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# Structure Description and Construction Plan

## Waste Rock, Ore Storage and Trails

For MV2020L2-0002

March, 2022

## Executive Summary

The Structure Description and Construction Plan summarizes the non-engineered storage of waste rock and ore (non-sensu stricto) as well as the road/trail construction on the Mon Gold Project area under MV2020L2-0002. An anticipated 2,400 m<sup>3</sup> of Non-Acid Generating (NAG) waste is anticipated on an annual basis to be used for construction of mine roads and laydown areas. No Potentially-Acid Generating (PAG) or Acid Generating (AG) waste rock is expected, but as a contingency these rocks could be placed on the laydown areas constructed with NAG rock. Gold-bearing quartz vein material will be temporarily held on the NAG waste laydown areas prior to processing.

All construction will be either on peat covered quaternary aggregate or on bedrock. The peat forms a thermal barrier in summer and when saturated, becomes a thermosiphon in winter. Topography will be followed in all cases. The waste area including roads totals 18,500 m<sup>2</sup> of surface area which can hold all of the waste rock anticipated to a depth of 1 m. The ore stockpile extends over 800 m<sup>2</sup> on the waste pad and can contain one month of production for each metre of elevation. Mine roads will be up to one km of rough trail for mine vehicles only. No other access is permitted nor possible.

Monitoring at existing Surveillance Network Program (SNP) sites, geochemical monitoring and geochemical characterization are covered in more detail in referenced plans. All drainage off of these piles will be monitored at these existing SNP stations or at additional ones to be proposed should pooling of waters be observed. Further details are provided under the Groundwater and Water Management Plan.

There is ample room for all of the waste rock anticipated over the life of the existing permits and no additional disturbances would be required.

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## Revision History

Version 1.0 to 1.6	consider editorial comments, format changes
Version 1.6a	Comments from staff letter March 3, 2022 addressed

## 1.0 Introduction

New Discovery Mines Ltd. has a Water License and Land Use Permit in place to mine and mill from the Mon A-Zone up to 100 tonnes per day (tpd). The property was originally acquired by Cominco Ltd in 1937 and their underground development in 1938 initiated advanced exploration on site. A 100 tpd mine and mill operated seasonally on the site between 1990 and 1997. A license to mine and mill was originally granted to New Discovery Mines in 2013 and 2014, and the new permits and licenses are a renewal of the earlier permits and licenses. The past year has seen limited activities on site while management plans are prepared for application.

This Structure Description and Construction plan describes how the rock is piled and pushed to a stable slope. The details into choosing where the rock is to be placed, and why this was selected is presented. The general setting of the pad and trail is presented, how the storage facility is acceptable for its design purposes, and how we will operate and maintain the storage facility. A brief explanation why it is not needed to have an engineer design storage facility or mine trails is explained. The schedule for placing the waste rock and a list of materials needed for the stockpiles and trails/roads is presented including the sources, quantities, physical and geochemical characteristics of these materials.

The potential effects on the receiving environment are described as well as measures to mitigate these impacts. The monitoring of the construction of the roads and storage facilities, explaining where and how frequently inspections will take place, explaining the rationale in determining this monitoring program as well as linkages to other monitoring programs is presented. A description of how the monitoring will be evaluated and what actions might occur as a result of this.

## 2.0 Facility Description

### Location

The roads and waste rock storage facilities on the property are shown on the attached Site Plan Map. The underlying contours prior to placement are shown. All development adjacent to and south of the historical Tailings Storage Facility already exist, remnants from previous activities on site.

### Background of area

The waste storage and roads are placed on bedrock or unconsolidated Quaternary sediments that are overlying Archean rocks of the Yellowknife Supergroup. The Quaternary sediments are composed of peat overlying minor boulders, gravels and sand on top of clays. This was exposed during construction of the historic tailings storage facility. The peat is up to 1 m thick, sand and gravel is typically <1 m thick but exceeds 4 m thickness where eskers are observed. The clay is noted to be generally <1 m thick. Existing mine roads (trails) occur on the property.

Excavations for the historical engineered Tailings Storage Facility was completed in 1992 and exposed 10 to 50 cm of peat and humus under the active organic layer followed by quaternary

clays approximately 50 cm thick. The entire footprint of the waste rock facility is adjacent to the historical Tailings Storage Facility (TSF) and will be on similar quaternary sediments except where it abuts up to exposed bedrock.

The trail system will extend the existing waste rock trail using identical construction methods.

Waste piles and roads on the Mon Property and on the nearby Discovery Mine site include observational data from the 1930's showing stability of waste rock piles with no observed slumps, erosion, or movement. No sediments have been observed extending from any of these constructions (see Waste Rock Management and Geochemical Characterization Plan, Appendix. Chemex ABA, Inspectorate Exploration and Mining Services, SNP samples DIAND, Germac).

Recent samples from SNP-03 show TSS <15 mg/l. Historic sampling from the site (see Groundwater and Water Management Plan, Appendix) is tabulated below in Table 1:

**Table 1. Summary of TSS from historic sampling by third parties on Mon Mine site.**

<b>Date</b>	<b>TSS (mg/l)</b>	<b>Site</b>	<b>Sampler</b>
October 2000	9	SNP-08 equivalent 1598-1	DIAND
September 2000	5	SNP-08 equivalent 1598-2	DIAND
September 2000	<3	SNP-08 equivalent 1598-3	DIAND
September 2000	4	SNP-08 equivalent 1598-7	DIAND
September 2000	5	SNP-08 equivalent 1598-1	DIAND
July 2001	67*	Old Portal (not SNP-08)	Nickerson
July 2001	7	Old Portal (not SNP-08)	Nickerson
July 2001	10	SNP-09 equivalent	Nickerson
July 2001	6	NP-09 equivalent	Nickerson
July 2001	15	Old Tailings drainage 1598-5	Nickerson
July 2001	14	Old Tailings drainage 1598-5	Nickerson
September 2003	4	SNP-08 equivalent 1598-1	DIAND
September 2003	14	Old Tailings drainage 1598-5	DIAND
September 2003	8	SNP-08 equivalent 1598-8	DIAND
July 2008	6	Old Tailings drainage 1598-5	DIAND
June 2005	4	SNP-01 Discovery Lake	DIAND

*\*Closed in 1997 after tailings were found to have escaped from this portal. Sampled by current SNP-10*

## Specification

The roads and waste storage facilities have similar specifications. Constructing the roads and pads on relatively undisturbed peat has been used in Alaska and Norway with significant benefits in maintaining ground temperatures in patch permafrost terrains (Reckard et al., 1988). This is a current standard in Saskatchewan (Pers. com., Civil Projects Ltd.) Run of mine muck will be placed by scooptram or mine truck and then leveled by scooptram or bulldozer.

