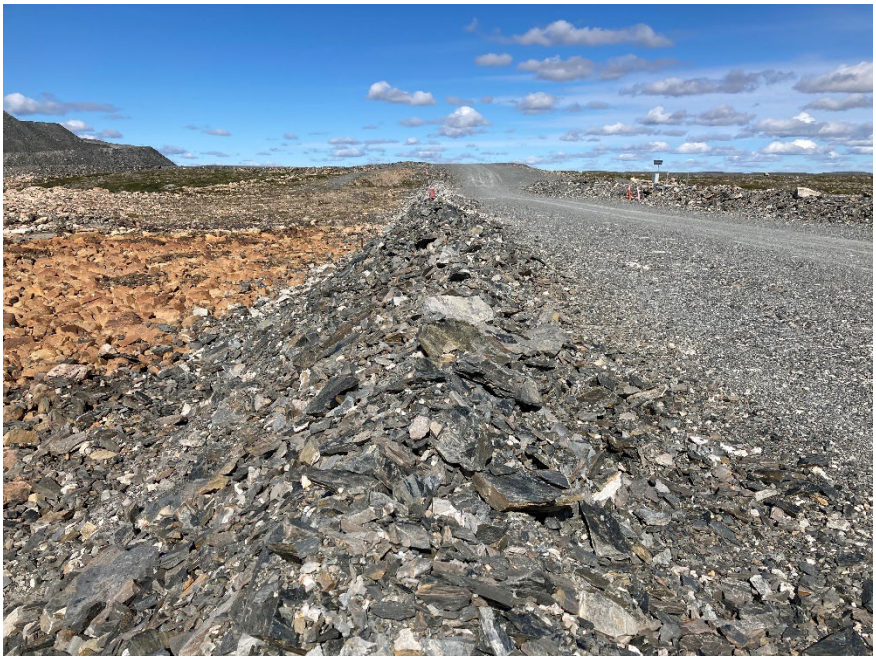
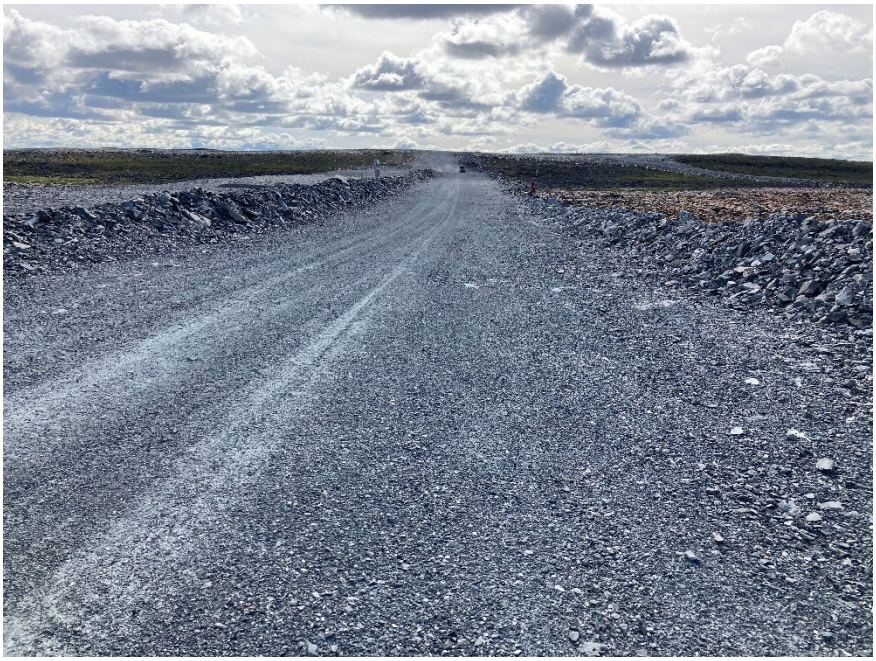


Photograph A4-3 Vault Dike

Date: July 29, 2022 **Photo Number**: 147

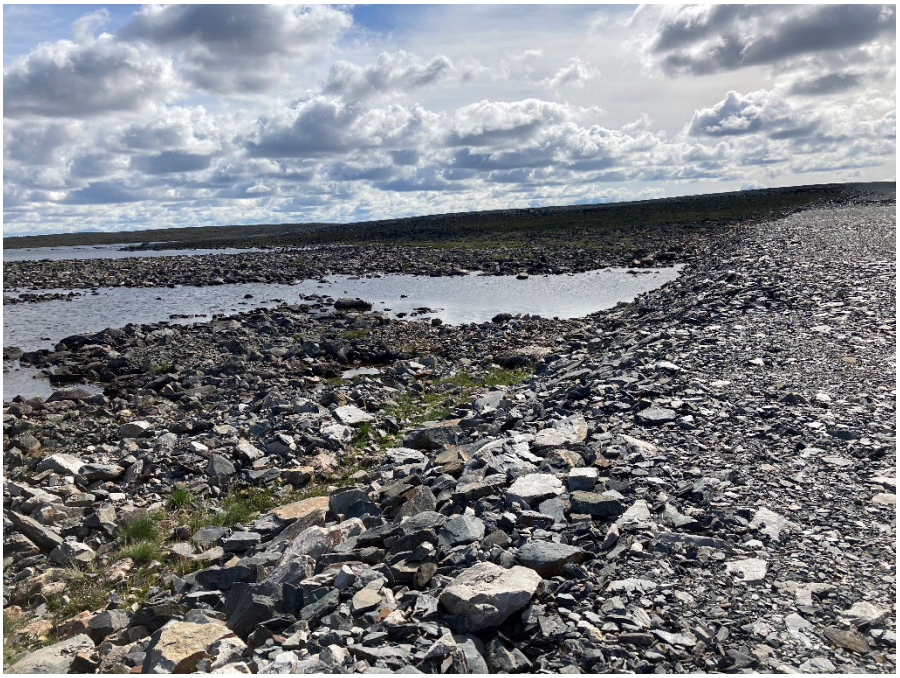
Description: From downstream, looking northwest at the downstream toe.



Photograph A4-4 Vault Dike

Date: July 29, 2022 **Photo Number:** 141

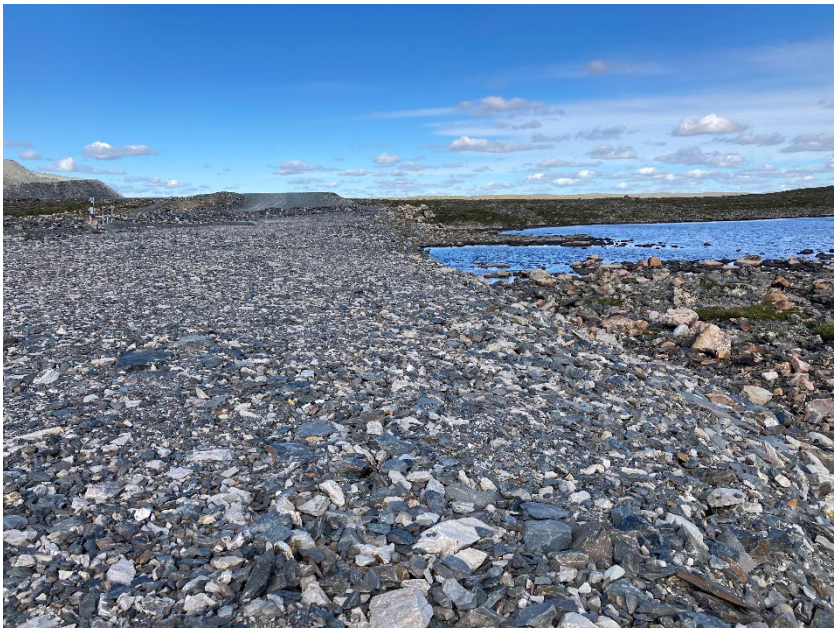
Description: From the west abutment, looking southeast at the crest.



Photograph A4-5 Vault Dike

Date: July 29, 2022 **Photo Number**: 142

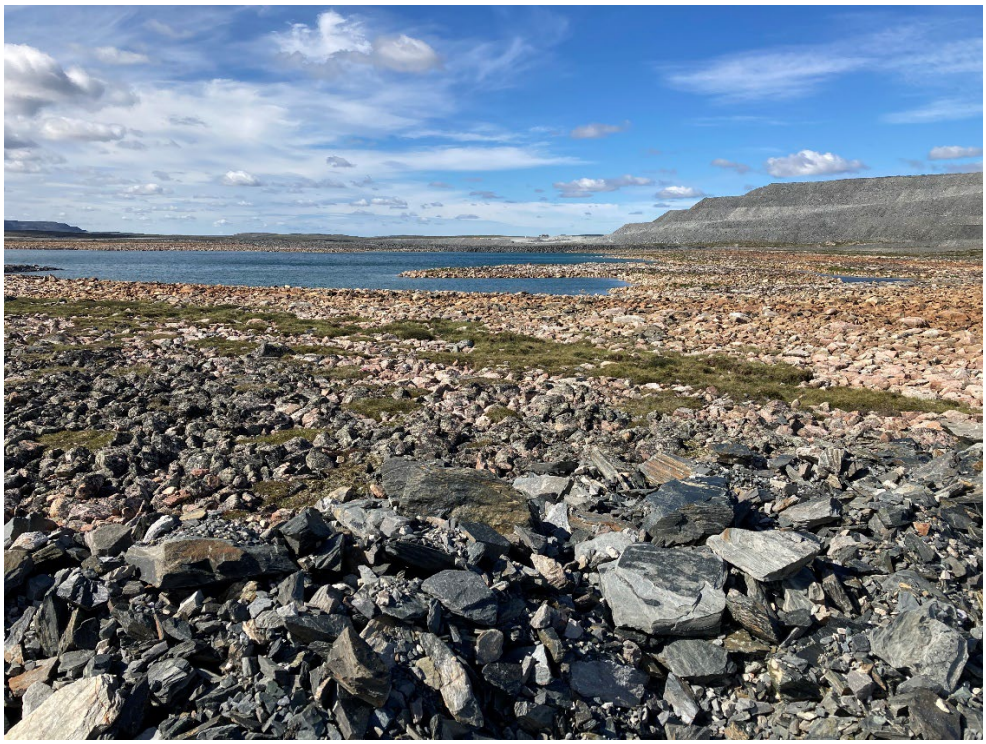
Description: From the upstream side, looking southeast at the upstream slope.



Photograph A4-6 Vault Dike

Date: July 29, 2022 **Photo Number**: 143

Description: From the upstream side, looking northwest at the upstream slope.



Photograph A4-7 Vault Dike

Date: July 29, 2022 **Photo Number**: 145

Description: From the downstream side, looking southwest towards Vault Lake.

Appendix A-5

Wail-Tail Dike

Client:	AEM	**By:**	Marion Habersetzer
Project:	Whale Tail Project	**Date:**	July 27, 2022
Location:	Whale Tail Dike	**Reviewed:**	Yves Boulianne

GENERAL INFORMATION			
Dam Type:	Rockfill shell with cement-bentonite secant pile cut-off wall enclosed in fine and coarse filter layers. 10 m deep grout curtain in the bedrock in the western section of the dike. Downstream grout blanket at bedrock interface all along the dike.		
Weather Conditions:	Sunny	**Temperature:**	20°C

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
1. DAM CREST		91, 92, 93, 95, 96, 98, 97, 99, 100, 101, 103, 107, 105, 102, 110, 111, 94	
1.1 Crest elevation	El. 159 m (rockfill) El. 157 m (cut-off wall)		A 2 m rockfill termal cap covers the cut-off wall (cement-bentonite secant piles)
1.2 Reservoir level	U/S El.155.2 m (Whale Tail South)		Operational water level: 155.5 m
Current freeboard	3.8 m (rockfill crest) 1.8 m (cut-off wall)		
1.3 Distance to tailings pond (if applicable)	Not applicable		
1.4 Surface cracking	Some at the East abutment	94, 108, 109	Associated to foundation thawing. Cracks parallel to center line (20 mm wide) depressions (500-700 mm) with some perpendicular to center line.

