# Well Head Protection Area Delineation for Small Municipal Groundwater Supplies

## Newfoundland and Labrador

133087.00 ● Final Report ● January 2015

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Prepared for:

**Water Resources Management Division**
**Department of Environment and Conservation**
**Government of Newfoundland and Labrador**

Prepared by:

CBCL LIMITED
Consulting Engineers

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| Final Report | | January 2015 | C. Walker |
| Draft Report | Terry Hennigar | August 2014 | C. Walker |
| ***Issue or Revision*** | ***Reviewed By:*** | ***Date*** | ***Issued By:*** |

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January ну, 2015

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Dear Ms. Hanchar:

*RE: Well Head Protection Area Delineation for Small Municipal Groundwater Supplies – Draft Report*

On behalf of CBCL Limited, I am pleased to submit the Final Report for the above noted project.

Yours very truly,

CBCL Limited

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# PREFACE

In 2002 the Walkerton Commission reported on a series of failures, both human and systemic, that led to bacterial contamination of the water supply serving a community of 5,000 people. The owner and the operators of the public utility engaged in a host of improper operating practices. The province of Ontario was also blamed for not regulating water quality and not enforcing the guidelines that had been in place. The two main operators of the system were charged and sentenced with 'common nuisance' while the other charges of forgery and breach of trust were dropped in exchange for guilty pleas. Key recommendations from the Walkerton Commission focused on source water protection as part of a comprehensive multi-barrier approach that also includes training and certification of operators, a quality management system, and more competent enforcement.

The following report is intended to serve as a reference of source water protection areas for system owners and operators, for the future management and protection of public drinking water supplies drawn from the various aquifers identified in the report. As part of the standard operating procedures for managing and protecting this valuable resource, it is recognized that every system and operator most likely have their own record and information system. The information in this report is intended to serve as starting point for well head protection planning in the province, to be improved on and augmented using existing methods and data that are available to each utility. Recognizing and protecting source water areas is just one element of work needed to implement and maintain effective source water protection. Further discussion of the multi-barrier approach is provided in Appendix F of this report.

# EXECUTIVE SUMMARY

Well Head Protection Areas (WHPAs) are zones around municipal drinking water wells, used to protect the community's source water. These zones are the basis for a community's Well Head Protection Plan, which provides guidelines for monitoring and regulation of land uses near the well field. Activities such as chemical and fuel handling, sewage treatment, manure spreading, and large scale industrial pumping are to be avoided in WHPAs, because they have the potential to degrade the quality and quantity of the community's drinking water.

WHPAs were created for 255 well heads, grouped into 106 well fields. Each WHPA was created using a method based on groundwater flow calculations and pumping rates, and is based on a mathematical model recommended in jurisdictions throughout Canada and by the U.S. Environmental Protection Agency. The shapes of WHPAs vary from circular around the well head, to more elongated zones that stretch backward toward the area where groundwater feeding the well originates. WHPAs created for this study assumed a 20-year Time of Travel from the outer edge of the zone to the well intake.

The size and shape of each WHPA depended on the pumping rate of the well and the properties of the aquifer providing water to the well. This information was gathered from the well operators, provincial mapping, the province's Drilled Well Database, and pumping tests. In many cases the pumping rate of each well was estimated based on the number of people served by the well, and aquifer properties were estimated based on drilling records for domestic wells in the area.

Maps are provided to show the size and position of each WHPA. WHPA maps may be used by communities and local service districts to begin the process of developing a Well Head Protection Plan, and to consider how to manage land uses within the WHPA. Each map shows the apparent material type and properties providing water to the well, and the population and pumping rate that were used to create the WHPA. Both of these types of estimates have the potential to be improved if direct measurements can be provided by the operator of each well. As the method to draw the WHPAs was automated using computer tools, each zone can be readily recalculated based on new data that becomes available.

# CHAPTER 1 INTRODUCTION

## 1.1 Background

The Department of Environment and Conservation (ENVC) has, for the past several years, been developing a series of datasets and tools to improve the province's understanding of groundwater resources. This work has included updates to the Provincial Drilled Well Database, preparation of new and updated Hydrogeological Atlases, and Groundwater Vulnerability mapping. Continuing investment in the province's groundwater data sources and infrastructure help to support and inform land use planning and management decisions at the individual, municipal and provincial levels.

The objective of this study was to develop a method for delineation of Well Head Protection Areas (WHPAs) in small municipalities and local service districts in Newfoundland and Labrador, and to provide preliminary mapping of WHPAs for 255 production wells across the province. Delineation of WHPAs was completed using an analytical solution recommended by the U.S. Environmental Protection Agency (USEPA) and automated using a MATLAB code and GIS mapping tools.

Approximately 29% of the province uses groundwater as a source of potable drinking water, concentrated in small municipalities and local service districts. Approximately 170 (mostly small) communities use a public groundwater supply serving between 5 and 40 homes. Larger communities that rely on wells for their potable supply include Happy Valley-Goose Bay, Stephenville, Wabana, Stephenville Crossing, St. Alban's, Kippens and Badger.

## 1.2 Delineation of Well Head Protection Areas

Well Head Protection Plans (WHPPs) form an essential component of source water protection for municipal water supplies. Jurisdictions throughout North America and the European Union have developed guidance documents on development and implementation of WHPPs. Typically this process requires creation of a WHPA through delineation of a capture zone or zones based on aquifer vulnerability and Time of Travel (TOT) calculations.

The outer boundary of a WHPA is associated with the longest considered travel time for contaminants of concern. Typical travel times are on the order of 20 years from the outer edge of the zone to the well

head. Land uses within the WHPA would be managed to minimize activities associated with potential contaminants. WHPAs are often delineated aerially in 2 dimensions, and do not account for vertical travel time through the unsaturated zone and any saturated aquitards. The additional travel time that would be required for vertical travel through these zones introduces further degrees of safety for the well field.

The Province, under the *Environment Act,* can designate a wellhead protection area and assist a community with the review of any applications or activities that may be proposed within the protected area, and discourage development where it could impact water quality of the well. For many small communities, the Department has assisted in determining the WHPA, coordinating interdepartmental review of proposed protection zones, preparing public notices once an area has been declared, and providing communities with signage and public information.

Analytical solutions to delineate a 2D WHPA are formulated based on the equations of radial flow to a well in the presence of a 1D ambient groundwater flow field. Guidance documents for Ontario (Ontario Ministry of the Environment, 2001), British Columbia (2004), the United States Geological Survey (Franke et al., 1998; Risser and Barton, 1995), and the USEPA (1987; 1991; 1993; 1994; Blandford and Wu, 1993; Heijde and Beljin, 1988) are based around this conceptual model, formulated originally by Bear and Jacob (1965), and Todd (1980). Solutions are commonly calculated for a given Time of Travel to the well head, which results in an outer limit of the WHPA. Other methods incorporate boundary conditions, such as groundwater flow divides, to define up gradient limits to the WHPA.

Later work has provided for a practical means to adapt and apply the solution to a wider range of pumping rates and groundwater flow fields (Ceric and Haitjema, 2005). Both the pumping rate and the ambient flow field can influence the size and shape of the WHPA. WHPAs dominated by pumping are predominantly circular, defined by the solution for radial flow to wells. WHPAs that are dominated by pumping but affected somewhat by the ambient flow field are approximated by shifting the circular zone in the up gradient direction of groundwater flow. WHPAs that show significant influence of both the pumping rate and the ambient flow field exhibit the more elongated bullet or boat-shaped zone.

## 1.3 Scope of Work

Work to delineate capture zones for 255 production wells included the following:

- A database of production wells for small communities in Newfoundland and Labrador was developed, including pumping rates and well construction information;
- Well operators were surveyed by email, fax and phone to obtain additional well information;
- Physical parameters for each well field were developed based on pumping test, airlift yield testing, and geological mapping;
- Wells were grouped into well fields and a Conceptual Site Model (CSM) for each well field was developed to indicate aquifer extent and groundwater flow directions;
- Analytical solutions from various jurisdictions were compiled and tested to select an appropriate method for delineation of WHPAs;
- WHPAs were calculated and mapped using GIS tools; and
- Each CSM, well field, and WHPA was checked individually and adjusted or calibrated where necessary.

# CHAPTER 2 METHODOLOGY

## 2.1 Production Well Data

### *2.1.1 Existing Data*

ENVC provided a preliminary list of water wells, developed to track and register groundwater supplies for small municipalities and local service districts. This source list of 182 wells was cross-checked with provincial mapping of small water systems and water quality data for small systems. The resulting master list of water wells contained locations for 265 wells and information on the local well ID, serviced community and area, and status as protected or unprotected. Some records contained population information from the Canadian Census and/or local information. A "STATUS" field from the initial dataset indicated whether a well was out of service.

Well records in the preliminary list were also associated with a provincial water supply ID ("WS_NUM"), for grouped and individual wells. In the case of grouped wells a sub-number ("WS_SUB") was created for each individual well head (e.g. for WS_NUM '10' in Badger, individual wells at this location were sub-numbered 10.1, 10.2, 10.3…etc.). The creation of an individual record for each well was required for subsequent assignment of physical parameters to each well, and eventual calculation of WHPAs for each well.

Information to be added to the preliminary list included:

- Well Depth;
- Well ID from the province's Drilled Well Database;
- Airlift Yield from Drilled Well Database; and
- Pumping rate / Community Demand.

Each record would also ultimately require information on the physical setting and aquifer properties:

- Hydraulic conductivity of source aquifer;
- Aquifer Media (bedrock or unconsolidated material);
- Mapped geologic unit(s);
- Borehole log information from Drilled Well Database;
- Gradient; and
- Primary flow direction.

The source of additional information varied according to the availability of data for each record. The following sections describe some of the methods used build the well heads master database. "Source" fields were used to indicate how the well depth, airlift yield, and aquifer hydraulic conductivity were determined and assigned. Each data source is associated with a level of uncertainty in the method of data collection.

### *2.1.2 Operator Interviews*

Contact information for small systems and service districts was obtained through the province's municipal directory, and by accessing available community information, local directories, personal referrals and web-based Canada 411 searches. Contact phone numbers, fax numbers, and email addresses were obtained for as many water supplies as possible. A summary of this contact information has been provided to ENVC under a separate cover.

Operating personnel and volunteers were interviewed by phone if possible. Targeted information included:

- Water use and community demand;
- Well depth;
- Pump type and/or pumping rate;
- Pumping schedules;
- Water use records;
- Drilling and borehole logs;
- Bedrock or screened surficial well; and
- Any and all well field information available.

With the exception of Happy Valley-Goose Bay, water use records were not available. Well and usage information was obtained for 25 communities, and any quantitative information was added to the well heads master database.

### *2.1.3 Well Identification*

Individual well names and community names were compared to information in the Province's Pumping Test Database (CBCL Limited, 2014) and Drilled Well Database. For well records where this information provided a close match, one or both of the databases were used to provide information on the well depth, airlift yield, driller's lithologic log, formation type, and hydraulic conductivity. If available, the 20-year safe yield ($Q_{20}$) was recorded to indicate the average to upper limit of the pumping rate.

### *2.1.4 Spatial Analysis*

A 200 metre buffer zone was projected around each municipal well head to allow for a spatial comparison to available data sources. All mapping and spatial analyses were completed using GIS techniques in ArcMap. Sources of data that intersected the buffer zone were considered on a case by case basis and used to supplement existing municipal well information (well depth, airlift yield, driller's lithologic log, formation type, and hydraulic conductivity).

The buffer zone was then extended to a two kilometre radius, constrained by geologic contacts mapping. Information from drilled well records in this zone was compiled and the average depth and airlift yield were determined. For records still lacking this information in the master database, average values for this buffer zone were used. In selected cases where data from drilled well records was limited

but other municipal wells were located nearby and within the same geologic formation, an average value for the well field was used.

Well locations in the master database were also joined to the underlying geology mapping layers for both bedrock and surficial geology. Each record was associated with the underlying group, formation, member, and quaternary mapping unit. The detailed and summary description of each group, formation or member were collated and sorted into 9 rock types according to the approximate depositional environment, degree of cementation and metamorphism, and corresponding approximate hydrostratigraphic category. Geology mapping and rock types are further discussed in Appendix A.

### *2.1.5 Surficial and Bedrock Wells*

The geology mapping for each municipal well was considered individually in an effort to determine whether the well was installed in bedrock or unconsolidated material. Most of the operators contacted were unable to provide information on the borehole stratigraphy and lithology. Wells for which the borehole or driller's lithologic log terminated in unconsolidated material were assumed to be completed as screened wells in unconsolidated material. All other wells were generally assumed to be installed in the underlying bedrock unless they exhibited the following attributes:

- Provincial record indicates "Dug" or "Spring"; or
- Depth of less than 30 metres; and
- Surficial mapping shows granular deposits and/or bedrock mapping indicates a "Quaternary" unit.

This group of wells was flagged as potentially installed in unconsolidated material. Wells of this type would generally be shallower, installed material with a lesser degree of confinement, and located in aquifers with typically higher hydraulic conductivities than the underlying bedrock. As these conditions would result in generally larger and longer WHPAs, the assumption of unconsolidated material for these wells was considered conservative, and preferred over the underlying bedrock material properties.

Wells that were classified as springs were treated as pumped surficial wells. Although this category implies that drawdown due to pumping may be absent, an apparent pumping rate was required to complete the analytical solution. Actual capture zones for water sources of this type are likely to be relatively long and narrow, depending only on the ambient groundwater flow field.

### *2.1.6 Pumping Rate*

The pumping rate for each well and well field formed an integral part of the analytical solution. The availability of individual pumping rate data was limited, drawn from pumping test data, usage and metering data provided by operators, and broad estimates by the operators based on pumping schedules, connections, and seasonal use. The master well heads database provides a summary of the available data.

For the purposes of obtaining a complete and consistent dataset for WHPA delineation, population data were combined with demand projections from Statistics Canada (2011). The population served per well head was for some wells provided as part of the provincial databases, whereas for others the population served was provided as a total for the well field. In these cases the average population served per well

head was obtained by dividing the well field population by the total number of wells. In selected cases the census population for a community provided the only estimate of total population served. The pumping rate for each well head was calculated by multiplying the average population served per well head by the average demand for communities in Newfoundland (621 litres per person per day; Environment Canada, 2009).

## 2.2 Physical Parameters

### *2.2.1 Hydraulic Conductivity*

The aquifer hydraulic conductivity was drawn wherever possible from pumping test data. The well depth was assumed equal to the aquifer thickness for the purpose of converting transmissivity data to hydraulic conductivity data. Although significant casing lengths and overburden thicknesses could affect this calculation, the output of the analytical solution was not sensitive to this step. If a well could not be associated with an individual aquifer test, the transmissivity for the well field study area was used. Each well field study area was defined according to the mapped geologic unit and regional flow characteristics as indicated by the conceptual site model.

Aquifer testing data was not available for all of the communities to be mapped. In these cases the transmissivity was estimated using a geospatial and statistical analysis of geology mapping and airlift yield data. Depth-normalized yield data obtained from the statistical analysis were used to estimate the specific capacity of available groups, formations, and zones within each formation. Specific capacity data were used to estimate the aquifer transmissivity (Neville, 2009). This data was used to provide a broad estimate of the hydraulic conductivity for well fields where aquifer testing data was unavailable. A description and results of the analysis are provided in Appendix A.

### *2.2.2 Porosity*

Porosity values were assigned based on the material type for each well record (Freeze and Cherry, 1979), consistent with the predominantly cemented and crystalline fractured rocks of Newfoundland and Labrador. Table 2.1 provides a summary of rock types and the associated porosity used for this work.

***Table 2.1. Assigned porosity for material types at each well field.***

| Material Type(s) | Porosity |
|---|---|
| Metamorphic and Plutonic | 0.05 |
| Fractured Crystalline Sedimentary, Carbonate and Volcanic Rocks | 0.1 |
| Sandstone/Conglomerate | 0.2 |
| Quaternary | 0.35 |

### *2.2.3 Gradient*

Groundwater gradients were assigned according the regional topographic gradient in the vicinity of each well field. The topographic gradient was calculated along a flow vector for each well using geospatial tools and a digital elevation model based on provincial data. Generalized groundwater flow vectors

were created as part of development of the conceptual site model for each well field (Section 2.3). Errors in estimation of the groundwater gradient are expected to be conservative, producing larger gradients and WHPAs than might be obtained from measured groundwater gradients. Gradients were limited to a maximum value of 0.2.

## 2.3 Conceptual Site Models

### *2.3.1 Boundaries*

Data from each well head and surrounding area were compiled and reviewed individually to produce a conceptual site model (CSM) for each well or group of wells serving a single community or administrative district. Preliminary CSMs were defined by determining potential hydrogeological boundary conditions in the region surrounding each well field. The following conditions were identified from available data:

- No-flow boundaries as indicated by regional topographic highs and peninsular divides, particularly up gradient of the well field;
- Constant head recharge boundaries as indicated by large river systems and lakes;
- Constant head discharge boundaries as indicated by water bodies, usually defined as bays or exposed coastline; and
- Geologic contacts.

The CSMs were further developed by examining features affecting flow patterns and transport of potential contaminants.

### *2.3.2 Hydrostratigraphic Units*

In most cases groups of community wells appeared to draw water from a single bedrock formation, constituting a single well field for the administrative unit. In other cases CSMs incorporated wells installed in more than one rock type, or wells installed in both bedrock and unconsolidated material. The primary aquifer material for each well field was encoded in the master well head database under the heading “Rock Type”, determined from bedrock and surficial geology mapping, well depth, and stratigraphy / lithology as indicated in the Pumping Test Database and drilled well logs for the area.

For each hydrostratigraphic unit within a given CSM, the production well depth was used to represent the approximate thickness of aquifer material. Information on the casing length and depth to overburden, where available, can be extracted to provide an indication of thickness and nature of confining material. Flow properties for each material type within the CSM were based on the analysis and assignment of data as described in Section 2.2.

### *2.3.3 Groundwater Flow Direction*

Regional and local components of groundwater flow were considered as indicated by the CSM boundaries, watershed mapping, hydrostratigraphic units, valleys, and intermediate groundwater-surface water interaction zones (wetlands, streams, and lakes within the CSM boundary). This information was used to indicate a primary groundwater flow axis from an upland recharge area of the CSM, through the well head, to the suspected zone of groundwater discharge. Where more than one

component of flow, or curved groundwater flow paths were suspected, the flow axis was generalized to represent a best fit.

A single groundwater flow vector was created for each well head, extending from the well head backward along the generalized flow axis to the up gradient boundary of the CSM. By extending the flow vector over the full up gradient length of the CSM, a regional topographic gradient was obtained and used as a proxy for the gradient of the ambient groundwater flow field. Flow vectors were created to allow for calculation of the analytical solution, and are not intended to represent or be used in place of detailed groundwater flow paths. The creation of flow vectors was an iterative process: in cases where the calculated capture zone indicated a smaller, local zone of influence, the vectors were adjusted to reflect shallower, more local flow boundaries and groundwater flow paths. When assigning flow vectors for well heads that were mapped as being installed in "Quaternary" material, emphasis was likewise placed on shallower, more local flow paths.

## 2.4 Delineation of Well Head Protection Areas

### *2.4.1 WHP Master File*

The completed well heads geodatabase contained mapping and information required to delineate a WHPA using an analytical solution. The data used directly in the analytical solution included the following:

- A unique well head ID;
- UTM easting and northing measured in metres;
- The pumping rate in cubic metres per day;
- The hydraulic conductivity of the aquifer material in metres per day;
- The gradient;
- The assigned porosity of the generalized rock type;
- The time of travel, set at 7300 days (20 years); and
- The mean direction of the flow vector, measured in degrees anti-clockwise from the east.

The pumping rate, Q ($m^3/d$), was calculated based on the average population served for each well head and an average consumption rate of 0.621 $m^3$/person/day.

### *2.4.2 Analytical Solution*

The analytical solution used in this study (Ceric and Haitjema, 2005) was developed in parallel with guidance documents provided by the USEPA for delineation of WHPAs for smaller groundwater systems. Time of Travel capture zones were delineated using a set of three simple tools based on the equations of 1D groundwater flow, while avoiding the need to develop a 3D groundwater flow model for each well field. The method is adapted to function under a range of pumping and groundwater flow conditions, effectively combining three individual methods for WHPA delineation.

The solution introduces a dimensionless time of travel parameter, t*, which provides an indication of the shape of the WHPA. The t* parameter compares the influence of radial flow induced by pumping to the influence of the ambient groundwater flow field. The t* parameter is small when pumping

dominates the shape of the capture zone, and grows larger as ambient flow exerts an increasing influence. Wells with a smaller t* are therefore essentially circular, and grow more elongated as t* increases. Ceric and Haitjema (2005) defined three thresholds for WHP delineation:

1. Calculation of a fixed radius around the well head when t*<0.1);
2. Calculation of a fixed radius, shifted in the up gradient direction of groundwater flow when 0.1<t*<1; and
3. Delineation of a more elongated zone when t*>1.

These thresholds were based on comparisons of detailed modelled zones to those calculated using simpler fixed radius methods.

Delineation of the more elongated zone is based on superposition of the Theim equation for steady, radial flow to a well and an ambient, 1D groundwater flow field with a sloping water table (Bear and Jacob, 1965; Todd, 1980). The equations describing points on the outer boundary of this zone cannot be solved directly and require computer methods to solve for and approximate the outer boundary. For this study Ceric and Haitjema's method (2005) was applied using spreadsheet calculations that were then adapted into a MATLAB code to allow for repeated calculation and calibration of solutions for 255 wells. The solution assumes that the influence of nearby wells and aquifer boundaries can be ignored. Appendix C provides the equations and conceptual model as defined by Todd (1980).

### *2.4.3 Spreadsheet Application of Analytical Solution*

Input data from the WHP master file were used to calculate the following:

- t*, the dimensionless time of travel parameter;
- r, the radius for a WHPA with t*<0.1;
- r*, the radius for a WHPA with 0.1<t*<1;
- d*, the distance of the shift for a circular WHPA with 0.1<t*<1;
- $X_{LD}$, the down gradient stagnation point of an elongated capture zone;
- $X_{LU}$, the (arbitrary) up gradient limit of an elongated capture zone; and
- $Y_L$, the maximum (asymptotic) width of the up gradient limit of the capture zone.

As the theoretical up gradient extent of the elongated WHPA solution is infinite, an approximation was used to iterate for a value of $X_{LU}$. $X_{LU}$ was calculated as the up gradient distance where the width, Y, of the capture zone was within 0.01 metres of $Y_L$. The distance between the well head and $X_{LU}$ was then subdivided, and the Y-coordinate for each of these points was calculated from the superposition of the radial and 1D flow fields (Appendix C). The coordinates of each point were rotated using the mean direction of the flow vector for each well head, and absolute distances were added to the UTM coordinate of the well head to delineate the zones in the map space.

A generic sensitivity analysis was created for ranges of the hydraulic conductivity, pumping rate, porosity, gradient, and aquifer thickness. The values of t*, $X_{LD}$, $X_{LU}$, and $Y_L$ were compared to provide an indication of how each parameter affected the length, width and shape of the resulting WHPA.

### *2.4.4 Calibration of Analytical Solution*

The spreadsheet solution was adapted to a MATLAB code in order to automate the following steps:

1. Calculation of t*.
2. Determination of the best method for delineation of a WHPA.
3. Calculation of the appropriate data depending on the solution indicated by t*.
4. Iteration for $X_{LU}$.
5. Output to a coordinate file for input into GIS mapping software.

By automating this process for all 255 well heads, repeated solutions allowed for comparison and calibration of the data set. Zones subject to the following conditions were truncated at up gradient no-flow/recharge boundaries as indicated by the CSMs:

- $X_{LU}$ exceeded the distance to the CSM boundary, or
- Several WHPAs intersected at an up gradient point (suggesting a local recharge boundary).

As many of the wells serving smaller communities are pumped at low rates, the influence of the groundwater flow field can be relatively high. In selected cases (approximately 25 wells), the resulting WHPAs were impractically long and narrow. Automation allowed for adjustment of input parameters and generation of a more user friendly dataset. The results of calibration are described in Chapter 3. Automation will furthermore allow for continued updates with minimal additional effort as more detailed data becomes available for groundwater use and the hydraulic conductivity of the underlying unit.

# CHAPTER 3 ATLAS OF WELL HEAD PROTECTION AREAS

## 3.1 Production Well Data

A copy of the complete well head master file is provided in Appendix B. Table B2 provides a list and summary explanation of fields used in the well heads master database. After identification of all known individual well heads (and springs), data were compiled for a total of 265 wells in 95 communities, 152 serviced areas, and grouped into 106 well field study areas/CSMs. Nine wells were reported to be out of service, ű ø 2 utilitλŜå had an existing WHPA based on a 3D groundwater flow model (Stephenville l·yŘ YλLJLJŜyã), and WHPAs were delineated for the remaining 255 well heads.

The largest communities (largest mapped demand) were:

- Springdale (1716 $m^3/d$),
- Happy Valley-Goose Bay (784 $m^3/d$),
- Colliers (448 $m^3/d$),
- Natuashish (438 $m^3/d$),
- Green's Harbour (416 $m^3/d$), and
- Port au Port East (378 $m^3/d$).

The highest hydraulic conductivity values were recorded for the aquifers serving:

- St. Mary's (4.77 x $10^{-5}$ m/s),
- Bay St. George South (3.77 x $10^{-5}$ m/s), and
- Bunyan's Cove (1.21 x $10^{-5}$ m/s).

An additional 20 wells were installed in aquifers assigned a hydraulic conductivity of $10^{-5}$ m/s.

## 3.2 Solutions

The analytical solution produced WHPAs as follows:

- 81 circular WHPAs using a fixed-radius;
- 47 circular WHPAs using a fixed radius solution shifted in the up gradient direction; and
- 128 elongated WHPAs using superposition of the Theim equation and 1D ambient flow field.

The size of WHPAs varied from 0.23 to 2174 hectares. 118 of the WHPAs exhibited an area of less than five hectares, with an additional 53 WHPAs between five and ten hectares. 80 WHPAs exhibited areas between 10 and 100 hectares. The four largest WHPAs were as follows:

- Happy Valley-Goose Bay Spring Gulch Quaternary Well (2174 ha, circular)
- Springdale Industrial Park (500 ha, elongated)
- Natuashish (185 ha, circular)
- Eastport (118 ha, elongated)

Low pumping rates in the context of larger apparent groundwater flow fields resulted in long narrow zones for some of the well heads. The sensitivity analysis showed that solutions exhibited a strong dependence on the pumping rate and hydraulic conductivity. As the average population served by individual wells did not vary greatly (less than 500 for all but 15 well heads), solutions calculated for this work depended most directly on the hydraulic conductivity, which varied from $4.77 \times 10^{-5}$ m/s to $5 \times 10^{-9}$ m/s. The sensitivity analysis showed that solutions with $t^*<200$ were stable and provided usable zones. For the range of pumping rates used in this study, the maximum usable hydraulic conductivity was on the order of $2 \times 10^{-6}$ to $5 \times 10^{-6}$ m/s. As many parts of Newfoundland and Labrador are characterized by crystalline, low permeability formations, low pumping rates did not generally create problems for the analytical solution.

In selected cases the groundwater flow field exceeded the pumping rate by a large enough amount that the solution did not converge or yielded a zone only several metres wide but tens to hundreds of kilometres long. An increase in the pumping rate for these wells provided a conservative method to create a more balanced WHPA, while increasing rather than decreasing degrees of safety for the well field. In selected cases the hydraulic conductivity of the formation was also adjusted downward to achieve convergence. Adjustments to the hydraulic conductivity were made by comparing local pumping test data to regional and local properties obtained from the statistical analysis of well yields. Appendix D provides a list of 27 locations and the associated adjusted parameter values.

## 3.3 WHPA Maps

Maps of the WHPA delineated for each well head are presented in Appendix E, grouped by community and/or the CSM for the well field. Summary tables on each map provide a summary of the Well ID as indicated in provincial databases or provided by the local operator, the population served, resulting average pumping rate, and the hydraulic conductivity of the formation.

## 3.4 Geodatabase

All mapping layers generated for this work have been collated into a geodatabase for further use. The primary sources of data for this work are a point file and polygon file containing all available well information, well head locations, and the associated WHPAs. The geodatabase also contains base mapping layers from previous mapping (e.g. Groundwater Vulnerability Mapping) and CSM boundaries.

# CHAPTER 4 RECOMMENDATIONS

## 4.1 Community Well Data

The analytical solution to delineate WHPAs is dependent on the quality of water use (pumping rate) and hydraulic conductivity data. The positions of shifted and elongated WHPAs also depend directly on the direction of groundwater flow. The accuracy of WHPA delineation would be improved by using site specific data for each well field and/or well head. The following initiatives can be implemented at the operator level, and would improve each WHPA:

- Review the data table provided on mapping of the WHPA and provide comments on the pumping rate and well depth.

This information may be readily available and would allow for recalculation of zones based on new operator information.

- Determine the pump type and depth, and record the approximate on-off schedule over one week to one month of pumping.

Estimates of the instantaneous pumping rate and pumping schedule can be used to provide a more accurate estimate of water use and long term pumping rates.

- Record water meter readings if available.

Water metering, either at the well head or at individual homes provides the best record of actual water use and average pumping rates.

- Measure and record water levels:
    - Static (well is off and fully recovered)
    - Pumping (well is on and stabilized)
    - Recovery – a series of water levels measured for one hour after the pump is turned off.

Water level data would help with interpretation of pumping records, and recovery data would allow for more accurate calculation of the aquifer properties, greatly improving the WHPA map.

The automated solution provides a means of updating WHPAs as additional data becomes available. Where new data is obtained for each well field, the analytical solution should be repeated to show the position of the new zone.

## 4.2 Well Head Protection Planning

WHPAs may be used to initiate work to build a WHPP for each community. Components of work to develop a WHPP include:

- Field reconnaissance of WHPAs;
- Inventory of land uses and ownership within each WHPA and documentation of land uses of concern;
- Monitoring of water use and well water levels;
- Risk analysis of potential groundwater protection concerns;
- Development of land use guidelines, by-laws, voluntary agreements, and management strategies to effectively address risks; and
- Incorporation of Well Head Protection Plan into a Community or Local Service District Planning Strategy.

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# APPENDIX A

GEOSPATIAL ANALYSIS OF VARIANCE OF AIRLIFT YIELD DATA

**Table A1. Summary of ANOVA for pQ̄**

| Test Group | Factor | no. of observations | F Statistic | F Critical | Variance |
|---|---|---|---|---|---|
| Alternating Sedimentary | Formation | 1326 | 10.50 | 1.44 | UNEQUAL |
| Carbonate | | 243 | 4.44 | 1.83 | UNEQUAL |
| Fine grained Sediments | | 753 | 11.87 | 1.62 | UNEQUAL |
| Metamorphic | | 113 | 2.13 | 1.81 | UNEQUAL |
| Plutonic | | 454 | 3.96 | 1.50 | UNEQUAL |
| Sandstone/Conglomerate | | 512 | 3.90 | 1.56 | UNEQUAL |
| Fine Grained Sandstone | | 611 | 2.06 | 1.66 | UNEQUAL |
| Volcanic | | 172 | 9.57 | 1.84 | UNEQUAL |
| American Tickle Formation | Polygon | 37 | 1.89 | 2.63 | EQUAL |
| Andersons Cove | | 12 | 0.38 | 3.89 | EQUAL |
| Bonavista Formation | | 140 | 3.65 | 1.95 | UNEQUAL |
| Bull Arm Formation | | 59 | 12.20 | 2.76 | UNEQUAL |
| Bull Arm Pluton | | 82 | 0.71 | 2.21 | EQUAL |
| Bull Arm Volcanics | | 73 | 5.99 | 2.07 | UNEQUAL |
| Campbellton greywacke | | 27 | 2.18 | 2.96 | EQUAL |
| Cashel Lookout | | 38 | 2.36 | 2.46 | EQUAL |
| Codroy Road Formation | | 34 | 2.20 | 2.88 | EQUAL |
| Connecting Point Group | | 91 | 1.71 | 2.20 | EQUAL |
| Cooks Brook Formation | | 8 | 1.31 | 4.46 | EQUAL |
| Creston Formation | | 7 | 2.03 | 4.74 | EQUAL |
| Crown Hill Formation | | 150 | 9.91 | 2.43 | UNEQUAL |
| Drook Formation | | 450 | 0.80 | 2.12 | EQUAL |
| Elliotts Cove Formation | | 72 | 17.42 | 3.12 | UNEQUAL |
| Fermeuse Formation | | 238 | 2.07 | 2.25 | EQUAL |
| Fogo Batholith Formation | | 49 | 1.67 | 2.79 | EQUAL |
| Fogo Harbour Formation | | 23 | 0.80 | 3.03 | EQUAL |
| Gibbett Hill Formation | | 103 | 7.54 | 2.69 | UNEQUAL |
| Great Bay de l'eau Formation | | 66 | 0.00 | 3.14 | EQUAL |
| Harbour Main Group | | 177 | 3.60 | 1.78 | UNEQUAL |
| Hawke Bay Formation | | 27 | 6.09 | 3.35 | UNEQUAL |
| Heart's Content Formation | | 143 | 2.84 | 2.67 | UNEQUAL |
| Heart's Desire Formation | | 57 | 1.30 | 2.53 | EQUAL |
| Holyrood Intrusive suite | | 89 | 0.56 | 3.10 | EQUAL |
| Irishtown Formation | | 10 | 0.23 | 4.10 | EQUAL |

**Table A1. Summary of ANOVA for pQ̄**

| Test Group | Factor | no. of observations | F Statistic | F Critical | Variance |
|---|---|---|---|---|---|
| Lawrenceton Formation | Polygon | 52 | 7.67 | 2.28 | UNEQUAL |
| Lewisporte Conglomerate | | 27 | 1.77 | 3.35 | EQUAL |
| Loon Bay batholith | | 39 | 2.58 | 3.24 | EQUAL |
| Love Cove | | 19 | 0.18 | 3.13 | EQUAL |
| Lushs Bight Group | | 11 | 7.18 | 3.59 | UNEQUAL |
| Maiden Point Formation Volcanics | | 16 | 6.57 | 3.63 | UNEQUAL |
| Maiden Point Formation | | 25 | 0.16 | 3.39 | EQUAL |
| Main Point Formation | | 22 | 3.21 | 3.44 | EQUAL |
| March Point Formation | | 29 | 0.58 | 2.55 | EQUAL |
| Maturin Ponds Formation | | 46 | 6.21 | 2.57 | UNEQUAL |
| Melange | | 22 | 0.95 | 3.05 | EQUAL |
| Mistaken Point Formation | | 195 | 5.55 | 2.06 | UNEQUAL |
| Musgravetown Group | | 141 | 7.99 | 3.06 | UNEQUAL |
| Petit Jardin Formation | | 93 | 0.49 | 2.47 | EQUAL |
| Point Leamington Formation | | 11 | 0.83 | 3.59 | EQUAL |
| Port au Port Group | | 25 | 0.27 | 2.99 | EQUAL |
| Porterville Gabbro | | 6 | 4.82 | 5.14 | EQUAL |
| Quaternary (Frm type) | | 120 | 2.01 | 2.09 | EQUAL |
| Renews Head Formation | | 208 | 4.12 | 2.42 | UNEQUAL |
| Rocky Harbour formation | | 14 | 1.57 | 3.34 | EQUAL |
| Saltwater Pond member | | 19 | 0.29 | 3.13 | EQUAL |
| Searston Formation | | 65 | 14.62 | 3.14 | UNEQUAL |
| South Brook Formation | | 18 | 0.67 | 3.55 | EQUAL |
| Squires Park Member | | 13 | 1.65 | 3.81 | EQUAL |
| Terra Nova Granite | | 22 | 8.36 | 3.44 | UNEQUAL |
| Torbay Member | | 27 | 9.25 | 3.35 | UNEQUAL |
| Trepassey Formation | | 56 | 4.43 | 2.38 | UNEQUAL |
| Undivided Sedimentary rocks | | 31 | 1.08 | 3.30 | EQUAL |
| Undivided | | 6 | 1.84 | 5.14 | EQUAL |
| Volcanic rocks | | 76 | 19.23 | 2.72 | UNEQUAL |
| Wigwam Formation | | 18 | 1.06 | 3.16 | EQUAL |
| AGE | | 2101 | 9.06 | 1.35 | UNEQUAL |

**Table A2. $\bar{Q}$ Groups, Codes and Data**

| LEVEL | ROCK | Formation | Polygon | CODE | p$\bar{Q}$ | $\bar{Q}$ (m2/d) |
|---|---|---|---|---|---|---|
| 1 | Quaternary | | | Quat | -0.32 | 1.38 |
| | Carbonate | | | CarbPluVolFGsed | 0.77 | 0.46 |
| | Plutonic | | | CarbPluVolFGsed | 0.77 | 0.46 |
| | Volcanic | | | CarbPluVolFGsed | 0.77 | 0.46 |
| | FG_Sedimentary | | | CarbPluVolFGsed | 0.77 | 0.46 |
| | Sandstone/Conglomerate | | | SndstCngMeta | 1.03 | 0.36 |
| | Metamorphic | | | SndstCngMeta | 1.03 | 0.36 |
| | Alternating Sedimentary | | | AltSedFGsndst | 1.27 | 0.28 |
| | Sandstone/FG | | | AltSedFGsndst | 1.27 | 0.28 |
| 2 | | Searston Formation | | AltSed1 | -0.27 | 1.31 |
| | | Hawke Bay Formation | | AltSed1 | -0.27 | 1.31 |
| | | Sedimentary rocks | | AltSed1 | -0.27 | 1.31 |
| | | Forteau Formation | | AltSed1 | -0.27 | 1.31 |
| | | Mollichignick Member | | AltSed1 | -0.27 | 1.31 |
| | | St. Josephs Cove Formation | | AltSed1 | -0.27 | 1.31 |
| | | Baccalieu Member | | AltSed1 | -0.27 | 1.31 |
| | | Codroy Group | | AltSed1 | -0.27 | 1.31 |
| | | Andersons Cove Formation | | AltSed2 | 0.92 | 0.40 |
| | | Barasway Formation | | AltSed2 | 0.92 | 0.40 |
| | | Cape Rouge Formation | | AltSed2 | 0.92 | 0.40 |
| | | Harbour Main Group | | AltSed2 | 0.92 | 0.40 |
| | | Heart's Content Formation | | AltSed2 | 0.92 | 0.40 |
| | | Cinq Isles Formation | | AltSed2 | 0.92 | 0.40 |
| | | Maturin Ponds Formation | | AltSed2 | 0.92 | 0.40 |
| | Alternating Sedimentary | (NFMAP 94-226 Carboniferous sediments) | | AltSed2 | 0.92 | 0.40 |
| | | Grandy's Pond formation | | AltSed2 | 0.92 | 0.40 |
| | | Drook Formation | | AltSed3 | 1.64 | 0.19 |
| | | Wigwam Formation altsed | | AltSed3 | 1.64 | 0.19 |
| | | Quidi Vidi Formation | | AltSed3 | 1.64 | 0.19 |
| | | Pinchgut Lake Group | | AltSed3 | 1.64 | 0.19 |
| | | Unnamed Breccia | | AltSed3 | 1.64 | 0.19 |
| | | Rocky Harbour Formation | | AltSed3 | 1.64 | 0.19 |
| | | Musgravetown Group | | AltSed3 | 1.64 | 0.19 |
| | | Undivided Sedimentary rocks | | AltSed3 | 1.64 | 0.19 |
| | | Mistaken Point Formation | | AltSed3 | 1.64 | 0.19 |
| | | Creston Formation | | AltSed3 | 1.64 | 0.19 |
| | | Trinny Cove Formation | | AltSed3 | 1.64 | 0.19 |
| | | Moores Cove Formation | | AltSed3 | 1.64 | 0.19 |
| | | Connecting Point Group | | AltSed4 | 2.36 | 0.09 |
| | | Outflow Formation | | AltSed4 | 2.36 | 0.09 |

**Table A2. Q̄ Groups, Codes and Data**

| LEVEL | ROCK | Formation | Polygon | CODE | pQ̄ | Q̄ (m2/d) |
|---|---|---|---|---|---|---|
| | Carbonate | Ship Cove Formation | | Carb1 | -0.62 | 1.86 |
| | | Berry Head Formation | | Carb1 | -0.62 | 1.86 |
| | | Table Point Formation | | Carb1 | -0.62 | 1.86 |
| | | Catoche Formation | | Carb1 | -0.62 | 1.86 |
| | | Boat Harbour Formation | | Carb1 | -0.62 | 1.86 |
| | | Port au Port Group | | Carb2 | 0.87 | 0.42 |
| | | Table Head Group | | Carb2 | 0.87 | 0.42 |
| | | March Point Formation | | Carb2 | 0.87 | 0.42 |
| | | Petit Jardin Formation | | Carb2 | 0.87 | 0.42 |
| | | Cooks Brook Formation | | Carb2 | 0.87 | 0.42 |
| | | Watts Bight Formation | | Carb2 | 0.87 | 0.42 |
| | Fine grained Sedimentary | Codroy Road Formation | | FGSed1 | -0.61 | 1.84 |
| | | Jeffreys Village Member | | FGSed1 | -0.61 | 1.84 |
| | | Rocky Brook Formation | | FGSed1 | -0.61 | 1.84 |
| | | Woody Cape Formation | | FGSed1 | -0.61 | 1.84 |
| | | Spillway Member | | FGSed2 | 0.42 | 0.66 |
| | | Epine Cadoret formation | | FGSed2 | 0.42 | 0.66 |
| | | Squires Park Member | | FGSed2 | 0.42 | 0.66 |
| | | American Tickle Formation | | FGSed2 | 0.42 | 0.66 |
| | | Brook Harbour Member | | FGSed2 | 0.42 | 0.66 |
| | | Bonavista Formation | | FGSed3 | 1.18 | 0.31 |
| | | Elliotts Cove Formation | | FGSed3 | 1.18 | 0.31 |
| | | Fermeuse Formation | | FGSed3 | 1.18 | 0.31 |
| | | Green Cove member | | FGSed3 | 1.18 | 0.31 |
| | | (001M/04/0170a undivided Cambrian shales and limestones) | | FGSed3 | 1.18 | 0.31 |
| | | Connecting Point Group FG Sed | | FGSed3 | 1.18 | 0.31 |
| | | Main Point Formation | | FGSed4 | 2.35 | 0.10 |
| | | Riches Island Formation | | FGSed4 | 2.35 | 0.10 |
| | | Charles Cove formation | | FGSed4 | 2.35 | 0.10 |
| | Metamorphic | Indian Head Complex | | Meta1 | 0.87 | 0.42 |
| | | Strong Island chert | | Meta1 | 0.87 | 0.42 |
| | | Undivided | | Meta1 | 0.87 | 0.42 |
| | | South Brook Formation | | Meta1 | 0.87 | 0.42 |
| | | American Tickle Formation M | | Meta1 | 0.87 | 0.42 |
| | | Hare Bay Gneiss | | Meta1 | 0.87 | 0.42 |
| | | Melange | | Meta1 | 0.87 | 0.42 |
| | | Companion Melange | | Meta1 | 0.87 | 0.42 |
| | | Carmanville Melange | | Meta1 | 0.87 | 0.42 |
| | | Love Cove Group | | Meta1 | 0.87 | 0.42 |
| | | Grandy's formation | | Meta1 | 0.87 | 0.42 |
| | | Dunnage Melange | | Meta2 | 2.01 | 0.13 |
| | | Kelby Cove orthogneiss | | Meta2 | 2.01 | 0.13 |
| | Plutonic | Terra Nova Granite | | Plu1 | -0.41 | 1.50 |
| | | Porterville gabbro | | Plu1 | -0.41 | 1.50 |
| | | Belleoram Granite | | Plu1 | -0.41 | 1.50 |
| | | Hodges Hill intrusive suite | | Plu1 | -0.41 | 1.50 |
| | | Cape Ray Granite | | Plu1 | -0.41 | 1.50 |
| | | Holyrood Intrusive Suite | | Plu2 | 0.80 | 0.45 |
| | | Loon Bay batholith | | Plu2 | 0.80 | 0.45 |
| | | St. Lawrence Granite | | Plu2 | 0.80 | 0.45 |
| | | Birchy complex | | Plu2 | 0.80 | 0.45 |
| | | Powder Horn Diorite Complex | | Plu2 | 0.80 | 0.45 |
| | | Red Head Porphyry | | Plu2 | 0.80 | 0.45 |

**Table A2. Q̄ Groups, Codes and Data**

| LEVEL | ROCK | Formation | Polygon | CODE | pQ̄ | Q̄ (m2/d) |
|---|---|---|---|---|---|---|
| | Plutonic | Bull Arm Formation Plu | | Plu2 | 0.80 | 0.45 |
| | | Fogo batholith | | Plu2 | 0.80 | 0.45 |
| | | Deadmans Bay Granite | | Plu2 | 0.80 | 0.45 |
| | | Swift Current Granite | | Plu2 | 0.80 | 0.45 |
| | | Whalesback Gabbro | | Plu2 | 0.80 | 0.45 |
| | | Woodfords Arm pluton | | Plu2 | 0.80 | 0.45 |
| | | Thwart Island gabbro | | Plu2 | 0.80 | 0.45 |
| | | Betts Cove Complex | | Plu2 | 0.80 | 0.45 |
| | | Advocate Complex | | Plu2 | 0.80 | 0.45 |
| | | Lockers Bay Granite | | Plu2 | 0.80 | 0.45 |
| | | Anchor Drogue granodiorite | | Plu3 | 2.28 | 0.10 |
| | | Wandsworth Formation | | Plu3 | 2.28 | 0.10 |
| | | Brighton gabbro | | Plu3 | 2.28 | 0.10 |
| | | Twillingate pluton | | Plu3 | 2.28 | 0.10 |
| | Sandstone/Conglomerate | Blow Me Down Brook Formation | | SndstCngl1 | 0.05 | 0.95 |
| | | Highlands Member | | SndstCngl1 | 0.05 | 0.95 |
| | | Great Bay de l'Eau Formation | | SndstCngl1 | 0.05 | 0.95 |
| | | Redmans Formation | | SndstCngl1 | 0.05 | 0.95 |
| | | Pools Cove Formation | | SndstCngl1 | 0.05 | 0.95 |
| | | Connecting Point Group Sndst | | SndstCngl2 | 1.23 | 0.29 |
| | | Heart's Desire Formation | | SndstCngl2 | 1.23 | 0.29 |
| | | Badger Group | | SndstCngl2 | 1.23 | 0.29 |
| | | Gibbett Hill Formation | | SndstCngl2 | 1.23 | 0.29 |
| | | Wigwam Formation | | SndstCngl2 | 1.23 | 0.29 |
| | | North Brook Formation | | SndstCngl2 | 1.23 | 0.29 |
| | | Goldson Formation | | SndstCngl2 | 1.23 | 0.29 |
| | | Cape Bonavista Facies | | SndstCngl2 | 1.23 | 0.29 |
| | | Lewisporte conglomerate | | SndstCngl2 | 1.23 | 0.29 |
| | | Point Leamington | | SndstCngl2 | 1.23 | 0.29 |
| | | Blackhead Formation | | SndstCngl2 | 1.23 | 0.29 |
| | | Bull Arm Formation | | SndstCngl2 | 1.23 | 0.29 |
| | | Crouse Harbour Formation | | SndstCngl2 | 1.23 | 0.29 |
| | | Random Formation Sndst | | SndstCngl2 | 1.23 | 0.29 |
| | | Fogo Harbour formation | | SndstCngl2 | 1.23 | 0.29 |
| | | Maiden Point Formation | | SndstCngl2 | 1.23 | 0.29 |
| | | New World Island | | SndstCngl2 | 1.23 | 0.29 |
| | Fine grained Sandstone | Campbellton greywacke | | FGSndst1 | 1.26 | 0.28 |
| | | Fermeuse Formation Sandst | | FGSndst1 | 1.26 | 0.28 |
| | | Crown Hill Formation | | FGSndst1 | 1.26 | 0.28 |
| | | Saltwater Pond Member | | FGSndst1 | 1.26 | 0.28 |
| | | Lower Head Formation | | FGSndst1 | 1.26 | 0.28 |
| | | Little Bell Island Formation | | FGSndst1 | 1.26 | 0.28 |
| | | Summerside Formation | | FGSndst1 | 1.26 | 0.28 |
| | | Jonathan's Pond Formation | | FGSndst1 | 1.26 | 0.28 |
| | | Renews Head Formation | | FGSndst1 | 1.26 | 0.28 |
| | | Trepassey formation | | FGSndst1 | 1.26 | 0.28 |
| | | Bay View Formation | | FGSndst1 | 1.26 | 0.28 |
| | | Brimstone Head formation | | FGSndst1 | 1.26 | 0.28 |
| | | Torbay Member | | FGSndst2 | 1.97 | 0.14 |
| | | Cuckold Formation | | FGSndst2 | 1.97 | 0.14 |
| | | Sansom-type greywacke | | FGSndst2 | 1.97 | 0.14 |
| | | Charles Brook Member | | FGSndst2 | 1.97 | 0.14 |

**Table A2. Q̄ Groups, Codes and Data**

| LEVEL | ROCK | Formation | Polygon | CODE | pQ̄ | Q̄ (m2/d) |
|---|---|---|---|---|---|---|
| | Volcanic | Volcanic rocks | | Vol1 | -0.23 | 1.26 |
| | | Maiden Point Formation Vol | | Vol1 | -0.23 | 1.26 |
| | | Western Head Formation | | Vol1 | -0.23 | 1.26 |
| | | Marystown Group | | Vol1 | -0.23 | 1.26 |
| | | Lushs Bight Group | | Vol1 | -0.23 | 1.26 |
| | | Taylors Bay Formation | | Vol1 | -0.23 | 1.26 |
| | | Noggin Cove Formation | | Vol1 | -0.23 | 1.26 |
| | | Port au Bras Formation | | Vol1 | -0.23 | 1.26 |
| | | Sleepy Cove Group | | Vol1 | -0.23 | 1.26 |
| | | Summerford Group | | Vol1 | -0.23 | 1.26 |
| | | Path End Formation | | Vol1 | -0.23 | 1.26 |
| 3 | Fine Grained Sedimentary (2) | Elliotts Cove Formation | NF191_0055 | FGSed2_EC1 | 0.84 | 0.43 |
| | | | NF191_0102 | FGSed2_EC2 | 2.83 | 0.06 |
| | Fine Grained Sedimentary (3) | Bonavista Formation | NF191_0147 | FGSed3_BV1 | 0.79 | 0.45 |
| | | | NF191_0065 | FGSed3_BV1 | 0.79 | 0.45 |
| | | | NF191_0058 | FGSed3_BV1 | 0.79 | 0.45 |
| | | | NF191_0086 | FGSed3_BV1 | 0.79 | 0.45 |
| | | | NF191_0361 | FGSed3_BV1 | 0.79 | 0.45 |
| | | | NF191_0045 | FGSed3_BV1 | 0.79 | 0.45 |
| | | | NF186_0017 | FGSed3_BV1 | 0.79 | 0.45 |
| | | | NF191_0041 | FGSed3_BV1 | 0.79 | 0.45 |
| | | | NF191_0290 | FGSed3_BV1 | 0.79 | 0.45 |
| | | | NF191_0041 | FGSed3_BV2 | 2.04 | 0.13 |
| | | | NF191_0290 | FGSed3_BV2 | 2.04 | 0.13 |
| | Sandstone/Conglomerate (2) | Gibbett Hill Formation | NF191_0431 | SndstCngl2_GH1 | 0.75 | 0.47 |
| | | | NF191_0003 | SndstCngl2_GH1 | 0.75 | 0.47 |
| | | | NF191_0024 | SndstCngl2_GH2 | 2.11 | 0.12 |
| | | Bull Arm Formation | NF188_0069 | SndstCngl2_BA1 | 0.98 | 0.38 |
| | | | NF188_0042 | SndstCngl2_BA1 | 0.98 | 0.38 |
| | | | NF188_0144 | SndstCngl2_BA2 | 2.73 | 0.07 |
| | Fine Grained Sandstone (1) | Crown Hill Formation | NF191_0006 | FGSndst1_CH1 | 0.76 | 0.47 |
| | | | NF191_0001 | FGSndst1_CH1 | 0.76 | 0.47 |
| | | | NF186_0010 | FGSndst1_CH2 | 2.75 | 0.06 |
| | | | NF191_0144 | FGSndst1_CH2 | 2.75 | 0.06 |
| | | Trepassey Formation | NF191_0176 | FGSndst1_Tp1 | 0.34 | 0.71 |
| | | | NF191_0152 | FGSndst1_Tp1 | 0.34 | 0.71 |
| | | | NF191_0080 | FGSndst1_Tp1 | 0.34 | 0.71 |
| | | | NF191_0096 | FGSndst1_Tp2 | 2.14 | 0.12 |
| | | | NF191_0057 | FGSndst1_Tp2 | 2.14 | 0.12 |
| | | Renews Head Formation | NF191_0016 | FGSndst1_RH1 | 0.92 | 0.40 |
| | | | NF191_0244 | FGSndst1_RH1 | 0.92 | 0.40 |
| | | | NF191_0027 | FGSndst1_RH2 | 1.67 | 0.19 |
| | | | NF191_0108 | FGSndst1_RH2 | 1.67 | 0.19 |
| | Fine Grained Sandstone (2) | Torbay Member | NF191_0161 | FGSndst2_Tb1 | 1.44 | 0.24 |
| | | | NF191_0143 | FGSndst2_Tb2 | 3.22 | 0.04 |
| | Alternating Sedimentary (1) | Searston Formation | NF143_0053 | AltSed1_S1 | -0.79 | 2.20 |
| | | | NF142_0002 | AltSed1_S2 | 0.77 | 0.46 |
| | | Hawke Bay Formation | NF116_0069 | AltSed1_HB1 | 1.38 | 0.25 |
| | | | NF121_0004 | AltSed1_HB2 | -0.51 | 1.66 |
| | | Maturin Ponds Formation | NF191_0087 | AltSed2_MtP1 | -0.88 | 2.42 |
| | | | NF191_0035 | AltSed2_MtP2 | 1.66 | 0.19 |
| | | | NF191_0015 | AltSed2_MtP2 | 1.66 | 0.19 |
| | | | NF191_0150 | AltSed2_MtP2 | 1.66 | 0.19 |
| | | Heart's Content Formation | NF191_0002 | AltSed2_HC1 | 1.08 | 0.34 |
| | | | NF191_0033 | AltSed2_HC1 | 1.08 | 0.34 |
| | | | NF191_0272 | AltSed2_HC2 | 1.96 | 0.14 |

**Table A2. Q̄ Groups, Codes and Data**

| LEVEL | ROCK | Formation | Polygon | CODE | pQ̄ | Q̄ (m2/d) |
|---|---|---|---|---|---|---|
| | Alternating Sedimentary (2) | Harbour Main Group | NF191_0215 | AltSed2_HM1 | -0.28 | 1.32 |
| | | | NF191_0376 | AltSed2_HM1 | -0.28 | 1.32 |
| | | | NF191_0320 | AltSed2_HM1 | -0.28 | 1.32 |
| | | | NF191_0234 | AltSed2_HM1 | -0.28 | 1.32 |
| | | | NF191_0262 | AltSed2_HM1 | -0.28 | 1.32 |
| | | | NF191_0020 | AltSed2_HM1 | -0.28 | 1.32 |
| | | | NF191_0095 | AltSed2_HM2 | 1.01 | 0.36 |
| | | | NF191_0253 | AltSed2_HM2 | 1.01 | 0.36 |
| | | | NF191_0273 | AltSed2_HM2 | 1.01 | 0.36 |
| | | | NF191_0324 | AltSed2_HM2 | 1.01 | 0.36 |
| | | | NF191_0166 | AltSed2_HM2 | 1.01 | 0.36 |
| | | | NF191_0133 | AltSed2_HM2 | 1.01 | 0.36 |
| | | | NF191_0184 | AltSed2_HM2 | 1.01 | 0.36 |
| | Alternating Sedimentary (3) | Mistaken Point Formation | NF191_0067 | AltSed3_MnP1 | 1.08 | 0.34 |
| | | | NF191_0048 | AltSed3_MnP1 | 1.08 | 0.34 |
| | | | NF191_0219 | AltSed3_MnP1 | 1.08 | 0.34 |
| | | | NF191_0031 | AltSed3_MnP1 | 1.08 | 0.34 |
| | | | NF191_0163 | AltSed3_MnP1 | 1.08 | 0.34 |
| | | | NF191_0021 | AltSed3_MnP2 | 2.03 | 0.13 |
| | | | NF191_0294 | AltSed3_MnP2 | 2.03 | 0.13 |
| | | Musgravetown Group | NF186_0011 | AltSed3_Mg1 | 1.90 | 0.15 |
| | | | NF186_0009 | AltSed3_Mg2 | 0.97 | 0.38 |
| | Volcanic (1) | Lawrenceton | NF046_0004 | Vol1_L1 | -1.13 | 3.09 |
| | | | NF029_0028 | Vol1_L1 | -1.13 | 3.09 |
| | | | NF046_0009 | Vol1_L1 | -1.13 | 3.09 |
| | | | NF046_0025 | Vol1_L2 | 1.05 | 0.35 |
| | | | NF029_0027 | Vol1_L2 | 1.05 | 0.35 |
| | | | NF152_0032 | Vol1_L2 | 1.05 | 0.35 |
| | | Lushs Bight Group | NF007_0084 | Vol1_LB1 | -1.69 | 5.43 |
| | | | NF008_0161 | Vol1_LB2 | 2.12 | 0.12 |
| | | | NF007_0096 | Vol1_LB2 | 2.12 | 0.12 |
| | | Maiden Point Formation Volcanics | NF160_0066 | Vol1_MP1 | -0.94 | 2.57 |
| | | | NF160_0070 | Vol1_MP2 | 1.32 | 0.27 |
| | | Volcanic rocks | NF067_0163 | Vol1_V1 | 0.62 | 0.54 |
| | | | NF096_0054 | Vol1_V2 | -1.28 | 3.59 |
| | | | NF096_0082 | Vol1_V3 | -1.13 | 3.11 |
| | Plutonic (1) | Terra Nova Granite | NF188_0120 | Plu1_TN1 | 0.37 | 0.69 |
| | | | NF185_0018 | Plu1_TN2 | -1.36 | 3.90 |

**Table A3. Summary of Polygon, Formation, and Rock Type Group Means and Codes ($\bar{Q}$ Sample Size = 5142)**

| Code | $\bar{Q}$ (m2/d) | Code | $\bar{Q}$ (m2/d) |
|---|---|---|---|
| FGSndst2_Tb2 | 0.04 | AltSed2 | 0.40 |
| FGSed2_EC2 | 0.06 | FGSndst1_RH1 | 0.40 |
| FGSndst1_CH2 | 0.06 | Meta1 | 0.42 |
| SndstCngl2_BA2 | 0.07 | Carb2 | 0.42 |
| AltSed4 | 0.09 | FGSed2_EC1 | 0.43 |
| FGSed4 | 0.10 | Plu2 | 0.45 |
| Plu3 | 0.10 | FGSed3_BV1 | 0.45 |
| FGSndst1_Tp2 | 0.12 | CarbPluVolFGsed | 0.46 |
| Vol1_LB2 | 0.12 | AltSed1_S2 | 0.46 |
| SndstCngl2_GH2 | 0.12 | FGSndst1_CH1 | 0.47 |
| FGSed3_BV2 | 0.13 | SndstCngl2_GH1 | 0.47 |
| AltSed3_MnP2 | 0.13 | Vol1_V1 | 0.54 |
| Meta2 | 0.13 | FGSed2 | 0.66 |
| FGSndst2 | 0.14 | Plu1_TN1 | 0.69 |
| AltSed2_HC2 | 0.14 | FGSndst1_Tp1 | 0.71 |
| AltSed3_Mg1 | 0.15 | SndstCngl1 | 0.95 |
| FGSndst1_RH2 | 0.19 | Vol1 | 1.26 |
| AltSed2_MtP2 | 0.19 | AltSed1 | 1.31 |
| AltSed3 | 0.19 | AltSed2_HM1 | 1.32 |
| FGSndst2_Tb1 | 0.24 | Quat | 1.38 |
| AltSed1_HB1 | 0.25 | Plu1 | 1.50 |
| Vol1_MP2 | 0.27 | AltSed1_HB2 | 1.66 |
| AltSedFGsndst | 0.28 | FGSed1 | 1.84 |
| FGSndst1 | 0.28 | Carb1 | 1.86 |
| SndstCngl2 | 0.29 | AltSed1_S1 | 2.20 |
| FGSed3 | 0.31 | AltSed2_MtP1 | 2.42 |
| AltSed3_MnP1 | 0.34 | Vol1_MP1 | 2.57 |
| AltSed2_HC1 | 0.34 | Vol1_L1 | 3.09 |
| Vol1_L2 | 0.35 | Vol1_V3 | 3.11 |
| SndstCngMeta | 0.36 | Vol1_V2 | 3.59 |
| AltSed2_HM2 | 0.36 | Plu1_TN2 | 3.90 |
| SndstCngl2_BA1 | 0.38 | Vol1_LB1 | 5.43 |
| AltSed3_Mg2 | 0.38 | | |

Bedrock geology mapping and geospatial data from the province's Drilled Well database were combined to provide an updated analysis of bedrock yields. The purpose of this analysis was to provide a statistically significant estimate of the yield of each mapped bedrock component in the study area.

Drilled well records were filtered to include only those records indicating a georeferencing method of "GPS" or "Map". Both of these methods are considered accurate enough to place drilled well locations within a given bedrock geology polygon from provincial mapping. Drilled well records were then intersected and associated with the underlying bedrock polygon unit.

Depth Normalized Yield ($\bar{Q}$)
The airlift yield for each well record was divided by the well depth to provide a depth-normalized-yield, abbreviated in this report as "$\bar{Q}$". $\bar{Q}$ data are reported in units of $m^2$/day.

$\bar{Q}$ data were also used to provide a broad estimate of the aquifer transmissivity. If the depth of the well is set equal to the drawdown required to obtain the airlift yield, and the airlift yield is substituted as a proxy for a stable pumping rate, the $\bar{Q}$ represents a lower estimate of the specific capacity of the well. The specific capacity was multiplied by 1.3 to obtain a (low) rough estimate of the aquifer transmissivity (Neville, 2009). The distribution of transmissivity data obtained by this method, compared to transmissivity data from the pumping test database is discussed below.

As drilled well data for the study area were clustered and did not intersect with all bedrock geology polygons in the study area, direct assignment of well yield data to geology polygons was not possible. It was necessary to control for anomalously high or low yields for a given polygon and ensure that each polygon was assigned a statistically significant yield. An analysis of variance (ANOVA) was completed in order to assign appropriate $\bar{Q}$ data for each polygon in the study area. The methodology followed studies by the United States Geological Survey (USGS) and others (Moore et al., 2002; Belcher and Elliot, 2002; Banks, 1998; Daniel, 1989;). As well yield and hydraulic conductivity data are ln-normally distributed, the analysis was performed on the negative natural-log transformed value of $\bar{Q}$, or p$\bar{Q}$.

A master feature class was created by intersecting p$\bar{Q}$ data with bedrock geology polygons. Each polygon was associated with a unique "FID" which allowed for distinction between different zones / areas of a given geologic unit. A generalized rock type was assigned to each polygon based on provincial mapping.

- Sandstone/Conglomerate (SndstCngl);
- Fine Grained Sandstone (FGSndst);
- Alternating Sedimentary (AltSed);
- Fine Grained Sedimentary (FGSed);
- Carbonate (Carb);
- Metamorphic (Meta);
- Volcanic (Vol);
- Plutonic (Plu); and

- Quaternary (Quat).

Provincial bedrock mapping indicated “quaternary” material in areas where a significant thickness of unconsolidated material is observed and where the underlying bedrock material has not been identified or mapped.

Each bedrock polygon contained the following fields, forming the basis for ANOVA:

- p$\bar{Q}$;
- Rock Type;
- Formation or Group; and
- Polygon ID.

A series of 1-way ANOVAs were completed in order to determine which bedrock polygons exhibited a distinct mean p$\bar{Q}$, and to group those polygons which did not. Each statistical test compared the variance of the mean p$\bar{Q}$ data across groups to the variance within each group. All analyses were completed at the 95% significance level. Table A1 provides a result summary of statistical tests for $\bar{Q}$ data.

Polygons that contained at least three well records were tested against the Formation mean. If the mean p$\bar{Q}$ within a polygon was statistically distinct from the mean of the formation as a whole, the polygon was assigned that mean. Additional ANOVAs were used to develop groups of polygons exhibiting equal means, and these groupings were used in assignment of $\bar{Q}$ data. Any remaining polygons were grouped under the formation mean.
Formation means were also tested against the group mean for a given rock type. If the mean p$\bar{Q}$ within a formation was statistically distinct from the mean of the rock type group as a whole, the formation was assigned that mean. Additional ANOVAs were used to develop groups of formations exhibiting equal means, and these groupings were used in assignment of $\bar{Q}$ data. Any remaining formations were grouped under the rock type mean.

$\bar{Q}$ data were assigned according to the greatest level of spatial detail possible, subject to the results of the ANOVA. Polygons that contained no $\bar{Q}$ data were automatically grouped according to the formation. Polygons that contained no formation or group data were grouped according to Rock Type. Each Rock Type contained many different formations / groups, and some formations or groups contained many distinct polygons. Figure A1 shows a schematic of the grouping process, and groupings resulting from the ANOVA are shown in Table A2.

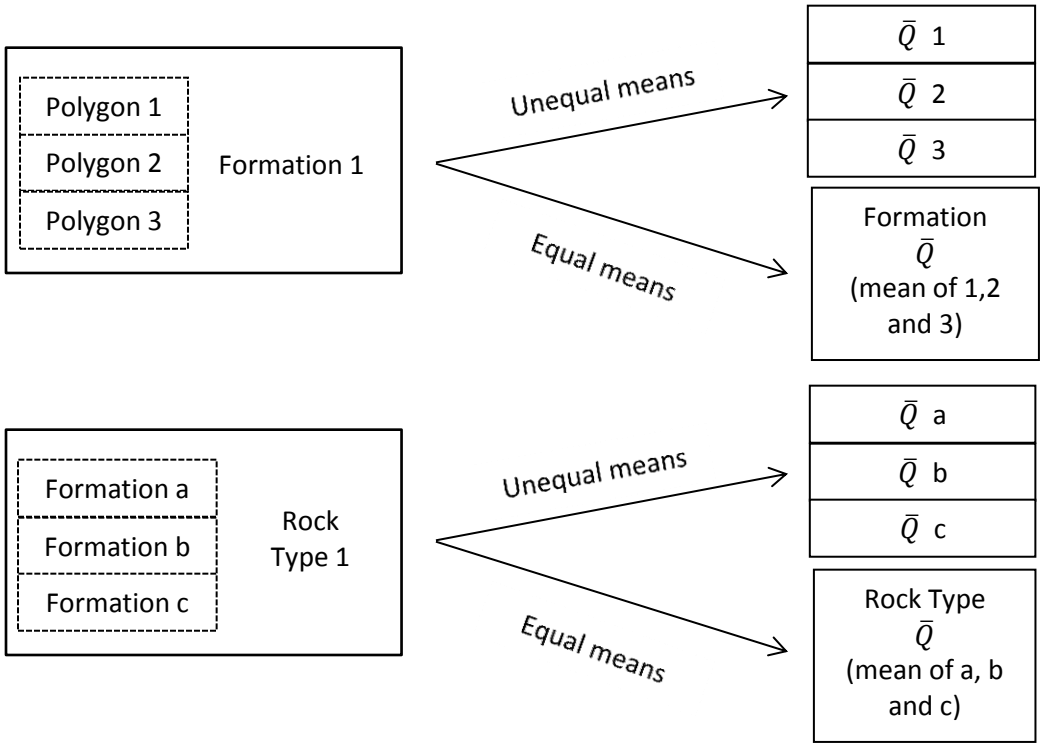



**Figure A1: Schematic of ANOVA Grouping**

The resulting feature class provided a $\bar{Q}$ for each polygon using the greatest level of detail possible while remaining statistically significant. A field was created to indicate the level of detail used to assign each polygon $\bar{Q}$ (i.e. Rock Type, Formation/Group, or FID), indicated in Table A2. Table A3 provides a summary of units that were associated with a distinct $\bar{Q}$ value, ranging from 0.04 to 5.43 $m^2$/day.

