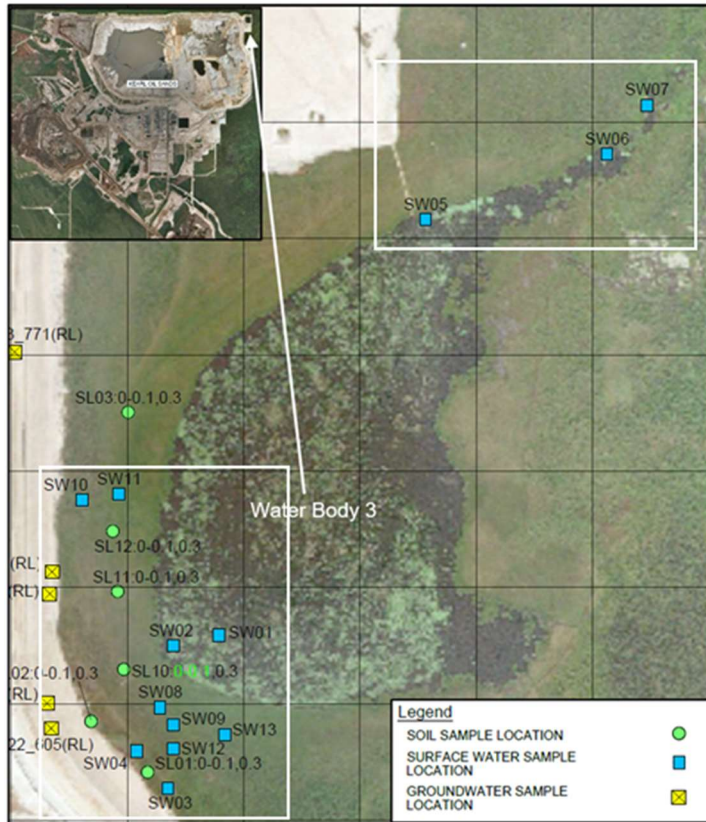


AER Third-Party Sampling 2023

Kearl Oil Sands

Surface Water Quality



* Environmental Quality Guidelines for Alberta Surface Waters, Surface Water Quality Guidelines for the Protection of Aquatic Life.

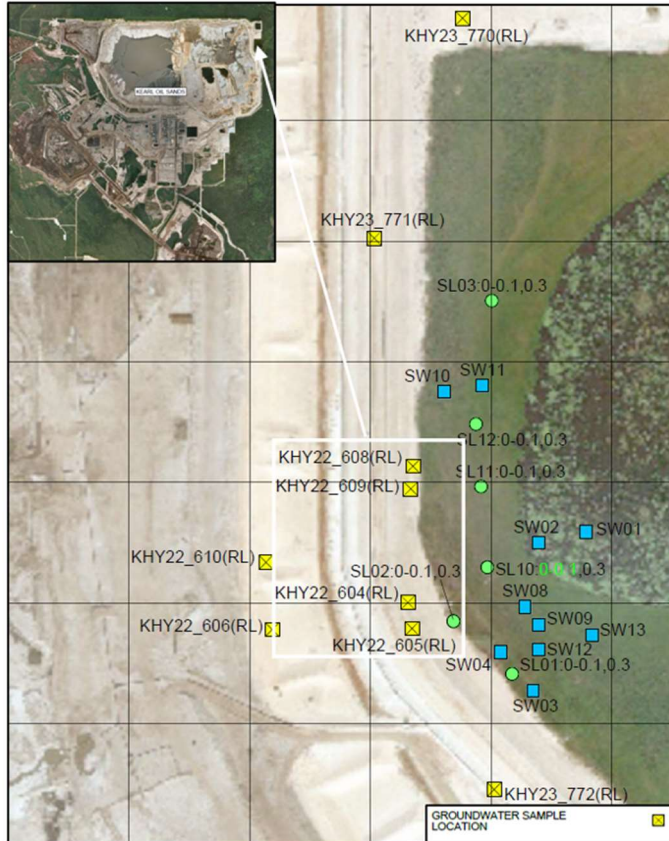
Location	Date	PAL Guideline Exceedance*
Receptor (Water Body 3)		
SW01 (receptor-near seep)	24-October-2023	Not sampled due to frozen conditions
SW02 (receptor-near seep)	24-October-2023	Not sampled due to frozen conditions
SW02-2 (receptor-near seep – 30 m SE of SW02)	24-October-2023	PAL: no guideline exceedances
SW05 (receptor-near outlet)	24-October-2023	PAL: no guideline exceedances
SW06 (receptor-outlet)	24-October-2023	Not sampled due to frozen conditions
SW07 (receptor-outlet)	24-October-2023	Not sampled due to frozen conditions
Source		
SW03 (source- seep)	24-October-2023	PAL: F2, total arsenic, total cobalt, total zinc No guideline: naphthenic acids (2.1 mg/L)
SW04 (source- seep)	24-October-2023	PAL: F2, total arsenic, total cobalt, total zinc, dissolved iron, ammonia No guideline: naphthenic acids (5.8 mg/L)
SW08 (source- onshore)	24-October-2023	F2, toluene, total cobalt, total copper, total zinc, dissolved aluminum, ammonia No guideline: naphthenic acids (1.1 mg/L)
SW11 (source- onshore)	24-October-2023	PAL: total cobalt, total zinc
SW13 (source- onshore)	24-October-2023	PAL: no guideline exceedances No guideline: naphthenic acids (0.3 mg/L) total sulphide

