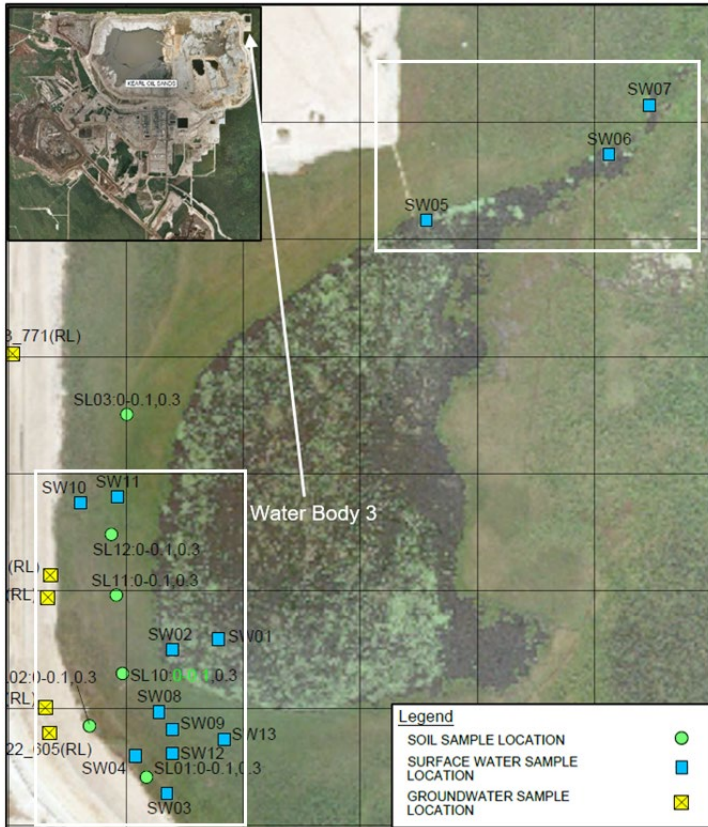


AER Third-Party Sampling 2023

Kearl Oil Sands

Surface Water Quality



Location	Date	PAL Guideline Exceedance*
Receptor (Water Body 3)		
SW01 (receptor-near seep)	31-May-2023	PAL: total sulphide
SW02 (receptor-near seep)	31-May-2023	PAL: total sulphide
SW05 (receptor-near outlet)	31-May-2023	PAL: total sulphide
SW06 (receptor-outlet)	31-May-2023	PAL: total sulphide
SW07 (receptor-outlet)	31-May-2023	PAL: total chromium, total cobalt, total sulphide
Source		
SW03 (source- seep)	31-May-2023	PAL: F2, total arsenic, total zinc, dissolved iron, total sulphide No guideline: naphthenic acids (1.1 mg/L)
SW04 (source- seep)	31-May-2023	PAL: F2, total cobalt, total zinc, dissolved iron, sulphate, total sulphide No guideline: naphthenic acids (0.7 mg/L)
SW08 (source- onshore)	31-May-2023	PAL: toluene, total zinc, total sulphide
SW11 (source- onshore)	31-May-2023	PAL: dissolved iron, total sulphide
SW13 (source- onshore)	31-May-2023	PAL: F2, dissolved iron, total sulphide No guideline: naphthenic acids (0.8 mg/L)

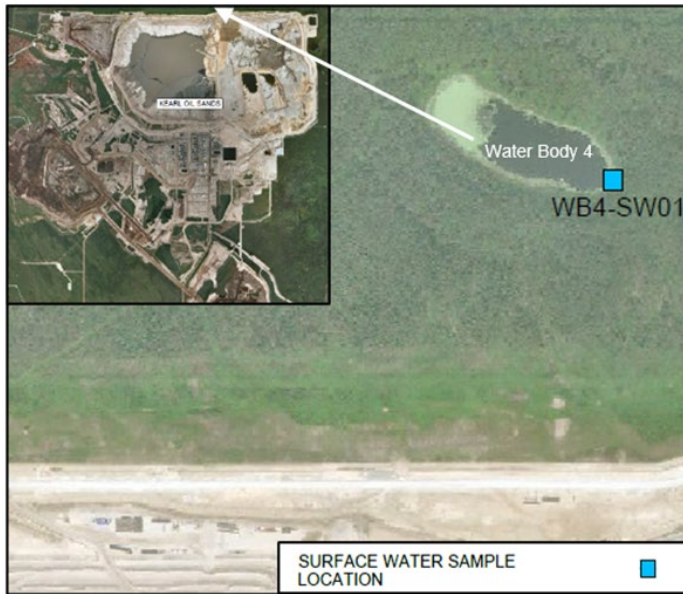
* Environmental Quality Guidelines for Alberta Surface Waters, Surface Water Quality Guidelines for the Protection of Aquatic Life.