# APPENDIX B

MASTER WELL HEADS DATABASE

**Table B1. Well Heads Database**

| WS_SUB | COMMUNITY | LGP_NUM | SERVICED_A | SA_NUM |
|---|---|---|---|---|
| | | | | |
| 1 | Admirals Beach | 20 | Admiral's Beach | SA-0001 |
| 10.1 | Badger | 155 | Badger | SA-0010 |
| 10.2 | Badger | 155 | Badger | SA-0010 |
| 10.3 | Badger | 155 | Badger | SA-0010 |
| 10.4 | Badger | 155 | Badger | SA-0010 |
| 10.5 | Badger | 155 | Badger | SA-0010 |
| 13 | Baine Harbour | 180 | Baine Harbour | SA-0013 |
| 14 | Barachois Brook | 65 | Barachois Brook | SA-0014 |
| 26 | Bay St. George South | 268 | Heatherton | SA-0026 |
| 27 | Bay St. George South | 268 | St. Fintan's, St. David's | SA-0027 |
| 28 | Bay St. George South | 268 | St. Fintan's | SA-0028 |
| 31 | Bay St. George South | 268 | Jeffrey's | SA-0031 |
| 32 | Bay St. George South | 268 | Jeffrey's | SA-0032 |
| 33 | Bay St. George South | 268 | Lock Leven | SA-0033 |
| 34 | Bay St. George South | 268 | McKay's | SA-0034 |
| 35 | Bay St. George South | 268 | Robinson's | SA-0035 |
| 40 | Bear Cove | 280 | Bear Cove | SA-0040 |
| 41 | Bear Cove | 280 | Bear Cove | SA-0041 |
| 48 | Benoit's Siding | 340 | Benoit's Siding (aka Bennett's Siding) | SA-0048 |
| 59 | Black Duck | 420 | Black Duck (Siding) | SA-0060 |
| 60 | Black Duck | 420 | Black Duck (Siding) | SA-0061 |
| 64 | Blaketown | 475 | Blaketown South | SA-0065 |
| 65 | Blaketown | 475 | Blaketown | SA-0066 |
| 67 | Blaketown | 475 | Blaketown North | SA-0068 |

**Table B1. **

| WS_SUB | SOURCENAME | STATUS | WS_NUM | TYPE | PROTECTED |
|---|---|---|---|---|---|
| | | | | | |
| 1 | 2 Well Fields | | WS-G-0001 | Drilled | U |
| 10.1 | Well #1 | MUNICIPAL | WS-G-0010 | Drilled | P |
| 10.2 | Well #2 | MUNICIPAL | WS-G-0010 | Drilled | P |
| 10.3 | Well #3 | OUT_OF_SERVICE | WS-G-0010 | Drilled | P |
| 10.4 | Well #4 | OUT_OF_SERVICE | WS-G-0010 | Drilled | P |
| 10.5 | Well #5 | OUT_OF_SERVICE | WS-G-0010 | Drilled | P |
| 13 | Dug | | WS-G-0013 | Dug | P |
| 14 | Barachois Brook Wellhead | | WS-G-0014 | Drilled | P |
| 26 | #1 Well Heatherton | | WS-G-0026 | Drilled | P |
| 27 | #1 Well St. Fintan's | | WS-G-0027 | Drilled | P |
| 28 | #2 Well St. Fintan's | | WS-G-0028 | Drilled | P |
| 31 | #2 Well Jefferys | | WS-G-0031 | Drilled | P |
| 32 | #1 Well Jefferys | | WS-G-0032 | Drilled | P |
| 33 | #6 Well Loch Leven | | WS-G-0033 | Drilled | P |
| 34 | #7 Well McKay's | | WS-G-0034 | Drilled | P |
| 35 | #1 Well Robinson's | | WS-G-0035 | Drilled | P |
| 40 | Lower Bear Cove | | WS-G-0040 | Drilled | U |
| 41 | Upper Bear Cove | | WS-G-0041 | Drilled | U |
| 48 | Drilled | | WS-G-0048 | Drilled | U |
| 59 | #1 Well | | WS-G-0059 | Drilled | U |
| 60 | #2 Well | | WS-G-0060 | Drilled | U |
| 64 | #1 Well | | WS-G-0064 | Drilled | U |
| 65 | #2 Well - Mercer's Well | | WS-G-0065 | Drilled | U |
| 67 | #4 Well | | WS-G-0067 | Drilled | U |

**Table B1. **

| WS_SUB | NUM_WELLS | POPULATION | WELLFIELD_POP | CENSUS_POP | HOMES | EASTING |
|---|---|---|---|---|---|---|
| | | | | | | |
| 1 | 6 | 185 | 185 | 185 | | -53.6350388 |
| 10.1 | 5 | 163 | 813 | | 90 | -56.0452220 |
| 10.2 | 5 | 163 | 813 | | 90 | -56.0454720 |
| 10.3 | 5 | 163 | 813 | | 90 | -56.0465000 |
| 10.4 | 5 | 163 | 813 | | 90 | -56.0460830 |
| 10.5 | 5 | 163 | 813 | | 90 | -56.0460280 |
| 13 | 1 | 52 | 52 | 134 | | -54.9025521 |
| 14 | 1 | 163 | 163 | 168 | 100 | -58.4332660 |
| 26 | 1 | 42 | 42 | 1,389 | | -58.7634700 |
| 27 | 1 | 147 | 890 | 1,389 | | -58.8423800 |
| 28 | 1 | 55 | 890 | 1,389 | | -58.8444000 |
| 31 | 1 | 61 | 890 | 1,389 | | -58.8532600 |
| 32 | 1 | 42 | 890 | 1,389 | | -58.8436000 |
| 33 | 1 | 44 | 890 | 1,389 | | -58.8640800 |
| 34 | 1 | 175 | 890 | 1,389 | | -58.8234800 |
| 35 | 1 | 101 | 890 | 1,389 | | -58.7893600 |
| 40 | 1 | 20 | 29 | 20 | 18 | -56.7460600 |
| 41 | 1 | 9 | 29 | 20 | 18 | -56.7660900 |
| 48 | 1 | 5 | 20 | 5 | | -59.1931500 |
| 59 | 1 | 25 | 54 | 25 | | -58.3829500 |
| 60 | 1 | 29 | 54 | 25 | | -58.3810600 |
| 64 | 1 | 26 | 237 | 547 | | -53.5488200 |
| 65 | 1 | 89 | 237 | 547 | | -53.5494400 |
| 67 | 1 | 47 | 237 | 547 | | -53.5585100 |

**Table B1. **

| WS_SUB | NORTHING | UTM_E | UTM_N | D_WELL_ID | WELL_DEPTH | YIELD1 |
|---|---|---|---|---|---|---|
| | | | | drilled well db | m | L/min |
| 1 | 47.0065968 | 755781.47 | 5211394.03 | | 48.77 | 56 |
| 10.1 | 48.9765000 | 569867.28 | 5425282.61 | | 106.75 | 123 |
| 10.2 | 48.9764720 | 569849.02 | 5425279.27 | | 42 | 123 |
| 10.3 | 48.9764170 | 569773.88 | 5425272.21 | | 42 | 123 |
| 10.4 | 48.9766670 | 569804.04 | 5425300.38 | | 42 | 123 |
| 10.5 | 48.9766940 | 569808.03 | 5425303.43 | | 42 | 123 |
| 13 | 47.3601685 | 658382.08 | 5247322.62 | 4857 | 91 | 3 |
| 14 | 48.4542200 | 394028.00 | 5367779.00 | 9076 | 58 | 114 |
| 26 | 48.2774500 | 369162.29 | 5348641.43 | 17230 | 40 | 270 |
| 27 | 48.1819400 | 363053.25 | 5338163.62 | 2297 | 15.4 | 137 |
| 28 | 48.1798700 | 362897.58 | 5337937.15 | 2247 | 15 | 46 |
| 31 | 48.2157400 | 362335.17 | 5341939.71 | | 56 | 51 |
| 32 | 48.2268700 | 363082.40 | 5343159.47 | 2251 | 39 | 30 |
| 33 | 48.1683500 | 361403.69 | 5336692.08 | | 29 | 46 |
| 34 | 48.2287100 | 364581.44 | 5343328.30 | | 51 | 97 |
| 35 | 48.2503900 | 367171.38 | 5345678.31 | | 54 | 97 |
| 40 | 51.2726900 | 517714.20 | 5680180.38 | 4796 | 71 | 14 |
| 41 | 51.2581900 | 516322.10 | 5678563.22 | 4798 | 26 | 200 |
| 48 | 47.8208000 | 335839.01 | 5298712.01 | 90 | 50 | 105 |
| 59 | 48.5786600 | 397998.31 | 5381542.31 | 20 | 30 | 2 |
| 60 | 48.5769500 | 398134.27 | 5381349.71 | | 25 | 1 |
| 64 | 47.4753600 | 760028.35 | 5263766.29 | | 68 | 24 |
| 65 | 47.4774300 | 759971.42 | 5263994.23 | 12585 | 132 | 33 |
| 67 | 47.5104200 | 759125.62 | 5267629.71 | | 57 | 13 |

**Table B1. **

| WS_SUB | Local_pQb | ROCK_LOG | ROCK_MAP | ROCK_TYPE |
|---|---|---|---|---|
| | m2/d | | | |
| 1 | -0.218397764 | SHALE | Alternating Sedimentary | Alternating Sedimentary |
| 10.1 | -0.21989972 | | Sandstone/Conglomerate | Sandstone/Conglomerate |
| 10.2 | -0.625018313 | | Sandstone/Conglomerate | Sandstone/Conglomerate |
| 10.3 | -0.625018313 | | Sandstone/Conglomerate | Sandstone/Conglomerate |
| 10.4 | -0.625018313 | | Sandstone/Conglomerate | Sandstone/Conglomerate |
| 10.5 | -0.625018313 | | Sandstone/Conglomerate | Sandstone/Conglomerate |
| 13 | 1.323557646 | SURFICIAL | Volcanic | Quaternary |
| 14 | -0.45183935 | SURFICIAL | Surficial Deposits | Quaternary |
| 26 | -0.987666265 | MUDST-SANDST | FG_Sedimentary | FG_Sedimentary |
| 27 | -1.107562338 | SURFICIAL | FG_Sedimentary | Quaternary |
| 28 | -0.645029065 | SURFICIAL | FG_Sedimentary | Quaternary |
| 31 | -0.117744641 | | FG_Sedimentary | FG_Sedimentary |
| 32 | -0.04441914 | SNDST-SHLE | FG_Sedimentary | FG_Sedimentary |
| 33 | -0.358722326 | | FG_Sedimentary | FG_Sedimentary |
| 34 | -0.43756405 | | FG_Sedimentary | FG_Sedimentary |
| 35 | -0.412740467 | | FG_Sedimentary | FG_Sedimentary |
| 40 | 0.546767821 | LIMESTONE | Carbonate | Carbonate |
| 41 | -1.04441914 | LIMESTONE | Carbonate | Carbonate |
| 48 | -0.480581787 | SHALE | Surficial Deposits | FG_Sedimentary |
| 59 | 1.017728767 | SANDST | Surficial Deposits | Sandstone/Conglomerate |
| 60 | 1.239577517 | SANDST | Surficial Deposits | Sandstone/Conglomerate |
| 64 | 0.293935179 | | Sandstone/FG | Sandstone/FG |
| 65 | 0.443697499 | SANDST | Sandstone/FG | Sandstone/FG |
| 67 | 0.483569011 | | Alternating Sedimentary | Alternating Sedimentary |

**Table B1. **

| WS_SUB | Ptest Q | USAGE | USAGE | Q_calc | Slope_Ave | DIR_MEAN | K | i |
|---|---|---|---|---|---|---|---|---|
| | m3/d | igpd | m3/d | m3/d | | o cc from due east | m/s | m/m |
| 1 | 48.96 | | | 115 | 12.5 | 144 | 1.12E-06 | 0.13 |
| 10.1 | | | | 101 | 3.2 | 322 | 4.12E-08 | 0.03 |
| 10.2 | | 84240 | 383 | 101 | 3.1 | 323 | 1.05E-07 | 0.03 |
| 10.3 | | | | 101 | 3.2 | 322 | 1.05E-07 | 0.03 |
| 10.4 | | | | 101 | 3.2 | 322 | 1.05E-07 | 0.03 |
| 10.5 | | | | 101 | 3.2 | 323 | 1.05E-07 | 0.03 |
| 13 | | | | 32 | 14.0 | 80 | 1.00E-05 | 0.14 |
| 14 | | 12000 | 55 | 101 | 3.5 | 196 | 1.00E-05 | 0.04 |
| 26 | | | | 26 | 2.5 | 159 | 2.00E-07 | 0.02 |
| 27 | | | | 91 | 1.2 | 132 | 3.77E-05 | 0.01 |
| 28 | | | | 34 | 1.2 | 133 | 3.77E-05 | 0.01 |
| 31 | | | | 38 | 2.3 | 179 | 2.00E-07 | 0.01 |
| 32 | | | | 26 | 1.5 | 148 | 2.00E-07 | 0.01 |
| 33 | | | | 27 | 6.0 | 157 | 2.00E-07 | 0.06 |
| 34 | | | | 109 | 1.5 | 114 | 2.00E-07 | 0.02 |
| 35 | | | | 63 | 3.6 | 196 | 2.00E-07 | 0.02 |
| 40 | | | | 12 | 2.5 | 149 | 9.77E-08 | 0.03 |
| 41 | | | | 6 | 1.7 | 157 | 2.67E-07 | 0.02 |
| 48 | | | | 3 | 2.9 | 236 | 1.39E-07 | 0.08 |
| 59 | | | | 16 | 4.6 | 275 | 1.78E-07 | 0.05 |
| 60 | | | | 18 | 6.1 | 275 | 2.14E-07 | 0.06 |
| 64 | | | | 16 | 3.8 | 342 | 3.46E-08 | 0.04 |
| 65 | | | | 55 | 4.2 | 346 | 3.46E-08 | 0.04 |
| 67 | | | | 29 | 3.4 | 77 | 3.46E-08 | 0.03 |

**Table B1. **

| WS_SUB | n | K_src | Depth_src | Yield_src | v_calc | TOT_20 |
|---|---|---|---|---|---|---|
| | | | | | m/s | m |
| 1 | 0.10 | ptest_xy | Ptest_xy | Local_avg | 1.40E-06 | 881 |
| 10.1 | 0.20 | Qb_Fm | Operator | Local_avg | 6.60E-09 | 4 |
| 10.2 | 0.20 | Qb_Fm | Local_avg | Local_avg | 1.63E-08 | 10 |
| 10.3 | 0.20 | Qb_Fm | Local_avg | Local_avg | 1.65E-08 | 10 |
| 10.4 | 0.20 | Qb_Fm | Local_avg | Local_avg | 1.66E-08 | 10 |
| 10.5 | 0.20 | Qb_Fm | Local_avg | Local_avg | 1.66E-08 | 10 |
| 13 | 0.35 | Qb_Rock | Drill_xy | Drill_xy | 3.99E-06 | 2519 |
| 14 | 0.35 | Qb_Rock | Operator | Drill_xy | 1.01E-06 | 636 |
| 26 | 0.10 | well_field | Drill_xy | Drill_xy | 4.99E-08 | 31 |
| 27 | 0.35 | well_field | Log | Drill_xy | 1.32E-06 | 834 |
| 28 | 0.35 | ptest wellID | Drill_xy | Drill_xy | 1.32E-06 | 833 |
| 31 | 0.10 | well_field | Log | Local_avg | 2.71E-08 | 17 |
| 32 | 0.10 | ptest wellID | Log | Drill_xy | 2.90E-08 | 18 |
| 33 | 0.10 | well_field | Drill_xy | Local_avg | 1.20E-07 | 76 |
| 34 | 0.10 | well_field | Log | Local_avg | 3.46E-08 | 22 |
| 35 | 0.10 | well_field | Drill_xy | Local_avg | 4.26E-08 | 27 |
| 40 | 0.10 | Qb_Rock | Drill_xy | Drill_xy | 2.49E-08 | 16 |
| 41 | 0.10 | Qb_Rock | Drill_xy | Drill_xy | 4.43E-08 | 28 |
| 48 | 0.10 | Qb_Rock | Drill_xy | Drill_xy | 1.07E-07 | 68 |
| 59 | 0.20 | Qb_Rock | Drill_xy | Drill_xy | 4.07E-08 | 26 |
| 60 | 0.20 | Qb_Rock | Drill_xy | Local_avg | 6.56E-08 | 41 |
| 64 | 0.10 | well_field | Drill_xy | Local_avg | 1.31E-08 | 8 |
| 65 | 0.10 | well_field | Drill_xy | Drill_xy | 1.44E-08 | 9 |
| 67 | 0.10 | well_field | Drill_xy | Local_avg | 1.17E-08 | 7 |

**Table B1. **

| WS_SUB | LITHOLOGY | GENETIC250 | GENETIC1MA |
|---|---|---|---|
| | | | |
| 1 | | till veneer | till, undifferentiated |
| 10.1 | | glaciofluvial gravel and sand | glaciofluvial |
| 10.2 | | glaciofluvial gravel and sand | glaciofluvial |
| 10.3 | | glaciofluvial gravel and sand | glaciofluvial |
| 10.4 | | glaciofluvial gravel and sand | glaciofluvial |
| 10.5 | | glaciofluvial gravel and sand | glaciofluvial |
| 13 | SAND 006 GREY ROCK 091 | marine clay, sand, gravel and diamicton | glaciomarine and marine |
| 14 | SAND/PUG 061 ROCK 000 | glaciofluvial gravel and sand | glaciofluvial |
| 26 | BRWN SAND 9.1 ;GREY CLAY 15.85 ;RED MUDSTONE 36.5 ;BRWN SNDS 39.6 | marine clay, sand, gravel and diamicton | glaciomarine and marine |
| 27 | TPSL 003 SILT/GRVL/CLAY 016 (3.2 7.6) | till blanket | till blanket |
| 28 | RED CLAY/GRVL 015 | till blanket | till blanket |
| 31 | | glaciofluvial gravel and sand | glaciofluvial |
| 32 | RED GRVL 011 RED SPST 021 RED SHLE 038 | glaciofluvial gravel and sand | glaciofluvial |
| 33 | | glaciofluvial gravel and sand | glaciofluvial |
| 34 | | glaciofluvial gravel and sand | glaciofluvial |
| 35 | | hummocky terrain | ablation drift |
| 40 | BRWN TILL 008 RED DLMT | marine clay, sand, gravel and diamicton | glaciomarine and marine |
| 41 | BRWN TPSL 008 BLCK LMSN | marine clay, sand, gravel and diamicton | glaciomarine and marine |
| 48 | RED CLAY 012 RED GREY SHLE 050 | glaciofluvial gravel and sand | glaciofluvial |
| 59 | RED SNDS 033 | bog | bog |
| 60 | | bog | bog |
| 64 | | hummocky terrain | ablation drift |
| 65 | BRWN TPSL 7 BLUE SNDS 132 | hummocky terrain | ablation drift |
| 67 | | till veneer | till, undifferentiated |

**Table B1. **

| WS_SUB | Keyword | D_ROCKTYPE | D_AGERANGE | D_AGEBASE | D_AGETOP |
|---|---|---|---|---|---|
| | | | | | |
| 1 | NF191_0515 | | | 575 | 542 |
| 10.1 | NF011_0003 | siliciclastic marine sandstone | Late Ordovician to Early Silurian | 452 | 431 |
| 10.2 | NF011_0003 | siliciclastic marine sandstone | Late Ordovician to Early Silurian | 452 | 431 |
| 10.3 | NF011_0003 | siliciclastic marine sandstone | Late Ordovician to Early Silurian | 452 | 431 |
| 10.4 | NF011_0003 | siliciclastic marine sandstone | Late Ordovician to Early Silurian | 452 | 431 |
| 10.5 | NF011_0003 | siliciclastic marine sandstone | Late Ordovician to Early Silurian | 452 | 431 |
| 13 | NF176_0311 | volcanic felsic | | 1000 | 542 |
| 14 | NF148_0090 | siliciclastic | | 1.8 | 0 |
| 26 | NF148_0087 | siliciclastic non-marine | Mississippian | 334 | 328 |
| 27 | NF148_0087 | siliciclastic non-marine | Mississippian | 334 | 328 |
| 28 | NF148_0087 | siliciclastic non-marine | Mississippian | 334 | 328 |
| 31 | NF148_0087 | siliciclastic non-marine | Mississippian | 334 | 328 |
| 32 | NF148_0087 | siliciclastic non-marine | Mississippian | 334 | 328 |
| 33 | NF148_0087 | siliciclastic non-marine | Mississippian | 334 | 328 |
| 34 | NF148_0087 | siliciclastic non-marine | Mississippian | 334 | 328 |
| 35 | NF148_0087 | siliciclastic non-marine | Mississippian | 334 | 328 |
| 40 | NF107_0010 | carbonate dolostone | Middle Cambrian to Late Cambrian | 502 | 498 |
| 41 | NF107_0010 | carbonate dolostone | Middle Cambrian to Late Cambrian | 502 | 498 |
| 48 | NF143_0082 | siliciclastic | | 1.8 | 0 |
| 59 | NF121_0128 | siliciclastic | | 1.8 | 0 |
| 60 | NF121_0128 | siliciclastic | | 1.8 | 0 |
| 64 | NF191_0001 | | | 575 | 542 |
| 65 | NF191_0001 | | | 575 | 542 |
| 67 | NF191_0002 | sedimentary marine | | 575 | 542 |

**Table B1. **

| WS_SUB | D_SUPERGRP | D_GROUP | D_FORMATN | D_MEMBER |
|---|---|---|---|---|
| | | | | |
| 1 | | Conception Group | Drook Formation | |
| 10.1 | | Badger Group | | |
| 10.2 | | Badger Group | | |
| 10.3 | | Badger Group | | |
| 10.4 | | Badger Group | | |
| 10.5 | | Badger Group | | |
| 13 | | Marystown Group | Cashel Lookout Formation | |
| 14 | Surficial deposits | | | |
| 26 | | Codroy Group | Robinsons River Formation | Jeffreys Village Member |
| 27 | | Codroy Group | Robinsons River Formation | Jeffreys Village Member |
| 28 | | Codroy Group | Robinsons River Formation | Jeffreys Village Member |
| 31 | | Codroy Group | Robinsons River Formation | Jeffreys Village Member |
| 32 | | Codroy Group | Robinsons River Formation | Jeffreys Village Member |
| 33 | | Codroy Group | Robinsons River Formation | Jeffreys Village Member |
| 34 | | Codroy Group | Robinsons River Formation | Jeffreys Village Member |
| 35 | | Codroy Group | Robinsons River Formation | Jeffreys Village Member |
| 40 | | Port au Port Group | Petit Jardin Formation | |
| 41 | | Port au Port Group | Petit Jardin Formation | |
| 48 | Surficial deposits | | | |
| 59 | Surficial deposits | | | |
| 60 | Surficial deposits | | | |
| 64 | | Musgravetown Group | Big Head Formation | |
| 65 | | Musgravetown Group | Big Head Formation | |
| 67 | | Musgravetown Group | Heart's Content Formation | |

**Table B1. Well Heads Database**

| WS_SUB | COMMUNITY | LGP_NUM | SERVICED_A | SA_NUM |
|---|---|---|---|---|
| 83 | Brigus South | 617 | Dunphey's Hill area | SA-0085 |
| 84 | Brigus South | 617 | Forge Hill area | SA-0086 |
| 85 | Brigus South | 617 | Near highway | SA-0087 |
| 91.1 | Bryant's Cove | 680 | Bryant's Cove South Side | SA-0093 |
| 91.2 | Bryant's Cove | 680 | Bryant's Cove South Side | SA-0093 |
| 91.3 | Bryant's Cove | 680 | Bryant's Cove South Side | SA-0093 |
| 94 | Bunyan's Cove | 710 | Bunyan's Cove | SA-0096 |
| 95 | Bunyan's Cove | 710 | Bunyan's Cove | SA-0097 |
| 114 | Canning's Cove | 845 | Lower Canning's Cove | SA-0116 |
| 115 | Canning's Cove | 845 | Upper Canning's Cove | SA-0117 |
| 116 | Canning's Cove | 845 | Centre Canning's Cove | SA-0118 |
| 135 | Cavendish | 990 | North Side Cavendish | SA-0137 |
| 142 | Chance Cove | 1010 | Upper Cove Centre | SA-0144 |
| 143 | Chance Cove | 1010 | Lower Cove East | SA-0145 |
| 144 | Chance Cove | 1010 | Upper Cove South | SA-0146 |
| 145 | Chance Cove | 1010 | Back Cove Area | SA-0147 |
| 146 | Chance Cove | 1010 | New Housing Area | SA-0148 |
| 170 | Clarke's Beach | 1060 | Otterbury | SA-0172 |
| 171 | Clarke's Beach | 1060 | Otterbury | SA-0173 |
| 179 | Colliers | 1125 | Main Road | SA-0181 |
| 180 | Colliers | 1125 | Merrigan's Lane + Main Rd | SA-0182 |
| 181 | Colliers | 1125 | Harbour Drive & Main Road | SA-0183 |
| 182 | Colliers | 1125 | Harbour Drive | SA-0184 |
| 183 | Colliers | 1125 | Harbour Drive | SA-0185 |
| 186 | Conception Harbour | 1148 | Healey's Pond Rd, Old Rd & Main Rd | SA-0189 |
| 187 | Conception Harbour | 1148 | Cemetery Road & Main Road | SA-0190 |
| 188 | Conception Harbour | 1148 | Upper Bacon Cove, Kitchuses | SA-0191 |
| 189 | Conception Harbour | 1148 | Lower Bacon Cove | SA-0192 |

**Table B1. **

| WS_SUB | SOURCENAME | STATUS | WS_NUM | TYPE | PROTECTED |
|---|---|---|---|---|---|
| 83 | #2 Well Dunphey's Hilll | | WS-G-0083 | Drilled | U |
| 84 | #1 Well Forge Hill | | WS-G-0084 | Drilled | U |
| 85 | #3 Well Main Road | | WS-G-0085 | Drilled | U |
| 91.1 | #1 Bert James Well | | WS-G-0091 | Drilled | P |
| 91.2 | #2 Baxter Bowering Well | | WS-G-0091 | Drilled | P |
| 91.3 | #3 Backup Well & Pumphouse | | WS-G-0091 | Drilled | P |
| 94 | #1 Well | | WS-G-0094 | Drilled | P |
| 95 | #2 Well | | WS-G-0095 | Drilled | P |
| 114 | #1 Well - Pleman Pitts | | WS-G-0114 | Drilled | P |
| 115 | #2 Well - Eugene Ellis | | WS-G-0115 | Drilled | P |
| 116 | #3 Well - Glenda Penney | | WS-G-0116 | Drilled | P |
| 135 | #1 Well - Max Bishop | | WS-G-0135 | Drilled | U |
| 142 | Angus Brace Well | | WS-G-0142 | Drilled | U |
| 143 | Albert Rowe Well | | WS-G-0143 | Drilled | U |
| 144 | Edgar Crann Well | | WS-G-0144 | Drilled | U |
| 145 | Olive Smith Well | | WS-G-0145 | Drilled | U |
| 146 | New Housing Area Well | | WS-G-0146 | Drilled | U |
| 170 | #1 Well - Quinlon Well | | WS-G-0170 | Drilled | U |
| 171 | #2 Well - Delaney Well | | WS-G-0171 | Drilled | U |
| 179 | #1 Mahoney's Well | | WS-G-0179 | Drilled | P |
| 180 | #2 Merrigan's Well | | WS-G-0180 | Drilled | P |
| 181 | #3 Griffin's Well | | WS-G-0181 | Drilled | P |
| 182 | #4 Flynn's Well | | WS-G-0182 | Drilled | P |
| 183 | #5 Whalen's Well | | WS-G-0183 | Drilled | P |
| 186 | Healey's Pond Road Well | | WS-G-0186 | Drilled | P |
| 187 | Cemetery Road Well | | WS-G-0187 | Drilled | P |
| 188 | Upper Bacon Cove Well | | WS-G-0188 | Drilled | P |
| 189 | Lower Bacon Cove Well | | WS-G-0189 | Drilled | P |

**Table B1. **

| WS_SUB | NUM_WELLS | POPULATION | WELLFIELD_POP | CENSUS_POP | HOMES | EASTING |
|---|---|---|---|---|---|---|
| 83 | 1 | 30 | 81 | 90 | | -52.8843700 |
| 84 | 1 | 25 | 81 | 90 | | -52.8867300 |
| 85 | 1 | 26 | 81 | 90 | | -52.9029800 |
| 91.1 | 2 | 93 | 279 | 417 | 97 | -53.1916357 |
| 91.2 | 2 | 93 | 279 | 417 | 97 | -53.1925022 |
| 91.3 | 2 | 93 | 279 | 417 | 97 | -53.1925768 |
| 94 | 1 | 195 | 234 | 462 | | -54.0199100 |
| 95 | 2 | 39 | 234 | 462 | | -53.9948600 |
| 114 | 1 | 58 | 138 | 279 | 45 | -53.8481700 |
| 115 | 1 | 41 | 138 | 279 | 45 | -53.8592900 |
| 116 | 1 | 39 | 138 | 279 | 45 | -53.8471000 |
| 135 | 1 | 32 | 57 | 334 | | -53.4923900 |
| 142 | 1 | 39 | 346 | 310 | 136 | -53.8195800 |
| 143 | 1 | 120 | 346 | 310 | 136 | -53.8275900 |
| 144 | 1 | 72 | 346 | 310 | 136 | -53.8134200 |
| 145 | 1 | 44 | 346 | 310 | 136 | -53.8182100 |
| 146 | 1 | 44 | 346 | 310 | 136 | -53.8066000 |
| 170 | 1 | 19 | 43 | 1,289 | 23 | -53.2797200 |
| 171 | 1 | 24 | 43 | 1,289 | 23 | -53.2733400 |
| 179 | 1 | 93 | 1049 | 722 | | -53.2348496 |
| 180 | 1 | 34 | 1049 | 722 | | -53.2359297 |
| 181 | 1 | 168 | 1049 | 722 | | -53.2309513 |
| 182 | 1 | 722 | 1049 | 722 | | -53.2141554 |
| 183 | 1 | 32 | 1049 | 722 | | -53.2036810 |
| 186 | 1 | 132 | 331 | 743 | | -53.2276009 |
| 187 | 1 | 79 | 331 | 743 | | -53.2031634 |
| 188 | 1 | 50 | 331 | 743 | | -53.1895550 |
| 189 | 1 | 12 | 331 | 743 | | -53.1667484 |

**Table B1. **

| WS_SUB | NORTHING | UTM_E | UTM_N | D_WELL_ID | WELL_DEPTH | YIELD1 |
|---|---|---|---|---|---|---|
| 83 | 47.1152100 | 812200.28 | 5226189.89 | | 67 | 47 |
| 84 | 47.1129000 | 812034.80 | 5225923.80 | | 50 | 47 |
| 85 | 47.1135300 | 810798.55 | 5225928.98 | | 50 | 47 |
| 91.1 | 47.6685251 | 785882.45 | 5286487.98 | 5871 | 123 | 14 |
| 91.2 | 47.6682206 | 785819.08 | 5286450.95 | 5872 | 104 | 68 |
| 91.3 | 47.6690470 | 785808.96 | 5286542.50 | | 71 | 25 |
| 94 | 48.3980300 | 720574.26 | 5364832.44 | 1434 | 122 | 94 |
| 95 | 48.4025600 | 722408.40 | 5365408.35 | 21178 | 32 | 4 |
| 114 | 48.4448800 | 733069.83 | 5370548.14 | | 104 | 6 |
| 115 | 48.4380000 | 732279.02 | 5369749.71 | | 87 | 6 |
| 116 | 48.4416100 | 733163.92 | 5370187.99 | | 44 | 6 |
| 135 | 47.7223700 | 763037.22 | 5291404.36 | | 44 | 18 |
| 142 | 47.6743300 | 738723.00 | 5285005.31 | 4585 | 64 | 33 |
| 143 | 47.6770400 | 738109.49 | 5285281.79 | 4586 | 79.3 | 23 |
| 144 | 47.6660500 | 739223.20 | 5284104.22 | 5882 | 79.3 | 18 |
| 145 | 47.6761300 | 738817.60 | 5285209.56 | | 61 | 17 |
| 146 | 47.6627400 | 739750.31 | 5283757.49 | 5009 | 61 | 32 |
| 170 | 47.5528700 | 779888.28 | 5273315.16 | 8954 | 54.29 | 136 |
| 171 | 47.5546300 | 780358.81 | 5273533.77 | | 73.2 | 12 |
| 179 | 47.4633235 | 783746.43 | 5263528.10 | 1194 | 91 | 23 |
| 180 | 47.4518742 | 783726.70 | 5262251.96 | 13331 | 146 | 2 |
| 181 | 47.4511613 | 784105.76 | 5262190.95 | 1256 | 67 | 1 |
| 182 | 47.4606117 | 785320.46 | 5263302.60 | 5815 | 49 | 135 |
| 183 | 47.4671396 | 786074.30 | 5264066.48 | 4668 | 91 | 34 |
| 186 | 47.4399962 | 784418.54 | 5260962.60 | 1227 | 46.2 | 120 |
| 187 | 47.4503131 | 786204.72 | 5262198.72 | | 61 | 45 |
| 188 | 47.4573949 | 787191.78 | 5263035.84 | 3660 | 152 | 18 |
| 189 | 47.4893505 | 788735.16 | 5266671.16 | 1238 | 97 | 9 |

**Table B1. **

| WS_SUB | Local_pQb | ROCK_LOG | ROCK_MAP | ROCK_TYPE |
|---|---|---|---|---|
| 83 | -0.004385547 | | FG_Sedimentary | FG_Sedimentary |
| 84 | -0.131490346 | | FG_Sedimentary | FG_Sedimentary |
| 85 | -0.131490346 | | FG_Sedimentary | FG_Sedimentary |
| 91.1 | 0.785414584 | ROCK | FG_Sedimentary | FG_Sedimentary |
| 91.2 | 0.026161934 | ROCK | FG_Sedimentary | FG_Sedimentary |
| 91.3 | 0.294955848 | | FG_Sedimentary | FG_Sedimentary |
| 94 | -0.045130515 | ROCK | Metamorphic | Metamorphic |
| 95 | 0.744727495 | SANDST | Sandstone/Conglomerate | Sandstone/Conglomerate |
| 114 | 1.080519597 | | Sandstone/Conglomerate | Sandstone/Conglomerate |
| 115 | 1.00300551 | | Plutonic | Plutonic |
| 116 | 0.706938934 | | Plutonic | Plutonic |
| 135 | 0.229817679 | | FG_Sedimentary | FG_Sedimentary |
| 142 | 0.129303542 | ROCK | Plutonic | Plutonic |
| 143 | 0.379182859 | ROCK | Plutonic | Plutonic |
| 144 | 0.48563819 | CHRT | Plutonic | Plutonic |
| 145 | 0.396518422 | | Plutonic | Plutonic |
| 146 | 0.121817365 | SHALE | Volcanic | Volcanic |
| 170 | -0.557181559 | | Alternating Sedimentary | Alternating Sedimentary |
| 171 | 0.626967343 | | Alternating Sedimentary | Alternating Sedimentary |
| 179 | 0.438951064 | ROCK | FG_Sedimentary | FG_Sedimentary |
| 180 | 1.704960368 | ROCK | FG_Sedimentary | FG_Sedimentary |
| 181 | 1.667712311 | ROCK | Alternating Sedimentary | Alternating Sedimentary |
| 182 | -0.598500181 | ROCK | Alternating Sedimentary | Alternating Sedimentary |
| 183 | 0.269199983 | SANDST | Alternating Sedimentary | Sandstone/FG |
| 186 | -0.572901763 | ROCK | Alternating Sedimentary | Alternating Sedimentary |
| 187 | -0.026245171 | | Alternating Sedimentary | Alternating Sedimentary |
| 188 | 0.768208591 | ROCK | Alternating Sedimentary | Alternating Sedimentary |
| 189 | 0.874166733 | ROCK | Alternating Sedimentary | Alternating Sedimentary |

**Table B1. **

| WS_SUB | Ptest Q | USAGE | USAGE | Q_calc | Slope_Ave | DIR_MEAN | K | i |
|---|---|---|---|---|---|---|---|---|
| 83 | 12.96 | | | 19 | 7.3 | 311 | 4.23E-07 | 0.07 |
| 84 | | | | 16 | 11.5 | 27 | 4.23E-07 | 0.12 |
| 85 | | | | 16 | 15.3 | 73 | 4.23E-07 | 0.15 |
| 91.1 | 26.208 | 9600 | 44 | 58 | 4.7 | 49 | 3.77E-08 | 0.05 |
| 91.2 | 39.312 | 9600 | 44 | 58 | 4.5 | 49 | 4.46E-08 | 0.04 |
| 91.3 | | 9600 | 44 | 58 | 4.7 | 52 | 6.53E-08 | 0.05 |
| 94 | 200.16 | 8500 | 39 | 121 | 7.0 | 38 | 1.24E-06 | 0.08 |
| 95 | 388.8 | 3000 | 14 | 24 | 8.0 | 96 | 1.21E-05 | 0.09 |
| 114 | 12.96 | 3714 | 17 | 36 | 29.5 | 306 | 5.02E-09 | 0.20 |
| 115 | 97.92 | 2142 | 10 | 25 | 10.4 | 40 | 1.44E-06 | 0.04 |
| 116 | 19.44 | 857 | 4 | 24 | 3.9 | 359 | 1.44E-06 | 0.04 |
| 135 | 15.84 | | | 20 | 6.3 | 221 | 5.16E-08 | 0.06 |
| 142 | 54.51 | 1800 | 8 | 24 | 8.9 | 89 | 6.88E-08 | 0.09 |
| 143 | 54.51 | 5200 | 24 | 75 | 4.5 | 81 | 5.55E-08 | 0.04 |
| 144 | 54.51 | 3500 | 16 | 45 | 8.3 | 90 | 5.55E-08 | 0.08 |
| 145 | 54.51 | 2000 | 9 | 27 | 7.7 | 90 | 7.22E-08 | 0.08 |
| 146 | 54.51 | 2000 | 9 | 27 | 6.5 | 79 | 7.22E-08 | 0.06 |
| 170 | | 14400 | 65 | 12 | 4.2 | 21 | 9.37E-08 | 0.04 |
| 171 | | 14400 | 65 | 15 | 4.2 | 20 | 4.00E-08 | 0.04 |
| 179 | | | | 58 | 3.4 | 18 | 7.48E-08 | 0.03 |
| 180 | | | | 21 | 13.9 | 29 | 4.66E-08 | 0.14 |
| 181 | | | | 104 | 7.7 | 42 | 8.17E-08 | 0.08 |
| 182 | | | | 448 | 11.5 | 63 | 1.12E-07 | 0.07 |
| 183 | | | | 20 | 15.7 | 156 | 6.02E-08 | 0.06 |
| 186 | 18.72 | | | 82 | 6.3 | 66 | 1.83E-07 | 0.08 |
| 187 | 54.72 | | | 49 | 12.3 | 11 | 1.83E-07 | 0.12 |
| 188 | | | | 31 | 8.7 | 304 | 1.83E-07 | 0.09 |
| 189 | 4.32 | | | 7 | 21.3 | 9 | 1.25E-08 | 0.21 |

**Table B1. **

| WS_SUB | n | K_src | Depth_src | Yield_src | v_calc | TOT_20 |
|---|---|---|---|---|---|---|
| 83 | 0.10 | ptest community | Drill_xy | Drill_xy | 3.10E-07 | 196 |
| 84 | 0.10 | well_field | Drill_xy | Local_avg | 4.86E-07 | 307 |
| 85 | 0.10 | well_field | Drill_xy | Local_avg | 6.47E-07 | 408 |
| 91.1 | 0.10 | Qb_Fm | Drill_xy | Drill_xy | 1.78E-08 | 11 |
| 91.2 | 0.10 | Qb_Fm | Drill_xy | Drill_xy | 1.99E-08 | 13 |
| 91.3 | 0.10 | Qb_Fm | Drill_xy | Local_avg | 3.05E-08 | 19 |
| 94 | 0.05 | ptest_xy | Operator | Drill_xy | 1.94E-06 | 1223 |
| 95 | 0.20 | ptest_xy | Drill_xy | Drill_xy | 5.28E-06 | 3333 |
| 114 | 0.20 | ptest_xy | Operator | Local_avg | 5.02E-09 | 3 |
| 115 | 0.05 | well_field | Operator | Local_avg | 1.15E-06 | 725 |
| 116 | 0.05 | ptest_xy | Operator | Local_avg | 1.11E-06 | 703 |
| 135 | 0.10 | well_field | Ptest_xy | Local_avg | 3.27E-08 | 21 |
| 142 | 0.05 | Qb_Fm | Operator | Drill_xy | 1.22E-07 | 77 |
| 143 | 0.05 | Qb_Fm | Operator | Drill_xy | 4.96E-08 | 31 |
| 144 | 0.05 | Qb_Fm | Operator | Drill_xy | 9.25E-08 | 58 |
| 145 | 0.05 | Qb_Fm | Operator | Local_avg | 1.11E-07 | 70 |
| 146 | 0.10 | Qb_Fm | Operator | Drill_xy | 4.67E-08 | 29 |
| 170 | 0.10 | Qb_Key | Operator | Drill_xy | 3.94E-08 | 25 |
| 171 | 0.10 | Qb_Fm | Operator | Local_avg | 1.70E-08 | 11 |
| 179 | 0.10 | Qb_Key | Drill_xy | Drill_xy | 2.48E-08 | 16 |
| 180 | 0.10 | Qb_Key | Drill_xy | Drill_xy | 6.50E-08 | 41 |
| 181 | 0.10 | Qb_Key | Drill_xy | Drill_xy | 6.32E-08 | 40 |
| 182 | 0.10 | Qb_Key | Drill_xy | Drill_xy | 7.58E-08 | 48 |
| 183 | 0.10 | Qb_Key | Drill_xy | Drill_xy | 3.47E-08 | 22 |
| 186 | 0.10 | well_field | Drill_xy | Drill_xy | 1.41E-07 | 89 |
| 187 | 0.10 | ptest_xy | Drill_xy | Local_avg | 2.25E-07 | 142 |
| 188 | 0.10 | well_field | Drill_xy | Drill_xy | 1.59E-07 | 100 |
| 189 | 0.10 | ptest_xy | Drill_xy | Drill_xy | 2.67E-08 | 17 |

**Table B1. **

| WS_SUB | LITHOLOGY | GENETIC250 | GENETIC1MA |
|---|---|---|---|
| 83 | | concealed bedrock | drift poor |
| 84 | | concealed bedrock | drift poor |
| 85 | | till blanket | till blanket |
| 91.1 | OBDN 016 ROCK 123 | concealed bedrock | drift poor |
| 91.2 | OBDN 016 ROCK 104 | concealed bedrock | drift poor |
| 91.3 | | concealed bedrock | drift poor |
| 94 | RED TPSL 001 BRWN OBDN 010 GREY ROCK 032 | hummocky terrain | ablation drift |
| 95 | BRWN GRAVEL & LOOS ROCK 4; BRWN BEDROCK, SNDS 111 | till veneer | till, undifferentiated |
| 114 | | till blanket | till blanket |
| 115 | | till blanket | till blanket |
| 116 | | till blanket | till blanket |
| 135 | | till veneer | till, undifferentiated |
| 142 | GREY GRVL 012 GREN ROCK 082 | exposed bedrock | exposed bedrock |
| 143 | GRVL 003 GREY ROCK 128 | exposed bedrock | exposed bedrock |
| 144 | OBDN 003 CHRT 105 | exposed bedrock | exposed bedrock |
| 145 | Bedrock | exposed bedrock | exposed bedrock |
| 146 | GREY GRVL 001 GREY SHLE 079 | exposed bedrock | exposed bedrock |
| 170 | | till blanket | till blanket |
| 171 | | till blanket | till blanket |
| 179 | YLLW CLAY 001 GREY ROCK 091 | concealed bedrock | drift poor |
| 180 | GRVL 6 GREN ROCK 146 | concealed bedrock | drift poor |
| 181 | CLAY 001 WHIT GREN ROCK 067 | glaciofluvial gravel and sand | glaciofluvial |
| 182 | GRVL 003 RED/GREY ROCK 049 | | |
| 183 | RED SNDS 091 | concealed bedrock | drift poor |
| 186 | GREY GRVL 017 RED ROCK 046 | concealed bedrock | drift poor |
| 187 | | concealed bedrock | drift poor |
| 188 | GRVL 003 RED/GREN/BLUE ROCK 152 | concealed bedrock | drift poor |
| 189 | ROCK 006 GREN WHIT ROCK 097 | concealed bedrock | drift poor |

**Table B1. **

| WS_SUB | Keyword | D_ROCKTYPE | D_AGERANGE | D_AGEBASE | D_AGETOP |
|---|---|---|---|---|---|
| 83 | NF191_0008 | sedimentary marine | | 575 | 542 |
| 84 | NF191_0008 | sedimentary marine | | 575 | 542 |
| 85 | NF191_0008 | sedimentary marine | | 575 | 542 |
| 91.1 | NF191_0005 | sedimentary marine | | 575 | 542 |
| 91.2 | NF191_0005 | sedimentary marine | | 575 | 542 |
| 91.3 | NF191_0005 | sedimentary marine | | 575 | 542 |
| 94 | NF188_0129 | metavolcanic | | 1000 | 542 |
| 95 | NF188_0144 | siliciclastic marine conglomerate | | 575 | 542 |
| 114 | NF188_0095 | siliciclastic marine conglomerate | | 575 | 542 |
| 115 | NF188_0142 | | | 575 | 542 |
| 116 | NF188_0142 | | | 575 | 542 |
| 135 | NF191_0058 | sedimentary marine | Early Cambrian to Middle Cambrian | 530 | 506 |
| 142 | NF191_0160 | | | 575 | 542 |
| 143 | NF191_0160 | | | 575 | 542 |
| 144 | NF191_0160 | | | 575 | 542 |
| 145 | NF191_0160 | | | 575 | 542 |
| 146 | NF191_0011 | volcanic | | 575 | 542 |
| 170 | NF191_0067 | | | 575 | 542 |
| 171 | NF191_0515 | | | 575 | 542 |
| 179 | NF191_0290 | sedimentary marine | Early Cambrian to Middle Cambrian | 530 | 506 |
| 180 | NF191_0290 | sedimentary marine | Early Cambrian to Middle Cambrian | 530 | 506 |
| 181 | NF191_0133 | | | 633 | 620 |
| 182 | NF191_0253 | | | 624.20001 | 620 |
| 183 | NF191_0095 | | | 633 | 620 |
| 186 | NF191_0320 | | | 633 | 620 |
| 187 | NF191_0095 | | | 633 | 620 |
| 188 | NF191_0095 | | | 633 | 620 |
| 189 | NF191_0078 | | | 575 | 542 |

**Table B1. **

| WS_SUB | D_SUPERGRP | D_GROUP | D_FORMATN | D_MEMBER |
|---|---|---|---|---|
| 83 | | St. John's Group | Fermeuse Formation | |
| 84 | | St. John's Group | Fermeuse Formation | |
| 85 | | St. John's Group | Fermeuse Formation | |
| 91.1 | | St. John's Group | Fermeuse Formation | |
| 91.2 | | St. John's Group | Fermeuse Formation | |
| 91.3 | | St. John's Group | Fermeuse Formation | |
| 94 | | Love Cove Group | | |
| 95 | | Musgravetown Group | Bull Arm Formation | |
| 114 | | Connecting Point Group | | |
| 115 | | Musgravetown Group | Bull Arm Formation | |
| 116 | | Musgravetown Group | Bull Arm Formation | |
| 135 | | Adeyton Group | Bonavista Formation | |
| 142 | | Musgravetown Group | Bull Arm Formation | |
| 143 | | Musgravetown Group | Bull Arm Formation | |
| 144 | | Musgravetown Group | Bull Arm Formation | |
| 145 | | Musgravetown Group | Bull Arm Formation | |
| 146 | | Musgravetown Group | Bull Arm Formation | |
| 170 | | Conception Group | Mistaken Point Formation | |
| 171 | | Conception Group | Drook Formation | |
| 179 | | Adeyton Group | Bonavista Formation | |
| 180 | | Adeyton Group | Bonavista Formation | |
| 181 | | Harbour Main Group | | |
| 182 | | Harbour Main Group | | |
| 183 | | Harbour Main Group | | |
| 186 | | Harbour Main Group | | |
| 187 | | Harbour Main Group | | |
| 188 | | Harbour Main Group | | |
| 189 | | Conception Group | Drook Formation | |

**Table B1. Well Heads Database**

| WS_SUB | COMMUNITY | LGP_NUM | SERVICED_A | SA_NUM |
|---|---|---|---|---|
| 202.1 | Cox's Cove | 1235 | Upper Area | SA-0206 |
| 202.2 | Cox's Cove | 1235 | Upper Area | SA-0206 |
| 202.3 | Cox's Cove | 1235 | Upper Area | SA-0206 |
| 213.1 | Deep Bight | 1365 | Deep Bight | SA-0218 |
| 213.2 | Deep Bight | 1365 | Deep Bight | SA-0218 |
| 213.3 | Deep Bight | 1365 | Deep Bight | SA-0218 |
| 218 | Dildo | 1395 | Hill Road Area | SA-0223 |
| 224.1 | Eastport | 1490 | Eastport (+Sandy Cove) | SA-0230 |
| 224.2 | Sandy Cove | 4515 | Sandy Cove | SA-0657 |
| 240 | Flat Bay | 1605 | Flat Bay (East) | SA-0246 |
| 241 | Flat Bay | 1605 | Flat Bay (East) | SA-0247 |
| 242 | Flat Bay | 1605 | Flat Bay (East) | SA-0248 |
| 244 | Flat Bay West | 1600 | Birchy Brook - Federation of Indians | SA-0250 |
| 261 | Frenchman's Cove | 1710 | Frenchman's Cove | SA-0267 |
| 264 | Freshwaterá | 1720 | Freshwater (Carbonear) | SA-0270 |
| 265 | Freshwaterá | 1720 | Freshwater (Carbonear) | SA-0271 |
| 279 | Georgetown | 1820 | Georgetown | SA-0285 |
| 293 | Grates Cove | 1975 | Grates Cove Centre | SA-0300 |
| 296 | Grates Cove | 1975 | Grates Cove South End | SA-0303 |
| 299 | Great Codroy | 1990 | Great Codroy East | SA-0306 |
| 300 | Great Codroy | 1990 | Great Codroy West | SA-0307 |

**Table B1. **

| WS_SUB | SOURCENAME | STATUS | WS_NUM | TYPE | PROTECTED |
|---|---|---|---|---|---|
| 202.1 | Well #1 | | WS-G-0202 | Drilled | P |
| 202.2 | Well #2 | | WS-G-0202 | Drilled | P |
| 202.3 | Upper Area Well #1 | | WS-G-0202 | Drilled | U |
| 213.1 | Deep Bight Well Field (well #1) | | WS-G-0213 | Drilled | U |
| 213.2 | Deep Bight Well Field (well #2) | | WS-G-0213 | Drilled | U |
| 213.3 | Deep Bight Well Field (well #3) | | WS-G-0213 | Drilled | U |
| 218 | #2 Well | | WS-G-0218 | Drilled | U |
| 224.1 | Dug | | WS-G-0224 | Dug | P |
| 224.2 | Dug | | WS-G-0224 | Dug | P |
| 240 | #3 Well | | WS-G-0240 | Drilled | P |
| 241 | #1 Well | | WS-G-0241 | Drilled | P |
| 242 | #2 Well | | WS-G-0242 | Drilled | P |
| 244 | #1 Well | | WS-G-0244 | Drilled | U |
| 261 | Dug Well | | WS-G-0261 | Dug | P |
| 264 | #2 Well - Covage's Lane Well | | WS-G-0264 | Drilled | U |
| 265 | #3 Well - Wallace Snow Well | | WS-G-0265 | Drilled | U |
| 279 | Drilled | | WS-G-0279 | Drilled | U |
| 293 | #1 Cyril Meadus Well | | WS-G-0293 | Drilled | U |
| 296 | #4 Stoyles Hill Well | | WS-G-0296 | Drilled | U |
| 299 | #1 Well | | WS-G-0299 | Drilled | U |
| 300 | #2 Well | | WS-G-0300 | Drilled | U |

**Table B1. **

| WS_SUB | NUM_WELLS | POPULATION | WELLFIELD_POP | CENSUS_POP | HOMES | EASTING |
|---|---|---|---|---|---|---|
| 202.1 | 2 | 20 | 60 | 646 | 30 | -58.0863345 |
| 202.2 | 2 | 20 | 60 | 646 | 30 | -58.0862591 |
| 202.3 | 2 | 20 | 60 | 646 | | -58.0863210 |
| 213.1 | 3 | 54.66666667 | 164 | 184 | | -53.9482300 |
| 213.2 | 3 | 54.66666667 | 164 | 184 | | -53.9482600 |
| 213.3 | 3 | 54.66666667 | 164 | 184 | | -53.9501902 |
| 218 | 1 | 91 | 91 | 1,199 | 152 | -53.5536800 |
| 224.1 | 1 | 499 | 499 | 499 | | -53.7543652 |
| 224.2 | 1 | 152 | 152 | 381 | | -53.7543652 |
| 240 | 1 | 235 | 391 | 255 | | -58.5845300 |
| 241 | 1 | 78 | 391 | 255 | | -58.5866900 |
| 242 | 1 | 78 | 391 | 255 | | -58.5881000 |
| 244 | 1 | 32 | 114 | 32 | | -58.6014400 |
| 261 | 1 | 166 | 166 | 166 | | -55.4083042 |
| 264 | 1 | 23 | 67 | 227 | | -53.1896700 |
| 265 | 1 | 44 | 67 | 227 | | -53.1848300 |
| 279 | 1 | 200 | 200 | 212 | 100 | -53.2394800 |
| 293 | 1 | 98 | 215 | 165 | | -52.9446800 |
| 296 | 1 | 50 | 202 | 165 | | -52.9301100 |
| 299 | 1 | 67 | 89 | 84 | 38 | -59.2480300 |
| 300 | 1 | 22 | | 84 | 38 | -59.2837100 |

**Table B1. **

| WS_SUB | NORTHING | UTM_E | UTM_N | D_WELL_ID | WELL_DEPTH | YIELD1 |
|---|---|---|---|---|---|---|
| 202.1 | 49.1090259 | 420717.00 | 5440144.00 | | 76.25 | 46 |
| 202.2 | 49.1087117 | 420722.00 | 5440109.00 | | 57.95 | 46 |
| 202.3 | 49.1090350 | 420718.00 | 5440145.00 | | 95 | 46 |
| 213.1 | 48.0953800 | 727216.89 | 5331407.06 | 2763 | 128 | 32 |
| 213.2 | 48.0957100 | 727213.21 | 5331443.65 | 2764 | 122 | 27 |
| 213.3 | 48.0963099 | 727066.87 | 5331504.62 | 19378 | 152 | 23 |
| 218 | 47.5710000 | 759190.17 | 5274377.45 | | 97.6 | 28 |
| 224.1 | 48.6490480 | 739041.19 | 5393528.31 | | 7 | 61 |
| 224.2 | 48.6490480 | 739041.19 | 5393528.31 | | 7 | 61 |
| 240 | 48.3995500 | 382718.50 | 5361922.96 | | 21 | 53 |
| 241 | 48.3909900 | 382538.93 | 5360974.84 | | 21 | 53 |
| 242 | 48.3985500 | 382451.97 | 5361817.28 | 19384 | 22 | 63 |
| 244 | 48.3985000 | 381464.48 | 5361832.28 | 195 | 56 | 69 |
| 261 | 47.2137357 | 620525.00 | 5230145.00 | | 53 | 36 |
| 264 | 47.7557200 | 785552.62 | 5296184.08 | | 26 | 5 |
| 265 | 47.7561300 | 785913.04 | 5296247.54 | | 80 | 5 |
| 279 | 47.4869100 | 783270.56 | 5266132.00 | 21118 | 85 | 27 |
| 293 | 48.1602900 | 801542.78 | 5342072.69 | | 60.4 | 42 |
| 296 | 48.1622600 | 802614.36 | 5342348.91 | | 65 | 42 |
| 299 | 47.8548400 | 331841.43 | 5302613.05 | 2308 | 61.9 | 144 |
| 300 | 47.8517200 | 329162.36 | 5302344.61 | 2309 | 50 | 45 |

**Table B1. **

| WS_SUB | Local_pQb | ROCK_LOG | ROCK_MAP | ROCK_TYPE |
|---|---|---|---|---|
| 202.1 | 0.061119524 | | Alternating Sedimentary | Alternating Sedimentary |
| 202.2 | -0.058066883 | | Alternating Sedimentary | Alternating Sedimentary |
| 202.3 | 0.156603282 | | Alternating Sedimentary | Alternating Sedimentary |
| 213.1 | 0.443697499 | ROCK | Alternating Sedimentary | Alternating Sedimentary |
| 213.2 | 0.496633574 | ROCK | Alternating Sedimentary | Alternating Sedimentary |
| 213.3 | 0.66175326 | SANDST | Alternating Sedimentary | Alternating Sedimentary |
| 218 | 0.383929294 | | Alternating Sedimentary | Alternating Sedimentary |
| 224.1 | -1.098594287 | SURFICIAL | Surficial Deposits | Quaternary |
| 224.2 | -1.098594287 | SURFICIAL | Surficial Deposits | Quaternary |
| 240 | -0.560419067 | | Surficial Deposits | Quaternary |
| 241 | -0.560419067 | | Surficial Deposits | Quaternary |
| 242 | -0.615280361 | SURFICIAL | Surficial Deposits | Quaternary |
| 244 | -0.249023556 | SANDST | FG_Sedimentary | Sandstone/FG |
| 261 | 0.009610877 | SURFICIAL | Volcanic | Quaternary |
| 264 | 0.557640852 | SILTST | FG_Sedimentary | FG_Sedimentary |
| 265 | 1.045757491 | | FG_Sedimentary | FG_Sedimentary |
| 279 | 0.339692669 | ROCK | Alternating Sedimentary | Alternating Sedimentary |
| 293 | -0.000574844 | SANDST | Alternating Sedimentary | Sandstone/FG |
| 296 | 0.031301574 | | FG_Sedimentary | FG_Sedimentary |
| 299 | -0.525034335 | SHALE | FG_Sedimentary | FG_Sedimentary |
| 300 | -0.112605002 | SHALE | Surficial Deposits | FG_Sedimentary |

**Table B1. **

| WS_SUB | Ptest Q | USAGE | USAGE | Q_calc | Slope_Ave | DIR_MEAN | K | i |
|---|---|---|---|---|---|---|---|---|
| 202.1 | | 3000 | 14 | 12 | 6.7 | 351 | 5.53E-08 | 0.07 |
| 202.2 | | 2500 | 11 | 12 | 6.7 | 352 | 7.27E-08 | 0.07 |
| 202.3 | | | | 12 | 6.7 | 350 | 4.44E-08 | 0.07 |
| 213.1 | | | | 34 | 10.0 | 58 | 1.11E-08 | 0.10 |
| 213.2 | | | | 34 | 9.7 | 58 | 1.17E-08 | 0.10 |
| 213.3 | | | | 34 | 9.1 | 59 | 9.36E-09 | 0.09 |
| 218 | 262.08 | | | 57 | 1.4 | 138 | 5.24E-08 | 0.01 |
| 224.1 | | | | 310 | 3.5 | 355 | 1.00E-05 | 0.04 |
| 224.2 | | | | 94 | 2.9 | 354 | 1.00E-05 | 0.03 |
| 240 | | | | 146 | 2.3 | 113 | 1.00E-05 | 0.02 |
| 241 | | | | 48 | 3.4 | 118 | 1.00E-05 | 0.03 |
| 242 | | | | 48 | 3.4 | 116 | 1.00E-05 | 0.03 |
| 244 | | | | 20 | 2.9 | 120 | 4.93E-07 | 0.03 |
| 261 | | | | 103 | 2.8 | 131 | 1.00E-05 | 0.03 |
| 264 | 18.72 | | | 14 | 5.5 | 7 | 6.10E-07 | 0.05 |
| 265 | 108 | | | 27 | 5.5 | 7 | 9.67E-07 | 0.05 |
| 279 | 4.32 | | | 124 | 2.8 | 47 | 2.24E-08 | 0.03 |
| 293 | 28.8 | | | 61 | 6.6 | 13 | 1.58E-06 | 0.07 |
| 296 | 92.16 | | | 31 | 6.5 | 74 | 1.58E-06 | 0.06 |
| 299 | 164.16 | | | 42 | 13.1 | 263 | 3.43E-06 | 0.08 |
| 300 | | | | 14 | 6.8 | 238 | 3.43E-06 | 0.07 |

**Table B1. **

| WS_SUB | n | K_src | Depth_src | Yield_src | v_calc | TOT_20 |
|---|---|---|---|---|---|---|
| 202.1 | 0.10 | Qb_Rock | Operator | Local_avg | 3.70E-08 | 23 |
| 202.2 | 0.10 | Qb_Rock | Operator | Local_avg | 4.85E-08 | 31 |
| 202.3 | 0.10 | Qb_Rock | Drill_xy | Local_avg | 2.98E-08 | 19 |
| 213.1 | 0.10 | Qb_Fm | Drill_xy | Drill_xy | 1.11E-08 | 7 |
| 213.2 | 0.10 | Qb_Fm | Drill_xy | Local_avg | 1.13E-08 | 7 |
| 213.3 | 0.10 | Qb_Fm | Drill_xy | Drill_xy | 8.54E-09 | 5 |
| 218 | 0.10 | Qb_Key | Operator | Local_avg | 7.09E-09 | 4 |
| 224.1 | 0.35 | Qb_Rock | Dug | Local_avg | 1.01E-06 | 635 |
| 224.2 | 0.35 | Qb_Rock | Dug | Local_avg | 8.30E-07 | 524 |
| 240 | 0.35 | Qb_Rock | Drill_xy | Local_avg | 6.66E-07 | 420 |
| 241 | 0.35 | Qb_Rock | Drill_xy | Local_avg | 9.81E-07 | 619 |
| 242 | 0.35 | Qb_Rock | Drill_xy | Drill_xy | 9.64E-07 | 608 |
| 244 | 0.10 | Qb_Fm | Drill_xy | Drill_xy | 1.32E-07 | 83 |
| 261 | 0.35 | Qb_Rock | Local_avg | Local_avg | 8.03E-07 | 506 |
| 264 | 0.10 | ptest_xy | Ptest_xy | Local_avg | 3.35E-07 | 211 |
| 265 | 0.10 | ptest_xy | Ptest_xy | Local_avg | 5.28E-07 | 333 |
| 279 | 0.10 | ptest_xy | Operator | Drill_xy | 6.24E-09 | 4 |
| 293 | 0.10 | ptest_xy | Ptest_xy | Local_avg | 1.10E-06 | 693 |
| 296 | 0.10 | well_field | Local_avg | Local_avg | 1.02E-06 | 642 |
| 299 | 0.10 | ptest community | Drill_xy | Drill_xy | 2.81E-06 | 1771 |
| 300 | 0.10 | well_field | Drill_xy | Drill_xy | 2.33E-06 | 1471 |

**Table B1. **

| WS_SUB | LITHOLOGY | GENETIC250 | GENETIC1MA |
|---|---|---|---|
| 202.1 | | till blanket | till blanket |
| 202.2 | | till blanket | till blanket |
| 202.3 | | till blanket | till blanket |
| 213.1 | GRVL 001 ROCK 128 | glaciofluvial gravel and sand | glaciofluvial |
| 213.2 | GRVL 008 ROCK 122 | glaciofluvial gravel and sand | glaciofluvial |
| 213.3 | 2.1 BRWN UNCONSOLIDATED; 152.4 RED SANDSTONE/SHALE (BEDROCK) | glaciofluvial gravel and sand | glaciofluvial |
| 218 | | hummocky terrain | ablation drift |
| 224.1 | | marine clay, sand, gravel and diamicton | glaciomarine and marine |
| 224.2 | | marine clay, sand, gravel and diamicton | glaciomarine and marine |
| 240 | | glaciofluvial gravel and sand | glaciofluvial |
| 241 | | glaciofluvial gravel and sand | glaciofluvial |
| 242 | BRWN SAND & CLAY 6.1; MULTI SAND &GRVL 22.3 | glaciofluvial gravel and sand | glaciofluvial |
| 244 | RED GRVL 012 RED SNDS 056 | glaciofluvial gravel and sand | glaciofluvial |
| 261 | | marine clay, sand, gravel and diamicton | glaciomarine and marine |
| 264 | | concealed bedrock | drift poor |
| 265 | | concealed bedrock | drift poor |
| 279 | GRAVEL 9.2; GREY BEDROCK 13.1; GREY ROCK 152.4 | concealed bedrock | drift poor |
| 293 | | till veneer | till, undifferentiated |
| 296 | | concealed bedrock | drift poor |
| 299 | BLCK/BRWN TILL 006 GREY/RED SHLE 062 | till veneer | till, undifferentiated |
| 300 | RED CLAY 005 RED SHLE 050 | glaciofluvial gravel and sand | glaciofluvial |

**Table B1. **

| WS_SUB | Keyword | D_ROCKTYPE | D_AGERANGE | D_AGEBASE | D_AGETOP |
|---|---|---|---|---|---|
| 202.1 | NF124_0076 | siliciclastic marine | Early Cambrian | 542 | 509 |
| 202.2 | NF124_0076 | siliciclastic marine | Early Cambrian | 542 | 509 |
| 202.3 | NF124_0076 | siliciclastic marine | Early Cambrian | 542 | 509 |
| 213.1 | NF191_0004 | siliciclastic marine | | 575 | 542 |
| 213.2 | NF191_0004 | siliciclastic marine | | 575 | 542 |
| 213.3 | NF191_0004 | siliciclastic marine | | 575 | 542 |
| 218 | NF191_0002 | sedimentary marine | | 575 | 542 |
| 224.1 | NF189_0128 | sedimentary | | 1.8 | 0 |
| 224.2 | NF189_0128 | sedimentary | | 1.8 | 0 |
| 240 | NF148_0090 | siliciclastic | | 1.8 | 0 |
| 241 | NF148_0090 | siliciclastic | | 1.8 | 0 |
| 242 | NF148_0090 | siliciclastic | | 1.8 | 0 |
| 244 | NF148_0086 | siliciclastic non-marine | Mississippian | 334 | 328 |
| 261 | NF174_0131 | volcanic mafic | | 1000 | 542 |
| 264 | NF191_0005 | sedimentary marine | | 575 | 542 |
| 265 | NF191_0005 | sedimentary marine | | 575 | 542 |
| 279 | NF191_0515 | | | 575 | 542 |
| 293 | NF191_0013 | | | 575 | 542 |
| 296 | NF191_0103 | siliciclastic siltstone | | 575 | 542 |
| 299 | NF148_0028 | siliciclastic non-marine siltstone | Mississippian | 336 | 329 |
| 300 | NF143_0080 | siliciclastic | | 1.8 | 0 |

**Table B1. **

| WS_SUB | D_SUPERGRP | D_GROUP | D_FORMATN | D_MEMBER |
|---|---|---|---|---|
| 202.1 | Humber Arm Allochthon (low structural slices) | Curling Group | Irishtown Formation | |
| 202.2 | Humber Arm Allochthon (low structural slices) | Curling Group | Irishtown Formation | |
| 202.3 | Humber Arm Allochthon (low structural slices) | Curling Group | Irishtown Formation | |
| 213.1 | | Connecting Point Group | | |
| 213.2 | | Connecting Point Group | | |
| 213.3 | | Connecting Point Group | | |
| 218 | | Musgravetown Group | Heart's Content Formation | |
| 224.1 | Surficial deposits | | | |
| 224.2 | Surficial deposits | | | |
| 240 | Surficial deposits | | | |
| 241 | Surficial deposits | | | |
| 242 | Surficial deposits | | | |
| 244 | | Codroy Group | Robinsons River Formation | Jeffreys Village Member |
| 261 | | Marystown Group | Garnish Formation | |
| 264 | | St. John's Group | Fermeuse Formation | |
| 265 | | St. John's Group | Fermeuse Formation | |
| 279 | | Conception Group | Drook Formation | |
| 293 | | Signal Hill Group | Bay de Verde Formation | Old Perlican Member |
| 296 | | Signal Hill Group | Bay de Verde Formation | Grates Cove Member |
| 299 | | Codroy Group | Codroy Road Formation | |
| 300 | Surficial deposits | | | |

**Table B1. Well Heads Database**

| WS_SUB | COMMUNITY | LGP_NUM | SERVICED_A | SA_NUM |
|---|---|---|---|---|
| 305 | Green's Harbour | 2015 | Green's Harbour West | SA-0312 |
| 322 | Happy Valley-Goose Bay | 2105 | Happy Valley-Goose Bay | SA-0329 |
| 323.1 | Happy Valley-Goose Bay | 2105 | Happy Valley-Goose Bay | SA-0330 |
| 323.2 | Happy Valley-Goose Bay | 2105 | Happy Valley-Goose Bay | SA-0330 |
| 323.3 | Happy Valley-Goose Bay | 2105 | Happy Valley-Goose Bay | SA-0330 |
| 323.4 | Happy Valley-Goose Bay | 2105 | Happy Valley-Goose Bay | SA-0330 |
| 323.5 | Happy Valley-Goose Bay | 2105 | Happy Valley-Goose Bay | SA-0330 |
| 326 | Harbour Grace | 2125 | Riverhead | SA-0333 |
| 327 | Harbour Grace | 2125 | Harbour Grace South | SA-0334 |
| 328 | Harbour Grace | 2125 | Thickett | SA-0335 |
| 329 | Harbour Grace | 2125 | Thickett | SA-0336 |
| 332 | Harbour Main-Chapel's Cove-Lakeview | 2145 | Harbour Main, Chapel's Cove, Lakeview | SA-0339 |
| 333 | Harbour Main-Chapel's Cove-Lakeview | 2145 | Harbour Main, Chapel's Cove, Lakeview | SA-0340 |
| 337 | Smith's Sound | 2160 | Harcourt-Monroe-Waterville | SA-0344 |
| 340 | Harry's Harbour | 2190 | Harry's Harbour | SA-0347 |
| 341 | Harry's Harbour | 2190 | Harry's Harbour | SA-0348 |
| 342 | Harry's Harbour | 2190 | Harry's Harbour | SA-0349 |
| 354 | Hodge's Cove | 2315 | Hodge's Cove | SA-0362 |
| 356.1 | Holyrood | 2320 | Holyrood | SA-0364 |
| 356.3 | Holyrood | 2320 | Holyrood | SA-0364 |
| 356.5 | Holyrood | 2320 | Holyrood | SA-0364 |
| 359 | Holyrood | 2320 | Holyrood | SA-0367 |
| 361.1 | Holyrood | 2320 | Holyrood | SA-0369 |
| 361.2 | Holyrood | 2320 | Holyrood | SA-0369 |
| 377 | Jackson's Cove-Langdon's Cove-Silverdale | 2480 | Langdon's Cove | SA-0385 |

