December 6, 2024

Build Nova Scotia
1875 Upper Water St. Suite 301
Halifax NS B3J 1S9

Attention: Kelly Henderson, Project Coordinator

RE: Technical Memorandum – Thorburn Mine Phase I Environmental Site Assessment – Thorburn, Nova Scotia
DesignPoint Project #24-750

Introduction

At the request of Build Nova Scotia (BNS), DesignPoint Engineering & Surveying Ltd. (DesignPoint) completed a Phase I Environmental Site Assessment (ESA) of the historical Thorburn Mine site situated on PID 00894162 in Thorburn, Nova Scotia (NS) (herein referred to as the 'site'). The average coal production of the Thorburn mine was 450 tons per day and the colliery produced over 3.5 million short tons during the life of the mine (Ellerbrok, 1998), during its operations from 1884 to 1934.

This memorandum was prepared ahead of the Phase I ESA report preparation and submission. The full Phase I ESA report will be included with the Phase II ESA report.

A site location plan is presented in Figure 1.

The purpose of the Phase I ESA was to identify potential environmental concerns at the former Thorburn Mine site that may have resulted from historical mining activities.

The Phase I ESA completed by DesignPoint in November 2024 consisted of:

- Reviewing available environmental records.
- Site visit and interviews; and,
- Phase I ESA report preparation.

Methodology

DesignPoint conducted the Phase I ESA according to its standard assessment procedures, which reflect the Canadian Standards Association (CSA) standard Z768-01 and the Nova Scotia Environment and Climate Change (NSECC) Contaminated Site Regulations (CSR) Phase I ESA Protocol (PRO-300).

Findings

A summary of the identified Areas of Potential Environmental Concerns (APECs) is provided in Table 1.

Table 1 – Summary of Identified APECs

APEC #	Location	Suspected Contaminants of Concern (CoCs)	Potentially Impacted Media	Recommendations	
1	Single structure footprint along the New Row; potential coal-laden fill material; potential post-mining fuel storage within the building	Suspected heavy metal, petroleum hydrocarbons (PHC) and polycyclic aromatic hydrocarbon (PAH) impacts	Soil and groundwater	Borehole and monitoring well installation, soil and groundwater sampling.	Soil x 1 sample – metal, PAH, PHC Groundwater x 1 sample – metals, PAH, PHC This well could potentially become a background well.
2	4-structures footprint in the center of the site; potential post-mining fuel storage within structures	Suspected heavy metal, PHC and PAH impacts	Soil and groundwater	Borehole and monitoring well installation, soil and groundwater sampling.	Soil x 2 sample – metal, PAH, PHC Groundwater x 1 sample – metals, PAH, PHC
3	Old access road turnaround in the southern corner of the site.	Suspected heavy metal, PHC and PAH impacts	Soil and groundwater	Borehole and monitoring well installation, soil and groundwater sampling.	Soil x 1 sample – metal, PAH, PHC Groundwater x 1 sample – metals, PAH, PHC
4	Pile of light-colored material in the center of the site.	Suspected heavy metal, PAH and PHC impacts,	Soil	Surface soil sampling	Soil x 1 sample – metal, PAH, PHC
5	Funnel-like wet area in the north-eastern potion of the site. Potential 4-structure outflow	Suspected heavy metal, PAH and PHC impacts	Soil	Surface soil sampling	Soil x 1 sample – metal, PAH, PHC
6	Diversion channel for the former airshaft. Potential mine water seeping	Suspected heavy metal PAH and PHC impacts	Surface water and sediment	Surface water and sediment sampling	Surface Water x 1 sample – metal, PAH, PHC Sediment x 1 sample – metals, PAH, PHC
7	Southern portion of the site. Unknown infilling material	Suspected heavy metal PAH and PHC impacts	Soil	Soil sampling	Soil x 1 sample – metal, PAH, PHC
TOTAL NUMBER OF SAMPLES (including field duplicates)				Water – 5 samples	Soil/Sediment – 9 samples

Based on findings of this Phase I ESA, DesignPoint concludes that there is a **medium potential** for significant environmental liabilities to be associated with the site.