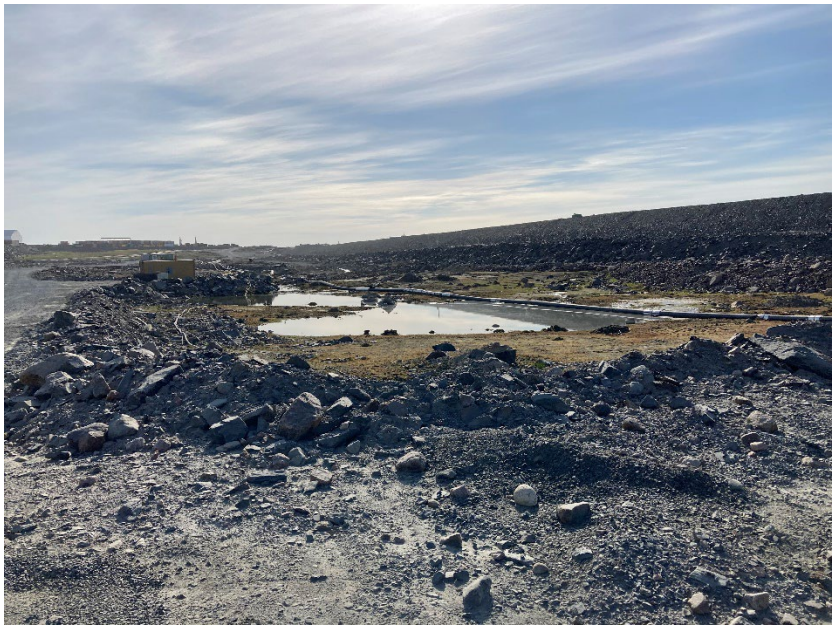
INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
1.5 Unexpected settlement	Some at the East abutment		Associated to foundation thawing
1.6 Lateral movement	Not apparent		
1.7 Other unusual conditions	None		
2. UPSTREAM SLOPE		91, 95, 96, 99, 103	
2.1 Slope angle	1.5H:1V(dike) 1.3H:1V (U/S berm)		Adequate
2.2 Signs of erosion	None observed		
2.3 Signs of movement (deformation)	None observed		
2.4 Cracks	None observed		
2.5 Face liner condition (if applicable)	Not applicable		
2.6 Other unusual conditions	None		
3. DOWNSTREAM SLOPE		93, 101, 105, 110, 111, 113, 114, 115, 117, 118, 119	
3.1 Slope angle	1.5H:1V(dike) 1.3H:1V (D/S berm)		Adequate
3.2 Signs of erosion	None observed		
3.3 Signs of movement (deformation)	None observed		
3.4 Cracks	None observed		
3.5 Seepage or wet areas	None observed.		
3.6 Vegetation growth	No		

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
3.7 Other unusual conditions	None		
4. DOWNSTREAM TOE AREA		93, 101, 105, 110, 111, 113, 114, 115, 117, 118, 119, 112	
4.1 Seepage from dam	Yes	117, 118, 112	Collected in a trench from Sta. 0+430 to 0+720. Seepage interception system pumping water compose of 4 pumping stations (inactive). Sta. 0+150, seepage in the road fill from the dyke toe (flow).
4.2 Signs of erosion	None observed		
4.3 Signs of turbidity in seepage water	None		All seepage water is clear
4.4 Discoloration/staining	No		
4.5 Outlet operating problem (if applicable)	Not applicable		
4.6 Other unusual conditions	None		
5. ABUTMENTS			
5.1 Seepage at contact zone (abutment/embankment)	None observed		
5.2 Signs of erosion	None observed		
5.3 Excessive vegetation	No		
5.4 Presence of rodent burrows	None observed		
5.5 Other unusual conditions	None		

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
6. RESERVOIR		91, 95, 96, 99, 103	
6.1 Stability of slopes	Stable		
6.2 Distance to nearest slide (if applicable)	Not applicable		
6.3 Estimate of slide volume (if applicable)	None observed		
6.4 Floating debris	None		
6.5 Other unusual conditions	None		
7. EMERGENCY SPILLWAY/ OUTLET STRUCTURE	No spillway or outlet structure exists		
7.1 Surface condition			
7.2 Signs of erosion			
7.3 Signs of movement (deformation)			
7.4 Cracks			
7.5 Settlement			
7.6 Presence of debris or blockage			
7.7 Closure mechanism operational			
7.8 Slope protection			
7.9 Instability of side slopes			
7.10 Other unusual conditions			
8. INSTRUMENTATION			

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
8.1 Piezometers	Yes		9 piezometer holes with each 3 instruments. See Section 4.1.2 of the report
8.2 Settlement cells	No		
8.3 Thermistors	Yes		16 piezometers in the dike. See Section 4.1.2 of the report.
8.4 Settlement monuments	No		
8.5 Seismograph	No		
8.6 Inclinometer	Yes		4 shape array accelerometers. See Section 4.1.2 of the report.
8.7 Weirs and flow monitors	Yes		1 V-notch weirs (0+430). The V-notch at Sta. 0+560 is not present anymore.
8.8 Data logger(s)	Yes		
8.9 Other	No		
9. DOCUMENTATION			
9.1 Operation, Maintenance and Surveillance (OMS) Plan			
9.1.1 OMS Plan exists	Yes		
9.1.2 OMS Plan reflects current dam conditions	Yes		
9.1.3 Date of last revision	November 2021		
9.2 Emergency Preparedness Plan (EPP)			
9.2.1 EPP exists	Yes		

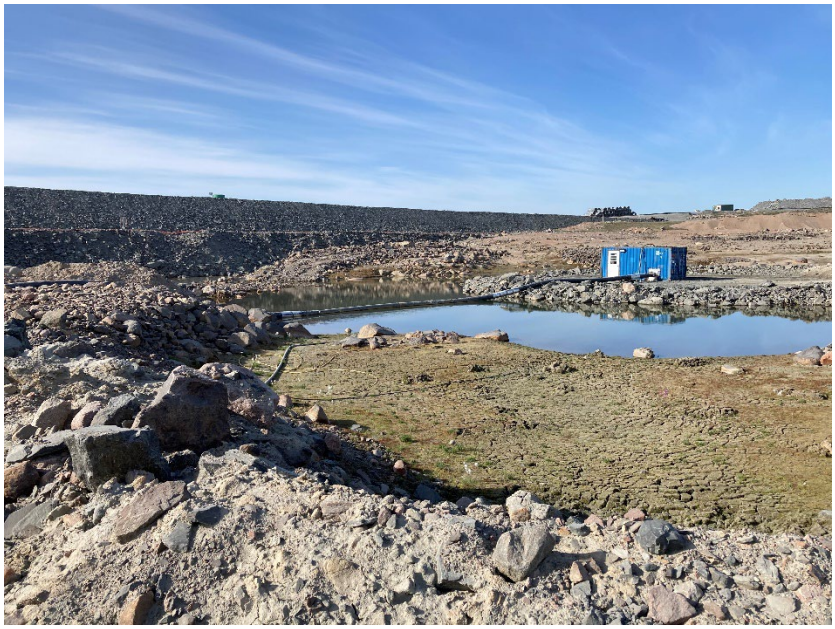
INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
9.2.2 EPP reflects current conditions	Yes		
9.2.3 Date of last revision	September 2021		
10. NOTES			
Inspector's Signature	Marion Habersetzer	**Date:**	July 27, 2022



Photograph A5-1 Whale Tail Dike

Date: July 27, 2022 **Photo Number**:115

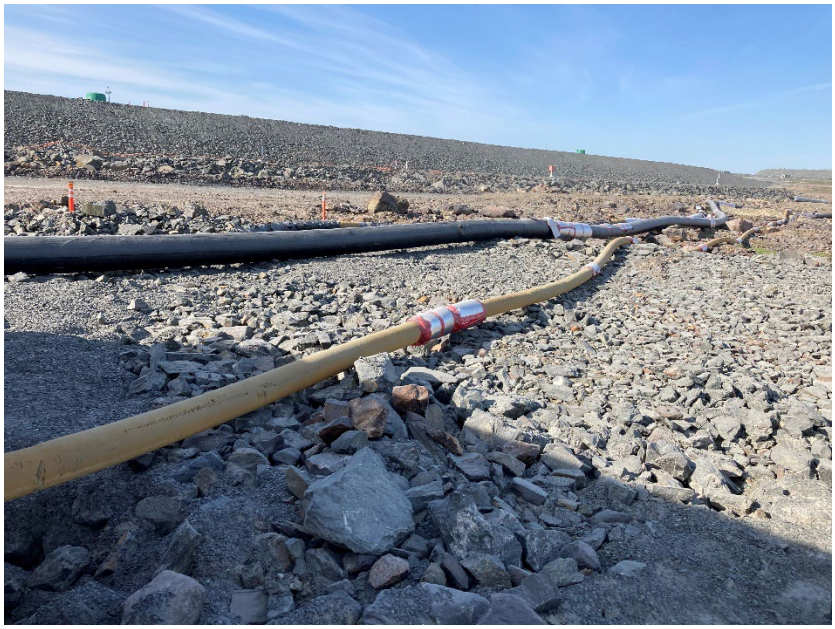
Description: From approx. Sta. 0+250 downstream (P4 pumping station), looking east. A large amount of water is ponding.



Photograph A5-2 Whale Tail Dike

Date: July 27, 2022 **Photo Number**:114

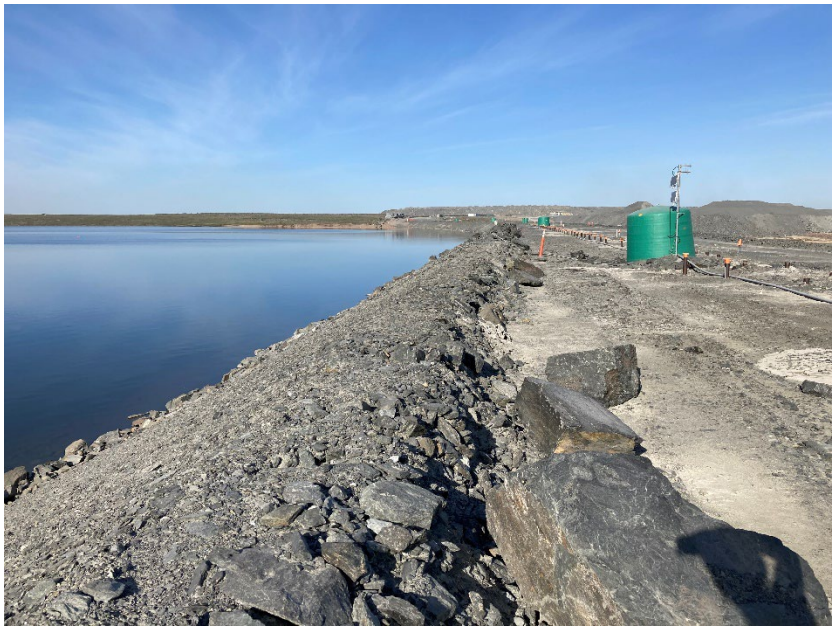
Description: From approx. Sta. 0+250 downstream (P4 pumping station), looking southwest. A large amount of water is ponding.



Photograph A5-3 Whale Tail Dike

Date: July 27, 2022 **Photo Number**:116

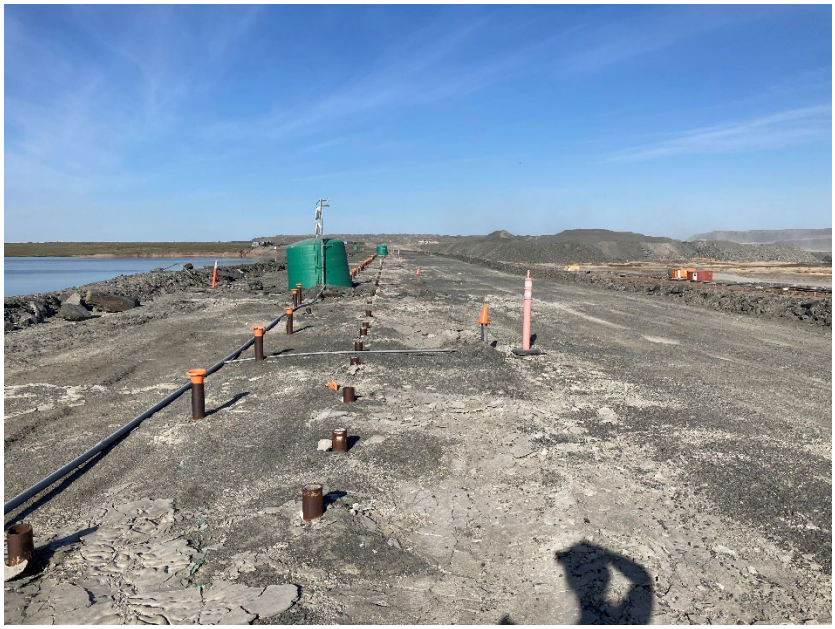
Description: From approx. Sta. 0+600 downstream (P1 pumping station), looking southwest.



