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FEB 02 2017

# PLACER

## WATER LICENCE AND CLASS 4 MINING LAND USE APPROVAL APPLICATION FORM

<b>Applicant Name:</b> (1) <i>(The Water Licence and Approval will be issued under this name):</i>		<b>H3 Mining Company</b>
<b>Watercourse(s):</b> (2) <b><u>Bonanza Creek: Carmack Fork, right limit bench, and tributaries.</u></b>	<b>Mining District:</b> (3) <b><u>Dawson City Mining District</u></b>	<b>Nearest Yukon Community:</b> (4) <b><u>Dawson City, Yukon</u></b>
<b>NTS Map sheet #:</b> (5) <b>115 O-14f &amp; 14g</b>	<b>Longitude and latitude: (centre of project)</b> (6) <b>63° 55' 9" N      139° 16' 14" W</b>	
<b>Total # of grants:</b> (7) <b>57 contiguous placer grants</b>	<b>Registered owner(s) of grants:</b> (8) <b>Cory Howden d.b.a. 'H3 Mining Company'</b>	

☐ - If registered owners of grants are different than the applicant, attach an agreement.

☒ Attach DFO appendix A worksheet.

*Please refer to the appropriate Watershed Authorization and map and complete the following (for assistance contact DFO or the district mining inspections office).*

<b>DFO HABITAT SUITABILITY:</b>	
<b>Does your operation require a Site Specific Authorization (SSA) from DFO?</b> (9)	
<input type="checkbox"/> Yes, If yes, your application might be delayed until the SSA is issued. <input checked="" type="checkbox"/> No	
<b>DFO Watershed:</b> (10) <b><u>Tributaries of (&amp;) Carmack Fork of upper Bonanza Creek, the lowest left limit tributary of the Klondike River Watershed.</u></b>	<b>DFO Watershed Category:</b> (11) <input checked="" type="checkbox"/> Category A <input type="checkbox"/> Category B

*If all grants are in the same zone, write "all" in the appropriate row.*

(12)

Operational Specification	From grant	To grant #	Restoration classification (if different from operational)
High			
Moderate – High			
Moderate – Moderate			
Moderate – Low			<b>P 43554-P 43574; P 517376-P517385</b>
Low	<b>ALL</b>	<b>ALL</b>	<b>The remainder</b>
Water Quality			

**\*\*Please attach additional pages if necessary\*\***

## MINING PLAN NARRATIVE:

(13)

The proposed mining program and attached water license renewal proposal seeks to extend the water license on the claims through years 11-20. Several tributaries will also now be included into the proposal to renew PM06-542. The property block is located in the headwaters of the world famous Bonanza Creek, on Carmack Fork, a right limit tributary and several small tributaries. Although the entire Bonanza Creek has been extensively explored and developed for placer, the majority of the property has seen limited mechanical mining over the past 40-50 years. There are typically 3 to 4 years of active mine cuts in various stages of preparation and rehabilitation over the claim block. The property is approximately 30 minutes away from Dawson City, driving on the Klondike Hwy (south ~2km) and the Bonanza Creek & Carmack Fork Valley access roads for approximately 25 km. There is no known settlement land in the vicinity of this proposed operation, however, the claims are located in the Tr'ondek Hwech'in traditional territory. There has been multiple phases of extensive, continuous mining on the Hunker Creek drainage since the time of the Klondike Gold rush.

VEGETATION – Carmack Fork has 2 distinct vegetation patterns. The first type is the vegetation that has re-grown on and around the historic hand and shafting tailings in the now thawed valley bottom, consisting of mainly of willow, buckbrush, birch and incidental coniferous growth. The second pattern is the historic second growth that extends along both sides of the Carmack Fork valley in areas that have been untouched by recent placer mining. This growth is fairly young due to the historic forest fires that have occurred in the vicinity, which are typically started by mid-summer lightning strikes throughout the Klondike.

WASTE OVERBURDEN – The Carmack Fork and tributary valley have a thick layer (1 to 3 meters) of frozen black muck that covers 2 to 5 meters of waste gravels, which was situated on 1 to 2 meters of pay gravels. The centre of the valley from one end of the claim block to the other has been previously hand and shaft mined to varying degrees, and more recently, by heavy equipment in beneath the confluence of Flannery Pup and Carmack Fork. In areas where there has been an historic disturbance, most of the frozen black muck has been water stripped and has been washed downstream off of the property in the Carmack Fork watercourse. The waste gravel overburden from the valley in the disturbed areas has been ramped either back onto the valley sides.

The focus of the proposed mining program is along the toe of the valley side and the low level benches that extend down the souther side of the valley. Areas of economic paygravels in the valley bottom will also be mined. The 5 tributaries have experienced a lesser degree of historical mining and therefore will be mined more completely then partially mined areas of downstream Carmack Fork. The black muck waste overburden along the valley slope is not excessive and does not exceed 2-3 metres in depth. The waste overburden gravels typically remain a uniform thickness in the valley and start to thin part way up the valley side. Once the gravels start to thin in depth they remain thin, and

the bench cuts have a uniform 1 to 3 meters of material covering the 1 meter of pay.

PAYGRAVELS – The centre of the Carmack Fork valley has been historically mined to varying degrees and levels of effectiveness whereas the 5 tributaries have seen less extensive historical mining. Where valley bottom paygravels remain intact they are 1-2 meter thick although the paygravels naturally thin to about 1 to 2 meters along valley sides.

MINE CUTS – The proposed annual mining plan involves working on 3 or more mine cuts all at one time. Generally, one cut will be in the stripping and preparation phase, another cut will be in sluicing phase, and a third cut will be receiving ongoing reclamation. Cuts will typically be reclaimed by the end of the 3<sup>rd</sup> year after being stripped. Historically, the mining operation can complete 3 to 6 smaller cuts per year and have up to 3 to 4 years of ground in various stages of preparation to be mined. When the mining program is fully operational, there may be a sluice and an active set of cuts in Carmack Fork as well as a operational sluice and set of mine cuts in one of the tributaries.

SETTLING FACILITIES – Sluicing with out-of-stream settling – the historic mining in portions of Carmack Fork has left ample supplies of tailings, RipRap, and available space for the creation of large out-of-stream settling facilities for that extend across much of the width of the Carmack Fork valley. Using a portion of the tailings, a safe perimeter berm encircling these settling facilities will be created using dozers and excavators. This berm will isolate the potential settling facility from the Carmack Fork watercourse. The sluice plant will be situated at the upstream end of the ponds, and the reservoir/recycling/pump pond facility will be located at the downstream end. An open-ended surface ditch will connect these facilities with the nearby watercourse. Whenever practical, adjoining mine cuts to the active face/cut are backfilled first with the excess, if available, being directed into other nearby areas that are presently being prepared for restoration. Due to the relatively large size of the property (57 claims), the same settling facility will not be utilized for the duration of the 10 year mining plan. The settling facility will move upstream on the Carmack Fork valley as needed. For example, when mining of Flannery Pup and the lower portions of Carmack Fork are completed, a new complete set of settling infrastructure will be built shortly downstream of the confluence of Discovery #3 Pup and Carmack Fork in the widest location available.

When the mining program is fully operational, two sluice plants and therefore two settling facilities be in use simultaneously. Both would be located in different locations of mainstem Carmack Fork. However, one settling plant would be processing paygravels from a tributary, whereas the second plant would be sluicing paygravels from Carmack Fork.

Due to the limited width and significant gradients of the tributaries, paygravels extracted from the tributaries will be trucked and then sluiced below in Carmack Fork where much more water and settling area is available. Small out-of-stream pre-settling facilities will

be used when employing hydraulic stripping in order to partially decant hydraulicing effluent prior to using the creek as a conduit to transport the effluent to the large out of stream settling facilities located in Carmack Fork.

RESERVOIRS – Out-of-stream reservoirs for the sluicing program will be located at the downstream end of the Carmack Fork settling facilities to allow up to 80% of the water to be reused/recycled. The reservoirs will be constructed using abundant coarse, washed historic tailings located adjacent to the planned site. The reservoir will connect to the nearby Carmack Fork channel by an open-ended surface ditch. When water levels in the reservoir/recycling/pump pond drop, make-up water will naturally divert from Carmack Fork. When make-up water is not required and the water level in the reservoir pond increases, discharge of decanted effluent from the mining operation into Carmack Fork will occur.

Hydraulicing will not occur at the same time as sluicing and thus reservoirs can be used for both purposes. This is also convenient as the tributaries alone can not be depended upon to provide adequate volumes of water for the hydraulicing operation. The downside of this plan is that the gradient and length of the tributary valleys may prevent hydraulicing within the upper claims as water must be pumped up from below. Even large pressure pumps required from hydraulicing cannot overcome a significant gradient and distance. Upstream of the limits of effective hydraulicing, conventional mechanical methods will be employed to complete the stripping program.

REHABILITATION – The year following the completion of a mine cut is when the majority of the back filling, contouring and grading of the cut and surrounding area are undertaken. Active mine cuts are typically located adjacent to historic mine cuts that have to be rehabilitated. Typically by the end of the second year after a cut is completed, there is 98% rehabilitation completed and just the final black muck layer has to be added, done the following summer as cover to finish an area. Once an area is ready to be abandoned, it is not touched again to allow natural re-vegetation. The Applicants monitor the rehabilitated areas for a number of years after abandonment to ensure a good vegetative cover (usually within a year).