**Table B1. **

| WS_SUB | SOURCENAME | STATUS | WS_NUM | TYPE | PROTECTED |
|---|---|---|---|---|---|
| 305 | Barrett's Well | | WS-G-0305 | Drilled | U |
| 322 | Spring Gulch | | WS-G-0322 | Spring | U |
| 323.1 | #1 Well | | WS-G-0323 | Drilled | U |
| 323.2 | #2 Well | | WS-G-0323 | Drilled | U |
| 323.3 | #3 Well | | WS-G-0323 | Drilled | U |
| 323.4 | #4 Well | | WS-G-0323 | Drilled | U |
| 323.5 | #5 Well | | WS-G-0323 | Drilled | U |
| 326 | Mercer's Road Well | | WS-G-0326 | Drilled | P |
| 327 | Southside Well | | WS-G-0327 | Drilled | P |
| 328 | #1 Thicket Susie Galway Well | | WS-G-0328 | Drilled | P |
| 329 | #2 Thicket Well | | WS-G-0329 | Drilled | P |
| 332 | Flynn's Hill Well | | WS-G-0332 | Drilled | P |
| 333 | Holden's Road Well | | WS-G-0333 | Drilled | P |
| 337 | Developed Spring | | WS-G-0337 | Dug | U |
| 340 | #1 Well - Northeast Well | | WS-G-0340 | Drilled | U |
| 341 | #2 Well - Northwest Hill / Country Road | | WS-G-0341 | Drilled | U |
| 342 | #3 Well - South Well | | WS-G-0342 | Drilled | U |
| 354 | Drilled | | WS-G-0354 | Drilled | U |
| 356.1 | Main Line (well #1) | | WS-G-0356 | Drilled | P |
| 356.3 | Main Line (well #3) | | WS-G-0356 | Drilled | P |
| 356.5 | Main Line (well #5) | | WS-G-0356 | Drilled | P |
| 359 | O'Connell's Well | | WS-G-0359 | Drilled | P |
| 361.1 | Woodford Station - Quinlan's Well | | WS-G-0361 | Drilled | P |
| 361.2 | Woodford Station - Healey's Well | | WS-G-0361 | Drilled | P |
| 377 | #3 Well Langdon's Cove Well | | WS-G-0377 | Drilled | U |

**Table B1. **

| WS_SUB | NUM_WELLS | POPULATION | WELLFIELD_POP | CENSUS_POP | HOMES | EASTING |
|---|---|---|---|---|---|---|
| 305 | 0 | 670 | 670 | 670 | | -53.5124600 |
| 322 | 0 | 1262 | 7572 | 7,572 | | -60.4595600 |
| 323.1 | 1 | 1262 | 7572 | 7,572 | | -60.4459050 |
| 323.2 | 1 | 1262 | 7572 | 7,572 | | -60.4495380 |
| 323.3 | 1 | 1262 | 7572 | 7,572 | | -60.4509620 |
| 323.4 | 1 | 1262 | 7572 | 7,572 | | -60.4538440 |
| 323.5 | 1 | 1262 | 7572 | 7,572 | | -60.4567090 |
| 326 | 1 | 43 | 179 | 3,074 | | -53.2728500 |
| 327 | 2 | 76 | 179 | 3,074 | | -53.2098900 |
| 328 | 1 | 27 | 179 | 3,074 | | -53.2507700 |
| 329 | 1 | 33 | 179 | 3,074 | | -53.2554900 |
| 332 | 1 | 76 | 122 | 1,090 | | -53.1511184 |
| 333 | 1 | 46 | 122 | 1,090 | | -53.1744271 |
| 337 | 1 | 40 | 40 | 301 | | -53.8597100 |
| 340 | 1 | 63 | 132 | 82 | | -55.9221200 |
| 341 | 1 | 26 | 132 | 82 | | -55.9269100 |
| 342 | 1 | 43 | 132 | 82 | | -55.9376800 |
| 354 | 1 | 16 | 16 | 301 | | -53.7483700 |
| 356.1 | 3 | 524.6666667 | 1816 | 2,005 | | -53.1227900 |
| 356.3 | 3 | 524.6666667 | 1816 | 2,005 | | -53.1229600 |
| 356.5 | 3 | 524.6666667 | 1816 | 2,005 | | -53.1526300 |
| 359 | 1 | 144 | 1816 | 2,005 | | -53.1482000 |
| 361.1 | 2 | 49 | 1816 | 2,005 | | -53.1513400 |
| 361.2 | 2 | 49 | 1816 | 2,005 | | -53.1576500 |
| 377 | 1 | 37 | 37 | 147 | | -55.9826200 |

**Table B1. **

| WS_SUB | NORTHING | UTM_E | UTM_N | D_WELL_ID | WELL_DEPTH | YIELD1 |
|---|---|---|---|---|---|---|
| 305 | 47.6328000 | 761980.83 | 5281383.25 | | 109.7 | 32 |
| 322 | 53.2895300 | 269423.71 | 5910062.60 | | 1 | 61 |
| 323.1 | 53.2787240 | 270275.49 | 5908817.08 | | 51 | 75 |
| 323.2 | 53.2781830 | 270030.47 | 5908768.62 | | 43 | 118 |
| 323.3 | 53.2780830 | 269935.03 | 5908762.09 | | 42 | 42 |
| 323.4 | 53.2776420 | 269740.59 | 5908722.34 | | 46 | 42 |
| 323.5 | 53.2772620 | 269547.61 | 5908689.33 | | 51 | 37 |
| 326 | 47.6519600 | 779875.38 | 5284350.54 | | 48 | 26 |
| 327 | 47.6805800 | 784446.74 | 5287760.22 | 27759 | 116 | 14 |
| 328 | 47.6526100 | 781529.67 | 5284502.82 | | 64 | 12 |
| 329 | 47.6515800 | 781180.83 | 5284371.22 | | 116 | 12 |
| 332 | 47.4124907 | 790335.59 | 5258189.23 | 1074 | 44 | 159 |
| 333 | 47.4274025 | 788495.97 | 5259759.32 | 1240 | 91 | 4 |
| 337 | 48.2025600 | 733320.11 | 5343583.32 | | 87 | 3 |
| 340 | 49.7001100 | 577727.21 | 5505846.06 | 2796 | 72 | 36 |
| 341 | 49.7006700 | 577380.91 | 5505903.38 | | 65 | 24 |
| 342 | 49.6958900 | 576611.82 | 5505360.92 | | 65 | 24 |
| 354 | 48.0006600 | 742540.38 | 5321490.78 | 4912 | 122 | 18 |
| 356.1 | 47.3804000 | 792650.11 | 5254729.77 | | 45 | 17 |
| 356.3 | 47.3783300 | 792648.75 | 5254499.12 | | 92.5 | 17 |
| 356.5 | 47.3794900 | 790403.09 | 5254516.77 | | 91.5 | 59 |
| 359 | 47.4084300 | 790578.07 | 5257748.94 | | 81 | 43 |
| 361.1 | 47.4058600 | 790355.37 | 5257451.65 | | 81 | 43 |
| 361.2 | 47.4023400 | 789898.72 | 5257036.97 | | 81 | 43 |
| 377 | 49.6917200 | 573377.19 | 5504852.45 | | 65 | 18 |

**Table B1. **

| WS_SUB | Local_pQb | ROCK_LOG | ROCK_MAP | ROCK_TYPE |
|---|---|---|---|---|
| 305 | 0.376694157 | | Sandstone/FG | Sandstone/FG |
| 322 | -1.943692327 | SURFICIAL | Surficial Deposits | Quaternary |
| 323.1 | -0.325853579 | | Surficial Deposits | Quaternary |
| 323.2 | -0.596776044 | | Surficial Deposits | Quaternary |
| 323.3 | -0.158362492 | | Surficial Deposits | Quaternary |
| 323.4 | -0.118853951 | | Surficial Deposits | Quaternary |
| 323.5 | -0.01899404 | | Surficial Deposits | Quaternary |
| 326 | 0.107905397 | | FG_Sedimentary | FG_Sedimentary |
| 327 | 0.759967461 | ROCK | Sandstone/FG | Sandstone/FG |
| 328 | 0.568636236 | | Sandstone/FG | Sandstone/FG |
| 329 | 0.826914251 | | Sandstone/FG | Sandstone/FG |
| 332 | -0.71630694 | ROCK | Alternating Sedimentary | Alternating Sedimentary |
| 333 | 1.198618909 | ROCK | Alternating Sedimentary | Alternating Sedimentary |
| 337 | 1.304035506 | SURFICIAL | #N/A | Quaternary |
| 340 | 0.142667504 | SHALE | Volcanic | Volcanic |
| 341 | 0.274339623 | | Volcanic | Volcanic |
| 342 | 0.274339623 | | Volcanic | Volcanic |
| 354 | 0.672724833 | ROCK | Volcanic | Volcanic |
| 356.1 | 0.2644011 | | Alternating Sedimentary | Alternating Sedimentary |
| 356.3 | 0.577330319 | | Alternating Sedimentary | Alternating Sedimentary |
| 356.5 | 0.03220659 | | Alternating Sedimentary | Alternating Sedimentary |
| 359 | 0.116654071 | | Alternating Sedimentary | Alternating Sedimentary |
| 361.1 | 0.116654071 | | Alternating Sedimentary | Alternating Sedimentary |
| 361.2 | 0.116654071 | | Alternating Sedimentary | Alternating Sedimentary |
| 377 | 0.399278359 | | Volcanic | Volcanic |

**Table B1. **

| WS_SUB | Ptest Q | USAGE | USAGE | Q_calc | Slope_Ave | DIR_MEAN | K | i |
|---|---|---|---|---|---|---|---|---|
| 305 | 4.752 | | | 416 | 4.4 | 133 | 1.49E-08 | 0.04 |
| 322 | | | | 784 | <Null> | 341 | 1.00E-05 | 0.01 |
| 323.1 | | | | 784 | <Null> | 292 | 1.00E-05 | 0.01 |
| 323.2 | | | | 784 | <Null> | 320 | 1.00E-05 | 0.02 |
| 323.3 | | | | 784 | <Null> | 320 | 1.00E-05 | 0.02 |
| 323.4 | | | | 784 | <Null> | 324 | 1.00E-05 | 0.02 |
| 323.5 | | | | 784 | <Null> | 329 | 1.00E-05 | 0.02 |
| 326 | 7.2 | | | 27 | 4.0 | 30 | 1.84E-08 | 0.04 |
| 327 | 25.2 | | | 47 | 15.1 | 127 | 1.84E-08 | 0.15 |
| 328 | 43.2 | | | 17 | 4.8 | 30 | 2.17E-08 | 0.05 |
| 329 | 24.912 | | | 20 | 4.4 | 30 | 2.17E-08 | 0.04 |
| 332 | | | | 47 | 4.1 | 58 | 6.66E-08 | 0.04 |
| 333 | | | | 29 | 3.6 | 75 | 2.18E-07 | 0.04 |
| 337 | | | | 25 | 6.8 | 235 | 1.00E-05 | 0.07 |
| 340 | | | | 39 | 17.9 | 167 | 9.63E-08 | 0.18 |
| 341 | | | | 16 | 16.2 | 11 | 1.07E-07 | 0.16 |
| 342 | | | | 27 | 10.3 | 279 | 1.07E-07 | 0.10 |
| 354 | | | | 10 | 7.4 | 63 | 3.61E-08 | 0.07 |
| 356.1 | | | | 326 | 6.5 | 92 | 3.11E-06 | 0.07 |
| 356.3 | 540 | | | 326 | 6.5 | 92 | 3.11E-06 | 0.07 |
| 356.5 | 540 | | | 326 | 6.4 | 95 | 1.26E-06 | 0.06 |
| 359 | | | | 89 | 5.6 | 52 | 3.51E-07 | 0.06 |
| 361.1 | | | | 30 | 5.5 | 52 | 3.51E-07 | 0.06 |
| 361.2 | | | | 30 | 5.3 | 53 | 3.51E-07 | 0.05 |
| 377 | | | | 23 | 10.2 | 79 | 2.92E-07 | 0.10 |

**Table B1. **

| WS_SUB | n | K_src | Depth_src | Yield_src | v_calc | TOT_20 |
|---|---|---|---|---|---|---|
| 305 | 0.10 | ptest_xy | Ptest_xy | Local_avg | 6.55E-09 | 4 |
| 322 | 0.35 | Qb_Rock | Operator | Local_avg | 4.03E-07 | 254 |
| 323.1 | 0.35 | Qb_Rock | Operator | Operator | 4.16E-07 | 262 |
| 323.2 | 0.35 | Qb_Rock | Operator | Operator | 4.42E-07 | 279 |
| 323.3 | 0.35 | Qb_Rock | Operator | Operator | 4.65E-07 | 293 |
| 323.4 | 0.35 | Qb_Rock | Operator | Operator | 5.11E-07 | 322 |
| 323.5 | 0.35 | Qb_Rock | Operator | Operator | 5.59E-07 | 353 |
| 326 | 0.10 | well_field | Local_avg | Local_avg | 7.28E-09 | 5 |
| 327 | 0.10 | ptest_xy | Drill_xy | Drill_xy | 2.77E-08 | 17 |
| 328 | 0.10 | well_field | Local_avg | Local_avg | 1.05E-08 | 7 |
| 329 | 0.10 | ptest_xy | Ptest_xy | Local_avg | 9.46E-09 | 6 |
| 332 | 0.10 | Qb_Fm | Drill_xy | Drill_xy | 2.71E-08 | 17 |
| 333 | 0.10 | Qb_Key | Drill_xy | Drill_xy | 7.92E-08 | 50 |
| 337 | 0.35 | Qb_Fm | Local_avg | Local_avg | 1.93E-06 | 1218 |
| 340 | 0.10 | Qb_Rock | Drill_xy | Local_avg | 1.73E-07 | 109 |
| 341 | 0.10 | Qb_Rock | Local_avg | Local_avg | 1.73E-07 | 109 |
| 342 | 0.10 | Qb_Rock | Local_avg | Local_avg | 1.10E-07 | 69 |
| 354 | 0.10 | Qb_Fm | Drill_xy | Drill_xy | 2.66E-08 | 17 |
| 356.1 | 0.10 | well_field | Local_avg | Local_avg | 2.03E-06 | 1279 |
| 356.3 | 0.10 | ptest_xy | Ptest_xy | Local_avg | 2.03E-06 | 1282 |
| 356.5 | 0.10 | ptest_xy | Ptest_xy | Local_avg | 8.08E-07 | 510 |
| 359 | 0.10 | Qb_Key | Local_avg | Local_avg | 1.97E-07 | 124 |
| 361.1 | 0.10 | Qb_Key | Local_avg | Local_avg | 1.93E-07 | 122 |
| 361.2 | 0.10 | Qb_Key | Local_avg | Local_avg | 1.85E-07 | 117 |
| 377 | 0.10 | Qb_Fm | Local_avg | Local_avg | 3.00E-07 | 189 |

**Table B1. **

| WS_SUB | LITHOLOGY | GENETIC250 | GENETIC1MA |
|---|---|---|---|
| 305 | | concealed bedrock | drift poor |
| 322 | | | glaciofluvial |
| 323.1 | | | glaciofluvial |
| 323.2 | | | glaciofluvial |
| 323.3 | | | glaciofluvial |
| 323.4 | | | glaciofluvial |
| 323.5 | | | glaciofluvial |
| 326 | | concealed bedrock | drift poor |
| 327 | GRAVEL 0.91M ;GREY, GREN BEDROCK 0.91M TO 9.6M ;GREY, GREN ROCK 9.6M TO 134.11M ;GREY, GREN, WHIT ROCK 134.11M TO 182.88M | concealed bedrock | drift poor |
| 328 | | concealed bedrock | drift poor |
| 329 | | concealed bedrock | drift poor |
| 332 | BRN TPSL 002 GREY ROCK 044 | concealed bedrock | drift poor |
| 333 | BRWN GRVL 002 GREN ROCK 091 | concealed bedrock | drift poor |
| 337 | | till blanket | till blanket |
| 340 | SHLE 072 | concealed bedrock | drift poor |
| 341 | | concealed bedrock | drift poor |
| 342 | | concealed bedrock | drift poor |
| 354 | GRVL 001 GREN RED ROCK 122 | glaciofluvial gravel and sand | glaciofluvial |
| 356.1 | | till veneer | till, undifferentiated |
| 356.3 | | till veneer | till, undifferentiated |
| 356.5 | | till veneer | till, undifferentiated |
| 359 | | concealed bedrock | drift poor |
| 361.1 | | concealed bedrock | drift poor |
| 361.2 | | concealed bedrock | drift poor |
| 377 | | concealed bedrock | drift poor |

**Table B1. **

| WS_SUB | Keyword | D_ROCKTYPE | D_AGERANGE | D_AGEBASE | D_AGETOP |
|---|---|---|---|---|---|
| 305 | NF191_0001 | | | 575 | 542 |
| 322 | | | | 0 | 0 |
| 323.1 | | | | 0 | 0 |
| 323.2 | | | | 0 | 0 |
| 323.3 | | | | 0 | 0 |
| 323.4 | | | | 0 | 0 |
| 323.5 | | | | 0 | 0 |
| 326 | NF191_0005 | sedimentary marine | | 575 | 542 |
| 327 | NF191_0096 | sedimentary marine | | 575 | 542 |
| 328 | NF191_0096 | sedimentary marine | | 575 | 542 |
| 329 | NF191_0096 | sedimentary marine | | 575 | 542 |
| 332 | NF191_0078 | | | 575 | 542 |
| 333 | NF191_0234 | | | 633 | 620 |
| 337 | NF191_0029 | sedimentary marine | Middle Cambrian to Late Cambrian | 509 | 489 |
| 340 | NF008_0227 | volcanic felsic marine | Early Ordovician to Middle Ordovician | 485 | 465 |
| 341 | NF008_0225 | volcanic mafic marine | Early Cambrian to Late Cambrian | 542 | 500 |
| 342 | NF008_0221 | siliciclastic marine shale | Early Cambrian to Late Cambrian | 542 | 500 |
| 354 | NF191_0040 | volcanic | | 575 | 542 |
| 356.1 | NF191_0149 | | | 575 | 542 |
| 356.3 | NF191_0149 | | | 575 | 542 |
| 356.5 | NF191_0020 | | | 633 | 620 |
| 359 | NF191_0273 | | | 633 | 620 |
| 361.1 | NF191_0273 | | | 633 | 620 |
| 361.2 | NF191_0273 | | | 633 | 620 |
| 377 | NF008_0214 | volcanic mafic marine | Early Cambrian to Middle Cambrian | 542 | 505 |

**Table B1. **

| WS_SUB | D_SUPERGRP | D_GROUP | D_FORMATN | D_MEMBER |
|---|---|---|---|---|
| 305 | | Musgravetown Group | Big Head Formation | |
| 322 | | | | |
| 323.1 | | | | |
| 323.2 | | | | |
| 323.3 | | | | |
| 323.4 | | | | |
| 323.5 | | | | |
| 326 | | St. John's Group | Fermeuse Formation | |
| 327 | | St. John's Group | Trepassey formation | |
| 328 | | St. John's Group | Trepassey formation | |
| 329 | | St. John's Group | Trepassey formation | |
| 332 | | Conception Group | Drook Formation | |
| 333 | | Harbour Main Group | | |
| 337 | | Harcourt Group | Elliotts Cove Formation | |
| 340 | | Western Arm Group | Welsh Cove Tuff | |
| 341 | | Western Arm Group | Big Hill Basalt | |
| 342 | | Western Arm Group | Skeleton Pond Tuff | |
| 354 | | Musgravetown Group | Bull Arm Formation | |
| 356.1 | | Conception Group | Drook Formation | |
| 356.3 | | Conception Group | Drook Formation | |
| 356.5 | | Harbour Main Group | | |
| 359 | | Harbour Main Group | | |
| 361.1 | | Harbour Main Group | | |
| 361.2 | | Harbour Main Group | | |
| 377 | | Lushs Bight Group | | |

**Table B1. Well Heads Database**

| WS_SUB | COMMUNITY | LGP_NUM | SERVICED_A | SA_NUM |
|---|---|---|---|---|
| 380 | Jean de Baie | 2495 | Jean de Baie | SA-0388 |
| 389.1 | Kippens | 2615 | Kippens | SA-0398 |
| 389.2 | Kippens | 2615 | Kippens | SA-0398 |
| 389.3 | Kippens | 2615 | Kippens | SA-0398 |
| 389.4 | Kippens | 2615 | Kippens | SA-0398 |
| 441.1 | Makinsons | 3105 | Turkswater & Hodgewater Line West | SA-0454 |
| 441.2 | Makinsons | 3105 | Turkswater & Hodgewater Line West | SA-0454 |
| 442.1 | Makinsons | 3105 | Hodgewater Line East & Juniper Stump | SA-0455 |
| 442.2 | Makinsons | 3105 | Hodgewater Line East & Juniper Stump | SA-0455 |
| 449 | Marysvale | 3165 | Marysvale, Long Pond | SA-0462 |
| 451 | Mattis Point | 3170 | Mattis Point | SA-0465 |
| 452 | McCallum | 3055 | McCallum | SA-0466 |
| 507 | North Harbour | 3530 | North Harbour North End, tap outlet | SA-0525 |
| 509 | Random Sound West | 2305 | North West Brook, Ivany Cove | SA-0527 |
| 510 | Random Sound West | 2305 | North West Brook, Ivany Cove | SA-0528 |
| 511 | Random Sound West | 2305 | North West Brook, Ivany Cove | SA-0529 |
| 512 | Random Sound West | 2305 | North West Brook, Ivany Cove | SA-0530 |
| 513.1 | North West River | 3555 | North West River | SA-0531 |
| 513.2 | North West River | 3555 | North West River | SA-0531 |
| 513.3 | North West River | 3555 | North West River | SA-0531 |
| 517.1 | O'Donnells | 3585 | O'Donnell's | SA-0535 |
| 517.2 | O'Donnells | 3585 | O'Donnell's | SA-0535 |
| 517.3 | O'Donnells | 3585 | O'Donnell's | SA-0535 |
| 523 | O'Regans East | 3587 | O'Regan's East | SA-0541 |
| 536 | Petley | 3750 | Petley | SA-0556 |
| 540 | Piccadilly Slant-Abraham's Cove | 3773 | Abraham's Cove | SA-0560 |
| 541 | Piccadilly Slant-Abraham's Cove | 3773 | Piccadilly Slant | SA-0561 |
| 571.3 | Port au Choix | 3935 | Port au Choix | SA-0591 |

**Table B1. **

| WS_SUB | SOURCENAME | STATUS | WS_NUM | TYPE | PROTECTED |
|---|---|---|---|---|---|
| 380 | #1 Well | | WS-G-0380 | Drilled | U |
| 389.1 | Well #1 | | WS-G-0389 | Drilled | P |
| 389.2 | Well #2 | | WS-G-0389 | Drilled | P |
| 389.3 | Well #3 | | WS-G-0389 | Drilled | P |
| 389.4 | Well #4 | | WS-G-0389 | Drilled | P |
| 441.1 | Country Path Wells (Dean Efford Well) | | WS-G-0441 | Drilled | U |
| 441.2 | Country Path Wells (Dale Efford Well) | | WS-G-0441 | Drilled | U |
| 442.1 | Taylor's Wells (Front Well) | | WS-G-0442 | Drilled | U |
| 442.2 | Taylor's Wells (Back Well) | | WS-G-0442 | Drilled | U |
| 449 | Drilled | | WS-G-0449 | Drilled | U |
| 451 | Drilled | | WS-G-0451 | Drilled | U |
| 452 | Drilled | | WS-G-0452 | Drilled | P |
| 507 | Communal Well | | WS-G-0507 | Drilled | U |
| 509 | #1 Well - Cabot Road South Well | | WS-G-0509 | Drilled | U |
| 510 | #2 Well | | WS-G-0510 | Drilled | U |
| 511 | #3 Well - Harbour Well | | WS-G-0511 | Drilled | U |
| 512 | #4 Well (Inactive, not hooked up) | OUT_OF_SERVICE | WS-G-0512 | Drilled | U |
| 513.1 | #1 Well | | WS-G-0513 | Drilled | P |
| 513.2 | #2 Well | | WS-G-0513 | Drilled | P |
| 513.3 | #3 Well | | WS-G-0513 | Drilled | P |
| 517.1 | Well Field (well #1) | | WS-G-0517 | Drilled | U |
| 517.2 | Well Field (well #2) | | WS-G-0517 | Drilled | U |
| 517.3 | Well Field (well #3) | | WS-G-0517 | Drilled | U |
| 523 | Drilled | | WS-G-0523 | Drilled | U |
| 536 | Drilled | | WS-G-0536 | Drilled | U |
| 540 | #2 Well - Abraham's Cove | | WS-G-0540 | Drilled | U |
| 541 | #1 Well - Piccadilly Slant | | WS-G-0541 | Drilled | U |
| 571.3 | Well Field (well #3) | | WS-G-0571 | Drilled | P |

**Table B1. **

| WS_SUB | NUM_WELLS | POPULATION | WELLFIELD_POP | CENSUS_POP | HOMES | EASTING |
|---|---|---|---|---|---|---|
| 380 | 1 | 205 | 205 | 188 | | -55.0636700 |
| 389.1 | 4 | 434.75 | 1739 | | | -58.6121840 |
| 389.2 | 4 | 434.75 | 1739 | | | -58.6067250 |
| 389.3 | 4 | 434.75 | 1739 | | | -58.6054490 |
| 389.4 | 4 | 434.75 | 1739 | | | -58.6155580 |
| 441.1 | 2 | 87.5 | 256 | 349 | | -53.3176800 |
| 441.2 | 2 | 87.5 | 256 | 349 | | -53.3180000 |
| 442.1 | 2 | 41 | 256 | 349 | | -53.3106700 |
| 442.2 | 2 | 41 | 256 | 349 | | -53.3105700 |
| 449 | 1 | 419 | 419 | 645 | | -53.2272400 |
| 451 | 1 | 136 | 136 | 136 | | -58.3937300 |
| 452 | 1 | 110 | 110 | 113 | | -56.2315702 |
| 507 | 1 | 6 | 6 | 91 | | -54.1004300 |
| 509 | 1 | 44 | 206 | 866 | 35 | -53.9620800 |
| 510 | 1 | 55 | 206 | 866 | 35 | -53.9616100 |
| 511 | 1 | 55 | 206 | 866 | 35 | -53.9596400 |
| 512 | 1 | 52 | 206 | 866 | 35 | -53.9539500 |
| 513.1 | 3 | 164 | 492 | 492 | | -60.1477775 |
| 513.2 | 3 | 164 | 492 | 492 | | -60.1468553 |
| 513.3 | 3 | 164 | 492 | 492 | | -60.1510097 |
| 517.1 | 3 | 61 | 183 | 183 | 70 | -53.5594600 |
| 517.2 | 3 | 61 | 183 | 183 | 70 | -53.5599600 |
| 517.3 | 3 | 61 | 183 | 183 | 70 | -53.5589700 |
| 523 | 1 | 118 | 118 | 118 | 38 | -59.1763300 |
| 536 | 1 | 92 | 92 | 93 | | -53.7473900 |
| 540 | 1 | 414 | 778 | 436 | | -58.9249600 |
| 541 | 1 | 364 | 778 | 436 | | -58.9216000 |
| 571.3 | 3 | 268.3333333 | 805 | 893 | 438 | -57.3462700 |

**Table B1. **

| WS_SUB | NORTHING | UTM_E | UTM_N | D_WELL_ID | WELL_DEPTH | YIELD1 |
|---|---|---|---|---|---|---|
| 380 | 47.2280400 | 646580.95 | 5232324.39 | 3167 | 43 | 113 |
| 389.1 | 48.5816390 | 381098.28 | 5382204.87 | 21319 | 60.9 | 682.5 |
| 389.2 | 48.5844850 | 381507.54 | 5382512.73 | | 31 | 29 |
| 389.3 | 48.5817060 | 381595.14 | 5382201.86 | | 31 | 29 |
| 389.4 | 48.5778730 | 380840.60 | 5381791.54 | | 31 | 29 |
| 441.1 | 47.4834000 | 777399.16 | 5265459.59 | 11514 | 92 | 36 |
| 441.2 | 47.4831000 | 777376.64 | 5265425.12 | 9016 | 92 | 16 |
| 442.1 | 47.4933500 | 777874.63 | 5266590.27 | | 92 | 11 |
| 442.2 | 47.4933700 | 777882.06 | 5266592.85 | | 92 | 11 |
| 449 | 47.4933900 | 784157.45 | 5266896.77 | 1089 | 135 | 45 |
| 451 | 48.4914400 | 397026.47 | 5371862.06 | | 41 | 61 |
| 452 | 47.6327867 | 557726.85 | 5275773.32 | 6393 | 17 | 7 |
| 507 | 47.8628200 | 716858.53 | 5305124.12 | 11515 | 93 | 81 |
| 509 | 48.0214700 | 726510.05 | 5323152.59 | 3567 | 122 | 5 |
| 510 | 48.0286100 | 726513.78 | 5323947.44 | 3568 | 31 | 2 |
| 511 | 48.0226900 | 726686.61 | 5323295.35 | 5727 | 122 | 14 |
| 512 | 48.0190200 | 727126.94 | 5322904.27 | | 85 | 13 |
| 513.1 | 53.5372245 | 291413.73 | 5936645.15 | | 37 | 61 |
| 513.2 | 53.5318613 | 291448.45 | 5936046.04 | | 37 | 61 |
| 513.3 | 53.5374185 | 291200.57 | 5936676.20 | | 37 | 61 |
| 517.1 | 47.0785000 | 761174.44 | 5219633.24 | | 153 | 18 |
| 517.2 | 47.0782400 | 761137.76 | 5219602.68 | | 55 | 18 |
| 517.3 | 47.0782000 | 761213.10 | 5219601.54 | | 55 | 18 |
| 523 | 47.8736500 | 337263.43 | 5304549.90 | 108 | 38 | 168 |
| 536 | 48.1554800 | 741885.97 | 5338698.74 | | 76 | 13 |
| 540 | 48.5244900 | 357871.41 | 5376386.94 | 125 | 81 | 40 |
| 541 | 48.5287200 | 358131.30 | 5376850.85 | | 64 | 31 |
| 571.3 | 50.7052300 | 475548.77 | 5617103.36 | | 48.77 | 450 |

**Table B1. **

| WS_SUB | Local_pQb | ROCK_LOG | ROCK_MAP | ROCK_TYPE |
|---|---|---|---|---|
| 380 | -0.57797248 | SHALE | Volcanic | Volcanic |
| 389.1 | -1.207847855 | | Surficial Deposits | Quaternary |
| 389.2 | -0.129398796 | | Surficial Deposits | Quaternary |
| 389.3 | -0.129398796 | | Surficial Deposits | Quaternary |
| 389.4 | -0.129398796 | | Surficial Deposits | Quaternary |
| 441.1 | 0.249122834 | ROCK | Alternating Sedimentary | Alternating Sedimentary |
| 441.2 | 0.601305353 | | Alternating Sedimentary | Alternating Sedimentary |
| 442.1 | 0.76403265 | | Alternating Sedimentary | Alternating Sedimentary |
| 442.2 | 0.76403265 | | Alternating Sedimentary | Alternating Sedimentary |
| 449 | 0.318758763 | SLATE | Alternating Sedimentary | Alternating Sedimentary |
| 451 | -0.33090847 | | Surficial Deposits | Quaternary |
| 452 | 0.226988389 | | Plutonic | Plutonic |
| 507 | -0.098364562 | ROCK | Volcanic | Volcanic |
| 509 | 1.229027334 | SANDST | Volcanic | Sandstone/FG |
| 510 | 1.031969206 | SURFICIAL | Volcanic | Quaternary |
| 511 | 0.781869303 | ROCK | Volcanic | Volcanic |
| 512 | 0.657113081 | | Volcanic | Volcanic |
| 513.1 | -0.375490603 | | Drift | Quaternary |
| 513.2 | -0.375490603 | | Drift | Quaternary |
| 513.3 | -0.375490603 | | Drift | Quaternary |
| 517.1 | 0.771056434 | | Alternating Sedimentary | Alternating Sedimentary |
| 517.2 | 0.326727692 | | Alternating Sedimentary | Alternating Sedimentary |
| 517.3 | 0.326727692 | | Alternating Sedimentary | Alternating Sedimentary |
| 523 | -0.803888177 | SHALE | Surficial Deposits | FG_Sedimentary |
| 536 | 0.608507748 | | FG_Sedimentary | FG_Sedimentary |
| 540 | 0.148062535 | | Carbonate | Carbonate |
| 541 | 0.156455788 | | Carbonate | Carbonate |
| 571.3 | -1.12342225 | | Carbonate | Carbonate |

**Table B1. **

| WS_SUB | Ptest Q | USAGE | USAGE | Q_calc | Slope_Ave | DIR_MEAN | K | i |
|---|---|---|---|---|---|---|---|---|
| 380 | | | | 127 | 12.7 | 270 | 1.61E-07 | 0.13 |
| 389.1 | | | | 270 | 12.9 | 271 | 1.00E-05 | 0.13 |
| 389.2 | | | | 270 | 14.1 | 288 | 1.00E-05 | 0.14 |
| 389.3 | | | | 270 | 11.5 | 289 | 1.00E-05 | 0.11 |
| 389.4 | | | | 270 | 10.0 | 267 | 1.00E-05 | 0.10 |
| 441.1 | 43.2 | | | 54 | 5.5 | 40 | 1.15E-07 | 0.06 |
| 441.2 | 67.68 | | | 54 | 6.5 | 39 | 1.76E-07 | 0.06 |
| 442.1 | | | | 25 | 7.6 | 36 | 1.76E-07 | 0.08 |
| 442.2 | 17.856 | | | 25 | 7.5 | 36 | 1.90E-08 | 0.08 |
| 449 | 24.48 | | | 260 | 2.2 | 47 | 2.17E-08 | 0.02 |
| 451 | | | | 84 | 4.1 | 143 | 1.00E-05 | 0.04 |
| 452 | | | | 68 | 21.0 | 271 | 4.08E-07 | 0.25 |
| 507 | 11.52 | | | 4 | 6.5 | 289 | 2.24E-08 | 0.06 |
| 509 | | 375 | 2 | 27 | 4.4 | 9 | 3.61E-08 | 0.04 |
| 510 | | 375 | 2 | 34 | 37.2 | 7 | 1.00E-05 | 0.20 |
| 511 | | 375 | 2 | 34 | 6.3 | 5 | 3.61E-08 | 0.06 |
| 512 | | 375 | 2 | 32 | 14.8 | 52 | 5.18E-08 | 0.15 |
| 513.1 | | | | 102 | <Null> | 254 | 1.00E-05 | 0.05 |
| 513.2 | | | | 102 | <Null> | 266 | 1.00E-05 | 0.20 |
| 513.3 | | | | 102 | <Null> | 228 | 1.00E-05 | 0.09 |
| 517.1 | 19.728 | | | 38 | 2.6 | 230 | 1.44E-08 | 0.03 |
| 517.2 | 21.6 | | | 38 | 2.7 | 243 | 4.12E-08 | 0.03 |
| 517.3 | | | | 38 | 2.9 | 224 | 4.12E-08 | 0.03 |
| 523 | | | | 73 | 8.6 | 252 | 1.82E-07 | 0.09 |
| 536 | | | | 57 | 7.2 | 47 | 6.10E-08 | 0.07 |
| 540 | | | | 257 | 5.2 | 200 | 8.56E-08 | 0.05 |
| 541 | | | | 226 | 4.5 | 194 | 1.08E-07 | 0.04 |
| 571.3 | 85.17 | 7500 | 34 | 167 | 1.0 | 153 | 1.42E-07 | 0.01 |

**Table B1. **

| WS_SUB | n | K_src | Depth_src | Yield_src | v_calc | TOT_20 |
|---|---|---|---|---|---|---|
| 380 | 0.10 | Qb_Rock | Drill_xy | Drill_xy | 2.05E-07 | 129 |
| 389.1 | 0.35 | Qb_Rock | Drill_xy | Drill_xy | 3.68E-06 | 2322 |
| 389.2 | 0.35 | Qb_Rock | Local_avg | Local_avg | 4.02E-06 | 2538 |
| 389.3 | 0.35 | Qb_Rock | Local_avg | Local_avg | 3.27E-06 | 2063 |
| 389.4 | 0.35 | Qb_Rock | Local_avg | Local_avg | 2.85E-06 | 1795 |
| 441.1 | 0.10 | ptest community | Operator | Drill_xy | 6.31E-08 | 40 |
| 441.2 | 0.10 | ptest_xy | Operator | Drill_xy | 1.14E-07 | 72 |
| 442.1 | 0.10 | well_field | Operator | Local_avg | 1.35E-07 | 85 |
| 442.2 | 0.10 | ptest_xy | Operator | Local_avg | 1.43E-08 | 9 |
| 449 | 0.10 | Qb_Fm | Drill_xy | Drill_xy | 4.83E-09 | 3 |
| 451 | 0.35 | Qb_Rock | Local_avg | Local_avg | 1.17E-06 | 736 |
| 452 | 0.05 | Qb_Rock | Drill_xy | Drill_xy | 2.05E-06 | 1296 |
| 507 | 0.10 | ptest_xy | Drill_xy | Drill_xy | 1.45E-08 | 9 |
| 509 | 0.10 | Qb_Fm | Operator | Drill_xy | 1.58E-08 | 10 |
| 510 | 0.35 | Qb_Fm | Operator | Drill_xy | 5.71E-06 | 3604 |
| 511 | 0.10 | Qb_Fm | Operator | Drill_xy | 2.28E-08 | 14 |
| 512 | 0.10 | Qb_Fm | Local_avg | Local_avg | 7.66E-08 | 48 |
| 513.1 | 0.35 | Qb_Rock | MQuat_avg | Local_avg | 1.34E-06 | 846 |
| 513.2 | 0.35 | Qb_Rock | MQuat_avg | Local_avg | 5.60E-06 | 3533 |
| 513.3 | 0.35 | Qb_Rock | MQuat_avg | Local_avg | 2.66E-06 | 1678 |
| 517.1 | 0.10 | ptest_xy | Operator | Local_avg | 3.68E-09 | 2 |
| 517.2 | 0.10 | ptest community | Operator | Local_avg | 1.12E-08 | 7 |
| 517.3 | 0.10 | well_field | Operator | Local_avg | 1.19E-08 | 8 |
| 523 | 0.10 | Qb_Rock | Drill_xy | Drill_xy | 1.57E-07 | 99 |
| 536 | 0.10 | Qb_Fm | Local_avg | Local_avg | 4.40E-08 | 28 |
| 540 | 0.10 | Qb_Rock | Drill_xy | Local_avg | 4.43E-08 | 28 |
| 541 | 0.10 | Qb_Rock | Local_avg | Local_avg | 4.88E-08 | 31 |
| 571.3 | 0.10 | Qb_Rock | Operator | Local_avg | 1.47E-08 | 9 |

**Table B1. **

| WS_SUB | LITHOLOGY | GENETIC250 | GENETIC1MA |
|---|---|---|---|
| 380 | CLAY 006 SHLE 043 | concealed bedrock | drift poor |
| 389.1 | | concealed bedrock | drift poor |
| 389.2 | | concealed bedrock | drift poor |
| 389.3 | | concealed bedrock | drift poor |
| 389.4 | | till blanket | till blanket |
| 441.1 | GRVL 3 GREY ROCK 91 | till veneer | till, undifferentiated |
| 441.2 | | till veneer | till, undifferentiated |
| 442.1 | | till veneer | till, undifferentiated |
| 442.2 | | till veneer | till, undifferentiated |
| 449 | GREY TILL 025 BLCK SLTE 135 | concealed bedrock | drift poor |
| 451 | | | |
| 452 | | exposed bedrock | exposed bedrock |
| 507 | ROCK 98 BRWN/GREY ROCK 152 | till veneer | till, undifferentiated |
| 509 | TPSL/TILL 007 SNDS 051 | glaciofluvial gravel and sand | glaciofluvial |
| 510 | TPSL 131 | glaciofluvial gravel and sand | glaciofluvial |
| 511 | GRVL 001 GREN WHIT ROCK 091 | glaciofluvial gravel and sand | glaciofluvial |
| 512 | | glaciofluvial gravel and sand | glaciofluvial |
| 513.1 | Drift covered or Gneiss | | glaciomarine and marine |
| 513.2 | Drift covered or Gneiss | | glaciomarine and marine |
| 513.3 | Drift covered or Gneiss | | glaciomarine and marine |
| 517.1 | | till blanket | till blanket |
| 517.2 | | till blanket | till blanket |
| 517.3 | | till blanket | till blanket |
| 523 | RED SILT 011 RED SHLE 038 | ridged till | rogen moraine |
| 536 | | | |
| 540 | | concealed bedrock | drift poor |
| 541 | | concealed bedrock | drift poor |
| 571.3 | Bedrock | concealed bedrock | drift poor |

**Table B1. **

| WS_SUB | Keyword | D_ROCKTYPE | D_AGERANGE | D_AGEBASE | D_AGETOP |
|---|---|---|---|---|---|
| 380 | NF174_0136 | volcanic felsic | | 1000 | 542 |
| 389.1 | NF121_0078 | siliciclastic | | 1.8 | 0 |
| 389.2 | NF121_0078 | siliciclastic | | 1.8 | 0 |
| 389.3 | NF121_0078 | siliciclastic | | 1.8 | 0 |
| 389.4 | NF121_0078 | siliciclastic | | 1.8 | 0 |
| 441.1 | NF191_0067 | | | 575 | 542 |
| 441.2 | NF191_0067 | | | 575 | 542 |
| 442.1 | NF191_0067 | | | 575 | 542 |
| 442.2 | NF191_0067 | | | 575 | 542 |
| 449 | NF191_0515 | | | 575 | 542 |
| 451 | NF148_0090 | siliciclastic | | 1.8 | 0 |
| 452 | NF092_0007 | plutonic felsic | Late Silurian | 423 | 419 |
| 507 | NF181_0077 | | | 1000 | 542 |
| 509 | NF191_0026 | volcanic | | 575 | 542 |
| 510 | NF191_0026 | volcanic | | 575 | 542 |
| 511 | NF191_0026 | volcanic | | 575 | 542 |
| 512 | NF191_0026 | volcanic | | 575 | 542 |
| 513.1 | | | | 0 | 0 |
| 513.2 | | | | 0 | 0 |
| 513.3 | | | | 0 | 0 |
| 517.1 | NF191_0515 | | | 575 | 542 |
| 517.2 | NF191_0515 | | | 575 | 542 |
| 517.3 | NF191_0515 | | | 575 | 542 |
| 523 | NF143_0082 | siliciclastic | | 1.8 | 0 |
| 536 | NF191_0049 | sedimentary marine | Early Cambrian to Middle Cambrian | 530 | 506 |
| 540 | NF121_0124 | carbonate | Middle Cambrian to Early Ordovician | 505 | 487 |
| 541 | NF121_0124 | carbonate | Middle Cambrian to Early Ordovician | 505 | 487 |
| 571.3 | NF103_0114 | carbonate limestone | Middle Ordovician | 467.5 | 464.5 |

**Table B1. **

| WS_SUB | D_SUPERGRP | D_GROUP | D_FORMATN | D_MEMBER |
|---|---|---|---|---|
| 380 | | Marystown Group | Cashel Lookout Formation | |
| 389.1 | Surficial deposits | | | |
| 389.2 | Surficial deposits | | | |
| 389.3 | Surficial deposits | | | |
| 389.4 | Surficial deposits | | | |
| 441.1 | | Conception Group | Mistaken Point Formation | |
| 441.2 | | Conception Group | Mistaken Point Formation | |
| 442.1 | | Conception Group | Mistaken Point Formation | |
| 442.2 | | Conception Group | Mistaken Point Formation | |
| 449 | | Conception Group | Drook Formation | |
| 451 | Surficial deposits | | | |
| 452 | | | McCallum Granite | |
| 507 | | Marystown Group | Cashel Lookout Formation | |
| 509 | | Musgravetown Group | Bull Arm Formation | |
| 510 | | Musgravetown Group | Bull Arm Formation | |
| 511 | | Musgravetown Group | Bull Arm Formation | |
| 512 | | Musgravetown Group | Bull Arm Formation | |
| 513.1 | | | | |
| 513.2 | | | | |
| 513.3 | | | | |
| 517.1 | | Conception Group | Drook Formation | |
| 517.2 | | Conception Group | Drook Formation | |
| 517.3 | | Conception Group | Drook Formation | |
| 523 | Surficial deposits | | | |
| 536 | | Adeyton Group | Bonavista Formation | |
| 540 | | Port au Port Group | | |
| 541 | | Port au Port Group | | |
| 571.3 | | Table Head Group | Table Point Formation | |

**Table B1. Well Heads Database**

| WS_SUB | COMMUNITY | LGP_NUM | SERVICED_A | SA_NUM |
|---|---|---|---|---|
| 571.5 | Port au Choix | 3935 | Port au Choix | SA-0591 |
| 571.7 | Port au Choix | 3935 | Port au Choix | SA-0591 |
| 574.1 | Port au Port West-Aguathuna-Felix Cove | 3941 | Port au Port West, Aguathuna | SA-0594 |
| 574.3 | Port au Port West-Aguathuna-Felix Cove | 3941 | Port au Port West, Aguathuna | SA-0594 |
| 574.6 | Port au Port West-Aguathuna-Felix Cove | 3941 | Port au Port West, Aguathuna | SA-0594 |
| 575 | Port au Port West-Aguathuna-Felix Cove | 3941 | Felix Cove | SA-0595 |
| 576 | Port au Port West-Aguathuna-Felix Cove | 3941 | Felix Cove | SA-0596 |
| 581.1 | Port Kirwan | 3962 | North Side | SA-0601 |
| 581.2 | Port Kirwan | 3962 | North Side | SA-0601 |
| 581.3 | Port Kirwan | 3962 | North Side | SA-0601 |
| 582 | Port Rexton | 3965 | Port Rexton | SA-0602 |
| 583 | Port Rexton | 3965 | Port Rexton (Seasonal Use) | SA-0603 |
| 584 | Port Rexton | 3965 | Hunchback Hill | SA-0604 |
| 586 | Port Rexton | 3965 | Ship Cove | SA-0606 |
| 587 | Port Rexton | 3965 | Ship Cove | SA-0607 |
| 588 | Port Rexton | 3965 | Champneys Arm | SA-0608 |
| 605.1 | Raleigh | 4095 | Raleigh | SA-0626 |
| 605.2 | Raleigh | 4095 | Raleigh | SA-0626 |
| 611.1 | Red Harbour | 4143 | Red Harbour | SA-0632 |
| 611.2 | Red Harbour | 4143 | Red Harbour | SA-0632 |
| 620.1 | Riverhead | 4215 | Riverhead (St. Mary's Bay) | SA-0641 |
| 620.2 | Riverhead | 4215 | Riverhead (St. Mary's Bay) | SA-0641 |
| 620.3 | Riverhead | 4215 | Riverhead (St. Mary's Bay) | SA-0641 |
| 633.1 | Sandringham | 4545 | Sandringham | SA-0656 |
| 633.2 | Sandringham | 4545 | Sandringham | SA-0656 |

**Table B1. **

| WS_SUB | SOURCENAME | STATUS | WS_NUM | TYPE | PROTECTED |
|---|---|---|---|---|---|
| 571.5 | Well Field (well #5) | | WS-G-0571 | Drilled | P |
| 571.7 | Well Field (well #7) | | WS-G-0571 | Drilled | P |
| 574.1 | #1 Marie Bell Well | | WS-G-0574 | Drilled | P |
| 574.3 | #3 John McLean Well | | WS-G-0574 | Drilled | P |
| 574.6 | #6 Father Joy's Well | | WS-G-0574 | Drilled | P |
| 575 | #4 Goose Pond Road Well | | WS-G-0575 | Drilled | P |
| 576 | #5 Oceanview Drive Well | | WS-G-0576 | Drilled | P |
| 581.1 | Drilled Well | | WS-G-0581 | Drilled | U |
| 581.2 | Dug Well | | WS-G-0581 | Dug | U |
| 581.3 | Spring | | WS-G-0581 | Spring | U |
| 582 | #1 Well - Lois Long Well | | WS-G-0582 | Drilled | U |
| 583 | #2 Well - Edmund Brown's Well | | WS-G-0583 | Drilled | U |
| 584 | #3 Well - Harold Vivian's Well | | WS-G-0584 | Drilled | U |
| 586 | #5 Well - Mabel Clarke's Well | | WS-G-0586 | Drilled | U |
| 587 | #6 Well - Banister's Well | | WS-G-0587 | Drilled | U |
| 588 | Champney's Arm Well | | WS-G-0588 | Drilled | U |
| 605.1 | #1 Well - Town of Raleigh | | WS-G-0605 | Drilled | P |
| 605.2 | #4 Well - Town of Raleigh | | WS-G-0605 | Drilled | P |
| 611.1 | Drilled | | WS-G-0611 | Drilled | P |
| 611.2 | Drilled (Backup Well) | | WS-G-0611 | Drilled | P |
| 620.1 | #1 Well | | WS-G-0620 | Drilled | P |
| 620.2 | #2 Well | | WS-G-0620 | Drilled | P |
| 620.3 | #3 Well | | WS-G-0620 | Drilled | P |
| 633.1 | Drilled (#1 Well) | | WS-G-0633 | Drilled | P |
| 633.2 | Drilled (#2 Well) | | WS-G-0633 | Drilled | P |

**Table B1. **

| WS_SUB | NUM_WELLS | POPULATION | WELLFIELD_POP | CENSUS_POP | HOMES | EASTING |
|---|---|---|---|---|---|---|
| 571.5 | 3 | 268.3333333 | 805 | 893 | 438 | -57.3385900 |
| 571.7 | 3 | 268.3333333 | 805 | 893 | 438 | -57.3414000 |
| 574.1 | 3 | 123.6666667 | 371 | 386 | | -58.7343890 |
| 574.3 | 3 | 123.6666667 | 371 | 386 | | -58.7540000 |
| 574.6 | 3 | 123.6666667 | 371 | 386 | | -58.7530560 |
| 575 | 1 | 86 | 95 | 386 | | -58.7826390 |
| 576 | 1 | 9 | 95 | 386 | | -58.7935830 |
| 581.1 | 1 | 18.5 | 102 | 85 | 45 | -52.9261010 |
| 581.2 | 1 | 18.5 | 102 | 85 | 45 | -52.9260820 |
| 581.3 | 1 | 32.5 | 102 | 85 | 45 | -52.9103530 |
| 582 | 1 | 7 | 94 | 351 | 37 | -53.3275400 |
| 583 | 1 | 18 | 94 | 351 | 37 | -53.3299400 |
| 584 | 1 | 21 | 94 | 351 | 37 | -53.3359100 |
| 586 | 1 | 18 | 94 | 351 | 37 | -53.3296700 |
| 587 | 1 | 3 | 94 | 351 | 37 | -53.3296400 |
| 588 | 1 | 27 | 94 | 351 | 37 | -53.3082900 |
| 605.1 | 1 | 124 | 248 | 248 | | -55.7226964 |
| 605.2 | 1 | 124 | 248 | 248 | | -55.7141696 |
| 611.1 | 2 | 105 | 210 | 210 | 65 | -55.0094000 |
| 611.2 | 2 | 105 | 210 | 210 | 65 | -55.0093500 |
| 620.1 | 3 | 73.33333333 | 220 | 220 | | -53.5081447 |
| 620.2 | 3 | 73.33333333 | 220 | 220 | | -53.5083851 |
| 620.3 | 3 | 73.33333333 | 220 | 220 | | -53.5079865 |
| 633.1 | 2 | 127.5 | 255 | 255 | 130 | -53.8238504 |
| 633.2 | 2 | 127.5 | 255 | 255 | 130 | -53.8339999 |

**Table B1. **

| WS_SUB | NORTHING | UTM_E | UTM_N | D_WELL_ID | WELL_DEPTH | YIELD1 |
|---|---|---|---|---|---|---|
| 571.5 | 50.7089000 | 476092.95 | 5617508.95 | | 48.77 | 450 |
| 571.7 | 50.7078200 | 475893.98 | 5617389.77 | | 48.77 | 450 |
| 574.1 | 48.5497220 | 372005.22 | 5378854.72 | 21274 | 112.8 | 67.5 |
| 574.3 | 48.5401110 | 370533.50 | 5377819.48 | | 57 | 37 |
| 574.6 | 48.5491670 | 370626.27 | 5378824.46 | | 57 | 37 |
| 575 | 48.5393610 | 368417.73 | 5377785.03 | | 57 | 37 |
| 576 | 48.5335280 | 367594.74 | 5377155.59 | | 57 | 37 |
| 581.1 | 46.9728000 | 809859.87 | 5210201.08 | | 91.5 | 5 |
| 581.2 | 46.9731250 | 809859.44 | 5210237.26 | | 7 | 61 |
| 581.3 | 46.9733560 | 811054.29 | 5210325.33 | | 1 | 61 |
| 582 | 48.3975200 | 771815.92 | 5367002.66 | | 42.7 | 10.4 |
| 583 | 48.3953100 | 771650.09 | 5366748.55 | 19242 | 36.6 | 27 |
| 584 | 48.3873900 | 771250.42 | 5365847.26 | 3596 | 61 | 4 |
| 586 | 48.3885300 | 771706.21 | 5365996.07 | | 61 | 6 |
| 587 | 48.3851800 | 771726.28 | 5365623.91 | 10488 | 61 | 36 |
| 588 | 48.3923400 | 773268.24 | 5366495.58 | | 67.1 | 6 |
| 605.1 | 51.5543431 | 588554.00 | 5712246.00 | | 35 | 24 |
| 605.2 | 51.5590158 | 589136.00 | 5712776.00 | | 35 | 24 |
| 611.1 | 47.2974700 | 650492.13 | 5240143.27 | | 46 | 51 |
| 611.2 | 47.2968800 | 650497.58 | 5240077.80 | 365 | 137 | 90 |
| 620.1 | 46.9808909 | 765553.73 | 5208960.42 | 331 | 13 | 182 |
| 620.2 | 46.9809485 | 765535.16 | 5208966.00 | | 116 | 35 |
| 620.3 | 46.9808769 | 765565.83 | 5208959.40 | | 116 | 35 |
| 633.1 | 48.6656112 | 733847.59 | 5395153.61 | | 74 | 11 |
| 633.2 | 48.6608180 | 733122.54 | 5394589.82 | | 74 | 11 |

**Table B1. **

| WS_SUB | Local_pQb | ROCK_LOG | ROCK_MAP | ROCK_TYPE |
|---|---|---|---|---|
| 571.5 | -1.12342225 | | Carbonate | Carbonate |
| 571.7 | -1.12342225 | | Carbonate | Carbonate |
| 574.1 | 0.064642835 | | Carbonate | Carbonate |
| 574.3 | 0.02931064 | | Carbonate | Carbonate |
| 574.6 | 0.02931064 | | Carbonate | Carbonate |
| 575 | 0.02931064 | | Carbonate | Carbonate |
| 576 | 0.02931064 | | Carbonate | Carbonate |
| 581.1 | 1.104088598 | | Sandstone/FG | Sandstone/FG |
| 581.2 | -1.098594287 | SURFICIAL | Sandstone/FG | Quaternary |
| 581.3 | -1.943692327 | SURFICIAL | FG_Sedimentary | Quaternary |
| 582 | 0.455032044 | | Alternating Sedimentary | Alternating Sedimentary |
| 583 | -0.026245171 | SILTST | Alternating Sedimentary | Alternating Sedimentary |
| 584 | 1.024907352 | ROCK | Alternating Sedimentary | Alternating Sedimentary |
| 586 | 0.848816093 | | Alternating Sedimentary | Alternating Sedimentary |
| 587 | 0.070664842 | | Alternating Sedimentary | Alternating Sedimentary |
| 588 | 0.890208778 | | Alternating Sedimentary | Alternating Sedimentary |
| 605.1 | 0.005494311 | | Volcanic | Volcanic |
| 605.2 | 0.005494311 | | Volcanic | Volcanic |
| 611.1 | -0.203174837 | | Volcanic | Volcanic |
| 611.2 | 0.024115566 | ROCK | Volcanic | Volcanic |
| 620.1 | -1.304490528 | SURFICIAL | Alternating Sedimentary | Quaternary |
| 620.2 | 0.362027453 | | Alternating Sedimentary | Alternating Sedimentary |
| 620.3 | 0.362027453 | | Alternating Sedimentary | Alternating Sedimentary |
| 633.1 | 0.669476542 | | Surficial Deposits | Quaternary |
| 633.2 | 0.669476542 | | Surficial Deposits | Quaternary |

**Table B1. **

| WS_SUB | Ptest Q | USAGE | USAGE | Q_calc | Slope_Ave | DIR_MEAN | K | i |
|---|---|---|---|---|---|---|---|---|
| 571.5 | 85.17 | 7500 | 34 | 167 | 1.0 | 160 | 1.42E-07 | 0.01 |
| 571.7 | 85.17 | 7500 | 34 | 167 | 1.4 | 153 | 1.42E-07 | 0.01 |
| 574.1 | | | | 77 | 3.6 | 347 | 6.15E-08 | 0.04 |
| 574.3 | | | | 77 | 5.7 | 333 | 1.22E-07 | 0.06 |
| 574.6 | | | | 77 | 5.7 | 6 | 1.22E-07 | 0.06 |
| 575 | | | | 53 | 2.9 | 245 | 1.22E-07 | 0.03 |
| 576 | | | | 6 | 7.1 | 303 | 1.22E-07 | 0.07 |
| 581.1 | 0.0076 | | | 11 | 4.7 | 290 | 1.94E-08 | 0.05 |
| 581.2 | | | | 11 | 4.7 | 276 | 1.00E-05 | 0.05 |
| 581.3 | | | | 20 | 19.4 | 328 | 1.00E-05 | 0.06 |
| 582 | | | | 4 | 5.5 | 293 | 1.17E-08 | 0.05 |
| 583 | 11.52 | | | 11 | 6.7 | 302 | 1.17E-08 | 0.07 |
| 584 | | | | 13 | 4.8 | 297 | 1.17E-08 | 0.05 |
| 586 | | | | 11 | 7.4 | 323 | 1.17E-08 | 0.07 |
| 587 | | | | 2 | 13.3 | 10 | 1.17E-08 | 0.13 |
| 588 | | | | 17 | 5.8 | 315 | 1.17E-08 | 0.06 |
| 605.1 | | | | 77 | 1.5 | 183 | 1.98E-07 | 0.02 |
| 605.2 | | | | 77 | 1.6 | 181 | 1.98E-07 | 0.02 |
| 611.1 | | | | 65 | 15.6 | 302 | 1.51E-07 | 0.15 |
| 611.2 | | | | 65 | 12.0 | 311 | 5.06E-08 | 0.12 |
| 620.1 | | | | 46 | 13.8 | 152 | 1.00E-05 | 0.14 |
| 620.2 | | | | 46 | 2.4 | 237 | 2.52E-08 | 0.02 |
| 620.3 | | | | 46 | 2.7 | 238 | 2.52E-08 | 0.03 |
| 633.1 | 131.04 | | | 79 | 12.1 | 144 | 1.00E-05 | 0.12 |
| 633.2 | 195.84 | | | 79 | 11.6 | 94 | 1.00E-05 | 0.12 |

**Table B1. **

| WS_SUB | n | K_src | Depth_src | Yield_src | v_calc | TOT_20 |
|---|---|---|---|---|---|---|
| 571.5 | 0.10 | Qb_Rock | Operator | Local_avg | 1.47E-08 | 9 |
| 571.7 | 0.10 | Qb_Rock | Operator | Local_avg | 1.95E-08 | 12 |
| 574.1 | 0.10 | Qb_Rock | Drill_xy | Drill_xy | 2.24E-08 | 14 |
| 574.3 | 0.10 | Qb_Rock | Local_avg | Local_avg | 6.88E-08 | 43 |
| 574.6 | 0.10 | Qb_Rock | Local_avg | Local_avg | 6.91E-08 | 44 |
| 575 | 0.10 | Qb_Rock | Local_avg | Local_avg | 3.50E-08 | 22 |
| 576 | 0.10 | Qb_Rock | Local_avg | Local_avg | 8.54E-08 | 54 |
| 581.1 | 0.10 | Qb_Key | Operator | Local_avg | 9.11E-09 | 6 |
| 581.2 | 0.35 | Qb_Key | Operator | Local_avg | 1.34E-06 | 848 |
| 581.3 | 0.35 | Qb_Fm | Spring | Local_avg | 1.68E-06 | 1061 |
| 582 | 0.10 | well_field | Operator | Local_avg | 6.44E-09 | 4 |
| 583 | 0.10 | ptest_xy | Operator | Local_avg | 7.84E-09 | 5 |
| 584 | 0.10 | well_field | Operator | Drill_xy | 5.62E-09 | 4 |
| 586 | 0.10 | well_field | Operator | Local_avg | 8.63E-09 | 5 |
| 587 | 0.10 | well_field | Operator | Drill_xy | 1.56E-08 | 10 |
| 588 | 0.10 | well_field | Ptest_xy | Local_avg | 6.75E-09 | 4 |
| 605.1 | 0.10 | Qb_Rock | Local_avg | Local_avg | 3.02E-08 | 19 |
| 605.2 | 0.10 | Qb_Rock | Local_avg | Local_avg | 3.14E-08 | 20 |
| 611.1 | 0.10 | Qb_Rock | Operator | Local_avg | 2.33E-07 | 147 |
| 611.2 | 0.10 | Qb_Rock | Operator | Drill_xy | 6.09E-08 | 38 |
| 620.1 | 0.35 | Qb_Fm | Drill_xy | Drill_xy | 3.94E-06 | 2488 |
| 620.2 | 0.10 | Qb_Fm | Local_avg | Local_avg | 6.18E-09 | 4 |
| 620.3 | 0.10 | Qb_Fm | Local_avg | Local_avg | 6.86E-09 | 4 |
| 633.1 | 0.35 | Qb_Rock | Local_avg | Local_avg | 3.45E-06 | 2174 |
| 633.2 | 0.35 | Qb_Rock | Local_avg | Local_avg | 3.32E-06 | 2092 |

**Table B1. **

| WS_SUB | LITHOLOGY | GENETIC250 | GENETIC1MA |
|---|---|---|---|
| 571.5 | Bedrock | marine clay, sand, gravel and diamicton | glaciomarine and marine |
| 571.7 | Bedrock | marine clay, sand, gravel and diamicton | glaciomarine and marine |
| 574.1 | | till veneer | till, undifferentiated |
| 574.3 | | till veneer | till, undifferentiated |
| 574.6 | | concealed bedrock | drift poor |
| 575 | | concealed bedrock | drift poor |
| 576 | | concealed bedrock | drift poor |
| 581.1 | 30' of regolith/overburden then bedrock | till veneer | till, undifferentiated |
| 581.2 | | till veneer | till, undifferentiated |
| 581.3 | bedrock | concealed bedrock | drift poor |
| 582 | bedrock | concealed bedrock | drift poor |
| 583 | GRAVEL 1.8; GREY BEDROCK 6.1; GREY ROCK 85.4 | till blanket | till blanket |
| 584 | GRVL 003 ROCK 152 | till blanket | till blanket |
| 586 | bedrock | till blanket | till blanket |
| 587 | bedrock | till blanket | till blanket |
| 588 | bedrock | concealed bedrock | drift poor |
| 605.1 | | marine clay, sand, gravel and diamicton | glaciomarine and marine |
| 605.2 | | marine clay, sand, gravel and diamicton | glaciomarine and marine |
| 611.1 | | concealed bedrock | drift poor |
| 611.2 | GREY GRVL 004 GREY ROCK 120 | concealed bedrock | drift poor |
| 620.1 | RED TPSL 001 GREY SAND 013 | concealed bedrock | drift poor |
| 620.2 | | concealed bedrock | drift poor |
| 620.3 | | concealed bedrock | drift poor |
| 633.1 | | marine clay, sand, gravel and diamicton | glaciomarine and marine |
| 633.2 | | marine clay, sand, gravel and diamicton | glaciomarine and marine |

**Table B1. **

| WS_SUB | Keyword | D_ROCKTYPE | D_AGERANGE | D_AGEBASE | D_AGETOP |
|---|---|---|---|---|---|
| 571.5 | NF103_0114 | carbonate limestone | Middle Ordovician | 467.5 | 464.5 |
| 571.7 | NF103_0114 | carbonate limestone | Middle Ordovician | 467.5 | 464.5 |
| 574.1 | NF121_0124 | carbonate | Middle Cambrian to Early Ordovician | 505 | 487 |
| 574.3 | NF121_0124 | carbonate | Middle Cambrian to Early Ordovician | 505 | 487 |
| 574.6 | NF121_0124 | carbonate | Middle Cambrian to Early Ordovician | 505 | 487 |
| 575 | NF121_0124 | carbonate | Middle Cambrian to Early Ordovician | 505 | 487 |
| 576 | NF121_0124 | carbonate | Middle Cambrian to Early Ordovician | 505 | 487 |
| 581.1 | NF191_0057 | sedimentary marine | | 575 | 542 |
| 581.2 | NF191_0057 | sedimentary marine | | 575 | 542 |
| 581.3 | NF191_0008 | sedimentary marine | | 575 | 542 |
| 582 | NF186_0011 | sedimentary | | 575 | 542 |
| 583 | NF186_0011 | sedimentary | | 575 | 542 |
| 584 | NF186_0011 | sedimentary | | 575 | 542 |
| 586 | NF186_0011 | sedimentary | | 575 | 542 |
| 587 | NF186_0011 | sedimentary | | 575 | 542 |
| 588 | NF186_0011 | sedimentary | | 575 | 542 |
| 605.1 | NF160_0096 | volcanic mafic marine | Early Ordovician | 489 | 478 |
| 605.2 | NF160_0096 | volcanic mafic marine | Early Ordovician | 489 | 478 |
| 611.1 | NF175_0037 | volcanic felsic | | 1000 | 542 |
| 611.2 | NF175_0037 | volcanic felsic | | 1000 | 542 |
| 620.1 | NF191_0515 | | | 575 | 542 |
| 620.2 | NF191_0515 | | | 575 | 542 |
| 620.3 | NF191_0515 | | | 575 | 542 |
| 633.1 | NF189_0128 | sedimentary | | 1.8 | 0 |
| 633.2 | NF189_0128 | sedimentary | | 1.8 | 0 |

**Table B1. **

| WS_SUB | D_SUPERGRP | D_GROUP | D_FORMATN | D_MEMBER |
|---|---|---|---|---|
| 571.5 | | Table Head Group | Table Point Formation | |
| 571.7 | | Table Head Group | Table Point Formation | |
| 574.1 | | Port au Port Group | | |
| 574.3 | | Port au Port Group | | |
| 574.6 | | Port au Port Group | | |
| 575 | | Port au Port Group | | |
| 576 | | Port au Port Group | | |
| 581.1 | | St. John's Group | Trepassey formation | |
| 581.2 | | St. John's Group | Trepassey formation | |
| 581.3 | | St. John's Group | Fermeuse Formation | |
| 582 | | Musgravetown Group | | |
| 583 | | Musgravetown Group | | |
| 584 | | Musgravetown Group | | |
| 586 | | Musgravetown Group | | |
| 587 | | Musgravetown Group | | |
| 588 | | Musgravetown Group | | |
| 605.1 | Hare Bay Allochthon | Cape Onion Slice | Cape Onion Formation | |
| 605.2 | Hare Bay Allochthon | Cape Onion Slice | Cape Onion Formation | |
| 611.1 | | Marystown Group | Cashel Lookout Formation | |
| 611.2 | | Marystown Group | Cashel Lookout Formation | |
| 620.1 | | Conception Group | Drook Formation | |
| 620.2 | | Conception Group | Drook Formation | |
| 620.3 | | Conception Group | Drook Formation | |
| 633.1 | Surficial deposits | | | |
| 633.2 | Surficial deposits | | | |

**Table B1. Well Heads Database**

| WS_SUB | COMMUNITY | LGP_NUM | SERVICED_A | SA_NUM |
|---|---|---|---|---|
| 643 | Sheaves Cove | 4655 | Sheaves Cove | SA-0666 |
| 644.1 | Sheppardville | 4657 | Sheppardville | SA-0667 |
| 644.2 | Sheppardville | 4657 | Sheppardville | SA-0667 |
| 645.1 | Sheshatsheits | 4660 | Sheshasheits - Indian Band Council | SA-0668 |
| 645.2 | Sheshatsheits | 4660 | Sheshasheits - Indian Band Council | SA-0668 |
| 645.3 | Sheshatsheits | 4660 | Sheshasheits - Indian Band Council | SA-0668 |
| 645.4 | Sheshatsheits | 4660 | Sheshasheits - Indian Band Council | SA-0668 |
| 648 | Ship Cove-Lower Cove-Jerry's Nose | 4665 | Ship Cove, Jerry's Nose | SA-0671 |
| 649 | Ship Cove-Lower Cove-Jerry's Nose | 4665 | Lower Cove | SA-0672 |
| 654 | Small Point-Adam's Cove-Blackhead-Broad Cove | 4755 | Adam's Cove | SA-0678 |
| 658 | Small Point-Adam's Cove-Blackhead-Broad Cove | 4755 | Blackhead | SA-0682 |
| 660 | Small Point-Adam's Cove-Blackhead-Broad Cove | 4755 | Broad Cove | SA-0684 |
| 661 | Small Point-Adam's Cove-Blackhead-Broad Cove | 4755 | Broad Cove | SA-0685 |
| 662.1 | Small Point-Adam's Cove-Blackhead-Broad Cove | 4755 | Small Point | SA-0686 |
| 662.2 | Small Point-Adam's Cove-Blackhead-Broad Cove | 4755 | Small Point | SA-0686 |
| 663.1 | Small Point-Adam's Cove-Blackhead-Broad Cove | 4755 | Small Point | SA-0687 |
| 663.2 | Small Point-Adam's Cove-Blackhead-Broad Cove | 4755 | Small Point | SA-0687 |
| 677 | Springdale | 4910 | Springdale Industrial Park | SA-0702 |
| 678.1 | St. Alban's | 4305 | St. Alban's | SA-0703 |
| 678.2 | St. Alban's | 4305 | St. Alban's | SA-0703 |
| 678.3 | St. Alban's | 4305 | St. Alban's | SA-0703 |
| 678.4 | St. Alban's | 4305 | St. Alban's | SA-0703 |