The proposed waste area (Figure 1) including roads totals 18,500 m<sup>2</sup> of surface area which could hold all of the waste rock anticipated to a depth of 1 m. The ore stockpile extends over 800 m<sup>2</sup> on

the waste pad and can contain 1 month of production for each m of elevation. The maximum height of the waste stockpile will be 3 m and it will be graded to maintain the existing drainage. Surveillance Network Program (SNP) stations (9 and 10) are designed to collect any surface drainage. Additional SNP sites will be recommended if waters are observed to collect elsewhere.

Roadways will be 3 metres (m) wide minimum and 4 m wide maximum. Roadway elevation or height above mean elevation will average 1 to 2 m with all trees and shrubs to be cut and placed flat on the site. Culverts are not needed for this site, but should be considered if ponding is noted. The expanded road system will extend 750m further to the north from the mine site to the Dry Stack Tailings (DST) facility. The side slopes of the roadways will be the natural angle of repose, expected to be 15 to 25 degrees over the 1 m height.

All waste piles will be constructed from run of mine Non-Acid Generating (NAG) rock and no flow will occur on the surface. Drainage will be through the waste rock into margins which will be collected in SNP-09, SNP-10, SNP-22. Additional sumps will be investigated if drainage patterns change and added if needed (SNP-09a, b, c) (See Map 1). **All details with respect to NAG, PAG, and AG definitions and management is reported in the Waste Rock Management and Geochemical Characterization Plan.**

It is entirely possible that no water will flow during periods of dryness in which case the sumps may become dry. The entire sit will be monitored daily during operations to determine if waters are not draining as expected or if the SNP stations require additions or modifications. All SNP stations are monitored daily during operations. No additional SNP stations are currently expected, however contingency plans will identify any should they be needed and the Board and Inspectors will be notified.

All roads will be constructed from run of mine NAG rock and no flow will occur on the surface. Some short-term ponding may occur on the road, however the crown will be designed to shed all waters to the sides. Natural sumps have been identified such that all waters draining from the roads and waste piles will be collected in the designed sumps. No Potentially Acid Generating (PAG) or Acid Generating (AG) rock will be used in road construction, and no PAG or AG rock is expected from operations.

The above plans allow for ease of closure as the relatively low elevation differences, NAG chemistries, and unsorted nature of the rock will allow for reclamation identically to what has occurred at the Mon property in the past, with minor enhancements.

In Waste Rock Management and Characterization Plan, Water Chemistry (Pg 24) shows the results of historic sampling at SNP sites collecting water draining from waste piles on the Mon Property from the 2000, 2001, 2003, 2005, 2008, 2009 and results from MV202L2-002 SNP sampling in 2020. Except for grease and oil exceedances, sampling showed no exceedances on their EQC standards. TSS was 14, 6, 9, 5, <3, 5, 4, 5, 67, 7, 10, 6, 14, 15 mg/L over this period. Our plan is to mine the same rock in the same manner and place it identically in similar location on the same

property. Standard engineering practices predict similar results over the same time, and we will operate using professional standards.

All measurements at SNP-09 and SNP-10 plus any other SNP to be established will also note the construction details. This is documented and linked to the Waste Rock Management and Geochemical Characterization Plan and the Groundwater and Water Management Plan.

All drainage is expected to flow downhill parallel to the topographic gradient. SNP stations are in place to measure this.