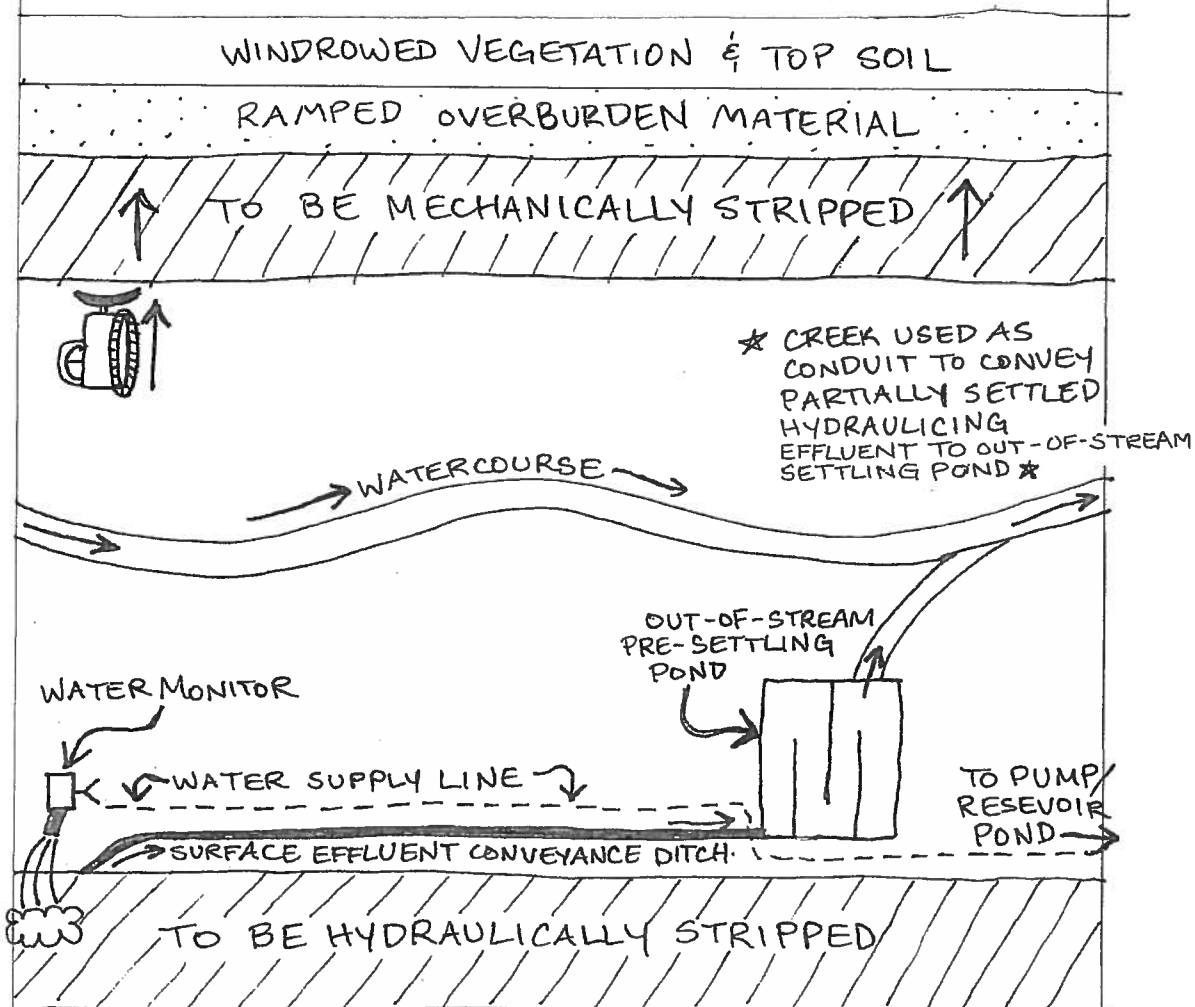
Only fords that are required to cross tributaries that intersect the Carmack Fork valley access road will be left in place following the completion of mining. All other fords, both of Carmack Fork and the tributaries will be decommissioned and abandoned upon the completion of mining.

**MINING SITE PLAN SKETCH: Mechanical & Hydraulic Stripping- Carmack Fork & Tributaries**

(14)

Attach additional pages as necessary.

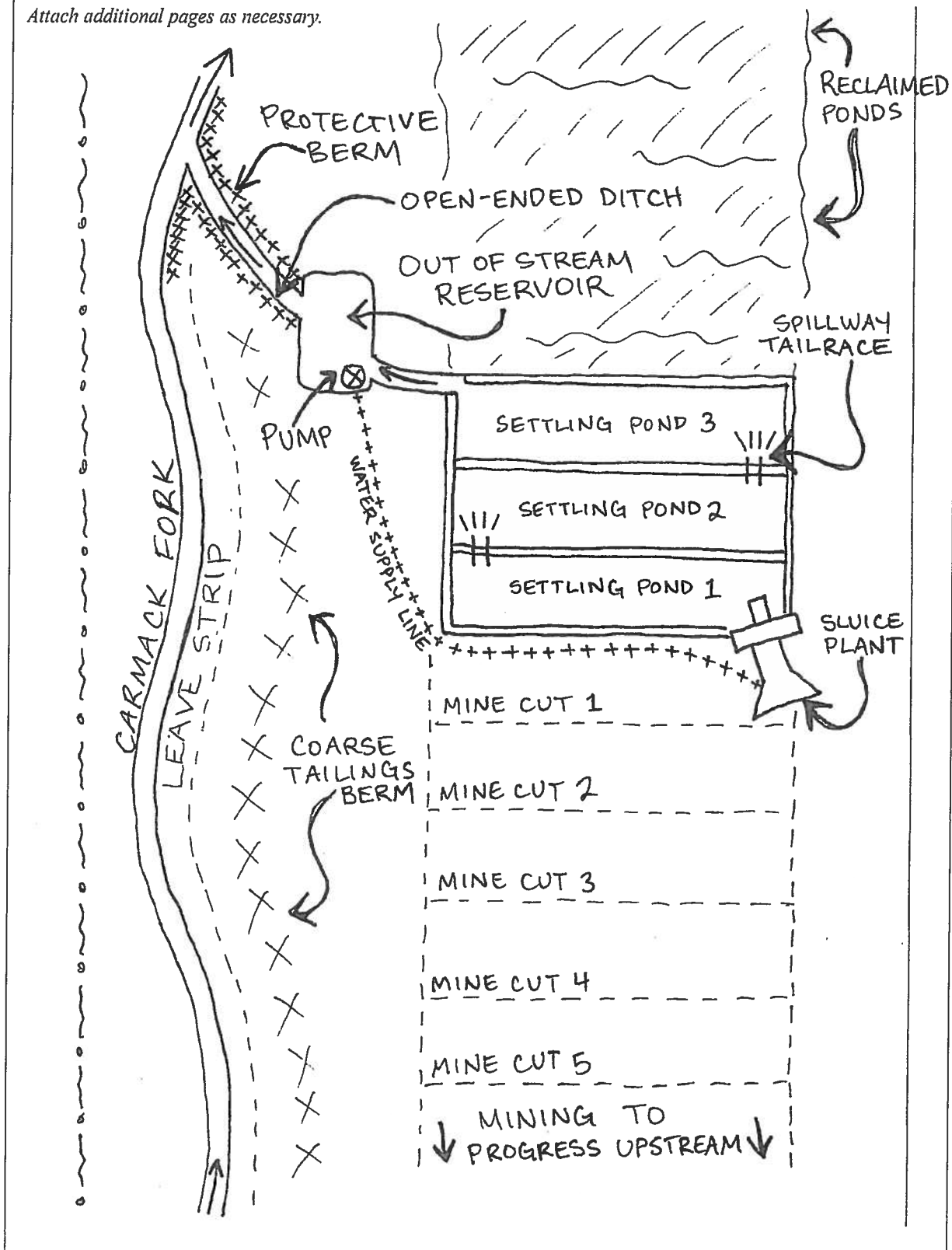
NOT TO SCALE



\* NOTE: HYDRAULIC STRIPPING WILL TAKE PLACE ON THE UPPER REACHES OF CARMACK FORK & THE LOWER REACHES OF THE TRIBUTARIES, WHILE MECHANICAL STRIPPING WILL TAKE PLACE ON THE LOWER REACHES OF CARMACK FORK & UPPER REACHES OF THE TRIBUTARIES.

**MINING SITE PLAN SKETCH: Typical sluice & settling facility set up- Carmack Fork**  
(14)

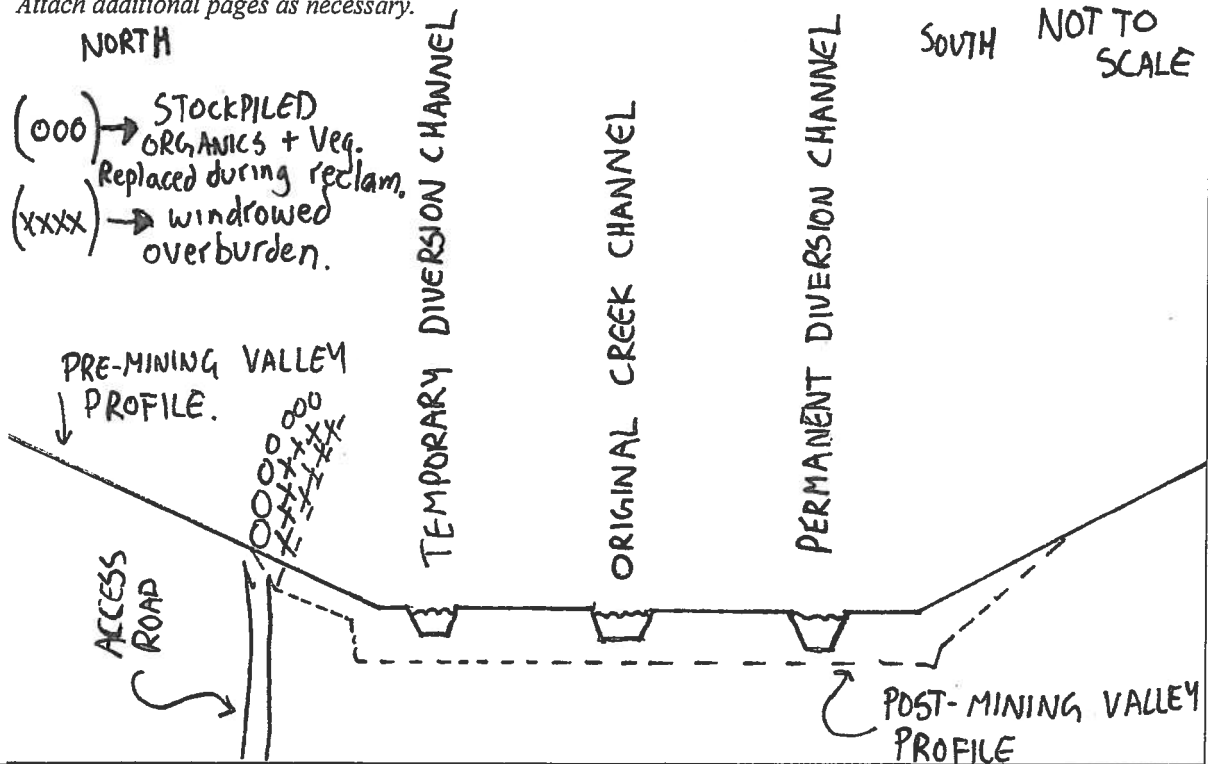
Attach additional pages as necessary.



# CROSS SECTION OF VALLEY: Carmack Fork & Tributaries

(15)

Attach additional pages as necessary.



