SPILL REMEDIATION AND RECLAMATION REPORT
Meadowbank Tanker Spill, KM 77

Meadowbank, Nunavut

PREPARED FOR:
Agnico Eagle Mines Ltd.

PREPARED BY:
SWAT Consulting Inc.

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INTRODUCTION

On May 26, 2016 Agnico Eagle Mines Ltd. (Agnico) encountered a tanker truck rollover at KM 77 on the Meadowbank Mine access road (Figures 1 and 2). Approximately 5 m^3 of diesel fuel was spilled from the tanker and entered the road ditch. The fluids were contained within the ditch. Agnico personnel began immediate containment and recovery efforts. On April 21, SWAT Consulting Inc. (SWAT) arrived on site to evaluate spill containment, recovery and continue with clean-up efforts. The following report contains detailed information regarding the KM 77 Tanker spill and clean-up actions.

OBJECTIVES AND SCOPE OF WORK

The objectives of the spill response and assessment activities were as follows:

- evaluate spill containment and ensure no further migration of the released fluid into the surrounding environment;
- evaluate the soil quality with reference to the Canadian Council of Ministries of the Environment *Canadian Soil Quality Guidelines for the Protection of the Environmental and Human Health; Industrial* (2008); and,
- coordinate with Agnico operations to remediate the release area.

The scope of work included:

- completing a background investigation of biophysical conditions in the area;
- delineating the impacted area through field screening and soil sampling;
- excavating hydrocarbon impacted materials from the spill area;
- comparing laboratory analytical results with the Canadian Council of Ministries of the Environment *Canadian Soil Quality Guidelines for the Protection of the Environmental and Human Health; Industrial* (2008), and;
- preparing a report detailing remediation and reclamation activities.

BIOPHYSICAL INVENTROY

Understanding the biophysical surroundings and potential receptors is imperative to developing a containment and remediation strategy suitable for expediting clean-up activities. The following section provides information on the environment in the vicinity of the spill.

The spill site is within the Northern Artic ecozone of Canada. This ecozone this is the coldest and driest part of the country. The average annual temperature is -3°C with an average precipitation of 100 to 200 mm a year classifying the region as the Arctic Desert. July and August are generally the only snow free months. Permafrost is present everywhere in this ecozone and can extend downwards for over 1000 m.

The major controlling influence on hydrologic response in the area is the presence of continuous permafrost underlying the landscape. Though the area receives relatively little precipitation, runoff is significant. Peak flows, which generally occur in June, arise very quickly because of the shallow active layer. Snowmelt generally moves into drainage channels quickly as evapotranspiration rates are low and infiltration is slow.

Vegetation

The Northern Arctic ecozone is above the tree line were vegetation is sparse and the species diversity is limited. Plants are generally more stunted and sparse moving north.
Common plants of this ecozone include purple saxifrage, mountain avens, arctic poppy, arctic willow, Dryas species, kobresia, sedges, cottongrass, moss, dwarf birch, northern Labrador tea, Vaccinium species, alder, alpine foxtail, wood rush, wire rush, moss campions, white arctic heather, arctic bladder campion, yellow oxytrope, mastodon flower, arctic lousewort, mountain sorrel, pygmy buttercup, and chickweed.

Soils

This ecozone consists of Palaeozoic and Mesozoic sedimentary rock in the west and Precambrian granite bedrock to the east. Most of the Northern Arctic ecozone is flat or slightly rolling terrain. The west is littered with glacial deposits and shattered limestone. Plains may extend for several kilometres inland from the coast; once underwater, these plains are now expanding as the continent rises after having been pushed down by glaciers during previous ice ages. The east is characterized by plateaus and rocky hills, which eventually lead to the mountains of the Arctic Cordillera ecozone.

Fish and Wildlife

Publicly available information was reviewed to determine if the spill area interacts with wildlife, and/or aquatic life. The following list provides a list of potential fish and wildlife species that may be present within the area:

Wildlife	Avian Species	Fish
Muskox	Snow Geese	Forage species
Moose	Gyrfalcon	Arctic Char
Wolf	Willow Ptarmigan	Arctic Grayling
Artic Fox	Rock Ptarmigan	Northern Pike
Grizzly	Parasitic Jaeger	Walleye
Artic Hare	Snowy Owl	Lake Trout
Arctic Ground Squirrel	Snow Bunting	Burbot
Arctic wolf	Red-throated Loon	
Brown Lemming	Arctic Loon	
Barren-land Caribou	Snow Goose	
Ermine	Rough-legged hawk	
Wolverine	Brant	
Snowshoe Hare	Canada Goose	
Arctic Hare	Eider	
Brown Lemming		
Collard Lemming		

Archeological Sites

There are no known archeological resources within the vicinity of the spill site.

