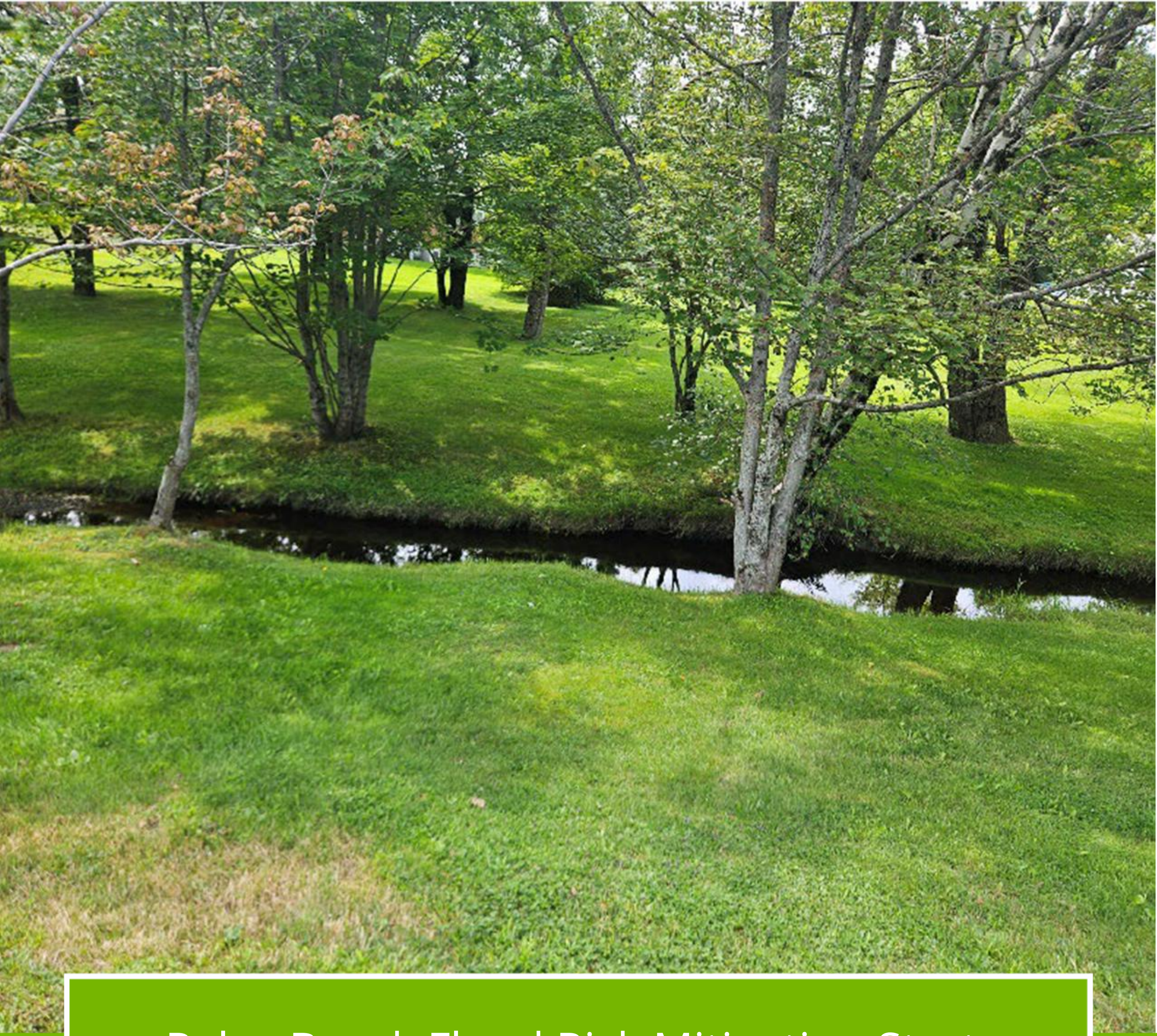

# Paley Brook Flood Risk Mitigation Strategy

## Final Report

241221.00 • April 2025

CBCL

EAST HANTS

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April 15, 2025

Jared Mullett, P.Eng.
Project Engineer
Municipality of East Hants
jmullett@easthants.ca

Dear Jared:

*RE: Paley Brook Flood Risk Mitigation Strategy*

CBCL is pleased to provide the East Hants Regional Municipality with this report for the Paley Brook Flood Risk Mitigation Strategy.

Please do not hesitate to contact the undersigned with any questions or comments you may have with regards to the contents of this report.

Yours very truly,

CBCL Limited

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Project No.: 241221.00

# Contents

# Appendices

# 1 Introduction

CBCL Limited (CBCL) has been selected by the Municipality of East Hants to develop flood line mapping and identify mitigation solutions for a defined study area along Paley Brook, located in Lantz, NS. This report summarizes the hydrological and hydraulic analysis completed.

## 1.1 Study Area

The defined study area, as presented in **Figure 1-1**, is located in Lantz, in the Municipality of East Hants ("East Hants"). The study area is along Paley Brook and extends from the Paley Brook crossing under the culvert at Highway 102 to the culvert at Highway 2, near Logan Drive. It encompasses a section of Paley Brook, forested and grassed areas, as well as built-up areas which are mainly residential houses and roadways.

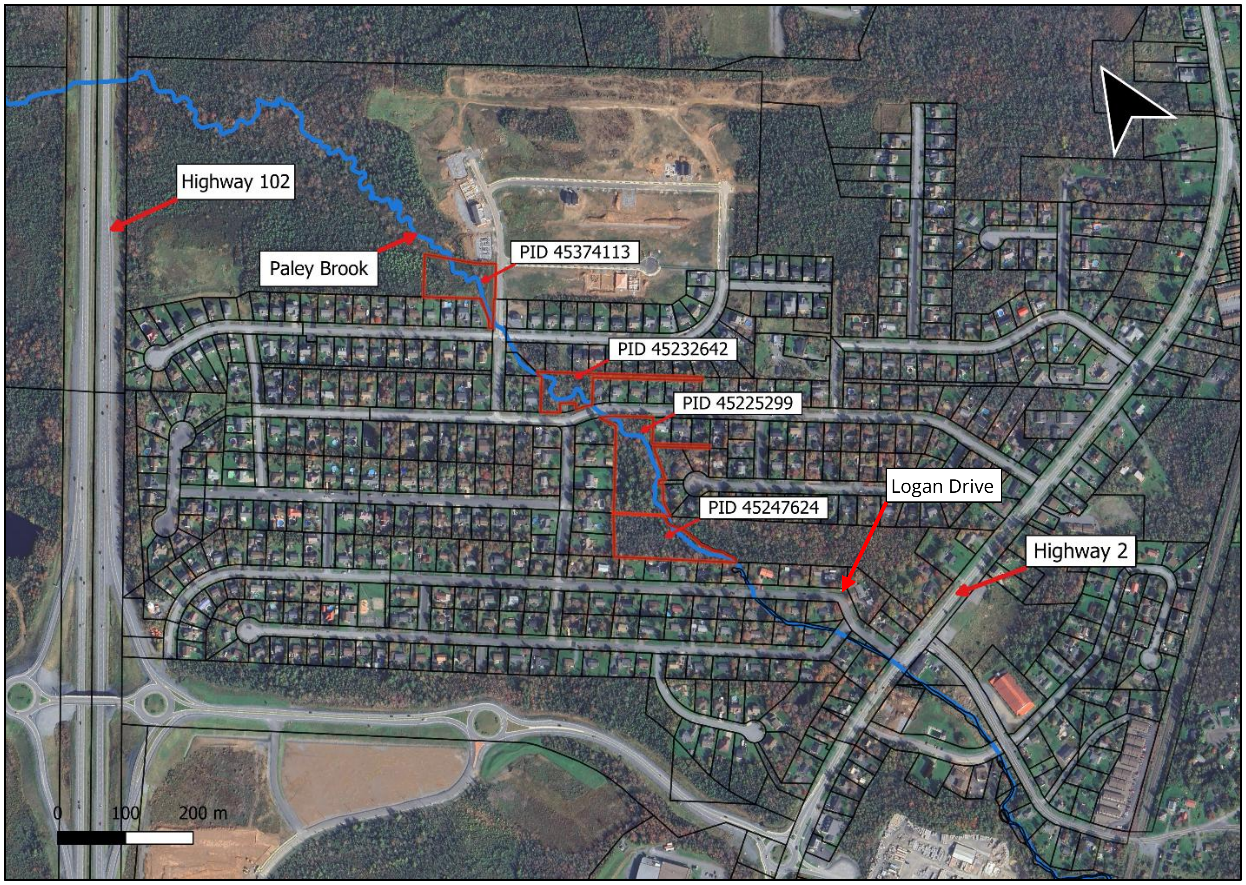


**Figure 1-1: Defined Study Area provided in the Request for Proposal**

# 2 Data Collection

The data collection phase consisted of a review of available information from East Hants, topographic site survey, and provincial and federal database queries.

## 2.1 Information provided by East Hants

Information provided by East Hants included:

- GIS database (currently under development by East Hants) with some locations of buried storm sewer, ditches, and roads. Data was used for ditches and roads where available.
- Lantz Subdivision: Phase 1 - Mariah Drive Culvert Record Drawings (DesignPoint, 2022).

## 2.2 Site Survey

A site visit and survey were completed by CBCL personnel on December 18th, 2024, during which hydraulic structures and river cross-sections were surveyed. The collected data has been used to support the detailed hydrological, and hydraulic assessment. **Table 2-1** outlines descriptions of the existing hydraulic structures in the study area. An overview figure with these culvert locations is presented in Appendix C.

**Table 2-1: Hydraulic Structures**

| Location | Existing Size and Material | Invert In (m) | Invert Out (m) | Description |
|---|---|---|---|---|
| Highway 102 | 1,050mm dia. Circular Concrete | 24.89 | 24.75 | Culvert under highway, most upstream culvert in study extents |
| Mariah Dr | 2,700mm x 1,350mm Concrete Box | 20.84 | 20.56 | Culvert under Mariah Dr, Dissipation pool on downstream end |
| Turner James Ave | Twin 1,800mm x 1,200mm CSP Ellipse | 20.79 | 20.75 | Two twin culverts under Turner James Ave, compressed to ellipse shape |
| Poplar Dr | Twin 1,050mm Circular Concrete | 20.45 | 20.44 | Two Twin culverts under Poplar Dr |

| Location | Existing Size and Material | Invert In (m) | Invert Out (m) | Description |
|---|---|---|---|---|
| Logan Dr | 1,800mm Circular Concrete | 19.01 | 18.86 | Culvert under Logan Dr |
| Towerview Court | 1,800mm Circular Concrete | 18.32 | 18.20 | Culvert under Towerview Court, culverts |
| Highway 2 | 2,100mm x 1,800mm Concrete Box | 18.28 | 17.70 | Culvert under Highway 2 |

### 2.2.1 Suitability of Provincial LiDAR

CBCL collected survey shots at a number of locations throughout the project area to compare to the available provincial LiDAR DEM and determine suitability for use for flood mapping. A comparison of elevation differences is presented in **Figure 2-1** and summary statistics are presented in **Table 2-2**.

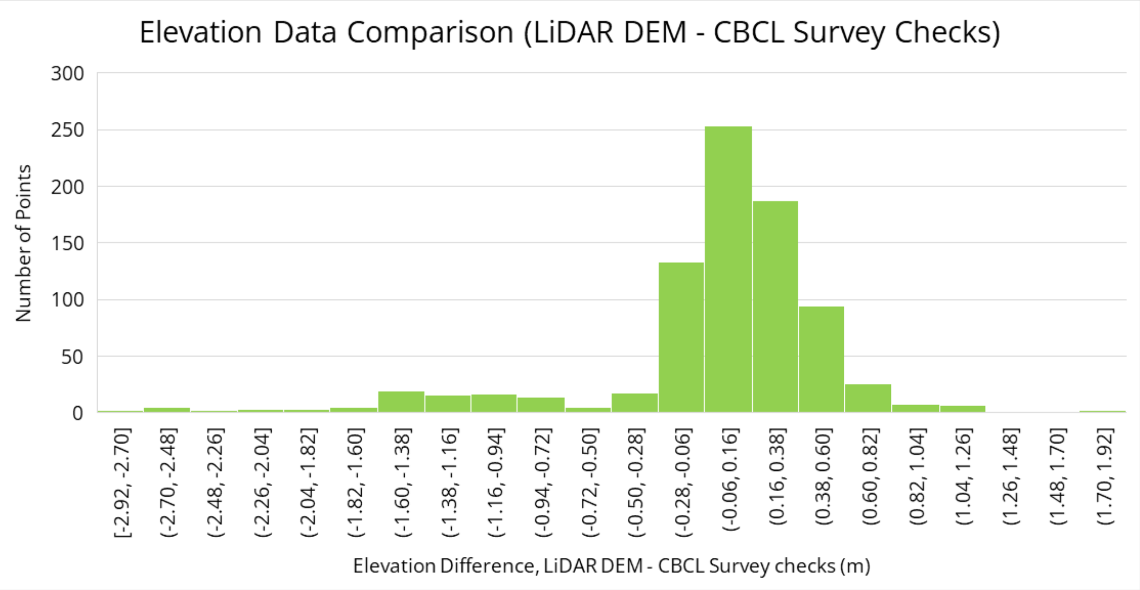


**Figure 2-1: LiDAR DEM to CBCL Survey Checks Comparison**

**Table 2-2: Summary Statistics, Topographic Survey vs LiDAR comparison**

| | Difference: LiDAR DEM – CBCL Topo Shots (m) |
|---|---|
| Maximum | 1.82 |
| Median | 0.09 |
| Mean | -0.003 |
| Minimum | -2.92 |

Overall, the provincial LiDAR DEM was found to be sufficient for the purposes of flood mapping. The majority of the survey shots were within 300mm of the provincial 1m LiDAR DEM grid and the calculated median and mean both show less than 0.1m difference between the DEM and survey points. Addressing the outliers, the following observations were made when comparing the survey shots to the LiDAR DEM:

- **Mariah Drive:** Most of the locations that had higher elevations from CBCL survey shots than the provincial DEM were on Mariah Drive where the road was recently raised/constructed (after the DEM was produced). These grades were adjusted based on the field survey in the DEM used for hydraulic analysis and floodplain mapping.
- **Significant grade changes:** Some of the significant point differences are located on the banks or foreslopes of the roads, where significant changes in elevation are present across the 1m LiDAR grid. Since the lidar grid is the average of the 1m x 1m tile, but the survey shot is at the top or bottom of the bank, significant differences in elevation can occur. This is a limitation of DEM products and is overcome by using a suitable DEM grid resolution.
- **Channel thalweg:** The channel thalweg ('stream centerline') shots where the local water depth is deep in the channel, but less than 1 m wide, show elevation discrepancies over 300mm in some locations. Differences are attributed to either that presented under **significant grade changes** above, or locations where the LiDAR reflected off the water surface, compared to survey shots that were collected in the actual bottom of the channel. These local high spots in the DEM are, overall, insignificant for the purposes of flood mapping as the flow conveyance area ignored in the DEM is a very small part of the total flow conveyance for the assessed events (1% and 5% AEP). Alternatively, for a low flow assessment, further refinement of the thalweg in the DEM would be required to produce representative results.

# 3 Flood Mapping Scenarios

One of the main goals of this study is to produce flood maps for the following four scenarios outlined in Table 3-1. This study uses the term Annual Exceedance Probability (AEP) to describe the probability of a flood event. Annual Exceedance Probability is the likelihood of an event of a specified magnitude occurring or being exceeded in a given year. This term is equivalent to, but considered a more understandable description of flood probability than a 'return period'; which can give the impression that, for example, the 1 in 100-year event, which has an annual exceedance probability of 1%, will only happen once every 100 years.

**Table 3-1: Flood Mapping Scenarios**

| Annual Exceedance Probability | Description | Time Horizons for Climate Condition |
|---|---|---|
| 5% AEP | Equivalent to the '1-in-20-year return period' | Present |
| | | 2100 |
| 1% AEP | Equivalent to the '1-in-100-year return period' | Present |
| | | 2100 |

# 4 Hydrologic Analysis

Hydrologic analysis for development of flood mapping scenarios was undertaken with a Storm Water Management Model (SWMM) hydrologic model.

## 4.1 PCSWMM Hydrologic Model

A SWMM hydrologic model was set up for the study area using the PCSWMM software produced by Computational Hydraulics International (CHI). PCSWMM is a platform built on version 5 of the US Environmental Protection Agency's (EPA) Storm Water Management Model (SWMM). EPA SWMM is a hydrologic and hydraulic model that has its origins dating to 1971, and which undergoes regular updates. It is an industry standard modelling software.

SWMM simulation methods used in the hydrologic model are as follows:

- Rainfall – runoff loss method: Green-Ampt Infiltration
- Runoff routing method: Non-linear reservoir routing
- Channel routing: 1D dynamic wave (full momentum shallow water equations)
- Storm Distribution: 24-Hour Chicago Design Storm

### 4.1.1 Watershed Delineation

The provincial 1 metre resolution topographic LiDAR Digital Elevation Model (DEM) was used as the basis for watershed delineation and assigning physical subcatchment parameters (i.e. slope and flow length). Watersheds upstream of the culvert structure were delineated in GIS software using the watershed tools series, resulting in 24 subcatchments delineated with areas ranging from 0.12 to 100 hectares. The watershed area consists of a section of Paley Brook, forested and grassed areas, as well as built-up areas which are mainly residential houses and roadways. The total watershed area upstream of Highway 2 is 429 hectares. The modelled watershed is presented in **Figure 4-1**.

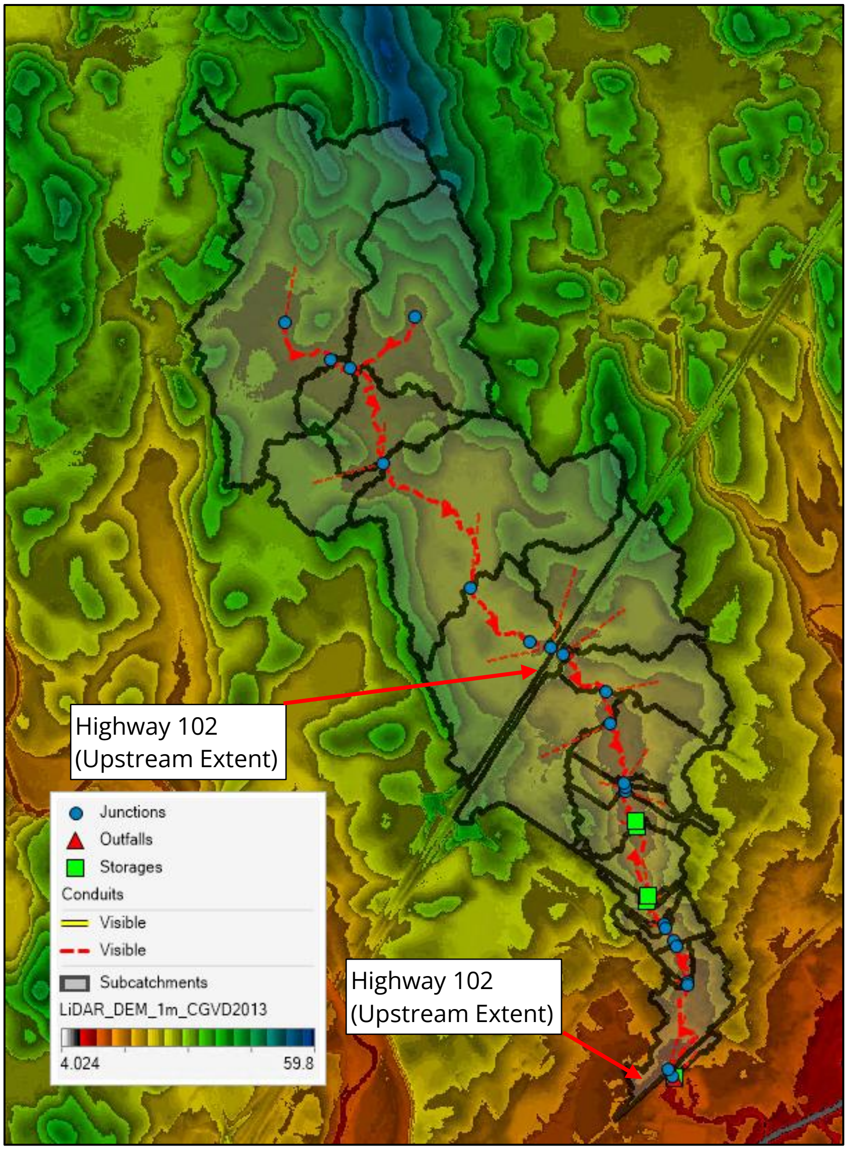


**Figure 4-1: Total Modelled Watershed of 4.50 km$^2$ outlined over contour map (grey shade with black outline)**

### 4.1.2 Land Cover and Soils

Land cover and soils mapping were retrieved from provincial and federal datasets. An overview of the modelled watersheds is presented in **Figure 4-2**.

Land cover mapping from the Natural Resources Canada National Land Cover Mapping dataset was used to define subcatchment roughness values. Roughness values from Highway Hydrology (McCuen, 1996) representing shallow overland flows were assigned to the ten NRCAN land cover types relevant in the study area. Dominant land cover types included broadleaf deciduous forest (44%), mixed forest (27%), and urban area (15%).

Provincial soil survey data obtained from Agriculture and Agri-Food Canada (2013) was used for determining soil infiltration parameters for the subcatchments in the PCSWMM model. Hydraulic conductivity and Suction Head values from Rawls et al (1983) were assigned to soil drainage classes present in the study area.

The dominant soil type in the area is Clay Loam (92%), with water covering 6% of the watershed, and Silty Clay Loam covering 3% (Appendix B). The polygons from the soil mapping were used to calculate a weighted average hydraulic conductivity value for each subcatchment.

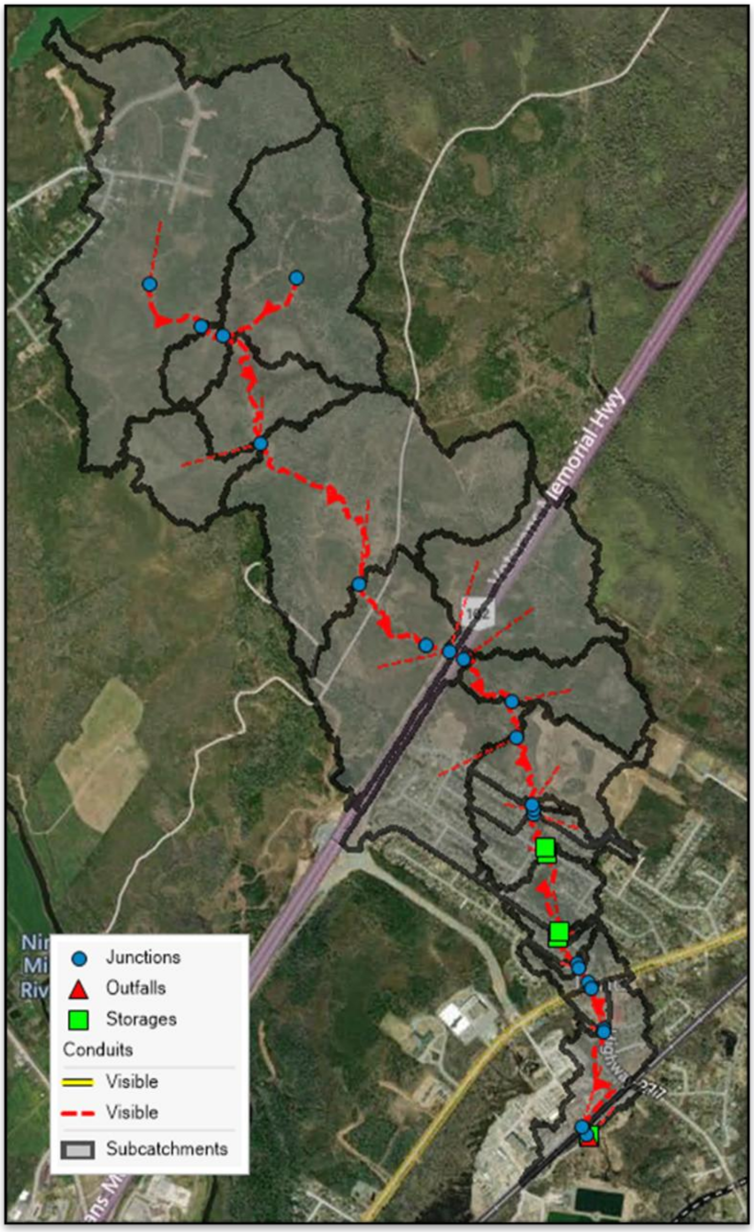


**Figure 4-2: Total Modelled Watershed over Satellite Imagery**

## 4.2 Rainfall Analysis

Hydrological modelling requires rainfall time series (hyetographs) as inputs to generate the runoff response. Synthetic design storm hyetographs representing statistical rainfall events for present and future climate conditions were used for the analysis.

### 4.2.1 Intensity-Duration-Frequency Data

Rainfall Intensity-Duration-Frequency (IDF) data is the result of statistical analyses of historical rainfall intensities. Environment and Climate Change Canada (ECCC) is the primary organization that publishes IDF data in Canada. The IDF data can be used to generate synthetic hyetographs (e.g., the Chicago storm distribution) that represent specific exceedance probability storm events (i.e., return periods).

ECCC climate stations with published IDF data near the study area were reviewed for direct use in generating storm hyetographs. **Table 4-1** presents a comparison of station IDF data relevant to the study area.

**Table 4-1: Regional ECCC stations with published IDF data.**

| Station Name | Record Length (years) | Record years | Station Elevation (m) | Proximity to Site (km) | Location Comments | 1% AEP, 24hr Rain (mm) |
|---|---|---|---|---|---|---|
| Halifax Stanfield Int'l Airport | 22 | 1977-2017 | 145 | 12 | Noted inaccuracy, underestimating rainfall | 140.8 |
| Halifax | 22 | 1941-1973 | 31 | 38 | Most conservative rainfall amount | 232.9 |
| Shearwater RCS | 66 | 1955-2021 | 66 | 40 | | 147.0 |

The Halifax station was chosen because it has the most conservative 100-year rainfall amount, and based on its proximity to the site. Some inaccuracies have been noted in the Halifax Stanfield Int'l Airport station rainfall record, including underestimating rainfall, therefore it was excluded. The Halifax climate Station was selected as it is slightly closer to the study area than the Shearwater RCS station and has a more conservative rainfall record.

The published rainfall amounts for different durations and return periods for the Halifax climate station (**Table 4-2**) have been used to generate 24-hour duration design storm hyetographs following a Chicago type storm distribution (Keifer and Chu, 1957).

**Table 4-2: Return Period Rainfall Amounts for Halifax Station**

| Duration | AEP | | | | | | |
|---|---|---|---|---|---|---|---|
| | 50% | 20% | 10% | 5% * | 4% | 2% | 1% |
| | Return Period (yrs) | | | | | | |
| | 2 | 5 | 10 | 20* | 25 | 50 | 100 |
| **5 mins** | 6.1 | 8.1 | 9.4 | 10.6 | 11.1 | 12.3 | 13.5 |
| **10 mins** | 8.3 | 10.6 | 12 | 13.3 | 13.9 | 15.2 | 16.6 |
| **15 mins** | 10.3 | 12.5 | 13.9 | 15.2 | 15.8 | 17.1 | 18.5 |
| **30 mins** | 14.1 | 17.5 | 19.8 | 21.8 | 22.6 | 24.7 | 26.8 |
| **60 mins** | 20.6 | 25.5 | 28.8 | 31.7 | 32.9 | 36 | 39 |
| **2 hrs** | 28.6 | 37.2 | 42.9 | 48.0 | 50.1 | 55.4 | 60.6 |
| **6 hrs** | 46.1 | 63 | 74.2 | 84.3 | 88.3 | 98.8 | 109.2 |
| **12 hrs** | 57.1 | 81.1 | 97 | 111.3 | 117.1 | 132 | 146.7 |
| **24 hrs** | 67.6 | 111.8 | 141.1 | 167.6 | 178.2 | 205.6 | 232.9 |

* Note: Rainfall amounts for 5% AEP are calculated by linear interpolation as ECCC climate stations do not publish IDF data for this return period.

### 4.2.2 Climate Change Projections

Climate change is expected to cause an increase in extreme precipitation, primarily due to the ability of warmer air to hold more moisture. Therefore, it is not suitable to use IDF data based on historical information alone for long-term planning. Instead, estimates of future changes in extreme precipitation must be obtained.

To project future changes in extreme precipitation, climate models and emission scenarios are used. A climate model is a computer representation of atmospheric, oceanic, and other processes. Climate models use greenhouse gas emission scenarios as inputs to project climate into the future. The Intergovernmental Panel on Climate Change (IPCC) has established future emission scenarios, including Representative Concentration Pathways (RCPs) and Shared Socioeconomic Pathways (SSPs).

Internationally, teams of scientists build and run global climate models, using mathematical equations to characterize physical processes that impact the climate. Climate models vary in their assumptions about initial conditions and use different mathematical approximations. This means that a given model can overestimate or underestimate the actual climate. Therefore, climate projections are best obtained from an ensemble of models that cover the range of possibilities (to the extent that they can be modelled). Projections are thus reported as a percentile of the model ensemble (e.g., 10th, 50th, 90th).

Projecting changes in precipitation extremes is challenging, in part because some precipitation processes, such as thunderstorms, happen on spatial scales that are smaller than the resolution of global climate models. Therefore, the recommended method for projecting precipitation extremes is the use of the Clausius-Clapeyron Equation, which is based on projected changes in temperature rather than precipitation.

With this "temperature scaling" approach, each degree of warming is taken to result in an approximately 7% increase in precipitation intensity (Westra et al. 2014). This method is considered scientifically defensible by authoritative sources such as CSA PLUS 4013:19 and Cannon et al. (2020), the ECCC report that will inform climate change updates to the building and bridge codes.

Although the general relationship between warming and extreme precipitation is robust, it is noted that the scaling rate may vary significantly around the approximate value of 7% (Cannon et al. 2020). There is also some evidence to suggest a doubling of the Clausius-Clapeyron scaling rate for shorter (i.e., sub-daily) precipitation event durations when temperature is higher than 12$^0$C; however, there is no clear guidance to apply this at present (CSA 2019) and thus this has not been applied for this project.

The application of the method is described by CSA (2019). In general, temperature projections were obtained and then converted to a precipitation projection using a simplified equation. Key decision points for the methodology include:

- **Generation of Climate Model Ensemble.** The modelling ensembles used for temperature projections were the Sixth Coupled Model Intercomparison Project models (CMIP6), downscaled with a method called multivariate downscaling (Cannon et al. 2018; available on PAVICS), as well as the Fifth Coupled Model Intercomparison Project models (CMIP5), downscaled using BCCAQv2 method (Cannon et al. 2015; available on PAVICS).
- **Climate Scenario.** The forcing scenario used in this assessment is the Shared Socioeconomic Pathways (SSP)5-8.5. More information can be found on ClimateData.Ca. The CMIP5 models use a related scenario (RCP 8.5).
- **Baseline.** The temperature projections were compared to a baseline of 1981-2010.
- **Projection horizons.** Projection horizons are defined based on the planning needs of the project. In this case, the 2050s and 2080s were used. The best practice for projection horizons is to use 30-year time periods, to account for natural variability in the earth's system. Thus, the year ranges that were used were 2071-2100 (to represent 2100). Note that bias-corrected CMIP5 and CMIP6 climate model outputs are not readily available past the year 2100. Thus, the 2100 projection is centered around the 2080s and may be an underestimate of projections for 2100.

The projected change in precipitation intensity is approximately 37% and 45% for the 30-year period representing the 2080s under CMIP5 and CMIP6, respectively (**Table 4-3**). In the PCSWMM model, the 100-year design storm was increased by 45% to account for climate change. These results (highlighted in red in Table 1) are based on the 50th percentile of the model ensemble. This is consistent with expected values for changes in extreme precipitation in Atlantic Canada. The percentage increases can be applied to the historical hyetograph used for hydrological/hydraulic modelling to approximate the effects of climate change on future flows. It is important to take into account the uncertainty (i.e., range of results from climate scenarios and the model ensemble) on this estimate when interpreting the resulting flood lines. The 50th percentile precipitation increase was chosen for this project to remain consistent with the project goal of long-term resiliency. Comparatively, the 95th percentile value would represent a "worst-case" scenario and allow for an extra factor of safety.

**Table 4-3: Precipitation increase, Climate Change**

| | CMIP5 (RCP8.5) | | CMIP6 (SSP 5-8.5) | |
|---|---|---|---|---|
| | 2050s | 2080s | 2050s | 2080s |
| **50th Percentile** | 21.0% | 36.5% | 25.8% | **44.8%** |
| **95th Percentile** | 31.5% | 55.7% | 42.3% | 77.8% |

## 4.3 Hydrologic Model Results

Key PCSWMM hydrologic model results are presented in **Table 4-4** for the 5% AEP (1 in 20 year) and the 1% AEP (1-in-100-year) events.

**Table 4-4: Hydrologic Model Results**

| River | Point ID | Flood Event & Climate Scenario | | | |
|---|---|---|---|---|---|
| | | 5% AEP ($m^3/s$) | | 1% AEP ($m^3/s$) | |
| | | Existing | 2100 | Existing | 2100 |
| PCWMM Model Outlet at Paley Rd | A | 9.5 | 16.6 | 14.4 | 25.1 |
| HEC-RAS Model Inflow at Highway 102 | B | 5.4 | 10.7 | 9.2 | 16.5 |

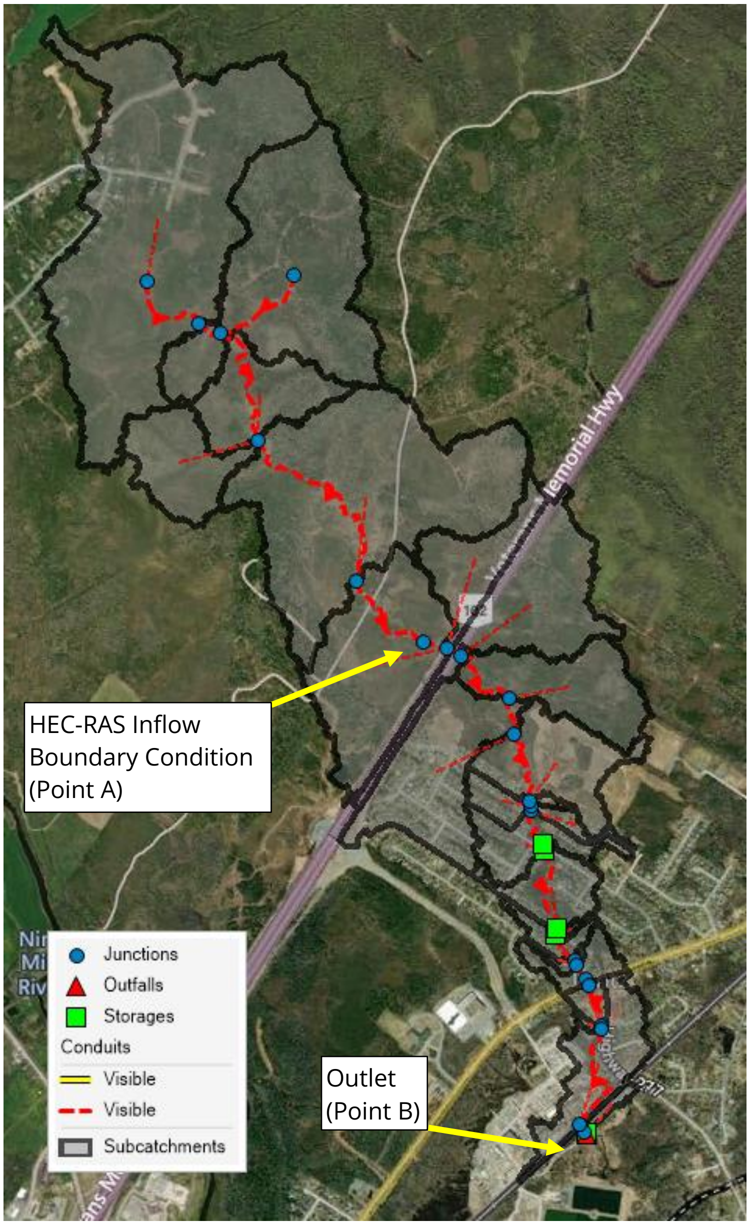

**Figure 4-3: Key hydrologic inputs**

# 5 Hydraulic Assessment

The detailed hydraulics and flood mapping were carried out using the US Army Corps of Engineers (USACE) Hydrologic Engineering Center - River Analysis System (HEC-RAS) version 6.5 with built-in RAS Mapper GIS interface. HEC-RAS is an industry standard software that is specifically built for hydraulic modelling of open channels and floodplain mapping. HEC-RAS was used in its 2-dimensional (2D) unsteady state mode, with input hydrographs as flow inputs from the PCSWMM model.

## 5.1 Model Development

The HEC-RAS model was developed to cover the entire flood mapping area. A description of the model development, key parameters, and assumptions are provided below.

### 5.1.1 Model Domain

The model domain extends from Highway 102 to Highway 2 (**Figure 5-1**), encompassing the study area. The 2D computational mesh extends beyond the study area (defined as the portion of Paley Brook between Highway 102 to Highway 2) to account for upstream attenuation of the highway and downstream tailwater from downstream culverts.

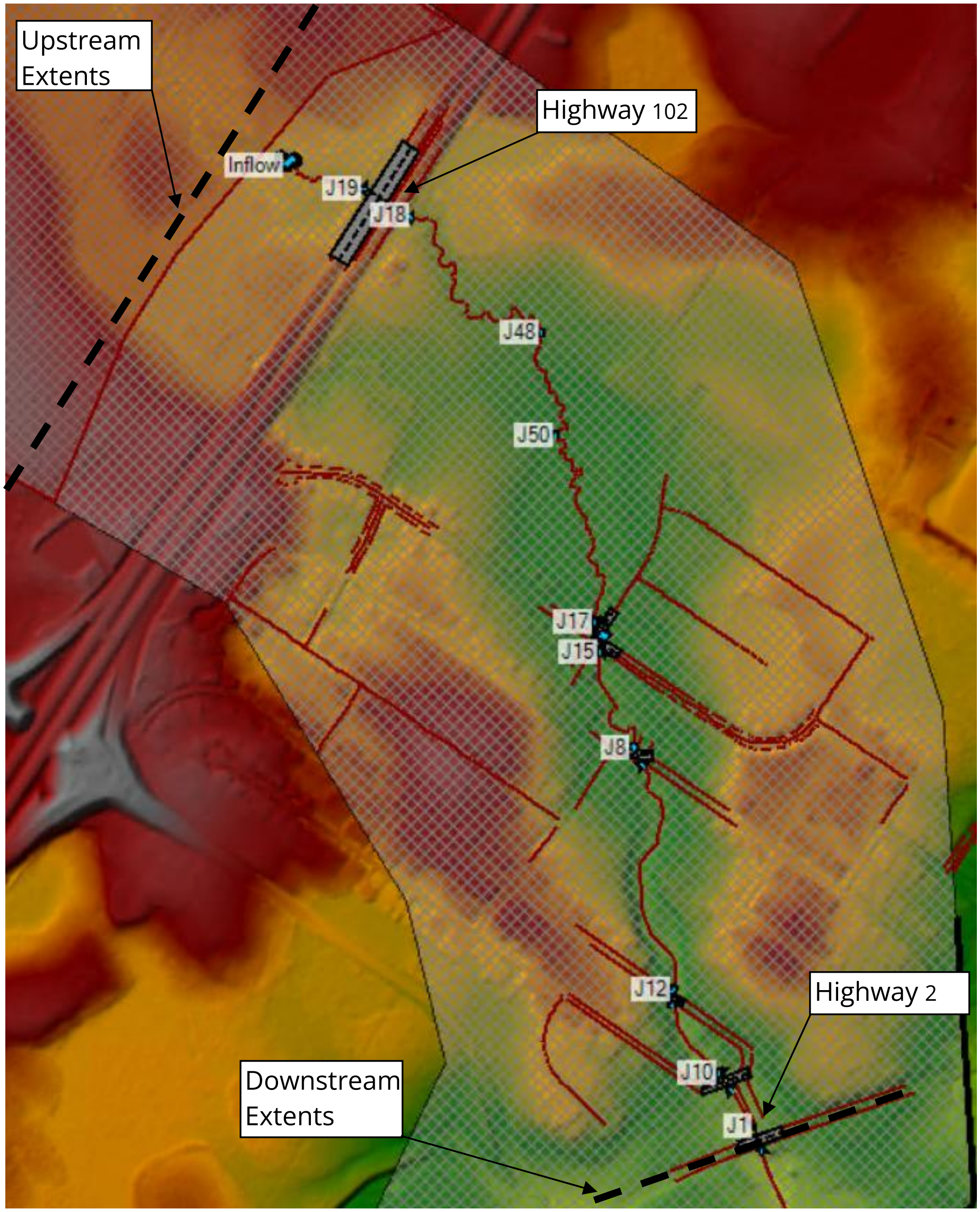


**Figure 5-1: Model domain overview**

### 5.1.2 Topographic Data

Topographic data for the model domain was developed with the 1m provincial LiDAR DEM data. The 1m LiDAR was suitable for model development after comparing the LiDAR DEM to collected survey verification points, which is presented in Section 2.2.

The topography of Paley Brook is very flat within the study area, with thalweg profiles showing channel slopes between 0.1% to 0.7%. Shallow watercourse slopes result in lower flow conveyance and higher water levels for a given cross-section when compared to profiles in the 1% to 2% (or higher) range.

### 5.1.3 2D Mesh Generation

For 2D unsteady state models a finite-volume solution scheme is used, which requires the project extents (study area) be defined with a computational mesh. The mesh extents were defined outside the expected flooding extents with a 10m grid resolution. Breaklines were established on channel banks, the stream centerline, ditches, roadways, and other areas with a large change in elevation to orient 2D computational cells with the expected streamflow, resulting in higher accuracy around these important model details. Cells within the flooding extents were set at a 1m grid resolution.

### 5.1.4 Hydraulic Roughness Parameters

Land cover mapping from the Natural Resources Canada National Land Cover Mapping was used to define overbank and overland roughness values. Roughness values from Highway Hydrology (McCuen, 1996) representing shallow overland flows, were assigned to the ten NRCAN land cover types relevant in the study area **Table 5-1**. Floodplains within the study extents are primarily grassed or forested around the watercourse, with urban/ residential areas adjacent to the stream. Upper extents of the modelled watershed, upstream of Highway 102, are primarily forested. Channel and culvert roughness values were assigned in accordance with values presented in Gravity Sanitary Sewer Design and Construction (ASCE, 1982) and Open Channel Hydraulics (Chow, 1957).

**Table 5-1: NRCAN land cover types and roughness values.**

| Land Cover Type | Subcatchment Roughness Value | Percentage of Study Area (%) |
|---|---|---|
| Temperate or sub-polar needleleaf forest | 0.8 | 9 |
| Temperate broadleaf deciduous forest | 0.4 | 30 |
| Mixed forest | 0.4 | 32 |
| Temperate or sub-polar shrubland | 0.4 | 6 |
| Temperate or sub-polar grassland | 0.24 | 7 |
| Wetland | 0.24 | 2 |
| Cropland | 0.24 | 7 |
| Barren lands | 0.05 | 1 |
| Urban (Roads / Built Up Area) | 0.013 | 4 |
| Water | 0.011 | 1 |

### 5.1.5 Hydraulic Structures

Hydraulic structures, such as bridges, culverts, and dams can have a strong influence on upstream flood water levels and downstream flows. A total of 10 culvert structures were identified within the limits of flood mapping (model domain) were surveyed for inclusion in the model. Culvert details and dimensions were measured during field surveys conducted by CBCL and supplemented by the LiDAR DEM surface. Inverts, obverts, and cross-sectional data were inputted into the 2D HEC-RAS model using 2D connections.

### 5.1.6 Inflows and Boundary Conditions

Flow rates were dynamically routed in HEC-RAS 2D using hydrograph inputs from the PCSWMM model. The HEC-RAS model was run in the unsteady state condition to allow for analysis of storage and routing options, meaning that input flows change over time according to hydrologic factors (i.e., inflow is defined by a hydrograph input).

An inflow hydrograph was added as the upstream boundary condition in the HEC-RAS 2D model, based on output from the PCSWMM hydrologic model. The outflow boundary condition, at the downstream end of the culvert downstream of the Highway 2 boundary (Church St.), was set to a normal depth boundary with a slope of 0.01 (1%) to simulate the continuation of the watercourse outside the modelled limits. Lateral flow hydrographs were added to the HEC-RAS 2D model at various intermediate locations from the PCSWMM model (refer to **Figure 5-3**).