**Table B1. **

| WS_SUB | SOURCENAME | STATUS | WS_NUM | TYPE | PROTECTED |
|---|---|---|---|---|---|
| 643 | Drilled Well | | WS-G-0643 | Drilled | P |
| 644.1 | Drilled | | WS-G-0644 | Drilled | P |
| 644.2 | Drilled (Backup Well) | | WS-G-0644 | Drilled | P |
| 645.1 | #1 Well | | WS-G-0645 | Drilled | U |
| 645.2 | #2 Well | | WS-G-0645 | Drilled | U |
| 645.3 | #3 Well | | WS-G-0645 | Drilled | U |
| 645.4 | #3A Well | | WS-G-0645 | Drilled | U |
| 648 | #5 Well - Murdock Wheeler Well | | WS-G-0648 | Drilled | P |
| 649 | #6 Well - Lower Cove Well | | WS-G-0649 | Drilled | P |
| 654 | #1 Well - Reg Bursey Well | | WS-G-0654 | Drilled | U |
| 658 | #4 Well - Leonard King Well | | WS-G-0658 | Drilled | U |
| 660 | #6 Well - Herb Trickett Well | | WS-G-0660 | Drilled | U |
| 661 | #7 Well - Gin Badcock Well | | WS-G-0661 | Drilled | U |
| 662.1 | #8 Well - Effie Flight Wells (Inside Well) | | WS-G-0662 | Drilled | U |
| 662.2 | #8 Well - Effie Flight Wells (Outside Well) | | WS-G-0662 | Drilled | U |
| 663.1 | #9 Well - Walter Reynolds Well (Inside Well) | | WS-G-0663 | Drilled | U |
| 663.2 | #9 Well - Walter Reynolds Well (Outside Well) | | WS-G-0663 | Drilled | U |
| 677 | # 1 Well | | WS-G-0677 | Drilled | P |
| 678.1 | Well #1 | | WS-G-0678 | Drilled | P |
| 678.2 | Well #2 | | WS-G-0678 | Drilled | P |
| 678.3 | Well #3 | | WS-G-0678 | Drilled | P |
| 678.4 | Well #4 | | WS-G-0678 | Drilled | P |

**Table B1. **

| WS_SUB | NUM_WELLS | POPULATION | WELLFIELD_POP | CENSUS_POP | HOMES | EASTING |
|---|---|---|---|---|---|---|
| 643 | 1 | 59 | 59 | 125 | 30 | -59.0447421 |
| 644.1 | 2 | 58.5 | 117 | 0 | 40 | -56.4282800 |
| 644.2 | 2 | 58.5 | 117 | 0 | 40 | -56.4297900 |
| 645.1 | 1 | 262 | 1048 | 1,054 | | -60.1425100 |
| 645.2 | 1 | 262 | 1048 | 1,054 | | -60.1333330 |
| 645.3 | 1 | 262 | 1048 | 1,054 | | -60.1416700 |
| 645.4 | 1 | 262 | 1048 | 1,054 | | -60.1425750 |
| 648 | 1 | 34 | 343 | 343 | | -58.9682699 |
| 649 | 1 | 61.8 | 343 | 343 | | -58.9916799 |
| 654 | 1 | 73 | 638 | 438 | | -53.0895300 |
| 658 | 1 | 182 | 638 | 438 | | -53.1027200 |
| 660 | 1 | 32 | 638 | 438 | | -53.0970600 |
| 661 | 1 | 53 | 638 | 438 | | -53.0940900 |
| 662.1 | 2 | 64 | 638 | 438 | | -53.1035500 |
| 662.2 | 2 | 64 | 638 | 438 | | -53.1032700 |
| 663.1 | 2 | 85 | 638 | 438 | | -53.1073500 |
| 663.2 | 2 | 85 | 638 | 438 | | -53.1072500 |
| 677 | 1 | 2764 | 2764 | 2,764 | | -56.1063355 |
| 678.1 | 6 | 213 | 1278 | | | -55.8521540 |
| 678.2 | 6 | 213 | 1278 | | | -55.8525830 |
| 678.3 | 6 | 213 | 1278 | | | -55.8518400 |
| 678.4 | 6 | 213 | 1278 | | | -55.8533590 |

**Table B1. **

| WS_SUB | NORTHING | UTM_E | UTM_N | D_WELL_ID | WELL_DEPTH | YIELD1 |
|---|---|---|---|---|---|---|
| 643 | 48.5261755 | 349032.80 | 5376803.91 | | 61 | 49 |
| 644.1 | 49.4516900 | 541437.49 | 5477827.08 | 2859 | 61 | 135 |
| 644.2 | 49.4502000 | 541329.30 | 5477660.61 | 2858 | 61 | 45 |
| 645.1 | 53.5157460 | 291657.23 | 5934241.26 | | 37 | 61 |
| 645.2 | 53.5070600 | 292222.96 | 5933248.55 | | 37 | 61 |
| 645.3 | 53.5136150 | 291702.44 | 5934001.83 | | 37 | 61 |
| 645.4 | 53.5132340 | 291640.59 | 5933962.11 | | 37 | 61 |
| 648 | 48.5180700 | 354655.42 | 5375754.79 | | 41 | 40 |
| 649 | 48.5183700 | 352927.69 | 5375832.91 | | 41 | 40 |
| 654 | 47.8620800 | 792457.62 | 5308377.30 | 12410 | 58 | 27 |
| 658 | 47.8497800 | 791540.35 | 5306960.65 | 12411 | 91 | 72 |
| 660 | 47.8382200 | 792028.66 | 5305697.53 | 4648 | 92 | 18 |
| 661 | 47.8363400 | 792261.42 | 5305499.87 | | 83 | 22 |
| 662.1 | 47.8338100 | 791567.87 | 5305182.97 | 12406 | 101 | 5 |
| 662.2 | 47.8335100 | 791590.50 | 5305150.69 | 12408 | 57 | 9 |
| 663.1 | 47.8321600 | 791292.81 | 5304985.28 | 12407 | 64 | 13 |
| 663.2 | 47.8320500 | 791300.91 | 5304973.43 | 11512 | 116 | 9 |
| 677 | 49.5065792 | 564699.00 | 5484156.00 | | 40 | 57 |
| 678.1 | 47.8832860 | 585816.53 | 5303965.76 | 2930 | 93 | 205 |
| 678.2 | 47.8829360 | 585785.04 | 5303926.39 | 15206 | 15 | 61 |
| 678.3 | 47.8829600 | 585840.55 | 5303929.88 | | 49 | 147 |
| 678.4 | 47.8843590 | 585724.67 | 5304083.68 | | 49 | 147 |

**Table B1. **

| WS_SUB | Local_pQb | ROCK_LOG | ROCK_MAP | ROCK_TYPE |
|---|---|---|---|---|
| 643 | -0.063228737 | | Carbonate | Carbonate |
| 644.1 | -0.503366426 | ROCK | Volcanic | Volcanic |
| 644.2 | -0.026245171 | ROCK | Volcanic | Volcanic |
| 645.1 | -0.375490603 | | Drift | Quaternary |
| 645.2 | -0.375490603 | | Drift | Quaternary |
| 645.3 | -0.375490603 | | Drift | Quaternary |
| 645.4 | -0.375490603 | | Drift | Quaternary |
| 648 | -0.147638627 | | Carbonate | Carbonate |
| 649 | -0.147638627 | | Carbonate | Carbonate |
| 654 | 0.173701737 | | FG_Sedimentary | FG_Sedimentary |
| 658 | -0.056653596 | ROCK | Sandstone/FG | Sandstone/FG |
| 660 | 0.55015283 | SILTST | Sandstone/FG | Sandstone/FG |
| 661 | 0.418292919 | | FG_Sedimentary | FG_Sedimentary |
| 662.1 | 1.146988877 | | Alternating Sedimentary | Alternating Sedimentary |
| 662.2 | 0.643269854 | | Alternating Sedimentary | Alternating Sedimentary |
| 663.1 | 0.53387413 | | Alternating Sedimentary | Alternating Sedimentary |
| 663.2 | 0.951852988 | ROCK | Alternating Sedimentary | Alternating Sedimentary |
| 677 | -0.312177356 | | Volcanic | Volcanic |
| 678.1 | -0.501633405 | SLATE | Alternating Sedimentary | Alternating Sedimentary |
| 678.2 | -0.767601068 | SURFICIAL | Alternating Sedimentary | Quaternary |
| 678.3 | -0.635483747 | | Alternating Sedimentary | Alternating Sedimentary |
| 678.4 | -0.635483747 | | Alternating Sedimentary | Alternating Sedimentary |

**Table B1. **

| WS_SUB | Ptest Q | USAGE | USAGE | Q_calc | Slope_Ave | DIR_MEAN | K | i |
|---|---|---|---|---|---|---|---|---|
| 643 | | | | 37 | 4.7 | 228 | 1.14E-07 | 0.05 |
| 644.1 | | | | 36 | 17.2 | 83 | 1.14E-07 | 0.17 |
| 644.2 | | | | 36 | 20.0 | 83 | 1.14E-07 | 0.20 |
| 645.1 | | | | 163 | <Null> | 40 | 1.00E-05 | 0.01 |
| 645.2 | | | | 163 | <Null> | 10 | 1.00E-05 | 0.01 |
| 645.3 | | | | 163 | <Null> | 36 | 1.00E-05 | 0.01 |
| 645.4 | | | | 163 | <Null> | 36 | 1.00E-05 | 0.01 |
| 648 | | | | 21 | 5.7 | 253 | 1.69E-07 | 0.06 |
| 649 | | | | 38 | 5.0 | 238 | 4.81E-07 | 0.05 |
| 654 | | | | 45 | 6.7 | 351 | 4.35E-06 | 0.06 |
| 658 | | | | 113 | 3.3 | 352 | 4.35E-06 | 0.06 |
| 660 | 90.72 | | | 20 | 6.2 | 79 | 4.35E-06 | 0.05 |
| 661 | | | | 33 | 3.3 | 51 | 4.35E-06 | 0.05 |
| 662.1 | | | | 40 | 3.6 | 13 | 5.17E-08 | 0.06 |
| 662.2 | | | | 40 | 3.3 | 11 | 5.17E-08 | 0.06 |
| 663.1 | | | | 53 | 1.9 | 2 | 5.17E-08 | 0.06 |
| 663.2 | | | | 53 | 2.2 | 0 | 5.17E-08 | 0.06 |
| 677 | | | | 1716 | 6.4 | 284 | 2.04E-06 | 0.06 |
| 678.1 | | | | 132 | 8.3 | 10 | 4.53E-08 | 0.08 |
| 678.2 | | | | 132 | 7.7 | 32 | 1.00E-05 | 0.08 |
| 678.3 | | | | 132 | 9.0 | 9 | 8.60E-08 | 0.09 |
| 678.4 | | | | 132 | 8.1 | 9 | 8.60E-08 | 0.08 |

**Table B1. **

| WS_SUB | n | K_src | Depth_src | Yield_src | v_calc | TOT_20 |
|---|---|---|---|---|---|---|
| 643 | 0.10 | Qb_Rock | Operator | Drill_xy | 5.40E-08 | 34 |
| 644.1 | 0.10 | Qb_Rock | Operator | Drill_xy | 1.97E-07 | 124 |
| 644.2 | 0.10 | Qb_Rock | Operator | Ptest_xy | 2.26E-07 | 142 |
| 645.1 | 0.35 | Qb_Rock | MQuat_avg | Local_avg | 3.28E-07 | 207 |
| 645.2 | 0.35 | Qb_Rock | MQuat_avg | Local_avg | 3.07E-07 | 194 |
| 645.3 | 0.35 | Qb_Rock | MQuat_avg | Local_avg | 3.67E-07 | 231 |
| 645.4 | 0.35 | Qb_Rock | MQuat_avg | Local_avg | 3.67E-07 | 232 |
| 648 | 0.10 | Qb_Rock | Local_avg | Local_avg | 9.68E-08 | 61 |
| 649 | 0.10 | Qb_Fm | Local_avg | Local_avg | 2.39E-07 | 151 |
| 654 | 0.10 | well_field | Drill_xy | Drill_xy | 2.75E-06 | 1732 |
| 658 | 0.10 | well_field | Drill_xy | Drill_xy | 2.56E-06 | 1617 |
| 660 | 0.10 | ptest_xy | Drill_xy | Drill_xy | 2.32E-06 | 1464 |
| 661 | 0.10 | well_field | Local_avg | Local_avg | 1.99E-06 | 1257 |
| 662.1 | 0.10 | Qb_Fm | Drill_xy | Drill_xy | 3.35E-08 | 21 |
| 662.2 | 0.10 | Qb_Fm | Drill_xy | Drill_xy | 3.34E-08 | 21 |
| 663.1 | 0.10 | Qb_Fm | Drill_xy | Drill_xy | 3.27E-08 | 21 |
| 663.2 | 0.10 | Qb_Fm | Drill_xy | Drill_xy | 3.31E-08 | 21 |
| 677 | 0.10 | Qb_Key | Local_avg | Local_avg | 1.31E-06 | 827 |
| 678.1 | 0.10 | Qb_Rock | Drill_xy | Drill_xy | 3.75E-08 | 24 |
| 678.2 | 0.35 | Qb_Rock | Drill_xy | Local_avg | 2.20E-06 | 1385 |
| 678.3 | 0.10 | Qb_Rock | Local_avg | Local_avg | 7.72E-08 | 49 |
| 678.4 | 0.10 | Qb_Rock | Local_avg | Local_avg | 6.99E-08 | 44 |

**Table B1. **

| WS_SUB | LITHOLOGY | GENETIC250 | GENETIC1MA |
|---|---|---|---|
| 643 | | till veneer | till, undifferentiated |
| 644.1 | SAND 003 ROCK 55 | till blanket | till blanket |
| 644.2 | SAND 005 ROCK 076 | till blanket | till blanket |
| 645.1 | Drift covered or Gneiss | | glaciomarine and marine |
| 645.2 | Drift covered or Gneiss | | glaciomarine and marine |
| 645.3 | Drift covered or Gneiss | | glaciomarine and marine |
| 645.4 | Drift covered or Gneiss | | glaciomarine and marine |
| 648 | | concealed bedrock | drift poor |
| 649 | | marine clay, sand, gravel and diamicton | glaciomarine and marine |
| 654 | | till veneer | till, undifferentiated |
| 658 | GRVL 15 RED ROCK 92 | till veneer | till, undifferentiated |
| 660 | | concealed bedrock | drift poor |
| 661 | | concealed bedrock | drift poor |
| 662.1 | | concealed bedrock | drift poor |
| 662.2 | | concealed bedrock | drift poor |
| 663.1 | | till veneer | till, undifferentiated |
| 663.2 | TILL 7 BRWN GREY ROCK 116 | concealed bedrock | drift poor |
| 677 | | concealed bedrock | drift poor |
| 678.1 | GRVL 015 SAND 039 GRVL 041 SLTE 093 | glaciofluvial gravel and sand | glaciofluvial |
| 678.2 | GRVL BLDR GREN 2 SAND GRVL GREN 16.7 | glaciofluvial gravel and sand | glaciofluvial |
| 678.3 | | glaciofluvial gravel and sand | glaciofluvial |
| 678.4 | | glaciofluvial gravel and sand | glaciofluvial |

**Table B1. **

| WS_SUB | Keyword | D_ROCKTYPE | D_AGERANGE | D_AGEBASE | D_AGETOP |
|---|---|---|---|---|---|
| 643 | NF121_0048 | carbonate | Middle Cambrian to Early Ordovician | 505 | 487 |
| 644.1 | NF096_0007 | volcanic marine | Early Ordovician to Middle Ordovician | 478 | 465 |
| 644.2 | NF096_0007 | volcanic marine | Early Ordovician to Middle Ordovician | 478 | 465 |
| 645.1 | | | | 0 | 0 |
| 645.2 | | | | 0 | 0 |
| 645.3 | | | | 0 | 0 |
| 645.4 | | | | 0 | 0 |
| 648 | NF121_0124 | carbonate | Middle Cambrian to Early Ordovician | 505 | 487 |
| 649 | NF121_0011 | sedimentary | Mississippian | 336 | 327 |
| 654 | NF191_0094 | sedimentary marine | | 575 | 542 |
| 658 | NF191_0152 | sedimentary marine | | 575 | 542 |
| 660 | NF191_0152 | sedimentary marine | | 575 | 542 |
| 661 | NF191_0094 | sedimentary marine | | 575 | 542 |
| 662.1 | NF191_0219 | | | 575 | 542 |
| 662.2 | NF191_0219 | | | 575 | 542 |
| 663.1 | NF191_0334 | | | 575 | 542 |
| 663.2 | NF191_0334 | | | 575 | 542 |
| 677 | NF007_0084 | volcanic mafic marine | Early Cambrian to Middle Cambrian | 542 | 505 |
| 678.1 | NF024_0024 | siliciclastic marine | Early Ordovician to Late Ordovician | 471 | 446 |
| 678.2 | NF024_0024 | siliciclastic marine | Early Ordovician to Late Ordovician | 471 | 446 |
| 678.3 | NF024_0024 | siliciclastic marine | Early Ordovician to Late Ordovician | 471 | 446 |
| 678.4 | NF024_0024 | siliciclastic marine | Early Ordovician to Late Ordovician | 471 | 446 |

**Table B1. **

| WS_SUB | D_SUPERGRP | D_GROUP | D_FORMATN | D_MEMBER |
|---|---|---|---|---|
| 643 | | Port au Port Group | | |
| 644.1 | | Catchers Pond Group | | |
| 644.2 | | Catchers Pond Group | | |
| 645.1 | | | | |
| 645.2 | | | | |
| 645.3 | | | | |
| 645.4 | | | | |
| 648 | | Port au Port Group | | |
| 649 | | Codroy Group | | |
| 654 | | St. John's Group | Fermeuse Formation | |
| 658 | | St. John's Group | Trepassey formation | |
| 660 | | St. John's Group | Trepassey formation | |
| 661 | | St. John's Group | Fermeuse Formation | |
| 662.1 | | Conception Group | Mistaken Point Formation | |
| 662.2 | | Conception Group | Mistaken Point Formation | |
| 663.1 | | Conception Group | Drook Formation | |
| 663.2 | | Conception Group | Drook Formation | |
| 677 | | Lushs Bight Group | | |
| 678.1 | | Baie d'Espoir Group | St. Josephs Cove Formation | |
| 678.2 | | Baie d'Espoir Group | St. Josephs Cove Formation | |
| 678.3 | | Baie d'Espoir Group | St. Josephs Cove Formation | |
| 678.4 | | Baie d'Espoir Group | St. Josephs Cove Formation | |

**Table B1. Well Heads Database**

| WS_SUB | COMMUNITY | LGP_NUM | SERVICED_A | SA_NUM |
|---|---|---|---|---|
| 678.5 | St. Alban's | 4305 | St. Alban's | SA-0703 |
| 678.6 | St. Alban's | 4305 | St. Alban's | SA-0703 |
| 679 | St. Andrews | 4310 | St. Andrew's | SA-0704 |
| 680 | St. Andrews | 4310 | St. Andrew's | SA-0705 |
| 681 | St. Andrews | 4310 | St. Andrew's East | SA-0706 |
| 695 | St. Joseph's | 4415 | St. Joseph's S.M.B. | SA-0720 |
| 695.1 | St. Joseph's | 4415 | St. Joseph's S.M.B. | SA-0720 |
| 695.2 | St. Joseph's | 4415 | St. Joseph's S.M.B. | SA-0720 |
| 702 | St. Lunaire-Griquet | 2050 | St. Lunaire-Griquet | SA-0727 |
| 704.1 | St. Mary's | 4455 | St. Mary's | SA-0729 |
| 704.2 | St. Mary's | 4455 | St. Mary's | SA-0729 |
| 704.3 | St. Mary's | 4455 | St. Mary's | SA-0729 |
| 704.4 | St. Mary's | 4455 | St. Mary's | SA-0729 |
| 704.5 | St. Mary's | 4455 | St. Mary's | SA-0729 |
| 704.6 | St. Mary's | 4455 | St. Mary's | SA-0729 |
| 704.7 | St. Mary's | 4455 | St. Mary's | SA-0729 |
| 704.8 | St. Mary's | 4455 | St. Mary's | SA-0729 |
| 704.9 | St. Mary's | 4455 | St. Mary's | SA-0729 |
| 706 | St. Patricks | 4470 | St. Patricks | SA-0731 |
| 716 | Stephenville | 4945 | Stephenville | SA-0741 |
| 717.1 | Stephenvillle Crossing | 4950 | Stephenvillle Crossing | SA-0742 |
| 717.2 | Stephenvillle Crossing | 4950 | Stephenvillle Crossing | SA-0742 |
| 717.3 | Stephenvillle Crossing | 4950 | Stephenvillle Crossing | SA-0742 |
| 717.4 | Stephenvillle Crossing | 4950 | Stephenvillle Crossing | SA-0742 |
| 717.5 | Stephenvillle Crossing | 4950 | Stephenvillle Crossing | SA-0742 |
| 717.6 | Stephenvillle Crossing | 4950 | Stephenvillle Crossing | SA-0742 |
| 717.7 | Stephenvillle Crossing | 4950 | Stephenvillle Crossing | SA-0742 |
| 725 | Swift Current | 5005 | Swift Current | SA-0751 |
| 738 | Tompkins | 5110 | Tompkins | SA-0764 |
| 756 | Upper Amherst Cove | 5200 | Upper Amherst Cove | SA-0782 |
| 757 | Upper Ferry | 5205 | Upper Ferry - Lower | SA-0783 |
| 758 | Upper Ferry | 5205 | Upper Ferry - Middle | SA-0784 |

**Table B1. **

| WS_SUB | SOURCENAME | STATUS | WS_NUM | TYPE | PROTECTED |
|---|---|---|---|---|---|
| 678.5 | Well #5 | | WS-G-0678 | Drilled | P |
| 678.6 | Well #6 | | WS-G-0678 | Drilled | P |
| 679 | #1 Well | | WS-G-0679 | Drilled | U |
| 680 | #2 Well | | WS-G-0680 | Drilled | U |
| 681 | #3 Well | | WS-G-0681 | Drilled | U |
| 695 | Supply Well #1 | | WS-G-0695 | Drilled | P |
| 695.1 | Backup Well #1 | | WS-G-0695 | Drilled | P |
| 695.2 | Backup Well #2 | | WS-G-0695 | Drilled | P |
| 702 | Drilled | | WS-G-0702 | Drilled | P |
| 704.1 | | | WS-G-0704 | Drilled | P |
| 704.2 | #2 Well | | WS-G-0704 | Drilled | P |
| 704.3 | #3 Well | | WS-G-0704 | Drilled | P |
| 704.4 | #4 Well | | WS-G-0704 | Drilled | P |
| 704.5 | #5 Well | | WS-G-0704 | Drilled | P |
| 704.6 | Wellhead | | WS-G-0704 | Drilled | P |
| 704.7 | Wellhead | | WS-G-0704 | Drilled | P |
| 704.8 | Wellhead | | WS-G-0704 | Drilled | P |
| 704.9 | Wellhead | | WS-G-0704 | Drilled | P |
| 706 | David Joy Well | | WS-G-0706 | Drilled | U |
| 716 | Well Field - chlorinator bldg. | | WS-G-0716 | Drilled | U |
| 717.1 | Well #1 | | WS-G-0717 | Drilled | P |
| 717.2 | Well #2 | | WS-G-0717 | Drilled | P |
| 717.3 | Well #3 | | WS-G-0717 | Drilled | P |
| 717.4 | Well #4 | | WS-G-0717 | Drilled | P |
| 717.5 | Well #5 | | WS-G-0717 | Drilled | P |
| 717.6 | Well #6 | | WS-G-0717 | Drilled | P |
| 717.7 | Well #7 | | WS-G-0717 | Drilled | P |
| 725 | Drilled | | WS-G-0725 | Drilled | U |
| 738 | Greg Wall Well | | WS-G-0738 | Drilled | U |
| 756 | Drilled | | WS-G-0756 | Drilled | U |
| 757 | #1 Well - Gerard Brownrigg Well | | WS-G-0757 | Drilled | U |
| 758 | #2 Well - Hughie MacIssac Well | | WS-G-0758 | Drilled | U |

**Table B1. **

| WS_SUB | NUM_WELLS | POPULATION | WELLFIELD_POP | CENSUS_POP | HOMES | EASTING |
|---|---|---|---|---|---|---|
| 678.5 | 6 | 213 | 1278 | | | -55.8516100 |
| 678.6 | 6 | 213 | 1278 | | | -55.8510330 |
| 679 | 1 | 66 | 204 | 346 | | -59.2879600 |
| 680 | 1 | 98 | 204 | 346 | | -59.2739500 |
| 681 | 1 | 33 | 204 | 346 | | -59.2628700 |
| 695 | 1 | 54 | 162 | 144 | | -53.5317912 |
| 695.1 | 1 | 54 | 162 | 144 | | -53.5318612 |
| 695.2 | 1 | 54 | 162 | 144 | | -53.5319708 |
| 702 | 1 | 19 | 19 | 666 | | -55.4778987 |
| 704.1 | 4 | 50 | 450 | 482 | 220 | -53.5577848 |
| 704.2 | 4 | 50 | 450 | 482 | 220 | -53.5585484 |
| 704.3 | 4 | 50 | 450 | 482 | 220 | -53.5575908 |
| 704.4 | 4 | 50 | 450 | 482 | 220 | -53.5628004 |
| 704.5 | 4 | 50 | 450 | 482 | 220 | -53.5574382 |
| 704.6 | 4 | 50 | 450 | 482 | 220 | -53.5582757 |
| 704.7 | 4 | 50 | 450 | 482 | 220 | -53.5585712 |
| 704.8 | 4 | 50 | 450 | 482 | 220 | -53.5583772 |
| 704.9 | 4 | 50 | 450 | 482 | 220 | -53.5586772 |
| 706 | 1 | 37 | 37 | 37 | | -55.9852800 |
| 716 | 10 | 6588 | 6588 | 6,588 | | -58.5700000 |
| 717.1 | 6 | 280 | 1960 | 1,960 | | -58.4473143 |
| 717.2 | 6 | 280 | 1960 | 1,960 | | -58.4465034 |
| 717.3 | 6 | 280 | 1960 | 1,960 | | -58.4459249 |
| 717.4 | 6 | 280 | 1960 | 1,960 | | -58.4417250 |
| 717.5 | 6 | 280 | 1960 | 1,960 | | -58.4405885 |
| 717.6 | 6 | 280 | 1960 | 1,960 | | -58.4340494 |
| 717.7 | 6 | 280 | 1960 | 1,960 | | -58.4340983 |
| 725 | 1 | 21 | 21 | 198 | | -54.1802300 |
| 738 | 1 | 87 | 87 | 93 | 38 | -59.2306300 |
| 756 | 1 | 44 | 44 | 44 | 26 | -53.2322400 |
| 757 | 1 | 49 | 164 | 189 | 73 | -59.2618100 |
| 758 | 1 | 52 | 164 | 189 | 73 | -59.2285600 |

**Table B1. **

| WS_SUB | NORTHING | UTM_E | UTM_N | D_WELL_ID | WELL_DEPTH | YIELD1 |
|---|---|---|---|---|---|---|
| 678.5 | 47.8827960 | 585858.01 | 5303911.91 | | 49 | 147 |
| 678.6 | 47.8827020 | 585901.31 | 5303902.10 | | 49 | 147 |
| 679 | 47.7997200 | 328673.33 | 5296575.06 | 114 | 61 | 86 |
| 680 | 47.7771800 | 329648.70 | 5294039.16 | 5347 | 50 | 63 |
| 681 | 47.7813300 | 330492.20 | 5294476.02 | 12435 | 32 | 68 |
| 695 | 47.1141539 | 763098.75 | 5223687.70 | | 76 | 16 |
| 695.1 | 47.1136844 | 763095.76 | 5223635.30 | | 76 | 16 |
| 695.2 | 47.1140510 | 763085.63 | 5223675.67 | | 76 | 16 |
| 702 | 51.5319932 | 605576.44 | 5710085.34 | | 52 | 25 |
| 704.1 | 46.9031348 | 762158.65 | 5200153.60 | | 46 | 35 |
| 704.2 | 46.9053856 | 762089.52 | 5200401.13 | | 45.5 | 35 |
| 704.3 | 46.9020952 | 762178.50 | 5200038.73 | | 61 | 35 |
| 704.4 | 46.9091872 | 761747.20 | 5200809.32 | | 122 | 35 |
| 704.5 | 46.9046815 | 762177.50 | 5200326.61 | | 116 | 35 |
| 704.6 | 46.9048967 | 762112.67 | 5200347.72 | | 45.5 | 35 |
| 704.7 | 46.9053131 | 762088.14 | 5200393.00 | | 116 | 35 |
| 704.8 | 46.9048225 | 762105.30 | 5200339.14 | | 116 | 35 |
| 704.9 | 46.9056077 | 762078.63 | 5200425.38 | | 116 | 35 |
| 706 | 49.5758900 | 573359.13 | 5491972.49 | | 40 | 18 |
| 716 | 48.5832900 | 384213.11 | 5382323.58 | | 32 | 61 |
| 717.1 | 48.5149343 | 393117.00 | 5374547.00 | | 32 | 61 |
| 717.2 | 48.5145127 | 393176.00 | 5374499.00 | | 32 | 61 |
| 717.3 | 48.5141691 | 393218.00 | 5374460.01 | 25 | 15 | 309 |
| 717.4 | 48.5121885 | 393524.00 | 5374234.00 | 11462 | 19 | 400 |
| 717.5 | 48.5136512 | 393611.00 | 5374395.00 | | 32 | 61 |
| 717.6 | 48.5122574 | 394091.00 | 5374231.00 | | 32 | 61 |
| 717.7 | 48.5130305 | 394089.00 | 5374317.00 | | 32 | 61 |
| 725 | 47.8796200 | 710822.58 | 5306770.05 | 2555 | 73 | 135 |
| 738 | 47.7979400 | 332960.39 | 5296251.78 | 5030 | 21 | 50 |
| 756 | 48.5590500 | 777983.27 | 5385295.75 | | 88 | 147 |
| 757 | 47.8396000 | 330761.11 | 5300949.46 | 2322 | 56 | 55 |
| 758 | 47.8375300 | 333242.26 | 5300647.11 | 117 | 32 | 68 |

**Table B1. **

| WS_SUB | Local_pQb | ROCK_LOG | ROCK_MAP | ROCK_TYPE |
|---|---|---|---|---|
| 678.5 | -0.635483747 | | Alternating Sedimentary | Alternating Sedimentary |
| 678.6 | -0.635483747 | | Alternating Sedimentary | Alternating Sedimentary |
| 679 | -0.307531108 | SANDST | Alternating Sedimentary | Alternating Sedimentary |
| 680 | -0.258733037 | SHALE | Alternating Sedimentary | Alternating Sedimentary |
| 681 | -0.485721426 | SANDST | Alternating Sedimentary | Alternating Sedimentary |
| 695 | 0.518331118 | | Alternating Sedimentary | Alternating Sedimentary |
| 695.1 | 0.518331118 | | Alternating Sedimentary | Alternating Sedimentary |
| 695.2 | 0.518331118 | | Alternating Sedimentary | Alternating Sedimentary |
| 702 | 0.159700843 | | Sandstone/Conglomerate | Sandstone/Conglomerate |
| 704.1 | -0.039672705 | | Alternating Sedimentary | Alternating Sedimentary |
| 704.2 | -0.04441914 | | Alternating Sedimentary | Alternating Sedimentary |
| 704.3 | 0.082899299 | | Alternating Sedimentary | Alternating Sedimentary |
| 704.4 | 0.383929294 | | Alternating Sedimentary | Alternating Sedimentary |
| 704.5 | 0.362027453 | | Alternating Sedimentary | Alternating Sedimentary |
| 704.6 | -0.04441914 | | Alternating Sedimentary | Alternating Sedimentary |
| 704.7 | 0.362027453 | | Alternating Sedimentary | Alternating Sedimentary |
| 704.8 | 0.362027453 | | Alternating Sedimentary | Alternating Sedimentary |
| 704.9 | 0.362027453 | | Alternating Sedimentary | Alternating Sedimentary |
| 706 | 0.188424994 | | Volcanic | Volcanic |
| 716 | -0.438542349 | | Surficial Deposits | Quaternary |
| 717.1 | -0.438542349 | | Surficial Deposits | Quaternary |
| 717.2 | -0.438542349 | | Surficial Deposits | Quaternary |
| 717.3 | -1.472229712 | SURFICIAL | Surficial Deposits | Quaternary |
| 717.4 | -1.481668882 | SURFICIAL | Surficial Deposits | Quaternary |
| 717.5 | -0.438542349 | SURFICIAL | Surficial Deposits | Quaternary |
| 717.6 | -0.438542349 | | Surficial Deposits | Quaternary |
| 717.7 | -0.438542349 | | Surficial Deposits | Quaternary |
| 725 | -0.4253734 | ROCK | Plutonic | Plutonic |
| 738 | -0.535113202 | SHALE | Surficial Deposits | FG_Sedimentary |
| 756 | -0.381197155 | | Alternating Sedimentary | Alternating Sedimentary |
| 757 | -0.150537155 | SHALE | Alternating Sedimentary | Alternating Sedimentary |
| 758 | -0.485721426 | SANDST | Alternating Sedimentary | Alternating Sedimentary |

**Table B1. **

| WS_SUB | Ptest Q | USAGE | USAGE | Q_calc | Slope_Ave | DIR_MEAN | K | i |
|---|---|---|---|---|---|---|---|---|
| 678.5 | | | | 132 | 9.0 | 9 | 8.60E-08 | 0.09 |
| 678.6 | | | | 132 | 9.0 | 9 | 8.60E-08 | 0.09 |
| 679 | | | | 41 | 2.5 | 232 | 5.43E-07 | 0.03 |
| 680 | | | | 61 | 3.6 | 276 | 6.62E-07 | 0.06 |
| 681 | | | | 20 | 6.2 | 284 | 1.03E-06 | 0.05 |
| 695 | | | | 34 | 7.5 | 138 | 3.85E-08 | 0.08 |
| 695.1 | | | | 34 | 6.6 | 134 | 3.85E-08 | 0.07 |
| 695.2 | | | | 34 | 7.0 | 136 | 3.85E-08 | 0.07 |
| 702 | | | | 12 | 5.3 | 356 | 8.46E-08 | 0.05 |
| 704.1 | | 4778 | 22 | 31 | 4.5 | 37 | 4.77E-05 | 0.02 |
| 704.2 | 328.32 | 4778 | 22 | 31 | 7.9 | 9 | 4.77E-05 | 0.03 |
| 704.3 | | 4778 | 22 | 31 | 3.1 | 30 | 4.77E-05 | 0.02 |
| 704.4 | | 4778 | 22 | 31 | 4.0 | 115 | 4.77E-05 | 0.03 |
| 704.5 | | 4778 | 22 | 31 | 10.3 | 26 | 4.77E-05 | 0.02 |
| 704.6 | 331.2 | 4778 | 22 | 31 | 9.1 | 5 | 4.77E-05 | 0.02 |
| 704.7 | | 4778 | 22 | 31 | 7.9 | 5 | 4.77E-05 | 0.02 |
| 704.8 | | 4778 | 22 | 31 | 10.2 | 14 | 4.77E-05 | 0.02 |
| 704.9 | | 4778 | 22 | 31 | 14.9 | 348 | 4.77E-05 | 0.03 |
| 706 | | | | 23 | 13.7 | 354 | 4.53E-08 | 0.14 |
| 716 | | | | 4091 | 4.6 | 246 | 1.00E-05 | 0.05 |
| 717.1 | | | | 174 | 1.1 | 268 | 1.00E-05 | 0.01 |
| 717.2 | | | | 174 | 1.1 | 269 | 1.00E-05 | 0.01 |
| 717.3 | | | | 174 | 1.0 | 270 | 1.00E-05 | 0.01 |
| 717.4 | | | | 174 | 0.8 | 276 | 1.00E-05 | 0.01 |
| 717.5 | | | | 174 | 0.7 | 278 | 1.00E-05 | 0.01 |
| 717.6 | | | | 174 | 1.0 | 288 | 1.00E-05 | 0.01 |
| 717.7 | | | | 174 | 1.0 | 288 | 1.00E-05 | 0.01 |
| 725 | 165.6 | | | 13 | 11.9 | 282 | 8.61E-07 | 0.17 |
| 738 | | | | 54 | 7.2 | 318 | 3.30E-07 | 0.10 |
| 756 | | | | 27 | 4.9 | 180 | 2.55E-08 | 0.05 |
| 757 | | | | 30 | 5.8 | 96 | 5.91E-07 | 0.07 |
| 758 | | | | 32 | 4.0 | 73 | 1.03E-06 | 0.05 |

**Table B1. **

| WS_SUB | n | K_src | Depth_src | Yield_src | v_calc | TOT_20 |
|---|---|---|---|---|---|---|
| 678.5 | 0.10 | Qb_Rock | Local_avg | Local_avg | 7.70E-08 | 49 |
| 678.6 | 0.10 | Qb_Rock | Local_avg | Local_avg | 7.75E-08 | 49 |
| 679 | 0.10 | Qb_Key | Drill_xy | Drill_xy | 1.80E-07 | 114 |
| 680 | 0.10 | Qb_Key | Drill_xy | Drill_xy | 3.79E-07 | 239 |
| 681 | 0.10 | Qb_Key | Drill_xy | Drill_xy | 5.48E-07 | 346 |
| 695 | 0.10 | Qb_Fm | Drill_xy | Drill_xy | 2.90E-08 | 18 |
| 695.1 | 0.10 | Qb_Fm | Drill_xy | Drill_xy | 2.55E-08 | 16 |
| 695.2 | 0.10 | Qb_Fm | Drill_xy | Drill_xy | 2.70E-08 | 17 |
| 702 | 0.20 | Qb_Fm | Local_avg | Local_avg | 2.23E-08 | 14 |
| 704.1 | 0.10 | well_field | Operator | Local_avg | 1.11E-05 | 7030 |
| 704.2 | 0.10 | ptest wellID | Ptest_xy | Local_avg | 1.20E-05 | 7559 |
| 704.3 | 0.10 | well_field | Operator | Local_avg | 9.24E-06 | 5826 |
| 704.4 | 0.10 | well_field | Operator | Local_avg | 1.24E-05 | 7793 |
| 704.5 | 0.10 | well_field | Local_avg | Local_avg | 1.16E-05 | 7297 |
| 704.6 | 0.10 | well_field | Ptest_xy | Local_avg | 1.14E-05 | 7183 |
| 704.7 | 0.10 | well_field | Local_avg | Local_avg | 1.14E-05 | 7182 |
| 704.8 | 0.10 | well_field | Local_avg | Local_avg | 1.17E-05 | 7376 |
| 704.9 | 0.10 | well_field | Local_avg | Local_avg | 1.25E-05 | 7904 |
| 706 | 0.10 | Qb_Key | Operator | Local_avg | 6.19E-08 | 39 |
| 716 | 0.35 | Qb_Rock | Local_avg | Local_avg | 1.31E-06 | 825 |
| 717.1 | 0.35 | Qb_Rock | Local_avg | Local_avg | 3.01E-07 | 190 |
| 717.2 | 0.35 | Qb_Rock | Local_avg | Local_avg | 3.02E-07 | 191 |
| 717.3 | 0.35 | Qb_Rock | Drill_xy | Drill_xy | 2.77E-07 | 175 |
| 717.4 | 0.35 | Qb_Rock | Drill_xy | Drill_xy | 2.33E-07 | 147 |
| 717.5 | 0.35 | Qb_Rock | Ptest_xy | Local_avg | 2.08E-07 | 131 |
| 717.6 | 0.35 | Qb_Rock | Ptest_xy | Local_avg | 2.87E-07 | 181 |
| 717.7 | 0.35 | Qb_Rock | Ptest_xy | Local_avg | 2.73E-07 | 172 |
| 725 | 0.05 | ptest_xy | Drill_xy | Drill_xy | 2.86E-06 | 1805 |
| 738 | 0.10 | Qb_Rock | Operator | Drill_xy | 3.23E-07 | 204 |
| 756 | 0.10 | Qb_Key | Operator | Local_avg | 1.26E-08 | 8 |
| 757 | 0.10 | Qb_Key | Drill_xy | Drill_xy | 4.01E-07 | 253 |
| 758 | 0.10 | Qb_Key | Drill_xy | Drill_xy | 4.84E-07 | 305 |

**Table B1. **

| WS_SUB | LITHOLOGY | GENETIC250 | GENETIC1MA |
|---|---|---|---|
| 678.5 | | glaciofluvial gravel and sand | glaciofluvial |
| 678.6 | | glaciofluvial gravel and sand | glaciofluvial |
| 679 | RED SLTS 5 RED GREY SHLE 52 WHIT SNDS 61 | till veneer | till, undifferentiated |
| 680 | RED CLAY/GRVL 006 RED/GREY SHLE 050 | till blanket | till blanket |
| 681 | GREY CLAY GRVL 6 GREY SNDS 32 | till blanket | till blanket |
| 695 | | | |
| 695.1 | | | |
| 695.2 | | | |
| 702 | | marine clay, sand, gravel and diamicton | glaciomarine and marine |
| 704.1 | | hummocky terrain | ablation drift |
| 704.2 | | hummocky terrain | ablation drift |
| 704.3 | | till blanket | till blanket |
| 704.4 | | hummocky terrain | ablation drift |
| 704.5 | | hummocky terrain | ablation drift |
| 704.6 | | hummocky terrain | ablation drift |
| 704.7 | | hummocky terrain | ablation drift |
| 704.8 | | hummocky terrain | ablation drift |
| 704.9 | | hummocky terrain | ablation drift |
| 706 | | concealed bedrock | drift poor |
| 716 | | glaciofluvial gravel and sand | glaciofluvial |
| 717.1 | | bog | bog |
| 717.2 | | bog | bog |
| 717.3 | SAND 015 | bog | bog |
| 717.4 | SAND GRVL 019 | bog | bog |
| 717.5 | SAND GRVL 019 | bog | bog |
| 717.6 | | bog | bog |
| 717.7 | | bog | bog |
| 725 | OBDN OO2 ROCK 079 | exposed bedrock | exposed bedrock |
| 738 | GREY GRVL 013 GREY SHLE 025 | glaciofluvial gravel and sand | glaciofluvial |
| 756 | | glaciofluvial gravel and sand | glaciofluvial |
| 757 | BRWN CLAY 005 GREY SHLE 056 | till blanket | till blanket |
| 758 | RED TPSL 004 RED GREY SNDS 032 | hummocky terrain | ablation drift |

**Table B1. **

| WS_SUB | Keyword | D_ROCKTYPE | D_AGERANGE | D_AGEBASE | D_AGETOP |
|---|---|---|---|---|---|
| 678.5 | NF024_0024 | siliciclastic marine | Early Ordovician to Late Ordovician | 471 | 446 |
| 678.6 | NF024_0024 | siliciclastic marine | Early Ordovician to Late Ordovician | 471 | 446 |
| 679 | NF143_0053 | siliciclastic non-marine | Mississippian | 327 | 314 |
| 680 | NF143_0053 | siliciclastic non-marine | Mississippian | 327 | 314 |
| 681 | NF143_0053 | siliciclastic non-marine | Mississippian | 327 | 314 |
| 695 | NF191_0515 | | | 575 | 542 |
| 695.1 | NF191_0515 | | | 575 | 542 |
| 695.2 | NF191_0515 | | | 575 | 542 |
| 702 | NF160_0088 | siliciclastic marine sandstone | Early Cambrian | 612 | 509 |
| 704.1 | NF191_0515 | | | 575 | 542 |
| 704.2 | NF191_0515 | | | 575 | 542 |
| 704.3 | NF191_0515 | | | 575 | 542 |
| 704.4 | NF191_0515 | | | 575 | 542 |
| 704.5 | NF191_0515 | | | 575 | 542 |
| 704.6 | NF191_0515 | | | 575 | 542 |
| 704.7 | NF191_0515 | | | 575 | 542 |
| 704.8 | NF191_0515 | | | 575 | 542 |
| 704.9 | NF191_0515 | | | 575 | 542 |
| 706 | NF008_0161 | volcanic mafic marine | Early Cambrian to Middle Cambrian | 542 | 505 |
| 716 | NF121_0078 | siliciclastic | | 1.8 | 0 |
| 717.1 | NF121_0128 | siliciclastic | | 1.8 | 0 |
| 717.2 | NF121_0128 | siliciclastic | | 1.8 | 0 |
| 717.3 | NF121_0128 | siliciclastic | | 1.8 | 0 |
| 717.4 | NF121_0128 | siliciclastic | | 1.8 | 0 |
| 717.5 | NF121_0128 | siliciclastic | | 1.8 | 0 |
| 717.6 | NF121_0128 | siliciclastic | | 1.8 | 0 |
| 717.7 | NF121_0128 | siliciclastic | | 1.8 | 0 |
| 725 | NF181_0106 | plutonic | | 1000 | 542 |
| 738 | NF143_0082 | siliciclastic | | 1.8 | 0 |
| 756 | NF186_0011 | sedimentary | | 575 | 542 |
| 757 | NF143_0053 | siliciclastic non-marine | Mississippian | 327 | 314 |
| 758 | NF143_0053 | siliciclastic non-marine | Mississippian | 327 | 314 |

**Table B1. **

| WS_SUB | D_SUPERGRP | D_GROUP | D_FORMATN | D_MEMBER |
|---|---|---|---|---|
| 678.5 | | Baie d'Espoir Group | St. Josephs Cove Formation | |
| 678.6 | | Baie d'Espoir Group | St. Josephs Cove Formation | |
| 679 | | Barachois Group | Searston Formation | |
| 680 | | Barachois Group | Searston Formation | |
| 681 | | Barachois Group | Searston Formation | |
| 695 | | Conception Group | Drook Formation | |
| 695.1 | | Conception Group | Drook Formation | |
| 695.2 | | Conception Group | Drook Formation | |
| 702 | Hare Bay Allochthon | Maiden Point Slice Assemblage | Maiden Point Formation | |
| 704.1 | | Conception Group | Drook Formation | |
| 704.2 | | Conception Group | Drook Formation | |
| 704.3 | | Conception Group | Drook Formation | |
| 704.4 | | Conception Group | Drook Formation | |
| 704.5 | | Conception Group | Drook Formation | |
| 704.6 | | Conception Group | Drook Formation | |
| 704.7 | | Conception Group | Drook Formation | |
| 704.8 | | Conception Group | Drook Formation | |
| 704.9 | | Conception Group | Drook Formation | |
| 706 | | Lushs Bight Group | | |
| 716 | Surficial deposits | | | |
| 717.1 | Surficial deposits | | | |
| 717.2 | Surficial deposits | | | |
| 717.3 | Surficial deposits | | | |
| 717.4 | Surficial deposits | | | |
| 717.5 | Surficial deposits | | | |
| 717.6 | Surficial deposits | | | |
| 717.7 | Surficial deposits | | | |
| 725 | | Swift Current Intrusive Suite | Swift Current Granite | |
| 738 | Surficial deposits | | | |
| 756 | | Musgravetown Group | | |
| 757 | | Barachois Group | Searston Formation | |
| 758 | | Barachois Group | Searston Formation | |

**Table B1. Well Heads Database**

| WS_SUB | COMMUNITY | LGP_NUM | SERVICED_A | SA_NUM |
|---|---|---|---|---|
| 759 | Upper Ferry | 5205 | Upper Ferry - Upper | SA-0785 |
| 763 | Wabana | 5245 | Wabana | SA-0790 |
| 764 | Wabana | 5245 | Wabana | SA-0791 |
| 770 | Wabana | 5245 | Wabana | SA-0797 |
| 771 | Wabana | 5245 | Wabana | SA-0798 |
| 772 | Wabana | 5245 | Wabana | SA-0799 |
| 773 | Wabana | 5245 | Wabana | SA-0800 |
| 774 | Wabana | 5245 | Wabana | SA-0801 |
| 776.1 | West St. Modeste | 5310 | West St. Modeste | SA-0804 |
| 776.7 | West St. Modeste | 5310 | West St. Modeste | SA-0804 |
| 786.1 | Winterland | 5445 | Winterland | SA-0814 |
| 786.2 | Winterland | 5445 | Winterland | SA-0814 |
| 802 | Hopeall | 2335 | Hopeall | SA-0833 |
| 804 | Lance Cove | 2680 | Lance Cove | SA-0835 |
| 821 | St. Andrews | 4310 | Air Strip Road | SA-0852 |
| 823 | Cavendish | 990 | North Side Cavendish | SA-0854 |
| 825 | Flat Bay West | 1600 | Flat Bay West - Federation of Indians | SA-0856 |
| 826 | Hopeall | 2335 | Gilberts Hill | SA-0857 |
| 837 | Ship Cove-Lower Cove-Jerry's Nose | 4665 | Ship Cove East | SA-0868 |
| 838 | Ship Cove-Lower Cove-Jerry's Nose | 4665 | Ship Cove, Jerry's Nose | SA-0869 |
| 839 | Ship Cove-Lower Cove-Jerry's Nose | 4665 | Ship Cove, Jerry's Nose | SA-0870 |
| 840 | Ship Cove-Lower Cove-Jerry's Nose | 4665 | Ship Cove, Jerry's Nose | SA-0871 |

**Table B1. **

| WS_SUB | SOURCENAME | STATUS | WS_NUM | TYPE | PROTECTED |
|---|---|---|---|---|---|
| 759 | #3 Well - Marshall Devoe Well | | WS-G-0759 | Drilled | U |
| 763 | Middleton Ave. Well | | WS-G-0763 | Drilled | P |
| 764 | #3 Yard Well | | WS-G-0764 | Drilled | P |
| 770 | #4 West Mines Well | | WS-G-0770 | Drilled | P |
| 771 | East #1 Well | | WS-G-0771 | Drilled | P |
| 772 | Quigley's Line Well | | WS-G-0772 | Drilled | P |
| 773 | Scotia #1 Well | | WS-G-0773 | Drilled | P |
| 774 | St. Edwards Well | | WS-G-0774 | Drilled | P |
| 776.1 | Well Field (well #1) | | WS-G-0776 | Drilled | U |
| 776.7 | Well Field (well #7) | | WS-G-0776 | Drilled | U |
| 786.1 | #1 Well | | WS-G-0786 | Drilled | P |
| 786.2 | #2 Well | | WS-G-0786 | Drilled | P |
| 802 | Charles Cumby Well | | WS-G-0802 | Drilled | P |
| 804 | Local Service District Well | | WS-G-0804 | Drilled | U |
| 821 | #4 Well Strip Road Well | | WS-G-0821 | Drilled | U |
| 823 | #2 Well - Tom Critch | | WS-G-0823 | Drilled | U |
| 825 | #3 Well | | WS-G-0825 | Drilled | U |
| 826 | Gilberts Hill Well | | WS-G-0826 | Drilled | P |
| 837 | #3 Well - Bernard Brake Well | | WS-G-0837 | Drilled | P |
| 838 | #2 Well - Howard & Rodney Jesso Well | | WS-G-0838 | Drilled | P |
| 839 | #4 Well - Nancy Rowe Well | | WS-G-0839 | Drilled | P |
| 840 | #1 Well - PJ's Variety Well | | WS-G-0840 | Drilled | P |

**Table B1. **

| WS_SUB | NUM_WELLS | POPULATION | WELLFIELD_POP | CENSUS_POP | HOMES | EASTING |
|---|---|---|---|---|---|---|
| 759 | 1 | 41 | 164 | 189 | 73 | -59.2238900 |
| 763 | 1 | 149.25 | 2418 | 2,418 | | -52.9781409 |
| 764 | 2 | 224 | 2418 | 2,418 | | -52.9529583 |
| 770 | 1 | 271 | 2418 | 2,418 | | -52.9628900 |
| 771 | 1 | 223 | 2418 | 2,418 | | -52.9401788 |
| 772 | 1 | 223 | 2418 | 2,418 | | -52.9399009 |
| 773 | 1 | 223 | 2418 | 2,418 | | -52.9643172 |
| 774 | 1 | 60 | 2418 | 2,418 | | -52.9363455 |
| 776.1 | 2 | 70 | 140 | 140 | 105 | -56.7099600 |
| 776.7 | 2 | 70 | 140 | 140 | 105 | -56.7093200 |
| 786.1 | 2 | 163.5 | 327 | 337 | | -55.3052361 |
| 786.2 | 2 | 163.5 | 327 | 337 | | -55.3055243 |
| 802 | 1 | 19 | 49 | 204 | | -53.5081900 |
| 804 | 1 | 18 | 18 | 126 | | -52.9697700 |
| 821 | 1 | 7 | 204 | 346 | | -59.3019300 |
| 823 | 1 | 25 | 57 | 334 | | -53.4916600 |
| 825 | 1 | 82 | 114 | 32 | | -58.6170600 |
| 826 | 1 | 30 | 49 | 204 | | -53.5229900 |
| 837 | 1 | 61.8 | 343 | 343 | | -58.9441899 |
| 838 | 1 | 61.8 | 343 | 343 | | -58.9389299 |
| 839 | 1 | 61.8 | 343 | 343 | | -58.9480299 |
| 840 | 1 | 61.8 | 343 | 343 | | -58.9359399 |

**Table B1. **

| WS_SUB | NORTHING | UTM_E | UTM_N | D_WELL_ID | WELL_DEPTH | YIELD1 |
|---|---|---|---|---|---|---|
| 759 | 47.8355200 | 333585.26 | 5300413.66 | | 44 | 61.5 |
| 763 | 47.6302674 | 802127.37 | 5283047.74 | | 91 | 31 |
| 764 | 47.6410560 | 803956.16 | 5284345.06 | 4174 | 152 | 31 |
| 770 | 47.6374851 | 803231.04 | 5283909.35 | 4151 | 49 | 31 |
| 771 | 47.6518998 | 804852.63 | 5285600.21 | | 91 | 31 |
| 772 | 47.6483502 | 804894.18 | 5285206.89 | 19238 | 165 | 27 |
| 773 | 47.6386215 | 803117.28 | 5284030.03 | 4179 | 113 | 31 |
| 774 | 47.6310617 | 805261.98 | 5283299.92 | 4177 | 122 | 31 |
| 776.1 | 51.5960500 | 520090.10 | 5716151.14 | 5323 | 61 | 46 |
| 776.7 | 51.5965300 | 520134.22 | 5716204.70 | 11354 | 92 | 55 |
| 786.1 | 47.1607752 | 628457.00 | 5224424.00 | 11567 | 107 | 53 |
| 786.2 | 47.1616703 | 628433.00 | 5224523.00 | 11568 | 107 | 90 |
| 802 | 47.6138500 | 762396.47 | 5279291.98 | | 36.6 | 23 |
| 804 | 47.6075600 | 802887.42 | 5280557.34 | | 96.3 | 36 |
| 821 | 47.7697600 | 327528.16 | 5293276.57 | 12601 | 31 | 68 |
| 823 | 47.7203100 | 763102.34 | 5291177.93 | | 60.35 | 18 |
| 825 | 48.3935200 | 380296.67 | 5361303.05 | 187 | 62 | 68 |
| 826 | 47.6079400 | 761313.90 | 5278585.25 | 4706 | 110 | 27 |
| 837 | 48.5195800 | 356437.76 | 5375877.13 | | 64 | 31 |
| 838 | 48.5199700 | 356827.25 | 5375910.61 | 5912 | 99 | 69 |
| 839 | 48.5190100 | 356152.61 | 5375820.99 | 144 | 72 | 9 |
| 840 | 48.5210200 | 357050.98 | 5376021.72 | | 64 | 31 |

**Table B1. **

| WS_SUB | Local_pQb | ROCK_LOG | ROCK_MAP | ROCK_TYPE |
|---|---|---|---|---|
| 759 | -0.303784931 | | Alternating Sedimentary | Alternating Sedimentary |
| 763 | 0.309317206 | | Sandstone/FG | Sandstone/FG |
| 764 | 0.532119402 | | Sandstone/FG | Sandstone/FG |
| 770 | 0.040471894 | | Sandstone/FG | Sandstone/FG |
| 771 | 0.309317206 | | Sandstone/FG | Sandstone/FG |
| 772 | 0.627757688 | ROCK | Sandstone/FG | Sandstone/FG |
| 773 | 0.403354258 | | Sandstone/FG | Sandstone/FG |
| 774 | 0.436635645 | | Sandstone/FG | Sandstone/FG |
| 776.1 | -0.035790489 | GRANITE | Plutonic | Plutonic |
| 776.7 | 0.065062646 | GRANITE | Plutonic | Plutonic |
| 786.1 | 0.146745416 | SANDST | Plutonic | Alternating Sedimentary |
| 786.2 | -0.083221224 | SANDST | Plutonic | Alternating Sedimentary |
| 802 | 0.043390757 | | Alternating Sedimentary | Alternating Sedimentary |
| 804 | 0.268961294 | | Sandstone/FG | Sandstone/FG |
| 821 | -0.499509711 | SHALE | Alternating Sedimentary | Alternating Sedimentary |
| 823 | 0.367042277 | | Sandstone/Conglomerate | Sandstone/Conglomerate |
| 825 | -0.198479715 | SURFICIAL | Surficial Deposits | Quaternary |
| 826 | 0.451666429 | SHALE | Alternating Sedimentary | Alternating Sedimentary |
| 837 | 0.156455788 | | Carbonate | Carbonate |
| 838 | -0.001576388 | LIMESTONE | Carbonate | Carbonate |
| 839 | 0.744727495 | SHALE | Carbonate | Carbonate |
| 840 | 0.156455788 | | Carbonate | Carbonate |

**Table B1. **

| WS_SUB | Ptest Q | USAGE | USAGE | Q_calc | Slope_Ave | DIR_MEAN | K | i |
|---|---|---|---|---|---|---|---|---|
| 759 | | | | 25 | 3.7 | 67 | 7.52E-07 | 0.05 |
| 763 | | | | 93 | 3.2 | 127 | 6.54E-06 | 0.03 |
| 764 | | | | 139 | 2.1 | 69 | 6.54E-06 | 0.02 |
| 770 | | | | 168 | 2.2 | 83 | 6.54E-06 | 0.02 |
| 771 | | | | 138 | 2.5 | 67 | 6.54E-06 | 0.02 |
| 772 | | | | 138 | 2.0 | 64 | 6.54E-06 | 0.02 |
| 773 | | | | 138 | 2.3 | 85 | 6.54E-06 | 0.02 |
| 774 | | | | 37 | 3.2 | 30 | 6.54E-06 | 0.03 |
| 776.1 | | 4000 | 18 | 43 | <Null> | 25 | 1.14E-07 | 0.09 |
| 776.7 | | 4000 | 18 | 43 | <Null> | 26 | 7.54E-08 | 0.09 |
| 786.1 | | 25200 | 115 | 102 | 2.7 | 339 | 3.94E-08 | 0.03 |
| 786.2 | | 25200 | 115 | 102 | 2.6 | 341 | 3.94E-08 | 0.03 |
| 802 | 58.896 | | | 12 | 5.0 | 157 | 7.56E-07 | 0.05 |
| 804 | 93.6 | | | 11 | 7.5 | 272 | 2.06E-07 | 0.08 |
| 821 | | | | 4 | 2.0 | 257 | 1.07E-06 | 0.04 |
| 823 | 27.216 | | | 16 | 8.7 | 219 | 5.16E-08 | 0.09 |
| 825 | | | | 51 | 1.0 | 161 | 1.00E-05 | 0.01 |
| 826 | | | | 19 | 17.1 | 69 | 7.56E-07 | 0.10 |
| 837 | | | | 38 | 5.1 | 282 | 1.08E-07 | 0.05 |
| 838 | | | | 38 | 4.9 | 291 | 7.00E-08 | 0.05 |
| 839 | | | | 38 | 6.4 | 276 | 9.63E-08 | 0.06 |
| 840 | | | | 38 | 4.7 | 294 | 1.08E-07 | 0.05 |

**Table B1. **

| WS_SUB | n | K_src | Depth_src | Yield_src | v_calc | TOT_20 |
|---|---|---|---|---|---|---|
| 759 | 0.10 | Qb_Key | Local_avg | Local_avg | 3.82E-07 | 241 |
| 763 | 0.10 | well_field | Local_avg | Local_avg | 1.69E-06 | 1065 |
| 764 | 0.10 | well_field | Drill_xy | Local_avg | 1.40E-06 | 882 |
| 770 | 0.10 | well_field | Drill_xy | Local_avg | 1.42E-06 | 896 |
| 771 | 0.10 | well_field | Local_avg | Local_avg | 1.63E-06 | 1026 |
| 772 | 0.10 | well_field | Drill_xy | Drill_xy | 1.31E-06 | 826 |
| 773 | 0.10 | well_field | Drill_xy | Local_avg | 1.49E-06 | 941 |
| 774 | 0.10 | well_field | Drill_xy | Local_avg | 1.98E-06 | 1247 |
| 776.1 | 0.05 | Qb_Rock | Operator | Drill_xy | 2.07E-07 | 130 |
| 776.7 | 0.05 | Qb_Rock | Operator | Drill_xy | 1.34E-07 | 84 |
| 786.1 | 0.10 | Qb_Rock | Operator | Drill_xy | 1.08E-08 | 7 |
| 786.2 | 0.10 | Qb_Rock | Operator | Drill_xy | 1.01E-08 | 6 |
| 802 | 0.10 | ptest_xy | Ptest_xy | Local_avg | 3.78E-07 | 238 |
| 804 | 0.10 | ptest_xy | Ptest_xy | Local_avg | 1.54E-07 | 97 |
| 821 | 0.10 | Qb_Key | Drill_xy | Drill_xy | 4.72E-07 | 297 |
| 823 | 0.20 | ptest_xy | Ptest_xy | Local_avg | 2.24E-08 | 14 |
| 825 | 0.35 | Qb_Rock | Drill_xy | Drill_xy | 2.78E-07 | 176 |
| 826 | 0.10 | well_field | Drill_xy | Drill_xy | 7.56E-07 | 477 |
| 837 | 0.10 | Qb_Rock | Local_avg | Local_avg | 5.51E-08 | 35 |
| 838 | 0.10 | Qb_Rock | Drill_xy | Drill_xy | 3.40E-08 | 21 |
| 839 | 0.10 | Qb_Rock | Drill_xy | Drill_xy | 6.13E-08 | 39 |
| 840 | 0.10 | Qb_Rock | Local_avg | Local_avg | 5.13E-08 | 32 |

**Table B1. **

| WS_SUB | LITHOLOGY | GENETIC250 | GENETIC1MA |
|---|---|---|---|
| 759 | | hummocky terrain | ablation drift |
| 763 | | concealed bedrock | drift poor |
| 764 | | till veneer | till, undifferentiated |
| 770 | | till veneer | till, undifferentiated |
| 771 | | till veneer | till, undifferentiated |
| 772 | GRVL 1.5; GREN BDRCK 12.8; GREN, WHIT, RED ROCK 164.6 | till veneer | till, undifferentiated |
| 773 | | till veneer | till, undifferentiated |
| 774 | | till veneer | till, undifferentiated |
| 776.1 | RED GRNT 093 | | glaciomarine and marine |
| 776.7 | GREY GRNT | | glaciomarine and marine |
| 786.1 | TPSL 4 RED SNDS 114 | till veneer | till, undifferentiated |
| 786.2 | TPSL 6 RED SNDS 98 | till veneer | till, undifferentiated |
| 802 | | till veneer | till, undifferentiated |
| 804 | | till veneer | till, undifferentiated |
| 821 | CLAY 6 RED GREY SHLE 32 | glaciofluvial gravel and sand | glaciofluvial |
| 823 | | till veneer | till, undifferentiated |
| 825 | GREY BRWN GRVL 009 RED SAND 062 | glaciofluvial gravel and sand | glaciofluvial |
| 826 | GREY GRVL 013 GREY SHLE 110 | concealed bedrock | drift poor |
| 837 | | concealed bedrock | drift poor |
| 838 | BLCK MUCK 001 GREY LMST 099 | concealed bedrock | drift poor |
| 839 | RED SHLE 073 | concealed bedrock | drift poor |
| 840 | | concealed bedrock | drift poor |

**Table B1. **

| WS_SUB | Keyword | D_ROCKTYPE | D_AGERANGE | D_AGEBASE | D_AGETOP |
|---|---|---|---|---|---|
| 759 | NF143_0053 | siliciclastic non-marine | Mississippian | 327 | 314 |
| 763 | NF191_0022 | sedimentary marine | Late Cambrian to Early Ordovician | 501 | 468 |
| 764 | NF191_0022 | sedimentary marine | Late Cambrian to Early Ordovician | 501 | 468 |
| 770 | NF191_0022 | sedimentary marine | Late Cambrian to Early Ordovician | 501 | 468 |
| 771 | NF191_0022 | sedimentary marine | Late Cambrian to Early Ordovician | 501 | 468 |
| 772 | NF191_0022 | sedimentary marine | Late Cambrian to Early Ordovician | 501 | 468 |
| 773 | NF191_0022 | sedimentary marine | Late Cambrian to Early Ordovician | 501 | 468 |
| 774 | NF191_0022 | sedimentary marine | Late Cambrian to Early Ordovician | 501 | 468 |
| 776.1 | | | | 0 | 0 |
| 776.7 | | | | 0 | 0 |
| 786.1 | NF174_0086 | plutonic felsic | Mississippian to Pennsylvanian | 360 | 300 |
| 786.2 | NF174_0086 | plutonic felsic | Mississippian to Pennsylvanian | 360 | 300 |
| 802 | NF191_0035 | sedimentary marine | | 575 | 542 |
| 804 | NF191_0022 | sedimentary marine | Late Cambrian to Early Ordovician | 501 | 468 |
| 821 | NF143_0053 | siliciclastic non-marine | Mississippian | 327 | 314 |
| 823 | NF191_0274 | siliciclastic marine sandstone | Early Cambrian | 530 | 524 |
| 825 | NF148_0090 | siliciclastic | | 1.8 | 0 |
| 826 | NF191_0035 | sedimentary marine | | 575 | 542 |
| 837 | NF121_0124 | carbonate | Middle Cambrian to Early Ordovician | 505 | 487 |
| 838 | NF121_0124 | carbonate | Middle Cambrian to Early Ordovician | 505 | 487 |
| 839 | NF121_0124 | carbonate | Middle Cambrian to Early Ordovician | 505 | 487 |
| 840 | NF121_0124 | carbonate | Middle Cambrian to Early Ordovician | 505 | 487 |

**Table B1. **

| WS_SUB | D_SUPERGRP | D_GROUP | D_FORMATN | D_MEMBER |
|---|---|---|---|---|
| 759 | | Barachois Group | Searston Formation | |
| 763 | | Bell Island Group | Little Bell Island Formation | |
| 764 | | Bell Island Group | Little Bell Island Formation | |
| 770 | | Bell Island Group | Little Bell Island Formation | |
| 771 | | Bell Island Group | Little Bell Island Formation | |
| 772 | | Bell Island Group | Little Bell Island Formation | |
| 773 | | Bell Island Group | Little Bell Island Formation | |
| 774 | | Bell Island Group | Little Bell Island Formation | |
| 776.1 | | | | |
| 776.7 | | | | |
| 786.1 | | | St. Lawrence Granite | |
| 786.2 | | | St. Lawrence Granite | |
| 802 | | Musgravetown Group | Maturin Ponds Formation | |
| 804 | | Bell Island Group | Little Bell Island Formation | |
| 821 | | Barachois Group | Searston Formation | |
| 823 | | Youngs Cove Group | Random Formation | |
| 825 | Surficial deposits | | | |
| 826 | | Musgravetown Group | Maturin Ponds Formation | |
| 837 | | Port au Port Group | | |
| 838 | | Port au Port Group | | |
| 839 | | Port au Port Group | | |
| 840 | | Port au Port Group | | |

**Table B1. Well Heads Database**

| WS_SUB | COMMUNITY | LGP_NUM | SERVICED_A | SA_NUM |
|---|---|---|---|---|
| 841 | Upper Ferry | 5205 | Upper Ferry | SA-0872 |
| 843 | Chance Cove | 1010 | Lower Cove Point | SA-0874 |
| 844 | Bay St. George South | 268 | McKay's | SA-0875 |
| 845 | Fermeuse | 1575 | Fermeuse | SA-0877 |
| 847 | Natuashish | 0 | | |
| 849 | South Dildo | 4820 | South Dildo | SA-0881 |
| 852.1 | Fox Roost-Margaree | 1685 | Fox Roost-Margaree | SA-0934 |
| 852.2 | Fox Roost-Margaree | 1685 | Fox Roost-Margaree - PWDU | SA-0935 |
| 858 | Renews-Cappahayden | 4185 | Cappahayden | SA-0890 |
| 859 | Bay St. George South | 268 | Jeffrey's | SA-0891 |
| 861 | Port au Port East | 3940 | Port au Port East | SA-0893 |
| 864.1 | Millertown | 0 | Millertown | |
| 864.2 | Millertown | 0 | Millertown | |
| 869 | Bauline | 240 | Bauline | SA-0912 |
| 870 | Change Islands | 1020 | Change Islands fill up station | SA-0913 |
| 872 | Bay St. George South | 268 | McKay's | SA-0914 |
| 873 | Benoit's Siding | 340 | Doyles | SA-0916 |
| 875 | Blaketown | 475 | Blaketown Centre | SA-0919 |
| 876.1 | St. George's | 4380 | St. George's | SA-0920 |
| 876.2 | St. George's | 4380 | St. George's | SA-0920 |
| 876.3 | St. George's | 4380 | St. George's | SA-0920 |
| 876.4 | St. George's | 4380 | St. George's | SA-0920 |
| 878 | Port Kirwan | 3962 | Port Kirwan | SA-0922 |

