



**Photograph NCIS-078: From Sta. 2+760/-39 m (approx.), looking S. Placement of a 0.5 m thick lift of fine filter over the coarse filter in the upstream slope from El. 150 m to 152 m with an excavator from Sta. 2+800 m to 2+980 m.**



**Photograph NCIS-079: From Sta. 1+280/-39 m (approx.), looking SW. Placement of a 0.5 m thick lift of coarse filter in the upstream slope from El. 150 m to 152 m with an excavator from Sta. 1+300 m to 1+200 m.**



**Photograph NCIS-080: From Sta. 2+800/-38 m (approx.), looking S. Compaction of the 0.5 m lift (approx.) of coarse filter between El. 150 and 152 m with a 10-tonne smooth-drum compactor (4 passes) in the upstream slope from Sta. 2+925 m to 3+160 m and from Sta. 1+300 m to 1+200 m.**





**Photograph NCIS-081: From Sta2+975/-37 m (approx.), looking SE. Placement of a 0.5 m thick lift of fine filter over the coarse filter in the upstream slope from El. 150 m to 152 m with an excavator from Sta. 1+300 m to 1+210 m and from Sta. 2+940 m to 3+120 m.**



**Photograph NCIS-082: From Sta 3+060/-33 m (approx.), looking S. Placement of a 0.5 m thick lift of fine filter over the coarse filter in the upstream slope from El. 150 m to 152 m with an excavator from Sta. 3+120 m to 3+160 m.**




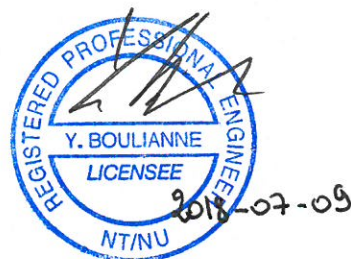
**Photograph NCIS-083: From Sta 1+140/-52 m (approx.), looking SW. Placement of a 2 m thick (approx.) lift of IV rockfill from El. 150 m to El. 152 m (approx.) with a dozer from Sta. 1+160 m to 1+170 m (-64 m to -111 m). The material is of good quality and is well graded.**





Photograph NCIS-084: From Sta 1+080/+47 m (approx.), looking E. Placement of a 2 m thick (approx.) lift of UM rockfill from El. 150 m to El. 152 m (approx.) with a dozer from Sta. 1+160 m to 1+130 m (-55 m to -102 m).

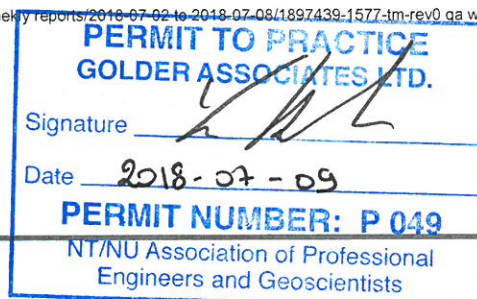
  
for: Samuel Barbeau  
Mine Waste Group



Yves Boulianne, P.Eng.  
Associate, Senior Geotechnical Engineer

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[https://golderassociates.sharepoint.com/sites/1897439/preparation of deliverables/weekly reports/2018-07-02 to 2018-07-08/1897439-1577-tm-rev0 qa weekly report north cell 2018-07-02 to 2018-07-08.docx](https://golderassociates.sharepoint.com/sites/1897439/preparation%20of%20deliverables/weekly%20reports/2018-07-02%20to%202018-07-08/1897439-1577-tm-rev0%20qa%20weekly%20report%20north%20cell%202018-07-02%20to%202018-07-08.docx)



## QA WEEKLY REPORT

**DATE** July 16th 2018

1897439-1577-TM-Rev0

**TO** Patrice Gagnon, Pier-Éric McDonald  
Agnico Eagle Mines Ltd, Meadowbank Division

**CC** Frédéric Bolduc, Alexandre Lavallée

**FROM** Samuel Barbeau

**EMAIL** sbarbeau@golder.com

### QA WEEKLY REPORT FROM JULY 9<sup>TH</sup> TO JULY 15<sup>TH</sup>– TSF NORTH CELL CONSTRUCTION MEADOWBANK (1897439)

This document summarizes QA activities performed by Golder from July 9<sup>th</sup> to July 15<sup>th</sup>, 2018 inclusively, related to the construction activities of the North Cell Internal Structure at the Meadowbank mine site.

