMIT STAMPS (As Required)

CUSTOMER

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WorleyParsons
resources&energy

CLINTON CREEK MINE LIFECYCLE
COST ANALYSIS FOR CLOSURE OPTIONS
CLINTON CREEK OPTION C2 (ALTERNATIVE)
PROFILE AND SECTIONS

DRG No 307071-00895-00-CI-DGA-CC- C202
REV 0

LOCATION: U:\YVR\307071\00895_YEMR_CLINTONCRK\11_DRAWINGS\01_CIVIL\02_CIVIL\3DOPTIONS\CLINTON CREEK\FIGURE FILES\307071-00895-00-CI-DGA-1000_OPTION C2.DWG
USER NAME: jiang.hu
PLOT DATE & TIME: 28/3/2014 2:18:39 PM
SAVE DATE & TIME: 28/3/2014 15:13:2 PM

EXISTING GABION DROP STRUCTURE

EXISTING CLINTON CREEK ALIGNMENT

TOE OF ORIGINAL SLOPE

HUDGEON LAKE

EXISTING GABION DROP STRUCTURES 200m

CUT

ALTERNATIVE D2 RIPRAP CHANNEL

ACCESS ROAD

FILL

RIPRAP-LINED CHANNEL 550m

TOE OF ORIGINAL SLOPE

WASTE ROCK EXCAVATION

PORCUPINE PIT

APPROXIMATE CONSTRUCTION QUANTITIES

MAJOR ROAD UPGRADES (15 KM)	
CUT TO FILL	120,000 m^3
GRAVEL RESURFACING	12,000 m^3
15m LONG BRIDGE	1
ACCESS ROAD	
GRAVEL SURFACING	990 m^3
BULK EARTHWORKS	
WASTE DUMP EXCAVATION TO PORCUPINE PIT	425,000 m^3
WASTE DUMP EXCAVATION TO CHANNEL FILL	25,000 m^3
CHANNEL ARMOURING (550m)	
RIPRAP - D50 = 500 mm DIA.	6,100 m^3

PRELIMINARY
DO NOT USE FOR CONSTRUCTION
Last Saved: Mar. 28/14 1:52pm

m 0 10 20 30 40 50 100 m
1:3000

NOTES:
1. DIMENSIONS AND ELEVATIONS ARE IN METRES.

REV	DATE (DD-MMM-YY)	REVISION DESCRIPTION	DRAWN	DRAFT CHK	DESIGNED	ENG CHK	APPROVED	CUSTOMER	REF DRAWING No	REFERENCE DRAWING TITLE
0	28-MAR-14	ISSUED FOR USE	JH		SJC	AT				
A	17-MAR-14	RE-ISSUED FOR CLIENT REVIEW	JH		SJC	AT				

D SHEET | SCALE AS SHOWN

OneWay to zero harm

WORLEYPARSONS PROJECT No
307071-00895

ENGINEERING AND PERMIT STAMPS (As Required)

CUSTOMER

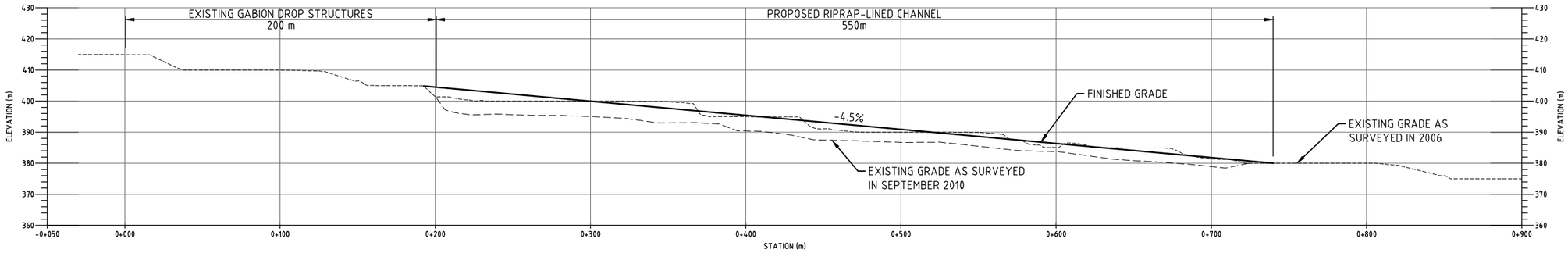
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WorleyParsons resources & energy

CLINTON CREEK MINE LIFECYCLE
COST ANALYSIS FOR CLOSURE OPTIONS
CLINTON CREEK OPTION D2 (ALTERNATIVE)
PLAN

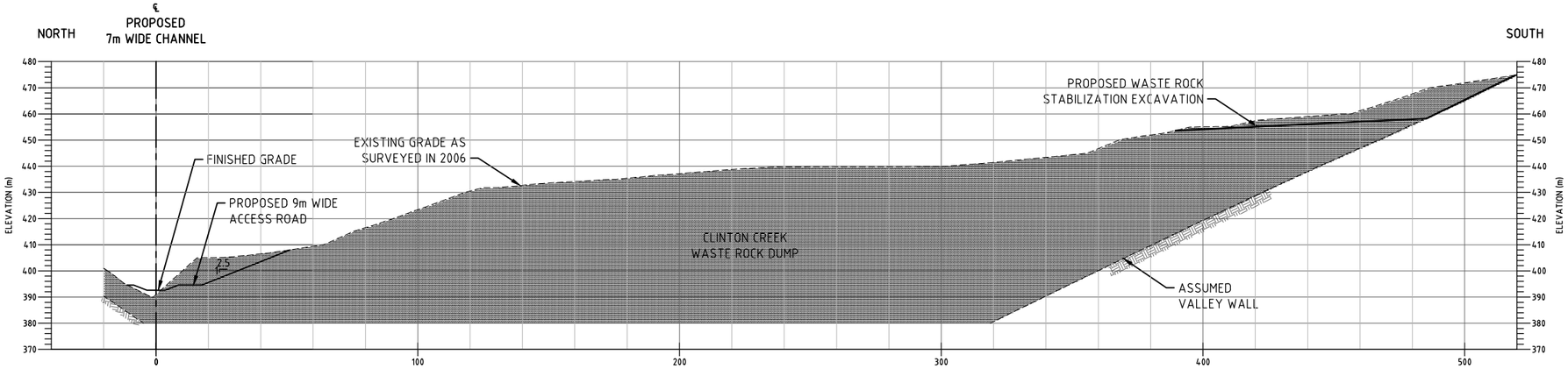
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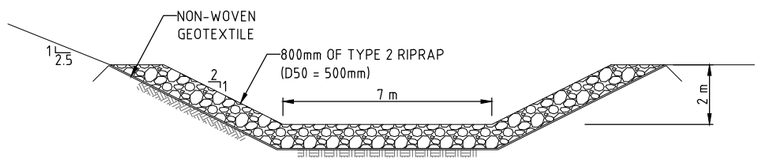
PROFILE - CLINTON CREEK PROPOSED ALIGNMENT

H:1:3000
V:1:1500



SECTION A

1:2000



TYPICAL RIPRAP-LINED CHANNEL (4.5%) SECTION

1:200

PRELIMINARY
DO NOT USE FOR CONSTRUCTION
Last Saved: Mar. 28/14 1:52pm

m 0 1 2 3 4 5 m
1:200

m 0 10 20 30 40 50 m
1:2000

m 0 10 20 30 40 50 100 m
1:3000

NOTES:

1. DIMENSIONS AND ELEVATIONS ARE IN METRES.

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0	28-MAR-14	ISSUED FOR USE	JH		SJC	AT				
A	17-MAR-14	RE-ISSUED FOR CLIENT REVIEW	JH		SJC	AT				

D SHEET | SCALE AS SHOWN

OneWay

WORLEYPARSONS PROJECT No
307071-00895

ENGINEERING AND PERMIT STAMPS (As Required)

CUSTOMER

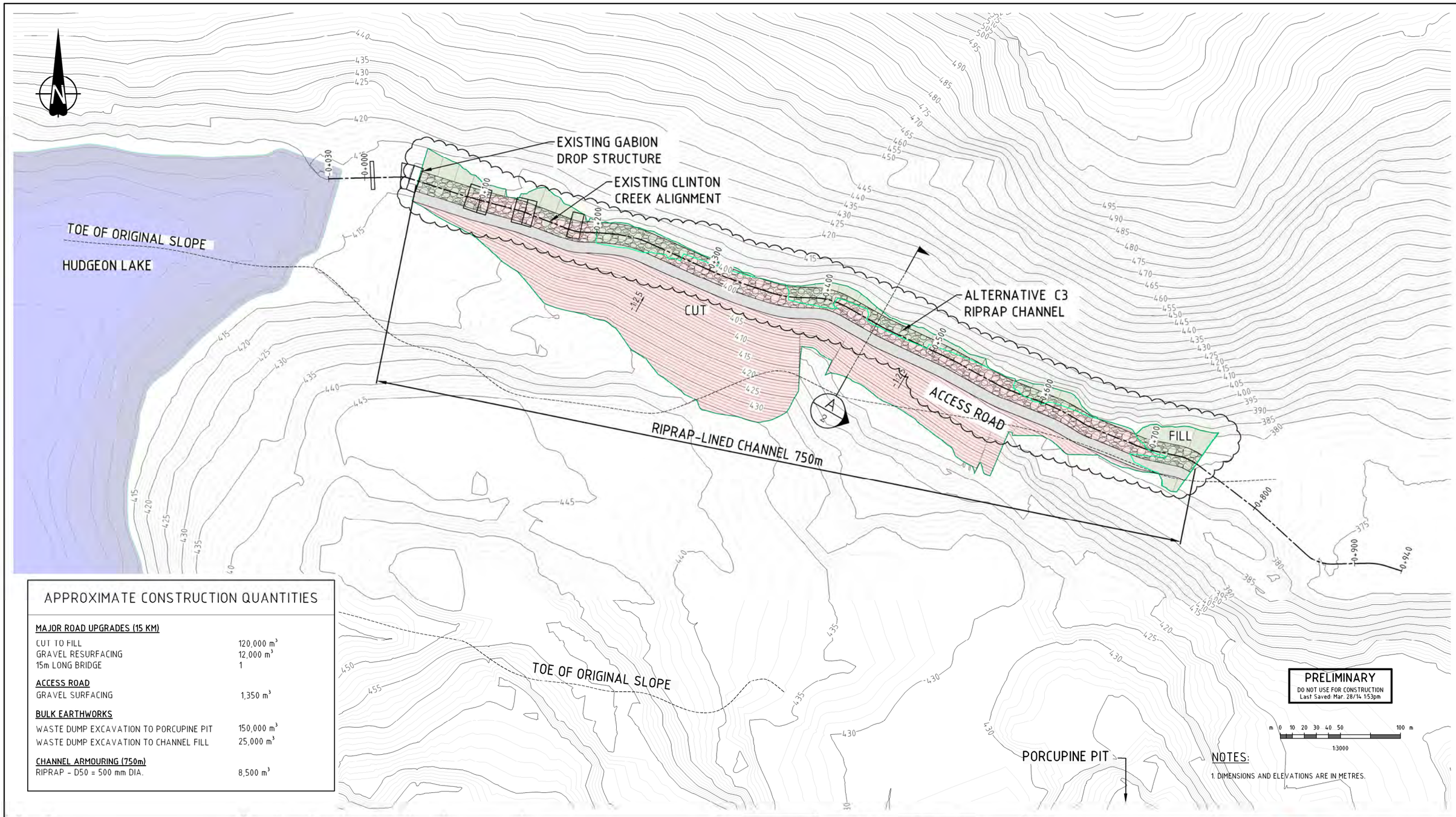
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WorleyParsons
resources & energy

CLINTON CREEK MINE LIFECYCLE
COST ANALYSIS FOR CLOSURE OPTIONS
CLINTON CREEK OPTION D2 (ALTERNATIVE)
PROFILE AND SECTIONS

DRG No 307071-00895-00-CI-DGA-CC- D202 | REV 0

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USER NAME: jiang.hu
PLOT DATE & TIME: 28/3/2014 2:19:01 PM
SAVE DATE & TIME: 28/3/2014 1:52:14 PM



APPROXIMATE CONSTRUCTION QUANTITIES

MAJOR ROAD UPGRADES (15 KM)

CUT TO FILL	120,000 m^3
GRAVEL RESURFACING	12,000 m^3
15m LONG BRIDGE	1

ACCESS ROAD

GRAVEL SURFACING	1,350 m^3

BULK EARTHWORKS

WASTE DUMP EXCAVATION TO PORCUPINE PIT	150,000 m^3
WASTE DUMP EXCAVATION TO CHANNEL FILL	25,000 m^3

CHANNEL ARMOURING (750m)

RIPRAP - D50 = 500 mm DIA.	8,500 m^3

NOTES:

1. DIMENSIONS AND ELEVATIONS ARE IN METRES.

REV	DATE dd-mmm-yy	REVISION DESCRIPTION	DRAWN	DRAFT CHK	DESIGNED	ENG CHK	APPROVED	CUSTOMER	REF DRAWING No	REFERENCE DRAWING TITLE
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A	17-MAR-14	RE-ISSUED FOR CLIENT REVIEW	JH		SJC	AT				

D SHEET SCALE AS SHOWN

OneWay to zero harm

WORLEYPARSONS PROJECT No 307071-00895

ENGINEERING AND PERMIT STAMPS (As Required)

CUSTOMER

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CLINTON CREEK MINE LIFECYCLE COST ANALYSIS FOR CLOSURE OPTIONS CLINTON CREEK OPTION C3 (ALTERNATIVE) PLAN

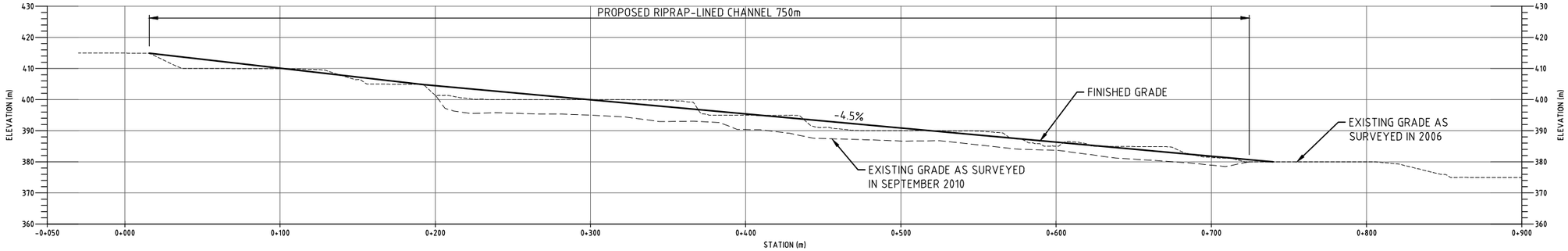
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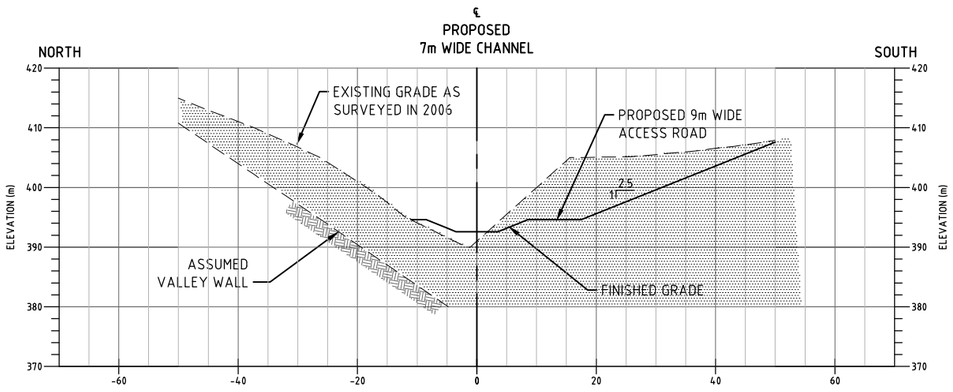
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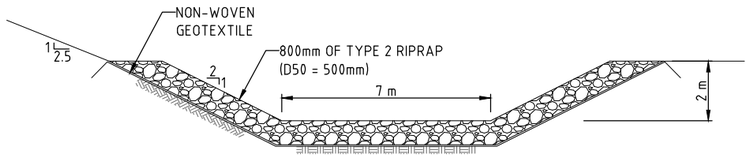
PROFILE - CLINTON CREEK PROPOSED ALIGNMENT

H:1:3000
V:1:1500



SECTION A

1:1000



TYPICAL RIPRAP-LINED CHANNEL (4.5%) SECTION

1:200

PRELIMINARY
DO NOT USE FOR CONSTRUCTION
Last Saved: Mar. 28/14 1:53pm

m 0 1 2 3 4 5 m
1:200

m 0 5 10 15 20 25 m
1:1000

m 0 10 20 30 40 50 100 m
1:3000

NOTES:

1. DIMENSIONS AND ELEVATIONS ARE IN METRES.

REV	DATE (DD-MMM-YY)	REVISION DESCRIPTION	DRAWN	DRAFT CHK	DESIGNED	ENG CHK	APPROVED	CUSTOMER	REF DRAWING No	REFERENCE DRAWING TITLE
0	28-MAR-14	ISSUED FOR USE	JH		SJC	AT				
A	17-MAR-14	RE-ISSUED FOR CLIENT REVIEW	JH		SJC	AT				

D SHEET | SCALE AS SHOWN

OneWay

WORLEYPARSONS PROJECT No
307071-00895

ENGINEERING AND PERMIT STAMPS (As Required)

CUSTOMER

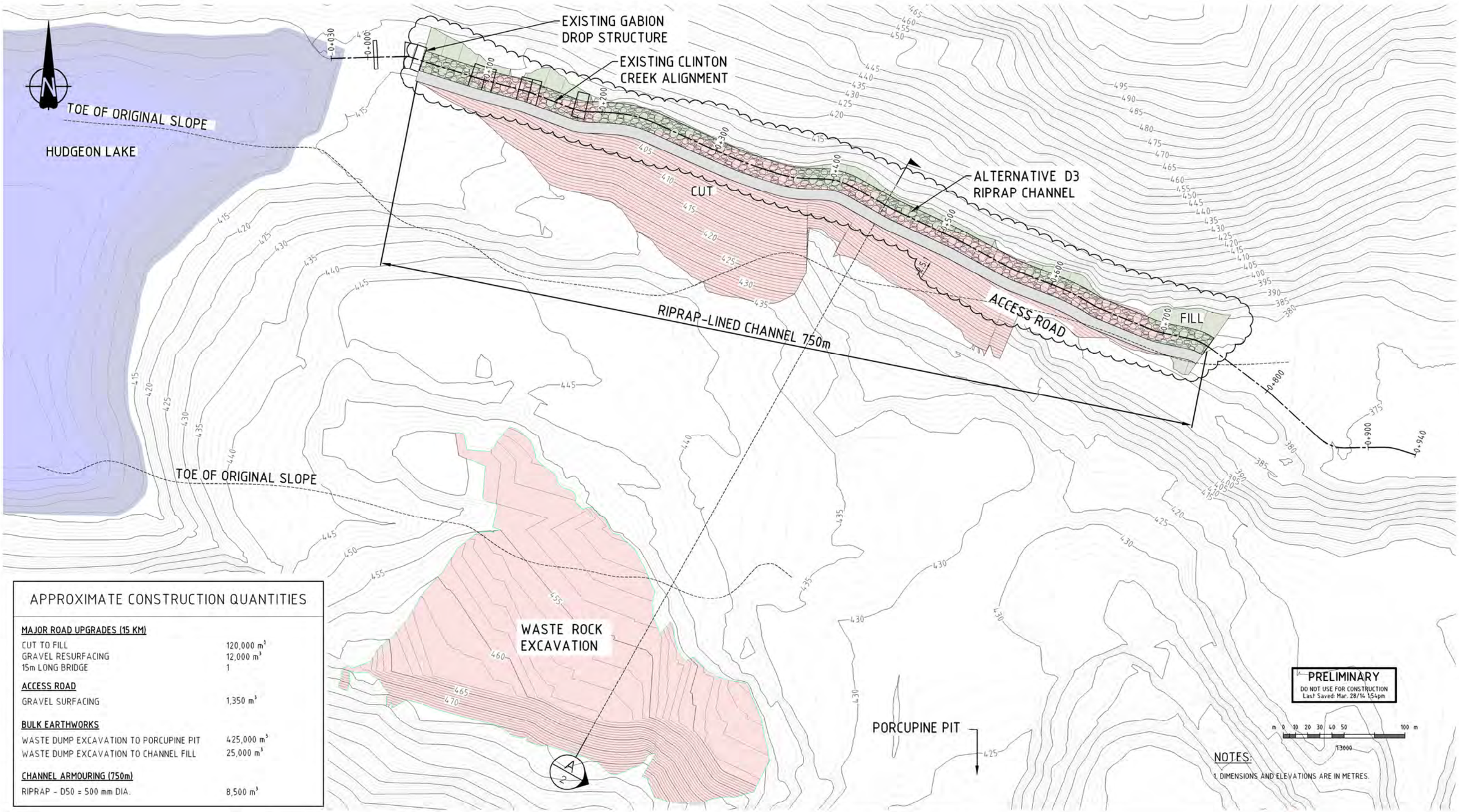
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CLINTON CREEK MINE LIFECYCLE
COST ANALYSIS FOR CLOSURE OPTIONS
CLINTON CREEK OPTION C3 (ALTERNATIVE)
PROFILE AND SECTIONS

DRG No 307071-00895-00-CI-DGA-CC- C302 | REV 0

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USER NAME: jiang.hu
PLOT DATE & TIME: 28/3/2014 2:19:19 PM
SAVE DATE & TIME: 28/3/2014 1:53:17 PM



APPROXIMATE CONSTRUCTION QUANTITIES

MAJOR ROAD UPGRADES (15 KM)

CUT TO FILL	120,000 m^3
GRAVEL RESURFACING	12,000 m^3
15m LONG BRIDGE	1

ACCESS ROAD

GRAVEL SURFACING	1,350 m^3

BULK EARTHWORKS

WASTE DUMP EXCAVATION TO PORCUPINE PIT	425,000 m^3
WASTE DUMP EXCAVATION TO CHANNEL FILL	25,000 m^3

CHANNEL ARMOURING (750m)

RIPRAP - D50 = 500 mm DIA.	8,500 m^3

PRELIMINARY
DO NOT USE FOR CONSTRUCTION
Last Saved: Mar. 28/14 1:54pm

m 0 10 20 30 40 50 100 m
1:3000

NOTES:
1. DIMENSIONS AND ELEVATIONS ARE IN METRES.

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0	28-MAR-14	ISSUED FOR USE	JH		SJC	AT				
A	17-MAR-14	RE-ISSUED FOR CLIENT REVIEW	JH		SJC	AT				

D SHEET SCALE AS SHOWN

OneWay to zero harm

WORLEYPARSONS PROJECT No
307071-00895

ENGINEERING AND PERMIT STAMPS (As Required)

CUSTOMER

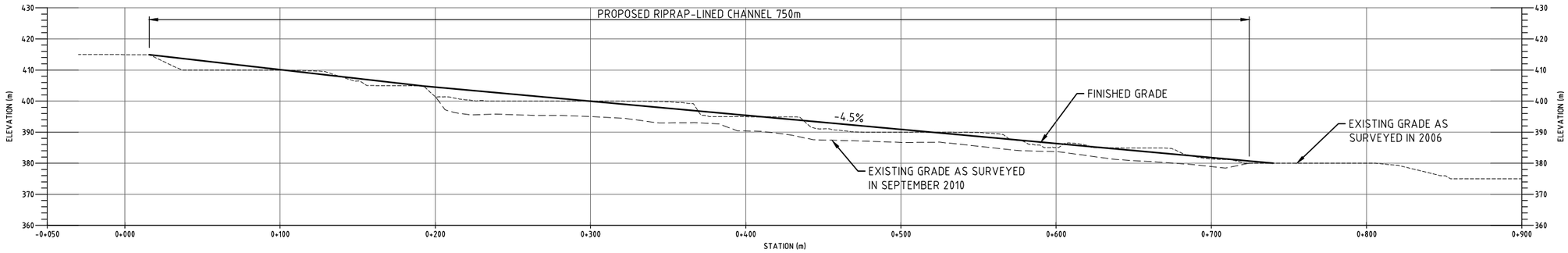
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CLINTON CREEK MINE LIFECYCLE
COST ANALYSIS FOR CLOSURE OPTIONS
CLINTON CREEK OPTION D3 (ALTERNATIVE)
PLAN

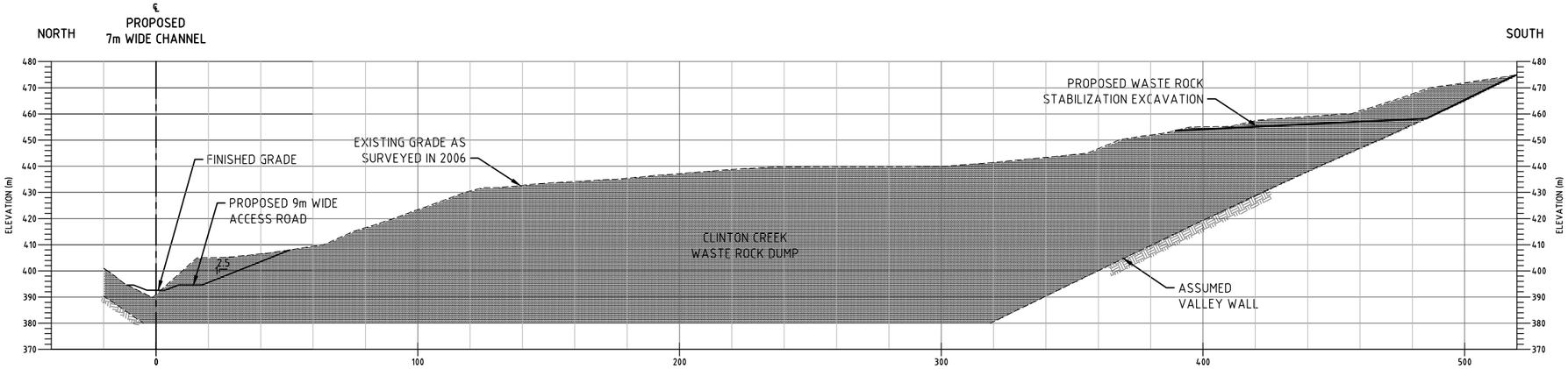
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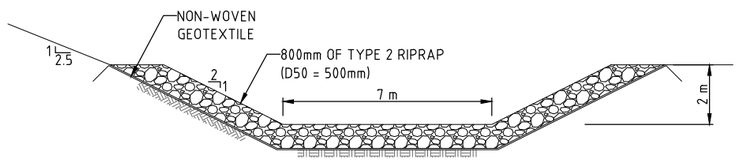
PROFILE - CLINTON CREEK PROPOSED ALIGNMENT

H:1:3000
V:1:1500



SECTION A

1:2000



TYPICAL RIPRAP-LINED CHANNEL (4.5%) SECTION

1:200

PRELIMINARY
DO NOT USE FOR CONSTRUCTION
Last Saved: Mar. 28/14 1:54pm

m 0 1 2 3 4 5 m
1:200

m 0 10 20 30 40 50 m
1:2000

m 0 10 20 30 40 50 100 m
1:3000

NOTES:

1. DIMENSIONS AND ELEVATIONS ARE IN METRES.

REV	DATE (DD-MMM-YY)	REVISION DESCRIPTION	DRAWN	DRAFT CHK	DESIGNED	ENG CHK	APPROVED	CUSTOMER	REF DRAWING No	REFERENCE DRAWING TITLE
0	28-MAR-14	ISSUED FOR USE	JH		SJC	AT				
A	17-MAR-14	RE-ISSUED FOR CLIENT REVIEW	JH		SJC	AT				

D SHEET | SCALE AS SHOWN

OneWay

WORLEYPARSONS PROJECT No
307071-00895

ENGINEERING AND PERMIT STAMPS (As Required)

CUSTOMER

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CLINTON CREEK MINE LIFECYCLE
COST ANALYSIS FOR CLOSURE OPTIONS
CLINTON CREEK OPTION D3 (ALTERNATIVE)
PROFILE AND SECTIONS

DRG No 307071-00895-00-CI-DGA-CC- D302 | REV 0

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SAVE DATE & TIME: 28/3/2014 1:54:13 PM

LOWER EXISTING CHANNEL TO 398m EL.
250m

STABLIZE WASTE ROCK ALONG EXISTING CHANNEL

EXISTING GABION
DROP STRUCTURE

ACCESS ROAD
CUT

EXISTING CLINTON
CREEK ALIGNMENT

ALTERNATIVE E2
MODIFIED CHANNEL
ALIGNMENT

TOE OF ORIGINAL SLOPE
HUDGEON LAKE

EXISTING EDGE OF
HUDGEON LAKE

FINISHED EDGE OF
HUDGEON LAKE

WASTE ROCK
EXCAVATION

TOE OF ORIGINAL SLOPE

PORCUPINE PIT

APPROXIMATE CONSTRUCTION QUANTITIES

MAJOR ROAD UPGRADES (15 KM)	
CUT TO FILL	120,000 m^3
GRAVEL RESURFACING	12,000 m^3
15m LONG BRIDGE	1
ACCESS ROAD	
GRAVEL SURFACING	1,350 m^3
BULK EARTHWORKS	
CHANNEL EXCAVATION TO PORCUPINE PIT	525,000 m^3
WASTE DUMP EXCAVATION TO PORCUPINE PIT	525,000 m^3

PRELIMINARY
DO NOT USE FOR CONSTRUCTION
Last Saved: Mar. 28/14 1:55pm

m 0 10 20 30 40 50 100 m
1:3000

NOTES:
1. DIMENSIONS AND ELEVATIONS ARE IN METRES.

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A	17-MAR-14	RE-ISSUED FOR CLIENT REVIEW	JH		SJC	AT				

D SHEET SCALE AS SHOWN

OneWay

WORLEYPARSONS PROJECT No
307071-00895

ENGINEERING AND PERMIT STAMPS (As Required)

CUSTOMER

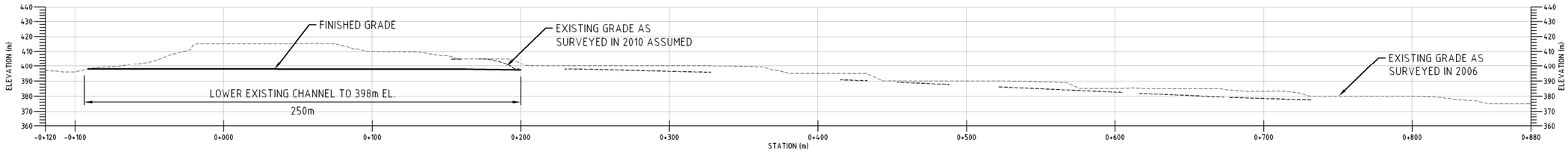
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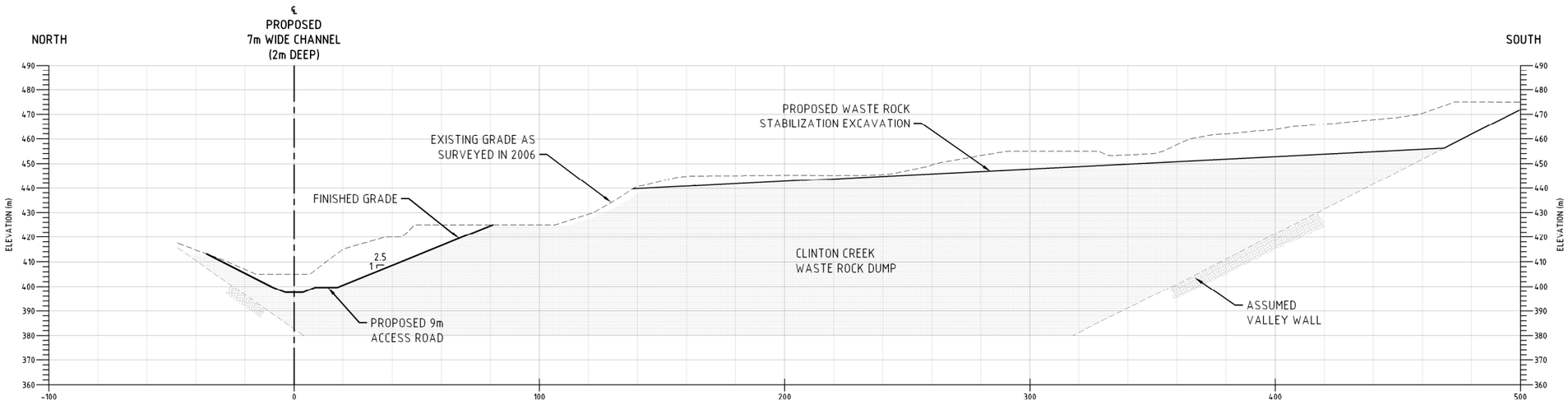
CLINTON CREEK MINE LIFECYCLE
COST ANALYSIS FOR CLOSURE OPTIONS
CLINTON CREEK OPTION E2 (ALTERNATIVE)
PLAN

DRG No 307071-00895-00-CI-DGA-CC- E201 REV 0

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SAVE DATE & TIME: 28/3/2014 1:55:31 PM



PROFILE - CLINTON CREEK PROPOSED ALIGNMENT
1:3000



SECTION A
1:2000

PRELIMINARY
DO NOT USE FOR CONSTRUCTION
Last Saved: Mar. 31/14 2:51pm

m 0 10 20 30 40 50 m
1:2000

m 0 10 20 30 40 50 100 m
1:3000

NOTES:

1. DIMENSIONS AND ELEVATIONS ARE IN METRES.

REV	DATE (DD-MMM-YY)	REVISION DESCRIPTION	DRAWN	DRAFT CHK	DESIGNED	ENG CHK	APPROVED	CUSTOMER	REF DRAWING No	REFERENCE DRAWING TITLE
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0	28-MAR-14	ISSUED FOR USE	JH		SJC	AT				
A	17-MAR-14	RE-ISSUED FOR CLIENT REVIEW	JH		SJC	AT				

D SHEET | SCALE AS SHOWN

OneWay to zero harm

WORLEYPARSONS PROJECT No
307071-00895

ENGINEERING AND PERMIT STAMPS (As Required)

CUSTOMER

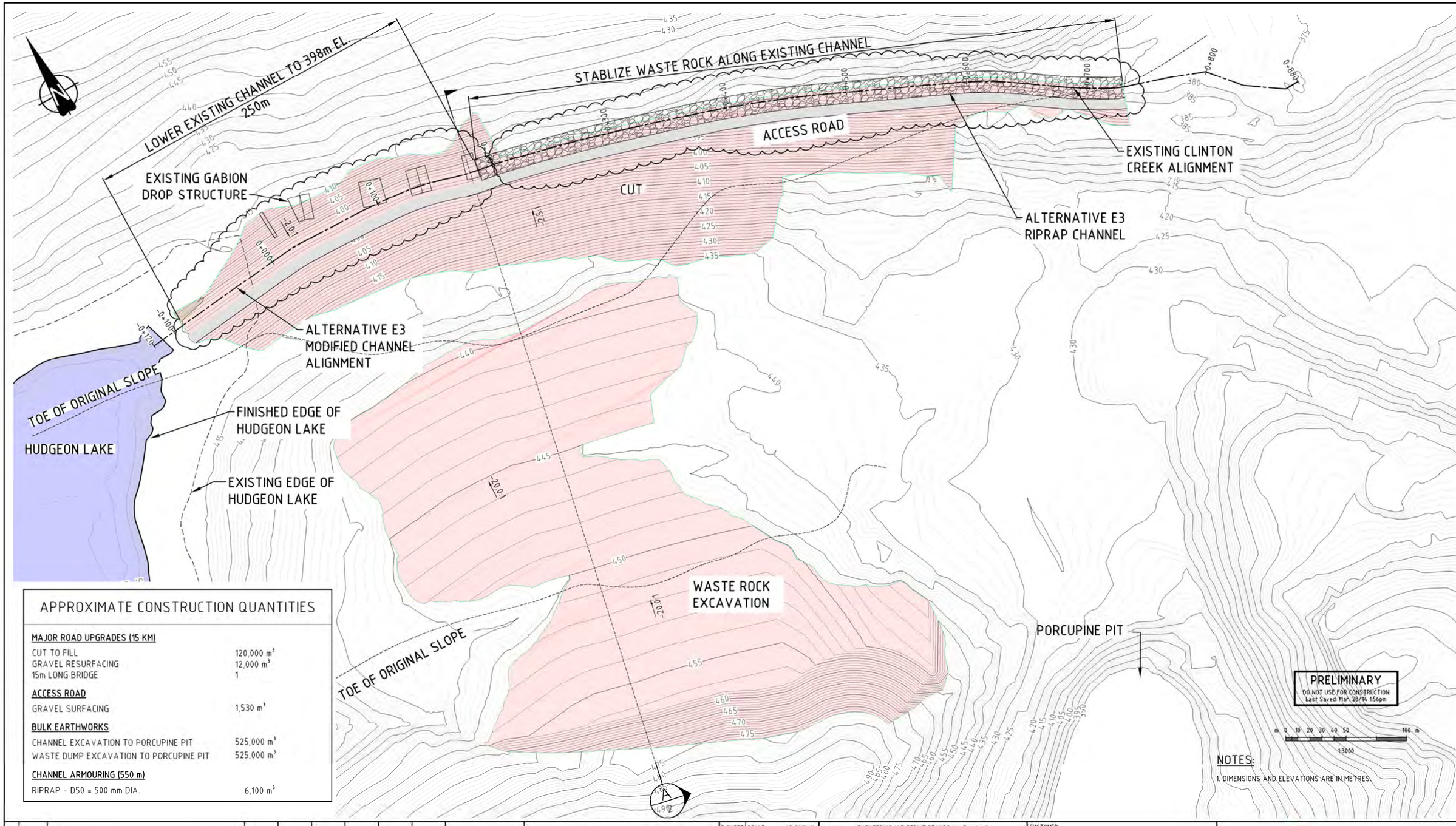
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CLINTON CREEK MINE LIFECYCLE
COST ANALYSIS FOR CLOSURE OPTIONS
CLINTON CREEK OPTION E2 (ALTERNATIVE)
PROFILE AND SECTIONS

DRG No 307071-00895-00-CI-DGA-CC- E202 | REV 1

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SAVE DATE & TIME: 31/3/2014 2:51:13 PM



APPROXIMATE CONSTRUCTION QUANTITIES

MAJOR ROAD UPGRADES (15 KM)	
CUT TO FILL	120,000 m^3
GRAVEL RESURFACING	12,000 m^3
15m LONG BRIDGE	1
ACCESS ROAD	
GRAVEL SURFACING	1,530 m^3
BULK EARTHWORKS	
CHANNEL EXCAVATION TO PORCUPINE PIT	525,000 m^3
WASTE DUMP EXCAVATION TO PORCUPINE PIT	525,000 m^3
CHANNEL ARMOURING (550 m)	
RIPRAP - D50 = 500 mm DIA.	6,100 m^3

REV	DATE DD-MMM-YY	REVISION DESCRIPTION	DRAWN	DRAFT CHK	DESIGNED	ENG CHK	APPROVED	CUSTOMER	REF DRAWING No	REFERENCE DRAWING TITLE
0	28-MAR-14	ISSUED FOR USE	JH		SJC	AT				
A	17-MAR-14	RE-ISSUED FOR CLIENT REVIEW	JH		SJC	AT				

D SHEET SCALE AS SHOWN

OneWay™ by Golder

WORLEYPARSONS PROJECT No
307071-00895

ENGINEERING AND PERMIT STAMPS (As Required)

CUSTOMER

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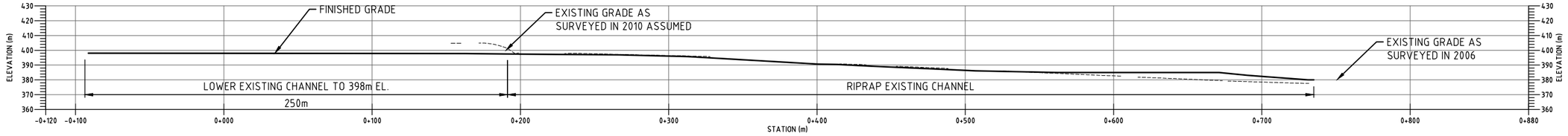
WorleyParsons

CLINTON CREEK MINE LIFECYCLE
COST ANALYSIS FOR CLOSURE OPTIONS
CLINTON CREEK OPTION E3 (ALTERNATIVE)
PLAN

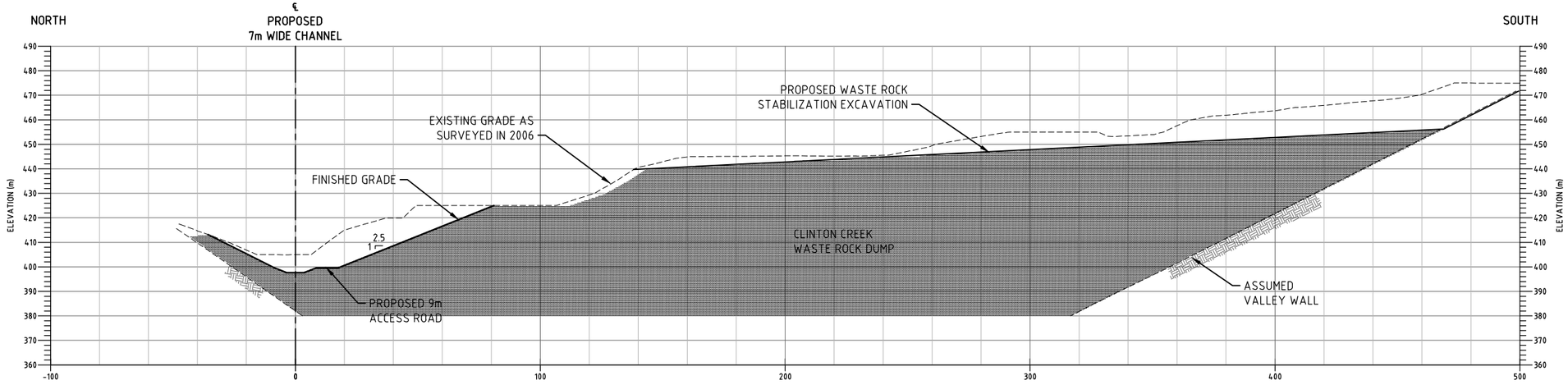
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REV 0

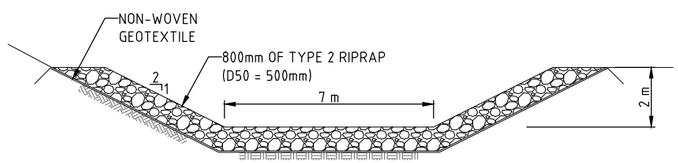
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PROFILE - CLINTON CREEK PROPOSED ALIGNMENT
1:3000



SECTION A



TYPICAL RIPRAP-LINED CHANNEL (4.5%) SECTION
1:200

PRELIMINARY
DO NOT USE FOR CONSTRUCTION
Last Saved: Mar. 28/14 1:56pm

m 0 1 2 3 4 5 m
1:200

m 0 10 20 30 40 50 m
1:2000

m 0 10 20 30 40 50 100 m
1:3000

NOTES:

1. DIMENSIONS AND ELEVATIONS ARE IN METRES.

REV	DATE (DD-MMM-YY)	REVISION DESCRIPTION	DRAWN	DRAFT CHK	DESIGNED	ENG CHK	APPROVED	CUSTOMER	REF DRAWING No	REFERENCE DRAWING TITLE
0	28-MAR-14	ISSUED FOR USE	JH		SJC	AT				
A	17-MAR-14	RE-ISSUED FOR CLIENT REVIEW	JH		SJC	AT				

D SHEET | SCALE AS SHOWN

OneWay

WORLEYPARSONS PROJECT No
307071-00895

ENGINEERING AND PERMIT STAMPS (As Required)

CUSTOMER

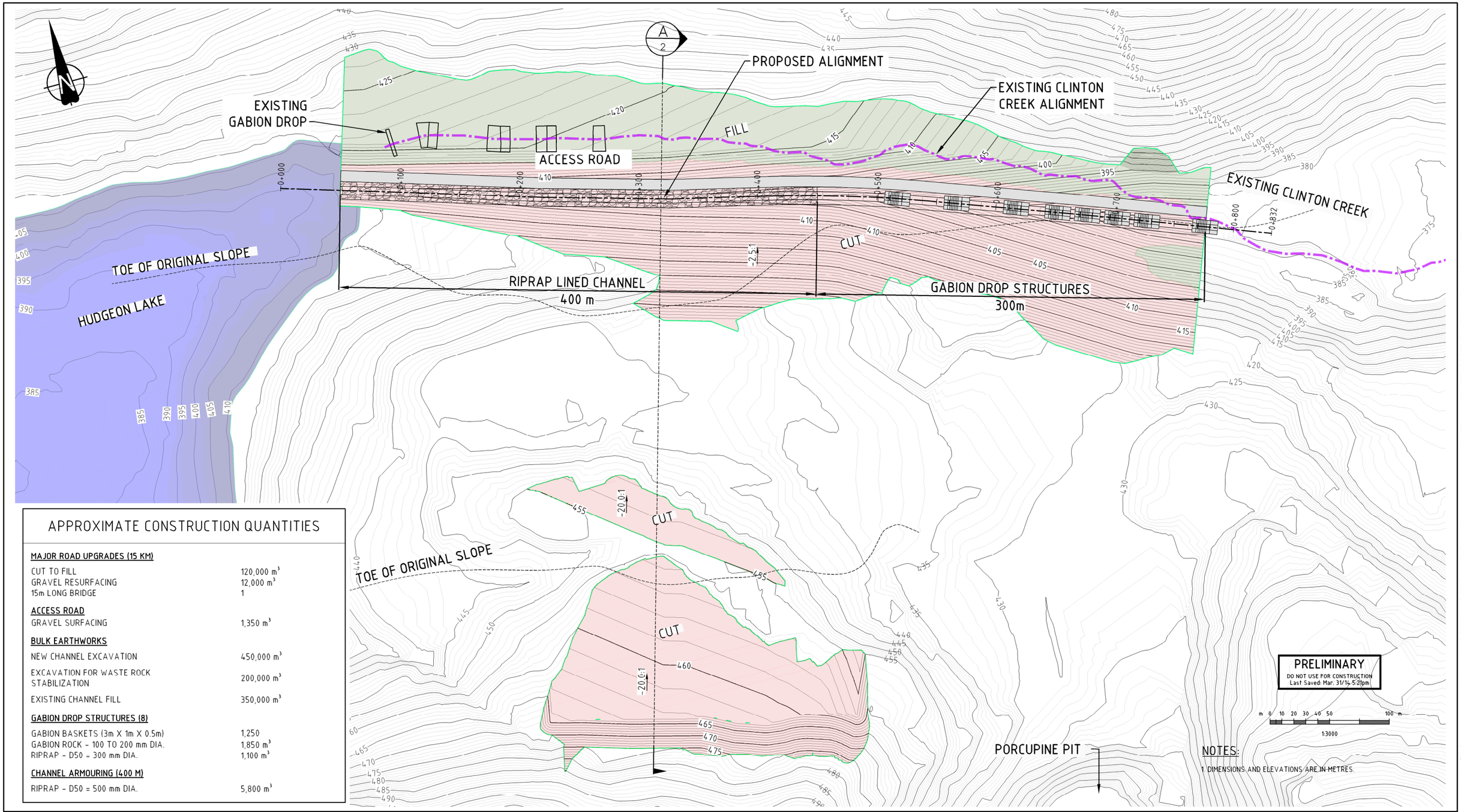
"This drawing is prepared for the use of the contractual customer of WorleyParsons Canada Services Ltd. and WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

WorleyParsons resources & energy

CLINTON CREEK MINE LIFECYCLE
COST ANALYSIS FOR CLOSURE OPTIONS
CLINTON CREEK OPTION E3 (ALTERNATIVE)
PROFILE AND SECTIONS

DRG No 307071-00895-00-CI-DGA-CC- E302 | REV 0

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USER NAME: jiang.hu
PLOT DATE & TIME: 28/3/2014 2:20:58 PM
SAVE DATE & TIME: 28/3/2014 1:56:03 PM



APPROXIMATE CONSTRUCTION QUANTITIES

MAJOR ROAD UPGRADES (15 KM)

CUT TO FILL	120,000 m^3
GRAVEL RESURFACING	12,000 m^3
15m LONG BRIDGE	1

ACCESS ROAD

GRAVEL SURFACING	1,350 m^3

BULK EARTHWORKS

NEW CHANNEL EXCAVATION	450,000 m^3
EXCAVATION FOR WASTE ROCK STABILIZATION	200,000 m^3
EXISTING CHANNEL FILL	350,000 m^3

GABION DROP STRUCTURES (8)

GABION BASKETS (3m X 1m X 0.5m)	1,250
GABION ROCK - 100 TO 200 mm DIA.	1,850 m^3
RIPRAP - D50 = 300 mm DIA.	1,100 m^3

CHANNEL ARMOURING (400 M)

RIPRAP - D50 = 500 mm DIA.	5,800 m^3

NOTES:

1. DIMENSIONS AND ELEVATIONS ARE IN METRES.

REV	DATE dd-mm-yy	REVISION DESCRIPTION	DRAWN	DRAFT CHK	DESIGNED	ENG CHK	APPROVED	CUSTOMER	REF DRAWING No	REFERENCE DRAWING TITLE
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0	28-MAR-14	ISSUED FOR USE	JH		SJC	AT				
A	17-MAR-14	RE-ISSUED FOR CLIENT REVIEW	JH		SJC	AT				

D SHEET SCALE AS SHOWN

OneWay™ to zero harm

WORLEYPARSONS PROJECT No 307071-00895

ENGINEERING AND PERMIT STAMPS (As Required)

CUSTOMER

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CLINTON CREEK MINE LIFECYCLE
COST ANALYSIS FOR CLOSURE OPTIONS
CLINTON CREEK OPTION I
PLAN

DRG No 307071-00895-00-CI-DGA-CC- 101

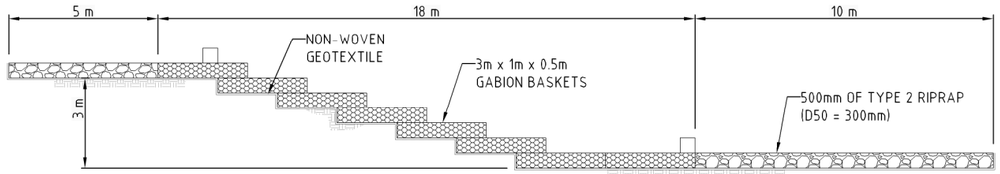
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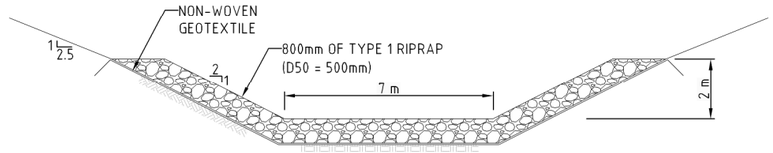
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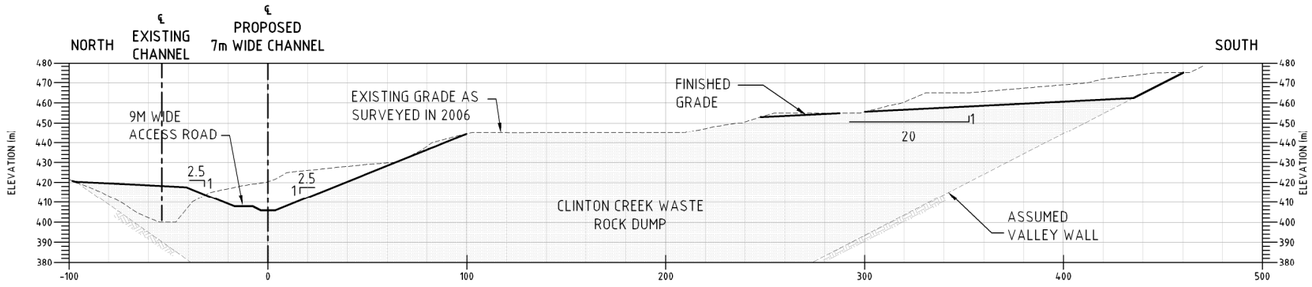
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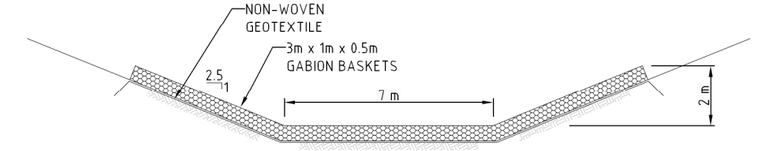
TYPICAL GABION DROP STRUCTURE PROFILE
1:200



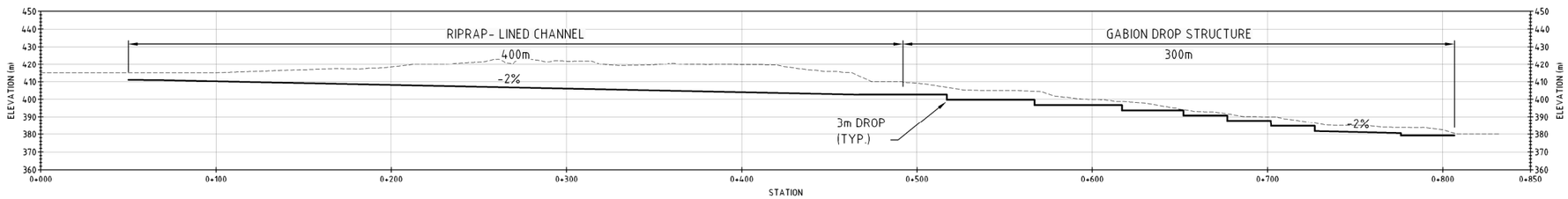
TYPICAL RIPRAP-LINED CHANNELSECTION
1:200



SECTION A
1:3000



TYPICAL GABION DROP STRUCTURE SECTION
1:200



PROFILE VIEW - CLINTON CREEK PROPOSED ALIGNMENT
1:3000

PRELIMINARY
DO NOT USE FOR CONSTRUCTION
Last Saved: Mar. 28/14 1:57pm

m 0 1 2 3 4 5 m
1:200

m 0 10 20 30 40 50 100 m
1:3000

NOTES:

1. DIMENSIONS AND ELEVATIONS ARE IN METRES.

REV	DATE dd-mmm-yy	REVISION DESCRIPTION	DRAWN	DRAFT CHK	DESIGNED	ENG CHK	APPROVED	CUSTOMER	REF DRAWING No	REFERENCE DRAWING TITLE
0	28-MAR-14	ISSUED FOR USE	JH		SJC	AT				
A	17-MAR-14	RE-ISSUED FOR CLIENT REVIEW	JH		SJC	AT				

D SHEET SCALE AS SHOWN

OneWay to zero harm

WORLEYPARSONS PROJECT No
307071-00895

ENGINEERING AND PERMIT STAMPS (As Required)

CUSTOMER

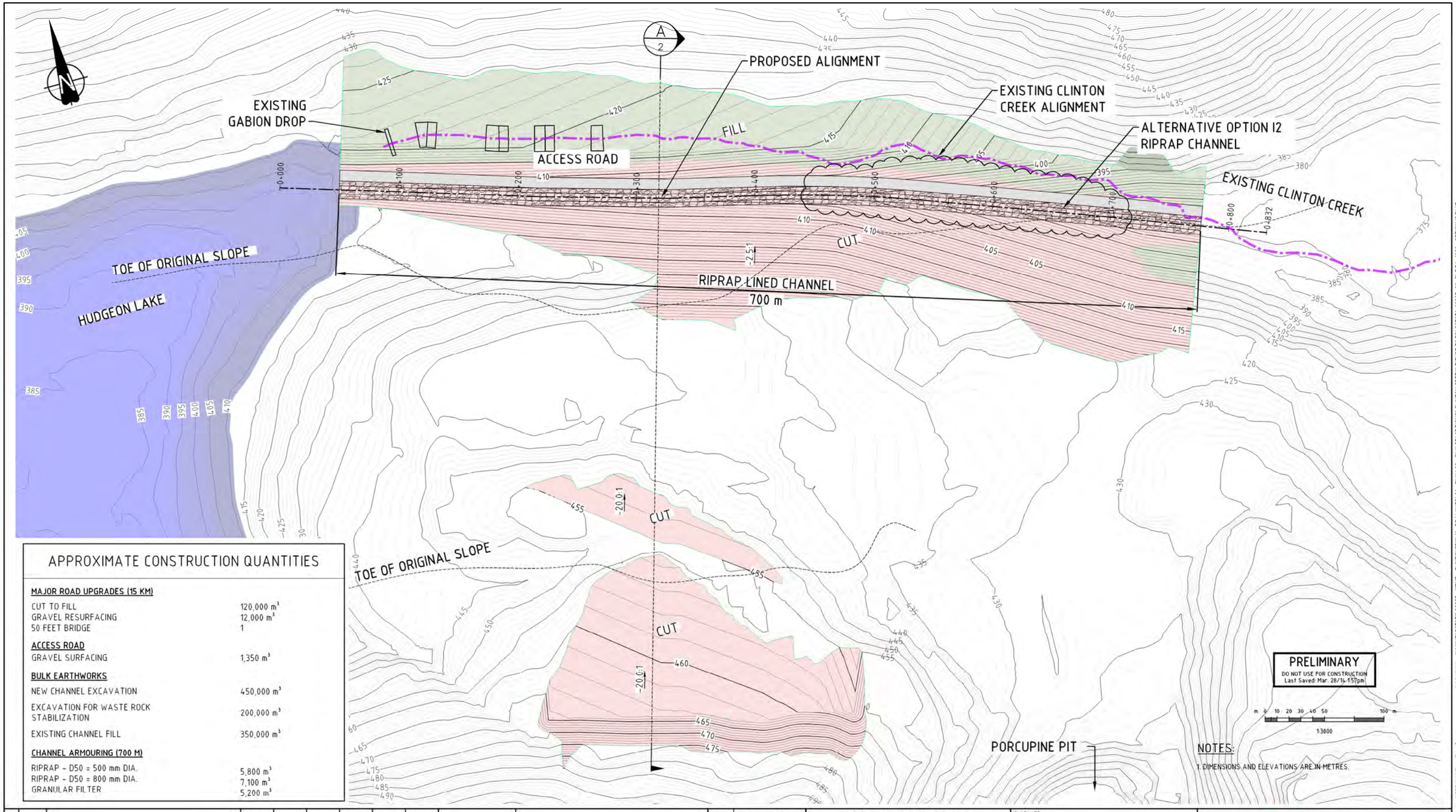
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CLINTON CREEK MINE LIFECYCLE
COST ANALYSIS FOR CLOSURE OPTIONS
CLINTON CREEK OPTION 1
PROFILE AND SECTIONS

DRG No 307071-00895-00-CI-DGA-CC-102
REV 0

PLOT DATE & TIME: 28/3/2014 4:19:24 PM
SAVE DATE & TIME: 28/3/2014 15:56 PM
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APPROXIMATE CONSTRUCTION QUANTITIES

MAJOR ROAD UPGRADES (15 KM)

CUT TO FILL	120,000 m^3
GRAVEL RESURFACING	12,000 m^3
50 FEET BRIDGE	1

ACCESS ROAD

GRAVEL SURFACING	1,350 m^3

BULK EARTHWORKS

NEW CHANNEL EXCAVATION	450,000 m^3
EXCAVATION FOR WASTE ROCK STABILIZATION	200,000 m^3
EXISTING CHANNEL FILL	350,000 m^3

CHANNEL ARMOURING (700 M)

RIPRAP - D50 = 500 mm DIA.	5,800 m^3
RIPRAP - D50 = 800 mm DIA.	7,100 m^3
GRANULAR FILTER	5,200 m^3

NOTES:

1. DIMENSIONS AND ELEVATIONS ARE IN METRES.

REV	DATE (DD-MMM-YY)	REVISION DESCRIPTION	DRAWN	DRAFT CHK	DESIGNED	ENG CHK	APPROVED	CUSTOMER	REF DRAWING No	REFERENCE DRAWING TITLE
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A	17-MAR-14	RE-ISSUED FOR CLIENT REVIEW	JH		SJC	AT				

D SHEET SCALE AS SHOWN

OneWay to zero harm

WORLEYPARSONS PROJECT No 307071-00895

ENGINEERING AND PERMIT STAMPS (As Required)

CUSTOMER

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CLINTON CREEK MINE LIFECYCLE COST ANALYSIS FOR CLOSURE OPTIONS CLINTON CREEK OPTION I2 (ALTERNATIVE) PLAN

DRG No 307071-00895-00-CI-DGA-CC- I201

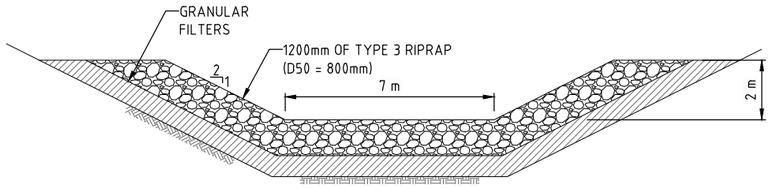
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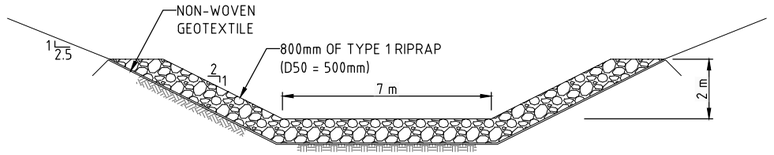
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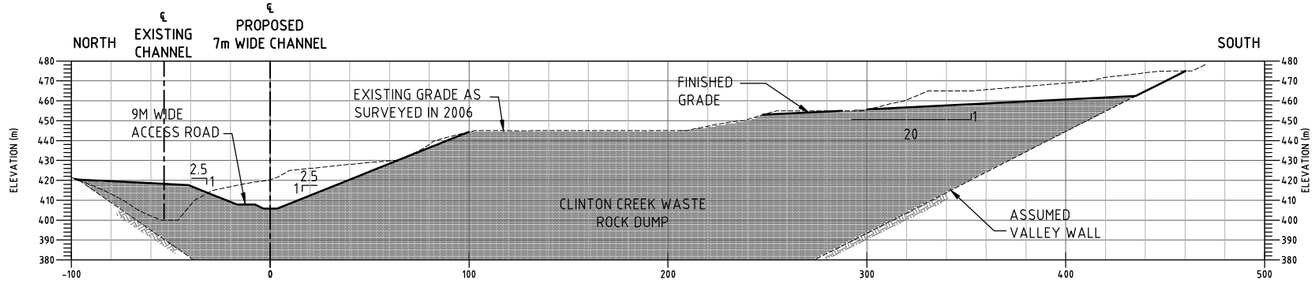
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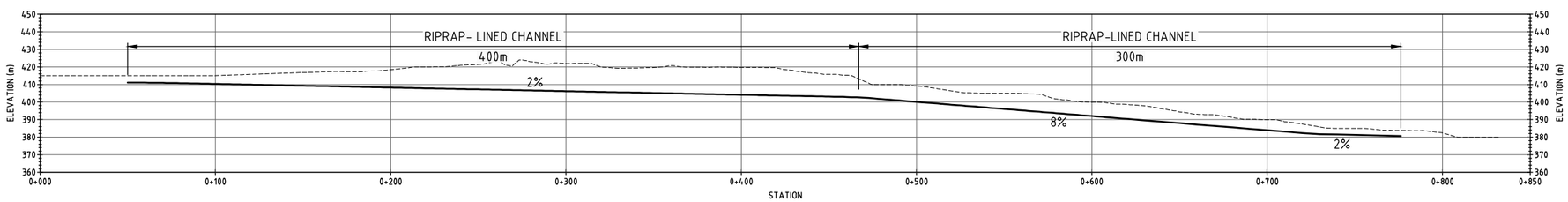
TYPICAL RIPRAP-LINED CHANNEL (8%) SECTION
1:200