**Table B1. **

| WS_SUB | SOURCENAME | STATUS | WS_NUM | TYPE | PROTECTED |
|---|---|---|---|---|---|
| 841 | #4 Well - Angus MacNeil Well | | WS-G-0841 | Drilled | U |
| 843 | Eugene Smith Well | | WS-G-0843 | Drilled | U |
| 844 | Lions Club Well | | WS-G-0844 | Drilled | P |
| 845 | Port Kirwan Road Well | | WS-G-0845 | Drilled | U |
| 847 | Well Field | | WS-G-0847 | Drilled | U |
| 849 | #5 Well - Calvin Reid Well | | WS-G-0849 | Drilled | U |
| 852.1 | Drilled 8 inch | | WS-G-0852 | Drilled | P |
| 852.2 | Drilled 8 inch | | WS-G-0852 | Drilled | P |
| 858 | #1 Dinn's Well | | WS-G-0858 | Drilled | U |
| 859 | #3 Well Jefferys | | WS-G-0859 | Drilled | P |
| 861 | #1 Well | | WS-G-0861 | Drilled | P |
| 864.1 | Well # 1 | OUT_OF_SERVICE | WS-G-0864 | Drilled | P |
| 864.2 | Well # 2 | OUT_OF_SERVICE | WS-G-0864 | Drilled | P |
| 869 | #1 Brook Path Well | | WS-G-0869 | Drilled | U |
| 870 | #1 Fox Cove Well | | WS-G-0870 | Drilled | U |
| 872 | #3 Woodworth Well McKay's | | WS-G-0872 | Drilled | P |
| 873 | # 2 Well Doyles | | WS-G-0873 | Drilled | U |
| 875 | #3 Well - Fred Osborne Well | | WS-G-0875 | Drilled | U |
| 876.1 | #1 Well | | WS-G-0876 | Drilled | P |
| 876.2 | #2 Well | | WS-G-0876 | Drilled | P |
| 876.3 | #3 Well | | WS-G-0876 | Drilled | P |
| 876.4 | #4 Well | | WS-G-0876 | Drilled | P |
| 878 | Developed Spring | | WS-G-0878 | Spring | U |

**Table B1. **

| WS_SUB | NUM_WELLS | POPULATION | WELLFIELD_POP | CENSUS_POP | HOMES | EASTING |
|---|---|---|---|---|---|---|
| 841 | 1 | 22 | 164 | 189 | | -59.2531200 |
| 843 | 1 | 27 | 346 | 310 | | -53.8253400 |
| 844 | 1 | 33 | 890 | 1,389 | | -58.8376600 |
| 845 | 1 | 24 | 24 | 284 | | -52.9382800 |
| 847 | 0 | 706 | 706 | | | -61.1861458 |
| 849 | 1 | 49 | 49 | 266 | | -53.5559461 |
| 852.1 | 1 | 163 | 325 | 325 | | -59.0515409 |
| 852.2 | 1 | 163 | 325 | 325 | | -59.0515409 |
| 858 | 0 | 50 | | 421 | | -52.9449408 |
| 859 | 1 | 71 | 890 | 1,389 | | -58.8459636 |
| 861 | 0 | 608 | 608 | 608 | | -58.6996502 |
| 864.1 | 0 | 50 | 99 | | | -56.5458252 |
| 864.2 | 0 | 50 | 99 | | | -56.5455262 |
| 869 | 0 | 105 | 105 | 379 | | -52.8324592 |
| 870 | 1 | 300 | 300 | 300 | | -54.4190730 |
| 872 | 1 | 90 | 890 | 1,389 | | -58.8206773 |
| 873 | 1 | 15 | 20 | 5 | | -59.2067270 |
| 875 | 1 | 75 | 237 | 547 | | -53.5497600 |
| 876.1 | 0 | 311.5 | 1246 | 1,246 | | -58.4616528 |
| 876.2 | 0 | 311.5 | 1246 | 1,246 | | -58.4600583 |
| 876.3 | 0 | 311.5 | 1246 | 1,246 | | -58.4638500 |
| 876.4 | 0 | 311.5 | 1246 | 1,246 | | -58.4619583 |
| 878 | 0 | 32.5 | 102 | 85 | | -52.9105719 |

**Table B1. **

| WS_SUB | NORTHING | UTM_E | UTM_N | D_WELL_ID | WELL_DEPTH | YIELD1 |
|---|---|---|---|---|---|---|
| 841 | 47.8426300 | 331421.12 | 5301267.20 | 71 | 74 | 91 |
| 843 | 47.6830400 | 738251.00 | 5285955.46 | 6065 | 91.5 | 36 |
| 844 | 48.2324000 | 363538.24 | 5343763.52 | 17231 | 61 | 45 |
| 845 | 46.9757500 | 808916.63 | 5210480.69 | 336 | 61 | 5 |
| 847 | 55.8889178 | 242196.80 | 6204535.38 | | 46 | 31 |
| 849 | 47.5162561 | 759289.87 | 5268286.78 | | 57 | 13 |
| 852.1 | 47.5805461 | 345730.81 | 5271720.70 | | 46 | 7 |
| 852.2 | 47.5805461 | 345730.81 | 5271720.70 | | 46 | 7 |
| 858 | 46.8618989 | 809065.08 | 5197804.85 | 335 | 58 | 9 |
| 859 | 48.2231749 | 362897.00 | 5342753.00 | | 49 | 41 |
| 861 | 48.5574942 | 374588.00 | 5379661.00 | 20205 | 60.9 | 230 |
| 864.1 | 48.8094226 | 533346.00 | 5406370.01 | | 58 | 94 |
| 864.2 | 48.8093584 | 533368.00 | 5406363.00 | | 58 | 94 |
| 869 | 47.7210671 | 812525.90 | 5293715.42 | 19278 | 55 | 27 |
| 870 | 49.6717813 | 686213.51 | 5505337.22 | | 42 | 6 |
| 872 | 48.2354272 | 364807.27 | 5344069.94 | 182 | 56 | 55 |
| 873 | 47.8235189 | 334831.42 | 5299043.10 | | 39 | 82 |
| 875 | 47.4817400 | 759926.03 | 5264472.08 | 21563 | 131.6 | 45 |
| 876.1 | 48.4337028 | 391885.66 | 5365538.20 | | 32 | 20 |
| 876.2 | 48.4322417 | 392000.50 | 5365373.55 | 18026 | 17 | 34 |
| 876.3 | 48.4335695 | 391722.86 | 5365526.49 | 18025 | 17 | 130 |
| 876.4 | 48.4318222 | 391859.08 | 5365329.60 | | 32 | 20 |
| 878 | 46.9733211 | 811037.85 | 5210320.58 | | 1 | 61 |

**Table B1. **

| WS_SUB | Local_pQb | ROCK_LOG | ROCK_MAP | ROCK_TYPE |
|---|---|---|---|---|
| 841 | -0.248172165 | SHALE | Alternating Sedimentary | Alternating Sedimentary |
| 843 | 0.246756101 | SANDST | Volcanic | Sandstone/FG |
| 844 | -0.026245171 | SANDST | FG_Sedimentary | FG_Sedimentary |
| 845 | 0.927997339 | SLATE | Alternating Sedimentary | Alternating Sedimentary |
| 847 | 0.013033646 | | Plutonic | Plutonic |
| 849 | 0.483569011 | | Alternating Sedimentary | Alternating Sedimentary |
| 852.1 | 0.6592973 | | Metamorphic | Metamorphic |
| 852.2 | 0.6592973 | | Metamorphic | Metamorphic |
| 858 | 0.650822992 | SILTST | Sandstone/FG | Sandstone/FG |
| 859 | -0.080950269 | | FG_Sedimentary | FG_Sedimentary |
| 861 | -0.735473035 | | Carbonate | Carbonate |
| 864.1 | -0.368062352 | | Volcanic | Volcanic |
| 864.2 | -0.368062352 | | Volcanic | Volcanic |
| 869 | 0.150636433 | ROCK | Alternating Sedimentary | Alternating Sedimentary |
| 870 | 0.686735548 | | Volcanic | Volcanic |
| 872 | -0.150537155 | SANDST | FG_Sedimentary | Sandstone/FG |
| 873 | -0.481111737 | | Surficial Deposits | Quaternary |
| 875 | 0.307680883 | QUARTZITE | Sandstone/FG | Sandstone/FG |
| 876.1 | 0.045757491 | | Surficial Deposits | Quaternary |
| 876.2 | -0.459392488 | SURFICIAL | Surficial Deposits | Quaternary |
| 876.3 | -1.041856923 | SURFICIAL | Surficial Deposits | Quaternary |
| 876.4 | 0.045757491 | | Surficial Deposits | Quaternary |
| 878 | -1.943692327 | | FG_Sedimentary | Quaternary |

**Table B1. **

| WS_SUB | Ptest Q | USAGE | USAGE | Q_calc | Slope_Ave | DIR_MEAN | K | i |
|---|---|---|---|---|---|---|---|---|
| 841 | | | | 14 | 7.6 | 83 | 4.47E-07 | 0.07 |
| 843 | | 500 | 2 | 17 | 11.1 | 20 | 4.81E-08 | 0.11 |
| 844 | | | | 20 | 0.7 | 169 | 2.00E-07 | 0.01 |
| 845 | | | | 15 | 5.5 | 297 | 8.34E-08 | 0.06 |
| 847 | | | | 438 | <Null> | 203 | 1.51E-07 | 0.01 |
| 849 | | | | 30 | 4.0 | 78 | 8.97E-08 | 0.04 |
| 852.1 | | | | 101 | 4.6 | 242 | 1.16E-07 | 0.05 |
| 852.2 | | | | 101 | 4.9 | 245 | 1.16E-07 | 0.05 |
| 858 | 4.896 | | | 31 | 5.3 | 348 | 1.41E-07 | 0.05 |
| 859 | | | | 44 | 1.4 | 148 | 2.00E-07 | 0.01 |
| 861 | | | | 378 | 13.7 | 229 | 1.14E-07 | 0.14 |
| 864.1 | | | | 31 | 3.8 | 175 | 1.20E-07 | 0.04 |
| 864.2 | | | | 31 | 3.6 | 170 | 1.20E-07 | 0.04 |
| 869 | | | | 65 | 24.3 | 99 | 1.09E-07 | 0.20 |
| 870 | | | | 186 | 2.3 | 254 | 1.26E-07 | 0.02 |
| 872 | | | | 56 | 2.9 | 102 | 1.24E-05 | 0.02 |
| 873 | | | | 9 | 1.4 | 207 | 1.00E-05 | 0.05 |
| 875 | 42.048 | | | 47 | 4.6 | 357 | 3.46E-08 | 0.05 |
| 876.1 | | | | 193 | 4.4 | 140 | 1.00E-05 | 0.04 |
| 876.2 | | | | 193 | 4.4 | 139 | 1.00E-05 | 0.04 |
| 876.3 | | | | 193 | 4.4 | 140 | 1.00E-05 | 0.04 |
| 876.4 | | | | 193 | 4.4 | 140 | 1.00E-05 | 0.04 |
| 878 | | | | 20 | 6.9 | 328 | 1.00E-05 | 0.17 |

**Table B1. **

| WS_SUB | n | K_src | Depth_src | Yield_src | v_calc | TOT_20 |
|---|---|---|---|---|---|---|
| 841 | 0.10 | Qb_Key | Drill_xy | Drill_xy | 3.24E-07 | 204 |
| 843 | 0.10 | Qb_Fm | Operator | Drill_xy | 5.33E-08 | 34 |
| 844 | 0.10 | well_field | Drill_xy | Drill_xy | 2.90E-08 | 18 |
| 845 | 0.10 | Qb_Key | Drill_xy | Drill_xy | 4.61E-08 | 29 |
| 847 | 0.05 | Qb_Rock | Local_avg | Local_avg | 4.46E-08 | 28 |
| 849 | 0.10 | Qb_Key | Local_avg | Local_avg | 3.59E-08 | 23 |
| 852.1 | 0.05 | Qb_Rock | Local_avg | Local_avg | 1.08E-07 | 68 |
| 852.2 | 0.05 | Qb_Rock | Local_avg | Local_avg | 1.13E-07 | 71 |
| 858 | 0.10 | ptest_xy | Drill_xy | Drill_xy | 7.44E-08 | 47 |
| 859 | 0.10 | well_field | Log | Local_avg | 2.63E-08 | 17 |
| 861 | 0.10 | Qb_Rock | Drill_xy | Drill_xy | 1.56E-07 | 98 |
| 864.1 | 0.10 | Qb_Rock | Local_avg | Local_avg | 4.49E-08 | 28 |
| 864.2 | 0.10 | Qb_Rock | Local_avg | Local_avg | 4.29E-08 | 27 |
| 869 | 0.10 | Qb_Fm | Drill_xy | Local_avg | 2.19E-07 | 138 |
| 870 | 0.10 | Qb_Key | Local_avg | Local_avg | 2.96E-08 | 19 |
| 872 | 0.10 | ptest wellID | Drill_xy | Drill_xy | 2.85E-06 | 1795 |
| 873 | 0.35 | Qb_Rock | Local_avg | Local_avg | 1.49E-06 | 938 |
| 875 | 0.10 | ptest_xy | Drill_xy | Drill_xy | 1.59E-08 | 10 |
| 876.1 | 0.35 | Qb_Rock | Local_avg | Local_avg | 1.26E-06 | 794 |
| 876.2 | 0.35 | Qb_Rock | Drill_xy | Drill_xy | 1.27E-06 | 799 |
| 876.3 | 0.35 | Qb_Rock | Drill_xy | Drill_xy | 1.26E-06 | 794 |
| 876.4 | 0.35 | Qb_Rock | Local_avg | Local_avg | 1.24E-06 | 785 |
| 878 | 0.35 | Qb_Fm | Spring | Local_avg | 4.99E-06 | 3145 |

**Table B1. **

| WS_SUB | LITHOLOGY | GENETIC250 | GENETIC1MA |
|---|---|---|---|
| 841 | RED GREY TPSL 009 RED GREY SHLE 074 | glaciofluvial gravel and sand | glaciofluvial |
| 843 | BLDR/SAND 005 SNDS 061 | exposed bedrock | exposed bedrock |
| 844 | GREY GRVL SAND, SILT, 27.4 ;GREY MUDSTONE 39.6 ;GREY SNDS 60.9 | glaciofluvial gravel and sand | glaciofluvial |
| 845 | BRWN SAND/BLDS 007 BLCK SLTE 061 | till veneer | till, undifferentiated |
| 847 | Plutonic or Drift | | drift poor |
| 849 | | concealed bedrock | drift poor |
| 852.1 | | exposed bedrock | exposed bedrock |
| 852.2 | | exposed bedrock | exposed bedrock |
| 858 | BRWN TPSL 005 SLTE 035 GREN SILT 150 | till blanket | till blanket |
| 859 | | glaciofluvial gravel and sand | glaciofluvial |
| 861 | | concealed bedrock | drift poor |
| 864.1 | | till blanket | till blanket |
| 864.2 | | till blanket | till blanket |
| 869 | GRVL 10.7; GREY ROCK 54.9 | concealed bedrock | drift poor |
| 870 | | concealed bedrock | drift poor |
| 872 | GRVL 005 SAND 018 SNDS 030 GYPS 056 | glaciofluvial gravel and sand | glaciofluvial |
| 873 | | ridged till | rogen moraine |
| 875 | GRAVEL 4.6; GREN, GREY, WHIT BEDROCK 12.8; GREN, GREY, WHIT, ROCK WITH QUARTZ 134.1 | hummocky terrain | ablation drift |
| 876.1 | | glaciofluvial gravel and sand | glaciofluvial |
| 876.2 | 17.1 BRWN SAND & GRVL | glaciofluvial gravel and sand | glaciofluvial |
| 876.3 | 17.1 GREY SAND | glaciofluvial gravel and sand | glaciofluvial |
| 876.4 | | glaciofluvial gravel and sand | glaciofluvial |
| 878 | | concealed bedrock | drift poor |

**Table B1. **

| WS_SUB | Keyword | D_ROCKTYPE | D_AGERANGE | D_AGEBASE | D_AGETOP |
|---|---|---|---|---|---|
| 841 | NF143_0053 | siliciclastic non-marine | Mississippian | 327 | 314 |
| 843 | NF191_0011 | volcanic | | 575 | 542 |
| 844 | NF148_0087 | siliciclastic non-marine | Mississippian | 334 | 328 |
| 845 | NF191_0048 | | | 575 | 542 |
| 847 | | | | 0 | 0 |
| 849 | NF191_0002 | sedimentary marine | | 575 | 542 |
| 852.1 | NF140_0085 | siliciclastic psammite | Early Cambrian to Early Ordovician | 540 | 471 |
| 852.2 | NF140_0085 | siliciclastic psammite | Early Cambrian to Early Ordovician | 540 | 471 |
| 858 | NF191_0121 | sedimentary marine | | 575 | 542 |
| 859 | NF148_0087 | siliciclastic non-marine | Mississippian | 334 | 328 |
| 861 | NF121_0124 | carbonate | Middle Cambrian to Early Ordovician | 505 | 487 |
| 864.1 | NF010_0001 | volcanic mafic marine | Early Ordovician to Middle Ordovician | 476 | 463 |
| 864.2 | NF010_0001 | volcanic mafic marine | Early Ordovician to Middle Ordovician | 476 | 463 |
| 869 | NF191_0017 | | | 633 | 620 |
| 870 | NF152_0032 | volcanic non-marine | Early Silurian to Late Silurian | 431 | 418 |
| 872 | NF148_0087 | siliciclastic non-marine | Mississippian | 334 | 328 |
| 873 | NF143_0082 | siliciclastic | | 1.8 | 0 |
| 875 | NF191_0001 | | | 575 | 542 |
| 876.1 | NF148_0090 | siliciclastic | | 1.8 | 0 |
| 876.2 | NF148_0090 | siliciclastic | | 1.8 | 0 |
| 876.3 | NF148_0090 | siliciclastic | | 1.8 | 0 |
| 876.4 | NF148_0090 | siliciclastic | | 1.8 | 0 |
| 878 | NF191_0008 | sedimentary marine | | 575 | 542 |

**Table B1. **

| WS_SUB | D_SUPERGRP | D_GROUP | D_FORMATN | D_MEMBER |
|---|---|---|---|---|
| 841 | | Barachois Group | Searston Formation | |
| 843 | | Musgravetown Group | Bull Arm Formation | |
| 844 | | Codroy Group | Robinsons River Formation | Jeffreys Village Member |
| 845 | | Conception Group | Mistaken Point Formation | |
| 847 | | | | |
| 849 | | Musgravetown Group | Heart's Content Formation | |
| 852.1 | | Port aux Basques Complex | | |
| 852.2 | | Port aux Basques Complex | | |
| 858 | | St. John's Group | Renews Head Formation | |
| 859 | | Codroy Group | Robinsons River Formation | Jeffreys Village Member |
| 861 | | Port au Port Group | | |
| 864.1 | | Buchans Group | Sandy Lake Formation | |
| 864.2 | | Buchans Group | Sandy Lake Formation | |
| 869 | | Harbour Main Group | | |
| 870 | | Botwood Group | Lawrenceton Formation | |
| 872 | | Codroy Group | Robinsons River Formation | Jeffreys Village Member |
| 873 | Surficial deposits | | | |
| 875 | | Musgravetown Group | Big Head Formation | |
| 876.1 | Surficial deposits | | | |
| 876.2 | Surficial deposits | | | |
| 876.3 | Surficial deposits | | | |
| 876.4 | Surficial deposits | | | |
| 878 | | St. John's Group | Fermeuse Formation | |

**Table B1. Well Heads Database**

| WS_SUB | COMMUNITY | LGP_NUM | SERVICED_A | SA_NUM |
|---|---|---|---|---|
| 879.1 | Wabana | 5245 | Wabana | SA-0923 |
| 879.2 | Wabana | 5245 | Wabana | SA-0923 |
| 879.3 | Wabana | 5245 | Wabana | SA-0923 |
| 879.4 | Wabana | 5245 | Wabana | SA-0923 |
| 879.5 | Wabana | 5245 | Wabana | SA-0923 |
| 879.6 | Wabana | 5245 | Wabana | SA-0923 |
| 879.7 | Wabana | 5245 | Wabana | SA-0923 |
| 880 | Bay St. George South | 268 | Highlands | SA-0924 |
| 883 | Grates Cove | 1975 | Grates Cove North End | SA-0927 |
| 887 | Bay St. George South | 268 | Robinson's | SA-0940 |
| 888 | Conception Harbour | 1148 | Old Road and Coles Cresent | SA-0941 |
| 889 | New Harbour | 3415 | New Harbour | SA-0942 |
| 1000 | Hughes Brook | 2373 | Hughes Brook | SA-0374 |
| 1001 | Hughes Brook | 2373 | Hughes Brook | SA-0374 |

**Table B1. **

| WS_SUB | SOURCENAME | STATUS | WS_NUM | TYPE | PROTECTED |
|---|---|---|---|---|---|
| 879.1 | #13 Scotia Road Well | | WS-G-0879 | Drilled | P |
| 879.2 | #15 Scotia Road Well | | WS-G-0879 | Drilled | P |
| 879.3 | Davidson Ave. Well | | WS-G-0879 | Drilled | P |
| 879.4 | Fancy Hill Well | | WS-G-0879 | Drilled | P |
| 879.5 | Kavanagh's Lane Well | | WS-G-0879 | Drilled | P |
| 879.6 | Kelloway's The Front Well | | WS-G-0879 | Drilled | P |
| 879.7 | Main Street Well | | WS-G-0879 | Drilled | P |
| 880 | #3 Brian Pumphrey Well Highlands | | WS-G-0880 | Drilled | U |
| 883 | #3 Frank Janes Well | | WS-G-0883 | Drilled | U |
| 887 | #3 Well Robinson's (Gales) | | WS-G-0887 | Drilled | U |
| 888 | Old Road Well | | WS-G-0888 | Drilled | U |
| 889 | William's Hill | | WS-G-0889 | Drilled | P |
| 1000 | #1 Well | OUT_OF_SERVICE | | Drilled | U |
| 1001 | #2 Well | OUT_OF_SERVICE | | Drilled | U |

**Table B1. **

| WS_SUB | NUM_WELLS | POPULATION | WELLFIELD_POP | CENSUS_POP | HOMES | EASTING |
|---|---|---|---|---|---|---|
| 879.1 | 7 | 149.25 | 2418 | 2,418 | | -52.9511526 |
| 879.2 | 7 | 149.25 | 2418 | 2,418 | | -52.9521500 |
| 879.3 | 7 | 149.25 | 2418 | 2,418 | | -52.9484046 |
| 879.4 | 7 | 149.25 | 2418 | 2,418 | | -52.9308487 |
| 879.5 | 7 | 149.25 | 2418 | 2,418 | | -52.9443740 |
| 879.6 | 7 | 149.25 | 2418 | 2,418 | | -52.9301458 |
| 879.7 | 7 | 149.25 | 2418 | 2,418 | | -52.9363465 |
| 880 | 1 | 47 | 890 | 1,389 | | -58.9023418 |
| 883 | 0 | 54 | 202 | 165 | | -52.9405908 |
| 887 | 0 | 24 | 890 | 1,389 | | -58.8015006 |
| 888 | 1 | 58 | 331 | 743 | | -53.2205568 |
| 889 | 1 | 80 | 80 | | 81 | -53.5467470 |
| 1000 | 0 | 107 | 213 | | | -57.8736124 |
| 1001 | 0 | 107 | 213 | | | -57.8694303 |

**Table B1. **

| WS_SUB | NORTHING | UTM_E | UTM_N | D_WELL_ID | WELL_DEPTH | YIELD1 |
|---|---|---|---|---|---|---|
| 879.1 | 47.6326403 | 804140.67 | 5283417.06 | 26818 | 91 | 270 |
| 879.2 | 47.6319555 | 804069.73 | 5283337.05 | 4168 | 91.5 | 23 |
| 879.3 | 47.6342498 | 804337.70 | 5283606.69 | 27080 | 91 | 226 |
| 879.4 | 47.6393968 | 805626.15 | 5284247.75 | 4175 | 202 | 34 |
| 879.5 | 47.6303860 | 804662.90 | 5283193.23 | 4169 | 64 | 23 |
| 879.6 | 47.6333258 | 805714.40 | 5283575.95 | 4178 | 134 | 9 |
| 879.7 | 47.6426154 | 805194.51 | 5284583.69 | 4171 | 190 | 23 |
| 880 | 48.1873197 | 358611.18 | 5338870.12 | | 42 | 56 |
| 883 | 48.1643122 | 801823.16 | 5342535.70 | | 60.96 | 42 |
| 887 | 48.2513505 | 366272.69 | 5345806.14 | 17229 | 37 | 60 |
| 888 | 47.4479285 | 784906.67 | 5261869.81 | | 43 | 44 |
| 889 | 47.5979130 | 759578.30 | 5277391.21 | | 122 | 18 |
| 1000 | 48.9993695 | 436101.32 | 5427753.35 | 22262 | 73.2 | 90 |
| 1001 | 49.0036925 | 436412.71 | 5428230.40 | | 47 | 199 |

**Table B1. **

| WS_SUB | Local_pQb | ROCK_LOG | ROCK_MAP | ROCK_TYPE |
|---|---|---|---|---|
| 879.1 | -0.630684864 | SHALE | Sandstone/Conglomerate | Sandstone/FG |
| 879.2 | 0.441330766 | SHALE | Sandstone/Conglomerate | Sandstone/FG |
| 879.3 | -0.553429539 | SLATE | Sandstone/Conglomerate | Sandstone/FG |
| 879.4 | 0.61550996 | SHALE | Sandstone/FG | Sandstone/FG |
| 879.5 | 0.286089646 | | Sandstone/FG | Sandstone/FG |
| 879.6 | 1.014499797 | SHALE | Sandstone/FG | Sandstone/FG |
| 879.7 | 0.758663273 | | Sandstone/Conglomerate | Sandstone/FG |
| 880 | -0.283301229 | | FG_Sedimentary | FG_Sedimentary |
| 883 | 0.003433176 | SANDST | FG_Sedimentary | Alternating Sedimentary |
| 887 | -0.368312018 | SANDST | FG_Sedimentary | FG_Sedimentary |
| 888 | -0.168346713 | | Alternating Sedimentary | Alternating Sedimentary |
| 889 | 0.672724833 | | Alternating Sedimentary | Alternating Sedimentary |
| 1000 | -0.24809392 | | Carbonate | Carbonate |
| 1001 | -0.785117711 | | Carbonate | Carbonate |

**Table B1. **

| WS_SUB | Ptest Q | USAGE | USAGE | Q_calc | Slope_Ave | DIR_MEAN | K | i |
|---|---|---|---|---|---|---|---|---|
| 879.1 | | | | 93 | 2.5 | 59 | 6.54E-06 | 0.03 |
| 879.2 | 108 | | | 93 | 2.7 | 59 | 6.54E-06 | 0.03 |
| 879.3 | | | | 93 | 2.3 | 56 | 6.54E-06 | 0.02 |
| 879.4 | | | | 93 | 2.0 | 43 | 6.54E-06 | 0.02 |
| 879.5 | | | | 93 | 2.3 | 39 | 6.54E-06 | 0.02 |
| 879.6 | | | | 93 | 3.0 | 31 | 6.54E-06 | 0.03 |
| 879.7 | | | | 93 | 2.1 | 54 | 6.54E-06 | 0.02 |
| 880 | | | | 29 | 2.0 | 127 | 2.00E-07 | 0.03 |
| 883 | 5.472 | | | 34 | 11.1 | 7 | 6.19E-07 | 0.10 |
| 887 | | | | 15 | 7.6 | 242 | 2.00E-07 | 0.02 |
| 888 | | | | 36 | 5.4 | 67 | 1.83E-07 | 0.07 |
| 889 | | | | 50 | 6.4 | 191 | 4.19E-08 | 0.06 |
| 1000 | | | | 66 | 35.4 | 182 | 3.83E-07 | 0.20 |
| 1001 | | | | 66 | 19.9 | 208 | 5.97E-07 | 0.20 |

**Table B1. **

| WS_SUB | n | K_src | Depth_src | Yield_src | v_calc | TOT_20 |
|---|---|---|---|---|---|---|
| 879.1 | 0.10 | well_field | Drill_xy | Drill_xy | 1.66E-06 | 1047 |
| 879.2 | 0.10 | ptest_xy | Drill_xy | Local_avg | 1.74E-06 | 1097 |
| 879.3 | 0.10 | well_field | Drill_xy | Drill_xy | 1.53E-06 | 963 |
| 879.4 | 0.10 | well_field | Drill_xy | Drill_xy | 1.30E-06 | 817 |
| 879.5 | 0.10 | well_field | Drill_xy | Local_avg | 1.52E-06 | 957 |
| 879.6 | 0.10 | well_field | Drill_xy | Drill_xy | 1.94E-06 | 1221 |
| 879.7 | 0.10 | well_field | Drill_xy | Local_avg | 1.36E-06 | 858 |
| 880 | 0.20 | well_field | Local_avg | Local_avg | 2.63E-08 | 17 |
| 883 | 0.10 | ptest_xy | Ptest_xy | Local_avg | 5.99E-07 | 378 |
| 887 | 0.10 | well_field | Drill_xy | Drill_xy | 4.49E-08 | 28 |
| 888 | 0.10 | well_field | Local_avg | Local_avg | 1.21E-07 | 76 |
| 889 | 0.10 | Qb_Key | Operator | Local_avg | 2.69E-08 | 17 |
| 1000 | 0.10 | Qb_Fm | Drill_xy | Drill_xy | 7.66E-07 | 483 |
| 1001 | 0.10 | Qb_Fm | Local_avg | Local_avg | 1.19E-06 | 748 |

**Table B1. **

| WS_SUB | LITHOLOGY | GENETIC250 | GENETIC1MA |
|---|---|---|---|
| 879.1 | BRWN GRAVEL 1M ;LIGHT GREY SHLE 1M TO 44M ;DARK GREY SHLE 44M TO 46M ;LIGHT GREY, GREN SHLE 46M TO 61M ;RED SHLE 61M TO 67M ;FRACTURED 67M TO 73M ;RED SHLE 73M TO 91M | concealed bedrock | drift poor |
| 879.2 | | concealed bedrock | drift poor |
| 879.3 | BRWN SAND AND GRAVEL 4M ;GREY AND BLCK SLTE 4M TO 39M ;FRACTURED 39M TO 42M ;GREY AND BLCK SLTE 42M TO 53M ;FRACTURED 53M TO 62M ;STREAKS OF IRON COLOUR 62M TO 71M ;GREY AND BLCK SLTE 71M TO 91M | concealed bedrock | drift poor |
| 879.4 | GREY SHLE 202 | till veneer | till, undifferentiated |
| 879.5 | | till veneer | till, undifferentiated |
| 879.6 | BRWN SHLE 002 GREY SHLE 134 | till veneer | till, undifferentiated |
| 879.7 | | concealed bedrock | drift poor |
| 880 | | glaciofluvial gravel and sand | glaciofluvial |
| 883 | | till veneer | till, undifferentiated |
| 887 | BRWN SAND, GRVL SILT16.7 ;RED SHLE & SNDS 36.5 ; | glaciofluvial gravel and sand | glaciofluvial |
| 888 | | concealed bedrock | drift poor |
| 889 | | concealed bedrock | drift poor |
| 1000 | | concealed bedrock | drift poor |
| 1001 | | concealed bedrock | drift poor |

**Table B1. **

| WS_SUB | Keyword | D_ROCKTYPE | D_AGERANGE | D_AGEBASE | D_AGETOP |
|---|---|---|---|---|---|
| 879.1 | NF191_0202 | sedimentary marine | Late Cambrian to Early Ordovician | 501 | 468 |
| 879.2 | NF191_0202 | sedimentary marine | Late Cambrian to Early Ordovician | 501 | 468 |
| 879.3 | NF191_0202 | sedimentary marine | Late Cambrian to Early Ordovician | 501 | 468 |
| 879.4 | NF191_0022 | sedimentary marine | Late Cambrian to Early Ordovician | 501 | 468 |
| 879.5 | NF191_0022 | sedimentary marine | Late Cambrian to Early Ordovician | 501 | 468 |
| 879.6 | NF191_0022 | sedimentary marine | Late Cambrian to Early Ordovician | 501 | 468 |
| 879.7 | NF191_0202 | sedimentary marine | Late Cambrian to Early Ordovician | 501 | 468 |
| 880 | NF148_0074 | siliciclastic non-marine sandstone | Mississippian | 334 | 327.5 |
| 883 | NF191_0103 | siliciclastic siltstone | | 575 | 542 |
| 887 | NF148_0087 | siliciclastic non-marine | Mississippian | 334 | 328 |
| 888 | NF191_0253 | | | 624.20001 | 620 |
| 889 | NF191_0002 | sedimentary marine | | 575 | 542 |
| 1000 | NF164_0305 | carbonate | Late Cambrian to Early Ordovician | 491 | 487 |
| 1001 | NF115_0011 | carbonate | Late Cambrian to Early Ordovician | 494 | 487 |

**Table B1. **

| WS_SUB | D_SUPERGRP | D_GROUP | D_FORMATN | D_MEMBER |
|---|---|---|---|---|
| 879.1 | | Bell Island Group | Redmans Formation | |
| 879.2 | | Bell Island Group | Redmans Formation | |
| 879.3 | | Bell Island Group | Redmans Formation | |
| 879.4 | | Bell Island Group | Little Bell Island Formation | |
| 879.5 | | Bell Island Group | Little Bell Island Formation | |
| 879.6 | | Bell Island Group | Little Bell Island Formation | |
| 879.7 | | Bell Island Group | Redmans Formation | |
| 880 | | Codroy Group | Robinsons River Formation | Highlands Member |
| 883 | | Signal Hill Group | Bay de Verde Formation | Grates Cove Member |
| 887 | | Codroy Group | Robinsons River Formation | Jeffreys Village Member |
| 888 | | Harbour Main Group | | |
| 889 | | Musgravetown Group | Heart's Content Formation | |
| 1000 | | Port au Port Group | Berry Head Formation | |
| 1001 | | Port au Port Group | Berry Head Formation | |

**Table B2. Explanation of Fields in Well Heads Database**

| | |
|---|---|
| WS_SUB | Unique number for each well head |
| COMMUNITY | Community location of well |
| LGP_NUM | Local Government Number |
| SERVICED_A | Name of serviced area within community |
| SA_NUM | Service area number |
| SOURCENAME | Local / operator well ID and/or name of well and well location |
| STATUS | Indicates whether well is out of service |
| WS_NUM | Water supply number for the well field |
| TYPE | Drilled or dug well |
| PROTECTED | Indicates whether the well has been officially designated with a WHPA |
| NUM_WELLS | Number of wells in well field for a single service area or community |
| POPULATION | Average number of persons served by each well head |
| WELLFIELD_POP | Total population served by the well field |
| CENSUS_POP | Population from the Canadian Census |
| HOMES | Number of homes/connections serviced by each well head or well field |
| EASTING | World coordinate in decimal degrees |
| NORTHING | World coordinate in decimal degrees |
| UTM_E | World coordinate in Universal Transmercator format, North American Datum, 1983 (NAD 83 UTM Zone 21) |
| UTM_N | World coordinate in Universal Transmercator format, North American Datum, 1983 (NAD 83 UTM Zone 21) |
| D_WELL_ID | ID number of well or nearby well log from provincial drilled well database |
| WELL_DEPTH | Depth of well |
| YIELD1 | Airlift yield of well |
| Local_pQb | Negative log of depth-normalized airlift yield, used as an indication of relative productivity of the underlying formation |
| ROCK_LOG | Lithology from drilled well database |
| ROCK_MAP | Rock type based on mapped underlying bedrock unit |
| ROCK_TYPE | Rock type for the well used in this study, based on ROCK_LOG and ROCK_MAP |

**Table B2. Explanation of Fields in Well Heads Database**

| | |
|---|---|
| Ptest Q | Pumping rate from pumping test if available |
| USAGE, igpm | Water use from records/operator in imperial gallons per minute |
| USAGE, m3/d | Water use from records/operator in cubic metres per day |
| Q_calc | Calculated demand for the well head, based on population and used in analytical solution |
| Slope_Ave | Average slope of digital elevatoin model along flow vector defined for CSM |
| DIR_MEAN | Direction of flow vector, degrees counterclockwase from due east |
| K | Hydraulic conductivity used in analytical solution |
| i | Estimated groundwater gradient based on slope analysis |
| n | Porosity of aquifer material |
| K_src | Data source for hydraulic conductivity data |
| Depth_src | Data source for well depth |
| Yield_src | Data source for airliftyield of well |
| v_calc | Calculated average linear velocity based on estimates of K, i, n |
| TOT_20 | 20 year time of travel based on calculated average linear groundwater velocity |
| LITHOLOGY | Driller's description of lithology from drilled well database |
| GENETIC250 | Mapped quaternary material type |
| GENETIC1MA | Mapped quaternary type |
| Keyword | Polygon ID from bedrock geology mapping |
| D_ROCKTYPE | Mapped bedrock type |
| D_AGERANGE | Mapped bedrock age range |
| D_AGEBASE | Mapped bedrock age (lower limit) |
| D_AGETOP | Mapped bedrock age (upper limit) |
| D_SUPERGRP | Mapped bedrock supergroup |
| D_GROUP | Mapped bedrock geology Group |
| D_FORMATN | Mapped bedrock geology Formation |
| D_MEMBER | Mapped bedrock geology Member |

# APPENDIX C

ANALYTICAL SOLUTION

These solutions assume that the 1D flow field is uniform and horizontal, and that the aquifer material is homogenous, isotropic, and of infinite extent. The solution adapted for the current study included a sloped water table and confined aquifer setting. Diagrams and equations are from Todd, 1980, unless otherwise noted.

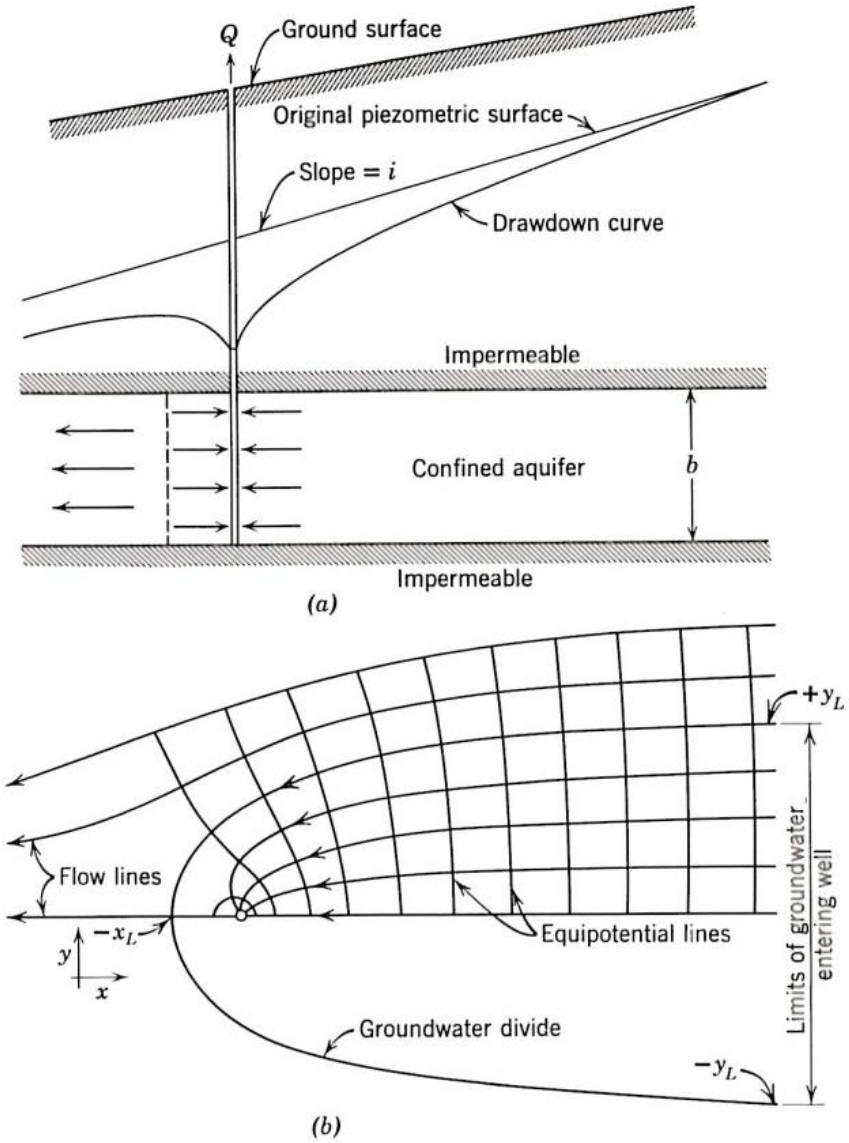



**Figure C1.**
**From Todd, 1980: "Flow to a well penetrating a confined aquifer having a sloping plane piezometric surface. (a) Vertical section. (b) Plan view."**

The Theim equation for steady radial flow to a well in a confined aquifer:

$$Q = 2\pi Kb\frac{(h - h_w)}{ln(\frac{r}{r_w})}$$

Hydraulic conductivity for a well in a uniform flow field with a sloping water table in a confined aquifer:

$$K = \frac{2Q}{\pi r(2b)(i_u + i_d)}$$

From superposition of the radial and 1D flow fields:

$$-\frac{Y}{X} = \tan(\frac{2\pi Kbi}{Q}Y)$$

The boundary asymptotically approaches the finite limits +/- $Y_L$ as X approaches infinity:

$$Y_L = \pm\frac{Q}{2Kbi}$$

The down gradient stagnation point can be calculated as:

$$X_{LD} = -\frac{Q}{2\pi Kbi}$$

The dimensionless time of travel parameter (Ceric and Haitjema, 2005):

$$t^* = \frac{2\pi(kbi)^2 t}{nbQ}$$

| | |
|---|---|
| Q | Pumping rate / flow rate |
| K | Hydraulic Conductivity |
| b | Aquifer thickness |
| h | hydraulic head |
| r | radius |
| i | gradient |
| X | x-coordinate |
| Y | y-coordinate |

# APPENDIX D

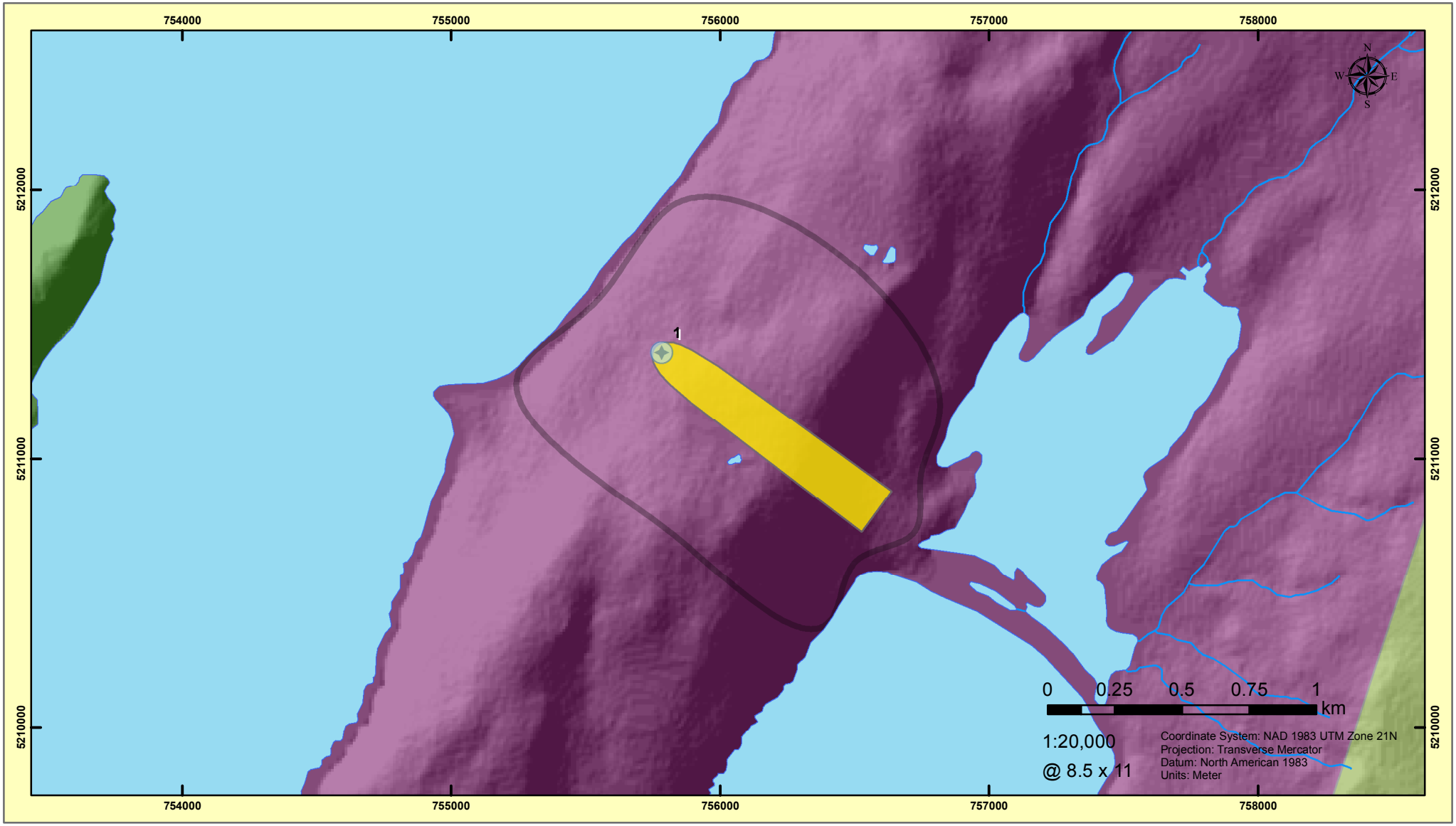
MODIFIED INPUT DATA

**Table D1. Altered Well Head Input Data**

| Well ID | Actual Population | Adjusted Population | Population Factor | Original estimate of Hydraulic Conductivity | Adjusted hydraulic conductivity | K Factor |
|---|---|---|---|---|---|---|
| 389.1 | 435 | 870 | 2 | 1.00E-05 | N/A | |
| 872 | 90 | 180 | 2 | 1.24E-05 | | |
| 620.1 | 73 | 147 | 2 | 1.00E-05 | | |
| 513.3 | 164 | 328 | 2 | 1.00E-05 | | |
| 654 | 73 | 146 | 2 | 4.35E-06 | | |
| 661 | 53 | 106 | 2 | 4.35E-06 | | |
| 513.2 | 164 | 328 | 2 | 1.00E-05 | | |
| 299 | 67 | 134 | 2 | 3.43E-06 | 1.72E-06 | 0.50 |
| 774 | 60 | 120 | 2 | 6.54E-06 | 3.27E-06 | 0.50 |
| 873 | 25 | 50 | 2 | 1.00E-05 | 5.00E-06 | 0.50 |
| 300 | 22 | 44 | 2 | 3.43E-06 | 1.72E-06 | 0.50 |
| 660 | 32 | 64 | 2 | 4.35E-06 | 2.17E-06 | 0.50 |
| 510 | 55 | 110 | 2 | 1.00E-05 | 5.00E-06 | 0.50 |
| 633.1 | 128 | 255 | 2 | 1.00E-05 | 5.00E-06 | 0.50 |
| 633.2 | 128 | 255 | 2 | 1.00E-05 | 5.00E-06 | 0.50 |
| 337 | 40 | 80 | 2 | 1.00E-05 | 5.00E-06 | 0.50 |
| 95 | 39 | 195 | 5 | 1.21E-05 | 2.42E-06 | 0.20 |
| 13 | 52 | 260 | 5 | 1.00E-05 | 2.00E-06 | 0.20 |
| 704.3 | 50 | 250 | 5 | 4.77E-05 | 9.54E-06 | 0.20 |
| 704.1 | 50 | 250 | 5 | 4.77E-05 | 9.54E-06 | 0.20 |
| 704.6 | 50 | 250 | 5 | 4.77E-05 | 9.54E-06 | 0.20 |
| 704.2 | 50 | 250 | 5 | 4.77E-05 | 9.54E-06 | 0.20 |
| 704.7 | 50 | 250 | 5 | 4.77E-05 | 9.54E-06 | 0.20 |
| 704.5 | 50 | 250 | 5 | 4.77E-05 | 9.54E-06 | 0.20 |
| 704.8 | 50 | 250 | 5 | 4.77E-05 | 9.54E-06 | 0.20 |
| 704.9 | 50 | 250 | 5 | 4.77E-05 | 9.54E-06 | 0.20 |
| 704.4 | 50 | 250 | 5 | 4.77E-05 | 9.54E-06 | 0.20 |

# APPENDIX E

ATLAS OF WELL HEAD PROTECTION AREAS




# Admiral's Beach

Bedrock Well

WHPA

Well Field Study Area

**Bedrock Geology**

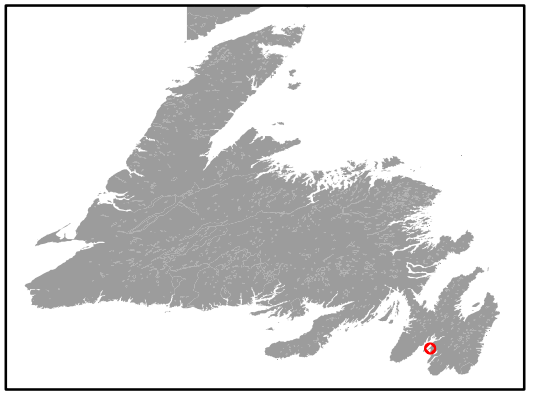
Alternating Sedimentary

Conception Group, Drook Formation

Conception Group, Gaskiers Formation

Conception Group, Mall Bay Formation

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 1 | 2 Well Fields | 49 | 185 | 115 | 0.00000112 |
| | | | | | |



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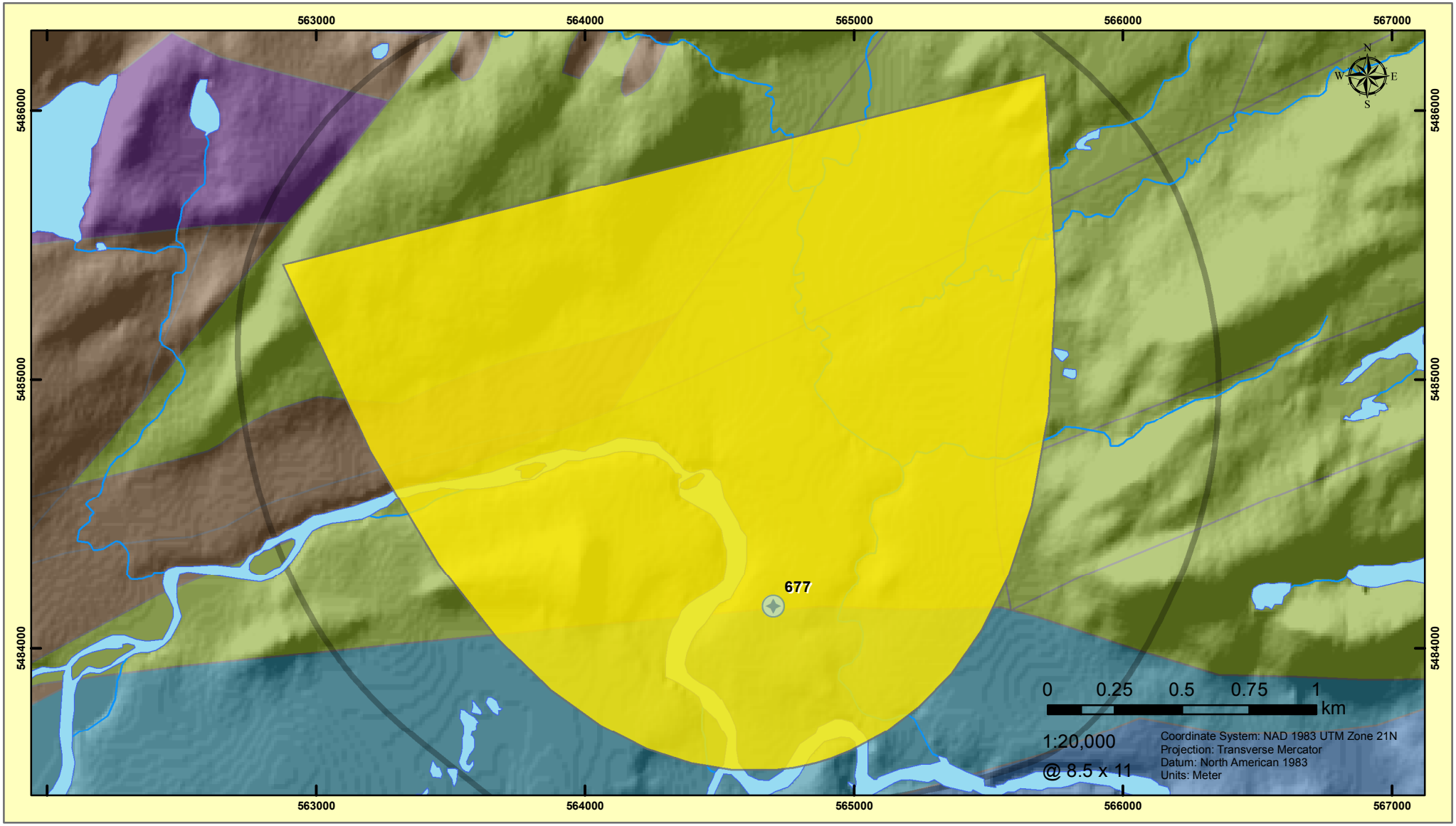



# Springdale

Bedrock Well

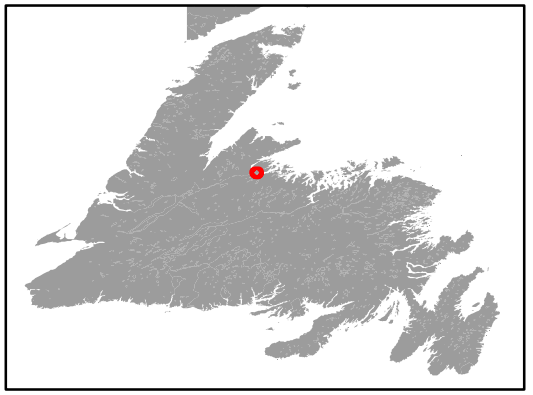
WHPA

Well Field Study Area

**Bedrock Geology** Volcanic

- Catchers Pond Group,
- Catchers Pond Group?,
- Lushs Bight Group,
- Springdale Group, Sedimentary rocks
- Springdale Group, Volcanic rocks
- Springdale Group, Volcanic rocks (exotically derived)

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 677 | # 1 Well | 40 | 2764 | 1716 | 0.00000204 |
| | | | | | |



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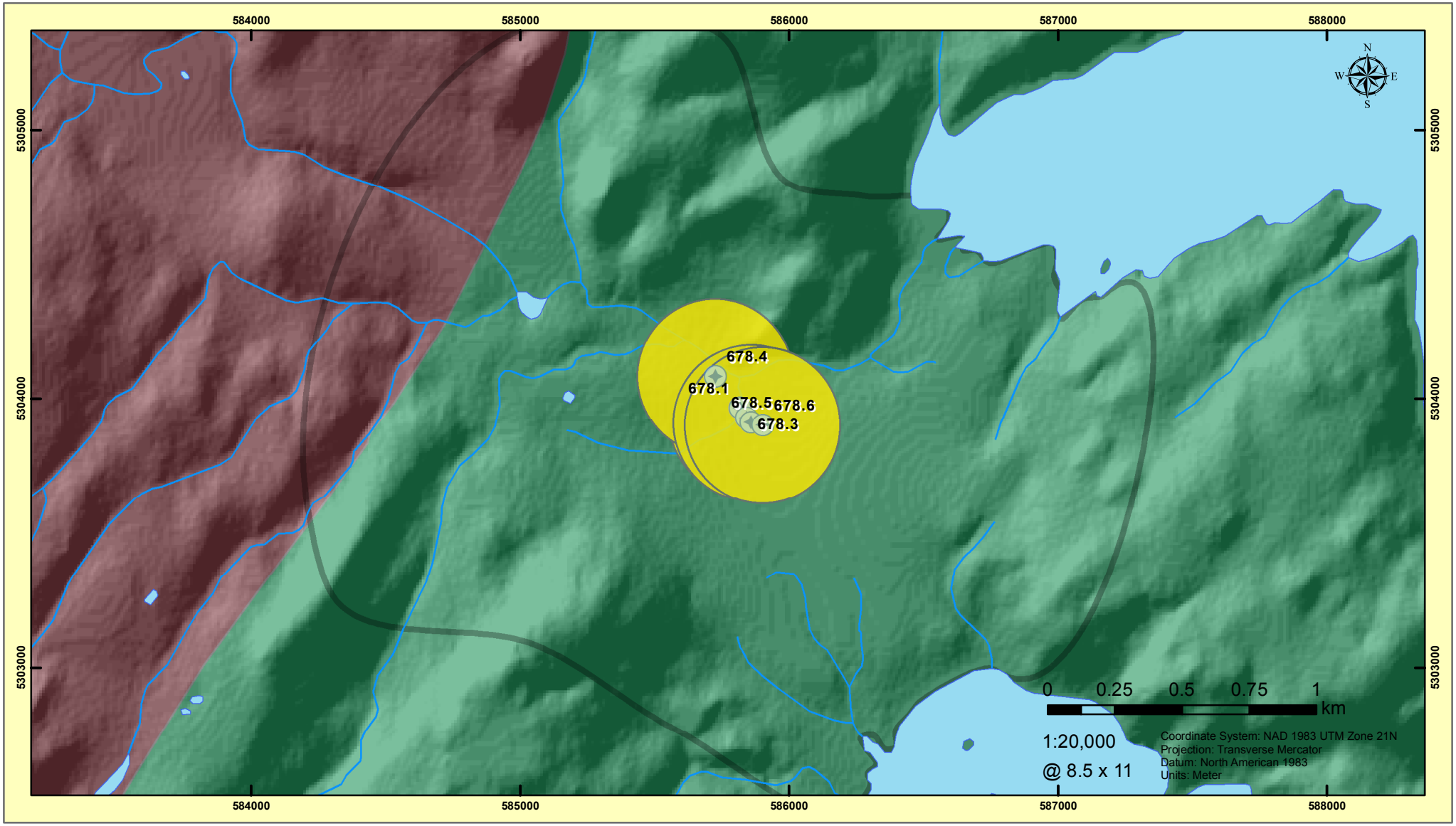



# St. Alban's

Bedrock Well

WHPA

Well Field Study Area

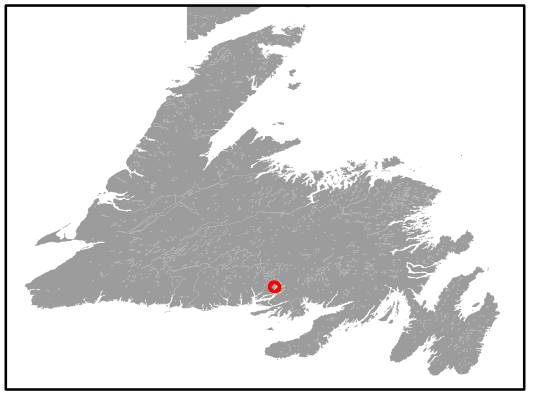
**Bedrock Geology**

Alternating Sedimentary

Baie d'Espoir Group, Salmon River Dam Formation

Baie d'Espoir Group, St. Josephs Cove Formation

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 678.1 | Well #1 | 93 | 213 | 132 | 0.0000000453 |
| 678.3 | Well #3 | 49 | 213 | 132 | 0.000000086 |
| 678.4 | Well #4 | 49 | 213 | 132 | 0.000000086 |
| 678.5 | Well #5 | 49 | 213 | 132 | 0.000000086 |
| 678.6 | Well #6 | 49 | 213 | 132 | 0.000000086 |
| | | | | | |



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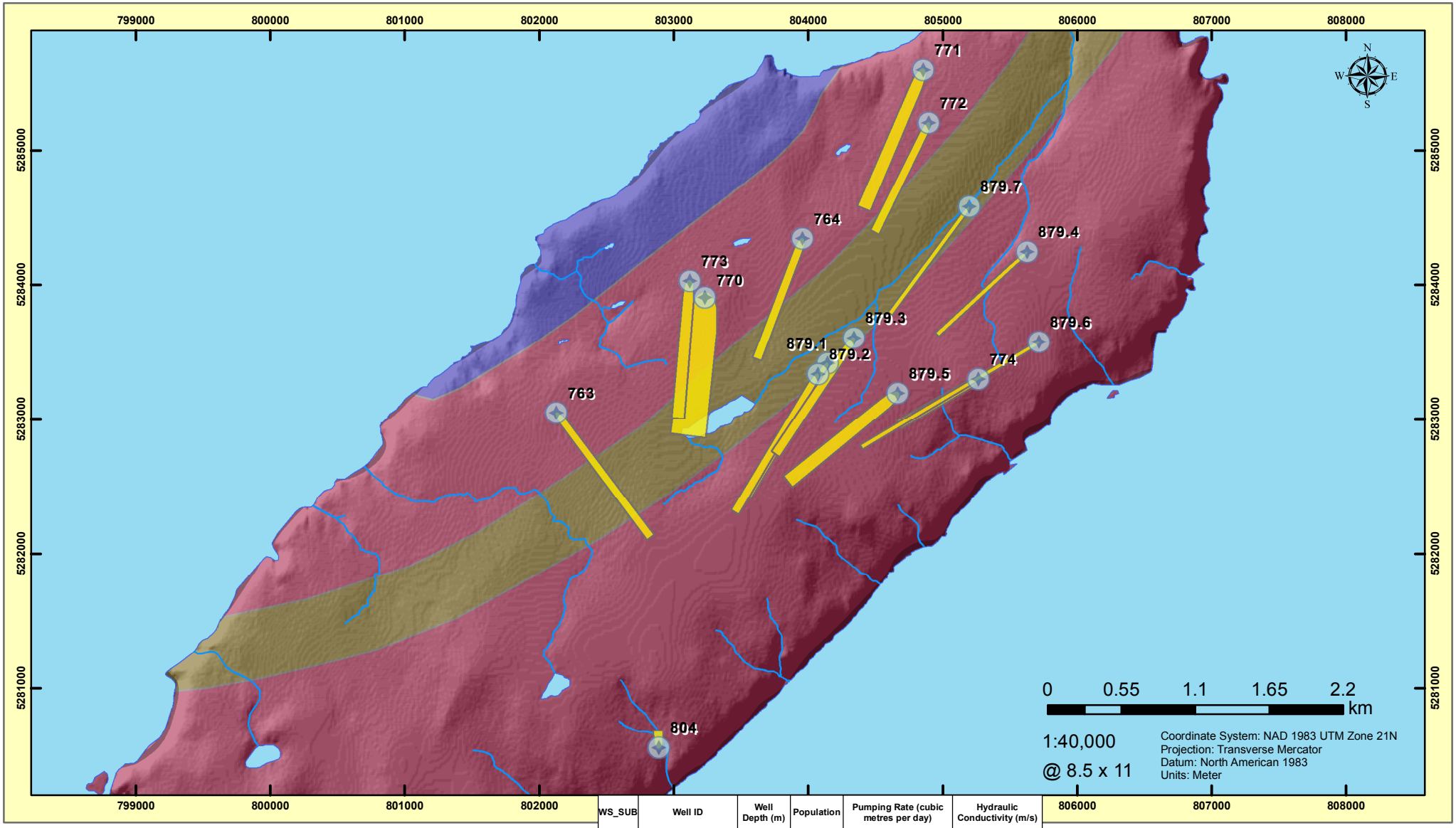


# Wabana

Bedrock Well

WHPA

Well Field Study Area

**Bedrock Geology** Sandstone/FG

- Bell Island Group, Little Bell Island Formation
- Bell Island Group, Redmans Formation
- Harbour Main Group,
- Wabana Group, Grebes Nest Point Formation

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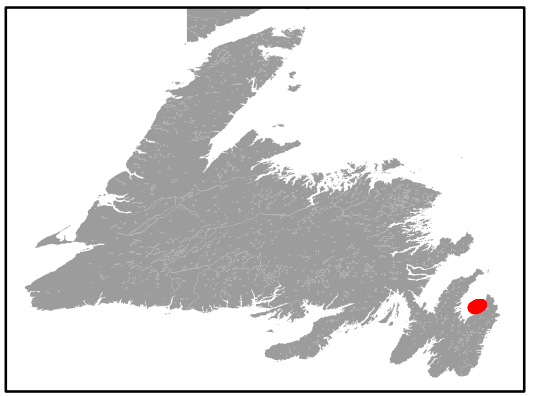
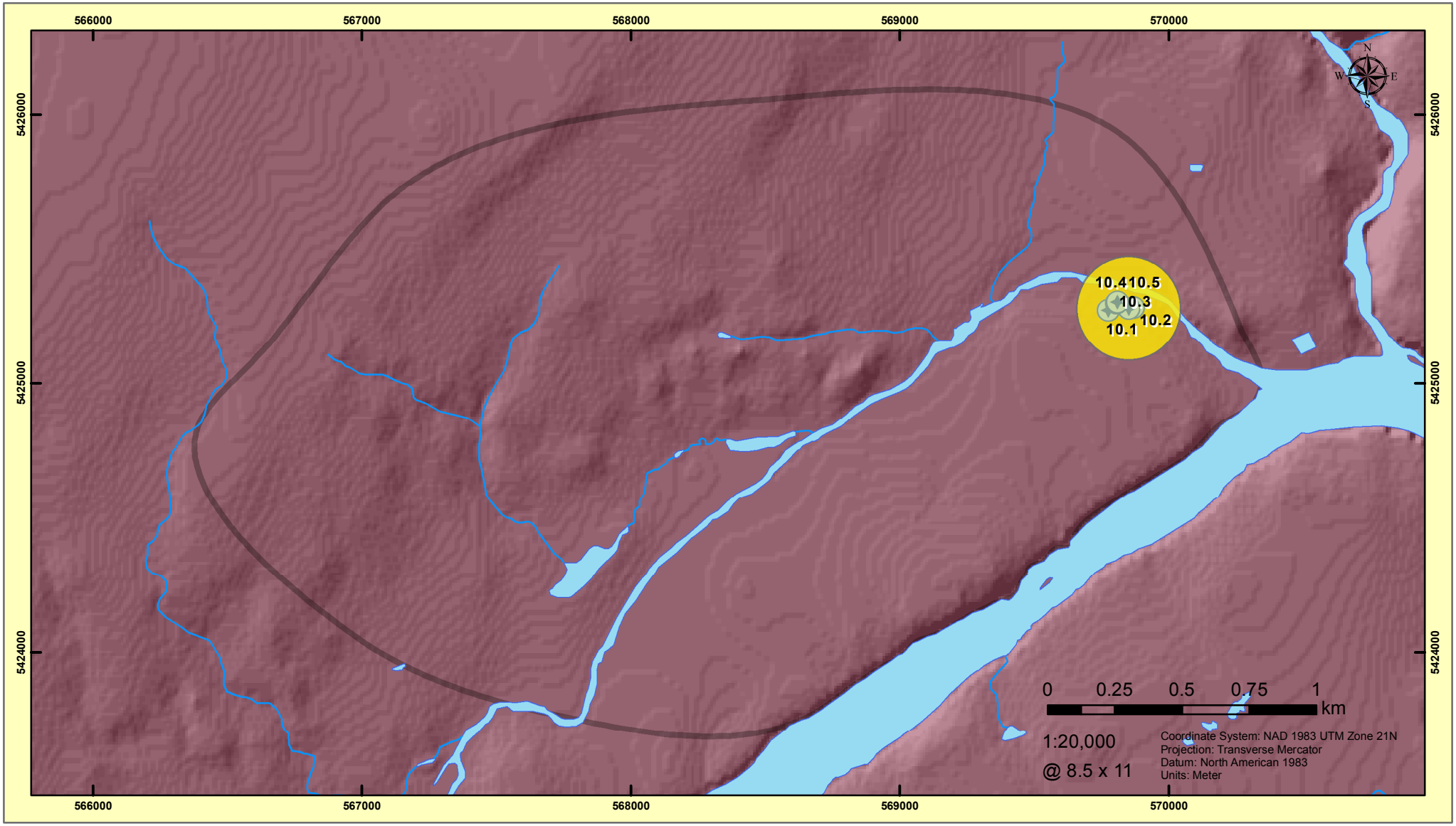
| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 763 | Middleton Ave. Well | 91 | 149 | 93 | 0.00000654 |
| 764 | #3 Yard Well | 152 | 224 | 139 | 0.00000654 |
| 770 | #4 West Mines Well | 49 | 271 | 168 | 0.00000654 |
| 771 | East #1 Well | 91 | 223 | 138 | 0.00000654 |
| 772 | Quigley's Line Well | 165 | 223 | 138 | 0.00000654 |
| 773 | Scotia #1 Well | 113 | 223 | 138 | 0.00000654 |
| 774 | St. Edwards Well | 122 | 60 | 37 | 0.00000654 |
| 804 | Local Service District Well | 96 | 18 | 11 | 0.000000206 |
| 879.1 | #13 Scotia Road Well | 91 | 149 | 93 | 0.00000654 |
| 879.2 | #15 Scotia Road Well | 92 | 149 | 93 | 0.00000654 |
| 879.3 | Davidson Ave. Well | 91 | 149 | 93 | 0.00000654 |
| 879.4 | Fancy Hill Well | 202 | 149 | 93 | 0.00000654 |
| 879.5 | Kavanagh's Lane Well | 64 | 149 | 93 | 0.00000654 |
| 879.6 | Kelloway's The Front Well | 134 | 149 | 93 | 0.00000654 |
| 879.7 | Main Street Well | 190 | 149 | 93 | 0.00000654 |
| | | | | | |