Unless otherwise specified, the construction activities use the centreline of the structures for a dike crest elevation of 152 m for reference (refer to the Drawings). The description of activities refers to the stations and offsets from the centreline (e.g., Sta. 0+500/-50 m). The “+” and “-” symbols indicate the location of the work downstream and upstream of the centreline, respectively.

## 1.0 GOLDER PERSONNEL ON SITE

Golder personnel on site during this reporting period is summarized in Table 1.

**Table 1: Golder Personnel on Site**

Name	Comments
Samuel Barbeau	QA Manager

## 2.0 HEALTH AND SAFETY

H&S meetings were held with AEM and FGL/SANA during the daily construction meetings. Minutes from these meetings are recorded and stored in Golder’s on-site office. The key H&S elements for the reporting period were as follows:



- Dust is still an issue on the construction field; be vigilant by staying out of the dust cloud near construction activities and road circulation.
- Coactivity on the dike: be aware of blind spots and safe spots, keep good communication and visual contact with the operators.
- A pickup passed a haul truck on the west road without calling on the radio. It was reiterated to never pass a haul truck on the west road and, where acceptable, to always call on the radio when passing a vehicle.
- It was reminded to drink a lot of water to stay hydrated despite the heat.

### 3.0 SUMMARY OF MAIN DISCUSSIONS IN CONSTRUCTION MEETINGS

Construction meetings were held daily during the reporting period and were attended by the QA Manager. The following items were discussed:

#### General

- A meeting was conducted between the AEM and the Designer to discuss a strategy regarding the sump and ditch construction around the North Cell Internal Structure. The strategy consisted of phasing the construction of the ditch through time and to manage water in the low points with pumping equipment. AEM wished to construct only ditch 2 this season and to deviate it back into the North Cell rather than building sump 2, as the North Cell Internal Structure construction is limited to Sta. 1+100 m. AEM raised the questions to know why the ditch 2 was planned to be lined. Following discussion with AEM, the water management works planned for this construction season consist of:
  - Clearing a channel through the area near the cyanide burning pad to allow water to flow gravitationally inside the North Cell Internal Structure.
  - Digging a ditch west of the North Cell Internal Structure (NCIS), flowing southbound towards the interior of the NCIS, without installing a liner.
  - Improving the water management capacities by deepening the low points in the tailings east of the NCIS; installing rockfill to prevent erosion of the tailings and create an access for the pumping crew. The QA/QC personnel will be required to closely follow up on the excavation in the tailings as the underlying RF2 till plug must not be excavated.
- The placement of the rockfill lift was completed for El. 152 m.
- An access for the UM rockfill lift at elevation 154 on the North Cell Internal Structure was constructed with UM rockfill from Sta. 2+780 m to 2+750 m.
- The QA Manager observed large deformations in the fine filter surface on the North Cell Internal Structure around Sta. 1+940 m following the compaction. According to the SANA foreman, the deformations are due to

a new operator on the excavator towing the compactor. The surface was corrected with the compactor on the following day.

- The SANA surveyor reports that the lift is 0.3 m to 0.5 m too thick around Sta. 2+610 m (approx.) as it was placed during the night shift. The SANA surveyor will install pickets at the end of the day shift to guide the bulldozer during the night shift.
- The UM rockfill lift installed on July 13<sup>th</sup> was thicker than required by 300 mm to 700 mm even though the surveyor installed guide pickets. The SANA surveyor will increase the frequency of the follow-ups with the bulldozer operator from the Mine, as the non-AG rockfill quantities are low and limited. The elevation will be corrected to 154 m by an excavator to have a smooth surface for the compactor as well as to limit the extent of the filters.
- The UM rockfill lift elevation at the North Cell Internal Structure is henceforth closely followed by the SANA surveyor.
- An approx. 30 m shift between the station measured by the SANA surveyor and the QA Manager was noted. A new alignment for the North Cell Internal Structure centerline at El. 154 m had been issued around 2 weeks ago. The new GPX file was provided to the QA Manager on July 12<sup>th</sup>.
- With the new alignment, the water pipe around Sta. 2+730 m (approx.) is crossing the North Cell Internal Structure footprint at El. 152 m. The water pipe is included in the footprint for the elevation 154 m. The water pipe will need to be displaced before raising this area to El. 154 m.
- Boulders acting as a berm on the North Cell Internal Structure were moved by mistake on the top of the upstream slope at El 152 m. They were scattered with an excavator to prevent honeycombing.
- The QA Manager observed oversized boulders at the North Cell Internal Structure in the lift close to the upstream slope. AEM mine supervisor was informed of the situation. The loader operator in the pit will hence informed the haul truck if a boulder is present in its load and transfer this information to the bulldozer operator. The haul truck will drop its load on the downstream side of the pad and the bulldozer operator shall push the oversized boulders downstream.