TYPICAL RIPRAP-LINED CHANNEL (2%) SECTION
1:200



SECTION A
1:3000



PROFILE VIEW - CLINTON CREEK PROPOSED ALIGNMENT
1:3000

PRELIMINARY
DO NOT USE FOR CONSTRUCTION
Last Saved: Mar. 28/14 1:57pm

m 0 1 2 3 4 5 m
1:200

m 0 10 20 30 40 50 100 m
1:3000

NOTES:

1. DIMENSIONS AND ELEVATIONS ARE IN METRES.

REV	DATE (DD-MMM-YY)	REVISION DESCRIPTION	DRAWN	DRAFT CHK	DESIGNED	ENG CHK	APPROVED	CUSTOMER	REF DRAWING No	REFERENCE DRAWING TITLE
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A	17-MAR-14	RE-ISSUED FOR CLIENT REVIEW	JH		SJC	AT				

D SHEET | SCALE AS SHOWN

OneWay

WORLEYPARSONS PROJECT No
307071-00895

ENGINEERING AND PERMIT STAMPS (As Required)

CUSTOMER

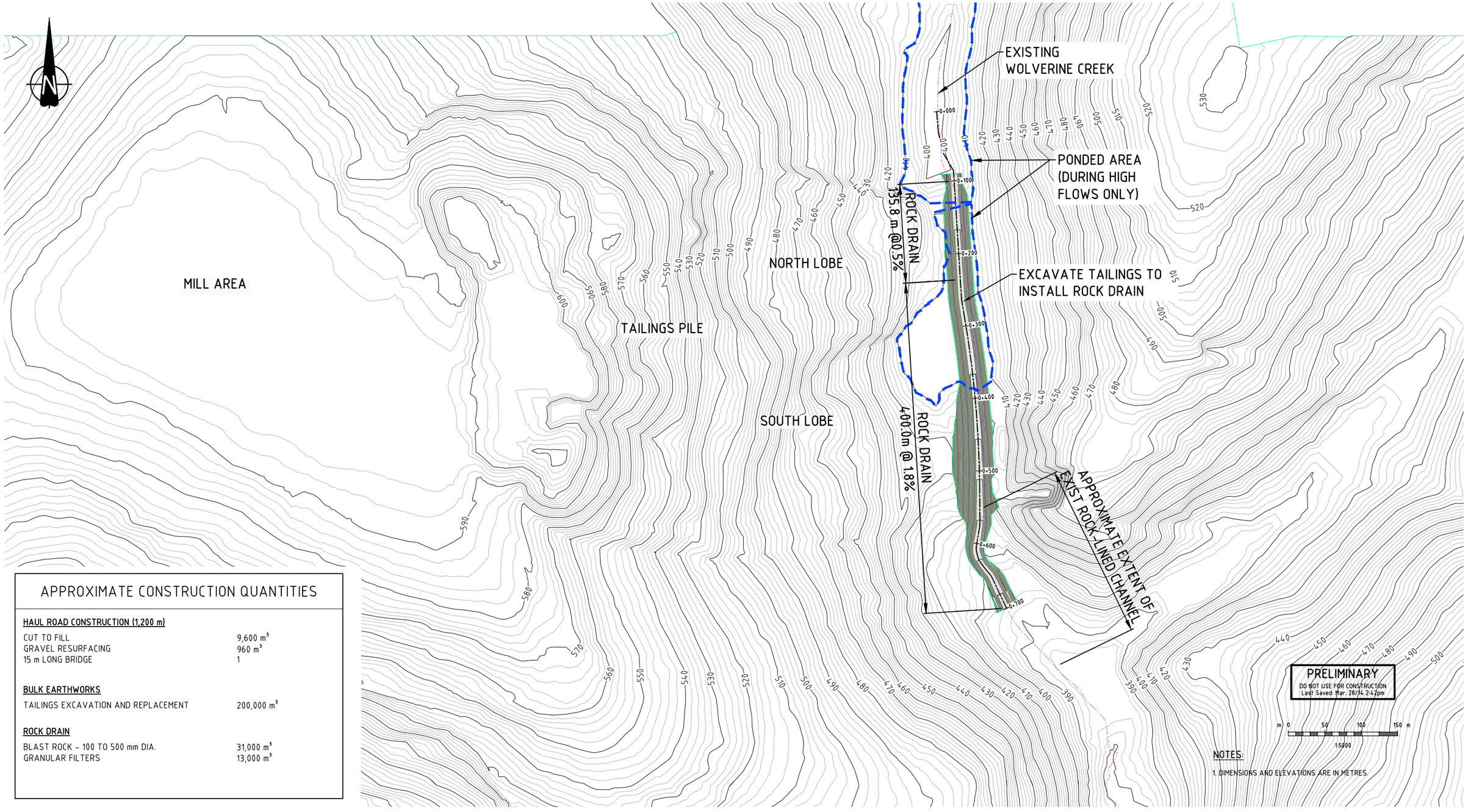
"This drawing is prepared for the use of the contractual customer of WorleyParsons Canada Services Ltd. and WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

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CLINTON CREEK MINE LIFECYCLE
COST ANALYSIS FOR CLOSURE OPTIONS
CLINTON CREEK OPTION I2 (ALTERNATIVE)
PROFILE AND SECTIONS

DRG No 307071-00895-00-CI-DGA-CC- I202 | REV 0

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USER NAME: jiang.hu
PLOT DATE & TIME: 28/3/2014 2:21:50 PM
SAVE DATE & TIME: 28/3/2014 1:57:20 PM



APPROXIMATE CONSTRUCTION QUANTITIES

HAUL ROAD CONSTRUCTION (1,200 m)

CUT TO FILL	9,600 m^3
GRAVEL RESURFACING	960 m^3
15 m LONG BRIDGE	1

BULK EARTHWORKS

TAILINGS EXCAVATION AND REPLACEMENT	200,000 m^3

ROCK DRAIN

BLAST ROCK - 100 TO 500 mm DIA.	31,000 m^3
GRANULAR FILTERS	13,000 m^3

NOTES:

1. DIMENSIONS AND ELEVATIONS ARE IN METRES.

REV	DATE (DD-MMM-YY)	REVISION DESCRIPTION	DRAWN	DRAFT CHK	DESIGNED	ENG CHK	APPROVED	CUSTOMER	REF DRAWING No	REFERENCE DRAWING TITLE
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B	17-MAR-14	RE-ISSUED FOR CLIENT REVIEW	JH		SJC	AT				
A	14-JAN-14	ISSUED FOR CLIENT REVIEW	JH		SJC	AT				

D SHEET | SCALE AS SHOWN

OneWay

WORLEYPARSONS PROJECT No
307071-00895

ENGINEERING AND PERMIT STAMPS (As Required)

CUSTOMER

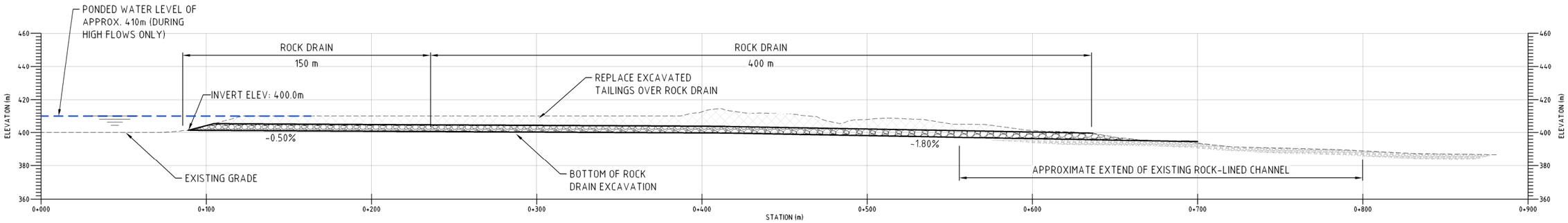
"This drawing is prepared for the use of the contractual customer of WorleyParsons Canada Services Ltd. and WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

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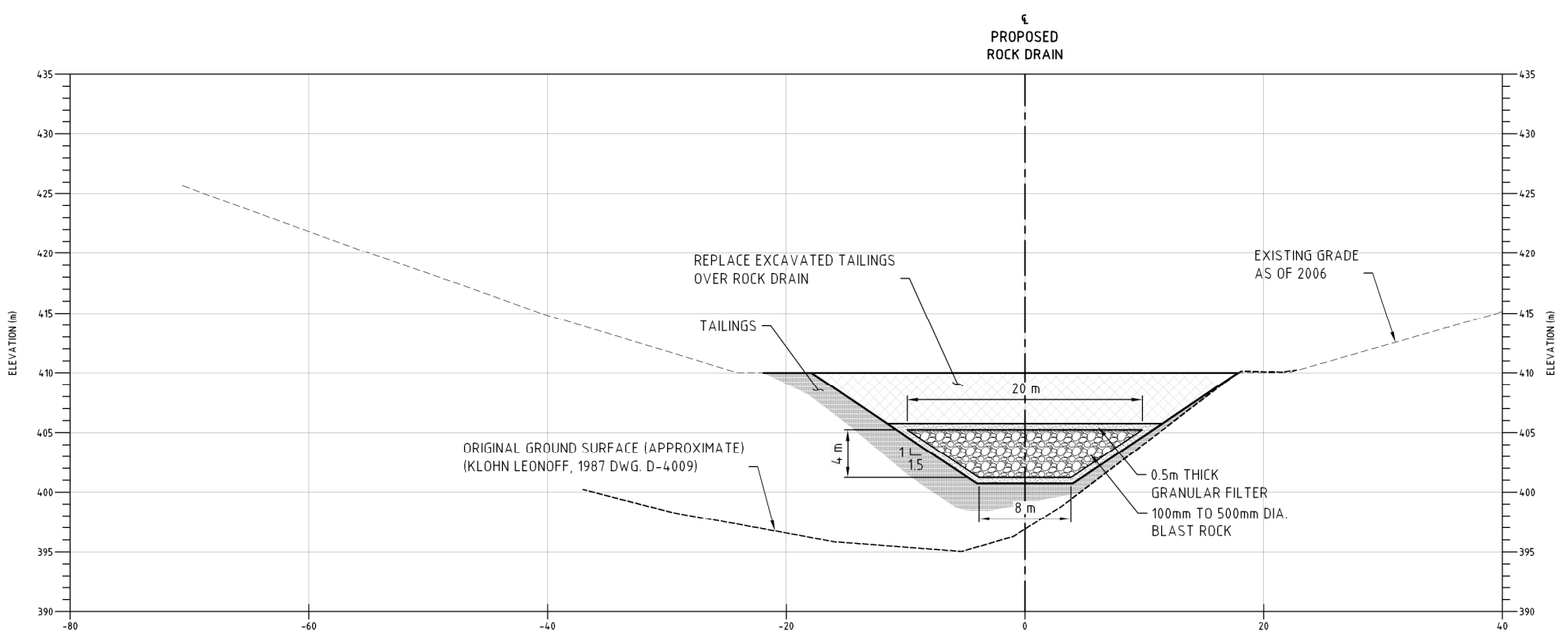
CLINTON CREEK SITE LIFECYCLE
COST ANALYSIS FOR REMEDIAL OPTIONS
WOLVERINE CREEK OPTION B
PLAN

DRG No 307071-00895-00-CI-DGA-WC_B 01 | REV 0

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PROFILE - WOLVERINE CREEK
1:2500



TYPICAL ROCK DRAIN SECTION
1:500

PRELIMINARY
DO NOT USE FOR CONSTRUCTION
Last Saved: Mar. 28/14 2:42pm

m 0 5 10 15 m
1:500

m 0 25 50 75 m
1:2500

NOTES:

1. DIMENSIONS AND ELEVATIONS ARE IN METRES.

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B	17-MAR-14	RE-ISSUED FOR CLIENT REVIEW	JH		SJC	AT				
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D SHEET | SCALE AS SHOWN

OneWay to zero harm

WORLEYPARSONS PROJECT No
307071-00895

ENGINEERING AND PERMIT STAMPS (As Required)

CUSTOMER

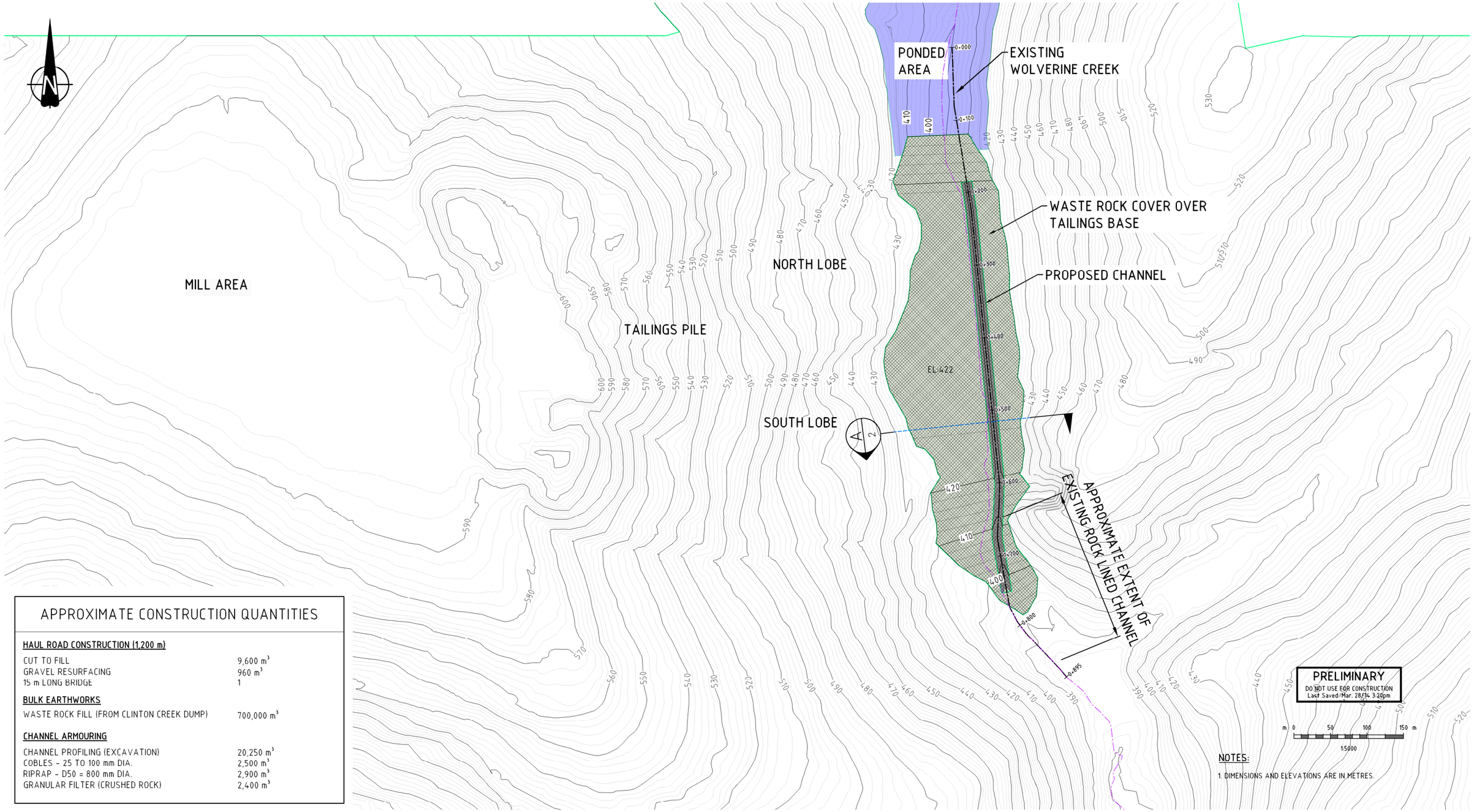
"This drawing is prepared for the use of the contractual customer of WorleyParsons Canada Services Ltd. and WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

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CLINTON CREEK SITE LIFECYCLE
COST ANALYSIS FOR REMEDIAL OPTIONS
WOLVERINE CREEK OPTION B
PROFILE AND SECTION

DRG No 307071-00895-00-CI-DGA-WC_B 02 | REV 0

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PLOT DATE & TIME: 28/3/2014 2:51:24 PM
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APPROXIMATE CONSTRUCTION QUANTITIES

HAUL ROAD CONSTRUCTION (1,200 m)

CUT TO FILL	9,600 m^3
GRAVEL RESURFACING	960 m^3
15 m LONG BRIDGE	1

BULK EARTHWORKS

WASTE ROCK FILL (FROM CLINTON CREEK DUMP)	700,000 m^3

CHANNEL ARMOURING

CHANNEL PROFILING (EXCAVATION)	20,250 m^3
COBLES - 25 TO 100 mm DIA.	2,500 m^3
RIPRAP - D50 = 800 mm DIA.	2,900 m^3
GRANULAR FILTER (CRUSHED ROCK)	2,400 m^3

NOTES:

1. DIMENSIONS AND ELEVATIONS ARE IN METRES.

REV	DATE (DD-MMM-YY)	REVISION DESCRIPTION	DRAWN	DRAFT CHK	DESIGNED	ENG CHK	APPROVED	CUSTOMER	REF DRAWING No	REFERENCE DRAWING TITLE
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B	17-MAR-14	RE-ISSUED FOR CLIENT REVIEW	JH		SJC	AT				
A	14-JAN-14	ISSUED FOR CLIENT REVIEW	JH		SJC	AT				

D SHEET | SCALE AS SHOWN

OneWay to zero harm

WORLEYPARSONS PROJECT No
307071-00895

ENGINEERING AND PERMIT STAMPS (As Required)

CUSTOMER

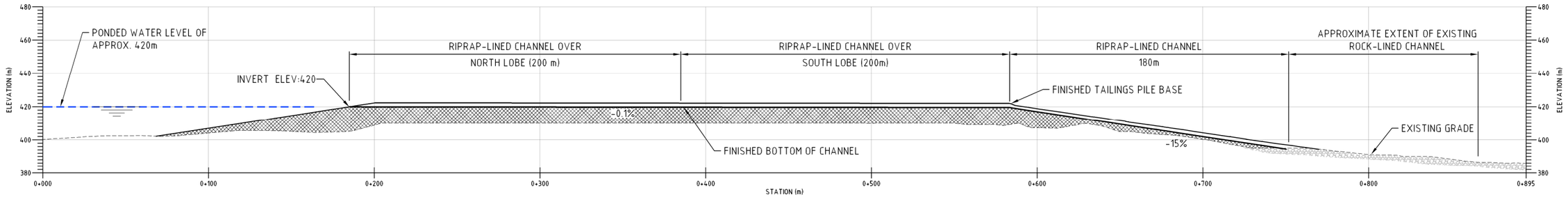
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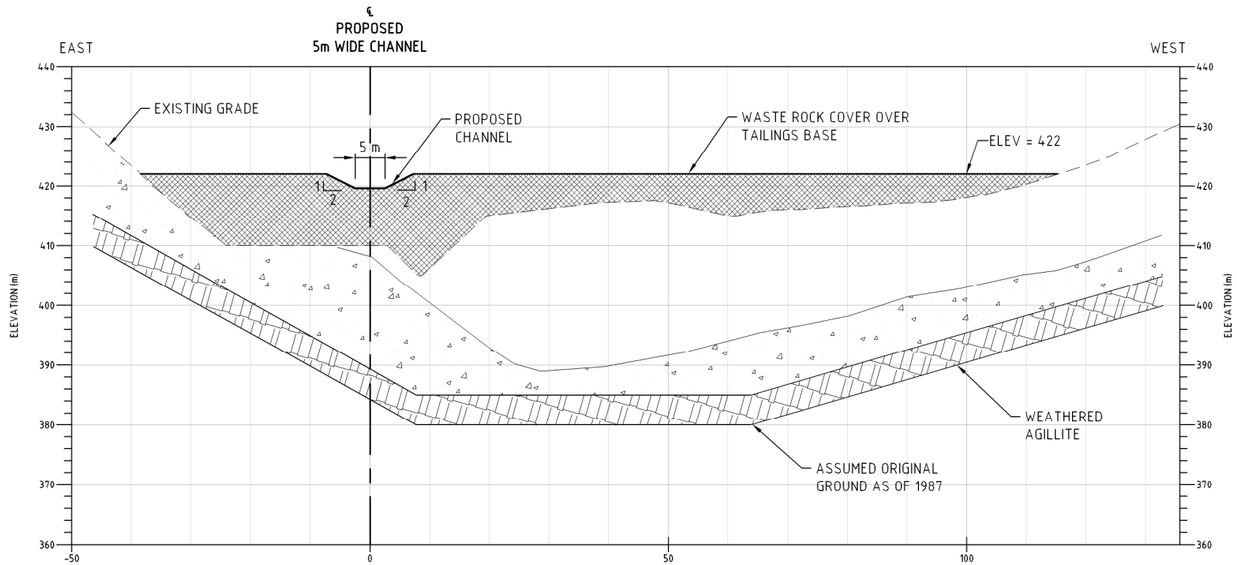
CLINTON CREEK SITE LIFECYCLE
COST ANALYSIS FOR REMEDIAL OPTIONS
WOLVERINE CREEK OPTION C
PLAN

DRG No 307071-00895-00-CI-DGA-WC_C 01 | REV 0

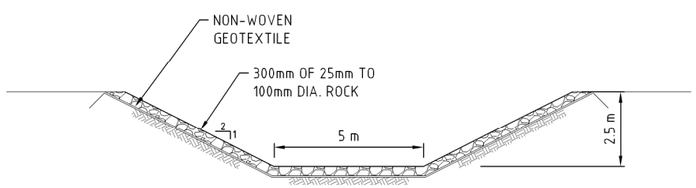
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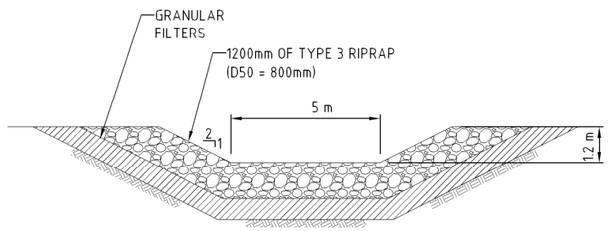
PROFILE - WOLVERINE CREEK
1:2500



SECTION A
1:1000



TYPICAL RIPRAP-LINED CHANNEL (0.1%) SECTION
1:200



TYPICAL RIPRAP-LINED CHANNEL (15%) SECTION
1:200

PRELIMINARY
DO NOT USE FOR CONSTRUCTION
Last Saved: Mar. 28/14 2:55pm

m 0 1 2 3 4 5 m
1:200

m 0 5 10 15 20 25 m
1:1000

m 0 25 50 75 m
1:2500

NOTES:

1. DIMENSIONS AND ELEVATIONS ARE IN METRES.

REV	DATE dd-mmm-yy	REVISION DESCRIPTION	DRAWN	DRAFT CHK	DESIGNED	ENG CHK	APPROVED	CUSTOMER	REF DRAWING No	REFERENCE DRAWING TITLE
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B	17-MAR-14	RE-ISSUED FOR CLIENT REVIEW	JH		SJC	AT				
A	14-JAN-14	ISSUED FOR CLIENT REVIEW	JH		SJC	AT				

D SHEET | SCALE AS SHOWN

OneWay to zero harm

WORLEYPARSONS PROJECT No
307071-00895

ENGINEERING AND PERMIT STAMPS (As Required)

CUSTOMER

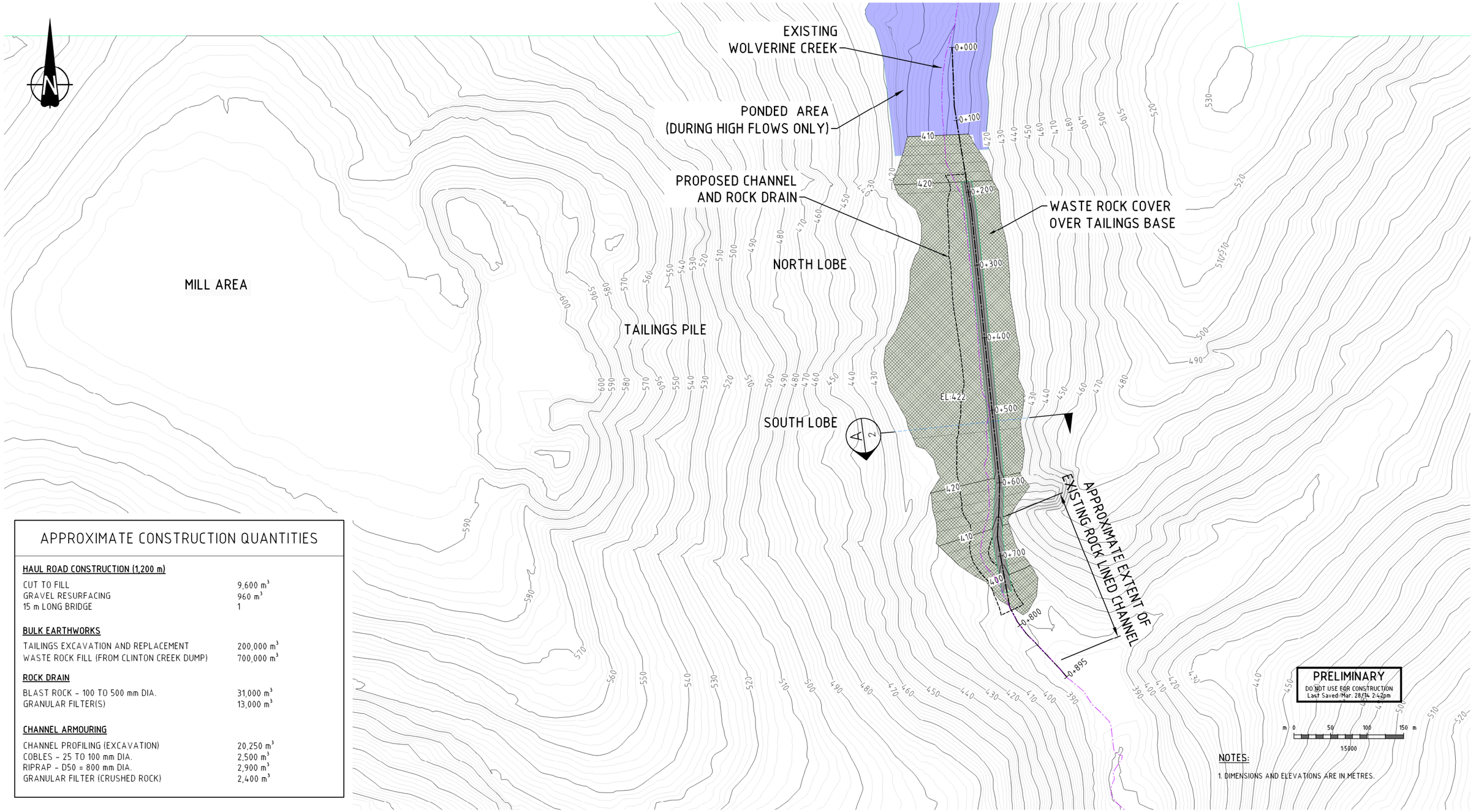
"This drawing is prepared for the use of the contractual customer of WorleyParsons Canada Services Ltd. and WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

WorleyParsons resources & energy

CLINTON CREEK SITE LIFECYCLE
COST ANALYSIS FOR REMEDIAL OPTIONS
WOLVERINE CREEK OPTION C
PROFILE AND SECTIONS

DRG No 307071-00895-00-CI-DGA-WC_C 02 | REV 0

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USER NAME: jiang.hu
PLOT DATE & TIME: 28/3/2014 2:57:31 PM
SAVE DATE & TIME: 28/3/2014 2:55:17 PM



APPROXIMATE CONSTRUCTION QUANTITIES

HAUL ROAD CONSTRUCTION (1,200 m)

CUT TO FILL	9,600 m^3
GRAVEL RESURFACING	960 m^3
15 m LONG BRIDGE	1

BULK EARTHWORKS

TAILINGS EXCAVATION AND REPLACEMENT	200,000 m^3
WASTE ROCK FILL (FROM CLINTON CREEK DUMP)	700,000 m^3

ROCK DRAIN

BLAST ROCK - 100 TO 500 mm DIA.	31,000 m^3
GRANULAR FILTER(S)	13,000 m^3

CHANNEL ARMOURING

CHANNEL PROFILING (EXCAVATION)	20,250 m^3
COBLES - 25 TO 100 mm DIA.	2,500 m^3
RIPRAP - D50 = 800 mm DIA.	2,900 m^3
GRANULAR FILTER (CRUSHED ROCK)	2,400 m^3

NOTES:

1. DIMENSIONS AND ELEVATIONS ARE IN METRES.

REV	DATE DD-MMM-YY	REVISION DESCRIPTION	DRAWN	DRAFT CHK	DESIGNED	ENG CHK	APPROVED	CUSTOMER	REF DRAWING No	REFERENCE DRAWING TITLE
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B	17-MAR-14	RE-ISSUED FOR CLIENT REVIEW	JH		SJC	AT				
A	14-JAN-14	ISSUED FOR CLIENT REVIEW	JH		SJC	AT				

D SHEET | SCALE AS SHOWN

OneWay to zero harm

WORLEYPARSONS PROJECT No
307071-00895

ENGINEERING AND PERMIT STAMPS (As Required)

CUSTOMER

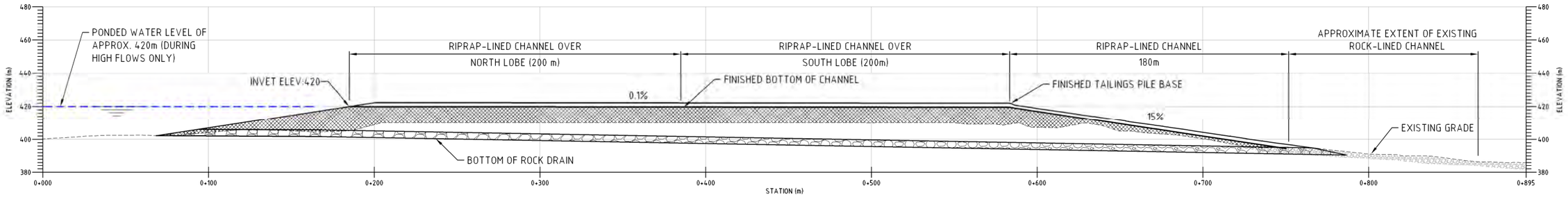
"This drawing is prepared for the use of the contractual customer of WorleyParsons Canada Services Ltd. and WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

WorleyParsons resources & energy

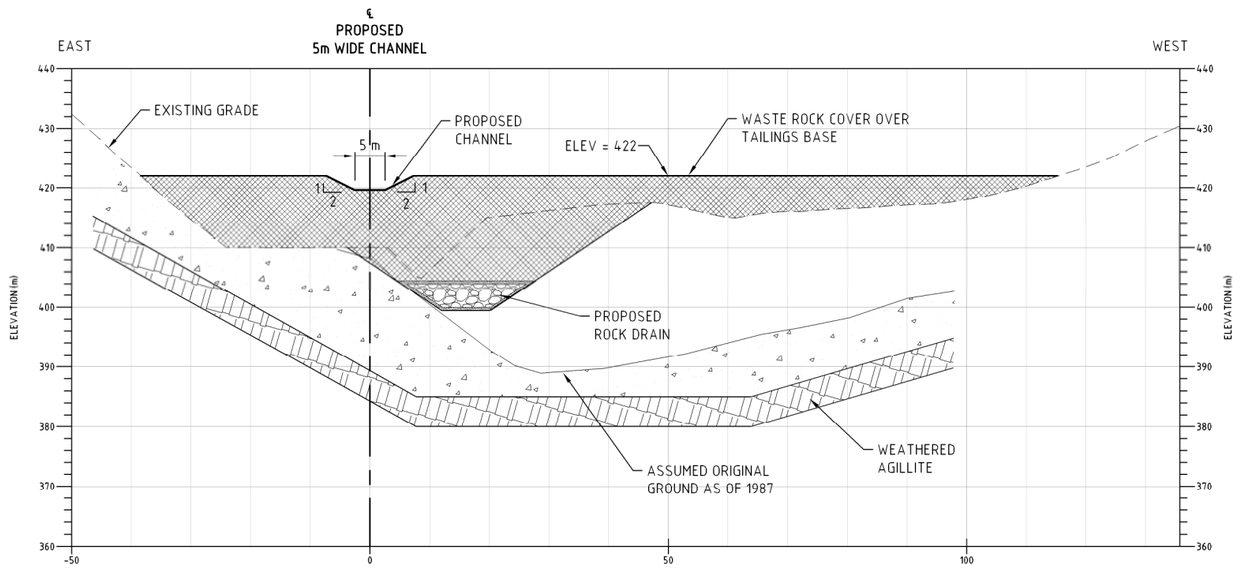
CLINTON CREEK SITE LIFECYCLE
COST ANALYSIS FOR REMEDIAL OPTIONS
WOLVERINE CREEK OPTION D
PLAN

DRG No 307071-00895-00-CI-DGA-WC_D 01 | REV 0

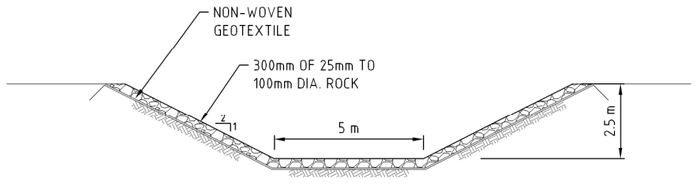
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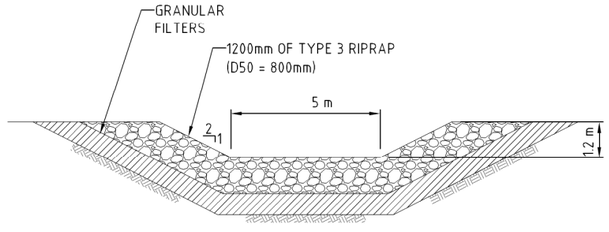
PROFILE - WOLVERINE CREEK
1:2500



SECTION A
1:1000



TYPICAL RIPRAP-LINED CHANNEL (0.1%) SECTION
1:200



TYPICAL RIPRAP-LINED CHANNEL (15%) SECTION
1:200

PRELIMINARY
DO NOT USE FOR CONSTRUCTION
Last Saved: Mar. 28/14 2:42pm

m 0 1 2 3 4 5 m
1:200

m 0 5 10 15 20 25 m
1:1000

m 0 25 50 75 m
1:2500

NOTES:

1. DIMENSIONS AND ELEVATIONS ARE IN METRES.

REV	DATE (DD-MMM-YY)	REVISION DESCRIPTION	DRAWN	DRAFT CHK	DESIGNED	ENG CHK	APPROVED	CUSTOMER	REF DRAWING No	REFERENCE DRAWING TITLE
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B	17-MAR-14	RE-ISSUED FOR CLIENT REVIEW	JH		SJC	AT				
A	14-JAN-14	ISSUED FOR CLIENT REVIEW	JH		SJC	AT				

SHEET SIZE: D | SCALE: AS SHOWN

OneWay to zero harm

ENGINEERING AND PERMIT STAMPS (As Required)

CUSTOMER

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WorleyParsons
resources & energy

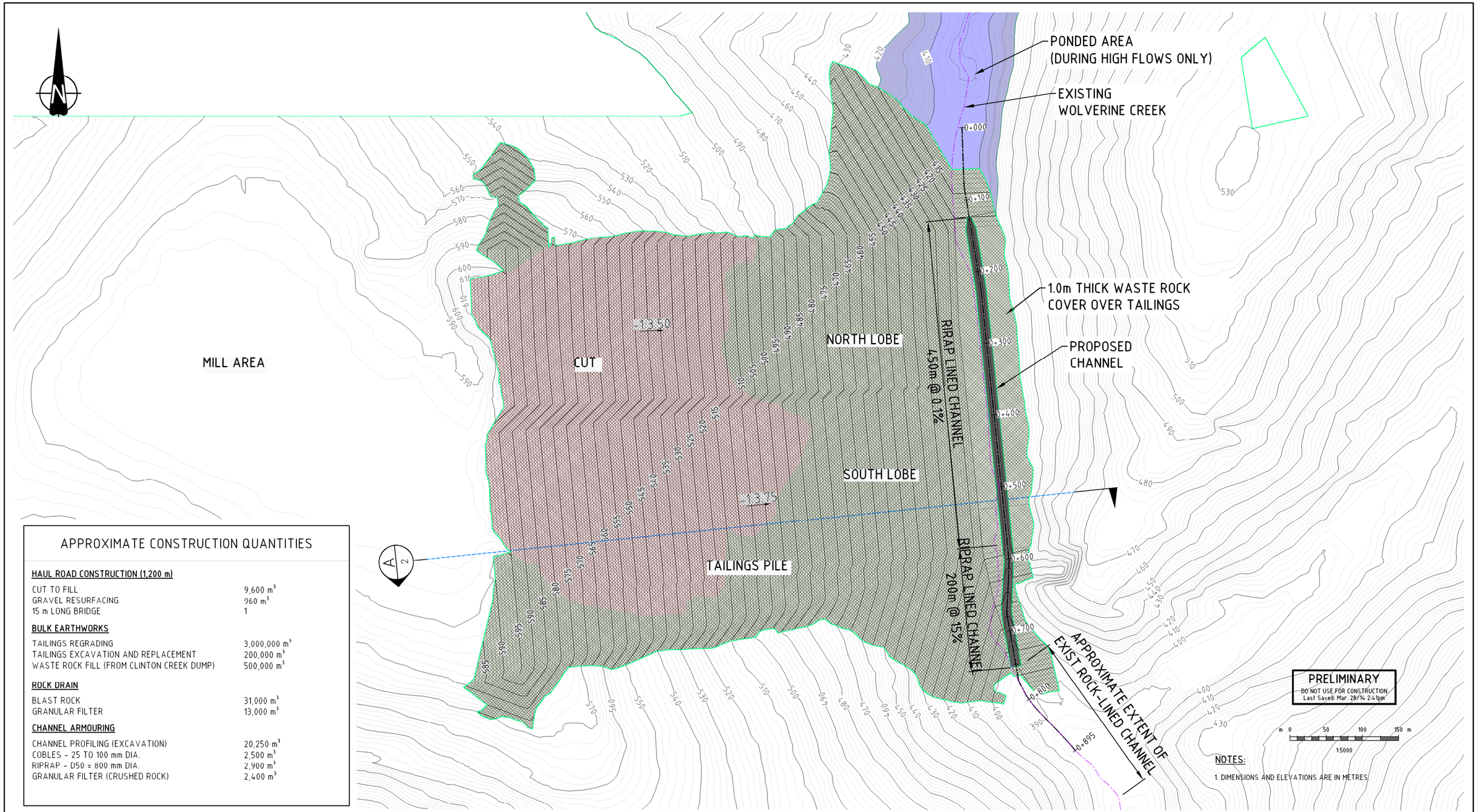
CLINTON CREEK SITE LIFECYCLE
COST ANALYSIS FOR REMEDIAL OPTIONS
WOLVERINE CREEK OPTION D
PROFILE AND SECTIONS

WORLEYPARSONS PROJECT No: 307071-00895

DRG No: 307071-00895-00-CI-DGA-WC_D 02

REV: 0

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USER NAME: jiang.hu
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SAVE DATE & TIME: 28/3/2014 2:40:04 PM



APPROXIMATE CONSTRUCTION QUANTITIES

HAUL ROAD CONSTRUCTION (1,200 m)

CUT TO FILL	9,600 m^3
GRAVEL RESURFACING	960 m^3
15 m LONG BRIDGE	1

BULK EARTHWORKS

TAILINGS REGRADING	3,000,000 m^3
TAILINGS EXCAVATION AND REPLACEMENT	200,000 m^3
WASTE ROCK FILL (FROM CLINTON CREEK DUMP)	500,000 m^3

ROCK DRAIN

BLAST ROCK	31,000 m^3
GRANULAR FILTER	13,000 m^3

CHANNEL ARMOURING

CHANNEL PROFILING (EXCAVATION)	20,250 m^3
COBLES - 25 TO 100 mm DIA.	2,500 m^3
RIPRAP - D50 = 800 mm DIA.	2,900 m^3
GRANULAR FILTER (CRUSHED ROCK)	2,400 m^3

NOTES:

1. DIMENSIONS AND ELEVATIONS ARE IN METRES.

REV	DATE (DD-MMM-YY)	REVISION DESCRIPTION	DRAWN	DRAFT CHK	DESIGNED	ENG CHK	APPROVED	CUSTOMER	REF DRAWING No	REFERENCE DRAWING TITLE
0	28-MAR-14	ISSUED FOR USE	JH		SJC	AT				
B	17-MAR-14	RE-ISSUED FOR CLIENT REVIEW	JH		SJC	AT				
A	14-JAN-14	ISSUED FOR CLIENT REVIEW	JH		SJC	AT				

D SHEET | SCALE AS SHOWN

OneWay to zero harm

WORLEYPARSONS PROJECT No 307071-00895

ENGINEERING AND PERMIT STAMPS (As Required)

CUSTOMER

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WorleyParsons resources & energy

CLINTON CREEK SITE LIFECYCLE
COST ANALYSIS FOR REMEDIAL OPTIONS
WOLVERINE CREEK OPTION E
PLAN

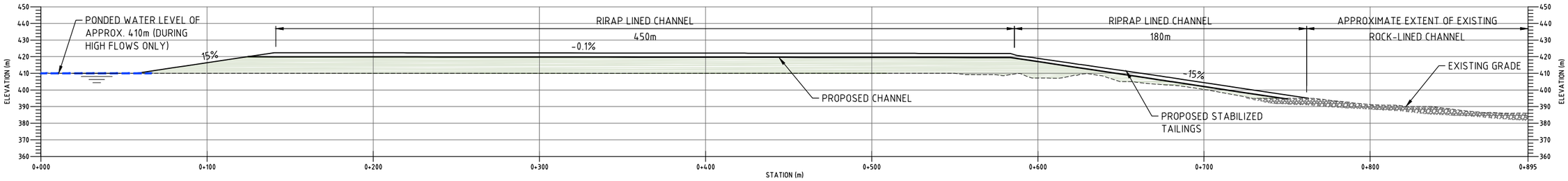
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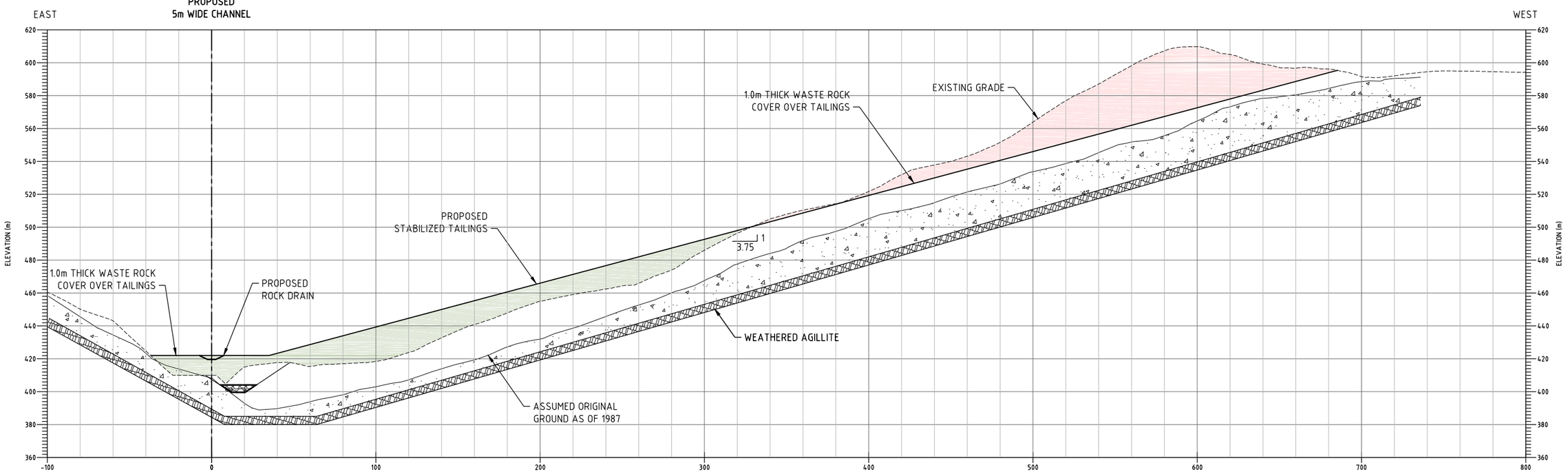
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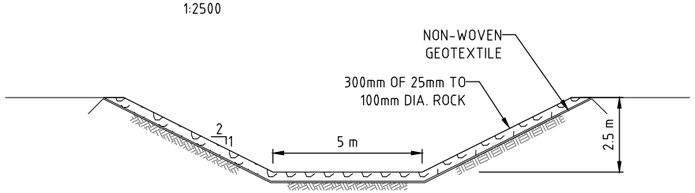
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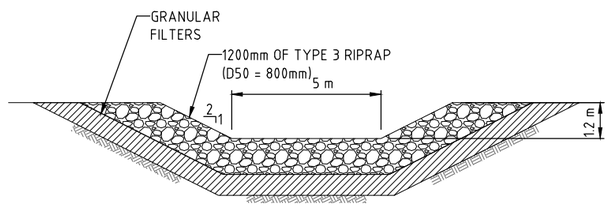
PROFILE - WOLVERINE CREEK
1:2500



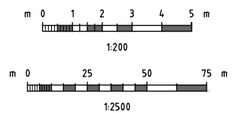
SECTION A
1:2500



TYPICAL RIPRAP-LINED CHANNEL (0.1%) SECTION
1:200



TYPICAL RIPRAP-LINED CHANNEL (15%) SECTION
1:200



PRELIMINARY
DO NOT USE FOR CONSTRUCTION
Last Saved: Mar. 28/14 2:41pm

NOTES:

1. DIMENSIONS AND ELEVATIONS ARE IN METRES.

REV	DATE (DD-MMM-YY)	REVISION DESCRIPTION	DRAWN	DRAFT CHK	DESIGNED	ENG CHK	APPROVED	CUSTOMER	REF DRAWING No	REFERENCE DRAWING TITLE
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B	17-MAR-14	RE-ISSUED FOR CLIENT REVIEW	JH		SJC	AT				
A	14-JAN-14	ISSUED FOR CLIENT REVIEW	JH		SJC	AT				

D SHEET | SCALE AS SHOWN

OneWay

WORLEYPARSONS PROJECT No
307071-00895

ENGINEERING AND PERMIT STAMPS (As Required)

CUSTOMER

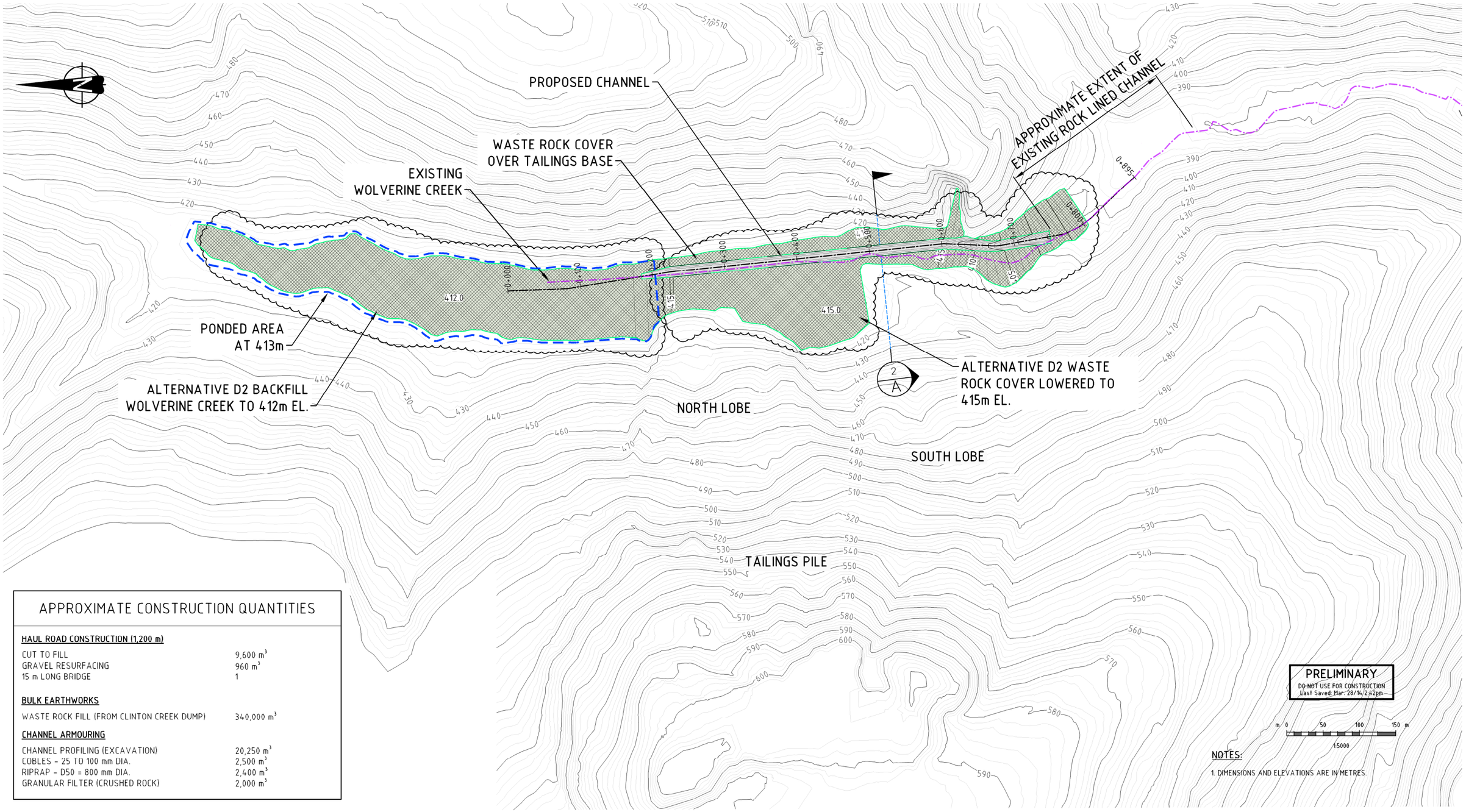
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WorleyParsons
resources & energy

CLINTON CREEK SITE LIFECYCLE
COST ANALYSIS FOR REMEDIAL OPTIONS
WOLVERINE CREEK OPTION E
PROFILE AND SECTIONS

DRG No 307071-00895-00-CI-DGA-WC_E 02 | REV 0

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USER NAME: jiang.hu
PLOT DATE & TIME: 28/3/2014 2:45:00 PM
SAVE DATE & TIME: 28/3/2014 2:41:42 PM



APPROXIMATE CONSTRUCTION QUANTITIES

HAUL ROAD CONSTRUCTION (1,200 m)

CUT TO FILL	9,600 m^3
GRAVEL RESURFACING	960 m^3
15 m LONG BRIDGE	1

BULK EARTHWORKS

WASTE ROCK FILL (FROM CLINTON CREEK DUMP)	340,000 m^3

CHANNEL ARMOURING

CHANNEL PROFILING (EXCAVATION)	20,250 m^3
COBBLES - 25 TO 100 mm DIA.	2,500 m^3
RIPRAP - D50 = 800 mm DIA.	2,400 m^3
GRANULAR FILTER (CRUSHED ROCK)	2,000 m^3

NOTES:

1. DIMENSIONS AND ELEVATIONS ARE IN METRES.

REV	DATE (DD-MMM-YY)	REVISION DESCRIPTION	DRAWN	DRAFT CHK	DESIGNED	ENG CHK	APPROVED	CUSTOMER	REF DRAWING No	REFERENCE DRAWING TITLE
0	28-MAR-14	ISSUED FOR USE	JH		SJC	AT				
A	17-MAR-14	ISSUED FOR CLIENT REVIEW	JH		SJC	AT				

D SHEET | SCALE AS SHOWN

OneWay to zero harm

WORLEYPARSONS PROJECT No 307071-00895

ENGINEERING AND PERMIT STAMPS (As Required)

CUSTOMER

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WorleyParsons resources & energy

CLINTON CREEK MINE LIFECYCLE
COST ANALYSIS FOR CLOSURE OPTIONS
WOLVERINE CREEK OPTION D2 (ALTERNATIVE)
PLAN

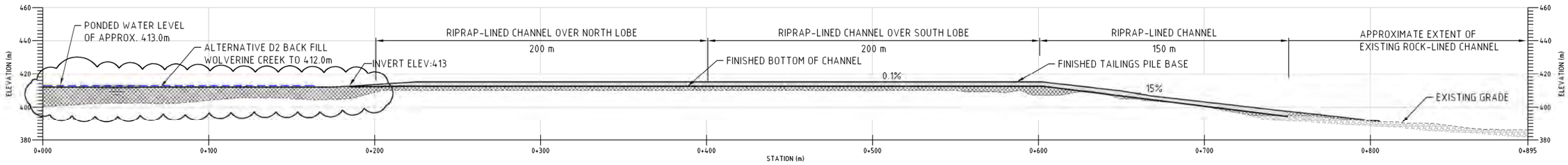
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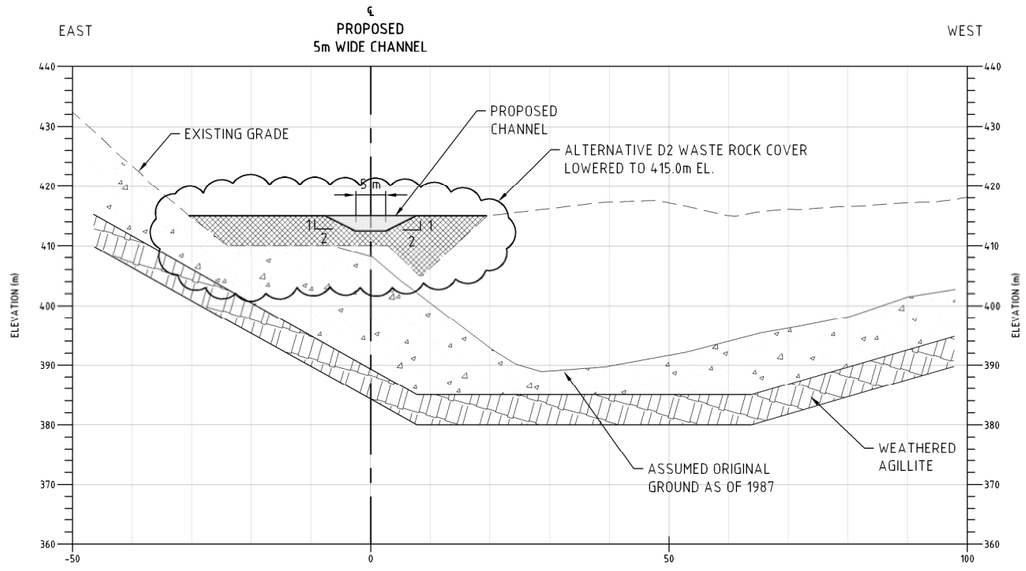
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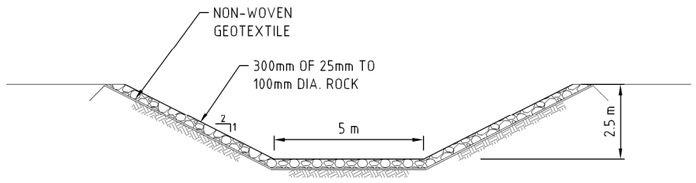
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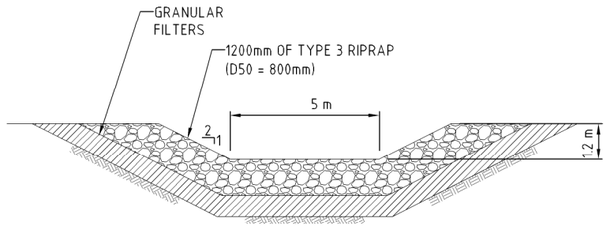
PROFILE - WOLVERINE CREEK
1:2500



SECTION A
1:1000



TYPICAL RIPRAP-LINED CHANNEL (0.1%) SECTION
1:200



TYPICAL RIPRAP-LINED CHANNEL (15%) SECTION
1:200

PRELIMINARY
DO NOT USE FOR CONSTRUCTION
Last Saved: Mar. 28/14 2:42pm

m 0 1 2 3 4 5 m
1:200

m 0 5 10 15 20 25 m
1:1000

m 0 25 50 75 m
1:2500

NOTES:

1. DIMENSIONS AND ELEVATIONS ARE IN METRES.

REV	DATE (DD-MMM-YY)	REVISION DESCRIPTION	DRAWN	DRAFT CHK	DESIGNED	ENG CHK	APPROVED	CUSTOMER	REF DRAWING No	REFERENCE DRAWING TITLE
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A	17-MAR-14	ISSUED FOR CLIENT REVIEW	JH		SJC	AT				

D SHEET | SCALE AS SHOWN

OneWay to zero harm

WORLEYPARSONS PROJECT No
307071-00895

ENGINEERING AND PERMIT STAMPS (As Required)

CUSTOMER

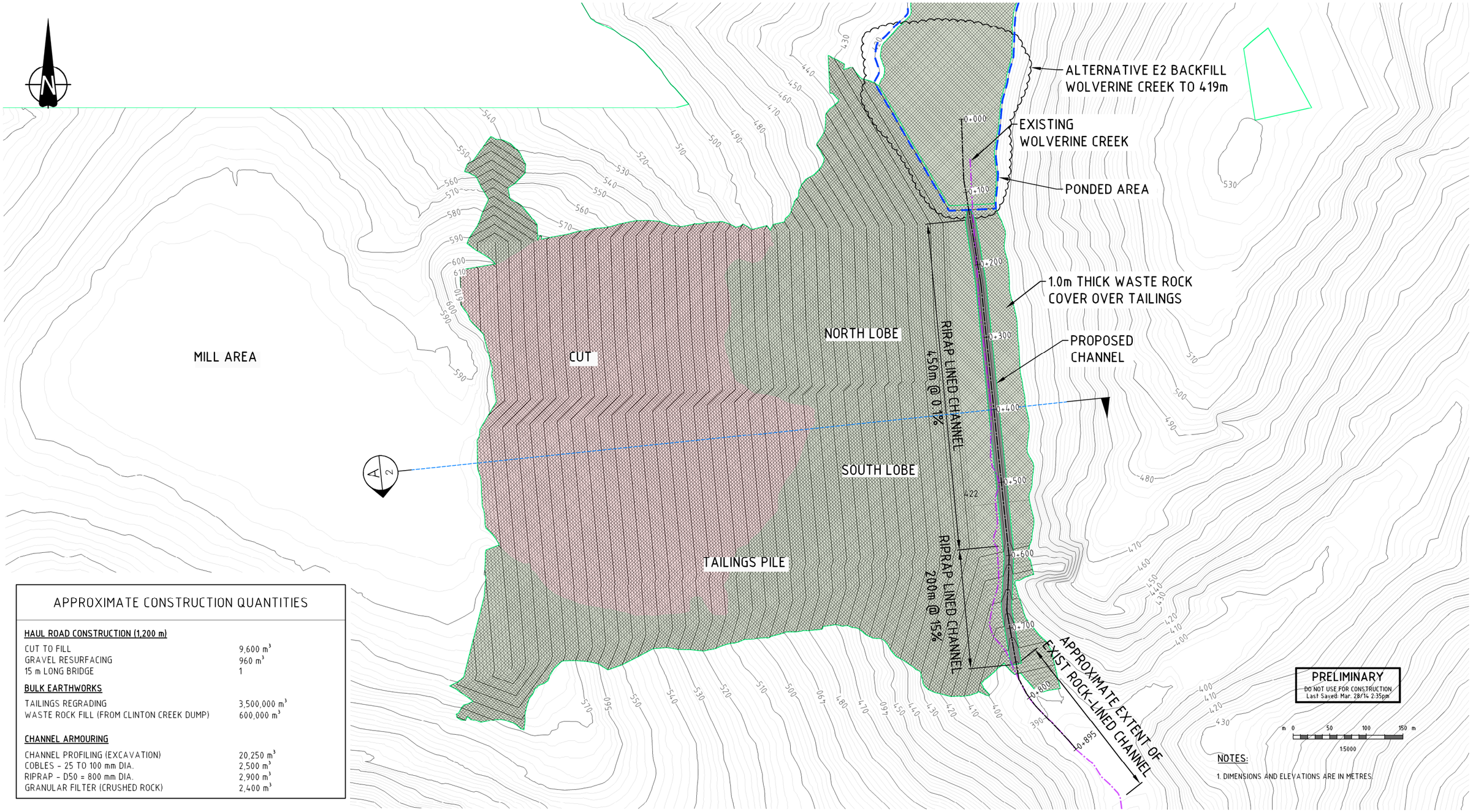
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WorleyParsons resources & energy

CLINTON CREEK MINE LIFECYCLE
COST ANALYSIS FOR CLOSURE OPTIONS
WOLVERINE CREEK OPTION D2 (ALTERNATIVE)
PROFILE AND SECTIONS

DRG No 307071-00895-00-CI-DGA-WC_D202 | REV 0

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USER NAME: jiang.hu
PLOT DATE & TIME: 28/3/2014 3:01:56 PM
SAVE DATE & TIME: 28/3/2014 2:42:10 PM



APPROXIMATE CONSTRUCTION QUANTITIES

HAUL ROAD CONSTRUCTION (1,200 m)	
CUT TO FILL	9,600 m^3
GRAVEL RESURFACING	960 m^3
15 m LONG BRIDGE	1
BULK EARTHWORKS	
TAILINGS REGRADING	3,500,000 m^3
WASTE ROCK FILL (FROM CLINTON CREEK DUMP)	600,000 m^3
CHANNEL ARMOURING	
CHANNEL PROFILING (EXCAVATION)	20,250 m^3
COBLES - 25 TO 100 mm DIA.	2,500 m^3
RIPRAP - D50 = 800 mm DIA.	2,900 m^3
GRANULAR FILTER (CRUSHED ROCK)	2,400 m^3

NOTES:

1. DIMENSIONS AND ELEVATIONS ARE IN METRES.

REV	DATE (DD-MMM-YY)	REVISION DESCRIPTION	DRAWN	DRAFT CHK	DESIGNED	ENG CHK	APPROVED	CUSTOMER	REF DRAWING No	REFERENCE DRAWING TITLE
0	28-MAR-14	ISSUED FOR USE	JH		SJC	AT				
A	17-MAR-14	ISSUED FOR CLIENT REVIEW	JH		SJC	AT				

D SHEET | SCALE AS SHOWN

OneWay to zero harm

WORLEYPARSONS PROJECT No 307071-00895

ENGINEERING AND PERMIT STAMPS (As Required)

CUSTOMER

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WorleyParsons resources & energy

CLINTON CREEK MINE LIFECYCLE
COST ANALYSIS FOR CLOSURE OPTIONS
WOLVERINE CREEK OPTION E2 (ALTERNATIVE)
PLAN

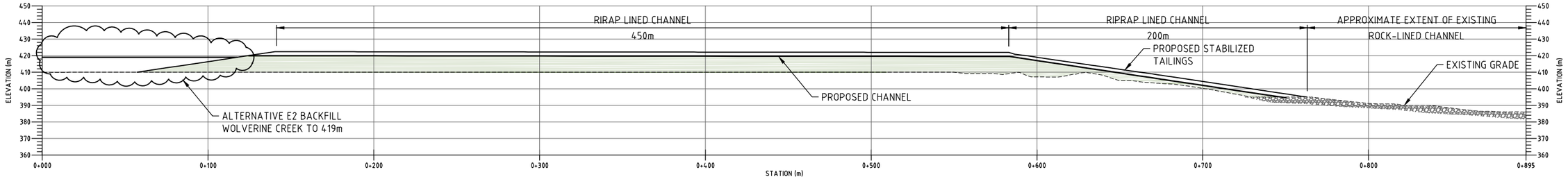
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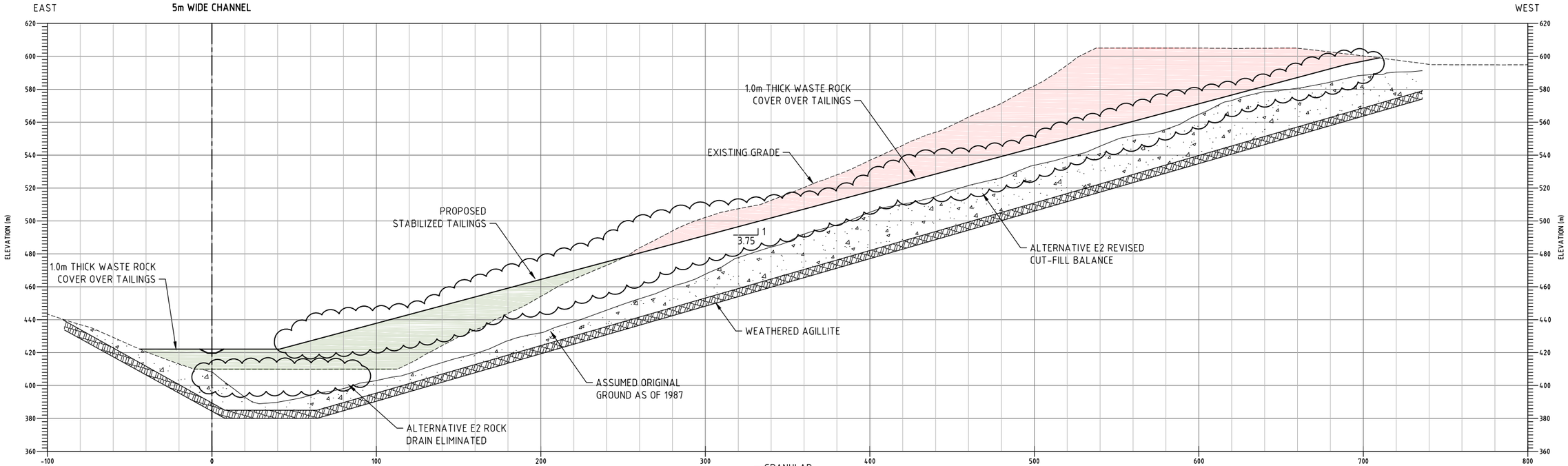
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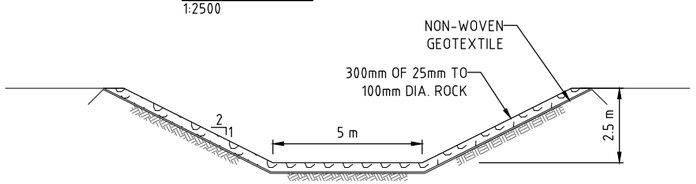
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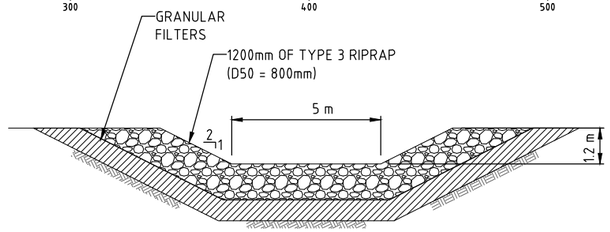
PROFILE - WOLVERINE CREEK
1:2500



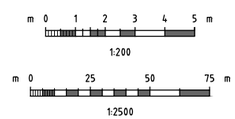
SECTION A
1:2500



TYPICAL RIPRAP-LINED CHANNEL (0.1%) SECTION
1:200



TYPICAL RIPRAP-LINED CHANNEL (15%) SECTION
1:200



PRELIMINARY
DO NOT USE FOR CONSTRUCTION
Last Saved: Mar. 28/14 2:35pm

NOTES:

1. DIMENSIONS AND ELEVATIONS ARE IN METRES.

REV	DATE (DD-MMM-YY)	REVISION DESCRIPTION	DRAWN	DRAFT CHK	DESIGNED	ENG CHK	APPROVED	CUSTOMER	REF DRAWING No	REFERENCE DRAWING TITLE
0	28-MAR-14	ISSUED FOR USE	JH		SJC	AT				
A	17-MAR-14	ISSUED FOR CLIENT REVIEW	JH		SJC	AT				

D SHEET | SCALE AS SHOWN

OneWay

WORLEYPARSONS PROJECT No
307071-00895

ENGINEERING AND PERMIT STAMPS (As Required)

CUSTOMER

"This drawing is prepared for the use of the contractual customer of WorleyParsons Canada Services Ltd. and WorleyParsons Canada Services Ltd. assumes no liability to any other party for any representations contained in this drawing."