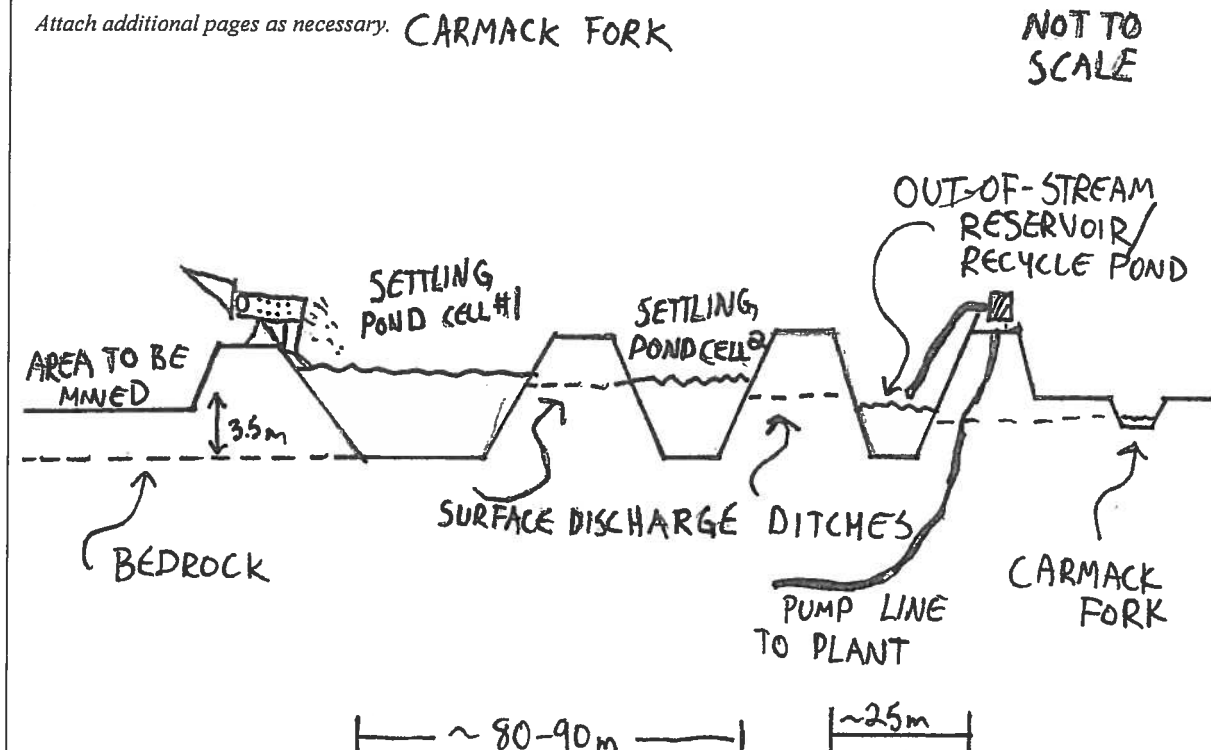
# CROSS SECTION OF SETTLING FACILITIES AND RESERVOIRS:

(16)

Attach additional pages as necessary.

CARMACK FORK

NOT TO SCALE





**WATER USE:**

(17)

*This includes withdrawal from the watercourse and from artificial reservoirs. Water withdrawal from artificial reservoirs with no natural inflow does not have to be included in your licensed water use quantity.*

**Sluicing:****Operation #1 – 4,092\*****m<sup>3</sup>/day****Operation #2- 4,092\*****m<sup>3</sup>/day****Hydraulic Stripping:****Hydraulic operation:****8,184\* m<sup>3</sup>/day****Camp:****Camp #1 – 2.0 m<sup>3</sup>/day**

- \* **Either sluice operation 1 and/or sluice operation 2 can operation concurrently, OR the hydraulic operation can operate at one time. Sluicing and hydraulicing will not occur simultaneously.**

**SLUICING:**

(18)

**1. Please provide the estimated volume of material that will be processed through the sluice plant(s).**

- **Sluice operation #1 & 2 is approximately 75,000 m<sup>3</sup>/yr each.**

Year 1: **150,000 m<sup>3</sup>**Year 5: **150,000 m<sup>3</sup>**Year 9: **150,000 m<sup>3</sup>**Year 2: **150,000 m<sup>3</sup>**Year 6: **150,000 m<sup>3</sup>**Year 10: **150,000 m<sup>3</sup>**Year 3: **150,000 m<sup>3</sup>**Year 7: **150,000 m<sup>3</sup>**Year 4: **150,000 m<sup>3</sup>**Year 8: **150,000 m<sup>3</sup>****LICENCED WATER USE:**

(19)

*This is for water withdrawal taken directly from a watercourse for all purposes, including sluicing, hydraulic stripping, and camp use. The total of the maximum daily withdrawal amounts must be the same as the requested amount on the Schedule 4, and will be the maximum daily amount allowed in the licence. Use a separate line for each watercourse. Attach separate page if necessary.*

Watercourse	Tributary of	Maximum withdrawal (m <sup>3</sup> /day)	(if recycling) Make Up water (m <sup>3</sup> /day)	Estimated Flow (m <sup>3</sup> /day)	
				Mining Season	Spring Freshet
<b><i>Tributaries of Bonanza Creek: Carmack Fork and tributaries</i></b>	<b><i>Bonanza Creek &amp; Klondike River</i></b>	<b><i>Camp + Sluice operations 1 &amp; 2 OR hydraulic operations : 8,184 m<sup>3</sup>/day</i></b>	<b><i>~1,637 m<sup>3</sup>/day Up to 80% of sluice water is recycled**</i></b>	<b><i>120,000 m<sup>3</sup></i></b>	<b><i>320,000 m<sup>3</sup></i></b>

- \* **Note: The sluice program will be recycling approximately 80% of the water used**

and the inflow to the out-of-stream reservoirs/recycle/pump ponds will represent make up water needed.

\* Hydraulic operations will not recycle any water.

Describe the method used to estimate flows during spring freshet and mining season?

There is a historical diversion that sits immediately upstream of the claim block that has a uniform channel width and an easily readable depth to the watercourse. Once a month the applicant tosses a piece of floating wood into the moving watercourse and times the length that it takes for the wood to float 8 meters. Depth and width of the watercourse are measured with a tape measure and all the information is gathered for a calculation. Depth and width of Carmack Fork are also visually observed weekly throughout the mining season by the Mine Site Manager, who monitors any large-scale changes in the volume of the river.

☒ Attach DFO Appendix C worksheet

**FLOW RATE CONVERSION:**

1 gallon/second (US) = 327 m<sup>3</sup>/day  
1 gallon/second (UK) = 393 m<sup>3</sup>/day

1 gallon/minute (US) = 5.45 m<sup>3</sup>/day  
1 gallon/minute (UK) = 6.55 m<sup>3</sup>/day

**HYDRAULIC STRIPPING:**

Is hydraulic stripping proposed?

(20)

☒ Yes (complete boxes 21 through 26)

☐ No (proceed to box 27)

What is the minimum distance between the hydraulic stripping and the nearest watercourse? 3 m

(21)

There has been the use of historic hydraulic stripping along much of the Carmack Fork claims. Hydraulicing along Carmack Fork will focus on continuing mining upstream on the creek bottom and the marginal benches. Hydraulicing will be used more liberally for stripping of the low level valley side benches of the tributaries included in the this application. The distance from the hydraulicing operation in the valley to the creek is only meters with the creek channel being used for conduiting effluent downstream to out of stream settling facilities located in historically mined out areas of Carmack Fork. The bench mining program will be using hydraulicing and these areas are located 30+ meters from a water course. In instances where the creek and mine cut is too tight, the creek will be diverted to isolate the flow from the active mine areas.

List the grant numbers where hydraulic stripping will occur:

(22)

Potentially all claims.

Describe the material that will be hydraulically stripped:

(23)

Much of the property has extensive areas that either display a north facing aspect, or at least, experiences significant shading by the well incised topography of the region. The effect is widespread permafrost outside of the creek floodplains that must be processed accordingly. To initiate new mine cuts, the applicant plans to first 'rip' and bulldoze the frozen black muck early in the spring while the surface remains frozen. What is left in the cut are gravels & colluvial rock all mixed with a heavy concentration of mud and fines. Hydraulicing removes the high mud concentration in the paygravels and reduces the volume of materials that have to go through the sluice plant. The hydraulicing of the bench mine cuts will remove frozen black muck and gravels from the large hillside boulders that have sloughed down the hillside into the mine cut. In the tributary mine cuts the frozen black muck is ripped and stacked into ramps by a dozer. The remaining silt layered gravels, cobbles and boulders are hydrauliced to reduce the volume of paygravels that will be sluiced. All of the hydraulicing is started after spring freshet.

Where will the stripped material be settled?

(24)

Carmack Fork mine cuts - the effluent produced during hydraulic monitoring of the mainstream Carmack Fork valley mine cuts will be initially pre-settled in a small settling pond adjacent to the water monitor site before being transferred down valley in a pre-excavated ditch to a large out of stream settling pond facility located within the lower claims. Hydraulic monitoring of the lower Carmack Fork claims (Diversion #1: DFO Worksheets) will not involve using the creek as a conduit as the valley space is wide enough to enable the excavation of a separate out of stream 'conduit'. However, mining of the upper Carmack Fork claims (Diversion #2: DFO Worksheets) may involve using the Creek as a conduit as the valley space becomes increasingly limited, eventually removing the ability to create a secondary out of stream conduit or ditch to transfer the effluent downstream to the large stationary out of stream settling ponds.

Carmack Fork valley side bench mine cuts - the effluent from the bench mining hydraulicing program will be directed through pre-settling ponds located adjacent to the water monitor site. The partially decanted flow then runs down a excavated ditch to the existing out of stream settling facilities in located in the lower Carmacks Fork settling facility. The treated effluent from these settling ponds will be discharged back to the receiving water via a surface discharge ditch.

Tributary mine cut stripping program- Due to the limited amount of water in the 4 tributaries, water for hydraulicing on these tributaries will be withdrawn from downstream out of stream reservoirs on Carmack Fork where significantly more water is available. Due to inevitable pumping constraints & abilities, available pipe, and the grade

of the tributaries, the upper limits (beyond 5 claim lengths) of Flannery Pup (Diversion #3: DFO Worksheets) or Discovery #3 Pup ( Diversion #5: DFO Worksheets) claims cannot be hydrauliced effectively. In these areas mechanical methods of stripping will be relied upon. The claim lengths of the other north draining tributaries are limited to discovery claims and can be hydrauliced due to their much shorter length and resulting proximity to the high pressure pump and line required for hydraulic monitoring.

During mine cut preparation on the tributary claims, material stripped using hydraulic monitoring (largely frozen black muck) will be initially settled in a presettling pond adjacent to the water monitor site. Partially decanted effluent will then be conduited downstream into a large out of stream settling pond located within the wider valley of Carmack Fork to receive final, complete treatment prior to discharge into the receiving waters. The effluent being discharged is tested for quality weekly.

How will the stripped material be transported to the settling facility?

(25)

Lower Carmack Fork mine cuts (Diversion 1: DFO Worksheets) - the effluent from hydraulic stripping will be initially presettled in a pre settling pond built adjacent to the active water monitoring site then conduited down a secondary out of stream ditch (as opposed to conduited down the Creek channel) to a large out of stream settling pond facility located in the lower reaches of the applicants Carmack Fork claims. There is adequate valley width where the bench mining programs occur to avoid having to use the creek as a conduit. The treated effluent from these settling ponds will be discharged back to the receiving water via a surface discharge ditch.

Carmack Fork valley side benches - the effluent from the bench mining hydraulicing program will be directed through the pre-settling ponds located adjacent to the water monitor site. Partially The decanted flow runs down a pre-excavated ditch to the existing out of stream settling facilities in the Carmack Fork valley. There is adequate valley width where the bench mining programs occur to avoid having to use the creek as a conduit. The treated effluent from these settling ponds will be discharged back to the receiving water via a surface discharge ditch. The effluent being discharged is tested for quality weekly.

Tributary mine cut stripping program – A hydraulicing program will only be used on the lower reaches (approx. 5 claim lengths) of 2 south draining tributaries (Flannery Pup, Discovery #3 Pup) because of the limited water in the drainage and extended length of planned mining up the 2 tributaries. The pump pond for the hydraulicing will be located in the Carmacks Fork valley and will be a combination of water flows from Carmacks Fork and each respective tributary . Once the bulk of the waste overburden is mechanically removed from the active mine cut, monitoring will be used to clean up the paygravels. Transporting of effluent will be accomplished through conduiting downstream to the Carmack Fork valley to out of stream settling facilities. Once the mining moves beyond the effective reach of the hydraulicing program up each tributary, stripping will be done

by accomplished solely through mechanical methods.