Interpretation

- 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 May 31, 2023 analyzed using the Orbitrap method is not available for this update.

AER Third-Party Sampling 2023

Kearl Oil Sands



Surface Water Quality

Location	Date	PAL Guideline Exceedance*
Water Body 4		
WB4-SW01	31-May-2023	PAL: toluene, total cobalt, total lead, total zinc, total sulphide

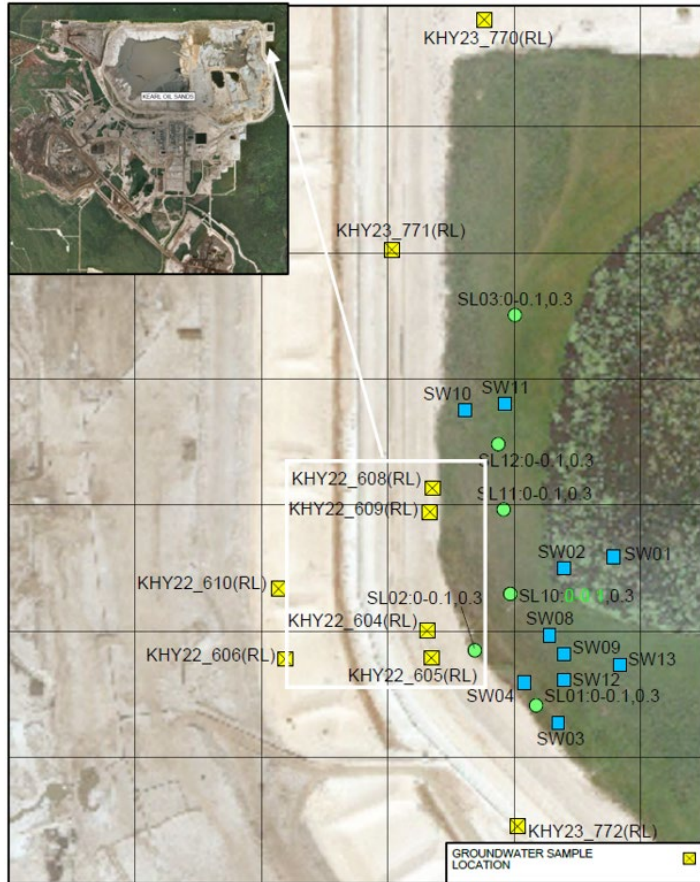
*Environmental Quality Guidelines for Alberta Surface Waters, Surface Water Quality Guidelines for the Protection of Aquatic Life

Interpretation

- Toluene may be biogenic (natural) in origin and is common in wetlands.
- Naphthenic acids were below detection limit based on the FTIR analytical method. Naphthenic acids sampled on May 31, 2023 analyzed using the Orbitrap method 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)	01-June-2023	AB Tier 1: TDS, sulphate, manganese, iron, No guideline: naphthenic acids (10.5 mg/L), F3 (6.7 mg/L), F4 (2.3 mg/L)
KHY-605 (deep well)	31-May-2023	AB Tier 1: manganese, iron
KHY22-608 (shallow well)	01-June-2023	AB Tier 1: TDS, sulphate, sodium, iron, manganese, aluminum, F2 No guideline: naphthenic acids (8.3 mg/L), F3 (8.7 mg/L), F4 (2.8 mg/L)
KHY22_609 (deep well)	01-June-2023	AB Tier 1: manganese, iron No guideline: F3 (0.7 mg/L), F4 (0.2 mg/L)
KHY23-772 (Shallow well)	01-June-2023	AB Tier 1: TDS, fluoride, sulphate, sodium, iron, manganese, F2 No guideline: naphthenic acids (38.6 mg/L), F3 (41.5 mg/L), F4 (35.6 mg/L)

*Alberta Tier 1 Soil and Groundwater Remediation Guidelines

Soils

Last sampled on April 22, 2023. Refer to previous updates.

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.