WorleyParsons
resources & energy

CLINTON CREEK MINE LIFECYCLE
COST ANALYSIS FOR CLOSURE OPTIONS
WOLVERINE CREEK OPTION E2 (ALTERNATIVE)
PROFILE AND SECTIONS

DRG No 307071-00895-00-CI-DGA-WC_E202 | REV 0

PLOT DATE & TIME: 28/3/2014 2:45:46 PM
SAVE DATE & TIME: 28/3/2014 2:35:58 PM
USER NAME: jiang.hu
LOCATION: U:\YVR\307071\00895_YEMR_CLINTONCRK\11_DRAWINGS\01_CIVIL\02_CIVIL3D\OPTIONS\WOLVERINE CREEK\FIGURES\307071-00895-00-CI-DGA-1000-OPTION WE2.DWG

Appendix 3 Construction Cost Estimate Breakdowns

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

WorleyParsons resources & energy

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Option CC-A	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
DIRECT COSTS																				
							-	-		-		-		-		-	-		-	-
		Equipment Mob / Demob	Edmonton to Dawson City 2,519km. Dawson City to Site	**14**	**EA**		-	-		-	18,723.36	262,127		-		-	262,127	25%	65,532	327,659
							-	-		-		-		-		-	-		-	-
		Major Road Improvements	15km				-	-		-		-		-		-	-		-	-
		Clear & grub	Medium	**9**	**HA**		-	-		-	11,877.51	106,898		-		-	106,898	25%	26,724	133,622
		Road embankment widening, 3m	Cut to fill existing shoulder. Approx 8M3 / LM.	**120,000**	**M3**		-	-		-	4.63	555,600		-		-	555,600	25%	138,900	694,500
		Re-grade road sub-base	Av. 150mm dp x 5m wide	**11,250**	**M3**		-	-		-	12.57	141,413		-		-	141,413	25%	35,353	176,766
		Gravel resurfacing, 100mm thk x 8m wide	Drill & blast, crushing, load & haul and place.	**12,000**	**M3**		-	-		-	160.88	1,930,560		-		-	1,930,560	25%	482,640	2,413,200
		Bridge construction	15m clear span x 11m w. Supply & install.	**1**	**LS**		-	-		-	889,246.48	889,246		-		-	889,246	25%	222,312	1,111,558
							-	-		-		-		-		-	-		-	-
		Bulk Earthworks					-	-		-		-		-		-	-		-	-
		Waste dump to porcupine pit		**50,000**	**M3**		-	-		-	4.90	245,000		-		-	245,000	25%	61,250	306,250
							-	-		-		-		-		-	-		-	-
		Channel Armouring					-	-		-		-		-		-	-		-	-
		Rip-rap - 800 mm dia.	Drill & blast, screen & sort, load & haul to site, double handling and place.	**3,000**	**M3**		-	-		-	141.27	423,810		-		-	423,810	25%	105,953	529,763
		Granular filter	Drill & blast, crushing, load & haul and place.	**2,200**	**M3**		-	-		-	157.35	346,170		-		-	346,170	25%	86,543	432,713
		Waste rock	Load, haul, place & compact	**3,000**	**M3**		-	-		-	10.12	30,360		-		-	30,360	25%	7,590	37,950
							-	-		-		-		-		-	-		-	-
		Water Diversion					-	-		-		-		-		-	-		-	-
		Aquadam - supply & install	6' x 100' lg	**1**	**EA**		-	-		-	26,000.00	26,000		-		-	26,000	25%	6,500	32,500
		610mm HDPE DR21 pipe	Trench 1.6m dp, BF 1m cover, supply & install.	**500**	**LM**		-	-		-	980.07	490,036		-		-	490,036	25%	122,509	612,545
							-	-		-		-		-		-	-		-	-
		Support Equipment					-	-		-		-		-		-	-		-	-
		Shop truck	1ea	**61**	**DY**		-	-		-	300.00	18,240		-		-	18,240	25%	4,560	22,800
		Temp maintenance shop	1ea	**1**	**LS**		-	-		-	15,000.00	15,000		-		-	15,000	25%	3,750	18,750
		Shop trailer	1ea	**2**	**MO**		-	-		-	2,000.00	4,000		-		-	4,000	25%	1,000	5,000
		Fuel bowser	1ea	**2**	**MO**		-	-		-	5,000.00	10,000		-		-	10,000	25%	2,500	12,500
		Pick-up trucks	6ea	**61**	**DY**		-	-		-	900.00	54,720		-		-	54,720	25%	13,680	68,400
		Portable light towers	6ea	**2**	**MO**		-	-		-	22,440.00	44,880		-		-	44,880	25%	11,220	56,100
		Generator	6ea	**2**	**MO**		-	-		-	7,920.00	15,840		-		-	15,840	25%	3,960	19,800
							-	-		-		-		-		-	-		-	-
		Support Labour	*During Road Improvements, Quarry Development & Creek Stabiliztion Work.				-	-		-		-		-		-	-		-	-
		Heavy duty mechanic	1ea/shift	**61**	**DY**		-	-		-	2,640.00	160,512		-		-	160,512	25%	40,128	200,640
		Welder	1ea/shift	**61**	**DY**		-	-		-	2,640.00	160,512		-		-	160,512	25%	40,128	200,640
		Labourer	2ea/shift	**122**	**DY**		-	-		-	1,800.00	218,880		-		-	218,880	25%	54,720	273,600
							-	-		-		-		-		-	-		-	-

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

WorleyParsons resources & energy

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Option CC-A	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
		Asbestos Control					-	-		-		-		-		-	-		-	-
		Equipment washdown facilites	1ea - 80'x120' temprorary building , 300mm SOG, 4ea - 4.5 GPM pressure washers w/ 600Gal tanks, 4man hours / day.	**1**	**EA**		-	-		-	733,293.73	733,294		-		-	733,294	25%	183,323	916,617
		Equipment / vehicle heppa filters,		**1**	**LS**		-	-		-	14,000.00	14,000		-		-	14,000	25%	3,500	17,500
		PPE; respirators, overalls		**50**	**EA**		-	-		-	500.00	25,000		-		-	25,000	25%	6,250	31,250
							-	-		-		-		-		-	-		-	-
		Fuel Transportation	Transport from Dawson City to site (approx 110km one-way).				-	-		-		-		-		-	-		-	-
		Fuel truck & driver	27,000 liter tanker	**7**	**LD**		-	-		-	685.60	5,022		-		-	5,022	25%	1,255	6,277
			*fuel included in all-in rates.	197,767	liters		-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
DIRECT COST SUB TOTAL							**-**	**-**		**-**		**6,927,119**		**-**	**0%**	**-**	**6,927,119**	**25%**	**1,731,780**	**8,658,899**
		TEMPORARY CONSTRUCTION CAMP	40 man temporary camp x 2.75mo.	**3,344**	**MDY**		-	-		-	557.93	1,865,718		-		-	1,865,718	25%	466,429	2,332,147
		TEMPORARY FACILITIES AND CONSTRUCTION SITE SERVICES		**3%**			-	-		-	6,927,119.35	207,814		-		-	207,814	25%	51,953	259,767
		SNOW REMOVAL	n/a				-	-		-		-		-		-	-		-	-
		ROAD MAINTENANCE	1ea Grader 12hrs/day	**75**	**DY**		-	-		-	2,677.20	200,790		-		-	200,790	25%	50,198	250,988
		OVERTIME PREMIUM FOR COMPRESSED WORK WEEK	n/a				-	-		-		-		-		-	-		-	-
		NON-PRODUCTIVE TIME	n/a				-	-		-		-		-		-	-		-	-
		SPOT OVERTIME	n/a				-	-		-		-		-		-	-		-	-
		CONTRACTOR LOA AND TRAVEL	Edm to Dawson City charter flight + DC to Site by charter bus. 1 flight/man every two weeks.	**90**	**Round Trip**		-	-		-	1,144.00	102,960		-		-	102,960	25%	25,740	128,700
		HEAVY LIFT	n/a				-	-		-		-		-		-	-		-	-
		TRANSPORTATION AND FREIGHT	HDPE pipe & aquadam.	**4**	**LD**		-	-		-	9,361.68	37,447		-		-	37,447	25%	9,362	46,808
		CAPITAL SPARE PARTS	n/a				-	-		-		-		-		-	-		-	-
		VENDOR ERECTION SUPERVISION	n/a				-	-		-		-		-		-	-		-	-
		FIRST FILLS	n/a				-	-		-		-		-		-	-		-	-
		ENVIRONMENTAL ASSESSMENT, MONITORING AND TESTING SERVICES		**2%**			-	-		-	6,927,119.35	138,542		-		-	138,542	25%	34,636	173,178
		GEOTECHNICAL INVESTIGATIONS AND RECOMMENDATIONS		**2%**			-	-		-	6,927,119.35	138,542		-		-	138,542	25%	34,636	173,178
		CONSTRUCTION INSURANCE	n/a				-	-		-		-		-		-	-		-	-
		BUILDING PERMITS	n/a				-	-		-		-		-		-	-		-	-
INDIRECT COST SUB TOTAL							**-**	**-**		**-**		**2,691,813**		**-**	**0%**	**-**	**2,691,813**	**25%**	**672,953**	**3,364,766**
		EPCM		**10%**			-	-		-	9,618,932.35	961,893		-		-	961,893	25%	240,473	1,202,367
		OWNERS COSTS					-	-		-		-		-		-	-		-	-
		ESCALATION					-	-		-		-		-		-	-		-	-
OTHER COST SUB TOTAL							**-**	**-**		**-**		**961,893**		**-**	**0%**	**-**	**961,893**	**25%**	**240,473**	**1,202,367**
TOTAL																	**10,580,826**	**25%**	**2,645,206**	**13,226,032**

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

WorleyParsons resources & energy

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Option CC-B	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

DIRECT COSTS

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
							-	-		-		-		-		-	-		-	-
		Equipment Mob / Demob	Edmonton to Dawson City 2,519km. Dawson City to Site	**26**	**EA**		-	-		-	29,170.38	758,430		-		-	758,430	25%	189,607	948,037
							-	-		-		-		-		-	-		-	-
		Major Road Improvements	15km				-	-		-		-		-		-	-		-	-
		Clear & grub	Medium	**9**	**HA**		-	-		-	11,877.51	106,898		-		-	106,898	25%	26,724	133,622
		Road embankment widening, 3m	Cut to fill existing shoulder. Approx 8M3 / LM.	**120,000**	**M3**		-	-		-	4.63	555,600		-		-	555,600	25%	138,900	694,500
		Re-grade road sub-base	Av. 150mm dp x 5m wide	**11,250**	**M3**		-	-		-	12.57	141,413		-		-	141,413	25%	35,353	176,766
		Gravel resurfacing, 100mm thk x 8m wide	Drill & blast, crushing, load & haul and place.	**12,000**	**M3**		-	-		-	161.33	1,935,960		-		-	1,935,960	25%	483,990	2,419,950
		Bridge construction	15m clear span x 11m w. Supply & install.	**1**	**LS**		-	-		-	889,246.48	889,246		-		-	889,246	25%	222,312	1,111,558
							-	-		-		-		-		-	-		-	-
		Bulk Earthworks					-	-		-		-		-		-	-		-	-
		New channel to channel fill	Equip Set 2	**600,000**	**M3**		-	-		-	3.95	2,370,000		-		-	2,370,000	25%	592,500	2,962,500
		Waste dump to channel fill	1ea-D8 w/ 345 ex; push top of existing channel to fill channel bed.	**100,000**	**M3**		-	-		-	5.22	522,000		-		-	522,000	25%	130,500	652,500
		Channel to porupine pit	Equip Set 1	**900,000**	**M3**		-	-		-	4.90	4,410,000		-		-	4,410,000	25%	1,102,500	5,512,500
		Waste dump to porcupine pit	Equip Set 1	**350,000**	**M3**		-	-		-	4.90	1,715,000		-		-	1,715,000	25%	428,750	2,143,750
							-	-		-		-		-		-	-		-	-
		Access Road Construction					-	-		-		-		-		-	-		-	-
		Gravel resurfacing, 300mm thk x 6m wide	Drill & blast, crushing, load & haul and place.	**1,350**	**M3**		-	-		-	161.33	217,796		-		-	217,796	25%	54,449	272,244
							-	-		-		-		-		-	-		-	-
		Gabion Drop Structures					-	-		-		-		-		-	-		-	-
		Gabion baskets (3m lg x 1m dp x 0.5m h)	Supply, load, haul, assemble, place	**1,250**	**EA**		-	-		-	638.72	798,400		-		-	798,400	25%	199,600	998,000
		Gabion rock - 100 to 200 mm dia.	(8 drop structures) Drill & blast, screen & sort, load & haul to site, double handling and place.	**1,850**	**M3**		-	-		-	118.15	218,578		-		-	218,578	25%	54,644	273,222
		Rip-rap - 300mm dia.	Drill & blast, screen & sort, load & haul to site, double handling and place.	**1,100**	**M3**		-	-		-	128.32	141,152		-		-	141,152	25%	35,288	176,440
		Geotextile 10oz	Under cobble layer.	**5,300**	**M2**		-	-		-	3.62	19,186		-		-	19,186	25%	4,797	23,983
							-	-		-		-		-		-	-		-	-
		Channel Armouring					-	-		-		-		-		-	-		-	-
		Rip-rap - 500mm dia.	Drill & blast, screen & sort, load & haul to site, double handling and place.	**6,525**	**M3**		-	-		-	128.32	837,288		-		-	837,288	25%	209,322	1,046,610
		Geotextile 10oz	Under cobble layer.	**9,700**	**M2**		-	-		-	3.62	35,114		-		-	35,114	25%	8,779	43,893
							-	-		-		-		-		-	-		-	-
		Support Equipment					-	-		-		-		-		-	-		-	-
		Shop truck	1ea	**213**	**DY**		-	-		-	300.00	63,840		-		-	63,840	25%	15,960	79,800
		Temp maintenance shop	1ea	**1**	**LS**		-	-		-	15,000.00	15,000		-		-	15,000	25%	3,750	18,750
		Shop trailer	1ea	**7**	**MO**		-	-		-	2,000.00	14,000		-		-	14,000	25%	3,500	17,500
		Fuel bowser	1ea	**7**	**MO**		-	-		-	5,000.00	35,000		-		-	35,000	25%	8,750	43,750
		Pick-up trucks	6ea	**213**	**DY**		-	-		-	900.00	191,520		-		-	191,520	25%	47,880	239,400
		Portable light towers	6ea	**7**	**MO**		-	-		-	22,440.00	157,080		-		-	157,080	25%	39,270	196,350
		Generator	6ea	**7**	**MO**		-	-		-	7,920.00	55,440		-		-	55,440	25%	13,860	69,300
							-	-		-		-		-		-	-		-	-
		Support Labour	*During Road Improvements, Quarry Development & Creek Stabiliztion Work.				-	-		-		-		-		-	-		-	-
		Heavy duty mechanic	1ea/shift	**91**	**DY**		-	-		-	2,640.00	240,768		-		-	240,768	25%	60,192	300,960
		Welder	1ea/shift	**91**	**DY**		-	-		-	2,640.00	240,768		-		-	240,768	25%	60,192	300,960
		Labourer	2ea/shift	**182**	**DY**		-	-		-	1,800.00	328,320		-		-	328,320	25%	82,080	410,400

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

WorleyParsons
resources & energy

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Option CC-B	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
							-	-		-		-		-		-	-		-	-
		Asbestos Control					-	-		-		-		-		-	-		-	-
		Equipment washdown facilites	1ea - 80'x120' temprorary building , 300mm SOG, 4ea - 4.5 GPM pressure washers w/ 600Gal tanks, 4man hours / day.	**1**	**EA**		-	-		-	797,158.05	797,158		-		-	797,158	25%	199,290	996,448
		Equipment / vehicle heppa filters,		**1**	**LS**		-	-		-	26,000.00	26,000		-		-	26,000	25%	6,500	32,500
		PPE; respirators, overalls		**60**	**EA**		-	-		-	500.00	30,000		-		-	30,000	25%	7,500	37,500
							-	-		-		-		-		-	-		-	-
		Fuel Transportation	Transport from Dawson City to site (approx 110km one-way).				-	-		-		-		-		-	-		-	-
		Fuel truck & driver	27,000 liter tanker	**66**	**LD**		-	-		-	685.60	44,997		-		-	44,997	25%	11,249	56,246
			*fuel included in all-in rates.	1,772,042	liters		-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
DIRECT COST SUB TOTAL							**-**	**-**		**-**		**17,911,950**		**-**	**0%**	**-**	**17,911,950**	**25%**	**4,477,988**	**22,389,938**

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

WorleyParsons resources & energy

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Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
INDIRECT COSTS																				
		TEMPORARY CONSTRUCTION CAMP	60 man temporary camp x 7.5mo.	**12,768**	**MDY**		-	-		-	408.10	5,210,621		-		-	5,210,621	25%	1,302,655	6,513,276
		TEMPORARY CAMP - MAINTENANCE	Winterize & Rental	**10**	**MO**		-	-			129,070.00	1,290,700		-		-	1,290,700	25%	322,675	1,613,375
		TEMPORARY FACILITIES AND CONSTRUCTION SITE SERVICES	n/a	**3%**			-	-		-	17,911,950.12	537,359		-		-	537,359	25%	134,340	671,698
		SNOW REMOVAL	n/a				-	-		-				-		-	-		-	-
		ROAD MAINTENANCE	1ea Grader 12hrs/day	**213**	**DY**		-	-		-	2,677.20	569,708		-		-	569,708	25%	142,427	712,135
		OVERTIME PREMIUM FOR COMPRESSED WORK WEEK	n/a				-	-		-		-		-		-	-		-	-
		NON-PRODUCTIVE TIME	n/a				-	-		-		-		-		-	-		-	-
		SPOT OVERTIME	n/a				-	-		-		-		-		-	-		-	-
		CONTRACTOR LOA AND TRAVEL	Edm to Dawson City charter flight (42 pass) + DC to Site by charter bus. 1 flight per week for 7.5 months.	**30**	**Round Trip**		-	-		-	56,000.00	1,680,000		-		-	1,680,000	25%	420,000	2,100,000
		HEAVY LIFT	n/a				-	-		-		-		-		-	-		-	-
		TRANSPORTATION AND FREIGHT	n/a				-	-		-		-		-		-	-		-	-
		CAPITAL SPARE PARTS	n/a				-	-		-		-		-		-	-		-	-
		VENDOR ERECTION SUPERVISION	n/a				-	-		-		-		-		-	-		-	-
		FIRST FILLS	n/a				-	-		-		-		-		-	-		-	-
		ENVIRONMENTAL ASSESSMENT, MONITORING AND TESTING SERVICES		**2%**			-	-		-	17,911,950.12	358,239		-		-	358,239	25%	89,560	447,799
		GEOTECHNICAL INVESTIGATIONS AND RECOMMENDATIONS		**2%**			-	-		-	17,911,950.12	358,239		-		-	358,239	25%	89,560	447,799
		CONSTRUCTION INSURANCE	n/a				-	-		-		-		-		-	-		-	-
		BUILDING PERMITS	n/a				-	-		-		-		-		-	-		-	-
INDIRECT COST SUB TOTAL							**-**	**-**		**-**		**10,004,865**		**-**	**0%**	**-**	**10,004,865**	**25%**	**2,501,216**	**12,506,082**
OTHER COSTS																				
		EPCM		**10%**			-	-		-	27,916,815.59	2,791,682		-		-	2,791,682	25%	697,920	3,489,602
		OWNERS COSTS					-	-		-		-		-		-	-		-	-
		ESCALATION					-	-		-		-		-		-	-		-	-
OTHER COST SUB TOTAL							**-**	**-**		**-**		**2,791,682**		**-**	**0%**	**-**	**2,791,682**	**25%**	**697,920**	**3,489,602**
TOTAL																	**30,708,497**	**25%**	**7,677,124**	**38,385,621**

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

WorleyParsons resources & energy

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Option CC-B2	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

DIRECT COSTS

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
							-	-		-		-		-		-	-		-	-
		Equipment Mob / Demob	Edmonton to Dawson City 2,519km. Dawson City to Site	**26**	**EA**		-	-		-	29,170.38	758,430		-		-	758,430	25%	189,607	948,037
							-	-		-		-		-		-	-		-	-
		Major Road Improvements	15km				-	-		-		-		-		-	-		-	-
		Clear & grub	Medium	**9**	**HA**		-	-		-	11,877.51	106,898		-		-	106,898	25%	26,724	133,622
		Road embankment widening, 3m	Cut to fill existing shoulder. Approx 8M3 / LM.	**120,000**	**M3**		-	-		-	4.63	555,600		-		-	555,600	25%	138,900	694,500
		Re-grade road sub-base	Av. 150mm dp x 5m wide	**11,250**	**M3**		-	-		-	12.57	141,413		-		-	141,413	25%	35,353	176,766
		Gravel resurfacing, 100mm thk x 8m wide	Drill & blast, crushing, load & haul and place.	**12,000**	**M3**		-	-		-	159.23	1,910,760		-		-	1,910,760	25%	477,690	2,388,450
		Bridge construction	15m clear span x 11m w. Supply & install.	**1**	**LS**		-	-		-	889,246.48	889,246		-		-	889,246	25%	222,312	1,111,558
							-	-		-		-		-		-	-		-	-
		Bulk Earthworks					-	-		-		-		-		-	-		-	-
		New Channel to Channel Fill	Equip Set 2	**600,000**	**M3**		-	-		-	3.95	2,370,000		-		-	2,370,000	25%	592,500	2,962,500
		Waste Dump to Channel Fill	1ea-D8 w/ 345 ex; push top of existing channel to fill channel bed.	**100,000**	**M3**		-	-		-	5.22	522,000		-		-	522,000	25%	130,500	652,500
		Channel to Porupine Pit	Equip Set 1	**900,000**	**M3**		-	-		-	4.90	4,410,000		-		-	4,410,000	25%	1,102,500	5,512,500
		Waste Dump to Porcupine Pit	Equip Set 1	**350,000**	**M3**		-	-		-	4.90	1,715,000		-		-	1,715,000	25%	428,750	2,143,750
							-	-		-		-		-		-	-		-	-
		Access Road Construction					-	-		-		-		-		-	-		-	-
		Gravel resurfacing, 300mm thk x 6m wide	Drill & blast, crushing, load & haul and place.	**1,350**	**M3**		-	-		-	159.23	214,961		-		-	214,961	25%	53,740	268,701
							-	-		-		-		-		-	-		-	-
		Channel Armouring					-	-		-		-		-		-	-		-	-
		Rip-rap - 500mm dia.	Drill & blast, screen & sort, load & haul to site, double handling and place.	**6,525**	**M3**		-	-		-	125.11	816,343		-		-	816,343	25%	204,086	1,020,428
		Rip-rap - 800 mm dia.	Drill & blast, screen & sort, load & haul to site, double handling and place.	**7,100**	**M3**		-	-		-	135.28	960,488		-		-	960,488	25%	240,122	1,200,610
		Granular filter	Drill & blast, crushing, load & haul and place.	**5,200**	**M3**		-	-		-	155.70	809,640		-		-	809,640	25%	202,410	1,012,050
		Geotextile 10oz	Under cobble layer.	**9,700**	**M2**		-	-		-	3.62	35,114		-		-	35,114	25%	8,779	43,893
							-	-		-		-		-		-	-		-	-
		Support Equipment					-	-		-		-		-		-	-		-	-
		Shop truck	1ea	**213**	**DY**		-	-		-	300.00	63,840		-		-	63,840	25%	15,960	79,800
		Temp maintenance shop	1ea	**1**	**LS**		-	-		-	15,000.00	15,000		-		-	15,000	25%	3,750	18,750
		Shop trailer	1ea	**7**	**MO**		-	-		-	2,000.00	14,000		-		-	14,000	25%	3,500	17,500
		Fuel bowser	1ea	**7**	**MO**		-	-		-	5,000.00	35,000		-		-	35,000	25%	8,750	43,750
		Pick-up trucks	6ea	**213**	**DY**		-	-		-	900.00	191,520		-		-	191,520	25%	47,880	239,400
		Portable light towers	6ea	**7**	**MO**		-	-		-	22,440.00	157,080		-		-	157,080	25%	39,270	196,350
		Generator	6ea	**7**	**MO**		-	-		-	7,920.00	55,440		-		-	55,440	25%	13,860	69,300

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Option CC-B2	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

WorleyParsons
resources & energy

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
							-	-		-		-		-		-	-		-	-
		Support Labour	*During Road Improvements, Quarry Development & Creek Stabiliztion Work.				-	-		-		-		-		-	-		-	-
		Heavy duty mechanic	1ea/shift	**91**	**DY**		-	-		-	2,640.00	240,768		-		-	240,768	25%	60,192	300,960
		Welder	1ea/shift	**91**	**DY**		-	-		-	2,640.00	240,768		-		-	240,768	25%	60,192	300,960
		Labourer	2ea/shift	**182**	**DY**		-	-		-	1,800.00	328,320		-		-	328,320	25%	82,080	410,400
							-	-		-		-		-		-	-		-	-
		Asbestos Control					-	-		-		-		-		-	-		-	-
		Equipment washdown facilites	1ea - 80'x120' temprorary building , 300mm SOG, 4ea - 4.5 GPM pressure washers w/ 600Gal tanks, 4man hours / day.	**1**	**EA**		-	-		-	797,158.05	797,158		-		-	797,158	25%	199,290	996,448
		Equipment / vehicle heppa filters,		**1**	**LS**		-	-		-	26,000.00	26,000		-		-	26,000	25%	6,500	32,500
		PPE; respirators, overalls		**60**	**EA**		-	-		-	500.00	30,000		-		-	30,000	25%	7,500	37,500
							-	-		-		-		-		-	-		-	-
		Fuel Transportation	Transport from Dawson City to site (approx 110km one-way).				-	-		-		-		-		-	-		-	-
		Fuel truck & driver	27,000 liter tanker	**66**	**LD**		-	-		-	685.60	44,997		-		-	44,997	25%	11,249	56,246
			*fuel included in all-in rates.	1,772,042	liters		-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
DIRECT COST SUB TOTAL							**-**	**-**		**-**		**18,455,782**		**-**	**0%**	**-**	**18,455,782**	**25%**	**4,613,946**	**23,069,728**

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

WorleyParsons resources & energy

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Option CC-B2	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
INDIRECT COSTS																				
		TEMPORARY CONSTRUCTION CAMP	60 man temporary camp x 6.75mo.	**12,312**	**MDY**		-	-		-	434.86	5,353,996		-		-	5,353,996	25%	1,338,499	6,692,495
		TEMPORARY CAMP - MAINTENANCE	Winterize & Rental	**10**	**MO**		-	-			129,070.00	1,290,700		-		-	1,290,700	25%	322,675	1,613,375
		TEMPORARY FACILITIES AND CONSTRUCTION SITE SERVICES	n/a	**3%**			-	-		-	18,455,782.37	553,673		-		-	553,673	25%	138,418	692,092
		SNOW REMOVAL	n/a				-	-		-				-		-	-		-	-
		ROAD MAINTENANCE	1ea Grader 12hrs/day	**213**	**DY**		-	-		-	2,677.20	569,708		-		-	569,708	25%	142,427	712,135
		OVERTIME PREMIUM FOR COMPRESSED WORK WEEK	n/a				-	-		-		-		-		-	-		-	-
		NON-PRODUCTIVE TIME	n/a				-	-		-		-		-		-	-		-	-
		SPOT OVERTIME	n/a				-	-		-		-		-		-	-		-	-
		CONTRACTOR LOA AND TRAVEL	Edm to Dawson City charter flight (42 pass) + DC to Site by charter bus. 1 flight per week for 6.75 months.	**27**	**Round Trip**		-	-		-	56,000.00	1,512,000		-		-	1,512,000	25%	378,000	1,890,000
		HEAVY LIFT	n/a				-	-		-		-		-		-	-		-	-
		TRANSPORTATION AND FREIGHT	n/a				-	-		-		-		-		-	-		-	-
		CAPITAL SPARE PARTS	n/a				-	-		-		-		-		-	-		-	-
		VENDOR ERECTION SUPERVISION	n/a				-	-		-		-		-		-	-		-	-
		FIRST FILLS	n/a				-	-		-		-		-		-	-		-	-
		ENVIRONMENTAL ASSESSMENT, MONITORING AND TESTING SERVICES		**2%**			-	-		-	18,455,782.37	369,116		-		-	369,116	25%	92,279	461,395
		GEOTECHNICAL INVESTIGATIONS AND RECOMMENDATIONS		**2%**			-	-		-	18,455,782.37	369,116		-		-	369,116	25%	92,279	461,395
		CONSTRUCTION INSURANCE	n/a				-	-		-		-		-		-	-		-	-
		BUILDING PERMITS	n/a				-	-		-		-		-		-	-		-	-
INDIRECT COST SUB TOTAL							**-**	**-**		**-**		**10,018,309**		**-**	**0%**	**-**	**10,018,309**	**25%**	**2,504,577**	**12,522,887**
OTHER COSTS																				
		EPCM		**10%**			-	-		-	28,474,091.61	2,847,409		-		-	2,847,409	25%	711,852	3,559,261
		OWNERS COSTS					-	-		-		-		-		-	-		-	-
		ESCALATION					-	-		-		-		-		-	-		-	-
OTHER COST SUB TOTAL							**-**	**-**		**-**		**2,847,409**		**-**	**0%**	**-**	**2,847,409**	**25%**	**711,852**	**3,559,261**
TOTAL																	**31,321,501**	**25%**	**7,830,375**	**39,151,876**

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

WorleyParsons
resources & energy

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Option CC-C	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
DIRECT COSTS																				
							-	-		-		-		-		-	-		-	-
		Equipment Mob / Demob	Edmonton to Dawson City 2,519km. Dawson City to Site	**15**	**EA**		-	-		-	18,723.36	280,850		-		-	280,850	25%	70,213	351,063
							-	-		-		-		-		-	-		-	-
		Major Road Improvements	15km				-	-		-		-		-		-	-		-	-
		Clear & grub	Medium	**9**	**HA**		-	-		-	11,877.51	106,898		-		-	106,898	25%	26,724	133,622
		Road embankment widening, 3m	Cut to fill existing shoulder. Approx 8M3 / LM.	**120,000**	**M3**		-	-		-	4.63	555,600		-		-	555,600	25%	138,900	694,500
		Re-grade road sub-base	Av. 150mm dp x 5m wide	**11,250**	**M3**		-	-		-	12.57	141,413		-		-	141,413	25%	35,353	176,766
		Gravel resurfacing, 100mm thk x 8m wide	Drill & blast, crushing, load & haul and place.	**12,000**	**M3**		-	-		-	123.30	1,479,600		-		-	1,479,600	25%	369,900	1,849,500
		Bridge construction	15m clear span x 11m w. Supply & install.	**1**	**LS**		-	-		-	889,246.48	889,246		-		-	889,246	25%	222,312	1,111,558
							-	-		-		-		-		-	-		-	-
		Bulk Earthworks					-	-		-		-		-		-	-		-	-
		Waste dump to channel fill	1ea-D8 w/ 345 ex; push top of existing channel to fill channel bed.	**25,000**	**M3**		-	-		-	5.22	130,500		-		-	130,500	25%	32,625	163,125
		Waste dump to porcupine pit	Equip Set 1	**150,000**	**M3**		-	-		-	4.90	735,000		-		-	735,000	25%	183,750	918,750
							-	-		-		-		-		-	-		-	-
		Access Road Construction					-	-		-		-		-		-	-		-	-
		Gravel resurfacing, 300mm thk x 6m wide	Drill & blast, crushing, load & haul and place.	**990**	**M3**		-	-		-	156.92	155,351		-		-	155,351	25%	38,838	194,189
							-	-		-		-		-		-	-		-	-
		Gabion Drop Structures					-	-		-		-		-		-	-		-	-
		Gabion baskets (3m lg x 1m dp x 0.5m h)	Supply, load, haul, assemble, place	**1,250**	**EA**		-	-		-	638.72	798,400		-		-	798,400	25%	199,600	998,000
		Gabion rock - 100 to 200 mm dia.	(8 drop structures) Drill & blast, screen & sort, load & haul to site, double handling and place.	**1,850**	**M3**		-	-		-	111.51	206,294		-		-	206,294	25%	51,573	257,867
		Rip-rap - 300 mm dia.	Drill & blast, screen & sort, load & haul to site, double handling and place.	**1,100**	**M3**		-	-		-	121.68	133,848		-		-	133,848	25%	33,462	167,310
		Geotextile 10oz	Under cobble layer.	**5,300**	**M2**		-	-		-	3.62	19,186		-		-	19,186	25%	4,797	23,983
							-	-		-		-		-		-	-		-	-
		Water Diversion					-	-		-		-		-		-	-		-	-
		Aquadam - supply & install	6' x 100' lg.	**1**	**EA**		-	-		-	26,000.00	26,000		-		-	26,000	25%	6,500	32,500
		610mm HDPE DR21 pipe	Trench 1.6m dp, BF 1m cover, supply & install.	**900**	**LM**		-	-		-	980.07	882,065		-		-	882,065	25%	220,516	1,102,581
							-	-		-		-		-		-	-		-	-
		Support Equipment					-	-		-		-		-		-	-		-	-
		Shop truck	1ea	**61**	**DY**		-	-		-	300.00	18,240		-		-	18,240	25%	4,560	22,800
		Temp maintenance shop	1ea	**1**	**LS**		-	-		-	15,000.00	15,000		-		-	15,000	25%	3,750	18,750
		Shop trailer	1ea	**2**	**MO**		-	-		-	2,000.00	4,000		-		-	4,000	25%	1,000	5,000
		Fuel bowser	1ea on-site	**2**	**MO**		-	-		-	5,000.00	10,000		-		-	10,000	25%	2,500	12,500
		Pick-up trucks	6ea	**61**	**DY**		-	-		-	900.00	54,720		-		-	54,720	25%	13,680	68,400
		Portable light towers	6ea	**2**	**MO**		-	-		-	22,440.00	44,880		-		-	44,880	25%	11,220	56,100
		Generator	6ea	**2**	**MO**		-	-		-	7,920.00	15,840		-		-	15,840	25%	3,960	19,800
							-	-		-		-		-		-	-		-	-
		Support Labour	*During Road Improvements, Quarry Development & Creek Stabiliztion Work.				-	-		-		-		-		-	-		-	-
		Heavy duty mechanic	1ea/shift	**61**	**DY**		-	-		-	2,640.00	160,512		-		-	160,512	25%	40,128	200,640
		Welder	1ea/shift	**61**	**DY**		-	-		-	2,640.00	160,512		-		-	160,512	25%	40,128	200,640
		Labourer	2ea/shift	**122**	**DY**		-	-		-	1,800.00	218,880		-		-	218,880	25%	54,720	273,600
							-	-		-		-		-		-	-		-	-
		Asbestos Control					-	-		-		-		-		-	-		-	-

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

WorleyParsons resources & energy

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Option CC-C	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
		Equipment washdown facilites	1ea - 80'x120' temprorary building , 300mm SOG, 4ea - 4.5 GPM pressure washers w/ 600Gal tanks, 4man hours / day.	**1**	**EA**		-	-		-	733,293.73	733,294		-		-	733,294	25%	183,323	916,617
		Equipment / vehicle heppa filters,		**1**	**LS**		-	-		-	15,000.00	15,000		-		-	15,000	25%	3,750	18,750
		PPE; respirators, overalls		**50**	**EA**		-	-		-	500.00	25,000		-		-	25,000	25%	6,250	31,250
							-	-		-		-		-		-	-		-	-
		Fuel Transportation	Transport from Dawson City to site (approx 110km one-way).				-	-		-		-		-		-	-		-	-
		Fuel truck & driver	27,000 liter tanker	**13**	**LD**		-	-		-	685.60	8,913		-		-	8,913	25%	2,228	11,141
			*fuel included in all-in rates.	329,027	liters		-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
DIRECT COST SUB TOTAL							**-**	**-**		**-**		**8,025,041**		**-**	**0%**	**-**	**8,025,041**	**25%**	**2,006,260**	**10,031,301**
INDIRECT COSTS																				
		TEMPORARY CONSTRUCTION CAMP	40 man temporary camp x 5mo.	**6,080**	**MDY**		-	-		-	534.80	3,251,584		-		-	3,251,584	25%	812,896	4,064,480
		TEMPORARY FACILITIES AND CONSTRUCTION SITE SERVICES		**3%**			-	-		-	8,025,040.96	240,751		-		-	240,751	25%	60,188	300,939
		SNOW REMOVAL	n/a				-	-		-		-		-		-	-		-	-
		ROAD MAINTENANCE	1ea grader 12hrs/day	**152**	**DY**		-	-		-	2,677.20	406,934		-		-	406,934	25%	101,734	508,668
		OVERTIME PREMIUM FOR COMPRESSED WORK WEEK	n/a				-	-		-		-		-		-	-		-	-
		NON-PRODUCTIVE TIME	n/a				-	-		-		-		-		-	-		-	-
		SPOT OVERTIME	n/a				-	-		-		-		-		-	-		-	-
		CONTRACTOR LOA AND TRAVEL	Edm to Dawson City charter flight + DC to Site by charter bus. 1 flight/man every two weeks.	**600**	**Round Trip**		-	-		-	1,144.00	686,400		-		-	686,400	25%	171,600	858,000
		HEAVY LIFT	n/a				-	-		-		-		-		-	-		-	-
		TRANSPORTATION AND FREIGHT	HDPE pipe & aquadam.	**6**	**LD**		-	-		-	9,361.68	56,170		-		-	56,170	25%	14,043	70,213
		CAPITAL SPARE PARTS	n/a				-	-		-		-		-		-	-		-	-
		VENDOR ERECTION SUPERVISION	n/a				-	-		-		-		-		-	-		-	-
		FIRST FILLS	n/a				-	-		-		-		-		-	-		-	-
		ENVIRONMENTAL ASSESSMENT, MONITORING AND TESTING SERVICES		**2%**			-	-		-	8,025,040.96	160,501		-		-	160,501	25%	40,125	200,626
		GEOTECHNICAL INVESTIGATIONS AND RECOMMENDATIONS		**2%**			-	-		-	8,025,040.96	160,501		-		-	160,501	25%	40,125	200,626
		CONSTRUCTION INSURANCE	n/a				-	-		-		-		-		-	-		-	-
		BUILDING PERMITS	n/a				-	-		-		-		-		-	-		-	-
INDIRECT COST SUB TOTAL							**-**	**-**		**-**		**4,962,841**		**-**	**0%**	**-**	**4,962,841**	**25%**	**1,240,710**	**6,203,552**
OTHER COSTS																				
		EPCM		**10%**			-	-		-	12,987,882.30	1,298,788		-		-	1,298,788	25%	324,697	1,623,485
		OWNERS COSTS					-	-		-		-		-		-	-		-	-
		ESCALATION					-	-		-		-		-		-	-		-	-
OTHER COST SUB TOTAL							**-**	**-**		**-**		**1,298,788**		**-**	**0%**	**-**	**1,298,788**	**25%**	**324,697**	**1,623,485**
TOTAL																	**14,286,671**	**25%**	**3,571,668**	**17,858,338**

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

WorleyParsons resources & energy

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Option CC-C2	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

DIRECT COSTS

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
							-	-		-		-		-		-	-		-	-
		Equipment Mob / Demob	Edmonton to Dawson City 2,519km. Dawson City to Site	**15**	**EA**		-	-		-	18,723.36	280,850		-		-	280,850	25%	70,213	351,063
							-	-		-		-		-		-	-		-	-
		Major Road Improvements	15km				-	-		-		-		-		-	-		-	-
		Clear & grub	Medium	**9**	**HA**		-	-		-	11,877.51	106,898		-		-	106,898	25%	26,724	133,622
		Road embankment widening, 3m	Cut to fill existing shoulder. Approx 8M3 / LM.	**120,000**	**M3**		-	-		-	4.63	555,600		-		-	555,600	25%	138,900	694,500
		Re-grade road sub-base	Av. 150mm dp x 5m wide	**11,250**	**M3**		-	-		-	12.57	141,413		-		-	141,413	25%	35,353	176,766
		Gravel resurfacing, 100mm thk x 8m wide	Drill & blast, crushing, load & haul and place.	**12,000**	**M3**		-	-		-	159.61	1,915,320		-		-	1,915,320	25%	478,830	2,394,150
		Bridge construction	15m clear span x 11m w. Supply & install.	**1**	**LS**		-	-		-	889,246.48	889,246		-		-	889,246	25%	222,312	1,111,558
							-	-		-		-		-		-	-		-	-
		Bulk Earthworks					-	-		-		-		-		-	-		-	-
		Waste dump to channel fill	1ea-D8 w/ 345 ex; push top of existing channel to fill channel bed.	**25,000**	**M3**		-	-		-	5.22	130,500		-		-	130,500	25%	32,625	163,125
		Waste dump to porcupine pit	Equip Set 1	**150,000**	**M3**		-	-		-	4.90	735,000		-		-	735,000	25%	183,750	918,750
							-	-		-		-		-		-	-		-	-
		Access Road Construction					-	-		-		-		-		-	-		-	-
		Gravel resurfacing, 300mm thk x 6m wide	Drill & blast, crushing, load & haul and place.	**990**	**M3**		-	-		-	159.61	158,014		-		-	158,014	25%	39,503	197,517
							-	-		-		-		-		-	-		-	-
		Channel Armouring					-	-		-		-		-		-	-		-	-
		Rip-rap - 500mm dia.	Drill & blast, screen & sort, load & haul to site, double handling and place.	**6,100**	**M3**		-	-		-	130.06	793,366		-		-	793,366	25%	198,342	991,708
		Geotextile 10oz	Under cobble layer.	**9,700**	**M2**		-	-		-	3.62	35,114		-		-	35,114	25%	8,779	43,893
							-	-		-		-		-		-	-		-	-
		Water Diversion					-	-		-		-		-		-	-		-	-
		Aquadam - supply & install	6' x 100' lg.	**1**	**EA**		-	-		-	26,000.00	26,000		-		-	26,000	25%	6,500	32,500
		610mm HDPE DR21 pipe	Trench 1.6m dp, BF 1m cover, supply & install.	**900**	**LM**		-	-		-	980.07	882,065		-		-	882,065	25%	220,516	1,102,581
							-	-		-		-		-		-	-		-	-
		Support Equipment					-	-		-		-		-		-	-		-	-
		Shop truck	1ea	**61**	**DY**		-	-		-	300.00	18,240		-		-	18,240	25%	4,560	22,800
		Temp maintenance shop	1ea	**1**	**LS**		-	-		-	15,000.00	15,000		-		-	15,000	25%	3,750	18,750
		Shop trailer	1ea	**2**	**MO**		-	-		-	2,000.00	4,000		-		-	4,000	25%	1,000	5,000
		Fuel bowser	1ea on-site	**2**	**MO**		-	-		-	5,000.00	10,000		-		-	10,000	25%	2,500	12,500
		Pick-up trucks	6ea	**61**	**DY**		-	-		-	900.00	54,720		-		-	54,720	25%	13,680	68,400
		Portable light towers	6ea	**2**	**MO**		-	-		-	22,440.00	44,880		-		-	44,880	25%	11,220	56,100
		Generator	6ea	**2**	**MO**		-	-		-	7,920.00	15,840		-		-	15,840	25%	3,960	19,800
							-	-		-		-		-		-	-		-	-
		Support Labour	*During Road Improvements, Quarry Development & Creek Stabiliztion Work.				-	-		-		-		-		-	-		-	-
		Heavy duty mechanic	1ea/shift	**61**	**DY**		-	-		-	2,640.00	160,512		-		-	160,512	25%	40,128	200,640
		Welder	1ea/shift	**61**	**DY**		-	-		-	2,640.00	160,512		-		-	160,512	25%	40,128	200,640
		Labourer	2ea/shift	**122**	**DY**		-	-		-	1,800.00	218,880		-		-	218,880	25%	54,720	273,600
							-	-		-		-		-		-	-		-	-
		Asbestos Control					-	-		-		-		-		-	-		-	-
		Equipment washdown facilites	1ea - 80'x120' temprorary building , 300mm SOG, 4ea - 4.5 GPM pressure washers w/ 600Gal tanks, 4man hours / day.	**1**	**EA**		-	-		-	733,293.73	733,294		-		-	733,294	25%	183,323	916,617
		Equipment / vehicle heppa filters,		**1**	**LS**		-	-		-	15,000.00	15,000		-		-	15,000	25%	3,750	18,750
		PPE; respirators, overalls		**40**	**EA**		-	-		-	500.00	20,000		-		-	20,000	25%	5,000	25,000

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

WorleyParsons resources & energy

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Option CC-C2	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
							-	-		-		-		-		-	-		-	-
		Fuel Transportation	Transport from Dawson City to site (approx 110km one-way).				-	-		-		-		-		-	-		-	-
		Fuel truck & driver	27,000 liter tanker	**13**	**LD**		-	-		-	685.60	8,913		-		-	8,913	25%	2,228	11,141
			*fuel included in all-in rates.	329,027	liters		-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
DIRECT COST SUB TOTAL							**-**	**-**		**-**		**8,129,177**		**-**	**0%**	**-**	**8,129,177**	**25%**	**2,032,294**	**10,161,471**
INDIRECT COSTS																				
		TEMPORARY CONSTRUCTION CAMP	40 man temporary camp x 4mo.	**4,864**	**MDY**		-	-		-	595.97	2,898,798		-		-	2,898,798	25%	724,700	3,623,498
		TEMPORARY FACILITIES AND CONSTRUCTION SITE SERVICES		**3%**			-	-		-	8,129,176.56	243,875		-		-	243,875	25%	60,969	304,844
		SNOW REMOVAL	n/a				-	-		-		-		-		-	-		-	-
		ROAD MAINTENANCE	1ea Grader 12hrs/day	**152**	**DY**		-	-		-	2,677.20	406,934		-		-	406,934	25%	101,734	508,668
		OVERTIME PREMIUM FOR COMPRESSED WORK WEEK	n/a				-	-		-		-		-		-	-		-	-
		NON-PRODUCTIVE TIME	n/a				-	-		-		-		-		-	-		-	-
		SPOT OVERTIME	n/a				-	-		-		-		-		-	-		-	-
		CONTRACTOR LOA AND TRAVEL	Edm to Dawson City charter flight + DC to Site by charter bus. 1 flight/man every two weeks.	**320**	**Round Trip**		-	-		-	1,144.00	366,080		-		-	366,080	25%	91,520	457,600
		HEAVY LIFT	n/a				-	-		-		-		-		-	-		-	-
		TRANSPORTATION AND FREIGHT	HDPE pipe & aquadam.	**6**	**LD**		-	-		-	9,361.68	56,170		-		-	56,170	25%	14,043	70,213
		CAPITAL SPARE PARTS	n/a				-	-		-		-		-		-	-		-	-
		VENDOR ERECTION SUPERVISION	n/a				-	-		-		-		-		-	-		-	-
		FIRST FILLS	n/a				-	-		-		-		-		-	-		-	-
		ENVIRONMENTAL ASSESSMENT, MONITORING AND TESTING SERVICES		**2%**			-	-		-	8,129,176.56	162,584		-		-	162,584	25%	40,646	203,229
		GEOTECHNICAL INVESTIGATIONS AND RECOMMENDATIONS		**2%**			-	-		-	8,129,176.56	162,584		-		-	162,584	25%	40,646	203,229
		CONSTRUCTION INSURANCE	n/a				-	-		-		-		-		-	-		-	-
		BUILDING PERMITS	n/a				-	-		-		-		-		-	-		-	-
INDIRECT COST SUB TOTAL							**-**	**-**		**-**		**4,297,025**		**-**	**0%**	**-**	**4,297,025**	**25%**	**1,074,256**	**5,371,281**
OTHER COSTS																				
		EPCM		**10%**			-	-		-	12,426,201.48	1,242,620		-		-	1,242,620	25%	310,655	1,553,275
		OWNERS COSTS					-	-		-		-		-		-	-		-	-
		ESCALATION					-	-		-		-		-		-	-		-	-
OTHER COST SUB TOTAL							**-**	**-**		**-**		**1,242,620**		**-**	**0%**	**-**	**1,242,620**	**25%**	**310,655**	**1,553,275**
TOTAL																	**13,668,822**	**25%**	**3,417,205**	**17,086,027**

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

WorleyParsons
resources & energy

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Option CC-C3	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

DIRECT COSTS

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
							-	-		-		-		-		-	-		-	-
		Equipment Mob / Demob	Edmonton to Dawson City 2,519km. Dawson City to Site	**15**	**EA**		-	-		-	18,723.36	280,850		-		-	280,850	25%	70,213	351,063
							-	-		-		-		-		-	-		-	-
		Major Road Improvements	15km				-	-		-		-		-		-	-		-	-
		Clear & grub	Medium	**9**	**HA**		-	-		-	11,877.51	106,898		-		-	106,898	25%	26,724	133,622
		Road embankment widening, 3m	Cut to fill existing shoulder. Approx 8M3 / LM.	**120,000**	**M3**		-	-		-	4.63	555,600		-		-	555,600	25%	138,900	694,500
		Re-grade road sub-base	Av. 150mm dp x 5m wide	**11,250**	**M3**		-	-		-	12.57	141,413		-		-	141,413	25%	35,353	176,766
		Gravel resurfacing, 100mm thk x 8m wide	Drill & blast, crushing, load & haul and place.	**12,000**	**M3**		-	-		-	159.61	1,915,320		-		-	1,915,320	25%	478,830	2,394,150
		Bridge construction	15m clear span x 11m w. Supply & install.	**1**	**LS**		-	-		-	889,246.48	889,246		-		-	889,246	25%	222,312	1,111,558
							-	-		-		-		-		-	-		-	-
		Bulk Earthworks					-	-		-		-		-		-	-		-	-
		Waste dump to channel fill	1ea-D8 w/ 345 ex; push top of existing channel to fill channel bed.	**25,000**	**M3**		-	-		-	5.22	130,500		-		-	130,500	25%	32,625	163,125
		Waste dump to porcupine pit	Equip Set 1	**150,000**	**M3**		-	-		-	4.90	735,000		-		-	735,000	25%	183,750	918,750
							-	-		-		-		-		-	-		-	-
		Access Road Construction					-	-		-		-		-		-	-		-	-
		Gravel resurfacing, 300mm thk x 6m wide	Drill & blast, crushing, load & haul and place.	**1,350**	**M3**		-	-		-	159.45	215,258		-		-	215,258	25%	53,814	269,072
							-	-		-		-		-		-	-		-	-
		Channel Armouring					-	-		-		-		-		-	-		-	-
		Rip-rap - 500mm dia.	Drill & blast, screen & sort, load & haul to site, double handling and place.	**8,500**	**M3**		-	-		-	126.59	1,076,015		-		-	1,076,015	25%	269,004	1,345,019
		Geotextile 10oz	Under cobble layer.	**13,500**	**M2**		-	-		-	3.62	48,870		-		-	48,870	25%	12,218	61,088
							-	-		-		-		-		-	-		-	-
		Water Diversion					-	-		-		-		-		-	-		-	-
		Aquadam - supply & install	6' x 100' lg.	**1**	**EA**		-	-		-	26,000.00	26,000		-		-	26,000	25%	6,500	32,500
		610mm HDPE DR21 pipe	Trench 1.6m dp, BF 1m cover, supply & install.	**900**	**LM**		-	-		-	980.07	882,065		-		-	882,065	25%	220,516	1,102,581
							-	-		-		-		-		-	-		-	-
		Support Equipment					-	-		-		-		-		-	-		-	-
		Shop truck	1ea	**61**	**DY**		-	-		-	300.00	18,240		-		-	18,240	25%	4,560	22,800
		Temp maintenance shop	1ea	**1**	**LS**		-	-		-	15,000.00	15,000		-		-	15,000	25%	3,750	18,750
		Shop trailer	1ea	**2**	**MO**		-	-		-	2,000.00	4,000		-		-	4,000	25%	1,000	5,000
		Fuel bowser	1ea on-site	**2**	**MO**		-	-		-	5,000.00	10,000		-		-	10,000	25%	2,500	12,500
		Pick-up trucks	6ea	**61**	**DY**		-	-		-	900.00	54,720		-		-	54,720	25%	13,680	68,400
		Portable light towers	6ea	**2**	**MO**		-	-		-	22,440.00	44,880		-		-	44,880	25%	11,220	56,100
		Generator	6ea	**2**	**MO**		-	-		-	7,920.00	15,840		-		-	15,840	25%	3,960	19,800
							-	-		-		-		-		-	-		-	-
		Support Labour	*During Road Improvements, Quarry Development & Creek Stabiliztion Work.				-	-		-		-		-		-	-		-	-
		Heavy duty mechanic	1ea/shift	**61**	**DY**		-	-		-	2,640.00	160,512		-		-	160,512	25%	40,128	200,640
		Welder	1ea/shift	**61**	**DY**		-	-		-	2,640.00	160,512		-		-	160,512	25%	40,128	200,640
		Labourer	2ea/shift	**122**	**DY**		-	-		-	1,800.00	218,880		-		-	218,880	25%	54,720	273,600
							-	-		-		-		-		-	-		-	-
		Asbestos Control					-	-		-		-		-		-	-		-	-
		Equipment washdown facilites	1ea - 80'x120' temprorary building , 300mm SOG, 4ea - 4.5 GPM pressure washers w/ 600Gal tanks, 4man hours / day.	**1**	**EA**		-	-		-	733,293.73	733,294		-		-	733,294	25%	183,323	916,617
		Equipment / vehicle heppa filters,		**1**	**LS**		-	-		-	15,000.00	15,000		-		-	15,000	25%	3,750	18,750
		PPE; respirators, overalls		**40**	**EA**		-	-		-	500.00	20,000		-		-	20,000	25%	5,000	25,000

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

WorleyParsons resources & energy

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Option CC-C3	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
							-	-		-		-		-		-	-		-	-
		Fuel Transportation	Transport from Dawson City to site (approx 110km one-way).				-	-		-		-		-		-	-		-	-
		Fuel truck & driver	27,000 liter tanker	**13**	**LD**		-	-		-	685.60	8,913		-		-	8,913	25%	2,228	11,141
			*fuel included in all-in rates.	337,027	liters		-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
DIRECT COST SUB TOTAL							**-**	**-**		**-**		**8,482,825**		**-**	**0%**	**-**	**8,482,825**	**25%**	**2,120,706**	**10,603,531**
INDIRECT COSTS																				
		TEMPORARY CONSTRUCTION CAMP	40 man temporary camp x 4mo.	**4,864**	**MDY**		-	-		-	595.97	2,898,798		-		-	2,898,798	25%	724,700	3,623,498
		TEMPORARY FACILITIES AND CONSTRUCTION SITE SERVICES		**3%**			-	-		-	8,482,825.16	254,485		-		-	254,485	25%	63,621	318,106
		SNOW REMOVAL	n/a				-	-		-		-		-		-	-		-	-
		ROAD MAINTENANCE	1ea Grader 12hrs/day	**152**	**DY**		-	-		-	2,677.20	406,934		-		-	406,934	25%	101,734	508,668
		OVERTIME PREMIUM FOR COMPRESSED WORK WEEK	n/a				-	-		-		-		-		-	-		-	-
		NON-PRODUCTIVE TIME	n/a				-	-		-		-		-		-	-		-	-
		SPOT OVERTIME	n/a				-	-		-		-		-		-	-		-	-
		CONTRACTOR LOA AND TRAVEL	Edm to Dawson City charter flight + DC to Site by charter bus. 1 flight/man every two weeks.	**320**	**Round Trip**		-	-		-	1,144.00	366,080		-		-	366,080	25%	91,520	457,600
		HEAVY LIFT	n/a				-	-		-		-		-		-	-		-	-
		TRANSPORTATION AND FREIGHT	HDPE pipe & aquadam.	**6**	**LD**		-	-		-	9,361.68	56,170		-		-	56,170	25%	14,043	70,213
		CAPITAL SPARE PARTS	n/a				-	-		-		-		-		-	-		-	-
		VENDOR ERECTION SUPERVISION	n/a				-	-		-		-		-		-	-		-	-
		FIRST FILLS	n/a				-	-		-		-		-		-	-		-	-
		ENVIRONMENTAL ASSESSMENT, MONITORING AND TESTING SERVICES		**2%**			-	-		-	8,482,825.16	169,657		-		-	169,657	25%	42,414	212,071
		GEOTECHNICAL INVESTIGATIONS AND RECOMMENDATIONS		**2%**			-	-		-	8,482,825.16	169,657		-		-	169,657	25%	42,414	212,071
		CONSTRUCTION INSURANCE	n/a				-	-		-		-		-		-	-		-	-
		BUILDING PERMITS	n/a				-	-		-		-		-		-	-		-	-
INDIRECT COST SUB TOTAL							**-**	**-**		**-**		**4,321,780**		**-**	**0%**	**-**	**4,321,780**	**25%**	**1,080,445**	**5,402,225**
OTHER COSTS																				
		EPCM		**10%**			-	-		-	12,804,605.48	1,280,461		-		-	1,280,461	25%	320,115	1,600,576
		OWNERS COSTS					-	-		-		-		-		-	-		-	-
		ESCALATION					-	-		-		-		-		-	-		-	-
OTHER COST SUB TOTAL							**-**	**-**		**-**		**1,280,461**		**-**	**0%**	**-**	**1,280,461**	**25%**	**320,115**	**1,600,576**
TOTAL																	**14,085,066**	**25%**	**3,521,267**	**17,606,333**