RESPONSE ACTIVITIES

The following section provides a summary of events to date.

The spill was reported on March 29, 2017 from a tanker truck rollover carrying diesel fuel from Baker Lake to Meadowbank. Approximately 4885 L of diesel fuel saturated the immediate ditch area. Agnico Eagle Mines Ltd. (Agnico) responded to the spill and immediately began containment and cleanup activities.

During initial response activities, Agnico removed the tanker and completed a surface scrape of the area. Impacted snow and surface soil was stockpiled beside the excavation. Once the initial material was removed, Agnico began excavating deeper impacted material and continued to stockpile it at the rollover location. On April 21, SWAT arrived on site assess the remediation efforts and to field screen and sample the excavation. SWAT removed additional impacted material from the spill boundaries and transported the material (including the stockpile) to the Meadowbank landfarm for remediation. When the excavation was complete, SWAT collected confirmatory samples and submitted them for laboratory analysis.

CONFIRMATORY SAMPLING

SWAT collected confirmatory soil samples from the base and walls of the excavations. The samples were sent for laboratory analysis of petroleum hydrocarbon fractions (F) 1-4, benzene, toluene, ethylene and xylene (BTEX) and polycyclic aromatic hydrocarbons (PAH). Select samples were also submitted for particle size analysis to determine contaminant transport pathways for criteria selection. The results were used to guide additional contaminated material removal. On April 22, 2017, confirmatory sampling determined that the excavation boundaries met applicable guidelines for hydrocarbon parameters of concern.

METHODS

Safe Work Procedures

SWAT adhered to all legislated, Agnico, and internal safety policies throughout the duration of the work. Standard personal-protective equipment including a hard hat, steel-toed boots, safety glasses, and coveralls were worn by all personnel on site. SWAT personnel on site held valid safety certification (Orientation, Ground Disturbance Level II, Transportation of Dangerous Goods, Workplace Hazardous Material Information System and Standard Level First Aid.

Soil Sampling Procedures

Sampling procedures followed industry-recognized requirements throughout the sample collection process. Clean nitrile gloves were worn when handling soil and changed between sampling events and/or after handling potentially impacted soil to prevent cross-contamination. Select samples were packed into laboratory supplied glass jars and placed in coolers packed with ice to maintain a temperature as close to 4°C as possible for transport to an accredited laboratory for analysis. Standard chain-of-custody protocol was followed during the transportation of samples. Soil samples were field screened for volatile organic compounds

(VOCs) using a MiniRae Lite handheld VOC detector. The MiniRae was bump tested prior to field screening activities with a calibration gas standard. Samples were individually placed into plastic bags, sealed, and warmed to approximately 20°C to testing. Organic vapour concentrations were then measured and recorded.

Samples were selected for laboratory analysis from specific COCs based on field observations, delineation objectives, and regulatory requirements.

Laboratory Quality Assurance and Quality Control

Select soil samples collected during remediation activities were submitted to H2Lab Inc. in Rpuyn-Noranda, Quebec. The analytical suite was selected based on regulated compounds that are typically associated with diesel fuel, and MSDS sheets.

H2Lab Inc. is an accredited laboratory that uses Canadian recognized methods to conduct laboratory analyses. Method blanks, control standards samples, CRM standards, method spikes, replicates, duplicates and instrument blanks are routinely analyzed as part of the QA/QC program at the laboratory. The lab should only release date if it passes the laboratory QA/QC procedures.

Regulatory Framework

Regulatory guidelines vary depending on the land use category, soil grain size, and soil depth. Based on analytical results, the soil texture was determined to be coarse-grained with coarse grain guidelines being applied. The release site is located within an industrial landuse setting. Soil laboratory test results were, therefore, evaluated using the Canadian Council of Ministries of the Environment *Canadian Soil Quality Guidelines for the Protection of the Environmental and Human Health; Industrial* (2008).

RESULTS

SWAT collected 4 soil samples from the walls of the excavation and 2 soil samples from the base of the south excavation (Figures 3 and 4). Soil analytical tables are attached. Final confirmatory results determined that all soil within the excavation met guidelines with the exception. The detection limit for Napthalene was above guideline due to moisture content in the sample.