# Badger

Bedrock Well

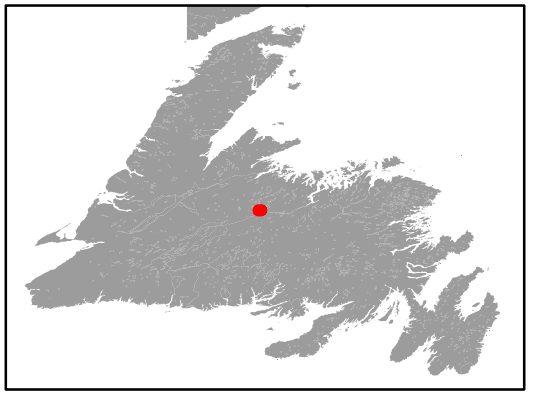
WHPA

Well Field Study Area

**Bedrock Geology**

Badger Group, Sandstone/Conglomerate

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 10.1 | Well #1 | 107 | 163 | 101 | 0.0000000412 |
| 10.2 | Well #2 | 42 | 163 | 101 | 0.000000105 |
| 10.3 | Well #3 | 42 | 163 | 101 | 0.000000105 |
| 10.4 | Well #4 | 42 | 163 | 101 | 0.000000105 |
| 10.5 | Well #5 | 42 | 163 | 101 | 0.000000105 |
| | | | | | |



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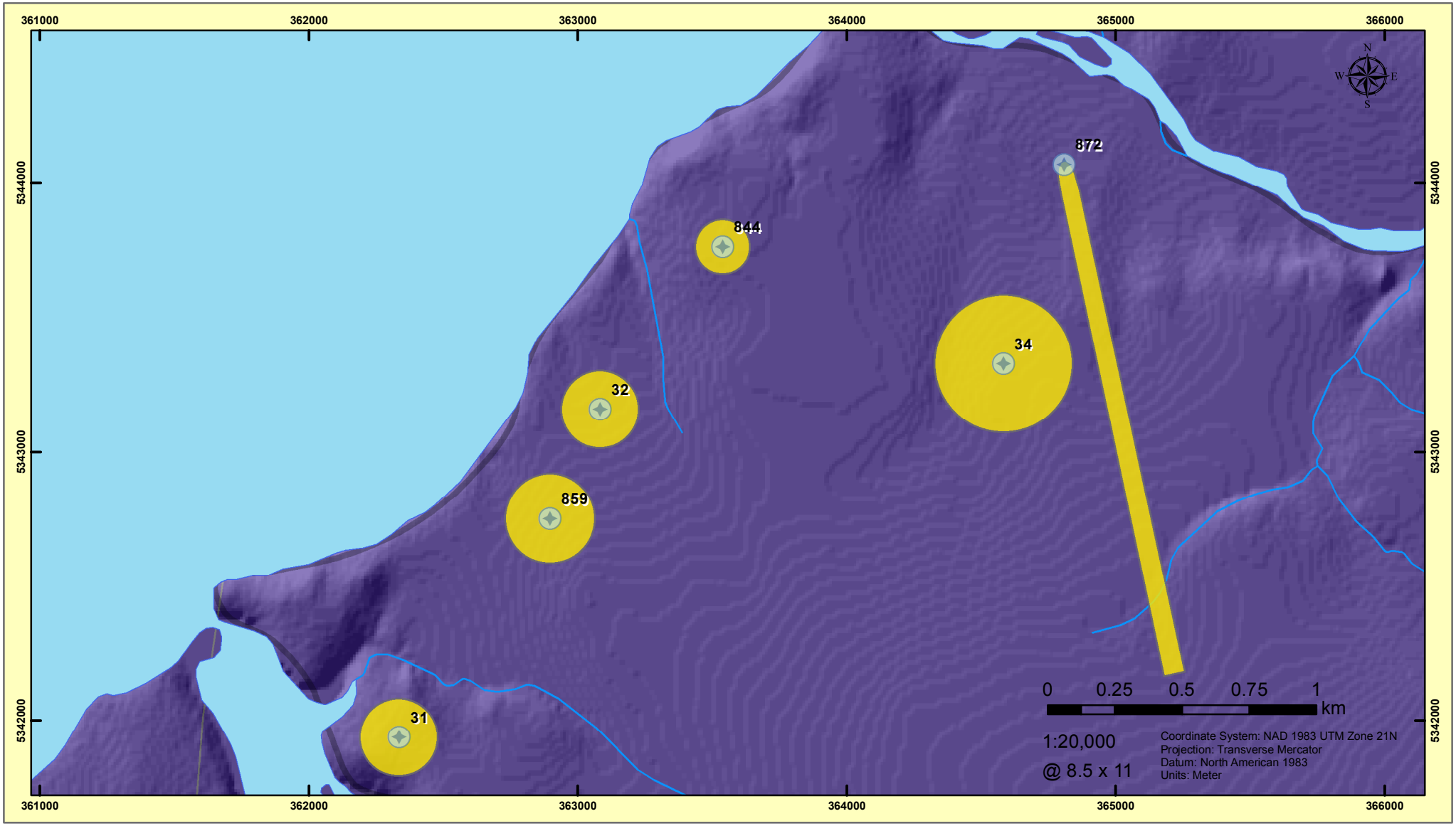


# Jeffrey's-Mckay's

Bedrock Well

WHPA

Well Field Study Area

**Bedrock Geology** FG_Sedimentary

Codroy Group, Robinsons River Formation

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 31 | #2 Well Jefferys | 56 | 61 | 38 | 0.0000002 |
| 32 | #1 Well Jefferys | 39 | 42 | 26 | 0.0000002 |
| 34 | #7 Well McKay's | 51 | 175 | 109 | 0.0000002 |
| 844 | Lions Club Well | 61 | 33 | 20 | 0.0000002 |
| 859 | #3 Well Jefferys | 49 | 71 | 44 | 0.0000002 |
| 872 | #3 Woodworth Well McKay's | 56 | 90 | 56 | 0.0000124 |
| | | | | | |

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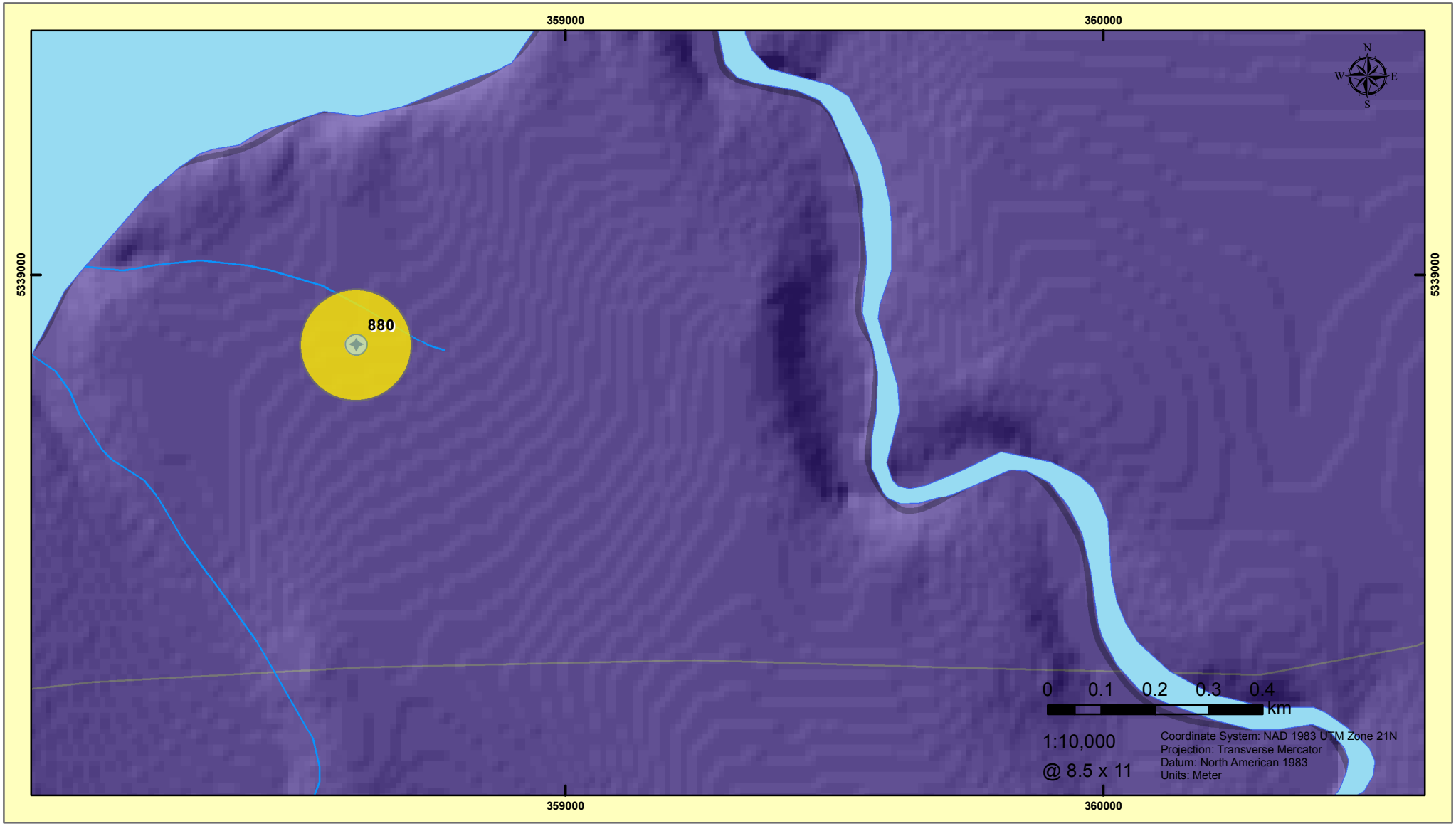


# Highlands-Lock Leven

Bedrock Well

WHPA

Well Field Study Area

**Bedrock Geology** FG_Sedimentary

Codroy Group, Robinsons River Formation

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 880 | #3 Brian Pumphrey Well Highlands | 42 | 47 | 29 | 0.0000002 |
| | | | | | |

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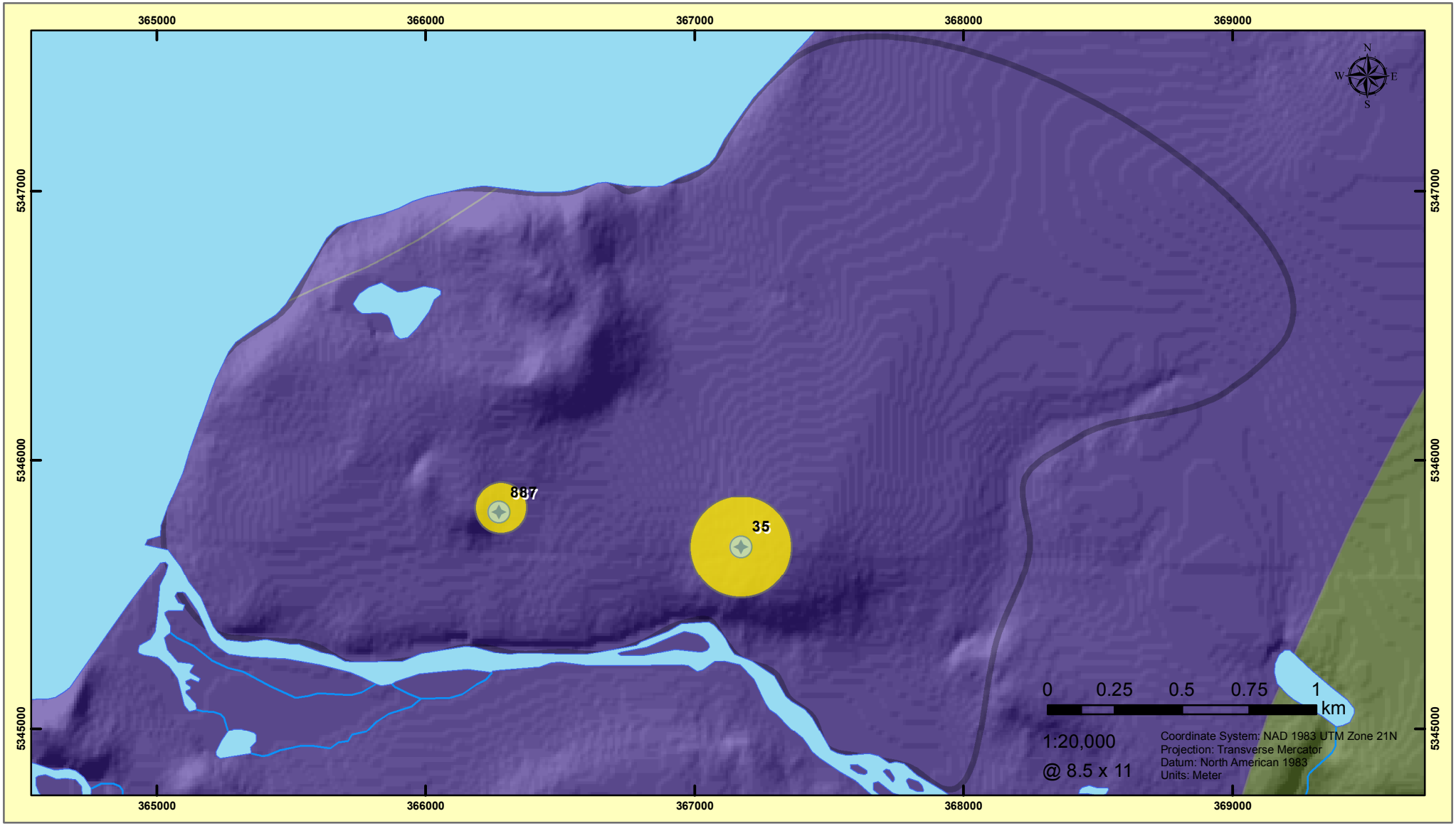


# Robinson's

Bedrock Well

WHPA

Well Field Study Area

**Bedrock Geology** FG_Sedimentary

Codroy Group, Codroy Road Formation

Codroy Group, Robinsons River Formation

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 35 | #1 Well Robinson's | 54 | 101 | 63 | 0.0000002 |
| 887 | #3 Well Robinson's (Gales) | 37 | 24 | 15 | 0.0000002 |
| | | | | | |

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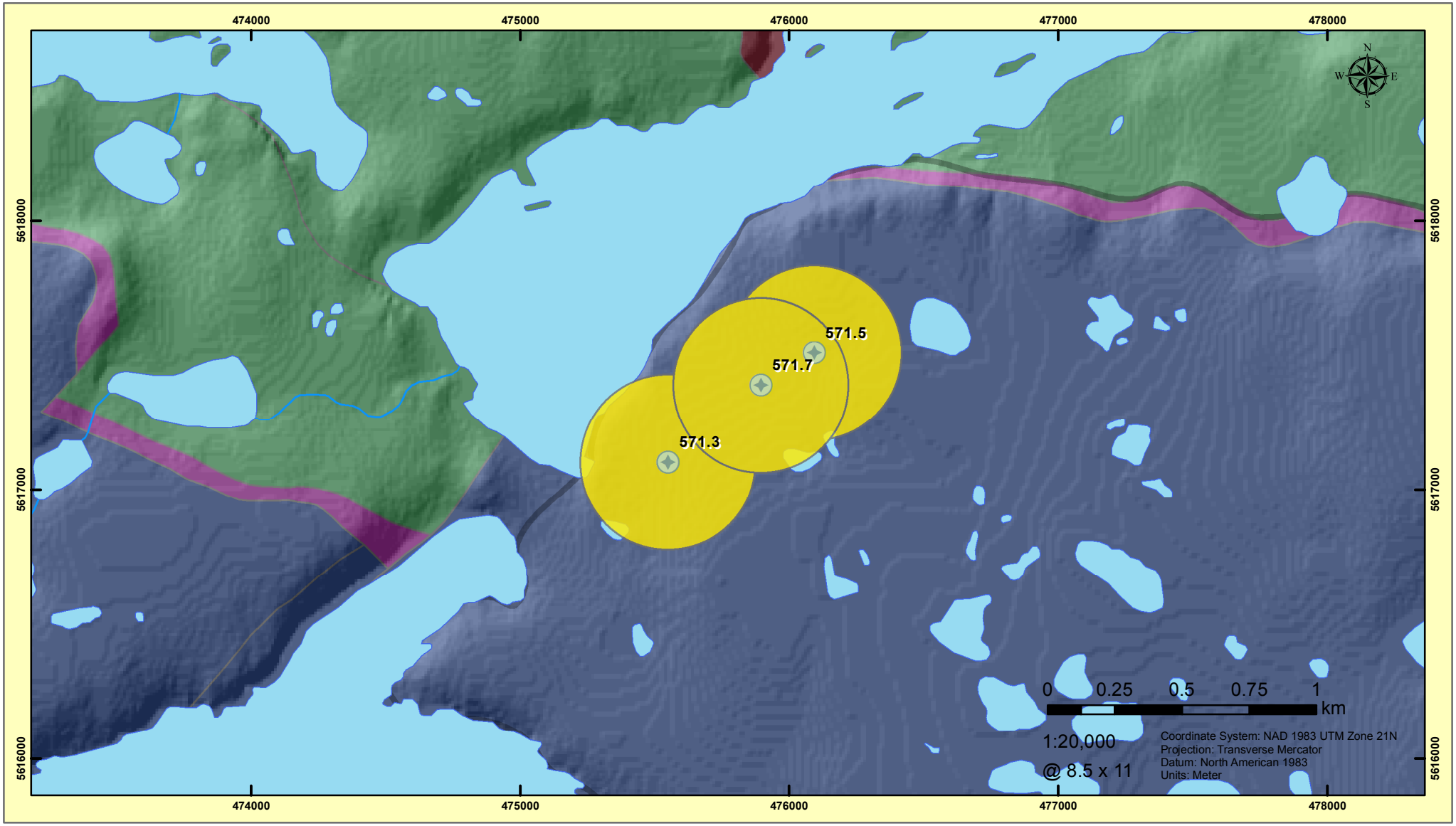



# Port au Choix

Bedrock Well

WHPA

Well Field Study Area

**Bedrock Geology** Carbonate

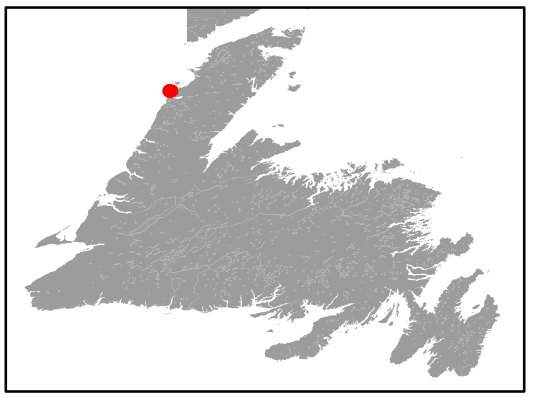
St. George Group, Aguathuna Formation

St. George Group, Boat Harbour Formation

St. George Group, Catoche Formation

Table Head Group, Table Point Formation

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 571.3 | Well Field (well #3) | 49 | 268 | 167 | 0.000000142 |
| 571.5 | Well Field (well #5) | 49 | 268 | 167 | 0.000000142 |
| 571.7 | Well Field (well #7) | 49 | 268 | 167 | 0.000000142 |
| | | | | | |



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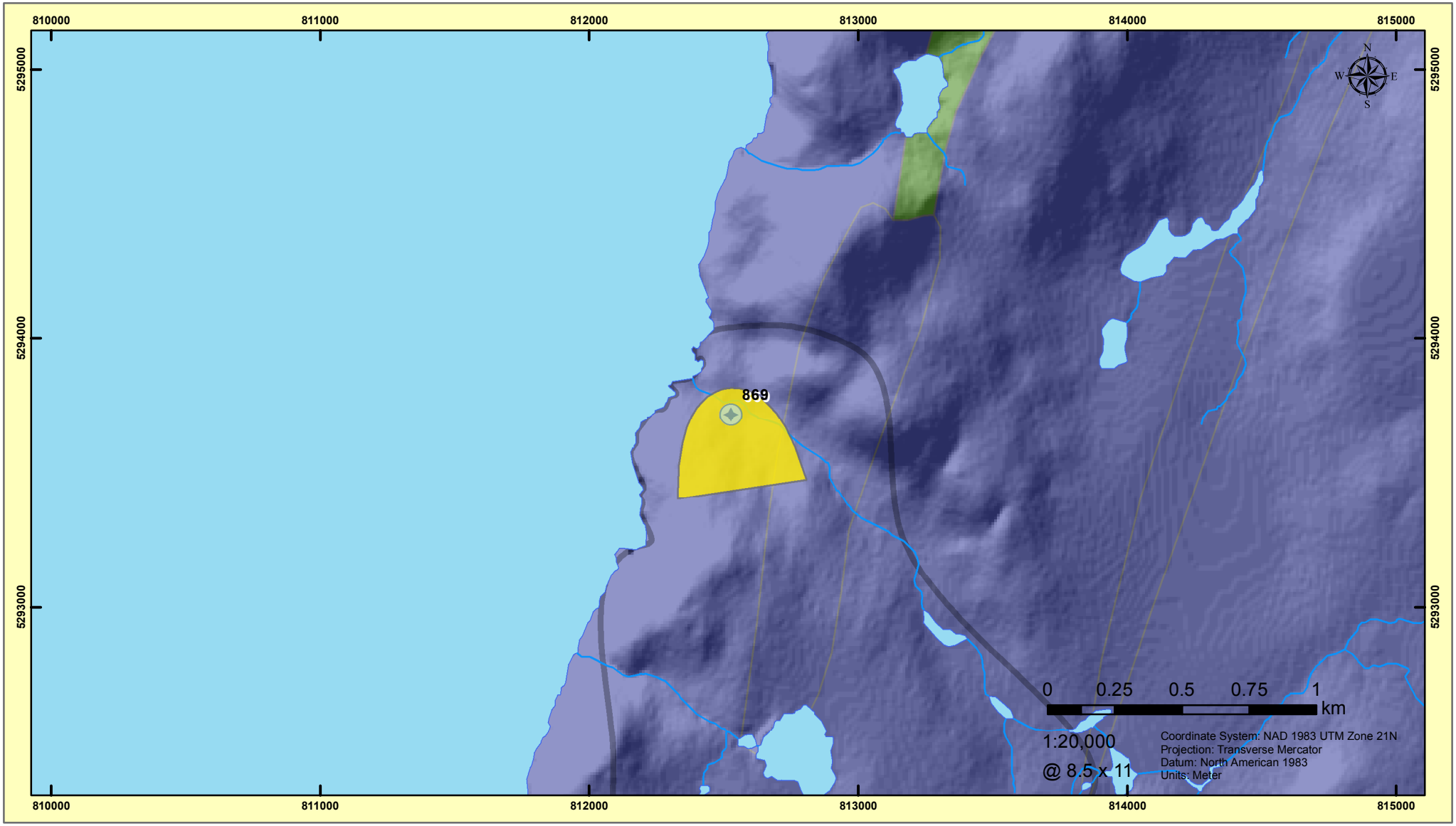


# Bauline

Bedrock Well

WHPA

Well Field Study Area

**Bedrock Geology**

Alternating Sedimentary

Harbour Main Group,

Holyrood Intrusive Suite,

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 869 | #1 Brook Path Well | 55 | 105 | 65 | 0.000000109 |
| | | | | | |

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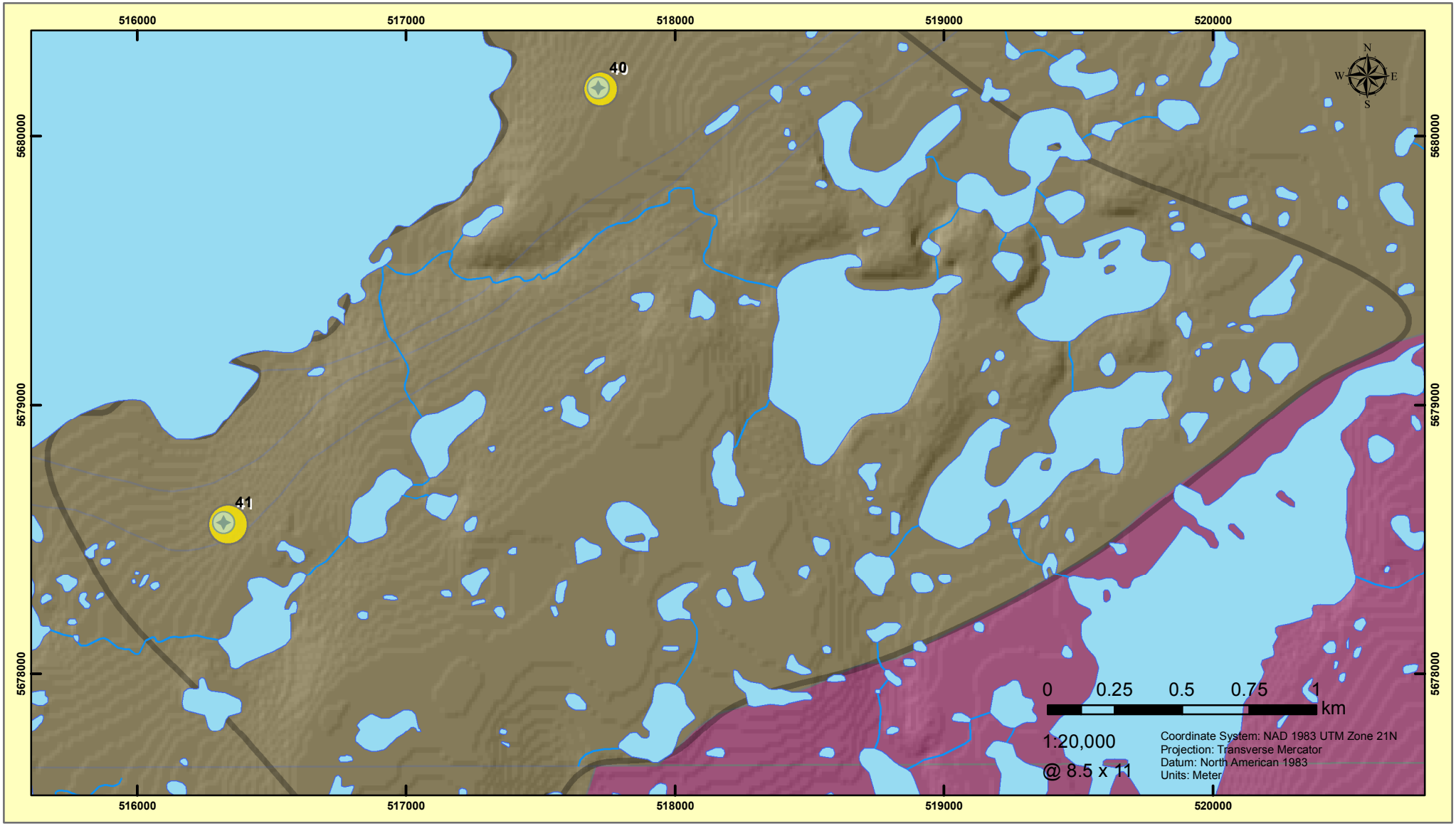



# Bear Cove

Bedrock Well

WHPA

Well Field Study Area

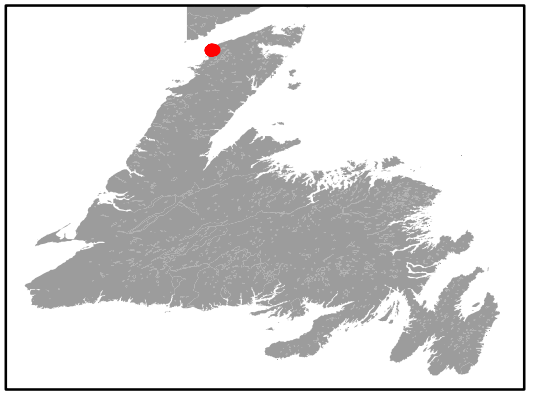
**Bedrock Geology**

Carbonate

Port au Port Group, Berry Head Formation

Port au Port Group, Petit Jardin Formation

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 40 | Lower Bear Cove | 71 | 20 | 12 | 0.0000000977 |
| 41 | Upper Bear Cove | 26 | 9 | 6 | 0.000000267 |
| | | | | | |



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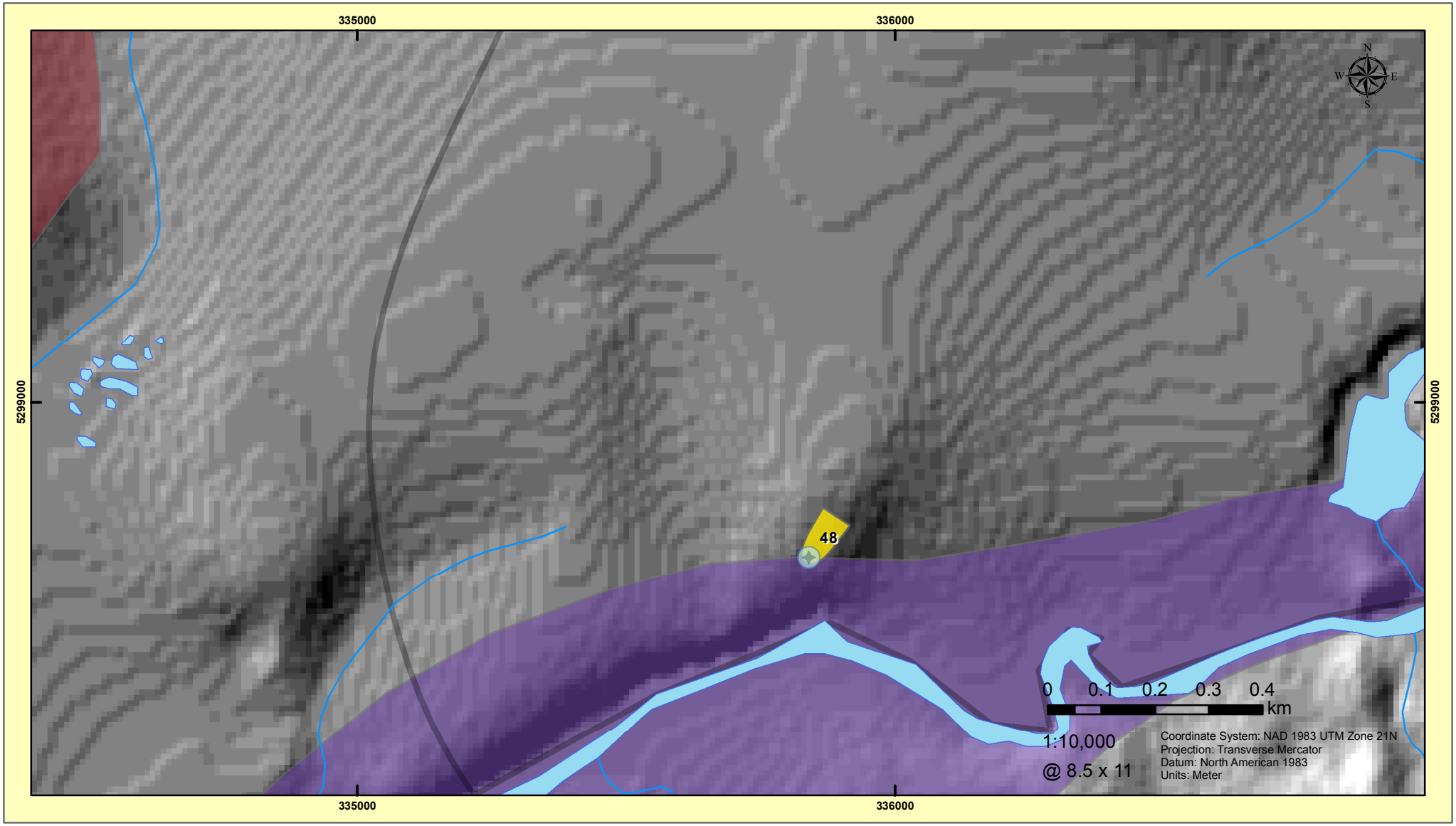


# Benoit's Siding

Bedrock Well
WHPA
Well Field Study Area

**Bedrock Geology** FG_Sedimentary
Barachois Group, Searston Formation
Codroy Group, Woody Cape Formation

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 48 | Drilled | 50 | 5 | 3 | 0.000000139 |
| | | | | | |

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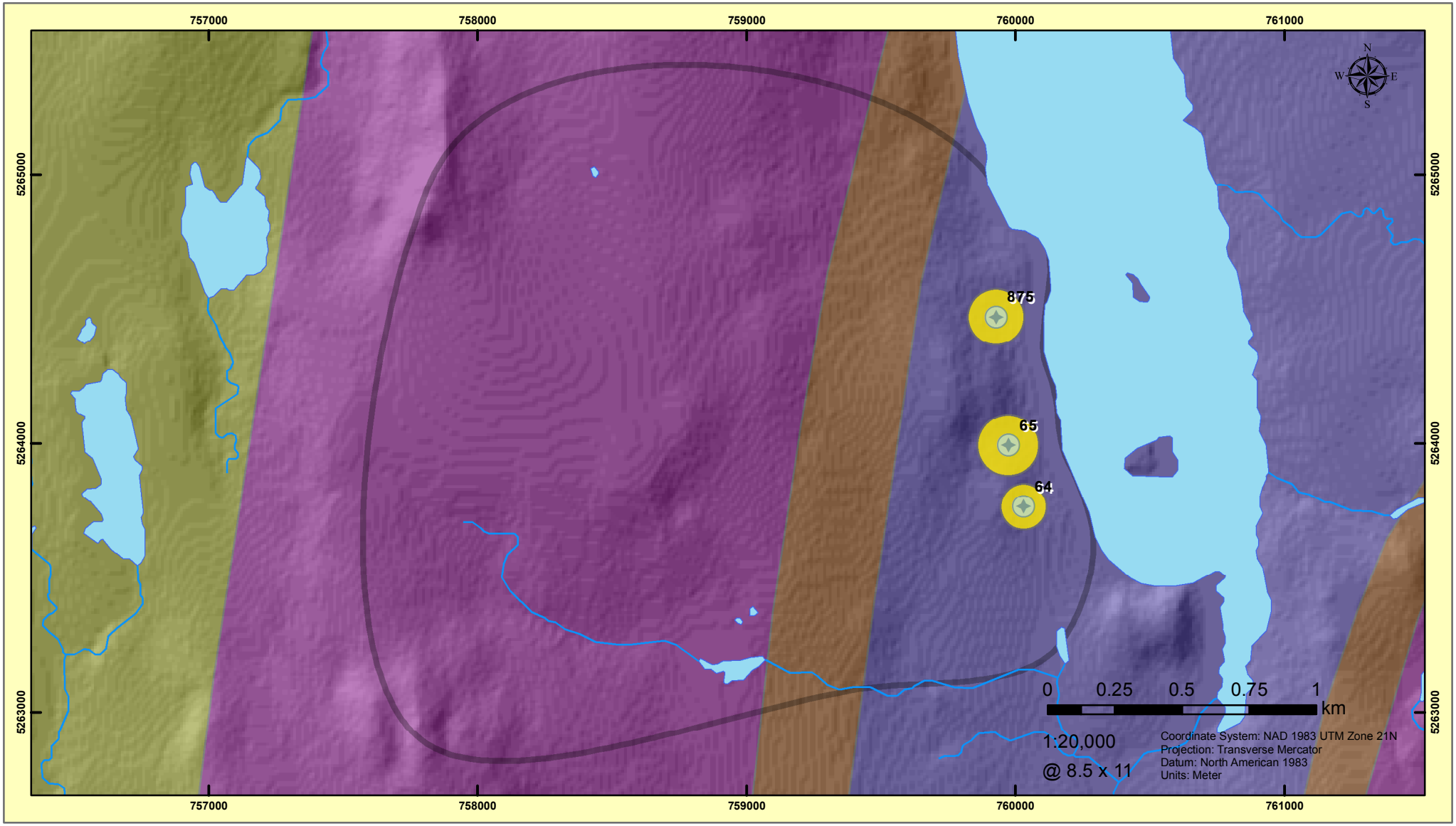



# Blaketown

Bedrock Well

WHPA

Well Field Study Area

**Bedrock Geology** Sandstone/FG

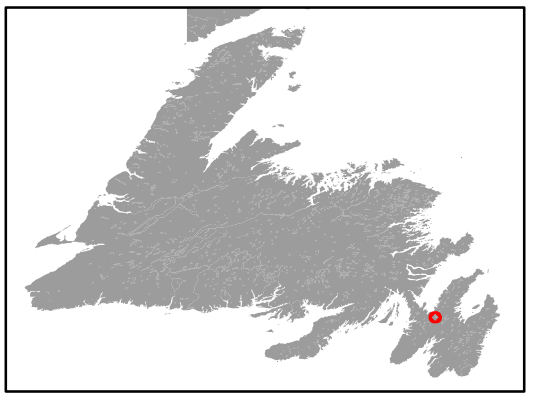
Musgravetown Group, Big Head Formation

Musgravetown Group, Heart's Content Formation

Musgravetown Group, Heart's Desire Formation

Musgravetown Group, Maturin Ponds Formation

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 64 | #1 Well | 68 | 26 | 16 | 0.0000000346 |
| 65 | #2 Well - Mercer's Well | 132 | 89 | 55 | 0.0000000346 |
| 875 | #3 Well - Fred Osborne Well | 132 | 75 | 47 | 0.0000000346 |
| | | | | | |



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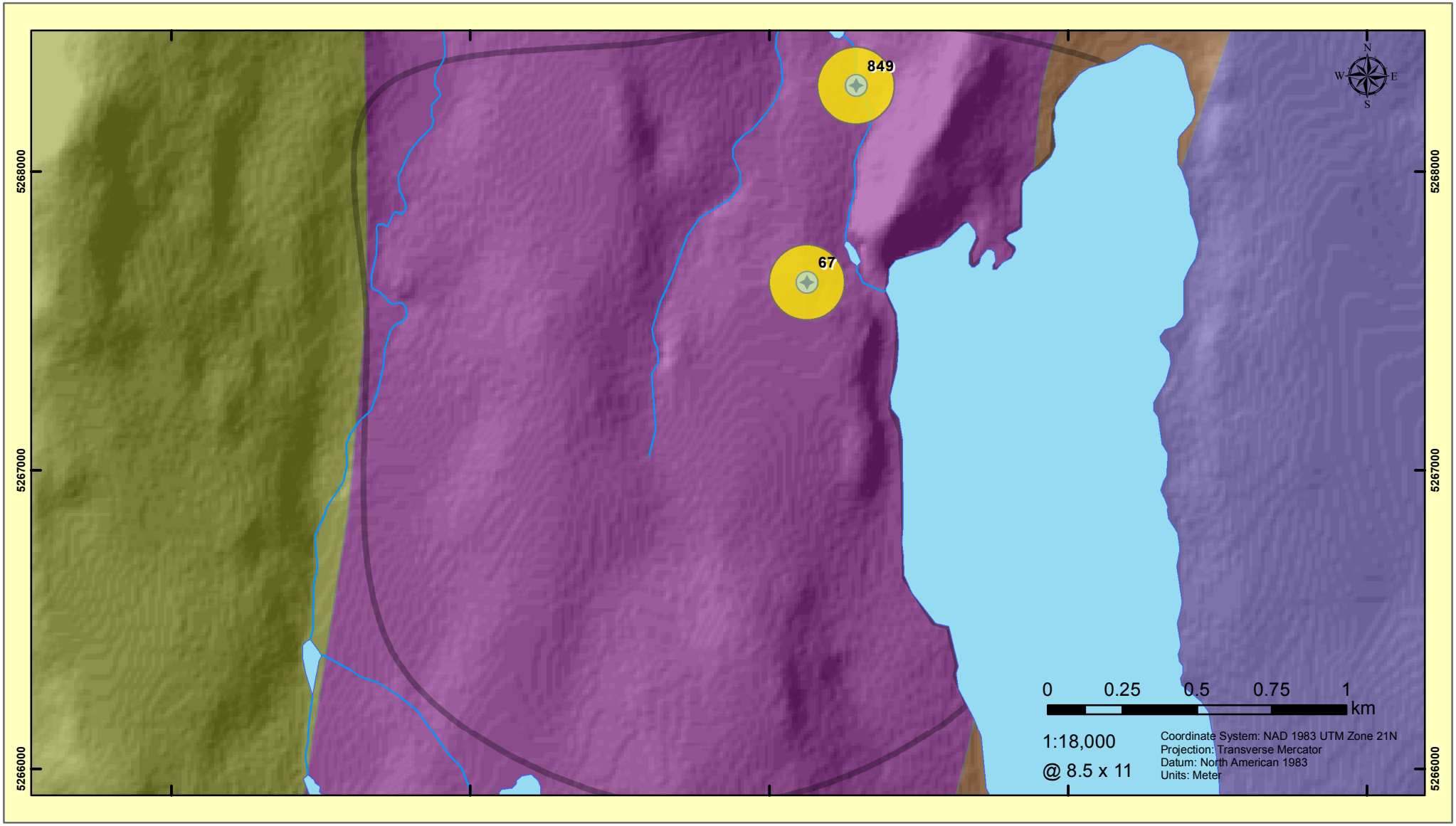



# South Dildo

Bedrock Well

WHPA

Well Field Study Area

**Bedrock Geology** Alternating Sedimentary

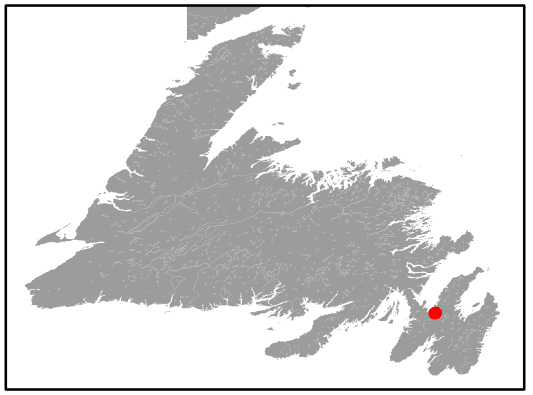
Musgravetown Group, Big Head Formation

Musgravetown Group, Heart's Content Formation

Musgravetown Group, Heart's Desire Formation

Musgravetown Group, Maturin Ponds Formation

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 67 | #4 Well | 57 | 47 | 29 | 0.0000000346 |
| 849 | #5 Well - Calvin Reid Well | 57 | 49 | 30 | 0.0000000897 |
| | | | | | |



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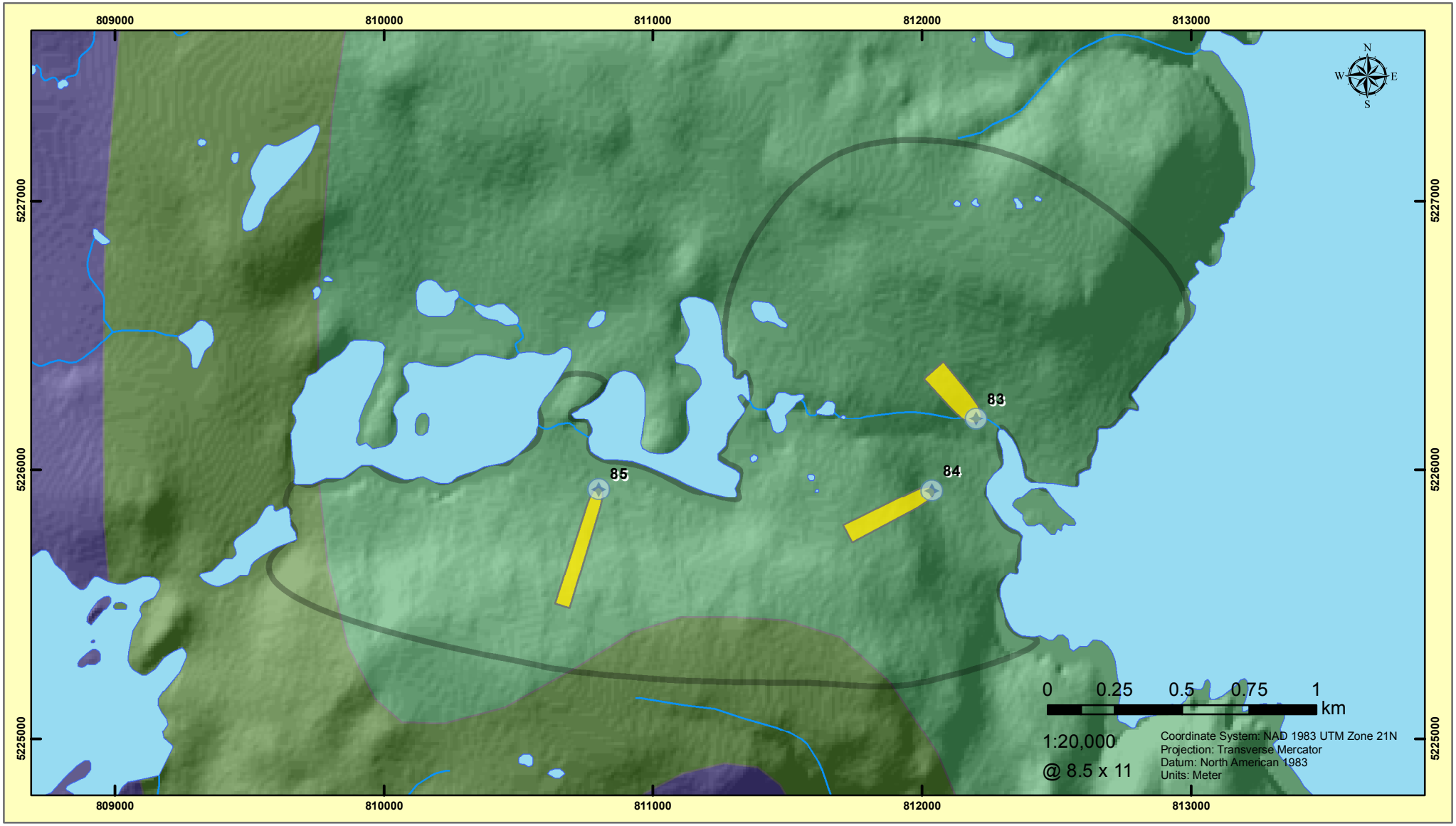


# Brigus South

Bedrock Well

WHPA

Well Field Study Area

**Bedrock Geology** FG_Sedimentary

Conception Group, Mistaken Point Formation

St. John's Group, Fermeuse Formation

St. John's Group, Trepassey formation

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 83 | #2 Well Dunphey's Hilll | 67 | 30 | 19 | 0.000000423 |
| 84 | #1 Well Forge Hill | 50 | 25 | 16 | 0.000000423 |
| 85 | #3 Well Main Road | 50 | 26 | 16 | 0.000000423 |
| | | | | | |

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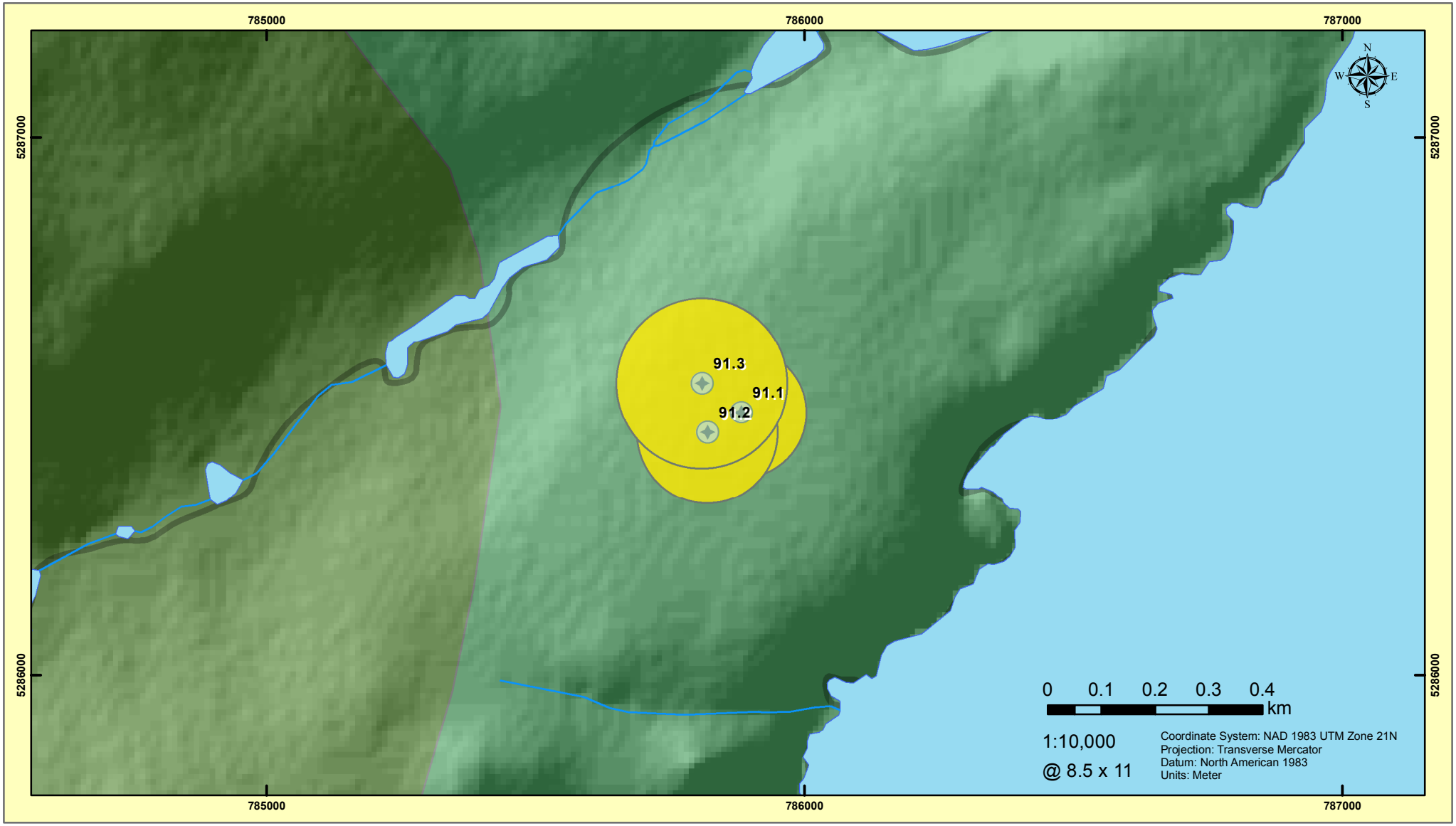



# Bryant's Cove South

Bedrock Well

WHPA

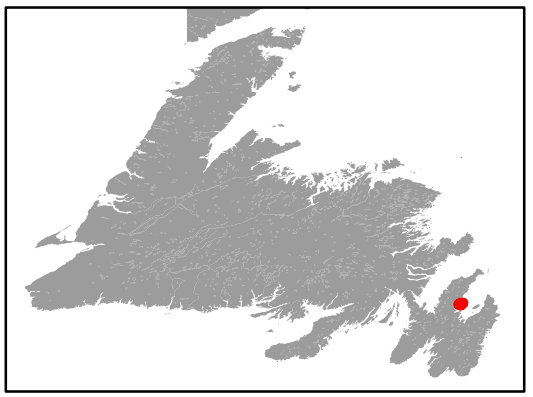
Well Field Study Area

**Bedrock Geology** FG_Sedimentary

St. John's Group, Fermeuse Formation

St. John's Group, Trepassey formation

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 91.1 | #1 Bert James Well | 123 | 93 | 58 | 0.0000000377 |
| 91.2 | #2 Baxter Bowering Well | 104 | 93 | 58 | 0.0000000446 |
| 91.3 | #3 Backup Well & Pumphouse | 71 | 93 | 58 | 0.0000000653 |
| | | | | | |



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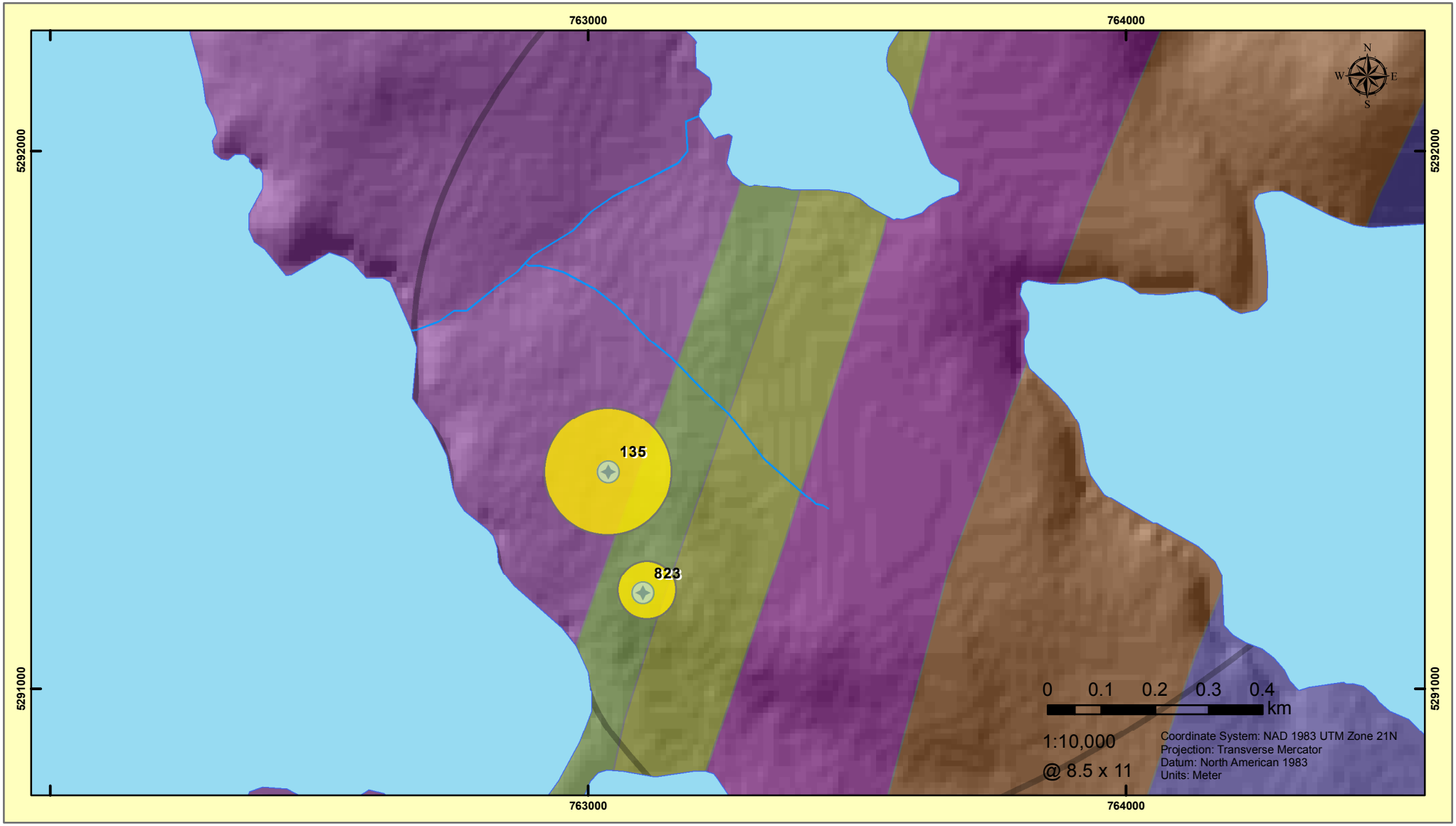


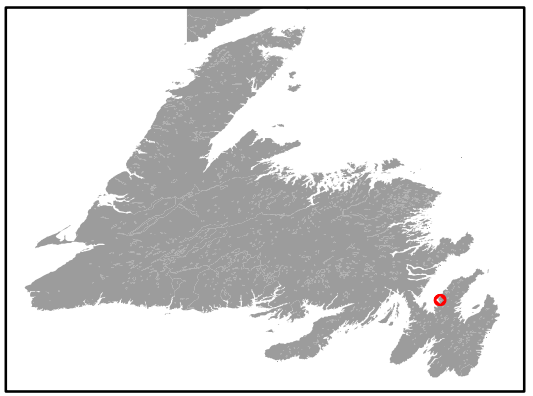

# North Side Cavendish

Bedrock Well
WHPA
Well Field Study Area

**Bedrock Geology** FG_Sedimentary

- Adeyton Group, Bonavista Formation
- Musgravetown Group, Big Head Formation
- Musgravetown Group, Heart's Content Formation
- Musgravetown Group, Heart's Desire Formation
- Musgravetown Group, Maturin Ponds Formation
- Youngs Cove Group, Random Formation

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 135 | #1 Well - Max Bishop | 44 | 32 | 20 | 0.0000000516 |
| 823 | #2 Well - Tom Critch | 60 | 25 | 16 | 0.0000000516 |
| | | | | | |



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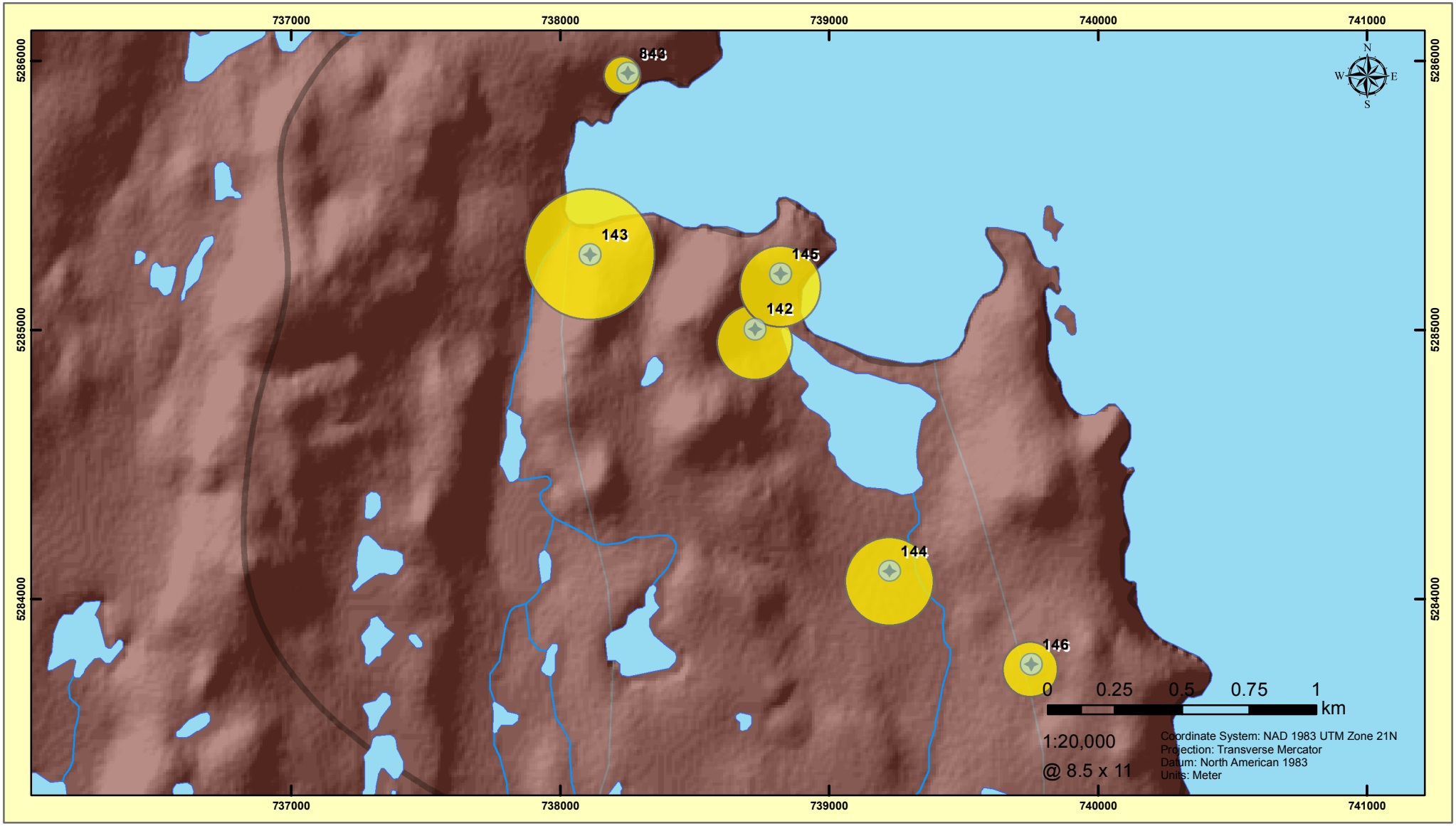



# Chance Cove

Bedrock Well

WHPA

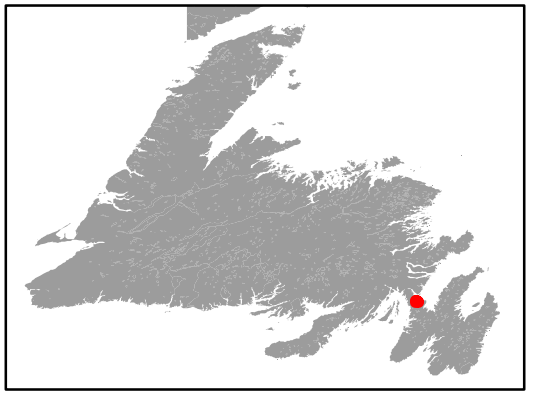
Well Field Study Area

**Bedrock Geology**

Plutonic

Musgravetown Group, Bull Arm Formation

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 142 | Angus Brace Well | 64 | 39 | 24 | 0.0000000688 |
| 143 | Albert Rowe Well | 79 | 120 | 75 | 0.0000000555 |
| 144 | Edgar Crann Well | 79 | 72 | 45 | 0.0000000555 |
| 145 | Olive Smith Well | 61 | 44 | 27 | 0.0000000722 |
| 146 | New Housing Area Well | 61 | 44 | 27 | 0.0000000722 |
| 843 | Eugene Smith Well | 92 | 27 | 17 | 0.0000000481 |
| | | | | | |



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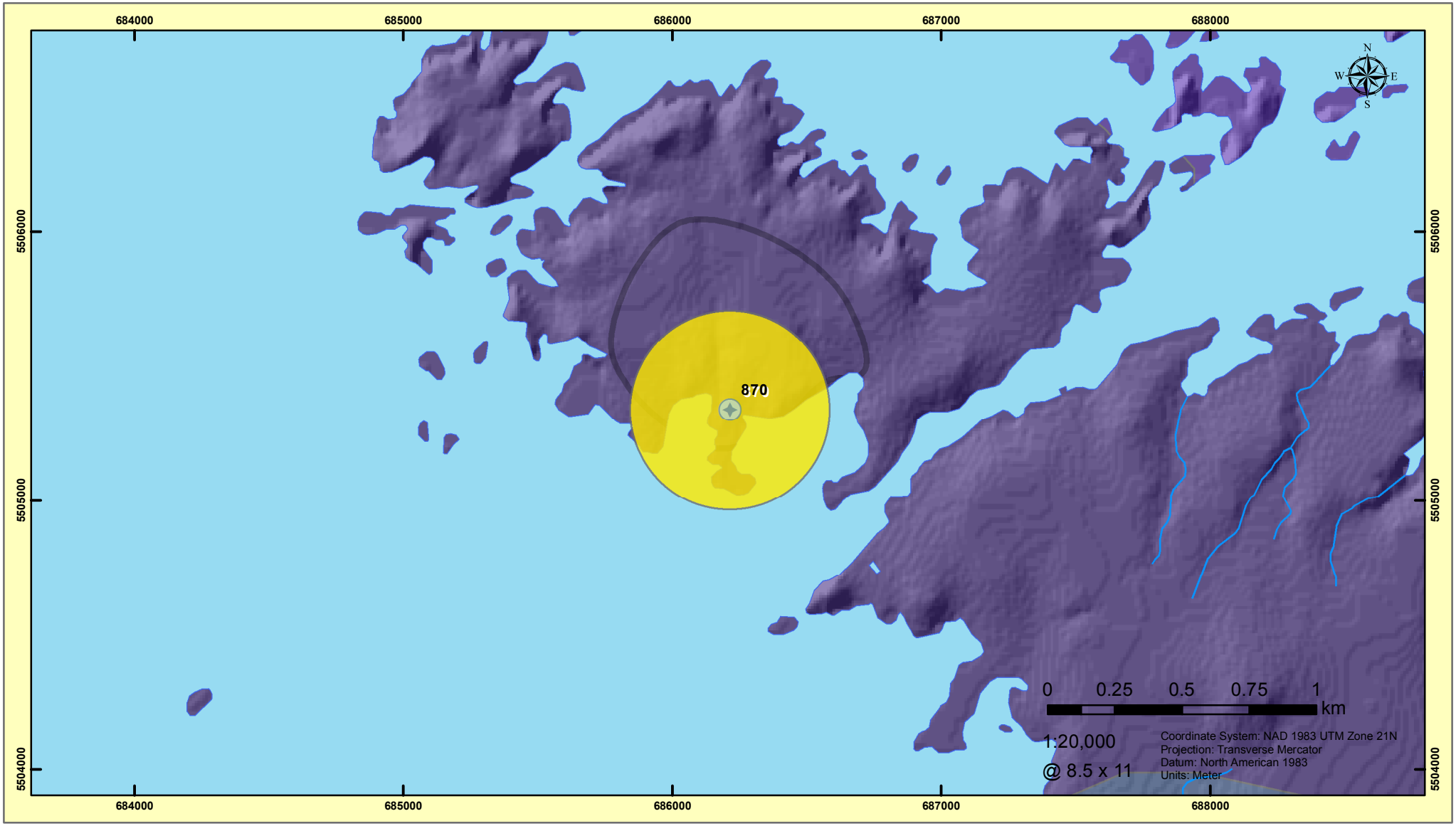



# Change Islands

Bedrock Well

WHPA

Well Field Study Area

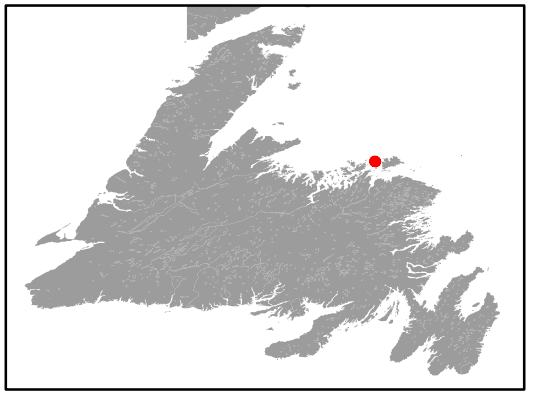
**Bedrock Geology** Volcanic

Badger Group, Sansom-type greywacke

Botwood Group, Fogo Harbour formation

Botwood Group, Lawrenceton Formation

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 870 | #1 Fox Cove Well | 42 | 300 | 186 | 0.000000126 |
| | | | | | |



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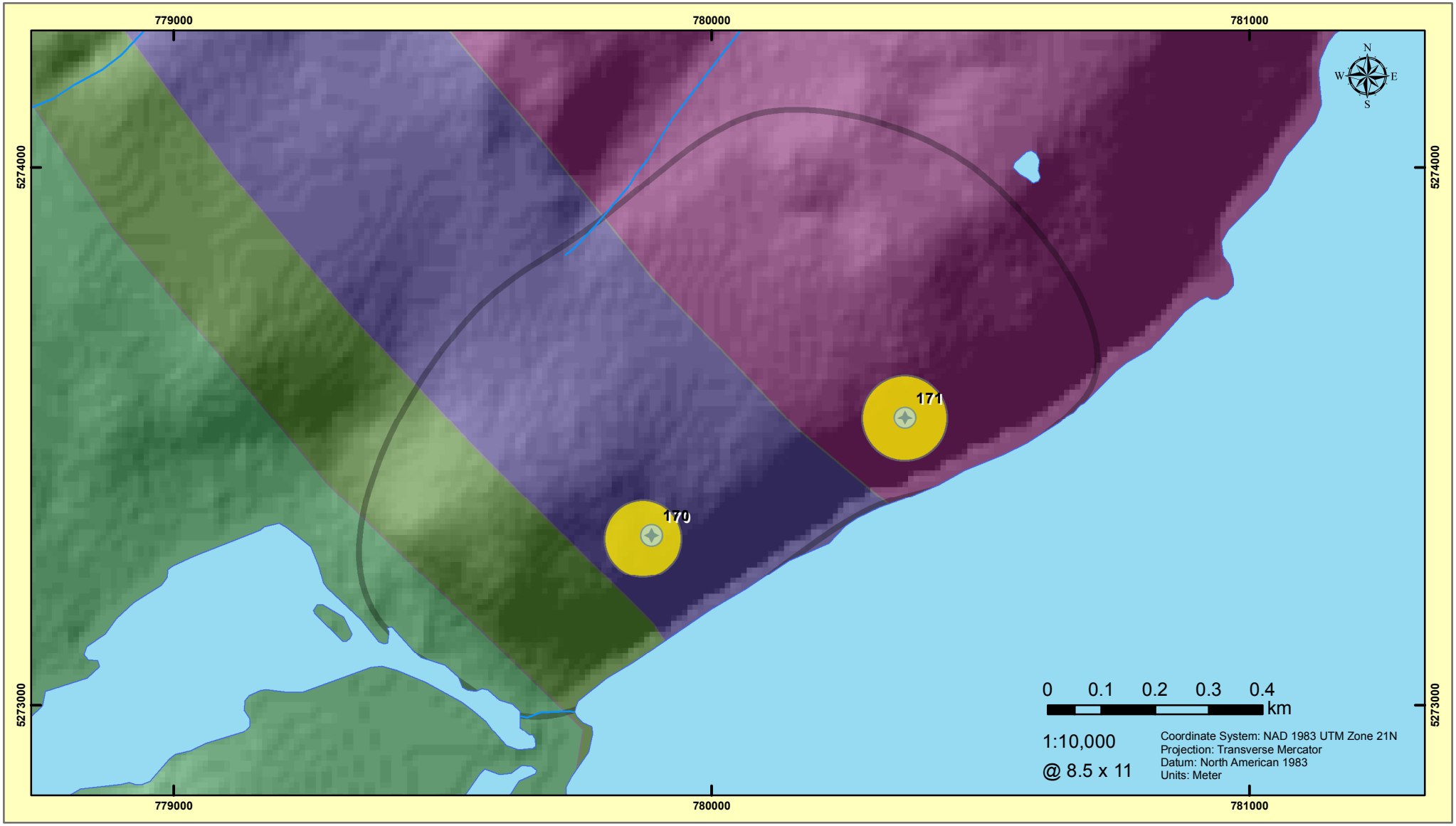