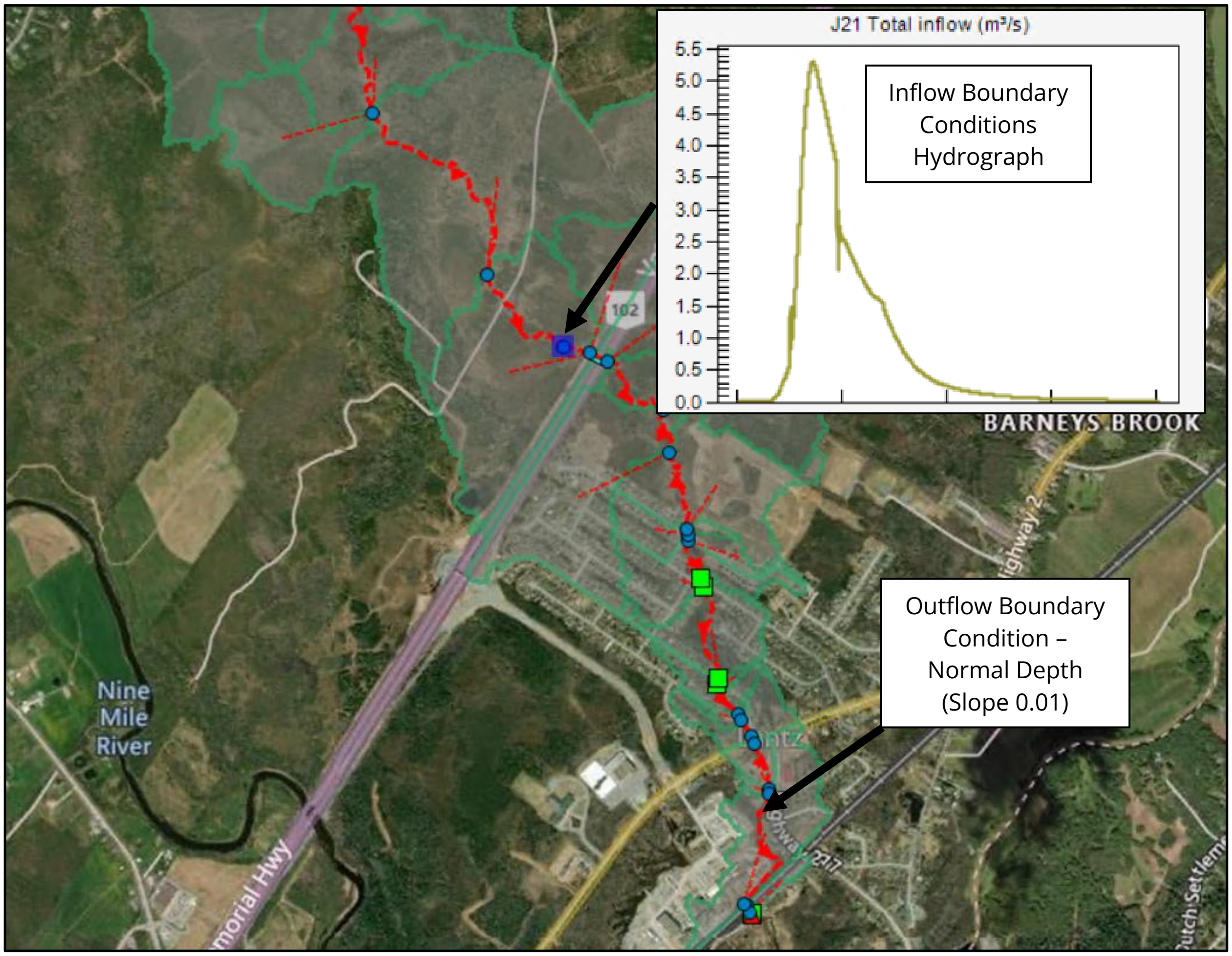


**Figure 5-2: Upstream and downstream hydraulic model boundary conditions**

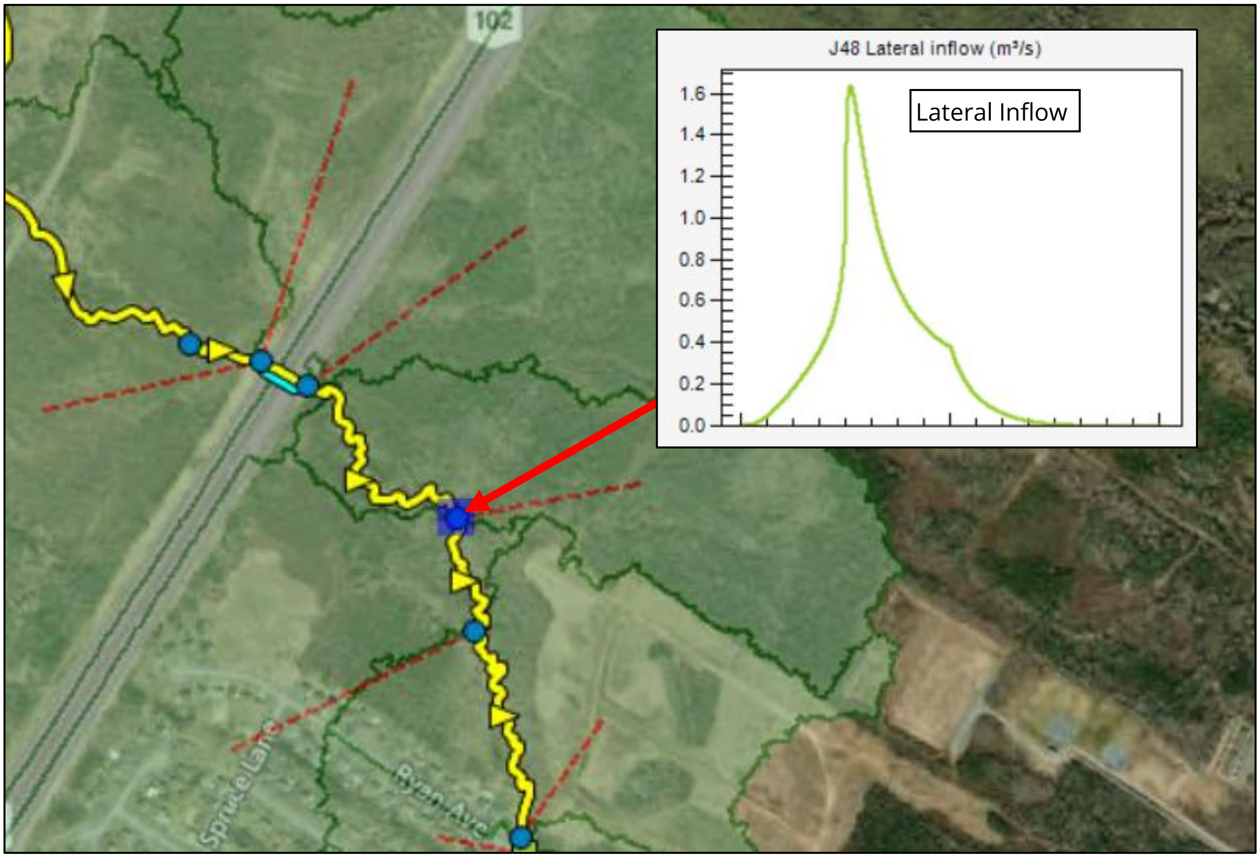


**Figure 5-3: Example of lateral flow hydrograph extracted from PCWMM and entered as in inflow hydrograph to HEC-RAS.**

# 6 Flood Mapping

Flood maps, including calculated flood depths, were prepared for the study area based on results of the hydrologic and hydraulic analyses. Maps were produced for existing conditions for the 1% AEP and 5% AEP precipitation events under present and future climate scenarios.

The appended flood maps (Appendix C) display the modeled extent of flooding under existing conditions for the 1% and 5% AEP events under present and future climate scenarios.

## 6.1 Existing Conditions Flood Line Extents

Flood lines were reviewed and the total flooded area within the study area was calculated for each scenario. **Table 6-1** presents the amount of area flooded within the study area (Highway 102 to Highway 2) under each scenario for comparison.

**Table 6-1: Flooded area within Study Area by Scenario**

| Event | Maximum Flooded Area ($m^2$) | |
|---|---|---|
| | 5% AEP | 1% AEP |
| Existing Conditions, Current Climate | 110,000 | 130,000 |
| Existing Conditions, 2100 Climate | 136,000 | 154,000 |

## 6.2 Flooded Properties Identified

The existing conditions flood lines presented in Appendix C encroach on many properties in the study area. The ten (10) property parcels with the largest amount of flooding in square metres, as well as the largest percentage of flooding compared to total parcel area, for the 5% AEP and 1% AEP existing conditions, current climate scenarios are presented in an **Table 6-2** and **Table 6-3**.

**Table 6-2: Properties with largest flooded area, Existing Conditions**

| # | 5% AEP (Current) | | 1% AEP (Current) | |
|---|---|---|---|---|
| | PID | Area Flooded (m²) | PID | Area Flooded (m²) |
| 1 | 45088168 | 68,910 | 45088168 | 76,670 |
| 2 | 45374113 | 6,150 | 45374113 | 6,250 |
| 3 | 45225299 | 4,370 | 45225299 | 4,850 |
| 4 | 45232642 | 3,830 | 45232642 | 4,070 |
| 5 | 45247624 | 1,890 | 45088176 | 2,100 |
| 6 | 45088176 | 1,660 | 45247624 | 1,980 |
| 7 | 45381662 | 1,530 | 45088572 | 1,660 |
| 8 | 45381670 | 1,210 | 45381662 | 1,570 |
| 9 | 45381688 | 1,130 | 45381670 | 1,300 |
| 10 | 45088572 | 1,050 | 45381688 | 1,270 |

**Table 6-3: Properties with highest percentage of area flooded, Existing Conditions**

| # | 5% AEP (Current) | | 1% AEP (Current) | |
|---|---|---|---|---|
| | PID | % Flooded | PID | Area Flooded (m²) |
| 1 | 45381696 | 98 | 45381696 | 100 |
| 2 | 45374113 | 97 | 45238193 | 100 |
| 3 | 45381662 | 93 | 45238177 | 100 |
| 4 | 45381688 | 87 | 45374113 | 98 |
| 5 | 45238193 | 80 | 45381688 | 97 |
| 6 | 45381704 | 80 | 45381662 | 95 |
| 7 | 45232642 | 79 | 45238144 | 93 |
| 8 | 45225307 | 72 | 45088176 | 91 |
| 9 | 45381670 | 72 | 45381704 | 90 |
| 10 | 45088176 | 72 | 45238151 | 89 |

## 6.3 Highway 102 Culvert

An additional set of existing conditions scenarios within the study area was also developed to assess the impact of the Nova Scotia Department of Public Works (NSDPW) upgrading the upstream 1,050mm diameter concrete culvert under Highway 102. This culvert appears to be undersized based on the hydrologic and hydraulic analyses, and results in significant ponding upstream of Highway 102 which, currently, reduces peak flows in Paley Brook downstream of the highway and through the subdivision for high flow events (i.e., acting as a large storage pond). Refer to **Figure 6-1** for an overview of the Highway 102 culvert; note that the hydraulic model boundary is just upstream of Highway 102, and the channel and inflow conditions are not refined in this area - flood mapping outside the study extents is not be used for any purpose without further analysis. If the culvert is upgraded it will no longer act as such a large restriction and higher peak flows will be seen in the downstream watercourse, resulting in larger flood extents within the subdivision. This additional set of scenarios was produced, for information only, as upgrading this culvert noticeably increases downstream flooding compared to existing conditions.

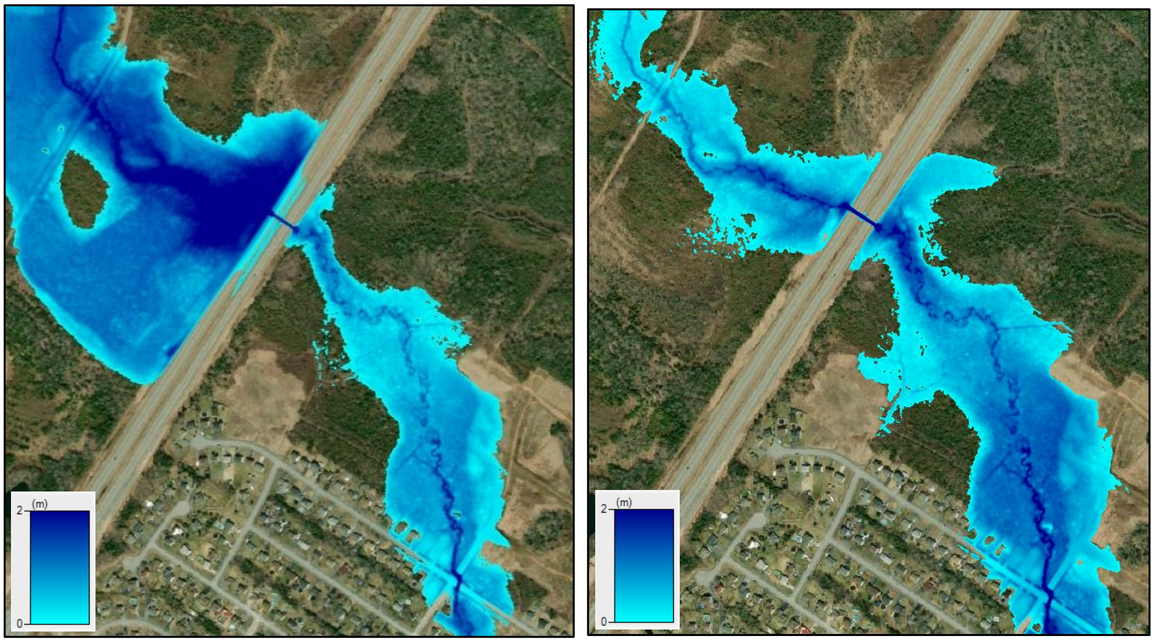


**Figure 6-1: Estimated flooding extents near Highway 102 culvert for the 1% AEP, 2100 event (left: current highway culvert; right: upgraded highway culvert).**

# 7 Conceptual Mitigation Options

Concept-level flood mitigation measures were investigated to reduce potential flooding within the study area based on the findings of existing conditions flood line mapping.

Concept options presented include:

- Structure (culvert) upgrades
- Detention ponds on municipal-owned land
- Stormwater storage in the low-lying area upstream of Mariah Drive
- Stormwater storage upstream of Highway 102
- Channel modifications

Concept options considered but excluded from initial screening include:

- Stormwater storage options with intermediate berms or grade controls; storage outlets with weirs or orifices (due to anticipated roadblocks with environmental approvals)
- Removal of existing culverts and reverting to naturalized channels (due to existing subdivision infrastructure on both sides of the watercourse)

Further analysis of the options presented is recommended prior to proceeding to detailed design which would include, but not be limited to; environmental screening, geotechnical analysis, legal and detailed topographic survey, and preliminary design. Further hydraulic analysis is also recommended for the options presented based on decisions and refinement of the concepts made during the design phase (preliminary and detailed design).

## 7.1 Option 1: Culvert Upgrades

Under the current condition flood scenarios, the existing culverts act as significant restrictions in the watercourse and result in upstream ponding and elevated water levels. Proposed culvert sizes for the structures within the study area were considered to convey higher peak flows through the watercourse at lower water elevations to reduce flooding extents. The proposed culvert upgrade scenarios were assessed with the existing 1,050mm diameter culvert remaining under Highway 102 which results in upstream storage; refer to Section 6.3. Detailed hydraulic analysis on a site-by-site basis, while still considering the overall hydraulic regime, should be completed for each culvert crossing at the design stage.

Proposed culvert sizes were established in HEC-RAS 2D. Culvert sizes were established such that physical requirements were met (i.e., existing inverts, cover to top of road, slope, standard dimensions, etc.) and selected to minimize upstream flooding/backwater extents.

**Table 7-1** shows proposed culvert sizes (minimum recommended size) for culverts within the study area. Culvert locations are presented in **Figure 7-1**. Larger culvert sizes may be required to account for fish passage or other environmental considerations.

The culverts under Highway 2 and Church Street have a notable impact on the flooding extents within the study area and, while downstream and outside the study area, were assessed for proposed culvert upgrades as well. All culverts downstream of the study area to the Shubenacadie River should be assessed for upgrade need if this option is pursued, including the Church Street crossing, railway crossing and the Paley Road crossing. These culverts were outside the study area and not assessed as part of this scope of work however if flows to these culverts are increased as a result of upstream capacity improvements then these downstream culverts may be undersized as a result.

Model results, presented in Appendix D, show the largest benefit in flood line reduction from the proposed culverts occurs upstream of Poplar Drive and between Highway 2 and Towerview Court. Culvert upgrades should be implemented starting at the most downstream structure and working upstream to ensure adequate hydraulic capacity to the Shubenacadie River. This will help avoid causing new flooding areas from moving peak flows and headwater ponding from upstream undersized culverts to downstream undersized culverts.

**Table 7-1: Table of Proposed Culvert Upgrades**

| Culvert No. | Location | Existing Size and Material | Proposed Size and Material |
|---|---|---|---|
| 1 | Highway 102 | 1,050mm Circular Concrete | N/A. (not in study area). |
| 2 | Mariah Dr. | 2,700mm x 1,350mm Concrete Box | 4,500mm x 1,350mm Concrete Box[1] |
| 3 | Turner James Ave. | Twin 1,800mm x 1,200mm CSP Ellipse | 4,500mm x 1,500mm Concrete Box |
| 4 | Poplar Dr. | Twin 1,050mm Circular Concrete | 4,500mm x 1,500mm Concrete Box |
| 5 | Logan Dr. | 1,800mm Circular Concrete | 4,500mm x 2,100mm Concrete Box |
| 6 | Towerview Ct. | 1,800mm Circular Concrete | 3,600mm x 1,800mm Concrete Box |
| 7 | Highway 2 | 2,100mm x 1,800mm Concrete Box | 6,000mm x 2,100mm Concrete Box |
| 8 | Church St. | 1,200mm Circular Metal and 1,200 Circular Concrete | 6,000mm x 1,500mm Concrete Box[2] |

[1] – 4,500mm x 1,500mm preferred, but kept at 1,350mm rise for the analysis due to existing cover restraint.
[2] – 6,000mm x 2,100mm (or equivalent) preferred, but kept at 2,100mm rise for the analysis due to existing cover restraint.

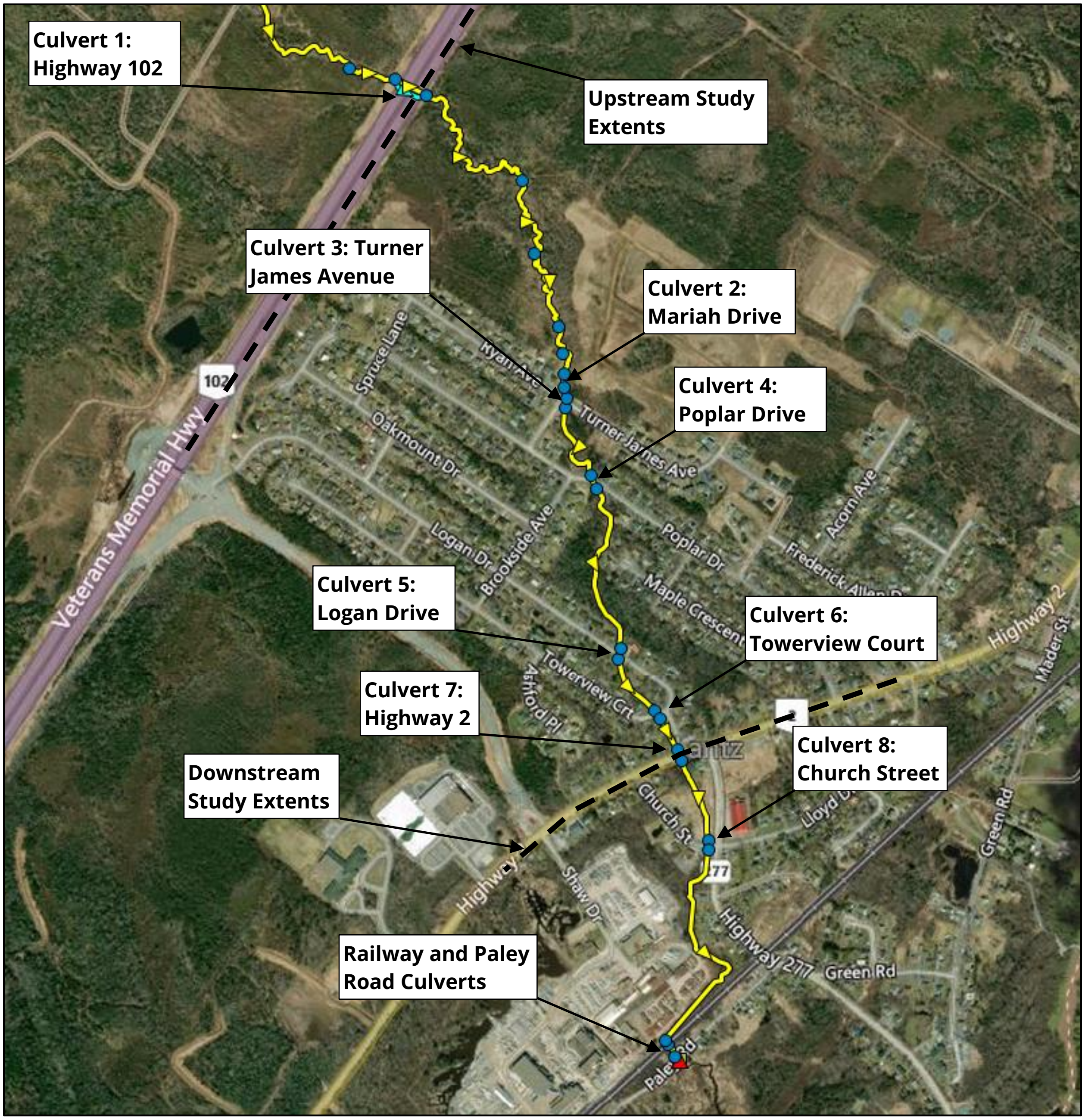


**Figure 7-1: Culvert Locations on Paley Brook**

## 7.2 Option 2: Stormwater Storage Ponds

Detention pond options were assessed at each of the properties of interest indicated in the Request for Proposals (PID 45374113, 45232642, 45225299 & 45247624), shown on **Figure 7-2**. Conceptual, in line detention ponds were established for each of these properties, with the top of the pond offset 3 metres from private property boundaries (to allow for setbacks and fencing) and 3H:1V pond side slopes, and targeted a depth of 1 metre or the bankfull channel elevation. Each pond option was individually modelled to determine the impact on the extent of flooding, as well as together to assess the combined benefit of installation of all ponds.


**Figure 7-2: Parcels assessed for feasibility of detention ponds**

The volume of storage utilized in each storage pond varies depending on the design event assessed as well as the downstream control structure (road culvert) causing a backwater into the storage area. A table of results presented in **Table 7-2**, shows an analysis of storage engaged and the maximum depth of ponded water achieved on an individual basis for the 1% AEP event. No berms, weirs or in-stream control structures were investigated at this stage of analysis as it is unlikely that environmental approval would be granted to construct in-stream structures where Paley Brook is a mapped watercourse. Full-scale figures are included in Appendix D.

**Table 7-2: Potential Storage Ponds Analysis; 1% AEP, Current Climate**

| Pond | PID | Estimated Cut Volume ($m^3$)[1] | Max. pond Depth (m)[2] | Peak Storage Utilized ($m^3$)[2] |
|---|---|---|---|---|
| Pond 1 | 45374113 | 5,300 | 1.8 | 5,200 |
| Pond 2 | 45232642 | 1,400 | 1.6 | 1,200 |
| Pond 3 | 45225299 & 45247624 | 10,700 | 1.1 | 630 |

[1] Existing Grade to Proposed Pond FG
[2] Peak for 1% AEP, current climate scenario. Assessed on individual pond basis. Pond outlets controlled by downstream culvert size. Downstream culverts were kept at existing sizes in this analysis.

Overall, modelling results show that implementation of all three ponds combined shows minimal flood line reduction with flood extents still encroaching onto a number of properties. The available pond storage is substantially reached before the peak of all assessed design events, resulting in very small attenuation of modelled peak flows which continue to result in significant flood extents. A summary of each of the three ponds assessed is presented below:

- **Pond 1:** The peak storage volume utilized in Pond 1 is significant compared to the estimated cut volume required for pond creation. The pond is wide and short, resulting in effective storage engagement without the use of intermediate water controls (berms, etc). This pond is upstream of all built infrastructure within the assessed area ('upstream end') and is situated in an ideal location for stormwater storage to benefit to the entire downstream subdivision. The overall pond volume is however insignificant compared to the design events assessed.
- **Pond 2:** Similar to Pond 1, the ratio of peak storage volume to cut volume is very good; however, this pond is slightly further downstream so is not as suitable a location as Pond 1 to service the entire neighbourhood. The overall pond volume is insignificant compared to the design events assessed.
- **Pond 3:** Pond 3 is even further downstream than Pond 2, so does not provide any benefit to the Mariah Drive to Poplar Drive area. This pond is long and narrow, resulting in poor storage volume utilization in the upstream area of the pond (as no in-stream water controls such as berms were considered at this stage). There is also a significant side slope and elevation change between the intersection of Logan Drive and Brookside Avenue and the Paley Brook channel, resulting in vey high excavation volumes compared to the peak storage volume utilized. The overall pond volume is insignificant compared to the design events assessed.

### 7.2.1 Option 1 & Option 2 (Culverts & Detention Ponds)

The combined effect of all culvert upgrades identified in Option 1, as well as all the ponds presented in Option 2 were also assessed. These flood lines are presented in Appendix D. The upsized culverts and detention pond options provide notable flood line reduction around the Mariah Drive area, primarily from the effects of Pond 1.

## 7.3 Option 3: Upstream Stormwater Storage

The area upstream of the Mariah Drive culvert crossing is a natural storage area with gentle side slopes and a shallow channel slope. Construction of a berm along the backs of the properties on Ryan Avenue and Mariah Drive would result in more stormwater storage in this large low-lying area. The proposed berm consists of a 160-metre long berm behind the properties on Ryan Avenue and a 570-metre long berm behind the properties on Mariah Drive. The outlet control structure at the intersection of the berms, upstream of the Mariah Drive culvert, was established in the model with a bottom width of 2 metres wide to avoid encroaching into the natural bankfull channel and to minimize environmental impacts.

Scenarios were assessed for the low-lying area stormwater storage option with the existing culverts as well as the culvert upgrades presented in Option 1.

This option functions best with the culvert upgrades presented in Option 1. With the existing culverts in place, the properties along Ryan Avenue flood from the culvert backwater at Mariah Drive. A comparison of the 1% AEP, current climate event is presented in **Figure 7-3** and **Figure 7-4** comparing existing conditions to the proposed storage behind the berm.

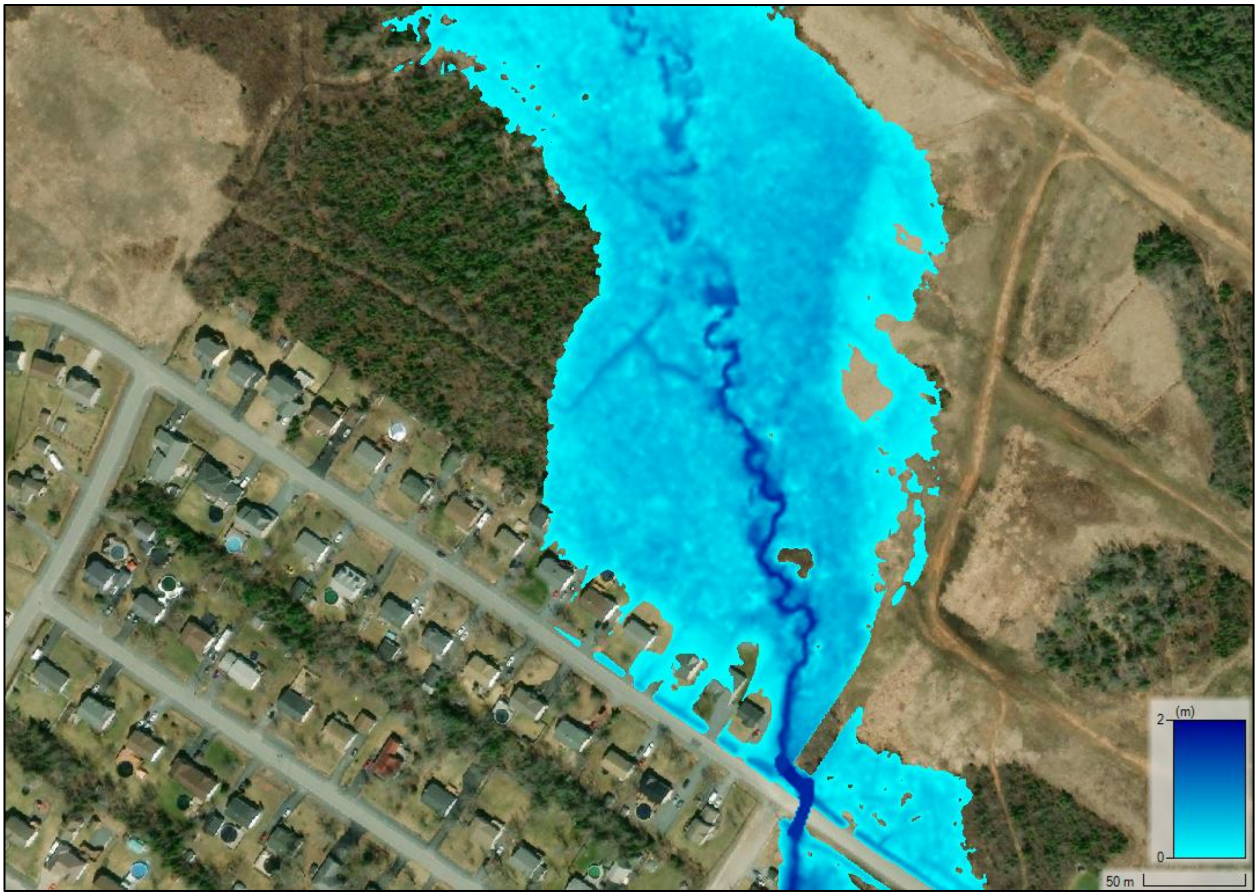


**Figure 7-3: Existing Conditions, 1% AEP Current Climate**

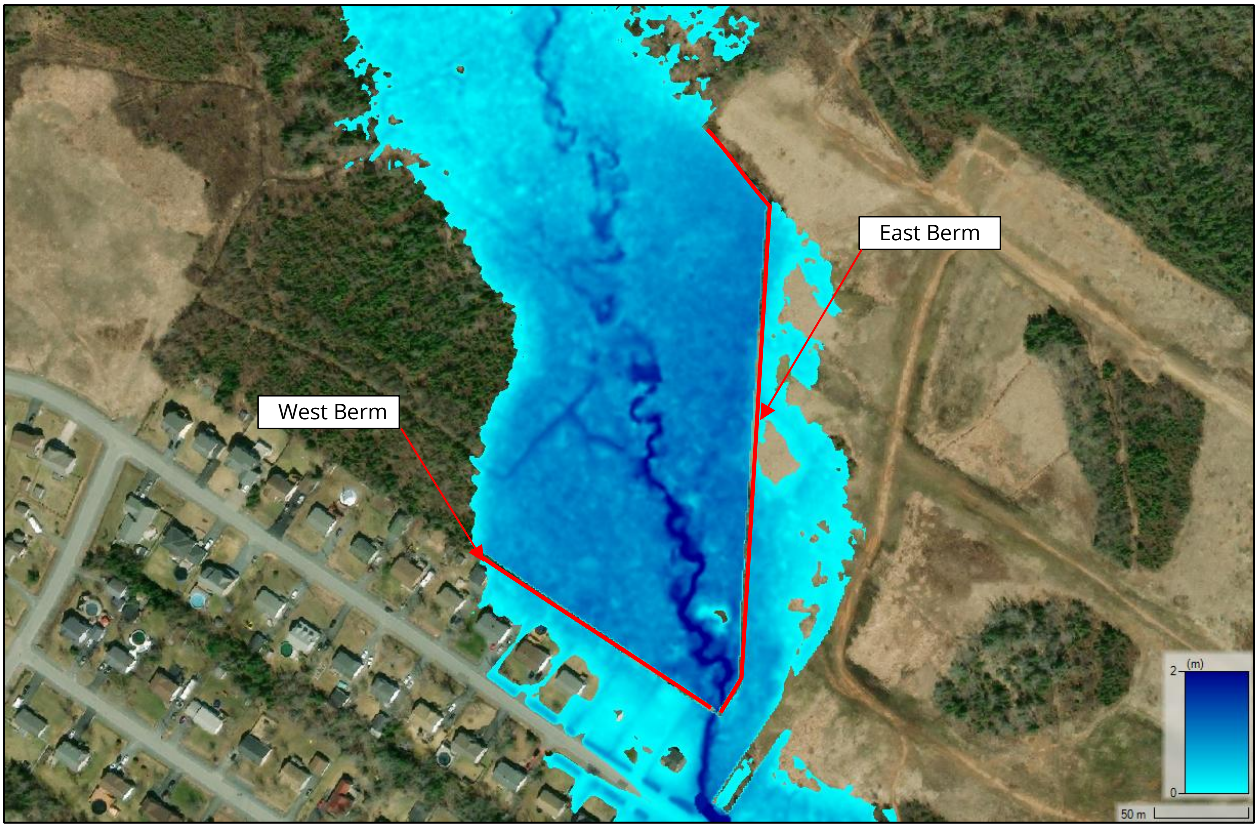


**Figure 7-4: Proposed Berm, 1% AEP Current Climate**

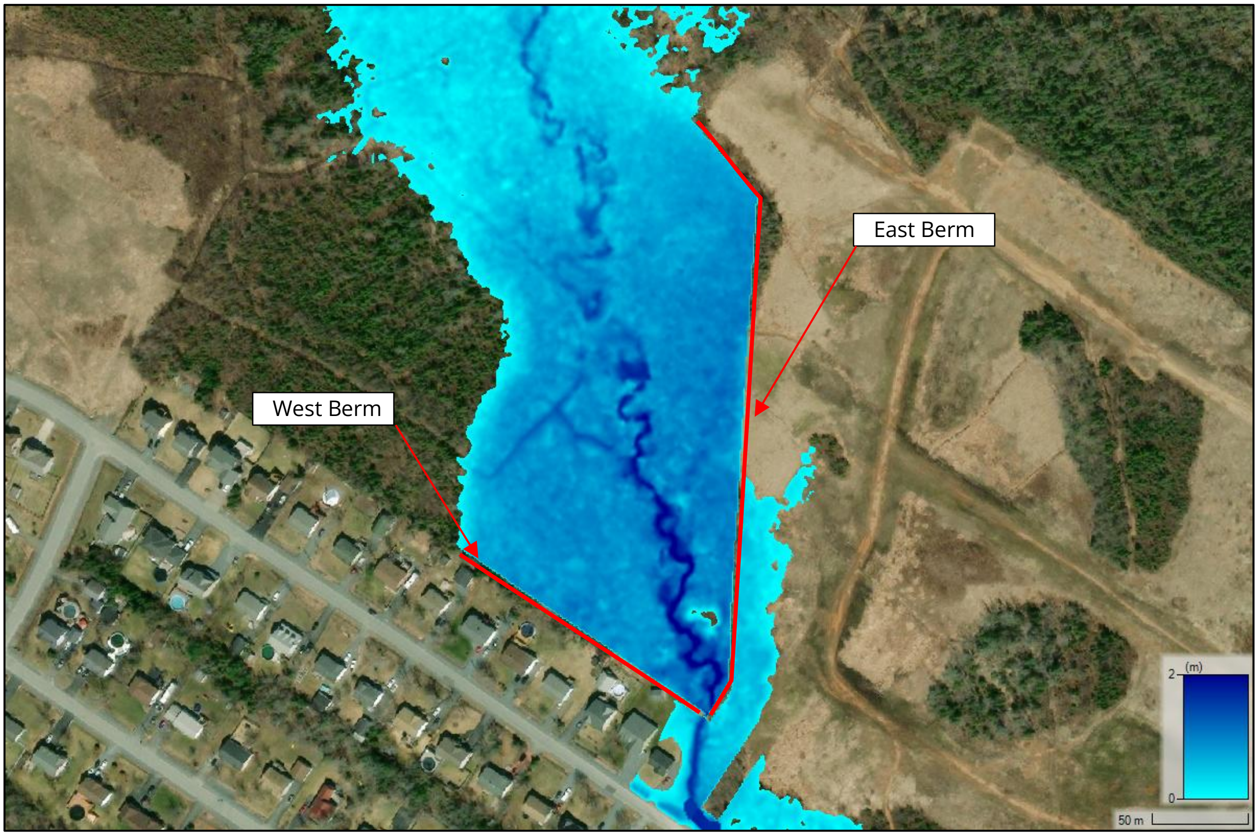


**Figure 7-5: Proposed Berm, 1% AEP Current Climate with Culvert Upgrades**

## 7.4 Option 4: Offsetting for Highway 102 Culvert Upgrade

One potential option to offset the storage lost when the culvert at Highway 102 is upgraded is to shift the ponding area further upstream to an existing low-lying area which is currently bounded by a dirt road, as shown on **Figure 7-6**. The hydraulic model boundary is just upstream of Highway 102 and the channel and inflow conditions are not refined in this area; flood mapping outside the study extents is not to be used for any purpose without further analysis. This area is expected to flood under current conditions from backwatering of the 1,050mm diameter culvert under Highway 102. The stored water could be designed to drain through a new structure in an allotted amount of time to minimize environmental impacts compared to current conditions. Additional analysis is to determine details of the water control structure such as optimal berm height, outlet control structure setup, and environmental impacts.

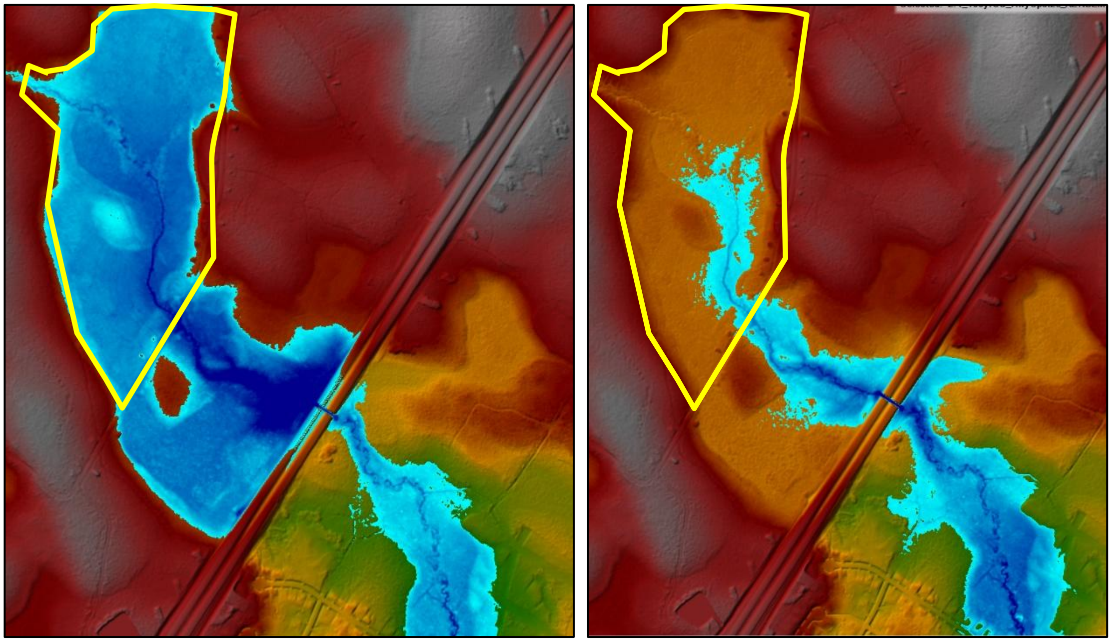

**Figure 7-6: Potential storage area upstream of Highway 102 (area = 30.5 Ha).**
**Topography indicated by colors; red = high, green = low.**
**Left: Current Highway 102 Culvert, 1% AEP, 2100 CC.**
**Right: Upgraded Highway 102 Culvert, 1% AEP, 2100CC.**

## 7.5 Option 5: Channel Modifications

The natural Paley Brook channel consists of a narrow wetted channel within the study area, generally 1 to 3 metres wide, bounded by dense brush and vegetation on both sides. Dense brush and vegetation are ideal for channel bank stability, erosion control, environmental considerations such as nesting and breeding habitat, and general riparian buffer.

One of the downsides of vegetation-dense channel banks at flood flows is the reduction in flow capacity per unit area in the overbanks due to the higher roughness compared to the wetted channel. Some examples of the typical Paley Brook channel and overbank characteristics encountered within the study area are presented in **Figure 7-7** through **Figure 7-9**.

**Figure 7-7: Highway 102 looking downstream**

**Figure 7-8: Logan Drive looking downstream**

**Figure 7-9: Poplar Drive looking upstream**

This option would consist of channel modifications between each culvert to reduce the channel roughness within the flood conveyance area. This could be accomplished by tree and brush clearing (unlikely to be approved on an environmental basis) or installation of a hybrid engineered approach on the channel banks (such as turf reinforcement mats) with vegetation species selected to promote erosion control but maintain low channel roughness. Another alternative could be to complete channel widening to increase the overall flow conveyance area and reinstate the existing rough overbank vegetation, depending on property access and environmental considerations.

Further analysis of either of these alternatives would be required to assess impacts on erosion and scour from increases in velocity (due to the lower overall channel roughness), other hydraulic considerations such as impacts on meandering and stream straightening, environmental feasibility, as well as overall feasibility.

Figures showing flood maps of the proposed reduction in channel roughness for the 1% AEP event are enclosed in Appendix D, which are based on a 16-metre wide channel with a roughness of 0.040. An overview of what this channel would look like is presented in **Figure 7-10**.

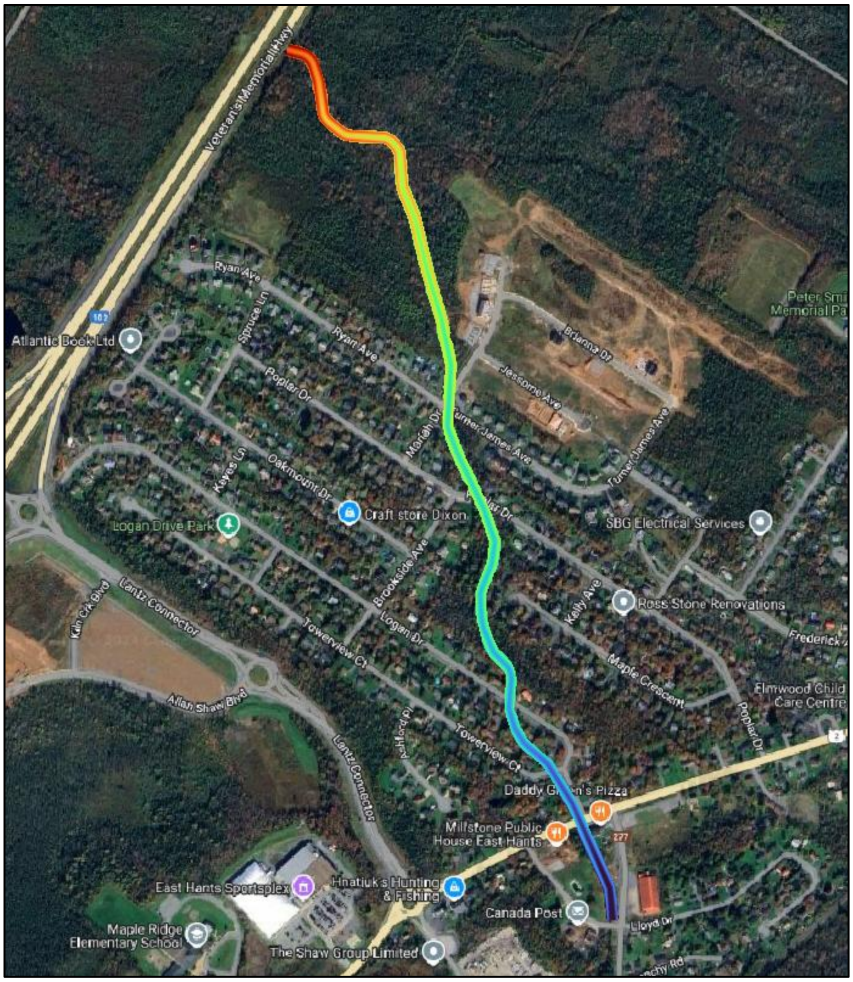


**Figure 7-10: Proposed Channel Modifications Extents**

## 7.6 Option 6: Site-Specific Mitigation Options

Site or property-specific mitigation measures may be implemented at the detailed design stage to address local flooding concerns, such as individual property berms. This project focused on overall flood reduction in the study area and did address properties on an individual basis. Additional analysis is recommended prior to implementation of site-specific mitigation options, such as individual property berms, to ensure that they do not cause additional flooding in other areas of Paley Brook by reducing overall system storage.

# 8 Option and Implementation Timelines

Conceptual options were investigated to reduce flood line extents with the study area based on the model results. Culvert upgrades are recommended as the existing culverts are undersized, upsized culverts do provide some flood line reduction, and other mitigation options can be constructed on top of the upsized culverts in the future to reduce flood lines further. The assessed detention ponds provide minimal storage volume compared to overall design storm volumes; however, they do provide some benefit when combined with the upsized culverts option. The Highway 102 culvert upgrade offsetting would be beneficial when NSDPW upsizes that culvert in the future. The upstream storage and channel modification options are both major projects from the construction, land ownership and environmental permitting perspectives and could be investigated further if additional flood line reduction is desired in the future.

The following mitigation options were considered:

- **Culvert Upgrades:** Culvert upgrades should be implemented starting at the Shubenacadie River and working up the watercourse. Additional study will be required to confirm culvert upgrade requirements on culverts downstream of the study extents.
- **Detention Ponds:** Pond 1 and Pond 2 are the preferred detention pond options based on stormwater volume utilized compared to excavated volume. However, for the flow rates and volumes resulting from the design storms, these ponds provide minimal reduction without the culvert upgrades completed.
- **Upstream Stormwater Storage:** The proposed upstream storage should be reviewed in further detail as the property identified for this storage is not currently owned by the municipality.
- **Highway 102 Culvert Upgrade Offsetting:** The existing Highway 102 culvert results in significant stormwater storage upstream of the highway and currently engages the proposed offsetting storage area as well. This option should be considered when NSDPW plans to replace the culvert under Highway 102 to offset some of the storage lost upstream of the highway.
- **Channel Modifications:** Channel modifications, either smoothing the overbanks or increasing the channel cross-sectional area, would provide flood line reduction but are both significant undertakings and require additional analysis.
- **Site-Specific Mitigation Options:** Should be considered to address local low areas (properties or infrastructure). These options must be reviewed to ensure they do not cause more flooding in other areas of the watercourse.

The standard implementation approach to achieve the maximum incremental benefit from each flood mitigation constructed is to implement stormwater storage from the top down (upstream to downstream), and road crossing upgrades from the bottom up (downstream to upstream). The recommended implementation approach is:

1. Proceed with the culvert upgrades, starting at the most downstream crossing and working up the watercourse, and construct the two upstream detention ponds (Pond 1 and Pond 2).
2. East Hants to determine if additional flood line reduction is warranted following the culvert upgrades and detention ponds based on the new design event flood lines compared to the existing developments (buildings and infrastructure), as well as planned future land uses in the area.
3. If additional flood line reduction is required, the remaining options (upstream stormwater storage or channel modifications) should undergo a broader feasibility assessment. This will help identify the most suitable option and would include some level of conceptual design, environmental screening and permitting, legal survey and landownership analysis, and a cost benefit analysis.
4. The Highway 102 offsetting option should be considered for study and implementation before or at the same time as NSDPW upsizes the Highway 102 culvert to offset some of the storage lost upstream of the highway.

Additional analysis should be completed on the conceptual mitigation options presented, including, but not limited to, environmental screening, geotechnical analysis, legal and topographic survey, geotechnical investigations, preliminary and detailed design, public consultations, and detailed project-specific hydraulic modelling.

# 9 Closing

This Paley Brook Flood Risk Mitigation Strategy report has been prepared for the Municipality of East Hants based on a specific scope of work, and it should be read in its entirety. The study used industry standard practices for the hydrologic and hydraulic modelling. Areas of uncertainty in the analysis presented include lack of site-specific climate, steam flow and water level data in the Paley Brook watershed for model calibration.