CCME suggests that investigation and management of polycyclic aromatic hydrocarbons, particularly napthalene, are considered based on concentrations relative to other petroleum-derived-hydrocarbons. Based on limitations in calculating direct soil contact, soil quality guidelines for the majority of the PAHs are of little practical significance to the overall achievement of environmental protection goals at Canadian contaminated sites (CCME, 2010). In this case, associated hydrocarbon contaminants of concern were removed from within the excavation boundaries, but inputs of napthalene (vehicle exhaust) are present within the immediate vicinity of the work area. Napthalene may be present for reasons other than due to the spill. To maintain an overall net-environmental gain, napthalene was not chosen as a parameter of concern.

CONCLUSIONS

Approximately 5 m^3 of diesel fuel was released from a tanker truck that rolled over at km 77 while travelling from Baker Lake to Meadow Bank. Agnico and SWAT completed response and remediation activities at the spill site. Final confirmatory soil samples indicated that contaminants relating to the spill have been remediated to meet CCME guidelines. Due to the moisture content of the samples, the laboratory detection limit of napthalene is above the suggested guideline. If napthalene is present within the area, the exceedances are likely minor and may be anthropogenic from inputs other than the spill.

Total estimated volume of 280 m^3 of impacted snow and soil removed from the spill area. This material is currently stockpiled at the Meadowbank Landfarm where it will undergo remediation.

CLOSURE

SWAT appreciated the opportunity to work on this project. Please do not hesitate to contact the undersigned at (780) 660-4883 for additional information.

This report was prepared by:

Sherree Dallyn, B.Sc., EP, QAES, P.Biol
Senior Environmental Scientist/Aquatic and Wetland Specialist
SWAT Consulting Inc.

DISCLOSURE

The material contained in this report reflects SWAT Consulting Inc.'s best judgment in light of the information available at the time of preparation. SWAT Consulting Inc. prepared this report for the sole use of Agnico Eagle Mines. Any use which a third party makes of this report, or any reliance on, or decisions based on this report, are the responsibility of such third parties. SWAT Consulting Inc. and Agnico Eagle Mines will not be held responsible or liable for any damages to the physical environment, any property, or to life, which may have occurred from actions of decisions based upon any of the information within this report.

REFERENCES

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TABLES

Agnico Eagle
Table 1. Soil Quality Results - Petroleum Hydroc
Response & Remediation Report
Meadowbank
June 2017 V1

SWAT Sample Name	Sample Depth (mbgl)	Sample Date (dd-mm-yy)	BTEX and PHC (F1-F4)							
			Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	Fraction 1 (mg/kg)	Fraction 2 (mg/kg)	Fraction 3 (mg/kg)	Fraction 4 (mg/kg)
CCME Soil Quality Guidelines Surface[1]			**0.03**	**0.37**	**0.082**	**NC**	**NC**	**NC**	**NC**	**NC**
CCME Soil Quality Guidelines Subsurface[1]			**0.03**	**0.37**	**0.082**	**NC**	**NC**	**NC**	**NC**	**NC**
BACKGROUND CONTROL										
17C01	0.15 m	22-Apr-17	<0.03	<0.06	<0.06	<0.06	<10	<10	140	110
NORTH WALL										
17N01	0.60 m	22-Apr-17	<0.03	<0.06	<0.06	<0.06	<10	<10	<50	54
17N01	1.50 m	22-Apr-17	<0.03	<0.06	<0.06	<0.06	<10	<10	<50	<50
EAST WALL										
17E01	0.50 m	22-Apr-17	<0.03	<0.06	<0.06	<0.06	<10	<10	<50	<50
17E01	1.50 m	22-Apr-17	<0.06	<0.06	<0.06	<0.06	<10	<10	<50	<50
SOUTH WALL										
17S01	0.50 m	22-Apr-17	<0.03	<0.06	<0.06	<0.06	<10	<10	<50	<50
17S01	1.50 m	22-Apr-17	<0.03	<0.06	<0.06	<0.06	<10	<10	<50	<50
WEST WALL										
17W01	0.50 m	22-Apr-17	<0.03	<0.06	<0.06	<0.06	<10	<10	<50	<50
17W01	1.50 m	22-Apr-17	<0.03	<0.06	<0.06	<0.06	<10	<10	<50	<50
BASE										
17B01	0.30 m	22-Apr-17	<0.03	<0.06	<0.06	<0.06	<10	<10	<50	<50
17B02	2.10 m	22-Apr-17	<0.03	<0.06	<0.06	<0.06	<10	<10	<50	<50