Will the water used in hydraulic stripping report to a watercourse? (26)

☐ No

☒ Yes, *If yes, identify the watercourse, and describe how the discharge standard will be met.*

The effluent from the hydraulicing program will be directed through a number of settling ponds that are connected to one another by surface discharge ditches. Ditches are all rip rap lined and have extended gradual tailraces that protect the dams from being washed out. Decanted effluent will report back to Carmack Fork of Bonanza Creek. The effluent being discharged is tested for quality weekly.

#### CREEK AS A CONDUIT:

Will the watercourse channel be used as a conduit to transport effluent? (27)

☐ No, (proceed to box 31)

☒ Yes, (complete boxes 28-30)

What is the valley width where the watercourse will be used as a conduit? (28)

< 80 m

For what distance will be watercourse be used as a conduit? Up to a maximum length<sup>(29)</sup> of 3000 m

Explain why it is necessary to use the creek as a conduit: (30)

Hydraulic stripping of black muck and fine sediment overburden will be utilized on claims located on the tributaries and upper reaches of Carmack Fork which are located high in the drainage and are limited in width. Hydraulic stripping is often the most cost effective method to remove a large amount of uneconomic overburden, particularly black muck. However, due to the limited width of the abovementioned valleys, effluent cannot be settled completely as a large enough settling pond cannot be constructed in the available space. Therefore, the conduiting of effluent downstream to a wider area where a large enough settling pond can be constructed is the most effective strategy.

#### RESERVOIRS: (pump ponds)

Will reservoirs be instream and/or out-of-stream? (check all that apply)

<input checked="" type="checkbox"/> Out-of-Stream Reservoir	Reservoir Dimensions: <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Length:</td> <td style="width: 50%; text-align: right;">30 m</td> </tr> <tr> <td>Width:</td> <td style="text-align: right;">30 m</td> </tr> <tr> <td>Depth:</td> <td style="text-align: right;">4 m</td> </tr> <tr> <td>Freeboard:</td> <td style="text-align: right;">1 m</td> </tr> </table>	Length:	30 m	Width:	30 m	Depth:	4 m	Freeboard:	1 m	(31) Conveyed to the reservoir by: <table style="width: 100%; border-collapse: collapse;"> <tr> <td><input checked="" type="checkbox"/> Gravity (<i>ditch/culvert from the watercourse</i>)</td> </tr> <tr> <td><input checked="" type="checkbox"/> Pump and hose/pipeline</td> </tr> <tr> <td><input type="checkbox"/> Groundwater seepage</td> </tr> </table>	<input checked="" type="checkbox"/> Gravity ( <i>ditch/culvert from the watercourse</i> )	<input checked="" type="checkbox"/> Pump and hose/pipeline	<input type="checkbox"/> Groundwater seepage
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Instream -Dug Outs <input type="checkbox"/> Dugout within the stream channel <input type="checkbox"/> Dugout in the stream bank	Dugout Dimensions: <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Length:</td> <td style="width: 50%; text-align: right;">m</td> </tr> <tr> <td>Width:</td> <td style="text-align: right;">m</td> </tr> <tr> <td>Depth:</td> <td style="text-align: right;">m</td> </tr> </table>	Length:	m	Width:	m	Depth:	m	(32) <input type="checkbox"/> Complete and attach DFO Appendix G1 and G2 worksheets					
Length:	m												
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<input type="checkbox"/> Instream -Dams or Weirs <input type="checkbox"/> Wing Dam <input type="checkbox"/> Cross-Valley Dam <input type="checkbox"/> Weir	Dam or Weir Dimensions: <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Length:</td> <td style="width: 50%; text-align: right;">m</td> </tr> <tr> <td>Height:</td> <td style="text-align: right;">m</td> </tr> <tr> <td>Width at crest:</td> <td style="text-align: right;">m</td> </tr> <tr> <td>Width at base:</td> <td style="text-align: right;">m</td> </tr> <tr> <td>Freeboard:</td> <td style="text-align: right;">m</td> </tr> </table>	Length:	m	Height:	m	Width at crest:	m	Width at base:	m	Freeboard:	m	(33) <input type="checkbox"/> Complete and attach DFO Appendix G1 and G2 worksheets	
Length:	m												
Height:	m												
Width at crest:	m												
Width at base:	m												
Freeboard:	m												
<div style="display: flex; justify-content: space-between;"> <b>Construction method and materials:</b> <span>(34)</span> </div> <p><b><u>A series of reservoir/recycle/pump pond will be used in order to facilitate the mining of the proponents claims. In general, reservoirs will be placed within the mainstem Carmack Fork valley in order to take advantage of the increased level of available water.</u></b></p> <p><b><u>Reservoirs/recycle/pump ponds will be the final component in a chain of water use infrastructure designed to recycle as much as 80% of the treated effluent discharged from the settling ponds. Reservoirs will consist of an excavated ~30 x 30 x 4m pit at the end of the settling facility surrounded by perimeter berms around the reservoir will be constructed using abundant coarse &amp; fine tailings from historic mining operations, and a portion of the sediment excavated during construction. When the berms are being constructed, the materials being hauled in are laid down in 1 meter thick layers or lifts. The lifts are then compacted by the use of a dozer and excavator before another lift is added. The remainder of the excavated sediment and vegetative layers will be stockpiled for reclamation. Lastly, a an open-ended surface ditch will be constructed that connects the Carmack Fork watercourse and the reservoir/recycle/pump pond. This surface ditch will have a plug of material left in place, separating creek flow from the reservoir when the facility is not in use. This plug will be replaced at the end of every mining season, and removed after spring freshet as mining operations commence. When water levels in the reservoir/recycling/pump pond fall, the negative pressure differential will divert make-up water from Carmack Fork into the reservoir through the open-ended surface ditch until the water level in the creek and reservoir facility is equal.</u></b></p>													

Will a bypass be constructed at seasonal closure in preparation for spring freshet? (35)

☐ Yes

☒ No The out of stream ponds are isolated by filling in the "plug" and effectively ceasing flow through the open ended surface ditch that connects the watercourse and the water use infrastructure.

What measures will be taken to ensure that spring freshet does not washout the out-of-stream reservoirs and/or intake structures? (36)

The out-of-stream reservoir/recycling/pump pond will be connected to the Carmack Fork channel with an open ended ditch. Typically, these ditches and out-of-stream reservoirs/recycle/pump ponds are used for a number of consecutive years until the immediate area is mined out. In the fall of each year of active mining, a plug of material is replaced into the open ended ditch that connects the out of stream reservoir to the watercourse. The replacement materials are ones that were originally removed from the ditch during excavation. If the ditch and connecting reservoir/recycling/pump pond is not expected to be re-used in the future, the entire ditch is backfilled by the dozer during grading and contouring of the disturbed areas in preparation to abandon the site once the rehabilitation has been completed.

Additionally, if required, the creek may be diverted to the opposing margin (in relation to the reservoirs and water use infrastructure) of the drainage in order to keep it directed away from the ponds. To ensure the watercourse is isolated from the mine site, a thick protective berm constructed of coarse tailings and locally available rip rap will separate the diverted channel and the out-of-stream settling facilities. The banks of the proposed channel diversion adjacent to the proposed out-of-stream settling and reservoir facilities will be armoured with rip rap and coarse washed tailings in order to guarantee that flow is constrained during high water events.

☐ Complete and attach DFO Appendix B worksheet,  
(For any work proposed in the riparian zone to access the watercourse for water withdrawal)

☒ Provide details of the instream/out-of-stream reservoirs on sketch of the mining site plan.

#### WATER FOR SLUICING:

How will you get supply water from the reservoir to the sluice plant? (37)

☐ Intake ditch – gravity fed

☐ Culvert – gravity fed

☒ Pump and hose/pipeline

☐ Other: \_\_\_\_\_

**SETTLING FACILITIES:**

**Are you proposing to use instream and/or out-of-stream settling facilities?** (38)

- ☐ **Instream** (complete boxes 39-46)  
☒ **Out-of-stream** (complete boxes 47-52)

- ☒ Provide details on the sketch of the mining site plan  
☐ Complete and attach DFO workbook Appendix B, for any work proposed in the riparian zone to construct instream settling ponds, intake structures, or discharge structures

**INSTREAM SETTLING:**

**Please describe the instream settling facilities, and explain why they must be instream:** (39)  
*N/A*

**What percentage of the stream flow is directed through the settling ponds?** (40)  
*N/A %*

**How wide is the valley instream settling ponds are required?** *N/A m* (41)

**How will you ensure the stability of your instream settling ponds?** (42)  
*N/A*

**Will settling ponds be cleaned out during the mining season?** (43)  
☒ No  
☐ Yes, *If yes, where will the sludge/ fines be placed?*

**For the instream settling facility, describe the design and construction of the structure at the final point of control (ex. culvert, spillway, pipe) including dimensions:** (44)  
*N/A*

**Will there be a bypass channel built to direct spring freshet around the settling ponds at seasonal closure?** (45)  
☐ Yes, *If yes, describe the dimensions and construction:*  
*N/A*

☒ No, *Ponds will be reclaimed at the end of each season (spring freshet cannot be routed through work areas).*

**Describe how ponds will be reclaimed to ensure that sediment is not mobilized during spring freshet:** (46)



## OUT-OF-STREAM SETTLING:

Will settling facilities remain in one place, or move as mining progresses? (47)

☐ Remain in place on grant number(s):

☒ Move as mining progresses on grant numbers:

The out of stream settling ponds/reservoir will most likely be located within the mainstem Carmack Fork valley where the width is wide enough to permit the construction of adequate size settling ponds. As mining progresses upstream of the main Fork and on the tributaries (effluent from the tributaries hydraulicing program will also be partially settled in the mainstem Carmack Fork settling ponds), new more proximal settling ponds may be constructed. Paygravels extracted during mining of claims on the tributary will be trucked to the main stem Carmack Fork valley and sluiced at the facilities there, rather than processing them within the smaller tributary valleys where space and water are limited.

Will there be a surface discharge from the settling pond to a watercourse? (48)

☒ Yes, If yes, describe the design and construction of the structure (ex. ditch, culvert, pipe, other, including dimensions):

Decanted effluent from the last pond drains through a surface discharge ditch and into a reservoir/recycling/pump pond. If there is a positive water pressure differential in this pond, then there is discharge to the receiving waters. If there is a negative pressure in this pond, then water flows from the receiving waters back into the pond as make-up water for the sluicing operation. The open ended ditch that connects the pump pond to the receiving waters has been excavated by back hoe and is rip rap lined with coarse rock. The operation expects to achieve an 80% water recycling rate. This ditch is sealed off from the receiving waters with a plug of sediment at the end of each mining season to avoid spring freshet washouts. The surface discharge ditches are rip rapped with coarse dredge tailings to prevent erosion.