Based on conclusions of the Phase I ESA, it was recommended that a Phase II ESA soil, sediment, groundwater and surface water sampling program to be conducted at the site to determine if environmental impacts are present and/or potentially impacting down-gradient residences, recreational areas (Ball Park) or potable water supplies.

As such, DesignPoint recommends modifying the previously proposed Phase II ESA's field intrusive investigation program to include **additional samples: four (4) soil samples, and one (1) additional analyte (PHC), as well as to remove one (1) surface water and sediment sample from the brook due to the off-site location:**

1. Site clearance.
2. Installation of three (3) monitoring wells. That includes collection of three (3) soil and groundwater samples to investigate soil and groundwater conditions within APECs 1, 2, and 3. Analytes are as follows: general water chemistry, metal scan, PAHs, PHCs.
3. Collection of four (4) surface soil samples: one (1) at the pile that was noted in the centre of the site within the APEC 4; one (1) in the 4-structures area, APEC 2; one (1) in the funnel-like wet area, APEC 5; and one (1) in the centre of APEC 7. Analytes are as follows: metal scan, PAHs, PHCs.
4. Collection of one (1) surface water and one (1) stream sediment sample from the diversion channel, APEC 6. Analytes are as follows: general water chemistry, metal scan, PAHs, PHCs.
5. Quality control/quality assurance field duplication to include one (1) soil and one (1) water sample.
6. Site geodetic survey.

Proposed intrusive investigation locations and the site features are presented in Figure 2.

Thank you,
DesignPoint Engineering & Surveying Ltd.

Arman Polatbekov, P.Geo.
Senior Hydrogeologist and Contaminated Site Professional

Enclosures:

Figure 1 Study Area
Figure 2 Proposed Intrusive Locations and Site Features

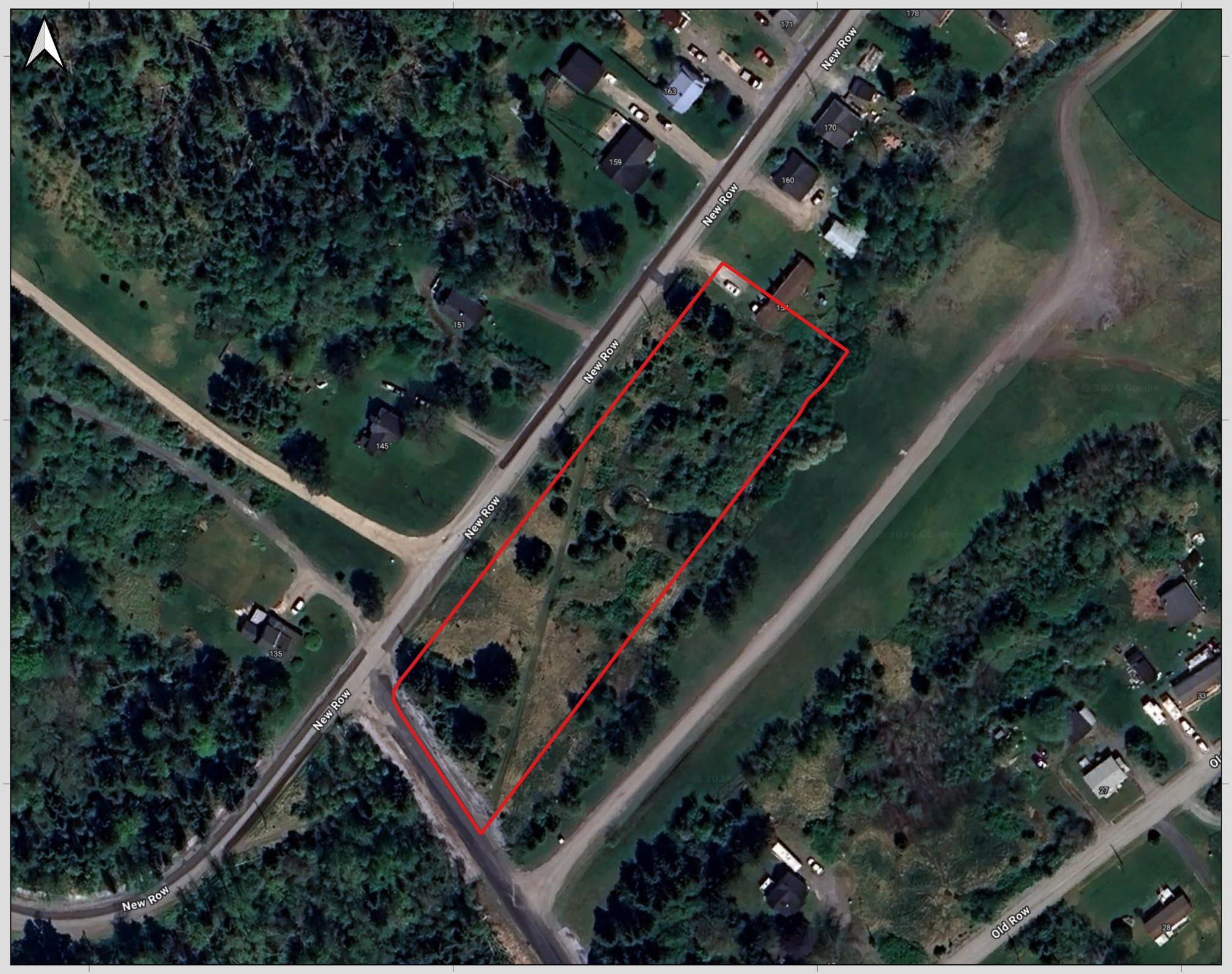
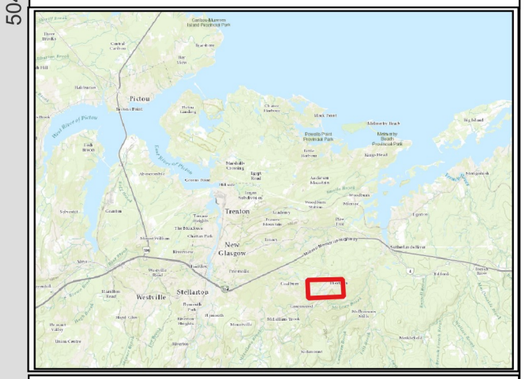


Figure 1

Study Area

PID 00894162
Project # 24-750

Study Area



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Tranverse Mercator
Datum: North American 1983 CSRS
Units: Meter

25 50 75 m

1:1,000 Scale when printed @ 11" x 17"