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# APPENDIX A

## Selected Site Visit Photos

**Photo 1: Outlet of 1500 mm diameter concrete culvert under Paley Road**

**Photo 2: Outlet of 1500 mm diameter concrete culvert under Railway just upstream Paley Road**

**Photo 3: Inlet of twin CSP and concrete 1200 mm diameter culverts under Church St**


**Photo 4: Inlet of 2100 mm X 1800 mm concrete box culvert under Highway 2**

**Photo 5: Inlet of 1800 mm diameter concrete culvert under Towerview Ct**

**Photo 6: Outlet of 1800 mm concrete culvert under Logan Dr**

**Photo 7: Outlet of two twin 1050 mm concrete culverts under Poplar Dr**

**Photo 8: Inlet of two twin 1800mm X 1200 mm CSP ellipse culverts under Turner James Ave**

**Photo 9: Outlet of 2700 mm X 1350 mm concrete box culverts under Mariah Dr**

**Photo 10: Outlet of 1050 mm concrete culvert under Highway 102**

**Photo 11: Area looking upstream Paley Brook off Mariah Dr (potential storage area)**

**Photo 12: Area looking downstream Paley Brook off Mariah Dr (potential storage area)**

# APPENDIX B

## SWMM Parameter Tables

Roughness values from Highway Hydrology (McCuen, 1996) representing shallow overland flows, were assigned to the ten NRCAN land cover types relevant in the study area

**NRCAN land cover types and roughness values.**

| Land Cover Type | Subcatchment Roughness Value | Percentage of Study Area |
|---|---|---|
| Temperate or sub-polar needleleaf forest | 0.8 | 9 |
| Temperate broadleaf deciduous forest | 0.4 | 64 |
| Mixed forest | 0.4 | 15 |
| Temperate or sub-polar shrubland | 0.4 | 5 |
| Temperate or sub-polar grassland | 0.24 | 1 |
| Wetland | 0.24 | 0 |
| Cropland | 0.24 | 5 |
| Barren lands | 0.05 | 0 |
| Urban (Roads / Built Up Area) | 0.013 | 1 |
| Water | 0.011 | 0 |

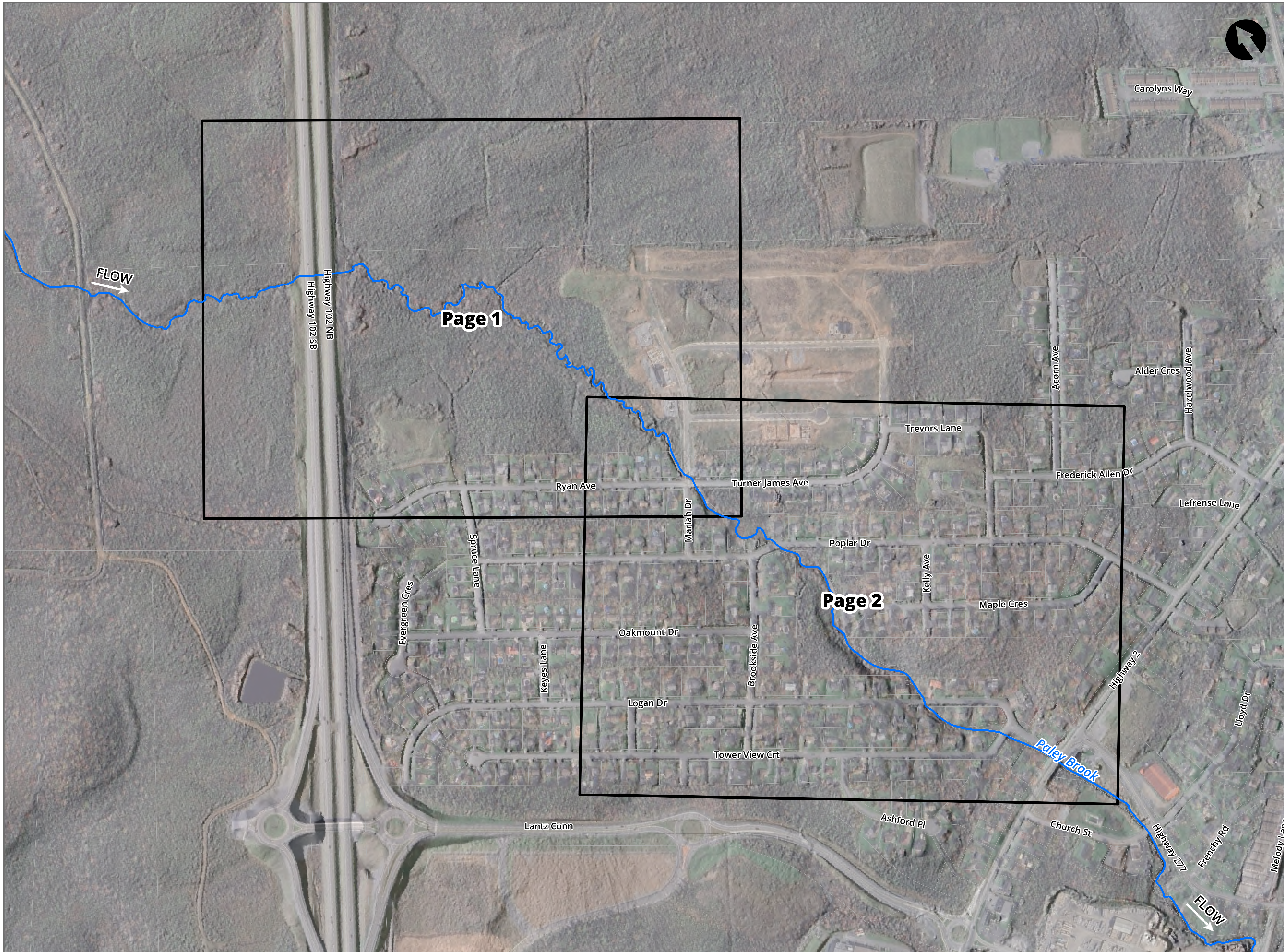
Study Area soil types and infiltration parameters.

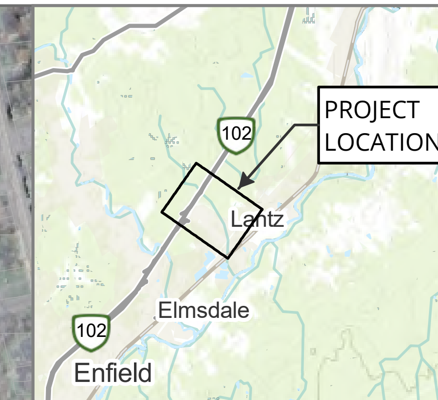
| Soil Type | Percentage of Study Area (%) (CanSIS) | Rawls et al reference Hydraulic Conductivity (mm/hr) | Suction Head (mm) |
|---|---|---|---|
| Sand | 0 | 120 | 49.0 |
| Loamy-Sand | 0 | 29.97 | 61.0 |
| Sandy- Loam | 0 | 10.92 | 110.0 |
| Silt- Loam | 40 | 6.6 | 169.9 |
| Loam | 59 | 3.3 | 88.9 |
| Sandy- Clay- Loam | 1 | 1.52 | 220.0 |
| Clay- Loam | 0 | 1.02 | 210.1 |
| Silty- Clay- Loam | 0 | 1.02 | 270.0 |
| Silty- Clay | 0 | 0.51 | 290.1 |
| Loam | | 0.1 | 400.0 |
| Water | 0 | 0.01 | 500.0 |

# APPENDIX C

## Existing Conditions Maps

- Figure Set 1: Key Plan
- Figure Set 2: Existing Conditions and Topographic Survey
- Figure Set 3: Existing Conditions Flood Lines
- Figure Set 4: Existing Conditions – Upgraded Highway 102 Culvert Flood Lines




Legend:

Paley Brook

Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 3 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 2 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |
| 1 | FEB 28, 2025 | ISSUED FOR DISCUSSION |

EAST HANTS

Project:

PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:

KEY PLAN

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: FEB 2025 | | Scale: 1:6,000 | |
| Drawn: SO | | Approved: AL | |
| Project No: 241221.00 | | Figure No: 1 | |

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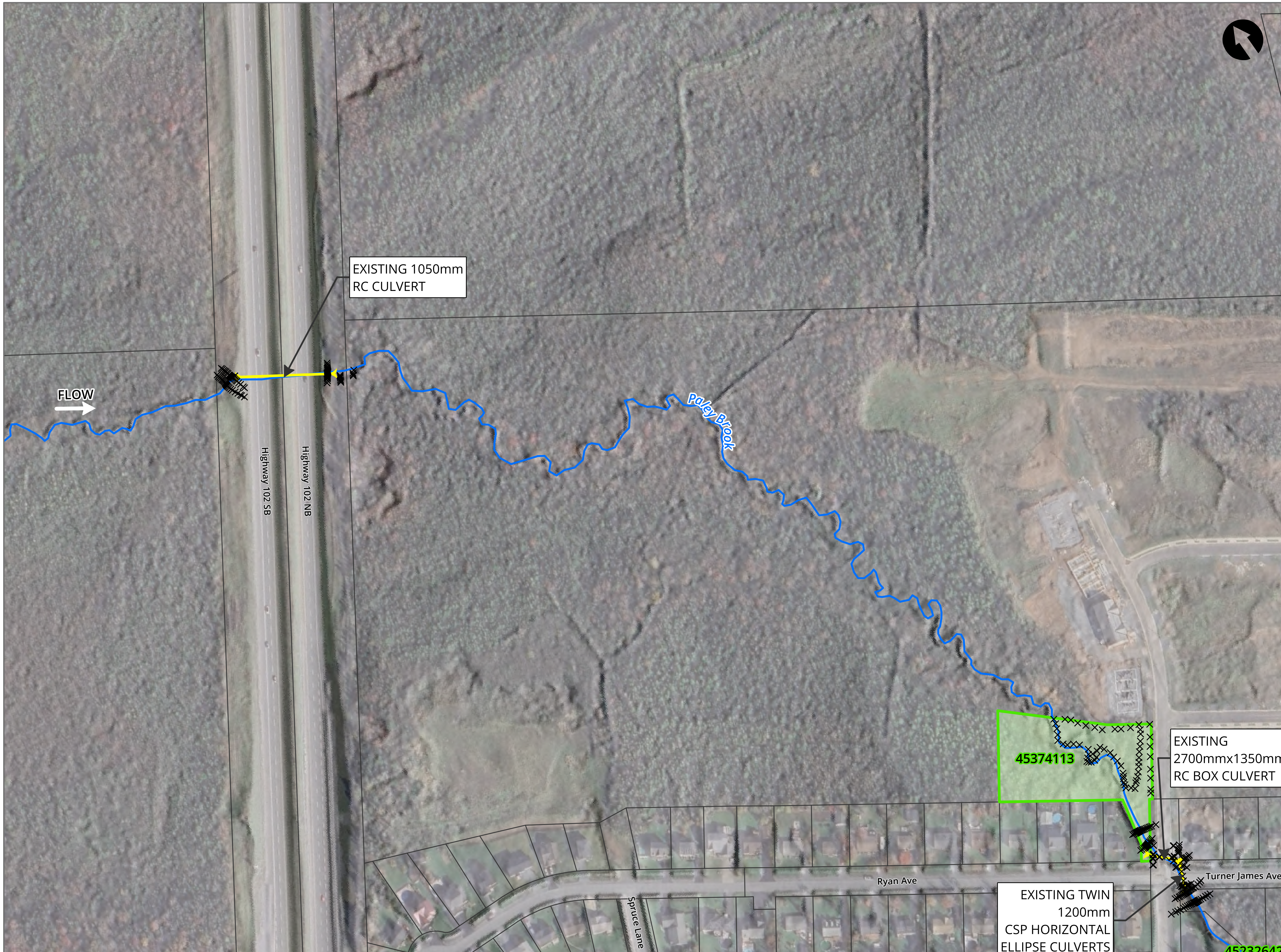


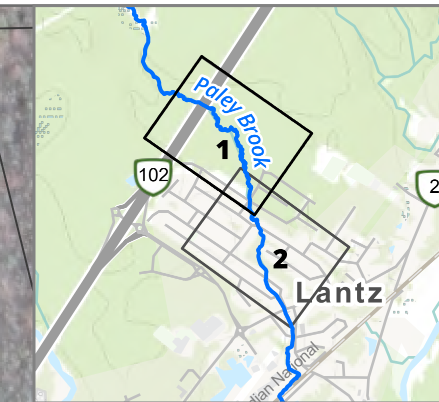


Legend:

- Paley Brook
- × Survey Point
- Culvert
- Property Parcels
- East Hants Owned Properties

| No | Date | Issue/Revision |
|---|---|---|
| 3 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 2 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |
| 1 | FEB 28, 2025 | ISSUED FOR DISCUSSION |

EAST HANTS

Project:

PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:

EXISTING CONDITIONS AND TOPOGRAPHIC SURVEY

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

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| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 2.1 |

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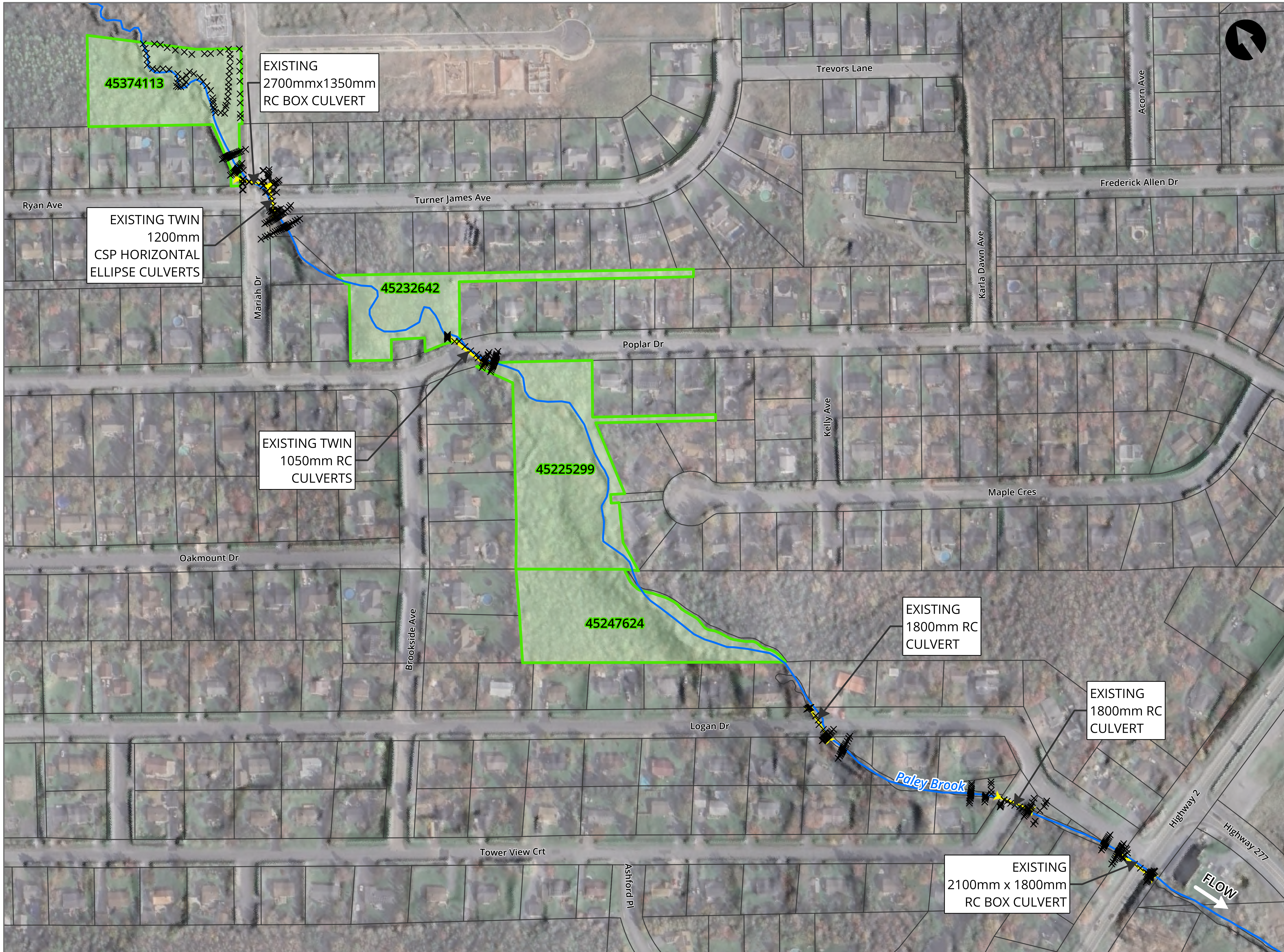


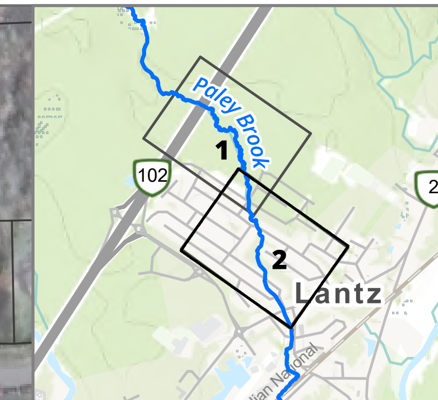


Legend:

- Paley Brook
- × Survey Point
- Culvert
- Property Parcels
- East Hants Owned Properties

| No | Date | Issue/Revision |
|---|---|---|
| 3 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 2 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |
| 1 | FEB 28, 2025 | ISSUED FOR DISCUSSION |

EAST HANTS

Project:

PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:

EXISTING CONDITIONS AND TOPOGRAPHIC SURVEY

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 2.2 |

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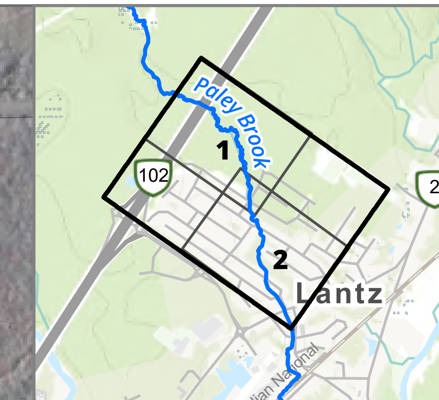


Legend:

5% AEP Flood Line Depth

- 0 m - 0.1 m
- 0.1m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.51 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 3 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 2 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |
| 1 | FEB 28, 2025 | ISSUED FOR DISCUSSION |

EAST HANTS

Project:

PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:

EXISTING CONDITIONS FLOOD LINES 5% AEP

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:4,250 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 3.1.0 |

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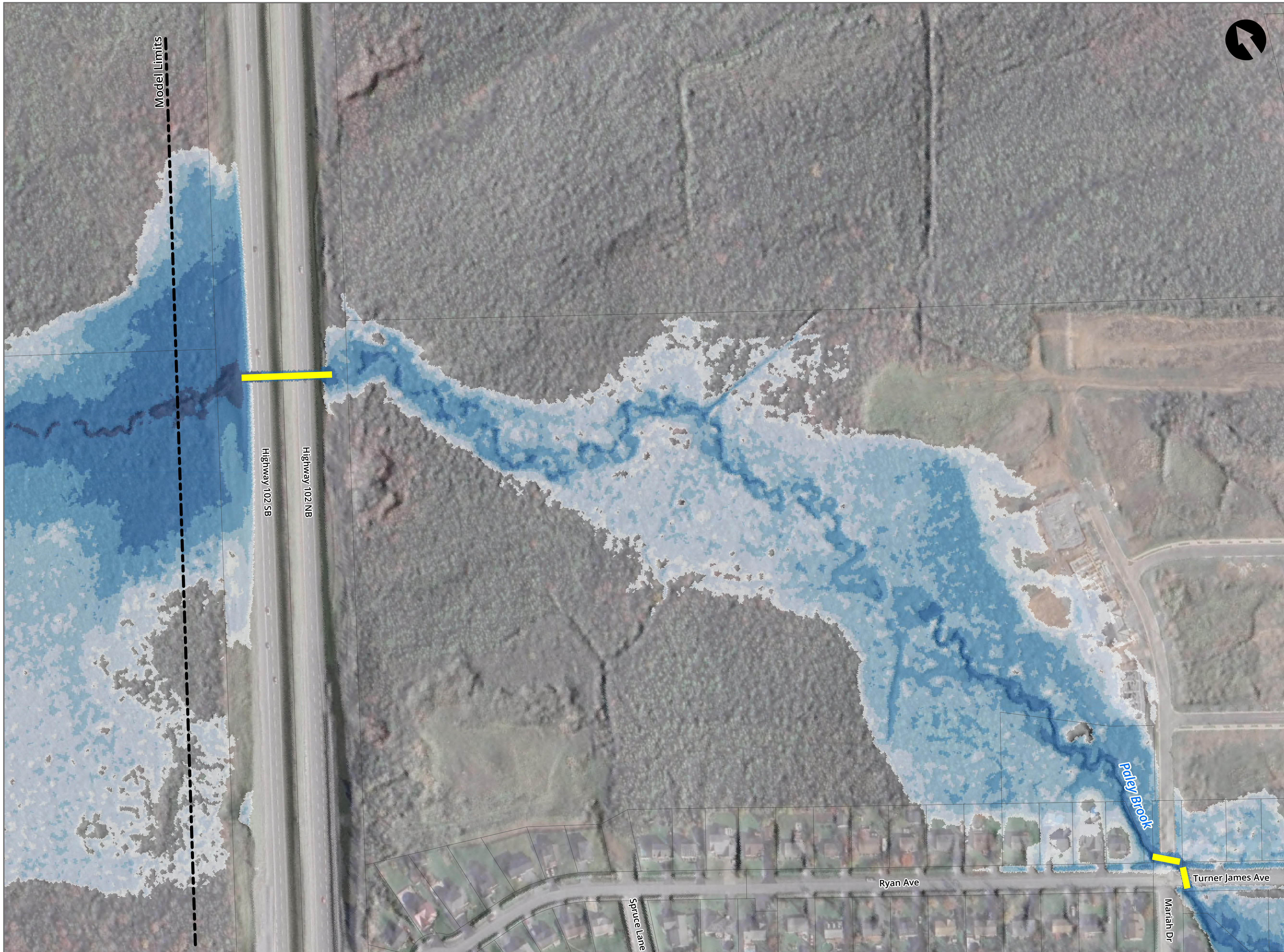


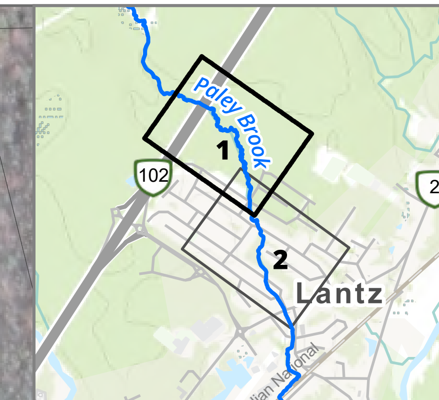


Legend:

5% AEP Flood Line Depth

- 0 m - 0.1 m
- 0.1m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.51 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 3 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 2 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |
| 1 | FEB 28, 2025 | ISSUED FOR DISCUSSION |

EAST HANTS

Project:

PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:

EXISTING CONDITIONS FLOOD LINES 5% AEP

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 3.1.1 |

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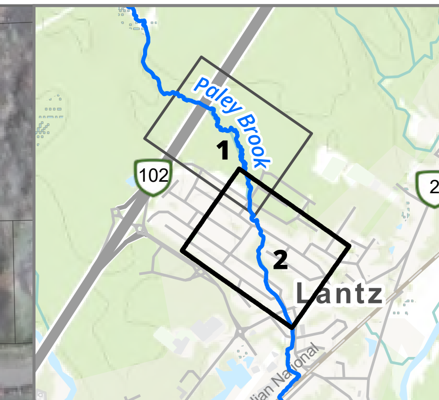


Legend:

5% AEP Flood Line Depth

- 0 m - 0.1 m
- 0.1m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.51 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 3 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 2 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |
| 1 | FEB 28, 2025 | ISSUED FOR DISCUSSION |

EAST HANTS

Project:

PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:

EXISTING CONDITIONS FLOOD LINES 5% AEP

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 3.1.2 |

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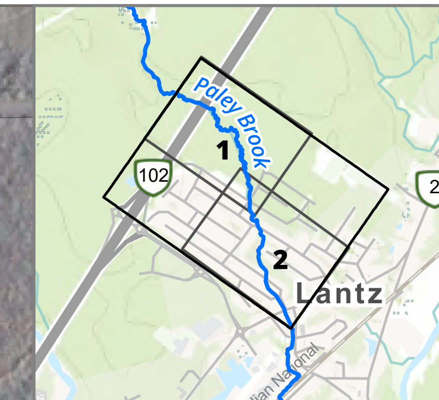


Legend:

1% AEP Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.85 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 3 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 2 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |
| 1 | FEB 28, 2025 | ISSUED FOR DISCUSSION |

EAST HANTS

Project:

PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:

EXISTING CONDITIONS FLOOD LINES 1% AEP

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:4,250 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 3.2.0 |

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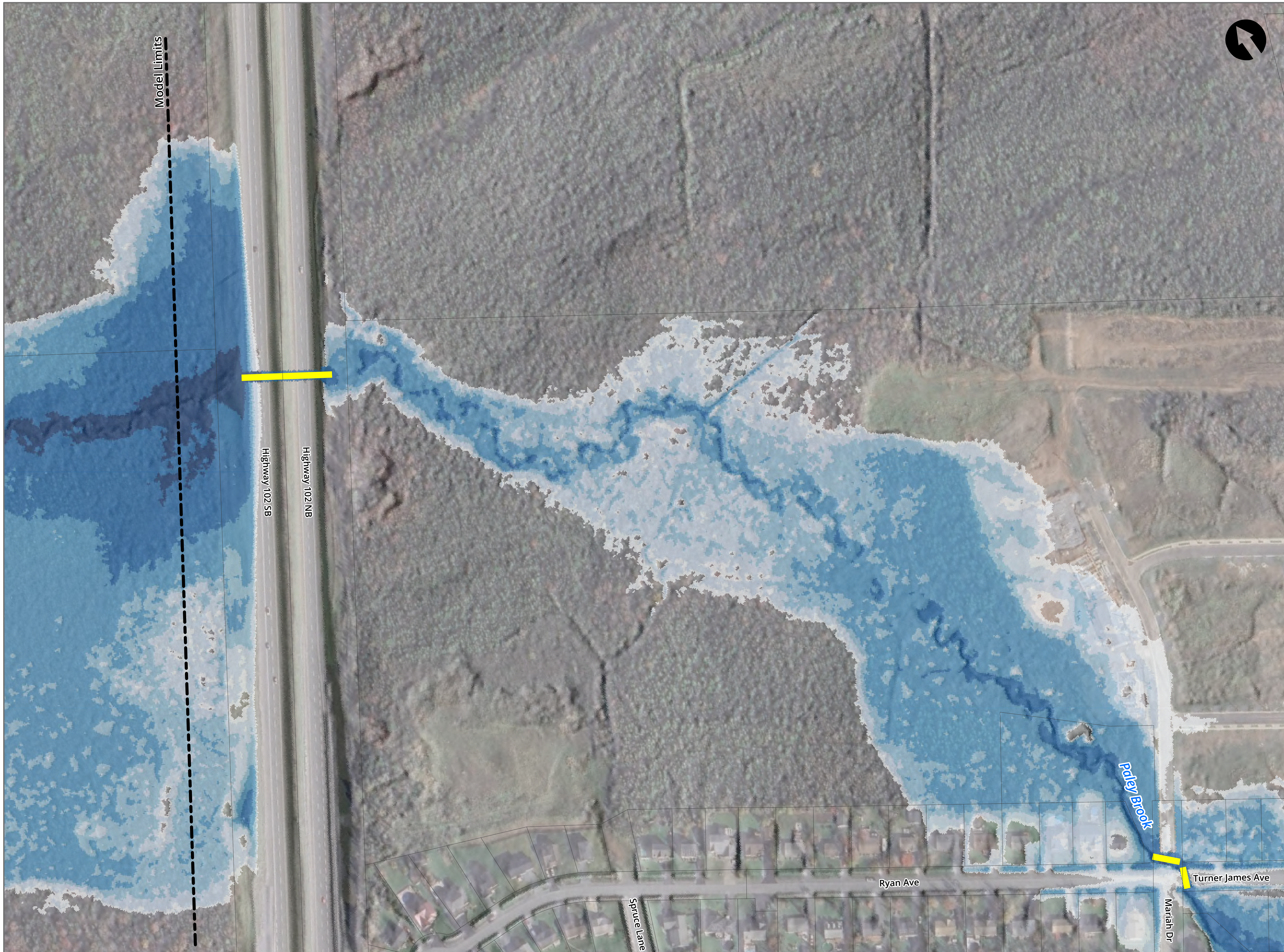


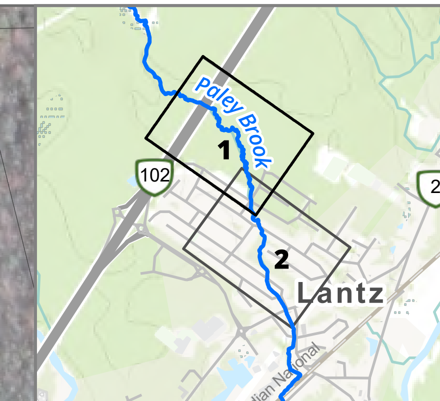


Legend:

1% AEP Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.85 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 3 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
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| 1 | FEB 28, 2025 | ISSUED FOR DISCUSSION |

EAST HANTS

Project:

PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:

EXISTING CONDITIONS FLOOD LINES 1% AEP

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 3.2.1 |

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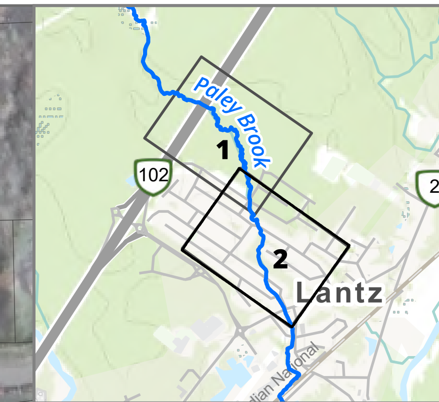


Legend:

1% AEP Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.85 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 3 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
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| 1 | FEB 28, 2025 | ISSUED FOR DISCUSSION |

EAST HANTS

Project:

PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:

EXISTING CONDITIONS FLOOD LINES 1% AEP

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 3.2.2 |

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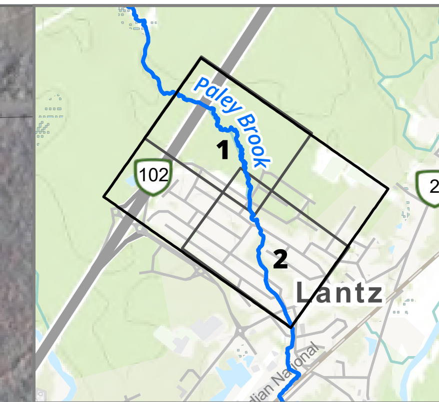


Legend:

5% AEP, 2100 Climate Change Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.97 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 3 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 2 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |
| 1 | FEB 28, 2025 | ISSUED FOR DISCUSSION |

EAST HANTS

Project:

PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:

EXISTING CONDITIONS FLOOD LINES 5% AEP 2100 CLIMATE CHANGE

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:4,250 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 3.3.0 |

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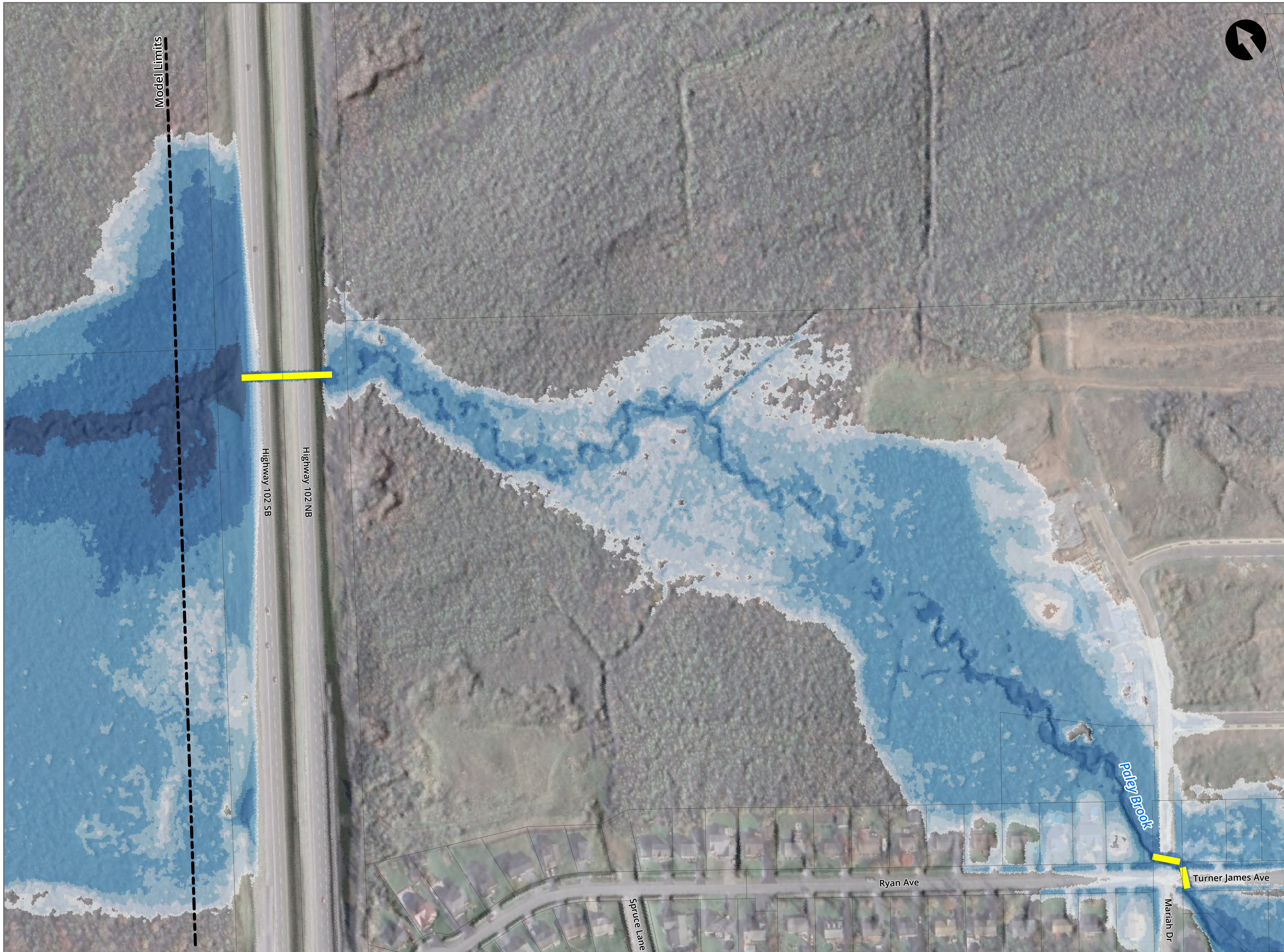


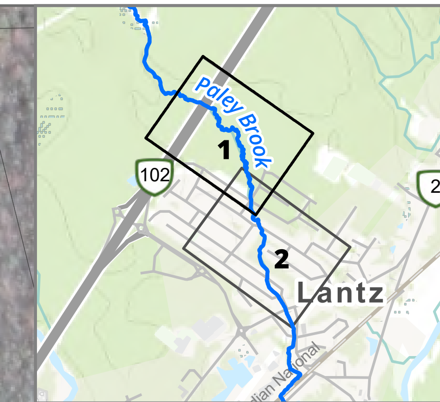


Legend:

5% AEP, 2100 Climate Change Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.97 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 3 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 2 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |
| 1 | FEB 28, 2025 | ISSUED FOR DISCUSSION |

EAST HANTS

Project:

PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:

EXISTING CONDITIONS FLOOD LINES 5% AEP 2100 CLIMATE CHANGE

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 3.3.1 |

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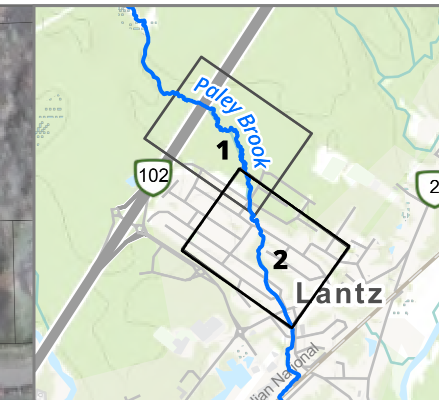


Legend:
5% AEP, 2100 Climate Change
Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.97 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 3 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 2 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |
| 1 | FEB 28, 2025 | ISSUED FOR DISCUSSION |

EAST HANTS

Project:
PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:
EXISTING CONDITIONS FLOOD LINES 5% AEP 2100 CLIMATE CHANGE

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 3.3.2 |

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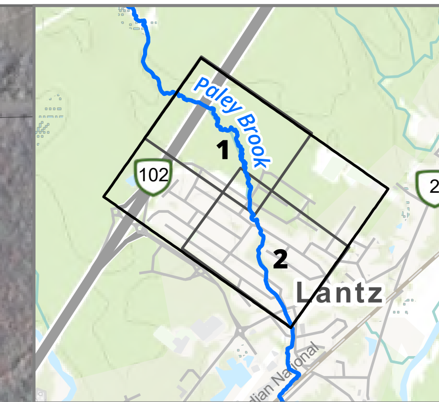


Legend:

1% AEP, 2100 Climate Change Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 4.37 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 3 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 2 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |
| 1 | FEB 28, 2025 | ISSUED FOR DISCUSSION |

EAST HANTS

Project:

PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:

EXISTING CONDITIONS FLOOD LINES 1% AEP 2100 CLIMATE CHANGE

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:4,250 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 3.4.0 |

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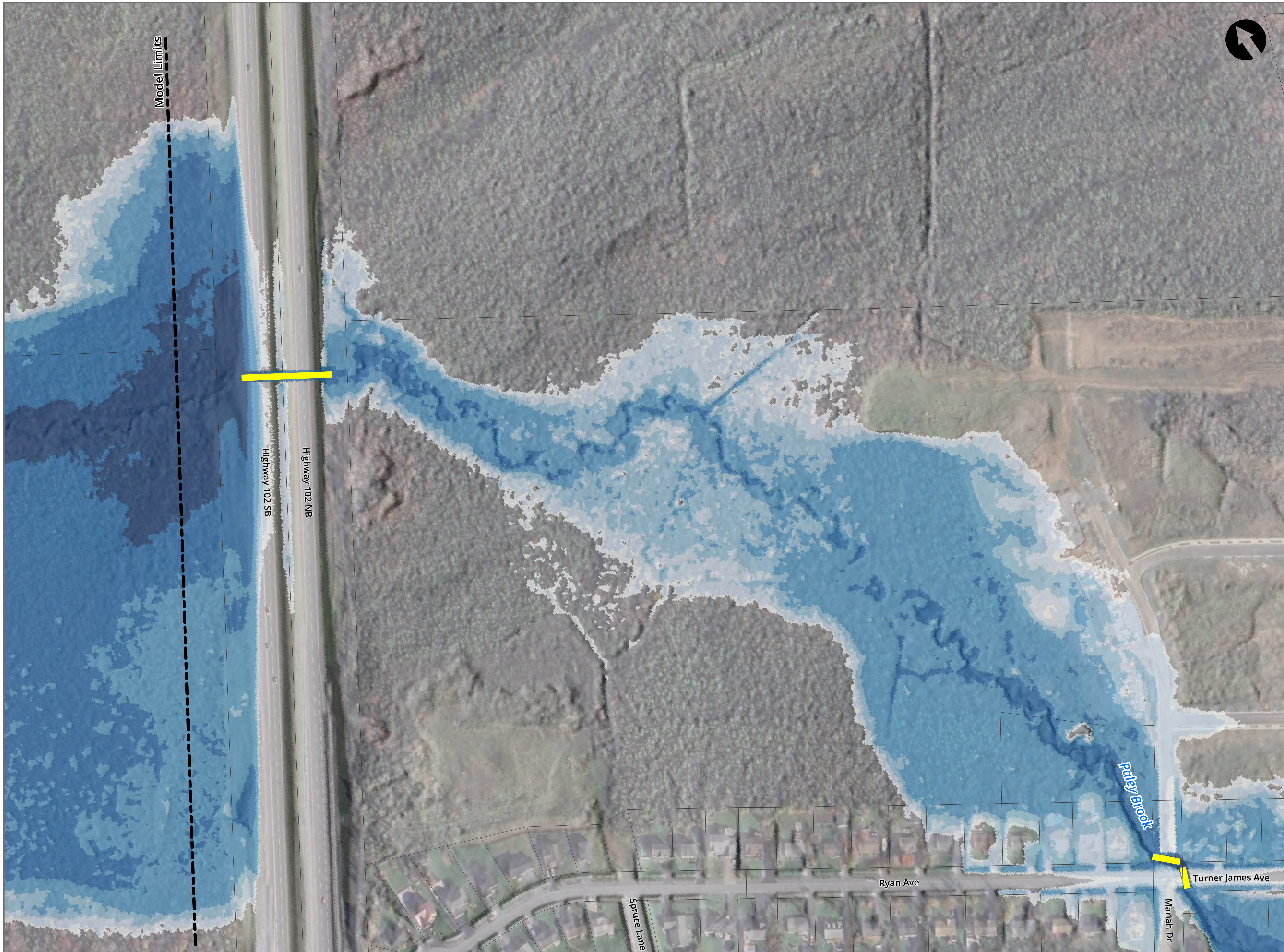


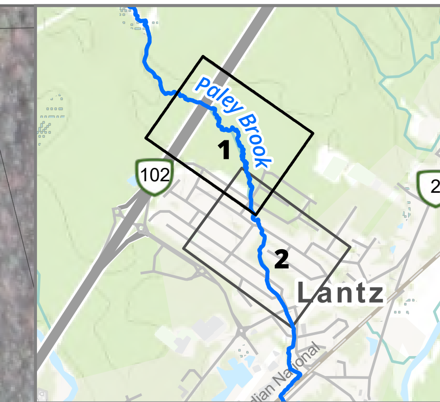


Legend:

1% AEP, 2100 Climate Change Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 4.37 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 3 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
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| 1 | FEB 28, 2025 | ISSUED FOR DISCUSSION |

EAST HANTS

Project:

PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:

EXISTING CONDITIONS FLOOD LINES 1% AEP 2100 CLIMATE CHANGE

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 3.4.1 |

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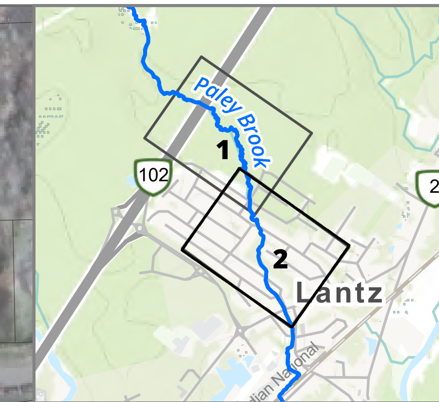


Legend:

1% AEP, 2100 Climate Change Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 4.37 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 3 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
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| 1 | FEB 28, 2025 | ISSUED FOR DISCUSSION |

EAST HANTS

Project:

PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:

EXISTING CONDITIONS FLOOD LINES 1% AEP 2100 CLIMATE CHANGE

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:2,500 |
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| Project No: | 241221.00 | Figure No: | 3.4.2 |

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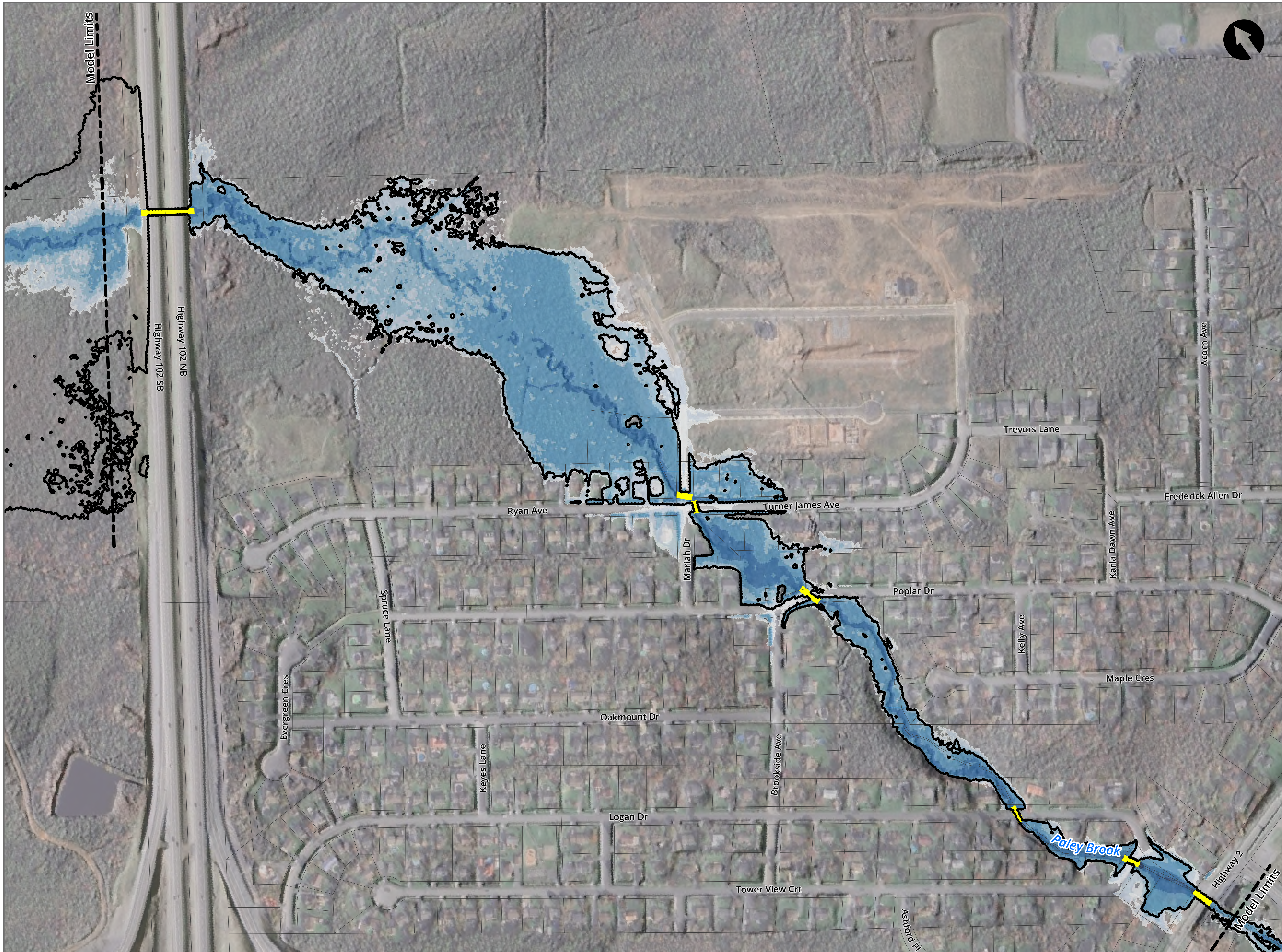


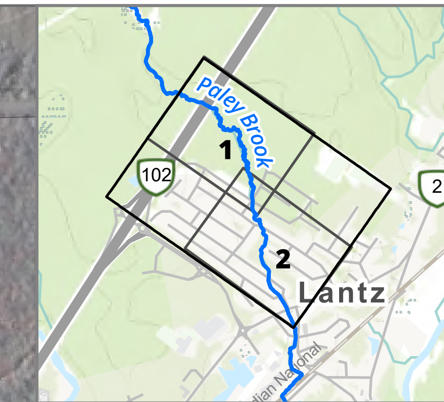


Legend:
5% AEP Flood Line Depth

- 0 m - 0.1 m
- 0.1m - 0.3 m
- 0.3m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 2.45 m
- Flood extents with existing highway culvert
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 3 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 2 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |
| 1 | FEB 28, 2025 | ISSUED FOR DISCUSSION |

EAST HANTS

Project:
PALEY BROOK FLOOD
RISK MITIGATION STUDY

Drawing Title:
EXISTING CONDITIONS
UPGRADED HIGHWAY CULVERT
FLOOD LINES
5% AEP

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:4,250 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 4.1.0 |

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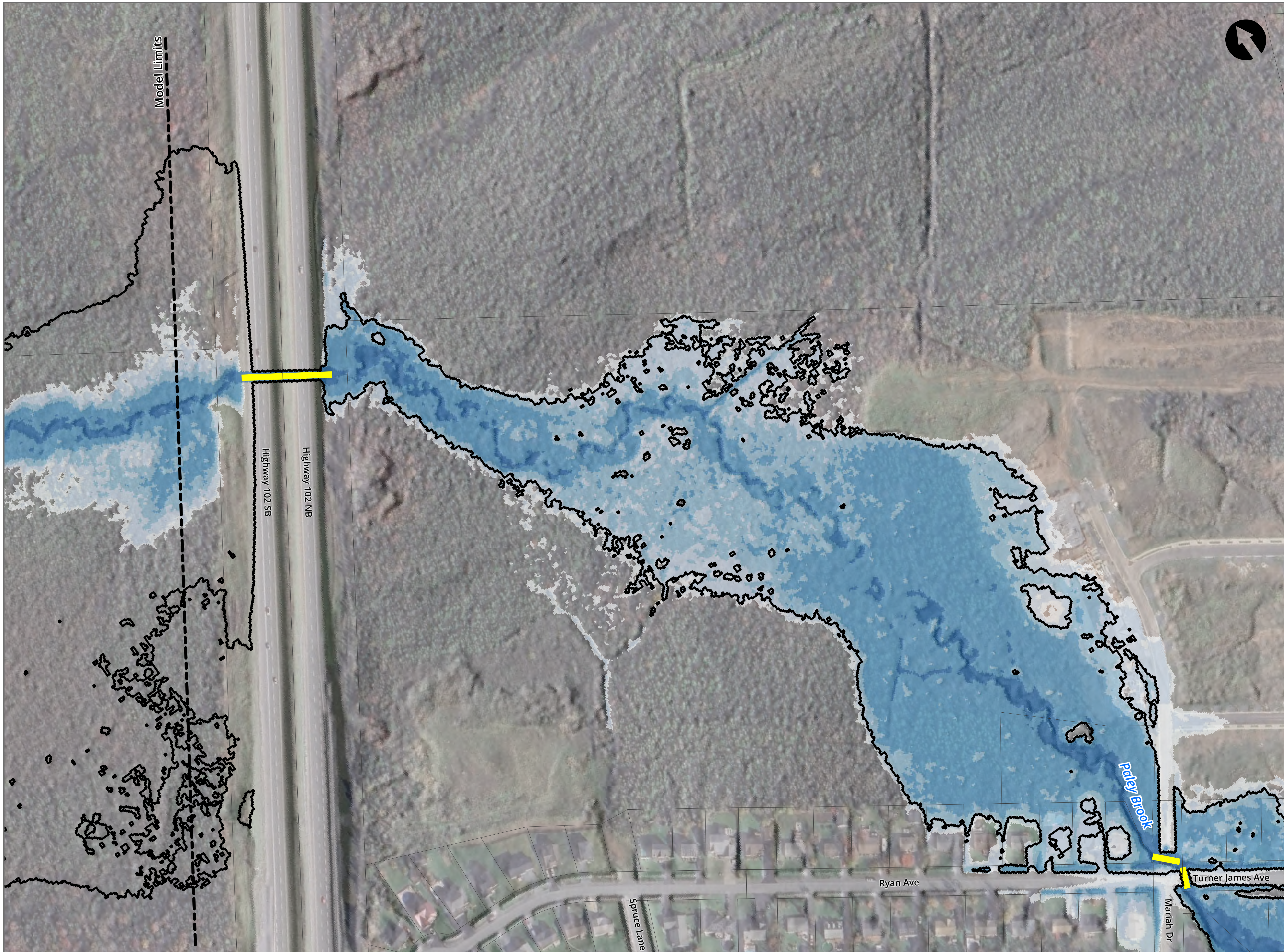