☐ No, If no, please confirm that 100% recycling will occur:

N/A

Could there be discharge from the settling facilities to a watercourse through seepage? (49)

☒ No

☐ Yes, If yes, please explain, including identifying the watercourse:

There may be some seepage to ground water/water table, but volumes would be very small. The settling facilities consist of a number of settling ponds that

ponds drain from one to another by way of surface discharge ditches. The surface discharge ditches are rip rapped with coarse previously washed coarse tailings to prevent erosion. The flow from the last pond drains through a surface discharge ditch and into a recycling/recirculation/pump pond. If there is positive water pressure in this pond then there is a flow back to the receiving waters. If there is a negative pressure in this pond then water flows from the receiving waters back into the pond. The open ended ditch that connects the pump pond to the receiving waters has been excavated by the back hoe and is rip rap lined with coarse tailings rock. This ditch is sealed off at the end of each mining season to avoid spring freshet wash outs.

How will you ensure the stability of your settling ponds?

(50)

The creek will be diverted to the opposite side of the valley and the diversion banks will be well armoured with rip rap to prevent lateral migration and potential damage of the settling facilities. The water use facilities are located well away from the creek channel towards the opposite side of the valley, and are typically elevated above the bottom of the valley floodplain. have existed for many years. Ponds will have a protective berms of coarse washed tailing separating the ponds from the creek and the settling pond berms will be well constructed; the materials being hauled in are laid down in 1 meter thick layers or lifts. The lifts are then compacted by the use of a dozer and excavator before another lift is added. The surface ditch that connects the reservoir to the creek is sealed off at the end of each mining season to avoid wash outs caused by spring freshet.

Will settling ponds be cleaned out during the mining season?

(51)

- ☒ No  
☐ Yes, If yes, where will the sludge/fines be placed?

The out of stream settling ponds have volume capabilities in excess of the fine tailings that are expected to be produced by the mining operation over the 3-4 year expected life cycle of each settling facility while mining slowly progresses upstream.

If the ponds do need to be cleaned during the course of the season, sludge will stored for use as topping to promote revegetation during the reclamation program. Fine tailings may be used for topping and road maintenance if removed from the settling ponds.

What measures will be taken to ensure that spring freshet and flood events do not washout settling ponds or intake structures?

(52)

See the answer to Question #50 above.

## DIVERSIONS:

**Are you constructing diversions?**

(53)

- ☐ No, (proceed to box 57)  
☒ Yes, (complete box 54-56)

*Refer to the DFO Fish Habitat Design, Operation and Reclamation Workbook and Worksheets prior to completing this section*

**Will diversions be:** (check all that apply)

(54)

- ☐ Seasonal, (in place for one mining season or less)  
☒ Temporary, (in place for more than one mining season, up to five years)  
☒ Permanent, (in place for six years or more)

*Note: - seasonal and temporary diversions will usually require a permanent restoration channel  
- end of season bypass channels around instream settling facilities are not considered diversions and do not require worksheets to be completed*

**What is the total length of the existing watercourse(s) that will be diverted?**

(55)

*Up to seven separate diversions ( #1-7: DFO Worksheets, Appendix 6) will be utilized. A series of short intermittent diversions will likely be used in each circumstance while mining is ongoing. However, once mining has been completed, the large majority of the watercourse length in every claim may have been diverted to facilitate and enable the mining process.*

*Six different watercourses will be diverted: Carmack Fork (2 separate Diversions: Upper and Lower (1-2), Flannery Pup (#3), Discovery 3 Pup (#4), Discovery 4 Pup (#5), Discovery B Pup (#6), Discovery W Pup (#7).*

**List the claims that the diversion(s) will be located on, by grant numbers:**

(56)

*The proposed diversions may involve 54 claims included in this application. (See Appendix 1). Three 1<sup>st</sup> tier limit bench claims on Carmack Fork will not have diversions ( P 517629-631) as they are located well away and above the watercourse.*

*Six different watercourses will be diverted: Carmack Fork (2 separate Diversions: Upper and Lower (1-2), Flannery Pup (#3), Discovery 3 Pup (#4), Discovery 4 Pup (#5), Discovery B Pup (#6), Discovery W Pup (#7).*

- ☒ Provide details on the sketch of the mining site plan  
☒ Complete and attach DFO workbook Appendices

## WATERCOURSE CROSSINGS:

Will you be crossing a watercourse? (Applies to on-claim crossings only)

(57)

☐ No, (Proceed to box 92)

☒ Yes, If yes will the crossings be by:

☒ Ford(s) (complete boxes 58-66)

☐ Bridge(s) (complete boxes 67-75)

☐ Culvert(s) (complete boxes 75-83)

☐ Other Crossing Type, including pipelines, (complete boxes 84-91)

☒ Indicate the location of all watercourse crossings on the sketch of the mining site plan

**FORDS:** (If your project includes more than one ford, attach additional pages as necessary.)

Watercourse Name: Carmack Fork

Ford 1-6 of 15 (58)

Grant number(s) where ford will be located: (59)

"Claim 2": P 43555: Ford 1- Existing ford

"Claim 5": P 43558: Ford 2- Existing ford

"Claim 12": P 43565: Ford 3- NEW FORD

"Claim 19": P 43572: Ford 4- Existing ford

"Claim 4": P 517379: Ford 5- NEW FORD

"Claim 9": 517384: Ford 6- NEW FORD

How frequently will the ford be used? (60)

(include a description of equipment that will be using the ford)

The Carmack Fork valley access road extends most the length of the claim block along the right limit. If a particular active mine site needs to be accessed, the employees tend to use this gazetted road as much as possible and drop back down to the access road in the valley once they near the active mine site. This results in limited ford crossings and creek fording's being limited to one at a time rather than several fords each time the vehicles need travel up and down the drainage.

Fords at "Claim 12": P 43565 (Ford 2) and "Claim 19": P 43572: (Ford 4) will be used only when mining occurs on Discovery B Pup and Discovery W Pup respectively. Fords at "Claim 2": P 43555: (Ford 1), "Claim 12": P 43565: (Ford 3), "Claim 4": P 517379: (Ford 5), and "Claim 9": P 517384: (Ford 6) will only be used when mining is occurring on the left limit of Carmack Fork, opposite of the existing access road.

When mining requires the use of a ford, daily crossings will be limited to foot and ATV traffic that will cross 2 times a day. Every third day a company pickup used to refuel the heavy equipment will cross the ford to access mining operations when at the right margin of the valley and above on the right limit first tier bench claims. Once every second week the company service truck is expected to cross the ford to conduct routine heavy equipment

*maintenance. The heavy equipment will cross the ford 1-2 times during the course of a mining season. Once in the spring when in transit between the nearby camp and mine maintenance yard, and potentially once in the fall while making the return trip between the two locations. Hover, heavy equipment may or may not be left to overwinter on the opposite side of the creek, depending on the maintenance schedule.*

What is the height of the banks of the watercourse at the ford location? 1-1.5 m (61)

The ford (s) are: (62)

- ☒ Existing (if existing, skip to box 66), or
- ☒ To be constructed? (if a new ford, complete the following questions)

Describe how the ford will be constructed, and methods to control the release of sediment during construction: (63)

*Ford construction will begin late in the mining season during low seasonal water flows of Carmack Fork. An excavator situated upon the banks of the new, dry diversion channel will be used to remove the vegetative material and overburden from each bank in order to create a safe, smooth gradient. A dump truck will haul nearby historical coarse, cobble-sized tailings to each bank of the ford to be used as road topping to smooth the gradient of the approaches into the ford. This material will also limit erosion of the bank material into Carmack Fork by creating a protective mat (~20 cm thick) over the approaches.*

Describe the stream bed material, stream bank material, and stream bank vegetation at the ford location: (64)

*Stream bed material the proposed new ford locations (Fords 3 & 5) is dominantly medium cobble-sized rock, with secondary and tertiary portions of gravel and sand. From the surface down, stream bank material consists of a 20-30 cm vegetative mat (dominantly birch, trembling aspen, with grassy and 'buckbrush' undergrowth). Underlying sediment consists of a ~ 25 cm horizon of organics and humic matter, underlain by 3-4 m of small cobble fluvial material.*

Provide a schedule for ford construction: (65)

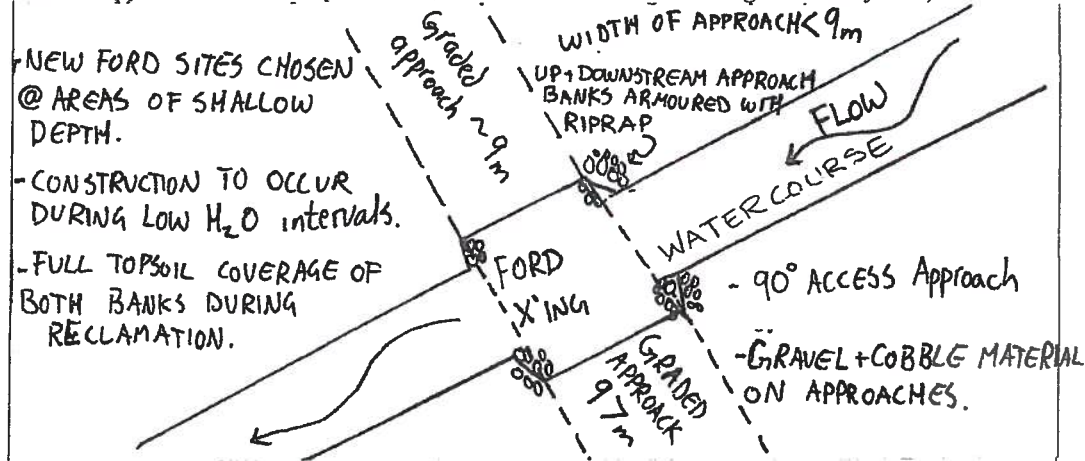
*Ford construction will begin late in the mining season prior to winter freeze up during low seasonal water flows of Carmack Fork. The ford will be in place before water is diverted into the proposed diversion channel, during the later stages of the proposed 10-year water*

license once the northern (right limit) margin of the property has been mined.

### Ford Cross Section:

(66)

(Include approaches, erosion protection, and watercourse levels at high and low flows.)



☒ Complete and attach DFO workbook Appendix B.

**FORDS:** (If your project includes more than one ford, attach additional pages as necessary.)

Watercourse Name: Flannery Pup Ford 7-9 of 15 (58)

Grant number(s) where ford will be located: (59)

"Claim 4": P 43557: Ford 7- Existing Ford

"Claim 1": P 518162: Ford 8- Existing Ford

"Claim 5": P 518166: Ford 9- NEW FORD

How frequently will the ford be used? (60)

(include a description of equipment that will be using the ford)

The Flannery Pup valley access road extends most the length of the claim block along the left limit. If a particular active mine site needs to be accessed along Flannery Pup, the employees tend to use this gazetted road as much as possible and drop back down to the access road in the valley once they near the active mine site. This results in limited ford crossings and creek fording's being limited to one at a time rather than several fords each time the vehicles need travel up and down the drainage.