Photograph A5-4 Whale Tail Dike

Date: July 27, 2022 **Photo Number**: 103

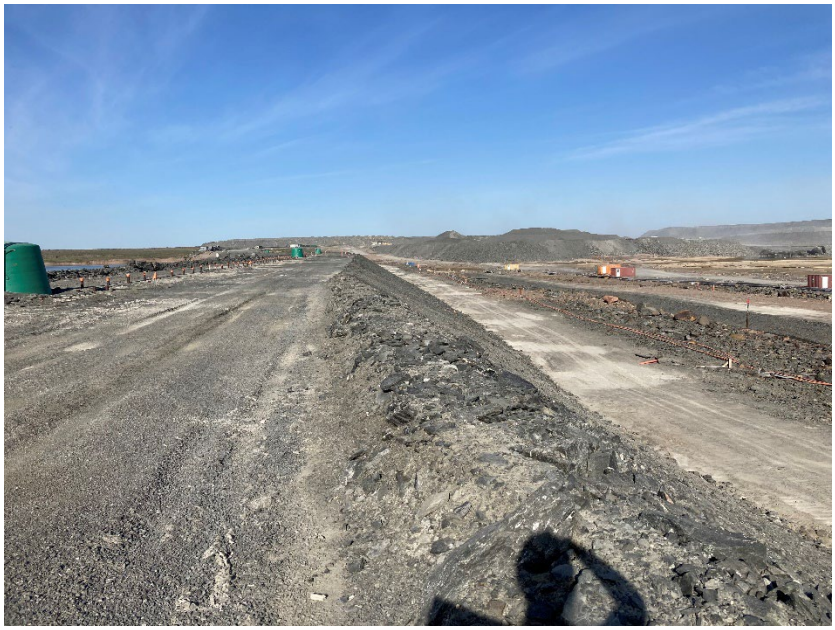
Description: From approx. Sta. 0+725 (east abutment), looking southwest at the upstream slope.



Photograph A5-5 Whale Tail Dike

Date: July 27, 2022 **Photo Number**: 104

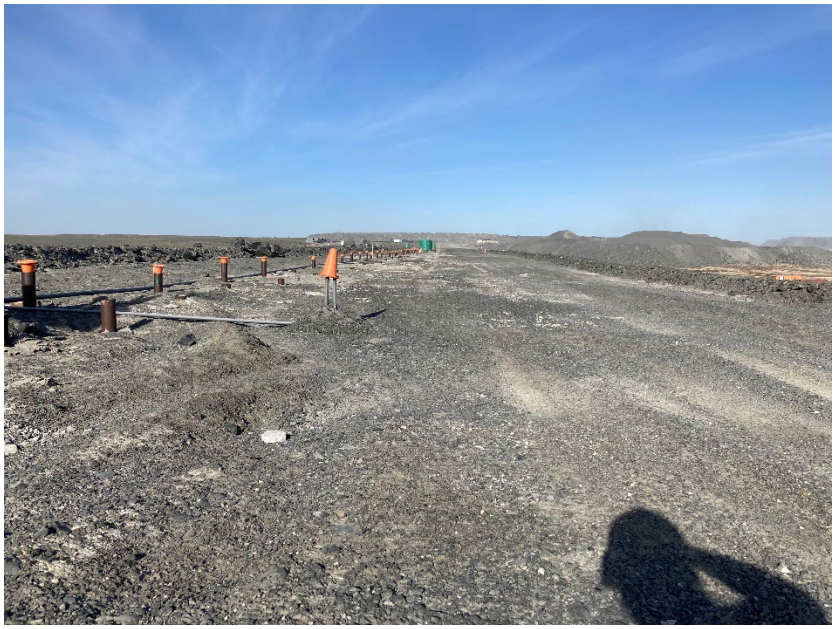
Description: From approx. Sta. 0+725 (east abutment), looking west at the crest.



Photograph A5-6 Whale Tail Dike

Date: July 27, 2022 **Photo Number**: 105

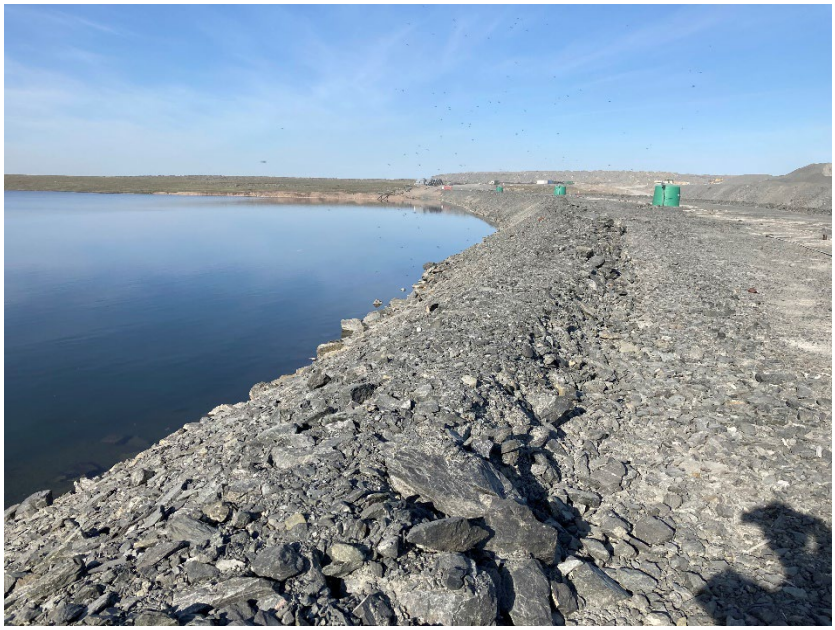
Description: From approx. Sta. 0+725 (east abutment), looking west at the downstream slope.



Photograph A5-7 Whale Tail Dike

Date: July 27, 2022 **Photo Number**: 102

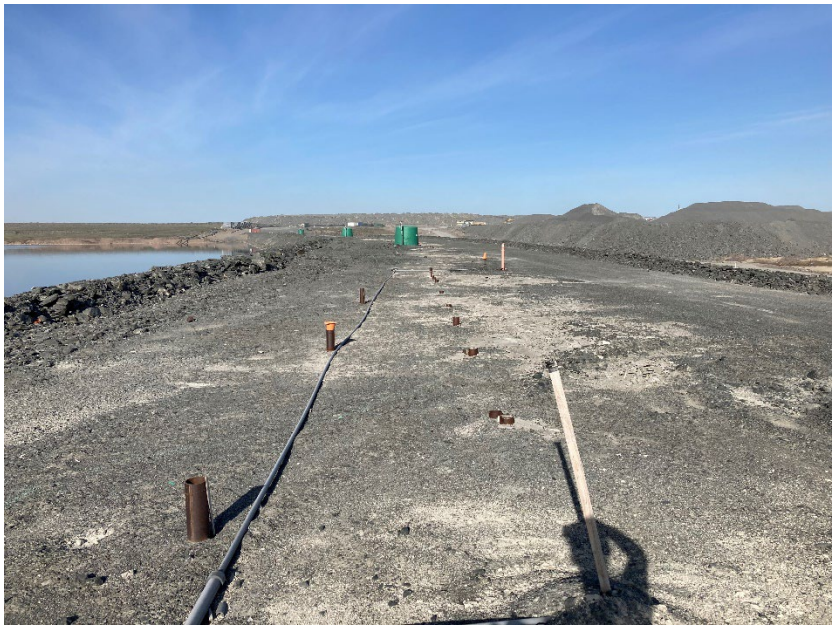
Description: From approx. Sta. 0+700 (east abutment), looking west at the crest.



Photograph A5-8 Whale Tail Dike

Date: July 27, 2022 **Photo Number**: 99

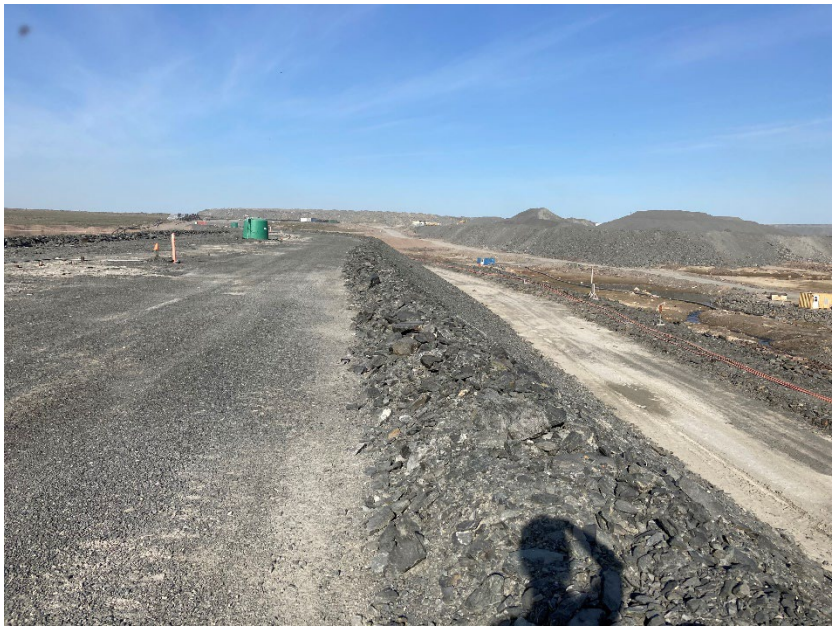
Description: From approx. Sta. 0+575, looking west at the upstream slope.



Photograph A5-9 Whale Tail Dike

Date: July 27, 2022 **Photo Number**: 100

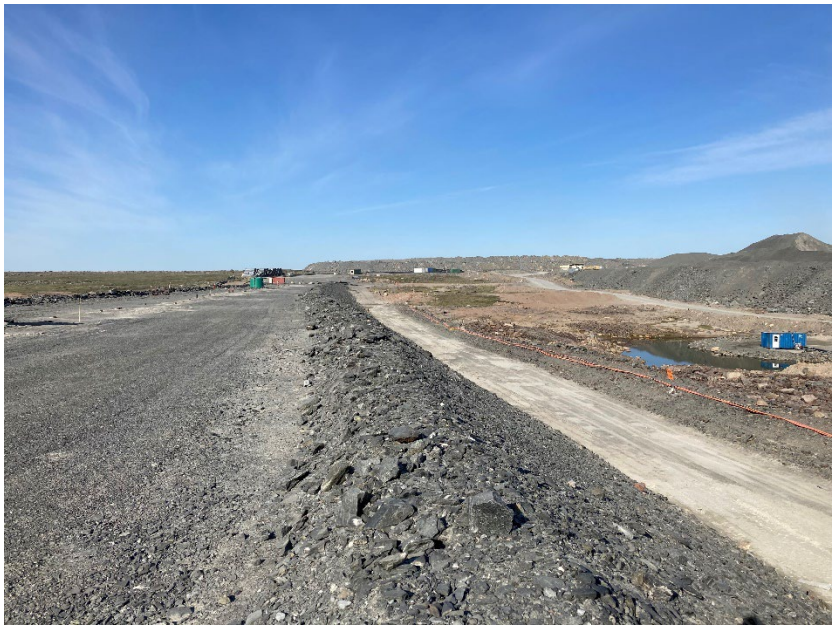
Description: From approx. Sta. 0+575, looking west at the crest.