Notes:
Land Use: **Industrial** Grain Size: **Coarse**
[1] - CCME Soil Quality Guidelines for Protection of Environmental and Human Health (2008)

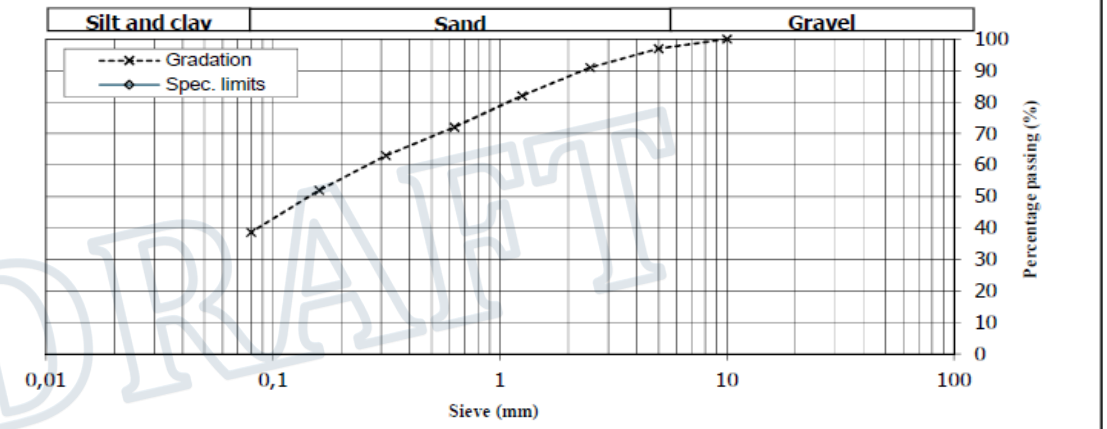
Agnico Eagle
Table 2. Soil Quality Results - Petroleum Hydrocarbons
Response & Remediation Report
Meadowbank
June 2017 V1

SWAT Sample Name	Sample Depth (mbgl)	Sample Date (dd-mm-yy)	Naphthalene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b+j+k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-c,d)pyrene	Dibenzo(a,h)anthracene	Benzo(g,h,i)perylene
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
CCME Soil Quality Guidelines[1]			**0.013**	**NC**	**NC**	**0.046**	**32**	**180**	**100**	**10**	**NC**	**NC**	**72**	**10**	**10**	**NC**
BACKGROUND CONTROL																
17C01	0.15 m	22-Apr-17	***<0.03***	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
NORTH WALL																
17N01	0.60 m	22-Apr-17	***<0.03***	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
17N01	1.50 m	22-Apr-17	***<0.03***	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
EAST WALL																
17E01	0.50 m	22-Apr-17	***<0.03***	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
17E01	1.50 m	22-Apr-17	***<0.03***	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
SOUTH WALL																
17S01	0.50 m	22-Apr-17	***<0.03***	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
17S01	1.50 m	22-Apr-17	***<0.03***	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
WEST WALL																
17W01	0.50 m	22-Apr-17	***<0.03***	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
17W01	1.50 m	22-Apr-17	***<0.03***	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
BASE																
17B01	0.30 m	22-Apr-17	***<0.03***	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
17B02	2.10 m	22-Apr-17	***<0.03***	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03

Notes:
Land Use: **Industrial** Grain Size: **Coarse**
[1] - *CCME Soil Quality Guidelines for Protection of Environmental and Human Health (2008) (analysis provided by maxxam analytics)*
Bold - detection limits were above guidelines due to moisture content
NC - not calculated

Sieve analysis (LC 21-040)

SIEVE (mm)	% PASSING REQUIREMENTS	% PASSING RESULT
112		
80		
56		
40		
31,5		
20		
14		
10		100
5		97
2,5		91
1,25		82
0,630		72
0,315		63
0,160		52
0,080		38,6



Cu : Cc : FM : 1,43 | D_{10} : D_{30} : D_{60} : 0,266

Maximum dry density kg/m³	Optimum moisture %	Retained 5 mm %

Proportions from sieve analysis (%)