Ford 7 is an existing ford located shortly upstream of the confluence of Carmack Fork and Flannery Pup. Ford 7 is part of the Carmack Fork valley access road and will be used often

## WATERCOURSE CROSSINGS:

**X** Indicate the location of all watercourse crossings on the sketch of the mining site plan

**FORDS:** *(If your project includes more than one ford, attach additional pages as necessary.)*

**Watercourse Name:** **Flannery Pup** **Ford #** 3 **of** 3 (58)

**Grant number(s) where ford will be located:** (59)

**Ford #1 – P 518164 (Claim #3) -**

**Ford #2 – P 518168 (Claim #7) -**

**Ford #3 – P 518169 (Claim #8) -**

**How frequently will the ford be used?** (60)

*(include a description of equipment that will be using the ford)*

**Ford #1 – P 518164 (Claim #3) – this ford will be used only when there is an active mining program occurring on the top half of Flannery Pup. When the ford is in use it will be crossed 3 to 4 times per day in each direction by employees in company pick-up trucks. Heavy machinery will use the crossing about 1 time per month when they are being located to the active cut or being removed for maintenance or winter storage from the active cut.**

**Ford #2 – P 518168 (Claim #7) - this ford will be used only when there is an active mining program occurring on the top half of Flannery Pup. When the ford is in use it will be crossed 3 to 4 times per day in each direction by employees in company pick-up trucks. Heavy machinery will use the crossing about 1 time per month when they are being located to the active cut or being removed for maintenance or winter storage from the active cut.**

**Ford #3 – P 518169 (Claim #8) - this ford will be used only when there is an active mining program occurring on the top half of Flannery Pup. When the ford is in use it will be crossed 3 to 4 times per day in each direction by employees in company pick-up trucks. Heavy machinery will use the crossing about 1 time per month when they are being located to the active cut or being removed for maintenance or winter storage from the active cut.**

**What is the height of the banks of the watercourse at the ford location?** 0.75 m (61)

**Flannery Pup has very uniform dimensions and soil composition. The largest percentage of material in the Pup is small to medium sized cobbles. All rock is rounded river rock and little to no flat and slabby slide rock.**

**The ford (s) are:**

(62)

- ☒ Existing (if existing, skip to box 66), or  
☐ To be constructed? (if a new ford, complete the following questions)

**Describe how the ford will be constructed, and methods to control the release of sediment during construction:**

(63)

N/A.

**Describe the stream bed material, stream bank material, and stream bank vegetation at the ford location:**

(64)

The creek bed of the watercourse crossing is a combination of small to medium cobbles mixed with sand and gravel. In areas if the watercourse where there is an organic topping there is some deciduous tree coverage. If there is little to no organic topping there is only willow and buckbrush coverage. All fords are existing.

**Provide a schedule for ford construction:**

(65)

N/A.

**Ford Cross Section:**

(66)

*(Include approaches, erosion protection, and watercourse levels at high and low flows.)*

**See previous ford crossing plan view**

☒ Complete and attach DFO workbook Appendix B.



trembling aspen, with grassy and 'buckbrush' undergrowth). Underlying sediment consists of a ~ 30 cm horizon of organics and humic matter, underlain by 3 m of small cobble fluvial material.

Provide a schedule for ford construction:

(65)

Ford construction will begin late in the mining season prior to winter freeze up during low seasonal water flows of Flannery Pup. The ford will be in place before water is diverted into the proposed diversion channel, during the later stages of the proposed 10-year water license once the western (left limit) margin of the property has been mined.

**Ford Cross Section:**

(66)

*(Include approaches, erosion protection, and watercourse levels at high and low flows.)*

See the site plans of the previous ford crossing description.

☒ Complete and attach DFO workbook Appendix B.

**FORDS:** *(If your project includes more than one ford, attach additional pages as necessary.)*

Watercourse Name: Discovery 3 Pup Ford 10-11 of 15 (58)

Grant number(s) where ford will be located: (59)

"Claim 6": P 43559: Ford 10- Existing Ford

"Carol" : P 518569: Ford 11- NEW FORD

**How frequently will the ford be used?**

(60)

*(include a description of equipment that will be using the ford)*

The Discovery 3 Pup valley access trail extends most the length of the claim block along the left limit of the Pup. If a particular active mine site needs to be accessed along Discovery 3 Pup, the employees tend to use this gazetted road as much as possible and drop back down to the access road in the valley once they near the active mine site. This results in limited ford crossings and creek fordings being limited to one at a time rather than several fords each time the vehicles need travel up and down the drainage.

Ford 10 is an existing ford located shortly upstream of the confluence of Carmack Fork and Discovery 3 Pup. Ford 10 is part of the Carmack Fork valley access road and will be used often once the mining progresses above P 43559, regardless of what side of Carmack Fork is being mined upstream.

Fords 11 across to the right limit of Discovery 3 Pup will only be utilized when mining is occurring on the opposing side of the Pup on the right limit. When mining is occurring on the left limit of the Pup fords across to the opposite right limit will not be in use.

When mining requires the use of a ford, daily crossings will be limited to foot and ATV traffic that will cross 2 times a day. Every third day a company pickup used to refuel the heavy equipment will cross the ford to access mining operations when at the right margin of the valley and above on the right limit first tier bench claims. Once every second week the company service truck is expected to cross the ford to conduct routine heavy equipment maintenance. The heavy equipment will cross the ford 1-2 times during the course of a mining season. Once in the spring when in transit between the nearby camp and mine maintenance yard, and potentially once in the fall while making the return trip between the two locations. Hover, heavy equipment may or may not be left to overwinter on the opposite side of the creek, depending on the maintenance schedule.

**What is the height of the banks of the watercourse at the ford location?** 1-1.5 m (61)

**The ford (s) are:**

(62)

- ☒ Existing *(if existing, skip to box 66), or*
- ☒ To be constructed? *(if a new ford, complete the following questions)*

**Describe how the ford will be constructed, and methods to control the release of sediment during construction:** (63)

Ford 11 construction will begin late in the mining season during low seasonal water flows of Discovery 3 Pup. An excavator situated upon the banks of the new, dry diversion channel will be used to remove the vegetative material and overburden from each bank in order to create a safe, smooth gradient. A dump truck will haul nearby historical coarse, cobble-sized tailings to each bank of the ford to be used as road topping to smooth the gradient of the

approaches into the ford. This material will also limit erosion of the bank material into Discovery 3 Pup by creating a protective mat (~20 cm thick) over the approaches.

**Describe the stream bed material, stream bank material, and stream bank vegetation** (64)  
**at the ford location:**

Stream bed material the proposed new ford location (Ford 11) is dominantly medium cobble-sized rock, with secondary and tertiary portions of gravel and sand. From the surface down, stream bank material consists of a 20-30 cm vegetative mat (dominantly birch, trembling aspen, with grassy and 'buckbrush' undergrowth). Underlying sediment consists of a ~ 30 cm horizon of organics and humic matter, underlain by 3 m of small cobble fluvial material.

**Provide a schedule for ford construction:** (65)

Ford construction will begin late in the mining season prior to winter freeze up during low seasonal water flows of Discovery 3 Pup. The ford will be in place before water is diverted into the proposed diversion channel, during the later stages of the proposed 10-year water license once the western (left limit) margin of the property has been mined.

**Ford Cross Section:**

(Include approaches, erosion protection, and watercourse levels at high and low flows.)

(66)

See the site plans of the Carmack Ford crossing description for image of standard ford crossing to be used on site.

☒ Complete and attach DFO workbook Appendix B.

**FORDS:** (If your project includes more than one ford, attach additional pages as necessary.)

Watercourse Name: Discovery 4 Pup Ford 12-13 of 15 (58)

Grant number(s) where ford will be located: (59)

"Claim 19": P 43572: Ford 12- Existing Ford

"TT#1" : P 517389: Ford 13- NEW FORD

How frequently will the ford be used? (60)

(include a description of equipment that will be using the ford)

The Discovery 4 Pup valley access trail extends most the length of the claim block along the left limit of the Pup. If a particular active mine site needs to be accessed along Discovery 4 Pup, the employees tend to use this gazetted road as much as possible and drop back down to the access road in the valley once they near the active mine site. This results in limited ford crossings and creek fordings being limited to one at a time rather than several fords each time the vehicles need travel up and down the drainage.

Ford 12 is an existing ford located shortly upstream of the confluence of Carmack Fork and Discovery 4 Pup. Ford 12 is part of the Carmack Fork valley access road and will be used often once the mining progresses above P 43572, regardless of what side of Carmack Fork is being mined upstream.

Fords 13 which will provide across to the right limit of Discovery 4 Pup will only be utilized when mining is occurring on the opposing side of the Pup on the right limit. When mining is occurring on the left limit of the Pup fords across to the opposite right limit will not be in use.

When mining requires the use of a ford, daily crossings will be limited to foot and ATV traffic that will cross 2 times a day. Every third day a company pickup used to refuel the heavy equipment will cross the ford to access mining operations when at the right margin of the valley and above on the right limit first tier bench claims. Once every second week the company service truck is expected to cross the ford to conduct routine heavy equipment maintenance. The heavy equipment will cross the ford 1-2 times during the course of a mining season. Once in the spring when in transit between the nearby camp and mine maintenance yard, and potentially once in the fall while making the return trip between the two locations. However, heavy equipment may or may not be left to overwinter on the opposite side of the creek, depending on the maintenance schedule.

What is the height of the banks of the watercourse at the ford location? 1-1.5 m (61)

**The ford (s) are:**

(62)

- ☒ Existing (if existing, skip to box 66), or
- ☒ To be constructed? (if a new ford, complete the following questions)

**Describe how the ford will be constructed, and methods to control the release of sediment during construction:**

(63)

Ford 13 construction will begin late in the mining season during low seasonal water flows of Discovery 4 Pup. An excavator situated upon the banks of the new, dry diversion channel will be used to remove the vegetative material and overburden from each bank in order to create a safe, smooth gradient. A dump truck will haul nearby historical coarse, cobble-sized tailings to each bank of the ford to be used as road topping to smooth the gradient of the approaches into the ford. This material will also limit erosion of the bank material into Discovery 4 Pup by creating a protective mat (~20 cm thick) over the approaches.

**Describe the stream bed material, stream bank material, and stream bank vegetation at the ford location:**

(64)

Stream bed material the proposed new ford location (Ford 12) is dominantly medium cobble-sized rock, with secondary and tertiary portions of gravel and sand. From the surface down, stream bank material consists of a 20-30 cm vegetative mat (dominantly birch, trembling aspen, with grassy and 'buckbrush' undergrowth). Underlying sediment consists of a ~ 30 cm horizon of organics and humic matter, underlain by 3 m of small cobble fluvial material.

**Provide a schedule for ford construction:**

(65)

Ford construction will begin late in the mining season prior to winter freeze up during low seasonal water flows of Discovery 4 Pup. The ford will be in place before water is diverted into the proposed diversion channel, during the later stages of the proposed 10-year water license once the northwestern (left limit) margin of the property has been mined.

**Ford Cross Section:**

(66)

*(Include approaches, erosion protection, and watercourse levels at high and low flows.)*

See the site plans of the Carmack Ford crossing description for image of standard ford crossing to be used on site.

☒ Complete and attach DFO workbook Appendix B.