Photograph A5-10 Whale Tail Dike

Date: July 27, 2022 **Photo Number**: 101

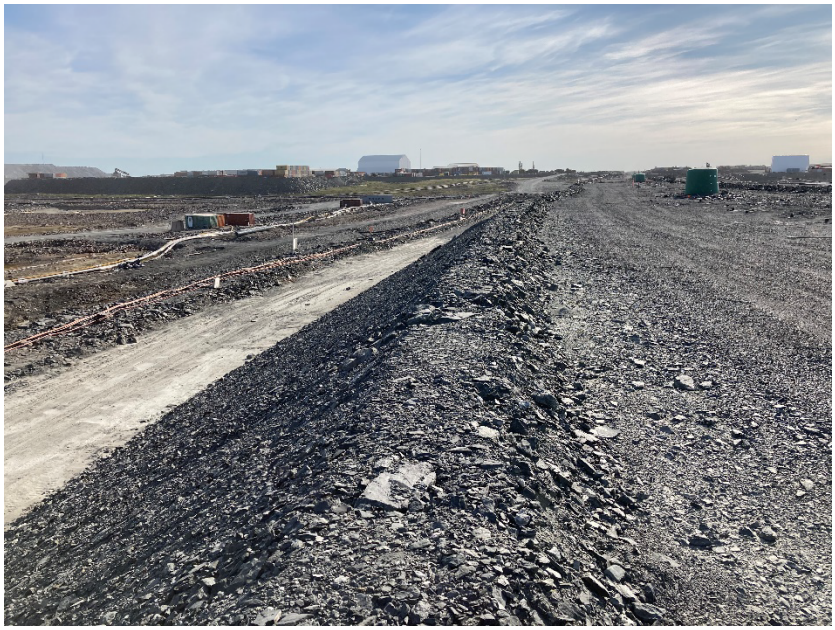
Description: From approx. Sta. 0+575, looking west at the downstream slope and downstream platform.



Photograph A5-11 Whale Tail Dike

Date: July 27, 2022 **Photo Number**: 111

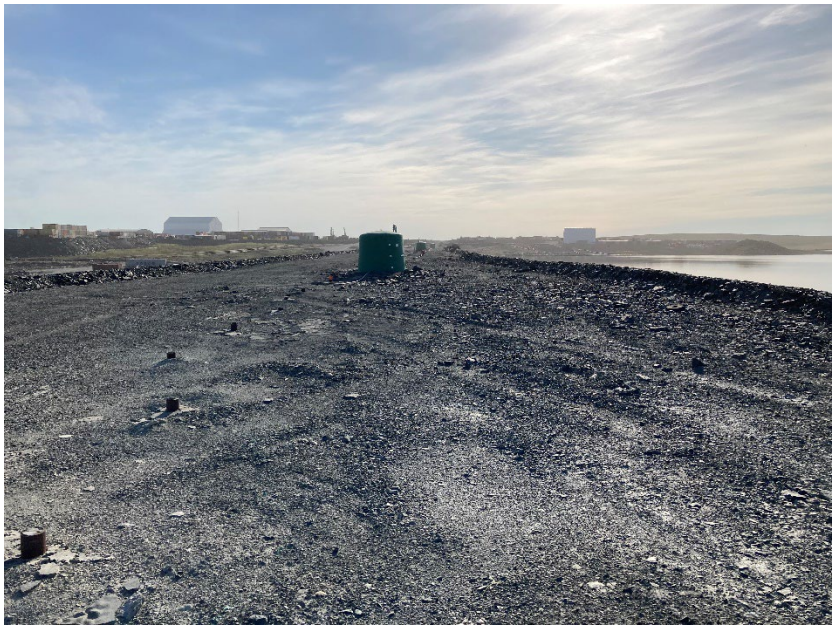
Description: From approx. Sta. 0+400, looking west at the downstream slope and downstream platform.



Photograph A5-12 Whale Tail Dike

Date: July 27, 2022 **Photo Number**: 110

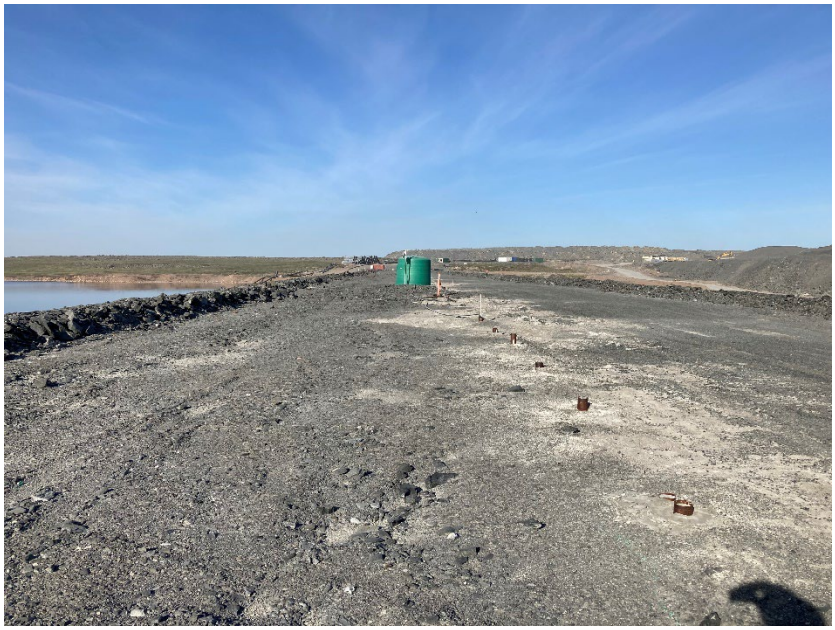
Description: From approx. Sta. 0+400, looking east at the downstream slope and downstream platform.



Photograph A5-13 Whale Tail Dike

Date: July 27, 2022 **Photo Number**: 98

Description: From approx. Sta. 0+400, looking west at the crest.



Photograph A5-14 Whale Tail Dike

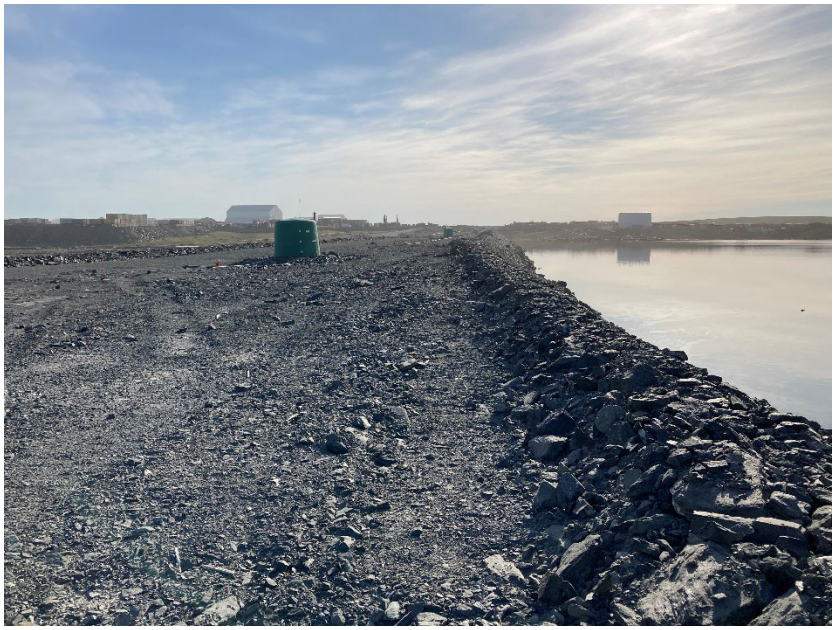
Date: July 27, 2022 **Photo Number**: 97

Description: From approx. Sta. 0+400, looking east at the crest.

Photograph A5-15 Whale Tail Dike

Date: July 27, 2022 **Photo Number**: 95

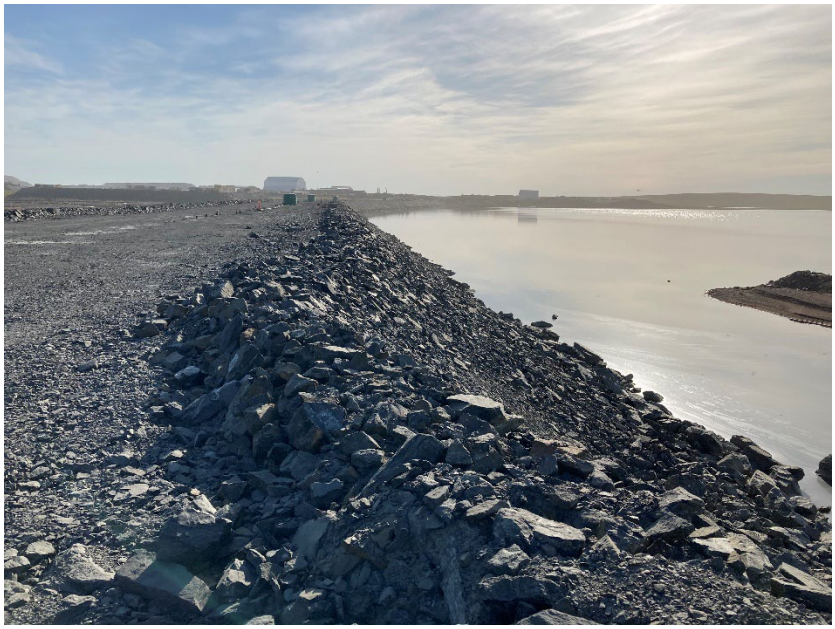
Description: From approx. Sta. 0+400, looking west at the upstream slope.



Photograph A5-16 Whale Tail Dike

Date: July 27, 2022 **Photo Number**: 96

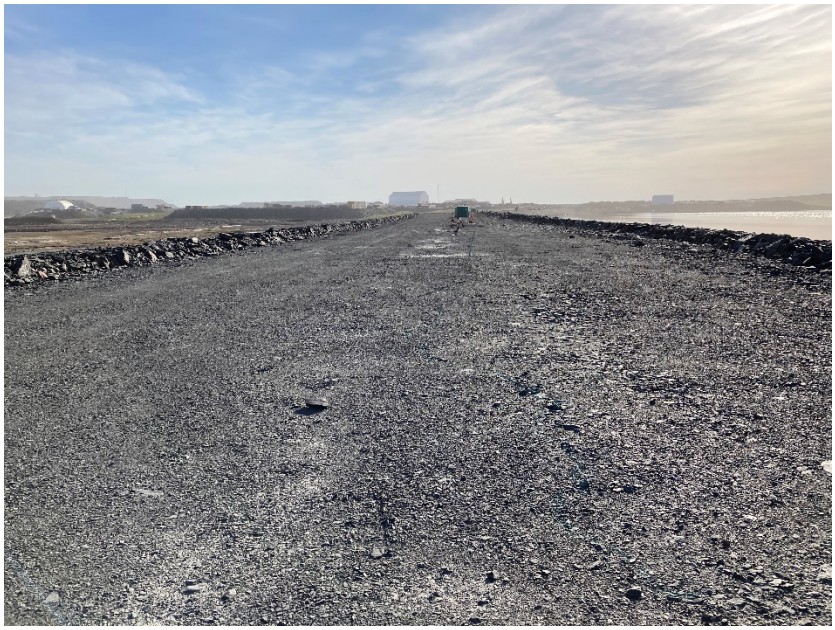
Description: From approx. Sta. 0+400, looking east at the upstream slope.