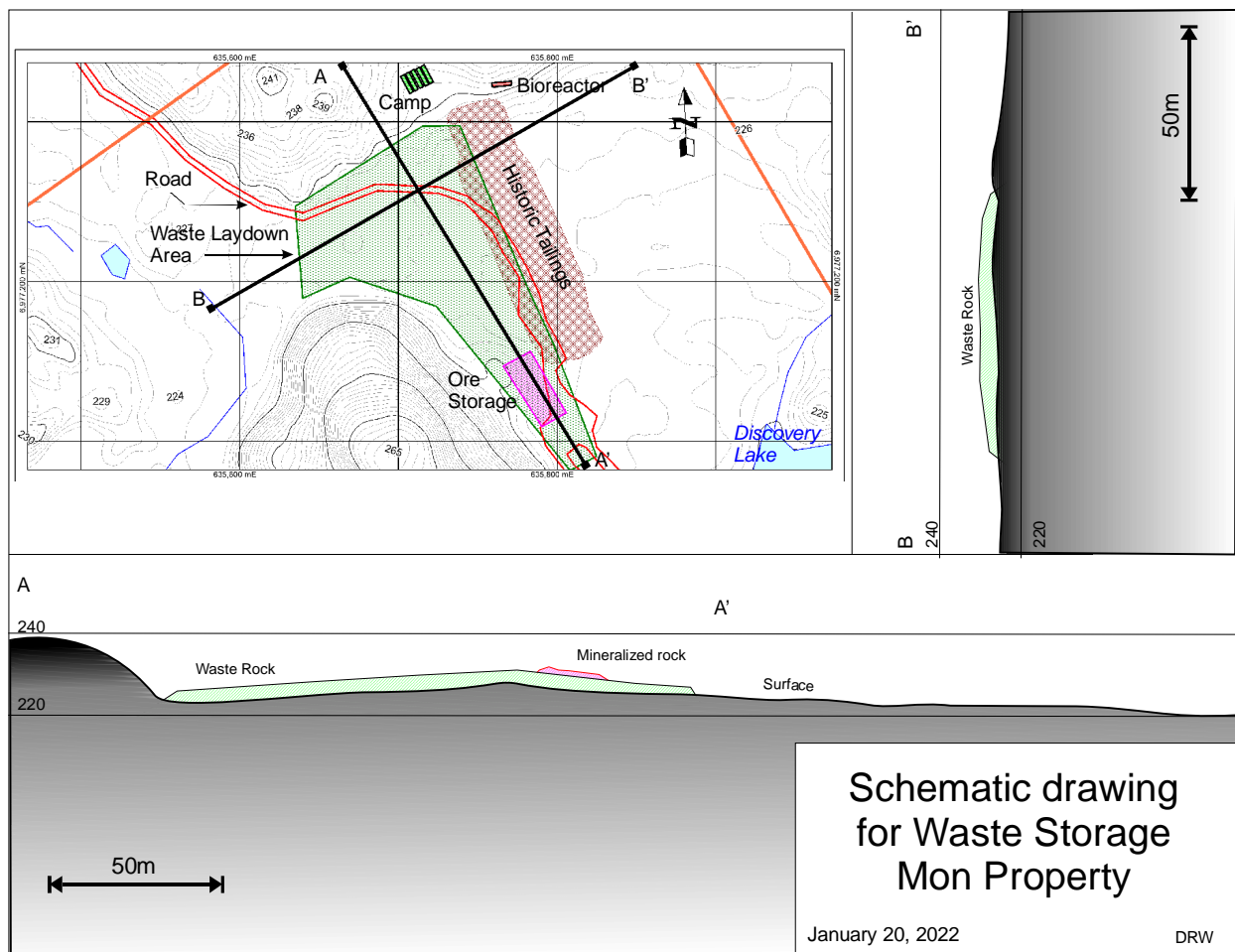
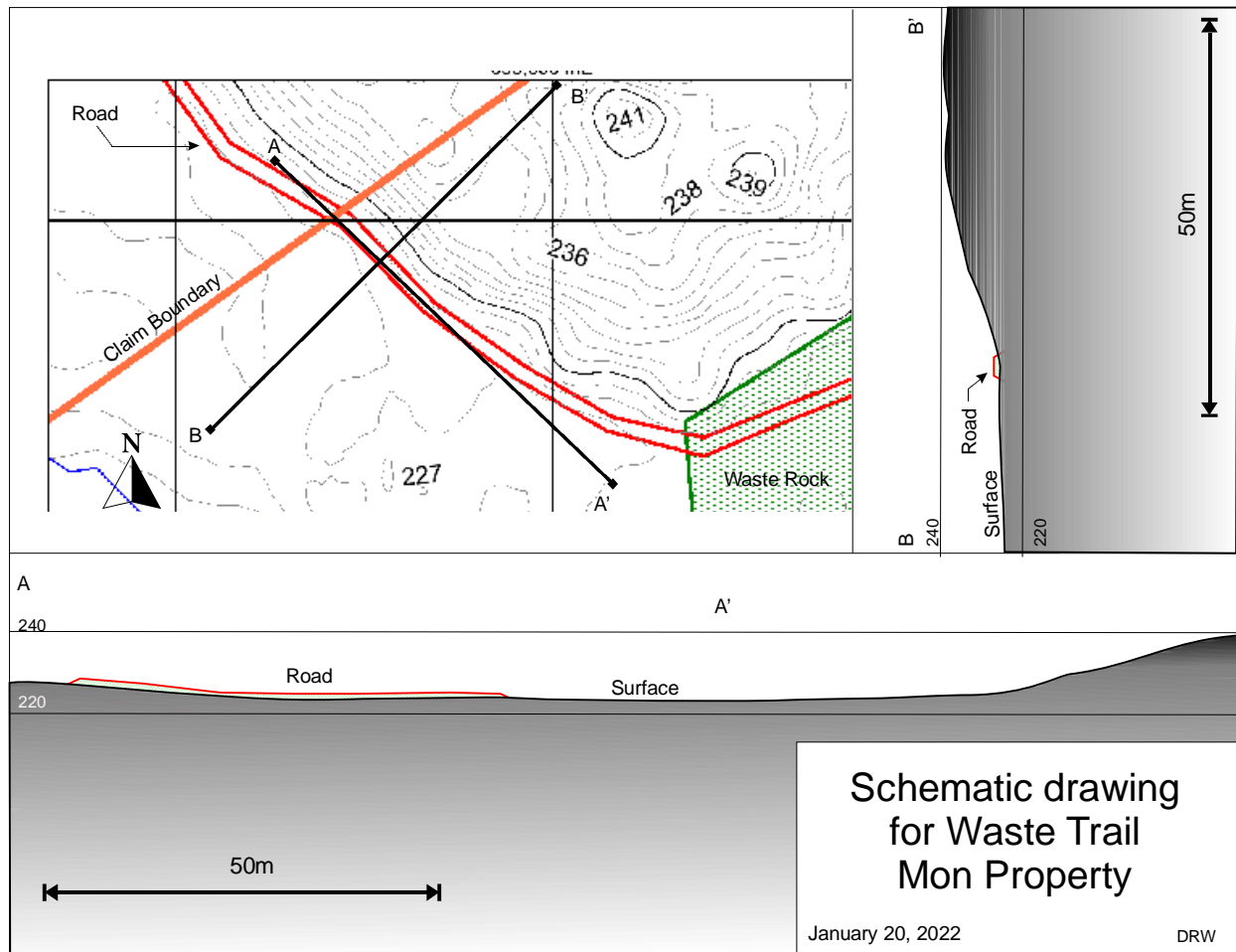


Figure 1. Schematic drawing for Waste Storage





**Figure 2. Schematic drawing for trail (roads).**

In engineering practices, the use of identical materials in an identical manner at the same locations are expected to result in the same results.

## Operations

The road will be the highest priority and will be pushed laterally to the DST site. The waste pad will be expanded from the south to the north, with the existing Tailings Facility forming the eastern limit. A maximum elevation of 3 m above existing surface is planned, primarily in the southern portion of the laydown area. The edge grades will be maintained at 1 in 3. Maximum longitudinal grades of 15 percent (%) will be allowed. No erosion nor enhanced TSS was observed from any existing roads now, nor were any referenced in historic SNP sampling reports or annual reports filed with the Northwest Territories (NWT) Water Board.