**FORDS:** *(If your project includes more than one ford, attach additional pages as necessary.)*

**Watercourse Name:** Discovery B Pup **Ford** 14 **of** 15 (58)

**Grant number(s) where ford will be located:** (59)

"Discovery B": P 517388: Ford 14- NEW FORD

**How frequently will the ford be used?** (60)

*(include a description of equipment that will be using the ford)*

Discovery B Pup contains 1 discovery placer claim. Access to this left limit tributary of Carmack Fork is provided by crossing Carmack Fork at "Claim 12": P 43565 (Ford 3). This ford will cross Carmack Fork shortly upstream of the confluence with Discovery B Pup. When mining occurs on the opposite, downstream side (left limit) of Discovery B Pup, Ford 14 will be utilized. When not mining the left limit of Discovery B Pup, the ford will not be in use.

When mining requires the use of a ford, daily crossings will be limited to foot and ATV traffic that will cross 2 times a day. Every third day a company pickup used to refuel the heavy equipment will cross the ford to access mining operations when at the right margin of the valley and above on the right limit first tier bench claims. Once every second week the company service truck is expected to cross the ford to conduct routine heavy equipment maintenance. The heavy equipment will cross the ford 1-2 times during the course of a mining season. Once in the spring when in transit between the nearby camp and mine maintenance

yard, and potentially once in the fall while making the return trip between the two locations. However, heavy equipment may or may not be left to overwinter on the opposite side of the creek, depending on the maintenance schedule.

What is the height of the banks of the watercourse at the ford location? 1-1.5 m (61)

The ford (s) are: (62)

- ☐ Existing (if existing, skip to box 66), or  
☒ To be constructed? (if a new ford, complete the following questions)

Describe how the ford will be constructed, and methods to control the release of sediment during construction: (63)

Ford 14 construction will begin late in the mining season during low seasonal water flows of Discovery B Pup. An excavator situated upon the banks of the new, dry diversion channel will be used to remove the vegetative material and overburden from each bank in order to create a safe, smooth gradient. A dump truck will haul nearby historical coarse, cobble-sized tailings to each bank of the ford to be used as road topping to smooth the gradient of the approaches into the ford. This material will also limit erosion of the bank material into Discovery B Pup by creating a protective mat (~20 cm thick) over the approaches.

Describe the stream bed material, stream bank material, and stream bank vegetation at the ford location: (64)

Stream bed material the proposed new ford location (Ford 14) is dominantly medium cobble-sized rock, with secondary and tertiary portions of gravel and sand. From the surface down, stream bank material consists of a 20-30 cm vegetative mat (dominantly birch, trembling aspen, with grassy and 'buckbrush' undergrowth). Underlying sediment consists of a ~ 30 cm horizon of organics and humic matter, underlain by 3 m of small cobble fluvial material.

Provide a schedule for ford construction: (65)

Ford construction will begin late in the mining season prior to winter freeze up during low seasonal water flows of Discovery B Pup. The ford will be in place before water is diverted into the proposed diversion channel, during the later stages of the proposed 10-year water license once the northwestern (right limit) margin of the property has been mined.

**Ford Cross Section:**

(66)

*(Include approaches, erosion protection, and watercourse levels at high and low flows.)*

See the site plans of the Carmack Ford crossing description for image of standard ford crossing to be used on site.

☒ Complete and attach DFO workbook Appendix B

**FORDS:** *(If your project includes more than one ford, attach additional pages as necessary.)*

**Watercourse Name:** Discovery W Pup Ford 15 of 15 (58)

**Grant number(s) where ford will be located:** (59)

"Discovery W": P 517388: Ford 15- NEW FORD

**How frequently will the ford be used?** (60)  
*(include a description of equipment that will be using the ford)*

Discovery W Pup contains 1 discovery placer claim. Access to this left limit tributary of Carmack Fork is provided by crossing Carmack Fork at "Claim 19": P 43565 (Ford 4). This ford will cross Carmack Fork shortly upstream of the confluence with Discovery W Pup. When mining occurs on the opposite, downstream side (left limit) of Discovery W Pup, Ford 15 will be utilized. When not mining the left limit of Discovery W Pup, the ford will not be in use.

When mining requires the use of a ford, daily crossings will be limited to foot and ATV traffic that will cross 2 times a day. Every third day a company pickup used to refuel the heavy equipment will cross the ford to access mining operations when at the right margin of the valley and above on the right limit first tier bench claims. Once every second week the company service truck is expected to cross the ford to conduct routine heavy equipment maintenance. The heavy equipment will cross the ford 1-2 times during the course of a mining season. Once in the spring when in transit between the nearby camp and mine maintenance yard, and potentially once in the fall while making the return trip between the two locations.



However, heavy equipment may or may not be left to overwinter on the opposite side of the creek, depending on the maintenance schedule.

What is the height of the banks of the watercourse at the ford location? 1-1.5 m (61)

The ford (s) are:

(62)

- ☐ Existing (if existing, skip to box 66), or  
☒ To be constructed? (if a new ford, complete the following questions)

Describe how the ford will be constructed, and methods to control the release of sediment during construction: (63)

Ford 15 construction will begin late in the mining season during low seasonal water flows of Discovery W Pup. An excavator situated upon the banks of the new, dry diversion channel will be used to remove the vegetative material and overburden from each bank in order to create a safe, smooth gradient. A dump truck will haul nearby historical coarse, cobble-sized tailings to each bank of the ford to be used as road topping to smooth the gradient of the approaches into the ford. This material will also limit erosion of the bank material into Discovery W Pup by creating a protective mat (~20 cm thick) over the approaches.

Describe the stream bed material, stream bank material, and stream bank vegetation at the ford location: (64)

Stream bed material the proposed new ford location (Ford 15) is dominantly medium cobble-sized rock, with secondary and tertiary portions of gravel and sand. From the surface down, stream bank material consists of a 20-30 cm vegetative mat (dominantly birch, trembling aspen, with grassy and 'buckbrush' undergrowth). Underlying sediment consists of a ~ 30 cm horizon of organics and humic matter, underlain by 3 m of small cobble fluvial material.

Provide a schedule for ford construction: (65)

Ford construction will begin late in the mining season prior to winter freeze up during low seasonal water flows of Discovery W Pup. The ford will be in place before water is diverted into the proposed diversion channel, during the later stages of the proposed 10-year water license once the northwestern (right limit) margin of the property has been mined.

**Ford Cross Section:**

(66)

*(Include approaches, erosion protection, and watercourse levels at high and low flows.)*

See the site plans of the Carmack Ford crossing description for image of standard ford crossing to be used on site.

☒ Complete and attach DFO workbook Appendix B

**BRIDGES:** *(If your project includes more than one bridge, attach additional pages as necessary.)*

Watercourse Name:	Bridge #	of	(67)
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What is the width of the creek where you propose to construct a bridge: ____m	(68)
---	------

Grant number(s) where bridge will be located:	(69)
---	------

At high flow, what is the vertical distance between the watercourse and the bottom of the bridge?	(70)
---	------

What are the dimensions of the bridge?	(71)
--	------

Describe the bridge design and construction, including deck material, abutment material, modifications to the bed or banks of the watercourse, and methods to control the release of sediment during construction or placement:	(72)
---	------

Describe the stream bed material, stream bank material, and stream bank vegetation at the bridge location:	(73)
--	------

Provide a schedule for bridge construction:	(74)
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**WATERCOURSE CROSSINGS:**

**X** Indicate the location of all watercourse crossings on the sketch of the mining site plan

**FORDS:** *(If your project includes more than one ford, attach additional pages as necessary.)*

**Watercourse Name:** **Flannery Pup** **Ford #** 3 **of** 3 (58)

**Grant number(s) where ford will be located:** (59)

**Ford #1 – P 518164 (Claim #3) -**

**Ford #2 – P 518168 (Claim #7) -**

**Ford #3 – P 518169 (Claim #8) -**

**How frequently will the ford be used?** (60)

*(include a description of equipment that will be using the ford)*

**Ford #1 – P 518164 (Claim #3) – this ford will be used only when there is an active mining program occurring on the top half of Flannery Pup. When the ford is in use it will be crossed 3 to 4 times per day in each direction by employees in company pick-up trucks. Heavy machinery will use the crossing about 1 time per month when they are being located to the active cut or being removed for maintenance or winter storage from the active cut.**

**Ford #2 – P 518168 (Claim #7) - this ford will be used only when there is an active mining program occurring on the top half of Flannery Pup. When the ford is in use it will be crossed 3 to 4 times per day in each direction by employees in company pick-up trucks. Heavy machinery will use the crossing about 1 time per month when they are being located to the active cut or being removed for maintenance or winter storage from the active cut.**

**Ford #3 – P 518169 (Claim #8) - this ford will be used only when there is an active mining program occurring on the top half of Flannery Pup. When the ford is in use it will be crossed 3 to 4 times per day in each direction by employees in company pick-up trucks. Heavy machinery will use the crossing about 1 time per month when they are being located to the active cut or being removed for maintenance or winter storage from the active cut.**

**What is the height of the banks of the watercourse at the ford location?** 0.75 m (61)

**Flannery Pup has very uniform dimensions and soil composition. The largest percentage of material in the Pup is small to medium sized cobbles. All rock is rounded river rock and little to no flat and slabby slide rock.**

**The ford (s) are:**

(62)

- ☒ **Existing** (if existing, skip to box 66), or  
☐ **To be constructed?** (if a new ford, complete the following questions)

**Describe how the ford will be constructed, and methods to control the release of sediment during construction:**

(63)

N/A.

**Describe the stream bed material, stream bank material, and stream bank vegetation at the ford location:**

(64)

The creek bed of the watercourse crossing is a combination of small to medium cobbles mixed with sand and gravel. In areas of the watercourse where there is an organic topping there is some deciduous tree coverage. If there is little to no organic topping there is only willow and buckbrush coverage. All fords are existing.

**Provide a schedule for ford construction:**

(65)

N/A.