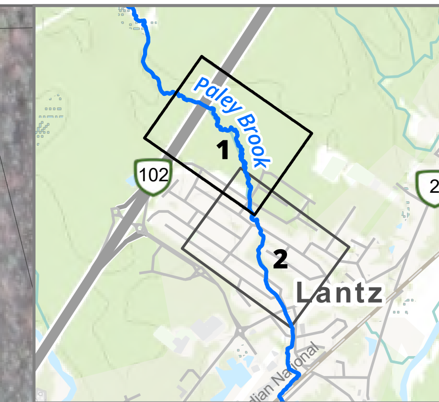


Legend:
5% AEP Flood Line Depth

- 0 m - 0.1 m
- 0.1m - 0.3 m
- 0.3m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 2.45 m
- Flood extents with existing highway culvert
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 3 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
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| 1 | FEB 28, 2025 | ISSUED FOR DISCUSSION |

EAST HANTS

Project:
PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:
EXISTING CONDITIONS UPGRADED HIGHWAY CULVERT FLOOD LINES 5% AEP

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 4.1.1 |

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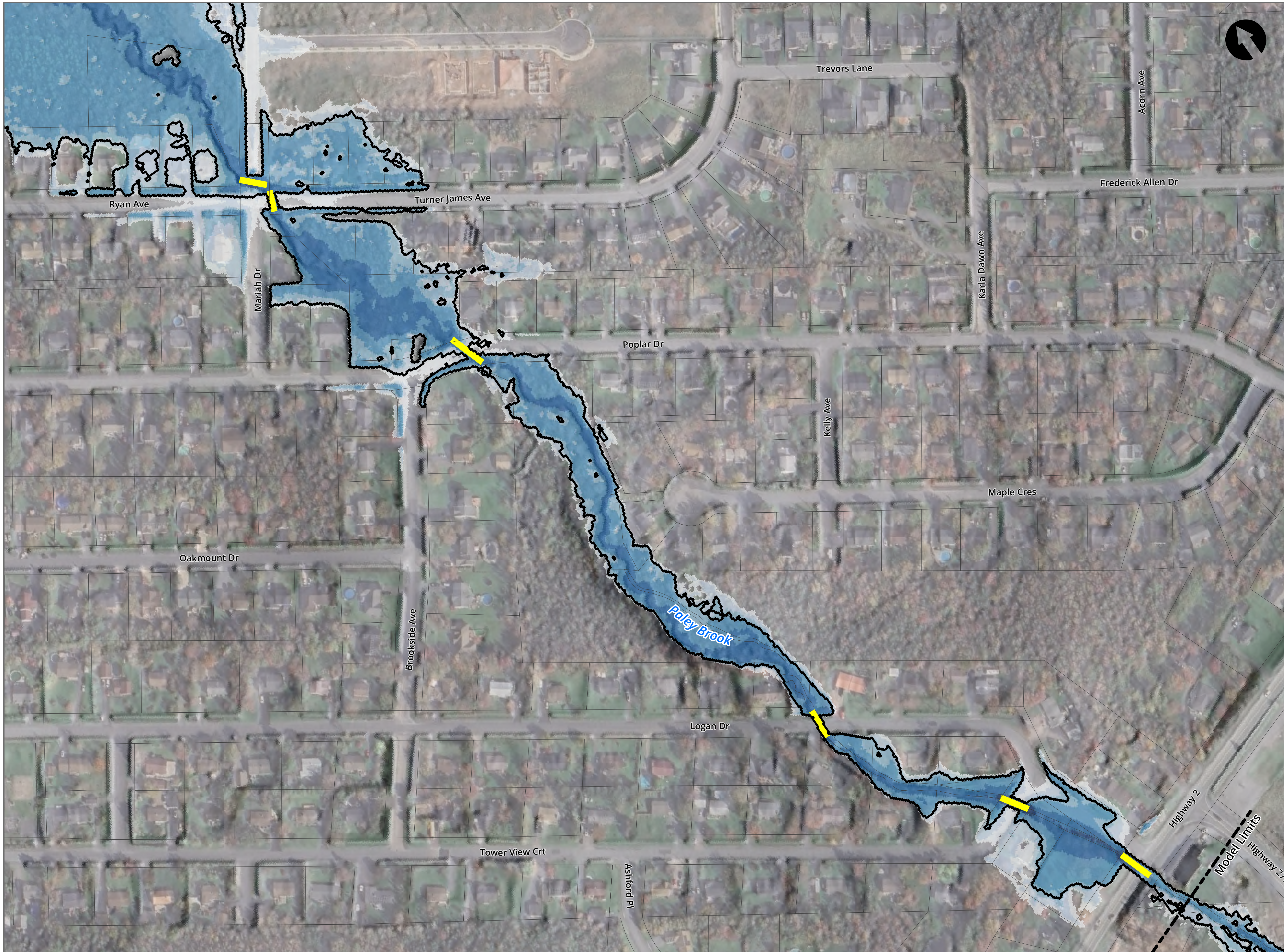


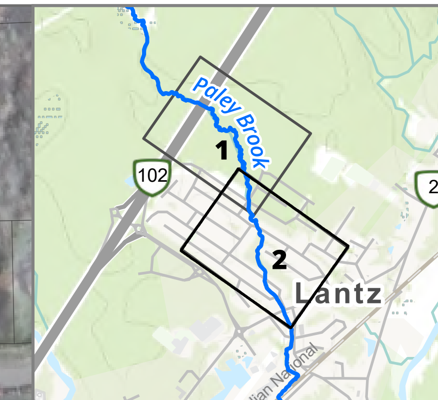


Legend:
5% AEP Flood Line Depth

- 0 m - 0.1 m
- 0.1m - 0.3 m
- 0.3m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 2.45 m
- Flood extents with existing highway culvert
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 3 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 2 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |
| 1 | FEB 28, 2025 | ISSUED FOR DISCUSSION |

EAST HANTS

Project:
PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:
EXISTING CONDITIONS UPGRADED HIGHWAY CULVERT FLOOD LINES 5% AEP

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 4.1.2 |

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EAST HANTS

Project:
PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:
EXISTING CONDITIONS UPGRADED HIGHWAY CULVERT FLOOD LINES 1% AEP

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
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| Date: | FEB 2025 | Scale: | 1:4,250 |
| Drawn: | SO | Approved: | AL |
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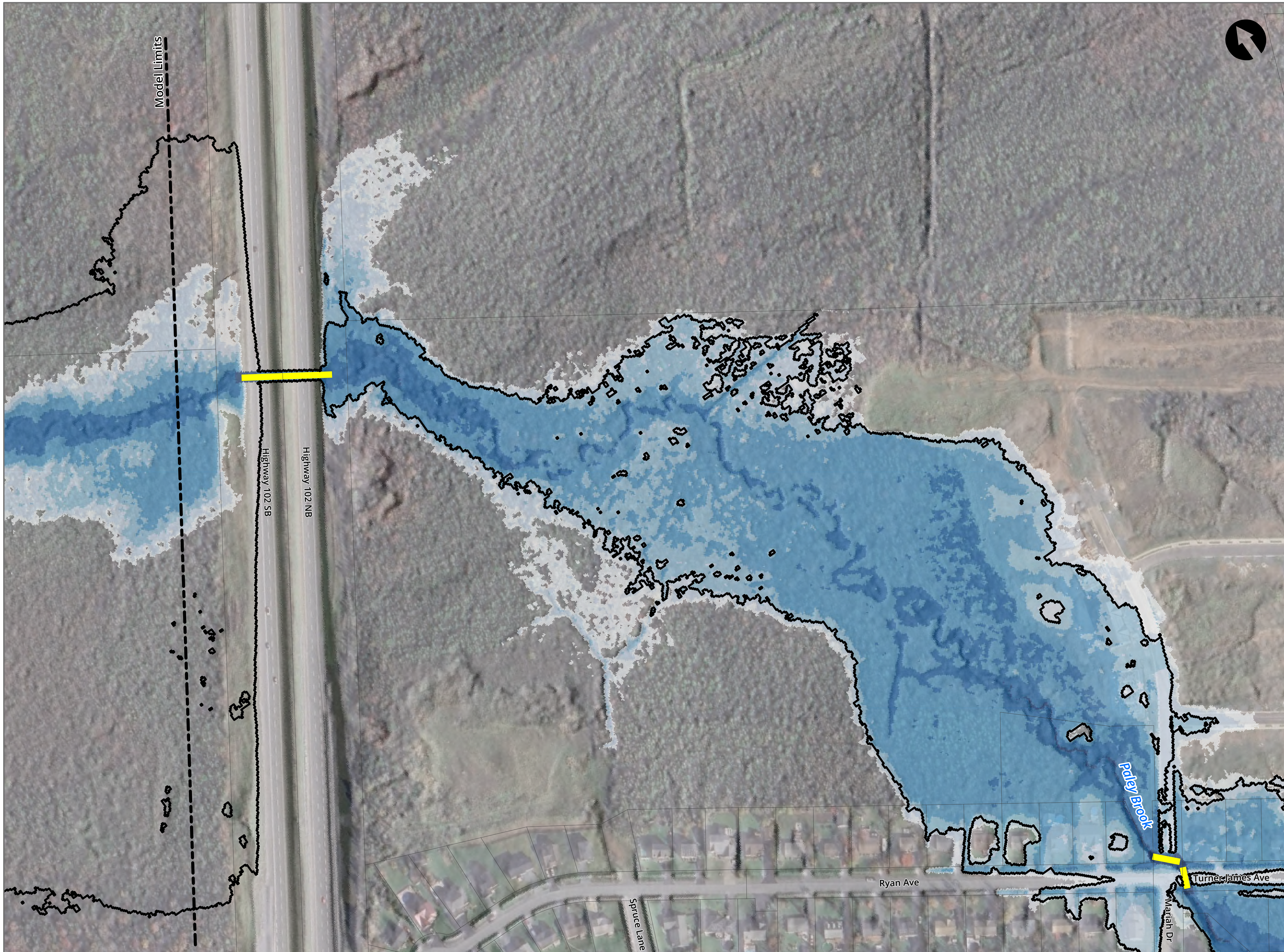


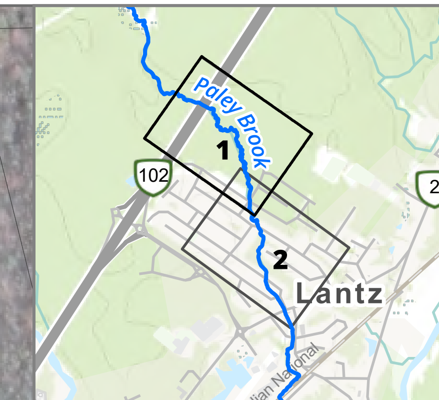


Legend:
1% AEP Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 2.93 m
- Flood extents with existing highway culvert
- Culvert
- Property Parcel

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CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

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| Drawn: | SO | Approved: | AL |
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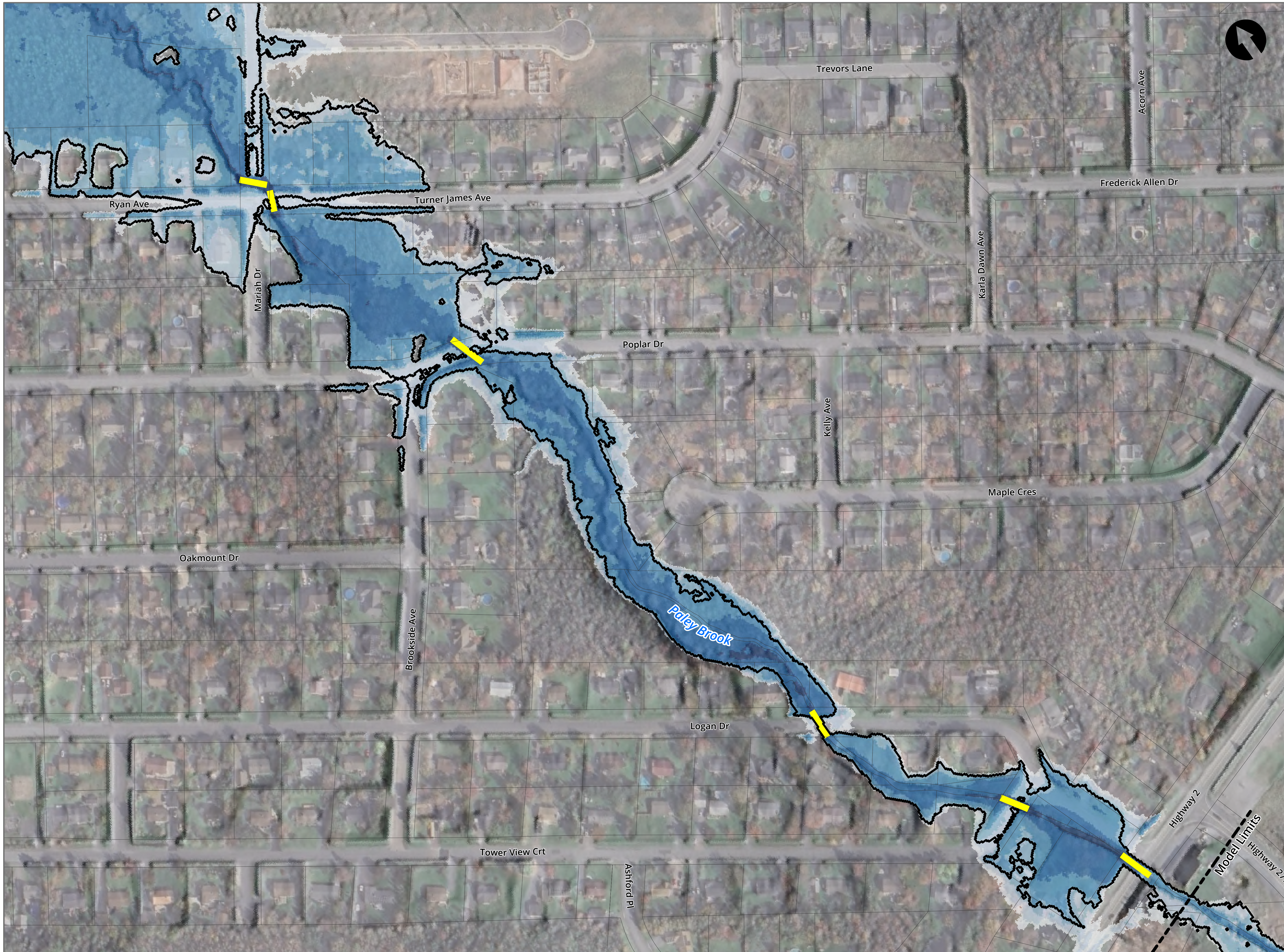


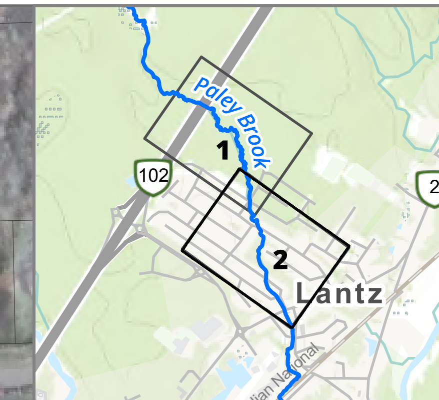


Legend:
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- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 2.93 m
- Flood extents with existing highway culvert
- Culvert
- Property Parcel

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PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:

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CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

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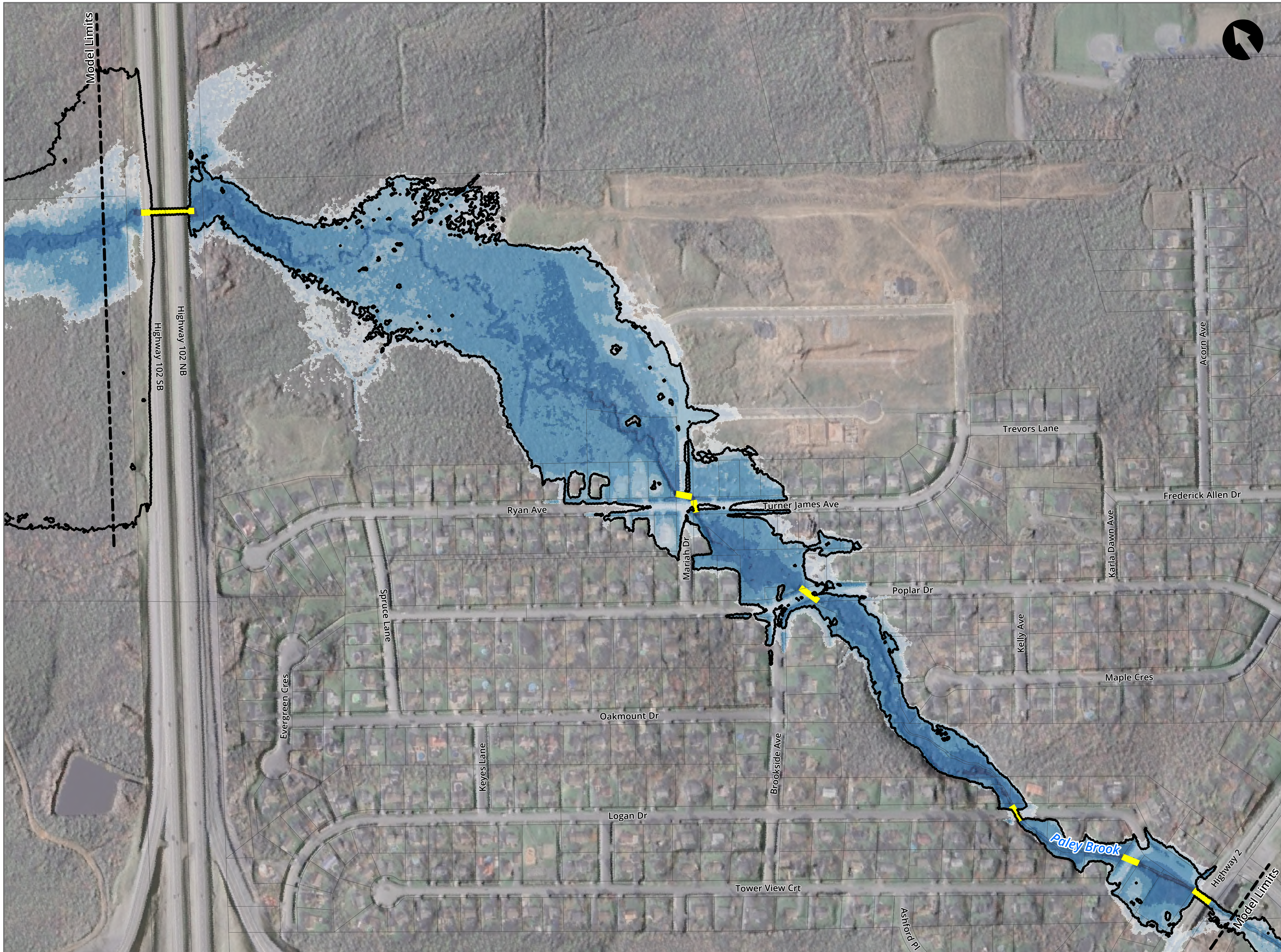


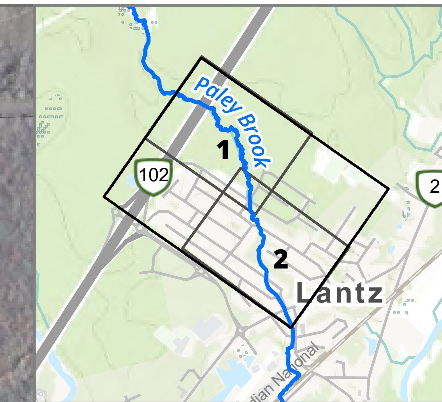


Legend:
5% AEP, 2100 Climate Change
Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 2.96 m
- Flood extents with existing highway culvert
- Culvert
- Property Parcel

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Drawing Title:
EXISTING CONDITIONS UPGRADED HIGHWAY CULVERT FLOOD LINES 5% AEP, 2100 CLIMATE CHANGE

CBCL

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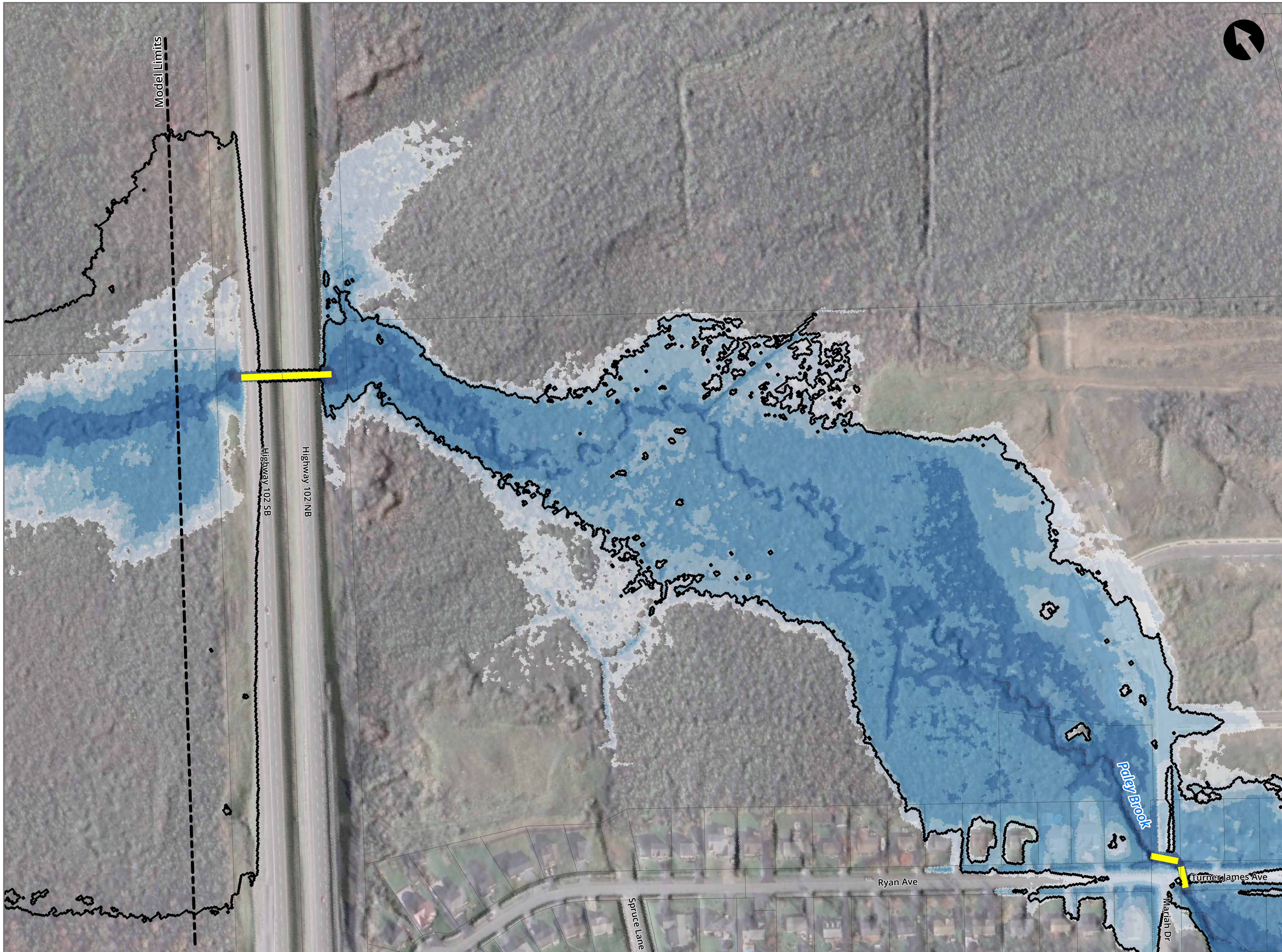


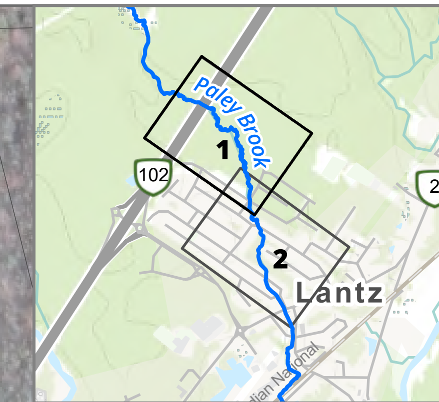


Legend:
5% AEP, 2100 Climate Change
Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
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- 2 m - 2.96 m
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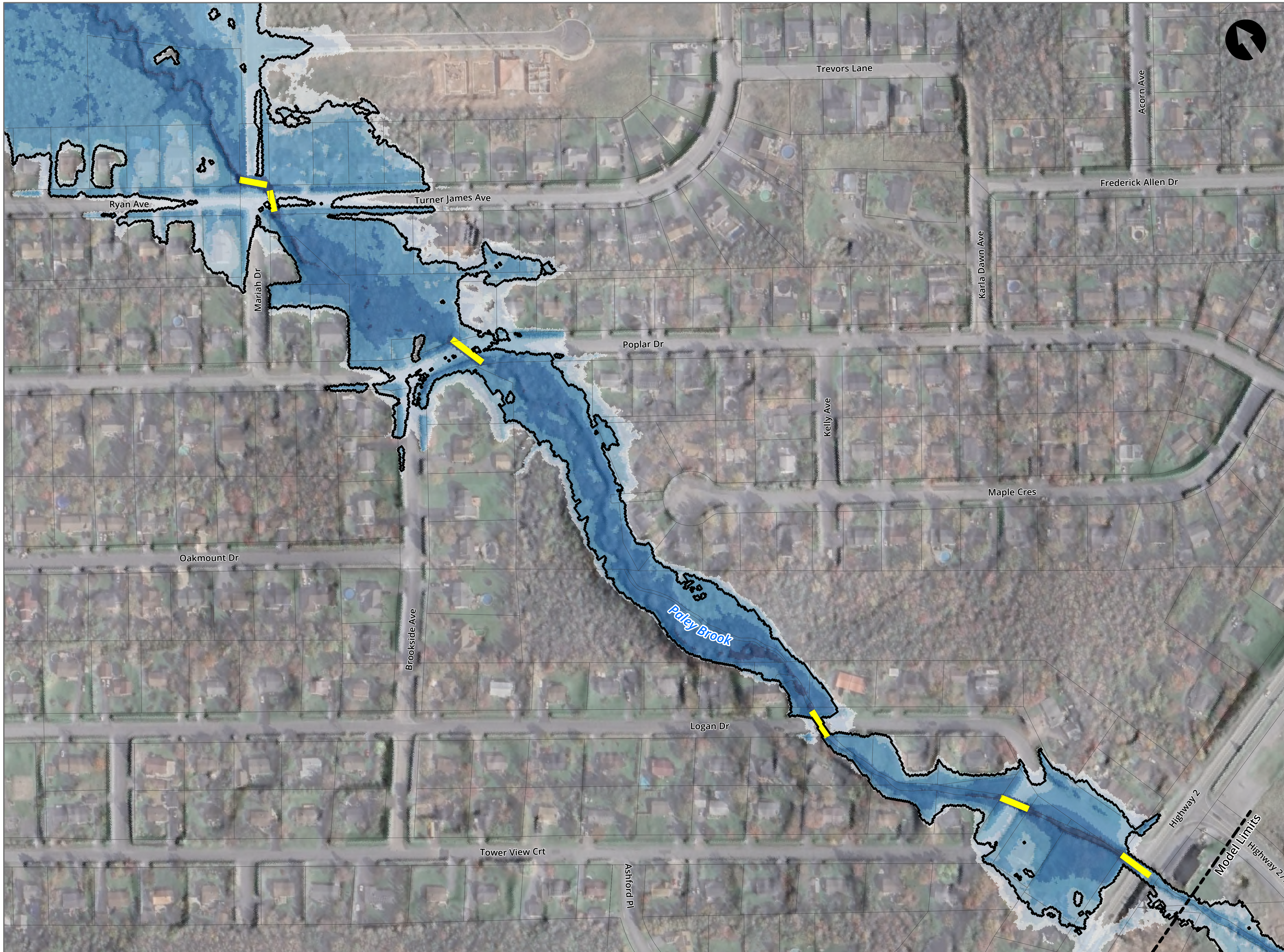


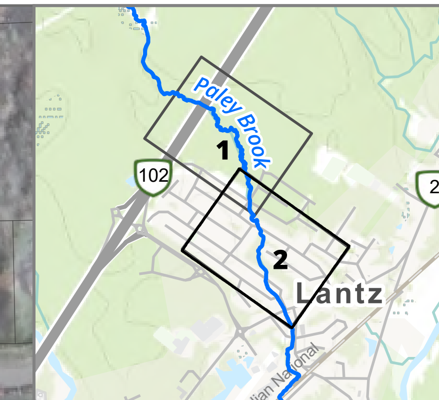


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Flood Line Depth

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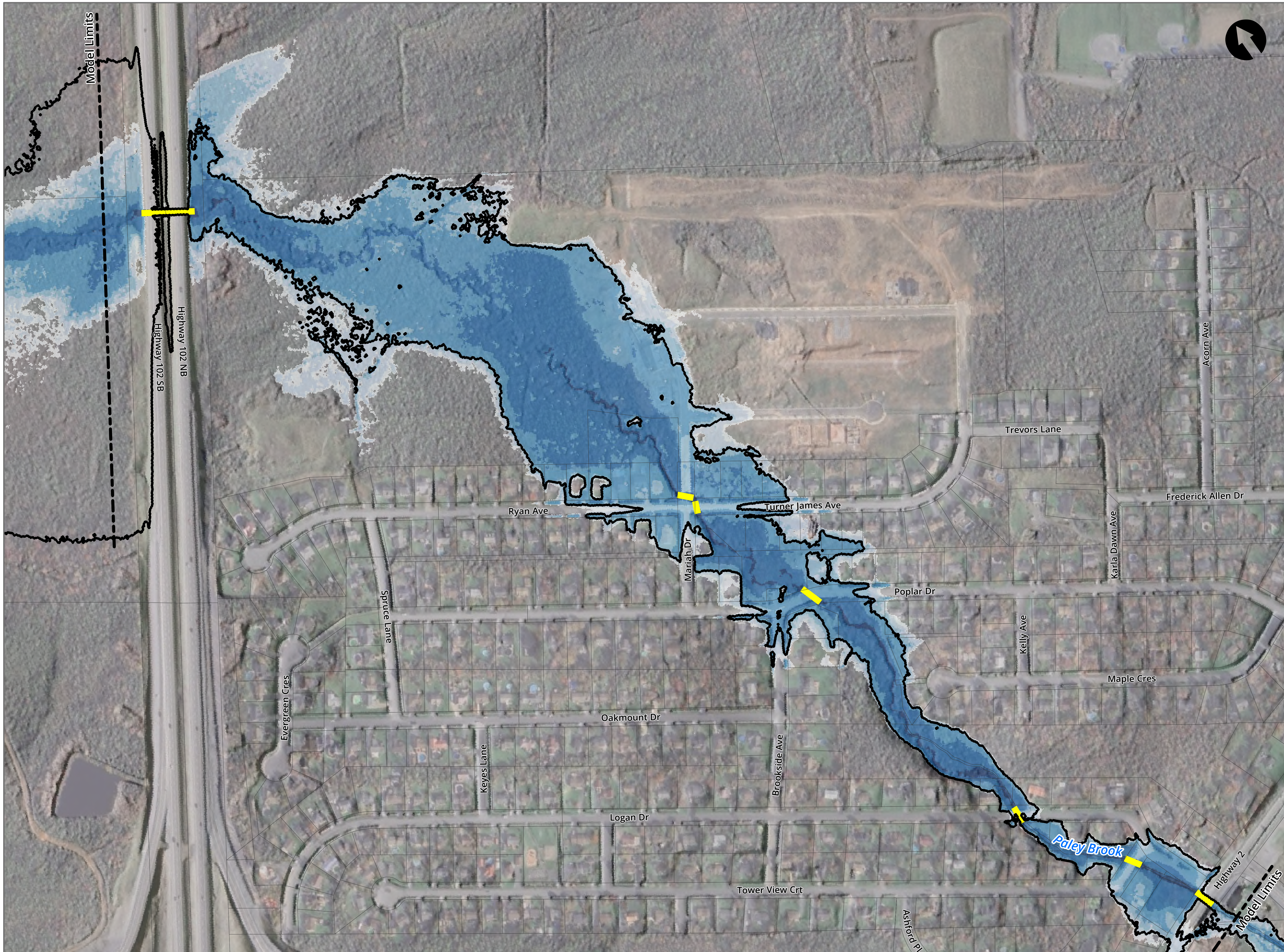


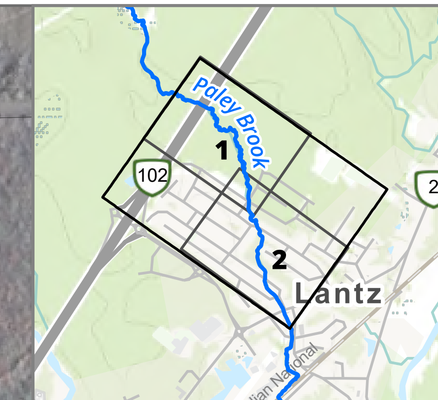


Legend:

1% AEP, 2100 Climate Change Flood Line Depth

- 0 m - 0.1 m
- 0.1m - 0.3 m
- 0.3 m - 0.5 m
- 0.5m - 1 m
- 1 m - 2 m
- 2 m - 3.05 m
- Flood extents with existing highway culvert
- Culvert
- Property Parcel

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EAST HANTS

Project:

PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:

EXISTING CONDITIONS UPGRADED HIGHWAY CULVERT FLOOD LINES 1% AEP, 2100 CLIMATE CHANGE

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

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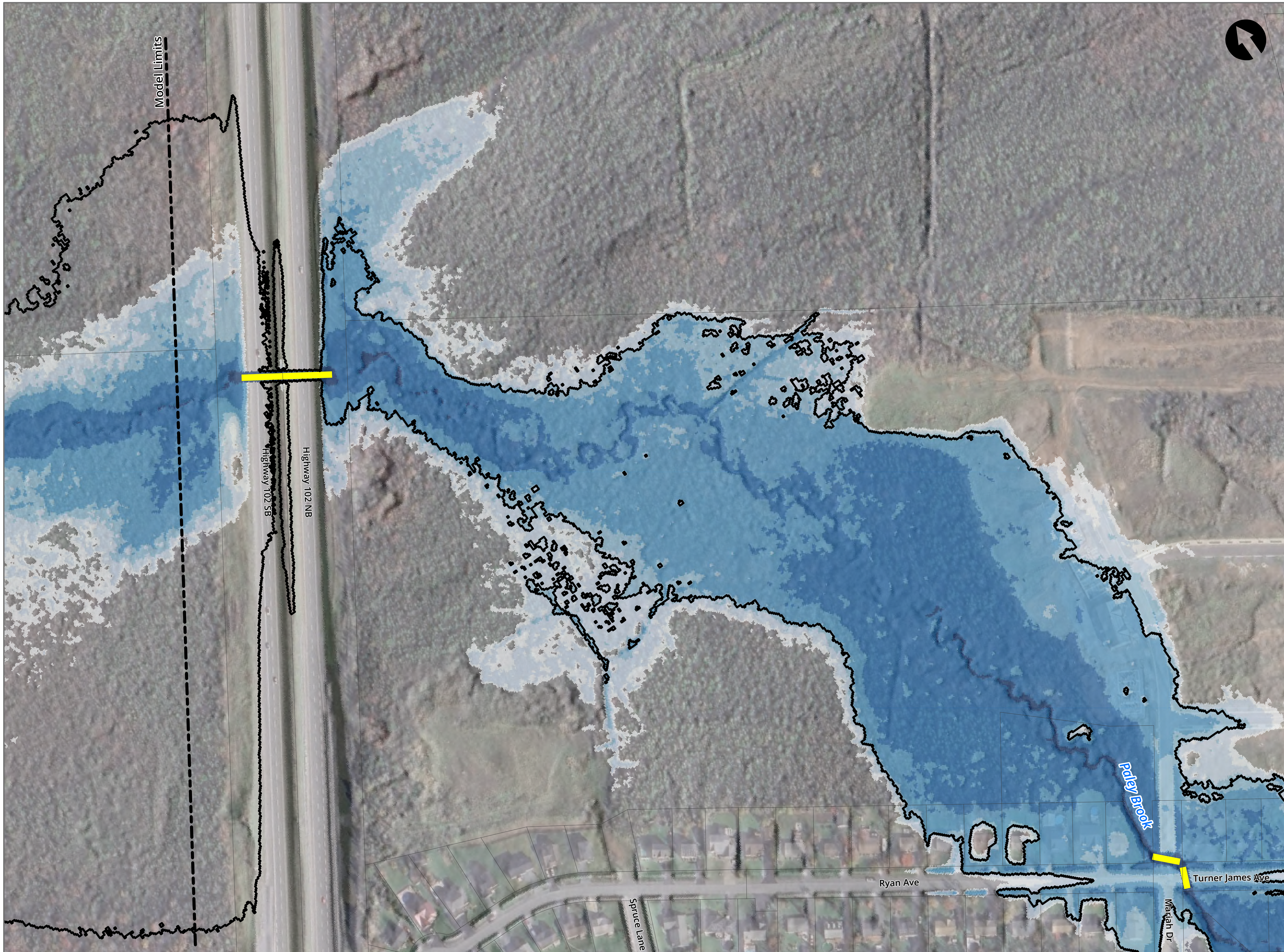


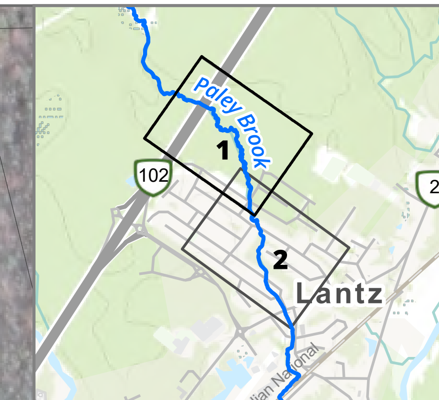


Legend:

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EXISTING CONDITIONS UPGRADED HIGHWAY CULVERT FLOOD LINES 1% AEP, 2100 CLIMATE CHANGE

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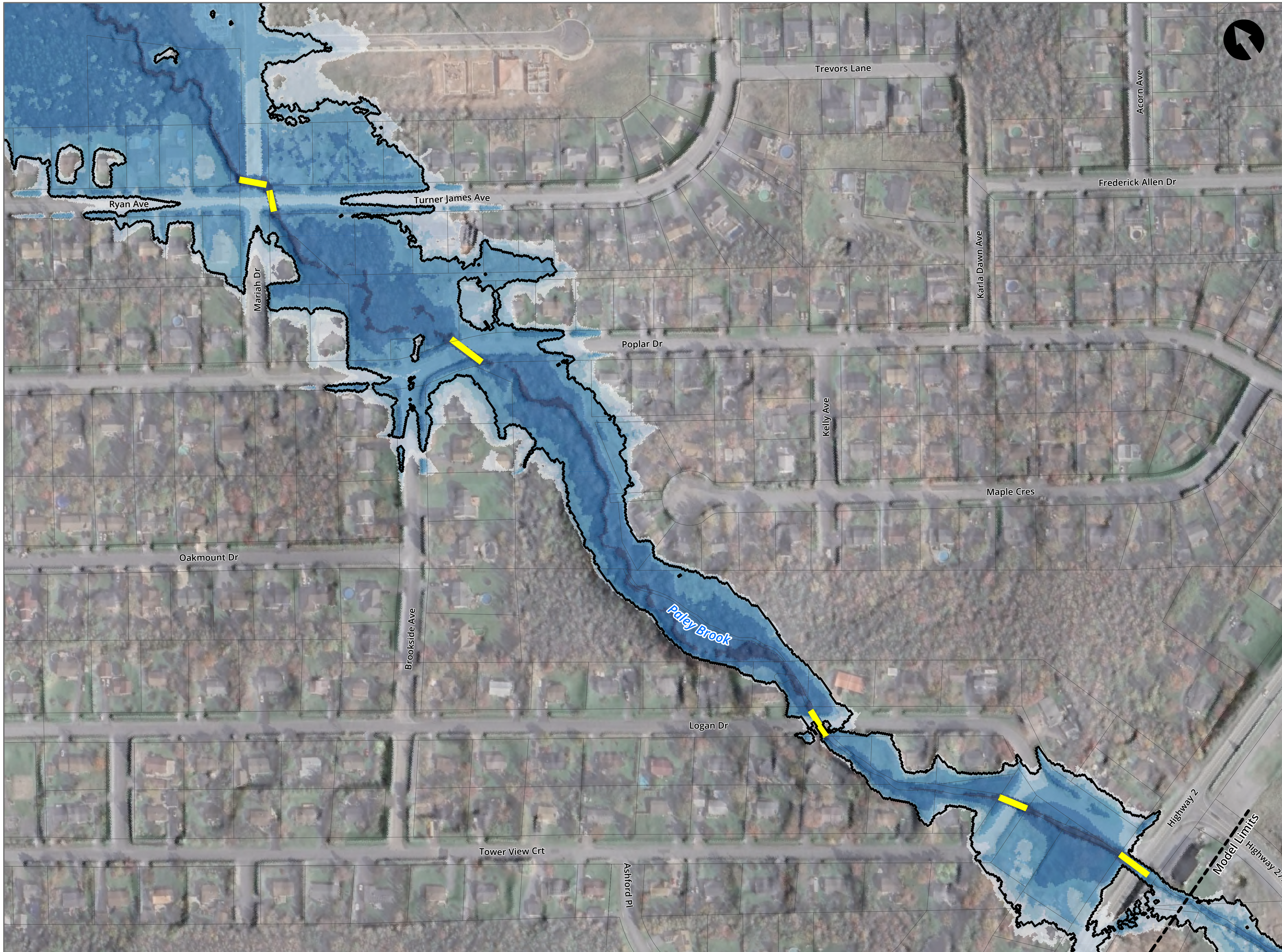


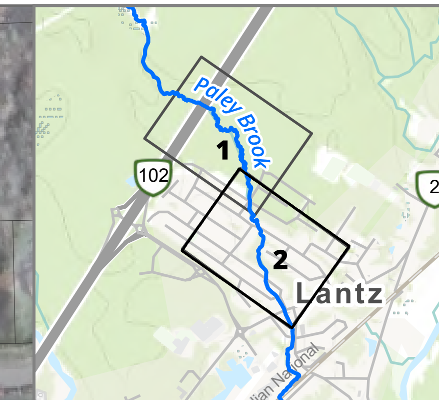


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- 1 m - 2 m
- 2 m - 3.05 m
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EXISTING CONDITIONS UPGRADED HIGHWAY CULVERT FLOOD LINES 1% AEP, 2100 CLIMATE CHANGE

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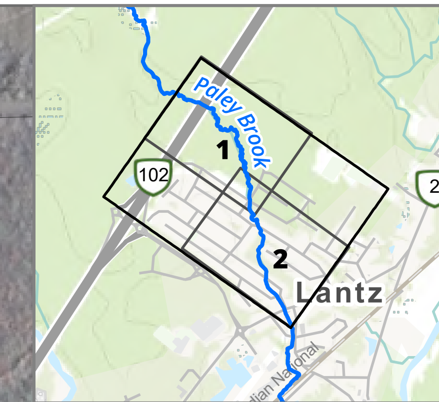
# APPENDIX D

## Concept Options Maps

- Figure Set 5: Proposed Culvert Upgrades
- Figure Set 6: Proposed Storage Ponds
- Figure Set 7: Upstream Stormwater Storage
- Figure Set 8: Channel Modifications


Legend:

5% AEP Flood Line Depth

- 0 m - 0.1 m
- 0.1m - 0.3 m
- 0.3 m - 0.5 m
- 0.51 m - 1 m
- 1 m - 2 m
- 2 m - 3.51 m
- Culvert
- Property Parcel

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PROPOSED CULVERT UPGRADES FLOOD LINES 5% AEP

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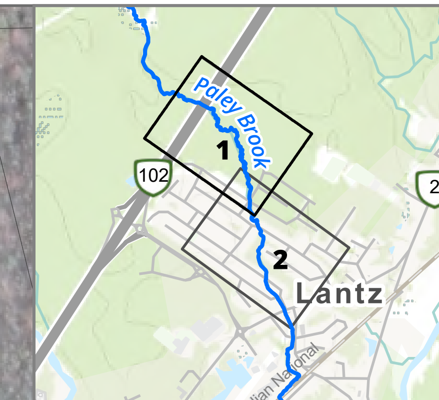


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- 0.51 m - 1 m
- 1 m - 2 m
- 2 m - 3.51 m
- Culvert
- Property Parcel

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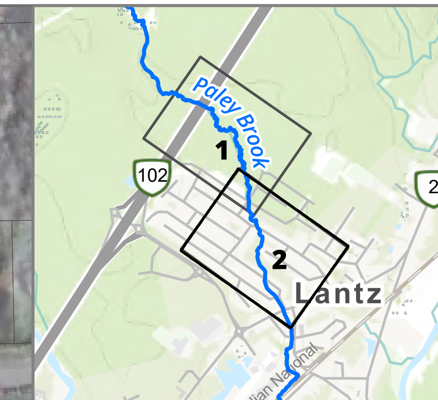


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- 1 m - 2 m
- 2 m - 3.51 m
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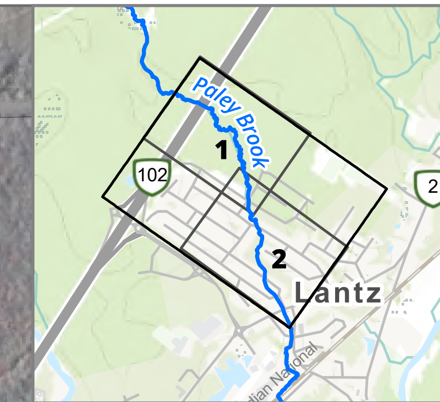


Legend:

1% AEP Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.85 m
- Culvert
- Property Parcel