Photograph A5-17 Whale Tail Dike

Date: July 27, 2022 **Photo Number**: 91

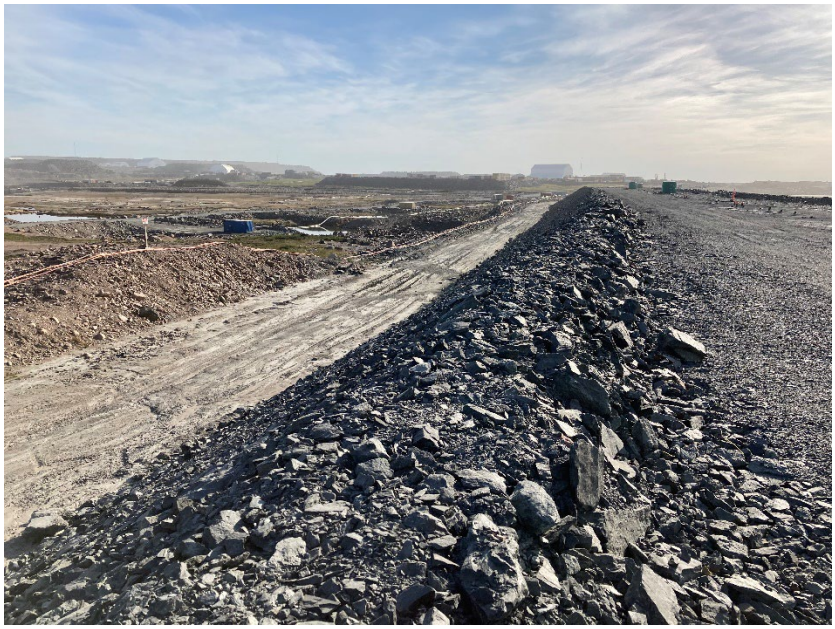
Description: From approx. Sta. 0+200 (west abutment), looking northeast at the upstream slope.



Photograph A5-18 Whale Tail Dike

Date: July 27, 2022 **Photo Number**: 92

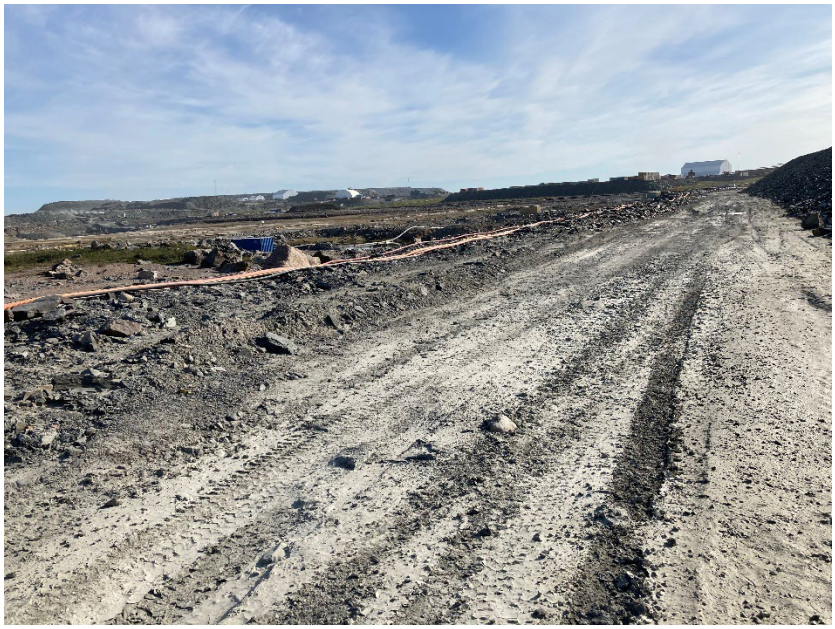
Description: From approx. Sta. 0+200 (west abutment), looking northeast at the crest.



Photograph A5-19 Whale Tail Dike

Date: July 27, 2022 **Photo Number**: 93

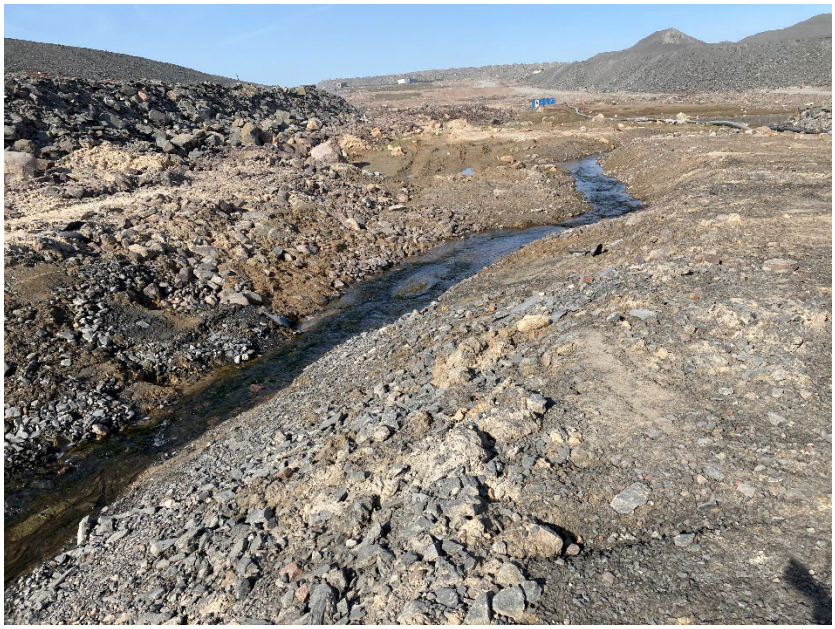
Description: From approx. Sta. 0+200 (west abutment), looking northeast at the downstream slope and downstream platform.



Photograph A5-20 Whale Tail Dike

Date: July 27, 2022 **Photo Number**: 113

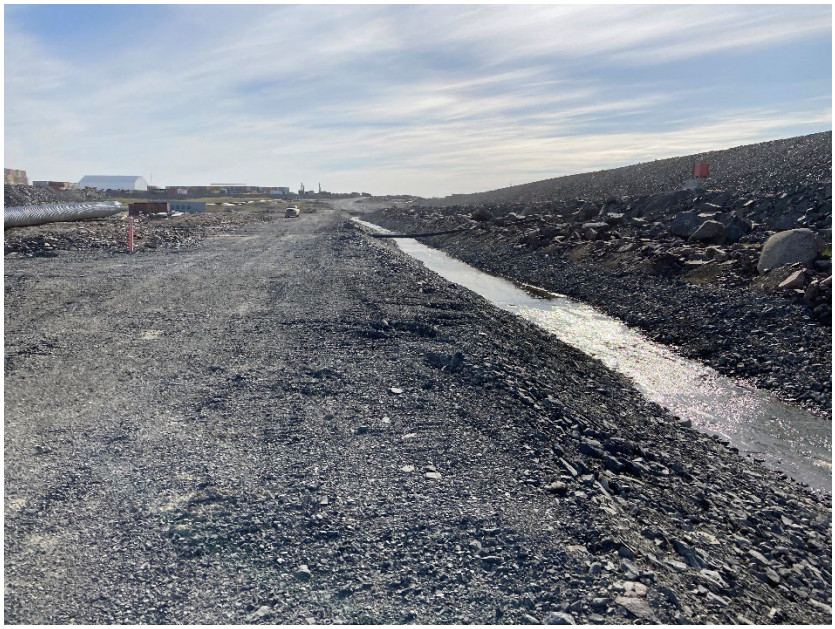
Description: From approx. Sta. 0+200 on the downstream platform, looking northeast at the downstream slope and platform.



Photograph A5-21 Whale Tail Dike

Date: July 27, 2022 **Photo Number**: 118

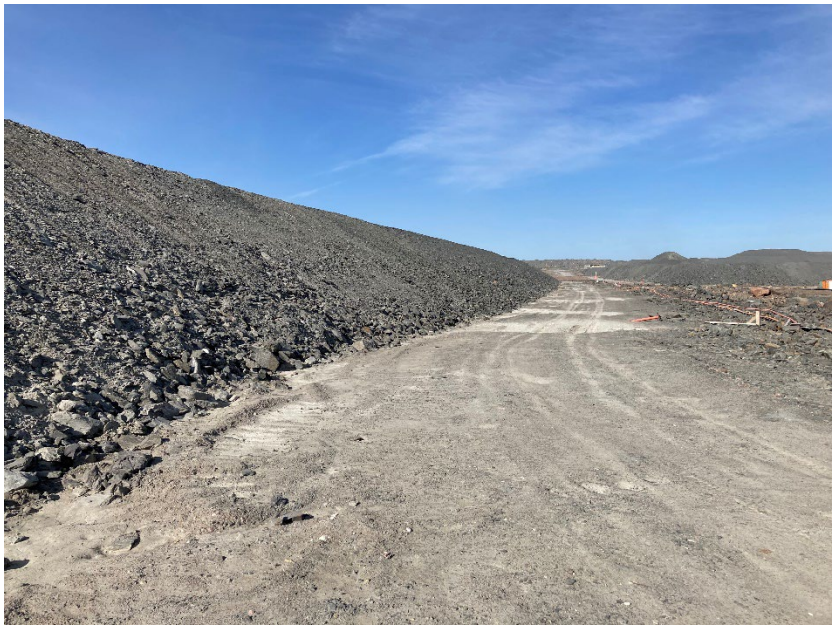
Description: From approx. Sta. 0+430 downstream, looking west at the seepage collection trench. V-notch is not present anymore.



Photograph A5-22 Whale Tail Dike

Date: July 27, 2022 **Photo Number**: 117

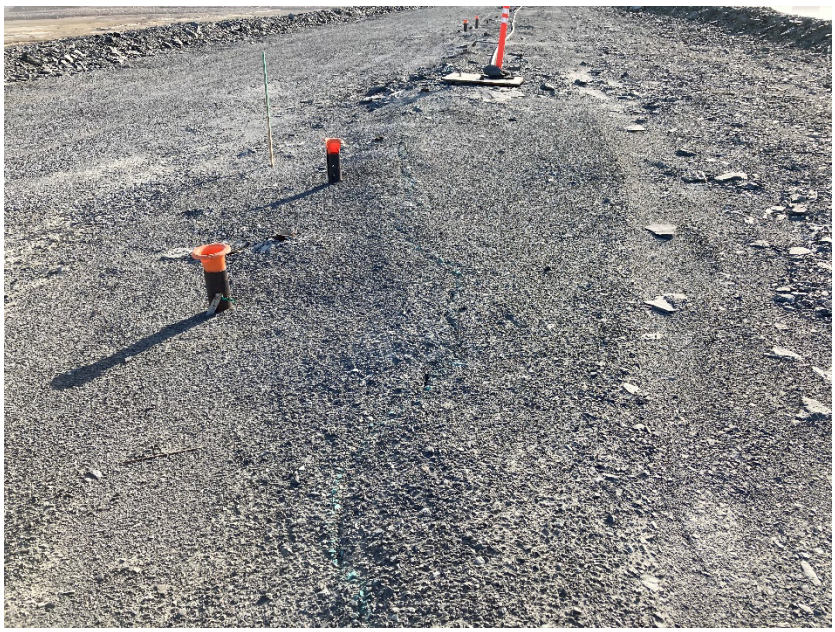
Description: From approx. Sta. 0+450 downstream, looking east at the seepage collection trench and downstream toe.



Photograph A5-23 Whale Tail Dike

Date: July 27, 2022 **Photo Number**: 119

Description: From approx. Sta. 0+675 downstream, looking west at the downstream slope and platform.



Photograph A5-24 Whale Tail Dike

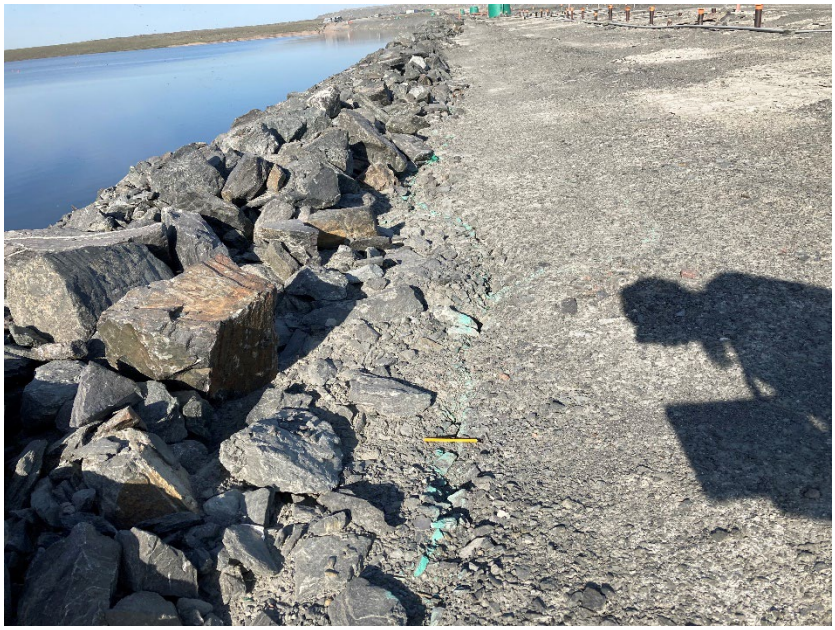
Date: July 27, 2022 **Photo Number**: 94

Description: From approx. Sta. 0+225 on the crest, looking northeast at the crest platform. Presence of a healing longitudinal tension crack.