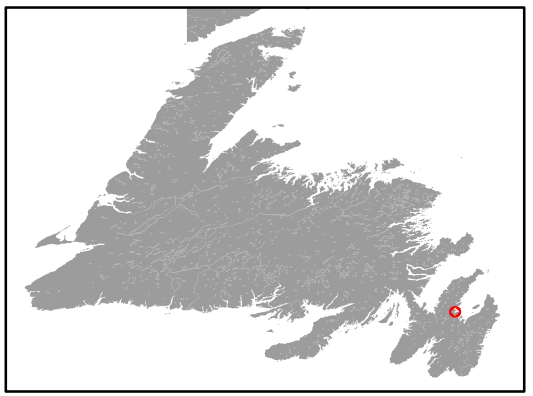

# Clarke's Beach

Bedrock Well
WHPA
Well Field Study Area

**Bedrock Geology** Alternating Sedimentary

Conception Group, Drook Formation
Conception Group, Mistaken Point Formation
St. John's Group, Fermeuse Formation
St. John's Group, Trepassey formation

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 170 | #1 Well - Quinlon Well | 54 | 19 | 12 | 0.0000000937 |
| 171 | #2 Well - Delaney Well | 73 | 24 | 15 | 0.00000004 |
| | | | | | |



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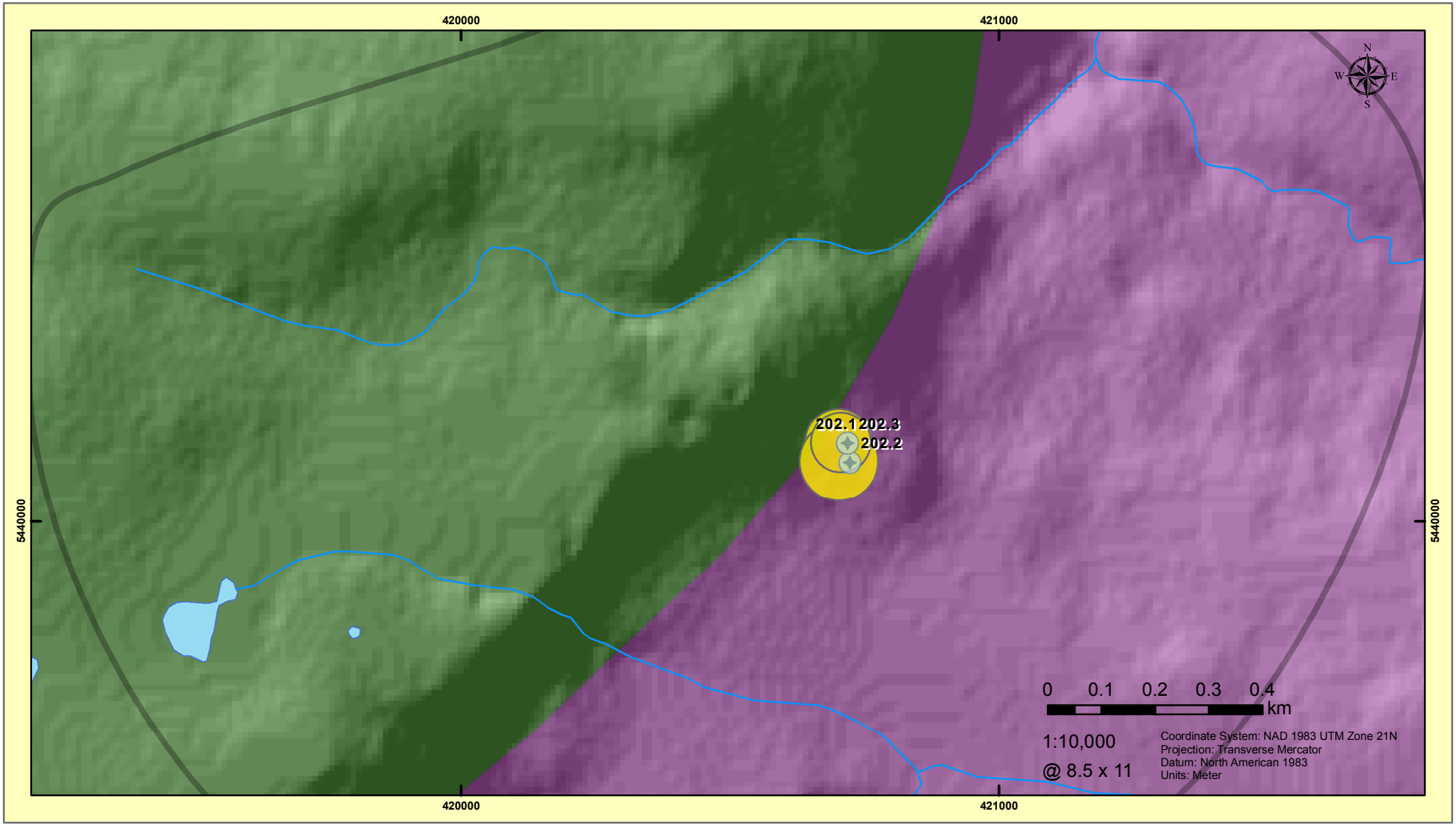



# Cox's Cove

Bedrock Well

WHPA

Well Field Study Area

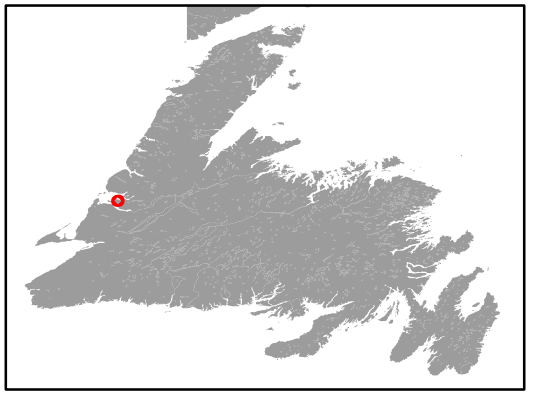
**Bedrock Geology**

Alternating Sedimentary

Curling Group, Irishtown Formation

Northern Head Group, Cooks Brook Formation

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 202.1 | Well #1 | 76 | 20 | 12 | 0.0000000553 |
| 202.2 | Well #2 | 58 | 20 | 12 | 0.0000000727 |
| 202.3 | Upper Area Well #1 | 95 | 20 | 12 | 0.0000000444 |
| | | | | | |



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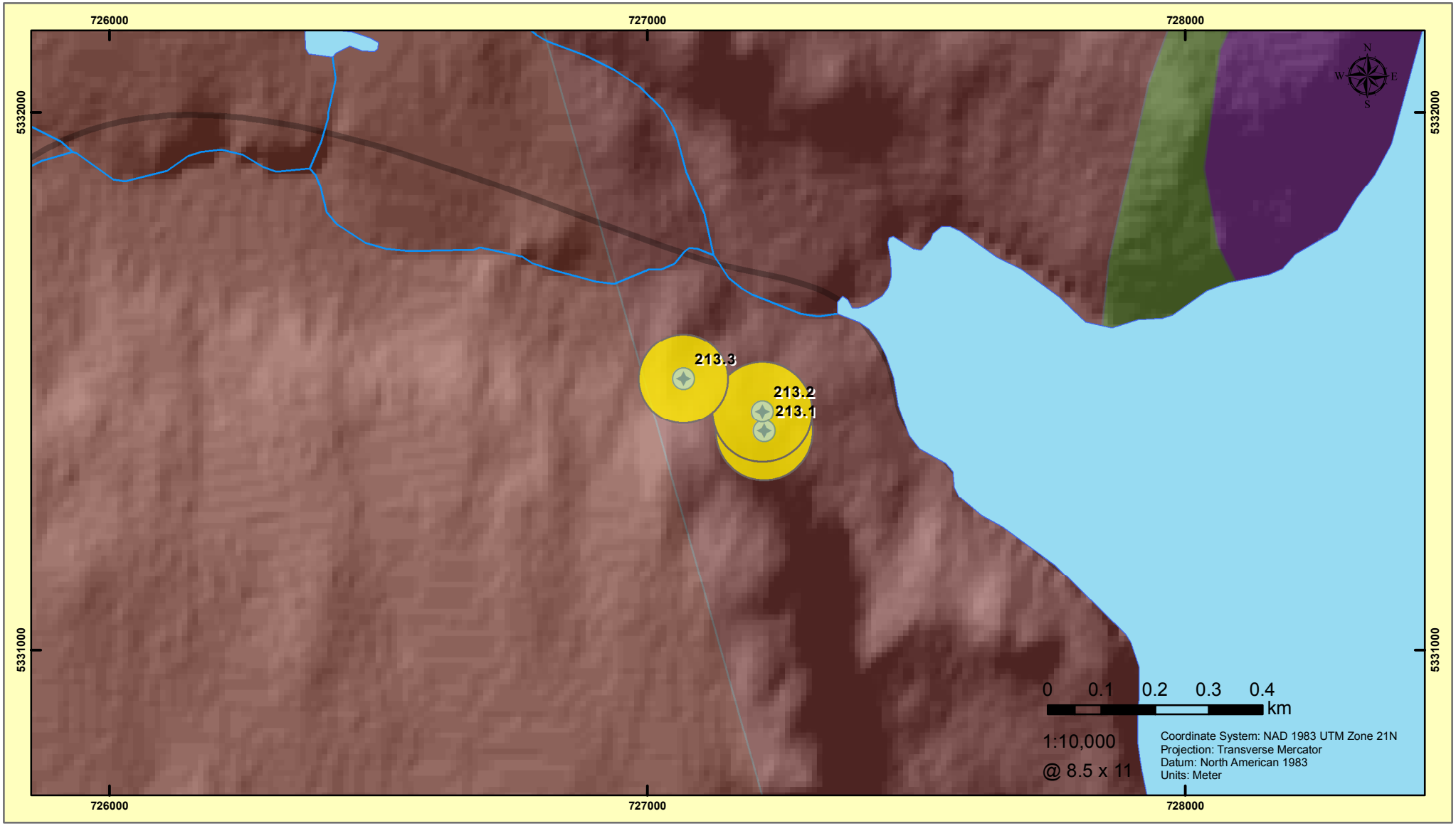



# Deep Bight

Bedrock Well

WHPA

Well Field Study Area

**Bedrock Geology** Alternating Sedimentary

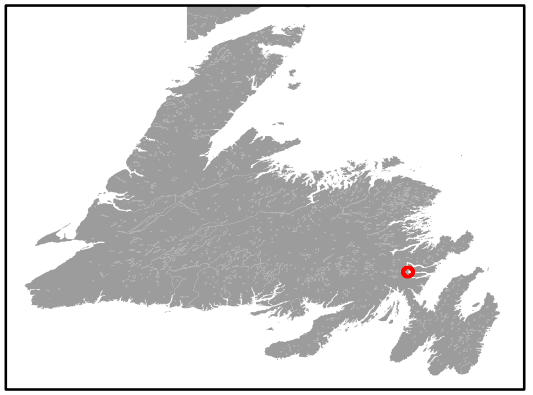
Adeyton Group, Bonavista Formation

Connecting Point Group,

Musgravetown Group, Bull Arm Formation

Youngs Cove Group, Random Formation

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 213.1 | Deep Bight Well Field (well #1) | 128 | 55 | 34 | 0.0000000111 |
| 213.2 | Deep Bight Well Field (well #2) | 122 | 55 | 34 | 0.0000000117 |
| 213.3 | Deep Bight Well Field (well #3) | 152 | 55 | 34 | 0.0000000094 |
| | | | | | |



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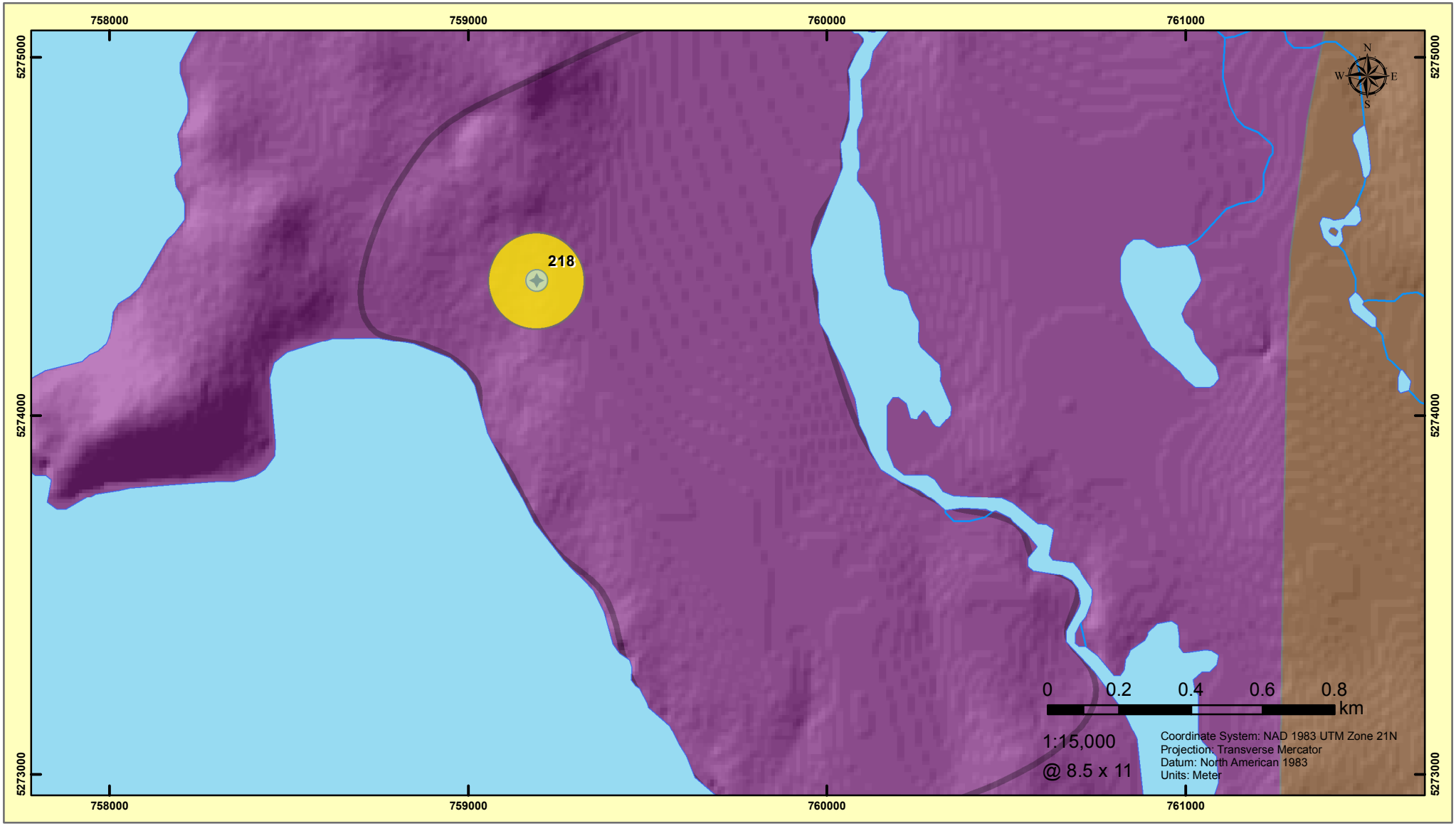



# Dildo

Bedrock Well

WHPA

Well Field Study Area

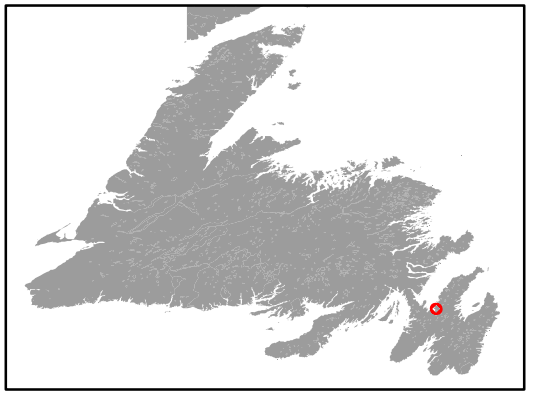
**Bedrock Geology**

Alternating Sedimentary

Musgravetown Group, Heart's Content Formation

Musgravetown Group, Maturin Ponds Formation

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 218 | #2 Well | 98 | 91 | 57 | 0.0000000524 |
| | | | | | |



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# Fermeuse

Bedrock Well

WHPA

Well Field Study Area

**Bedrock Geology** Alternating Sedimentary

Conception Group, Mistaken Point Formation

St. John's Group, Fermeuse Formation

St. John's Group, Trepassey formation

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 845 | Port Kirwan Road Well | 61 | 24 | 15 | 0.0000000834 |
| | | | | | |

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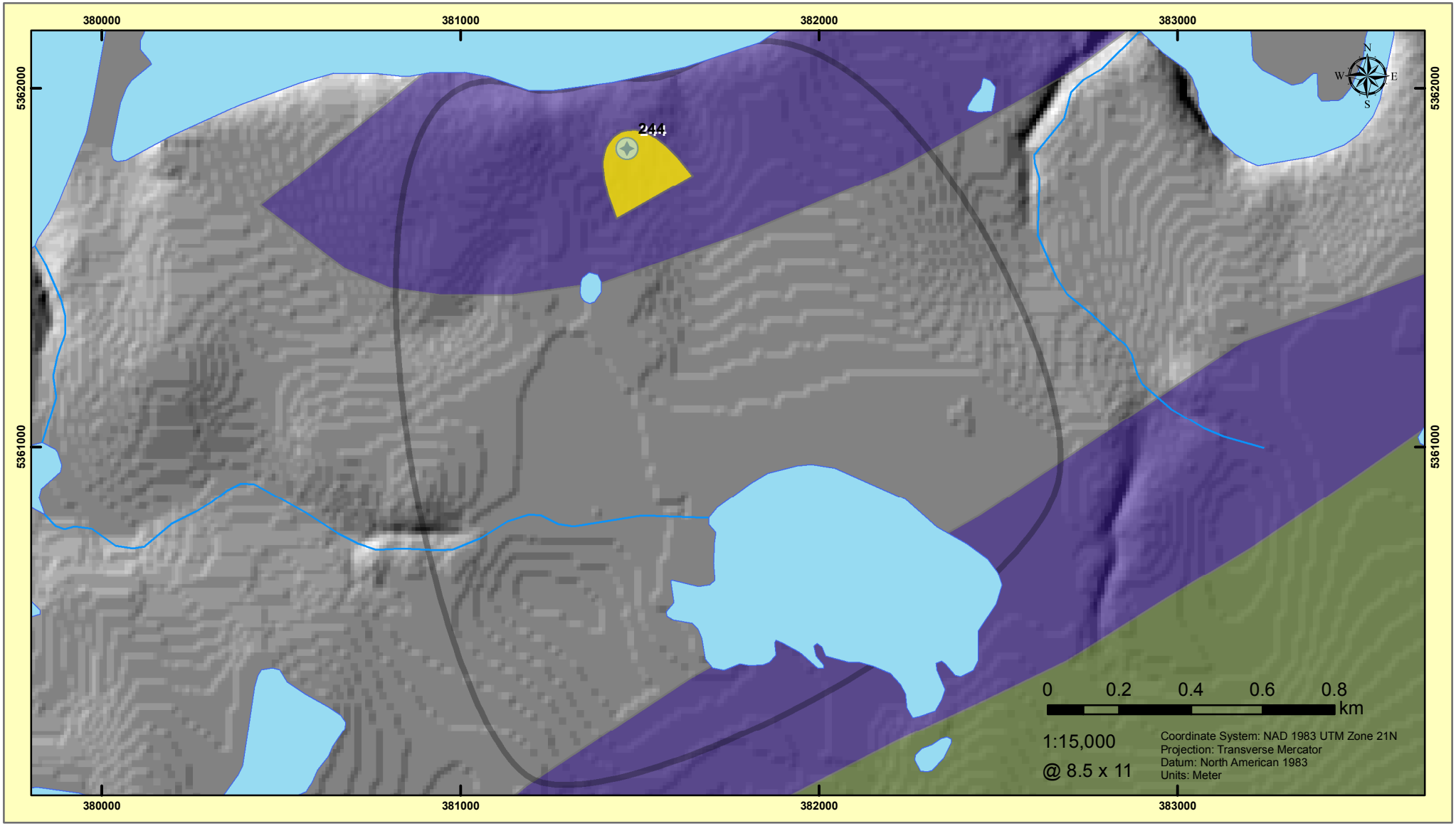


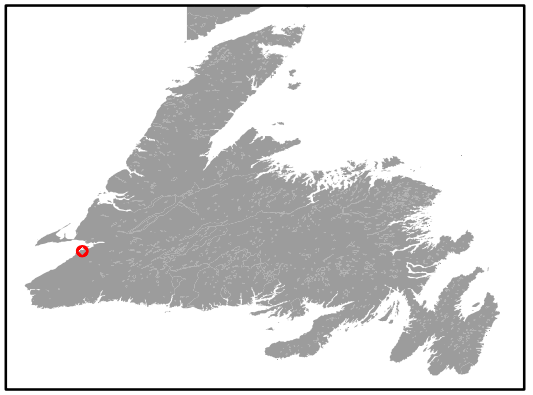

# Flat Bay West BR

Bedrock Well
WHPA
Well Field Study Area

**Bedrock Geology** Bedrock

Codroy Group, Codroy Road Formation
Codroy Group, Robinsons River Formation

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 244 | #1 Well | 56 | 32 | 20 | 0.000000493 |
| | | | | | |



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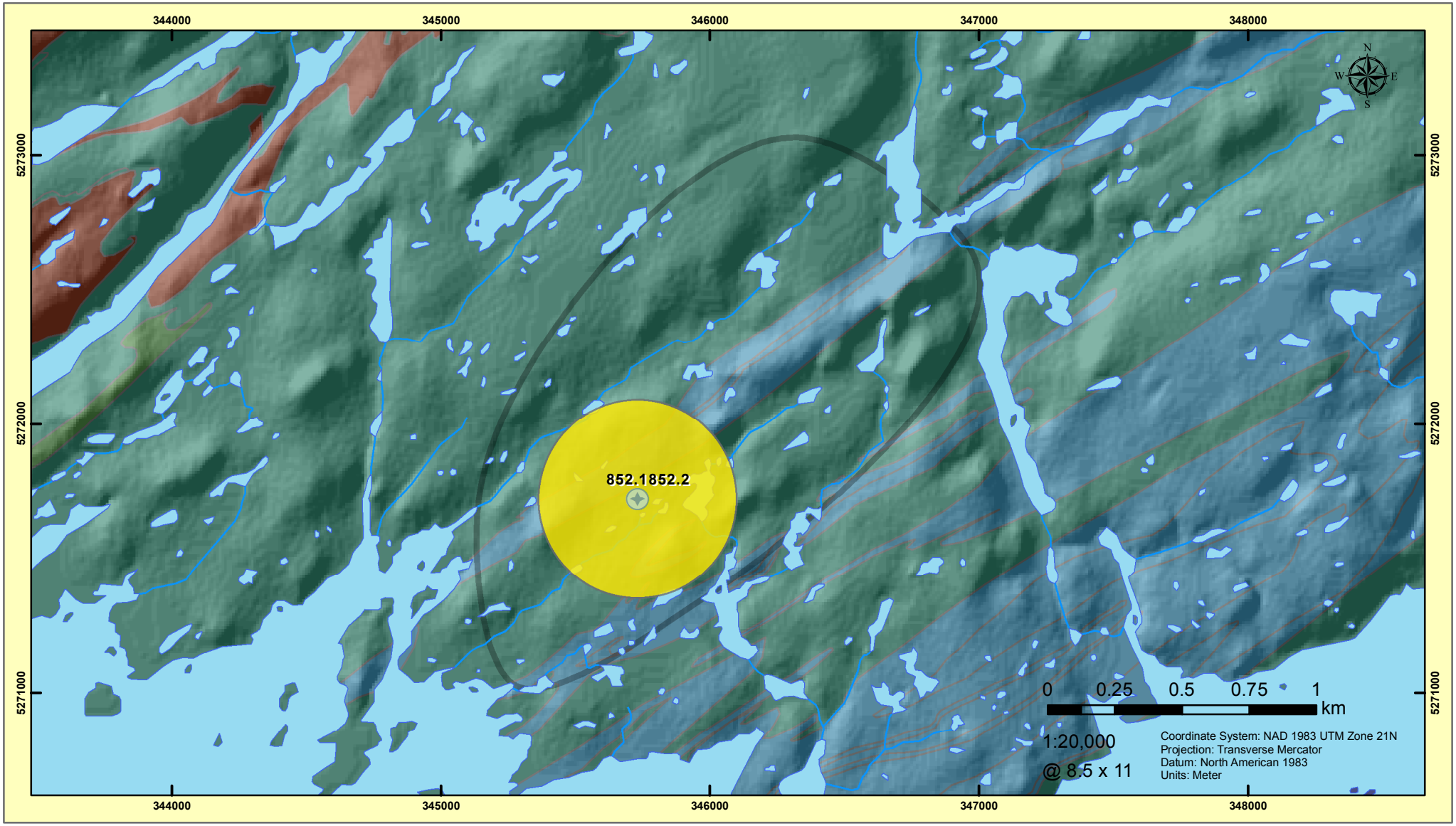


# Fox Roost-Margaree

Bedrock Well

WHPA

Well Field Study Area

**Bedrock Geology** Metamorphic

, Port aux Basques granite

Harbour Le Cou Group, Otter Bay formation

Kelby Cove orthogneiss,

Margaree orthogneiss,

Port aux Basques Complex,

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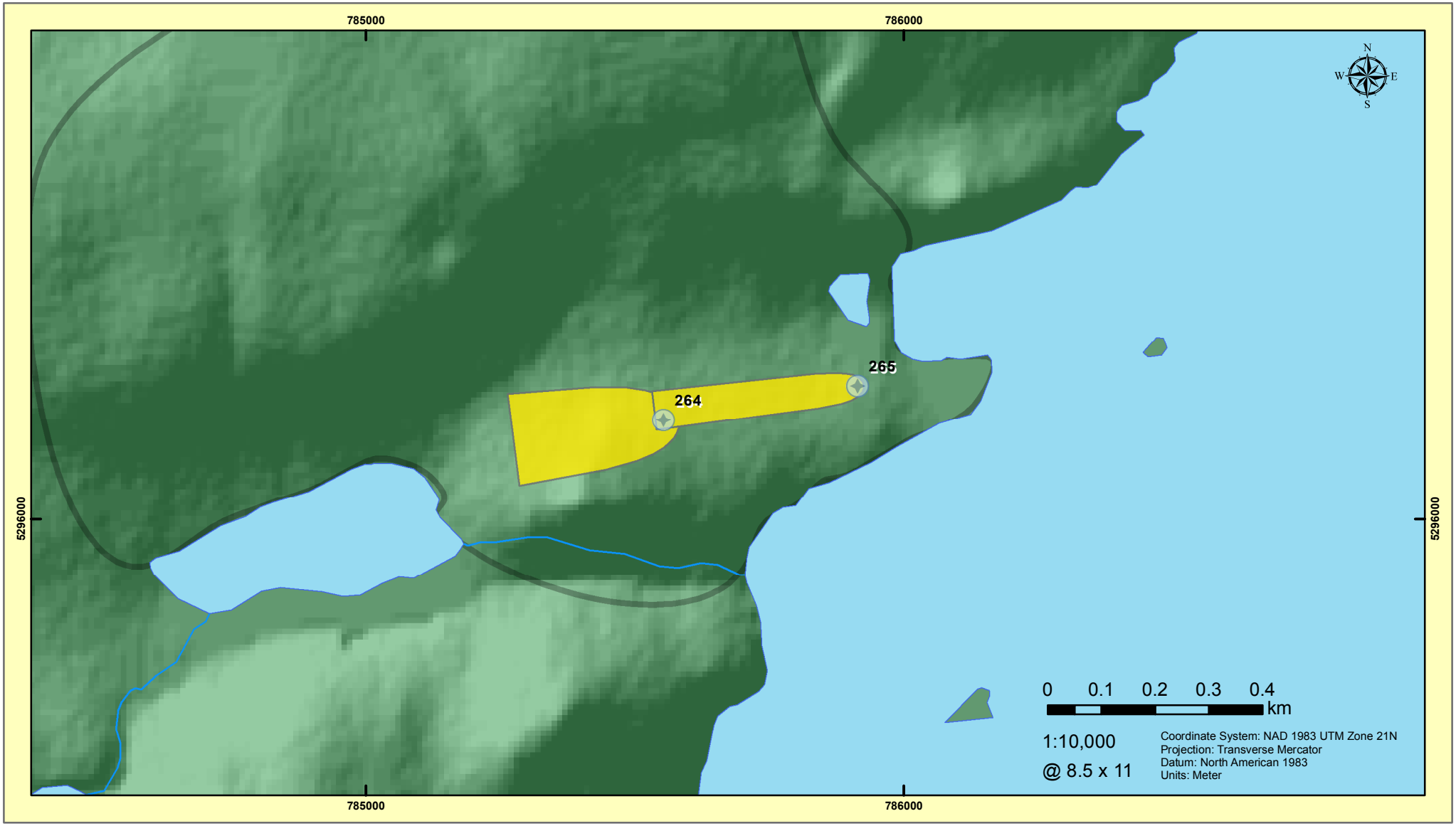
| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 852.1 | Drilled 8 inch | 46 | 163 | 101 | 0.000000116 |
| 852.2 | Drilled 8 inch | 46 | 163 | 101 | 0.000000116 |
| | | | | | |




## Freshwatera

Bedrock Well

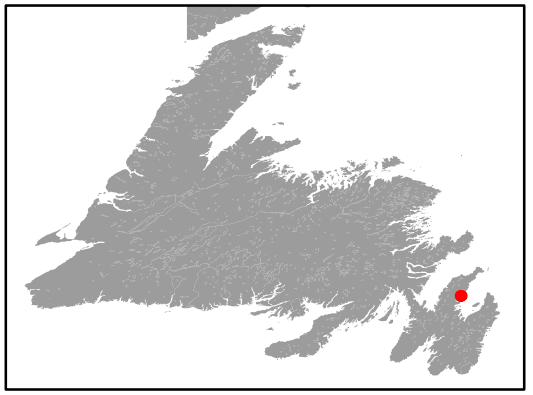
WHPA

Well Field Study Area

**Bedrock Geology** FG_Sedimentary

St. John's Group, Fermeuse Formation

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 264 | #2 Well - Covage's Lane Well | 26 | 23 | 14 | 0.00000061 |
| 265 | #3 Well - Wallace Snow Well | 80 | 44 | 27 | 0.000000967 |
| | | | | | |



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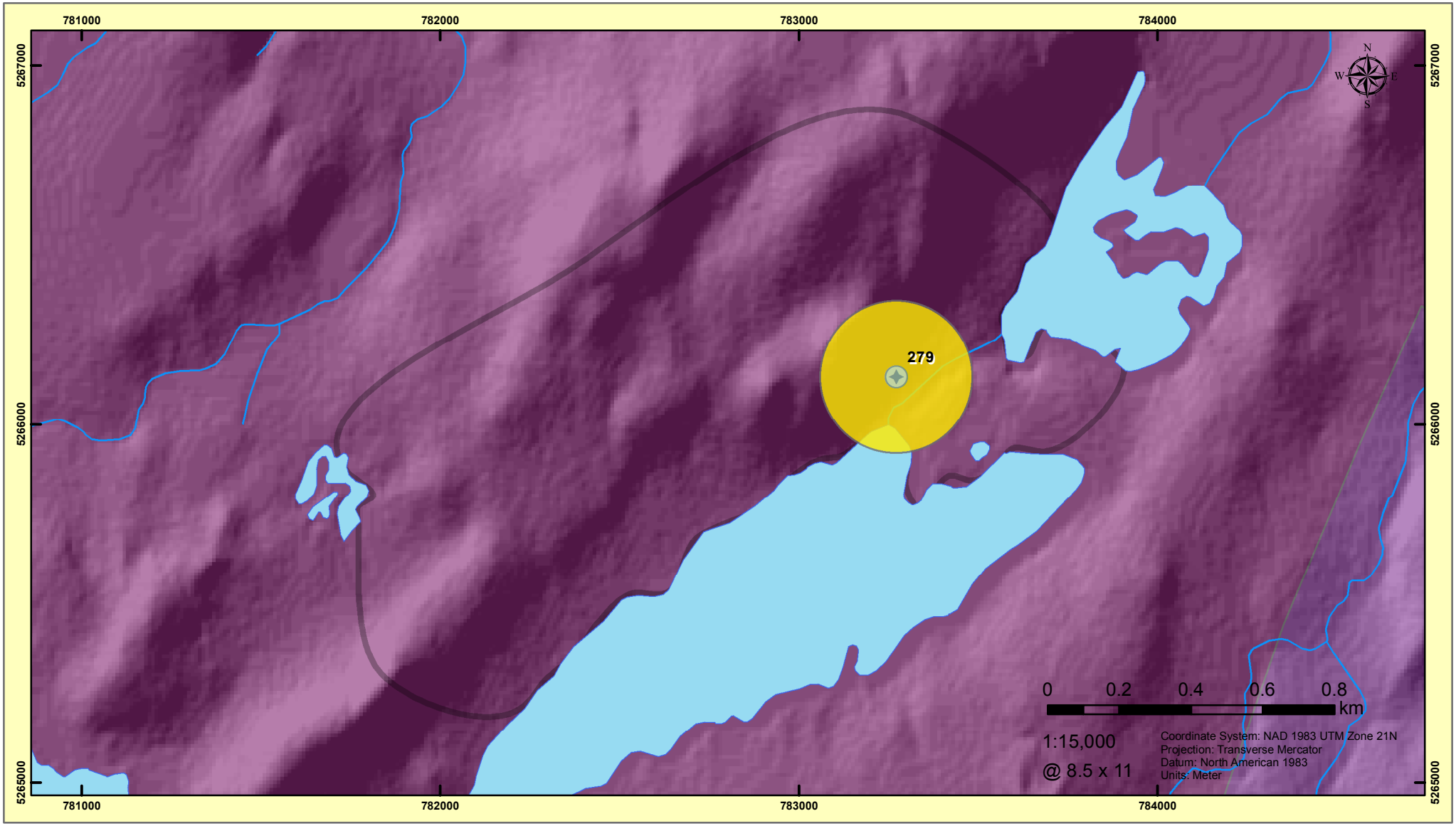



# Georgetown

Bedrock Well

WHPA

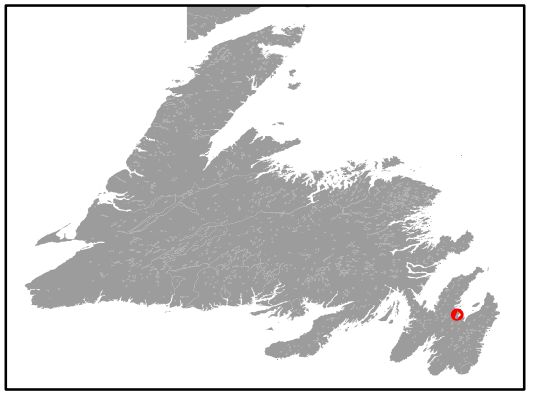
Well Field Study Area

**Bedrock Geology** Alternating Sedimentary

Adeyton Group, Bonavista Formation

Conception Group, Drook Formation

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 279 | Drilled | 85 | 200 | 124 | 0.0000000224 |
| | | | | | |



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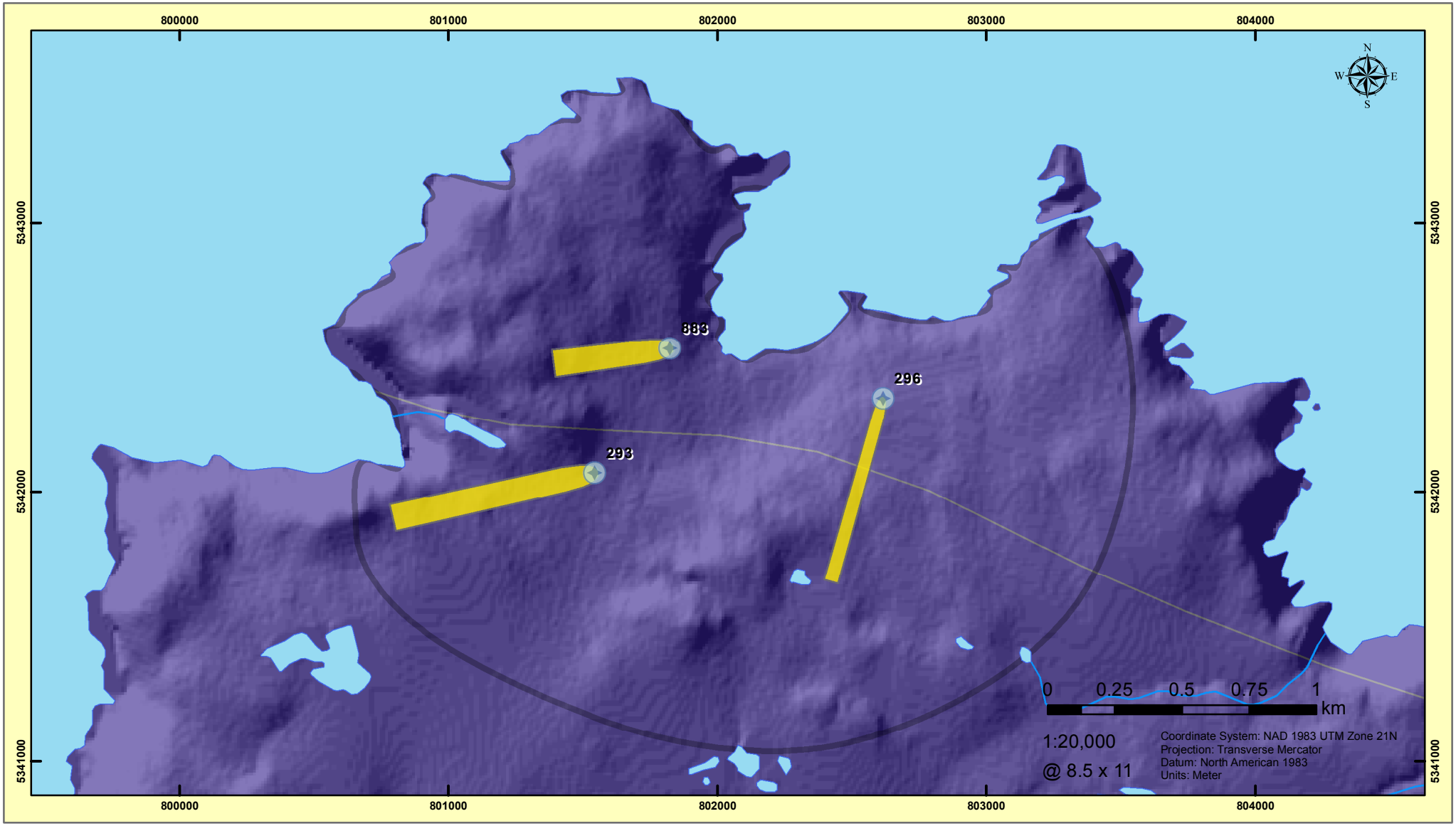


# Grates Cove

Bedrock Well

WHPA

Well Field Study Area

**Bedrock Geology** Sandstone/FG

Signal Hill Group, Bay de Verde Formation

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 293 | #1 Cyril Meadus Well | 60 | 98 | 61 | 0.00000158 |
| 296 | #4 Stoyles Hill Well | 65 | 50 | 31 | 0.00000158 |
| 883 | #3 Frank Janes Well | 61 | 54 | 34 | 0.000000619 |
| | | | | | |

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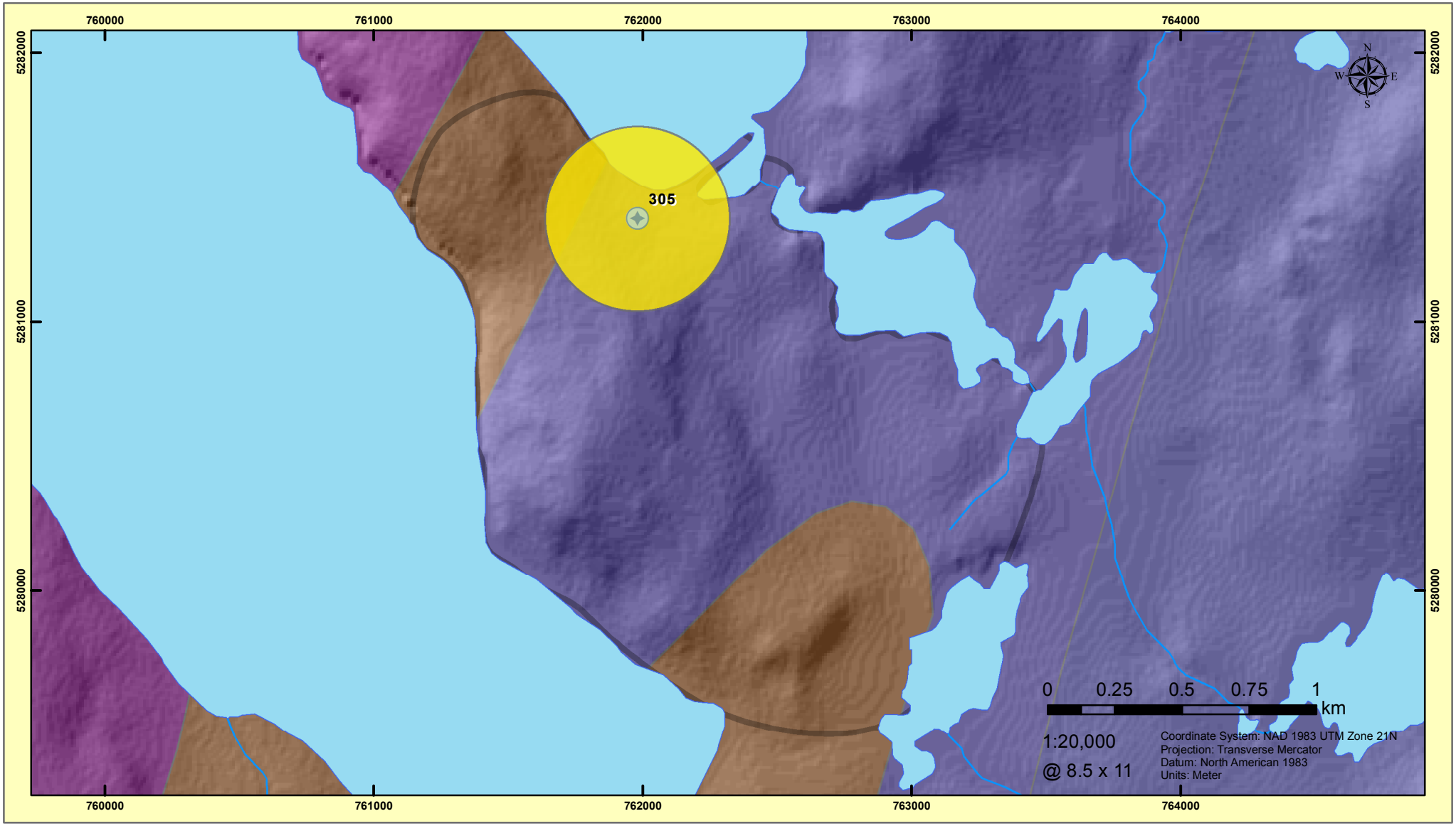



# Green's Harbour

Bedrock Well

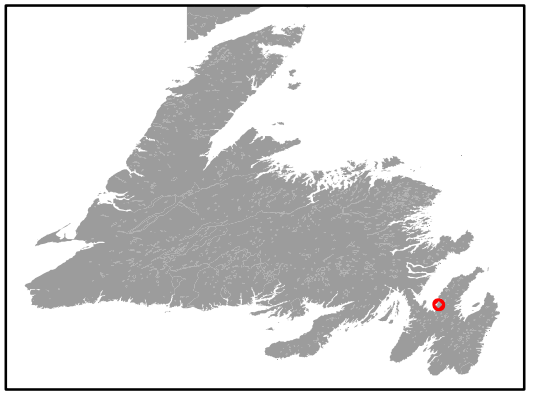
WHPA

Well Field Study Area

**Bedrock Geology** Sandstone/FG

- Musgravetown Group, Big Head Formation
- Musgravetown Group, Heart's Content Formation
- Musgravetown Group, Maturin Ponds Formation
- Signal Hill Group, Gibbett Hill Formation

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 305 | Barrett's Well | 110 | 670 | 416 | 0.0000000149 |
| | | | | | |



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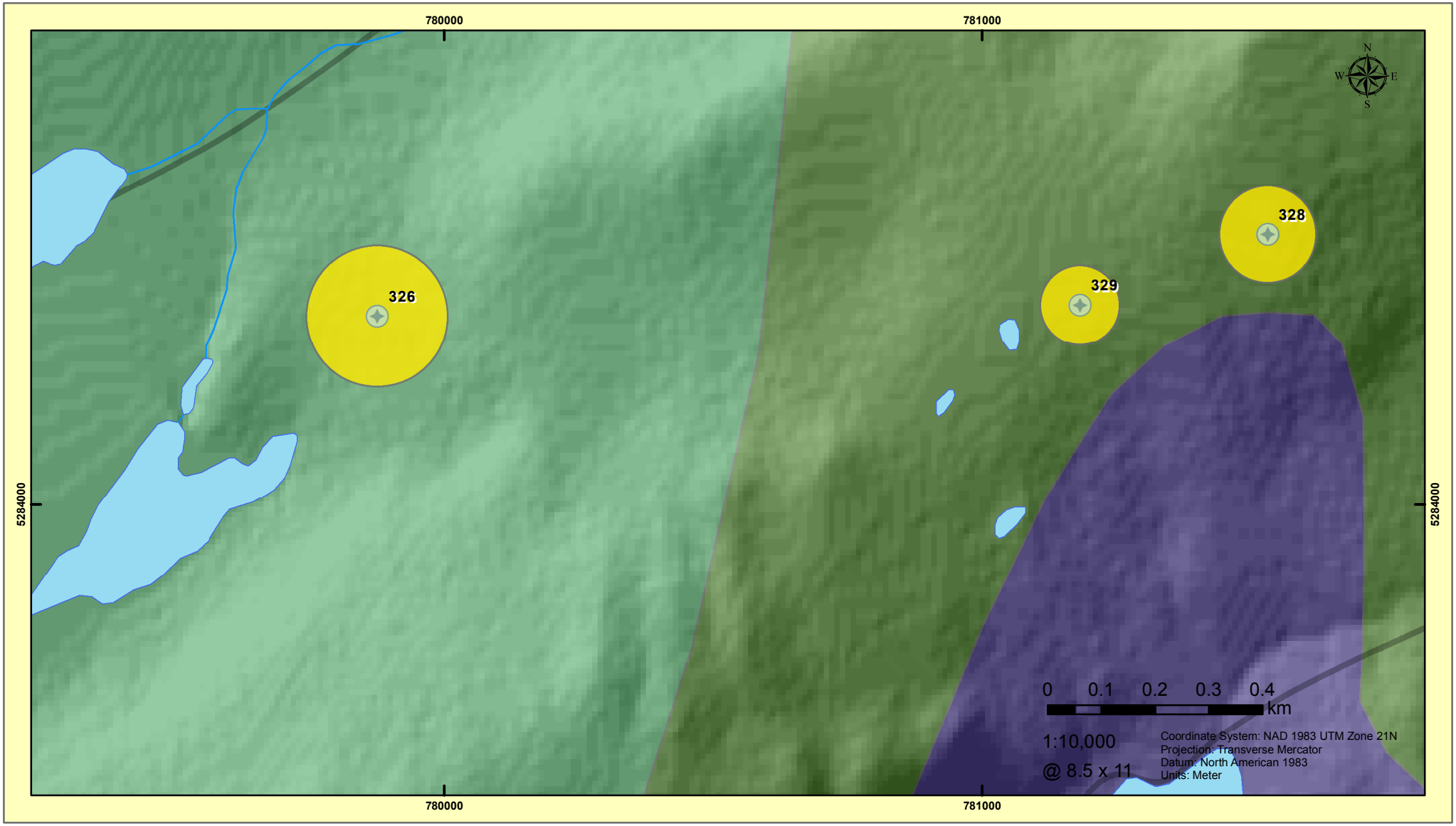



# Harbour Grace

Bedrock Well

WHPA

Well Field Study Area

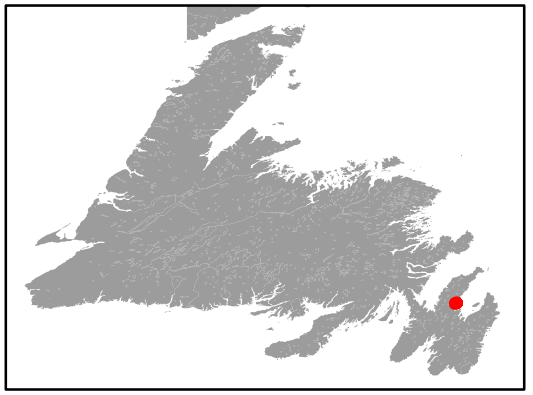
**Bedrock Geology** FG_Sedimentary

Conception Group, Mistaken Point Formation

St. John's Group, Fermeuse Formation

St. John's Group, Trepassey formation

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 326 | Mercer's Road Well | 48 | 43 | 27 | 0.0000000184 |
| 328 | #1 Thicket Susie Galway Well | 64 | 27 | 17 | 0.0000000217 |
| 329 | #2 Thicket Well | 116 | 33 | 20 | 0.0000000217 |
| | | | | | |



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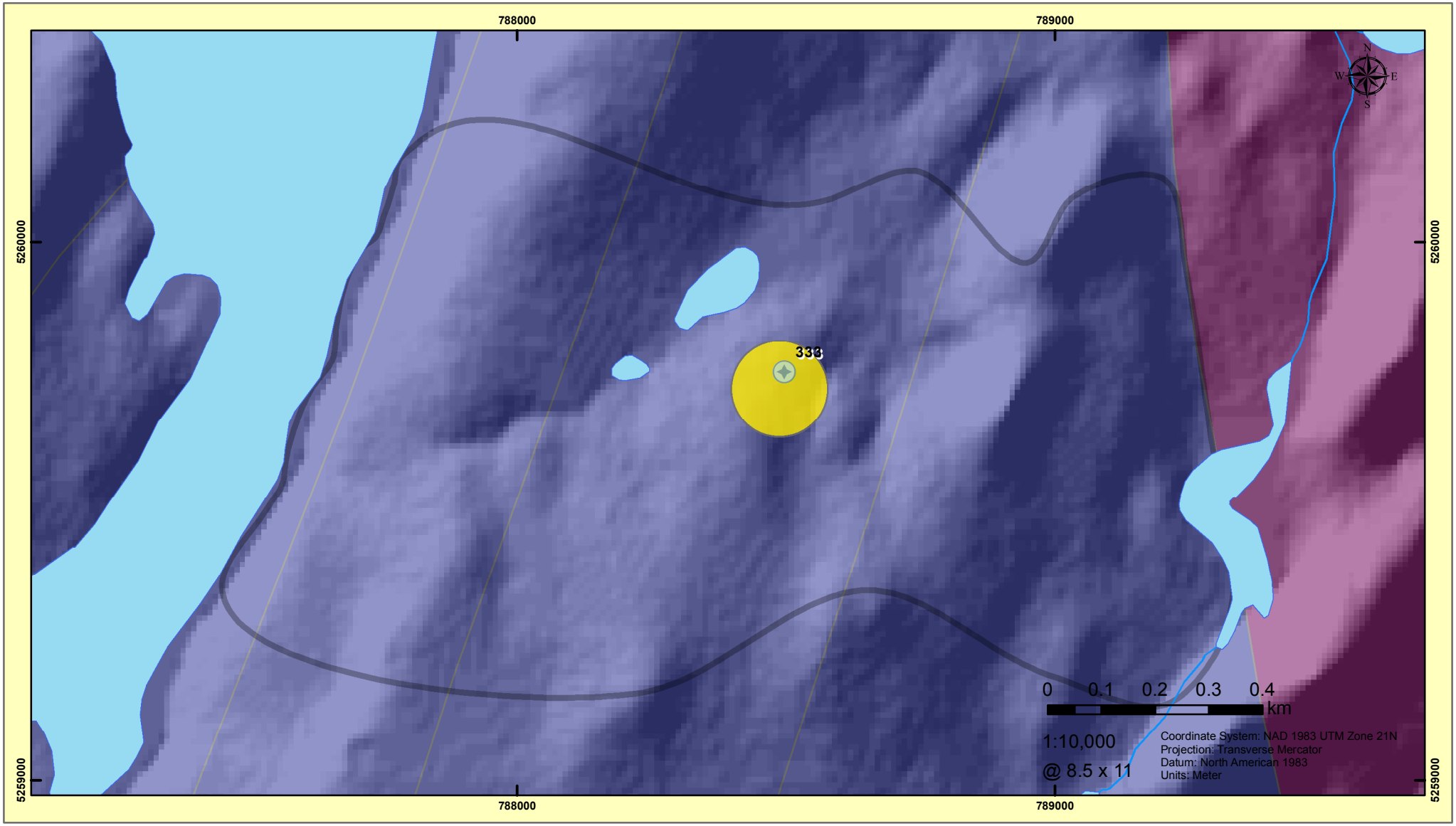



# Harbour Main 1

Bedrock Well

WHPA

Well Field Study Area

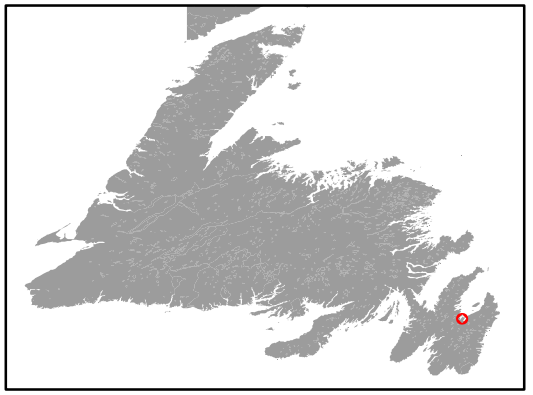
**Bedrock Geology**

Alternating Sedimentary

Conception Group, Drook Formation

Harbour Main Group,

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 333 | Holden's Road Well | 91 | 46 | 29 | 0.000000218 |
| | | | | | |



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# Harry's Harbour

Bedrock Well

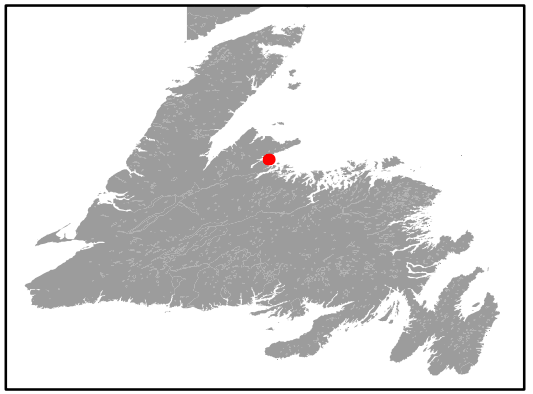
WHPA

Well Field Study Area

**Bedrock Geology** Volcanic

- Western Arm Group,
- Western Arm Group, Big Hill Basalt
- Western Arm Group, Skeleton Pond Tuff
- Western Arm Group, Welsh Cove Tuff
- Western Arm Group, Western Head Agglomerate

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 340 | #1 Well - Northeast Well | 72 | 63 | 39 | 0.0000000963 |
| 341 | #2 Well - Northwest Hill / Country Road | 65 | 26 | 16 | 0.000000107 |
| 342 | #3 Well - South Well | 65 | 43 | 27 | 0.000000107 |
| | | | | | |



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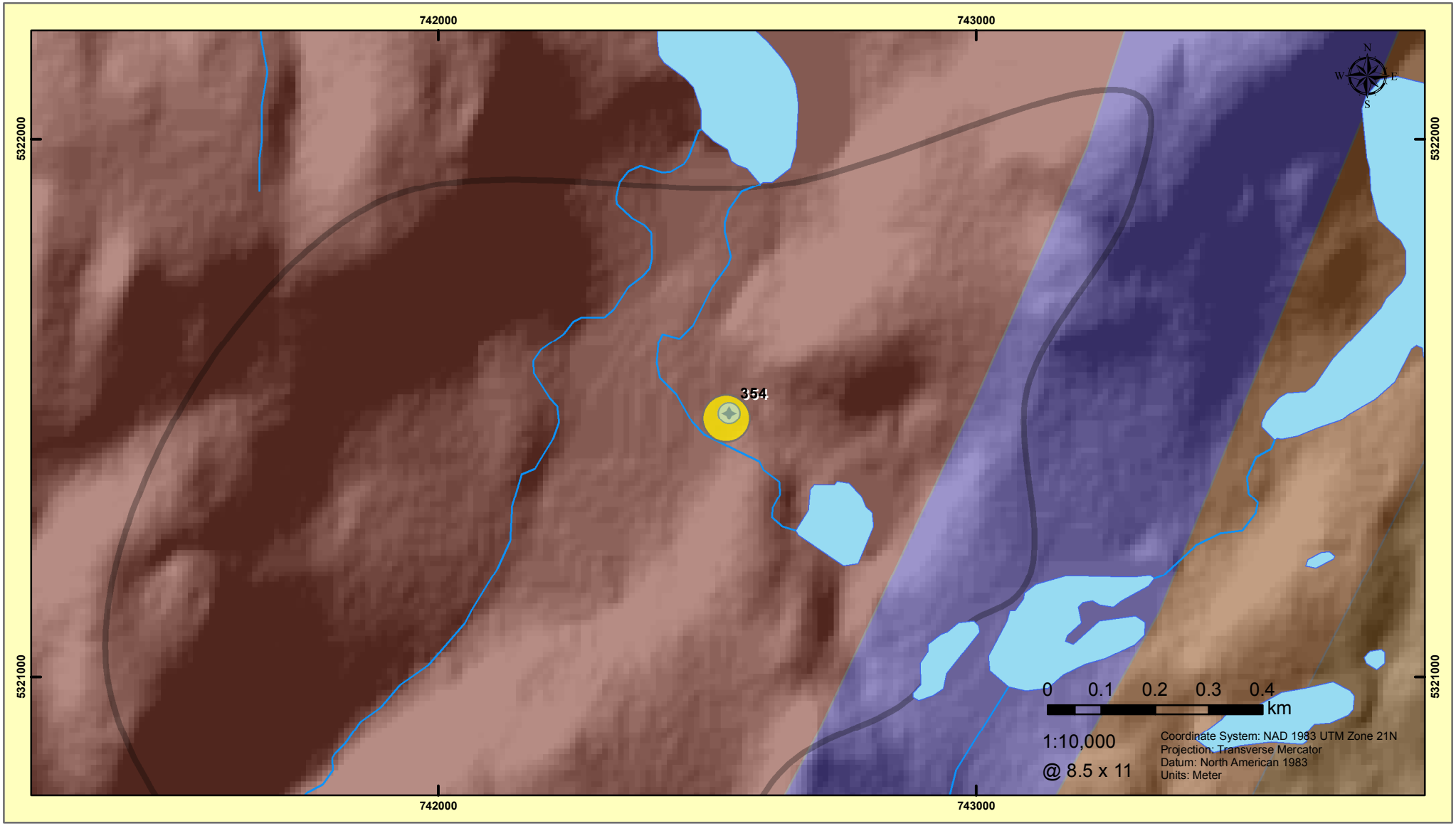



# Hodge's Cove

Bedrock Well

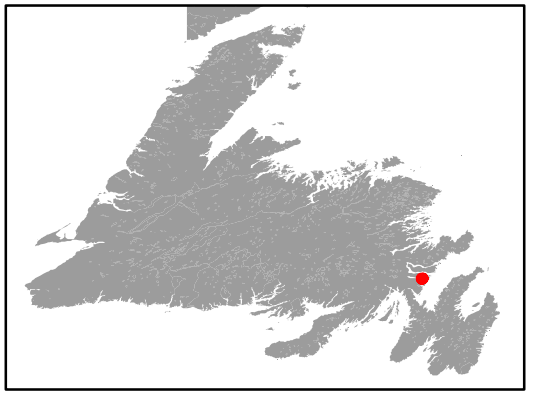
WHPA

Well Field Study Area

**Bedrock Geology** Volcanic

- Musgravetown Group, Big Head Formation
- Musgravetown Group, Bull Arm Formation
- Musgravetown Group, Maturin Ponds Formation
- Musgravetown Group, Trinny Cove Formation

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 354 | Drilled | 122 | 16 | 10 | 0.0000000361 |
| | | | | | |



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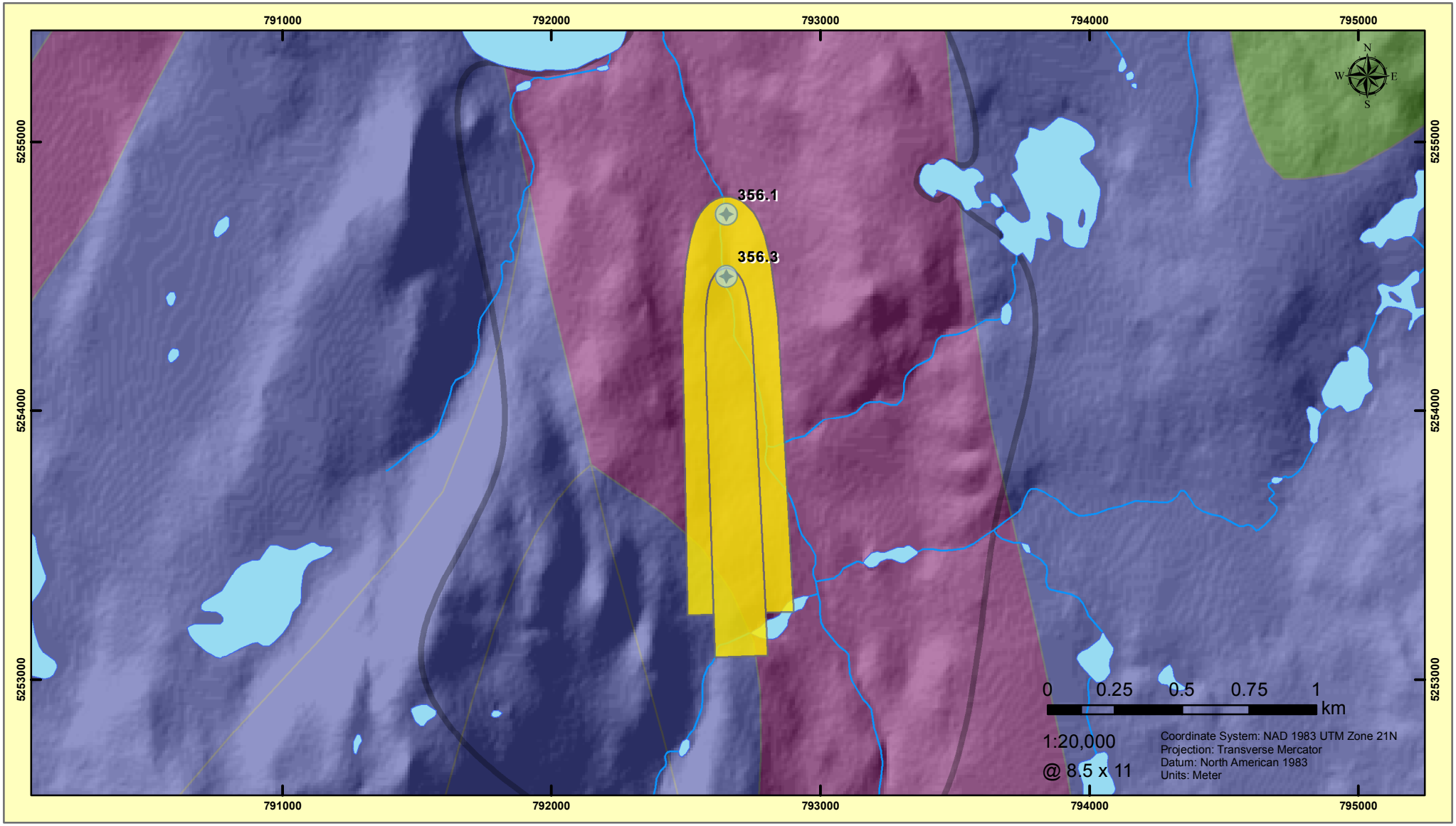



# Holyrood 1

Bedrock Well

WHPA

Well Field Study Area

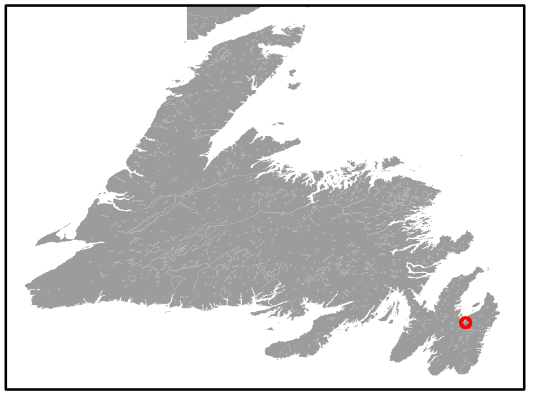
**Bedrock Geology** Alternating Sedimentary

Conception Group, Drook Formation

Harbour Main Group,

Holyrood Intrusive Suite,

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 356.1 | Main Line (well #1) | 45 | 525 | 326 | 0.00000311 |
| 356.3 | Main Line (well #3) | 93 | 525 | 326 | 0.00000311 |
| | | | | | |



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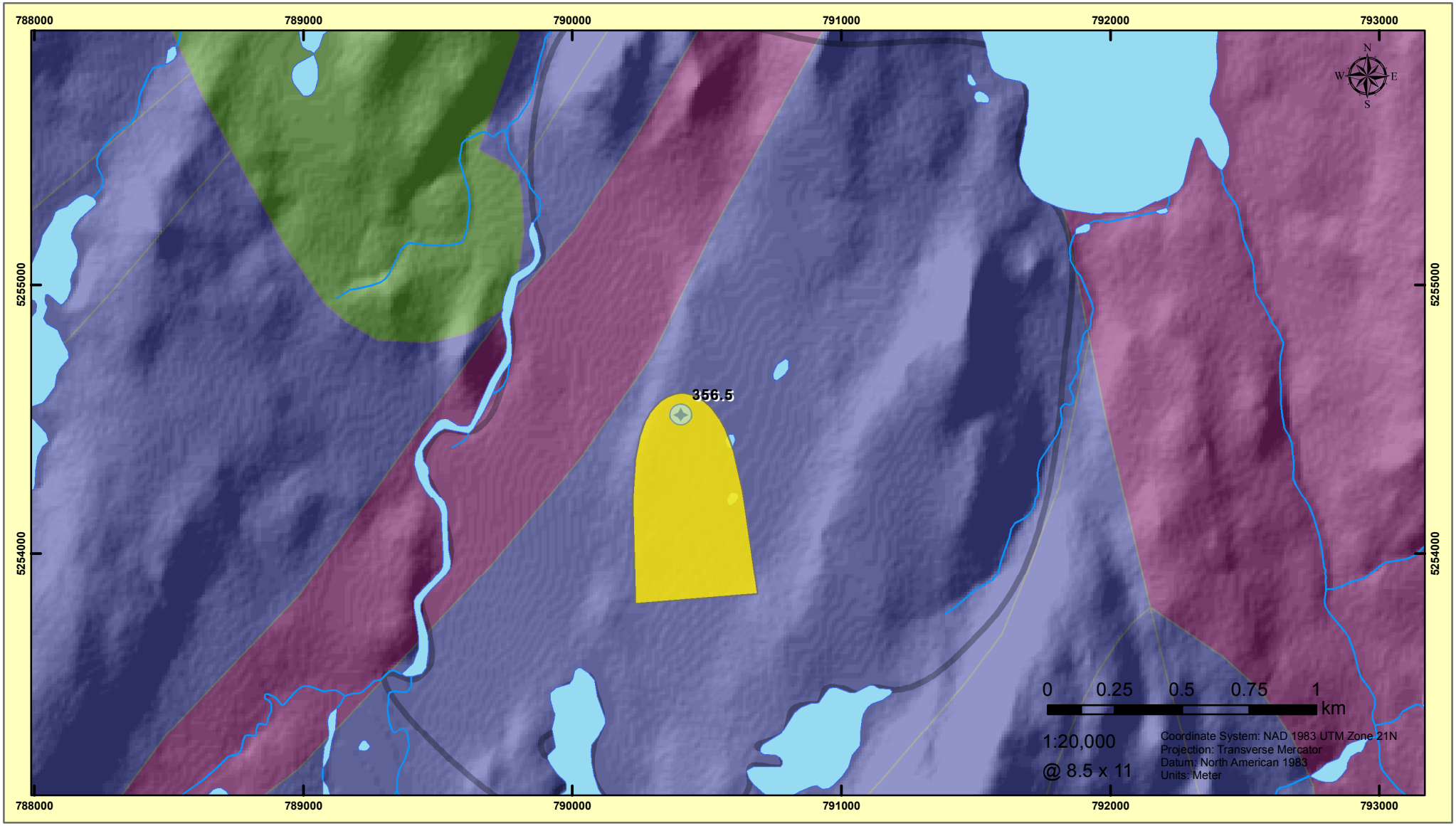