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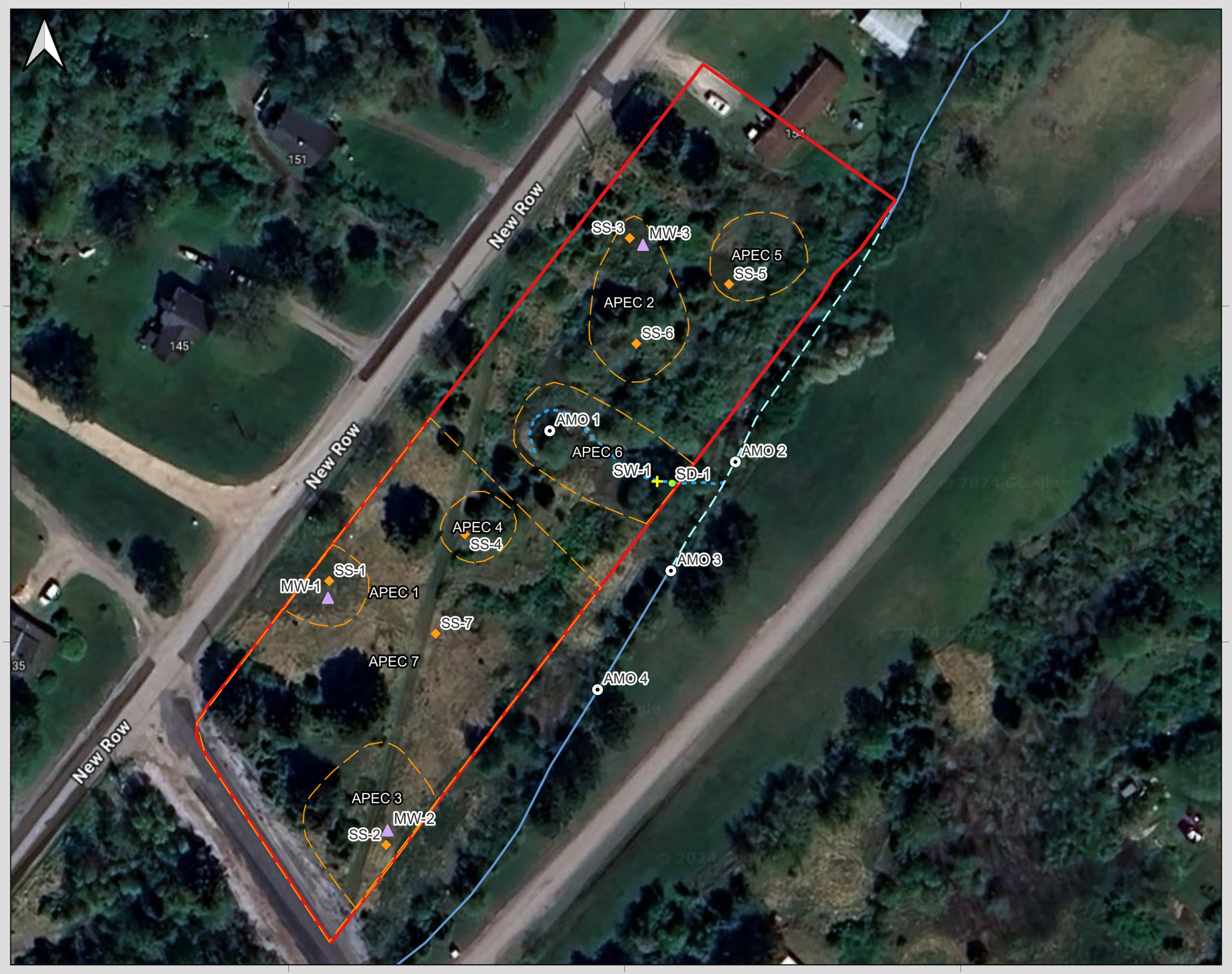
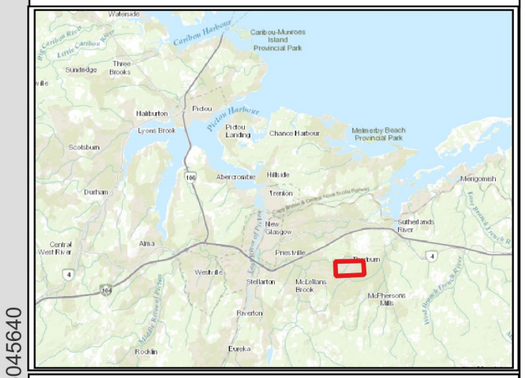
Figure 2

Proposed Intrusive Investigation Locations & Site Features

PID 00894162
Project # 24-750



- Soil Sample Locations
- Monitoring Well Locations
- Surface Water Sample Locations
- Sediment Sample Locations
- Abandoned Mine Openings
- Field Identified Channel
- NSTDB Mapped Watercourses
- APEC Locations
- Study Area



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Tranverse Mercator
Datum: North American 1983 CSRS
Units: Meter

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1:650 Scale when printed @ 11" x 17"

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