Photograph A5-25 Whale Tail Dike

Date: July 27, 2022 **Photo Number**: 106

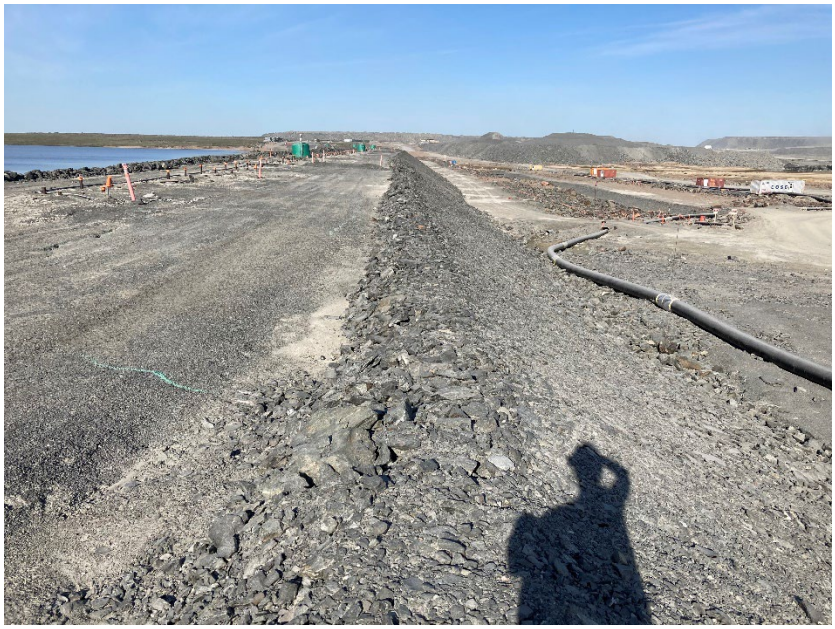
Description: From approx. Sta. 0+725 downstream, looking northwest at the downstream slope and platform.



Photograph A5-26 Whale Tail Dike

Date: July 27, 2022 **Photo Number**: 108

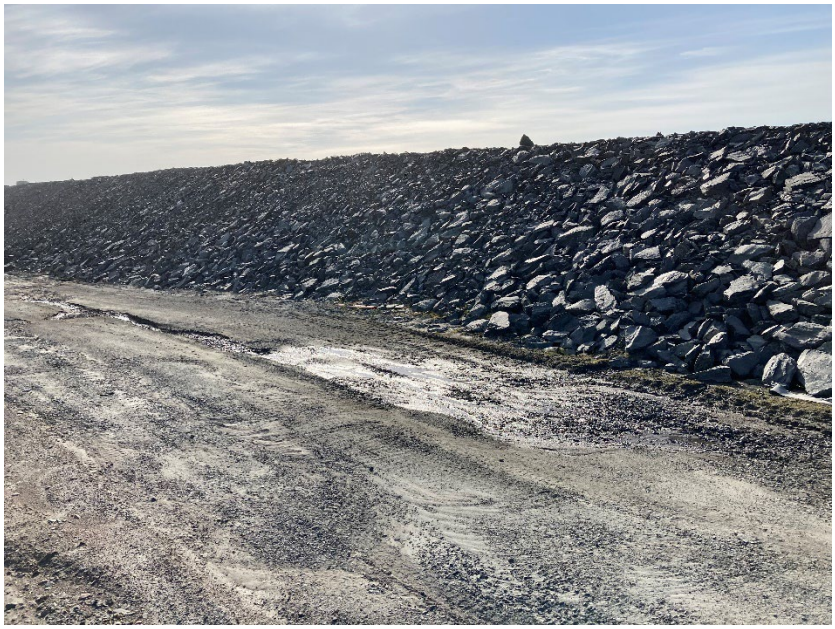
Description: From approx. Sta. 0+775 upstream, looking west at the crest platform. Presence of tension crack along upstream crest berm.



Photograph A5-27 Whale Tail Dike

Date: July 27, 2022 **Photo Number**: 109

Description: From approx. Sta. 0+775 downstream, looking west at the downstream crest and slope. Presence of a tension crack perpendicular to the dike.



Photograph A5-28 Whale Tail Dike

Date: July 27, 2022 **Photo Number**: 112

Description: From approx. Sta. 0+150 downstream, looking east at the downstream slope and platform. Water resurgence within the rockill (flow).

Appendix A-6

IVR Dike D-1

Client:	AEM	**By:**	Marion Habersetzer
Project:	Whale Tail Project	**Date:**	July 26, 2022
Location:	IVR Dike	**Reviewed:**	Yves Boulianne

GENERAL INFORMATION			
Dam Type:	Rockfill shell with a LLDPE geomembrane liner tied in a fine filter amended with bentonite key trench and an upstream thermal berm.		
Weather Conditions:	Cloudy	**Temperature:**	10°C

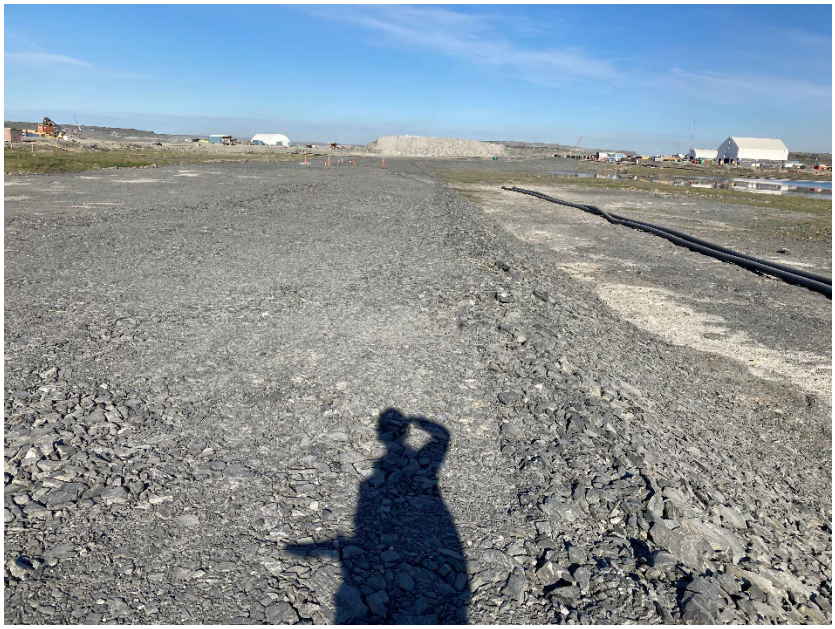
INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
1. DAM CREST		8, 9, 10, 11, 13, 12, 14, 16, 18, 20, 21, 22, 24, 23	
1.1 Crest elevation	El. 165.5 m (rockfill and liner)		
1.2 Reservoir level	U/S El. 161.92 m		IVR Attenuation Pond
Current freeboard	3.58 m (rockfill crest and liner)		Max. operational water level: 163.2 m
1.3 Distance to tailings pond (if applicable)	Not applicable		
1.4 Surface cracking	Yes		Likely related to rockfill and shallow foundation thawing after winter construction. Cracks 1-2 m long.
1.5 Unexpected settlement	Yes		Likely related to rockfill, esker and shallow foundation thawing after winter construction. Settlement of about 200 to 300 mm
1.6 Lateral movement	Not apparent		

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
1.7 Other unusual conditions	None		
2. UPSTREAM SLOPE		9, 10, 11, 13, 12, 15, 14	
2.1 Slope angle	2H: 1V		Adequate
2.2 Signs of erosion	None observed		
2.3 Signs of movement (deformation)	None observed		
2.4 Cracks	None observed		
2.5 Face liner condition (if applicable)	Not observed		Liner covered in a fine filter protection layer.
2.6 Other unusual conditions	None		
3. DOWNSTREAM SLOPE		9, 18, 20, 21, 22, 24	
3.1 Slope angle	2H:1V		Adequate
3.2 Signs of erosion	None observed		
3.3 Signs of movement (deformation)	None observed		
3.4 Cracks	None observed		
3.5 Seepage or wet areas	None observed.		
3.6 Vegetation growth	None		
3.7 Other unusual conditions	None		
4. DOWNSTREAM TOE AREA		8, 18, 20, 21, 22, 24	
4.1 Seepage from dam	None observed		Little water ponding at the toe. No flow observed.
4.2 Signs of erosion	None observed		

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
4.3 Signs of turbidity in seepage water	None		
4.4 Discoloration/staining	No		
4.5 Outlet operating problem (if applicable)	Not applicable		
4.6 Other unusual conditions	None		
5. ABUTMENTS			
5.1 Seepage at contact zone (abutment/embankment)	None observed		
5.2 Signs of erosion	None observed		
5.3 Excessive vegetation	None		
5.4 Presence of rodent burrows	None observed		
5.5 Other unusual conditions	None		
6. RESERVOIR		15	
6.1 Stability of slopes	Stable		
6.2 Distance to nearest slide (if applicable)	Not applicable		
6.3 Estimate of slide volume (if applicable)	None observed		
6.4 Floating debris	None		
6.5 Other unusual conditions	None		
7. EMERGENCY SPILLWAY/ OUTLET STRUCTURE		19, 16, 17, 18	

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
7.1 Surface condition	Good		
7.2 Signs of erosion	None		
7.3 Signs of movement (deformation)	None		
7.4 Cracks	None		
7.5 Settlement	None		
7.6 Presence of debris or blockage	Yes, piping in the lower spillway		
7.7 Closure mechanism operational	None		
7.8 Slope protection	None		
7.9 Instability of side slopes	None		
7.10 Other unusual conditions	None		
8. INSTRUMENTATION			
8.1 Piezometers	No		
8.2 Settlement cells	No		
8.3 Thermistors	Yes		See Section 4.3.2 of the report.
8.4 Settlement monuments	No		
8.5 Seismograph	No		
8.6 Inclinometer	No		
8.7 Weirs and flow monitors	No		
8.8 Data logger(s)	Yes		
8.9 Other	No		
9. DOCUMENTATION			

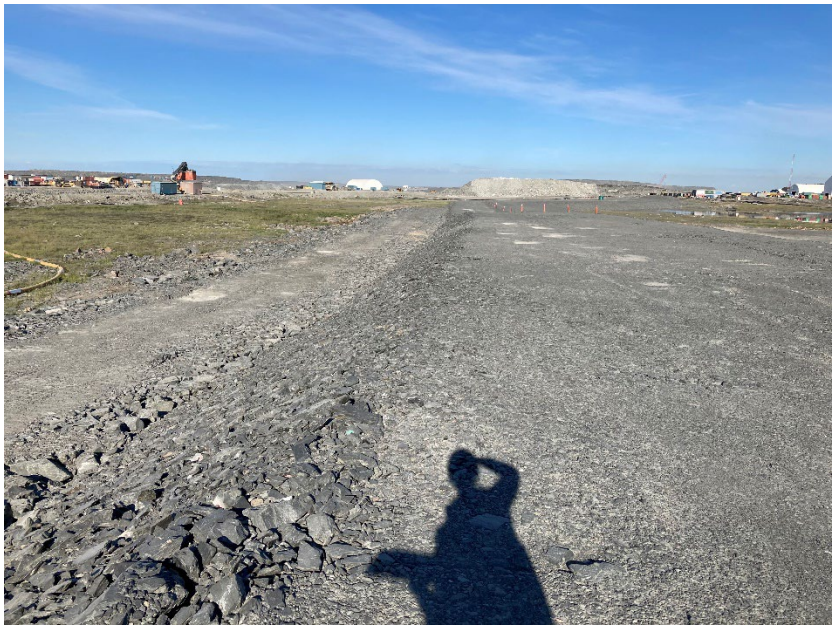
INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
9.1 Operation, Maintenance and Surveillance (OMS) Plan			
9.1.1 OMS Plan exists	Yes		
9.1.2 OMS Plan reflects current dam conditions	Yes		
9.1.3 Date of last revision	November 2021		
9.2 Emergency Preparedness Plan (EPP)			
9.2.1 EPP exists	Yes		
9.2.2 EPP reflects current conditions	Yes		
9.2.3 Date of last revision	September 2021		
10. NOTES			
Inspector's Signature	Marion Habersetzer	**Date:**	July 26, 2022