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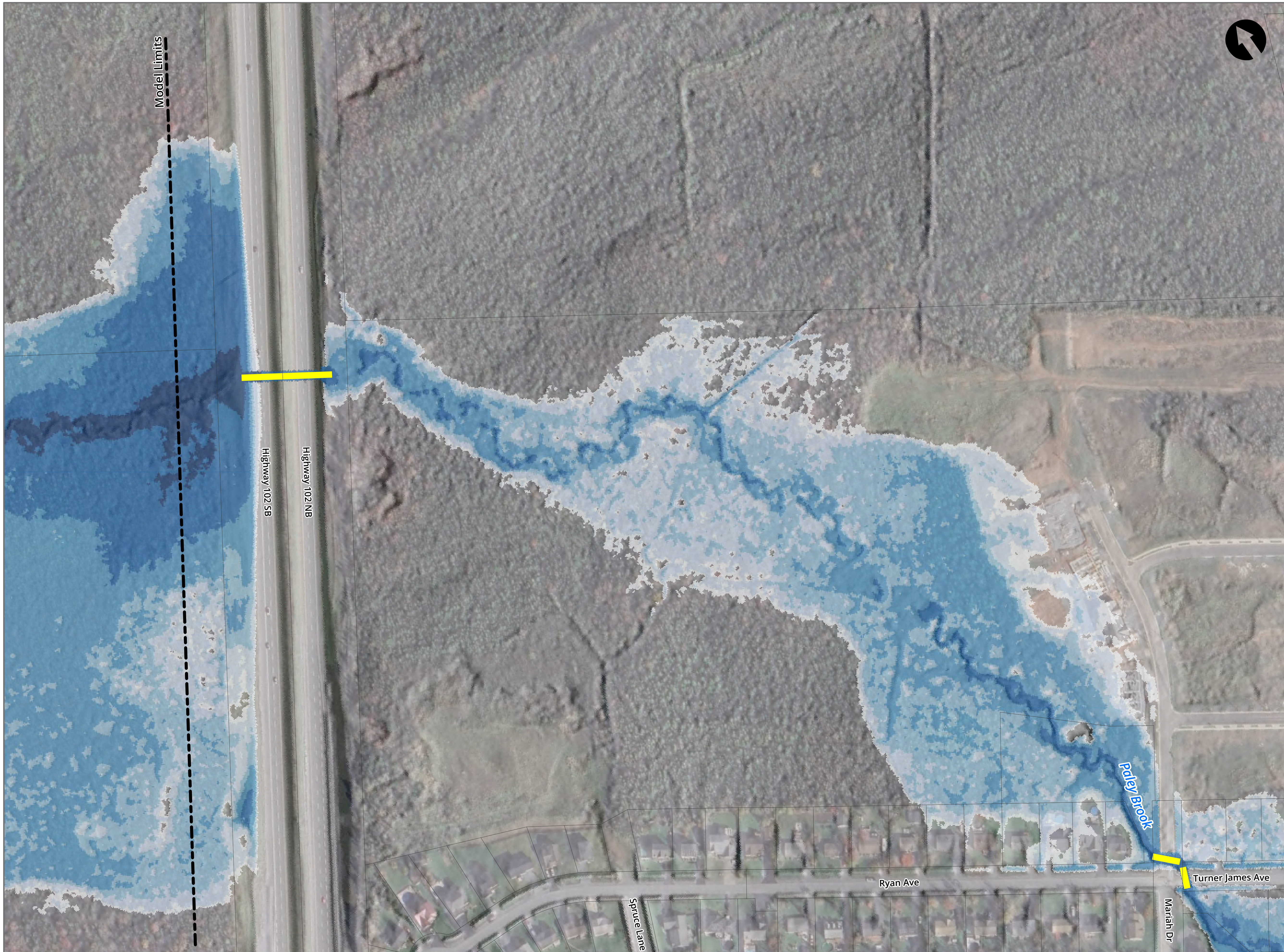


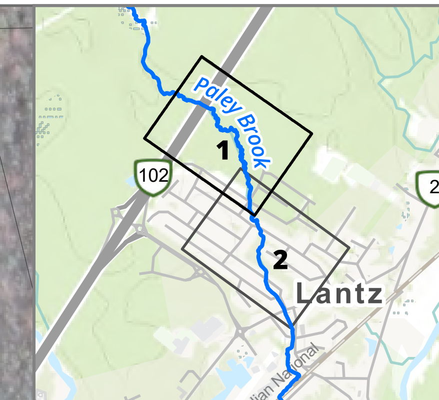


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| Date: | FEB 2025 | Scale: | 1:2,500 |
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| Project No: | 241221.00 | Figure No: | 5.2.2 |

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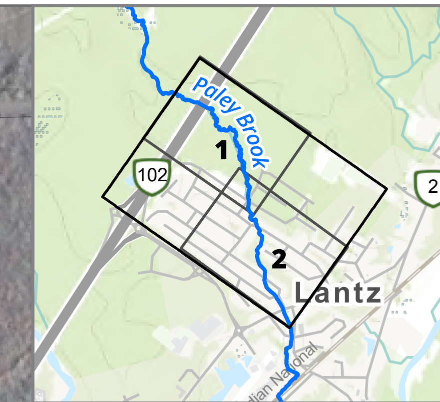


Legend:

5% AEP, 2100 Climate Change Flood Line Depth

- 0 m - 0.1 m
- 0.1m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.97 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:

PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:

PROPOSED CULVERT UPGRADES FLOOD LINES 5% AEP 2100 CLIMATE CHANGE

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:4,250 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 5.3.0 |

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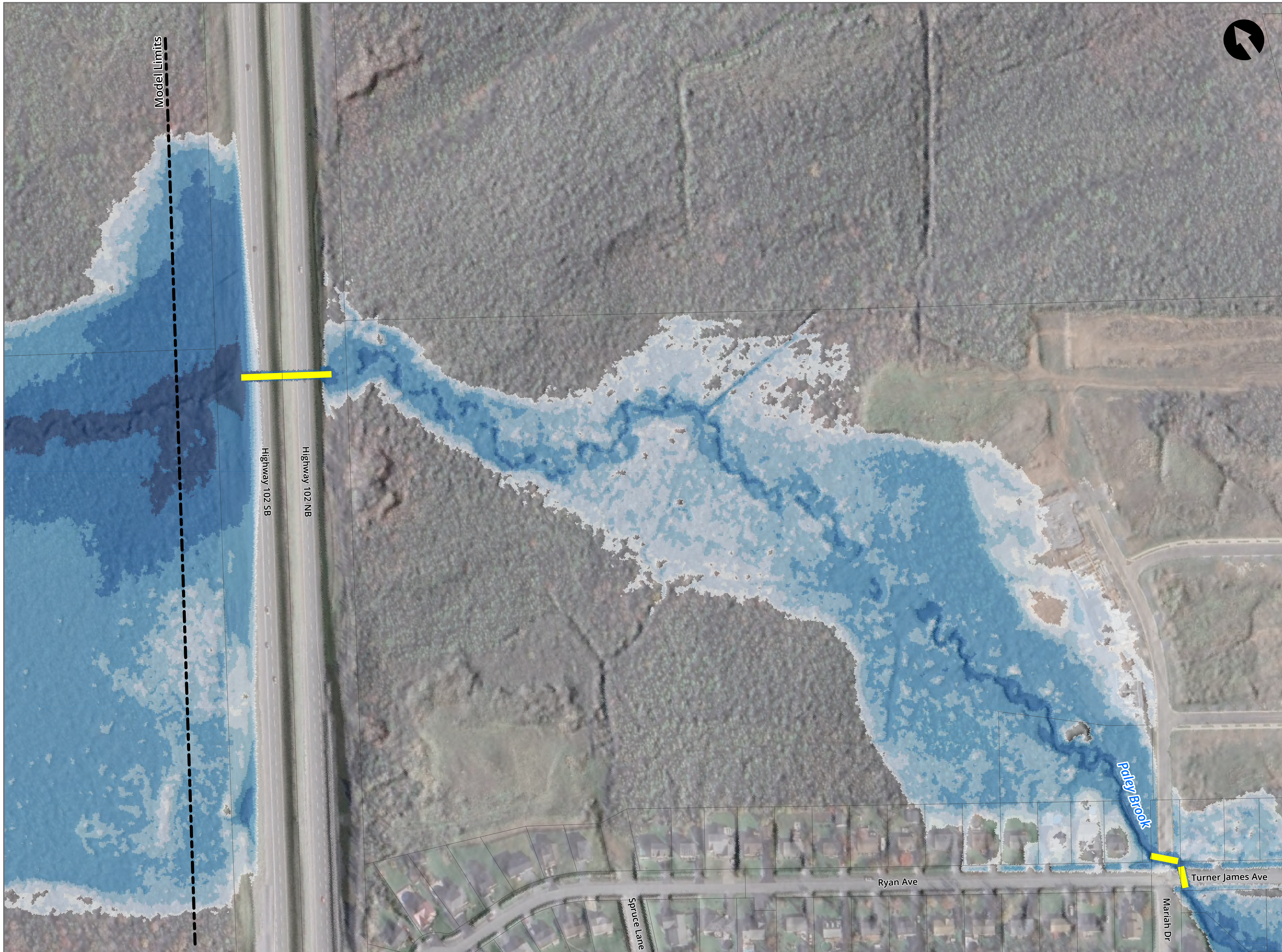


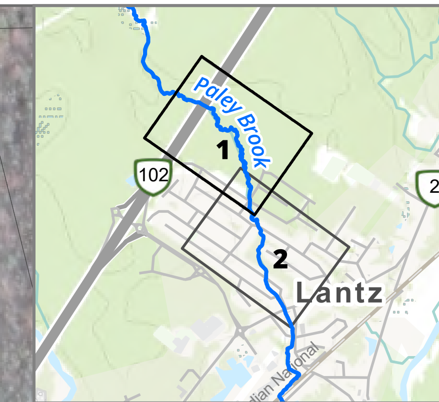


Legend:

5% AEP, 2100 Climate Change Flood Line Depth

- 0 m - 0.1 m
- 0.1m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.97 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:

PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:

PROPOSED CULVERT UPGRADES FLOOD LINES 5% AEP 2100 CLIMATE CHANGE

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 5.3.1 |

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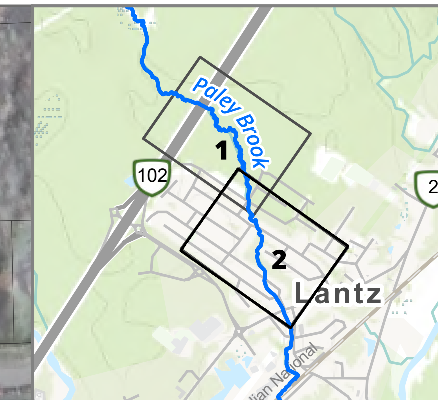


Legend:

5% AEP, 2100 Climate Change Flood Line Depth

- 0 m - 0.1 m
- 0.1m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.97 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:

PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:

PROPOSED CULVERT UPGRADES FLOOD LINES 5% AEP 2100 CLIMATE CHANGE

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 5.3.2 |

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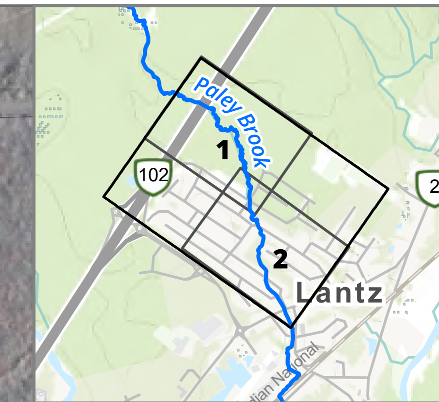


Legend:

1% AEP, 2100 Climate Change Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.83 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:

PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:

PROPOSED CULVERT UPGRADES FLOOD LINES 1% AEP 2100 CLIMATE CHANGE

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:4,250 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 5.4.1 |

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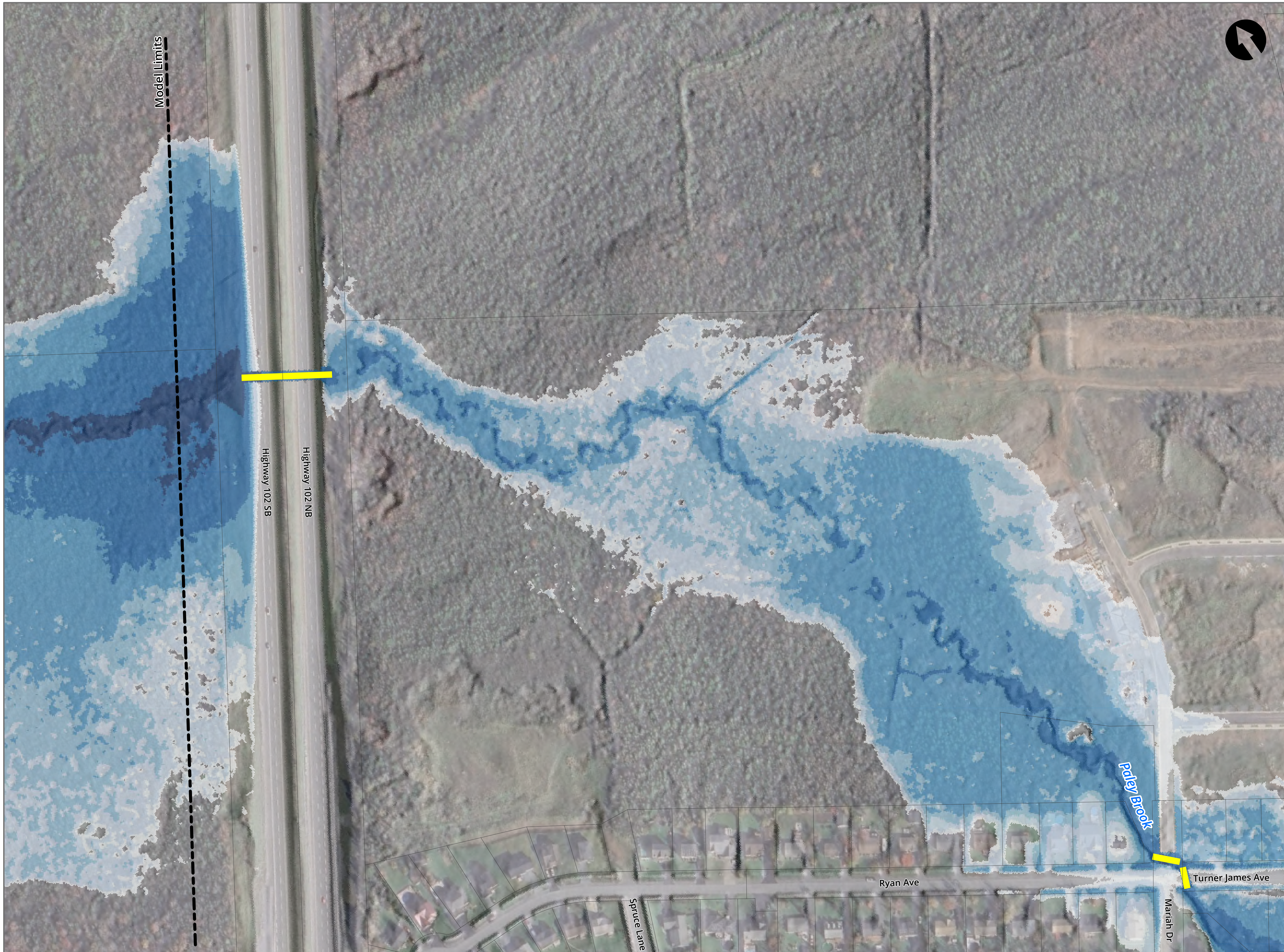


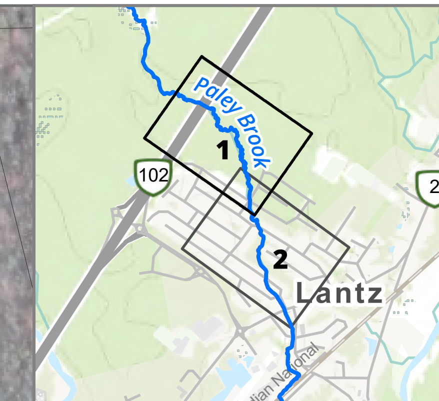


Legend:

1% AEP, 2100 Climate Change Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.83 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:

PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:

PROPOSED CULVERT UPGRADES FLOOD LINES 1% AEP 2100 CLIMATE CHANGE

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 5.4.2 |

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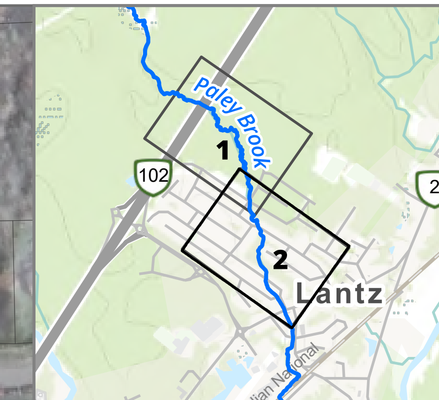


Legend:

1% AEP, 2100 Climate Change
Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.83 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:

PALEY BROOK FLOOD
RISK MITIGATION STUDY

Drawing Title:

PROPOSED CULVERT UPGRADES
FLOOD LINES
1% AEP 2100 CLIMATE CHANGE

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 5.4.3 |

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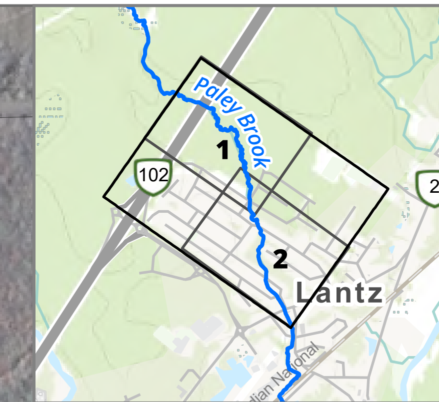



Legend:
5% AEP Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 7.94 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 28, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:
PALEY BROOK FLOOD
RISK MITIGATION STUDY

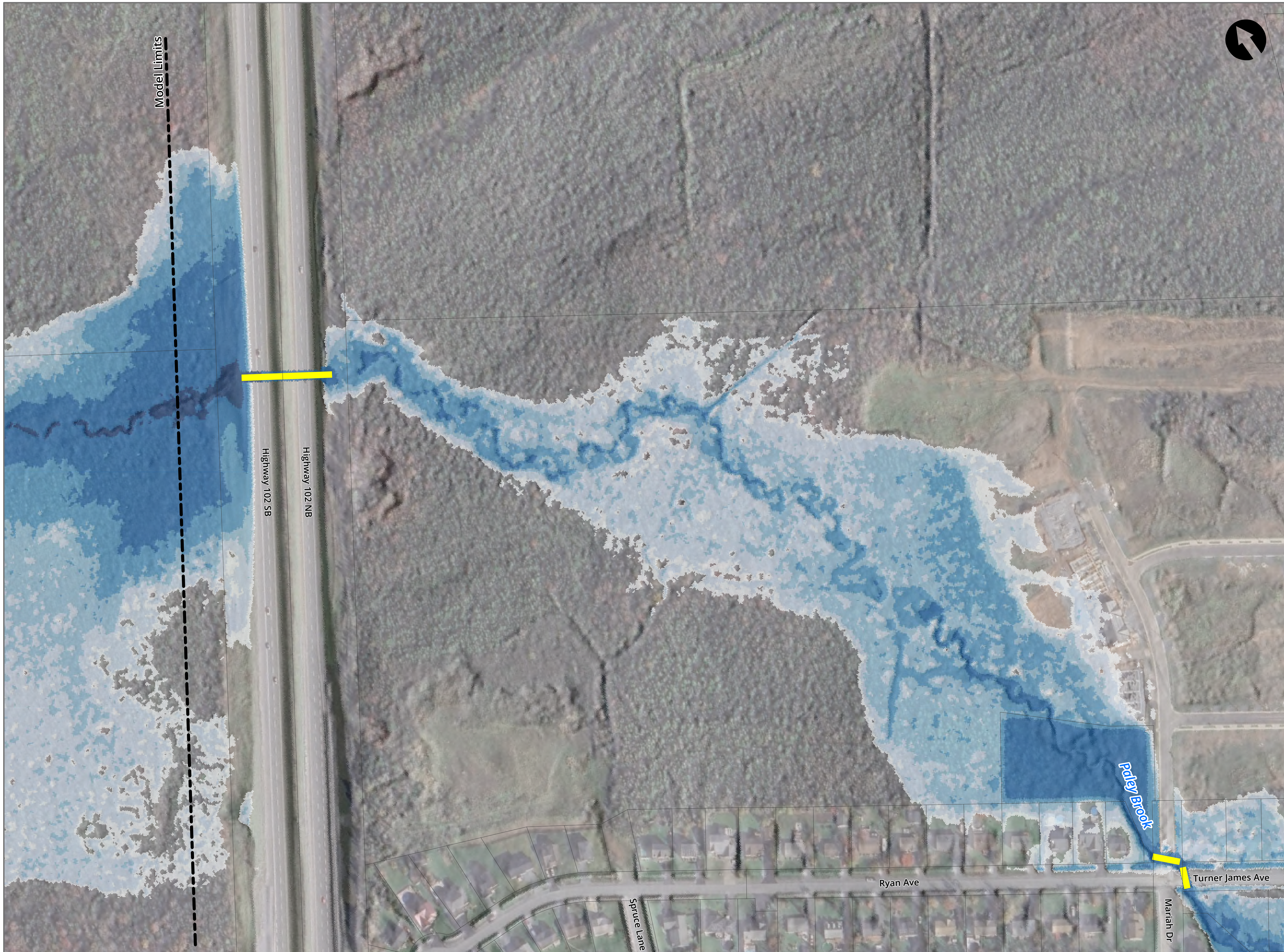
Drawing Title:
PROPOSED STORAGE PONDS
POND 1
FLOOD LINES
5% AEP

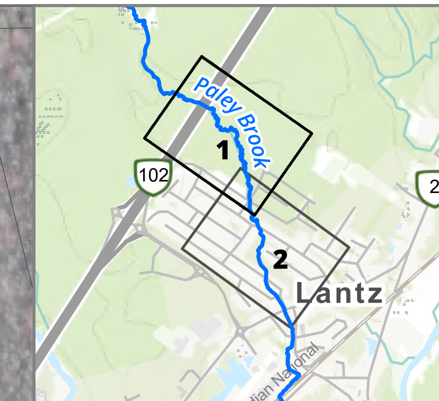
CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:4,250 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 6.1.1.0 |

Figure Name: Y:\Halifax\Data\Projects\2024\241221.00 Paley Brook Flood Study, East Hants\44 CAD\08 GIS\PRO\241221_Paley_Brook_Flood_Study - Appendix D.aprx




Legend:
5% AEP Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 7.94 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 28, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:

PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:

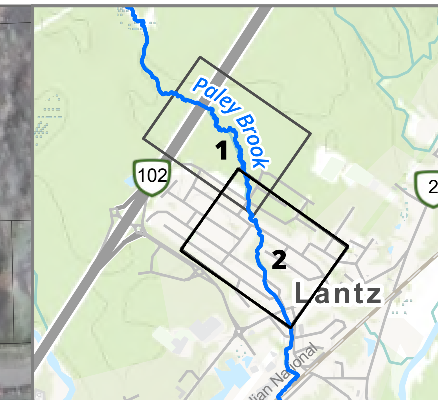
PROPOSED STORAGE PONDS
POND 1
FLOOD LINES
5% AEP

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 6.1.1.1 |

Figure Name: Y:\Halifax\Data\Projects\2024\241221.00 Paley Brook Flood Study, East Hants\44 CAD\08 GIS\PRO\241221_Paley_Brook_Flood_Study - Appendix D.aprx


Legend:
5% AEP Flood Line Depth
- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 7.94 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 28, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:
PALEY BROOK FLOOD RISK MITIGATION STUDY

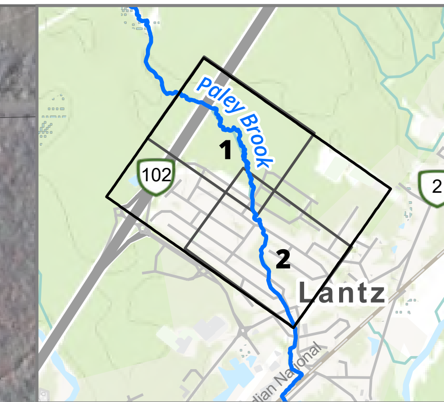
Drawing Title:
PROPOSED STORAGE PONDS POND 1 FLOOD LINES 5% AEP

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 6.1.1.2 |

Figure Name: Y:\Halifax\Data\Projects\2024\241221.00 Paley Brook Flood Study, East Hants\44 CAD\08 GIS\PRO\241221_Paley_Brook_Flood_Study - Appendix D.aprx


Legend:
1% AEP Flood Line Depth

- 0m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5m - 1 m
- 1 m - 2 m
- 2 m - 3.85 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:
PALEY BROOK FLOOD
RISK MITIGATION STUDY

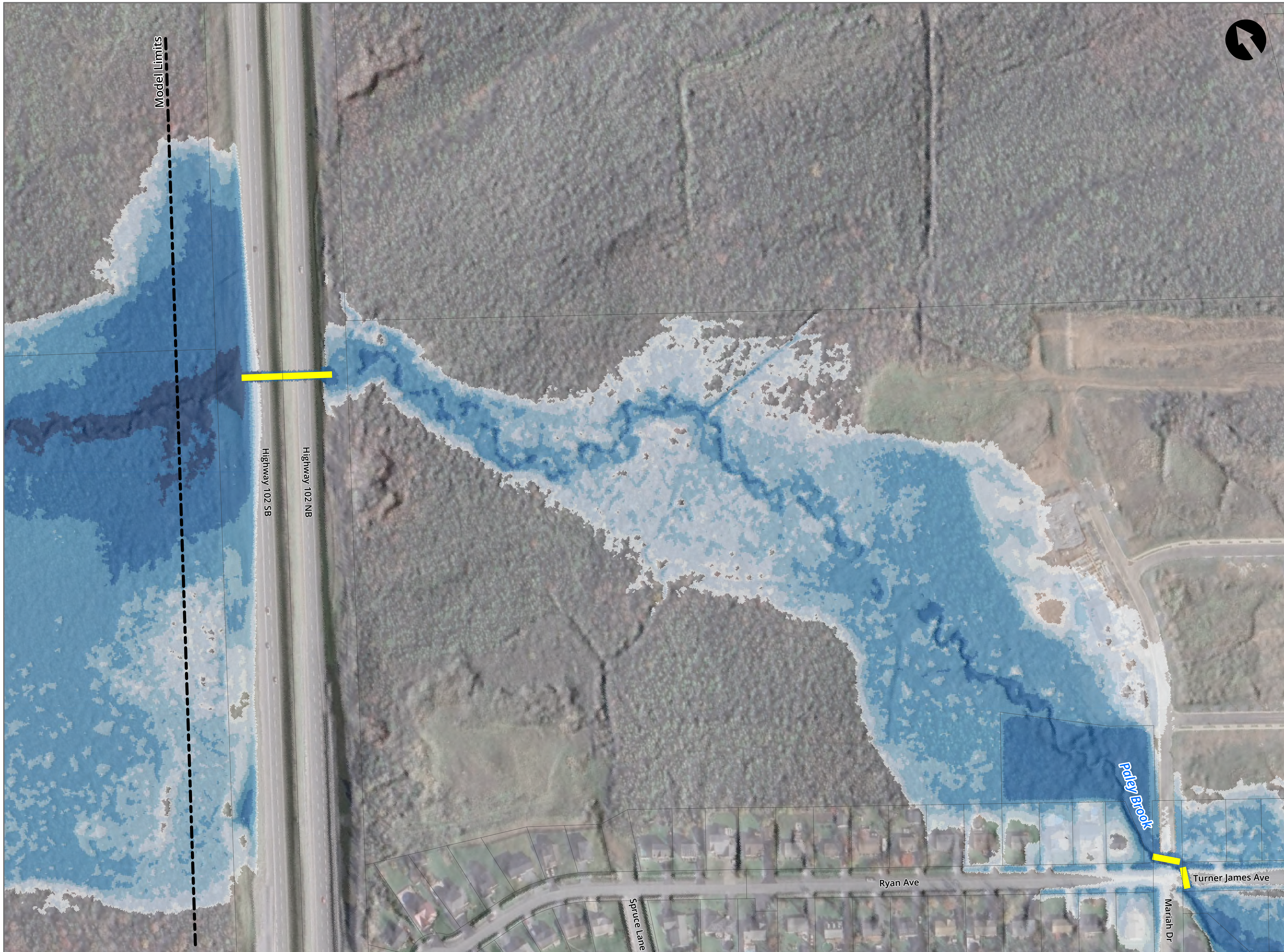
Drawing Title:
PROPOSED STORAGE PONDS
POND 1
FLOOD LINES
1% AEP

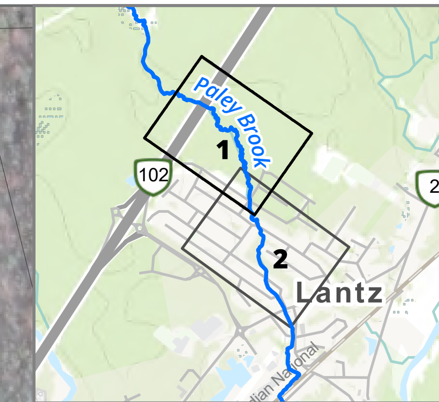
CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:4,250 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 6.1.2.0 |

Figure Name: Y:\Halifax\Data\Projects\2024\241221.00 Paley Brook Flood Study, East Hants\44 CAD\08 GIS\PRO\241221_Paley_Brook_Flood_Study - Appendix D.aprx




Legend:
1% AEP Flood Line Depth

- 0m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5m - 1 m
- 1 m - 2 m
- 2 m - 3.85 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:
PALEY BROOK FLOOD RISK MITIGATION STUDY

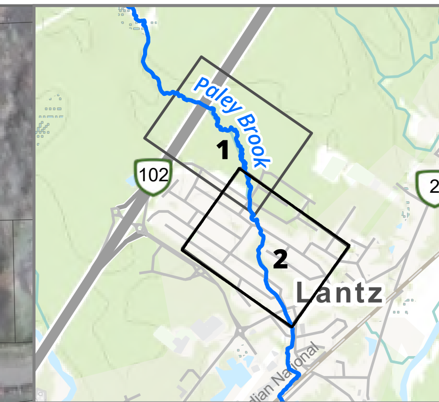
Drawing Title:
PROPOSED STORAGE PONDS
POND 1
FLOOD LINES
1% AEP

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 6.1.2.1 |

Figure Name: Y:\Halifax\Data\Projects\2024\241221.00 Paley Brook Flood Study, East Hants\44 CAD\08 GIS\PRO\241221_Paley_Brook_Flood_Study - Appendix D.aprx


Legend:
1% AEP Flood Line Depth

- 0m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5m - 1 m
- 1 m - 2 m
- 2 m - 3.85 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:
PALEY BROOK FLOOD
RISK MITIGATION STUDY

Drawing Title:
PROPOSED STORAGE PONDS
POND 1
FLOOD LINES
1% AEP

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 6.1.2.2 |

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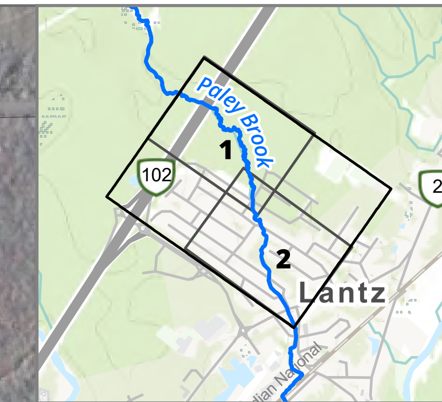


Legend:
5% AEP, 2100 Climate Change
Flood Line Depth

- 0 m - 0.1 m
- 0.1m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.97 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:
PALEY BROOK FLOOD
RISK MITIGATION STUDY

Drawing Title:
PROPOSED STORAGE PONDS
POND 1
FLOOD LINES
5% AEP, 2100 CLIMATE CHANGE

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:4,250 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 6.1.3.0 |

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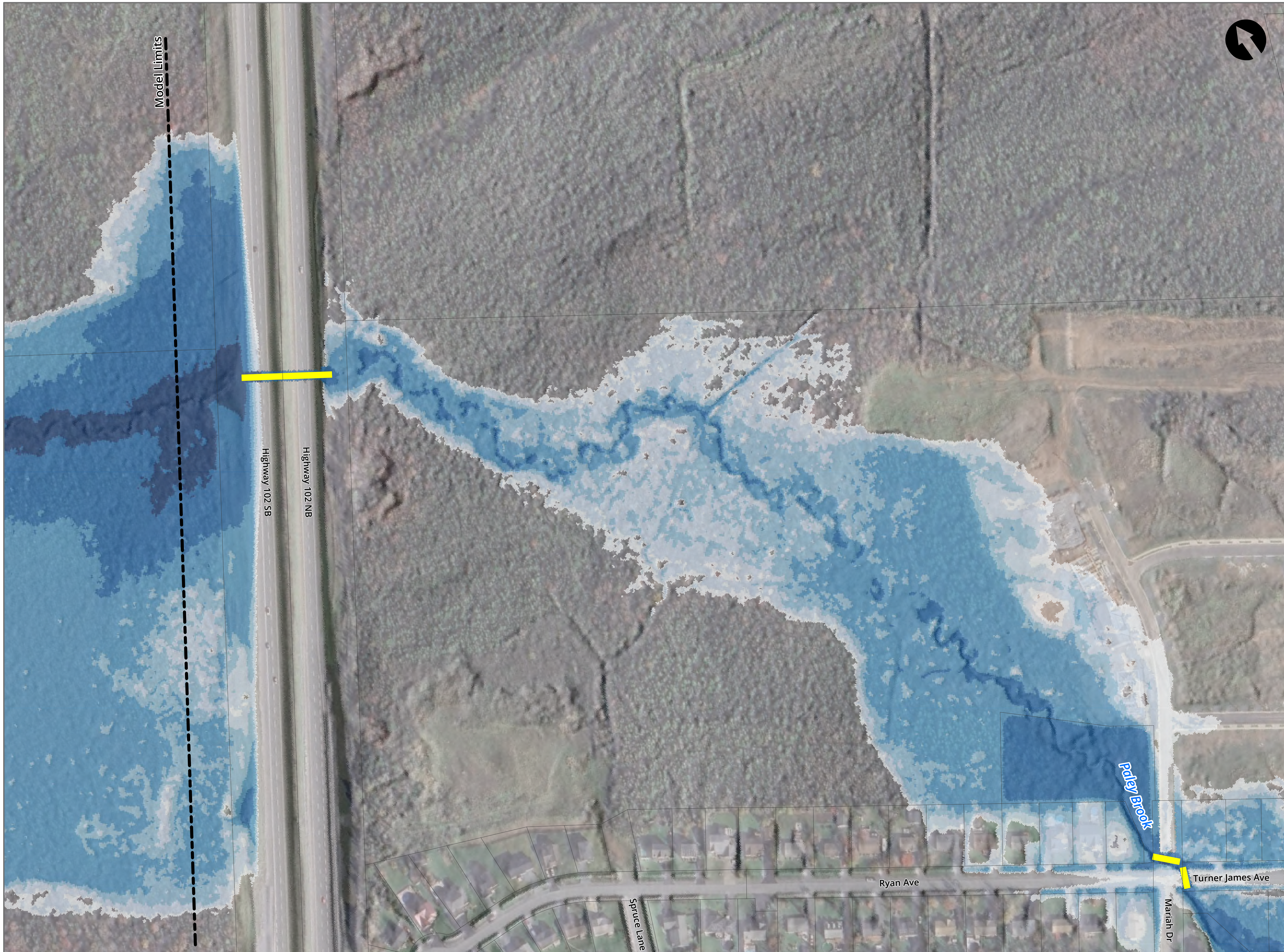


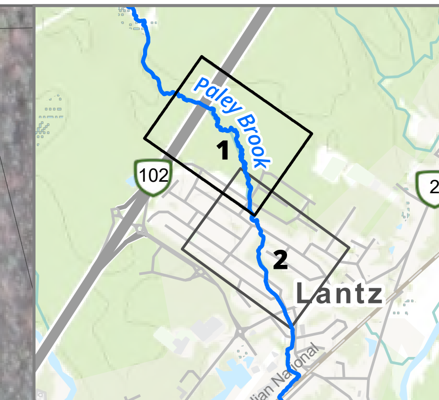


Legend:
5% AEP, 2100 Climate Change
Flood Line Depth

- 0 m - 0.1 m
- 0.1m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.97 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:
PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:
PROPOSED STORAGE PONDS
POND 1
FLOOD LINES
5% AEP, 2100 CLIMATE CHANGE

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 6.1.3.1 |

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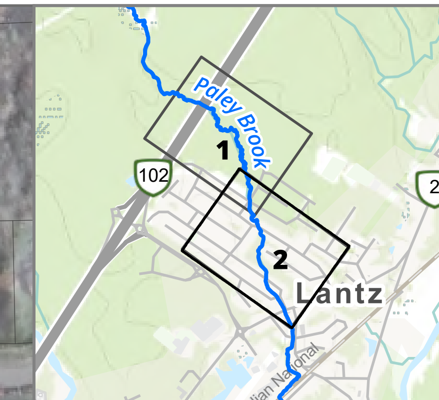


Legend:
5% AEP, 2100 Climate Change
Flood Line Depth

- 0 m - 0.1 m
- 0.1m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.97 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:
PALEY BROOK FLOOD
RISK MITIGATION STUDY

Drawing Title:
PROPOSED STORAGE PONDS
POND 1
FLOOD LINES
5% AEP, 2100 CLIMATE CHANGE

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 6.1.3.2 |

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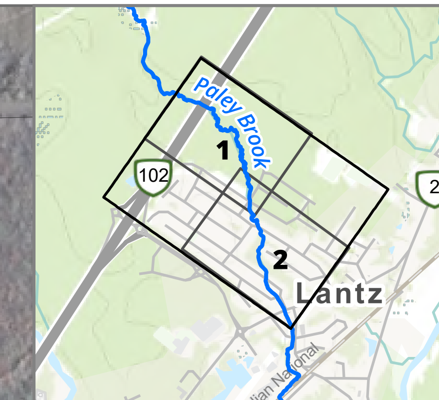


Legend:

1% AEP, 2100 Climate Change
Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1.01 m - 2 m
- 2 m - 4.37 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:

PALEY BROOK FLOOD
RISK MITIGATION STUDY

Drawing Title:

PROPOSED STORAGE PONDS
POND 1
FLOOD LINES
1% AEP, 2100 CLIMATE CHANGE

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:4,250 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 6.1.4.0 |

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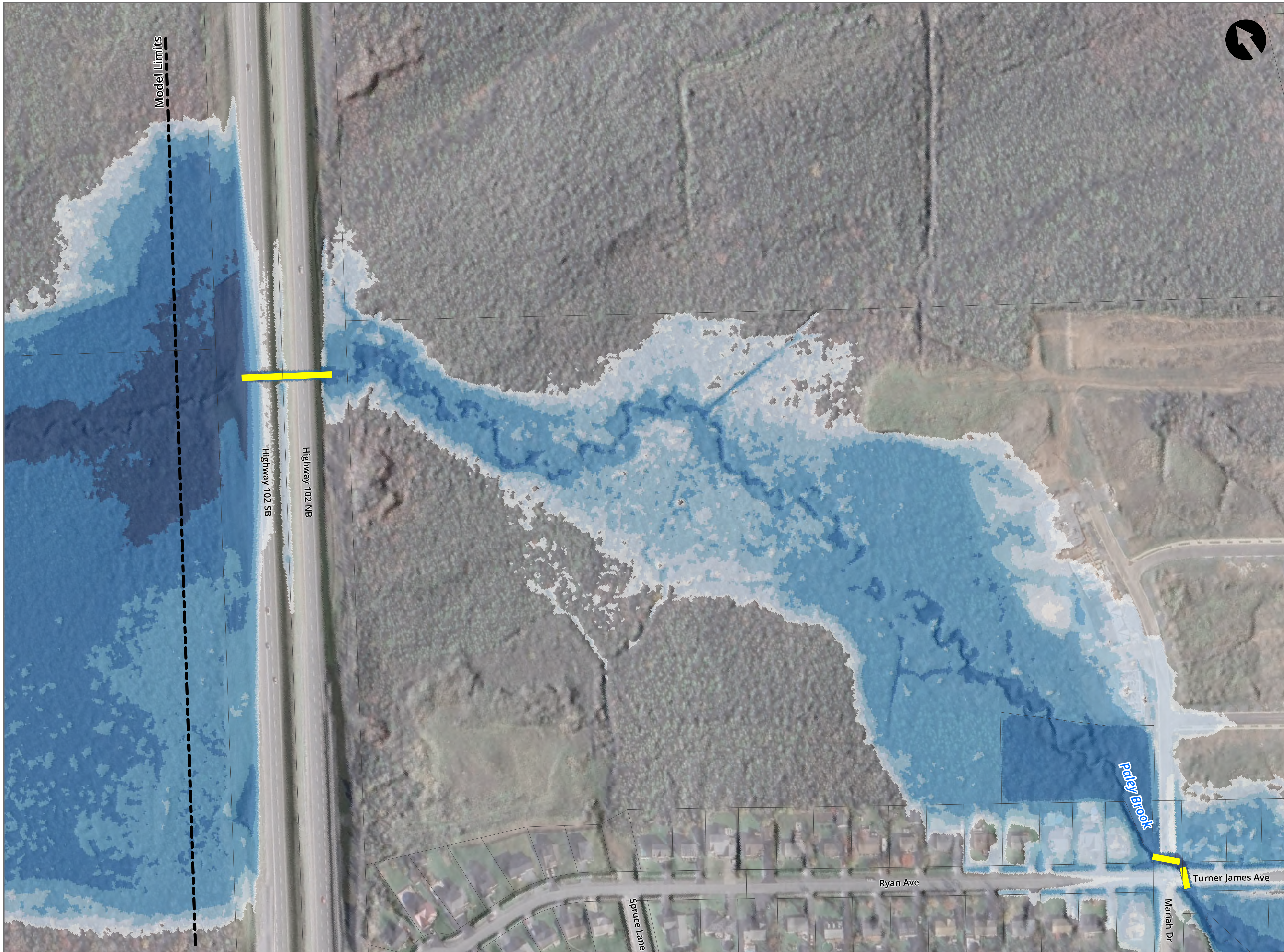


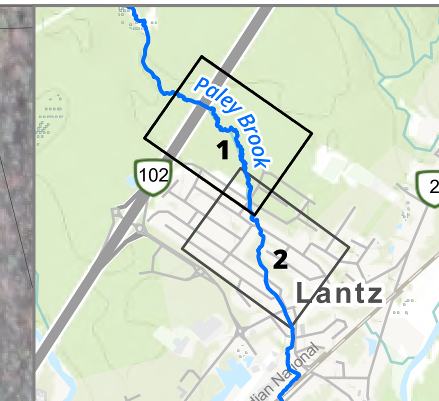


Legend:

1% AEP, 2100 Climate Change Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1.01 m - 2 m
- 2 m - 4.37 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:

PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:

PROPOSED STORAGE PONDS
POND 1
FLOOD LINES
1% AEP, 2100 CLIMATE CHANGE

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 6.1.4.1 |

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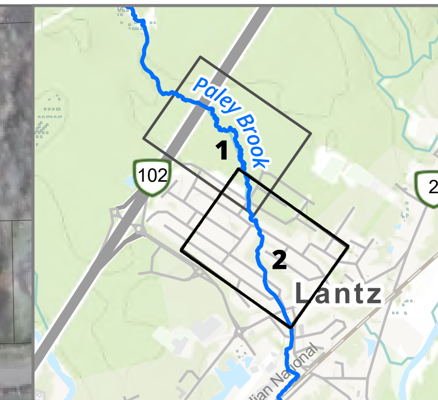


Legend:

1% AEP, 2100 Climate Change Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1.01 m - 2 m
- 2 m - 4.37 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:

PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:

PROPOSED STORAGE PONDS
POND 1
FLOOD LINES
1% AEP, 2100 CLIMATE CHANGE

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
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| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 6.1.4.2 |

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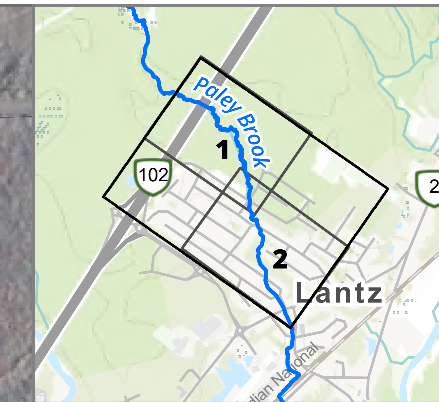


Legend:
5% AEP Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.51 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 28, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:
PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:
PROPOSED STORAGE PONDS
POND 2
FLOOD LINES
5% AEP

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:4,250 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 6.2.1.0 |

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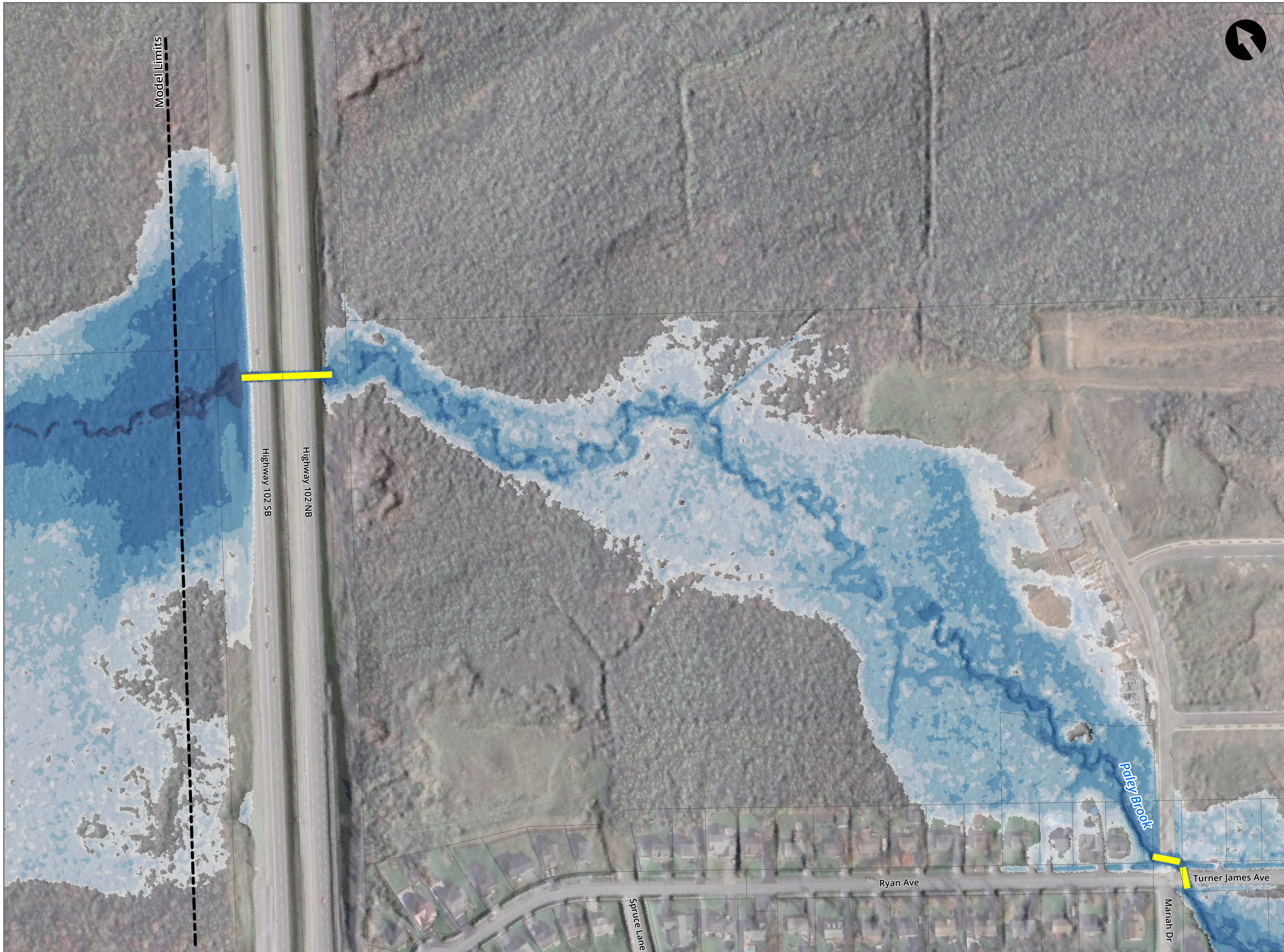
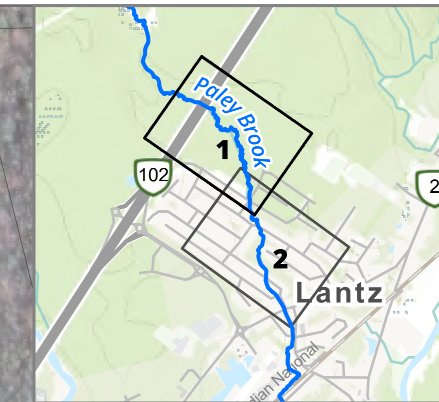