Wildlife consisting of bears, moose and caribou plus smaller mammals have been observed on the existing waste pads and roads and we expect that this will continue into the future.

## Engineering

It is believed that the roadway and waste storage facilities need not be designed by an engineer due to its small size, limited options, and minimal operations requirements. Failure may result in minor slumping or diversion/ponding of waters. The low height, coarse nature and innocuous chemical nature of the waste rock, its NAG characteristics, low sulphide, and very low SWEP-test results as well as the historic results from previous storage of these rocks at this site since 1937 suggest minimal potential impacts.

## Construction Schedule

Construction will commence once approved, and continue annually over the course of operations when waste rock is generated in the Mine.

1. Trees and shrubs will be cut and laid flat.
2. Waste rock will be placed on the ground within the surface area shown on the appended Site Map.
3. Surface contours of the road and waste stockpiles will be gentle to the sides, comparable to the underlying topography.

The road construction is planned to be completed in the summer of 2022 and the waste stockpiles will continue throughout the life of the mine when waste is generated. Waste will be deposited starting in the south and placed towards the north in a strip along the historic TSF, and from the east to west. No compaction is necessary nor planned.

Waste piles will continue year-round. Road construction will only occur during the first year of operations. All rock will be documented as placed as defined by a registered professional geologist and only NAG will be used for construction. All construction will use run of mine rock without sizing. Any PAG or AG rock identified by the registered professional will not be mined until it is confirmed by laboratory analysis with a standard Acid Base Accounting (ABA) test completed by the laboratory approved by the Analyst.

## Materials required

Waste rock will be provided exclusively from the Mon Mine. A total of 2,400 m<sup>3</sup> of waste rock is expected to be generated annually. This material will be run of mine development muck, angular 80% -30 cm diameter blocks, unsorted mafic igneous rock with minor intercalated metasedimentary rock. The mafic igneous rock has an NPR >4 and the intercalated metasedimentary rock has an NPR of 2.7 (see Waste Rock Management and Geochemical Characterization Plan). None of these rocks are expected to generate acid.

## Potential Effects on the Receiving Environment

The waste rock and roads have a direct foot print of 18,500 m<sup>2</sup>.

- The sides of the stockpiles may slump, as such it is recommended to monitor the slope of the sides of the waste piles.

- Drainage from these piles may be outside of the normal chemistries of waters and as such these should be monitored. It is recommended that SNP-09 and SNP-10 standards apply for any such samples with similar action plans.

### Monitoring of the Construction

The Mine Manager or his designate will monitor the excavation of waste rock and placement of this rock. Samples defined in the Waste Rock Management and Geochemical Characterization Plan will be implemented.

Records confirming:

- Source of the rock.
- What samples were collected, and what the results of any tests completed.
- Dimensions of monthly updates on:
  - The disturbed area
  - The roads and storage facility
- Number of inspections (frequencies)
- Any observations, recommendations and conclusions

All measurements at SNP-09 and SNP-10 plus any other SNP to be established will also note the construction details. This is documented and linked to the Waste Rock Management and Geochemical Characterization Plan and the Groundwater and Water Management Plan.

All drainage is expected to flow downhill parallel to the topographic gradient. SNP stations are in place to measure this.

Annual freeze and thaw effects on waste piles and roads will be monitored by standard survey techniques with maintenance of slopes and grades monitored. Standard survey techniques include the use of transits, total stations with established survey stations (Ollerhead 2021), rods and chains.

NDM will monitor the entire perimeter of the waste and ore piles and road several times per day. Any water flows, ponding, sedimentation, slumping, movement will be reported to the Mine Manager. All details will be summarized and reported in the Water License Annual Report. Evidence of erosion and sedimentation should be documented carefully, and if observed, sedimentation fences should be installed.

### Maintenance

Ongoing waste rock production will be placed on the active face of the waste rock stockpile and be used to maintain a stable slope should any instabilities be observed. The low height of the waste rock stockpiles, ore stockpile, and roads/trail system precludes any significant instability being developed.

## Linkages to other Management Programs

This Structure and Design Plan is required under Schedule 3 of MV2020L2-0002 and affects the following plans:

- A. Groundwater and Water Management Plan
- B. Waste Rock Monitoring and Geochemical Characterization Plan
- C. Waste Management Plan
- D. Spill Contingency Plan
- E. Explosives Management Plan

Construction materials are dominated by waste rock, and therefore the Waste Rock Management and Geochemical Plan is of paramount importance in defining many management and action plans.

## Evaluation of Monitoring

The Construction of the waste and ore storage facilities, and road construction described in this Structure Description and Construction Plan, once approved will be conducted during mining operations and the generation of waste rocks. Monitoring of the road and storage facilities under this plan requires confirmation the mitigation measures are effective.

The EQC on the stockpiles and roads are the same as those described in the Waste Rock Management and Geochemical characterization Plan.

This will be reviewed monthly in reports from the Mine Manager to head office and will be annexed to the annual water license report.

Any exceedances in water quality as defined in the License and reported in the Waste Rock Management and Geochemical Characterization Plan will be considered under that Plan's Action Levels and Corrective Actions sections.

Slumping and erosion, including sedimentation coming from the waste or ore piles or the roads will require a halt to all activities, immediate remedial action including but not restricted to resetting all slopes, limiting elevations, covering all piles and roads with impermeable liners to halt water ingress. Any excess sedimentation would be excavated and contained in a lined area to be established with the Inspectors and Boards approvals.

Historic operations placed mined rock in proximity to the north-end of Discovery Lake (see Map in Appendix). We have smoothed these rock piles for progressive abandonment and will monitor any drainages at a site labeled SNP-09a.

## Mitigation

In the event the design and construction of the waste and ore storage facilities, roads and sumps fail to mean design specifications, including exceedances under the Groundwater and Water Management Plans, all construction shall halt and the actions triggered under Section 5. Action Levels in that plan shall be implemented, including those listed in Corrective Actions in that

section. No waters shall be discharged that do not meet EQC or CCME guidelines for the protection of Aquatic Life. Any waters exceeding that shall be treated using lime to raise the pH to acceptable levels.