Interpretation

- SW02-2 located 30m southeast of SW02 was sampled in place of SW02 on October 24, 2023, due to frozen conditions.
- Some near-shore shallow water locations and seep locations required breaking through ice for sample collection. resulting in some samples being turbid.
- Several metals and major ions exceed guidelines in the area prior to Kearl mine development, based on 2003-2004 baseline sampling. This includes iron, sulphide, zinc.
- Naphthenic acids were analyzed using the FTIR method. Naphthenic acids sampled on October 24, 2023 analyzed using the Orbitrap method is not available for this update.
- Total and dissolved sulphide samples were analyzed by a different lab. Therefore, October 24, 2023 data is not available for this update.

AER Third-Party Sampling 2023

Kearl Oil Sands



Groundwater

Location	Date	AB Tier 1 Guideline Exceedance*
KHY22-604 (shallow well)	24-October-2023	AB Tier 1: TDS, sulphate, manganese No guideline: naphthenic acids (7.5 mg/L)
KHY22-605 (deep well)	24-October-2023	AB tier 1: iron, manganese
KHY22-608 (shallow well)	24-October-2023	AB Tier 1: TDS, sulphate, sodium, iron, manganese, F2 No guideline: naphthenic acids (8.6 and 7.5 mg/L)
KHY22-609 (deep well)	24-October-2023	AB Tier 1: iron, manganese
KHY23-771 (shallow well)	24-October-2023	AB Tier 1: TDS, manganese No guideline: naphthenic acids (1.2 mg/L)
KHY23-772 (shallow well)	24-October-2023	AB Tier 1: TDS, sulphate, sodium, manganese, F2 No guideline: naphthenic acids (12 mg/L)