#### **4.0 SUMMARY OF CONSTRUCTION ACTIVITIES AND TEST RESULTS**

Periodic QA inspections to monitor the construction activities and progress were performed by the QA Manager; these are summarized in the tables below. For the location and extent of the construction works, refer to the enclosed plans.

**Table 2: QA Observations for the North Cell Internal Structure**

Activity or Area	Comments
Crest	<ul style="list-style-type: none"> <li>■ Placement of a 2 m thick (approx.) lift of UM rockfill from El. 150 m to El. 152 m (approx.) with a dozer from Sta. 1+130 m to 1+100 m (-55 m to -78 m). The material is of good quality and is well graded.</li> <li>■ Placement of a 2 m thick (approx.) lift of UM rockfill from El. 152 m to El. 154 m (approx.) with a dozer from Sta. 2+750 m to 2+280 m (+9 m to -26 m). The material is of good quality and is well graded.</li> </ul>
Upstream	<ul style="list-style-type: none"> <li>■ Compaction of the 0.5 m lift (approx.) of fine filter between El. 150 m and 152 m with a 10-tonne smooth-drum compactor (4 passes) in the upstream slope from Sta. 2+028 m to 1+650 m. Vibration is used except for the first pass down the slope in order to stabilize the material and limit deformation of the lift.</li> <li>■ Profiling of the upstream slope (3H:1V) from El. 150 to 152 m with an excavator from Sta. 1+185 m to 1+100 m.</li> <li>■ Profiling of the upstream slope (3H:1V) from El. 152 to 154 m with an excavator from Sta. 2+720 m to 2+545 m.</li> </ul>

## 5.0 SAMPLING, LABORATORY AND FIELD TESTING

Table 3 and Table 4 present the samples collected or tested by the QA and QC.

**Table 3: Samples Taken by the QC**

Sample ID	Date Sampled	Date Tested	Fill Material Type	Location (Station/Offset Elevation)	Test	Testing Result



**Table 4: Samples Taken by the QA**

<b>Sample ID</b>	<b>Date Sampled</b>	<b>Date Tested</b>	<b>Fill Material Type</b>	<b>Location (Station/Offset Elevation)</b>	<b>Test</b>	<b>Testing Result</b>

## 6.0 PHOTOGRAPHS



**Photograph NCIS-085: From Sta 1+150/-67m (approx.), looking SW. Placement of a 2 m thick (approx.) lift of UM rockfill from El. 150 m to El. 152 m (approx.) with a dozer from Sta. 1+130 m to 1+100 m (-55 m to -78 m).**



**Photograph NCIS-086: From Sta 2+750/+14 m (approx.), looking E. Placement of a 2 m thick (approx.) lift of UM rockfill from El. 152 m to El. 154 m (approx.) with a dozer from Sta. 2+780 m to 2+760 m (-60 m to -44 m).**





**Photograph NCIS-087: From Sta 1+950/-34 m (approx.), looking W. Compaction of the 0.5 m lift (approx.) of fine filter between El. 150 and 152 m with a 10-tonne smooth-drum compactor (4 passes) in the upstream slope from Sta. 2+000 m to 1+930 m. Vibration is used except for the first pass down the slope in order to stabilize the material and limit deformation of the lift.**



**Photograph NCIS-088: From Sta 2+000/-35 m (approx.), looking W. Compaction of the 0.5 m lift (approx.) of fine filter between El. 150 m and 152 m with a 10-tonne smooth-drum compactor (4 passes) in the upstream slope from Sta. 2+028 m to 1+650 m.**