## Conformity Table

### Current Review Comments

GNWT-ENR - EAM (Environmental Assessment and Monitoring) - GNWT ENR				
1	Concordance Table	ENR previously commented that the Structure Description and Construction Plan – Waste Rock, Ore Storage and Trails (the Plan) is required under Part E, Condition 7 of Water Licence MV2020L2-0002. Part E, Condition 7 refers to Schedule 3, which outlines the information required within the Plan. ENR notes that although the conformity table states that a concordance table has been added, no concordance table was found in the Plan and there was no other reference to the requirements outlined in Schedule 3 or linkages to locations in the Plan where those requirements are addressed.	ENR recommends that New Discovery Mines Ltd. (NDM) update the Plan to include a concordance table which directs reviewers to specific locations in the Plan which correlate to the information requirements outlined in the Water Licence.	Conformity Table renamed Concordance Table with reference to changes added. This table
2	Definitions of Abbreviations	ENR notes that the abbreviations used within the Plan are not defined.	ENR recommends that NDM define all abbreviations at their first use in the Plan.	Abbreviations explained on first use. Starting with the Executive Summary SNP redefined.
3	Historical Tailings Storage Facility Location	Under the “Location” heading, the Plan states the following: “All adjacent to and south of the historical Tailings Storage Facility already exist.” ENR notes that the location of the historical Tailings Storage Facility is not indicated on the site maps provided, making it unclear what areas would be adjacent to and south of the historical Tailings Storage Facility. Additionally, ENR notes that it is not clear if “all” is referring to all the roads and waste rock storage facilities, or to all of something else.	ENR recommends that NDM add the historical Tailings Storage Facility to the site maps provided. ENR recommends that NDM clarify what “all” is referring to in the above noted phrase.	Historic tailing site added to maps. Statement "All adjacent to..." is restated. Location, page 5. Figure 1 is referenced and “waste rock” is now “proposed waste rock”. Site Plan Map is changed to Site Map, and historic tailings are shown.
4	Legend – Figures 1 and 2	ENR notes that neither Figure 1 nor Figure 2 of the Plan includes a legend.	ENR recommends that NDM include a legend for both Figures 1 and 2.	Labels added. Figure 1, page 8, Figure 2, page 9

5	Erosion and Sedimentation Measures	Under the “Operations” heading, the Plan states that no erosion or sedimentation measures will be required. However, under the “Monitoring of the Construction” and “Evaluation of Monitoring” headings, several potential mitigations are proposed in case issues with sedimentation and erosion are observed. ENR notes the information provided in the “Operations” section regarding sedimentation and erosion is not consistent with the other noted sections of the Plan.	ENR recommends that NDM update the Plan to consistently reflect that control measures for erosion and sedimentation will be implemented if needed.	Reference to erosion and sedimentation under Operations is a statement of fact. Data from the Appendixes are tabulated to demonstrate no sedimentation has been noted. Conclusion that no controls will be needed is removed. Monitoring of the Construction section amended to be conditional, therefor consistent with Operations statement. Evaluation of Monitoring is a contingency and is correct and consistent.
6	PAG/AG Rock Contingency	The Executive Summary of the Plan explains that, although no PAG or AG rock is expected, a contingency plan in the case that PAG or AG rock is identified could be to place these types of rock on the NAG laydown areas. Although the “Construction Schedule” section of the Plan does indicate that a registered professional geologist will be involved in the identification of rock types, ENR notes that the contingency plan for the placement of PAG and AG rock is not discussed in the Plan beyond being mentioned in the Executive Summary.	ENR recommends that NDM provide further information related to the contingency plan for the placement of PAG and AG rock.	No PAG or AG waste rock has been identified in the mine area during any of the past or current mining operation going back 85 years. All reference to potential PAG or AG waste rock occurrences are considered in the Waste Rock Management and Geochemical Characterization Plan.  1.0 Introduction, Page 5.

Board Comment	Response
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Should be Version 1.5. Suggest updating the cover page and including a revision history table to reflect that there were earlier versions.	Done
As recommended for the other Management Plans, it is cleaner if the conformity tables are provided as appendices instead of the beginning of the report.	Done
Add page numbers for ease of reference.	Done
Edit all inaccurate external plan references. In several areas throughout the term 'Monitoring' Plan where it should be 'Management' Plan.	Done
The Introduction should include company and project information to provide context to the Report.	Done
Specification Section – this section refers to SNP sites and to the attached map. If the additional SNP-09 locations (a, b, c) are part of the plan now for construction and monitoring of the waste rock pile, the SNP references here should clearly identify them so that it is not ambiguous whether or not those stations will be established or if they are only considered potential. This will also facilitate any discussion with the Board in amending the Surveillance Network Program appended to the Licence. Providing the precise coordinates would also facilitate the Board's edits to the SNP as well. Please clarify in this section as well as in the discussion on Page 11.	SNP-09 is a station that exists, SNP-09a, b, and c are contingent stations in case SNP-09 does not meet our objectives. Statement added to this effect.
Specification Section – this section is on page 6 of the plan with the introduction of SNP stations for monitoring the facilities. It is not until page 11 that some rationale supporting the location of these points is provided (why water is expected to collect at these locations). This information should be provided here as well.	Rationale supporting SNP locations is duplicated on page 7 to clarify Specifications.
There seems to be some inconsistencies in the descriptions for the height of the facilities. For example, the Executive Summary and page 6 states: "The waste area including roads totals 18,500 m <sup>2</sup> of surface area which can hold all of the waste rock anticipated to a depth of 1 m." Later, page 6 also states: "Roadway elevation will be 1 to 2 m". And page 9 says: A maximum elevation of 3 m above existing surface is planned." Some consistent wording regarding the range of expected depths/heights of the facilities should be provided.	The first statement is a statement of fact. "all of the waste rock anticipated can be held within the waste pile area if limited to a depth of 1 m." Roadway elevation is accurate for average with a 3 m maximum. Verbiage has been added to make this clearer.
Likewise, references to facility slope are inconsistent. Page 6 states that: "The side slopes will be the natural angle of repose, expected to be 35 to 45 degrees." Page 9 states: "The edge grades will be maintained at 1 in 3."	Side slopes and edge-grades have been adjusted. Grades is a civil term that generally refers to the

Which does not seem to make sense. And “Maximum grades of 15% will be allowed.” Some consistent wording regarding the range of acceptable slopes for the facilities should be provided.	longitudinal slope of a roadway, and is correct.
Page 10 describes waste rock being segregated into cells. As far as we understand, this is not the plan. The Waste Rock Management and Geochemical Characterization Plan says that only PAG/AG rock will be separated on top of the NAG and not necessarily into a separate waste rock pile cell. Please clarify.	