Cobble :	0,0	Sand :	58,8
Gravel :	2,6	Silt and clay :	38,6

FIGURES

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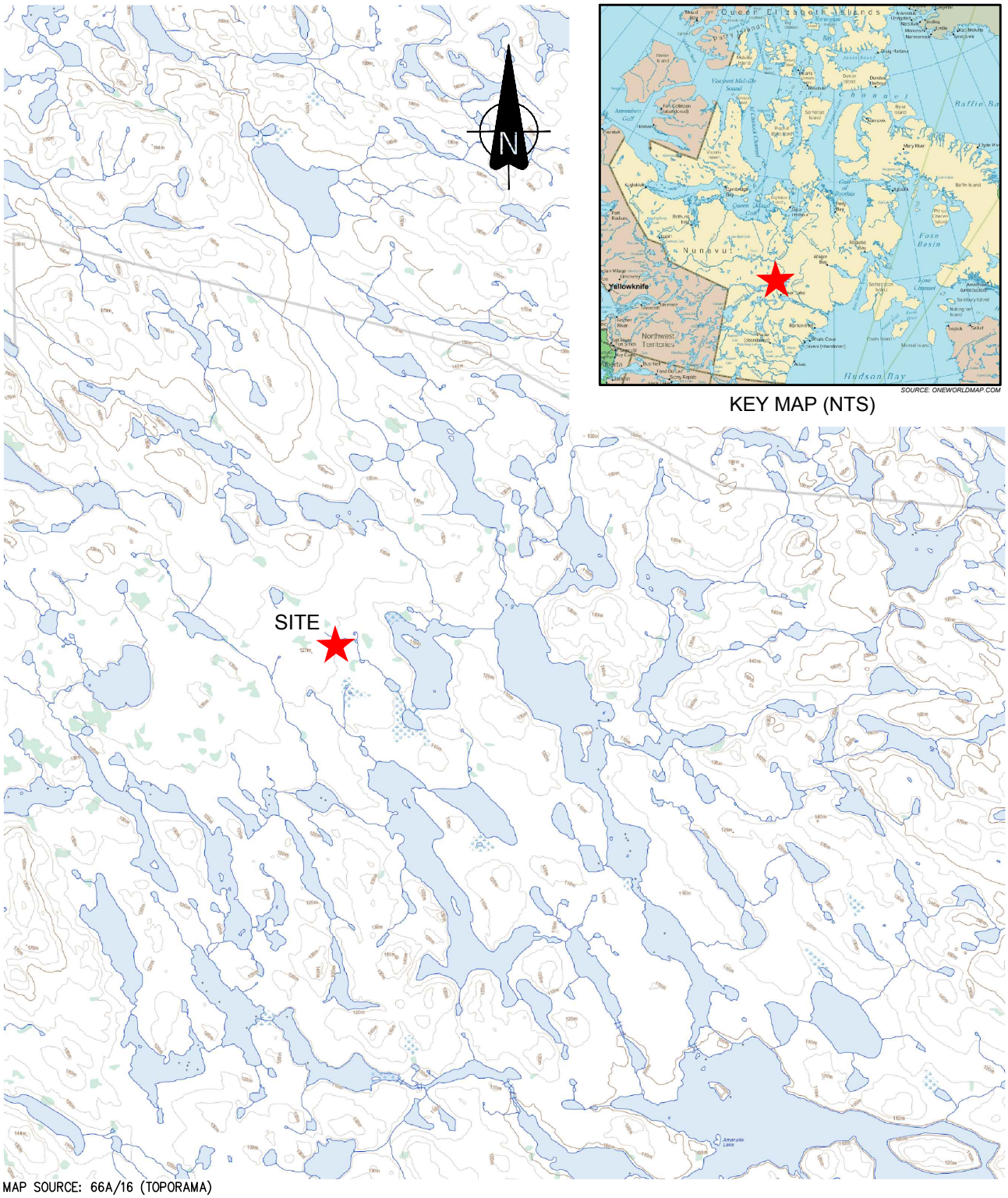
SOURCE: ONEWORLDMAP.COM

KEY MAP (NTS)



MAP SOURCE: 66A/16 (TOPORAMA)

0 1000 2000 4000m

Scale 1 : 100 000

SITE LOCATION MAP

SWAT Consulting Inc.