**Ford Cross Section:**

(66)

*(Include approaches, erosion protection, and watercourse levels at high and low flows.)*

**See previous ford crossing plan view**

☒ **Complete and attach DFO workbook Appendix B.**

LOCATION OF EXISTING AND PROPOSED FORD CROSSINGS AND PROPOSED DIVERSIONS OF CARMACK FORK AND TRIBUTARIESLOWER CARMACK FORK CLAIMS

<u>Grant No.</u>	<u>Claim Name</u>	<u>Existing ford</u>	<u>New ford construction proposed</u>	<u>Diversion</u>
P 43554	Claim #1	no	no	Lower Carmack Fork Diversion # 1
P 43555	Claim #2	yes	no	Lower Carmack Fork Diversion # 1
P 43556	Claim #3	no	no	Lower Carmack Fork Diversion # 1
P 43557	Claim #4	no	no	Lower Carmack Fork Diversion # 1
P 43558	Claim #5	yes	no	Lower Carmack Fork Diversion # 1
P 43559	Claim #6	no	no	Lower Carmack Fork Diversion # 1
P 43560	Claim #7	no	no	Lower Carmack Fork Diversion # 1
P 43561	Claim #8	no	no	Lower Carmack Fork Diversion # 1
P 43562	Claim #9	no	no	Lower Carmack Fork Diversion # 1
P 43563	Claim #10	no	no	Lower Carmack Fork Diversion # 1
P 43564	Claim #11	no	no	Lower Carmack Fork Diversion # 1
P 43565	Claim #12	no	yes	Lower Carmack Fork Diversion # 1
P 43566	Claim #13	no	no	Lower Carmack Fork Diversion # 1
P 43567	Claim #14	no	no	Lower Carmack Fork Diversion # 1
P 43568	Claim #15	no	no	Lower Carmack Fork Diversion # 1
P 43569	Claim #16	no	no	Lower Carmack Fork Diversion # 1
P 43570	Claim #17	no	no	Lower Carmack Fork Diversion # 1
P 43571	Claim #18	no	no	Lower Carmack Fork Diversion # 1
P 43572	Claim #19	yes	no	Lower Carmack Fork Diversion # 1
P 43573	Claim #20	no	no	Lower Carmack Fork Diversion # 1
P 43574	Claim #21	no	no	Lower Carmack Fork Diversion # 1

UPPER CARMACK FORK CLAIMS

<u>Grant No.</u>	<u>Claim Name</u>	<u>Existing ford</u>	<u>New ford construction proposed</u>	<u>Diversion</u>
P 517376	Claim #1	no	no	Upper Carmack Fork Diversion # 2
P 517377	Claim #2	no	no	Upper Carmack Fork Diversion # 2
P 517378	Claim #3	no	no	Upper Carmack Fork Diversion # 2
P 517379	Claim #4	no	yes	Upper Carmack Fork Diversion # 2
P 517380	Claim #5	no	no	Upper Carmack Fork Diversion # 2
P 517381	Claim #6	no	no	Upper Carmack Fork Diversion # 2
P 517382	Claim #7	no	no	Upper Carmack Fork Diversion # 2
P 517383	Claim #8	no	no	Upper Carmack Fork Diversion # 2
P 517384	Claim #9	no	yes	Upper Carmack Fork Diversion # 2
P 517385	Claim #10	no	no	Upper Carmack Fork Diversion # 2
P 517386	Claim #11	no	no	Upper Carmack Fork Diversion # 2

FLANNERY PUP CLAIMS

<u>Grant No.</u>	<u>Claim Name</u>	<u>Existing ford</u>	<u>New ford construction proposed</u>	<u>Diversion</u>
P 43575	Co-discovery 1	no	no	Flannery Pup Diversion # 3
P 43576	Co-discovery 2	no	no	Flannery Pup Diversion # 3
P 518162	Claim 1	yes	no	Flannery Pup Diversion # 3
P 518163	Claim 2	no	no	Flannery Pup Diversion # 3
P 518164	Claim 3	yes	no	Flannery Pup Diversion # 3
P 518165	Claim 4	no	no	Flannery Pup Diversion # 3
P 518166	Claim 5	no	yes	Flannery Pup Diversion # 3
P 518167	Claim 6	no	no	Flannery Pup Diversion # 3
P 518168	Claim 7	yes	no	Flannery Pup Diversion # 3
P 518169	Claim 8	yes	no	Flannery Pup Diversion # 3
P 43557	Claim 4	yes	no	Lower Carmack Fork Diversion #1

**DISCOVERY #3 PUP CLAIMS**

<u>Grant No.</u>	<u>Claim Name</u>	<u>Existing ford</u>	<u>New ford construction proposed</u>	<u>Diversion</u>
P 43577	Discovery #3	no	no	Discovery #3 Pup Diversion # 4
P 518568	Ben	no	no	Discovery #3 Pup Diversion # 4
P 518569	Carol	no	yes	Discovery #3 Pup Diversion # 4
P 518570	Marnie	no	no	Discovery #3 Pup Diversion # 4
P 518571	Jayse	no	no	Discovery #3 Pup Diversion # 4
P 518572	Porscha	no	no	Discovery #3 Pup Diversion # 4
P 43559	Claim 6	yes	no	Lower Carmack Fork Diversion #1

**DISCOVERY #4 PUP CLAIMS**

<u>Grant No.</u>	<u>Claim Name</u>	<u>Existing ford</u>	<u>New ford construction proposed</u>	<u>Diversion</u>
P 43578	Discovery #4	no	no	Discovery #4 Pup Diversion # 5
P 517389	TT #1	no	yes	Discovery #4 Pup Diversion # 5
P 517390	TT #2	no	no	Discovery #4 Pup Diversion # 5
P 517391	TT #3	no	no	Discovery #4 Pup Diversion # 5
P 43572	Claim 19	yes	no	Lower Carmack Fork Diversion # 1

**DISCOVERY B PUP CLAIM**

<u>Grant No.</u>	<u>Claim Name</u>	<u>Existing ford</u>	<u>New ford construction proposed</u>	<u>Diversion</u>
P 517388	Discovery B	no	yes	Discovery B Pup Diversion #6

**DISCOVERY W PUP CLAIM**

<u>Grant No.</u>	<u>Claim Name</u>	<u>Existing ford</u>	<u>New ford construction proposed</u>	<u>Diversion</u>
P 517387	Discovery W	no	yes	Discovery W Pup Diversion #7

**Bridge Cross Section:**

(75)

*(Include approaches, erosion protection, bridge structure, and distance from bridge deck to the watercourse.)*☐ Complete and attach DFO workbook Appendix B, for each bridge.**CULVERTS:** *(If your project includes more than one culvert, attach additional pages as necessary.)***Watercourse Name:** N/A **Culvert #** of (76)**Grant number(s) where culvert will be located:** (77)

N/A

**Provide the type, diameter, and length of culvert:** (78)

N/A

**Provide the following watercourse dimensions at the location of the proposed culvert?** (79)

Maximum Depth of Watercourse \_\_\_\_\_

Maximum Width of Watercourse \_\_\_\_\_

**Describe how the culvert will be installed, and methods to control the release of sediment during construction or placement:** (80)

N/A

**Describe the stream bed material, stream bank material, and stream bank vegetation at the culvert location:** (81)

N/A

**Provide a schedule for the culvert installation (time of year):**

(82)

N/A

**Culvert Cross Section:**

(83)

*(Include approaches, erosion protection, culvert structure, and watercourse levels at high and low flows.)*

*Note: - the installation of culverts referred to in this section pertain only to watercourse crossings (i.e. do **not** include culverts used for the conveyance of effluent between out-of-stream settling ponds)*

**OTHER CROSSINGS:** *(Attach additional pages as necessary.)*

**Watercourse Name:** N/A

**Crossing #** \_\_\_\_\_ **of** \_\_\_\_\_ (84)

**Grant number(s) where crossing will be located:**

(85)

N/A

**Describe the type and nature of the crossing (pipeline, powerline, etc.):**

(86)

N/A

**The crossing(s) is:**

(87)

☐ Existing *(if existing, skip to box 91), or*

☐ To be constructed? *(if a new crossing, complete the following questions)*

**Describe how the crossing will be constructed, and methods to control the release of sediment during construction:**

(88)

N/A

**Describe the stream bed material, stream bank material, and stream bank vegetation at the crossing location:**

(89)

N/A



**Provide a schedule for construction:**

(90)

N/A

**Crossing Cross Section:**

(91)

*(Include structures, erosion protection, and watercourse levels at high and low flows.)*

N/A

☐ Complete and attach DFO workbook Appendix B, for each crossing.

**FINAL SITE DECOMMISSIONING:**

(92)

*If any water related structures (dams, reservoirs, ditches, settling ponds, culverts, fords, bridges, etc.) are going to be left in place at the completion of mining, please describe what measures will be taken to ensure stability, and explain why they will not be reclaimed:*

**As the mining program moves up the valley and specific settling facilities are no longer needed, there will be a complete restoration of the drained settling ponds, reservoirs and connecting ditches. All out-of-stream reservoirs/recycle/pump ponds and settling facilities will be sealed off from the adjacent Carmack Fork, and the ponds themselves will be backfilled with nearby coarse tailings. The sites will be graded and contoured.**

**Fords across the upper tributaries, as well as to the left limit of Carmack Fork will be decommissioned and reclaimed immediately post-mining. Fords along the pre-existing Carmack Fork valley access road that provide access across the lower section of the tributaries will be left in place.**

**OTHER AFFECTED PARTIES:**

**Identify the nearest upstream water user(s) or potentially affected upstream users (placer operations, trappers, residences, etc.):** (93)

**Wade Loewen owns the downstream claims, P 10320 & P35041. Downstream of Loewen is a Natural Resources Canada Placer Historic Reserve on Bonanza Creek. H3 Mining Company Ltd. owns the furthest upstream claims on Carmack Fork and the associated tributaries. The claims included within this application fall within RTC #53.**

Identify the nearest downstream water user(s) or potentially affected downstream users (placer operations, trappers, residences, etc.): (94)

Wade Loewen owns the downstream claims, P 10320 & P35041. Downstream of Loewen is a Natural Resources Canada Placer Historic Reserve on Bonanza Creek. The claims included within this application fall within RTC #53.

Section 12(4) of the Waters Act states that the Board may not issue a water use licence unless the applicant (95) satisfies the Board that the issuance of the licence will not adversely affect, in any significant way, the use of waters by any existing licensee.

**Do you believe that your proposed use of water or deposit of waste will have an adverse effect on an existing licensee?**

☐ Yes, If yes, describe the mitigations proposed:

☒ No,

**In which First Nation's traditional territory is your project located?** (96)

Tr'ondek Hwech'in First Nation (T.H.F.N.)

**Is any part of the project located on First Nation Settlement Land?** (97)

☐ Yes

☒ No

**Have you entered into a compensation agreement with any potentially affected parties?** (98)

☐ Yes, If yes, please attach a copy of the agreement.

☒ No

**Have you discussed the proposed operation with any individuals or organizations that may be affected by the project?** (99)

☒ Yes, If yes, please indicate who, and what input you received.

Ongoing dialogue with both the the downstream claim owners (Wade Loewen) has occurred and all relevant parties, including T.H.F.N. are aware of the existing operation and aware of this application submissions.

☐ No

**FINANCIAL RESPONSIBILITY:**

(100)

The *Waters Act* requires that the *Yukon Water Board* not issue a licence unless it is satisfied that the financial ability of the applicant, taking into account the applicant's past performance, is adequate for:

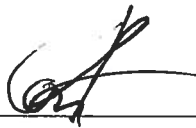
- i. the completion of the appurtenant undertaking; and
- ii. such mitigative measures as may be required; and
- iii. the satisfactory maintenance and restoration of the site in the event of any future closing or abandonment of that undertaking.

**Do you have the financial resources to complete the undertaking proposed in this water use application?**

☒ Yes

☐ No

Signature:



Name (printed):

**Cory Howden d.b.a. H3 Mining Company**

**OFFICERS OF THE COMPANY** (complete only if applicant is a limited company or corporation) (101)

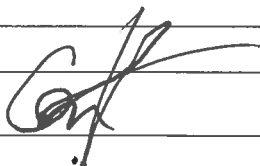
*Licences can only be issued to a limited company or corporation if they are registered to do business in Yukon. The Yukon Water Board will not consider issuing a licence to a company or corporation unless this section is completed.*

I, **Cory Howden** certify that (name of business entity) **H3 Mining Company** is incorporated or registered pursuant to the *Business Corporations Act* of the Yukon or is registered in the province or territory of **Yukon Territory** and is registered in Yukon as an extraterritorial corporation.

The officers of the company are (Name and Title – please print):

**Cory Howden**

Signature:



Date:

**JANUARY 21, 17**

Attach a Corporate Summary issued by Yukon Corporate Affairs, and a certificate of registration.