Photograph A6-1 IVR Dike D-1

Date: July 26, 2022 **Photo Number**: 9

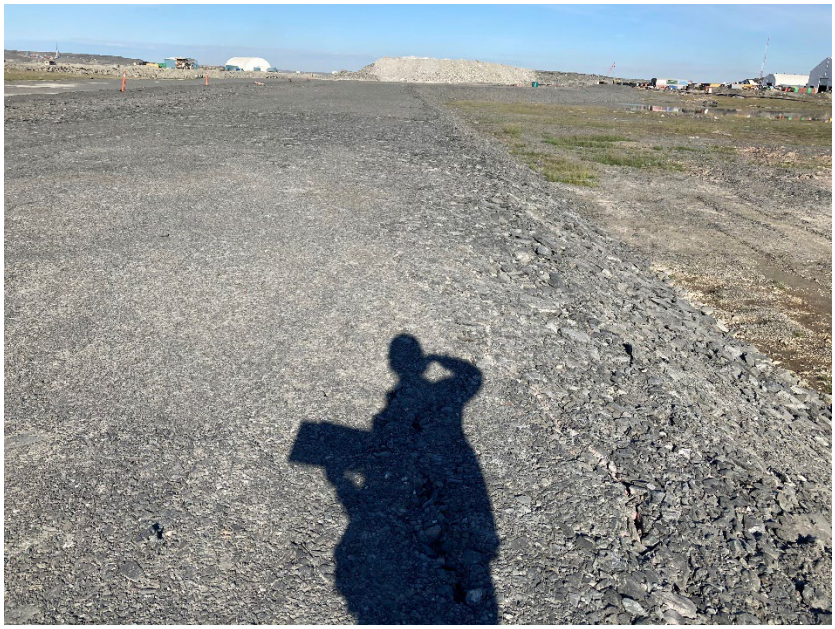
Description: From approx. Sta. 0+540 (east abutment), looking west at the crest (thermal cap) and upstream slope.



Photograph A6-2 IVR Dike D-1

Date: July 26, 2022 **Photo Number**: 8

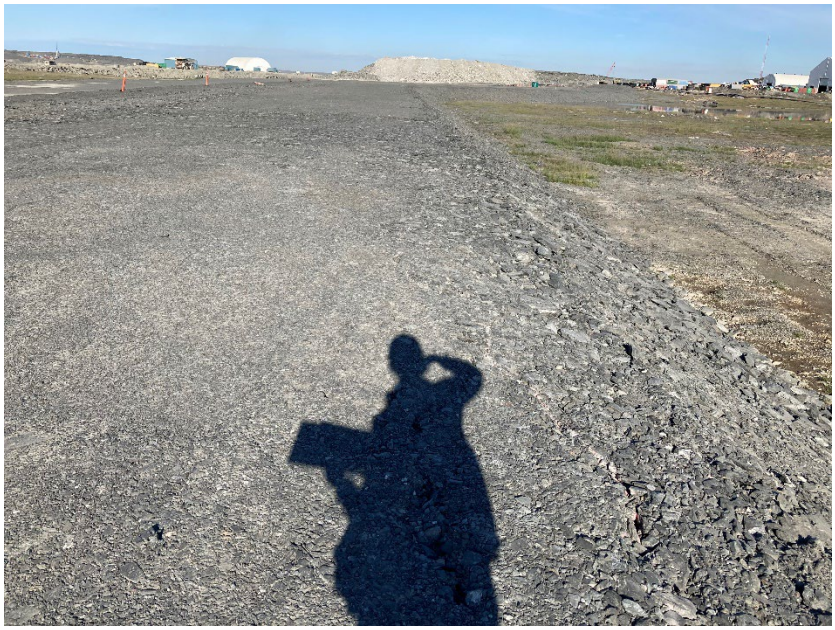
Description: From approx. Sta. 0+540 (east abutment), looking west at the crest (thermal cap) and downstream slope.



Photograph A6-3 IVR Dike D-1

Date: July 26, 2022 **Photo Number**: 10

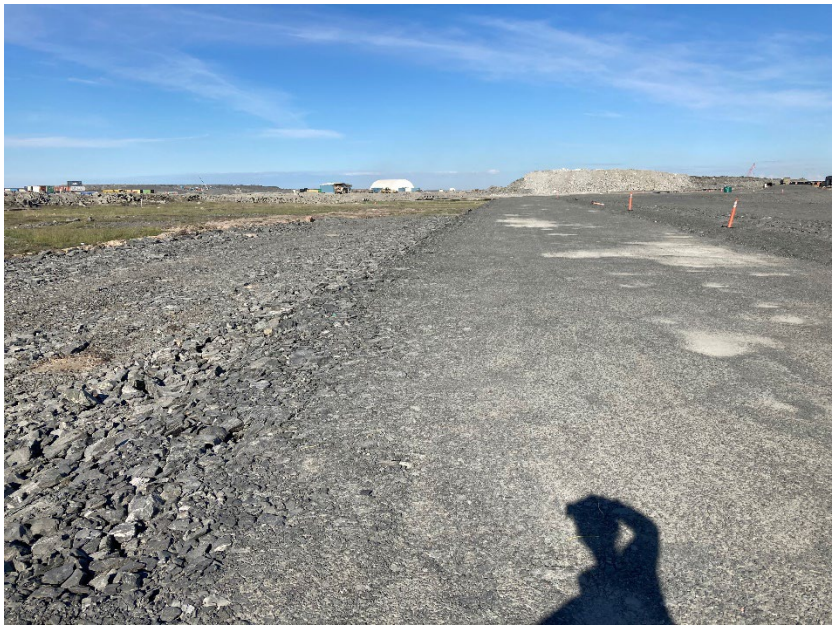
Description: From approx. Sta. 0+480, looking west at the crest (thermal cap) and upstream slope.



Photograph A6-4 IVR Dike D-1

Date: July 26, 2022 **Photo Number**: 11

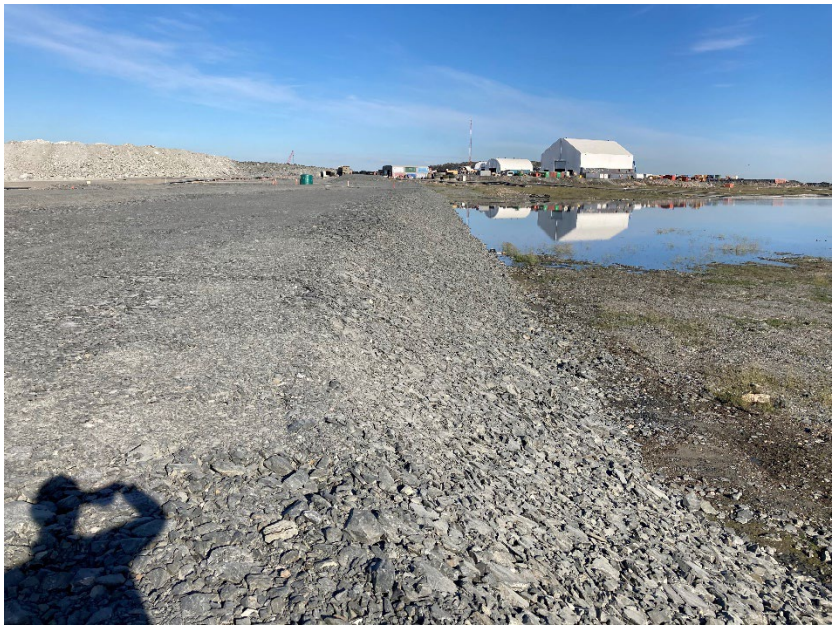
Description: From approx. Sta. 0+430, looking west at the crest and upstream slope. Presence of old tension cracks.



Photograph A6-5 IVR Dike D-1

Date: July 26, 2022 **Photo Number**: 24

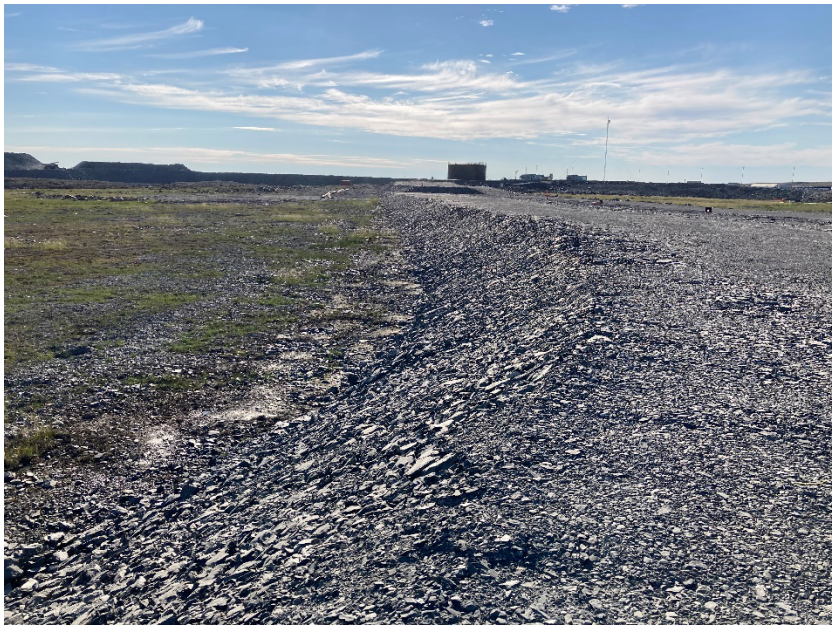
Description: From approx. Sta. 0+430, looking west at the crest and downstream slope. Presence of tension cracks.



Photograph A6-6 IVR Dike D-1

Date: July 26, 2022 **Photo Number**: 12

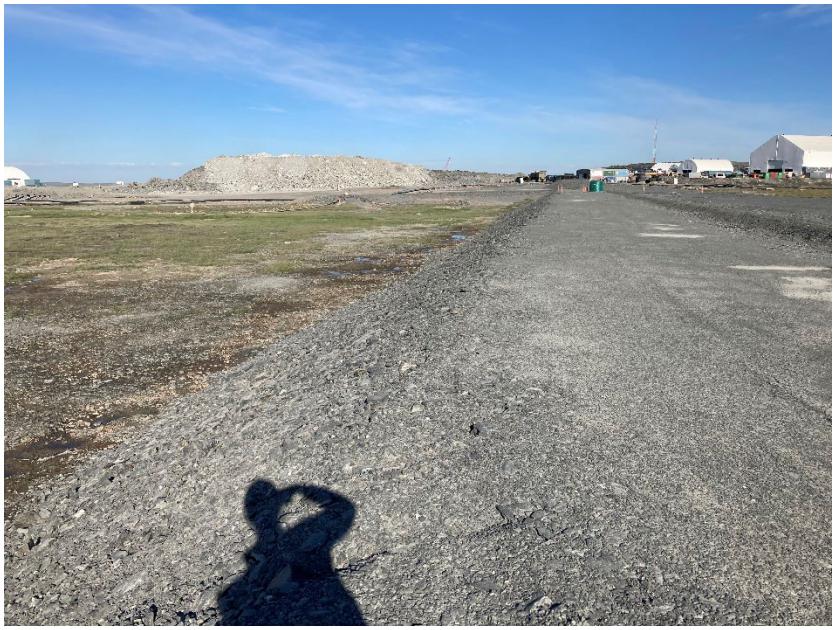
Description: From approx. Sta. 0+300, looking northwest at the crest and upstream slope.