AGNICO EAGLE MINES LIMITED MEADOWBANK KM77 SPILL	DRAWN	APPROVED	DWN. DATE	FIGURE:
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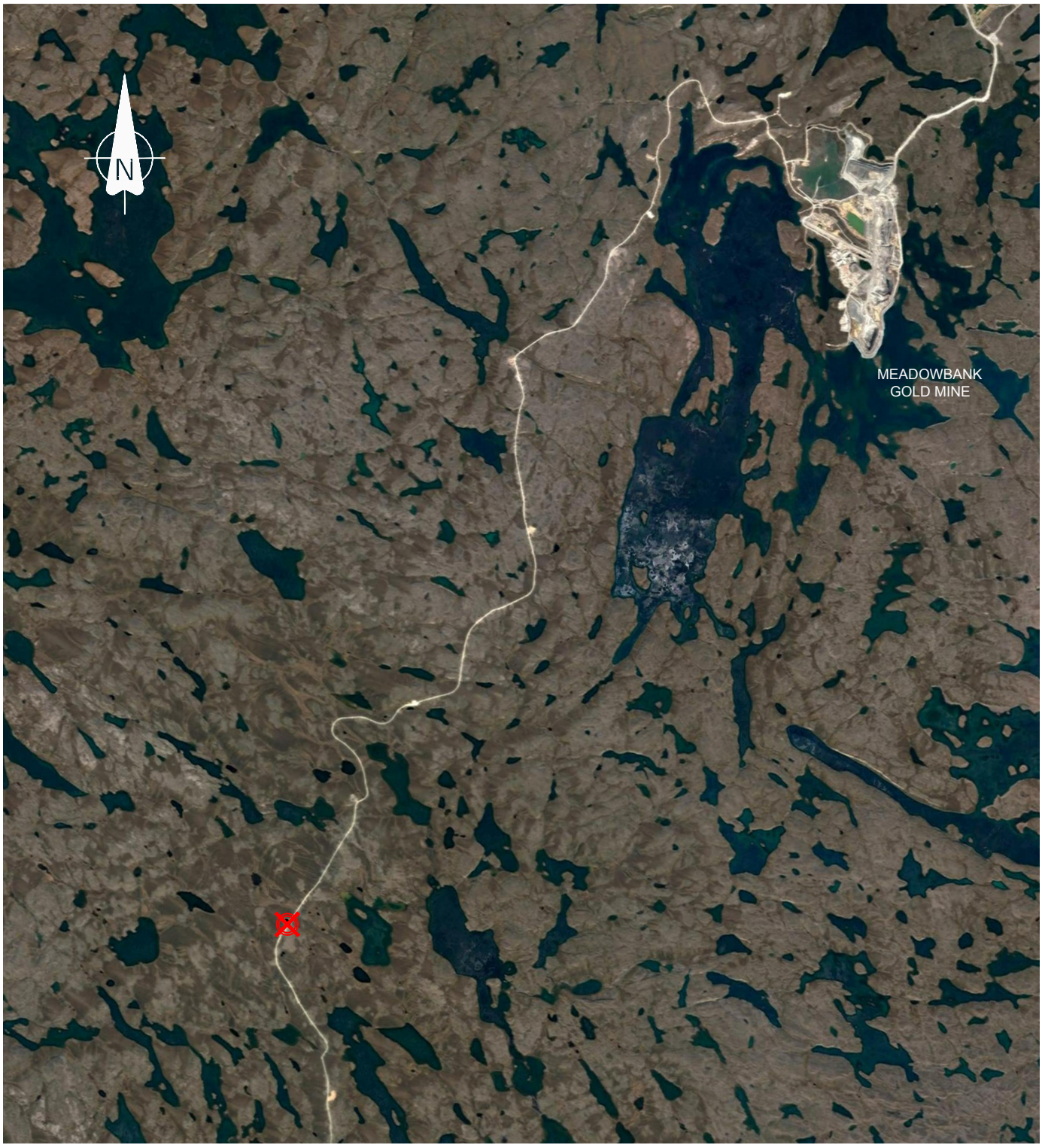

SATELLITE AERIAL PHOTO SOURCE: GOOGLE EARTH
MAP PROJECTION: UTM NAD83 14W

LEGEND

RELEASE POINT

NOTES:

LOCATIONS ARE APPROXIMATE.

0 1 2.5 5km

Scale 1 : 125 000

AERIAL OVERVIEW

SWAT Consulting Inc.