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Option CC-D	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

WorleyParsons
resources & energy

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
DIRECT COSTS																				
							-	-		-		-		-		-	-		-	-
		Equipment Mob / Demob	Edmonton to Dawson City 2,519km. Dawson City to Site	**20**	**EA**		-	-		-	32,304.48	646,090		-		-	646,090	25%	161,522	807,612
							-	-		-		-		-		-	-		-	-
		Major Road Improvements	15km				-	-		-		-		-		-	-		-	-
		Clear & grub	Medium	**9**	**HA**		-	-		-	11,877.51	106,898		-		-	106,898	25%	26,724	133,622
		Road embankment widening, 3m	Cut to fill existing shoulder. Approx 8M3 / LM.	**120,000**	**M3**		-	-		-	4.63	555,600		-		-	555,600	25%	138,900	694,500
		Re-grade road sub-base	Av. 150mm dp x 5m wide	**11,250**	**M3**		-	-		-	12.57	141,413		-		-	141,413	25%	35,353	176,766
		Gravel resurfacing, 100mm thk x 8m wide	Drill & blast, crushing, load & haul and place.	**12,000**	**M3**		-	-		-	123.30	1,479,600		-		-	1,479,600	25%	369,900	1,849,500
		Bridge construction	15m clear span x 11m w. Supply & install.	**1**	**LS**		-	-		-	889,246.48	889,246		-		-	889,246	25%	222,312	1,111,558
							-	-		-		-		-		-	-		-	-
		Bulk Earthworks					-	-		-		-		-		-	-		-	-
		Waste dump to channel fill	1ea-D8 & 1ea-345 ex; push top of existing channel to fill channel bed.	**25,000**	**M3**		-	-		-	5.22	130,500		-		-	130,500	25%	32,625	163,125
		Waste dump to porupine pit	Equip Set 1	**425,000**	**M3**		-	-		-	4.90	2,082,500		-		-	2,082,500	25%	520,625	2,603,125
							-	-		-		-		-		-	-		-	-
		Access Road Construction					-	-		-		-		-		-	-		-	-
		Gravel resurfacing, 300mm thk x 6m wide	Drill & blast, crushing, load & haul and place.	**990**	**M3**		-	-		-	156.92	155,351		-		-	155,351	25%	38,838	194,189
							-	-		-		-		-		-	-		-	-
		Gabion Drop Structures					-	-		-		-		-		-	-		-	-
		Gabion baskets (3m lg x 1m dp x 0.5m h)	Supply, load, haul, assemble, place	**1,250**	**EA**		-	-		-	638.72	798,400		-		-	798,400	25%	199,600	998,000
		Gabion rock - 100 to 200 mm dia.	(8 drop structures) Drill & blast, screen & sort, load & haul to site, double handling and place.	**1,850**	**M3**		-	-		-	111.51	206,294		-		-	206,294	25%	51,573	257,867
		Rip-rap - 300 mm dia.	Drill & blast, screen & sort, load & haul to site, double handling and place.	**1,100**	**M3**		-	-		-	121.68	133,848		-		-	133,848	25%	33,462	167,310
		Geotextile 10oz	Under cobble layer.	**5,300**	**M2**		-	-		-	3.62	19,186		-		-	19,186	25%	4,797	23,983
							-	-		-		-		-		-	-		-	-
		Water Diversion					-	-		-		-		-		-	-		-	-
		Aquadam - supply & install	6' x 100' lg.	**1**	**EA**		-	-		-	26,000.00	26,000		-		-	26,000	25%	6,500	32,500
		610mm HDPE DR21 pipe	Trench 1.6m dp, BF 1m cover, supply & install.	**900**	**LM**		-	-		-	980.07	882,065		-		-	882,065	25%	220,516	1,102,581
							-	-		-		-		-		-	-		-	-
		Support Equipment					-	-		-		-		-		-	-		-	-
		Shop truck	1ea	**84**	**DY**		-	-		-	300.00	25,080		-		-	25,080	25%	6,270	31,350
		Temp maintenance shop	1ea	**1**	**LS**		-	-		-	15,000.00	15,000		-		-	15,000	25%	3,750	18,750
		Shop trailer	1ea	**3**	**MO**		-	-		-	2,000.00	5,500		-		-	5,500	25%	1,375	6,875
		Fuel bowser	1ea on-site	**3**	**MO**		-	-		-	5,000.00	13,750		-		-	13,750	25%	3,438	17,188
		Pick-up trucks	6ea	**84**	**DY**		-	-		-	900.00	75,240		-		-	75,240	25%	18,810	94,050
		Portable light towers	6ea	**3**	**MO**		-	-		-	22,440.00	61,710		-		-	61,710	25%	15,428	77,138
		Generator	6ea	**3**	**MO**		-	-		-	7,920.00	21,780		-		-	21,780	25%	5,445	27,225
							-	-		-		-		-		-	-		-	-
		Support Labour	*During Road Improvements, Quarry Development & Creek Stabiliztion Work.				-	-		-		-		-		-	-		-	-
		Heavy duty mechanic	1ea/shift	**91**	**DY**		-	-		-	2,640.00	240,768		-		-	240,768	25%	60,192	300,960
		Welder	1ea/shift	**91**	**DY**		-	-		-	2,640.00	240,768		-		-	240,768	25%	60,192	300,960
		Labourer	2ea/shift	**182**	**DY**		-	-		-	1,800.00	328,320		-		-	328,320	25%	82,080	410,400
							-	-		-		-		-		-	-		-	-
		Asbestos Control					-	-		-		-		-		-	-		-	-

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Option CC-D	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

WorleyParsons
resources & energy

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
		Equipment washdown facilites	1ea - 80'x120' temprorary building , 300mm SOG, 4ea - 4.5 GPM pressure washers w/ 600Gal tanks, 4man hours / day.	1	EA		-	-		-	742,873.38	742,873		-		-	742,873	25%	185,718	928,592
		Equipment / vehicle heppa filters,		1	LS		-	-		-	20,000.00	20,000		-		-	20,000	25%	5,000	25,000
		PPE; respirators, overalls		50	EA		-	-		-	500.00	25,000		-		-	25,000	25%	6,250	31,250
							-	-		-		-		-		-	-		-	-
		Fuel Transportation	Transport from Dawson City to site (approx 110km one-way).				-	-		-		-		-		-	-		-	-
		Fuel truck & driver	27,000 liter tanker	25	LD		-	-		-	685.60	16,855		-		-	16,855	25%	4,214	21,068
			*fuel included in all-in rates.	663,763	liters		-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
DIRECT COST SUB TOTAL							**-**	**-**		**-**		**10,085,634**		**-**	**0%**	**-**	**10,085,634**	**25%**	**2,521,408**	**12,607,042**
INDIRECT COSTS																				
		TEMPORARY CONSTRUCTION CAMP	50 man temporary camp x 5.25mo.	7,980	MDY		-	-		-	489.86	3,909,083		-		-	3,909,083	25%	977,271	4,886,354
		TEMPORARY FACILITIES AND CONSTRUCTION SITE SERVICES		3%			-	-		-	10,085,633.67	302,569		-		-	302,569	25%	75,642	378,211
		SNOW REMOVAL	Grader & dozer for winter months, 12hrs/day x 7days.	7	DY		-	-		-	4,538.76	31,771		-		-	31,771	25%	7,943	39,714
		ROAD MAINTENANCE	1ea Grader 12hrs/day	213	DY		-	-		-	2,677.20	569,708		-		-	569,708	25%	142,427	712,135
		OVERTIME PREMIUM FOR COMPRESSED WORK WEEK	n/a				-	-		-		-		-		-	-		-	-
		NON-PRODUCTIVE TIME	n/a				-	-		-		-		-		-	-		-	-
		SPOT OVERTIME	n/a				-	-		-		-		-		-	-		-	-
		CONTRACTOR LOA AND TRAVEL	Edm to Dawson City charter flight + DC to Site by charter bus. 1 flight/man every two weeks.	420	Round Trip		-	-		-	1,144.00	480,480		-		-	480,480	25%	120,120	600,600
		HEAVY LIFT	n/a				-	-		-		-		-		-	-		-	-
		TRANSPORTATION AND FREIGHT	HDPE pipe & aquadam.	6	LD		-	-		-	9,361.68	56,170		-		-	56,170	25%	14,043	70,213
		CAPITAL SPARE PARTS	n/a				-	-		-		-		-		-	-		-	-
		VENDOR ERECTION SUPERVISION	n/a				-	-		-		-		-		-	-		-	-
		FIRST FILLS	n/a				-	-		-		-		-		-	-		-	-
		ENVIRONMENTAL ASSESSMENT, MONITORING AND TESTING SERVICES		2%			-	-		-	10,085,633.67	201,713		-		-	201,713	25%	50,428	252,141
		GEOTECHNICAL INVESTIGATIONS AND RECOMMENDATIONS		2%			-	-		-	10,085,633.67	201,713		-		-	201,713	25%	50,428	252,141
		CONSTRUCTION INSURANCE	n/a				-	-		-		-		-		-	-		-	-
		BUILDING PERMITS	n/a				-	-		-		-		-		-	-		-	-
INDIRECT COST SUB TOTAL							**-**	**-**		**-**		**5,753,207**		**-**	**0%**	**-**	**5,753,207**	**25%**	**1,438,302**	**7,191,508**
OTHER COSTS																				
		EPCM		10%			-	-		-	15,838,840.39	1,583,884		-		-	1,583,884	25%	395,971	1,979,855
		OWNERS COSTS					-	-		-		-		-		-	-		-	-
		ESCALATION					-	-		-		-		-		-	-		-	-
OTHER COST SUB TOTAL							**-**	**-**		**-**		**1,583,884**		**-**	**0%**	**-**	**1,583,884**	**25%**	**395,971**	**1,979,855**
TOTAL																	**17,422,724**	**25%**	**4,355,681**	**21,778,406**

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

WorleyParsons resources & energy

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Option CC-D2	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

DIRECT COSTS

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
							-	-		-		-		-		-	-		-	-
		Equipment Mob / Demob	Edmonton to Dawson City 2,519km. Dawson City to Site	**20**	**EA**		-	-		-	32,304.48	646,090		-		-	646,090	25%	161,522	807,612
							-	-		-		-		-		-	-		-	-
		Major Road Improvements	15km				-	-		-		-		-		-	-		-	-
		Clear & grub	Medium	**9**	**HA**		-	-		-	11,877.51	106,898		-		-	106,898	25%	26,724	133,622
		Road embankment widening, 3m	Cut to fill existing shoulder. Approx 8M3 / LM.	**120,000**	**M3**		-	-		-	4.63	555,600		-		-	555,600	25%	138,900	694,500
		Re-grade road sub-base	Av. 150mm dp x 5m wide	**11,250**	**M3**		-	-		-	12.57	141,413		-		-	141,413	25%	35,353	176,766
		Gravel resurfacing, 100mm thk x 8m wide	Drill & blast, crushing, load & haul and place.	**12,000**	**M3**		-	-		-	159.61	1,915,320		-		-	1,915,320	25%	478,830	2,394,150
		Bridge construction	15m clear span x 11m w. Supply & install.	**1**	**LS**		-	-		-	889,246.48	889,246		-		-	889,246	25%	222,312	1,111,558
							-	-		-		-		-		-	-		-	-
		Bulk Earthworks					-	-		-		-		-		-	-		-	-
		Waste dump to channel fill	1ea-D8 & 1ea-345 ex; push top of existing channel to fill channel bed.	**25,000**	**M3**		-	-		-	5.22	130,500		-		-	130,500	25%	32,625	163,125
		Waste rock to porupine pit	Equip Set 1	**425,000**	**M3**		-	-		-	4.90	2,082,500		-		-	2,082,500	25%	520,625	2,603,125
							-	-		-		-		-		-	-		-	-
		Access Road Construction					-	-		-		-		-		-	-		-	-
		Gravel resurfacing, 300mm thk x 6m wide	Drill & blast, crushing, load & haul and place.	**990**	**M3**		-	-		-	159.61	158,014		-		-	158,014	25%	39,503	197,517
							-	-		-		-		-		-	-		-	-
		Channel Armouring					-	-		-		-		-		-	-		-	-
		Rip-rap - 500mm dia.	Drill & blast, screen & sort, load & haul to site, double handling and place.	**6,100**	**M3**		-	-		-	130.06	793,366		-		-	793,366	25%	198,342	991,708
		Geotextile 10oz	Under cobble layer.	**9,700**	**M2**		-	-		-	3.62	35,114		-		-	35,114	25%	8,779	43,893
							-	-		-		-		-		-	-		-	-
		Water Diversion					-	-		-		-		-		-	-		-	-
		Aquadam - supply & install	6' x 100' lg.	**1**	**EA**		-	-		-	26,000.00	26,000		-		-	26,000	25%	6,500	32,500
		610mm HDPE DR21 pipe	Trench 1.6m dp, BF 1m cover, supply & install.	**900**	**LM**		-	-		-	980.07	882,065		-		-	882,065	25%	220,516	1,102,581
							-	-		-		-		-		-	-		-	-
		Support Equipment					-	-		-		-		-		-	-		-	-
		Shop truck	1ea	**84**	**DY**		-	-		-	300.00	25,080		-		-	25,080	25%	6,270	31,350
		Temp maintenance shop	1ea	**1**	**LS**		-	-		-	15,000.00	15,000		-		-	15,000	25%	3,750	18,750
		Shop trailer	1ea	**3**	**MO**		-	-		-	2,000.00	5,500		-		-	5,500	25%	1,375	6,875
		Fuel bowser	1ea on-site	**3**	**MO**		-	-		-	5,000.00	13,750		-		-	13,750	25%	3,438	17,188
		Pick-up trucks	6ea	**84**	**DY**		-	-		-	900.00	75,240		-		-	75,240	25%	18,810	94,050
		Portable light towers	6ea	**3**	**MO**		-	-		-	22,440.00	61,710		-		-	61,710	25%	15,428	77,138
		Generator	6ea	**3**	**MO**		-	-		-	7,920.00	21,780		-		-	21,780	25%	5,445	27,225
							-	-		-		-		-		-	-		-	-
		Support Labour	*During Road Improvements, Quarry Development & Creek Stabiliztion Work.				-	-		-		-		-		-	-		-	-
		Heavy duty mechanic	1ea/shift	**84**	**DY**		-	-		-	2,640.00	220,704		-		-	220,704	25%	55,176	275,880
		Welder	1ea/shift	**84**	**DY**		-	-		-	2,640.00	220,704		-		-	220,704	25%	55,176	275,880
		Labourer	2ea/shift	**167**	**DY**		-	-		-	1,800.00	300,960		-		-	300,960	25%	75,240	376,200
							-	-		-		-		-		-	-		-	-
		Asbestos Control					-	-		-		-		-		-	-		-	-
		Equipment washdown facilites	1ea - 80'x120' temprorary building , 300mm SOG, 4ea - 4.5 GPM pressure washers w/ 600Gal tanks, 4man hours / day.	**1**	**EA**		-	-		-	742,873.38	742,873		-		-	742,873	25%	185,718	928,592
		Equipment / vehicle heppa filters,		**1**	**LS**		-	-		-	20,000.00	20,000		-		-	20,000	25%	5,000	25,000
		PPE; respirators, overalls		**50**	**EA**		-	-		-	500.00	25,000		-		-	25,000	25%	6,250	31,250

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

WorleyParsons resources & energy

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Option CC-D2	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
							-	-		-		-		-		-	-		-	-
		Fuel Transportation	Transport from Dawson City to site (approx 110km one-way).				-	-		-		-		-		-	-		-	-
		Fuel truck & driver	27,000 liter tanker	**25**	**LD**		-	-		-	685.60	16,855		-		-	16,855	25%	4,214	21,068
			*fuel included in all-in rates.	663,763	liters		-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
DIRECT COST SUB TOTAL							**-**	**-**		**-**		**10,127,281**		**-**	**0%**	**-**	**10,127,281**	**25%**	**2,531,820**	**12,659,102**
INDIRECT COSTS																				
		TEMPORARY CONSTRUCTION CAMP	50 man temporary camp x 3.75mo.	**5,700**	**MDY**		-	-		-	618.90	3,527,730		-		-	3,527,730	25%	881,933	4,409,663
		TEMPORARY FACILITIES AND CONSTRUCTION SITE SERVICES		**3%**			-	-		-	10,127,281.27	303,818		-		-	303,818	25%	75,955	379,773
		SNOW REMOVAL	Grader & dozer for winter months, 12hrs/day x 7days.	**7**	**DY**		-	-		-	4,538.76	31,771		-		-	31,771	25%	7,943	39,714
		ROAD MAINTENANCE	1ea Grader 12hrs/day	**213**	**DY**		-	-		-	2,677.20	569,708		-		-	569,708	25%	142,427	712,135
		OVERTIME PREMIUM FOR COMPRESSED WORK WEEK	n/a				-	-		-		-		-		-	-		-	-
		NON-PRODUCTIVE TIME	n/a				-	-		-		-		-		-	-		-	-
		SPOT OVERTIME	n/a				-	-		-		-		-		-	-		-	-
		CONTRACTOR LOA AND TRAVEL	Edm to Dawson City charter flight + DC to Site by charter bus. 1 flight/man every two weeks.	**300**	**Round Trip**		-	-		-	1,144.00	343,200		-		-	343,200	25%	85,800	429,000
		HEAVY LIFT	n/a				-	-		-		-		-		-	-		-	-
		TRANSPORTATION AND FREIGHT	HDPE pipe & aquadam.	**6**	**LD**		-	-		-	9,361.68	56,170		-		-	56,170	25%	14,043	70,213
		CAPITAL SPARE PARTS	n/a				-	-		-		-		-		-	-		-	-
		VENDOR ERECTION SUPERVISION	n/a				-	-		-		-		-		-	-		-	-
		FIRST FILLS	n/a				-	-		-		-		-		-	-		-	-
		ENVIRONMENTAL ASSESSMENT, MONITORING AND TESTING SERVICES		**2%**			-	-		-	10,127,281.27	202,546		-		-	202,546	25%	50,636	253,182
		GEOTECHNICAL INVESTIGATIONS AND RECOMMENDATIONS		**2%**			-	-		-	10,127,281.27	202,546		-		-	202,546	25%	50,636	253,182
		CONSTRUCTION INSURANCE	n/a				-	-		-		-		-		-	-		-	-
		BUILDING PERMITS	n/a				-	-		-		-		-		-	-		-	-
INDIRECT COST SUB TOTAL							**-**	**-**		**-**		**5,237,489**		**-**	**0%**	**-**	**5,237,489**	**25%**	**1,309,372**	**6,546,862**
OTHER COSTS																				
		EPCM		**10%**			-	-		-	15,364,770.52	1,536,477		-		-	1,536,477	25%	384,119	1,920,596
		OWNERS COSTS					-	-		-		-		-		-	-		-	-
		ESCALATION					-	-		-		-		-		-	-		-	-
OTHER COST SUB TOTAL							**-**	**-**		**-**		**1,536,477**		**-**	**0%**	**-**	**1,536,477**	**25%**	**384,119**	**1,920,596**
TOTAL																	**16,901,248**	**25%**	**4,225,312**	**21,126,559**

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Option CC-D3	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

WorleyParsons resources & energy

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
DIRECT COSTS																				
							-	-		-		-		-		-	-		-	-
		Equipment Mob / Demob	Edmonton to Dawson City 2,519km. Dawson City to Site	**20**	**EA**		-	-		-	32,304.48	646,090		-		-	646,090	25%	161,522	807,612
							-	-		-		-		-		-	-		-	-
		Major Road Improvements	15km				-	-		-		-		-		-	-		-	-
		Clear & grub	Medium	**9**	**HA**		-	-		-	11,877.51	106,898		-		-	106,898	25%	26,724	133,622
		Road embankment widening, 3m	Cut to fill existing shoulder. Approx 8M3 / LM.	**120,000**	**M3**		-	-		-	4.63	555,600		-		-	555,600	25%	138,900	694,500
		Re-grade road sub-base	Av. 150mm dp x 5m wide	**11,250**	**M3**		-	-		-	12.57	141,413		-		-	141,413	25%	35,353	176,766
		Gravel resurfacing, 100mm thk x 8m wide	Drill & blast, crushing, load & haul and place.	**12,000**	**M3**		-	-		-	159.61	1,915,320		-		-	1,915,320	25%	478,830	2,394,150
		Bridge construction	15m clear span x 11m w. Supply & install.	**1**	**LS**		-	-		-	889,246.48	889,246		-		-	889,246	25%	222,312	1,111,558
							-	-		-		-		-		-	-		-	-
		Bulk Earthworks					-	-		-		-		-		-	-		-	-
		Waste dump to channel fill	1ea-D8 & 1ea-345 ex; push top of existing channel to fill channel bed.	**25,000**	**M3**		-	-		-	5.22	130,500		-		-	130,500	25%	32,625	163,125
		Waste rock to porupine pit	Equip Set 1	**425,000**	**M3**		-	-		-	4.90	2,082,500		-		-	2,082,500	25%	520,625	2,603,125
							-	-		-		-		-		-	-		-	-
		Access Road Construction					-	-		-		-		-		-	-		-	-
		Gravel resurfacing, 300mm thk x 6m wide	Drill & blast, crushing, load & haul and place.	**1,350**	**M3**		-	-		-	159.45	215,258		-		-	215,258	25%	53,814	269,072
							-	-		-		-		-		-	-		-	-
		Channel Armouring					-	-		-		-		-		-	-		-	-
		Rip-rap - 500mm dia.	Drill & blast, screen & sort, load & haul to site, double handling and place.	**8,500**	**M3**		-	-		-	126.59	1,076,015		-		-	1,076,015	25%	269,004	1,345,019
		Geotextile 10oz	Under cobble layer.	**13,500**	**M2**		-	-		-	3.62	48,870		-		-	48,870	25%	12,218	61,088
							-	-		-		-		-		-	-		-	-
		Water Diversion					-	-		-		-		-		-	-		-	-
		Aquadam - supply & install	6' x 100' lg.	**1**	**EA**		-	-		-	26,000.00	26,000		-		-	26,000	25%	6,500	32,500
		610mm HDPE DR21 pipe	Trench 1.6m dp, BF 1m cover, supply & install.	**900**	**LM**		-	-		-	980.07	882,065		-		-	882,065	25%	220,516	1,102,581
							-	-		-		-		-		-	-		-	-
		Support Equipment					-	-		-		-		-		-	-		-	-
		Shop truck	1ea	**84**	**DY**		-	-		-	300.00	25,080		-		-	25,080	25%	6,270	31,350
		Temp maintenance shop	1ea	**1**	**LS**		-	-		-	15,000.00	15,000		-		-	15,000	25%	3,750	18,750
		Shop trailer	1ea	**3**	**MO**		-	-		-	2,000.00	5,500		-		-	5,500	25%	1,375	6,875
		Fuel bowser	1ea on-site	**3**	**MO**		-	-		-	5,000.00	13,750		-		-	13,750	25%	3,438	17,188
		Pick-up trucks	6ea	**84**	**DY**		-	-		-	900.00	75,240		-		-	75,240	25%	18,810	94,050
		Portable light towers	6ea	**3**	**MO**		-	-		-	22,440.00	61,710		-		-	61,710	25%	15,428	77,138
		Generator	6ea	**3**	**MO**		-	-		-	7,920.00	21,780		-		-	21,780	25%	5,445	27,225
							-	-		-		-		-		-	-		-	-
		Support Labour	*During Road Improvements, Quarry Development & Creek Stabiliztion Work.				-	-		-		-		-		-	-		-	-
		Heavy duty mechanic	1ea/shift	**84**	**DY**		-	-		-	2,640.00	220,704		-		-	220,704	25%	55,176	275,880
		Welder	1ea/shift	**84**	**DY**		-	-		-	2,640.00	220,704		-		-	220,704	25%	55,176	275,880
		Labourer	2ea/shift	**167**	**DY**		-	-		-	1,800.00	300,960		-		-	300,960	25%	75,240	376,200
							-	-		-		-		-		-	-		-	-
		Asbestos Control					-	-		-		-		-		-	-		-	-
		Equipment washdown facilites	1ea - 80'x120' temprorary building , 300mm SOG, 4ea - 4.5 GPM pressure washers w/ 600Gal tanks, 4man hours / day.	**1**	**EA**		-	-		-	742,873.38	742,873		-		-	742,873	25%	185,718	928,592
		Equipment / vehicle heppa filters,		**1**	**LS**		-	-		-	20,000.00	20,000		-		-	20,000	25%	5,000	25,000
		PPE; respirators, overalls		**50**	**EA**		-	-		-	500.00	25,000		-		-	25,000	25%	6,250	31,250

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

WorleyParsons resources & energy

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Option CC-D3	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
							-	-		-		-		-		-	-		-	-
		Fuel Transportation	Transport from Dawson City to site (approx 110km one-way).				-	-		-		-		-		-	-		-	-
		Fuel truck & driver	27,000 liter tanker	**25**	**LD**		-	-		-	685.60	17,058		-		-	17,058	25%	4,264	21,322
			*fuel included in all-in rates.	671,763	liters		-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
DIRECT COST SUB TOTAL							**-**	**-**		**-**		**10,481,133**		**-**	**0%**	**-**	**10,481,133**	**25%**	**2,620,283**	**13,101,416**
INDIRECT COSTS																				
		TEMPORARY CONSTRUCTION CAMP	50 man temporary camp x 3.75mo.	**5,700**	**MDY**		-	-		-	618.90	3,527,730		-		-	3,527,730	25%	881,933	4,409,663
		TEMPORARY FACILITIES AND CONSTRUCTION SITE SERVICES		**3%**			-	-		-	10,481,133.01	314,434		-		-	314,434	25%	78,608	393,042
		SNOW REMOVAL	Grader & dozer for winter months, 12hrs/day x 7days.	**7**	**DY**		-	-		-	4,538.76	31,771		-		-	31,771	25%	7,943	39,714
		ROAD MAINTENANCE	1ea Grader 12hrs/day	**213**	**DY**		-	-		-	2,677.20	569,708		-		-	569,708	25%	142,427	712,135
		OVERTIME PREMIUM FOR COMPRESSED WORK WEEK	n/a				-	-		-		-		-		-	-		-	-
		NON-PRODUCTIVE TIME	n/a				-	-		-		-		-		-	-		-	-
		SPOT OVERTIME	n/a				-	-		-		-		-		-	-		-	-
		CONTRACTOR LOA AND TRAVEL	Edm to Dawson City charter flight + DC to Site by charter bus. 1 flight/man every two weeks.	**300**	**Round Trip**		-	-		-	1,144.00	343,200		-		-	343,200	25%	85,800	429,000
		HEAVY LIFT	n/a				-	-		-		-		-		-	-		-	-
		TRANSPORTATION AND FREIGHT	HDPE pipe & aquadam.	**6**	**LD**		-	-		-	9,361.68	56,170		-		-	56,170	25%	14,043	70,213
		CAPITAL SPARE PARTS	n/a				-	-		-		-		-		-	-		-	-
		VENDOR ERECTION SUPERVISION	n/a				-	-		-		-		-		-	-		-	-
		FIRST FILLS	n/a				-	-		-		-		-		-	-		-	-
		ENVIRONMENTAL ASSESSMENT, MONITORING AND TESTING SERVICES		**2%**			-	-		-	10,481,133.01	209,623		-		-	209,623	25%	52,406	262,028
		GEOTECHNICAL INVESTIGATIONS AND RECOMMENDATIONS		**2%**			-	-		-	10,481,133.01	209,623		-		-	209,623	25%	52,406	262,028
		CONSTRUCTION INSURANCE	n/a				-	-		-		-		-		-	-		-	-
		BUILDING PERMITS	n/a				-	-		-		-		-		-	-		-	-
INDIRECT COST SUB TOTAL							**-**	**-**		**-**		**5,262,259**		**-**	**0%**	**-**	**5,262,259**	**25%**	**1,315,565**	**6,577,824**
OTHER COSTS																				
		EPCM		**10%**			-	-		-	15,743,391.88	1,574,339		-		-	1,574,339	25%	393,585	1,967,924
		OWNERS COSTS					-	-		-		-		-		-	-		-	-
		ESCALATION					-	-		-		-		-		-	-		-	-
OTHER COST SUB TOTAL							**-**	**-**		**-**		**1,574,339**		**-**	**0%**	**-**	**1,574,339**	**25%**	**393,585**	**1,967,924**
TOTAL																	**17,317,731**	**25%**	**4,329,433**	**21,647,164**

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

WorleyParsons
resources & energy

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Option CC-E	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
DIRECT COSTS																				
							-	-		-		-		-		-	-		-	-
		Equipment Mob / Demob	Edmonton to Dawson City 2,519km. Dawson City to Site	**18**	**EA**		-	-		-	35,893.87	646,090		-		-	646,090	50%	323,045	969,134
							-	-		-		-		-		-	-		-	-
		Major Road Improvements	15km				-	-		-		-		-		-	-		-	-
		Clear & grub	Medium	**9**	**HA**		-	-		-	11,877.51	106,898		-		-	106,898	50%	53,449	160,346
		Road embankment widening, 3m	Cut to fill existing shoulder. Approx 8M3 / LM.	**120,000**	**M3**		-	-		-	4.63	555,600		-		-	555,600	50%	277,800	833,400
		Re-grade road sub-base	Av. 150mm dp x 5m wide	**11,250**	**M3**		-	-		-	12.57	141,413		-		-	141,413	50%	70,706	212,119
		Gravel resurfacing, 100mm thk x 8m wide	Drill & blast, crushing, load & haul and place.	**12,000**	**M3**		-	-		-	168.82	2,025,840		-		-	2,025,840	50%	1,012,920	3,038,760
		Bridge construction	15m clear span x 11m w. Supply & install.	**1**	**LS**		-	-		-	889,246.48	889,246		-		-	889,246	50%	444,623	1,333,870
							-	-		-		-		-		-	-		-	-
		Bulk Earthworks					-	-		-		-		-		-	-		-	-
		Existing channel to porupine pit	Equip Set 1	**450,000**	**M3**		-	-		-	4.90	2,205,000		-		-	2,205,000	50%	1,102,500	3,307,500
		Waste dump to porupine pit	Equip Set 1	**500,000**	**M3**		-	-		-	4.90	2,450,000		-		-	2,450,000	50%	1,225,000	3,675,000
							-	-		-		-		-		-	-		-	-
		Access Road Construction					-	-		-		-		-		-	-		-	-
		Gravel resurfacing, 300mm thk x 6m wide	Drill & blast, crushing, load & haul and place.	**1,350**	**M3**		-	-		-	168.82	227,907		-		-	227,907	50%	113,954	341,861
							-	-		-		-		-		-	-		-	-
		Siphon					-	-		-		-		-		-	-		-	-
		Air pump	supply	**1**	**EA**		-	-		-	20,000.00	20,000		-		-	20,000	50%	10,000	30,000
		First Location:					-	-		-		-		-		-	-		-	-
		610mm HDPE DR21 pipe	Supply & install.	**900**	**LM**		-	-		-	935.27	841,743		-		-	841,743	50%	420,872	1,262,615
		Lock blocks	Supply & place.	**46**	**EA**		-	-		-	150.00	6,900		-		-	6,900	50%	3,450	10,350
							-	-		-		-		-		-	-		-	-
		Relocate:					-	-		-		-		-		-	-		-	-
		Cut & move 900m of pipe	Cut into 150m lengths, relocate 500m.	**6**	**EA**		-	-		-	5,000.00	30,000		-		-	30,000	50%	15,000	45,000
		610mm HDPE DR21 pipe	Re-weld joints	**6**	**EA**		-	-		-	1,440.00	8,640		-		-	8,640	50%	4,320	12,960
		Lock blocks	Relocate	**46**	**EA**		-	-		-	50.00	2,300		-		-	2,300	50%	1,150	3,450
							-	-		-		-		-		-	-		-	-
		Support Equipment					-	-		-		-		-		-	-		-	-
		Shop truck	1ea	**137**	**DY**		-	-		-	300.00	41,040		-		-	41,040	50%	20,520	61,560
		Temp maintenance shop	1ea	**1**	**LS**		-	-		-	15,000.00	15,000		-		-	15,000	50%	7,500	22,500
		Shop trailer	1ea	**5**	**MO**		-	-		-	2,000.00	9,000		-		-	9,000	50%	4,500	13,500
		Fuel bowser	1ea on-site	**5**	**MO**		-	-		-	5,000.00	22,500		-		-	22,500	50%	11,250	33,750
		Pick-up trucks	6ea	**137**	**DY**		-	-		-	900.00	123,120		-		-	123,120	50%	61,560	184,680
		Portable light towers	6ea	**5**	**MO**		-	-		-	22,440.00	100,980		-		-	100,980	50%	50,490	151,470
		Generator	6ea	**5**	**MO**		-	-		-	7,920.00	35,640		-		-	35,640	50%	17,820	53,460
							-	-		-		-		-		-	-		-	-
		Support Labour	*During Road Improvements, Quarry Development & Creek Stabiliztion Work.				-	-		-		-		-		-	-		-	-
		Heavy duty mechanic	1ea/shift	**61**	**DY**		-	-		-	2,640.00	160,512		-		-	160,512	50%	80,256	240,768
		Welder	1ea/shift	**61**	**DY**		-	-		-	2,640.00	160,512		-		-	160,512	50%	80,256	240,768
		Labourer	2ea/shift	**122**	**DY**		-	-		-	1,800.00	218,880		-		-	218,880	50%	109,440	328,320
							-	-		-		-		-		-	-		-	-
		Asbestos Control					-	-		-		-		-		-	-		-	-
		Equipment washdown facilites	1ea - 80'x120' temprorary building , 300mm SOG, 4ea - 4.5 GPM pressure washers w/ 600Gal tanks, 4man hours / day.	**1**	**EA**		-	-		-	765,225.89	765,226		-		-	765,226	50%	382,613	1,147,839
		Equipment / vehicle heppa filters,		**1**	**LS**		-	-		-	18,000.00	18,000		-		-	18,000	50%	9,000	27,000
		PPE; respirators, overalls		**50**	**EA**		-	-		-	500.00	25,000		-		-	25,000	50%	12,500	37,500

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

WorleyParsons resources & energy

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Option CC-E	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
							-	-		-		-		-		-	-		-	-
		Fuel Transportation	Transport from Dawson City to site (approx 110km one-way).				-	-		-		-		-		-	-		-	-
		Fuel truck & driver	27,000 liter tanker	**43**	**LD**		-	-		-	685.60	29,267		-		-	29,267	50%	14,634	43,901
			*fuel included in all-in rates.	1,152,583	liters		-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
DIRECT COST SUB TOTAL							**-**	**-**		**-**		**11,882,253**		**-**	**0%**	**-**	**11,882,253**	**50%**	**5,941,127**	**17,823,380**
INDIRECT COSTS																				
		TEMPORARY CONSTRUCTION CAMP	av 50men camp x 3.75mo.	**5,700**	**MDY**		-	-		-	615.49	3,508,293		-		-	3,508,293	50%	1,754,147	5,262,440
		TEMPORARY FACILITIES AND CONSTRUCTION SITE SERVICES		**3%**			-	-		-	11,882,253.13	356,468		-		-	356,468	50%	178,234	534,701
		SNOW REMOVAL	Grader & dozer for winter months, 12hrs/day x 7days.	**7**	**DY**		-	-		-	4,538.76	31,771		-		-	31,771	50%	15,886	47,657
		ROAD MAINTENANCE	1ea Grader 12hrs/day	**152**	**DY**		-	-		-	2,677.20	406,934		-		-	406,934	50%	203,467	610,402
		OVERTIME PREMIUM FOR COMPRESSED WORK WEEK	n/a				-	-		-		-		-		-	-		-	-
		NON-PRODUCTIVE TIME	n/a				-	-		-		-		-		-	-		-	-
		SPOT OVERTIME	n/a				-	-		-		-		-		-	-		-	-
		CONTRACTOR LOA AND TRAVEL	Edm to Dawson City charter flight + DC to Site by charter bus. 1 flight/man every two weeks.	**375**	**Round Trip**		-	-		-	1,144.00	429,000		-		-	429,000	50%	214,500	643,500
		HEAVY LIFT	n/a				-	-		-		-		-		-	-		-	-
		TRANSPORTATION AND FREIGHT	HDPE pipe & lock blocks.	**9**	**LD**		-	-		-	9,361.68	84,255		-		-	84,255	50%	42,128	126,383
		CAPITAL SPARE PARTS	n/a				-	-		-		-		-		-	-		-	-
		VENDOR ERECTION SUPERVISION	n/a				-	-		-		-		-		-	-		-	-
		FIRST FILLS	n/a				-	-		-		-		-		-	-		-	-
		ENVIRONMENTAL ASSESSMENT, MONITORING AND TESTING SERVICES		**2%**			-	-		-	11,882,253.13	237,645		-		-	237,645	50%	118,823	356,468
		GEOTECHNICAL INVESTIGATIONS AND RECOMMENDATIONS		**4%**			-	-		-	11,882,253.13	475,290		-		-	475,290	50%	237,645	712,935
		CONSTRUCTION INSURANCE	n/a				-	-		-		-		-		-	-		-	-
		BUILDING PERMITS	n/a				-	-		-		-		-		-	-		-	-
INDIRECT COST SUB TOTAL							**-**	**-**		**-**		**5,529,657**		**-**	**0%**	**-**	**5,529,657**	**50%**	**2,764,828**	**8,294,485**
OTHER COSTS																				
		EPCM		**10%**			-	-		-	17,411,909.75	1,741,191		-		-	1,741,191	50%	870,595	2,611,786
		OWNERS COSTS					-	-		-		-		-		-	-		-	-
		ESCALATION					-	-		-		-		-		-	-		-	-
OTHER COST SUB TOTAL							**-**	**-**		**-**		**1,741,191**		**-**	**0%**	**-**	**1,741,191**	**50%**	**870,595**	**2,611,786**
TOTAL																	**19,153,101**	**50%**	**9,576,550**	**28,729,651**

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

WorleyParsons
resources & energy

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Option CC-E2	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
DIRECT COSTS																				
							-	-		-		-		-		-	-		-	-
		Equipment Mob / Demob	Edmonton to Dawson City 2,519km. Dawson City to Site	**18**	**EA**		-	-		-	35,893.87	646,090		-		-	646,090	25%	161,522	807,612
							-	-		-		-		-		-	-		-	-
		Major Road Improvements	15km				-	-		-		-		-		-	-		-	-
		Clear & grub	Medium	**9**	**HA**		-	-		-	11,877.51	106,898		-		-	106,898	25%	26,724	133,622
		Road embankment widening, 3m	Cut to fill existing shoulder. Approx 8M3 / LM.	**120,000**	**M3**		-	-		-	4.63	555,600		-		-	555,600	25%	138,900	694,500
		Re-grade road sub-base	Av. 150mm dp x 5m wide	**11,250**	**M3**		-	-		-	12.57	141,413		-		-	141,413	25%	35,353	176,766
		Gravel resurfacing, 100mm thk x 8m wide	Drill & blast, crushing, load & haul and place.	**12,000**	**M3**		-	-		-	168.82	2,025,840		-		-	2,025,840	25%	506,460	2,532,300
		Bridge construction	15m clear span x 11m w. Supply & install.	**1**	**LS**		-	-		-	889,246.48	889,246		-		-	889,246	25%	222,312	1,111,558
							-	-		-		-		-		-	-		-	-
		Bulk Earthworks					-	-		-		-		-		-	-		-	-
		Existing channel to porupine pit	Equip Set 1	**525,000**	**M3**		-	-		-	4.90	2,572,500		-		-	2,572,500	25%	643,125	3,215,625
		Waste dump to porupine pit	Equip Set 1	**525,000**	**M3**		-	-		-	4.90	2,572,500		-		-	2,572,500	25%	643,125	3,215,625
							-	-		-		-		-		-	-		-	-
		Access Road Construction					-	-		-		-		-		-	-		-	-
		Gravel resurfacing, 300mm thk x 6m wide	Drill & blast, crushing, load & haul and place.	**1,350**	**M3**		-	-		-	168.82	227,907		-		-	227,907	25%	56,977	284,884
							-	-		-		-		-		-	-		-	-
		Siphon					-	-		-		-		-		-	-		-	-
		Air pump	supply	**1**	**EA**		-	-		-	20,000.00	20,000		-		-	20,000	25%	5,000	25,000
		First Location:					-	-		-		-		-		-	-		-	-
		610mm HDPE DR21 pipe	Supply & install.	**900**	**LM**		-	-		-	935.27	841,743		-		-	841,743	25%	210,436	1,052,179
		Lock blocks	Supply & place.	**46**	**EA**		-	-		-	150.00	6,900		-		-	6,900	25%	1,725	8,625
							-	-		-		-		-		-	-		-	-
		Relocate:					-	-		-		-		-		-	-		-	-
		Cut & move 900m of pipe	Cut into 150m lengths, relocate 500m.	**6**	**EA**		-	-		-	5,000.00	30,000		-		-	30,000	25%	7,500	37,500
		610mm HDPE DR21 pipe	Re-weld joints	**6**	**EA**		-	-		-	1,440.00	8,640		-		-	8,640	25%	2,160	10,800
		Lock blocks	Relocate	**46**	**EA**		-	-		-	50.00	2,300		-		-	2,300	25%	575	2,875
							-	-		-		-		-		-	-		-	-
		Support Equipment					-	-		-		-		-		-	-		-	-
		Shop truck	1ea	**122**	**DY**		-	-		-	300.00	36,480		-		-	36,480	25%	9,120	45,600
		Temp maintenance shop	1ea	**1**	**LS**		-	-		-	15,000.00	15,000		-		-	15,000	25%	3,750	18,750
		Shop trailer	1ea	**5**	**MO**		-	-		-	2,000.00	9,000		-		-	9,000	25%	2,250	11,250
		Fuel bowser	1ea on-site	**5**	**MO**		-	-		-	5,000.00	22,500		-		-	22,500	25%	5,625	28,125
		Pick-up trucks	6ea	**122**	**DY**		-	-		-	900.00	109,440		-		-	109,440	25%	27,360	136,800
		Portable light towers	6ea	**5**	**MO**		-	-		-	22,440.00	100,980		-		-	100,980	25%	25,245	126,225
		Generator	6ea	**5**	**MO**		-	-		-	7,920.00	35,640		-		-	35,640	25%	8,910	44,550
							-	-		-		-		-		-	-		-	-
		Support Labour	*During Road Improvements, Quarry Development & Creek Stabiliztion Work.				-	-		-		-		-		-	-		-	-
		Heavy duty mechanic	1ea/shift	**61**	**DY**		-	-		-	2,640.00	160,512		-		-	160,512	25%	40,128	200,640
		Welder	1ea/shift	**61**	**DY**		-	-		-	2,640.00	160,512		-		-	160,512	25%	40,128	200,640
		Labourer	2ea/shift	**122**	**DY**		-	-		-	1,800.00	218,880		-		-	218,880	25%	54,720	273,600
							-	-		-		-		-		-	-		-	-
		Asbestos Control					-	-		-		-		-		-	-		-	-
		Equipment washdown facilites	1ea - 80'x120' temprorary building , 300mm SOG, 4ea - 4.5 GPM pressure washers w/ 600Gal tanks, 4man hours / day.	**1**	**EA**		-	-		-	758,839.46	758,839		-		-	758,839	25%	189,710	948,549
		Equipment / vehicle heppa filters,		**1**	**LS**		-	-		-	18,000.00	18,000		-		-	18,000	25%	4,500	22,500
		PPE; respirators, overalls		**50**	**EA**		-	-		-	500.00	25,000		-		-	25,000	25%	6,250	31,250

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

WorleyParsons resources & energy

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Option CC-E2	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
							-	-		-		-		-		-	-		-	-
		Fuel Transportation	Transport from Dawson City to site (approx 110km one-way).				-	-		-		-		-		-	-		-	-
		Fuel truck & driver	27,000 liter tanker	**43**	**LD**		-	-		-	685.60	29,724		-		-	29,724	25%	7,431	37,155
			*fuel included in all-in rates.	1,170,583	liters		-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
DIRECT COST SUB TOTAL							**-**	**-**		**-**		**12,348,084**		**-**	**0%**	**-**	**12,348,084**	**25%**	**3,087,021**	**15,435,105**
INDIRECT COSTS																				
		TEMPORARY CONSTRUCTION CAMP	av 50men camp x 4mo.	**6,080**	**MDY**		-	-		-	615.49	3,742,179		-		-	3,742,179	25%	935,545	4,677,724
		TEMPORARY FACILITIES AND CONSTRUCTION SITE SERVICES		**3%**			-	-		-	12,348,083.76	370,443		-		-	370,443	25%	92,611	463,053
		SNOW REMOVAL	Grader & dozer for winter months, 12hrs/day x 7days.	**7**	**DY**		-	-		-	4,538.76	31,771		-		-	31,771	25%	7,943	39,714
		ROAD MAINTENANCE	1ea Grader 12hrs/day	**152**	**DY**		-	-		-	2,677.20	406,934		-		-	406,934	25%	101,734	508,668
		OVERTIME PREMIUM FOR COMPRESSED WORK WEEK	n/a				-	-		-		-		-		-	-		-	-
		NON-PRODUCTIVE TIME	n/a				-	-		-		-		-		-	-		-	-
		SPOT OVERTIME	n/a				-	-		-		-		-		-	-		-	-
		CONTRACTOR LOA AND TRAVEL	Edm to Dawson City charter flight + DC to Site by charter bus. 1 flight/man every two weeks.	**375**	**Round Trip**		-	-		-	1,144.00	429,000		-		-	429,000	25%	107,250	536,250
		HEAVY LIFT	n/a				-	-		-		-		-		-	-		-	-
		TRANSPORTATION AND FREIGHT	HDPE pipe & lock blocks.	**9**	**LD**		-	-		-	9,361.68	84,255		-		-	84,255	25%	21,064	105,319
		CAPITAL SPARE PARTS	n/a				-	-		-		-		-		-	-		-	-
		VENDOR ERECTION SUPERVISION	n/a				-	-		-		-		-		-	-		-	-
		FIRST FILLS	n/a				-	-		-		-		-		-	-		-	-
		ENVIRONMENTAL ASSESSMENT, MONITORING AND TESTING SERVICES		**2%**			-	-		-	12,348,083.76	246,962		-		-	246,962	25%	61,740	308,702
		GEOTECHNICAL INVESTIGATIONS AND RECOMMENDATIONS		**4%**			-	-		-	12,348,083.76	493,923		-		-	493,923	25%	123,481	617,404
		CONSTRUCTION INSURANCE	n/a				-	-		-		-		-		-	-		-	-
		BUILDING PERMITS	n/a				-	-		-		-		-		-	-		-	-
INDIRECT COST SUB TOTAL							**-**	**-**		**-**		**5,805,468**		**-**	**0%**	**-**	**5,805,468**	**25%**	**1,451,367**	**7,256,834**
OTHER COSTS																				
		EPCM		**10%**			-	-		-	18,153,551.34	1,815,355		-		-	1,815,355	25%	453,839	2,269,194
		OWNERS COSTS					-	-		-		-		-		-	-		-	-
		ESCALATION					-	-		-		-		-		-	-		-	-
OTHER COST SUB TOTAL							**-**	**-**		**-**		**1,815,355**		**-**	**0%**	**-**	**1,815,355**	**25%**	**453,839**	**2,269,194**
TOTAL																	**19,968,906**	**25%**	**4,992,227**	**24,961,133**

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

WorleyParsons resources & energy

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Option CC-E3	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
DIRECT COSTS																				
							-	-		-		-		-		-	-		-	-
		Equipment Mob / Demob	Edmonton to Dawson City 2,519km. Dawson City to Site	**18**	**EA**		-	-		-	35,893.87	646,090		-		-	646,090	25%	161,522	807,612
							-	-		-		-		-		-	-		-	-
		Major Road Improvements	15km				-	-		-		-		-		-	-		-	-
		Clear & grub	Medium	**9**	**HA**		-	-		-	11,877.51	106,898		-		-	106,898	25%	26,724	133,622
		Road embankment widening, 3m	Cut to fill existing shoulder. Approx 8M3 / LM.	**120,000**	**M3**		-	-		-	4.63	555,600		-		-	555,600	25%	138,900	694,500
		Re-grade road sub-base	Av. 150mm dp x 5m wide	**11,250**	**M3**		-	-		-	12.57	141,413		-		-	141,413	25%	35,353	176,766
		Gravel resurfacing, 100mm thk x 8m wide	Drill & blast, crushing, load & haul and place.	**12,000**	**M3**		-	-		-	168.82	2,025,840		-		-	2,025,840	25%	506,460	2,532,300
		Bridge construction	15m clear span x 11m w. Supply & install.	**1**	**LS**		-	-		-	889,246.48	889,246		-		-	889,246	25%	222,312	1,111,558
							-	-		-		-		-		-	-		-	-
		Bulk Earthworks					-	-		-		-		-		-	-		-	-
		Existing channel to porupine pit	Equip Set 1	**525,000**	**M3**		-	-		-	4.90	2,572,500		-		-	2,572,500	25%	643,125	3,215,625
		Waste dump to porupine pit	Equip Set 1	**525,000**	**M3**		-	-		-	4.90	2,572,500		-		-	2,572,500	25%	643,125	3,215,625
							-	-		-		-		-		-	-		-	-
		Access Road Construction					-	-		-		-		-		-	-		-	-
		Gravel resurfacing, 300mm thk x 6m wide	Drill & blast, crushing, load & haul and place.	**1,530**	**M3**		-	-		-	159.38	243,851		-		-	243,851	25%	60,963	304,814
							-	-		-		-		-		-	-		-	-
		Channel Armouring					-	-		-		-		-		-	-		-	-
		Rip-rap - 500mm dia.	Drill & blast, screen & sort, load & haul to site, double handling and place.	**6,100**	**M3**		-	-		-	130.06	793,366		-		-	793,366	25%	198,342	991,708
		Geotextile 10oz	Under cobble layer.	**9,700**	**M2**		-	-		-	3.62	35,114		-		-	35,114	25%	8,779	43,893
							-	-		-		-		-		-	-		-	-
		Siphon					-	-		-		-		-		-	-		-	-
		Air pump	supply	**1**	**EA**		-	-		-	20,000.00	20,000		-		-	20,000	25%	5,000	25,000
		First Location:					-	-		-		-		-		-	-		-	-
		610mm HDPE DR21 pipe	Supply & install.	**900**	**LM**		-	-		-	935.27	841,743		-		-	841,743	25%	210,436	1,052,179
		Lock blocks	Supply & place.	**46**	**EA**		-	-		-	150.00	6,900		-		-	6,900	25%	1,725	8,625
							-	-		-		-		-		-	-		-	-
		Relocate:					-	-		-		-		-		-	-		-	-
		Cut & move 900m of pipe	Cut into 150m lengths, relocate 500m.	**6**	**EA**		-	-		-	5,000.00	30,000		-		-	30,000	25%	7,500	37,500
		610mm HDPE DR21 pipe	Re-weld joints	**6**	**EA**		-	-		-	1,440.00	8,640		-		-	8,640	25%	2,160	10,800
		Lock blocks	Relocate	**46**	**EA**		-	-		-	50.00	2,300		-		-	2,300	25%	575	2,875
							-	-		-		-		-		-	-		-	-
		Support Equipment					-	-		-		-		-		-	-		-	-
		Shop truck	1ea	**137**	**DY**		-	-		-	300.00	41,040		-		-	41,040	25%	10,260	51,300
		Temp maintenance shop	1ea	**1**	**LS**		-	-		-	15,000.00	15,000		-		-	15,000	25%	3,750	18,750
		Shop trailer	1ea	**5**	**MO**		-	-		-	2,000.00	9,000		-		-	9,000	25%	2,250	11,250
		Fuel bowser	1ea on-site	**5**	**MO**		-	-		-	5,000.00	22,500		-		-	22,500	25%	5,625	28,125
		Pick-up trucks	6ea	**137**	**DY**		-	-		-	900.00	123,120		-		-	123,120	25%	30,780	153,900
		Portable light towers	6ea	**5**	**MO**		-	-		-	22,440.00	100,980		-		-	100,980	25%	25,245	126,225
		Generator	6ea	**5**	**MO**		-	-		-	7,920.00	35,640		-		-	35,640	25%	8,910	44,550
							-	-		-		-		-		-	-		-	-
		Support Labour	*During Road Improvements, Quarry Development & Creek Stabiliztion Work.				-	-		-		-		-		-	-		-	-
		Heavy duty mechanic	1ea/shift	**61**	**DY**		-	-		-	2,640.00	160,512		-		-	160,512	25%	40,128	200,640
		Welder	1ea/shift	**61**	**DY**		-	-		-	2,640.00	160,512		-		-	160,512	25%	40,128	200,640
		Labourer	2ea/shift	**122**	**DY**		-	-		-	1,800.00	218,880		-		-	218,880	25%	54,720	273,600
							-	-		-		-		-		-	-		-	-
		Asbestos Control					-	-		-		-		-		-	-		-	-

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

WorleyParsons resources & energy

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Option CC-E3	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
		Equipment washdown facilites	1ea - 80'x120' temprorary building , 300mm SOG, 4ea - 4.5 GPM pressure washers w/ 600Gal tanks, 4man hours / day.	**1**	**EA**		-	-		-	765,225.89	765,226		-		-	765,226	25%	191,306	956,532
		Equipment / vehicle heppa filters,		**1**	**LS**		-	-		-	18,000.00	18,000		-		-	18,000	25%	4,500	22,500
		PPE; respirators, overalls		**50**	**EA**		-	-		-	500.00	25,000		-		-	25,000	25%	6,250	31,250
							-	-		-		-		-		-	-		-	-
		Fuel Transportation	Transport from Dawson City to site (approx 110km one-way).				-	-		-		-		-		-	-		-	-
		Fuel truck & driver	27,000 liter tanker	**44**	**LD**		-	-		-	685.60	30,212		-		-	30,212	25%	7,553	37,765
			*fuel included in all-in rates.	1,189,783	liters		-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
DIRECT COST SUB TOTAL							**-**	**-**		**-**		**13,217,622**		**-**	**0%**	**-**	**13,217,622**	**25%**	**3,304,406**	**16,522,028**

INDIRECT COSTS

		TEMPORARY CONSTRUCTION CAMP	av 50men camp x 4.5mo.	**7,220**	**MDY**		-	-		-	615.49	4,443,838		-		-	4,443,838	25%	1,110,959	5,554,797
		TEMPORARY FACILITIES AND CONSTRUCTION SITE SERVICES		**3%**			-	-		-	13,217,622.13	396,529		-		-	396,529	25%	99,132	495,661
		SNOW REMOVAL	Grader & dozer for winter months, 12hrs/day x 7days.	**7**	**DY**		-	-		-	4,538.76	31,771		-		-	31,771	25%	7,943	39,714
		ROAD MAINTENANCE	1ea Grader 12hrs/day	**152**	**DY**		-	-		-	2,677.20	406,934		-		-	406,934	25%	101,734	508,668
		OVERTIME PREMIUM FOR COMPRESSED WORK WEEK	n/a				-	-		-		-		-		-	-		-	-
		NON-PRODUCTIVE TIME	n/a				-	-		-		-		-		-	-		-	-
		SPOT OVERTIME	n/a				-	-		-		-		-		-	-		-	-
		CONTRACTOR LOA AND TRAVEL	Edm to Dawson City charter flight + DC to Site by charter bus. 1 flight/man every two weeks.	**375**	**Round Trip**		-	-		-	1,144.00	429,000		-		-	429,000	25%	107,250	536,250
		HEAVY LIFT	n/a				-	-		-		-		-		-	-		-	-
		TRANSPORTATION AND FREIGHT	HDPE pipe & lock blocks.	**9**	**LD**		-	-		-	9,361.68	84,255		-		-	84,255	25%	21,064	105,319
		CAPITAL SPARE PARTS	n/a				-	-		-		-		-		-	-		-	-
		VENDOR ERECTION SUPERVISION	n/a				-	-		-		-		-		-	-		-	-
		FIRST FILLS	n/a				-	-		-		-		-		-	-		-	-
		ENVIRONMENTAL ASSESSMENT, MONITORING AND TESTING SERVICES		**2%**			-	-		-	13,217,622.13	264,352		-		-	264,352	25%	66,088	330,441
		GEOTECHNICAL INVESTIGATIONS AND RECOMMENDATIONS		**4%**			-	-		-	13,217,622.13	528,705		-		-	528,705	25%	132,176	660,881
		CONSTRUCTION INSURANCE	n/a				-	-		-		-		-		-	-		-	-
		BUILDING PERMITS	n/a				-	-		-		-		-		-	-		-	-
INDIRECT COST SUB TOTAL							**-**	**-**		**-**		**6,585,385**		**-**	**0%**	**-**	**6,585,385**	**25%**	**1,646,346**	**8,231,731**

OTHER COSTS

		EPCM		**10%**			-	-		-	19,803,006.76	1,980,301		-		-	1,980,301	25%	495,075	2,475,376
		OWNERS COSTS					-	-		-		-		-		-	-		-	-
		ESCALATION					-	-		-		-		-		-	-		-	-
OTHER COST SUB TOTAL							**-**	**-**		**-**		**1,980,301**		**-**	**0%**	**-**	**1,980,301**	**25%**	**495,075**	**2,475,376**

TOTAL																	**21,783,307**	**25%**	**5,445,827**	**27,229,134**

WorleyParsons
resources & energy

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Option CC-F	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
DIRECT COSTS																				
							-	-		-		-		-		-	-		-	-
		Equipment Mob / Demob	Edmonton to Dawson City 2,519km. Dawson City to Site	**27**	**EA**		-	-		-	38,843.54	1,048,776		-		-	1,048,776	25%	262,194	1,310,969
							-	-		-		-		-		-	-		-	-
		Major Road Improvements	15km				-	-		-		-		-		-	-		-	-
		Clear & grub	Medium	**9**	**HA**		-	-		-	11,877.51	106,898		-		-	106,898	25%	26,724	133,622
		Road embankment widening, 3m	Cut to fill existing shoulder. Approx 8M3 / LM.	**120,000**	**M3**		-	-		-	4.63	555,600		-		-	555,600	25%	138,900	694,500
		Re-grade road sub-base	Av. 150mm dp x 5m wide	**11,250**	**M3**		-	-		-	12.57	141,413		-		-	141,413	25%	35,353	176,766
		Gravel resurfacing, 100mm thk x 8m wide	Drill & blast, crushing, load & haul and place.	**12,000**	**M3**		-	-		-	160.09	1,921,080		-		-	1,921,080	25%	480,270	2,401,350
		Bridge construction	15m clear span x 11m w. Supply & install.	**1**	**LS**		-	-		-	889,246.48	889,246		-		-	889,246	25%	222,312	1,111,558
							-	-		-		-		-		-	-		-	-
		Bulk Earthworks					-	-		-		-		-		-	-		-	-
		Waste dump to porcupine pit	Equip Set 1	**5,000,000**	**M3**		-	-		-	4.90	24,500,000		-		-	24,500,000	25%	6,125,000	30,625,000
		Waste dump to hudgeon lake	Equip Set 1	**4,500,000**	**M3**		-	-		-	4.90	22,050,000		-		-	22,050,000	25%	5,512,500	27,562,500
							-	-		-		-		-		-	-		-	-
		Channel Armouring					-	-		-		-		-		-	-		-	-
		Cobbles 50 - 200 mm dia.	Drill & blast, screen & sort, load & haul to site, double handling and place.	**4,000**	**M3**		-	-		-	130.12	520,480		-		-	520,480	25%	130,120	650,600
		Granular filter	Drill & blast, crushing, load & haul and place.	**4,000**	**M3**		-	-		-	156.56	626,240		-		-	626,240	25%	156,560	782,800
		Waste rock	Load, haul, place & compact	**5,800**	**M3**		-	-		-	10.12	58,696		-		-	58,696	25%	14,674	73,370
		Turf reinforcement mat	P550	**10,800**	**M2**		-	-		-	18.00	194,400		-		-	194,400	25%	48,600	243,000
							-	-		-		-		-		-	-		-	-
		Drain Hudgeon Lake					-	-		-		-		-		-	-		-	-
		Air pump	supply	**1**	**EA**		-	-		-	20,000.00	20,000		-		-	20,000	25%	5,000	25,000
		First Location:					-	-		-		-		-		-	-		-	-
		610mm HDPE DR21 pipe	Supply & install.	**1,800**	**LM**		-	-		-	935.27	1,683,486		-		-	1,683,486	25%	420,872	2,104,358
		Lock blocks	Supply & place.	**92**	**EA**		-	-		-	150.00	13,800		-		-	13,800	25%	3,450	17,250
							-	-		-		-		-		-	-		-	-
		Relocate: 3X					-	-		-		-		-		-	-		-	-
		Cut & move 900m of pipe	Cut into 150m lengths, relocate 500m.	**18**	**EA**		-	-		-	5,000.00	90,000		-		-	90,000	25%	22,500	112,500
		610mm HDPE DR21 pipe	Re-weld joints	**18**	**EA**		-	-		-	1,440.00	25,920		-		-	25,920	25%	6,480	32,400
		Lock blocks	Relocate	**138**	**EA**		-	-		-	50.00	6,900		-		-	6,900	25%	1,725	8,625
							-	-		-		-		-		-	-		-	-
		Support Equipment					-	-		-		-		-		-	-		-	-
		Shop truck	1ea	**274**	**DY**		-	-		-	300.00	82,080		-		-	82,080	25%	20,520	102,600
		Temp maintenance shop	1ea	**1**	**LS**		-	-		-	15,000.00	15,000		-		-	15,000	25%	3,750	18,750
		Shop trailer	1ea	**9**	**MO**		-	-		-	2,000.00	18,000		-		-	18,000	25%	4,500	22,500
		Fuel bowser	1ea on-site	**9**	**MO**		-	-		-	5,000.00	45,000		-		-	45,000	25%	11,250	56,250
		Pick-up trucks	6ea	**274**	**DY**		-	-		-	900.00	246,240		-		-	246,240	25%	61,560	307,800
		Portable light towers	6ea	**9**	**MO**		-	-		-	22,440.00	201,960		-		-	201,960	25%	50,490	252,450
		Generator	6ea	**9**	**MO**		-	-		-	7,920.00	71,280		-		-	71,280	25%	17,820	89,100
							-	-		-		-		-		-	-		-	-
		Support Labour	*During Road Improvements, Quarry Development & Creek Stabiliztion Work.				-	-		-		-		-		-	-		-	-
		Heavy duty mechanic	1ea/shift	**61**	**DY**		-	-		-	2,640.00	160,512		-		-	160,512	25%	40,128	200,640
		Welder	1ea/shift	**61**	**DY**		-	-		-	2,640.00	160,512		-		-	160,512	25%	40,128	200,640
		Labourer	2ea/shift	**122**	**DY**		-	-		-	1,800.00	218,880		-		-	218,880	25%	54,720	273,600
							-	-		-		-		-		-	-		-	-
		Asbestos Control					-	-		-		-		-		-	-		-	-