Legend:
5% AEP Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.51 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 28, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:
PALEY BROOK FLOOD RISK MITIGATION STUDY

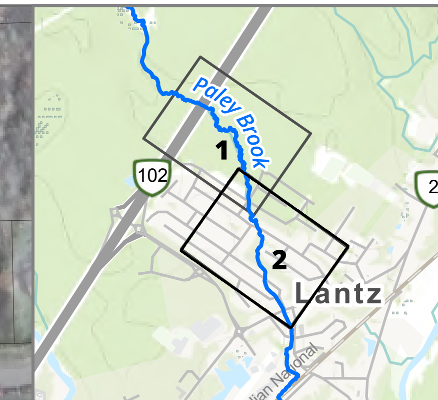
Drawing Title:
PROPOSED STORAGE PONDS
POND 2
FLOOD LINES
5% AEP

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 6.2.1.1 |

Figure Name: Y:\Halifax\Data\Projects\2024\241221.00 Paley Brook Flood Study, East Hants\44 CAD\08 GIS\PRO\241221_Paley_Brook_Flood_Study - Appendix D.aprx


Legend:
5% AEP Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.51 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 28, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:
PALEY BROOK FLOOD RISK MITIGATION STUDY

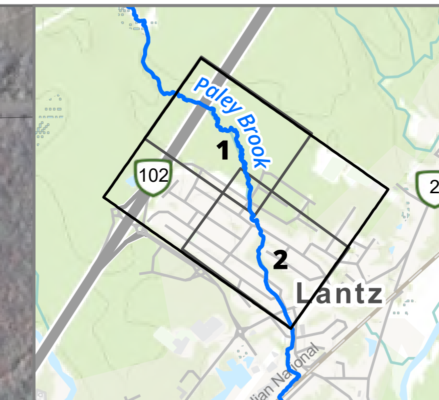
Drawing Title:
PROPOSED STORAGE PONDS POND 2 FLOOD LINES 5% AEP

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 6.2.1.2 |

Figure Name: Y:\Halifax\Data\Projects\2024\241221.00 Paley Brook Flood Study, East Hants\44 CAD\08 GIS\PRO\241221_Paley_Brook_Flood_Study - Appendix D.aprx


Legend:
1% AEP Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5m - 1 m
- 1 m - 2 m
- 2 m - 3.85 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:
PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:
PROPOSED STORAGE PONDS
POND 2
FLOOD LINES
1% AEP

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:4,250 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 6.2.2.0 |

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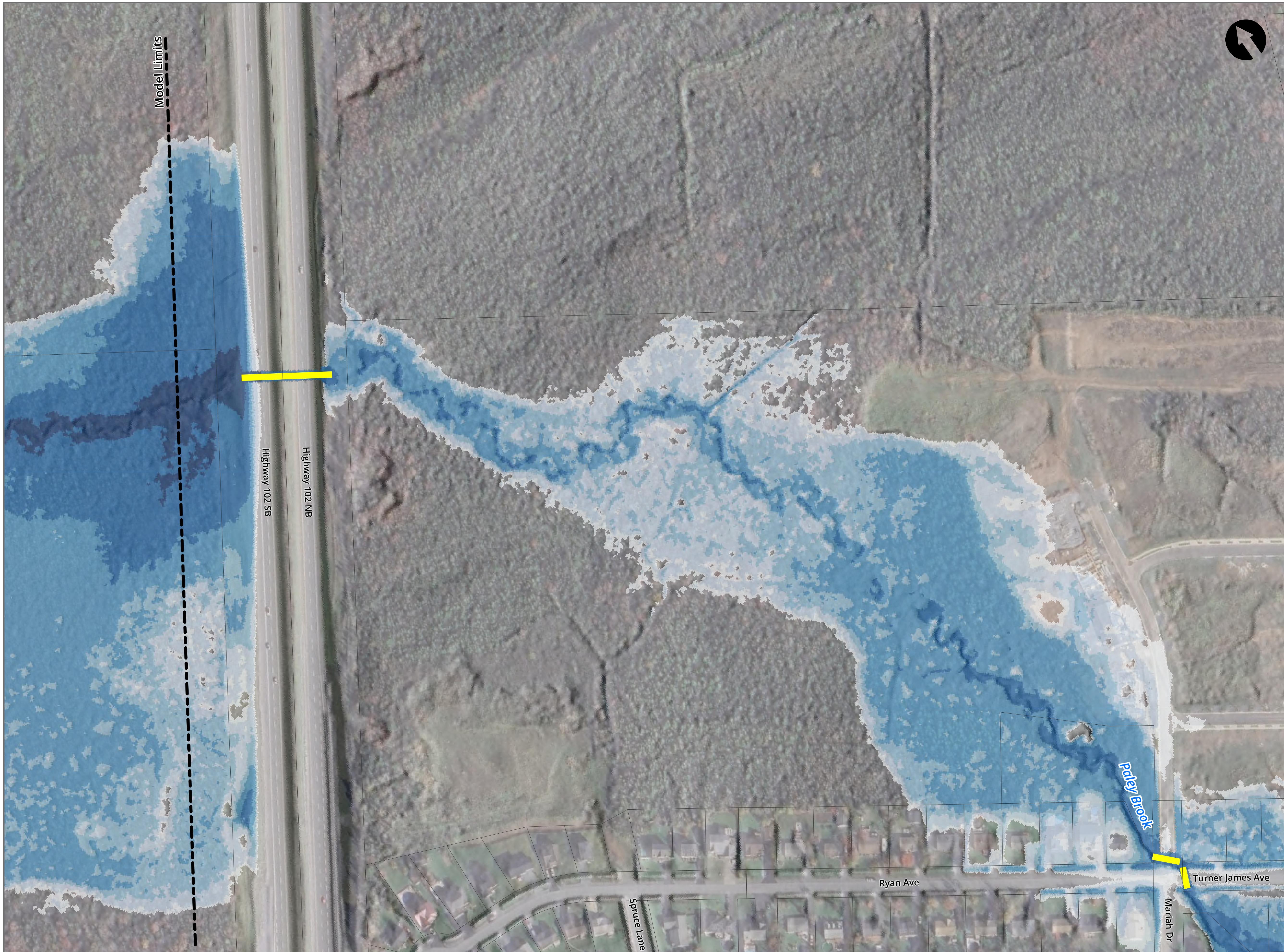
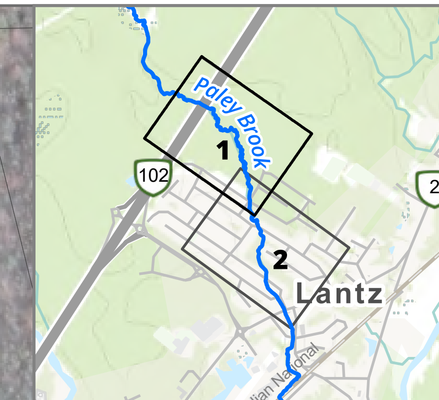



Legend:
1% AEP Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5m - 1 m
- 1 m - 2 m
- 2 m - 3.85 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:
PALEY BROOK FLOOD
RISK MITIGATION STUDY

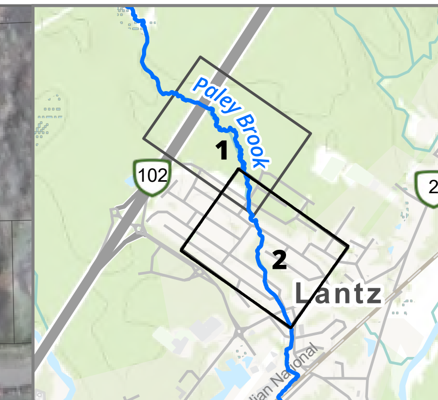
Drawing Title:
PROPOSED STORAGE PONDS
POND 2
FLOOD LINES
1% AEP

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 6.2.2.1 |

Figure Name: Y:\Halifax\Data\Projects\2024\241221.00 Paley Brook Flood Study, East Hants\44 CAD\08 GIS\PRO\241221_Paley_Brook_Flood_Study - Appendix D.aprx


Legend:
1% AEP Flood Line Depth
- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5m - 1 m
- 1 m - 2 m
- 2 m - 3.85 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:
PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:
PROPOSED STORAGE PONDS POND 2 FLOOD LINES 1% AEP

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

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| Project No: | 241221.00 | Figure No: | 6.2.2.2 |

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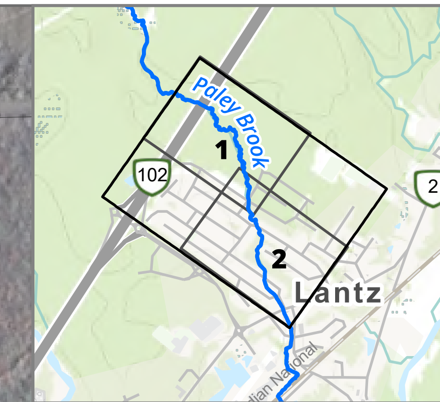


Legend:
5% AEP, 2100 Climate Change
Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.97 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:
PALEY BROOK FLOOD
RISK MITIGATION STUDY

Drawing Title:
PROPOSED STORAGE PONDS
POND 2
FLOOD LINES
5% AEP, 2100 CLIMATE CHANGE

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

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|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:4,250 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 6.2.3.0 |

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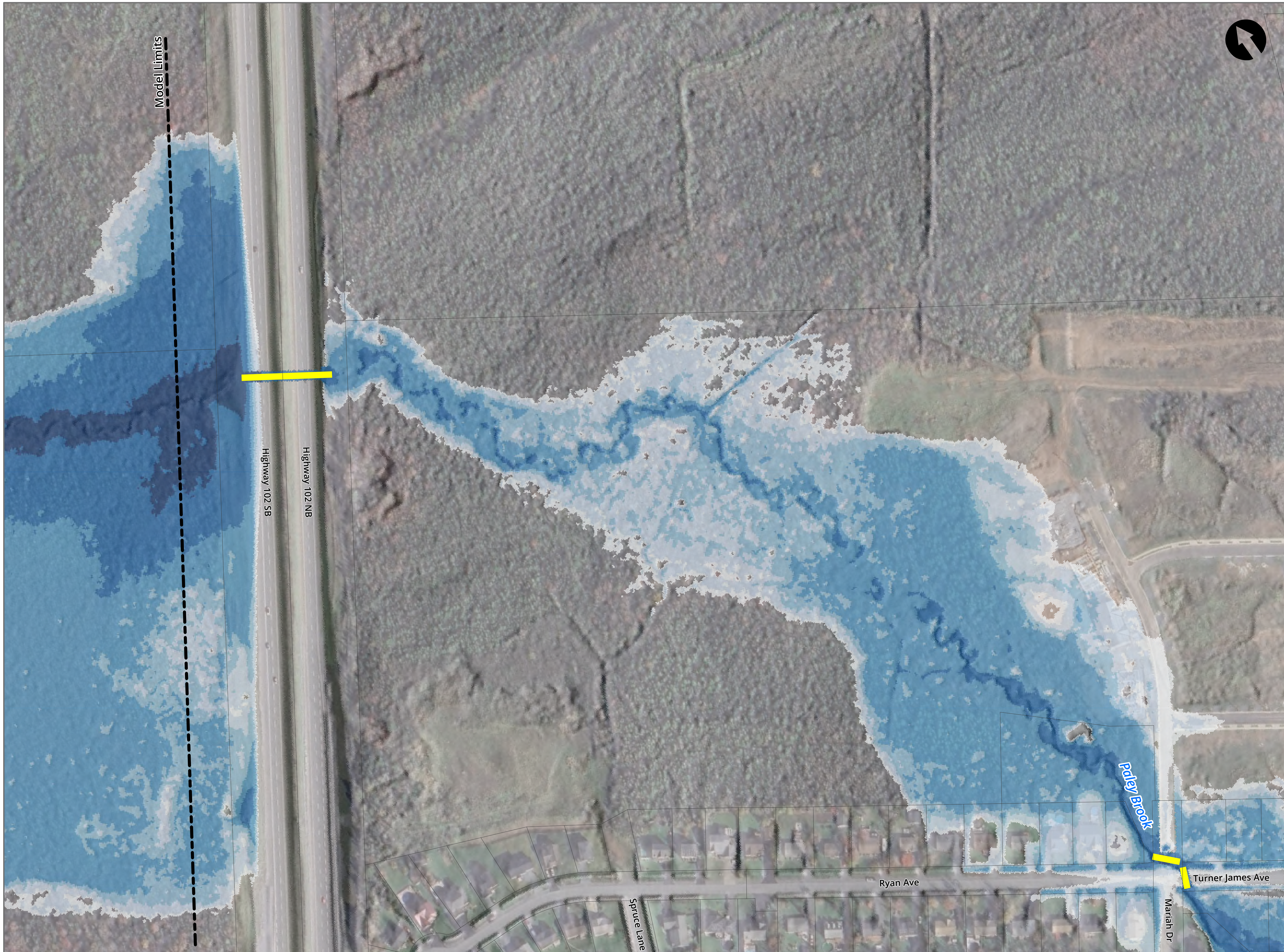


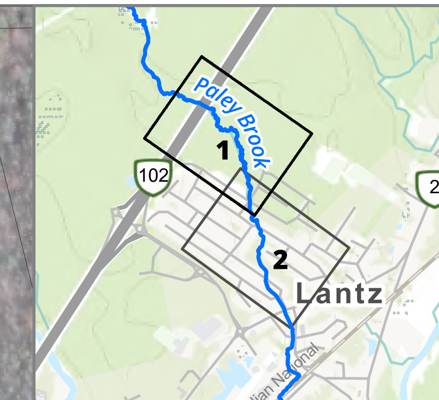


Legend:
5% AEP, 2100 Climate Change
Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.97 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:
PALEY BROOK FLOOD
RISK MITIGATION STUDY

Drawing Title:
PROPOSED STORAGE PONDS
POND 2
FLOOD LINES
5% AEP, 2100 CLIMATE CHANGE

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 6.2.3.1 |

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Legend:
5% AEP, 2100 Climate Change
Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.97 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
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| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
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EAST HANTS

Project:
PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:
PROPOSED STORAGE PONDS
POND 2
FLOOD LINES
5% AEP, 2100 CLIMATE CHANGE

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

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| Date: | FEB 2025 | Scale: | 1:2,500 |
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| Project No: | 241221.00 | Figure No: | 6.2.3.2 |

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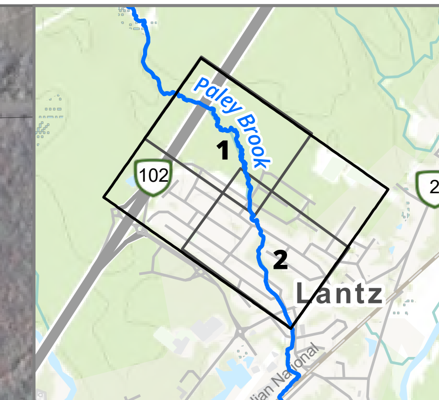


Legend:
1% AEP, 2100 Climate Change
Flood Line Depth

- 0m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 4.37 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:
PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:
PROPOSED STORAGE PONDS
POND 2
FLOOD LINES
1% AEP, 2100 CLIMATE CHANGE

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:4,250 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 6.2.4.0 |

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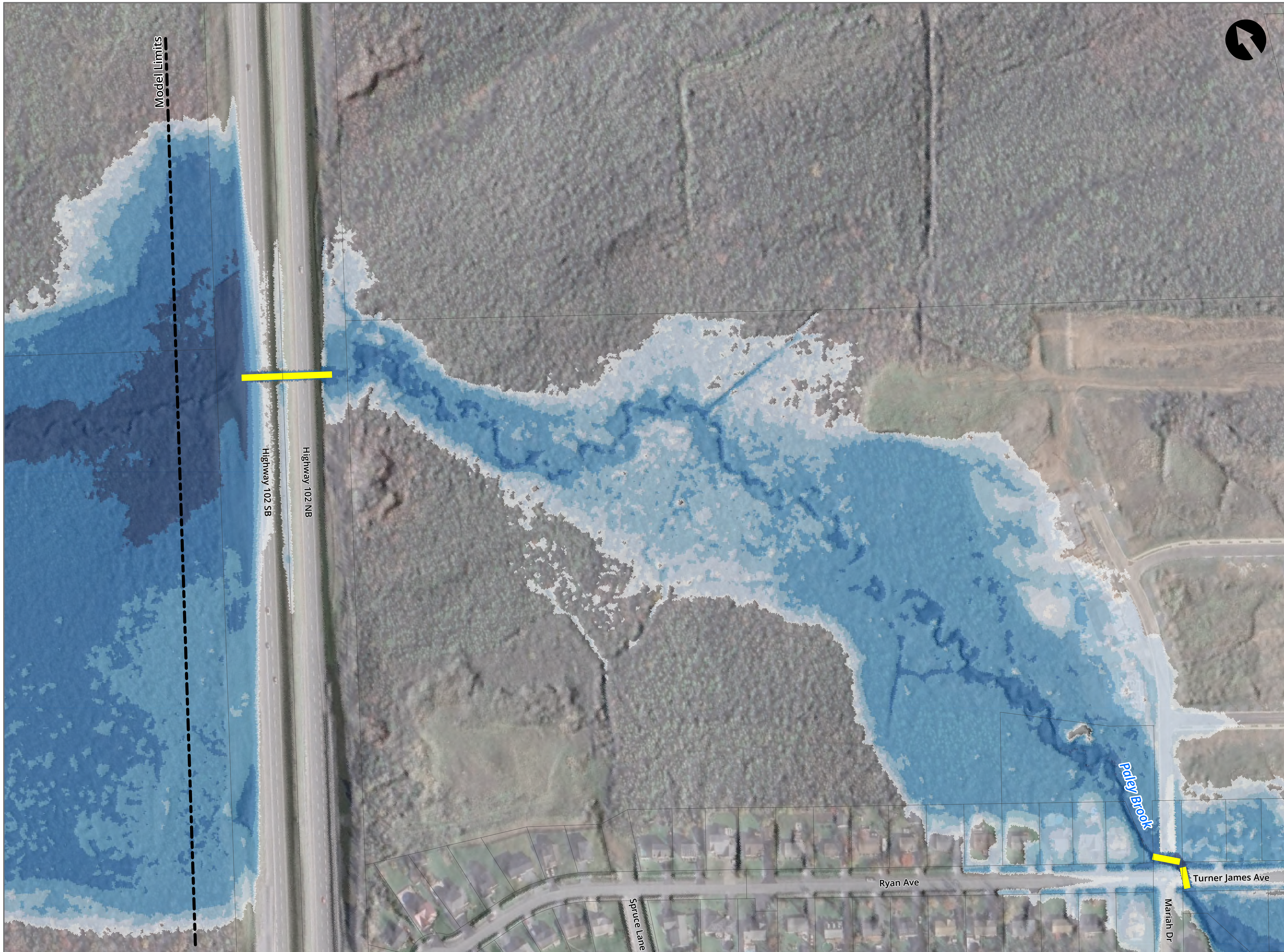


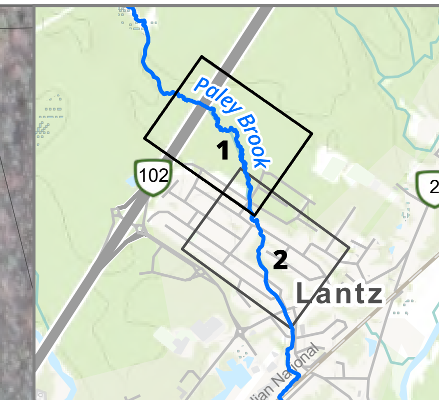


Legend:

1% AEP, 2100 Climate Change Flood Line Depth

- 0m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 4.37 m
- Culvert
- Property Parcel

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EAST HANTS

Project:

PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:

PROPOSED STORAGE PONDS
POND 2
FLOOD LINES
1% AEP, 2100 CLIMATE CHANGE

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
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| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 6.2.4.1 |

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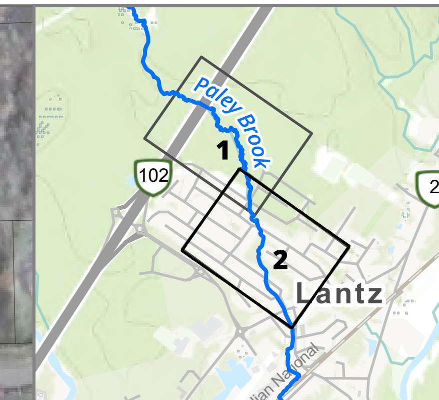


Legend:

1% AEP, 2100 Climate Change Flood Line Depth

- 0m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 4.37 m
- Culvert
- Property Parcel

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EAST HANTS

Project:

PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:

PROPOSED STORAGE PONDS
POND 2
FLOOD LINES
1% AEP, 2100 CLIMATE CHANGE

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
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| Project No: | 241221.00 | Figure No: | 6.2.4.2 |

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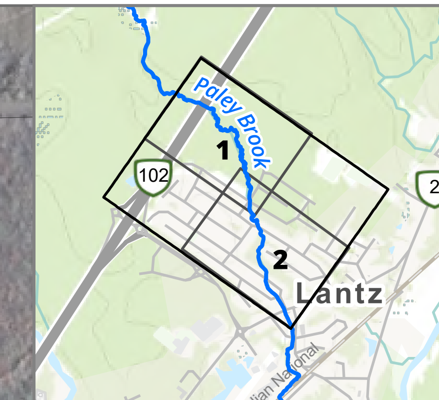


Legend:
5% AEP Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.51 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 28, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:
PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:
PROPOSED STORAGE PONDS
POND 3
FLOOD LINES
5% AEP

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
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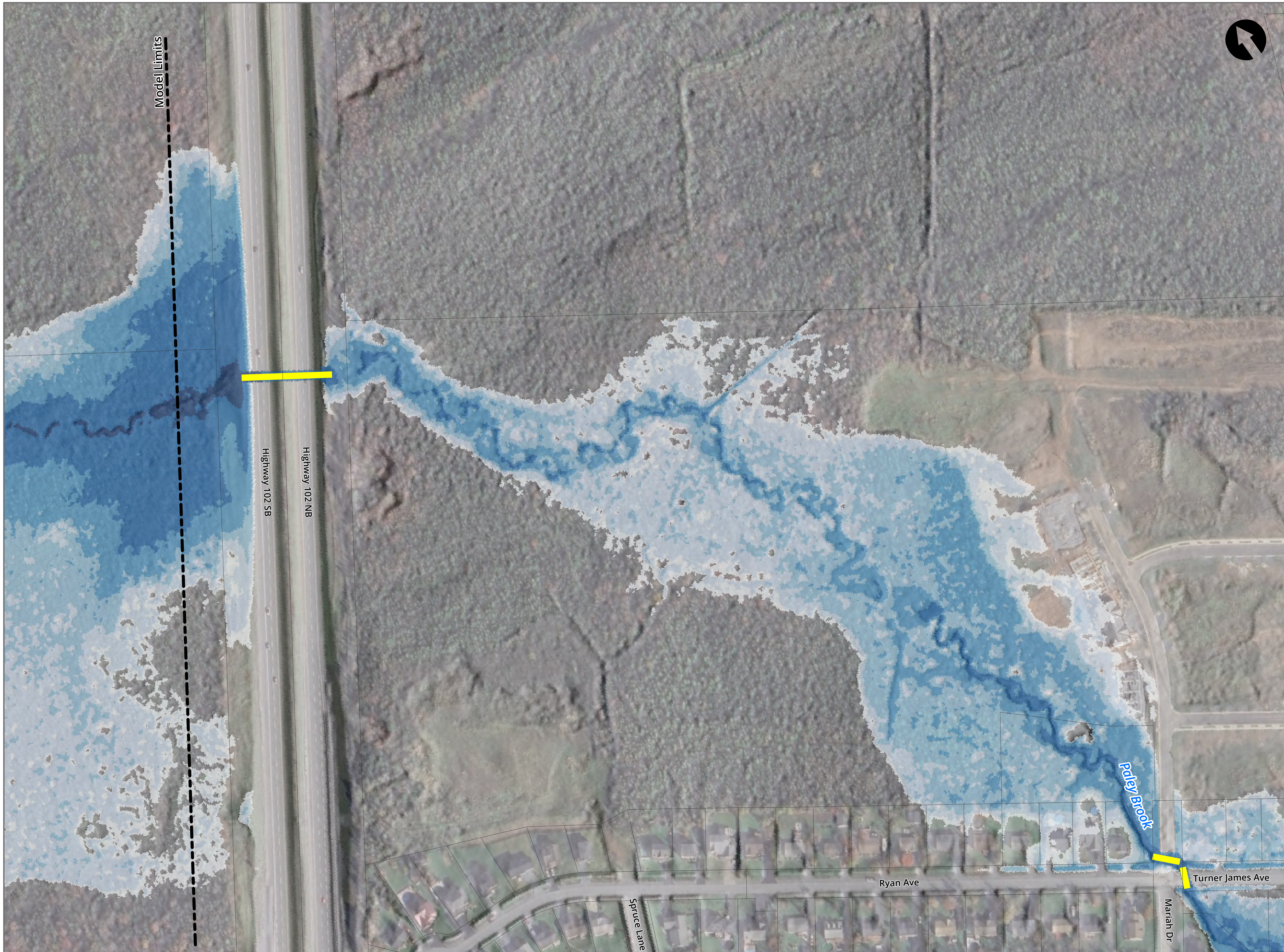
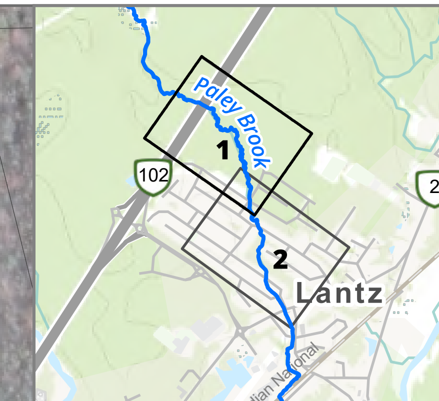
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 6.3.1.0 |

Figure Name: Y:\Halifax\Data\Projects\2024\241221.00 Paley Brook Flood Study, East Hants\44 CAD\08 GIS\PRO\241221_Paley_Brook_Flood_Study - Appendix D.aprx




Legend:
5% AEP Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.51 m
- Culvert
- Property Parcel

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EAST HANTS

Project:
PALEY BROOK FLOOD
RISK MITIGATION STUDY

Drawing Title:
PROPOSED STORAGE PONDS
POND 3
FLOOD LINES
5% AEP

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
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| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 6.3.1.1 |

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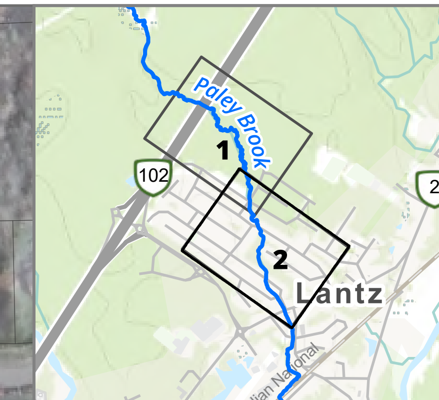



Legend:
5% AEP Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.51 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 28, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:
PALEY BROOK FLOOD
RISK MITIGATION STUDY

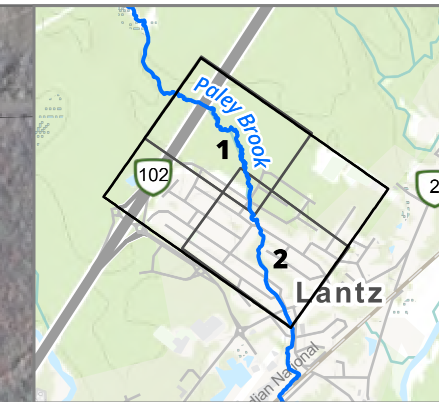
Drawing Title:
PROPOSED STORAGE PONDS
POND 3
FLOOD LINES
5% AEP

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 6.3.1.2 |

Figure Name: Y:\Halifax\Data\Projects\2024\241221.00 Paley Brook Flood Study, East Hants\44 CAD\08 GIS\PRO\241221_Paley_Brook_Flood_Study - Appendix D.aprx


Legend:
1% AEP Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.85 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:
PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:
PROPOSED STORAGE PONDS
POND 3
FLOOD LINES
1% AEP

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

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| Date: | FEB 2025 | Scale: | 1:4,250 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 6.3.2.0 |

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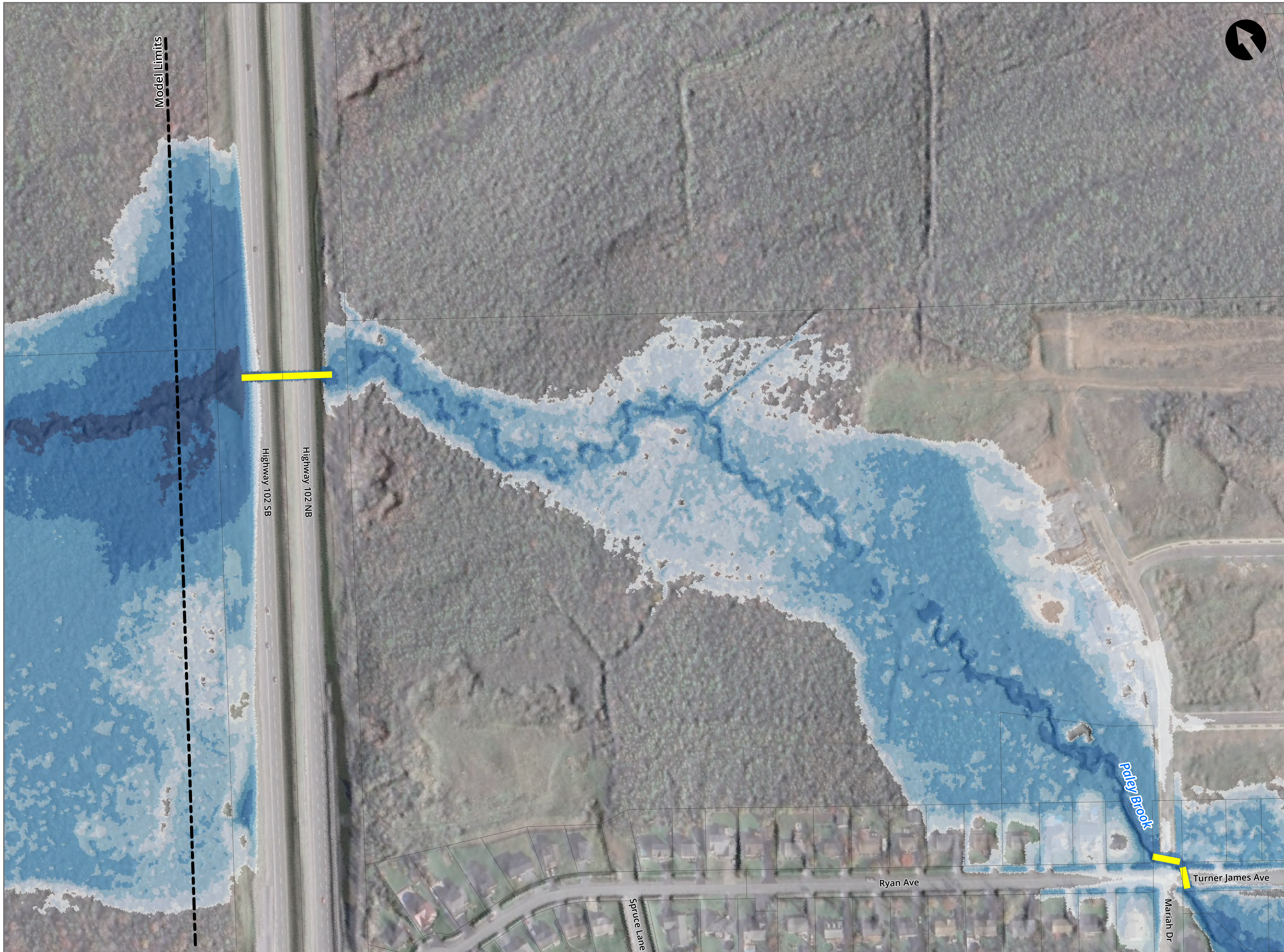


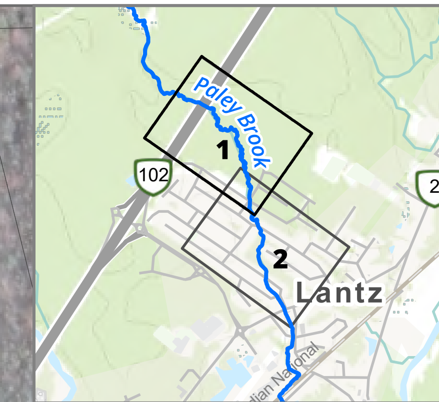


Legend:
1% AEP Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.85 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
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| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:
PALEY BROOK FLOOD
RISK MITIGATION STUDY

Drawing Title:
PROPOSED STORAGE PONDS
POND 3
FLOOD LINES
1% AEP

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

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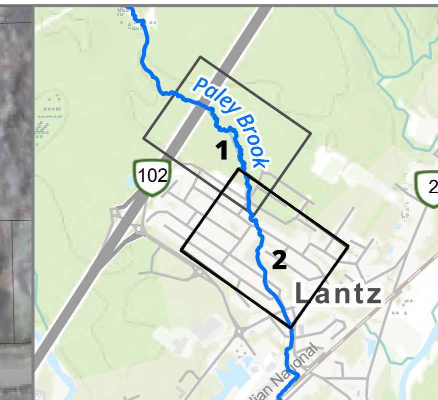
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 6.3.2.1 |

Figure Name: Y:\Halifax\Data\Projects\2024\241221.00 Paley Brook Flood Study, East Hants\44 CAD\08 GIS\PRO\241221_Paley_Brook_Flood_Study - Appendix D.aprx


Legend:
1% AEP Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.85 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
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| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
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EAST HANTS

Project:
PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:
PROPOSED STORAGE PONDS
POND 3
FLOOD LINES
1% AEP

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

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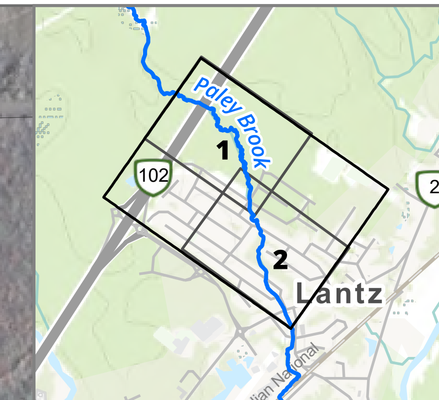
Figure Name: Y:\Halifax\Data\Projects\2024\241221.00 Paley Brook Flood Study, East Hants\44 CAD\08 GIS\PRO\241221_Paley_Brook_Flood_Study - Appendix D.aprx


Legend:
5% AEP, 2100 Climate Change
Flood Line Depth

- 0m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.97 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:
PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:
PROPOSED STORAGE PONDS
POND 3
FLOOD LINES
5% AEP, 2100 CLIMATE CHANGE

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

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|---|---|---|---|
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| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 6.3.3.0 |

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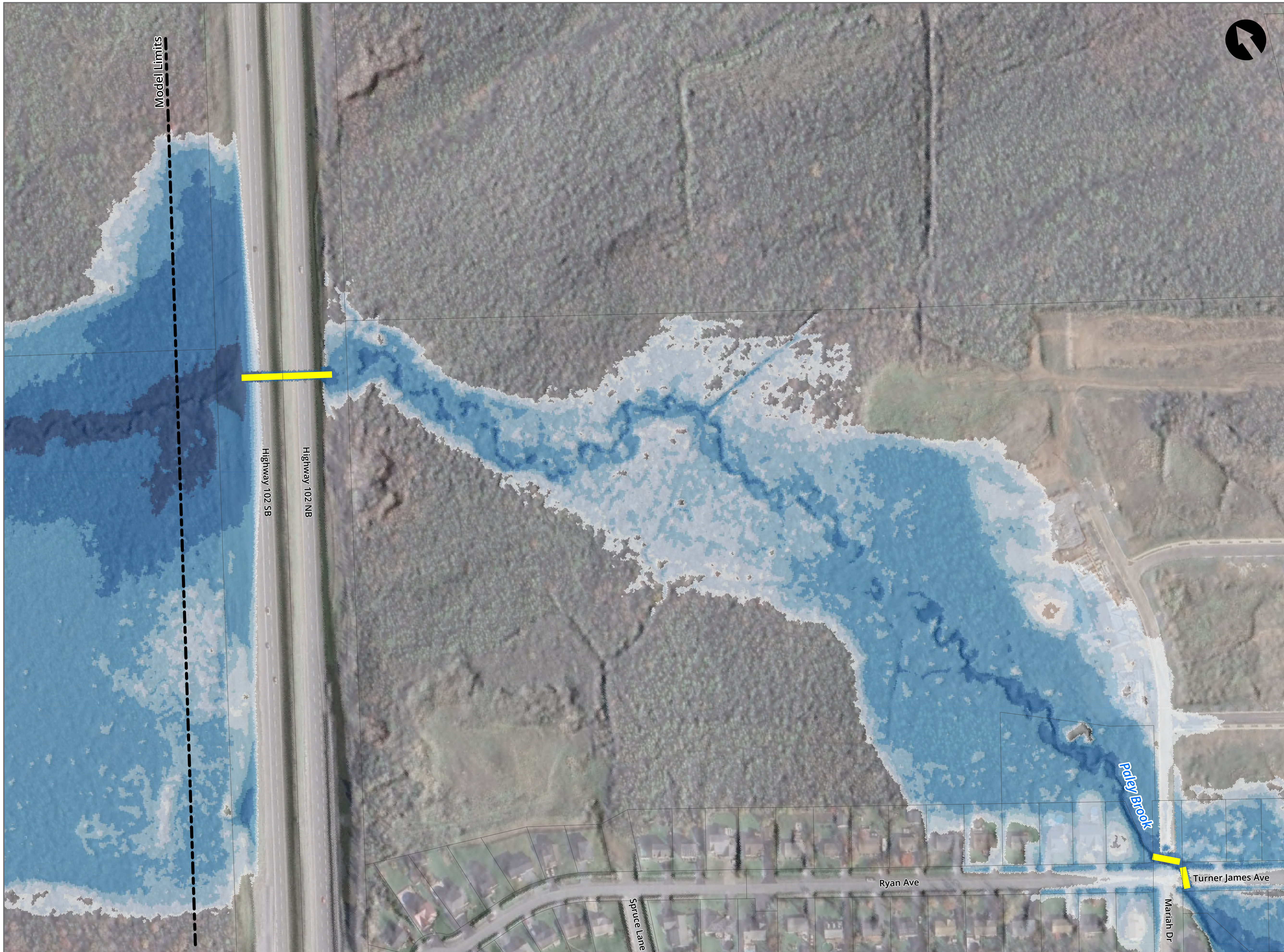


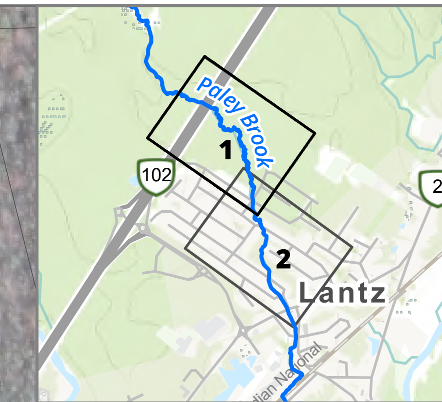


Legend:
5% AEP, 2100 Climate Change
Flood Line Depth

- 0m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.97 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:
PALEY BROOK FLOOD
RISK MITIGATION STUDY

Drawing Title:
PROPOSED STORAGE PONDS
POND 3
FLOOD LINES
5% AEP, 2100 CLIMATE CHANGE

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 6.3.3.1 |

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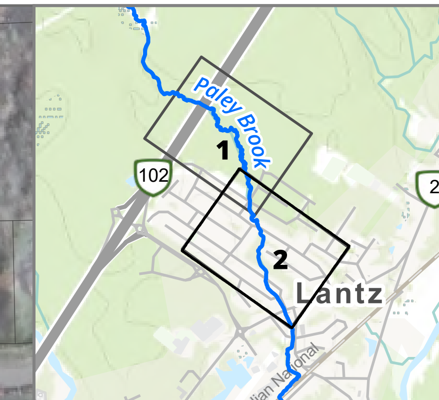


Legend:
5% AEP, 2100 Climate Change
Flood Line Depth

- 0m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.97 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
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| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
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EAST HANTS

Project:
PALEY BROOK FLOOD
RISK MITIGATION STUDY

Drawing Title:
PROPOSED STORAGE PONDS
POND 3
FLOOD LINES
5% AEP, 2100 CLIMATE CHANGE

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 6.3.3.2 |

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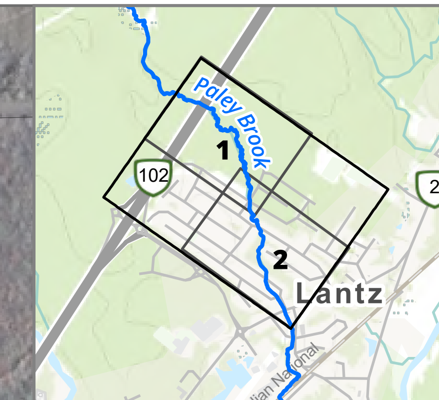


Legend:

1% AEP, 2100 Climate Change Flood Line Depth

- 0 m - 0.1 m
- 0.1m - 0.3 m
- 0.3m - 0.5 m
- 0.5m - 1 m
- 1 m - 2 m
- 2 m - 4.37 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:

PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:

PROPOSED STORAGE PONDS
POND 3
FLOOD LINES
1% AEP, 2100 CLIMATE CHANGE

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

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|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:4,250 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 6.3.4.0 |

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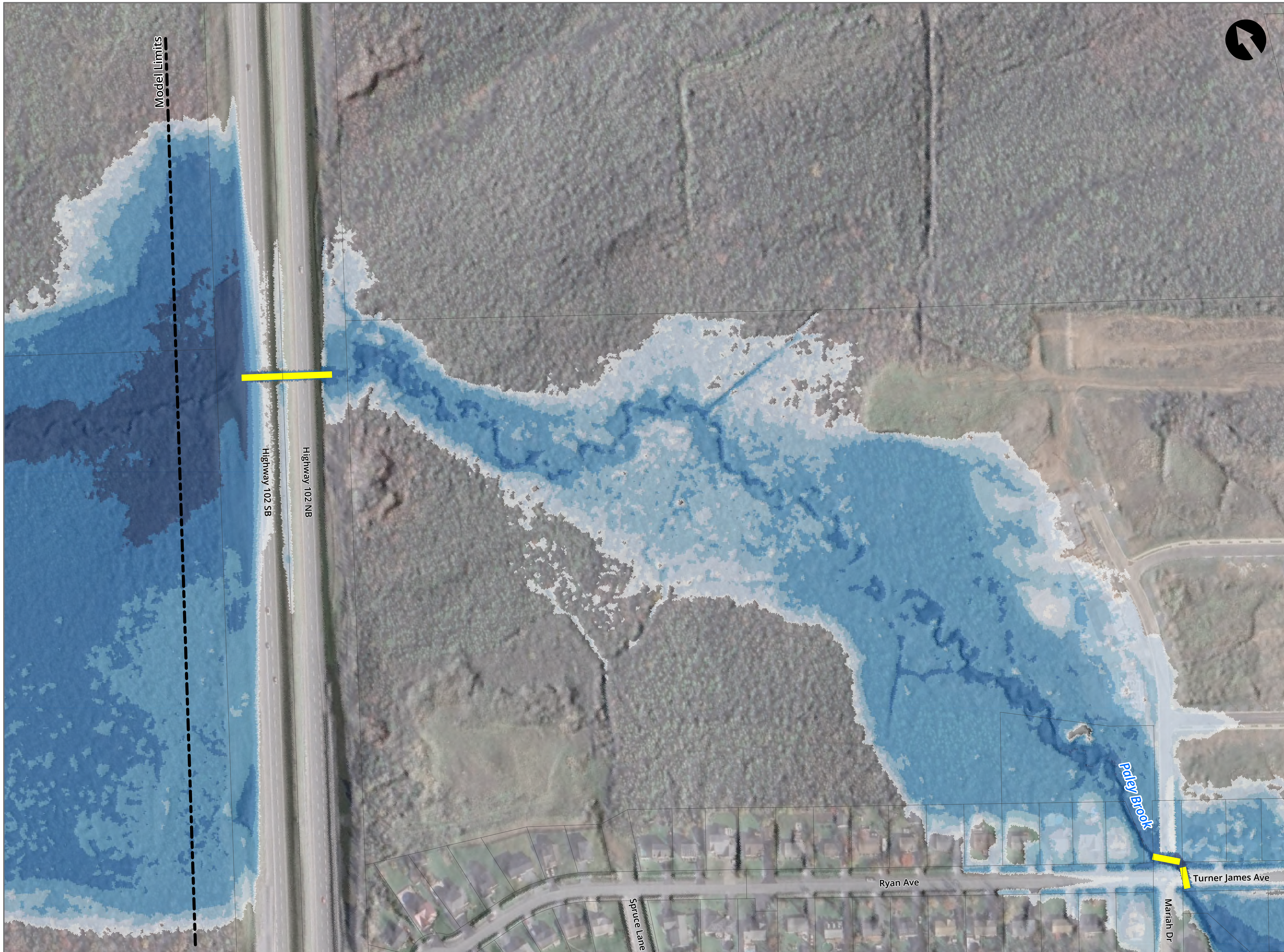


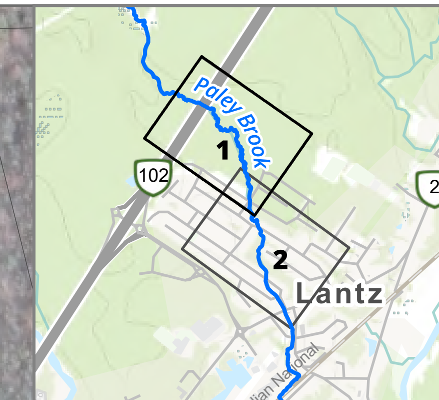


Legend:

1% AEP, 2100 Climate Change
Flood Line Depth

- 0 m - 0.1 m
- 0.1m - 0.3 m
- 0.3m - 0.5 m
- 0.5m - 1 m
- 1 m - 2 m
- 2 m - 4.37 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
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| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:

PALEY BROOK FLOOD
RISK MITIGATION STUDY

Drawing Title:

PROPOSED STORAGE PONDS
POND 3
FLOOD LINES
1% AEP, 2100 CLIMATE CHANGE

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 6.3.4.1 |

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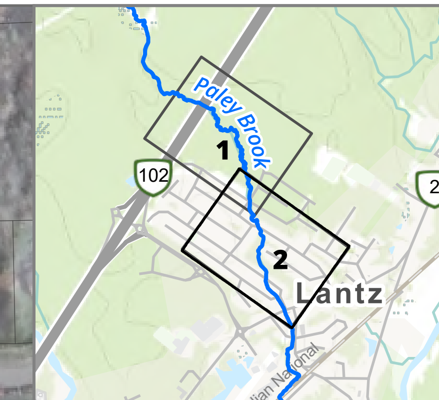


Legend:

1% AEP, 2100 Climate Change Flood Line Depth

- 0 m - 0.1 m
- 0.1m - 0.3 m
- 0.3m - 0.5 m
- 0.5m - 1 m
- 1 m - 2 m
- 2 m - 4.37 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:

PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:

PROPOSED STORAGE PONDS
POND 3
FLOOD LINES
1% AEP, 2100 CLIMATE CHANGE

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

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| Project No: | 241221.00 | Figure No: | 6.3.4.2 |