**Photograph NCIS-089: From Sta 2+525/+4 m (approx.), looking S. Placement of a 2 m thick (approx.) lift of UM rockfill from El. 152 m to El. 154 m (approx.) with a dozer from Sta. 2+605 m to 2+455 m (+3 m to -23 m).**





**Photograph NCIS-090: From Sta 2+440/-1 m (approx.), looking SE. Placement of a 2 m thick (approx.) lift of UM rockfill from El. 152 m to El. 154 m (approx.) with a dozer from Sta. 2+455 m to 2+370 m (+4 m to -24 m).**



**Photograph NCIS-091: From Sta 2+330/+13 m (approx.), looking S. Placement of a 2 m thick (approx.) lift of UM rockfill from El. 152 m to El. 154 m (approx.) with a dozer from Sta. 2+370 m to 2+290 m (+9 m to -22 m). The material is of good quality and is well graded.**



**Photograph NCIS-092: From Sta 1+160/-77 m (approx.), looking S. Profiling of the upstream slope (3H:1V) from El. 150 to 152 m with an excavator from Sta. 1+185 m to 1+135 m.**





**Photograph NCIS-093: From Sta 2+260/+12 m (approx.), looking S. Placement of a 2 m thick (approx.) lift of UM rockfill from El. 152 m to El. 154 m (approx.) with a dozer from Sta. 2+290 m to 2+280 m (+9 m to -22 m).**





Photograph NCIS-094: From Sta 1+125/-109 m (approx.), looking SW. Profiling of the upstream slope (3H:1V) from El. 150 to 152 m with an excavator from Sta. 1+135 m to 1+100 m


  
Marion Haberscher  
for: Samuel Barbeau  
Mine Waste Group



Yves Boulianne, P.Eng.  
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[https://golderassociates.sharepoint.com/sites/1897439/preparation of deliverables/weekly reports/2018-07-09 to 2018-07-15/1897439-1577-tm-rev0 qa weekly report north cell 2018-07-09 to 2018-07-15.docx](https://golderassociates.sharepoint.com/sites/1897439/preparation%20of%20deliverables/weekly%20reports/2018-07-09%20to%202018-07-15/1897439-1577-tm-rev0%20qa%20weekly%20report%20north%20cell%202018-07-09%20to%202018-07-15.docx)

<b>PERMIT TO PRACTICE</b> <b>GOLDER ASSOCIATES LTD.</b>
Signature 
Date <u>2018-07-16</u>
<b>PERMIT NUMBER: P 049</b> NT/NU Association of Professional Engineers and Geoscientists

## QA WEEKLY REPORT

**DATE** July 23rd 2018

1897439-1577-TM-Rev0

**TO** Patrice Gagnon, Pier-Éric McDonald  
Agnico Eagle Mines Ltd, Meadowbank Division

**CC** Frédéric Bolduc, Alexandre Lavallée

**FROM** Marion Habersetzer

**EMAIL** mhabersetzer@golder.com

### QA WEEKLY REPORT FROM JULY 16<sup>TH</sup> TO JULY 22<sup>ND</sup> – TSF NORTH CELL CONSTRUCTION MEADOWBANK (1897439)

This document summarizes QA activities performed by Golder from July 16<sup>th</sup> to July 22<sup>nd</sup>, 2018 inclusively, related to the construction activities of the North Cell Internal Structure at the Meadowbank mine site.

Unless otherwise specified, the construction activities use the centreline of the structures for a dike crest elevation of 152 m for reference (refer to the Drawings). The description of activities refers to the stations and offsets from the centreline (e.g., Sta. 0+500/-50 m). The “+” and “-” symbols indicate the location of the work downstream and upstream of the centreline, respectively.

## 1.0 GOLDER PERSONNEL ON SITE

Golder personnel on site during this reporting period is summarized in Table 1.