WorleyParsons
resources & energy

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Option CC-F	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
		Equipment washdown facilites	1ea - 80'x120' temprorary building , 300mm SOG, 4ea - 4.5 GPM pressure washers w/ 600Gal tanks, 4man hours / day.	**1**	**EA**		-	-		-	822,703.78	822,704		-		-	822,704	25%	205,676	1,028,380
		Equipment / vehicle heppa filters,		**1**	**LS**		-	-		-	27,000.00	27,000		-		-	27,000	25%	6,750	33,750
		PPE; respirators, overalls		**70**	**EA**		-	-		-	500.00	35,000		-		-	35,000	25%	8,750	43,750
							-	-		-		-		-		-	-		-	-
		Fuel Transportation	Transport from Dawson City to site (approx 110km one-way).				-	-		-		-		-		-	-		-	-
		Fuel truck & driver	27,000 liter tanker	**513**	**LD**		-	-		-	685.60	351,968		-		-	351,968	25%	87,992	439,960
			*fuel included in all-in rates.	13,861,064	liters		-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
DIRECT COST SUB TOTAL							**-**	**-**		**-**		**56,909,070**		**-**	**0%**	**-**	**56,909,070**	**25%**	**14,227,268**	**71,136,338**

INDIRECT COSTS

		TEMPORARY CONSTRUCTION CAMP	80 man temporary camp x 12mo.	**29,184**	**MDY**		-	-		-	336.53	9,821,292		-		-	9,821,292	25%	2,455,323	12,276,614
		TEMPORARY FACILITIES AND CONSTRUCTION SITE SERVICES		**3%**			-	-		-	56,909,070.22	1,707,272		-		-	1,707,272	25%	426,818	2,134,090
		SNOW REMOVAL	2ea Grader 12hrs/day	**213**	**DY**		-	-		-	5,354.40	1,139,416		-		-	1,139,416	25%	284,854	1,424,270
		ROAD MAINTENANCE	1ea Grader 12hrs/day	**91**	**DY**		-	-		-	2,677.20	244,161		-		-	244,161	25%	61,040	305,201
		OVERTIME PREMIUM FOR COMPRESSED WORK WEEK	n/a				-	-		-		-		-		-	-		-	-
		NON-PRODUCTIVE TIME	n/a				-	-		-		-		-		-	-		-	-
		SPOT OVERTIME	n/a				-	-		-		-		-		-	-		-	-
		CONTRACTOR LOA AND TRAVEL	Edm to Dawson City charter flight + DC to Site by charter bus. 1 flight/man every two weeks.	**1,920**	**Round Trip**		-	-		-	1,144.00	2,196,480		-		-	2,196,480	25%	549,120	2,745,600
		HEAVY LIFT	n/a				-	-		-		-		-		-	-		-	-
		TRANSPORTATION AND FREIGHT	HDPE pipe & lock blocks.	**18**	**LD**		-	-		-	9,361.68	168,510		-		-	168,510	25%	42,128	210,638
		CAPITAL SPARE PARTS	n/a				-	-		-		-		-		-	-		-	-
		VENDOR ERECTION SUPERVISION	n/a				-	-		-		-		-		-	-		-	-
		FIRST FILLS	n/a				-	-		-		-		-		-	-		-	-
		ENVIRONMENTAL ASSESSMENT, MONITORING AND TESTING SERVICES		**2%**			-	-		-	56,909,070.22	1,138,181		-		-	1,138,181	25%	284,545	1,422,727
		GEOTECHNICAL INVESTIGATIONS AND RECOMMENDATIONS		**2%**			-	-		-	56,909,070.22	1,138,181		-		-	1,138,181	25%	284,545	1,422,727
		CONSTRUCTION INSURANCE	n/a				-	-		-		-		-		-	-		-	-
		BUILDING PERMITS	n/a				-	-		-		-		-		-	-		-	-
INDIRECT COST SUB TOTAL							**-**	**-**		**-**		**17,553,494**		**-**	**0%**	**-**	**17,553,494**	**25%**	**4,388,373**	**21,941,867**

OTHER COSTS

		EPCM		**10%**			-	-		-	74,462,563.85	7,446,256		-		-	7,446,256	25%	1,861,564	9,307,820
		OWNERS COSTS					-	-		-		-		-		-	-		-	-
		ESCALATION					-	-		-		-		-		-	-		-	-
OTHER COST SUB TOTAL							**-**	**-**		**-**		**7,446,256**		**-**	**0%**	**-**	**7,446,256**	**25%**	**1,861,564**	**9,307,820**

TOTAL																	**81,908,820**	**25%**	**20,477,205**	**102,386,025**

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

WorleyParsons
resources & energy

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Option CC-G	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

DIRECT COSTS

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
							-	-		-		-		-		-	-		-	-
		Equipment Mob / Demob	Edmonton to Dawson City 2,519km. Dawson City to Site	**13**	**EA**		-	-		-	18,723.36	243,404		-		-	243,404	25%	60,851	304,255
							-	-		-		-		-		-	-		-	-
		Major Road Improvements	15km				-	-		-		-		-		-	-		-	-
		Clear & grub	Medium	**9**	**HA**		-	-		-	11,877.51	106,898		-		-	106,898	25%	26,724	133,622
		Road embankment widening, 3m	Cut to fill existing shoulder. Approx 8M3 / LM.	**120,000**	**M3**		-	-		-	4.63	555,600		-		-	555,600	25%	138,900	694,500
		Re-grade road sub-base	Av. 150mm dp x 5m wide	**11,250**	**M3**		-	-		-	12.57	141,413		-		-	141,413	25%	35,353	176,766
		Gravel resurfacing, 100mm thk x 8m wide	Drill & blast, crushing, load & haul and place.	**12,000**	**M3**		-	-		-	159.72	1,916,640		-		-	1,916,640	25%	479,160	2,395,800
		Bridge construction	15m clear span x 11m w. Supply & install.	**1**	**LS**		-	-		-	889,246.48	889,246		-		-	889,246	25%	222,312	1,111,558
							-	-		-		-		-		-	-		-	-
		Bulk Earthworks					-	-		-		-		-		-	-		-	-
		Waste dump to channel fill	1ea-D8 & 1ea-345 ex; push top of existing channel to fill channel bed.	**25,000**	**M3**		-	-		-	5.22	130,500		-		-	130,500	25%	32,625	163,125
		Waste dump to porcupine pit	Equip Set 1	**150,000**	**M3**		-	-		-	4.90	735,000		-		-	735,000	25%	183,750	918,750
							-	-		-		-		-		-	-		-	-
		Access Road Construction					-	-		-		-		-		-	-		-	-
		Gravel resurfacing, 300mm thk x 6m wide	Drill & blast, crushing, load & haul and place.	**990**	**M3**		-	-		-	159.72	158,123		-		-	158,123	25%	39,531	197,654
							-	-		-		-		-		-	-		-	-
		Channel Armouring					-	-		-		-		-		-	-		-	-
		Gabion baskets (3m lg x 1m dp x 0.5m h)	Supply, load, haul, assemble, place	**3,800**	**EA**		-	-		-	162.23	616,484		-		-	616,484	25%	154,121	770,605
		Gabion Rock - 100 to 200 mm dia.	Drill & blast, screen & sort, load & haul to site, double handling and place.	**5,700**	**M3**		-	-		-	104.96	598,272		-		-	598,272	25%	149,568	747,840
		Geotextile 10oz	Under cobble layer.	**11,000**	**M2**		-	-		-	3.62	39,820		-		-	39,820	25%	9,955	49,775
							-	-		-		-		-		-	-		-	-
		Water Diversion					-	-		-		-		-		-	-		-	-
		Aquadam - supply & install	6' x 100' lg.	**1**	**EA**		-	-		-	26,000.00	26,000		-		-	26,000	25%	6,500	32,500
		610mm HDPE DR21 pipe	Trench 1.6m dp, BF 1m cover, supply & install.	**900**	**LM**		-	-		-	980.07	882,065		-		-	882,065	25%	220,516	1,102,581
							-	-		-		-		-		-	-		-	-
		Support Equipment					-	-		-		-		-		-	-		-	-
		Shop truck	1ea	**61**	**DY**		-	-		-	300.00	18,240		-		-	18,240	25%	4,560	22,800
		Temp maintenance shop	1ea	**1**	**LS**		-	-		-	15,000.00	15,000		-		-	15,000	25%	3,750	18,750
		Shop trailer	1ea	**2**	**MO**		-	-		-	2,000.00	4,000		-		-	4,000	25%	1,000	5,000
		Fuel bowser	1ea on-site	**2**	**MO**		-	-		-	5,000.00	10,000		-		-	10,000	25%	2,500	12,500
		Pick-up trucks	6ea	**61**	**DY**		-	-		-	900.00	54,720		-		-	54,720	25%	13,680	68,400
		Portable light towers	6ea	**2**	**MO**		-	-		-	22,440.00	44,880		-		-	44,880	25%	11,220	56,100
		Generator	6ea	**2**	**MO**		-	-		-	7,920.00	15,840		-		-	15,840	25%	3,960	19,800
							-	-		-		-		-		-	-		-	-
		Support Labour	*During Road Improvements, Quarry Development & Creek Stabiliztion Work.				-	-		-		-		-		-	-		-	-
		Heavy duty mechanic	1ea/shift	**61**	**DY**		-	-		-	2,640.00	160,512		-		-	160,512	25%	40,128	200,640
		Welder	1ea/shift	**61**	**DY**		-	-		-	2,640.00	160,512		-		-	160,512	25%	40,128	200,640
		Labourer	2ea/shift	**122**	**DY**		-	-		-	1,800.00	218,880		-		-	218,880	25%	54,720	273,600
							-	-		-		-		-		-	-		-	-
		Asbestos Control					-	-		-		-		-		-	-		-	-
		Equipment washdown facilites	1ea - 80'x120' temprorary building , 300mm SOG, 4ea - 4.5 GPM pressure washers w/ 600Gal tanks, 4man hours / day.	**1**	**EA**		-	-		-	733,293.73	733,294		-		-	733,294	25%	183,323	916,617

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

WorleyParsons resources & energy

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Option CC-G	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
		Equipment / vehicle heppa filters,		1	LS		-	-		-	13,000.00	13,000		-		-	13,000	25%	3,250	16,250
		PPE; respirators, overalls		50	EA		-	-		-	500.00	25,000		-		-	25,000	25%	6,250	31,250
							-	-		-		-		-		-	-		-	-
		Fuel Transportation	Transport from Dawson City to site (approx 110km one-way).				-	-		-		-		-		-	-		-	-
		Fuel truck & driver	27,000 liter tanker	12	LD		-	-		-	685.60	8,355		-		-	8,355	25%	2,089	10,444
			*fuel included in all-in rates.	329,027	liters		-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
DIRECT COST SUB TOTAL							**-**	**-**		**-**		**8,521,697**		**-**	**0%**	**-**	**8,521,697**	**25%**	**2,130,424**	**10,652,121**
INDIRECT COSTS																				
		TEMPORARY CONSTRUCTION CAMP	50 man temporary camp x 3.25mo.	4,940	MDY		-	-		-	487.52	2,408,349		-		-	2,408,349	25%	602,087	3,010,436
		TEMPORARY FACILITIES AND CONSTRUCTION SITE SERVICES		3%			-	-		-	8,521,696.79	255,651		-		-	255,651	25%	63,913	319,564
		SNOW REMOVAL	n/a				-	-		-		-		-		-	-		-	-
		ROAD MAINTENANCE	1ea Grader 12hrs/day	91	DY		-	-		-	2,677.20	244,161		-		-	244,161	25%	61,040	305,201
		OVERTIME PREMIUM FOR COMPRESSED WORK WEEK	n/a				-	-		-		-		-		-	-		-	-
		NON-PRODUCTIVE TIME	n/a				-	-		-		-		-		-	-		-	-
		SPOT OVERTIME	n/a				-	-		-		-		-		-	-		-	-
		CONTRACTOR LOA AND TRAVEL	Edm to Dawson City charter flight + DC to Site by charter bus. 1 flight/man every two weeks.	240	Round Trip		-	-		-	1,144.00	274,560		-		-	274,560	25%	68,640	343,200
		HEAVY LIFT	n/a				-	-		-		-		-		-	-		-	-
		TRANSPORTATION AND FREIGHT	HDPE pipe & aquadam.	6	LD		-	-		-	9,361.68	56,170		-		-	56,170	25%	14,043	70,213
		CAPITAL SPARE PARTS	n/a				-	-		-		-		-		-	-		-	-
		VENDOR ERECTION SUPERVISION	n/a				-	-		-		-		-		-	-		-	-
		FIRST FILLS	n/a				-	-		-		-		-		-	-		-	-
		ENVIRONMENTAL ASSESSMENT, MONITORING AND TESTING SERVICES		2%			-	-		-	8,521,696.79	170,434		-		-	170,434	25%	42,608	213,042
		GEOTECHNICAL INVESTIGATIONS AND RECOMMENDATIONS		2%			-	-		-	8,521,696.79	170,434		-		-	170,434	25%	42,608	213,042
		CONSTRUCTION INSURANCE	n/a				-	-		-		-		-		-	-		-	-
		BUILDING PERMITS	n/a				-	-		-		-		-		-	-		-	-
INDIRECT COST SUB TOTAL							**-**	**-**		**-**		**3,579,758**		**-**	**0%**	**-**	**3,579,758**	**25%**	**894,940**	**4,474,698**
OTHER COSTS																				
		EPCM		10%			-	-		-	12,101,455.08	1,210,146		-		-	1,210,146	25%	302,536	1,512,682
		OWNERS COSTS					-	-		-		-		-		-	-		-	-
		ESCALATION					-	-		-		-		-		-	-		-	-
OTHER COST SUB TOTAL							**-**	**-**		**-**		**1,210,146**		**-**	**0%**	**-**	**1,210,146**	**25%**	**302,536**	**1,512,682**
TOTAL																	**13,311,601**	**25%**	**3,327,900**	**16,639,501**

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

WorleyParsons
resources & energy

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Option CC-H	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
DIRECT COSTS																				
							-	-		-		-		-		-	-		-	-
		Equipment Mob / Demob	Edmonton to Dawson City 2,519km. Dawson City to Site	**21**	**EA**		-	-		-	31,657.76	664,813		-		-	664,813	25%	166,203	831,016
							-	-		-		-		-		-	-		-	-
		Major Road Improvements	15km				-	-		-		-		-		-	-		-	-
		Clear & grub	Medium	**9**	**HA**		-	-		-	11,877.51	106,898		-		-	106,898	25%	26,724	133,622
		Road embankment widening, 3m	Cut to fill existing shoulder. Approx 8M3 / LM.	**120,000**	**M3**		-	-		-	4.63	555,600		-		-	555,600	25%	138,900	694,500
		Re-grade road sub-base	Av. 150mm dp x 5m wide	**11,250**	**M3**		-	-		-	12.57	141,413		-		-	141,413	25%	35,353	176,766
		Gravel resurfacing, 100mm thk x 8m wide	Drill & blast, crushing, load & haul and place.	**12,000**	**M3**		-	-		-	161.53	1,938,360		-		-	1,938,360	25%	484,590	2,422,950
		Bridge construction	15m clear span x 11m w. Supply & install.	**1**	**LS**		-	-		-	889,246.48	889,246		-		-	889,246	25%	222,312	1,111,558
							-	-		-		-		-		-	-		-	-
		Bulk Earthworks					-	-		-		-		-		-	-		-	-
		Waste dump excavation to channel fill	1ea-D8 & 1ea-345 ex	**25,000**	**M3**		-	-		-	5.22	130,500		-		-	130,500	25%	32,625	163,125
		Waste dump to porupine pit	Equip Set 1	**425,000**	**M3**		-	-		-	4.90	2,082,500		-		-	2,082,500	25%	520,625	2,603,125
							-	-		-		-		-		-	-		-	-
		Access Road Construction					-	-		-		-		-		-	-		-	-
		Gravel resurfacing, 300mm thk x 6m wide	Drill & blast, crushing, load & haul and place.	**990**	**M3**		-	-		-	161.53	159,915		-		-	159,915	25%	39,979	199,893
							-	-		-		-		-		-	-		-	-
		Channel Armouring					-	-		-		-		-		-	-		-	-
		Gabion baskets (3m lg x 1m dp x 0.5m h)	Supply, load, haul, assemble, place	**3,800**	**EA**		-	-		-	162.23	616,484		-		-	616,484	25%	154,121	770,605
		Gabion rock - 100 to 200 mm dia.	Drill & blast, screen & sort, load & haul to site, double handling and place.	**5,700**	**M3**		-	-		-	104.96	598,272		-		-	598,272	25%	149,568	747,840
		Geotextile 10oz	Under cobble layer.	**11,000**	**M2**		-	-		-	3.62	39,820		-		-	39,820	25%	9,955	49,775
							-	-		-		-		-		-	-		-	-
		Water Diversion					-	-		-		-		-		-	-		-	-
		Aquadam - supply & install	6' x 100' lg	**1**	**EA**		-	-		-	26,000.00	26,000		-		-	26,000	25%	6,500	32,500
		610mm HDPE DR21 pipe	Trench 1.6m dp, BF 1m cover, supply & install.	**900**	**LM**		-	-		-	980.07	882,065		-		-	882,065	25%	220,516	1,102,581
							-	-		-		-		-		-	-		-	-
		Support Equipment					-	-		-		-		-		-	-		-	-
		Shop truck	1ea	**106**	**DY**		-	-		-	300.00	31,920		-		-	31,920	25%	7,980	39,900
		Temp maintenance shop	1ea	**1**	**LS**		-	-		-	15,000.00	15,000		-		-	15,000	25%	3,750	18,750
		Shop trailer	1ea	**4**	**MO**		-	-		-	2,000.00	7,000		-		-	7,000	25%	1,750	8,750
		Fuel bowser	1ea on-site	**4**	**MO**		-	-		-	5,000.00	17,500		-		-	17,500	25%	4,375	21,875
		Pick-up trucks	6ea	**106**	**DY**		-	-		-	900.00	95,760		-		-	95,760	25%	23,940	119,700
		Portable light towers	6ea	**4**	**MO**		-	-		-	22,440.00	78,540		-		-	78,540	25%	19,635	98,175
		Generator	6ea	**4**	**MO**		-	-		-	7,920.00	27,720		-		-	27,720	25%	6,930	34,650
							-	-		-		-		-		-	-		-	-
		Support Labour	*During Road Improvements, Quarry Development & Creek Stabiliztion Work.				-	-		-		-		-		-	-		-	-
		Heavy duty mechanic	1ea/shift	**61**	**DY**		-	-		-	2,640.00	160,512		-		-	160,512	25%	40,128	200,640
		Welder	1ea/shift	**61**	**DY**		-	-		-	2,640.00	160,512		-		-	160,512	25%	40,128	200,640
		Labourer	2ea/shift	**122**	**DY**		-	-		-	1,800.00	218,880		-		-	218,880	25%	54,720	273,600
							-	-		-		-		-		-	-		-	-
		Asbestos Control					-	-		-		-		-		-	-		-	-
		Equipment washdown facilites	1ea - 80'x120' temprorary building , 300mm SOG, 4ea - 4.5 GPM pressure washers w/ 600Gal tanks, 4man hours / day.	**1**	**EA**		-	-		-	752,453.02	752,453		-		-	752,453	25%	188,113	940,566
		Equipment / vehicle heppa filters,		**1**	**LS**		-	-		-	21,000.00	21,000		-		-	21,000	25%	5,250	26,250

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

WorleyParsons resources & energy

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Option CC-H	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
		PPE; respirators, overalls		**50**	**EA**		-	-		-	500.00	25,000		-		-	25,000	25%	6,250	31,250
							-	-		-		-		-		-	-		-	-
		Fuel Transportation	Transport from Dawson City to site (approx 110km one-way).				-	-		-		-		-		-	-		-	-
		Fuel truck & driver	27,000 liter tanker	**25**	**LD**		-	-		-	685.60	16,855		-		-	16,855	25%	4,214	21,068
			*fuel included in all-in rates.	663,763	liters		-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
DIRECT COST SUB TOTAL							**-**	**-**		**-**		**10,460,537**		**-**	**0%**	**-**	**10,460,537**	**25%**	**2,615,134**	**13,075,671**
INDIRECT COSTS																				
		TEMPORARY CONSTRUCTION CAMP	40 man temporary camp x 5.25mo.	**6,384**	**MDY**		-	-		-	493.92	3,153,185		-		-	3,153,185	25%	788,296	3,941,482
		TEMPORARY FACILITIES AND CONSTRUCTION SITE SERVICES		**3%**			-	-		-	10,460,537.08	313,816		-		-	313,816	25%	78,454	392,270
		ROAD MAINTENANCE	1ea Grader 12hrs/day	**152**	**DY**		-	-		-	2,677.20	406,934		-		-	406,934	25%	101,734	508,668
		OVERTIME PREMIUM FOR COMPRESSED WORK WEEK	n/a				-	-		-		-		-		-	-		-	-
		NON-PRODUCTIVE TIME	n/a				-	-		-		-		-		-	-		-	-
		SPOT OVERTIME	n/a				-	-		-		-		-		-	-		-	-
		CONTRACTOR LOA AND TRAVEL	Edm to Dawson City charter flight + DC to Site by charter bus. 1 flight/man every two weeks.	**480**	**Round Trip**		-	-		-	1,144.00	549,120		-		-	549,120	25%	137,280	686,400
		HEAVY LIFT	n/a				-	-		-		-		-		-	-		-	-
		TRANSPORTATION AND FREIGHT	HDPE pipe & aquadam.	**6**	**LD**		-	-		-	9,361.68	56,170		-		-	56,170	25%	14,043	70,213
		CAPITAL SPARE PARTS	n/a				-	-		-		-		-		-	-		-	-
		VENDOR ERECTION SUPERVISION	n/a				-	-		-		-		-		-	-		-	-
		FIRST FILLS	n/a				-	-		-		-		-		-	-		-	-
		ENVIRONMENTAL ASSESSMENT, MONITORING AND TESTING SERVICES		**2%**			-	-		-	10,460,537.08	209,211		-		-	209,211	25%	52,303	261,513
		GEOTECHNICAL INVESTIGATIONS AND RECOMMENDATIONS		**2%**			-	-		-	10,460,537.08	209,211		-		-	209,211	25%	52,303	261,513
		CONSTRUCTION INSURANCE	n/a				-	-		-		-		-		-	-		-	-
		BUILDING PERMITS	n/a				-	-		-		-		-		-	-		-	-
INDIRECT COST SUB TOTAL							**-**	**-**		**-**		**4,897,647**		**-**	**0%**	**-**	**4,897,647**	**25%**	**1,224,412**	**6,122,059**
OTHER COSTS																				
		EPCM		**10%**			-	-		-	15,358,184.43	1,535,818		-		-	1,535,818	25%	383,955	1,919,773
		OWNERS COSTS					-	-		-		-		-		-	-		-	-
		ESCALATION					-	-		-		-		-		-	-		-	-
OTHER COST SUB TOTAL							**-**	**-**		**-**		**1,535,818**		**-**	**0%**	**-**	**1,535,818**	**25%**	**383,955**	**1,919,773**
TOTAL																	**16,894,003**	**25%**	**4,223,501**	**21,117,504**

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

WorleyParsons resources & energy

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Option CC-I	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
DIRECT COSTS																				
							-	-		-		-		-		-	-		-	-
		Equipment Mob / Demob	Edmonton to Dawson City 2,519km. Dawson City to Site	**26**	**EA**		-	-		-	29,170.38	758,430		-		-	758,430	25%	189,607	948,037
							-	-		-		-		-		-	-		-	-
		Major Road Improvements	15km				-	-		-		-		-		-	-		-	-
		Clear & grub	Medium	**9**	**HA**		-	-		-	11,877.51	106,898		-		-	106,898	25%	26,724	133,622
		Road embankment widening, 3m	Cut to fill existing shoulder. Approx 8M3 / LM.	**120,000**	**M3**		-	-		-	4.63	555,600		-		-	555,600	25%	138,900	694,500
		Re-grade road sub-base	Av. 150mm dp x 5m wide	**11,250**	**M3**		-	-		-	12.57	141,413		-		-	141,413	25%	35,353	176,766
		Gravel resurfacing, 100mm thk x 8m wide	Drill & blast, crushing, load & haul and place.	**12,000**	**M3**		-	-		-	161.33	1,935,960		-		-	1,935,960	25%	483,990	2,419,950
		Bridge construction	15m clear span x 11m w. Supply & install.	**1**	**LS**		-	-		-	889,246.48	889,246		-		-	889,246	25%	222,312	1,111,558
							-	-		-		-		-		-	-		-	-
		Bulk Earthworks					-	-		-		-		-		-	-		-	-
		New channel to channel fill	Equip Set 2	**150,000**	**M3**		-	-		-	3.95	592,500		-		-	592,500	25%	148,125	740,625
		Waste dump to channel fill	1ea-D8 w/ 345 ex; push top of existing channel to fill channel bed.	**200,000**	**M3**		-	-		-	5.22	1,044,000		-		-	1,044,000	25%	261,000	1,305,000
		Channel to porupine pit	Equip Set 1	**300,000**	**M3**		-	-		-	4.90	1,470,000		-		-	1,470,000	25%	367,500	1,837,500
							-	-		-		-		-		-	-		-	-
		Access Road Construction					-	-		-		-		-		-	-		-	-
		Gravel resurfacing, 300mm thk x 6m wide	Drill & blast, crushing, load & haul and place.	**1,350**	**M3**		-	-		-	161.33	217,796		-		-	217,796	25%	54,449	272,244
							-	-		-		-		-		-	-		-	-
		Gabion Drop Structures					-	-		-		-		-		-	-		-	-
		Gabion baskets (3m lg x 1m dp x 0.5m h)	Supply, load, haul, assemble, place	**1,250**	**EA**		-	-		-	638.72	798,400		-		-	798,400	25%	199,600	998,000
		Gabion rock - 100 to 200 mm dia.	(8 drop structures) Drill & blast, screen & sort, load & haul to site, double handling and place.	**1,850**	**M3**		-	-		-	118.15	218,578		-		-	218,578	25%	54,644	273,222
		Rip-rap - 300mm dia.	Drill & blast, screen & sort, load & haul to site, double handling and place.	**1,100**	**M3**		-	-		-	128.32	141,152		-		-	141,152	25%	35,288	176,440
		Geotextile 10oz	Under cobble layer.	**5,300**	**M2**		-	-		-	3.62	19,186		-		-	19,186	25%	4,797	23,983
							-	-		-		-		-		-	-		-	-
		Channel Armouring					-	-		-		-		-		-	-		-	-
		Rip-rap - 500mm dia.	Drill & blast, screen & sort, load & haul to site, double handling and place.	**5,800**	**M3**		-	-		-	128.32	744,256		-		-	744,256	25%	186,064	930,320
		Geotextile 10oz	Under cobble layer.	**8,600**	**M2**		-	-		-	3.62	31,132		-		-	31,132	25%	7,783	38,915
							-	-		-		-		-		-	-		-	-
		Support Equipment					-	-		-		-		-		-	-		-	-
		Shop truck	1ea	**167**	**DY**		-	-		-	300.00	50,160		-		-	50,160	25%	12,540	62,700
		Temp maintenance shop	1ea	**1**	**LS**		-	-		-	15,000.00	15,000		-		-	15,000	25%	3,750	18,750
		Shop trailer	1ea	**7**	**MO**		-	-		-	2,000.00	14,000		-		-	14,000	25%	3,500	17,500
		Fuel bowser	1ea	**7**	**MO**		-	-		-	5,000.00	35,000		-		-	35,000	25%	8,750	43,750
		Pick-up trucks	6ea	**167**	**DY**		-	-		-	900.00	150,480		-		-	150,480	25%	37,620	188,100
		Portable light towers	6ea	**7**	**MO**		-	-		-	22,440.00	157,080		-		-	157,080	25%	39,270	196,350
		Generator	6ea	**7**	**MO**		-	-		-	7,920.00	55,440		-		-	55,440	25%	13,860	69,300
							-	-		-		-		-		-	-		-	-
		Support Labour	*During Road Improvements, Quarry Development & Creek Stabiliztion Work.				-	-		-		-		-		-	-		-	-
		Heavy duty mechanic	1ea/shift	**61**	**DY**		-	-		-	2,640.00	160,512		-		-	160,512	25%	40,128	200,640
		Welder	1ea/shift	**61**	**DY**		-	-		-	2,640.00	160,512		-		-	160,512	25%	40,128	200,640
		Labourer	2ea/shift	**122**	**DY**		-	-		-	1,800.00	218,880		-		-	218,880	25%	54,720	273,600

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

WorleyParsons resources & energy

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Option CC-I	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
							-	-		-		-		-		-	-		-	-
		Asbestos Control					-	-		-		-		-		-	-		-	-
		Equipment washdown facilites	1ea - 80'x120' temprorary building , 300mm SOG, 4ea - 4.5 GPM pressure washers w/ 600Gal tanks, 4man hours / day.	**1**	**EA**		-	-		-	777,998.75	777,999		-		-	777,999	25%	194,500	972,498
		Equipment / vehicle heppa filters,		**1**	**LS**		-	-		-	26,000.00	26,000		-		-	26,000	25%	6,500	32,500
		PPE; respirators, overalls		**60**	**EA**		-	-		-	500.00	30,000		-		-	30,000	25%	7,500	37,500
							-	-		-		-		-		-	-		-	-
		Fuel Transportation	Transport from Dawson City to site (approx 110km one-way).				-	-		-		-		-		-	-		-	-
		Fuel truck & driver	27,000 liter tanker	**50**	**LD**		-	-		-	685.60	34,004		-		-	34,004	25%	8,501	42,505
			*fuel included in all-in rates.	1,339,144	liters		-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
DIRECT COST SUB TOTAL							**-**	**-**		**-**		**11,549,612**		**-**	**0%**	**-**	**11,549,612**	**25%**	**2,887,403**	**14,437,016**

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

WorleyParsons resources & energy

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Option CC-I	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
INDIRECT COSTS																				
		TEMPORARY CONSTRUCTION CAMP	60 man temporary camp x 5.5mo.	**10,032**	**MDY**		-	-		-	471.93	4,734,402		-		-	4,734,402	25%	1,183,600	5,918,002
		TEMPORARY CAMP - MAINTENANCE	Winterize & Rental	**9**	**MO**		-	-			130,834.71	1,112,095		-		-	1,112,095	25%	278,024	1,390,119
		TEMPORARY FACILITIES AND CONSTRUCTION SITE SERVICES	n/a	**3%**			-	-		-	11,549,612.42	346,488		-		-	346,488	25%	86,622	433,110
		SNOW REMOVAL	n/a				-	-		-				-		-	-		-	-
		ROAD MAINTENANCE	1ea Grader 12hrs/day	**167**	**DY**		-	-		-	2,677.20	447,628		-		-	447,628	25%	111,907	559,535
		OVERTIME PREMIUM FOR COMPRESSED WORK WEEK	n/a				-	-		-		-		-		-	-		-	-
		NON-PRODUCTIVE TIME	n/a				-	-		-		-		-		-	-		-	-
		SPOT OVERTIME	n/a				-	-		-		-		-		-	-		-	-
		CONTRACTOR LOA AND TRAVEL	Edm to Dawson City charter flight (42 pass) + DC to Site by charter bus. 1 flight per week for 7.5 months.	**22**	**Round Trip**		-	-		-	56,000.00	1,232,000		-		-	1,232,000	25%	308,000	1,540,000
		HEAVY LIFT	n/a				-	-		-		-		-		-	-		-	-
		TRANSPORTATION AND FREIGHT	n/a				-	-		-		-		-		-	-		-	-
		CAPITAL SPARE PARTS	n/a				-	-		-		-		-		-	-		-	-
		VENDOR ERECTION SUPERVISION	n/a				-	-		-		-		-		-	-		-	-
		FIRST FILLS	n/a				-	-		-		-		-		-	-		-	-
		ENVIRONMENTAL ASSESSMENT, MONITORING AND TESTING SERVICES		**2%**			-	-		-	11,549,612.42	230,992		-		-	230,992	25%	57,748	288,740
		GEOTECHNICAL INVESTIGATIONS AND RECOMMENDATIONS		**2%**			-	-		-	11,549,612.42	230,992		-		-	230,992	25%	57,748	288,740
		CONSTRUCTION INSURANCE	n/a				-	-		-		-		-		-	-		-	-
		BUILDING PERMITS	n/a				-	-		-		-		-		-	-		-	-
INDIRECT COST SUB TOTAL							**-**	**-**		**-**		**8,334,597**		**-**	**0%**	**-**	**8,334,597**	**25%**	**2,083,649**	**10,418,247**
OTHER COSTS																				
		EPCM		**10%**			-	-		-	19,884,209.89	1,988,421		-		-	1,988,421	25%	497,105	2,485,526
		OWNERS COSTS					-	-		-		-		-		-	-		-	-
		ESCALATION					-	-		-		-		-		-	-		-	-
OTHER COST SUB TOTAL							**-**	**-**		**-**		**1,988,421**		**-**	**0%**	**-**	**1,988,421**	**25%**	**497,105**	**2,485,526**
TOTAL																	**21,872,631**	**25%**	**5,468,158**	**27,340,789**

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

WorleyParsons
resources & energy

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Option CC-I2	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
DIRECT COSTS																				
							-	-		-		-		-		-	-		-	-
		Equipment Mob / Demob	Edmonton to Dawson City 2,519km. Dawson City to Site	**26**	**EA**		-	-		-	29,170.38	758,430		-		-	758,430	25%	189,607	948,037
							-	-		-		-		-		-	-		-	-
		Major Road Improvements	15km				-	-		-		-		-		-	-		-	-
		Clear & grub	Medium	**9**	**HA**		-	-		-	11,877.51	106,898		-		-	106,898	25%	26,724	133,622
		Road embankment widening, 3m	Cut to fill existing shoulder. Approx 8M3 / LM.	**120,000**	**M3**		-	-		-	4.63	555,600		-		-	555,600	25%	138,900	694,500
		Re-grade road sub-base	Av. 150mm dp x 5m wide	**11,250**	**M3**		-	-		-	12.57	141,413		-		-	141,413	25%	35,353	176,766
		Gravel resurfacing, 100mm thk x 8m wide	Drill & blast, crushing, load & haul and place.	**12,000**	**M3**		-	-		-	159.23	1,910,760		-		-	1,910,760	25%	477,690	2,388,450
		Bridge construction	15m clear span x 11m w. Supply & install.	**1**	**LS**		-	-		-	889,246.48	889,246		-		-	889,246	25%	222,312	1,111,558
							-	-		-		-		-		-	-		-	-
		Bulk Earthworks					-	-		-		-		-		-	-		-	-
		New Channel to Channel Fill	Equip Set 2	**150,000**	**M3**		-	-		-	3.95	592,500		-		-	592,500	25%	148,125	740,625
		Waste Dump to Channel Fill	1ea-D8 w/ 345 ex; push top of existing channel to fill channel bed.	**200,000**	**M3**		-	-		-	5.22	1,044,000		-		-	1,044,000	25%	261,000	1,305,000
		Channel to Porupine Pit	Equip Set 1	**300,000**	**M3**		-	-		-	4.90	1,470,000		-		-	1,470,000	25%	367,500	1,837,500
							-	-		-		-		-		-	-		-	-
		Access Road Construction					-	-		-		-		-		-	-		-	-
		Gravel resurfacing, 300mm thk x 6m wide	Drill & blast, crushing, load & haul and place.	**1,350**	**M3**		-	-		-	159.23	214,961		-		-	214,961	25%	53,740	268,701
							-	-		-		-		-		-	-		-	-
		Channel Armouring					-	-		-		-		-		-	-		-	-
		Rip-rap - 500mm dia.	Drill & blast, screen & sort, load & haul to site, double handling and place.	**5,800**	**M3**		-	-		-	125.11	725,638		-		-	725,638	25%	181,410	907,048
		Rip-rap - 800 mm dia.	Drill & blast, screen & sort, load & haul to site, double handling and place.	**7,100**	**M3**		-	-		-	135.28	960,488		-		-	960,488	25%	240,122	1,200,610
		Granular filter	Drill & blast, crushing, load & haul and place.	**5,200**	**M3**		-	-		-	155.70	809,640		-		-	809,640	25%	202,410	1,012,050
		Geotextile 10oz	Under cobble layer.	**8,600**	**M2**		-	-		-	3.62	31,132		-		-	31,132	25%	7,783	38,915
							-	-		-		-		-		-	-		-	-
		Support Equipment					-	-		-		-		-		-	-		-	-
		Shop truck	1ea	**182**	**DY**		-	-		-	300.00	54,720		-		-	54,720	25%	13,680	68,400
		Temp maintenance shop	1ea	**1**	**LS**		-	-		-	15,000.00	15,000		-		-	15,000	25%	3,750	18,750
		Shop trailer	1ea	**7**	**MO**		-	-		-	2,000.00	14,000		-		-	14,000	25%	3,500	17,500
		Fuel bowser	1ea	**7**	**MO**		-	-		-	5,000.00	35,000		-		-	35,000	25%	8,750	43,750
		Pick-up trucks	6ea	**182**	**DY**		-	-		-	900.00	164,160		-		-	164,160	25%	41,040	205,200
		Portable light towers	6ea	**7**	**MO**		-	-		-	22,440.00	157,080		-		-	157,080	25%	39,270	196,350
		Generator	6ea	**7**	**MO**		-	-		-	7,920.00	55,440		-		-	55,440	25%	13,860	69,300
							-	-		-		-		-		-	-		-	-
		Support Labour	*During Road Improvements, Quarry Development & Creek Stabiliztion Work.				-	-		-		-		-		-	-		-	-
		Heavy duty mechanic	1ea/shift	**91**	**DY**		-	-		-	2,640.00	240,768		-		-	240,768	25%	60,192	300,960
		Welder	1ea/shift	**91**	**DY**		-	-		-	2,640.00	240,768		-		-	240,768	25%	60,192	300,960
		Labourer	2ea/shift	**182**	**DY**		-	-		-	1,800.00	328,320		-		-	328,320	25%	82,080	410,400
							-	-		-		-		-		-	-		-	-
		Asbestos Control					-	-		-		-		-		-	-		-	-
		Equipment washdown facilites	1ea - 80'x120' temprorary building , 300mm SOG, 4ea - 4.5 GPM pressure washers w/ 600Gal tanks, 4man hours / day.	**1**	**EA**		-	-		-	784,385.18	784,385		-		-	784,385	25%	196,096	980,481
		Equipment / vehicle heppa filters.		**1**	**LS**		-	-		-	26,000.00	26,000		-		-	26,000	25%	6,500	32,500

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

WorleyParsons
resources & energy

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Option CC-I2	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
		PPE; respirators, overalls		60	EA		-	-		-	500.00	30,000		-		-	30,000	25%	7,500	37,500
							-	-		-		-		-		-	-		-	-
		Fuel Transportation	Transport from Dawson City to site (approx 110km one-way).				-	-		-		-		-		-	-		-	-
		Fuel truck & driver	27,000 liter tanker	50	LD		-	-		-	685.60	34,004		-		-	34,004	25%	8,501	42,505
			*fuel included in all-in rates.	1,339,144	liters		-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
DIRECT COST SUB TOTAL							**-**	**-**		**-**		**12,390,350**		**-**	**0%**	**-**	**12,390,350**	**25%**	**3,097,588**	**15,487,938**

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

WorleyParsons resources & energy

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Option CC-I2	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
INDIRECT COSTS																				
		TEMPORARY CONSTRUCTION CAMP	60 man temporary camp x 6mo.	**10,944**	**MDY**		-	-		-	457.43	5,006,114		-		-	5,006,114	25%	1,251,528	6,257,642
		TEMPORARY CAMP - MAINTENANCE	Winterize & Rental	**9**	**MO**		-	-			130,834.71	1,112,095		-		-	1,112,095	25%	278,024	1,390,119
		TEMPORARY FACILITIES AND CONSTRUCTION SITE SERVICES	n/a	**3%**			-	-		-	12,390,350.35	371,711		-		-	371,711	25%	92,928	464,638
		SNOW REMOVAL	n/a				-	-		-				-		-	-		-	-
		ROAD MAINTENANCE	1ea Grader 12hrs/day	**182**	**DY**		-	-		-	2,677.20	488,321		-		-	488,321	25%	122,080	610,402
		OVERTIME PREMIUM FOR COMPRESSED WORK WEEK	n/a				-	-		-		-		-		-	-		-	-
		NON-PRODUCTIVE TIME	n/a				-	-		-		-		-		-	-		-	-
		SPOT OVERTIME	n/a				-	-		-		-		-		-	-		-	-
		CONTRACTOR LOA AND TRAVEL	Edm to Dawson City charter flight (42 pass) + DC to Site by charter bus. 1 flight per week for 6.75 months.	**24**	**Round Trip**		-	-		-	56,000.00	1,344,000		-		-	1,344,000	25%	336,000	1,680,000
		HEAVY LIFT	n/a				-	-		-		-		-		-	-		-	-
		TRANSPORTATION AND FREIGHT	n/a				-	-		-		-		-		-	-		-	-
		CAPITAL SPARE PARTS	n/a				-	-		-		-		-		-	-		-	-
		VENDOR ERECTION SUPERVISION	n/a				-	-		-		-		-		-	-		-	-
		FIRST FILLS	n/a				-	-		-		-		-		-	-		-	-
		ENVIRONMENTAL ASSESSMENT, MONITORING AND TESTING SERVICES		**2%**			-	-		-	12,390,350.35	247,807		-		-	247,807	25%	61,952	309,759
		GEOTECHNICAL INVESTIGATIONS AND RECOMMENDATIONS		**2%**			-	-		-	12,390,350.35	247,807		-		-	247,807	25%	61,952	309,759
		CONSTRUCTION INSURANCE	n/a				-	-		-		-		-		-	-		-	-
		BUILDING PERMITS	n/a				-	-		-		-		-		-	-		-	-
INDIRECT COST SUB TOTAL							**-**	**-**		**-**		**8,817,855**		**-**	**0%**	**-**	**8,817,855**	**25%**	**2,204,464**	**11,022,318**
OTHER COSTS																				
		EPCM		**10%**			-	-		-	21,208,205.08	2,120,821		-		-	2,120,821	25%	530,205	2,651,026
		OWNERS COSTS					-	-		-		-		-		-	-		-	-
		ESCALATION					-	-		-		-		-		-	-		-	-
OTHER COST SUB TOTAL							**-**	**-**		**-**		**2,120,821**		**-**	**0%**	**-**	**2,120,821**	**25%**	**530,205**	**2,651,026**
TOTAL																	**23,329,026**	**25%**	**5,832,256**	**29,161,282**

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

WorleyParsons
resources & energy

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Site Access Rd Resurfacing (15km)	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
DIRECT COSTS																				
							-	-		-		-		-		-	-		-	-
		Equipment Mob / Demob	Edmonton to Dawson City 2,519km. Dawson City to Site	**12**	**EA**		-	-		-	18,723.36	224,680		-		-	224,680	25%	56,170	280,850
							-	-		-		-		-		-	-		-	-
		Major Road Improvements	15km				-	-		-		-		-		-	-		-	-
		Re-grade road sub-base	Av. 150mm dp x 5m wide	**11,250**	**M3**		-	-		-	12.57	141,413		-		-	141,413	25%	35,353	176,766
		Gravel resurfacing, 100mm thk x 8m wide	Drill & blast, crushing, load & haul and place.	**12,000**	**M3**		-	-		-	139.80	1,677,600		-		-	1,677,600	25%	419,400	2,097,000
							-	-		-		-		-		-	-		-	-
		Fuel Transportation	Transport from Dawson City to site (approx 110km one-way).				-	-		-		-		-		-	-		-	-
		Fuel truck & driver	27,000 liter tanker	**5**	**LD**		-	-		-	685.60	3,169		-		-	3,169	25%	792	3,961
			*fuel included in all-in rates.	124,800	liters		-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
DIRECT COST SUB TOTAL							**-**	**-**		**-**		**2,046,862**		**-**	**0%**	**-**	**2,046,862**	**25%**	**511,715**	**2,558,577**
INDIRECT COSTS																				
		TEMPORARY CONSTRUCTION CAMP	30 man camp x 4.25mo	**1,292**	**MDY**		-	-		-	440.21	568,751		-		-	568,751	25%	142,188	710,939
		TEMPORARY FACILITIES AND CONSTRUCTION SITE SERVICES		**3%**			-	-		-	2,558,577.27	76,757		-		-	76,757	25%	19,189	95,947
		ROAD MAINTENANCE	n/a				-	-		-		-		-		-	-		-	-
		OVERTIME PREMIUM FOR COMPRESSED WORK WEEK	n/a				-	-		-		-		-		-	-		-	-
		NON-PRODUCTIVE TIME	n/a				-	-		-		-		-		-	-		-	-
		SPOT OVERTIME	n/a				-	-		-		-		-		-	-		-	-
		CONTRACTOR LOA AND TRAVEL	Edm to Dawson City charter flight + DC to Site by charter bus. 1 flight/man every two weeks.	**80**	**Round Trip**		-	-		-	1,144.00	91,520		-		-	91,520	25%	22,880	114,400
		HEAVY LIFT	n/a				-	-		-		-		-		-	-		-	-
		TRANSPORTATION AND FREIGHT	n/a				-	-		-		-		-		-	-		-	-
		CAPITAL SPARE PARTS	n/a				-	-		-		-		-		-	-		-	-
		VENDOR ERECTION SUPERVISION	n/a				-	-		-		-		-		-	-		-	-
		FIRST FILLS	n/a				-	-		-		-		-		-	-		-	-
		ENVIRONMENTAL ASSESSMENT, MONITORING AND TESTING SERVICES		**2%**			-	-		-	2,558,577.27	51,172		-		-	51,172	25%	12,793	63,964
		GEOTECHNICAL INVESTIGATIONS AND RECOMMENDATIONS	n/a				-	-		-		-		-		-	-		-	-
		CONSTRUCTION INSURANCE	n/a				-	-		-		-		-		-	-		-	-
		BUILDING PERMITS	n/a				-	-		-		-		-		-	-		-	-
INDIRECT COST SUB TOTAL							**-**	**-**		**-**		**788,200**		**-**	**0%**	**-**	**788,200**	**25%**	**197,050**	**985,250**
OTHER COSTS																				
		EPCM		**10%**			-	-		-	2,835,062.00	283,506		-		-	283,506	25%	70,877	354,383
		OWNERS COSTS					-	-		-		-		-		-	-		-	-
		ESCALATION					-	-		-		-		-		-	-		-	-
OTHER COST SUB TOTAL							**-**	**-**		**-**		**283,506**		**-**	**0%**	**-**	**283,506**	**25%**	**70,877**	**354,383**
TOTAL																	**3,118,568**	**25%**	**779,642**	**3,898,210**

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

WorleyParsons resources & energy

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Repair 4 Drop Structures	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

USE hourly rate: $ 100.00

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
DIRECT COSTS																				
							-	-		-		-		-		-	-		-	-
		Equipment Mob / Demob	Whitehorse to Dawson City 1,284km. Dawson City to Site approx 110km. Bobcat, Loader.	**1**	**EA**		-	-		-	10,000	10,000		-		-	10,000	25%	2,500	12,500
							-	-		-		-		-		-	-		-	-
		Drop Structures (4ea):					-	-		-		-		-		-	-		-	-
		Maintenance work	Bobcat & Loader + 6men	**26**	**Day**		-	-		-	8,500.50	221,013		-		-	221,013	25%	55,253	276,266
		Gabion rock material	10% of original rock volume replaced	**92**	**M3**		-	-		-	175.03	16,102		-		-	16,102	25%	4,026	20,128
							-	-		-		-		-		-	-		-	-
		Asbestos Control					-	-		-		-		-		-	-		-	-
		Equipment washdown equip & labour	Assume existing building of 1ea - 80'x120' temprorary building , 300mm SOG. 1ea - 4.5 GPM pressure washers w/ 600Gal tanks, 2man hours / day.	**1**	**EA**		-	-		-	22,544.00	22,544		-		-	22,544	25%	5,636	28,180
		Equipment / vehicle heppa filters,		**1**	**LS**		-	-		-	3,000.00	3,000		-		-	3,000	25%	750	3,750
		PPE; respirators, overalls		**20**	**EA**		-	-		-	300.00	6,000		-		-	6,000	25%	1,500	7,500
							-	-		-		-		-		-	-		-	-
		Fuel Transportation	Transport from Dawson City to site (approx 110km one-way).				-	-		-		-		-		-	-		-	-
		Truck & Driver	27,000 liter tanker	**1**	**Load**		-	-		-	685.60	686		-		-	686	25%	171	857
							-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
DIRECT COST SUB TOTAL							**-**	**-**		**-**		**279,345**		**-**	**0%**	**-**	**279,345**	**25%**	**69,836**	**349,181**
INDIRECT COSTS																				
		TEMPORARY CONSTRUCTION CAMP	RV rental, 2men per unit + per diem. 10men x 30 days.	**300**	**MDY**		-	-		-	255.00	76,500		-		-	76,500	25%	19,125	95,625
		TEMPORARY FACILITIES AND CONSTRUCTION SITE SERVICES		**5%**			-	-		-	349,181	17,459		-		-	17,459	25%	4,365	21,824
		SNOW REMOVAL					-	-		-		-		-		-	-		-	-
		OVERTIME PREMIUM FOR COMPRESSED WORK	n/a				-	-		-		-		-		-	-		-	-
		NON-PRODUCTIVE TIME	n/a				-	-		-		-		-		-	-		-	-
		SPOT OVERTIME	n/a				-	-		-		-		-		-	-		-	-
		CONTRACTOR LOA AND TRAVEL	2 return trips x 7 men. Edm to Dawson City (Flight) to Site (Charter Bus).	**14**	**Round Trip**		-	-		-	1,184	16,576		-		-	16,576	25%	4,144	20,720
		HEAVY LIFT	n/a				-	-		-		-		-		-	-		-	-
		TRANSPORTATION AND FREIGHT	n/a				-	-		-		-		-		-	-		-	-
		CAPITAL SPARE PARTS	n/a				-	-		-		-		-		-	-		-	-
		VENDOR ERECTION SUPERVISION	n/a				-	-		-		-		-		-	-		-	-
		FIRST FILLS	n/a				-	-		-		-		-		-	-		-	-
		ENVIRONMENTAL ASSESSMENT, MONITORING AND TESTING SERVICES					-	-		-	349,181	-		-		-	-	25%	-	-
		GEOTECHNICAL INVESTIGATIONS AND RECOMMENDATIONS	n/a				-	-		-		-		-		-	-		-	-
		CONSTRUCTION INSURANCE	n/a				-	-		-		-		-		-	-		-	-
		BUILDING PERMITS	n/a				-	-		-		-		-		-	-		-	-
INDIRECT COST SUB TOTAL							**-**	**-**		**-**		**110,535**		**-**	**0%**	**-**	**110,535**	**25%**	**27,634**	**138,169**
OTHER COSTS																				

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Repair 4 Drop Structures	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

USE hourly rate: $ 100.00

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
		EPCM		**10%**			-	-		-	389,880	38,988		-		-	38,988	25%	9,747	48,735
		OWNERS COSTS					-	-		-		-		-		-	-		-	-
		ESCALATION					-	-		-		-		-		-	-		-	-
OTHER COST SUB TOTAL							**-**	**-**		**-**		**38,988**		**-**	**0%**	**-**	**38,988**	**25%**	**9,747**	**48,735**
TOTAL																	**428,868**	**25%**	**107,217**	**536,085**

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

WorleyParsons resources & energy

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Repair 8 Drop Structures	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

USE hourly rate: $ 100.00

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
DIRECT COSTS																				
							-	-		-		-		-		-	-		-	-
		Equipment Mob / Demob	Whitehorse to Dawson City 1,284km. Dawson City to Site approx 110km. Bobcat, Loader.	**1**	**EA**		-	-		-	10,000	10,000		-		-	10,000	25%	2,500	12,500
							-	-		-		-		-		-	-		-	-
		Drop Structures (8ea):					-	-		-		-		-		-	-		-	-
		Maintenance work	Bobcat & Loader + 6men	**46**	**Day**		-	-		-	8,500.50	391,023		-		-	391,023	25%	97,756	488,779
		Gabion rock material	10% of original rock volume replaced	**184**	**M3**		-	-		-	175.03	32,205		-		-	32,205	25%	8,051	40,256
							-	-		-		-		-		-	-		-	-
		Asbestos Control					-	-		-		-		-		-	-		-	-
		Equipment washdown equip & labour	Assume existing building of 1ea - 80'x120' temprorary building , 300mm SOG. 1ea - 4.5 GPM pressure washers w/ 600Gal tanks, 2man hours / day.	**1**	**EA**		-	-		-	22,544.00	22,544		-		-	22,544	25%	5,636	28,180
		Equipment / vehicle heppa filters,		**1**	**LS**		-	-		-	3,000.00	3,000		-		-	3,000	25%	750	3,750
		PPE; respirators, overalls		**20**	**EA**		-	-		-	300.00	6,000		-		-	6,000	25%	1,500	7,500
							-	-		-		-		-		-	-		-	-
		Fuel Transportation	Transport from Dawson City to site (approx 110km one-way).				-	-		-		-		-		-	-		-	-
		Truck & Driver	27,000 liter tanker	**2**	**Load**		-	-		-	685.60	1,371		-		-	1,371	25%	343	1,714
							-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
DIRECT COST SUB TOTAL							**-**	**-**		**-**		**466,143**		**-**	**0%**	**-**	**466,143**	**25%**	**116,536**	**582,679**
INDIRECT COSTS																				
		TEMPORARY CONSTRUCTION CAMP	RV rental, 2men per unit + per diem. 10men x 46 days.	**460**	**MDY**		-	-		-	255.00	117,300		-		-	117,300	25%	29,325	146,625
		TEMPORARY FACILITIES AND CONSTRUCTION SITE SERVICES		**5%**			-	-		-	582,679	29,134		-		-	29,134	25%	7,283	36,417
		SNOW REMOVAL					-	-		-		-		-		-	-		-	-
		OVERTIME PREMIUM FOR COMPRESSED WORK WEEK	n/a				-	-		-		-		-		-	-		-	-
		NON-PRODUCTIVE TIME	n/a				-	-		-		-		-		-	-		-	-
		SPOT OVERTIME	n/a				-	-		-		-		-		-	-		-	-
		CONTRACTOR LOA AND TRAVEL	3 return trips x 7 men. Edm to Dawson City (Flight) to Site (Charter Bus).	**21**	**Round Trip**		-	-		-	1,184	24,864		-		-	24,864	25%	6,216	31,080
		HEAVY LIFT	n/a				-	-		-		-		-		-	-		-	-
		TRANSPORTATION AND FREIGHT	n/a				-	-		-		-		-		-	-		-	-
		CAPITAL SPARE PARTS	n/a				-	-		-		-		-		-	-		-	-
		VENDOR ERECTION SUPERVISION	n/a				-	-		-		-		-		-	-		-	-
		FIRST FILLS	n/a				-	-		-		-		-		-	-		-	-
		ENVIRONMENTAL ASSESSMENT, MONITORING AND TESTING SERVICES					-	-		-	582,679	-		-		-	-	25%	-	-
		GEOTECHNICAL INVESTIGATIONS AND RECOMMENDATIONS	n/a				-	-		-		-		-		-	-		-	-
		CONSTRUCTION INSURANCE	n/a				-	-		-		-		-		-	-		-	-
		BUILDING PERMITS	n/a				-	-		-		-		-		-	-		-	-
INDIRECT COST SUB TOTAL							**-**	**-**		**-**		**171,298**		**-**	**0%**	**-**	**171,298**	**25%**	**42,824**	**214,122**
OTHER COSTS																				

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

WorleyParsons resources & energy

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Repair 8 Drop Structures	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

USE hourly rate: $ 100.00

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
		EPCM		**10%**			-	-		-	637,441	63,744		-		-	63,744	25%	15,936	79,680
		OWNERS COSTS					-	-		-		-		-		-	-		-	-
		ESCALATION					-	-		-		-		-		-	-		-	-
OTHER COST SUB TOTAL							**-**	**-**		**-**		**63,744**		**-**	**0%**	**-**	**63,744**	**25%**	**15,936**	**79,680**
TOTAL																	**701,185**	**25%**	**175,296**	**876,481**

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Repair 12 Drop Structures	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

USE hourly rate: $ 100.00

WorleyParsons resources & energy

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	SubcontractTotal ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
DIRECT COSTS																				
							-	-		-		-		-		-	-		-	-
		Equipment Mob / Demob	Whitehorse to Dawson City 1,284km. Dawson City to Site approx 110km. Bobcat, Loader.	**1**	**EA**		-	-		-	10,000	10,000		-		-	10,000	25%	2,500	12,500
							-	-		-		-		-		-	-		-	-
		Drop Structures (12ea):					-	-		-		-		-		-	-		-	-
		Maintenance work	Bobcat & Loader + 6men	**66**	**Day**		-	-		-	8,500.50	561,033		-		-	561,033	25%	140,258	701,291
		Gabion rock material	10% of original rock volume replaced	**276**	**M3**		-	-		-	175.03	48,307		-		-	48,307	25%	12,077	60,384
							-	-		-		-		-		-	-		-	-
		Asbestos Control					-	-		-		-		-		-	-		-	-
		Equipment washdown equip & labour	Assume existing building of 1ea - 80'x120' temprorary building , 300mm SOG. 1ea - 4.5 GPM pressure washers w/ 600Gal tanks, 2man hours / day.	**1**	**EA**		-	-		-	22,544.00	22,544		-		-	22,544	25%	5,636	28,180
		Equipment / vehicle heppa filters,		**1**	**LS**		-	-		-	3,000.00	3,000		-		-	3,000	25%	750	3,750
		PPE; respirators, overalls		**20**	**EA**		-	-		-	300.00	6,000		-		-	6,000	25%	1,500	7,500
							-	-		-		-		-		-	-		-	-
		Fuel Transportation	Transport from Dawson City to site (approx 110km one-way).				-	-		-		-		-		-	-		-	-
		Truck & Driver	27,000 liter tanker	**2**	**Load**		-	-		-	685.60	1,371		-		-	1,371	25%	343	1,714
							-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
DIRECT COST SUB TOTAL							**-**	**-**		**-**		**652,255**		**-**	**0%**	**-**	**652,255**	**25%**	**163,064**	**815,319**
INDIRECT COSTS																				
		TEMPORARY CONSTRUCTION CAMP	RV rental, 2men per unit + per diem. 10men x 66 days.	**660**	**MDY**		-	-		-	255.00	168,300		-		-	168,300	25%	42,075	210,375
		TEMPORARY FACILITIES AND CONSTRUCTION SITE SERVICES		**5%**			-	-		-	815,319	40,766		-		-	40,766	25%	10,191	50,957
		SNOW REMOVAL					-	-		-		-		-		-	-		-	-
		OVERTIME PREMIUM FOR COMPRESSED WORK WEEK	n/a				-	-		-		-		-		-	-		-	-
		NON-PRODUCTIVE TIME	n/a				-	-		-		-		-		-	-		-	-
		SPOT OVERTIME	n/a				-	-		-		-		-		-	-		-	-
		CONTRACTOR LOA AND TRAVEL	4 return trips x 7 men. Edm to Dawson City (Flight) to Site (Charter Bus).	**28**	**Round Trip**		-	-		-	1,184	33,152		-		-	33,152	25%	8,288	41,440
		HEAVY LIFT	n/a				-	-		-		-		-		-	-		-	-
		TRANSPORTATION AND FREIGHT	n/a				-	-		-		-		-		-	-		-	-
		CAPITAL SPARE PARTS	n/a				-	-		-		-		-		-	-		-	-
		VENDOR ERECTION SUPERVISION	n/a				-	-		-		-		-		-	-		-	-
		FIRST FILLS	n/a				-	-		-		-		-		-	-		-	-
		ENVIRONMENTAL ASSESSMENT, MONITORING AND TESTING SERVICES					-	-		-	815,319	-		-		-	-	25%	-	-
		GEOTECHNICAL INVESTIGATIONS AND RECOMMENDATIONS	n/a				-	-		-		-		-		-	-		-	-
		CONSTRUCTION INSURANCE	n/a				-	-		-		-		-		-	-		-	-
		BUILDING PERMITS	n/a				-	-		-		-		-		-	-		-	-
INDIRECT COST SUB TOTAL							**-**	**-**		**-**		**242,218**		**-**	**0%**	**-**	**242,218**	**25%**	**60,554**	**302,772**

OTHER COSTS

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

WorleyParsons resources & energy

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Repair 12 Drop Structures	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

USE hourly rate: $ 100.00

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	SubcontractTotal ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
		EPCM		**10%**			-	-		-	894,473	89,447		-		-	89,447	25%	22,362	111,809
		OWNERS COSTS					-	-		-		-		-		-	-		-	-
		ESCALATION					-	-		-		-		-		-	-		-	-
OTHER COST SUB TOTAL							**-**	**-**		**-**		**89,447**		**-**	**0%**	**-**	**89,447**	**25%**	**22,362**	**111,809**
TOTAL																	**983,920**	**25%**	**245,980**	**1,229,901**

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Replace 2 Drop Structures	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