ID	Reviewer	Reviewer Comment	Reviewer Recommendation	Proponent Response
1	Shannon Allerston	The 'Specification' Section, NDM states that "SNP stations (9 and 10) are designed to collect any surface drainage. Additional SNP sites will be recommended is [sic] waters are observed to collect elsewhere." At this stage, Board staff would expect to have more precise coordinates and locations for SNP stations identified based on the structure construction plans provided by this Plan. Board staff note that the Waste Rock Management and Geochemical Characterization Plan also identify the potential segregation and storage or PAG/AG waste rock if required. Details of these contingency structures and associated SNP station locations should also be identified in this Plan. Board staff also note	NDM to provide additional detail on how the roads, waste rock, and ore storage structures will be designed to manage seepage and runoff so that waters can be collected and monitored through SNP stations 9, 10, and proposed SNP-22. The precise locations, based on the structure construction plans should also be identified. It is not unlikely that more than one sampling station may be associated with each of these SNPs. This Structure Description and Construction Plan should include the details that show how the structures are being constructed to manage, collect, and sample runoff waters. In the event 'waters are observed to collect elsewhere', contingencies for construction and/or water management of the	run of mine rock and no flow will occur on the surface.



		that SNP-22 has been identified in the Waste Rock Management and Geochemical Characterization Plan and Groundwater and Water Management Plan to sample runoff from roads. This proposed SNP site should also be included in this discussion.	main waste rock storage area, ore stockpile, and roads should be identified. Similarly, NDM should provide information on the location of potential PAG/AG stockpiles, including details of how water will be managed, collected, and sampled from these structures through the establishment of additional SNP stations under SNP-9, 10, and/or proposed SNP station 22.	
2	Shannon Allerston	The Structure Description and Construction Plan for Waste Rock, Ore, and Roads does not include detailed information on the slope that will be maintained, particularly for the waste rock pile and ore stockpile.	NDM to provide additional detail on the slope and grade of waste rock and ore expected and how that impacts structure construction and water management. NDM should also discuss if and how temperature fluctuations might impact the physical stability of the waste rock storage area as seasons change and in the long-term.	Added in Operations. Monitoring incorporates discussion of temperature fluctuations.

3	Shannon Allerston	<p>SNP stations and associated EQC are required to monitor the chemical stability of the waste rock structures. Does NDM have any plans for monitoring the physical stability of these structures?</p>	<p>NDM to provide details on any monitoring to support and confirm the physical stability of all waste rock structures. This should include rationale for the proposed method(s) of monitoring and any criteria used to assess physical stability.</p>	<p>See expansion of background data</p>
4	Shannon Allerston	<p>The construction schedule and sequencing information does not provide the detail expected. Will road construction occur year-round or seasonally? Will waste rock be extracted on a year-round basis, and therefore be deposited year-round or will mining and waste rock deposition be carried out seasonally? Will there be defined cells? Will waste rock be segregated by size for construction purposes? Will waste rock be segregated while awaiting geochemical results?</p>	<p>NDM to provide more detail on the construction of waste rock structures including how waste rock will be handled while awaiting geochemical results.</p>	<p>Details added in Construction schedule.</p>
5	Shannon Allerston	<p>The Evaluation of Monitoring Section refers to the requirement to confirm mitigation measures are effective.</p>	<p>NDM to clearly identify mitigation measures that are being considered for the construction and post-construction periods of all waste rock structures. What are the mitigation measures proposed in the event water quality or geochemistry results do not align with the Licence or Waste Rock Management and Geochemical</p>	<p>See expansion of Evaluation of Monitoring</p>

			<p>Characterization Plans?</p> <p>What are the mitigation measures proposed in the event slumping and erosion issues are identified? These should be described.</p>	
6	Shannon Allerston	<p>The Monitoring of Construction Section identifies some monitoring components for waste rock, including the source, sample locations and results, monthly calculations of disturbances, inspections, and observations/conclusions. Board staff note that the southern portion of the waste rock pile and ore storage stockpile are fairly close to Discovery Lake. Does NDM propose to carry out additional TSS monitoring during construction to ensure impacts are not being seen in Discovery Lake? Can NDM confirm the location of SNP-12?</p>	<p>NDM to provide additional information on the location of monitoring activities, parameters being monitored, and the frequency of construction monitoring. This should include all monitoring associated with SNP stations 9, 10, 12, and proposed SNP 22 and any physical stability monitoring being proposed. NDM should also confirm that all monitoring results documented should be reported in the WL Annual Report.</p>	<p>See expanded Monitoring and Construction section.</p>

7	Shannon Allerston	NDM lists associated Monitoring Programs. This list includes the 'Hydrocarbon-Stained Soil Operations and Management Plan.' Board staff are not aware of any plan under this title.	NDM to confirm the list of associated Monitoring Plans.	Corrected
8	Shannon Allerston	There is no discussion provided on how the roads or waste rock piles are being constructed with closure in mind.	NDM to discuss how the construction plans will facilitate closure of the waste rock structures in the future.	See specifications
1	Jennifer Sabourin	N/A	N/A	
2	Jennifer Sabourin	<p>In Section 2.0 (Facility Description; Background of Area), the Proponent states "The waste storage and roads are placed on bedrock or unconsolidated Quaternary sediments that are overlying Archean rocks of the Yellowknife Supergroup. The Quaternary sediments are composed of peat overlying minor boulders, gravels and sand on top of clays."</p> <p>In Section 2.0 under the "Specification" subheading, the Proponent indicated "Constructing the roads and pads on relatively undisturbed peat has been used in Alaska and Norway with significant benefits in maintaining ground temperatures in patch permafrost terrains</p>	<p>ECCC recommends the Proponent:</p> <p>a) Put in place a mitigation measure to collect seepage/drainage from the waste rock pile, and treat (if necessary) before it is discharged or drains into the environment, especially when the chemistry of the drainage may already be "outside of the normal chemistries of waters".</p> <p>b) Provide more information on the thickness of the unconsolidated Quaternary sediments that are overlying Archean rocks on which the waste rock pile is to be constructed.</p> <p>c) Identify if the drainage from the waste rock and ore pile will drain into the excavation sump as noted in the Site Map;</p>	<p>The chemistry of the seepage will not exceed specification. The natural chemistries referred to was in error and has been corrected.</p> <p>Thickness of quaternary material provided in Background of Area. Drainage from waste piles confirmed in Engineering.</p> <p>SNP-09 is designed to collect drainage from waste piles and SNP-10 is designed to collect drainage from ore piles.</p>