**Table 1: Golder Personnel on Site**

Name	Comments
Samuel Barbeau	QA Manager (departure on July 16 <sup>th</sup> )
Marion Habersetzer	QA Manager (arrival on July 16 <sup>th</sup> )

## 2.0 HEALTH AND SAFETY

H&S meetings were held with AEM and FGL/SANA during the daily construction meetings. Minutes from these meetings are recorded and stored in Golder's on-site office. The key H&S elements for the reporting period were as follows:

- Dust is still an issue on the construction field; be vigilant by staying out of the dust cloud near construction activities and road circulation.
- Coactivity on the dike: be aware of blind spots and safe spots, keep good communication and visual contact with the operators.
- A haul truck passed by 2 larger haul trucks yesterday on the North Cell Internal Structure without obtaining the radio clearance beforehand. It was reiterated to wait for confirmation before taking over heavy equipment and to make sure to always use the correct radio channel.
- A near-miss incident happened in Amaruq where a suspended load (boulder) dropped near workers.
- A caribou was spotted on the North Cell on July 21<sup>st</sup>. Activities were slowed down as a precaution.
- It is required to slow down when passing near workers on foot, as vehicles lift a large quantity of dust.

### **3.0 SUMMARY OF MAIN DISCUSSIONS IN CONSTRUCTION MEETINGS**

Construction meetings were held daily during the reporting period and were attended by the QA Manager. The following items were discussed:

#### **General**

- The water pipe crossing the North Cell Internal Structure around Sta. 2+730 m will need to be moved. AEM will inform SANA on who will move the pipe and where will it be moved to.
- The works on the portion of the North Cell Internal Structure at El. 152 m are prioritized. Ditches and sumps as well as deposition points should be completed by August 1<sup>st</sup> to allow for deposition from that date on.
- AEM asked to know the volume of rockfill needed to complete the North Cell Internal Structure (NCIS). An estimated 15 000 m<sup>3</sup> is required to finish the crest, and additional UM rockfill will be used to prepare deposition points.
- The QA Manager and the foreman reviewed the works to be done for the ditch (west of the NCIS and through the Cyanide Burning Pad) and the sumps (east of the NCIS, near the rock storage facility) planned for this year.

#### **Follow-up**

- Deposition points design to be discussed between AEM and Golder.

## 4.0 SUMMARY OF CONSTRUCTION ACTIVITIES AND TEST RESULTS

Periodic QA inspections to monitor the construction activities and progress were performed by the QA Manager; these are summarized in the tables below. For the location and extent of the construction works, refer to the enclosed plans.

**Table 2: QA Observations for the North Cell Internal Structure**

Activity or Area	Comments
Crest	<ul style="list-style-type: none"> <li>■ Placement of a 2 m thick (approx.) lift of UM rockfill from El. 152 m to El. 154 m (approx.) with a dozer from Sta. 2+190 m to 1+863 m (+14 m to -26 m). The material is of good quality and is well graded.</li> </ul>
Upstream	<ul style="list-style-type: none"> <li>■ Placement of a 0.5 m thick lift of coarse filter in the upstream slope from El. 150 m to 152 m with an excavator from Sta. 1+113 m to 1+200 m. The material visually seemed well graded and of good quality.</li> <li>■ Compaction of the 0.5 m lift (approx.) of coarse filter between El. 150 m and 152 m with a 10-tonne smooth-drum compactor with vibration (4 passes) in the upstream slope from Sta. 1+113 m to 1+200 m.</li> <li>■ Placement of a 0.5 m thick lift of fine filter in the upstream slope from El. 150 m to 152 m with an excavator from Sta. 1+113 m to 1+215 m. The material visually seemed well graded and of good quality.</li> <li>■ Compaction of the 0.5 m lift (approx.) of fine filter between El. 150 m and 152 m with a 10-tonne smooth-drum compactor with vibration (4 passes) in the upstream slope from Sta. 1+251 m to 1+660 m.</li> <li>■ Profiling of the upstream slope (3H:1V) from El. 152 to 154 m with an excavator from Sta. 2+545 m to 2+159 m. Oversize boulders were removed.</li> <li>■ Placement of a 0.5 m thick lift of coarse filter in the upstream slope from El. 152 m to 154 m with an excavator from Sta. 2+293 m to 2+710 m. The material visually seemed well graded and of good quality.</li> <li>■ Compaction of the 0.5 m lift (approx.) of coarse filter between El. 152 m and 154 m with a 10-tonne smooth-drum compactor with vibration (4 passes) in the upstream slope from Sta. 2+710 m to 2+411 m.</li> <li>■ Placement of a 0.5 m thick lift of fine filter in the upstream slope from El. 152 m to 154 m with an excavator from Sta. 2+710 m to 2+445 m. The material visually seemed well graded and of good quality.</li> </ul>



## 5.0 SAMPLING, LABORATORY AND FIELD TESTING

Table 3 and Table 4 present the samples collected or tested by the QA and QC.