USE hourly rate: $ 100.00

WorleyParsons resources & energy

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
DIRECT COSTS																				
							-	-		-		-		-		-	-		-	-
		Equipment Mob / Demob	Whitehorse to Dawson City 1,284km round trip. Dawson City to Site approx 110km. Excavator, Loader.	**2**	**EA**		-	-		-	10,000	20,000		-		-	20,000	25%	5,000	25,000
							-	-		-		-		-		-	-		-	-
		Drop Structures (2ea):	Assume 230M3 per drop structure.				-	-		-		-		-		-	-		-	-
		Demolish existing drop structure (2ea)		**14**	**Day**		-	-		-	9,980.00	139,720		-		-	139,720	25%	34,930	174,650
		Install new drop structure (2ea)	Excavator & Loader + 6men	**28**	**Day**		-	-		-	9,980.00	279,440		-		-	279,440	25%	69,860	349,300
		Geotextile 10oz	Under cobble layer.	**1,400**	**M2**		-	-		-	3.62	5,068		-		-	5,068	25%	1,267	6,335
		Gabion rock material	incl salvage 50% rock.	**230**	**M3**		-	-		-	175.03	40,256		-		-	40,256	25%	10,064	50,320
							-	-		-		-		-		-	-		-	-
		Water Management																		
		Aquadam - supply & install	6' x 100' lg	**1**	**EA**		-	-		-	26,000.00	26,000		-		-	26,000	25%	6,500	32,500
							-	-		-		-		-		-	-		-	-
		Asbestos Control					-	-		-		-		-		-	-		-	-
		Equipment washdown equip & labour	Assume existing building of 1ea - 80'x120' temprorary building , 300mm SOG. 1ea - 4.5 GPM pressure washers w/ 600Gal tanks, 2man hours / day.	**1**	**EA**		-	-		-	22,544.00	22,544		-		-	22,544	25%	5,636	28,180
		Equipment / vehicle heppa filters,		**1**	**LS**		-	-		-	3,000.00	3,000		-		-	3,000	25%	750	3,750
		PPE; respirators, overalls		**20**	**EA**		-	-		-	300.00	6,000		-		-	6,000	25%	1,500	7,500
							-	-		-		-		-		-	-		-	-
		Fuel Transportation	Transport from Dawson City to site (approx 110km one-way).				-	-		-		-		-		-	-		-	-
		Truck & Driver	27,000 liter tanker	**2**	**Load**		-	-		-	685.60	1,371		-		-	1,371	25%	343	1,714
							-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
DIRECT COST SUB TOTAL							**-**	**-**		**-**		**543,399**		**-**	**0%**	**-**	**543,399**	**25%**	**135,850**	**679,249**
INDIRECT COSTS																				
		TEMPORARY CONSTRUCTION CAMP	RV rental, 2men per unit + per diem. 15men x 60 days.	**900**	**MDY**		-	-		-	255.00	229,500		-		-	229,500	25%	57,375	286,875
		TEMPORARY FACILITIES AND CONSTRUCTION SITE SERVICES		**5%**			-	-		-	679,249	33,962		-		-	33,962	25%	8,491	42,453
		SNOW REMOVAL	n/a				-	-		-		-		-		-	-		-	-
		OVERTIME PREMIUM FOR COMPRESSED WORK WEEK	n/a				-	-		-		-		-		-	-		-	-
		NON-PRODUCTIVE TIME	n/a				-	-		-		-		-		-	-		-	-
		SPOT OVERTIME	n/a				-	-		-		-		-		-	-		-	-
		CONTRACTOR LOA AND TRAVEL	5 return trips x 15 men. Edm to Dawson City (Flight) to Site (Charter Bus).	**75**	**Round Trip**		-	-		-	1,144	85,800		-		-	85,800	25%	21,450	107,250
		HEAVY LIFT	n/a				-	-		-		-		-		-	-		-	-
		TRANSPORTATION AND FREIGHT	n/a				-	-		-		-		-		-	-		-	-
		CAPITAL SPARE PARTS	n/a				-	-		-		-		-		-	-		-	-
		VENDOR ERECTION SUPERVISION	n/a				-	-		-		-		-		-	-		-	-
		FIRST FILLS	n/a				-	-		-		-		-		-	-		-	-
		ENVIRONMENTAL ASSESSMENT, MONITORING AND TESTING SERVICES		**2%**			-	-		-	679,249	13,585		-		-	13,585	25%	3,396	16,981
		GEOTECHNICAL INVESTIGATIONS AND RECOMMENDATIONS	n/a				-	-		-		-		-		-	-		-	-

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Replace 2 Drop Structures	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

USE hourly rate: $ 100.00

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
		CONSTRUCTION INSURANCE	n/a				-	-		-		-		-		-	-		-	-
		BUILDING PERMITS	n/a				-	-		-		-		-		-	-		-	-
INDIRECT COST SUB TOTAL							**-**	**-**		**-**		**362,847**		**-**	**0%**	**-**	**362,847**	**25%**	**90,712**	**453,559**
OTHER COSTS																				
		EPCM		**10%**			-	-		-	906,246	90,625		-		-	90,625	25%	22,656	113,281
		OWNERS COSTS					-	-		-		-		-		-	-		-	-
		ESCALATION					-	-		-		-		-		-	-		-	-
OTHER COST SUB TOTAL							**-**	**-**		**-**		**90,625**		**-**	**0%**	**-**	**90,625**	**25%**	**22,656**	**113,281**
TOTAL																	**996,871**	**25%**	**249,218**	**1,246,089**

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

WorleyParsons resources & energy

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - 15 m Bridge Replacement	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
DIRECT COSTS																				
							-	-		-		-		-		-	-		-	-
		Equipment Mob / Demob	Edmonton to Dawson City 2,519km. Dawson City to Site	**5**	**EA**		-	-		-	18,723.36	93,617		-		-	93,617	25%	23,404	117,021
							-	-		-		-		-		-	-		-	-
		Bridge Replacement																		
		Demolish existing bridge	Deck, span, CIP abutments.	**1**	**LS**		-	-		-	93,733.00	93,733		-		-	93,733	25%	23,433	117,166
		New bridge construction	15m clear span x 11m w. Supply & install.	**1**	**LS**		-	-		-	889,246.48	889,246		-		-	889,246	25%	222,312	1,111,558
							-	-		-		-		-		-	-		-	-
		Fuel Transportation	Transport from Dawson City to site (approx 110km one-way).				-	-		-		-		-		-	-		-	-
		Fuel truck & driver	27,000 liter tanker	**4**	**LD**		-	-		-	685.60	2,606		-		-	2,606	25%	651	3,257
			*fuel included in all-in rates.	102,613	liters		-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
DIRECT COST SUB TOTAL							**-**	**-**		**-**		**1,079,202**		**-**	**0%**	**-**	**1,079,202**	**25%**	**269,800**	**1,349,002**
INDIRECT COSTS																				
		TEMPORARY CONSTRUCTION CAMP	RV rental, 2men per unit + per diem.	**456**	**MDY**		-	-		-	255.00	116,280		-		-	116,280	25%	29,070	145,350
		TEMPORARY FACILITIES AND CONSTRUCTION SITE SERVICES		**3%**			-	-		-	1,349,002.35	40,470		-		-	40,470	25%	10,118	50,588
		OVERTIME PREMIUM FOR COMPRESSED WORK WEEK	n/a				-	-		-		-		-		-	-		-	-
		NON-PRODUCTIVE TIME	n/a				-	-		-		-		-		-	-		-	-
		SPOT OVERTIME	n/a				-	-		-		-		-		-	-		-	-
		CONTRACTOR LOA AND TRAVEL	Edm to Dawson City charter flight + DC to Site by charter bus.	**30**	**Round Trip**		-	-		-	1,144.00	34,320		-		-	34,320	25%	8,580	42,900
		HEAVY LIFT	n/a				-	-		-		-		-		-	-		-	-
		TRANSPORTATION AND FREIGHT	Scrap demolished bridge deck to Dawson City	**4**	**LD**		-	-		-	1,000.00	4,000		-		-	4,000	25%	1,000	5,000
		CAPITAL SPARE PARTS	n/a				-	-		-		-		-		-	-		-	-
		VENDOR ERECTION SUPERVISION	n/a				-	-		-		-		-		-	-		-	-
		FIRST FILLS	n/a				-	-		-		-		-		-	-		-	-
		ENVIRONMENTAL ASSESSMENT, MONITORING AND TESTING SERVICES		**2%**			-	-		-	1,349,002.35	26,980		-		-	26,980	25%	6,745	33,725
		GEOTECHNICAL INVESTIGATIONS AND RECOMMENDATIONS	n/a				-	-		-		-		-		-	-		-	-
		CONSTRUCTION INSURANCE	n/a				-	-		-		-		-		-	-		-	-
		BUILDING PERMITS	n/a				-	-		-		-		-		-	-		-	-
INDIRECT COST SUB TOTAL							**-**	**-**		**-**		**222,050**		**-**	**0%**	**-**	**222,050**	**25%**	**55,513**	**277,563**
OTHER COSTS																				
		EPCM		**10%**			-	-		-	1,301,251.99	130,125		-		-	130,125	25%	32,531	162,656
		OWNERS COSTS					-	-		-		-		-		-	-		-	-
		ESCALATION					-	-		-		-		-		-	-		-	-
OTHER COST SUB TOTAL							**-**	**-**		**-**		**130,125**		**-**	**0%**	**-**	**130,125**	**25%**	**32,531**	**162,656**
TOTAL																	**1,431,377**	**25%**	**357,844**	**1,789,221**

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Replace 550 m of Gabion-Lined Channel (Clinton Options G and H)	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

WorleyParsons
resources & energy

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
DIRECT COSTS																				
							-	-		-		-		-		-	-		-	-
		Equipment Mob / Demob	Edmonton to Dawson City 2,519km. Dawson City to Site	**10**	**EA**		-	-		-	18,723.36	187,234		-		-	187,234	25%	46,808	234,042
							-	-		-		-		-		-	-		-	-
		Gabions					-	-		-		-		-		-	-		-	-
		Gabion baskets (3m lg x 1m dp x 0.5m h)	Supply, load, haul, assemble, place	**3,800**	**EA**		-	-		-	294.15	1,117,760		-		-	1,117,760	25%	279,440	1,397,200
		Gabion rock - 100 to 200 mm dia.	Drill & blast, screen & sort, load & haul to site, double handling and place.	**5,700**	**M3**		-	-		-	104.96	598,272		-		-	598,272	25%	149,568	747,840
		Geotextile 10oz	Under cobble layer.	**11,000**	**M2**		-	-		-	3.62	39,820		-		-	39,820	25%	9,955	49,775
							-	-		-		-		-		-	-		-	-
		Water Diversion					-	-		-		-		-		-	-		-	-
		Aquadam - supply & install	6' x 100' lg.	**1**	**EA**		-	-		-	26,000.00	26,000		-		-	26,000	25%	6,500	32,500
		610mm HDPE DR21 pipe	Trench 1.6m dp, BF 1m cover, supply & install.	**900**	**LM**		-	-		-	980.07	882,065		-		-	882,065	25%	220,516	1,102,581
							-	-		-		-		-		-	-		-	-
		Asbestos Control					-	-		-		-		-		-	-		-	-
		Equipment washdown equip & labour	Assume existing building of 1ea - 80'x120' temprorary building , 300mm SOG. 1ea - 4.5 GPM pressure washers w/ 600Gal tanks, 2man hours / day.	**1**	**EA**		-	-		-	22,544.00	22,544		-		-	22,544	25%	5,636	28,180
		Equipment / vehicle heppa filters,		**1**	**LS**		-	-		-	3,000.00	3,000		-		-	3,000	25%	750	3,750
		PPE; respirators, overalls		**20**	**EA**		-	-		-	300.00	6,000		-		-	6,000	25%	1,500	7,500
							-	-		-		-		-		-	-		-	-
		Fuel Transportation	Transport from Dawson City to site (approx 110km one-way).				-	-		-		-		-		-	-		-	-
		Fuel truck & driver	27,000 liter tanker	**1**	**LD**		-	-		-	685.60	686		-		-	686	25%	171	857
			*fuel included in all-in rates.	27,000	liters		-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
DIRECT COST SUB TOTAL							**-**	**-**		**-**		**2,883,380**		**-**	**0%**	**-**	**2,883,380**	**25%**	**720,845**	**3,604,225**
INDIRECT COSTS																				
		TEMPORARY CONSTRUCTION CAMP	RV rental, 2men per unit + per diem. Aquadam & HDPE, drill & blast, crush, load & haul, place gabions.	**183**	**MDY**		-	-		-	255.00	46,665		-		-	46,665	25%	11,666	58,331
		TEMPORARY FACILITIES AND CONSTRUCTION SITE SERVICES		**3%**			-	-		-	3,604,225.45	108,127		-		-	108,127	25%	27,032	135,158
		SNOW REMOVAL	n/a				-	-		-		-		-		-	-		-	-
		ROAD MAINTENANCE	n/a				-	-		-		-		-		-	-		-	-
		OVERTIME PREMIUM FOR COMPRESSED WORK	n/a				-	-		-		-		-		-	-		-	-
		NON-PRODUCTIVE TIME	n/a				-	-		-		-		-		-	-		-	-
		SPOT OVERTIME	n/a				-	-		-		-		-		-	-		-	-
		CONTRACTOR LOA AND TRAVEL	Edm to Dawson City charter flight + DC to Site by charter bus. 1 flight/man.	**24**	**Round Trip**		-	-		-	1,144.00	27,456		-		-	27,456	25%	6,864	34,320
		CONTRACTOR LOA AND TRAVEL	Dawson City to Site - 15 passenger shuttle bus.	**45**	**Round Trip**		-	-		-	1,011.60	45,522		-		-	45,522	25%	11,381	56,903
		HEAVY LIFT	n/a				-	-		-		-		-		-	-		-	-
		TRANSPORTATION AND FREIGHT	HDPE pipe & aquadam.	**6**	**LD**		-	-		-	9,361.68	56,170		-		-	56,170	25%	14,043	70,213

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Replace 550 m of Gabion-Lined Channel (Clinton Options G and H)	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

WorleyParsons
resources & energy

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
		CAPITAL SPARE PARTS	n/a				-	-		-		-		-		-	-		-	-
		VENDOR ERECTION SUPERVISION	n/a				-	-		-		-		-		-	-		-	-
		FIRST FILLS	n/a				-	-		-		-		-		-	-		-	-
		ENVIRONMENTAL ASSESSMENT, MONITORING AND TESTING SERVICES		**2%**			-	-		-	3,604,225.45	72,085		-		-	72,085	25%	18,021	90,106
		GEOTECHNICAL INVESTIGATIONS AND RECOMMENDATIONS	n/a				-	-		-		-		-		-	-		-	-
		CONSTRUCTION INSURANCE	n/a				-	-		-		-		-		-	-		-	-
		BUILDING PERMITS	n/a				-	-		-		-		-		-	-		-	-
INDIRECT COST SUB TOTAL							**-**	**-**		**-**		**356,024**		**-**	**0%**	**-**	**356,024**	**25%**	**89,006**	**445,030**
OTHER COSTS																				
		EPCM		**10%**			-	-		-	3,239,404.71	323,940		-		-	323,940	25%	80,985	404,926
		OWNERS COSTS					-	-		-		-		-		-	-		-	-
		ESCALATION					-	-		-		-		-		-	-		-	-
OTHER COST SUB TOTAL							**-**	**-**		**-**		**323,940**		**-**	**0%**	**-**	**323,940**	**25%**	**80,985**	**404,926**
TOTAL																	**3,563,345**	**25%**	**890,836**	**4,454,181**

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

WorleyParsons resources & energy

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Replace 550 m of Type 2 Riprap-Lined Channel (Clinton Option C2)	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
DIRECT COSTS																				
							-	-		-		-		-		-	-		-	-
		Equipment Mob / Demob	Edmonton to Dawson City 2,519km. Dawson City to Site	**9**	**EA**		-	-		-	18,723.36	168,510		-		-	168,510	25%	42,128	210,638
							-	-		-		-		-		-	-		-	-
		Channel Armouring					-	-		-		-		-		-	-		-	-
		Rip-rap - 500mm dia.	Drill & blast, screen & sort, load & haul to site, double handling and place.	**6,100**	**M3**		-	-		-	130.06	793,366		-		-	793,366	25%	198,342	991,708
		Geotextile 10oz	Under cobble layer.	**9,700**	**M2**		-	-		-	3.62	35,114		-		-	35,114	25%	8,779	43,893
							-	-		-		-		-		-	-		-	-
		Water Diversion					-	-		-		-		-		-	-		-	-
		Aquadam - supply & install	6' x 100' lg.	**1**	**EA**		-	-		-	26,000.00	26,000		-		-	26,000	25%	6,500	32,500
		610mm HDPE DR21 pipe	Trench 1.6m dp, BF 1m cover, supply & install.	**900**	**LM**		-	-		-	980.07	882,065		-		-	882,065	25%	220,516	1,102,581
							-	-		-		-		-		-	-		-	-
		Asbestos Control					-	-		-		-		-		-	-		-	-
		Equipment washdown equip & labour	Assume existing building of 1ea - 80'x120' temprorary building , 300mm SOG. 1ea - 4.5 GPM pressure washers w/ 600Gal tanks, 2man hours / day.	**1**	**EA**		-	-		-	22,544.00	22,544		-		-	22,544	25%	5,636	28,180
		Equipment / vehicle heppa filters,		**1**	**LS**		-	-		-	3,000.00	3,000		-		-	3,000	25%	750	3,750
		PPE; respirators, overalls		**20**	**EA**		-	-		-	300.00	6,000		-		-	6,000	25%	1,500	7,500
							-	-		-		-		-		-	-		-	-
		Fuel Transportation	Transport from Dawson City to site (approx 110km one-way).				-	-		-		-		-		-	-		-	-
		Fuel truck & driver	27,000 liter tanker	**1**	**LD**		-	-		-	685.60	686		-		-	686	25%	171	857
			*fuel included in all-in rates.	329,027	liters		-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
DIRECT COST SUB TOTAL							**-**	**-**		**-**		**1,937,285**		**-**	**0%**	**-**	**1,937,285**	**25%**	**484,321**	**2,421,606**
INDIRECT COSTS																				
		TEMPORARY CONSTRUCTION CAMP	RV rental, 2men per unit + per diem.. Aquadam & HDPE, drill & blast, crush, load & haul, place gabions.	**192**	**MDY**		-	-		-	255.00	48,960		-		-	48,960	25%	12,240	61,200
		TEMPORARY FACILITIES AND CONSTRUCTION SITE SERVICES		**3%**			-	-		-	2,421,606.25	72,648		-		-	72,648	25%	18,162	90,810
		SNOW REMOVAL	n/a				-	-		-		-		-		-	-		-	-
		ROAD MAINTENANCE	n/a				-	-		-		-		-		-	-		-	-
		OVERTIME PREMIUM FOR COMPRESSED WORK WEEK	n/a				-	-		-		-		-		-	-		-	-
		NON-PRODUCTIVE TIME	n/a				-	-		-		-		-		-	-		-	-
		SPOT OVERTIME	n/a				-	-		-		-		-		-	-		-	-
		CONTRACTOR LOA AND TRAVEL	Edm to Dawson City charter flight + DC to Site by charter bus. 1 flight/man.	**21**	**Round Trip**		-	-		-	1,144.00	24,024		-		-	24,024	25%	6,006	30,030
		CONTRACTOR LOA AND TRAVEL	Dawson City to Site - 15 passenger shuttle bus.	**48**	**Round Trip**		-	-		-	1,011.60	48,557		-		-	48,557	25%	12,139	60,696
		TRANSPORTATION AND FREIGHT	n/a				-	-		-		-		-		-	-		-	-
		CAPITAL SPARE PARTS	HDPE pipe & aquadam.	**6**	**LD**		-	-		-	9,361.68	56,170		-		-	56,170	25%	14,043	70,213
		VENDOR ERECTION SUPERVISION	n/a				-	-		-		-		-		-	-		-	-

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Replace 550 m of Type 2 Riprap-Lined Channel (Clinton Option C2)	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

WorleyParsons
resources & energy

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
		FIRST FILLS	n/a				-	-		-		-		-		-	-		-	-
		ENVIRONMENTAL ASSESSMENT, MONITORING AND TESTING SERVICES	n/a				-	-		-		-		-		-	-		-	-
		GEOTECHNICAL INVESTIGATIONS AND RECOMMENDATIONS		**2%**			-	-		-	2,421,606.25	48,432		-		-	48,432	25%	12,108	60,540
		CONSTRUCTION INSURANCE	n/a				-	-		-		-		-		-	-		-	-
		BUILDING PERMITS	n/a				-	-		-		-		-		-	-		-	-
INDIRECT COST SUB TOTAL							**-**	**-**		**-**		**298,791**		**-**	**0%**	**-**	**298,791**	**25%**	**74,698**	**373,489**
OTHER COSTS																				
		EPCM		**10%**			-	-		-	2,236,076.19	223,608		-		-	223,608	25%	55,902	279,510
		OWNERS COSTS					-	-		-		-		-		-	-		-	-
		ESCALATION					-	-		-		-		-		-	-		-	-
OTHER COST SUB TOTAL							**-**	**-**		**-**		**223,608**		**-**	**0%**	**-**	**223,608**	**25%**	**55,902**	**279,510**
TOTAL																	**2,459,684**	**25%**	**614,921**	**3,074,605**

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

WorleyParsons resources & energy

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Replace 750 m of Riprap-Lined Channel (Clinton Option C3)	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
DIRECT COSTS																				
							-	-		-		-		-		-	-		-	-
		Equipment Mob / Demob	Edmonton to Dawson City 2,519km. Dawson City to Site	**9**	**EA**		-	-		-	18,723.36	168,510		-		-	168,510	25%	42,128	210,638
							-	-		-		-		-		-	-		-	-
		Channel Armouring					-	-		-		-		-		-	-		-	-
		Rip-rap - 500mm dia.	Drill & blast, screen & sort, load & haul to site, double handling and place.	**8,500**	**M3**		-	-		-	130.06	1,105,510		-		-	1,105,510	25%	276,378	1,381,888
		Geotextile 10oz	Under cobble layer.	**13,500**	**M2**		-	-		-	3.62	48,870		-		-	48,870	25%	12,218	61,088
							-	-		-		-		-		-	-		-	-
		Water Diversion					-	-		-		-		-		-	-		-	-
		Aquadam - supply & install	6' x 100' lg.	**1**	**EA**		-	-		-	26,000.00	26,000		-		-	26,000	25%	6,500	32,500
		610mm HDPE DR21 pipe	Trench 1.6m dp, BF 1m cover, supply & install.	**900**	**LM**		-	-		-	980.07	882,065		-		-	882,065	25%	220,516	1,102,581
							-	-		-		-		-		-	-		-	-
		Asbestos Control					-	-		-		-		-		-	-		-	-
		Equipment washdown equip & labour	Assume existing building of 1ea - 80'x120' temprorary building , 300mm SOG. 1ea - 4.5 GPM pressure washers w/ 600Gal tanks, 2man hours / day.	**1**	**EA**		-	-		-	22,544.00	22,544		-		-	22,544	25%	5,636	28,180
		Equipment / vehicle heppa filters,		**1**	**LS**		-	-		-	3,000.00	3,000		-		-	3,000	25%	750	3,750
		PPE; respirators, overalls		**20**	**EA**		-	-		-	300.00	6,000		-		-	6,000	25%	1,500	7,500
							-	-		-		-		-		-	-		-	-
		Fuel Transportation	Transport from Dawson City to site (approx 110km one-way).				-	-		-		-		-		-	-		-	-
		Fuel truck & driver	27,000 liter tanker	**1**	**LD**		-	-		-	685.60	686		-		-	686	25%	171	857
			*fuel included in all-in rates.	329,027	liters		-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
DIRECT COST SUB TOTAL							**-**	**-**		**-**		**2,263,185**		**-**	**0%**	**-**	**2,263,185**	**25%**	**565,796**	**2,828,981**
INDIRECT COSTS																				
		TEMPORARY CONSTRUCTION CAMP	RV rental, 2men per unit + per diem.. Aquadam & HDPE, drill & blast, crush, load & haul, place gabions.	**268**	**MDY**		-	-		-	255.00	68,223		-		-	68,223	25%	17,056	85,279
		TEMPORARY FACILITIES AND CONSTRUCTION SITE SERVICES		**3%**			-	-		-	2,828,981.25	84,869		-		-	84,869	25%	21,217	106,087
		SNOW REMOVAL	n/a				-	-		-		-		-		-	-		-	-
		ROAD MAINTENANCE	n/a				-	-		-		-		-		-	-		-	-
		OVERTIME PREMIUM FOR COMPRESSED WORK WEEK	n/a				-	-		-		-		-		-	-		-	-
		NON-PRODUCTIVE TIME	n/a				-	-		-		-		-		-	-		-	-
		SPOT OVERTIME	n/a				-	-		-		-		-		-	-		-	-
		CONTRACTOR LOA AND TRAVEL	Edm to Dawson City charter flight + DC to Site by charter bus. 1 flight/man.	**29**	**Round Trip**		-	-		-	1,144.00	33,476		-		-	33,476	25%	8,369	41,845
		CONTRACTOR LOA AND TRAVEL	Dawson City to Site - 15 passenger shuttle bus.	**67**	**Round Trip**		-	-		-	1,011.60	67,661		-		-	67,661	25%	16,915	84,576
		TRANSPORTATION AND FREIGHT	n/a				-	-		-		-		-		-	-		-	-
		CAPITAL SPARE PARTS	HDPE pipe & aquadam.	**6**	**LD**		-	-		-	9,361.68	56,170		-		-	56,170	25%	14,043	70,213
		VENDOR ERECTION SUPERVISION	n/a				-	-		-		-		-		-	-		-	-

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Replace 750 m of Riprap-Lined Channel (Clinton Option C3)	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

WorleyParsons
resources & energy

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
		FIRST FILLS	n/a				-	-		-		-		-		-	-		-	-
		ENVIRONMENTAL ASSESSMENT, MONITORING AND TESTING SERVICES	n/a				-	-		-		-		-		-	-		-	-
		GEOTECHNICAL INVESTIGATIONS AND RECOMMENDATIONS		**2%**			-	-		-	2,828,981.25	56,580		-		-	56,580	25%	14,145	70,725
		CONSTRUCTION INSURANCE	n/a				-	-		-		-		-		-	-		-	-
		BUILDING PERMITS	n/a				-	-		-		-		-		-	-		-	-
INDIRECT COST SUB TOTAL							**-**	**-**		**-**		**366,979**		**-**	**0%**	**-**	**366,979**	**25%**	**91,745**	**458,724**
OTHER COSTS																				
		EPCM		**10%**			-	-		-	2,630,164.27	263,016		-		-	263,016	25%	65,754	328,771
		OWNERS COSTS					-	-		-		-		-		-	-		-	-
		ESCALATION					-	-		-		-		-		-	-		-	-
OTHER COST SUB TOTAL							**-**	**-**		**-**		**263,016**		**-**	**0%**	**-**	**263,016**	**25%**	**65,754**	**328,771**
TOTAL																	**2,893,181**	**25%**	**723,295**	**3,616,476**

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Replace Drop Structure 4 Armouring (Clinton Option A)	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

WorleyParsons resources & energy

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
DIRECT COSTS																				
							-	-		-		-		-		-	-		-	-
		Equipment Mob / Demob	Edmonton to Dawson City 2,519km. Dawson City to Site	**10**	**EA**		-	-		-	18,723.36	187,234		-		-	187,234	25%	46,808	234,042
							-	-		-		-		-		-	-		-	-
		Channel Armouring					-	-		-		-		-		-	-		-	-
		Rip-rap - 800 mm dia.	Drill & blast, screen & sort, load & haul to site, double handling and place.	**3,400**	**M3**		-	-		-	139.70	474,980		-		-	474,980	25%	118,745	593,725
		Waste rock	1ea-D8 & 1ea-345 ex	**3,000**	**M3**		-	-		-	5.22	15,660		-		-	15,660	25%	3,915	19,575
							-	-		-		-		-		-	-		-	-
		Water Diversion					-	-		-		-		-		-	-		-	-
		Aquadam - supply & install	6' x 100' lg	**1**	**EA**		-	-		-	26,000.00	26,000		-		-	26,000	25%	6,500	32,500
							-	-		-		-		-		-	-		-	-
		Asbestos Control					-	-		-		-		-		-	-		-	-
		Equipment washdown equip & labour	Assume existing building of 1ea - 80'x120' temprorary building , 300mm SOG. 1ea - 4.5 GPM pressure washers w/ 600Gal tanks, 2man hours / day.	**1**	**EA**		-	-		-	22,544.00	22,544		-		-	22,544	25%	5,636	28,180
		Equipment / vehicle heppa filters,		**1**	**LS**		-	-		-	3,000.00	3,000		-		-	3,000	25%	750	3,750
		PPE; respirators, overalls		**20**	**EA**		-	-		-	300.00	6,000		-		-	6,000	25%	1,500	7,500
							-	-		-		-		-		-	-		-	-
		Fuel Transportation	Transport from Dawson City to site (approx 110km one-way).				-	-		-		-		-		-	-		-	-
		Fuel truck & driver	27,000 liter tanker	**1**	**LD**		-	-		-	685.60	686		-		-	686	25%	171	857
			*fuel included in all-in rates.	27,000	liters		-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
DIRECT COST SUB TOTAL							**-**	**-**		**-**		**736,103**		**-**	**0%**	**-**	**736,103**	**25%**	**184,026**	**920,129**
INDIRECT COSTS																				
		TEMPORARY CONSTRUCTION CAMP	RV rental, 2men per unit + per diem. Aquadam & HDPE, drill & blast, crush, load & haul, place gabions.	**94**	**MDY**		-	-		-	255.00	23,970		-		-	23,970	25%	5,993	29,963
		TEMPORARY FACILITIES AND CONSTRUCTION SITE SERVICES		**3%**			-	-		-	920,129.00	27,604		-		-	27,604	25%	6,901	34,505
		SNOW REMOVAL	n/a				-	-		-		-		-		-	-		-	-
		ROAD MAINTENANCE	n/a				-	-		-		-		-		-	-		-	-
		OVERTIME PREMIUM FOR COMPRESSED WORK	n/a				-	-		-		-		-		-	-		-	-
		NON-PRODUCTIVE TIME	n/a				-	-		-		-		-		-	-		-	-
		SPOT OVERTIME	n/a				-	-		-		-		-		-	-		-	-
		CONTRACTOR LOA AND TRAVEL	Edm to Dawson City charter flight + DC to Site by charter bus. 1 flight/man.	**24**	**Round Trip**		-	-		-	1,144.00	27,456		-		-	27,456	25%	6,864	34,320
		CONTRACTOR LOA AND TRAVEL	Dawson City to Site - 15 passenger shuttle bus.	**36**	**Round Trip**		-	-		-	1,011.60	36,418		-		-	36,418	25%	9,104	45,522
		HEAVY LIFT	n/a				-	-		-		-		-		-	-		-	-
		TRANSPORTATION AND FREIGHT	HDPE pipe & aquadam.	**6**	**LD**		-	-		-	9,361.68	56,170		-		-	56,170	25%	14,043	70,213
		CAPITAL SPARE PARTS	n/a				-	-		-		-		-		-	-		-	-
		VENDOR ERECTION SUPERVISION	n/a				-	-		-		-		-		-	-		-	-
		FIRST FILLS	n/a				-	-		-		-		-		-	-		-	-

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Replace Drop Structure 4 Armouring (Clinton Option A)	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

WorleyParsons
resources & energy

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
		ENVIRONMENTAL ASSESSMENT, MONITORING AND TESTING SERVICES		**2%**			-	-		-	920,129.00	18,403		-		-	18,403	25%	4,601	23,003
		GEOTECHNICAL INVESTIGATIONS AND RECOMMENDATIONS	n/a				-	-		-		-		-		-	-		-	-
		CONSTRUCTION INSURANCE	n/a				-	-		-		-		-		-	-		-	-
		BUILDING PERMITS	n/a				-	-		-		-		-		-	-		-	-
INDIRECT COST SUB TOTAL							**-**	**-**		**-**		**190,020**		**-**	**0%**	**-**	**190,020**	**25%**	**47,505**	**237,525**
OTHER COSTS																				
		EPCM		**10%**			-	-		-	926,123.33	92,612		-		-	92,612	25%	23,153	115,765
		OWNERS COSTS					-	-		-		-		-		-	-		-	-
		ESCALATION					-	-		-		-		-		-	-		-	-
OTHER COST SUB TOTAL							**-**	**-**		**-**		**92,612**		**-**	**0%**	**-**	**92,612**	**25%**	**23,153**	**115,765**
TOTAL																	**1,018,736**	**25%**	**254,684**	**1,273,420**

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

WorleyParsons resources & energy

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - WC-B	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

DIRECT COSTS

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
							-	-		-		-		-		-	-		-	-
		Equipment Mob / Demob	Edmonton to Dawson City 2,519km. Dawson City to Site	**14**	**EA**		-	-		-	18,723.36	262,127		-		-	262,127	25%	65,532	327,659
							-	-		-		-		-		-	-		-	-
		Haul Road Construction	1,200m				-	-		-		-		-		-	-		-	-
		Clear & grub	Medium	**1**	**HA**		-	-		-	11,877.51	11,878		-		-	11,878	25%	2,969	14,847
		Road embankment widening, 3m	Cut to fill existing shoulder. Approx 8M3 / LM.	**9,600**	**M3**		-	-		-	4.63	44,448		-		-	44,448	25%	11,112	55,560
		Re-grade road sub-base	Av. 150mm dp x 5m wide	**900**	**M3**		-	-		-	12.57	11,313		-		-	11,313	25%	2,828	14,141
		Gravel resurfacing, 100mm thk x 8m wide	Drill & blast, crushing, load & haul and place.	**960**	**M3**		-	-		-	157.36	151,066		-		-	151,066	25%	37,766	188,832
		Bridge construction	15m clear span x 11m w. Supply & install.	**1**	**LS**		-	-		-	889,246.48	889,246		-		-	889,246	25%	222,312	1,111,558
							-	-		-		-		-		-	-		-	-
		Bulk Earthworks					-	-		-		-		-		-	-		-	-
		Tailings excavation and replacement	Stock pile approx 500m one-way haul distance.	**200,000**	**M3**		-	-		-	9.80	1,960,000		-		-	1,960,000	25%	490,000	2,450,000
							-	-		-		-		-		-	-		-	-
		Rock Drain					-	-		-		-		-		-	-		-	-
		Blast rock 100-500mm dia.	Drill & blast, screen & sort, load & haul to site and place.	**31,000**	**M3**		-	-		-	100.72	3,122,320		-		-	3,122,320	25%	780,580	3,902,900
		Granular filter - 20mm road crush	Drill & blast, screen & sort, load & haul to site and place.	**13,000**	**M3**		-	-		-	126.65	1,646,450		-		-	1,646,450	25%	411,613	2,058,063
							-	-		-		-		-		-	-		-	-
		Water Management					-	-		-		-		-		-	-		-	-
		Aquadam - supply & install	6' x 100' lg.	**1**	**EA**		-	-		-	26,000.00	26,000		-		-	26,000	25%	6,500	32,500
		Pumps, hoses, fuel & maintainence	150mm submersible	**2**	**EA**		-	-		-	37,148.80	74,298		-		-	74,298	25%	18,574	92,872
							-	-		-		-		-		-	-		-	-
		Support Equipment					-	-		-		-		-		-	-		-	-
		Shop truck		**213**	**DY**		-	-		-	300.00	63,840		-		-	63,840	25%	15,960	79,800
		Temp maintenance shop		**1**	**LS**		-	-		-	15,000.00	15,000		-		-	15,000	25%	3,750	18,750
		Shop trailer		**7**	**MO**		-	-		-	2,000.00	14,000		-		-	14,000	25%	3,500	17,500
		Fuel bowser	1ea on-site	**7**	**MO**		-	-		-	5,000.00	35,000		-		-	35,000	25%	8,750	43,750
		Pick-up trucks	6ea	**213**	**DY**		-	-		-	900.00	191,520		-		-	191,520	25%	47,880	239,400
		Portable light towers	6ea	**7**	**MO**		-	-		-	22,440.00	157,080		-		-	157,080	25%	39,270	196,350
		Generator	6ea	**7**	**MO**		-	-		-	7,920.00	55,440		-		-	55,440	25%	13,860	69,300
							-	-		-		-		-		-	-		-	-
		Support Labour					-	-		-		-		-		-	-		-	-
		Heavy duty mechanic	1ea/shift	**213**	**DY**		-	-		-	2,640.00	561,792		-		-	561,792	25%	140,448	702,240
		Welder	1ea/shift	**213**	**DY**		-	-		-	2,640.00	561,792		-		-	561,792	25%	140,448	702,240
		Labourer	2ea/shift	**426**	**DY**		-	-		-	1,800.00	766,080		-		-	766,080	25%	191,520	957,600
							-	-		-		-		-		-	-		-	-
		Asbestos Control					-	-		-		-		-		-	-		-	-
		Equipment washdown facilites	1ea - 80'x120' temprorary building , 300mm SOG, 4ea - 4.5 GPM pressure washers w/ 600Gal tanks, 4man hours / day.	**1**	**EA**		-	-		-	766,116.00	766,116		-		-	766,116	25%	191,529	957,645
		Equipment / vehicle heppa filters,		**1**	**LS**		-	-		-	14,000.00	14,000		-		-	14,000	25%	3,500	17,500
		PPE; respirators, overalls		**50**	**EA**		-	-		-	500.00	25,000		-		-	25,000	25%	6,250	31,250
							-	-		-		-		-		-	-		-	-
		Fuel Transportation	Transport from Dawson City to site (approx 110km one-way).				-	-		-		-		-		-	-		-	-
		Fuel truck & driver	27,000 liter tanker	**21**	**LD**		-	-		-	685.60	14,183		-		-	14,183	25%	3,546	17,729
			*fuel included in all-in rates.	558,550	liters		-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

WorleyParsons
resources & energy

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - WC-B	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
DIRECT COST SUB TOTAL							**-**	**-**		**-**		**11,439,988**		**-**	**0%**	**-**	**11,439,988**	**25%**	**2,859,997**	**14,299,985**
INDIRECT COSTS																				
		TEMPORARY CONSTRUCTION CAMP	45 man temporary camp x 7mo.	**9,576**	**MDY**		-	-		-	438.90	4,202,906		-		-	4,202,906	25%	1,050,727	5,253,633
		TEMPORARY FACILITIES AND CONSTRUCTION SITE SERVICES		**3%**			-	-		-	14,299,985.33	429,000		-		-	429,000	25%	107,250	536,249
		SNOW REMOVAL	2ea Grader 12hrs/day	**7**	**DY**		-	-		-	5,354.40	37,481		-		-	37,481	25%	9,370	46,851
		ROAD MAINTENANCE	1ea Grader 12hrs/day	**205**	**DY**		-	-		-	2,677.20	549,361		-		-	549,361	25%	137,340	686,702
		OVERTIME PREMIUM FOR COMPRESSED WORK WEEK	n/a				-	-		-		-		-		-	-		-	-
		NON-PRODUCTIVE TIME	n/a				-	-		-		-		-		-	-		-	-
		SPOT OVERTIME	n/a				-	-		-		-		-		-	-		-	-
		CONTRACTOR LOA AND TRAVEL	Edm to Dawson City charter flight + DC to Site by charter bus. 1 flight/man every two weeks.	**630**	**Round Trip**		-	-		-	1,144.00	720,720		-		-	720,720	25%	180,180	900,900
		HEAVY LIFT	n/a				-	-		-		-		-		-	-		-	-
		TRANSPORTATION AND FREIGHT	n/a				-	-		-		-		-		-	-		-	-
		CAPITAL SPARE PARTS	n/a				-	-		-		-		-		-	-		-	-
		VENDOR ERECTION SUPERVISION	n/a				-	-		-		-		-		-	-		-	-
		FIRST FILLS	n/a				-	-		-		-		-		-	-		-	-
		ENVIRONMENTAL ASSESSMENT, MONITORING AND TESTING SERVICES		**2%**			-	-		-	14,299,985.33	286,000		-		-	286,000	25%	71,500	357,500
		GEOTECHNICAL INVESTIGATIONS AND RECOMMENDATIONS		**2%**			-	-		-	14,299,985.33	286,000		-		-	286,000	25%	71,500	357,500
		CONSTRUCTION INSURANCE	n/a				-	-		-		-		-		-	-		-	-
		BUILDING PERMITS	n/a				-	-		-		-		-		-	-		-	-
INDIRECT COST SUB TOTAL							**-**	**-**		**-**		**6,511,468**		**-**	**0%**	**-**	**6,511,468**	**25%**	**1,627,867**	**8,139,335**
OTHER COSTS																				
		EPCM		**10%**			-	-		-	17,951,455.87	1,795,146		-		-	1,795,146	25%	448,786	2,243,932
		OWNERS COSTS					-	-		-		-		-		-	-		-	-
		ESCALATION					-	-		-		-		-		-	-		-	-
OTHER COST SUB TOTAL							**-**	**-**		**-**		**1,795,146**		**-**	**0%**	**-**	**1,795,146**	**25%**	**448,786**	**2,243,932**
TOTAL																	**19,746,601**	**25%**	**4,936,650**	**24,683,252**

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - WC-C	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

WorleyParsons resources & energy

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
DIRECT COSTS																				
							-	-		-		-		-		-	-		-	-
		Equipment Mob / Demob	Edmonton to Dawson City 2,519km. Dawson City to Site	**21**	**EA**		-	-		-	37,201.07	781,223		-		-	781,223	25%	195,306	976,528
							-	-		-		-		-		-	-		-	-
		Haul Road Construction	1,200m				-	-		-		-		-		-	-		-	-
		Clear & grub	Medium	**1**	**HA**		-	-		-	11,877.51	11,878		-		-	11,878	25%	2,969	14,847
		Road embankment widening, 3m	Cut to fill existing shoulder. Approx 8M3 / LM.	**9,600**	**M3**		-	-		-	4.63	44,448		-		-	44,448	25%	11,112	55,560
		Re-grade road sub-base	Av. 150mm dp x 5m wide	**900**	**M3**		-	-		-	12.57	11,313		-		-	11,313	25%	2,828	14,141
		Gravel resurfacing, 100mm thk x 8m wide	Drill & blast, crushing, load & haul and place.	**960**	**M3**		-	-		-	161.60	155,136		-		-	155,136	25%	38,784	193,920
		Bridge construction	15m clear span x 11m w. Supply & install.	**1**	**LS**		-	-		-	889,246.48	889,246		-		-	889,246	25%	222,312	1,111,558
							-	-		-		-		-		-	-		-	-
		Bulk Earthworks					-	-		-		-		-		-	-		-	-
		Waste rock fill from Clinton Creek	2.4km one-way haul	**700,000**	**M3**		-	-		-	7.52	5,264,000		-		-	5,264,000	25%	1,316,000	6,580,000
							-	-		-		-		-		-	-		-	-
		Channel Armouring					-	-		-		-		-		-	-		-	-
		Channel profiling	Excavator & Dozer	**20,250**	**M3**		-	-		-	5.22	105,705		-		-	105,705	25%	26,426	132,131
		Cobbles - 25 to 100mm dia.	Drill & blast, screen & sort, load & haul to site and place.	**2,500**	**M3**		-	-		-	115.43	288,575		-		-	288,575	25%	72,144	360,719
		Geotextile 10oz	Under cobble layer.	**8,333**	**M2**		-	-		-	3.62	30,167		-		-	30,167	25%	7,542	37,708
		Riprap - D50 = 800mm dia.	Drill & blast, screen & sort, load & haul to site and place.	**2,900**	**M3**		-	-		-	112.09	325,061		-		-	325,061	25%	81,265	406,326
		Granular filter - 20mm road crush	Drill & blast, screen & sort, load & haul to site and place.	**2,400**	**M3**		-	-		-	130.89	314,136		-		-	314,136	25%	78,534	392,670
							-	-		-		-		-		-	-		-	-
		Water Management					-	-		-		-		-		-	-		-	-
		Aquadam - supply & install	6' x 100' lg.	**1**	**EA**		-	-		-	26,000.00	26,000		-		-	26,000	25%	6,500	32,500
		Pumps, hoses, fuel & maintainence	150mm submersible	**2**	**EA**		-	-		-	27,861.60	55,723		-		-	55,723	25%	13,931	69,654
							-	-		-		-		-		-	-		-	-
		Support Equipment					-	-		-		-		-		-	-		-	-
		Shop Truck		**167**	**DY**		-	-		-	300.00	50,160		-		-	50,160	25%	12,540	62,700
		Temp Maintenance Shop		**1**	**LS**		-	-		-	15,000.00	15,000		-		-	15,000	25%	3,750	18,750
		Shop Trailer		**6**	**MO**		-	-		-	2,000.00	11,000		-		-	11,000	25%	2,750	13,750
		Fuel Bowser	1ea on-site	**6**	**MO**		-	-		-	5,000.00	27,500		-		-	27,500	25%	6,875	34,375
		Pick-up Trucks	6ea	**167**	**DY**		-	-		-	900.00	150,480		-		-	150,480	25%	37,620	188,100
		Portable Light Towers	6ea	**6**	**MO**		-	-		-	22,440.00	123,420		-		-	123,420	25%	30,855	154,275
		Generator	6ea	**6**	**MO**		-	-		-	7,920.00	43,560		-		-	43,560	25%	10,890	54,450
							-	-		-		-		-		-	-		-	-
		Support Labour	Only for first 2 months				-	-		-		-		-		-	-		-	-
		Heavy Duty Mechanic	1ea/shift	**167**	**DY**		-	-		-	2,640.00	441,408		-		-	441,408	25%	110,352	551,760
		Welder	1ea/shift	**167**	**DY**		-	-		-	2,640.00	441,408		-		-	441,408	25%	110,352	551,760
		Labourer	2ea/shift	**334**	**DY**		-	-		-	1,800.00	601,920		-		-	601,920	25%	150,480	752,400
							-	-		-		-		-		-	-		-	-
		Asbestos Control					-	-		-		-		-		-	-		-	-
		Equipment washdown facilites	1ea - 80'x120' temprorary building , 300mm SOG, 4ea - 4.5 GPM pressure washers w/ 600Gal tanks, 4man hours / day.	**1**	**EA**		-	-		-	762,468.00	762,468		-		-	762,468	25%	190,617	953,085
		Equipment / vehicle heppa filters,		**1**	**LS**		-	-		-	21,000.00	21,000		-		-	21,000	25%	5,250	26,250
		PPE; respirators, overalls		**60**	**EA**		-	-		-	300.00	18,000		-		-	18,000	25%	4,500	22,500
							-	-		-		-		-		-	-		-	-
		Fuel Transportation	Transport from Dawson City to site (approx 110km one-way).				-	-		-		-		-		-	-		-	-
		Fuel Truck & Driver	27,000 liter tanker	**31**	**LD**		-	-		-	685.60	21,504		-		-	21,504	25%	5,376	26,880
			*fuel included in all-in rates.	846,849	liters		-	-		-		-		-		-	-		-	-

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - WC-C	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

WorleyParsons resources & energy

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
							-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
DIRECT COST SUB TOTAL							**-**	**-**		**-**		**11,031,438**		**-**	**0%**	**-**	**11,031,438**	**25%**	**2,757,860**	**13,789,298**
INDIRECT COSTS																				
		TEMPORARY CONSTRUCTION CAMP	45 man temporary camp x 5.5mo.	**7,524**	**MDY**		-	-		-	501.11	3,770,352		-		-	3,770,352	25%	942,588	4,712,940
		TEMPORARY FACILITIES AND CONSTRUCTION SITE SERVICES		**3%**			-	-		-	13,789,297.63	413,679		-		-	413,679	25%	103,420	517,099
		SNOW REMOVAL	2ea Grader 12hrs/day	**7**	**DY**		-	-		-	5,354.40	37,481		-		-	37,481	25%	9,370	46,851
		ROAD MAINTENANCE	1ea Grader 12hrs/day	**160**	**DY**		-	-		-	2,677.20	427,281		-		-	427,281	25%	106,820	534,101
		OVERTIME PREMIUM FOR COMPRESSED WORK WEEK	n/a				-	-		-		-		-		-	-		-	-
		NON-PRODUCTIVE TIME	n/a				-	-		-		-		-		-	-		-	-
		SPOT OVERTIME	n/a				-	-		-		-		-		-	-		-	-
		CONTRACTOR LOA AND TRAVEL	Edm to Dawson City charter flight + DC to Site by charter bus. 1 flight/man every two weeks.	**495**	**Round Trip**		-	-		-	1,144.00	566,280		-		-	566,280	25%	141,570	707,850
		HEAVY LIFT	n/a				-	-		-		-		-		-	-		-	-
		TRANSPORTATION AND FREIGHT	Edm to Dawson City to Site.	**4**	**LD**		-	-		-	18,723.36	74,893		-		-	74,893	25%	18,723	93,617
		CAPITAL SPARE PARTS	n/a				-	-		-		-		-		-	-		-	-
		VENDOR ERECTION SUPERVISION	n/a				-	-		-		-		-		-	-		-	-
		FIRST FILLS	n/a				-	-		-		-		-		-	-		-	-
		ENVIRONMENTAL ASSESSMENT, MONITORING AND TESTING SERVICES		**2%**			-	-		-	13,789,297.63	275,786		-		-	275,786	25%	68,946	344,732
		GEOTECHNICAL INVESTIGATIONS AND RECOMMENDATIONS		**2%**			-	-		-	13,789,297.63	275,786		-		-	275,786	25%	68,946	344,732
		CONSTRUCTION INSURANCE	n/a				-	-		-		-		-		-	-		-	-
		BUILDING PERMITS	n/a				-	-		-		-		-		-	-		-	-
INDIRECT COST SUB TOTAL							**-**	**-**		**-**		**5,841,538**		**-**	**0%**	**-**	**5,841,538**	**25%**	**1,460,384**	**7,301,922**
OTHER COSTS																				
		EPCM		**10%**			-	-		-	16,872,975.94	1,687,298		-		-	1,687,298	25%	421,824	2,109,122
		OWNERS COSTS					-	-		-		-		-		-	-		-	-
		ESCALATION					-	-		-		-		-		-	-		-	-
OTHER COST SUB TOTAL							**-**	**-**		**-**		**1,687,298**		**-**	**0%**	**-**	**1,687,298**	**25%**	**421,824**	**2,109,122**
TOTAL																	**18,560,274**	**25%**	**4,640,068**	**23,200,342**

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - WC-D	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

WorleyParsons resources & energy

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	SubcontractCosts/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
DIRECT COSTS																				
							-	-		-		-		-		-	-		-	-
		Equipment Mob / Demob	Edmonton to Dawson City 2,519km. Dawson City to Site	**31**	**EA**		-	-		-	31,240.52	968,456		-		-	968,456	25%	242,114	1,210,570
							-	-		-		-		-		-	-		-	-
		Haul Road Construction	1,200m				-	-		-		-		-		-	-		-	-
		Clear & grub	Medium	**1**	**HA**		-	-		-	11,877.51	11,878		-		-	11,878	25%	2,969	14,847
		Road embankment widening, 3m	Cut to fill existing shoulder. Approx 8M3 / LM.	**9,600**	**M3**		-	-		-	4.63	44,448		-		-	44,448	25%	11,112	55,560
		Re-grade road sub-base	Av. 150mm dp x 5m wide	**900**	**M3**		-	-		-	12.57	11,313		-		-	11,313	25%	2,828	14,141
		Gravel resurfacing, 100mm thk x 8m wide	Drill & blast, crushing, load & haul and place.	**960**	**M3**		-	-		-	150.92	144,883		-		-	144,883	25%	36,221	181,104
		Bridge construction	15m clear span x 11m w. Supply & install.	**1**	**LS**		-	-		-	889,246.48	889,246		-		-	889,246	25%	222,312	1,111,558
							-	-		-		-		-		-	-		-	-
		Bulk Earthworks					-	-		-		-		-		-	-		-	-
		Tailings excavation and replacement	Stock pile approx 500m one-way haul distance.	**200,000**	**M3**		-	-		-	9.80	1,960,000		-		-	1,960,000	25%	490,000	2,450,000
		Waste rock fill from Clinton Creek	2.4km one-way haul	**700,000**	**M3**		-	-		-	7.52	5,264,000		-		-	5,264,000	25%	1,316,000	6,580,000
							-	-		-		-		-		-	-		-	-
		Rock Drain					-	-		-		-		-		-	-		-	-
		Blast rock 100-500mm dia.	Drill & blast, screen & sort, load & haul to site and place.	**31,000**	**M3**		-	-		-	110.08	3,412,480		-		-	3,412,480	25%	853,120	4,265,600
		Granular filter - 20mm road crush	Drill & blast, screen & sort, load & haul to site and place.	**13,000**	**M3**		-	-		-	120.21	1,562,730		-		-	1,562,730	25%	390,683	1,953,413
							-	-		-		-		-		-	-		-	-
		Channel Armouring					-	-		-		-		-		-	-		-	-
		Channel profiling	Excavator & Dozer	**20,250**	**M3**		-	-		-	5.22	105,705		-		-	105,705	25%	26,426	132,131
		Cobbles - 25 to 100mm dia.	Drill & blast, screen & sort, load & haul to site and place.	**2,500**	**M3**		-	-		-	107.43	268,575		-		-	268,575	25%	67,144	335,719
		Geotextile 10oz	Under cobble layer.	**8,333**	**M2**		-	-		-	3.62	30,167		-		-	30,167	25%	7,542	37,708
		Riprap - D50 = 800mm dia.	Drill & blast, screen & sort, load & haul to site and place.	**2,900**	**M3**		-	-		-	105.20	305,080		-		-	305,080	25%	76,270	381,350
		Granular filter - 20mm road crush	Drill & blast, screen & sort, load & haul to site and place.	**2,400**	**M3**		-	-		-	130.89	314,136		-		-	314,136	25%	78,534	392,670
							-	-		-		-		-		-	-		-	-
		Water Management					-	-		-		-		-		-	-		-	-
		Aquadam - supply & install	6' x 100' lg. 2x install.	**1**	**EA**		-	-		-	42,800.00	42,800		-		-	42,800	25%	10,700	53,500
		Pumps, hoses, fuel & maintainence	150mm submersible	**2**	**EA**		-	-		-	51,079.60	102,159		-		-	102,159	25%	25,540	127,699
							-	-		-		-		-		-	-		-	-
		Support Equipment	For duration of project				-	-		-		-		-		-	-		-	-
		Shop Truck		**228**	**DY**		-	-		-	300.00	68,400		-		-	68,400	25%	17,100	85,500
		Temp Maintenance Shop		**1**	**LS**		-	-		-	15,000.00	15,000		-		-	15,000	25%	3,750	18,750
		Shop Trailer		**8**	**MO**		-	-		-	2,000.00	15,000		-		-	15,000	25%	3,750	18,750
		Fuel Bowser	1ea on-site	**8**	**MO**		-	-		-	5,000.00	37,500		-		-	37,500	25%	9,375	46,875
		Pick-up Trucks	6ea	**228**	**DY**		-	-		-	900.00	205,200		-		-	205,200	25%	51,300	256,500
		Portable Light Towers	6ea	**8**	**MO**		-	-		-	22,440.00	168,300		-		-	168,300	25%	42,075	210,375
		Generator	6ea	**8**	**MO**		-	-		-	7,920.00	59,400		-		-	59,400	25%	14,850	74,250
							-	-		-		-		-		-	-		-	-
		Support Labour	For duration of project				-	-		-		-		-		-	-		-	-
		Heavy Duty Mechanic	1ea/shift	**228**	**DY**		-	-		-	2,640.00	601,920		-		-	601,920	25%	150,480	752,400
		Welder	1ea/shift	**228**	**DY**		-	-		-	2,640.00	601,920		-		-	601,920	25%	150,480	752,400
		Labourer	2ea/shift	**456**	**DY**		-	-		-	1,800.00	820,800		-		-	820,800	25%	205,200	1,026,000
							-	-		-		-		-		-	-		-	-
		Asbestos Control					-	-		-		-		-		-	-		-	-
		Equipment washdown facilites	1ea - 80'x120' temprorary building , 300mm SOG, 4ea - 4.5 GPM pressure washers w/ 600Gal tanks, 4man hours / day.	**1**	**EA**		-	-		-	788,004.00	788,004		-		-	788,004	25%	197,001	985,005

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

WorleyParsons resources & energy

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - WC-D	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	SubcontractCosts/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
		Equipment / vehicle heppa filters,		1	LS		-	-		-	31,000.00	31,000		-		-	31,000	25%	7,750	38,750
		PPE; respirators, overalls		80	EA		-	-		-	300.00	24,000		-		-	24,000	25%	6,000	30,000
							-	-		-		-		-		-	-		-	-
		Fuel Transportation	Transport from Dawson City to site (approx 110km one-way).				-	-		-		-		-		-	-		-	-
		Fuel truck & driver	27,000 liter tanker	50	LD		-	-		-	685.60	34,337		-		-	34,337	25%	8,584	42,921
			*fuel included in all-in rates.	1,352,235	liters		-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
DIRECT COST SUB TOTAL							**-**	**-**		**-**		**18,908,837**		**-**	**0%**	**-**	**18,908,837**	**25%**	**4,727,209**	**23,636,046**
INDIRECT COSTS																				
		TEMPORARY CONSTRUCTION CAMP	60 man temporary camp x 7.75mo.	14,136	MDY		-	-		-	484.56	6,849,740		-		-	6,849,740	25%	1,712,435	8,562,175
		TEMPORARY FACILITIES AND CONSTRUCTION SITE SERVICES		3%			-	-		-	23,636,046.21	709,081		-		-	709,081	25%	177,270	886,352
		SNOW REMOVAL	2ea Grader 12hrs/day	21	DY		-	-		-	5,354.40	112,442		-		-	112,442	25%	28,111	140,553
		ROAD MAINTENANCE	1ea Grader 12hrs/day	236	DY		-	-		-	2,677.20	630,748		-		-	630,748	25%	157,687	788,435
		OVERTIME PREMIUM FOR COMPRESSED WORK WEEK	n/a				-	-		-		-		-		-	-		-	-
		NON-PRODUCTIVE TIME	n/a				-	-		-		-		-		-	-		-	-
		SPOT OVERTIME	n/a				-	-		-		-		-		-	-		-	-
		CONTRACTOR LOA AND TRAVEL	Edm to Dawson City charter flight + DC to Site by charter bus. 1 flight/man every two weeks.	960	Round Trip		-	-		-	1,144.00	1,098,240		-		-	1,098,240	25%	274,560	1,372,800
		HEAVY LIFT	n/a				-	-		-		-		-		-	-		-	-
		TRANSPORTATION AND FREIGHT	Edm to Dawson City to Site.	4	LD		-	-		-	18,723.36	74,893		-		-	74,893	25%	18,723	93,617
		CAPITAL SPARE PARTS	n/a				-	-		-		-		-		-	-		-	-
		VENDOR ERECTION SUPERVISION	n/a				-	-		-		-		-		-	-		-	-
		FIRST FILLS	n/a				-	-		-		-		-		-	-		-	-
		ENVIRONMENTAL ASSESSMENT, MONITORING AND TESTING SERVICES		2%			-	-		-	23,636,046.21	472,721		-		-	472,721	25%	118,180	590,901
		GEOTECHNICAL INVESTIGATIONS AND RECOMMENDATIONS		2%			-	-		-	23,636,046.21	472,721		-		-	472,721	25%	118,180	590,901
		CONSTRUCTION INSURANCE	n/a				-	-		-		-		-		-	-		-	-
		BUILDING PERMITS	n/a				-	-		-		-		-		-	-		-	-
INDIRECT COST SUB TOTAL							**-**	**-**		**-**		**10,420,588**		**-**	**0%**	**-**	**10,420,588**	**25%**	**2,605,147**	**13,025,734**
OTHER COSTS																				
		EPCM		10%			-	-		-	29,329,424.52	2,932,942		-		-	2,932,942	25%	733,236	3,666,178
		OWNERS COSTS					-	-		-		-		-		-	-		-	-
		ESCALATION					-	-		-		-		-		-	-		-	-
OTHER COST SUB TOTAL							**-**	**-**		**-**		**2,932,942**		**-**	**0%**	**-**	**2,932,942**	**25%**	**733,236**	**3,666,178**
TOTAL																	**32,262,367**	**25%**	**8,065,592**	**40,327,959**

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - WC-D2	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

WorleyParsons resources & energy

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	SubcontractCosts/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
DIRECT COSTS																				
							-	-		-		-		-		-	-		-	-
		Equipment Mob / Demob	Edmonton to Dawson City 2,519km. Dawson City to Site	**21**	**EA**		-	-		-	37,201.07	781,223		-		-	781,223	25%	195,306	976,528
							-	-		-		-		-		-	-		-	-
		Haul Road Construction	1,200m				-	-		-		-		-		-	-		-	-
		Clear & grub	Medium	**1**	**HA**		-	-		-	11,877.51	11,878		-		-	11,878	25%	2,969	14,847
		Road embankment widening, 3m	Cut to fill existing shoulder. Approx 8M3 / LM.	**9,600**	**M3**		-	-		-	4.63	44,448		-		-	44,448	25%	11,112	55,560
		Re-grade road sub-base	Av. 150mm dp x 5m wide	**900**	**M3**		-	-		-	12.57	11,313		-		-	11,313	25%	2,828	14,141
		Gravel resurfacing, 100mm thk x 8m wide	Drill & blast, crushing, load & haul and place.	**960**	**M3**		-	-		-	158.68	152,333		-		-	152,333	25%	38,083	190,416
		Bridge construction	15m clear span x 11m w. Supply & install.	**1**	**LS**		-	-		-	889,246.48	889,246		-		-	889,246	25%	222,312	1,111,558
							-	-		-		-		-		-	-		-	-
		Bulk Earthworks					-	-		-		-		-		-	-		-	-
		Waste rock fill from Clinton Creek	2.4km one-way haul	**340,000**	**M3**		-	-		-	7.52	2,556,800		-		-	2,556,800	25%	639,200	3,196,000
							-	-		-		-		-		-	-		-	-
		Channel Armouring					-	-		-		-		-		-	-		-	-
		Channel profiling	Excavator & Dozer	**20,250**	**M3**		-	-		-	5.22	105,705		-		-	105,705	25%	26,426	132,131
		Cobbles - 25 to 100mm dia.	Drill & blast, screen & sort, load & haul to site and place.	**2,500**	**M3**		-	-		-	112.73	281,825		-		-	281,825	25%	70,456	352,281
		Geotextile 10oz	Under cobble layer.	**8,333**	**M2**		-	-		-	3.62	30,167		-		-	30,167	25%	7,542	37,708
		Riprap - D50 = 800mm dia.	Drill & blast, screen & sort, load & haul to site and place.	**2,400**	**M3**		-	-		-	109.38	262,512		-		-	262,512	25%	65,628	328,140
		Granular filter - 20mm road crush	Drill & blast, screen & sort, load & haul to site and place.	**2,000**	**M3**		-	-		-	127.97	255,940		-		-	255,940	25%	63,985	319,925
							-	-		-		-		-		-	-		-	-
		Water Management					-	-		-		-		-		-	-		-	-
		Aquadam - supply & install	6' x 100' lg. 2x install.	**1**	**EA**		-	-		-	42,800.00	42,800		-		-	42,800	25%	10,700	53,500
		Pumps, hoses, fuel & maintainence	150mm submersible	**2**	**EA**		-	-		-	51,079.60	102,159		-		-	102,159	25%	25,540	127,699
							-	-		-		-		-		-	-		-	-
		Support Equipment	For duration of project				-	-		-		-		-		-	-		-	-
		Shop Truck		**122**	**DY**		-	-		-	300.00	36,480		-		-	36,480	25%	9,120	45,600
		Temp Maintenance Shop		**1**	**LS**		-	-		-	15,000.00	15,000		-		-	15,000	25%	3,750	18,750
		Shop Trailer		**4**	**MO**		-	-		-	2,000.00	8,000		-		-	8,000	25%	2,000	10,000
		Fuel Bowser	1ea on-site	**4**	**MO**		-	-		-	5,000.00	20,000		-		-	20,000	25%	5,000	25,000
		Pick-up Trucks	6ea	**122**	**DY**		-	-		-	900.00	109,440		-		-	109,440	25%	27,360	136,800
		Portable Light Towers	6ea	**4**	**MO**		-	-		-	22,440.00	89,760		-		-	89,760	25%	22,440	112,200
		Generator	6ea	**4**	**MO**		-	-		-	7,920.00	31,680		-		-	31,680	25%	7,920	39,600
							-	-		-		-		-		-	-		-	-
		Support Labour	For duration of project				-	-		-		-		-		-	-		-	-
		Heavy Duty Mechanic	1ea/shift	**76**	**DY**		-	-		-	2,640.00	200,640		-		-	200,640	25%	50,160	250,800
		Welder	1ea/shift	**76**	**DY**		-	-		-	2,640.00	200,640		-		-	200,640	25%	50,160	250,800
		Labourer	2ea/shift	**152**	**DY**		-	-		-	1,800.00	273,600		-		-	273,600	25%	68,400	342,000
							-	-		-		-		-		-	-		-	-
		Asbestos Control					-	-		-		-		-		-	-		-	-
		Equipment washdown facilites	1ea - 80'x120' temprorary building , 300mm SOG, 4ea - 4.5 GPM pressure washers w/ 600Gal tanks, 4man hours / day.	**1**	**EA**		-	-		-	788,004.00	788,004		-		-	788,004	25%	197,001	985,005
		Equipment / vehicle heppa filters,		**1**	**LS**		-	-		-	31,000.00	31,000		-		-	31,000	25%	7,750	38,750
		PPE; respirators, overalls		**80**	**EA**		-	-		-	300.00	24,000		-		-	24,000	25%	6,000	30,000
							-	-		-		-		-		-	-		-	-
		Fuel Transportation	Transport from Dawson City to site (approx 110km one-way).				-	-		-		-		-		-	-		-	-
		Fuel truck & driver	27,000 liter tanker	**32**	**LD**		-	-		-	685.60	21,598		-		-	21,598	25%	5,400	26,998
			*fuel included in all-in rates.	850,572	liters		-	-		-		-		-		-	-		-	-