AGNICO EAGLE MINES LIMITED
MEADOWBANK KM77 SPILL

DRAWN	APPROVED	DWN. DATE	FIGURE:
LH	DRAFT	2-May-17	2

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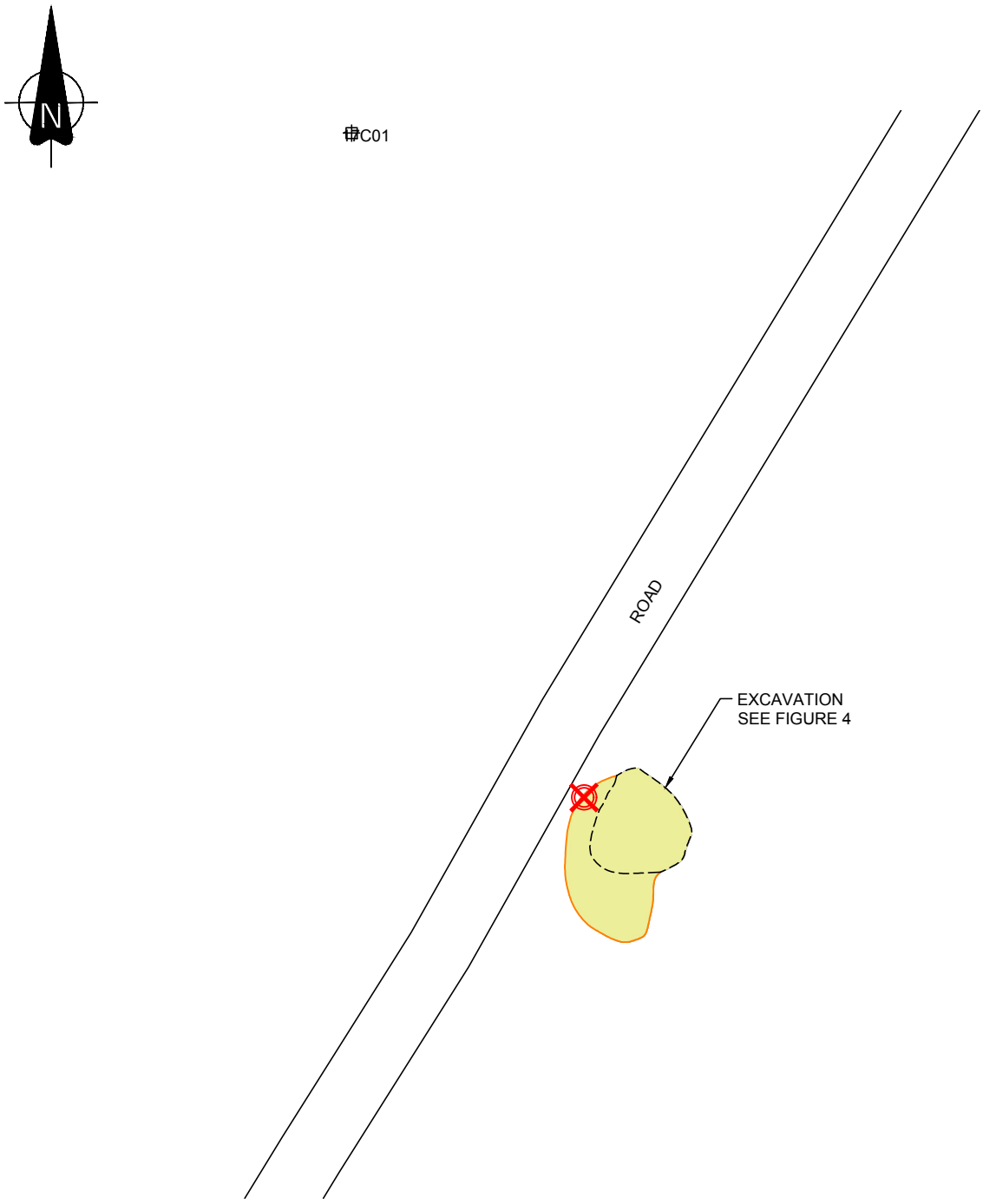

LEGEND

RELEASE POINT

CONTROL SOIL SAMPLE

NOTES:

LOCATIONS ARE APPROXIMATE.

0 5 10 20 30m

Scale 1 : 750

INITIAL SOIL ASSESSMENT

SWAT Consulting Inc.