**Table 3: Samples Taken by the QC**

Sample ID	Date Sampled	Date Tested	Fill Material Type	Location (Station/Offset Elevation)	Test	Testing Result
CF-389-2018	2018-07-20	2018-07-22	Coarse Filter	North Cell Internal Structure (in place) 2+720/-22 m, El. 154 m	Gradation	Compliant
					Water content	0.5%
FF-419-2018	2018-07-21		Fine Filter	North Cell Internal Structure (in place) 2+690/-13 m, El. 154 m		

**Table 4: Samples Taken by the QA**

Sample ID	Date Sampled	Date Tested	Fill Material Type	Location (Station/Offset Elevation)	Test	Testing Result
FF-420-2018	2018-07-21		Fine Filter	North cell Internal Structure (in place) 2+690/-13 m, El. 154 m		

## 6.0 PHOTOGRAPHS



**Photograph NCIS-096: From Sta 2+355/+9 m (approx.), looking N. Placement of a 2 m thick (approx.) lift of UM rockfill from El. 152 m to El. 154 m (approx.) with a dozer from Sta. 2+190 m to 2+103 m (+7 m to -22 m). The material is of good quality and is well graded.**



**Photograph NCIS-095: From Sta 2+375/-18 m (approx.), looking S. Profiling of the upstream slope (3H:1V) from El. 152 to 154 m with an excavator from Sta. 2+545 m to 2+410 m.**



**Photograph NCIS-097: From Sta. 1+180/-75 m (approx.), looking SW. Placement of a 0.5 m thick lift of coarse filter in the upstream slope from El. 150 m to 152 m with an excavator from Sta. 1+200 m to 1+113 m.**





**Photograph NCIS-098: From Sta. 2+040/-9 m (approx.), looking E. Placement of a 2 m thick (approx.) lift of UM rockfill from El. 152 m to El. 154 m (approx.) with a dozer from Sta. 2+103 m to 1+984 m (+7 m to -22 m). The material is of good quality and is well graded.**



**Photograph NCIS-099: From Sta. 1+180/-76 m (approx.), looking SE. Compaction of the 0.5 m lift (approx.) of coarse filter between El. 150 m and 152 m with a 10-tonne smooth-drum compactor with vibration (4 passes) in the upstream slope from Sta. 1+200 m to 1+170 m.**



**Photograph NCIS-100: From Sta. 1+960/+10 m (approx.), looking E. Placement of a 2 m thick (approx.) lift of UM rockfill from El. 152 m to El. 154 m (approx.) with a dozer from Sta. 1+984 m to 1+947 m (+14 m to -26 m). The material is of good quality and is well graded.**





**Photograph NCIS-101: From Sta. 1+120/-89 m (approx.), looking N. Placement of a 0.5 m thick lift of fine filter in the upstream slope from El. 150 m to 152 m with an excavator from Sta. 1+113 m to 1+205 m.**





**Photograph NCIS-102: From Sta. 2+680/-21 m (approx.), looking W. Placement of a 0.5 m thick lift of coarse filter in the upstream slope from El. 152 m to 154 m with an excavator from Sta. 2+575 m to 2+710 m and from Sta. 2+411 m to 2+460 m.**



**Photograph NCIS-103: From Sta. 2+420/-27 m (approx.), looking NE. Profiling of the upstream slope (3H:1V) from El. 152 to 154 m with an excavator from Sta. 2+400 m to 2+410 m. Oversize boulders were removed.**





**Photograph NCIS-104: From Sta. 2+650/-23 m (approx.), looking SE. Placement of a 0.5 m thick lift of fine filter in the upstream slope from El. 152 m to 154 m with an excavator from Sta. 2+710 m to 2+445 m.**