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - WC-D2	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

WorleyParsons
resources & energy

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	SubcontractCosts/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
							-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
DIRECT COST SUB TOTAL							**-**	**-**		**-**		**7,378,190**		**-**	**0%**	**-**	**7,378,190**	**25%**	**1,844,548**	**9,222,738**

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - WC-D2	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

WorleyParsons resources & energy

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	SubcontractCosts/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
INDIRECT COSTS																				
		TEMPORARY CONSTRUCTION CAMP	45 man temporary camp x 4mo.	**5,472**	**MDY**		-	-		-	593.67	3,248,562		-		-	3,248,562	25%	812,141	4,060,703
		TEMPORARY FACILITIES AND CONSTRUCTION SITE SERVICES		**3%**			-	-		-	9,222,738.05	276,682		-		-	276,682	25%	69,171	345,853
		SNOW REMOVAL	2ea Grader 12hrs/day	**21**	**DY**		-	-		-	5,354.40	112,442		-		-	112,442	25%	28,111	140,553
		ROAD MAINTENANCE	1ea Grader 12hrs/day	**152**	**DY**		-	-		-	2,677.20	406,934		-		-	406,934	25%	101,734	508,668
		OVERTIME PREMIUM FOR COMPRESSED WORK WEEK	n/a				-	-		-		-		-		-	-		-	-
		NON-PRODUCTIVE TIME	n/a				-	-		-		-		-		-	-		-	-
		SPOT OVERTIME	n/a				-	-		-		-		-		-	-		-	-
		CONTRACTOR LOA AND TRAVEL	Edm to Dawson City charter flight + DC to Site by charter bus. 1 flight/man every two weeks.	**540**	**Round Trip**		-	-		-	1,144.00	617,760		-		-	617,760	25%	154,440	772,200
		HEAVY LIFT	n/a				-	-		-		-		-		-	-		-	-
		TRANSPORTATION AND FREIGHT	Edm to Dawson City to Site.	**4**	**LD**		-	-		-	18,723.36	74,893		-		-	74,893	25%	18,723	93,617
		CAPITAL SPARE PARTS	n/a				-	-		-		-		-		-	-		-	-
		VENDOR ERECTION SUPERVISION	n/a				-	-		-		-		-		-	-		-	-
		FIRST FILLS	n/a				-	-		-		-		-		-	-		-	-
		ENVIRONMENTAL ASSESSMENT, MONITORING AND TESTING SERVICES		**2%**			-	-		-	9,222,738.05	184,455		-		-	184,455	25%	46,114	230,568
		GEOTECHNICAL INVESTIGATIONS AND RECOMMENDATIONS		**2%**			-	-		-	9,222,738.05	184,455		-		-	184,455	25%	46,114	230,568
		CONSTRUCTION INSURANCE	n/a				-	-		-		-		-		-	-		-	-
		BUILDING PERMITS	n/a				-	-		-		-		-		-	-		-	-
INDIRECT COST SUB TOTAL							**-**	**-**		**-**		**5,106,184**		**-**	**0%**	**-**	**5,106,184**	**25%**	**1,276,546**	**6,382,730**
OTHER COSTS																				
		EPCM		**10%**			-	-		-	12,484,374.59	1,248,437		-		-	1,248,437	25%	312,109	1,560,547
		OWNERS COSTS					-	-		-		-		-		-	-		-	-
		ESCALATION					-	-		-		-		-		-	-		-	-
OTHER COST SUB TOTAL							**-**	**-**		**-**		**1,248,437**		**-**	**0%**	**-**	**1,248,437**	**25%**	**312,109**	**1,560,547**
TOTAL																	**13,732,812**	**25%**	**3,433,203**	**17,166,015**

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - WC-E	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

WorleyParsons
resources & energy

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	SubcontractCosts/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
DIRECT COSTS																				
							-	-		-		-		-		-	-		-	-
		Equipment Mob / Demob	Edmonton to Dawson City 2,519km. Dawson City to Site	**32**	**EA**		-	-		-	38,124.96	1,219,999		-		-	1,219,999	25%	305,000	1,524,998
							-	-		-		-		-		-	-		-	-
		Haul Road Construction	1,200m				-	-		-		-		-		-	-		-	-
		Clear & grub	Medium	**1**	**HA**		-	-		-	11,877.51	11,878		-		-	11,878	25%	2,969	14,847
		Road embankment widening, 3m	Cut to fill existing shoulder. Approx 8M3 / LM.	**9,600**	**M3**		-	-		-	4.63	44,448		-		-	44,448	25%	11,112	55,560
		Re-grade road sub-base	Av. 150mm dp x 5m wide	**900**	**M3**		-	-		-	12.57	11,313		-		-	11,313	25%	2,828	14,141
		Gravel resurfacing, 100mm thk x 8m wide	Drill & blast, crushing, load & haul and place.	**960**	**M3**		-	-		-	150.92	144,883		-		-	144,883	25%	36,221	181,104
		Bridge construction	15m clear span x 11m w. Supply & install.	**1**	**LS**		-	-		-	889,246.48	889,246		-		-	889,246	25%	222,312	1,111,558
							-	-		-		-		-		-	-		-	-
		Bulk Earthworks					-	-		-		-		-		-	-		-	-
		Tailings regrading	Dozers	**3,000,000**	**M3**		-	-		-	1.60	4,800,000		-		-	4,800,000	25%	1,200,000	6,000,000
		Tailings excavation and replacement	Stock pile approx 500m one-way haul distance.	**200,000**	**M3**		-	-		-	9.80	1,960,000		-		-	1,960,000	25%	490,000	2,450,000
		Waste rock fill from Clinton Creek	Approx. 2.4km one-way haul	**500,000**	**M3**		-	-		-	7.52	3,760,000		-		-	3,760,000	25%	940,000	4,700,000
							-	-		-		-		-		-	-		-	-
		Rock Drain					-	-		-		-		-		-	-		-	-
		Blast rock 100-500mm dia.	Drill & blast, screen & sort, load & haul to site and place.	**31,000**	**M3**		-	-		-	110.08	3,412,480		-		-	3,412,480	25%	853,120	4,265,600
		Granular filter - 20mm road crush	Drill & blast, screen & sort, load & haul to site and place.	**13,000**	**M3**		-	-		-	120.21	1,562,730		-		-	1,562,730	25%	390,683	1,953,413
							-	-		-		-		-		-	-		-	-
		Channel Armouring					-	-		-		-		-		-	-		-	-
		Channel profiling	Excavator & Dozer	**20,250**	**M3**		-	-		-	5.22	105,705		-		-	105,705	25%	26,426	132,131
		Cobbles - 25 to 100mm dia.	Drill & blast, screen & sort, load & haul to site and place.	**2,500**	**M3**		-	-		-	107.43	268,575		-		-	268,575	25%	67,144	335,719
		Geotextile 10oz	Under cobble layer.	**8,333**	**M2**		-	-		-	3.62	30,167		-		-	30,167	25%	7,542	37,708
		Riprap - D50 = 800mm dia.	Drill & blast, screen & sort, load & haul to site and place.	**2,900**	**M3**		-	-		-	105.20	305,080		-		-	305,080	25%	76,270	381,350
		Granular filter - 20mm road crush	Drill & blast, screen & sort, load & haul to site and place.	**2,400**	**M3**		-	-		-	130.89	314,136		-		-	314,136	25%	78,534	392,670
							-	-		-		-		-		-	-		-	-
		Water Management					-	-		-		-		-		-	-		-	-
		Aquadam - supply & install	6' x 100' lg.	**1**	**EA**		-	-		-	42,800.00	42,800		-		-	42,800	25%	10,700	53,500
		Pumps, hoses, fuel & maintainence	150mm submersible	**2**	**EA**		-	-		-	67,332.20	134,664		-		-	134,664	25%	33,666	168,331
							-	-		-		-		-		-	-		-	-
		Support Equipment	For duration of project				-	-		-		-		-		-	-		-	-
		Shop truck		**319**	**DY**		-	-		-	300.00	95,760		-		-	95,760	25%	23,940	119,700
		Temp maintenance shop		**1**	**LS**		-	-		-	15,000.00	15,000		-		-	15,000	25%	3,750	18,750
		Shop trailer		**11**	**MO**		-	-		-	2,000.00	21,000		-		-	21,000	25%	5,250	26,250
		Fuel bowser	1ea on-site	**11**	**MO**		-	-		-	5,000.00	52,500		-		-	52,500	25%	13,125	65,625
		Pick-up trucks	6ea	**319**	**DY**		-	-		-	900.00	287,280		-		-	287,280	25%	71,820	359,100
		Portable light towers	6ea	**11**	**MO**		-	-		-	22,440.00	235,620		-		-	235,620	25%	58,905	294,525
		Generator	6ea	**11**	**MO**		-	-		-	7,920.00	83,160		-		-	83,160	25%	20,790	103,950
							-	-		-		-		-		-	-		-	-
		Support Labour	For duration of project				-	-		-		-		-		-	-		-	-
		Heavy duty mechanic	1ea/shift	**319**	**DY**		-	-		-	2,640.00	842,688		-		-	842,688	25%	210,672	1,053,360
		Welder	1ea/shift	**319**	**DY**		-	-		-	2,640.00	842,688		-		-	842,688	25%	210,672	1,053,360
		Labourer	2ea/shift	**638**	**DY**		-	-		-	1,800.00	1,149,120		-		-	1,149,120	25%	287,280	1,436,400
							-	-		-		-		-		-	-		-	-
		Asbestos Control					-	-		-		-		-		-	-		-	-

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - WC-E	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

WorleyParsons resources & energy

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	SubcontractCosts/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
		Equipment washdown facilites	1ea - 80'x120' temprorary building , 300mm SOG, 4ea - 4.5 GPM pressure washers w/ 600Gal tanks, 4man hours / day.	1	EA		-	-		-	766,116.00	766,116		-		-	766,116	25%	191,529	957,645
		Equipment / vehicle heppa filters,		1	LS		-	-		-	32.00	32		-		-	32	25%	8	40
		PPE; respirators, overalls		80	EA		-	-		-	300.00	24,000		-		-	24,000	25%	6,000	30,000
							-	-		-		-		-		-	-		-	-
		Fuel Transportation	Transport from Dawson City to site (approx 110km one-way).				-	-		-		-		-		-	-		-	-
		Fuel truck & driver	27,000 liter tanker	83	LD		-	-		-	685.60	56,824		-		-	56,824	25%	14,206	71,031
			*fuel included in all-in rates.	2,237,835	liters		-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
DIRECT COST SUB TOTAL							**-**	**-**		**-**		**23,489,892**		**-**	**0%**	**-**	**23,489,892**	**25%**	**5,872,473**	**29,362,366**
INDIRECT COSTS																				
		TEMPORARY CONSTRUCTION CAMP	60 man temporary camp x 10.5mo.	18,696	MDY		-	-		-	418.16	7,817,919		-		-	7,817,919	25%	1,954,480	9,772,399
		TEMPORARY FACILITIES AND CONSTRUCTION SITE SERVICES		3%			-	-		-	29,362,365.51	880,871		-		-	880,871	25%	220,218	1,101,089
		SNOW REMOVAL	2ea Grader 12hrs/day	14	DY		-	-		-	5,354.40	74,962		-		-	74,962	25%	18,740	93,702
		ROAD MAINTENANCE	1ea Grader 12hrs/day	312	DY		-	-		-	2,677.20	834,216		-		-	834,216	25%	208,554	1,042,769
		OVERTIME PREMIUM FOR COMPRESSED WORK WEEK	n/a				-	-		-		-		-		-	-		-	-
		NON-PRODUCTIVE TIME	n/a				-	-		-		-		-		-	-		-	-
		SPOT OVERTIME	n/a				-	-		-		-		-		-	-		-	-
		CONTRACTOR LOA AND TRAVEL	Edm to Dawson City charter flight + DC to Site by charter bus. 1 flight/man every two weeks.	1,320	Round Trip		-	-		-	1,144.00	1,510,080		-		-	1,510,080	25%	377,520	1,887,600
		HEAVY LIFT	n/a				-	-		-		-		-		-	-		-	-
		TRANSPORTATION AND FREIGHT	Edm to Dawson City to Site.	4	LD		-	-		-	18,723.36	74,893		-		-	74,893	25%	18,723	93,617
		CAPITAL SPARE PARTS	n/a				-	-		-		-		-		-	-		-	-
		VENDOR ERECTION SUPERVISION	n/a				-	-		-		-		-		-	-		-	-
		FIRST FILLS	n/a				-	-		-		-		-		-	-		-	-
		ENVIRONMENTAL ASSESSMENT, MONITORING AND TESTING SERVICES		2%			-	-		-	29,362,365.51	587,247		-		-	587,247	25%	146,812	734,059
		GEOTECHNICAL INVESTIGATIONS AND RECOMMENDATIONS		2%			-	-		-	29,362,365.51	587,247		-		-	587,247	25%	146,812	734,059
		CONSTRUCTION INSURANCE	n/a				-	-		-		-		-		-	-		-	-
		BUILDING PERMITS	n/a				-	-		-		-		-		-	-		-	-
INDIRECT COST SUB TOTAL							**-**	**-**		**-**		**12,367,436**		**-**	**0%**	**-**	**12,367,436**	**25%**	**3,091,859**	**15,459,294**
OTHER COSTS																				
		EPCM		10%			-	-		-	35,857,327.91	3,585,733		-		-	3,585,733	25%	896,433	4,482,166
		OWNERS COSTS					-	-		-		-		-		-	-		-	-
		ESCALATION					-	-		-		-		-		-	-		-	-
OTHER COST SUB TOTAL							**-**	**-**		**-**		**3,585,733**		**-**	**0%**	**-**	**3,585,733**	**25%**	**896,433**	**4,482,166**
TOTAL																	**39,443,061**	**25%**	**9,860,765**	**49,303,826**

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - WC-E2	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

WorleyParsons
resources & energy

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	SubcontractCosts/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
DIRECT COSTS																				
							-	-		-		-		-		-	-		-	-
		Equipment Mob / Demob	Edmonton to Dawson City 2,519km. Dawson City to Site	**32**	**EA**		-	-		-	38,124.96	1,219,999		-		-	1,219,999	25%	305,000	1,524,998
							-	-		-		-		-		-	-		-	-
		Haul Road Construction	1,200m				-	-		-		-		-		-	-		-	-
		Clear & grub	Medium	**1**	**HA**		-	-		-	11,877.51	11,878		-		-	11,878	25%	2,969	14,847
		Road embankment widening, 3m	Cut to fill existing shoulder. Approx 8M3 / LM.	**9,600**	**M3**		-	-		-	4.63	44,448		-		-	44,448	25%	11,112	55,560
		Re-grade road sub-base	Av. 150mm dp x 5m wide	**900**	**M3**		-	-		-	12.57	11,313		-		-	11,313	25%	2,828	14,141
		Gravel resurfacing, 100mm thk x 8m wide	Drill & blast, crushing, load & haul and place.	**960**	**M3**		-	-		-	157.61	151,306		-		-	151,306	25%	37,826	189,132
		Bridge construction	15m clear span x 11m w. Supply & install.	**1**	**LS**		-	-		-	889,246.48	889,246		-		-	889,246	25%	222,312	1,111,558
							-	-		-		-		-		-	-		-	-
		Bulk Earthworks					-	-		-		-		-		-	-		-	-
		Tailings regrading	Dozers	**3,500,000**	**M3**		-	-		-	1.60	5,600,000		-		-	5,600,000	25%	1,400,000	7,000,000
		Waste rock fill from Clinton Creek	Approx. 2.4km one-way haul	**600,000**	**M3**		-	-		-	7.52	4,512,000		-		-	4,512,000	25%	1,128,000	5,640,000
							-	-		-		-		-		-	-		-	-
		Channel Armouring					-	-		-		-		-		-	-		-	-
		Channel profiling	Excavator & Dozer	**20,250**	**M3**		-	-		-	5.22	105,705		-		-	105,705	25%	26,426	132,131
		Cobbles - 25 to 100mm dia.	Drill & blast, screen & sort, load & haul to site and place.	**2,500**	**M3**		-	-		-	110.07	275,175		-		-	275,175	25%	68,794	343,969
		Geotextile 10oz	Under cobble layer.	**8,333**	**M2**		-	-		-	3.62	30,167		-		-	30,167	25%	7,542	37,708
		Riprap - D50 = 800mm dia.	Drill & blast, screen & sort, load & haul to site and place.	**2,900**	**M3**		-	-		-	107.47	311,663		-		-	311,663	25%	77,916	389,579
		Granular filter - 20mm road crush	Drill & blast, screen & sort, load & haul to site and place.	**2,400**	**M3**		-	-		-	126.90	304,560		-		-	304,560	25%	76,140	380,700
							-	-		-		-		-		-	-		-	-
		Water Management					-	-		-		-		-		-	-		-	-
		Aquadam - supply & install	6' x 100' lg.	**1**	**EA**		-	-		-	42,800.00	42,800		-		-	42,800	25%	10,700	53,500
		Pumps, hoses, fuel & maintainence	150mm submersible	**2**	**EA**		-	-		-	67,332.20	134,664		-		-	134,664	25%	33,666	168,331
							-	-		-		-		-		-	-		-	-
		Support Equipment	For duration of project				-	-		-		-		-		-	-		-	-
		Shop truck		**213**	**DY**		-	-		-	300.00	63,840		-		-	63,840	25%	15,960	79,800
		Temp maintenance shop		**1**	**LS**		-	-		-	15,000.00	15,000		-		-	15,000	25%	3,750	18,750
		Shop trailer		**11**	**MO**		-	-		-	2,000.00	21,000		-		-	21,000	25%	5,250	26,250
		Fuel bowser	1ea on-site	**11**	**MO**		-	-		-	5,000.00	52,500		-		-	52,500	25%	13,125	65,625
		Pick-up trucks	6ea	**213**	**DY**		-	-		-	900.00	191,520		-		-	191,520	25%	47,880	239,400
		Portable light towers	6ea	**11**	**MO**		-	-		-	22,440.00	235,620		-		-	235,620	25%	58,905	294,525
		Generator	6ea	**11**	**MO**		-	-		-	7,920.00	83,160		-		-	83,160	25%	20,790	103,950
							-	-		-		-		-		-	-		-	-
		Support Labour	For duration of project				-	-		-		-		-		-	-		-	-
		Heavy duty mechanic	1ea/shift	**213**	**DY**		-	-		-	2,640.00	561,792		-		-	561,792	25%	140,448	702,240
		Welder	1ea/shift	**213**	**DY**		-	-		-	2,640.00	561,792		-		-	561,792	25%	140,448	702,240
		Labourer	2ea/shift	**426**	**DY**		-	-		-	1,800.00	766,080		-		-	766,080	25%	191,520	957,600
							-	-		-		-		-		-	-		-	-
		Asbestos Control					-	-		-		-		-		-	-		-	-
		Equipment washdown facilites	1ea - 80'x120' temprorary building , 300mm SOG, 4ea - 4.5 GPM pressure washers w/ 600Gal tanks, 4man hours / day.	**1**	**EA**		-	-		-	766,116.00	766,116		-		-	766,116	25%	191,529	957,645
		Equipment / vehicle heppa filters,		**1**	**LS**		-	-		-	32.00	32		-		-	32	25%	8	40
		PPE; respirators, overalls		**80**	**EA**		-	-		-	300.00	24,000		-		-	24,000	25%	6,000	30,000
							-	-		-		-		-		-	-		-	-

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - WC-E2	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

WorleyParsons resources & energy

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	SubcontractCosts/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
		Fuel Transportation	Transport from Dawson City to site (approx 110km one-way).				-	-		-		-		-		-	-		-	-
		Fuel truck & driver	27,000 liter tanker	**77**	**LD**		-	-		-	685.60	52,992		-		-	52,992	25%	13,248	66,240
			*fuel included in all-in rates.	2,086,902	liters		-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
DIRECT COST SUB TOTAL							**-**	**-**		**-**		**17,040,367**		**-**	**0%**	**-**	**17,040,367**	**25%**	**4,260,092**	**21,300,459**
INDIRECT COSTS																				
		TEMPORARY CONSTRUCTION CAMP	60 man temporary camp x 7mo.	**12,768**	**MDY**		-	-		-	413.41	5,278,419		-		-	5,278,419	25%	1,319,605	6,598,024
		TEMPORARY FACILITIES AND CONSTRUCTION SITE SERVICES		**3%**			-	-		-	21,300,459.03	639,014		-		-	639,014	25%	159,753	798,767
		SNOW REMOVAL	2ea Grader 12hrs/day	**14**	**DY**		-	-		-	5,354.40	74,962		-		-	74,962	25%	18,740	93,702
		ROAD MAINTENANCE	1ea Grader 12hrs/day	**213**	**DY**		-	-		-	2,677.20	569,708		-		-	569,708	25%	142,427	712,135
		OVERTIME PREMIUM FOR COMPRESSED WORK WEEK	n/a				-	-		-		-		-		-	-		-	-
		NON-PRODUCTIVE TIME	n/a				-	-		-		-		-		-	-		-	-
		SPOT OVERTIME	n/a				-	-		-		-		-		-	-		-	-
		CONTRACTOR LOA AND TRAVEL	Edm to Dawson City charter flight + DC to Site by charter bus. 1 flight/man every two weeks.	**840**	**Round Trip**		-	-		-	1,144.00	960,960		-		-	960,960	25%	240,240	1,201,200
		HEAVY LIFT	n/a				-	-		-		-		-		-	-		-	-
		TRANSPORTATION AND FREIGHT	Edm to Dawson City to Site.	**4**	**LD**		-	-		-	18,723.36	74,893		-		-	74,893	25%	18,723	93,617
		CAPITAL SPARE PARTS	n/a				-	-		-		-		-		-	-		-	-
		VENDOR ERECTION SUPERVISION	n/a				-	-		-		-		-		-	-		-	-
		FIRST FILLS	n/a				-	-		-		-		-		-	-		-	-
		ENVIRONMENTAL ASSESSMENT, MONITORING AND TESTING SERVICES		**2%**			-	-		-	21,300,459.03	426,009		-		-	426,009	25%	106,502	532,511
		GEOTECHNICAL INVESTIGATIONS AND RECOMMENDATIONS		**2%**			-	-		-	21,300,459.03	426,009		-		-	426,009	25%	106,502	532,511
		CONSTRUCTION INSURANCE	n/a				-	-		-		-		-		-	-		-	-
		BUILDING PERMITS	n/a				-	-		-		-		-		-	-		-	-
INDIRECT COST SUB TOTAL							**-**	**-**		**-**		**8,449,974**		**-**	**0%**	**-**	**8,449,974**	**25%**	**2,112,494**	**10,562,468**
OTHER COSTS																				
		EPCM		**10%**			-	-		-	25,490,341.44	2,549,034		-		-	2,549,034	25%	637,259	3,186,293
		OWNERS COSTS					-	-		-		-		-		-	-		-	-
		ESCALATION					-	-		-		-		-		-	-		-	-
OTHER COST SUB TOTAL							**-**	**-**		**-**		**2,549,034**		**-**	**0%**	**-**	**2,549,034**	**25%**	**637,259**	**3,186,293**
TOTAL																	**28,039,376**	**25%**	**7,009,844**	**35,049,219**

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

WorleyParsons resources & energy

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Site Access Rd and Wolverine Access Rd Resurfacing (16.2km)	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
DIRECT COSTS																				
							-	-		-		-		-		-	-		-	-
		Equipment Mob / Demob	Edmonton to Dawson City 2,519km. Dawson City to Site	**12**	**EA**		-	-		-	18,723.36	224,680		-		-	224,680	25%	56,170	280,850
							-	-		-		-		-		-	-		-	-
		Major Road Improvements	15km				-	-		-		-		-		-	-		-	-
		Re-grade road sub-base	Av. 150mm dp x 8m wide	**19,440**	**M3**		-	-		-	12.57	244,361		-		-	244,361	25%	61,090	305,451
		Gravel resurfacing, 100mm thk x 8m wide	Drill & blast, crushing, load & haul and place.	**12,960**	**M3**		-	-		-	139.80	1,811,808		-		-	1,811,808	25%	452,952	2,264,760
							-	-		-		-		-		-	-		-	-
		Fuel Transportation	Transport from Dawson City to site (approx 110km one-way).				-	-		-		-		-		-	-		-	-
		Fuel truck & driver	27,000 liter tanker	**5**	**LD**		-	-		-	685.60	3,423		-		-	3,423	25%	856	4,278
			*fuel included in all-in rates.	134,784	liters		-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
DIRECT COST SUB TOTAL							**-**	**-**		**-**		**2,284,272**		**-**	**0%**	**-**	**2,284,272**	**25%**	**571,068**	**2,855,340**
INDIRECT COSTS																				
		TEMPORARY CONSTRUCTION CAMP	30 man camp x 4.25mo	**1,395**	**MDY**		-	-		-	440.21	614,251		-		-	614,251	25%	153,563	767,814
		TEMPORARY FACILITIES AND CONSTRUCTION SITE SERVICES		**3%**			-	-		-	2,855,339.54	85,660		-		-	85,660	25%	21,415	107,075
		ROAD MAINTENANCE	n/a				-	-		-		-		-		-	-		-	-
		OVERTIME PREMIUM FOR COMPRESSED WORK WEEK	n/a				-	-		-		-		-		-	-		-	-
		NON-PRODUCTIVE TIME	n/a				-	-		-		-		-		-	-		-	-
		SPOT OVERTIME	n/a				-	-		-		-		-		-	-		-	-
		CONTRACTOR LOA AND TRAVEL	Edm to Dawson City charter flight + DC to Site by charter bus. 1 flight/man every two weeks.	**86**	**Round Trip**		-	-		-	1,144.00	98,842		-		-	98,842	25%	24,710	123,552
		HEAVY LIFT	n/a				-	-		-		-		-		-	-		-	-
		TRANSPORTATION AND FREIGHT	n/a				-	-		-		-		-		-	-		-	-
		CAPITAL SPARE PARTS	n/a				-	-		-		-		-		-	-		-	-
		VENDOR ERECTION SUPERVISION	n/a				-	-		-		-		-		-	-		-	-
		FIRST FILLS	n/a				-	-		-		-		-		-	-		-	-
		ENVIRONMENTAL ASSESSMENT, MONITORING AND TESTING SERVICES		**2%**			-	-		-	2,855,339.54	57,107		-		-	57,107	25%	14,277	71,383
		GEOTECHNICAL INVESTIGATIONS AND RECOMMENDATIONS	n/a				-	-		-		-		-		-	-		-	-
		CONSTRUCTION INSURANCE	n/a				-	-		-		-		-		-	-		-	-
		BUILDING PERMITS	n/a				-	-		-		-		-		-	-		-	-
INDIRECT COST SUB TOTAL							**-**	**-**		**-**		**855,860**		**-**	**0%**	**-**	**855,860**	**25%**	**213,965**	**1,069,825**
OTHER COSTS																				
		EPCM		**10%**			-	-		-	3,140,131.64	314,013		-		-	314,013	25%	78,503	392,516
		OWNERS COSTS					-	-		-		-		-		-	-		-	-
		ESCALATION					-	-		-		-		-		-	-		-	-
OTHER COST SUB TOTAL							**-**	**-**		**-**		**314,013**		**-**	**0%**	**-**	**314,013**	**25%**	**78,503**	**392,516**
TOTAL																	**3,454,145**	**25%**	**863,536**	**4,317,681**

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Excavate Rock Drain Sediment (Wolverine Options B, D and E)	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

WorleyParsons resources & energy

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
DIRECT COSTS																				
							-	-		-		-		-		-	-		-	-
		Equipment Mob / Demob	Edmonton to Dawson City 2,519km. Dawson City to Site	**4**	**EA**		-	-		-	18,723.36	74,893		-		-	74,893	25%	18,723	93,617
							-	-		-		-		-		-	-		-	-
		Excavate Sediment Trap		**2,000**	**M3**		-	-		-	15.69	31,380		-		-	31,380	25%	7,845	39,225
							-	-		-		-		-		-	-		-	-
		Water Management					-	-		-		-		-		-	-		-	-
		Aquadam - supply & install	6' x 100' lg.	**2**	**EA**		-	-		-	26,000.00	52,000		-		-	52,000	25%	13,000	65,000
		Pumps, hoses, fuel & maintainence	150mm submersible	**4**	**EA**		-	-		-	4,643.60	18,574		-		-	18,574	25%	4,644	23,218
							-	-		-		-		-		-	-		-	-
		Asbestos Control					-	-		-		-		-		-	-		-	-
		Equipment washdown equip & labour	Assume existing building of 1ea - 80'x120' temprorary building , 300mm SOG. 1ea - 4.5 GPM pressure washers w/ 600Gal tanks, 2man hours / day.	**1**	**EA**		-	-		-	22,544.00	22,544		-		-	22,544	25%	5,636	28,180
		Equipment / vehicle heppa filters,		**1**	**LS**		-	-		-	3,000.00	3,000		-		-	3,000	25%	750	3,750
		PPE; respirators, overalls		**20**	**EA**		-	-		-	300.00	6,000		-		-	6,000	25%	1,500	7,500
							-	-		-		-		-		-	-		-	-
		Fuel Transportation	Transport from Dawson City to site (approx 110km one-way).				-	-		-		-		-		-	-		-	-
		Fuel truck & driver	27,000 liter tanker	**1**	**LD**		-	-		-	685.60	640		-		-	640	25%	160	800
			*fuel included in all-in rates.	25,200	liters		-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
DIRECT COST SUB TOTAL							**-**	**-**		**-**		**209,032**		**-**	**0%**	**-**	**209,032**	**25%**	**52,258**	**261,290**
INDIRECT COSTS																				
		TEMPORARY CONSTRUCTION CAMP	RV rental, 2men per unit + per diem.	**70**	**MDY**		-	-		-	255.00	17,850		-		-	17,850	25%	4,463	22,313
		TEMPORARY FACILITIES AND CONSTRUCTION SITE SERVICES		**3%**			-	-		-	261,289.67	7,839		-		-	7,839	25%	1,960	9,798
		OVERTIME PREMIUM FOR COMPRESSED WORK WEEK	n/a				-	-		-		-		-		-	-		-	-
		NON-PRODUCTIVE TIME	n/a				-	-		-		-		-		-	-		-	-
		SPOT OVERTIME	n/a				-	-		-		-		-		-	-		-	-
		CONTRACTOR LOA AND TRAVEL	Edm to Dawson City charter flight + DC to Site by charter bus.	**10**	**Round Trip**		-	-		-	1,144.00	11,440		-		-	11,440	25%	2,860	14,300
		HEAVY LIFT	n/a				-	-		-		-		-		-	-		-	-
		TRANSPORTATION AND FREIGHT	n/a				-	-		-		-		-		-	-		-	-
		CAPITAL SPARE PARTS	n/a				-	-		-		-		-		-	-		-	-
		VENDOR ERECTION SUPERVISION	n/a				-	-		-		-		-		-	-		-	-
		FIRST FILLS	n/a				-	-		-		-		-		-	-		-	-
		ENVIRONMENTAL ASSESSMENT, MONITORING AND TESTING SERVICES		**2%**			-	-		-	261,289.67	5,226		-		-	5,226	25%	1,306	6,532
		GEOTECHNICAL INVESTIGATIONS AND RECOMMENDATIONS		**2%**			-	-		-	261,289.67	5,226		-		-	5,226	25%	1,306	6,532
		CONSTRUCTION INSURANCE	n/a				-	-		-		-		-		-	-		-	-
		BUILDING PERMITS	n/a				-	-		-		-		-		-	-		-	-
INDIRECT COST SUB TOTAL							**-**	**-**		**-**		**47,580**		**-**	**0%**	**-**	**47,580**	**25%**	**11,895**	**59,475**
OTHER COSTS																				
		EPCM		**10%**			-	-		-	320,765.01	32,077		-		-	32,077	25%	8,019	40,096

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Excavate Rock Drain Sediment (Wolverine Options B, D and E)	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

WorleyParsons
resources & energy

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
		OWNERS COSTS					-	-		-		-		-		-	-		-	-
		ESCALATION					-	-		-		-		-		-	-		-	-
OTHER COST SUB TOTAL							**-**	**-**		**-**		**32,077**		**-**	**0%**	**-**	**32,077**	**25%**	**8,019**	**40,096**
TOTAL																	**288,689**	**25%**	**72,172**	**360,861**

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Replace 200m of 0.1% Riprap Channel (Wolverine Options C and D)	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

WorleyParsons resources & energy

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
DIRECT COSTS																				
							-	-		-		-		-		-	-		-	-
		Equipment Mob / Demob	Edmonton to Dawson City 2,519km. Dawson City to Site	**7**	**EA**		-	-		-	18,723.36	131,064		-		-	131,064	25%	32,766	163,829
							-	-		-		-		-		-	-		-	-
		Channel Replacement					-	-		-		-		-		-	-		-	-
		Channel profiling	Excavator & Dozer	**6,000**	**M3**		-	-		-	5.22	31,320		-		-	31,320	25%	7,830	39,150
		Cobbles - 25 to 100mm dia.	Drill & blast, screen & sort, load & haul to site and place.	**1,100**	**M3**		-	-		-	186.16	204,776		-		-	204,776	25%	51,194	255,970
		Geotextile 10oz		**3,667**	**M2**		-	-		-	3.62	13,273		-		-	13,273	25%	3,318	16,592
							-	-		-		-		-		-	-		-	-
		Asbestos Control					-	-		-		-		-		-	-		-	-
		Equipment washdown equip & labour	Assume existing building of 1ea - 80'x120' temprorary building , 300mm SOG. 1ea - 4.5 GPM pressure washers w/ 600Gal tanks, 2man hours / day.	**1**	**EA**		-	-		-	23,760.00	23,760		-		-	23,760	25%	5,940	29,700
		Equipment / vehicle heppa filters,		**1**	**LS**		-	-		-	7,000.00	7,000		-		-	7,000	25%	1,750	8,750
		PPE; respirators, overalls		**20**	**EA**		-	-		-	300.00	6,000		-		-	6,000	25%	1,500	7,500
							-	-		-		-		-		-	-		-	-
		Fuel Transportation	Transport from Dawson City to site (approx 110km one-way).				-	-		-		-		-		-	-		-	-
		Fuel truck & driver	27,000 liter tanker	**1**	**LD**		-	-		-	685.60	396		-		-	396	25%	99	495
			*fuel included in all-in rates.	15,584	liters		-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
DIRECT COST SUB TOTAL							**-**	**-**		**-**		**417,589**		**-**	**0%**	**-**	**417,589**	**25%**	**104,397**	**521,986**
INDIRECT COSTS																				
		TEMPORARY CONSTRUCTION CAMP	RV rental, 2men per unit + per diem.	**182**	**MDY**		-	-		-	255.00	46,410		-		-	46,410	25%	11,603	58,013
		TEMPORARY FACILITIES AND CONSTRUCTION SITE SERVICES		**3%**			-	-		-	521,985.71	15,660		-		-	15,660	25%	3,915	19,574
		OVERTIME PREMIUM FOR COMPRESSED WORK WEEK	n/a				-	-		-		-		-		-	-		-	-
		NON-PRODUCTIVE TIME	n/a				-	-		-		-		-		-	-		-	-
		SPOT OVERTIME	n/a				-	-		-		-		-		-	-		-	-
		CONTRACTOR LOA AND TRAVEL	Edm to Dawson City charter flight + DC to Site by charter bus.	**10**	**Round Trip**		-	-		-	1,144.00	11,440		-		-	11,440	25%	2,860	14,300
		HEAVY LIFT	n/a				-	-		-		-		-		-	-		-	-
		TRANSPORTATION AND FREIGHT	n/a				-	-		-		-		-		-	-		-	-
		CAPITAL SPARE PARTS	n/a				-	-		-		-		-		-	-		-	-
		VENDOR ERECTION SUPERVISION	n/a				-	-		-		-		-		-	-		-	-
		FIRST FILLS	n/a				-	-		-		-		-		-	-		-	-
		ENVIRONMENTAL ASSESSMENT, MONITORING AND TESTING SERVICES		**2%**			-	-		-	521,985.71	10,440		-		-	10,440	25%	2,610	13,050
		GEOTECHNICAL INVESTIGATIONS AND RECOMMENDATIONS	n/a				-	-		-		-		-		-	-		-	-
		CONSTRUCTION INSURANCE	n/a				-	-		-		-		-		-	-		-	-
		BUILDING PERMITS	n/a				-	-		-		-		-		-	-		-	-
INDIRECT COST SUB TOTAL							**-**	**-**		**-**		**83,949**		**-**	**0%**	**-**	**83,949**	**25%**	**20,987**	**104,937**
OTHER COSTS																				

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Replace 200m of 0.1% Riprap Channel (Wolverine Options C and D)	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

WorleyParsons
resources & energy

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
		EPCM		**10%**			-	-		-	626,922.32	62,692		-		-	62,692	25%	15,673	78,365
		OWNERS COSTS					-	-		-		-		-		-	-		-	-
		ESCALATION					-	-		-		-		-		-	-		-	-
OTHER COST SUB TOTAL							**-**	**-**		**-**		**62,692**		**-**	**0%**	**-**	**62,692**	**25%**	**15,673**	**78,365**
TOTAL																	**564,230**	**25%**	**141,058**	**705,288**

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Replace 250 m of 15% Riprap Channel (Wolverine Options A, C and D)	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

WorleyParsons resources & energy

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
DIRECT COSTS																				
							-	-		-		-		-		-	-		-	-
		Equipment Mob / Demob	Edmonton to Dawson City 2,519km. Dawson City to Site	**8**	**EA**		-	-		-	18,723.36	149,787		-		-	149,787	25%	37,447	187,234
							-	-		-		-		-		-	-		-	-
		Rip-Rap Channel Replacement (250LM)					-	-		-		-		-		-	-		-	-
		Existing rip-rap - D50 = 800mm dia.	Remove & dispose.	**2,000**	**M3**		-	-		-	51.33	102,660		-		-	102,660	25%	25,665	128,325
		Existing rip-rap - D50 = 800mm dia.	Salvage, sort and replace.	**2,000**	**M3**		-	-		-	19.48	38,960		-		-	38,960	25%	9,740	48,700
		New rip-rap - D50 = 800mm dia.	Drill & blast, screen & sort, load & haul to site and place.	**2,000**	**M3**		-	-		-	108.30	216,600		-		-	216,600	25%	54,150	270,750
		Existing granular filter	Remove & dispose.	**3,150**	**M3**		-	-		-	4.90	15,435		-		-	15,435	25%	3,859	19,294
		New granular filter - 20mm road crush	Drill & blast, screen & sort, load & haul to site and place.	**3,150**	**M3**		-	-		-	125.00	393,750		-		-	393,750	25%	98,438	492,188
							-	-		-		-		-		-	-		-	-
		Asbestos Control					-	-		-		-		-		-	-		-	-
		Equipment washdown equip & labour	Assume existing building of 1ea - 80'x120' temprorary building , 300mm SOG. 1ea - 4.5 GPM pressure washers w/ 600Gal tanks, 2man hours / day.	**1**	**EA**		-	-		-	34,248.00	34,248		-		-	34,248	25%	8,562	42,810
		Equipment / vehicle heppa filters,		**1**	**LS**		-	-		-	3,000.00	3,000		-		-	3,000	25%	750	3,750
		PPE; respirators, overalls		**20**	**EA**		-	-		-	300.00	6,000		-		-	6,000	25%	1,500	7,500
							-	-		-		-		-		-	-		-	-
		Fuel Transportation	Transport from Dawson City to site (approx 110km one-way).				-	-		-		-		-		-	-		-	-
		Fuel truck & driver	27,000 liter tanker	**3**	**LD**		-	-		-	685.60	2,084		-		-	2,084	25%	521	2,606
			*fuel included in all-in rates.	82,090	liters		-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
							-	-		-		-		-		-	-		-	-
DIRECT COST SUB TOTAL							**-**	**-**		**-**		**962,524**		**-**	**0%**	**-**	**962,524**	**25%**	**240,631**	**1,203,155**
INDIRECT COSTS																				
		TEMPORARY CONSTRUCTION CAMP	RV rental, 2men per unit + per diem.	**385**	**MDY**		-	-		-	255.00	98,175		-		-	98,175	25%	24,544	122,719
		TEMPORARY FACILITIES AND CONSTRUCTION SITE SERVICES		**3%**			-	-		-	1,203,155.45	36,095		-		-	36,095	25%	9,024	45,118
		OVERTIME PREMIUM FOR COMPRESSED WORK WEEK	n/a				-	-		-		-		-		-	-		-	-
		NON-PRODUCTIVE TIME	n/a				-	-		-		-		-		-	-		-	-
		SPOT OVERTIME	n/a				-	-		-		-		-		-	-		-	-
		CONTRACTOR LOA AND TRAVEL	Edm to Dawson City charter flight + DC to Site by charter bus.	**40**	**Round Trip**		-	-		-	1,144.00	45,760		-		-	45,760	25%	11,440	57,200
		HEAVY LIFT	n/a				-	-		-		-		-		-	-		-	-
		TRANSPORTATION AND FREIGHT	n/a				-	-		-		-		-		-	-		-	-
		CAPITAL SPARE PARTS	n/a				-	-		-		-		-		-	-		-	-
		VENDOR ERECTION SUPERVISION	n/a				-	-		-		-		-		-	-		-	-
		FIRST FILLS	n/a				-	-		-		-		-		-	-		-	-
		ENVIRONMENTAL ASSESSMENT, MONITORING AND TESTING SERVICES		**2%**			-	-		-	1,203,155.45	24,063		-		-	24,063	25%	6,016	30,079
		GEOTECHNICAL INVESTIGATIONS AND RECOMMENDATIONS	n/a				-	-		-		-		-		-	-		-	-
		CONSTRUCTION INSURANCE	n/a				-	-		-		-		-		-	-		-	-
		BUILDING PERMITS	n/a				-	-		-		-		-		-	-		-	-
INDIRECT COST SUB TOTAL							**-**	**-**		**-**		**204,093**		**-**	**0%**	**-**	**204,093**	**25%**	**51,023**	**255,116**

ESTIMATE - DIRECT/INDIRECT/OTHER CONSTRUCTION COSTS DETAIL

WorleyParsons resources & energy

CLIENT:	Assessment and Abandoned Mines	**DATE:**	28-Mar-14
PROJECT TITLE:	Clinton Creek Site LCCA - Replace 250 m of 15% Riprap Channel (Wolverine Options A, C and D)	**ACCURACY:**	+/-50%
PROJECT No.:	307071-00895	**AUTHOR:**	MW
MTO No.:		**REVISION:**	0

Area / WBS	Sub Area	Description	Remarks	Qty	Unit	Mhr/Unit	Mhr Total	Mhr Cost ($)	Material/Unit ($)	Material Total ($)	Subcontract Costs/Unit ($)	Subcontract Total ($)	Other/Unit ($)	Other Total ($)	Allowance %	Allowance ($)	Sub Total ($)	Contingency %	Contingency ($)	Total ($)
OTHER COSTS																				
		EPCM		**10%**			-	-		-	1,458,271.41	145,827		-		-	145,827	25%	36,457	182,284
		OWNERS COSTS					-	-		-		-		-		-	-		-	-
		ESCALATION					-	-		-		-		-		-	-		-	-
OTHER COST SUB TOTAL							**-**	**-**		**-**		**145,827**		**-**	**0%**	**-**	**145,827**	**25%**	**36,457**	**182,284**
TOTAL																	**1,312,444**	**25%**	**328,111**	**1,640,555**

Appendix 4 Life Cycle Cost Breakdowns

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SHEET TITLE:	**Clinton Creek Option A LCCA**
PROJECT NO. AND TITLE:	307071-00895 Clinton Creek LCCA
CLIENT:	Assessment and Abandoned Mines
LOCATION:	Clinton Creek Site, YT
ESTIMATE BASIS:	2014 CDN Dollars (+/- 50% accuracy)
DATE:	March 28, 2014
REVISION:	0

LIFECYCLE COST ANALYSIS

Capital Costs

Task No.	Description		Cost (2014 CAD)
1.0	**Mobilization**	**$**	**0.26 M**
2.0	**Major Road Improvements**	**$**	**3.62 M**
3.0	**Slope Stabilization**	**$**	**0.25 M**
4.0	**Drop Structure 4 Repair**	**$**	**0.80 M**
5.0	**Construction Water Management**	**$**	**0.52 M**
6.0	**Support Equipment**	**$**	**0.16 M**
7.0	**Support Labour**	**$**	**0.54 M**
8.0	**Asbestos Control**	**$**	**0.77 M**
9.0	**Fuel Transportation**	**$**	**0.01 M**
10.0	**Indirects**	**$**	**2.69 M**
Note: Cost Breakdown in Appendix 3, Option CC-A			
Subtotal		**$**	**9.61 M**
	EPCM	**$**	**0.96 M**
	Contingency (25%)	**$**	**2.64 M**
Total Estimated Capital Costs		**$**	**13.22 M**

Operational Costs

25% Contingency Incl., Real Discount Rate = 2.5%

Task No.	Description	Cost (2014 CAD)	Frequency (Years)	Duration (Years)		NPC (2014 CAD)
1.0	**Monitoring**				**$**	**1.63 M**
1.1	Visual Inspections	$ 15,000	1	100	$	0.55 M
1.2	Surveys	$ 60,000	2	100	$	1.08 M
2.0	**Maintenance**				**$**	**3.73 M**
2.1	Repair 4 Gabion Drop Structures (Cost Breakdown in Appendix 3)	$ 536,000	5	100	$	3.73 M
3.0	**Replacement**				**$**	**6.18 M**
3.1	Replace 2 Gabion Drop Structures (Cost Breakdown in Appendix 3)	$ 1,246,000	7.5	100	$	5.61 M
3.2	Replace Drop Structure 4 Armouring (Cost Breakdown in Appendix 3)	$ 1,273,000	45	100	$	0.57 M
Subtotal					**$**	**11.55 M**
Total Estimated Operational Costs (Over 100-Year Period)					**$**	**11.55 M**
Equivalent Annual Operational Costs					**$**	**0.32 M/yr**

Total Estimated Lifecycle Costs (Over 100-Year Period)	**$**	**24.76 M**

Maintaining Site Access

25% Contingency Incl., Real Discount Rate = 2.5%

Task No.	Description	Cost (2014 CAD)	Frequency (Years)	Duration (Years)		NPC (2014 CAD)
1.0	**Grade Access Road (15 km)**	**$ 40,000**	**4**	**100**	**$**	**0.35 M**
2.0	**Site Access Road Resurfacing (15 km) (Cost Breakdown in Appendix 3)**	**$ 3,898,000**	**20**	**100**	**$**	**5.59 M**
3.0	**15 m Long Bridge Replacement (Cost Breakdown in Appendix 3)**	**$ 1,789,000**	**50**	**100**	**$**	**0.67 M**
Subtotal					**$**	**6.61 M**
Total Estimated Cost (Over 100-Year Period)					**$**	**6.61 M**
Equivalent Annual Cost					**$**	**0.18 M/yr**

Note: This is not considered a walk-away solution. Site access would need to be maintained in order to complete regular monitoring, maintenance and replacement.

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SHEET TITLE:	**Clinton Creek Option B LCCA**
PROJECT NO. AND TITLE:	307071-00895 Clinton Creek LCCA
CLIENT:	Assessment and Abandoned Mines
LOCATION:	Clinton Creek Site, YT
ESTIMATE BASIS:	2014 CDN Dollars (+/- 50% accuracy)
DATE:	March 28, 2014
REVISION:	0

LIFECYCLE COST ANALYSIS

Capital Costs

Task No.	Description		Cost (2014 CAD)
1.0	**Mobilization**	**$**	**0.76 M**
2.0	**Major Road Improvements**	**$**	**3.63 M**
3.0	**Waste Rock Dump Stabilization**	**$**	**9.02 M**
4.0	**Access Road Construction**	**$**	**0.22 M**
5.0	**Creek Bed Stabilization**	**$**	**2.05 M**
6.0	**Support Equipment**	**$**	**0.53 M**
7.0	**Support Labour**	**$**	**0.81 M**
8.0	**Asbestos Control**	**$**	**0.85 M**
9.0	**Fuel Transportation**	**$**	**0.05 M**
10.0	**Indirects**	**$**	**10.00 M**
Note: Cost Breakdown in Appendix 3, Option CC-B			
Subtotal		**$**	**27.91 M**
	EPCM	**$**	**2.79 M**
	Contingency (25%)	**$**	**7.67 M**
Total Estimated Capital Costs		**$**	**38.37 M**

Operational Costs

25% Contingency Incl., Real Discount Rate = 2.5%

Task No.	Description	Cost (2014 CAD)	Frequency (Years)	Duration (Years)		NPC (2014 CAD)
1.0	**Monitoring**				**$**	**1.63 M**
1.1	Visual Inspections	$ 15,000	1	100	$	0.55 M
1.2	Surveys	$ 60,000	2	100	$	1.08 M
2.0	**Maintenance**				**$**	**6.10 M**
2.1	Repair 8 Gabion Drop Structures (Cost Breakdown in Appendix 3)	$ 876,000	5	100	$	6.10 M
3.0	**Replacement**				**$**	**6.83 M**
3.1	Replace 2 Gabion Drop Structures (Cost Breakdown in Appendix 3)	$ 1,246,000	6.3	100	$	6.83 M
Subtotal					**$**	**14.57 M**
Total Estimated Operational Costs (Over 100-Year Period)					**$**	**14.57 M**
Equivalent Annual Operational Costs					**$**	**0.40 M/yr**

Total Estimated Lifecycle Costs (Over 100-Year Period)	**$**	**52.95 M**

Maintaining Site Access

25% Contingency Incl., Real Discount Rate = 2.5%

Task No.	Description	Cost (2014 CAD)	Frequency (Years)	Duration (Years)		NPC (2014 CAD)
1.0	**Grade Access Road (15 km)**	**$ 40,000**	**4**	**100**	**$**	**0.35 M**
2.0	**Site Access Road Resurfacing (15 km) (Cost Breakdown in Appendix 3)**	**$ 3,898,000**	**20**	**100**	**$**	**5.59 M**
3.0	**15 m Long Bridge Replacement (Cost Breakdown in Appendix 3)**	**$ 1,789,000**	**50**	**100**	**$**	**0.67 M**
Subtotal					**$**	**6.61 M**
Total Estimated Cost (Over 100-Year Period)					**$**	**6.61 M**
Equivalent Annual Cost					**$**	**0.18 M/yr**

Note: This is not considered a walk-away solution. Site access would need to be maintained in order to complete regular monitoring, maintenance and replacement.

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SHEET TITLE:	**Clinton Creek Option B2 LCCA**
PROJECT NO. AND TITLE:	307071-00895 Clinton Creek LCCA
CLIENT:	Assessment and Abandoned Mines
LOCATION:	Clinton Creek Site, YT
ESTIMATE BASIS:	2014 CDN Dollars (+/- 50% accuracy)
DATE:	March 28, 2014
REVISION:	0

LIFECYCLE COST ANALYSIS

Capital Costs

Task No.	Description		Cost (2014 CAD)
1.0	**Mobilization**	**$**	**0.76 M**
2.0	**Major Road Improvements**	**$**	**3.60 M**
3.0	**Waste Rock Dump Stabilization**	**$**	**9.02 M**
4.0	**Access Road Construction**	**$**	**0.22 M**
5.0	**Creek Bed Stabilization**	**$**	**2.62 M**
6.0	**Support Equipment**	**$**	**0.53 M**
7.0	**Support Labour**	**$**	**0.81 M**
8.0	**Asbestos Control**	**$**	**0.85 M**
9.0	**Fuel Transportation**	**$**	**0.05 M**
10.0	**Indirects**	**$**	**10.02 M**
Note: Cost Breakdown in Appendix 3, Option CC-B2			
Subtotal		**$**	**28.47 M**
	EPCM	**$**	**2.85 M**
	Contingency (25%)	**$**	**7.83 M**
Total Estimated Capital Costs		**$**	**39.15 M**

Operational Costs

25% Contingency Incl., Real Discount Rate = 2.5%

Task No.	Description	Cost (2014 CAD)	Frequency (Years)	Duration (Years)		NPC (2014 CAD)
1.0	**Monitoring**				**$**	**1.63 M**
1.1	Visual Inspections	$ 15,000	1	100	$	0.55 M
1.2	Surveys	$ 60,000	2	100	$	1.08 M
Subtotal					**$**	**1.63 M**
Total Estimated Operational Costs (Over 100-Year Period)					**$**	**1.63 M**
Equivalent Annual Operational Costs					**$**	**0.04 M/yr**

Total Estimated Lifecycle Costs (Over 100-Year Period)	**$**	**40.78 M**

Note: This is considered a walk-away solution. Therefore site access would not need to be maintained.

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SHEET TITLE:	**Clinton Creek Option C LCCA**
PROJECT NO. AND TITLE:	307071-00895 Clinton Creek LCCA
CLIENT:	Assessment and Abandoned Mines
LOCATION:	Clinton Creek Site, YT
ESTIMATE BASIS:	2014 CDN Dollars (+/- 50% accuracy)
DATE:	March 28, 2014
REVISION:	0

LIFECYCLE COST ANALYSIS

Capital Costs

Task No.	Description		Cost (2014 CAD)
1.0	**Mobilization**	**$**	**0.28 M**
2.0	**Major Road Improvements**	**$**	**3.17 M**
3.0	**Bulk Earthworks**	**$**	**0.87 M**
4.0	**Access Road Construction**	**$**	**0.16 M**
5.0	**Creek Bed Stabilization**	**$**	**1.16 M**
6.0	**Construction Water Management**	**$**	**0.91 M**
7.0	**Support Equipment**	**$**	**0.16 M**
8.0	**Support Labour**	**$**	**0.54 M**
9.0	**Asbestos Control**	**$**	**0.77 M**
10.0	**Fuel Transportation**	**$**	**0.01 M**
11.0	**Indirects**	**$**	**4.96 M**
Note: Cost Breakdown in Appendix 3, Option CC-C			
Subtotal		**$**	**12.98 M**
	EPCM	**$**	**1.30 M**
	Contingency (25%)	**$**	**3.57 M**
Total Estimated Capital Costs		**$**	**17.85 M**

Operational Costs

25% Contingency Incl., Real Discount Rate = 2.5%

Task No.	Description	Cost (2014 CAD)	Frequency (Years)	Duration (Years)		NPC (2014 CAD)
1.0	**Monitoring**				**$**	**1.63 M**
1.1	Visual Inspections	$ 15,000	1	100	$	0.55 M
1.2	Surveys	$ 60,000	2	100	$	1.08 M
2.0	**Maintenance**				**$**	**8.57 M**
2.1	Repair 12 Gabion Drop Structures (Cost Breakdown in Appendix 3)	$ 1,230,000	5	100	$	8.57 M
3.0	**Replacement**				**$**	**17.91 M**
3.1	Replace 2 Gabion Drop Structures (Cost Breakdown in Appendix 3)	$ 1,246,000	2.5	100	$	17.91 M
Subtotal					**$**	**28.11 M**
Total Estimated Operational Costs (Over 100-Year Period)					**$**	**28.11 M**
Equivalent Annual Operational Costs					**$**	**0.77 M/yr**

Total Estimated Lifecycle Costs (Over 100-Year Period)	**$**	**45.96 M**

Maintaining Site Access

25% Contingency Incl., Real Discount Rate = 2.5%

Task No.	Description	Cost (2014 CAD)	Frequency (Years)	Duration (Years)		NPC (2014 CAD)
1.0	**Grade Access Road (15 km)**	**$ 40,000**	**4**	**100**	**$**	**0.35 M**
2.0	**Site Access Road Resurfacing (15 km) (Cost Breakdown in Appendix 3)**	**$ 3,898,000**	**20**	**100**	**$**	**5.59 M**
3.0	**15 m Long Bridge Replacement (Cost Breakdown in Appendix 3)**	**$ 1,789,000**	**50**	**100**	**$**	**0.67 M**
Subtotal					**$**	**6.61 M**
Total Estimated Cost (Over 100-Year Period)					**$**	**6.61 M**
Equivalent Annual Cost					**$**	**0.18 M/yr**

Note: This is not considered a walk-away solution. Site access would need to be maintained in order to complete regular monitoring, maintenance and replacement.

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SHEET TITLE:	**Clinton Creek Option C2 LCCA**
PROJECT NO. AND TITLE:	307071-00895 Clinton Creek LCCA
CLIENT:	Assessment and Abandoned Mines
LOCATION:	Clinton Creek Site, YT
ESTIMATE BASIS:	2014 CDN Dollars (+/- 50% accuracy)
DATE:	March 28, 2014
REVISION:	0

LIFECYCLE COST ANALYSIS

Capital Costs

Task No.	Description		Cost (2014 CAD)
1.0	**Mobilization**	**$**	**0.28 M**
2.0	**Major Road Improvements**	**$**	**3.61 M**
3.0	**Bulk Earthworks**	**$**	**0.87 M**
4.0	**Access Road Construction**	**$**	**0.16 M**
5.0	**Creek Bed Stabilization**	**$**	**0.83 M**
6.0	**Construction Water Management**	**$**	**0.91 M**
7.0	**Support Equipment**	**$**	**0.16 M**
8.0	**Support Labour**	**$**	**0.54 M**
9.0	**Asbestos Control**	**$**	**0.77 M**
10.0	**Fuel Transportation**	**$**	**0.01 M**
11.0	**Indirects**	**$**	**4.29 M**
Note: Cost Breakdown in Appendix 3, Option CC-C2			
Subtotal		**$**	**12.42 M**
	EPCM	**$**	**1.24 M**
	Contingency (25%)	**$**	**3.42 M**
Total Estimated Capital Costs		**$**	**17.08 M**

Operational Costs — 25% Contingency Incl., Real Discount Rate = 2.5%

Task No.	Description	Cost (2014 CAD)	Frequency (Years)	Duration (Years)		NPC (2014 CAD)
1.0	**Monitoring**				**$**	**1.63 M**
1.1	Visual Inspections	$ 15,000	1	100	$	0.55 M
1.2	Surveys	$ 60,000	2	100	$	1.08 M
2.0	**Maintenance**				**$**	**3.73 M**
2.1	Repair 4 Gabion Drop Structures (Cost Breakdown in Appendix 3)	$ 536,000	5	100	$	3.73 M
3.0	**Replacement**				**$**	**6.99 M**
3.1	Replace 2 Gabion Drop Structures (Cost Breakdown in Appendix 3)	$ 1,246,000	7.5	100	$	5.61 M
3.2	Replace 550 m Riprap-Lined Channel (Cost Breakdown in Appendix 3)	$ 3,075,000	45	100	$	1.38 M
Subtotal					**$**	**12.35 M**
Total Estimated Operational Costs (Over 100-Year Period)					**$**	**12.35 M**
Equivalent Annual Operational Costs					**$**	**0.34 M/yr**

Total Estimated Lifecycle Costs (Over 100-Year Period)	**$**	**29.43 M**

Maintaining Site Access — 25% Contingency Incl., Real Discount Rate = 2.5%

Task No.	Description	Cost (2014 CAD)	Frequency (Years)	Duration (Years)		NPC (2014 CAD)
1.0	**Grade Access Road (15 km)**	**$ 40,000**	**4**	**100**	**$**	**0.35 M**
2.0	**Site Access Road Resurfacing (15 km) (Cost Breakdown in Appendix 3)**	**$ 3,898,000**	**20**	**100**	**$**	**5.59 M**
3.0	**15 m Long Bridge Replacement (Cost Breakdown in Appendix 3)**	**$ 1,789,000**	**50**	**100**	**$**	**0.67 M**
Subtotal					**$**	**6.61 M**
Total Estimated Cost (Over 100-Year Period)					**$**	**6.61 M**
Equivalent Annual Cost					**$**	**0.18 M/yr**

Note: This is not considered a walk-away solution. Site access would need to be maintained in order to complete regular monitoring, maintenance and replacement.

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SHEET TITLE:	**Clinton Creek Option C3 LCCA**
PROJECT NO. AND TITLE:	307071-00895 Clinton Creek LCCA
CLIENT:	Assessment and Abandoned Mines
LOCATION:	Clinton Creek Site, YT
ESTIMATE BASIS:	2014 CDN Dollars (+/- 50% accuracy)
DATE:	March 28, 2014
REVISION:	0

LIFECYCLE COST ANALYSIS

Capital Costs

Task No.	Description		Cost (2014 CAD)
1.0	**Mobilization**	**$**	**0.28 M**
2.0	**Major Road Improvements**	**$**	**3.61 M**
3.0	**Bulk Earthworks**	**$**	**0.87 M**
4.0	**Access Road Construction**	**$**	**0.22 M**
5.0	**Creek Bed Stabilization**	**$**	**1.13 M**
6.0	**Construction Water Management**	**$**	**0.91 M**
7.0	**Support Equipment**	**$**	**0.16 M**
8.0	**Support Labour**	**$**	**0.54 M**
9.0	**Asbestos Control**	**$**	**0.77 M**
10.0	**Fuel Transportation**	**$**	**0.01 M**
11.0	**Indirects**	**$**	**4.32 M**
Note: Cost Breakdown in Appendix 3, Option CC-C3			
Subtotal		**$**	**12.80 M**
	EPCM	**$**	**1.28 M**
	Contingency (25%)	**$**	**3.52 M**
Total Estimated Capital Costs		**$**	**17.61 M**

Operational Costs

25% Contingency Incl., Real Discount Rate = 2.5%

Task No.	Description	Cost (2014 CAD)	Frequency (Years)	Duration (Years)		NPC (2014 CAD)
1.0	**Monitoring**				**$**	**1.63 M**
1.1	Visual Inspections	$ 15,000	1	100	$	0.55 M
1.2	Surveys	$ 60,000	2	100	$	1.08 M
2.0	**Replacement**				**$**	**1.62 M**
2.1	Replace 750 m Riprap-Lined Channel (Cost Breakdown in Appendix 3)	$ 3,616,000	45	100	$	1.62 M
Subtotal					**$**	**3.26 M**
Total Estimated Operational Costs (Over 100-Year Period)					**$**	**3.26 M**
Equivalent Annual Operational Costs					**$**	**0.09 M/yr**

Total Estimated Lifecycle Costs (Over 100-Year Period)	**$**	**20.86 M**

Maintaining Site Access

25% Contingency Incl., Real Discount Rate = 2.5%

Task No.	Description	Cost (2014 CAD)	Frequency (Years)	Duration (Years)		NPC (2014 CAD)
1.0	**Grade Access Road (15 km)**	**$ 40,000**	**4**	**100**	**$**	**0.35 M**
2.0	**Site Access Road Resurfacing (15 km) (Cost Breakdown in Appendix 3)**	**$ 3,898,000**	**20**	**100**	**$**	**5.59 M**
3.0	**15 m Long Bridge Replacement (Cost Breakdown in Appendix 3)**	**$ 1,789,000**	**50**	**100**	**$**	**0.67 M**
Subtotal					**$**	**6.61 M**
Total Estimated Cost (Over 100-Year Period)					**$**	**6.61 M**
Equivalent Annual Cost					**$**	**0.18 M/yr**

Note: This is not considered a walk-away solution. Site access would need to be maintained in order to complete regular monitoring, maintenance and replacement.