	<p>(Reckard et al., 1988)".</p> <p>ECCC is of the view that the peat may act as an insulator for the cold permafrost ground, which could be an indication the base of the waste rock pile will remain unfrozen, allowing free drainage/seepage from the pile into the environment. The plan also gives no indication as to how any seepage from the waste rock will be managed, given the peat on which it lies may prevent the aggradation of permafrost.</p> <p>In Section 2.0 (Facility Description; Potential Effects on the Receiving Environment), the Proponent states "Drainage from these piles may be outside of the normal chemistries of waters and as such these should be monitored.". If current knowledge of the water chemistry is "outside of the normal chemistries of waters", ECCC recommends a mitigation measure be put in place to collect the seepage and treat (if necessary) before being discharged to the environment.</p> <p>In addition, it is not</p>	<p>and</p> <p>d) Clarify the purpose of SNP-09 and SNP-10, and what the SNP's are monitoring for.</p>	
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		<p>clear from the Site Map (Appendices) whether drainage from the waste rock and ore pile drain into the excavated sump (shown in the map) where it is treated before discharge, or whether the seepage bypasses the excavated sump and is then monitored at the SNP-09 &amp; SNP-10 location.</p> <p>References: -Structure Description and Construction Plan -Waste Rock, Ore Storage and Trails- Section: 2.0: Facility Description; Background of area; Specification; Potential Effects on the Receiving Environment- Appendices: Site Map</p>		
1	Mr. Patrick Clancy	ENR Cover Letter to the MVLWB	N?A	
2	Mr. Patrick Clancy	ENR Letter to the Proponent	For the Proponent	

3	Mr. Patrick Clancy	While there is no reference within the Plan, ENR notes from the ORS review item that the plan is required under Part E, Condition 7 of Water Licence MV2020L2-0002. Part E, Condition 7 refers to Schedule 3, which outlines the information required within the plan. There is no reference to these requirements within the plan or linkages to locations within the document that this information can be found.	1) ENR recommends that the plan be updated to include a concordance table which directs reviewers to specific locations in the plan which correlate to the information requirements outlined in the Water Licence.	A concordance table is added.
4	Mr. Patrick Clancy	The site plan provided is somewhat unclear. Based on the map and legend included, it is difficult to determine the location of the waste rock storage, the esker, etc.	1) ENR recommends that the site plan be revised to outline the locations of the various mine components more clearly.	
5	Mr. Patrick Clancy	ENR notes that specific comments were provided regarding the waste rock and geochemical characterization plan on May 11, 2021. As well, additional comments are provided on the Groundwater and Water Monitoring Plan. These comments will not be reiterated here but remain valid regarding waste rock management and monitoring/assessment at the site.	N/A	Reference to the Waste Rock Management and Geochemical Characterization Plan is made explicit in Linkages to other Monitoring Plans.

Tlic ho Go ver nm ent - LO NG IN US EK WE				
1	LONGINUS EKWE	<p>There seems to be a minimal information on the erosion and sediment management/control. New Discovery Mines (NDM) stated in the application document that, “no erosion or sedimentation measures will be required as identified in past activities”. Activities like excavations, cutting of trees and shrubs, waste rock management, ore stockpiling, roadways etc, will alter the landscape, disturb the soil structure and could result in erosion which could lead to undesirable impacts on the receiving environment.</p>	<p>TG recommends that NDM and the Board ensure there are adequate sediment and erosion control measures in place. Sediment transport and deposition is of great interest to TG because we want to ensure prevention of potential effects on fish and fish habitat, increased turbidity, and changes in water chemistry.</p>	<p>Specific sediment and erosion control measures are added in Monitoring of Construction.</p>



2	LONGINUS EKWE	According to NDM in the executive summary paragraph three, "All drainage off of these piles will be monitored at these existing SNP stations or at additional ones to be proposed should obvious pooling of waters be observed". How will NDM monitor and report on any additional water pooling?	N/A	Please see Groundwater and Water Management Plan for specifics. A reference to this is added
1	Jennifer Sabourin	<p>In Section 2.0 (Facility Description; Background of Area), the Proponent states "The waste storage and roads are placed on bedrock or unconsolidated Quaternary sediments that are overlying Archean rocks of the Yellowknife Supergroup. The Quaternary sediments are composed of peat overlying minor boulders, gravels and sand on top of clays."</p> <p>In Section 2.0 under the "Specification" subheading, the Proponent indicated "Constructing the roads and pads on relatively undisturbed peat has been used in Alaska and Norway with significant benefits in maintaining ground temperatures in patch permafrost terrains (Reckard et al., 1988)". ECCC is of the view that the peat may act as an insulator for the cold permafrost ground, which</p>	<p>ECCC recommends the Proponent:</p> <p>a) Put in place a mitigation measure to collect seepage/drainage from the waste rock pile, and treat (if necessary) before it is discharged or drains into the environment, especially when the chemistry of the drainage may already be "outside of the normal chemistries of waters".</p> <p>b) Provide more information on the thickness of the unconsolidated Quaternary sediments that are overlying Archean rocks on which the waste rock pile is to be constructed.</p> <p>c) Identify if the drainage from the waste rock and ore pile will drain into the excavation sump as noted in the Site Map; and d) Clarify the purpose of SNP-09 and SNP-10, and what the SNP's are monitoring for.</p>	<p>a) Please see new section, Mitigation which cross links to the Ground Water and Water Management Plan.</p> <p>b) Section Background describes the Quaternary sediments at the adjacent historical engineered Tailings Storage Facility as 10 to 50 cm of peat and humus under the active organic layer followed by quaternary clays approximately 50 cm thick. Below this there is variable thicknesses of sand, gravel and boulders up to 4 m thick, but averaging &lt;2 m thick. The entire</p>