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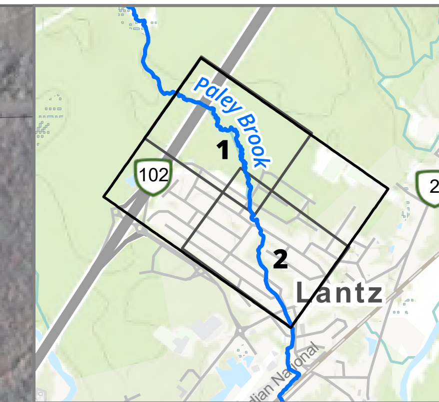


Legend:
5% AEP Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.15 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 28, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:
PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:
PROPOSED STORAGE PONDS
ALL PONDS
FLOOD LINES
5% AEP

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

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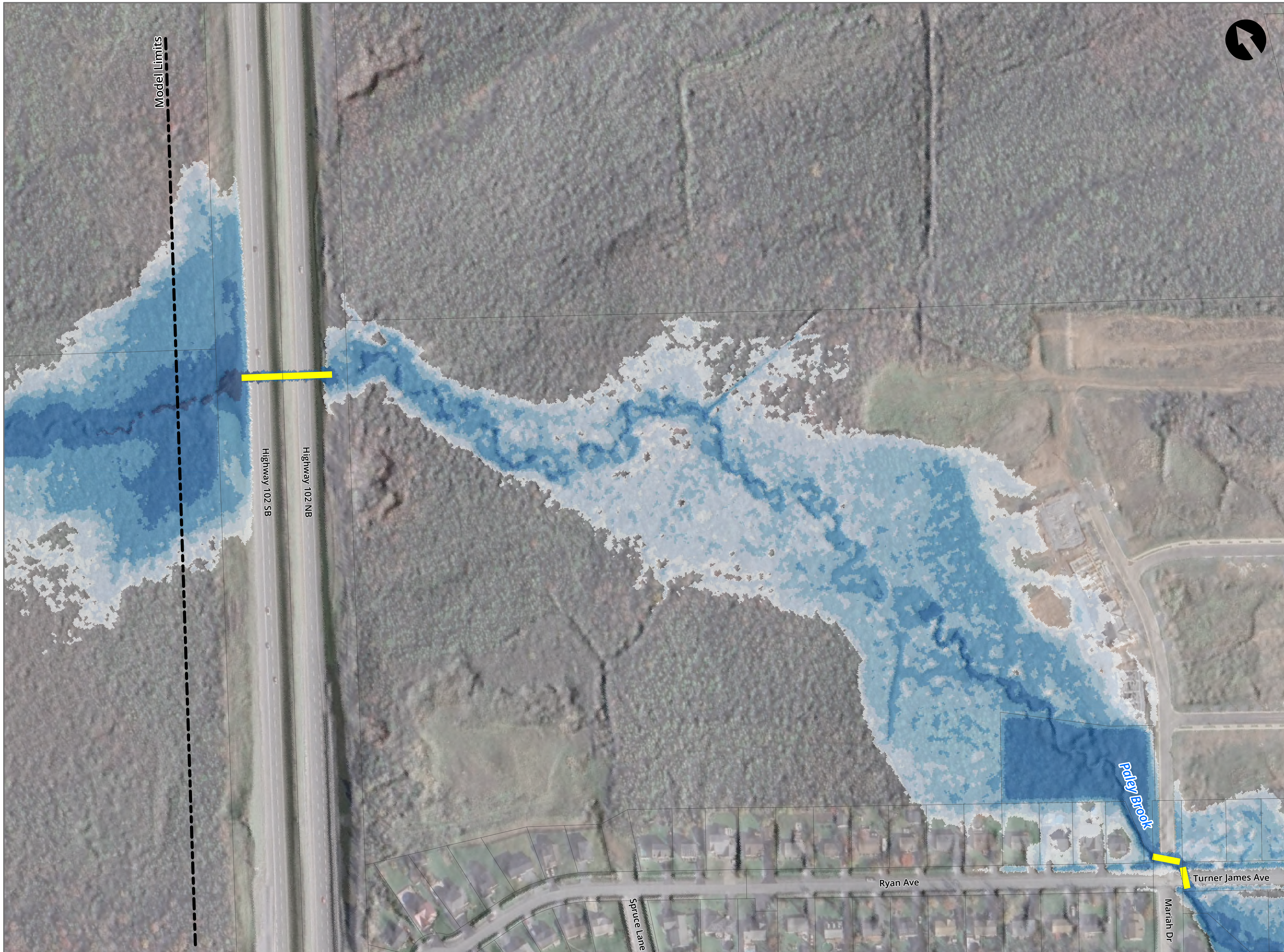
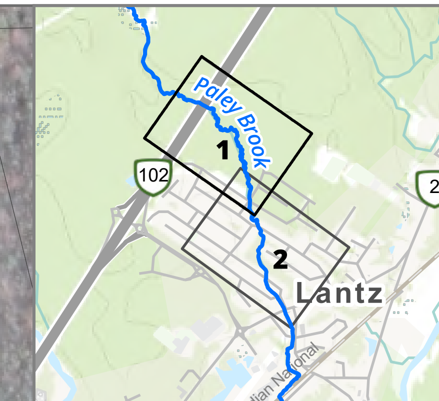
| Project No: | 241221.00 | Figure No: | 6.4.1.0 |

Figure Name: Y:\Halifax\Data\Projects\2024\241221.00 Paley Brook Flood Study, East Hants\44 CAD\08 GIS\PRO\241221_Paley_Brook_Flood_Study - Appendix D.aprx




Legend:
5% AEP Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.15 m
- Culvert
- Property Parcel

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EAST HANTS

Project:
PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:
PROPOSED STORAGE PONDS
ALL PONDS
FLOOD LINES
5% AEP

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

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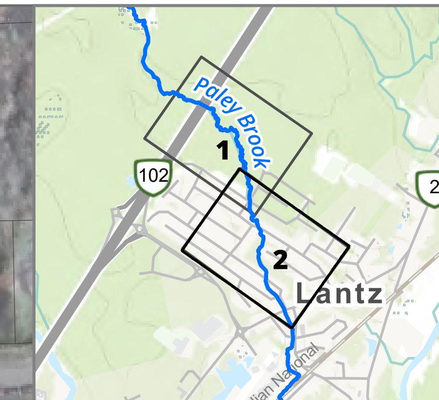
| Project No: | 241221.00 | Figure No: | 6.4.1.1 |

Figure Name: Y:\Halifax\Data\Projects\2024\241221.00 Paley Brook Flood Study, East Hants\44 CAD\08 GIS\PRO\241221_Paley_Brook_Flood_Study - Appendix D.aprx


Legend:
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- 0.5 m - 1 m
- 1 m - 2 m
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- Property Parcel

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EAST HANTS

Project:
PALEY BROOK FLOOD
RISK MITIGATION STUDY

Drawing Title:
PROPOSED STORAGE PONDS
ALL PONDS
FLOOD LINES
5% AEP

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

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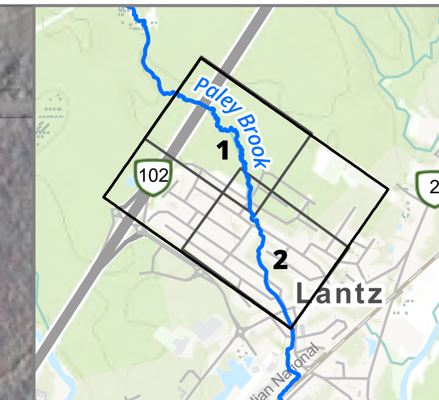


Legend:
1% AEP Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.85 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:
PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:
PROPOSED STORAGE PONDS
ALL PONDS
FLOOD LINES
1% AEP

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

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| Project No: | 241221.00 | Figure No: | 6.4.2.0 |

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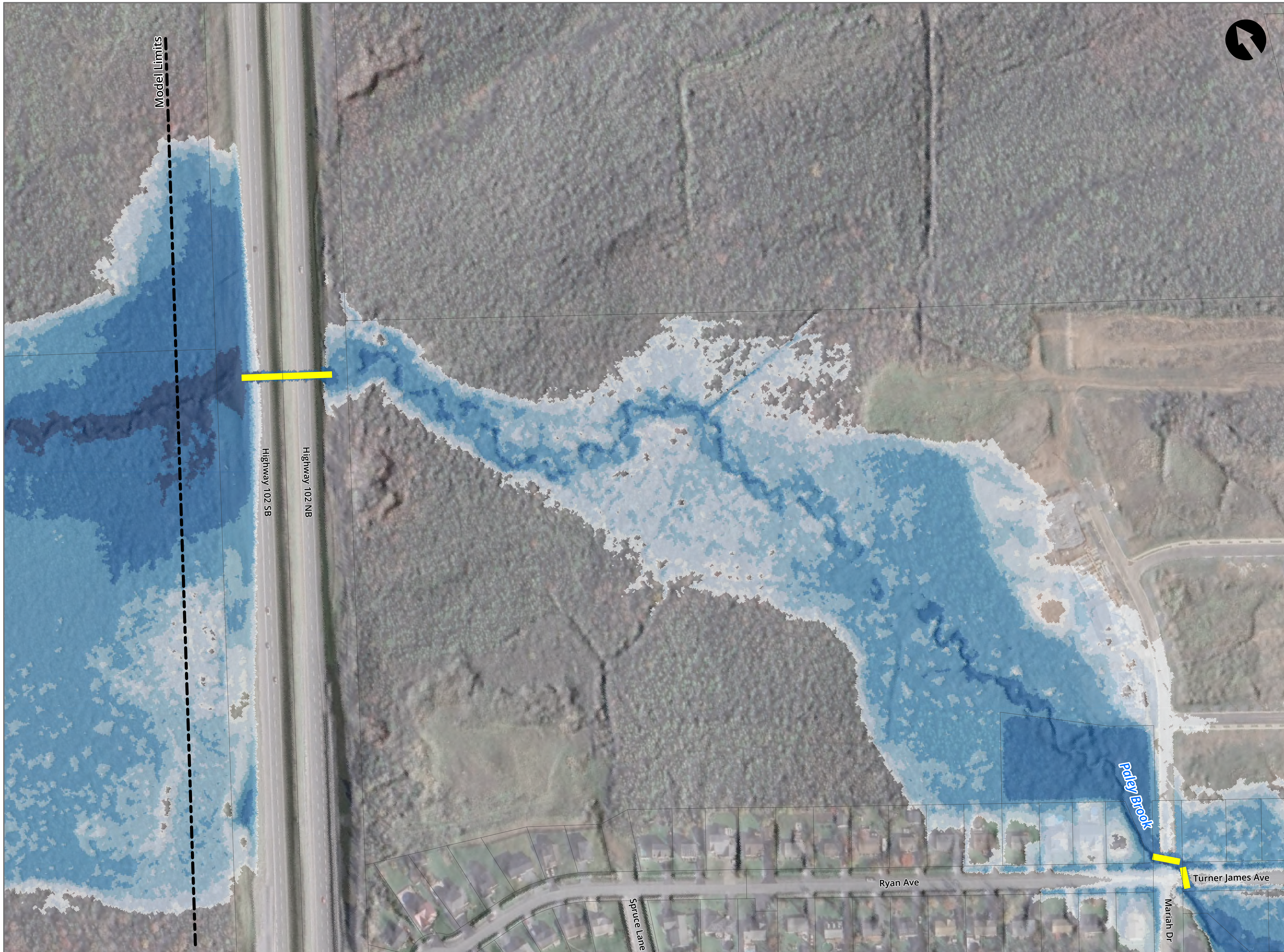


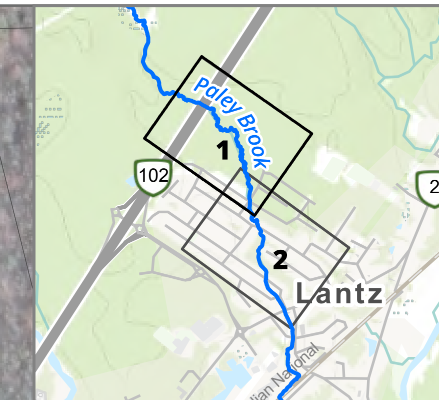


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- 0.3 m - 0.5 m
- 0.5 m - 1 m
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- 2 m - 3.85 m
- Culvert
- Property Parcel

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EAST HANTS

Project:
PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:
PROPOSED STORAGE PONDS
ALL PONDS
FLOOD LINES
1% AEP

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

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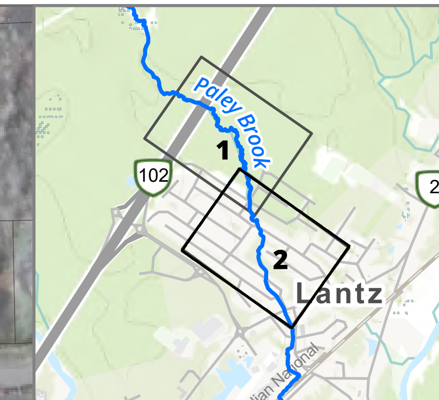
| Project No: | 241221.00 | Figure No: | 6.4.2.1 |

Figure Name: Y:\Halifax\Data\Projects\2024\241221.00 Paley Brook Flood Study, East Hants\44 CAD\08 GIS\PRO\241221_Paley_Brook_Flood_Study - Appendix D.aprx


Legend:
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- 0 m - 0.1 m
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- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
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- Culvert
- Property Parcel

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EAST HANTS

Project:
PALEY BROOK FLOOD
RISK MITIGATION STUDY

Drawing Title:
PROPOSED STORAGE PONDS
ALL PONDS
FLOOD LINES
1% AEP

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

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| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 6.4.2.2 |

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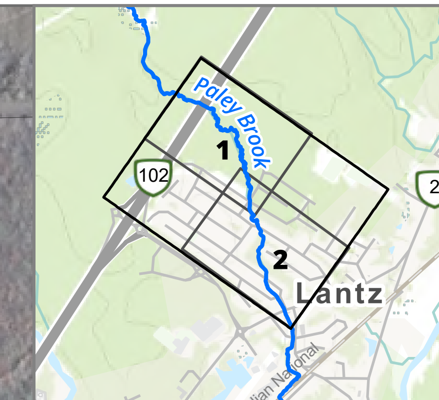


Legend:
5% AEP, 2100 Climate Change
Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.97 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:
PALEY BROOK FLOOD
RISK MITIGATION STUDY

Drawing Title:
PROPOSED STORAGE PONDS
ALL PONDS
FLOOD LINES
5% AEP, 2100 CLIMATE CHANGE

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:4,250 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 6.4.3.0 |

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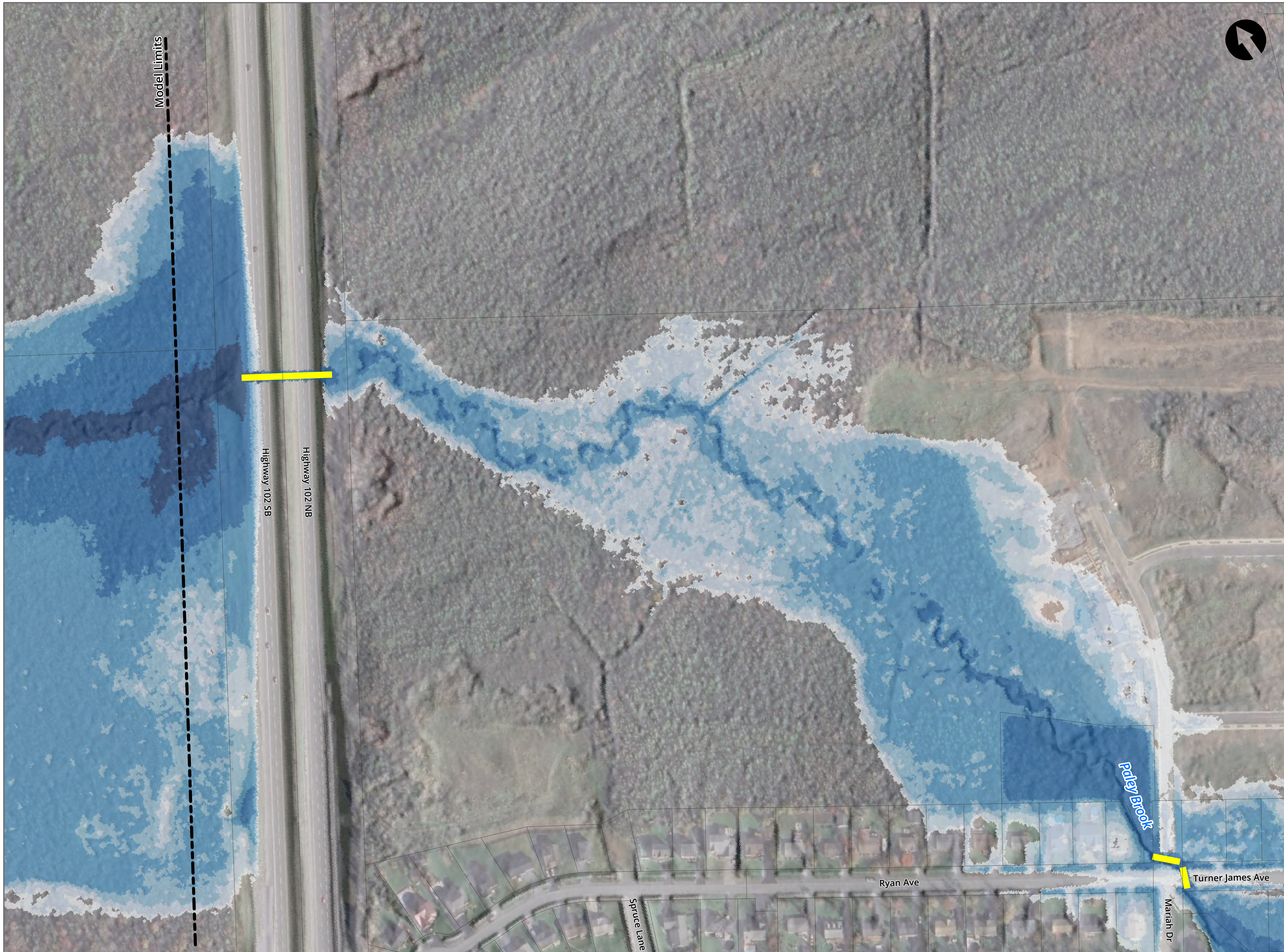


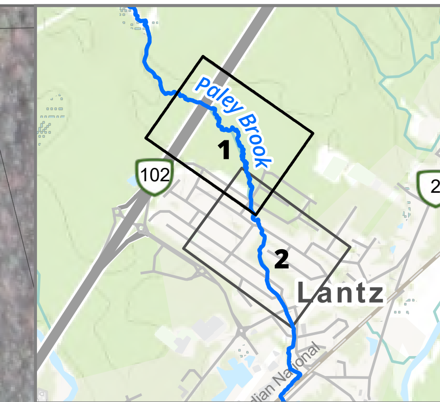


Legend:
5% AEP, 2100 Climate Change
Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.97 m
- Culvert
- Property Parcel

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EAST HANTS

Project:
PALEY BROOK FLOOD
RISK MITIGATION STUDY

Drawing Title:
PROPOSED STORAGE PONDS
ALL PONDS
FLOOD LINES
5% AEP, 2100 CLIMATE CHANGE

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

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| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 6.4.3.1 |

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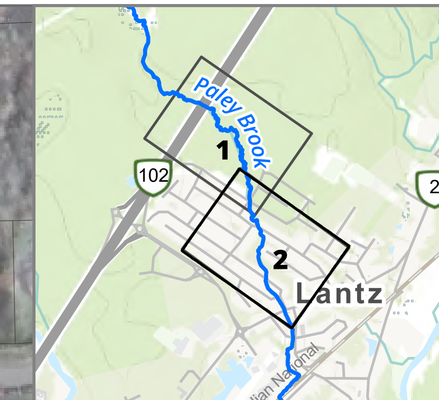


Legend:
5% AEP, 2100 Climate Change
Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.97 m
- Culvert
- Property Parcel

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EAST HANTS

Project:
PALEY BROOK FLOOD
RISK MITIGATION STUDY

Drawing Title:
PROPOSED STORAGE PONDS
ALL PONDS
FLOOD LINES
5% AEP, 2100 CLIMATE CHANGE

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

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| Project No: | 241221.00 | Figure No: | 6.4.3.2 |

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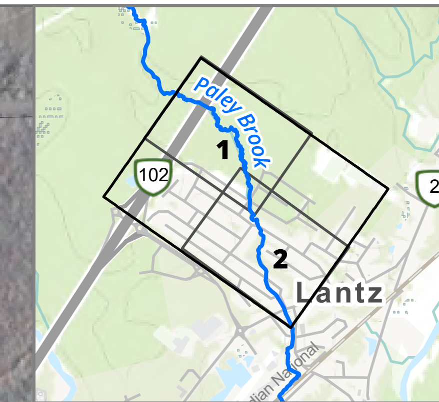


Legend:

1% AEP, 2100 Climate Change Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 4.37 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
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| 1 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:

PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:

PROPOSED STORAGE PONDS
ALL PONDS
FLOOD LINES
1% AEP, 2100 CLIMATE CHANGE

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:4,250 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 6.4.4.0 |

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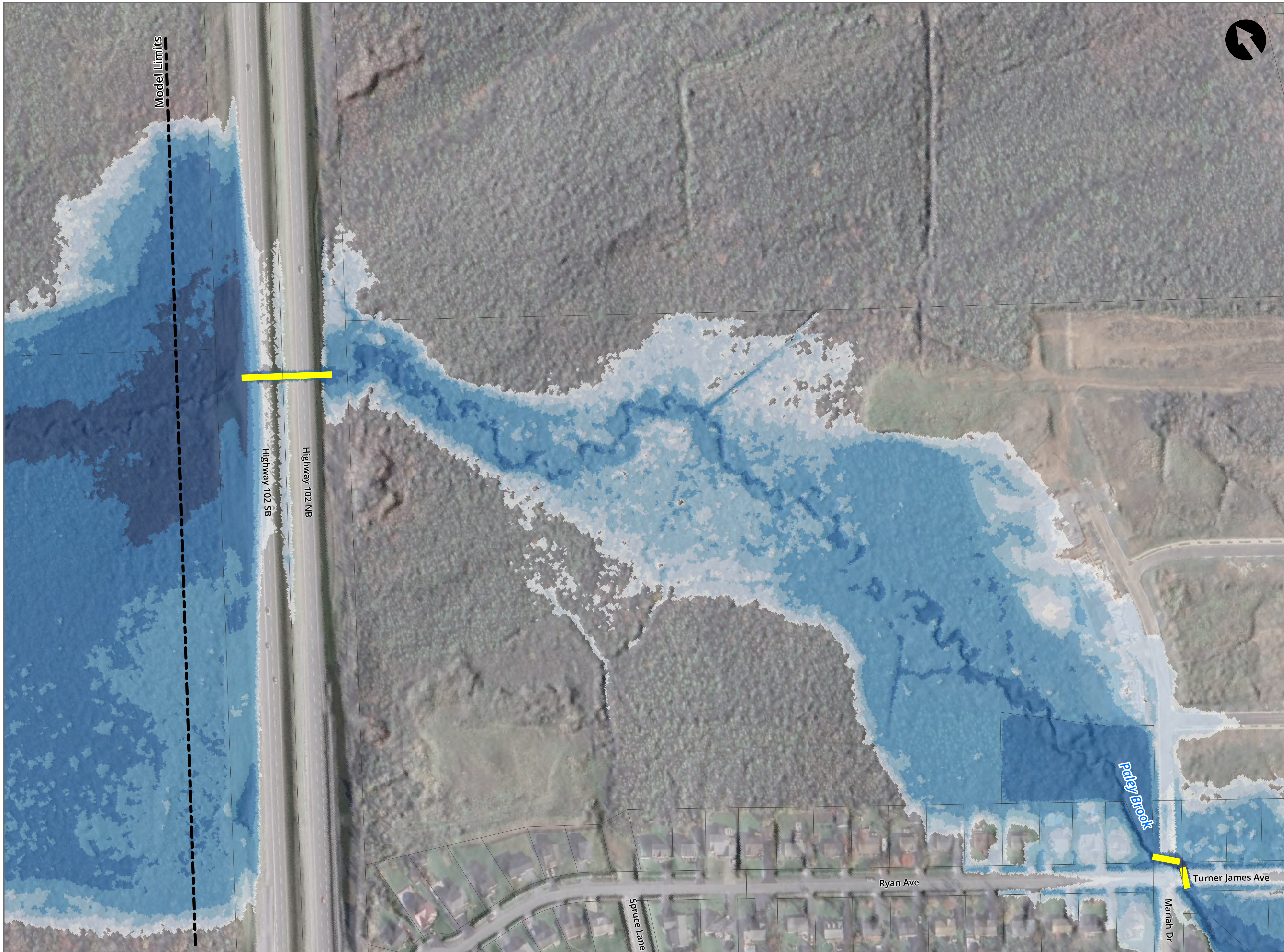


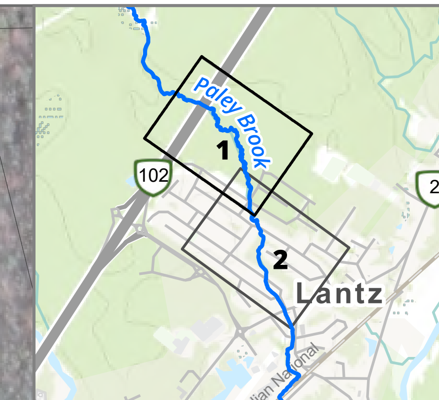


Legend:

1% AEP, 2100 Climate Change Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 4.37 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
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EAST HANTS

Project:

PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:

PROPOSED STORAGE PONDS
ALL PONDS
FLOOD LINES
1% AEP, 2100 CLIMATE CHANGE

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 6.4.4.1 |

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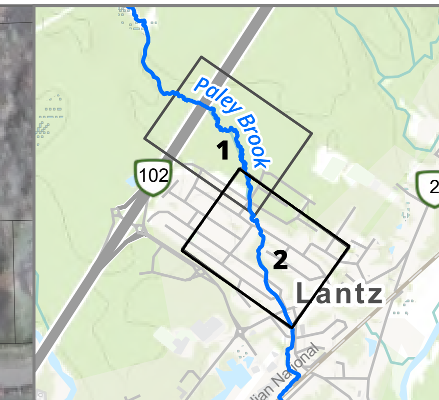


Legend:
1% AEP, 2100 Climate Change Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 4.37 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
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EAST HANTS

Project:
PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:
PROPOSED STORAGE PONDS
ALL PONDS
FLOOD LINES
1% AEP, 2100 CLIMATE CHANGE

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 6.4.4.2 |

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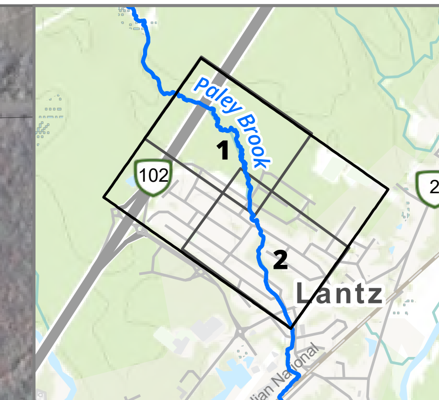


Legend:
5% AEP Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.51 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 28, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:
PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:
ALL STORAGE PONDS AND CULVERT UPGRADES FLOOD LINES 5% AEP

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:4,250 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 6.5.1.0 |

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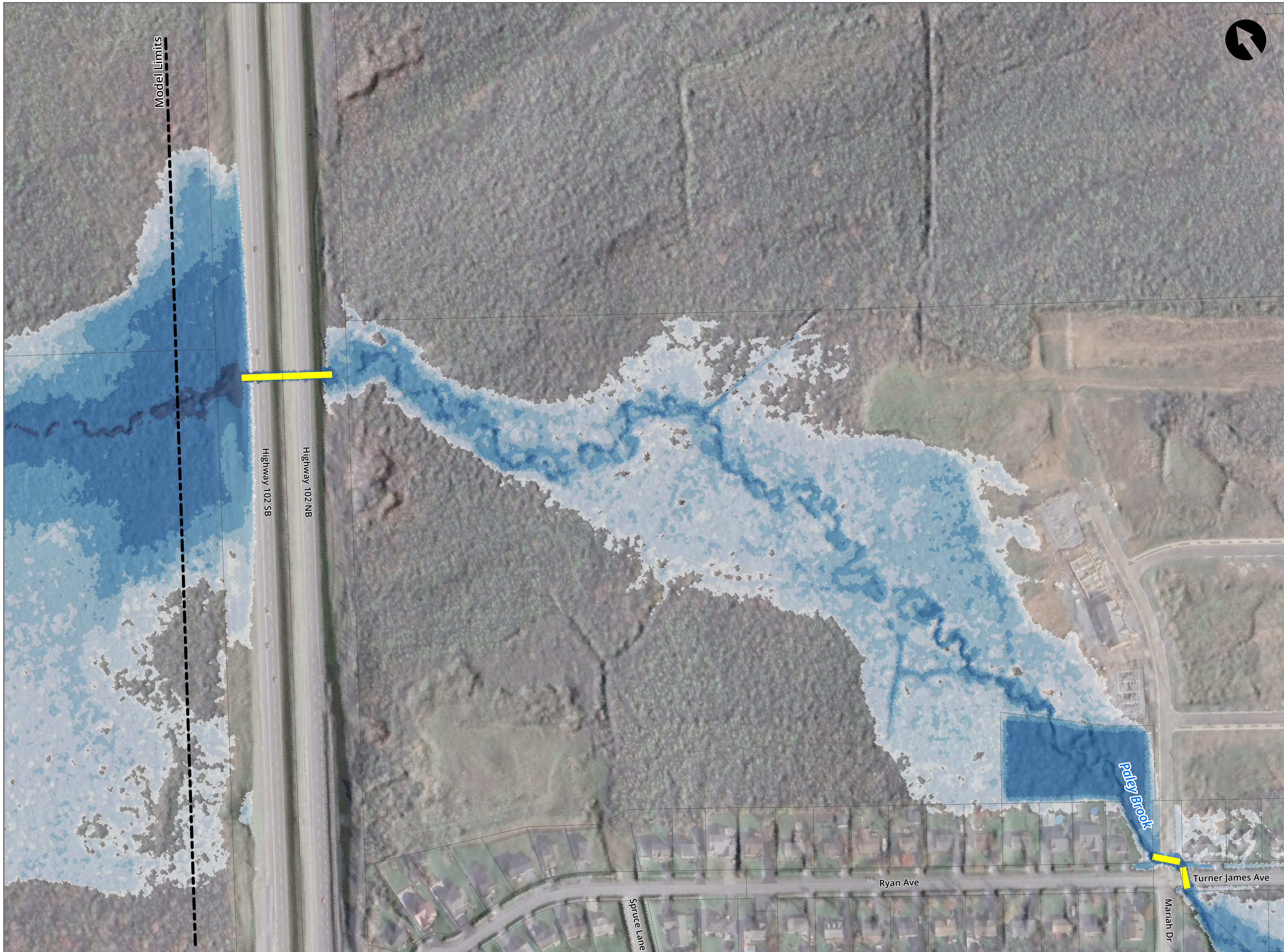


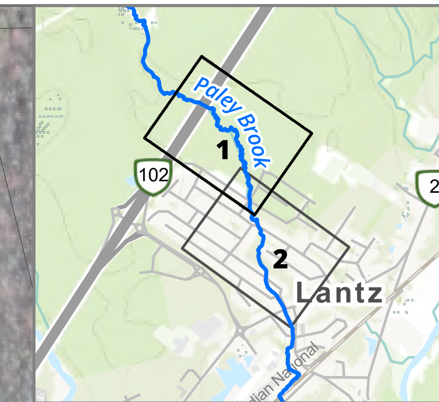


Legend:
5% AEP Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.51 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
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| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
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EAST HANTS

Project:
PALEY BROOK FLOOD RISK MITIGATION STUDY

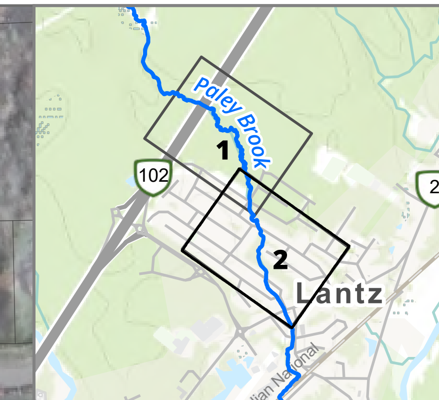
Drawing Title:
ALL STORAGE PONDS AND CULVERT UPGRADES FLOOD LINES 5% AEP

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 6.5.1.1 |

Figure Name: Y:\Halifax\Data\Projects\2024\241221.00 Paley Brook Flood Study, East Hants\44 CAD\08 GIS\PRO\241221_Paley_Brook_Flood_Study - Appendix D.aprx


Legend:
5% AEP Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.51 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
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EAST HANTS

Project:
PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:
ALL STORAGE PONDS AND CULVERT UPGRADES FLOOD LINES 5% AEP

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 6.5.1.2 |

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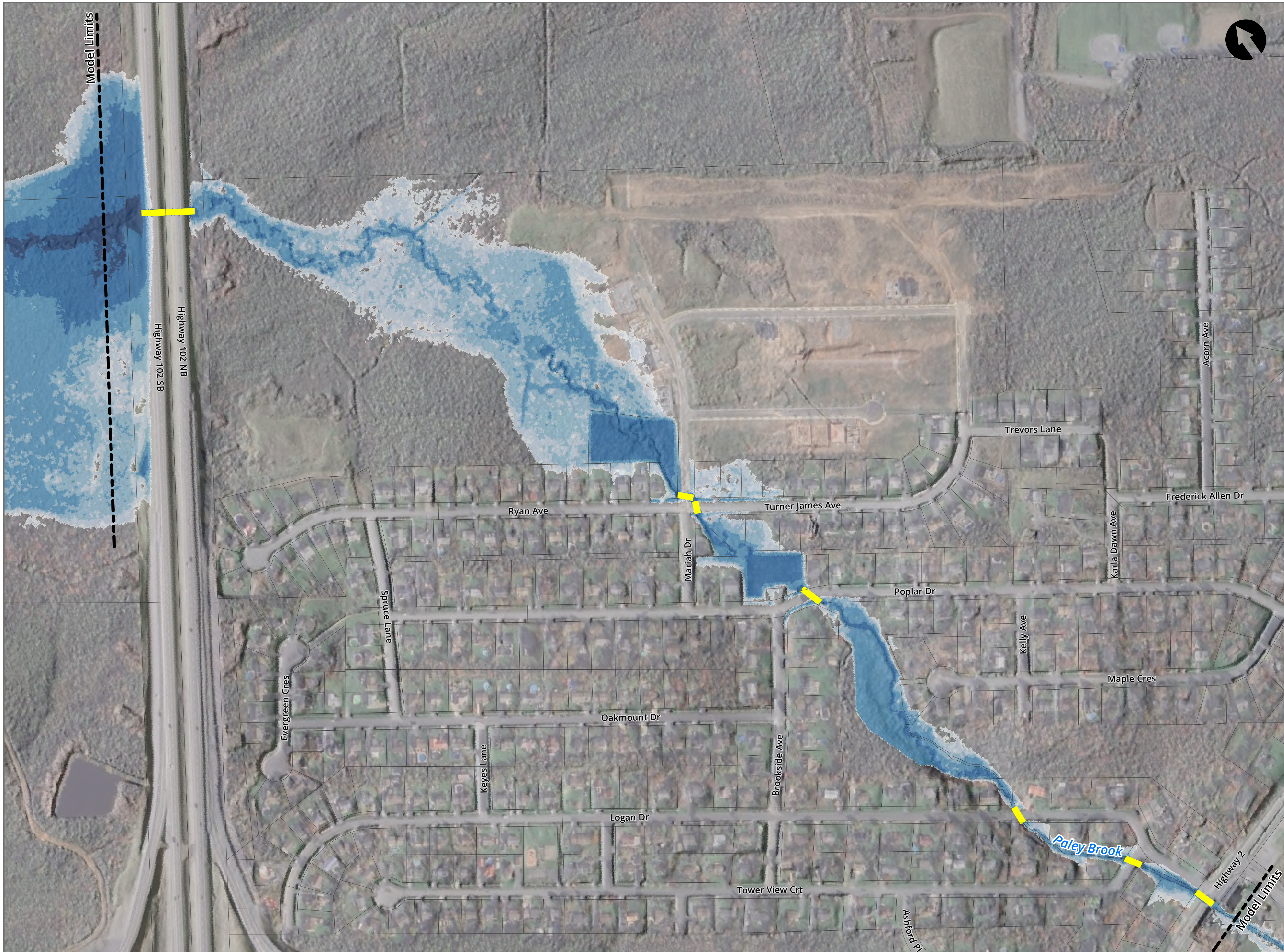


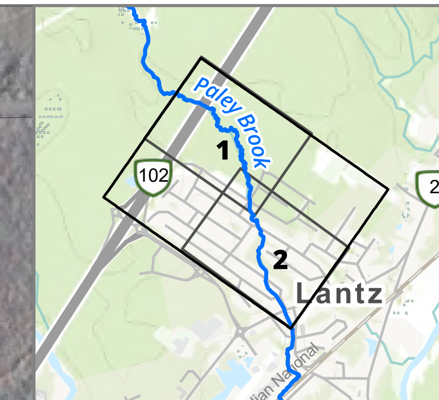


Legend:
1% AEP Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.85 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:

PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:

ALL STORAGE PONDS AND CULVERT UPGRADES FLOOD LINES 1% AEP

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

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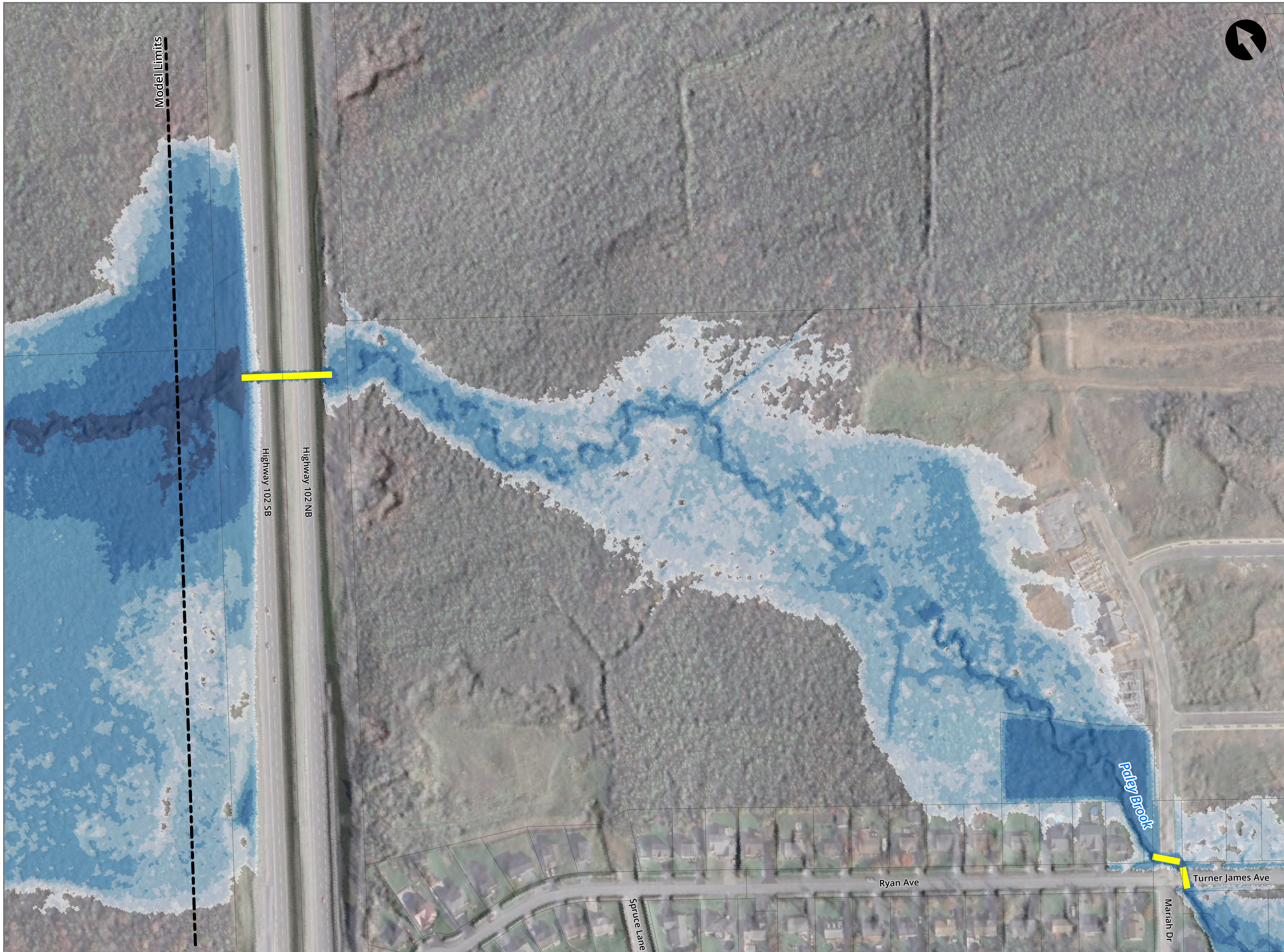
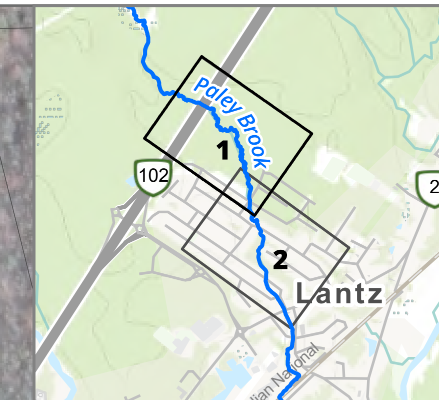
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:4,250 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 6.5.2.0 |

Figure Name: Y:\Halifax\Data\Projects\2024\241221.00 Paley Brook Flood Study, East Hants\44 CAD\08 GIS\PRO\241221_Paley_Brook_Flood_Study - Appendix D.aprx




Legend:
1% AEP Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.85 m
- Culvert
- Property Parcel

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| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
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EAST HANTS

Project:
PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:
ALL STORAGE PONDS AND CULVERT UPGRADES FLOOD LINES 1% AEP

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:2,500 |
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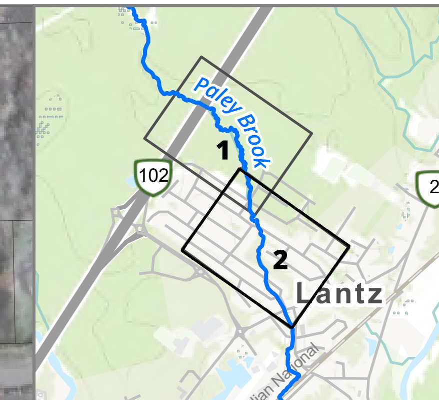
| Project No: | 241221.00 | Figure No: | 6.5.2.1 |

Figure Name: Y:\Halifax\Data\Projects\2024\241221.00 Paley Brook Flood Study, East Hants\44 CAD\08 GIS\PRO\241221_Paley_Brook_Flood_Study - Appendix D.aprx


Legend:
1% AEP Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.85 m
- Culvert
- Property Parcel

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EAST HANTS

Project:
PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:
ALL STORAGE PONDS AND CULVERT UPGRADES FLOOD LINES 1% AEP

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

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| Project No: | 241221.00 | Figure No: | 6.5.2.2 |

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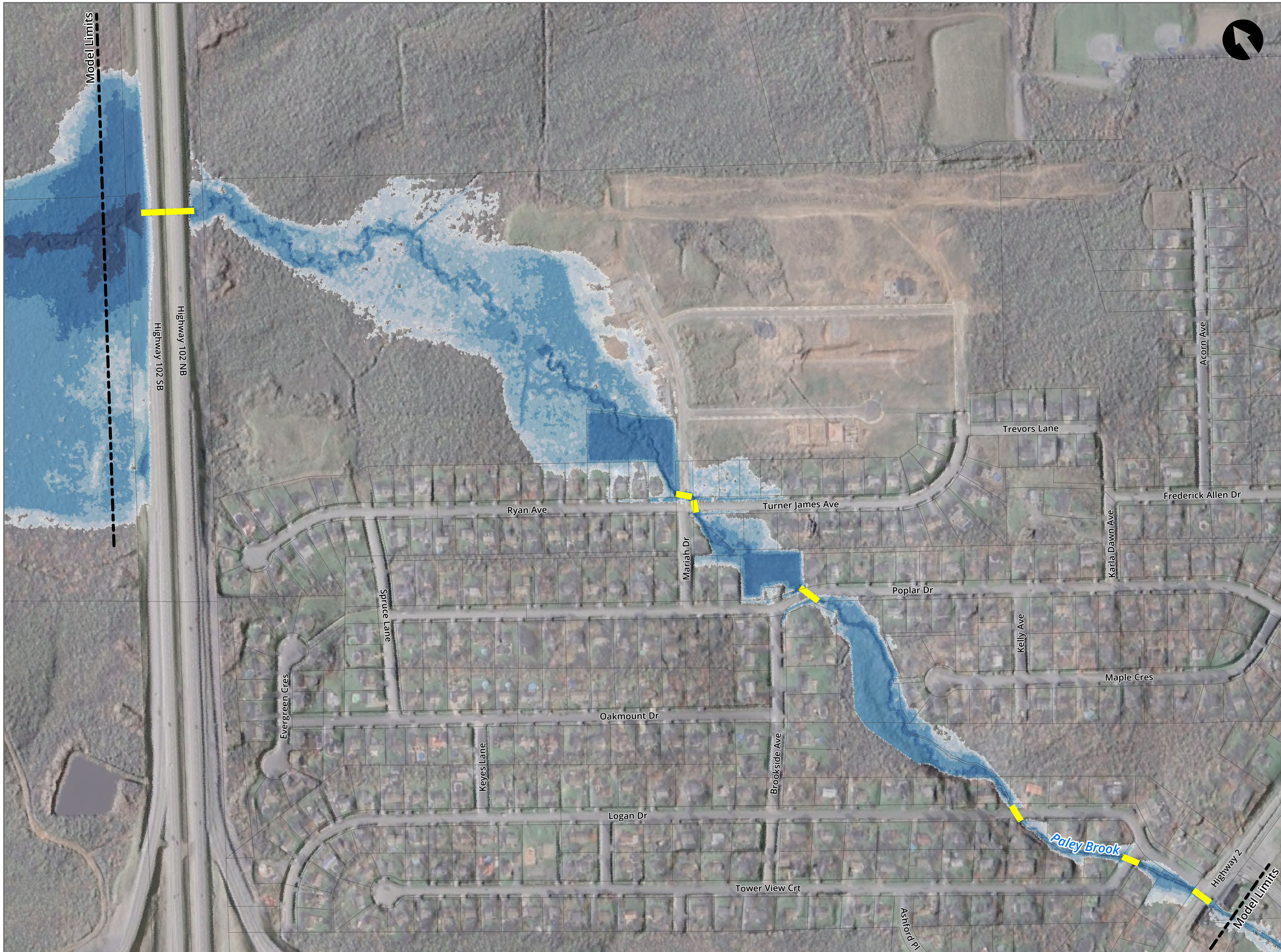


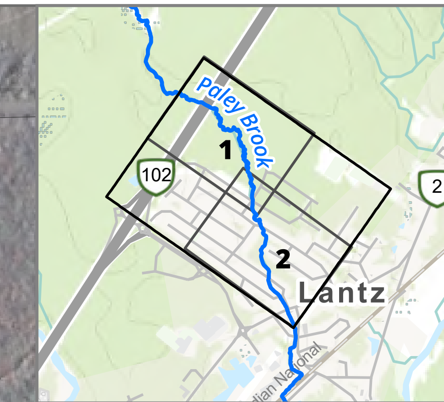


Legend:
5% AEP, 2100 Climate Change
Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.97 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
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EAST HANTS