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SHEET TITLE:	**Clinton Creek Option D LCCA**
PROJECT NO. AND TITLE:	307071-00895 Clinton Creek LCCA
CLIENT:	Assessment and Abandoned Mines
LOCATION:	Clinton Creek Site, YT
ESTIMATE BASIS:	2014 CDN Dollars (+/- 50% accuracy)
DATE:	March 28, 2014
REVISION:	0

LIFECYCLE COST ANALYSIS

Capital Costs

Task No.	Description		Cost (2014 CAD)
1.0	**Mobilization**	**$**	**0.65 M**
2.0	**Major Road Improvements**	**$**	**3.17 M**
3.0	**Waste Rock Dump Stabilization**	**$**	**2.21 M**
4.0	**Access Road Construction**	**$**	**0.16 M**
5.0	**Creek Bed Stabilization**	**$**	**1.16 M**
6.0	**Construction Water Management**	**$**	**0.91 M**
7.0	**Support Equipment**	**$**	**0.22 M**
8.0	**Support Labour**	**$**	**0.81 M**
9.0	**Asbestos Control**	**$**	**0.79 M**
10.0	**Fuel Transportation**	**$**	**0.02 M**
11.0	**Indirects**	**$**	**5.75 M**
Note: Cost Breakdown in Appendix 3, Option CC-D			
Subtotal		**$**	**15.84 M**
	EPCM	**$**	**1.58 M**
	Contingency (25%)	**$**	**4.35 M**
Total Estimated Capital Costs		**$**	**21.77 M**

Operational Costs

25% Contingency Incl., Real Discount Rate = 2.5%

Task No.	Description	Cost (2014 CAD)	Frequency (Years)	Duration (Years)		NPC (2014 CAD)
1.0	**Monitoring**				**$**	**1.63 M**
1.1	Visual Inspections	$ 15,000	1	100	$	0.55 M
1.2	Surveys	$ 60,000	2	100	$	1.08 M
2.0	**Maintenance**				**$**	**8.57 M**
2.1	Repair 12 Gabion Drop Structures (Cost Breakdown in Appendix 3)	$ 1,230,000	5	100	$	8.57 M
3.0	**Replacement**				**$**	**10.52 M**
3.1	Replace 2 Gabion Drop Structures (Cost Breakdown in Appendix 3)	$ 1,246,000	4.2	100	$	10.52 M
Subtotal					**$**	**20.73 M**
Total Estimated Operational Costs (Over 100-Year Period)					**$**	**20.73 M**
Equivalent Annual Operational Costs					**$**	**0.57 M/yr**

Total Estimated Lifecycle Costs (Over 100-Year Period)	**$**	**42.50 M**

Maintaining Site Access

25% Contingency Incl., Real Discount Rate = 2.5%

Task No.	Description	Cost (2014 CAD)	Frequency (Years)	Duration (Years)		NPC (2014 CAD)
1.0	**Grade Access Road (15 km)**	**$ 40,000**	**4**	**100**	**$**	**0.35 M**
2.0	**Site Access Road Resurfacing (15 km) (Cost Breakdown in Appendix 3)**	**$ 3,898,000**	**20**	**100**	**$**	**5.59 M**
3.0	**15 m Long Bridge Replacement (Cost Breakdown in Appendix 3)**	**$ 1,789,000**	**50**	**100**	**$**	**0.67 M**
Subtotal					**$**	**6.61 M**
Total Estimated Cost (Over 100-Year Period)					**$**	**6.61 M**
Equivalent Annual Cost					**$**	**0.18 M/yr**

Note: This is not considered a walk-away solution. Site access would need to be maintained in order to complete regular monitoring, maintenance and replacement.

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SHEET TITLE:	**Clinton Creek Option D2 LCCA**
PROJECT NO. AND TITLE:	307071-00895 Clinton Creek LCCA
CLIENT:	Assessment and Abandoned Mines
LOCATION:	Clinton Creek Site, YT
ESTIMATE BASIS:	2014 CDN Dollars (+/- 50% accuracy)
DATE:	March 28, 2014
REVISION:	0

LIFECYCLE COST ANALYSIS

Capital Costs

Task No.	Description		Cost (2014 CAD)
1.0	**Mobilization**	**$**	**0.65 M**
2.0	**Major Road Improvements**	**$**	**3.61 M**
3.0	**Waste Rock Dump Stabilization**	**$**	**2.21 M**
4.0	**Access Road Construction**	**$**	**0.16 M**
5.0	**Creek Bed Stabilization**	**$**	**0.83 M**
6.0	**Construction Water Management**	**$**	**0.91 M**
7.0	**Support Equipment**	**$**	**0.22 M**
8.0	**Support Labour**	**$**	**0.74 M**
9.0	**Asbestos Control**	**$**	**0.79 M**
10.0	**Fuel Transportation**	**$**	**0.02 M**
11.0	**Indirects**	**$**	**5.24 M**
Note: Cost Breakdown in Appendix 3, Option CC-D2			
Subtotal		**$**	**15.37 M**
	EPCM	**$**	**1.54 M**
	Contingency (25%)	**$**	**4.23 M**
Total Estimated Capital Costs		**$**	**21.13 M**

Operational Costs

25% Contingency Incl., Real Discount Rate = 2.5%

Task No.	Description	Cost (2014 CAD)	Frequency (Years)	Duration (Years)		NPC (2014 CAD)
1.0	**Monitoring**				**$**	**1.63 M**
1.1	Visual Inspections	$ 15,000	1	100	$	0.55 M
1.2	Surveys	$ 60,000	2	100	$	1.08 M
2.0	**Maintenance**				**$**	**3.73 M**
2.1	Repair 4 Gabion Drop Structures (Cost Breakdown in Appendix 3)	$ 536,000	5	100	$	3.73 M
3.0	**Replacement**				**$**	**3.15 M**
3.1	Replace 2 Gabion Drop Structures (Cost Breakdown in Appendix 3)	$ 1,246,000	12.5	100	$	3.15 M
Subtotal					**$**	**8.52 M**
Total Estimated Operational Costs (Over 100-Year Period)					**$**	**8.52 M**
Equivalent Annual Operational Costs					**$**	**0.23 M/yr**

Total Estimated Lifecycle Costs (Over 100-Year Period)	**$**	**29.65 M**

Maintaining Site Access

25% Contingency Incl., Real Discount Rate = 2.5%

Task No.	Description	Cost (2014 CAD)	Frequency (Years)	Duration (Years)		NPC (2014 CAD)
1.0	**Grade Access Road (15 km)**	**$ 40,000**	**4**	**100**	**$**	**0.35 M**
2.0	**Site Access Road Resurfacing (15 km) (Cost Breakdown in Appendix 3)**	**$ 3,898,000**	**20**	**100**	**$**	**5.59 M**
3.0	**15 m Long Bridge Replacement (Cost Breakdown in Appendix 3)**	**$ 1,789,000**	**50**	**100**	**$**	**0.67 M**
Subtotal					**$**	**6.61 M**
Total Estimated Cost (Over 100-Year Period)					**$**	**6.61 M**
Equivalent Annual Cost					**$**	**0.18 M/yr**

Note: This is not considered a walk-away solution. Site access would need to be maintained in order to complete regular monitoring, maintenance and replacement.

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SHEET TITLE:	**Clinton Creek Option D3 LCCA**
PROJECT NO. AND TITLE:	307071-00895 Clinton Creek LCCA
CLIENT:	Assessment and Abandoned Mines
LOCATION:	Clinton Creek Site, YT
ESTIMATE BASIS:	2014 CDN Dollars (+/- 50% accuracy)
DATE:	March 28, 2014
REVISION:	0

LIFECYCLE COST ANALYSIS

Capital Costs

Task No.	Description		Cost (2014 CAD)
1.0	**Mobilization**	**$**	**0.65 M**
2.0	**Major Road Improvements**	**$**	**3.61 M**
3.0	**Waste Rock Dump Stabilization**	**$**	**2.21 M**
4.0	**Access Road Construction**	**$**	**0.22 M**
5.0	**Creek Bed Stabilization**	**$**	**1.13 M**
6.0	**Construction Water Management**	**$**	**0.91 M**
7.0	**Support Equipment**	**$**	**0.22 M**
8.0	**Support Labour**	**$**	**0.74 M**
9.0	**Asbestos Control**	**$**	**0.79 M**
10.0	**Fuel Transportation**	**$**	**0.02 M**
11.0	**Indirects**	**$**	**5.26 M**
Note: Cost Breakdown in Appendix 3, Option CC-D3			
Subtotal		**$**	**15.75 M**
	EPCM	**$**	**1.57 M**
	Contingency (25%)	**$**	**4.33 M**
Total Estimated Capital Costs		**$**	**21.65 M**

Operational Costs

25% Contingency Incl., Real Discount Rate = 2.5%

Task No.	Description	Cost (2014 CAD)	Frequency (Years)	Duration (Years)		NPC (2014 CAD)
1.0	**Monitoring**				**$**	**1.63 M**
1.1	Visual Inspections	$ 15,000	1	100	$	0.55 M
1.2	Surveys	$ 60,000	2	100	$	1.08 M
Subtotal					**$**	**1.63 M**
Total Estimated Operational Costs (Over 100-Year Period)					**$**	**1.63 M**
Equivalent Annual Operational Costs					**$**	**0.04 M/yr**

Total Estimated Lifecycle Costs (Over 100-Year Period)	**$**	**23.29 M**

Note: This is considered a walk-away solution. Therefore site access would not need to be maintained.

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SHEET TITLE:	**Clinton Creek Option E LCCA**
PROJECT NO. AND TITLE:	307071-00895 Clinton Creek LCCA
CLIENT:	Assessment and Abandoned Mines
LOCATION:	Clinton Creek Site, YT
ESTIMATE BASIS:	2014 CDN Dollars (+/- 50% accuracy)
DATE:	March 28, 2014
REVISION:	0

LIFECYCLE COST ANALYSIS

Capital Costs

Task No.	Description		Cost (2014 CAD)
1.0	**Mobilization**	**$**	**0.65 M**
2.0	**Major Road Improvements**	**$**	**3.72 M**
3.0	**Waste Rock Dump Stabilization**	**$**	**4.66 M**
4.0	**Access Road Construction**	**$**	**0.23 M**
5.0	**Construction Water Management**	**$**	**0.91 M**
6.0	**Support Equipment**	**$**	**0.35 M**
7.0	**Support Labour**	**$**	**0.54 M**
8.0	**Asbestos Control**	**$**	**0.81 M**
9.0	**Fuel Transportation**	**$**	**0.03 M**
10.0	**Indirects**	**$**	**5.53 M**
Note: Cost Breakdown in Appendix 3, Option CC-E			
Subtotal		**$**	**17.41 M**
	EPCM	**$**	**1.74 M**
	Contingency (50%)	**$**	**9.58 M**
Total Estimated Capital Costs		**$**	**28.73 M**

Operational Costs

25% Contingency Incl., Real Discount Rate = 2.5%

Task No.	Description	Cost (2014 CAD)	Frequency (Years)	Duration (Years)		NPC (2014 CAD)
1.0	**Monitoring**				**$**	**1.63 M**
1.1	Visual Inspections	$ 15,000	1	100	$	0.55 M
1.2	Surveys	$ 60,000	2	100	$	1.08 M
Subtotal					**$**	**1.63 M**
Total Estimated Operational Costs (Over 100-Year Period)					**$**	**1.63 M**
Equivalent Annual Operational Costs					**$**	**0.04 M/yr**

Total Estimated Lifecycle Costs (Over 100-Year Period)	**$**	**30.37 M**

Note: This is considered a walk-away solution. Therefore site access would not need to be maintained.

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SHEET TITLE:	**Clinton Creek Option E2 LCCA**
PROJECT NO. AND TITLE:	307071-00895 Clinton Creek LCCA
CLIENT:	Assessment and Abandoned Mines
LOCATION:	Clinton Creek Site, YT
ESTIMATE BASIS:	2014 CDN Dollars (+/- 50% accuracy)
DATE:	March 28, 2014
REVISION:	0

LIFECYCLE COST ANALYSIS

Capital Costs

Task No.	Description		Cost (2014 CAD)
1.0	**Mobilization**	**$**	**0.65 M**
2.0	**Major Road Improvements**	**$**	**3.72 M**
3.0	**Waste Rock Dump Stabilization**	**$**	**5.15 M**
4.0	**Access Road Construction**	**$**	**0.23 M**
5.0	**Construction Water Management**	**$**	**0.91 M**
6.0	**Support Equipment**	**$**	**0.33 M**
7.0	**Support Labour**	**$**	**0.54 M**
8.0	**Asbestos Control**	**$**	**0.80 M**
9.0	**Fuel Transportation**	**$**	**0.03 M**
10.0	**Indirects**	**$**	**5.81 M**
Note: Cost Breakdown in Appendix 3, Option CC-E2			
Subtotal		**$**	**18.16 M**
	EPCM	**$**	**1.82 M**
	Contingency (25%)	**$**	**4.99 M**
Total Estimated Capital Costs		**$**	**24.97 M**

Operational Costs

25% Contingency Incl., Real Discount Rate = 2.5%

Task No.	Description	Cost (2014 CAD)	Frequency (Years)	Duration (Years)		NPC (2014 CAD)
1.0	**Monitoring**				**$**	**1.63 M**
1.1	Visual Inspections	$ 15,000	1	100	$	0.55 M
1.2	Surveys	$ 60,000	2	100	$	1.08 M
Subtotal					**$**	**1.63 M**
Total Estimated Operational Costs (Over 100-Year Period)					**$**	**1.63 M**
Equivalent Annual Operational Costs					**$**	**0.04 M/yr**

Total Estimated Lifecycle Costs (Over 100-Year Period)	**$**	**26.60 M**

Note: This is considered a walk-away solution. Therefore site access would not need to be maintained.

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SHEET TITLE:	**Clinton Creek Option E3 LCCA**
PROJECT NO. AND TITLE:	307071-00895 Clinton Creek LCCA
CLIENT:	Assessment and Abandoned Mines
LOCATION:	Clinton Creek Site, YT
ESTIMATE BASIS:	2014 CDN Dollars (+/- 50% accuracy)
DATE:	March 28, 2014
REVISION:	0

LIFECYCLE COST ANALYSIS

Capital Costs

Task No.	Description		Cost (2014 CAD)
1.0	**Mobilization**	**$**	**0.65 M**
2.0	**Major Road Improvements**	**$**	**3.72 M**
3.0	**Waste Rock Dump Stabilization**	**$**	**5.15 M**
4.0	**Access Road Construction**	**$**	**0.24 M**
5.0	**Creek Bed Stabilization**	**$**	**0.83 M**
6.0	**Construction Water Management**	**$**	**0.91 M**
7.0	**Support Equipment**	**$**	**0.35 M**
8.0	**Support Labour**	**$**	**0.54 M**
9.0	**Asbestos Control**	**$**	**0.81 M**
10.0	**Fuel Transportation**	**$**	**0.03 M**
11.0	**Indirects**	**$**	**6.59 M**
Note: Cost Breakdown in Appendix 3, Option CC-E3			
Subtotal		**$**	**19.80 M**
	EPCM	**$**	**1.98 M**
	Contingency (25%)	**$**	**5.45 M**
Total Estimated Capital Costs		**$**	**27.23 M**

Operational Costs

25% Contingency Incl., Real Discount Rate = 2.5%

Task No.	Description	Cost (2014 CAD)	Frequency (Years)	Duration (Years)		NPC (2014 CAD)
1.0	**Monitoring**				**$**	**1.63 M**
1.1	Visual Inspections	$ 15,000	1	100	$	0.55 M
1.2	Surveys	$ 60,000	2	100	$	1.08 M
Subtotal					**$**	**1.63 M**
Total Estimated Operational Costs (Over 100-Year Period)					**$**	**1.63 M**
Equivalent Annual Operational Costs					**$**	**0.04 M/yr**

Total Estimated Lifecycle Costs (Over 100-Year Period)	**$**	**28.86 M**

Note: This is considered a walk-away solution. Therefore site access would not need to be maintained.

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SHEET TITLE:	**Clinton Creek Option F LCCA**
PROJECT NO. AND TITLE:	307071-00895 Clinton Creek LCCA
CLIENT:	Assessment and Abandoned Mines
LOCATION:	Clinton Creek Site, YT
ESTIMATE BASIS:	2014 CDN Dollars (+/- 50% accuracy)
DATE:	March 28, 2014
REVISION:	0

LIFECYCLE COST ANALYSIS

Capital Costs

Task No.	Description		Cost (2014 CAD)
1.0	**Mobilization**	**$**	**1.05 M**
2.0	**Major Road Improvements**	**$**	**3.61 M**
3.0	**Waste Rock Dump Stabilization**	**$**	**46.55 M**
4.0	**Creek Bed Stabilization**	**$**	**1.40 M**
5.0	**Construction Water Management**	**$**	**1.84 M**
6.0	**Support Equipment**	**$**	**0.68 M**
7.0	**Support Labour**	**$**	**0.54 M**
8.0	**Asbestos Control**	**$**	**0.88 M**
9.0	**Fuel Transportation**	**$**	**0.35 M**
10.0	**Indirects**	**$**	**17.55 M**
Note: Cost Breakdown in Appendix 3, Option CC-F			
Subtotal		**$**	**74.46 M**
	EPCM	**$**	**7.45 M**
	Contingency (25%)	**$**	**20.48 M**
Total Estimated Capital Costs		**$**	**102.38 M**

Operational Costs

25% Contingency Incl., Real Discount Rate = 2.5%

Task No.	Description	Cost (2014 CAD)	Frequency (Years)	Duration (Years)		NPC (2014 CAD)
1.0	**Monitoring**				**$**	**0.69 M**
1.1	Visual Inspections	$ 15,000	2	100	$	0.27 M
1.2	Surveys	$ 60,000	5	100	$	0.42 M
Subtotal					**$**	**0.69 M**
Total Estimated Operational Costs (Over 100-Year Period)					**$**	**0.69 M**
Equivalent Annual Operational Costs					**$**	**0.02 M/yr**

Total Estimated Lifecycle Costs (Over 100-Year Period)	**$**	**103.06 M**

Note: This is considered a walk-away solution. Therefore site access would not need to be maintained.

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SHEET TITLE:	**Clinton Creek Option G LCCA**
PROJECT NO. AND TITLE:	307071-00895 Clinton Creek LCCA
CLIENT:	Assessment and Abandoned Mines
LOCATION:	Clinton Creek Site, YT
ESTIMATE BASIS:	2014 CDN Dollars (+/- 50% accuracy)
DATE:	March 28, 2014
REVISION:	0

LIFECYCLE COST ANALYSIS

Capital Costs

Task No.	Description		Cost (2014 CAD)
1.0	**Mobilization**	**$**	**0.24 M**
2.0	**Major Road Improvements**	**$**	**3.61 M**
3.0	**Bulk Excavation**	**$**	**0.87 M**
4.0	**Access Road Construction**	**$**	**0.16 M**
5.0	**Creek Bed Stabilization**	**$**	**1.26 M**
6.0	**Construction Water Management**	**$**	**0.91 M**
7.0	**Support Equipment**	**$**	**0.16 M**
8.0	**Support Labour**	**$**	**0.54 M**
9.0	**Asbestos Control**	**$**	**0.77 M**
10.0	**Fuel Transportation**	**$**	**0.01 M**
11.0	**Indirects**	**$**	**3.58 M**
Note: Cost Breakdown in Appendix 3, Option CC-G			
Subtotal		**$**	**12.10 M**
	EPCM	**$**	**1.21 M**
	Contingency (25%)	**$**	**3.33 M**
Total Estimated Capital Costs		**$**	**16.64 M**

Operational Costs — 25% Contingency Incl., Real Discount Rate = 2.5%

Task No.	Description	Cost (2014 CAD)	Frequency (Years)	Duration (Years)		NPC (2014 CAD)
1.0	**Monitoring**				**$**	**1.63 M**
1.1	Visual Inspections	$ 15,000	1	100	$	0.55 M
1.2	Surveys	$ 60,000	2	100	$	1.08 M
2.0	**Maintenance**				**$**	**8.57 M**
2.1	Repair 4 Gabion Drop Structures and Gabion Channel (Same as "Repair 12 Drop Structures", Cost Breakdown in Appendix 3)	$ 1,230,000	5	100	$	8.57 M
3.0	**Replacement**				**$**	**14.70 M**
3.1	Replace 2 Gabion Drop Structures (Cost Breakdown in Appendix 3)	$ 1,246,000	7.5	100	$	5.61 M
3.2	Replace 550 m Gabion Channel (Cost Breakdown in Appendix 3)	$ 4,454,000	15	100	$	9.09 M
Subtotal					**$**	**24.90 M**
Total Estimated Operational Costs (Over 100-Year Period)					**$**	**24.90 M**
Equivalent Annual Operational Costs					**$**	**0.68 M/yr**

Total Estimated Lifecycle Costs (Over 100-Year Period)	**$**	**41.54 M**

Maintaining Site Access — 25% Contingency Incl., Real Discount Rate = 2.5%

Task No.	Description	Cost (2014 CAD)	Frequency (Years)	Duration (Years)		NPC (2014 CAD)
1.0	**Grade Access Road (15 km)**	**$ 40,000**	**4**	**100**	**$**	**0.35 M**
2.0	**Site Access Road Resurfacing (15 km) (Cost Breakdown in Appendix 3)**	**$ 3,898,000**	**20**	**100**	**$**	**5.59 M**
3.0	**15 m Long Bridge Replacement (Cost Breakdown in Appendix 3)**	**$ 1,789,000**	**50**	**100**	**$**	**0.67 M**
Subtotal					**$**	**6.61 M**
Total Estimated Cost (Over 100-Year Period)					**$**	**6.61 M**
Equivalent Annual Cost					**$**	**0.18 M/yr**

Note: This is not considered a walk-away solution. Site access would need to be maintained in order to complete regular monitoring, maintenance and replacement.

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SHEET TITLE:	**Clinton Creek Option H LCCA**
PROJECT NO. AND TITLE:	307071-00895 Clinton Creek LCCA
CLIENT:	Assessment and Abandoned Mines
LOCATION:	Clinton Creek Site, YT
ESTIMATE BASIS:	2014 CDN Dollars (+/- 50% accuracy)
DATE:	March 28, 2014
REVISION:	0

LIFECYCLE COST ANALYSIS

Capital Costs

Task No.	Description		Cost (2014 CAD)
1.0	**Mobilization**	**$**	**0.66 M**
2.0	**Major Road Improvements**	**$**	**3.63 M**
3.0	**Waste Rock Dump Stabilization**	**$**	**2.21 M**
4.0	**Access Road Construction**	**$**	**0.16 M**
5.0	**Creek Bed Stabilization**	**$**	**1.26 M**
6.0	**Construction Water Management**	**$**	**0.91 M**
7.0	**Support Equipment**	**$**	**0.27 M**
8.0	**Support Labour**	**$**	**0.54 M**
9.0	**Asbestos Control**	**$**	**0.80 M**
10.0	**Fuel Transportation**	**$**	**0.02 M**
11.0	**Indirects**	**$**	**4.90 M**
Note: Cost Breakdown in Appendix 3, Option CC-H			
Subtotal		**$**	**15.36 M**
	EPCM	**$**	**1.54 M**
	Contingency (25%)	**$**	**4.22 M**
Total Estimated Capital Costs		**$**	**21.12 M**

Operational Costs — 25% Contingency Incl., Real Discount Rate = 2.5%

Task No.	Description	Cost (2014 CAD)	Frequency (Years)	Duration (Years)		NPC (2014 CAD)
1.0	**Monitoring**				**$**	**1.63 M**
1.1	Visual Inspections	$ 15,000	1	100	$	0.55 M
1.2	Surveys	$ 60,000	2	100	$	1.08 M
2.0	**Maintenance**				**$**	**8.57 M**
2.1	Repair 4 Gabion Drop Structures and Gabion Channel (Same as "Repair 12 Drop Structures", Cost Breakdown in Appendix 3)	$ 1,230,000	5	100	$	8.57 M
3.0	**Replacement**				**$**	**7.93 M**
3.1	Replace 2 Gabion Drop Structures (Cost Breakdown in Appendix 3)	$ 1,246,000	12.5	100	$	3.15 M
3.2	Replace 550 m Gabion Channel (Cost Breakdown in Appendix 3)	$ 4,454,000	25	100	$	4.77 M
Subtotal					**$**	**18.13 M**
Total Estimated Operational Costs (Over 100-Year Period)					**$**	**18.13 M**
Equivalent Annual Operational Costs					**$**	**0.50 M/yr**

Total Estimated Lifecycle Costs (Over 100-Year Period)	**$**	**39.25 M**

Maintaining Site Access — 25% Contingency Incl., Real Discount Rate = 2.5%

Task No.	Description	Cost (2014 CAD)	Frequency (Years)	Duration (Years)		NPC (2014 CAD)
1.0	**Grade Access Road (15 km)**	**$ 40,000**	**4**	**100**	**$**	**0.35 M**
2.0	**Site Access Road Resurfacing (15 km) (Cost Breakdown in Appendix 3)**	**$ 3,898,000**	**20**	**100**	**$**	**5.59 M**
3.0	**15 m Long Bridge Replacement (Cost Breakdown in Appendix 3)**	**$ 1,789,000**	**50**	**100**	**$**	**0.67 M**
Subtotal					**$**	**6.61 M**
Total Estimated Cost (Over 100-Year Period)					**$**	**6.61 M**
Equivalent Annual Cost					**$**	**0.18 M/yr**

Note: This is not considered a walk-away solution. Site access would need to be maintained in order to complete regular monitoring, maintenance and replacement.

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SHEET TITLE:	**Clinton Creek Option I LCCA**
PROJECT NO. AND TITLE:	307071-00895 Clinton Creek LCCA
CLIENT:	Assessment and Abandoned Mines
LOCATION:	Clinton Creek Site, YT
ESTIMATE BASIS:	2014 CDN Dollars (+/- 50% accuracy)
DATE:	March 28, 2014
REVISION:	0

LIFECYCLE COST ANALYSIS

Capital Costs

Task No.	Description		Cost (2014 CAD)
1.0	**Mobilization**	**$**	**0.76 M**
2.0	**Major Road Improvements**	**$**	**3.62 M**
3.0	**Waste Rock Dump Stabilization**	**$**	**3.11 M**
4.0	**Access Road Construction**	**$**	**0.22 M**
5.0	**Creek Bed Stabilization**	**$**	**1.95 M**
6.0	**Support Equipment**	**$**	**0.48 M**
7.0	**Support Labour**	**$**	**0.54 M**
8.0	**Asbestos Control**	**$**	**0.83 M**
9.0	**Fuel Transportation**	**$**	**0.03 M**
10.0	**Indirects**	**$**	**8.34 M**
Note: Cost Breakdown in Appendix 3, Option CC-I			
Subtotal		**$**	**19.88 M**
	EPCM	**$**	**1.99 M**
	Contingency (25%)	**$**	**5.47 M**
Total Estimated Capital Costs		**$**	**27.34 M**

Operational Costs

25% Contingency Incl., Real Discount Rate = 2.5%

Task No.	Description	Cost (2014 CAD)	Frequency (Years)	Duration (Years)		NPC (2014 CAD)
1.0	**Monitoring**				**$**	**1.63 M**
1.1	Visual Inspections	$ 15,000	1	100	$	0.55 M
1.2	Surveys	$ 60,000	2	100	$	1.08 M
2.0	**Maintenance**				**$**	**6.10 M**
2.1	Repair 8 Gabion Drop Structures (Cost Breakdown in Appendix 3)	$ 876,000	5	100	$	6.10 M
3.0	**Replacement**				**$**	**6.83 M**
3.1	Replace 2 Gabion Drop Structures (Cost Breakdown in Appendix 3)	$ 1,246,000	6.3	100	$	6.83 M
Subtotal					**$**	**14.57 M**
Total Estimated Operational Costs (Over 100-Year Period)					**$**	**14.57 M**
Equivalent Annual Operational Costs					**$**	**0.40 M/yr**

Total Estimated Lifecycle Costs (Over 100-Year Period)	**$**	**41.91 M**

Maintaining Site Access

25% Contingency Incl., Real Discount Rate = 2.5%

Task No.	Description	Cost (2014 CAD)	Frequency (Years)	Duration (Years)		NPC (2014 CAD)
1.0	**Grade Access Road (15 km)**	**$ 40,000**	**4**	**100**	**$**	**0.35 M**
2.0	**Site Access Road Resurfacing (15 km) (Cost Breakdown in Appendix 3)**	**$ 3,898,000**	**20**	**100**	**$**	**5.59 M**
3.0	**15 m Long Bridge Replacement (Cost Breakdown in Appendix 3)**	**$ 1,789,000**	**50**	**100**	**$**	**0.67 M**
Subtotal					**$**	**6.61 M**
Total Estimated Cost (Over 100-Year Period)					**$**	**6.61 M**
Equivalent Annual Cost					**$**	**0.18 M/yr**

Note: This is not considered a walk-away solution. Site access would need to be maintained in order to complete regular monitoring, maintenance and replacement.

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SHEET TITLE:	**Clinton Creek Option I2 LCCA**
PROJECT NO. AND TITLE:	307071-00895 Clinton Creek LCCA
CLIENT:	Assessment and Abandoned Mines
LOCATION:	Clinton Creek Site, YT
ESTIMATE BASIS:	2014 CDN Dollars (+/- 50% accuracy)
DATE:	March 28, 2014
REVISION:	0

LIFECYCLE COST ANALYSIS

Capital Costs

Task No.	Description		Cost (2014 CAD)
1.0	**Mobilization**	**$**	**0.76 M**
2.0	**Major Road Improvements**	**$**	**3.60 M**
3.0	**Waste Rock Dump Stabilization**	**$**	**3.11 M**
4.0	**Access Road Construction**	**$**	**0.21 M**
5.0	**Creek Bed Stabilization**	**$**	**2.53 M**
6.0	**Support Equipment**	**$**	**0.50 M**
7.0	**Support Labour**	**$**	**0.81 M**
8.0	**Asbestos Control**	**$**	**0.84 M**
9.0	**Fuel Transportation**	**$**	**0.03 M**
10.0	**Indirects**	**$**	**8.82 M**
Note: Cost Breakdown in Appendix 3, Option CC-I2			
Subtotal		**$**	**21.21 M**
	EPCM	**$**	**2.12 M**
	Contingency (25%)	**$**	**5.83 M**
Total Estimated Capital Costs		**$**	**29.16 M**

Operational Costs

25% Contingency Incl., Real Discount Rate = 2.5%

Task No.	Description	Cost (2014 CAD)	Frequency (Years)	Duration (Years)		NPC (2014 CAD)
1.0	**Monitoring**				**$**	**1.63 M**
1.1	Visual Inspections	$ 15,000	1	100	$	0.55 M
1.2	Surveys	$ 60,000	2	100	$	1.08 M
Subtotal					**$**	**1.63 M**
Total Estimated Operational Costs (Over 100-Year Period)					**$**	**1.63 M**
Equivalent Annual Operational Costs					**$**	**0.04 M/yr**

Total Estimated Lifecycle Costs (Over 100-Year Period)	**$**	**30.79 M**

Note: This is considered a walk-away solution. Therefore site access would not need to be maintained.

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SHEET TITLE:	**Wolverine Creek Option A LCCA**
PROJECT NO. AND TITLE:	307071-00895 Clinton Creek LCCA
CLIENT:	Assessment and Abandoned Mines
LOCATION:	Clinton Creek Site, YT
ESTIMATE BASIS:	2014 CDN Dollars (+/- 50% accuracy)
DATE:	March 28, 2014
REVISION:	0

LIFECYCLE COST ANALYSIS

Capital Costs

Task No.	Description		Cost (2014 CAD)
	Status Quo - Leave As Is		**-**
Subtotal		**$**	**-**
	EPCM	**$**	**-**
	Contingency (25%)	**$**	**-**
Total Estimated Capital Costs		**$**	**-**

Operational Costs

25% Contingency Incl., Real Discount Rate = 2.5%

Task No.	Description	Cost (2014 CAD)	Frequency (Years)	Duration (Years)		NPC (2014 CAD)
1.0	**Monitoring**				**$**	**1.63 M**
1.1	Visual Inspections	$ 15,000	1	100	$	0.55 M
1.2	Surveys	$ 60,000	2	100	$	1.08 M
2.0	**Maintenance**				**$**	**0.07 M**
2.1	Clear Vegetation from Existing Rock-Lined Channel	$ 20,000	10	100	$	0.07 M
Subtotal					**$**	**1.70 M**
Total Estimated Operational Costs (Over 100-Year Period)					**$**	**1.70 M**
Equivalent Annual Operational Costs					**$**	**0.05 M/yr**

Total Estimated Lifecycle Costs (Over 100-Year Period)	**$**	**1.70 M**

Note: While this is not entirely a walk-away solution, very little regular maintenance would be required for this option. Therefore site access would not need to be maintained.

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SHEET TITLE:	**Wolverine Creek Option B LCCA**
PROJECT NO. AND TITLE:	307071-00895 Clinton Creek LCCA
CLIENT:	Assessment and Abandoned Mines
LOCATION:	Clinton Creek Site, YT
ESTIMATE BASIS:	2014 CDN Dollars (+/- 50% accuracy)
DATE:	March 28, 2014
REVISION:	0

LIFECYCLE COST ANALYSIS

Capital Costs

Task No.	Description		Cost (2014 CAD)
1.0	**Mobilization**	**$**	**0.26 M**
2.0	**Access Road Construction**	**$**	**1.11 M**
3.0	**Rock Drain**	**$**	**6.73 M**
4.0	**Water Management**	**$**	**0.10 M**
5.0	**Support Equipment**	**$**	**0.53 M**
6.0	**Support Labour**	**$**	**1.89 M**
7.0	**Asbestos Control**	**$**	**0.81 M**
8.0	**Fuel Transportation**	**$**	**0.01 M**
9.0	**Indirects**	**$**	**6.51 M**
Note: Cost Breakdown in Appendix 3, Option WC-B			
Subtotal		**$**	**17.95 M**
	EPCM	**$**	**1.80 M**
	Contingency (25%)	**$**	**4.94 M**
Total Estimated Capital Costs		**$**	**24.68 M**

Operational Costs

25% Contingency Incl., Real Discount Rate = 2.5%

Task No.	Description	Cost (2014 CAD)	Frequency (Years)	Duration (Years)		NPC (2014 CAD)
1.0	**Monitoring**				**$**	**1.63 M**
1.1	Visual Inspections	$ 15,000	1	100	$	0.55 M
1.2	Surveys	$ 60,000	2	100	$	1.08 M
2.0	**Maintenance**				**$**	**1.25 M**
2.1	Excavate Rock Drain Sediment (at Inlet) (Cost Breakdown in Appendix 3)	$ 361,000	10	100	$	1.18 M
2.2	Clear Vegetation from Existing Rock-Lined Channel	$ 20,000	10	100	$	0.07 M
Subtotal					**$**	**2.88 M**
Total Estimated Operational Costs (Over 100-Year Period)					**$**	**2.88 M**
Equivalent Annual Operational Costs					**$**	**0.08 M/yr**

Total Estimated Lifecycle Costs (Over 100-Year Period)	**$**	**27.56 M**

Note: While this is not entirely a walk-away solution, very little regular maintenance would be required for this option. Therefore site access would not need to be maintained.

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SHEET TITLE:	**Wolverine Creek Option C LCCA**
PROJECT NO. AND TITLE:	307071-00895 Clinton Creek LCCA
CLIENT:	Assessment and Abandoned Mines
LOCATION:	Clinton Creek Site, YT
ESTIMATE BASIS:	2014 CDN Dollars (+/- 50% accuracy)
DATE:	March 28, 2014
REVISION:	0

LIFECYCLE COST ANALYSIS

Capital Costs

Task No.	Description		Cost (2014 CAD)
1.0	**Mobilization**	**$**	**0.78 M**
2.0	**Access Road Construction**	**$**	**1.11 M**
3.0	**Cover over Tailings Pile Base**	**$**	**5.26 M**
4.0	**Channel Stabilization**	**$**	**1.06 M**
5.0	**Water Management**	**$**	**0.08 M**
6.0	**Support Equipment**	**$**	**0.42 M**
7.0	**Support Labour**	**$**	**1.49 M**
8.0	**Asbestos Control**	**$**	**0.80 M**
9.0	**Fuel Transportation**	**$**	**0.02 M**
10.0	**Indirects**	**$**	**5.84 M**
Note: Cost Breakdown in Appendix 3, Option WC-C			
Subtotal		**$**	**16.87 M**
	EPCM	**$**	**1.69 M**
	Contingency (25%)	**$**	**4.64 M**
Total Estimated Capital Costs		**$**	**23.20 M**

Operational Costs — 25% Contingency Incl., Real Discount Rate = 2.5%

Task No.	Description	Cost (2014 CAD)	Frequency (Years)	Duration (Years)		NPC (2014 CAD)
1.0	**Monitoring**				**$**	**1.63 M**
1.1	Visual Inspections	$ 15,000	1	100	$	0.55 M
1.2	Surveys	$ 60,000	2	100	$	1.08 M
2.0	**Maintenance**				**$**	**0.07 M**
2.1	Clear Vegetation from Existing Rock-Lined Channel	$ 20,000	10	100	$	0.07 M
3.0	**Replacement**				**$**	**0.32 M**
3.1	Replace 200m of 0.1% Channel (North Lobe) (Cost Breakdown in Appendix 3)	$ 705,000	45	100	$	0.32 M
3.2	Replace 200m of 0.1% Channel (South Lobe) (Cost Breakdown in Appendix 3)	$ 705,000	12	100	$	1.87 M
Subtotal					**$**	**3.89 M**
Total Estimated Operational Costs (Over 100-Year Period)					**$**	**3.89 M**
Equivalent Annual Operational Costs					**$**	**0.11 M/yr**

Total Estimated Lifecycle Costs (Over 100-Year Period)	**$**	**27.08 M**

Maintaining Site Access — 25% Contingency Incl., Real Discount Rate = 2.5%

Task No.	Description	Cost (2014 CAD)	Frequency (Years)	Duration (Years)		NPC (2014 CAD)
1.0	**Grade Access Road (16.2 km)**	**$ 40,000**	**4**	**100**	**$**	**0.35 M**
2.0	**Site Access Road Resurfacing (16.2 km) (Cost Breakdown in Appendix 3)**	**$ 4,318,000**	**20**	**100**	**$**	**6.19 M**
3.0	**15 m Long Bridge Replacement (Cost Breakdown in Appendix 3)**	**$ 1,789,000**	**50**	**100**	**$**	**0.67 M**
Subtotal					**$**	**7.21 M**
Total Estimated Cost (Over 100-Year Period)					**$**	**7.21 M**
Equivalent Annual Cost					**$**	**0.20 M/yr**

Note: This is not considered a walk-away solution. Site access would need to be maintained in order to complete regular monitoring, maintenance and replacement.

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SHEET TITLE:	**Wolverine Creek Option D LCCA**
PROJECT NO. AND TITLE:	307071-00895 Clinton Creek LCCA
CLIENT:	Assessment and Abandoned Mines
LOCATION:	Clinton Creek Site, YT
ESTIMATE BASIS:	2014 CDN Dollars (+/- 50% accuracy)
DATE:	March 28, 2014
REVISION:	0

LIFECYCLE COST ANALYSIS

Capital Costs

Task No.	Description		Cost (2014 CAD)
1.0	**Mobilization**	**$**	**0.97 M**
2.0	**Access Road Construction**	**$**	**1.10 M**
3.0	**Rock Drain**	**$**	**6.94 M**
4.0	**Cover over Tailings Pile Base**	**$**	**5.26 M**
5.0	**Channel Stabilization**	**$**	**1.02 M**
6.0	**Water Management**	**$**	**0.15 M**
7.0	**Support Equipment**	**$**	**0.57 M**
8.0	**Support Labour**	**$**	**2.03 M**
9.0	**Asbestos Control**	**$**	**0.84 M**
10.0	**Fuel Transportation**	**$**	**0.03 M**
11.0	**Indirects**	**$**	**10.42 M**
Note: Cost Breakdown in Appendix 3, Option WC-D			
Subtotal		**$**	**29.33 M**
	EPCM	**$**	**2.93 M**
	Contingency (25%)	**$**	**8.07 M**
Total Estimated Capital Costs		**$**	**40.33 M**

Operational Costs — 25% Contingency Incl., Real Discount Rate = 2.5%

Task No.	Description	Cost (2014 CAD)	Frequency (Years)	Duration (Years)		NPC (2014 CAD)
1.0	**Monitoring**				**$**	**1.63 M**
1.1	Visual Inspections	$ 15,000	1	100	$	0.55 M
1.2	Surveys	$ 60,000	2	100	$	1.08 M
2.0	**Maintenance**				**$**	**1.25 M**
2.1	Clear Vegetation from Existing Rock-Lined Channel	$ 20,000	10	100	$	0.07 M
2.2	Excavate Rock Drain Sediment (at Inlet) (Cost Breakdown in Appendix 3)	$ 361,000	10	100	$	1.18 M
3.0	**Replacement**				**$**	**0.32 M**
3.1	Replace 200m of 0.1% Channel (North Lobe) (Cost Breakdown in Appendix 3)	$ 705,000	45	100	$	0.32 M
3.2	Replace 200m of 0.1% Channel (South Lobe) (Cost Breakdown in Appendix 3)	$ 705,000	12	100	$	1.87 M
Subtotal					**$**	**5.07 M**
Total Estimated Operational Costs (Over 100-Year Period)					**$**	**5.07 M**
Equivalent Annual Operational Costs					**$**	**0.14 M/yr**

Total Estimated Lifecycle Costs (Over 100-Year Period)	**$**	**45.39 M**

Maintaining Site Access — 25% Contingency Incl., Real Discount Rate = 2.5%

Task No.	Description	Cost (2014 CAD)	Frequency (Years)	Duration (Years)		NPC (2014 CAD)
1.0	**Grade Access Road (15 km)**	**$ 40,000**	**4**	**100**	**$**	**0.35 M**
2.0	**Site Access Road Resurfacing (16.2 km) (Cost Breakdown in Appendix 3)**	**$ 4,318,000**	**20**	**100**	**$**	**6.19 M**
3.0	**15 m Long Bridge Replacement (Cost Breakdown in Appendix 3)**	**$ 1,789,000**	**50**	**100**	**$**	**0.67 M**
Subtotal					**$**	**7.21 M**
Total Estimated Cost (Over 100-Year Period)					**$**	**7.21 M**
Equivalent Annual Cost					**$**	**0.20 M/yr**

Note: This is not considered a walk-away solution. Site access would need to be maintained in order to complete regular monitoring, maintenance and replacement.

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SHEET TITLE:	**Wolverine Creek Option D2 LCCA**
PROJECT NO. AND TITLE:	307071-00895 Clinton Creek LCCA
CLIENT:	Assessment and Abandoned Mines
LOCATION:	Clinton Creek Site, YT
ESTIMATE BASIS:	2014 CDN Dollars (+/- 50% accuracy)
DATE:	March 28, 2014
REVISION:	0

LIFECYCLE COST ANALYSIS

Capital Costs

Task No.	Description		Cost (2014 CAD)
1.0	**Mobilization**	**$**	**0.78 M**
2.0	**Access Road Construction**	**$**	**1.11 M**
3.0	**Cover over Tailings Pile Base**	**$**	**2.56 M**
4.0	**Channel Stabilization**	**$**	**0.94 M**
5.0	**Water Management**	**$**	**0.15 M**
6.0	**Support Equipment**	**$**	**0.31 M**
7.0	**Support Labour**	**$**	**0.68 M**
8.0	**Asbestos Control**	**$**	**0.84 M**
9.0	**Fuel Transportation**	**$**	**0.02 M**
10.0	**Indirects**	**$**	**5.11 M**
Note: Cost Breakdown in Appendix 3, Option WC-D2			
Subtotal		**$**	**12.48 M**
	EPCM	**$**	**1.25 M**
	Contingency (25%)	**$**	**3.43 M**
Total Estimated Capital Costs		**$**	**17.17 M**

Operational Costs

25% Contingency Incl., Real Discount Rate = 2.5%

Task No.	Description	Cost (2014 CAD)	Frequency (Years)	Duration (Years)		NPC (2014 CAD)
1.0	**Monitoring**				**$**	**1.63 M**
1.1	Visual Inspections	$ 15,000	1	100	$	0.55 M
1.2	Surveys	$ 60,000	2	100	$	1.08 M
2.0	**Maintenance**				**$**	**0.07 M**
2.1	Clear Vegetation from Existing Rock-Lined Channel	$ 20,000	10	100	$	0.07 M
3.0	**Replacement**				**$**	**0.32 M**
2.1	Replace 200m of 0.1% Channel (North Lobe) (Cost Breakdown in Appendix 3)	$ 705,000	45	100	$	0.32 M
2.2	Replace 200m of 0.1% Channel (South Lobe) (Cost Breakdown in Appendix 3)	$ 705,000	12	100	$	1.87 M
Subtotal					**$**	**3.89 M**
Total Estimated Operational Costs (Over 100-Year Period)					**$**	**3.89 M**
Equivalent Annual Operational Costs					**$**	**0.11 M/yr**

Total Estimated Lifecycle Costs (Over 100-Year Period)	**$**	**21.05 M**

Maintaining Site Access

25% Contingency Incl., Real Discount Rate = 2.5%

Task No.	Description	Cost (2014 CAD)	Frequency (Years)	Duration (Years)		NPC (2014 CAD)
1.0	**Grade Access Road (15 km)**	**$ 40,000**	**4**	**100**	**$**	**0.35 M**
2.0	**Site Access Road Resurfacing (16.2 km) (Cost Breakdown in Appendix 3)**	**$ 4,318,000**	**20**	**100**	**$**	**6.19 M**
3.0	**15 m Long Bridge Replacement (Cost Breakdown in Appendix 3)**	**$ 1,789,000**	**50**	**100**	**$**	**0.67 M**
Subtotal					**$**	**7.21 M**
Total Estimated Cost (Over 100-Year Period)					**$**	**7.21 M**
Equivalent Annual Cost					**$**	**0.20 M/yr**

Note: This is not considered a walk-away solution. Site access would need to be maintained in order to complete regular monitoring, maintenance and replacement.

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SHEET TITLE:	**Wolverine Creek Option E LCCA**
PROJECT NO. AND TITLE:	307071-00895 Clinton Creek LCCA
CLIENT:	Assessment and Abandoned Mines
LOCATION:	Clinton Creek Site, YT
ESTIMATE BASIS:	2014 CDN Dollars (+/- 50% accuracy)
DATE:	March 28, 2014
REVISION:	0

LIFECYCLE COST ANALYSIS

Capital Costs

Task No.	Description		Cost (2014 CAD)
1.0	**Mobilization**	**$**	**1.22 M**
2.0	**Access Road Construction**	**$**	**1.10 M**
3.0	**Rock Drain**	**$**	**6.94 M**
4.0	**Tailings Stabilization**	**$**	**4.80 M**
5.0	**Cover over Tailings**	**$**	**3.76 M**
6.0	**Channel Stabilization**	**$**	**1.02 M**
7.0	**Water Management**	**$**	**0.18 M**
8.0	**Support Equipment**	**$**	**0.79 M**
9.0	**Support Labour**	**$**	**2.83 M**
10.0	**Asbestos Control**	**$**	**0.79 M**
11.0	**Fuel Transportation**	**$**	**0.06 M**
12.0	**Indirects**	**$**	**12.37 M**
Note: Cost Breakdown in Appendix 3, Option WC-E			
Subtotal		**$**	**35.86 M**
	EPCM	**$**	**3.59 M**
	Contingency (25%)	**$**	**9.86 M**
Total Estimated Capital Costs		**$**	**49.30 M**

Operational Costs — 25% Contingency Incl., Real Discount Rate = 2.5%

Task No.	Description	Cost (2014 CAD)	Frequency (Years)	Duration (Years)		NPC (2014 CAD)
1.0	**Monitoring**				**$**	**1.63 M**
1.1	Visual Inspections	$ 15,000	1	100	$	0.55 M
1.2	Surveys	$ 60,000	2	100	$	1.08 M
2.0	**Maintenance**				**$**	**1.25 M**
2.1	Excavate Rock Drain Sediment (at Inlet) (Cost Breakdown in Appendix 3)	$ 361,000	10	100	$	1.18 M
2.2	Clear Vegetation from Existing Rock-Lined Channel	$ 20,000	10	100	$	0.07 M
Subtotal					**$**	**2.88 M**
Total Estimated Operational Costs (Over 100-Year Period)					**$**	**2.88 M**
Equivalent Annual Operational Costs					**$**	**0.08 M/yr**

Total Estimated Lifecycle Costs (Over 100-Year Period)	**$**	**52.18 M**

Note: While this is not entirely a walk-away solution, very little regular maintenance would be required for this option. Therefore site access would not need to be maintained.

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SHEET TITLE:	**Wolverine Creek Option E2 LCCA**
PROJECT NO. AND TITLE:	307071-00895 Clinton Creek LCCA
CLIENT:	Assessment and Abandoned Mines
LOCATION:	Clinton Creek Site, YT
ESTIMATE BASIS:	2014 CDN Dollars (+/- 50% accuracy)
DATE:	March 28, 2014
REVISION:	0

LIFECYCLE COST ANALYSIS

Capital Costs

Task No.	Description		Cost (2014 CAD)
1.0	**Mobilization**	**$**	**1.22 M**
2.0	**Access Road Construction**	**$**	**1.10 M**
3.0	**Tailings Stabilization**	**$**	**5.60 M**
5.0	**Cover over Tailings**	**$**	**4.51 M**
6.0	**Channel Stabilization**	**$**	**1.02 M**
7.0	**Water Management**	**$**	**0.18 M**
8.0	**Support Equipment**	**$**	**0.66 M**
9.0	**Support Labour**	**$**	**1.89 M**
10.0	**Asbestos Control**	**$**	**0.79 M**
11.0	**Fuel Transportation**	**$**	**0.05 M**
12.0	**Indirects**	**$**	**8.45 M**
Note: Cost Breakdown in Appendix 3, Option WC-E2			
Subtotal		**$**	**25.47 M**
	EPCM	**$**	**2.55 M**
	Contingency (25%)	**$**	**7.01 M**
Total Estimated Capital Costs		**$**	**35.03 M**

Operational Costs

25% Contingency Incl., Real Discount Rate = 2.5%

Task No.	Description	Cost (2014 CAD)	Frequency (Years)	Duration (Years)		NPC (2014 CAD)
1.0	**Monitoring**				**$**	**1.63 M**
1.1	Visual Inspections	$ 15,000	1	100	$	0.55 M
1.2	Surveys	$ 60,000	2	100	$	1.08 M
2.0	**Maintenance**				**$**	**0.03 M**
2.1	Clear Vegetation from Existing Rock-Lined Channel	$ 20,000	10	100	$	0.03 M
Subtotal					**$**	**1.67 M**
Total Estimated Operational Costs (Over 100-Year Period)					**$**	**1.67 M**
Equivalent Annual Operational Costs					**$**	**0.05 M/yr**

Total Estimated Lifecycle Costs (Over 100-Year Period)	**$**	**36.69 M**

Note: This is considered a walk-away solution. Therefore site access would not need to be maintained.

Appendix 5 Site Access Letter

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28 March 2014

Proj. No.: 307071-00895
File Loc.: Burnaby

Yukon Energy, Mines and Resources
Assessment and Abandoned Mines
PO Box 2703 (K-419)
Whitehorse, YT
Y1A 2C6 Canada

Attention: Ms. Josée Perron and Mr. Wade McMillan

Dear Ms. Perron and Mr. McMillan:

RE: CLINTON CREEK REMEDIATION OPTIONS - PUBLIC ACCESS ASSESSMENT

WorleyParsons Canada Services Ltd. (WorleyParsons) has been retained by Assessment and Abandoned Mines (AAM) to present the anticipated public access approach that will be associated with each of the remediation options assessed as part of the Clinton Creek Site Closure Options - Life Cycle Cost Analysis (LCCA) project, including alternatives.

This letter summarizes the anticipated approach, and will become an addendum to the life cycle cost analysis project report (Reference No. 307071-00895-00-WW-REP-0001).

1. METHOD OF ASSESSMENT

The Clinton Creek site includes both Clinton Creek and Wolverine Creek. Each of the remediation options has been evaluated to determine whether safe public access to the site:

- May be achieved;
- Would not be anticipated; or
- May be achieved with additional option-specific risk mitigation measures in place.

This assessment considers the safety aspects to typical public access, and not unusual or excessive loads.

The following general philosophies have been considered in the assessment.

- Where the waste rock (in the case of the Clinton Creek options) is to be stabilized, public access may be achieved.
- Where the tailings pile (in the case of the Wolverine Creek options) is to be stabilized, public access may be achieved.

- Where no channel armouring is proposed for Clinton Creek, the existing access road in this area is at risk of failure during peak flow events. Public access may be achieved with these options; however, a regular safety inspection of the access road (after peak flow events) is recommended.
- Where implementation of an option results in increasing impounded water levels in Wolverine Pond (upstream of the tailings pile), an assessment of whether a Dam Safety Review (DSR) (under the Canadian Dam Safety Regulations) is required. If the DSR results in the site being classified as a dam, additional safety aspects will need to be addressed, and a regular inspection and monitoring program implemented.

2. REMEDIATION OPTIONS PUBLIC ACCESS ASSESSMENT

2.1 General

This assessment is based on information available at the time of issuance of this letter and the assumptions in the LCCA report. Should some of the information or assumptions be modified during the detailed design stage, the recommendations put forward in this letter may no longer be valid.

The ultimately selected remediation option will need to address access and monitoring (particularly slope stability) requirements, and a site wide risk assessment should be completed.

This letter does not explicitly consider the potential human safety implications of exposure to asbestos fibres, from either the tailings pile or waste rock piles. All options noted below leave some possibility for human exposure to airborne asbestos fibres. The risks of this exposure and potential mitigative measures are outside the scope of this letter and should be considered through a formal Human Health Risk Assessment (HHRA) before allowing public access to the site.

Table A and Table B provide a summary of the public access approaches for the Clinton Creek and Wolverine Creek remediation options.

It is noted that the future slope stability assessments to be carried out by a registered geotechnical engineer (as recommended above), DSRs (if required), and/or HHRAs may alter the approaches outlined in this letter.

2.2 Clinton Creek Public Access Summary

Table A Clinton Creek Public Access Summary

Option	Description	Public Access Approach	Option Specific Risk Mitigation Measures
A	CC-1 / WR-1 / HL-1 • Maintaining status quo.	Not anticipated.	---
B	CC-2 / WR-3 / HL-1 • Excavating and armouring a new channel (with gabion drop-structures). • Stabilizing the waste rock dump.	May be achieved with additional risk mitigation.	• Ongoing stability monitoring. • Installation of a flow gauging station. • Inspections after peak flow events. • Posting signs noting known hazards (flash floods, asbestos, etc.).

Option	Description	Public Access Approach	Option Specific Risk Mitigation Measures
B2	CC-2 / WR-3 / HL-1 (Alternative) • Excavating and armouring a new channel (with riprap). • Stabilizing the waste rock dump.	May be achieved with additional risk mitigation.	• Ongoing stability monitoring. • Installation of a flow gauging station. • Inspections after peak flow events. • Posting signs noting known hazards (flash floods, asbestos, etc.).
C	CC-4 / WR-1 / HL-1 • Armouring existing channel with gabion drop structures.	Not anticipated.	---
C2	CC-4 / WR-1 / HL-1 (Alternative) • Armouring existing channel with riprap.	Not anticipated.	---
C3	CC-4 / WR-1 / HL-1 (Alternative) • Armouring existing channel with riprap. • Extending rip rap lined channel upstream to replace existing gabion drop structures.	Not anticipated.	---
D	CC-4 / WR-3 / HL-1 • Armouring existing channel with gabion drop structures. • Stabilizing the waste rock dump.	May be achieved with additional risk mitigation.	• Ongoing stability monitoring. • Installation of a flow gauging station. • Inspections after peak flow events. • Posting signs noting known hazards (flash floods, asbestos, etc.).
D2	CC-4 / WR-3 / HL-1 (Alternative • Armouring existing channel with riprap. • Stabilizing the waste rock dump.	May be achieved with additional risk mitigation.	• Ongoing stability monitoring. • Installation of a flow gauging station. • Inspections after peak flow events. • Posting signs noting known hazards (flash floods, asbestos, etc.).
D3	CC-4 / WR-3 / HL-1 (Alternative) • Armouring existing channel with riprap. • Stabilizing the waste rock dump. • Extending rip rap lined channel upstream to replace existing gabion drop structures.	May be achieved with additional risk mitigation.	• Ongoing stability monitoring. • Installation of a flow gauging station. • Inspections after peak flow events. • Posting signs noting known hazards (flash floods, asbestos, etc.).
E	CC-5 / WR-3 / HL-3 • Lowering the existing channel to the bedrock lining. • Stabilizing the waste rock dump. • Lowering the lake level.	May be achieved with additional risk mitigation.	• Ongoing stability monitoring. • Installation of a flow gauging station. • Inspections after peak flow events, particularly for road condition. • Posting signs noting known hazards (flash floods, asbestos, etc.).
E2	CC-5 / WR-3 / HL-3 • Lowering the existing channel to the bedrock lining. • Modifying channel alignment. • Stabilizing the waste rock dump. • Lowering the lake level.	May be achieved with additional risk mitigation.	• Ongoing stability monitoring. • Installation of a flow gauging station. • Inspections after peak flow events, particularly for road condition. • Posting signs noting known hazards (flash floods, asbestos, etc.).

Option	Description	Public Access Approach	Option Specific Risk Mitigation Measures
E3	CC-5 / WR-3 / HL-3 • Lowering the existing channel to the bedrock lining. • Modifying channel alignment and lining with riprap. • Stabilizing the waste rock dump. • Lowering the lake level.	May be achieved with additional risk mitigation.	• Ongoing stability monitoring. • Installation of a flow gauging station. • Inspections after peak flow events, particularly for road condition. • Posting signs noting known hazards (flash floods, asbestos, etc.).
F	CC-6 / WR-2 / HL-2 • Restoring Clinton Creek to the original valley bottom. • Stabilizing the waste rock dump by removing waste rock to valley bottom. • Fully drain lake.	May be achieved with additional risk mitigation.	• Ongoing stability monitoring. • Water and soil quality assessment to determine initial (and potential ongoing) effects of disturbing the bottom layers of the lake. • Posting signs noting known hazards (flash floods, asbestos, etc.).
G	CC-10 / WR-1 / HL-1 • Armouring existing channel with gabion baskets (gabion chute).	Not anticipated.	---
H	CC-10 / WR-3 / HL-1 • Armouring existing channel with gabion baskets (gabion chute). • Stabilizing the waste rock dump.	May be achieved with additional risk mitigation.	• Ongoing stability monitoring. • Installation of a flow gauging station. • Inspections after peak flow events. • Posting signs noting known hazards (flash floods, asbestos, etc.).

2.3 Wolverine Creek Public Access Summary

Table B Wolverine Creek Public Access Summary

Option	Description	Public Access Recommendation	Option Specific Risk Mitigation Measures
A	WC-2 / T-1 • Maintaining status quo.	Not anticipated.	---
B	WC-3 / T-1 • Installing a rock drain along the toe of the tailings lobes.	Not anticipated.	---
C	WC-7 / T-5 • Providing a cover over the tailings pile base. • Constructing an armoured channel (riprap) through the cover.	May be achieved with additional risk mitigation.	• Ongoing stability monitoring. • Preparation of a dam safety inspection and monitoring program (under the Canadian Dam Safety Regulations as part of a DSR) due to increased water levels. • Installation of a flow gauging station. • Inspections after peak flow events. • Posting signs noting known hazards (flash floods, asbestos, etc.).

Option	Description	Public Access Recommendation	Option Specific Risk Mitigation Measures
D	WC-3 and WC-7 / T-5 • Installing a rock drain along the toe of the tailings lobe. • Providing a cover over the tailings pile base. • Constructing an armoured channel (riprap) through the cover.	May be achieved with additional risk mitigation.	• Ongoing stability monitoring. • Installation of a flow gauging station. • Inspections after peak flow events. • Posting signs noting known hazards (flash floods, asbestos, etc.).
D2	WC-3 and WC-7 / T-5 • Providing a cover over the tailings pile base. • Constructing an armoured channel (riprap) through the cover. • Lowering the waste rock cover.	May be achieved with additional risk mitigation.	• Ongoing stability monitoring. • Installation of a flow gauging station. • Inspections after peak flow events. • Posting signs noting known hazards (flash floods, asbestos, etc.).
E	WC-3 and WC-7 / T-2 and T-3 • Installing a rock drain along the toe of the tailings lobes. • Stabilizing the tailings pile. • Providing a cover over the tailings pile base. • Constructing an armoured channel (riprap) through the cover.	May be achieved with additional risk mitigation.	• Ongoing stability monitoring. • Installation of a flow gauging station. • Inspections after peak flow events. • Posting signs noting known hazards (flash floods, asbestos, etc.).
E2	WC-3 and WC-7 / T-2 and T-3 • Stabilizing the tailings pile. • Providing a cover over the tailings pile base. • Constructing an armoured channel (riprap) through the cover. • Lowering the waste rock cover.	May be achieved with additional risk mitigation.	• Ongoing stability monitoring. • Installation of a flow gauging station. • Inspections after peak flow events. • Posting signs noting known hazards (flash floods, asbestos, etc.).

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We trust that this meets your requirements. Should you require further clarification, please do not hesitate to contact Alex Timmis at alex.timmis@worleyparsons.com or Project Manager Lee Martin at lee.martin@worleyparsons.com or by phone at 604-298-1616.

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AT/lmv

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