AGNICO EAGLE MINES LIMITED
MEADOWBANK KM77 SPILL

DRAWN	APPROVED	DWN. DATE	FIGURE:
LH	DRAFT	4-May-17	3

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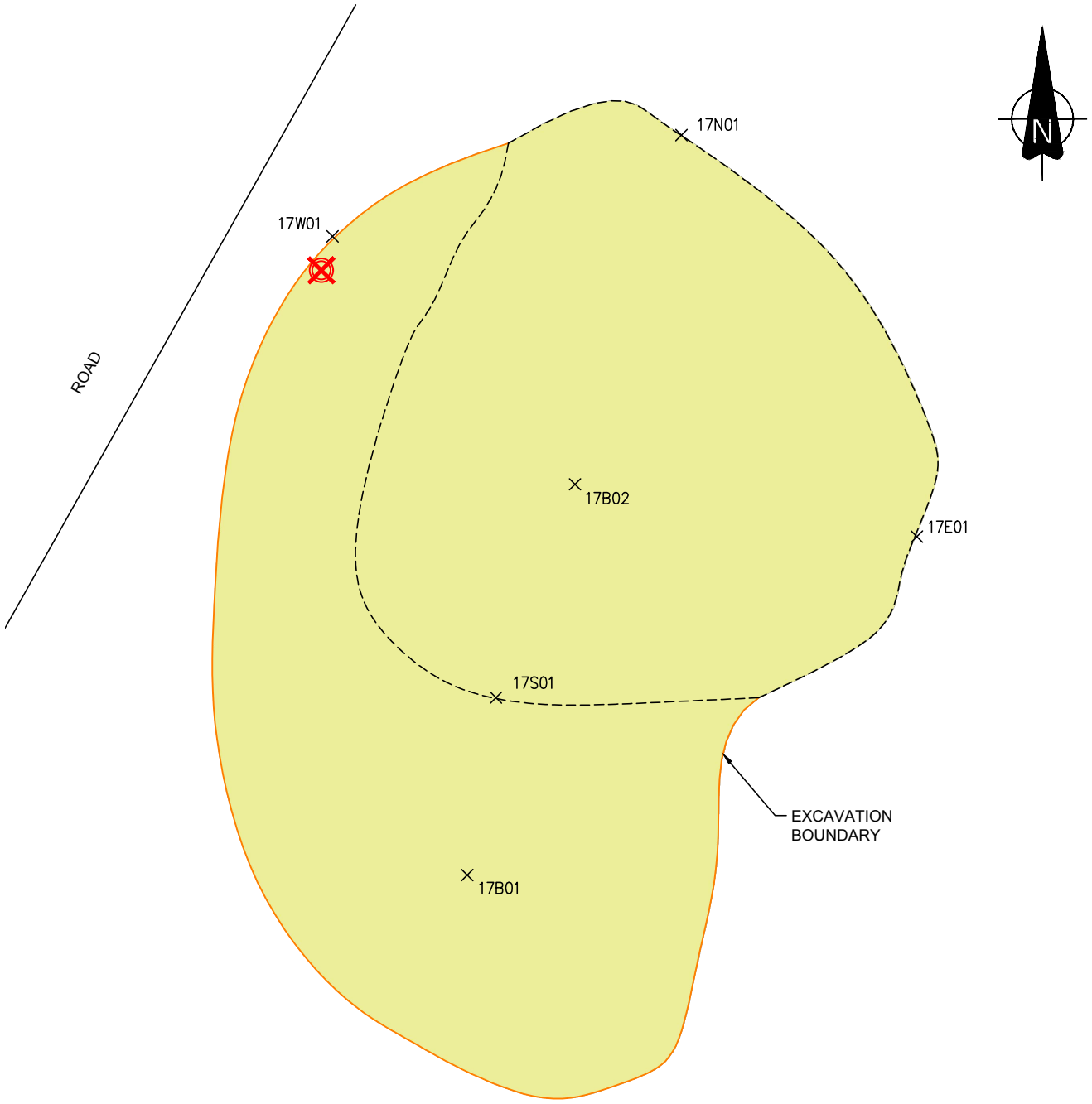

LEGEND

RELEASE POINT

CONFIRMATORY SOIL SAMPLE

NOTES:

LOCATIONS ARE APPROXIMATE.

0 1.0 2.5 5m

Scale 1 : 125

EXCAVATION DIAGRAM

AGNICO EAGLE MINES LIMITED
MEADOWBANK KM77 SPILL

DRAWN	APPROVED	DWN. DATE	FIGURE:
LH	DRAFT	4-May-17	4

FILE: AGNICO_17SP-B.dwg

APPENDIX A

SITE PHOTOGRAPHS

April 20: Excavation activities.

April 20: Loading trucks.

April 21: Using the hammer to remove material.

April 21: Removing snow from excavation for confirmatory sampling.

April 22: Stockpile removed from location.

April 22: Final excavation boundary.