Project:
PALEY BROOK FLOOD
RISK MITIGATION STUDY

Drawing Title:
ALL STORAGE PONDS
AND CULVERT UPGRADES
FLOOD LINES
5% AEP, 2100 CLIMATE CHANGE

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

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|---|---|---|---|
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| Project No: | 241221.00 | Figure No: | 6.5.3.0 |

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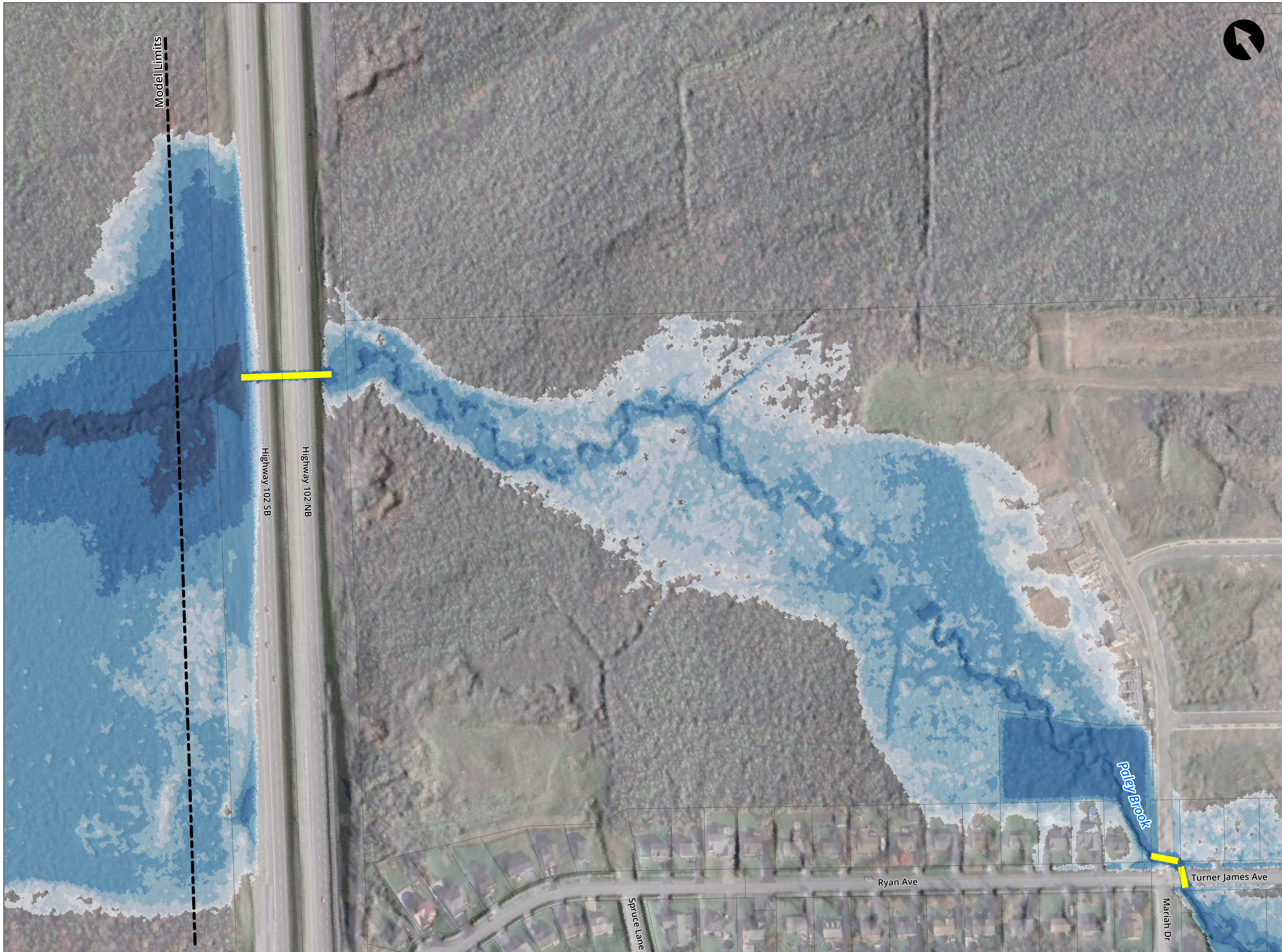


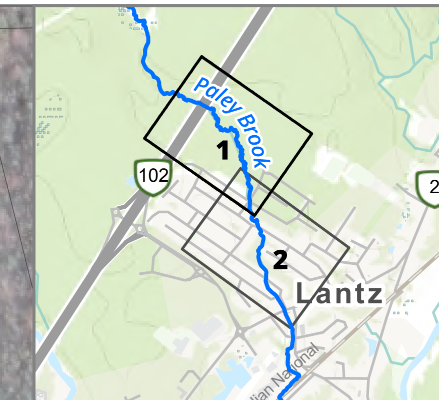


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Flood Line Depth

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EAST HANTS

Project:
PALEY BROOK FLOOD
RISK MITIGATION STUDY

Drawing Title:
ALL STORAGE PONDS
AND CULVERT UPGRADES
FLOOD LINES
5% AEP, 2100 CLIMATE CHANGE

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

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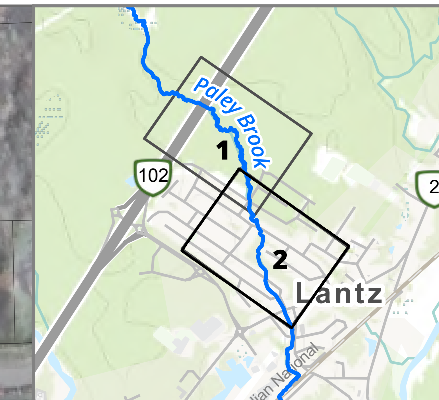


Legend:
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Flood Line Depth

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- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.97 m
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EAST HANTS

Project:
PALEY BROOK FLOOD
RISK MITIGATION STUDY

Drawing Title:
ALL STORAGE PONDS
AND CULVERT UPGRADES
FLOOD LINES
5% AEP, 2100 CLIMATE CHANGE

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

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|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 6.5.3.2 |

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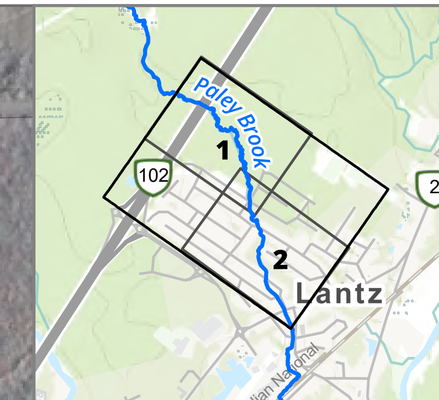


Legend:

1% AEP, 2100 Climate Change Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 4.37 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:

PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:

ALL STORAGE PONDS AND CULVERT UPGRADES FLOOD LINES 1% AEP, 2100 CLIMATE CHANGE

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:4,250 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 6.5.4.0 |

Path: Y:\Halifax\Data\Projects\2024\241221.00 Paley Brook Flood Study, East Hants\44 CAD\08 GIS\PRO\241221_Paley_Brook_Flood_Study - Appendix D.aprx


Legend:
1% AEP, 2100 Climate Change Flood Line Depth
- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 4.37 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:
PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:
ALL STORAGE PONDS AND CULVERT UPGRADES FLOOD LINES 1% AEP, 2100 CLIMATE CHANGE

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 6.5.4.1 |

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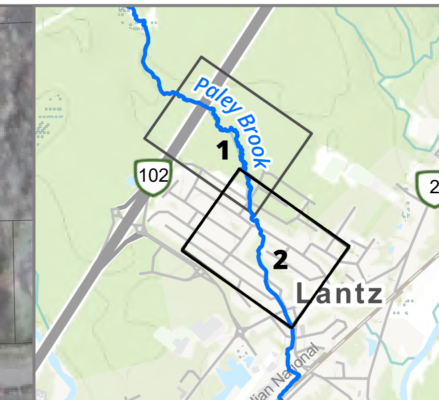


Legend:

1% AEP, 2100 Climate Change Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 4.37 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
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EAST HANTS

Project:

PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:

ALL STORAGE PONDS AND CULVERT UPGRADES FLOOD LINES 1% AEP, 2100 CLIMATE CHANGE

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 6.5.4.2 |

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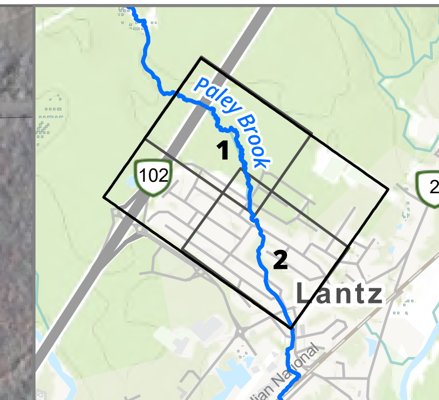


Legend:

1% AEP Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.85 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
| --- | --- | --- |
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:

PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:

UPSTREAM STORMWATER STORAGE, EXISTING CULVERTS FLOOD LINES 1% AEP

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
| --- | --- | --- | --- |
| Date: | FEB 2025 | Scale: | 1:4,250 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 7.1.1.0 |

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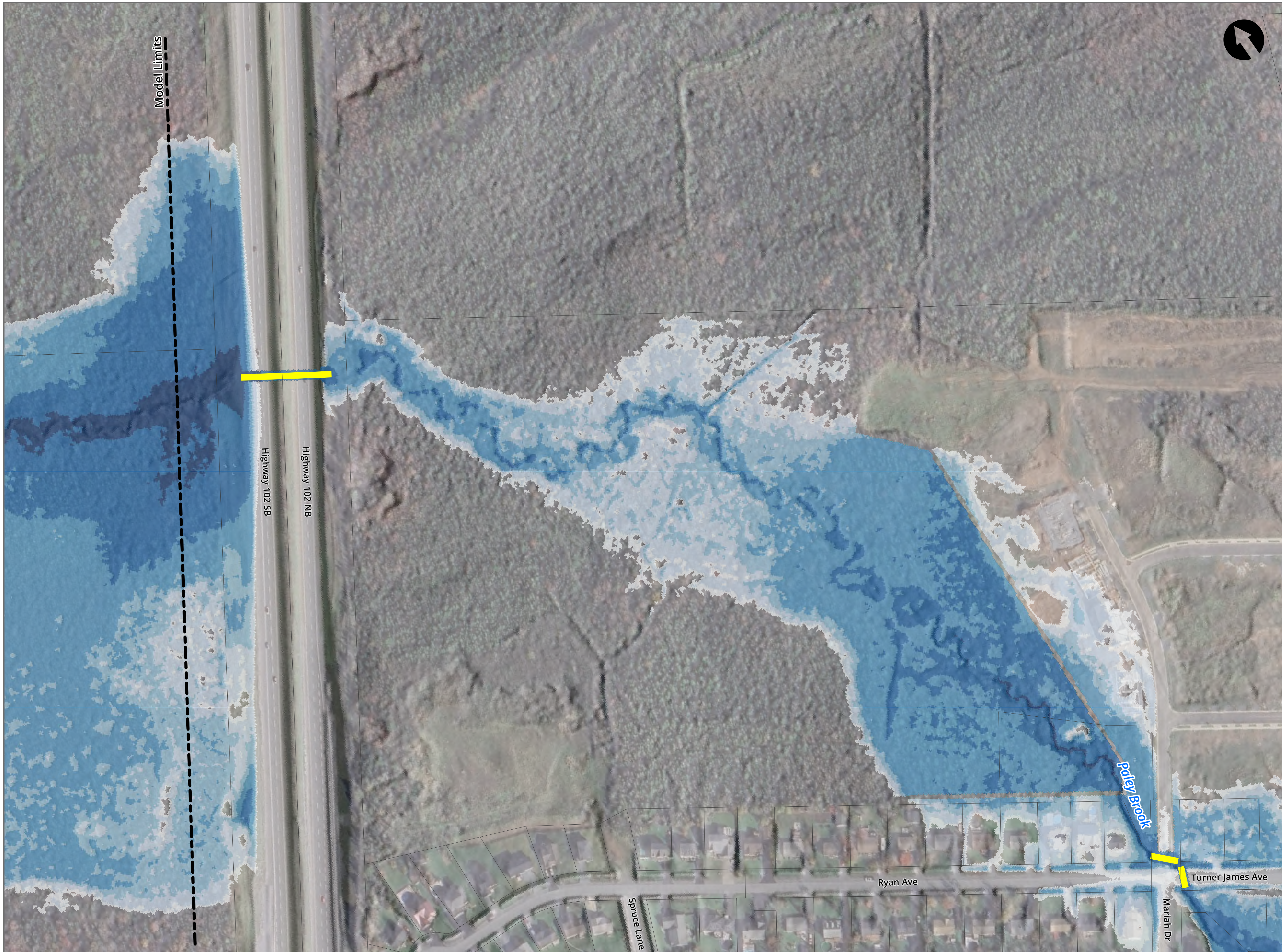


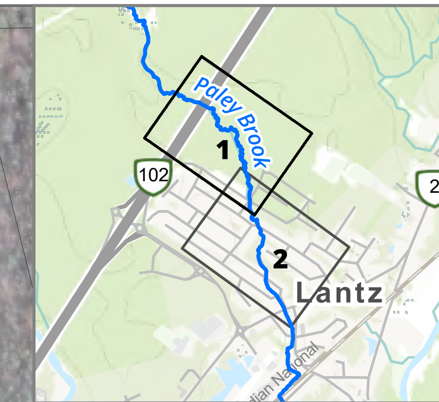


Legend:

1% AEP Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
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- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:

PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:

UPSTREAM STORMWATER STORAGE, EXISTING CULVERTS FLOOD LINES 1% AEP

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 7.1.1.1 |

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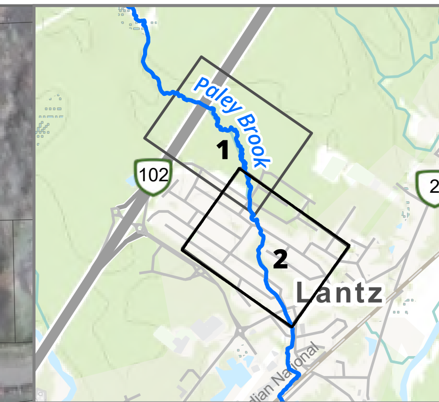


Legend:

1% AEP Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.85 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
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| 1 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:

PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:

UPSTREAM STORMWATER STORAGE, EXISTING CULVERTS FLOOD LINES 1% AEP

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 7.1.1.2 |

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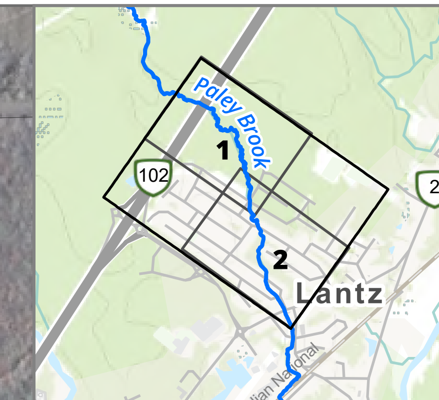


Legend:
1% AEP, 2100 Climate Change
Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 4.37 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
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| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:
PALEY BROOK FLOOD
RISK MITIGATION STUDY

Drawing Title:
UPSTREAM STORMWATER
STORAGE, EXISTING CULVERTS
FLOOD LINES
1% AEP, 2100 CLIMATE CHANGE

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:4,250 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 7.1.2.0 |

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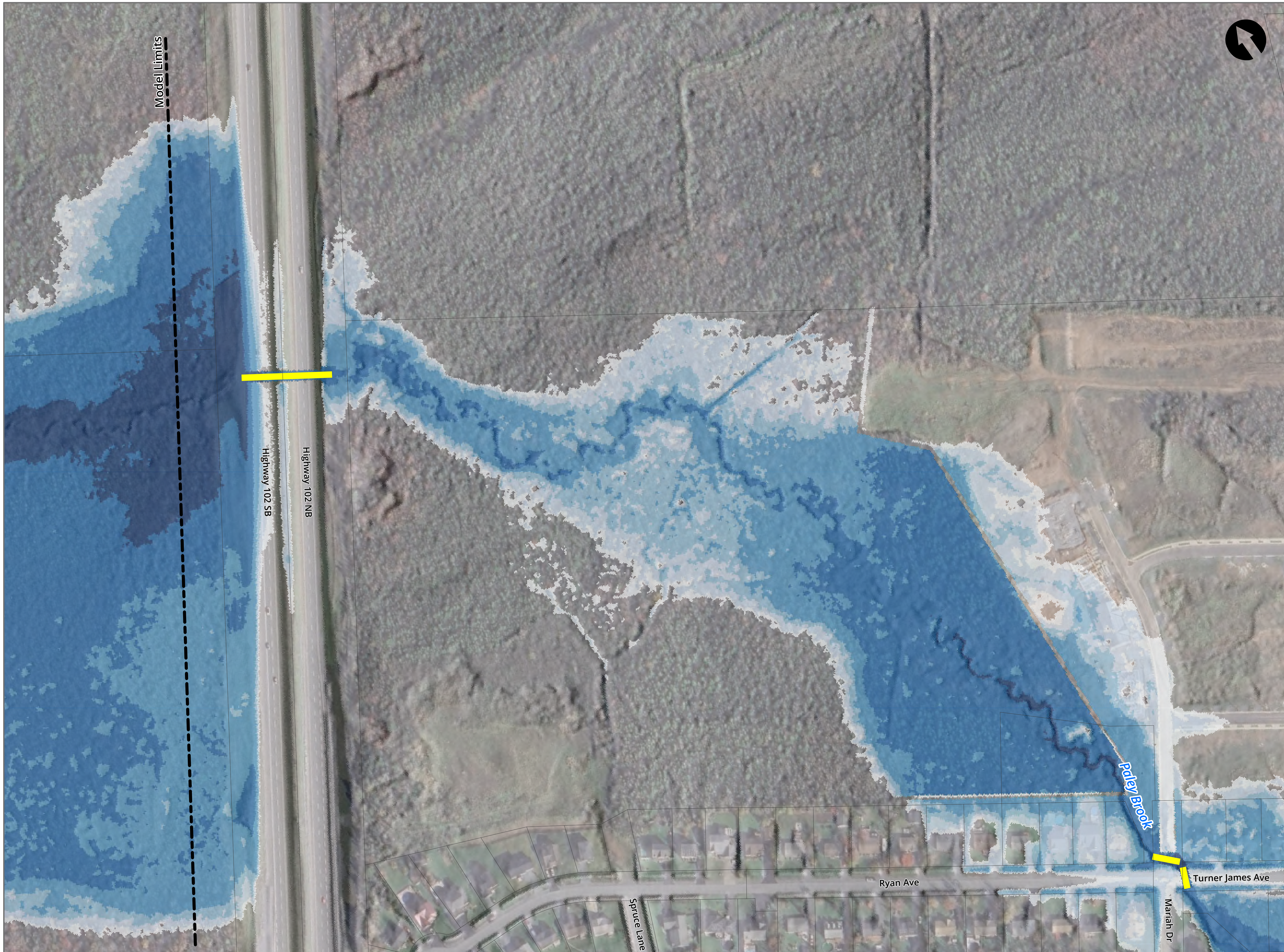


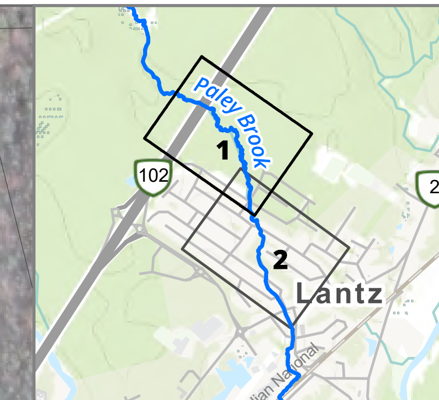


Legend:
1% AEP, 2100 Climate Change
Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 4.37 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
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EAST HANTS

Project:
PALEY BROOK FLOOD
RISK MITIGATION STUDY

Drawing Title:
UPSTREAM STORMWATER
STORAGE, EXISTING CULVERTS
FLOOD LINES
1% AEP, 2100 CLIMATE CHANGE

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 7.1.2.1 |

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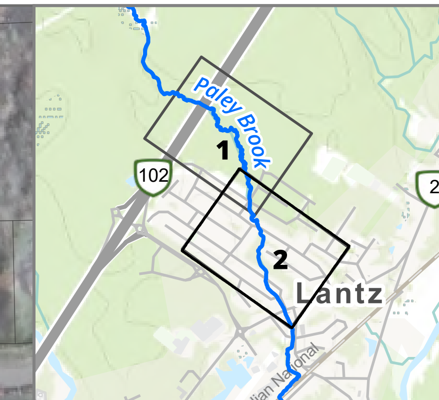


Legend:
1% AEP, 2100 Climate Change
Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
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- Culvert
- Property Parcel

| No | Date | Issue/Revision |
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| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
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EAST HANTS

Project:
PALEY BROOK FLOOD
RISK MITIGATION STUDY

Drawing Title:
UPSTREAM STORMWATER
STORAGE, EXISTING CULVERTS
FLOOD LINES
1% AEP, 2100 CLIMATE CHANGE

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 7.1.2.2 |

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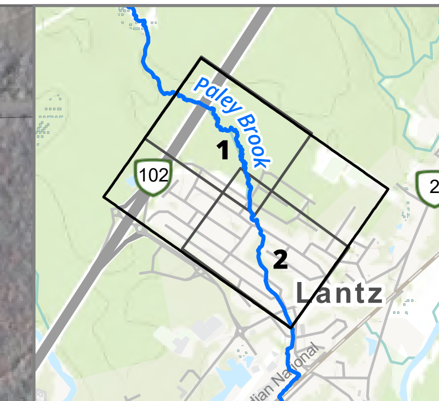


Legend:

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.85 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:

PALEY BROOK FLOOD
RISK MITIGATION STUDY

Drawing Title:

UPSTREAM STORMWATER
STORAGE, PROPOSED CULVERTS
FLOOD LINES
1% AEP

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:4,250 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 7.2.1.0 |

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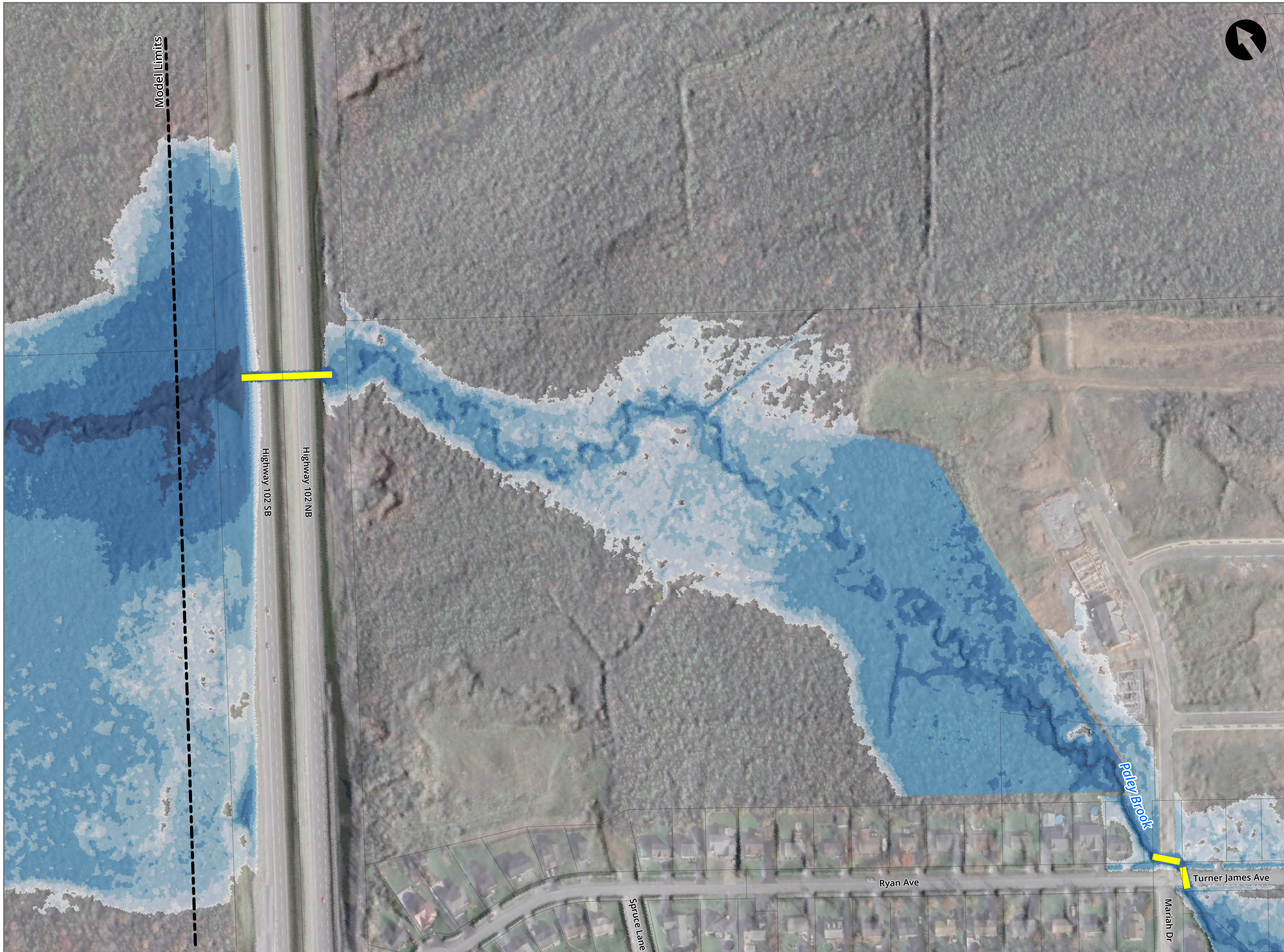


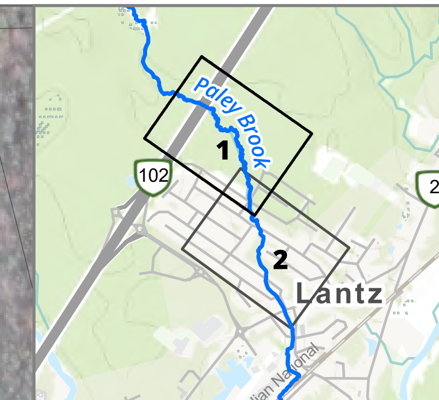


Legend:

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
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- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:

PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:

UPSTREAM STORMWATER STORAGE, PROPOSED CULVERTS FLOOD LINES 1% AEP

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 7.2.1.1 |

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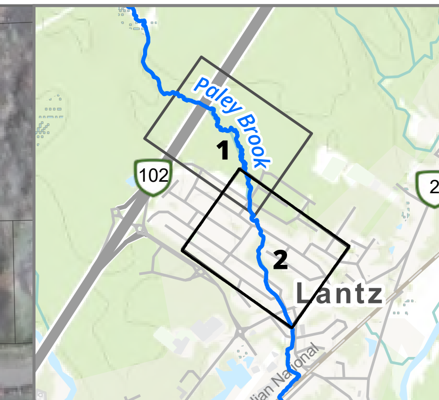


Legend:

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
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- 1 m - 2 m
- 2 m - 3.85 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
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EAST HANTS

Project:

PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:

UPSTREAM STORMWATER STORAGE, PROPOSED CULVERTS FLOOD LINES 1% AEP

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 7.2.1.2 |

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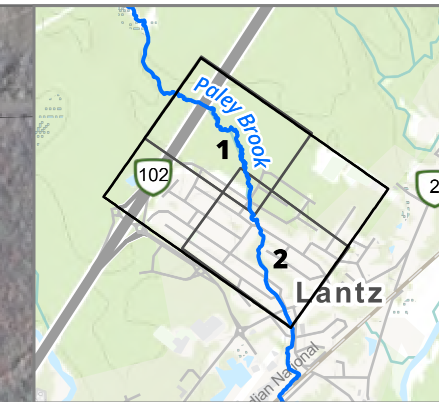


Legend:
1% AEP, 2100 Climate Change
Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 4.37 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:
PALEY BROOK FLOOD
RISK MITIGATION STUDY

Drawing Title:
UPSTREAM STORMWATER
STORAGE, PROPOSED CULVERTS
FLOOD LINES
1% AEP, 2100 CLIMATE CHANGE

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:4,250 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 7.2.2.0 |

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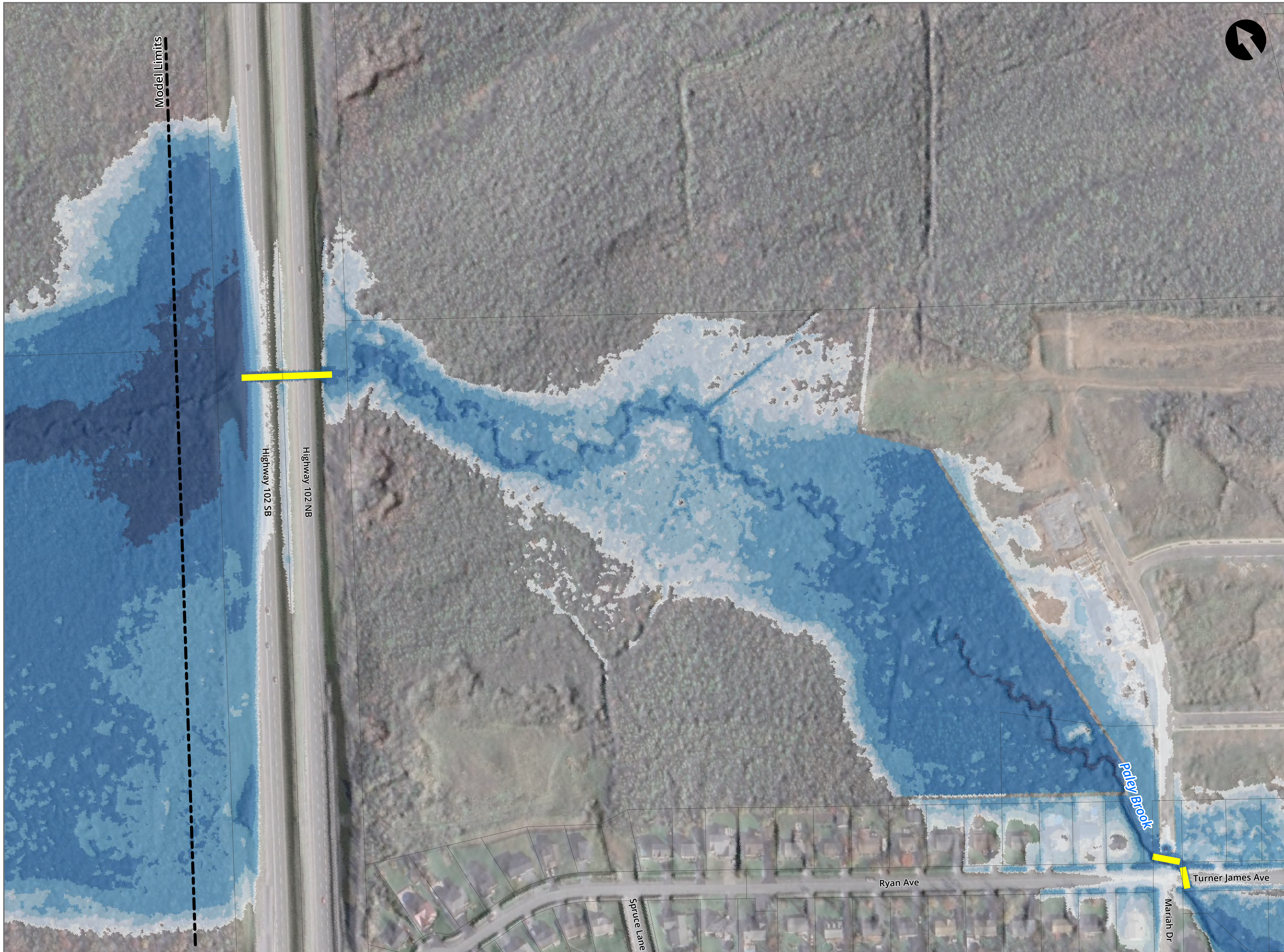


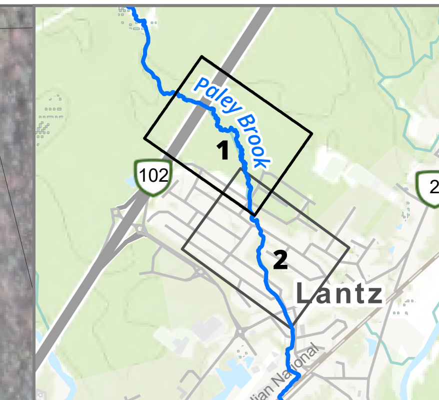


Legend:
1% AEP, 2100 Climate Change
Flood Line Depth

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| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
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EAST HANTS

Project:
PALEY BROOK FLOOD
RISK MITIGATION STUDY

Drawing Title:
UPSTREAM STORMWATER
STORAGE, PROPOSED CULVERTS
FLOOD LINES
1% AEP, 2100 CLIMATE CHANGE

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 7.2.2.1 |

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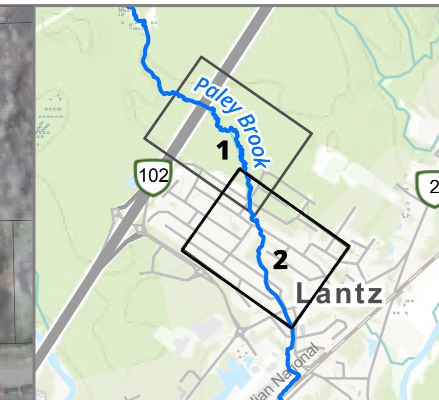


Legend:
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Flood Line Depth

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EAST HANTS

Project:
PALEY BROOK FLOOD
RISK MITIGATION STUDY

Drawing Title:
UPSTREAM STORMWATER
STORAGE, PROPOSED CULVERTS
FLOOD LINES
1% AEP, 2100 CLIMATE CHANGE

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 7.2.2.2 |

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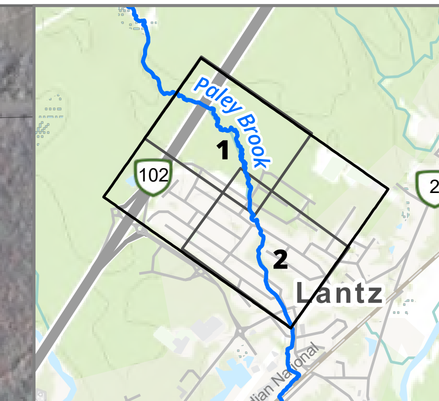


Legend:
1% AEP Flood Line Depth
- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.84 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:
PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:
CHANNEL MODIFICATIONS
EXISTING CULVERTS
FLOOD LINES
1% AEP

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:4,250 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 8.1.1.0 |

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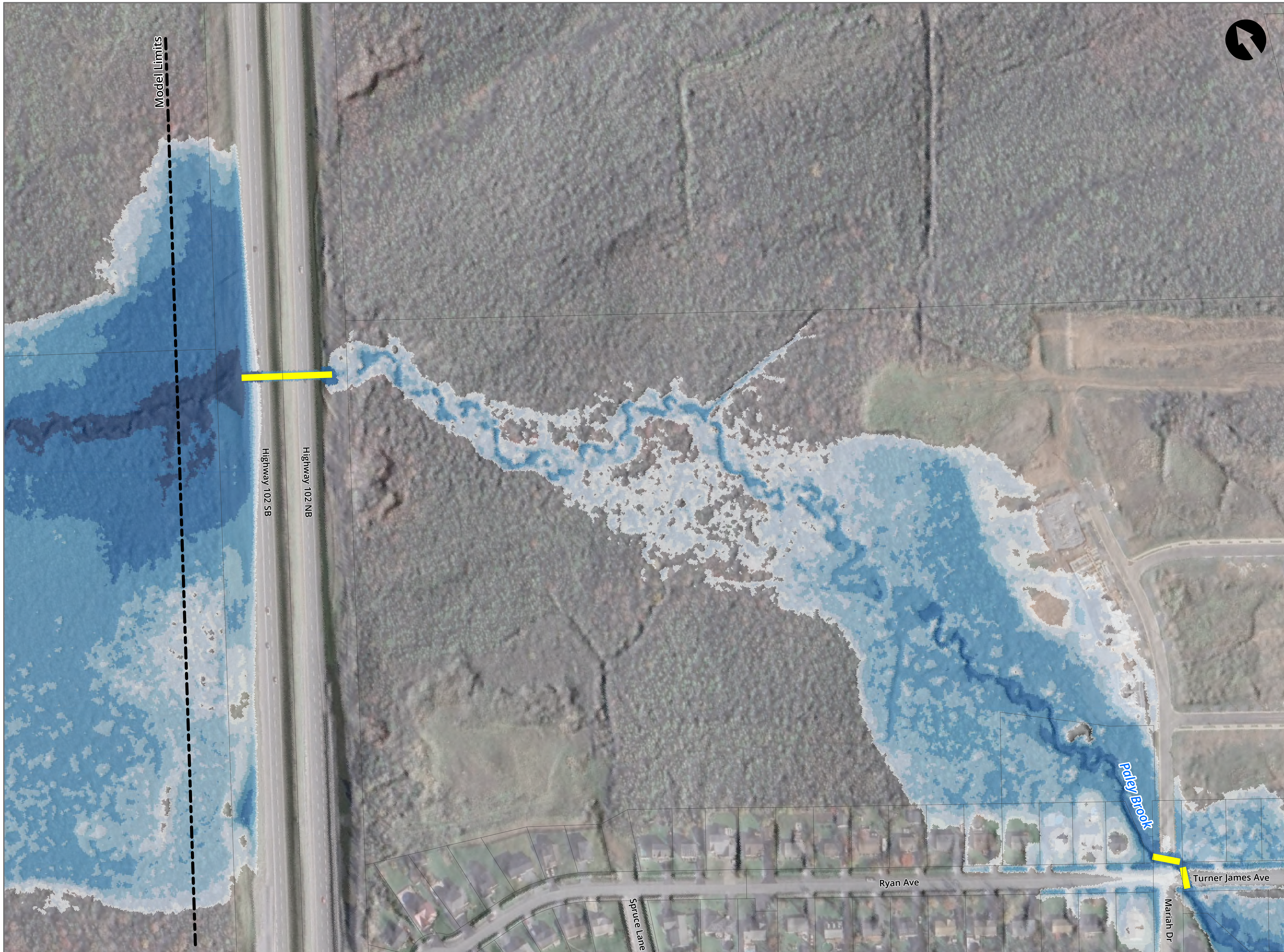


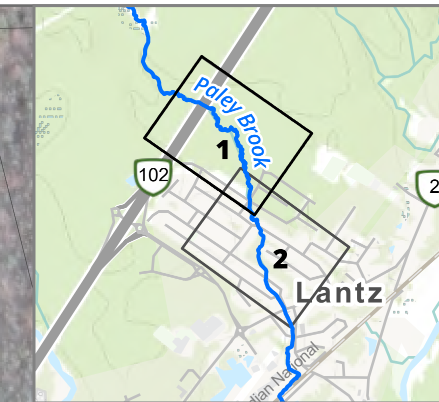


Legend:
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EAST HANTS

Project:
PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:
CHANNEL MODIFICATIONS
EXISTING CULVERTS
FLOOD LINES
1% AEP

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

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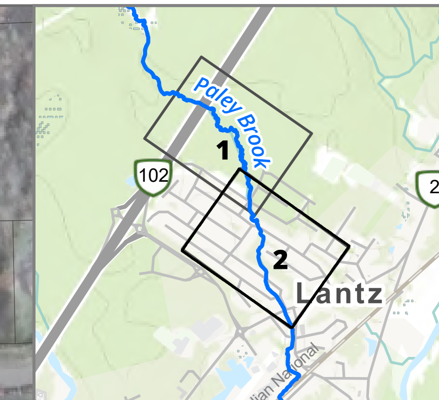
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 8.1.1.1 |

Figure Name: Y:\Halifax\Data\Projects\2024\241221.00 Paley Brook Flood Study, East Hants\44 CAD\08 GIS\PRO\241221_Paley_Brook_Flood_Study.aprx


Legend:
1% AEP Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.84 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:
PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:
CHANNEL MODIFICATIONS EXISTING CULVERTS FLOOD LINES 1% AEP

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

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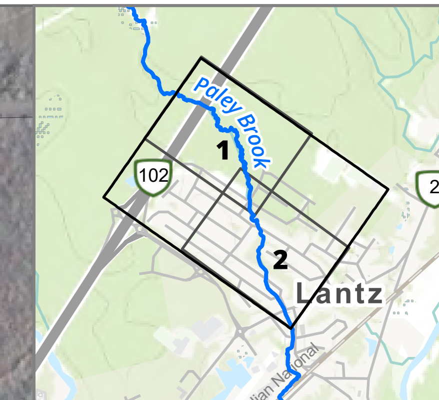
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 8.1.1.2 |

Figure Name: Y:\Halifax\Data\Projects\2024\241221.00 Paley Brook Flood Study, East Hants\44 CAD\08 GIS\PRO\241221_Paley_Brook_Flood_Study.aprx


Legend:
1% AEP Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.84 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:
PALEY BROOK FLOOD
RISK MITIGATION STUDY

Drawing Title:
CHANNEL MODIFICATIONS
PROPOSED CULVERTS
FLOOD LINES
1% AEP

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

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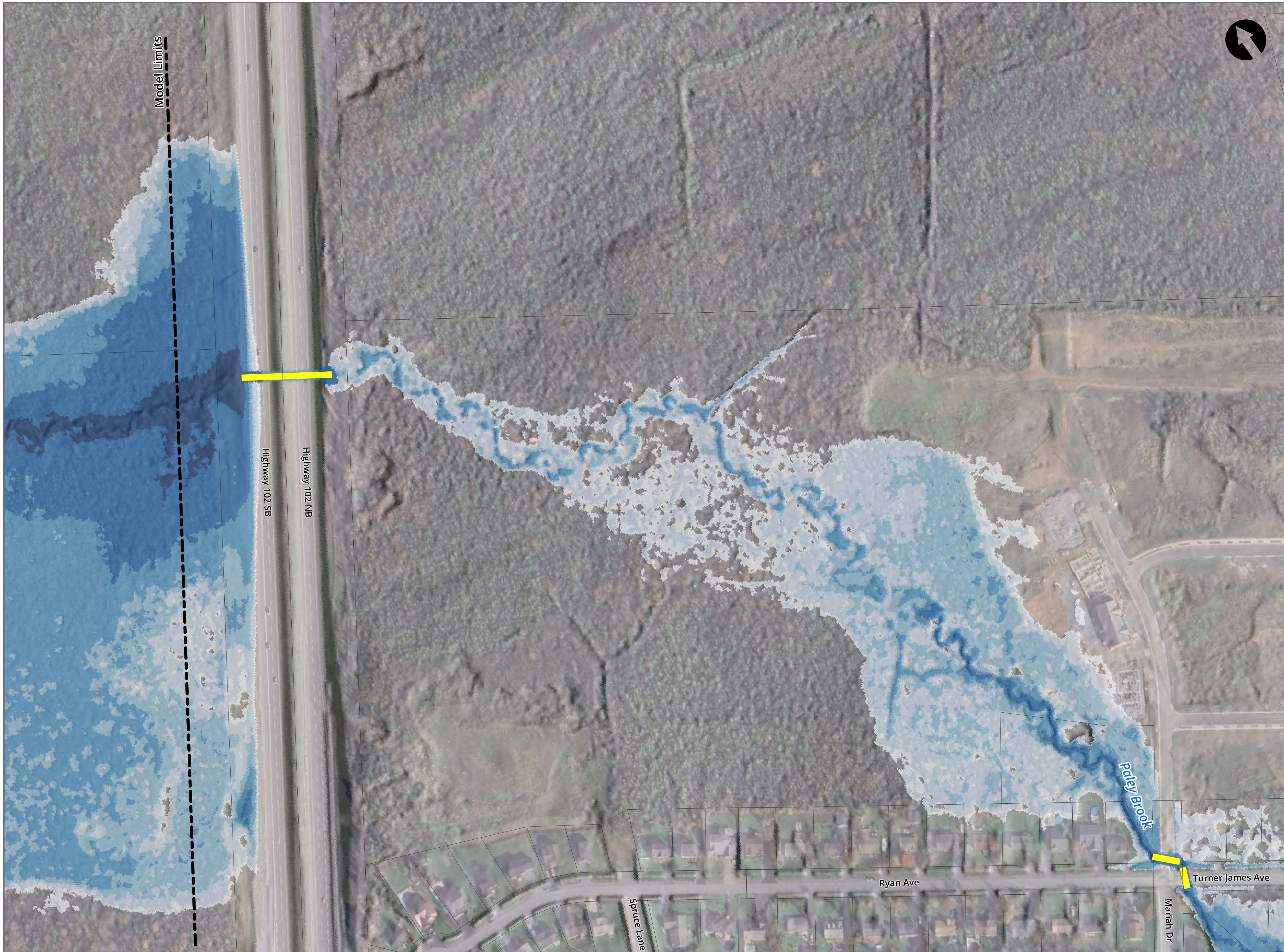
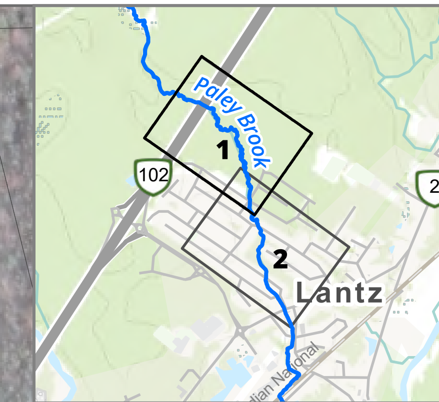
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:4,250 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 8.2.1.0 |

Figure Name: Y:\Halifax\Data\Projects\2024\241221.00 Paley Brook Flood Study, East Hants\44 CAD\08 GIS\PRO\241221_Paley_Brook_Flood_Study.aprx




Legend:
1% AEP Flood Line Depth

- 0 m - 0.1 m
- 0.1 m - 0.3 m
- 0.3 m - 0.5 m
- 0.5 m - 1 m
- 1 m - 2 m
- 2 m - 3.84 m
- Culvert
- Property Parcel

| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
| 1 | MAR 24, 2025 | ISSUED FOR DRAFT REPORT |

EAST HANTS

Project:
PALEY BROOK FLOOD RISK MITIGATION STUDY

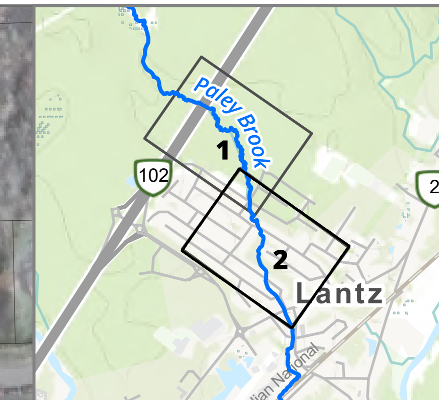
Drawing Title:
CHANNEL MODIFICATIONS
PROPOSED CULVERTS
FLOOD LINES
1% AEP

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 8.2.1.1 |

Figure Name: Y:\Halifax\Data\Projects\2024\241221.00 Paley Brook Flood Study, East Hants\44 CAD\08 GIS\PRO\241221_Paley_Brook_Flood_Study.aprx


Legend:

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| No | Date | Issue/Revision |
|---|---|---|
| 2 | MAR 28, 2025 | ISSUED FOR FINAL REPORT |
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EAST HANTS

Project:

PALEY BROOK FLOOD RISK MITIGATION STUDY

Drawing Title:

CHANNEL MODIFICATIONS
PROPOSED CULVERTS
FLOOD LINES
1% AEP

CBCL

Coordinate System: NAD 1983 CSRS UTM Zone 20N

| | | | |
|---|---|---|---|
| Date: | FEB 2025 | Scale: | 1:2,500 |
| Drawn: | SO | Approved: | AL |
| Project No: | 241221.00 | Figure No: | 8.2.1.2 |

Figure Name: Y:\Halifax\Data\Projects\2024\241221.00 Paley Brook Flood Study, East Hants\44 CAD\08 GIS\PRO\241221_Paley_Brook_Flood_Study.aprx

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