Photograph A6-7 IVR Dike D-1

Date: July 26, 2022 **Photo Number**: 13

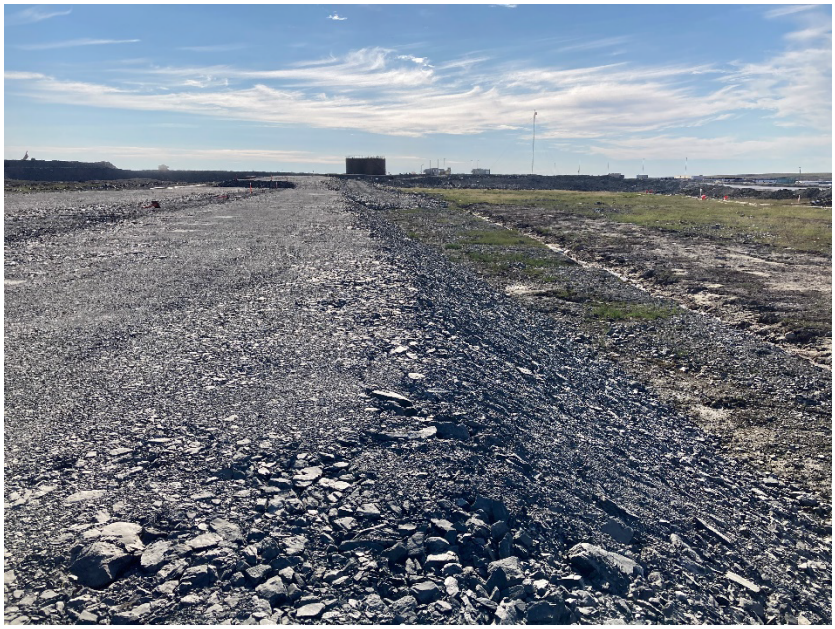
Description: From approx. Sta. 0+300, looking east at the crest and upstream slope.



Photograph A6-8 IVR Dike D-1

Date: July 26, 2022 **Photo Number**: 21

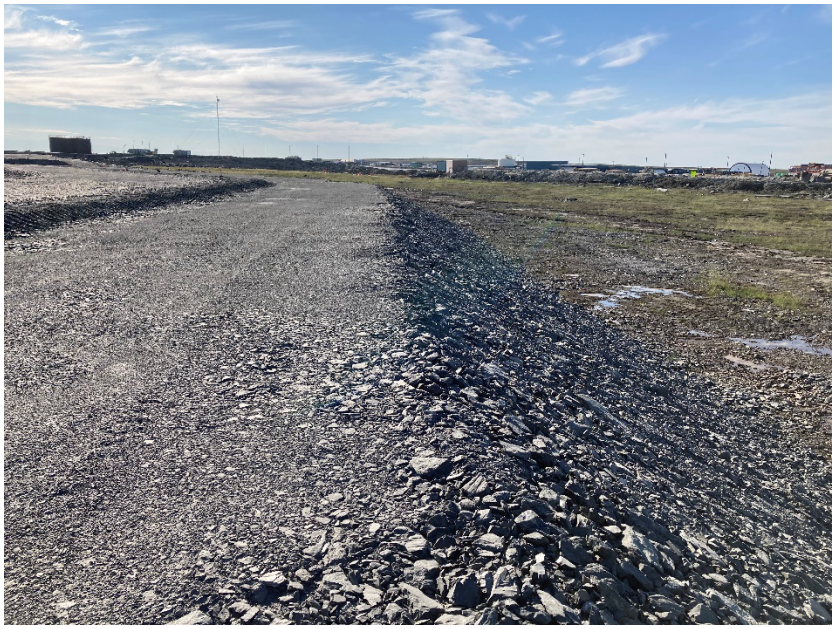
Description: From approx. Sta. 0+300, looking northwest at the crest and downstream slope. Some water ponding at the toe.



Photograph A6-9 IVR Dike D-1

Date: July 26, 2022 **Photo Number**: 22

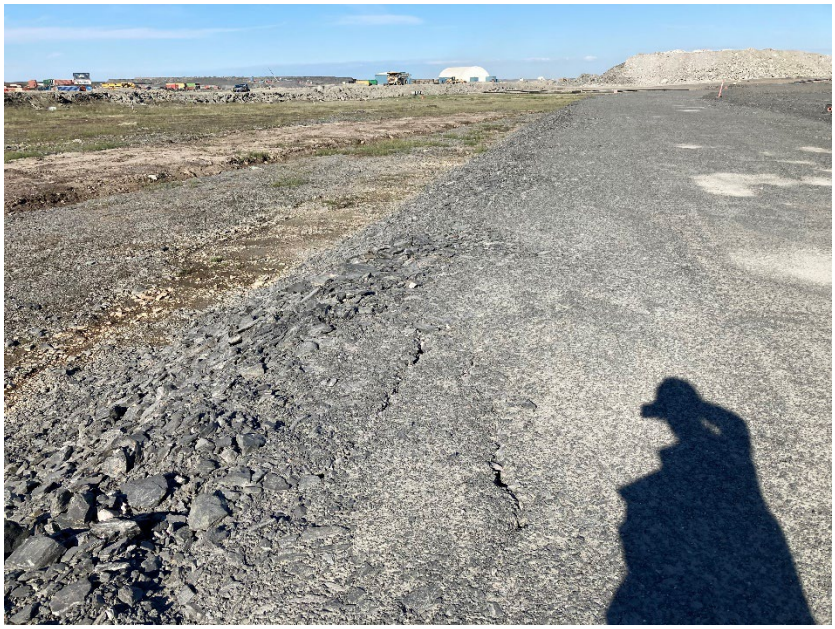
Description: From approx. Sta. 0+300, looking east at the crest and downstream slope. Some water ponding at the toe.



Photograph A6-10 IVR Dike D-1

Date: July 26, 2022 **Photo Number**: 20

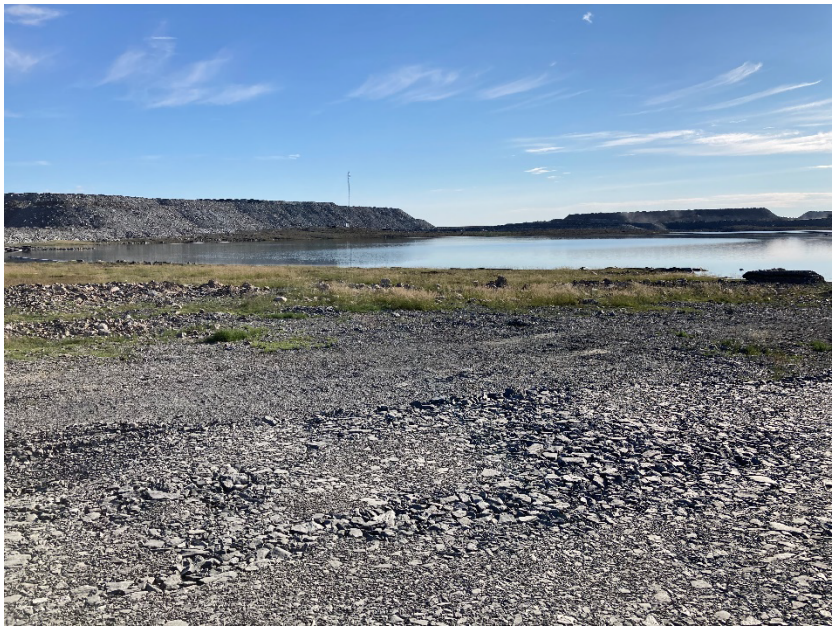
Description: From approx. Sta. 0+220, looking southeast at the crest and downstream slope. Some water ponding at the toe.



Photograph A6-11 IVR Dike D-1

Date: July 26, 2022 **Photo Number**: 23

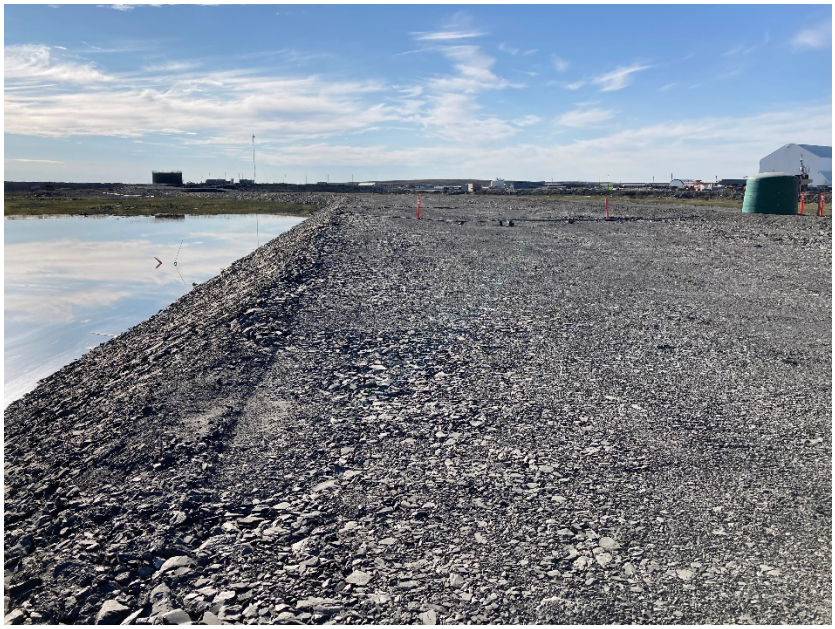
Description: From approx. Sta. 0+395, looking west at the crest. Presence of tension cracks (1-2 m long).



Photograph A6-12 IVR Dike D-1

Date: July 26, 2022 **Photo Number**: 15

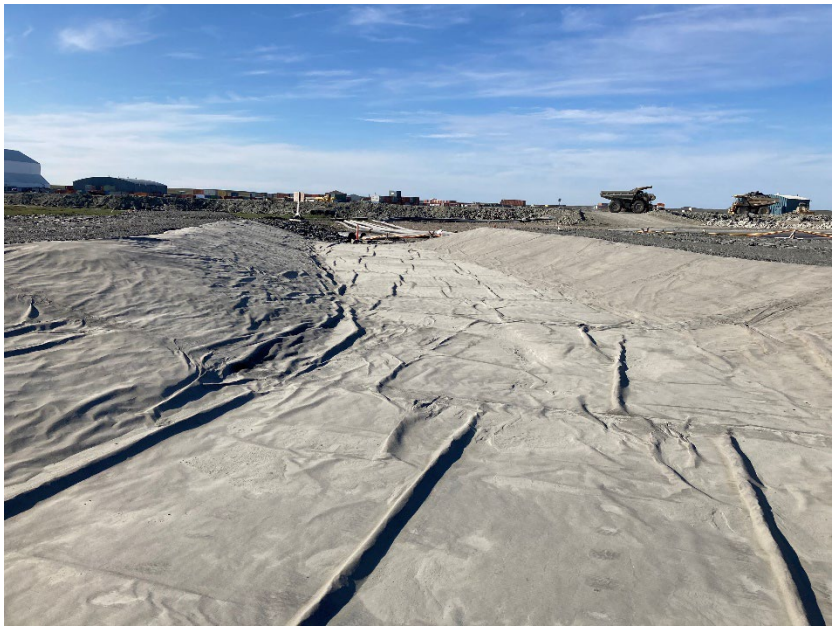
Description: From approx. Sta. 0+070, looking northeast at the downstream toe and the attenuation pond.



Photograph A6-13 IVR Dike D-1

Date: July 26, 2022 **Photo Number**: 14

Description: From approx. Sta. 0+070, looking southeast at the crest and downstream slope.



Photograph A6-14 IVR Dike D-1

Date: July 26, 2022 **Photo Number**: 19

Description: From approx. Sta. 0+070, looking southwest at the emergency spillway.