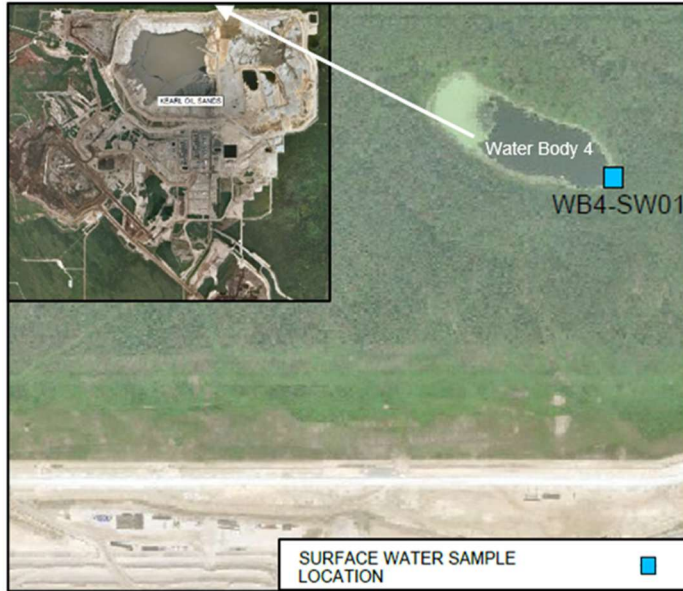
*Alberta Tier 1 Soil and Groundwater Remediation Guidelines.

Interpretation

- Exceedances suggest the presence of tailings seepage in shallow groundwater.
- KHY22-605 and KHY22-609 do not show impacts from tailings seepage in deeper groundwater.

AER Third-Party Sampling 2023

Kearl Oil Sands



Surface Water Quality

Location	Date	PAL 1 Guideline Exceedance*
Water Body 4		
WB4-SW01	24-October-2023	PAL: total cobalt, dissolved aluminum

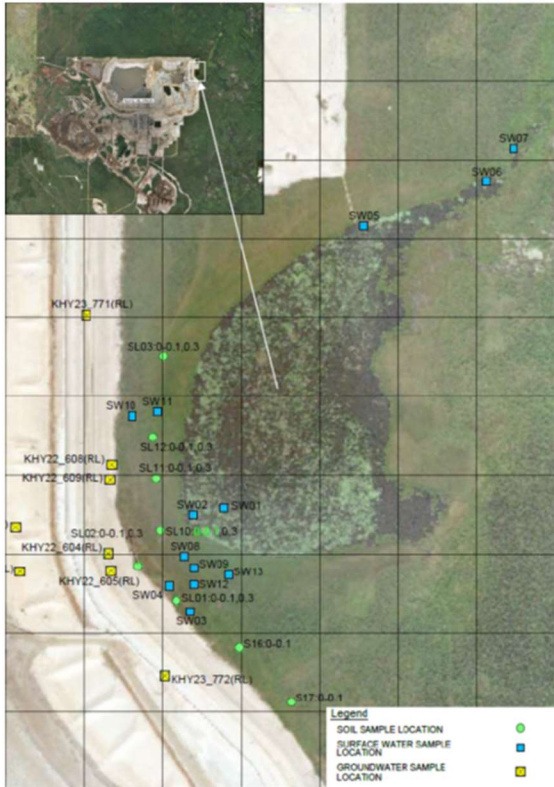
* Environmental Quality Guidelines for Alberta Surface Waters, Surface Water Quality Guidelines for the Protection of Aquatic Life

Interpretation

- Some near-shore shallow water locations and seep locations required breaking through ice for sample collection, resulting in some samples being turbid.
- Naphthenic acids are analyzed using the FTIR method. Naphthenic acids sampled on October 24, 2023 analyzed using the Orbitrap method is not available for this update.
- Total and dissolved sulphide samples were analyzed by a different lab. Therefore, October 24, 2023 data is not available for this update.

AER Third-Party Sampling 2023

Kearl Oil Sands



Soils

Location	Date	AB Tier 1 Guideline Exceedance*
SL01 (southwest of WB3)	24-October-2023	AB Tier 1: No exceedance of PHC

*Alberta Tier 1 Soil and Groundwater Remediation Guidelines.



Interpretation

- SL01 was resampled for PHC due to a missed sample from September 27, 2023.
- F3 hydrocarbons are possibly biogenic (natural) in origin. To be confirmed with further analysis and sampling.
- Low pH is not uncommon for soils in the area.
- Soil sampling locations north of DP4 were last sampled on April 21, 2023. Refer to previous update.
- Soil sampling locations north of NODA were last sampled on March 15, 2023. Refer to previous update.