		<p>could be an indication the base of the waste rock pile will remain unfrozen, allowing free drainage/seepage from the pile into the environment. The plan also gives no indication as to how any seepage from the waste rock will be managed, given the peat on which it lies may prevent the aggradation of permafrost.</p> <p>In Section 2.0 (Facility Description; Potential Effects on the Receiving Environment), the Proponent states “Drainage from these piles may be outside of the normal chemistries of waters and as such these should be monitored.”. If current knowledge of the water chemistry is “outside of the normal chemistries of waters”, ECCC recommends a mitigation measure be put in place to collect the seepage and treat (if necessary) before being discharged to the environment.</p> <p>In addition, it is not clear from the Site Map (Appendices) whether drainage from the waste rock and ore pile drain into the excavated sump (shown in the map) where it is treated before discharge, or whether the</p>		<p>footprint of the waste rock facility is adjacent to the historical TSF and will be on similar quaternary sediments except where it abuts up to exposed bedrock.</p> <p>c) Yes, see Groundwater and Water Management Plan including attached map.</p> <p>D) As stipulated in MV2020L2-0002 SNP-09 and SNP-10 are defined in Pat F. Section 20. <b><i>“The Licensee shall ensure that Runoff and Seepage from Waste Rock and ore stockpiles at Surveillance Network Program stations SNP-09 and SNP-10 has a pH value between 6.0 and 9.5 and meets the following Effluent Quality Criteria (EQC): with the attached table describing what is being monitored.”</i></b></p>
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		seepage bypasses the excavated sump and is then monitored at the SNP-09 & SNP-10 location. References: -Structure Description and Construction Plan -Waste Rock, Ore Storage and Trails- Section: 2.0: Facility Description; Background of area; Specification; Potential Effects on the Receiving Environment- Appendices: Site Map		
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1	NDM to provide more information that demonstrates how the construction of the waste rock pile, ore stockpile and roads will direct water to a sump or series of sumps so that waters seeping through and running off the rocks will be collected and sampled at SNP stations 9, 10, and 22, prior to entering the receiving environment. The Structure Description and Construction Plan should include the details that show how the structures are being constructed to manage, collect, and sample runoff waters.	ECCC – 1, Board Staff - 1	<i>*Closed in 1997 after tailings were found to have escaped from this portal. Sampled by current SNP-10</i> <b>Specification and Operations expanded to clearly state all waters will be collected in the sumps at SNP stations.</b>
2	NDM to identify mitigation measures to be considered in the event waters are not draining as anticipated or volumes of water being collected in the planned sump(s) are not enough to confirm the runoff and seepage quality.	ECCC - 1	<i>*Closed in 1997 after tailings were found to have escaped from this portal. Sampled by current SNP-10</i>

			Specification has been modified to include this contingency.
3	NDM to provide the precise locations of SNP stations 9, 10, and 22, based on the structure construction plans. In the event 'waters are observed to collect elsewhere', contingencies for construction and/or water management of the main waste rock storage area, ore stockpile, and roads should be identified. NDM should clearly identify whether or not more than one sampling location will be required to meet the objectives of each station.	Board Staff - 1	See item 2 (above).
4	NDM to provide information on the location of potential PAG/AG stockpiles, including details of how water will be managed, collected, and sampled from these structures through the establishment of additional SNP stations under SNP-9, 10, and/or proposed SNP station 22. This should include more detailed information on the handling, timing of sampling and segregation, and ongoing monitoring of waste rock in the event PAG rock is identified is required.	Board Staff – 1, 4	No PAG or AG has been identified at the minesite, none will be mined. All mining halt should daily monitoring identify any PAG or AG rocks. No SNP stations could monitor PAG or AG rock.
5	NDM to provide additional information on the 'standard survey techniques' used to measure the impacts of temperature on the structures.	Board Staff - 2	See Monitoring of the Construction
6	NDM to provide references to supporting documentation that demonstrate the observations and conclusions regarding erosion potential and risk provided in the Structure Description and Construction Plan.	Board Staff – 3	References appended.
7	NDM to provide rationale for why the physical stability of historic structures would apply to new structures.	Board Staff - 3	Statement added to Specifications
8	NDM to provide an analysis of water samples from the existing waste rock pile that demonstrate erosion is not an issue and explain why the same results are expected to be true of the new waste rock pile.	Board Staff – 3	Statement added to Specifications
9	NDM to proactively commit to implementing sediment and erosion control measures anywhere erosion issues could directly impact surface waters during construction.	Board Staff – 6, Tlicho Government - 1	Statement in Evaluation and Monitoring commit to halting activities and mitigating exceedances.
10	NDM address the proximity of the southern portion of the waste rock pile to Discovery Lake and discuss any additional risk and potential preventative and/or monitoring measures that could be implemented to ensure construction and operation of the waste rock pile will not have adverse impacts on the lake.	Board Staff – 6, Tlicho Government - 1	Statement in Evaluation and Monitoring references progressive abandonment of old waste piles and commitment to monitor drainage.
11	NDM to ensure that all future plan or plan updates meet the Board's submission standards	GNWT-ENR 2, 3	All attempts will be made.
12	NDM to ensure all future plans or plan updates include, as an appendix, a concordance table demonstrating where information required by the Licence can be referenced.	GNWT-ENR-3	Agreed
13	NDM to edit the site map and legend to better differentiate site features.	GNWT-ENR-4	Multiple maps used to simplify presentation.
14	NDM to include the contingencies required to deal with unplanned water pooling from both a water management perspective and through the structure design.	Tlicho Government - 2	Included in Specification.



## References

Rekard, M., Esch, D., and McHattie, R., 1988. Peat used as Roadway Insulation over Permafrost.  
Results from Canyon Creek Site.

## Appendixes

Site Map