# Holyrood 2

Bedrock Well

WHPA

Well Field Study Area

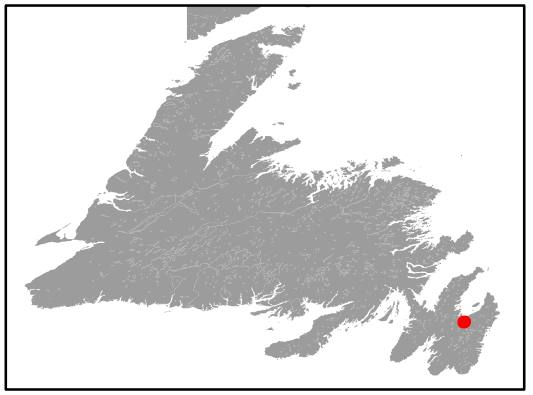
**Bedrock Geology** Alternating Sedimentary

Conception Group, Drook Formation

Harbour Main Group,

Holyrood Intrusive Suite,

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 356.5 | Main Line (well #5) | 92 | 525 | 326 | 0.00000126 |
| | | | | | |



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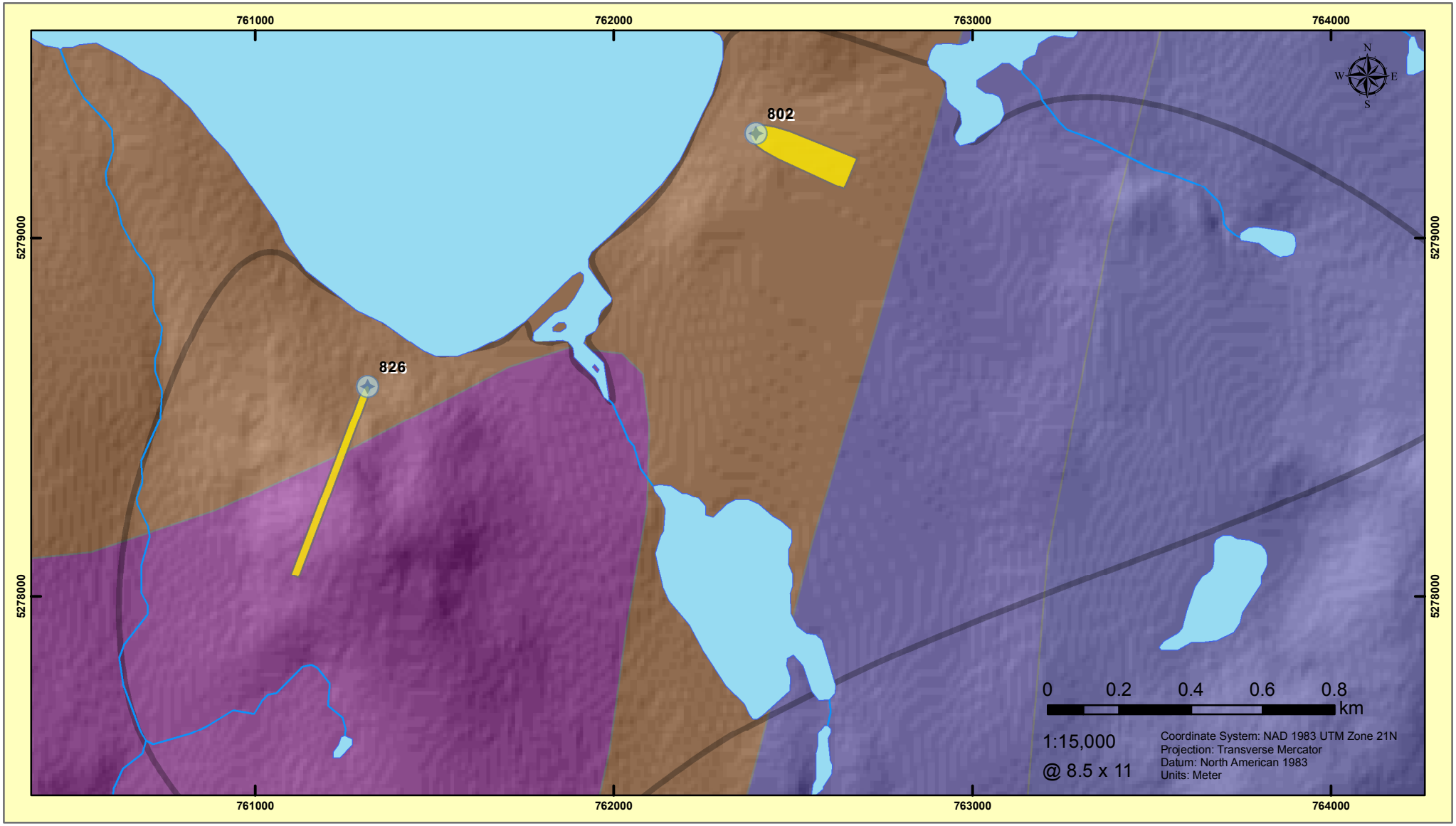



# Hopeall

Bedrock Well

WHPA

Well Field Study Area

**Bedrock Geology** Alternating Sedimentary

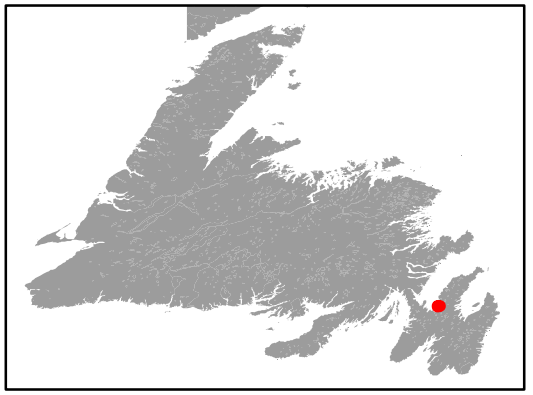
Musgravetown Group, Big Head Formation

Musgravetown Group, Heart's Content Formation

Musgravetown Group, Maturin Ponds Formation

Signal Hill Group, Gibbett Hill Formation

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 802 | Charles Cumby Well | 37 | 19 | 12 | 0.000000756 |
| 826 | Gilberts Hill Well | 110 | 30 | 19 | 0.000000756 |
| | | | | | |



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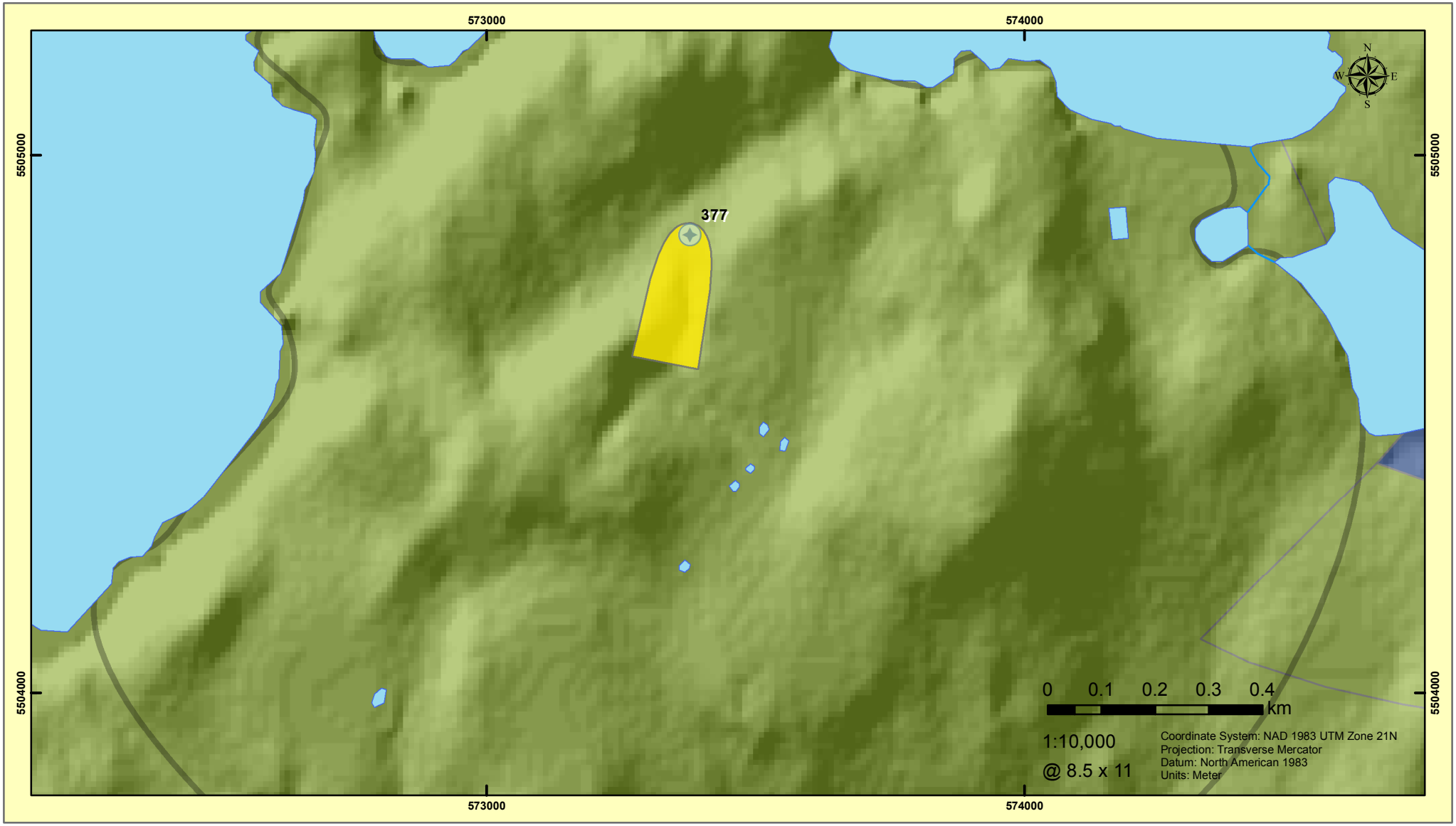



# Jackson's Cove

Bedrock Well

WHPA

Well Field Study Area

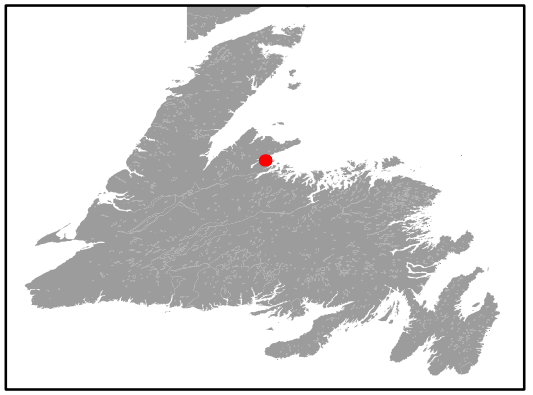
**Bedrock Geology**

Volcanic

Lushs Bight Group,

Western Arm Group, Skeleton Pond Tuff

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 377 | #3 Well Langdon's Cove Well | 65 | 37 | 23 | 0.000000292 |
| | | | | | |



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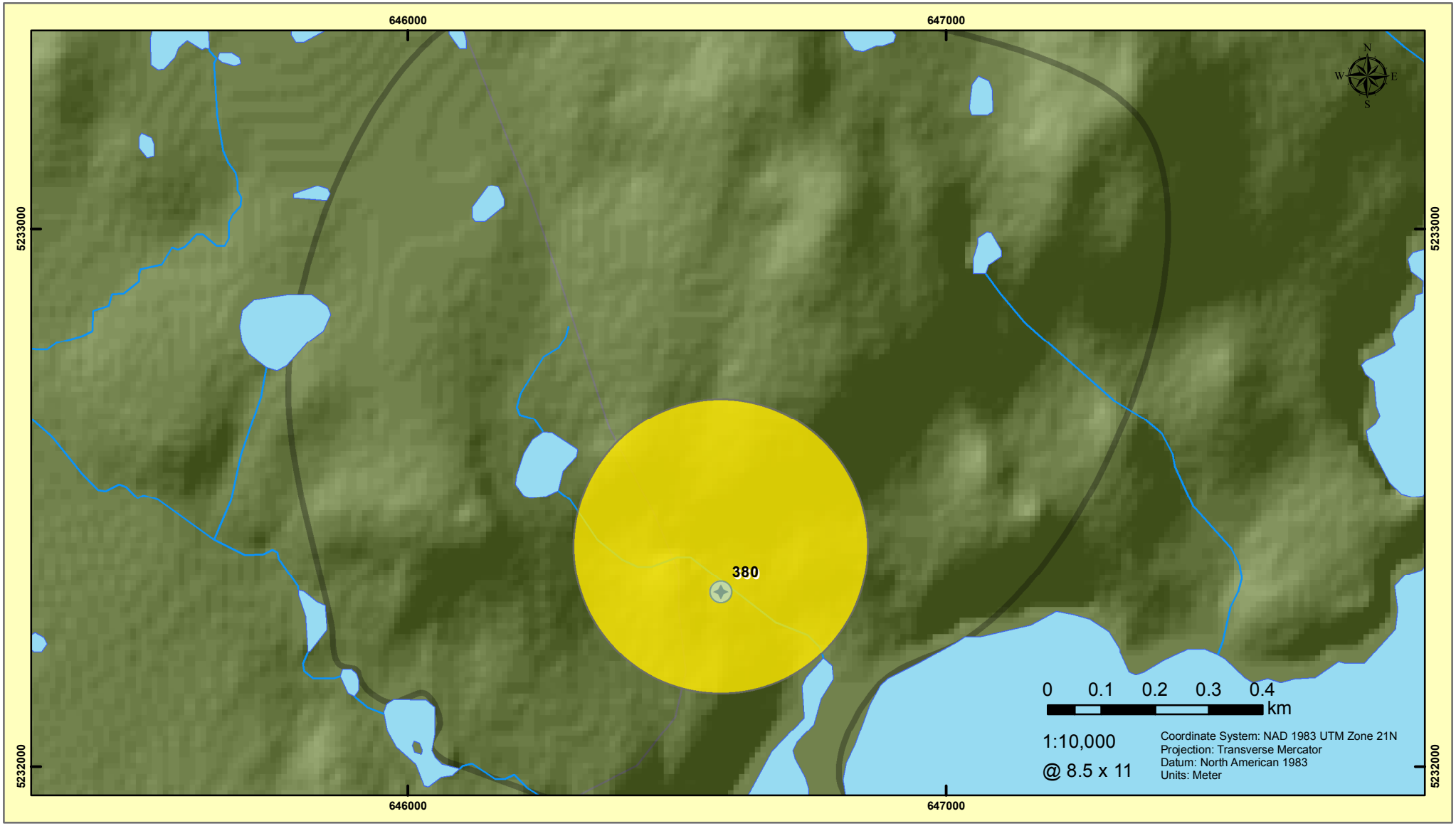



# Jean de Baie

Bedrock Well

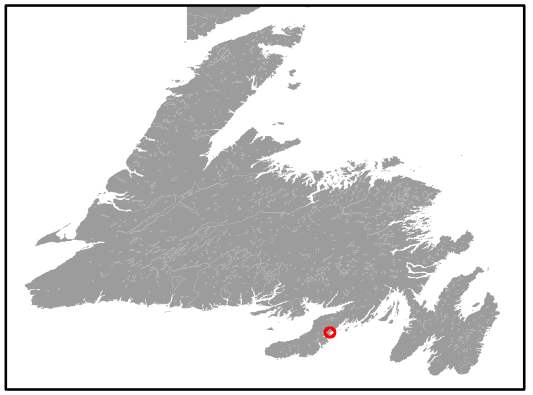
WHPA

Well Field Study Area

**Bedrock Geology** Volcanic

Marystown Group, Cashel Lookout Formation

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 380 | #1 Well | 43 | 205 | 127 | 0.000000161 |
| | | | | | |



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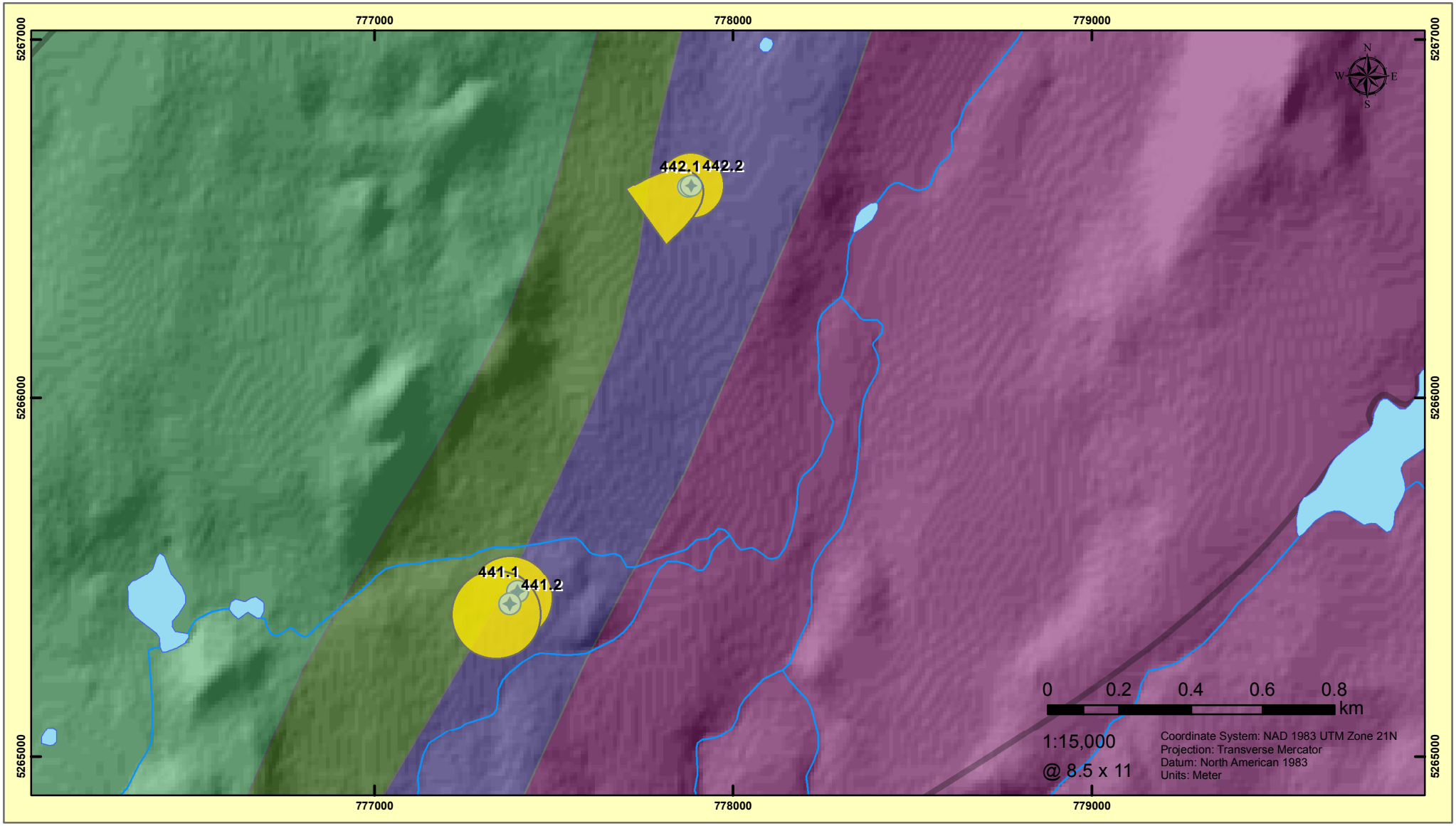



# Makinsons

Bedrock Well

WHPA

Well Field Study Area

**Bedrock Geology** Alternating Sedimentary

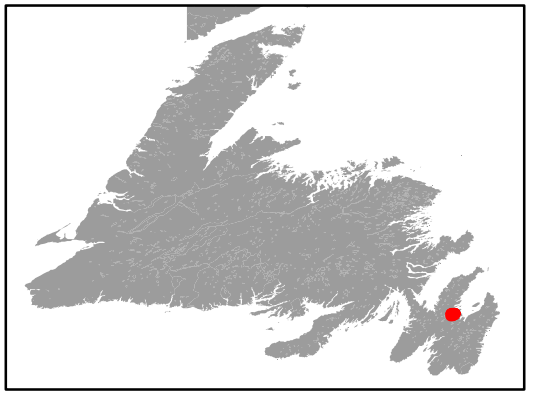
Conception Group, Drook Formation

Conception Group, Mistaken Point Formation

St. John's Group, Fermeuse Formation

St. John's Group, Trepassey formation

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 441.1 | Country Path Wells (Dean Efford Well) | 92 | 88 | 54 | 0.000000115 |
| 441.2 | Country Path Wells (Dale Efford Well) | 92 | 88 | 54 | 0.000000176 |
| 442.1 | Taylor's Wells (Front Well) | 92 | 41 | 25 | 0.000000176 |
| 442.2 | Taylor's Wells (Back Well) | 92 | 41 | 25 | 0.000000019 |
| | | | | | |



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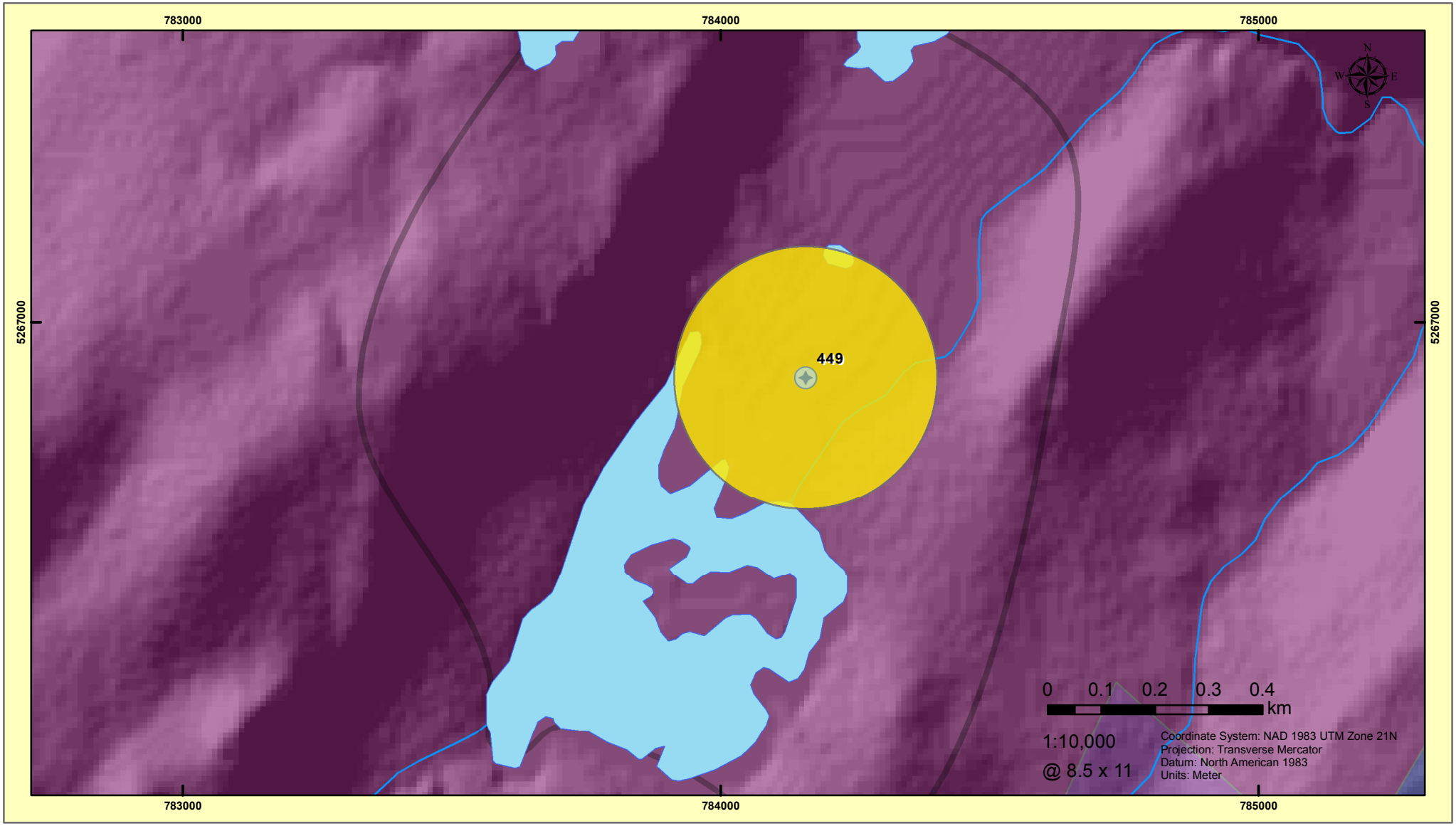



# Marysvale

Bedrock Well

WHPA

Well Field Study Area

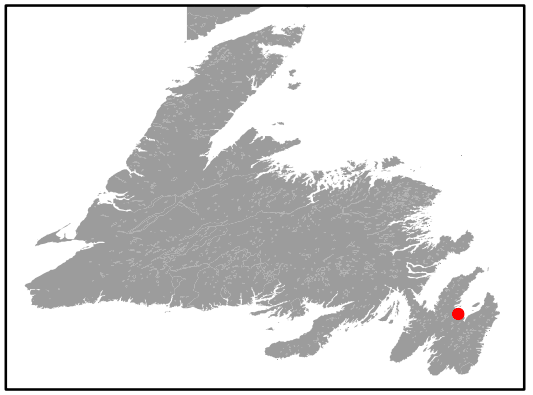
**Bedrock Geology** Alternating Sedimentary

Adeyton Group, Bonavista Formation

Conception Group, Drook Formation

Harbour Main Group,

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 449 | Drilled | 135 | 419 | 260 | 0.0000000217 |
| | | | | | |



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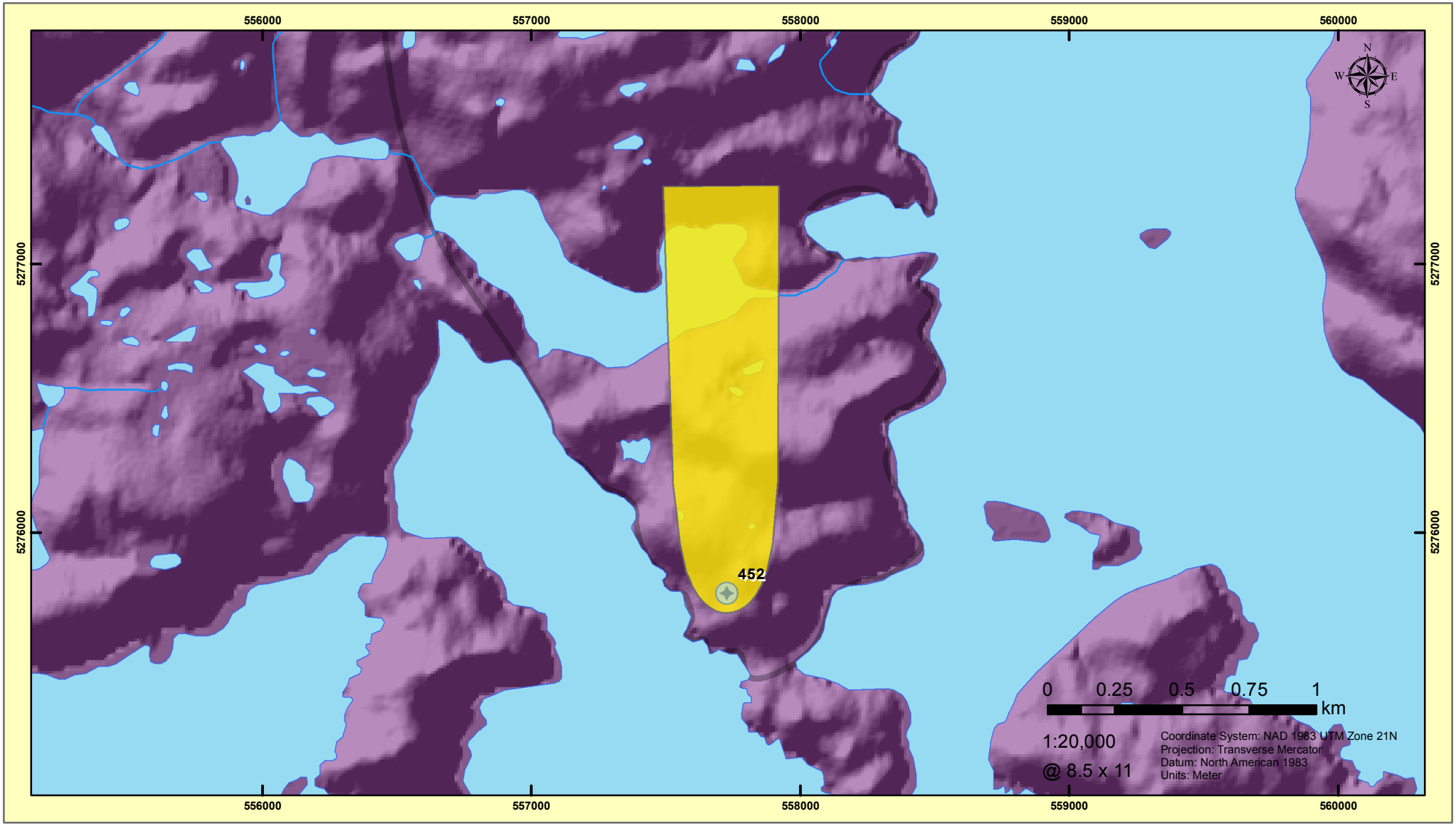



# McCallum

Bedrock Well

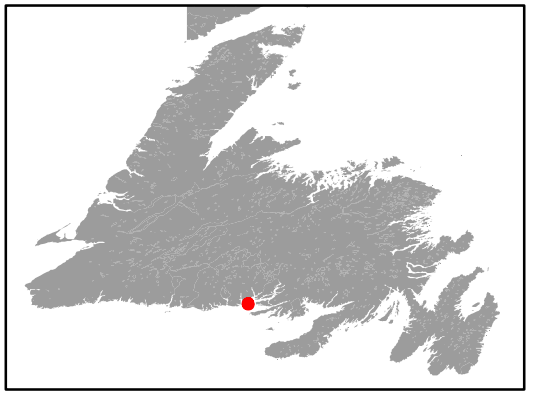
WHPA

Well Field Study Area

**Bedrock Geology** Plutonic

, McCallum Granite

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 452 | Drilled | 17 | 110 | 68 | 0.000000408 |
| | | | | | |



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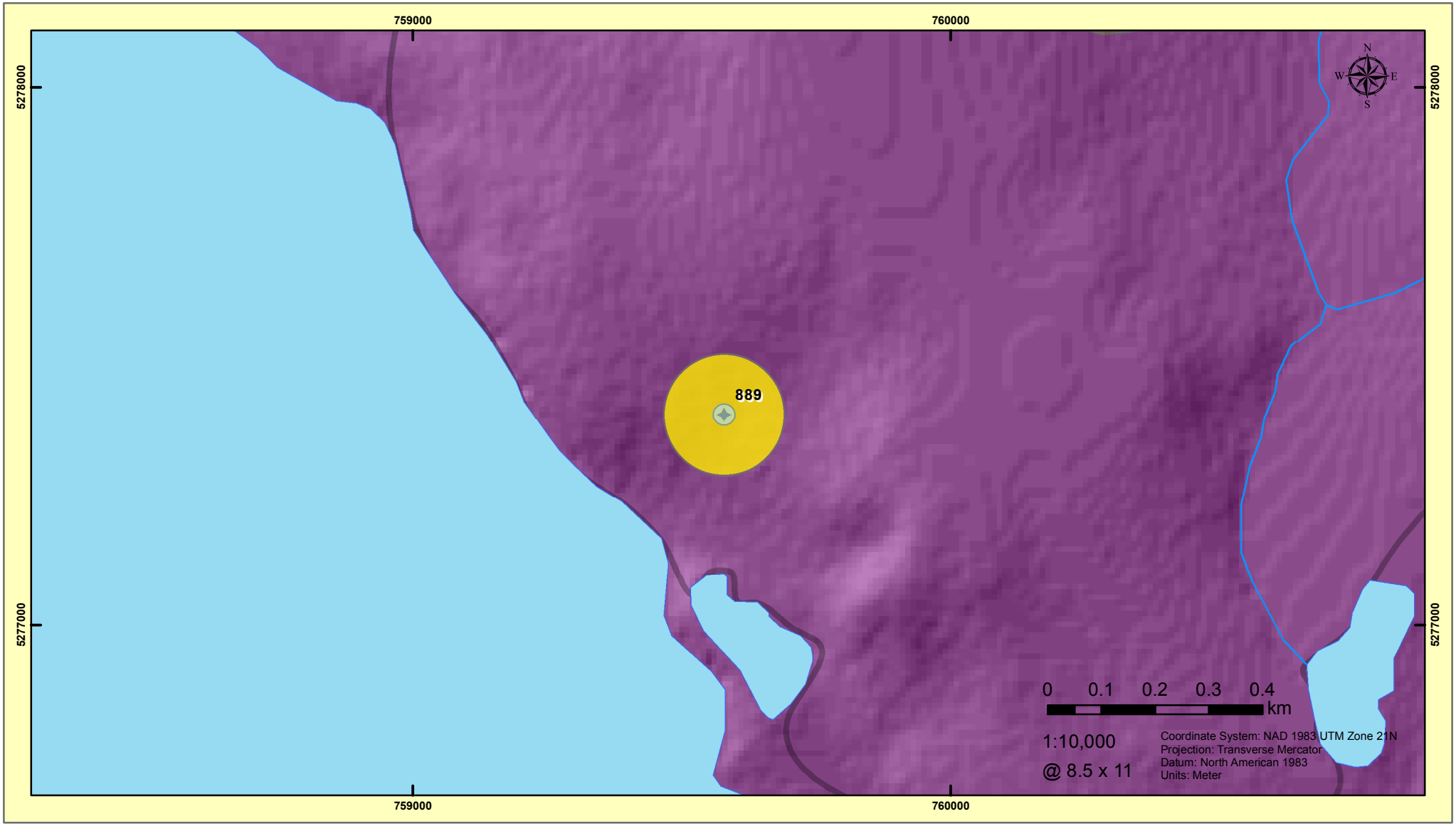



# New Harbour

Bedrock Well

WHPA

Well Field Study Area

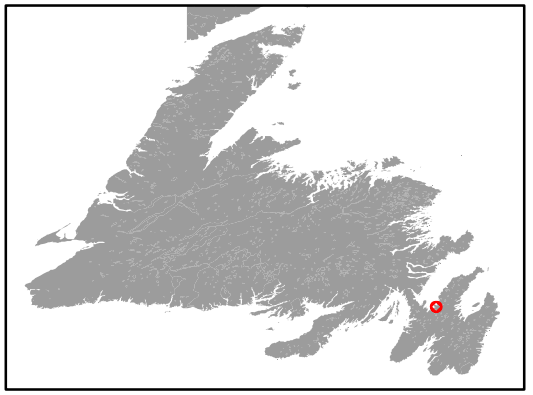
**Bedrock Geology**

Alternating Sedimentary

Musgravetown Group, Heart's Content Formation

Musgravetown Group, Maturin Ponds Formation

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 889 | William's Hill | 122 | 80 | 50 | 0.0000000419 |
| | | | | | |



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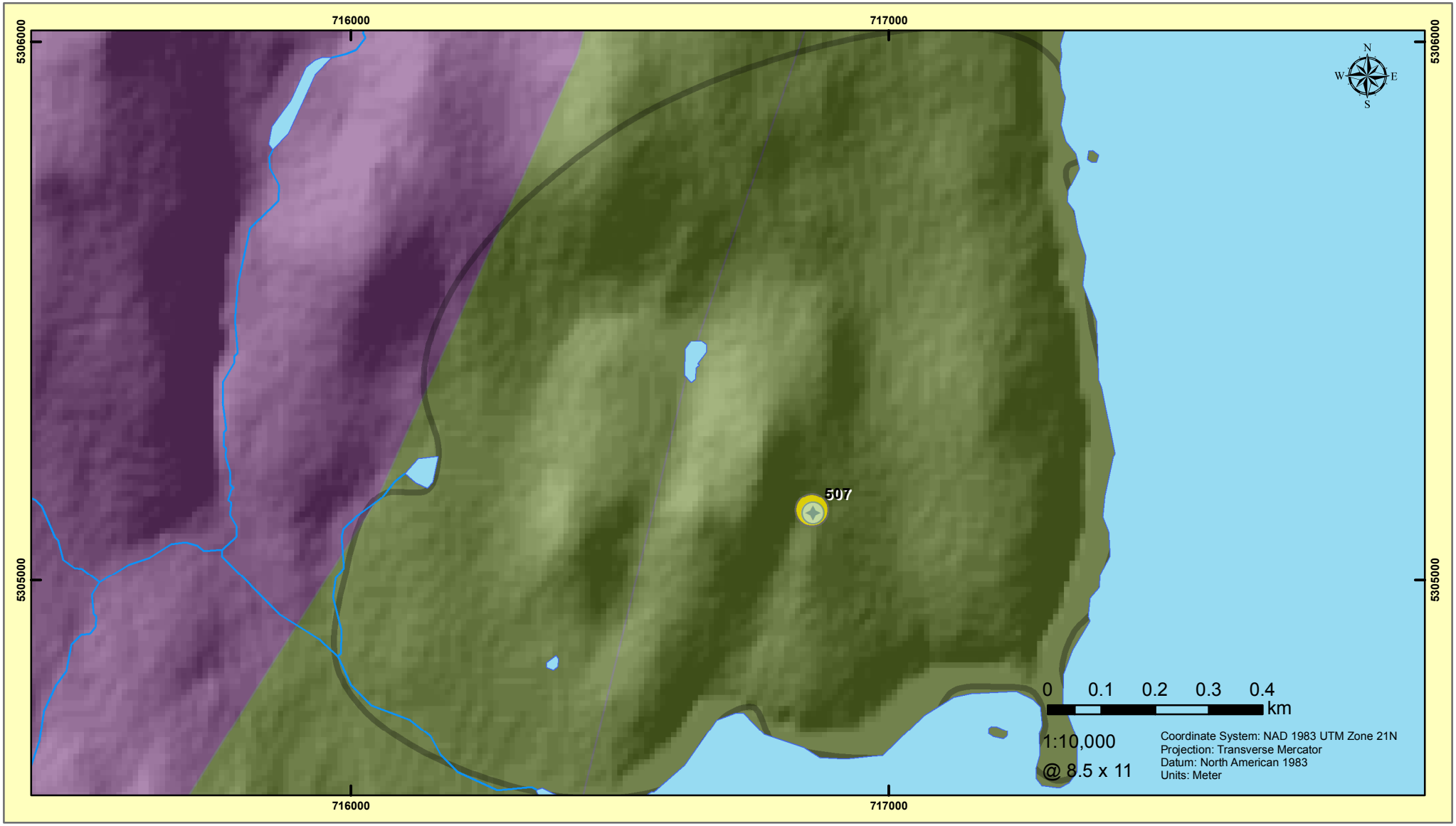



# North Harbour

Bedrock Well

WHPA

Well Field Study Area

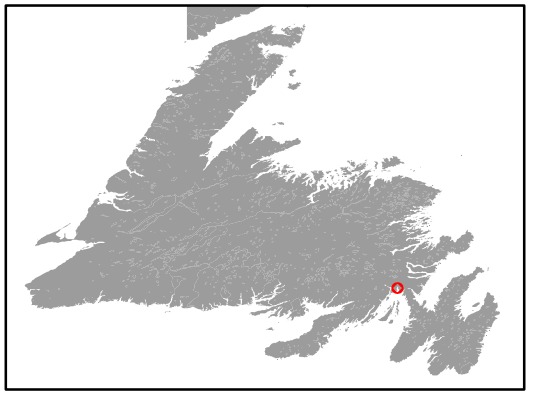
**Bedrock Geology** Volcanic

, Sall the Maid Granite

Marystown Group, Cashel Lookout Formation

Swift Current Intrusive Suite, Swift Current Granite

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 507 | Communal Well | 93 | 6 | 4 | 0.0000000224 |
| | | | | | |



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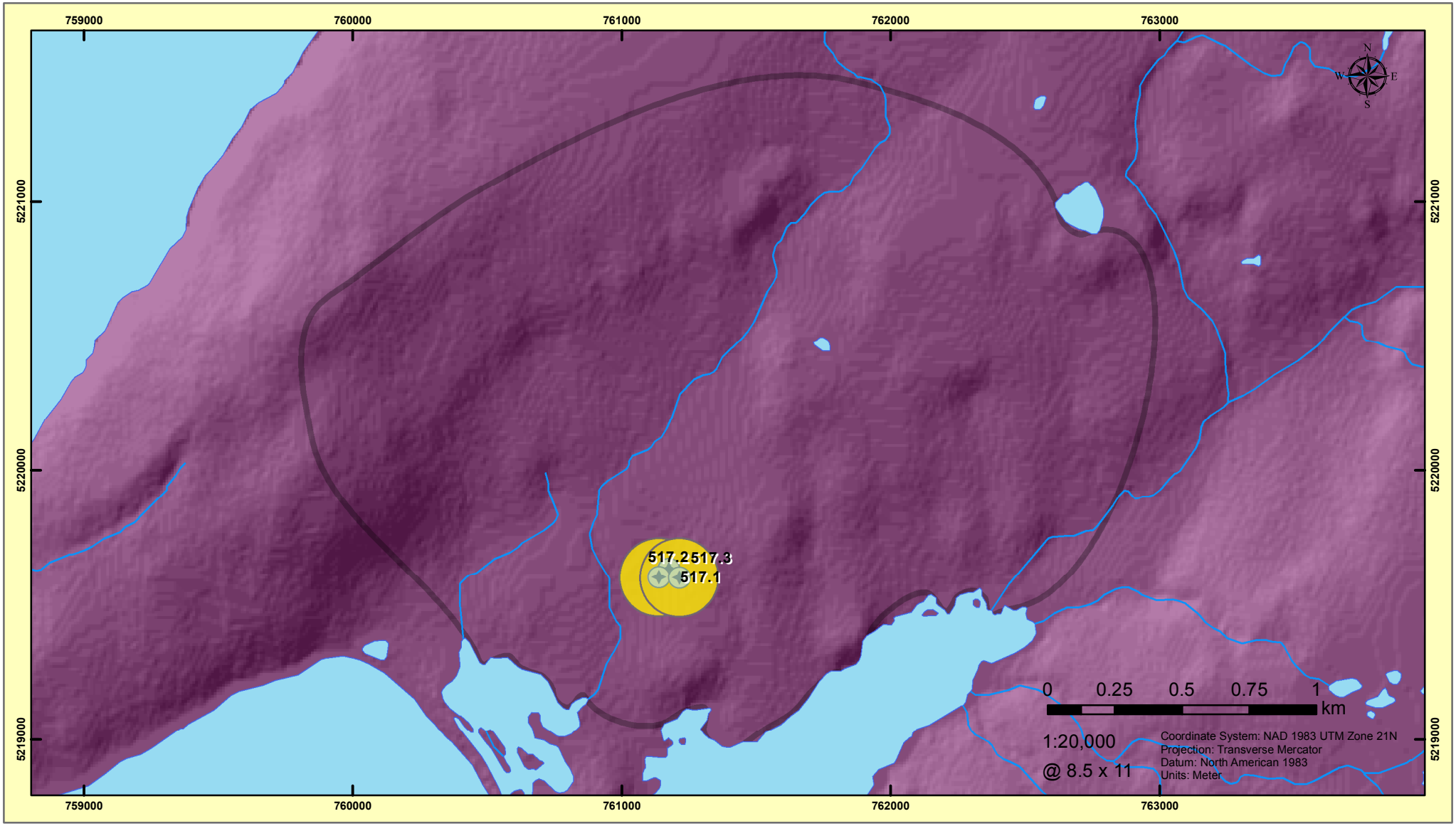
Consulting Engineers




# O'Donnells

Bedrock Well

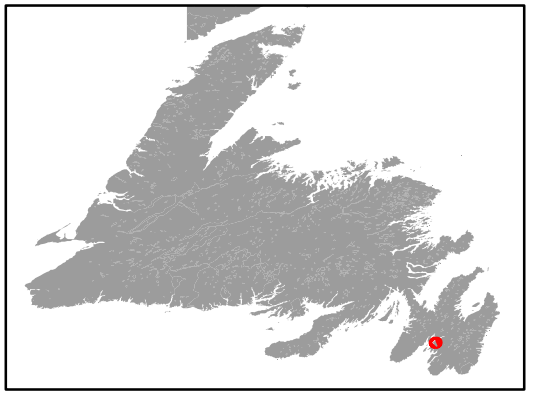
WHPA

Well Field Study Area

**Bedrock Geology** Alternating Sedimentary

Conception Group, Drook Formation

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 517.1 | Well Field (well #1) | 153 | 61 | 38 | 0.0000000144 |
| 517.2 | Well Field (well #2) | 55 | 61 | 38 | 0.0000000412 |
| 517.3 | Well Field (well #3) | 55 | 61 | 38 | 0.0000000412 |
| | | | | | |



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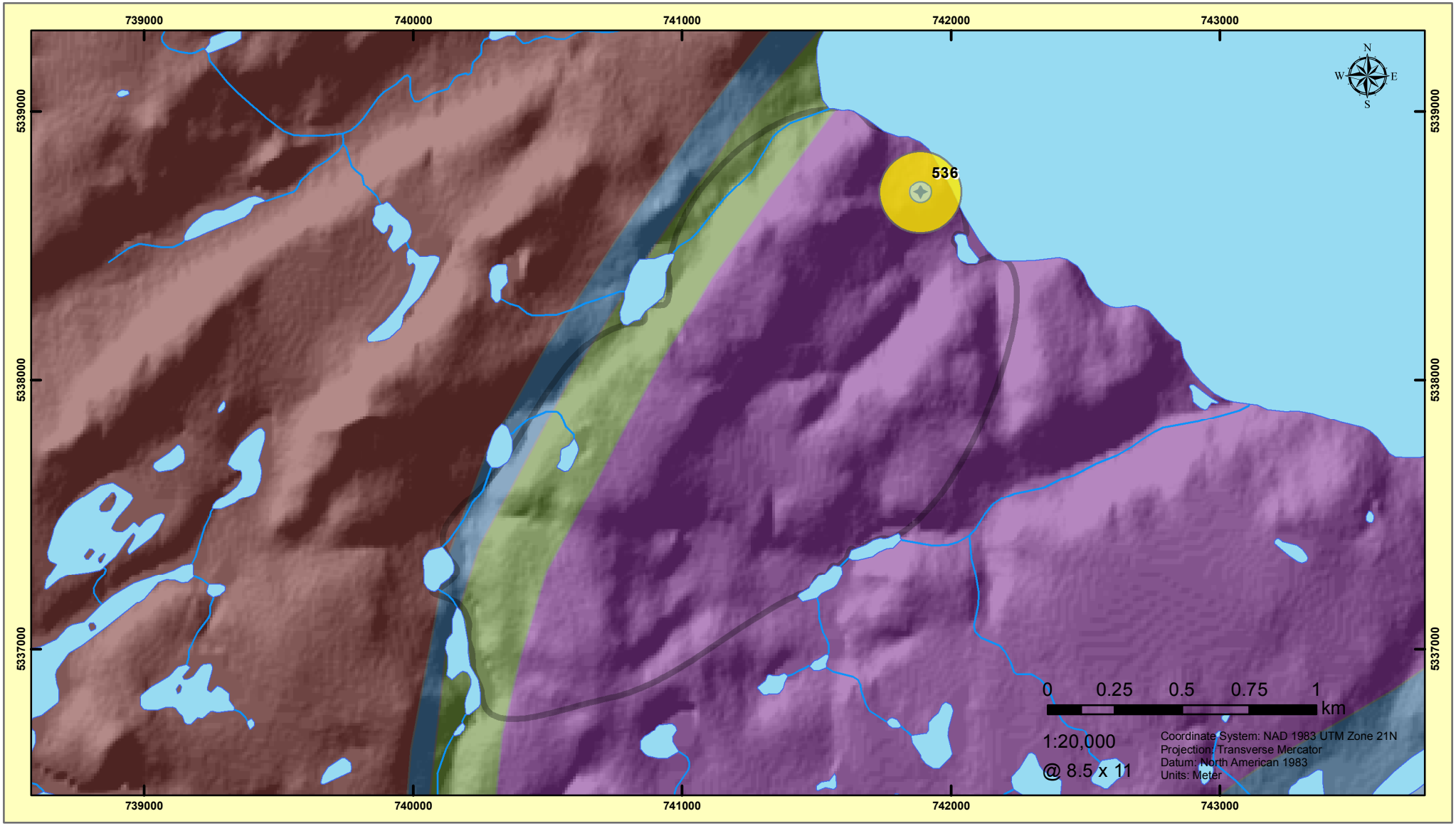



# Petley

Bedrock Well

WHPA

Well Field Study Area

**Bedrock Geology** FG_Sedimentary

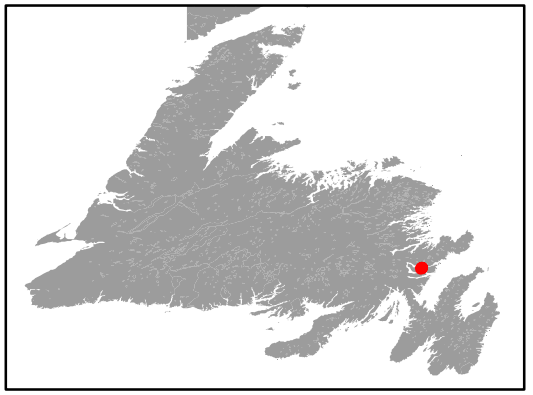
Adeyton Group, Bonavista Formation

Connecting Point Group,

Musgravetown Group, Crown Hill Formation

Youngs Cove Group, Random Formation

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 536 | Drilled | 76 | 92 | 57 | 0.000000061 |
| | | | | | |



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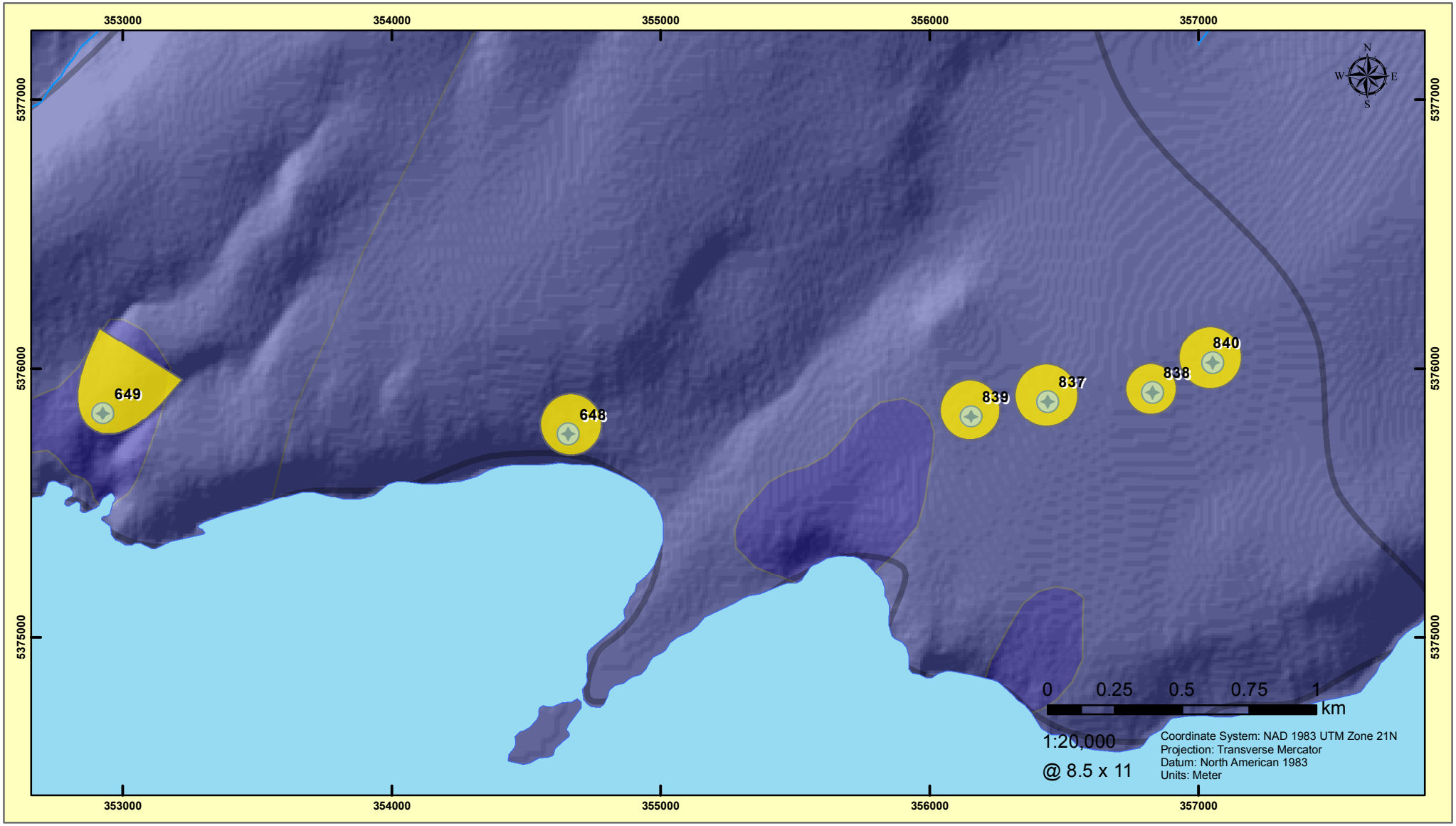


# Ship Cove

Bedrock Well

WHPA

Well Field Study Area

**Bedrock Geology**

Carbonate

Codroy Group,

Port au Port Group,

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 648 | #5 Well - Murdock Wheeler Well | 41 | 34 | 21 | 0.000000169 |
| 649 | #6 Well - Lower Cove Well | 41 | 62 | 38 | 0.000000481 |
| 837 | #3 Well - Bernard Brake Well | 64 | 62 | 38 | 0.000000108 |
| 838 | #2 Well - Howard & Rodney Jesso Well | 99 | 62 | 38 | 0.00000007 |
| 839 | #4 Well - Nancy Rowe Well | 72 | 62 | 38 | 0.0000000963 |
| 840 | #1 Well - PJ's Variety Well | 64 | 62 | 38 | 0.000000108 |
| | | | | | |

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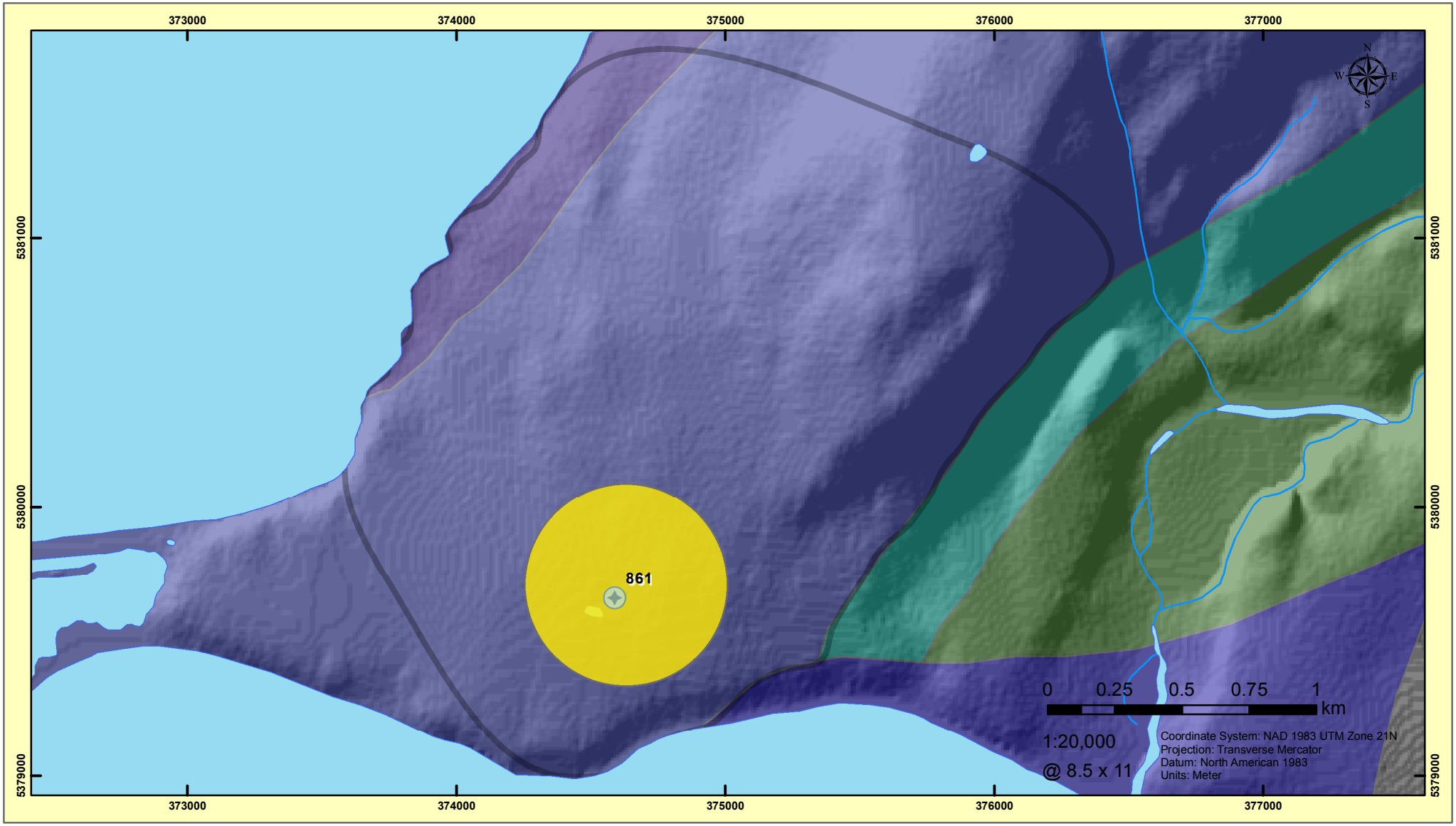



# Port au Port East

Bedrock Well

WHPA

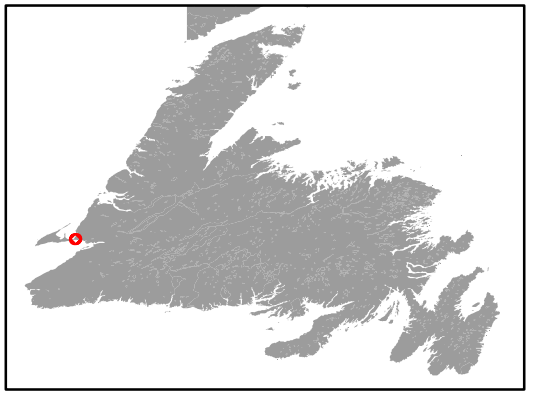
Well Field Study Area

## Bedrock Geology

Carbonate

- Codroy Group,
- Goose Tickle Group, American Tickle Formation
- Labrador Group, Forteau Formation
- Labrador Group, Hawke Bay Formation
- Port au Port Group,
- Table Head Group,

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 861 | #1 Well | 61 | 608 | 378 | 0.000000114 |
| | | | | | |



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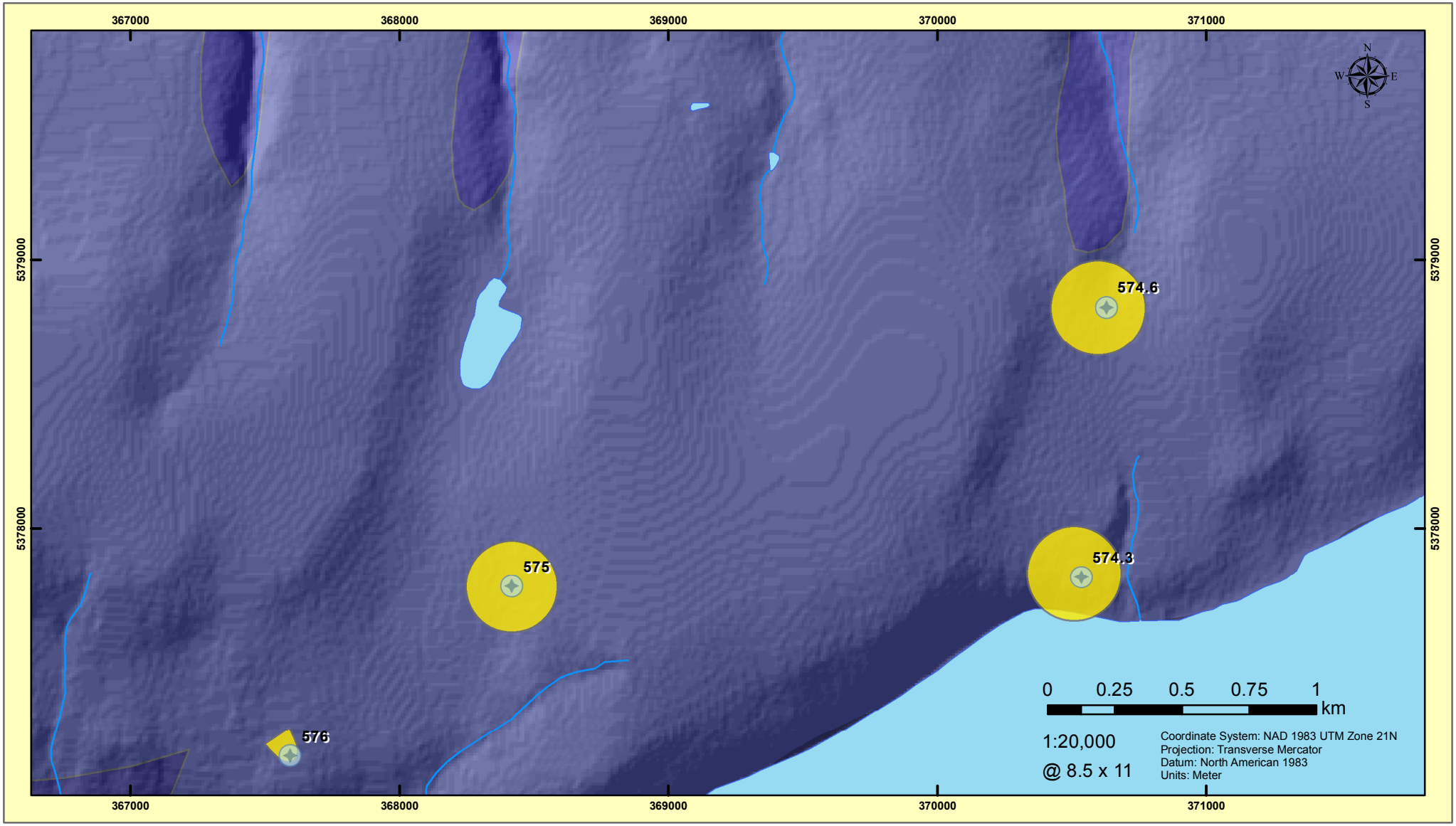



# Port au Port West

Bedrock Well

WHPA

Well Field Study Area

**Bedrock Geology**

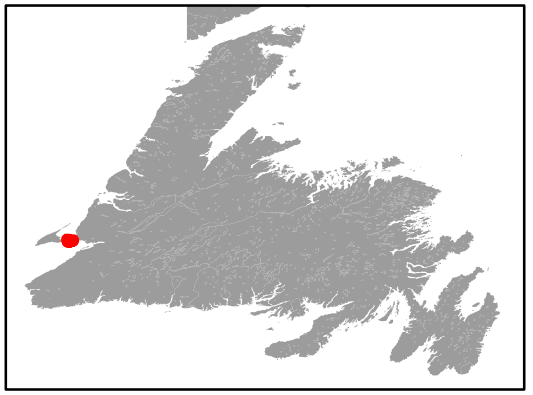
Carbonate

Codroy Group,

Port au Port Group,

Port au Port Group, March Point Formation

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 574.3 | #3 John McLean Well | 57 | 124 | 77 | 0.000000122 |
| 574.6 | #6 Father Joy's Well | 57 | 124 | 77 | 0.000000122 |
| 575 | #4 Goose Pond Road Well | 57 | 86 | 53 | 0.000000122 |
| 576 | #5 Oceanview Drive Well | 57 | 9 | 6 | 0.000000122 |
| | | | | | |



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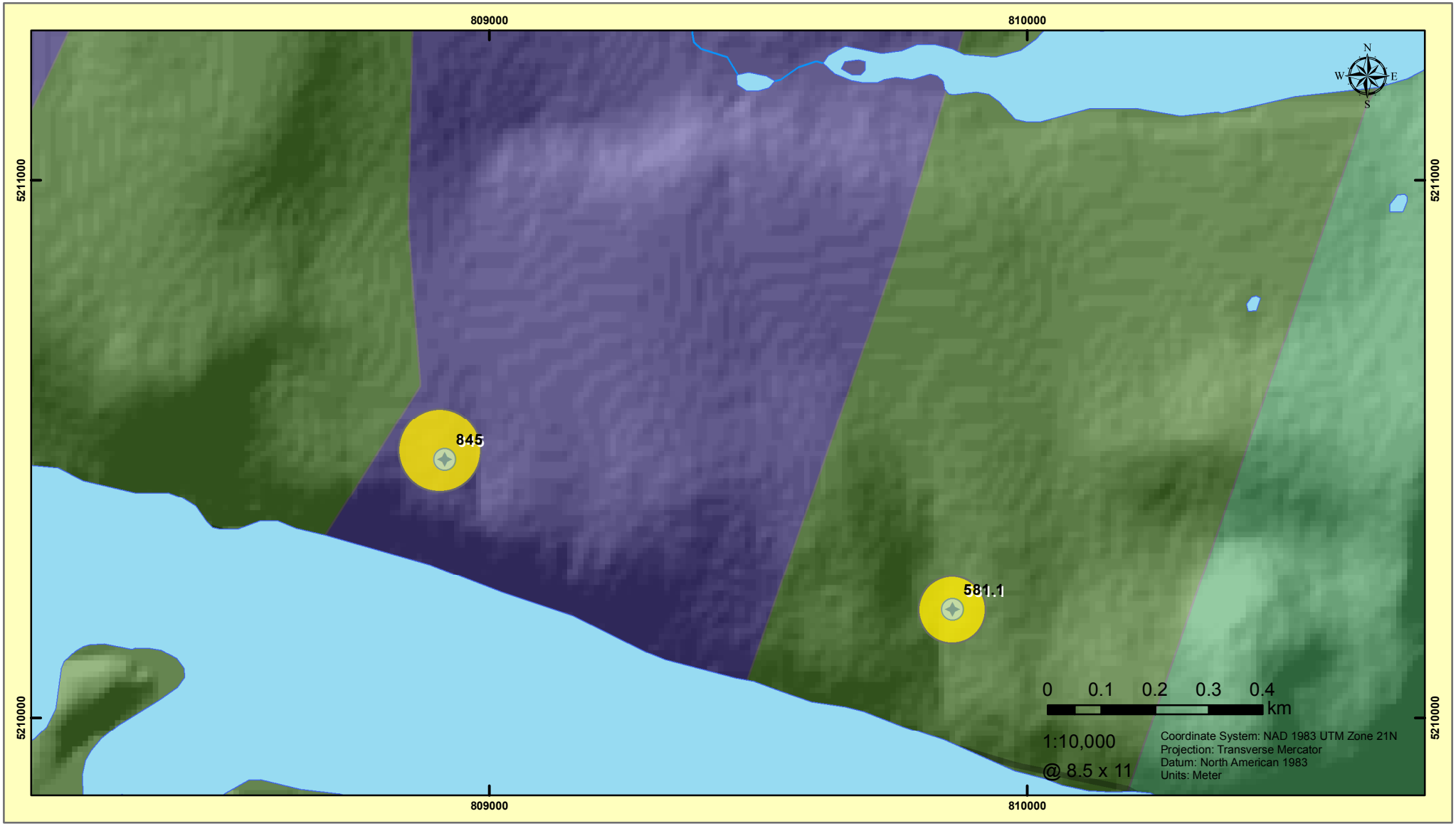


# Port Kirwan

Bedrock Well

WHPA

Well Field Study Area

**Bedrock Geology** Sandstone/FG

Conception Group, Mistaken Point Formation

St. John's Group, Fermeuse Formation

St. John's Group, Trepassey formation

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 581.1 | Drilled Well | 92 | 19 | 11 | 0.0000000194 |
| 845 | Port Kirwan Road Well | 61 | 24 | 15 | 0.0000000834 |
| | | | | | |

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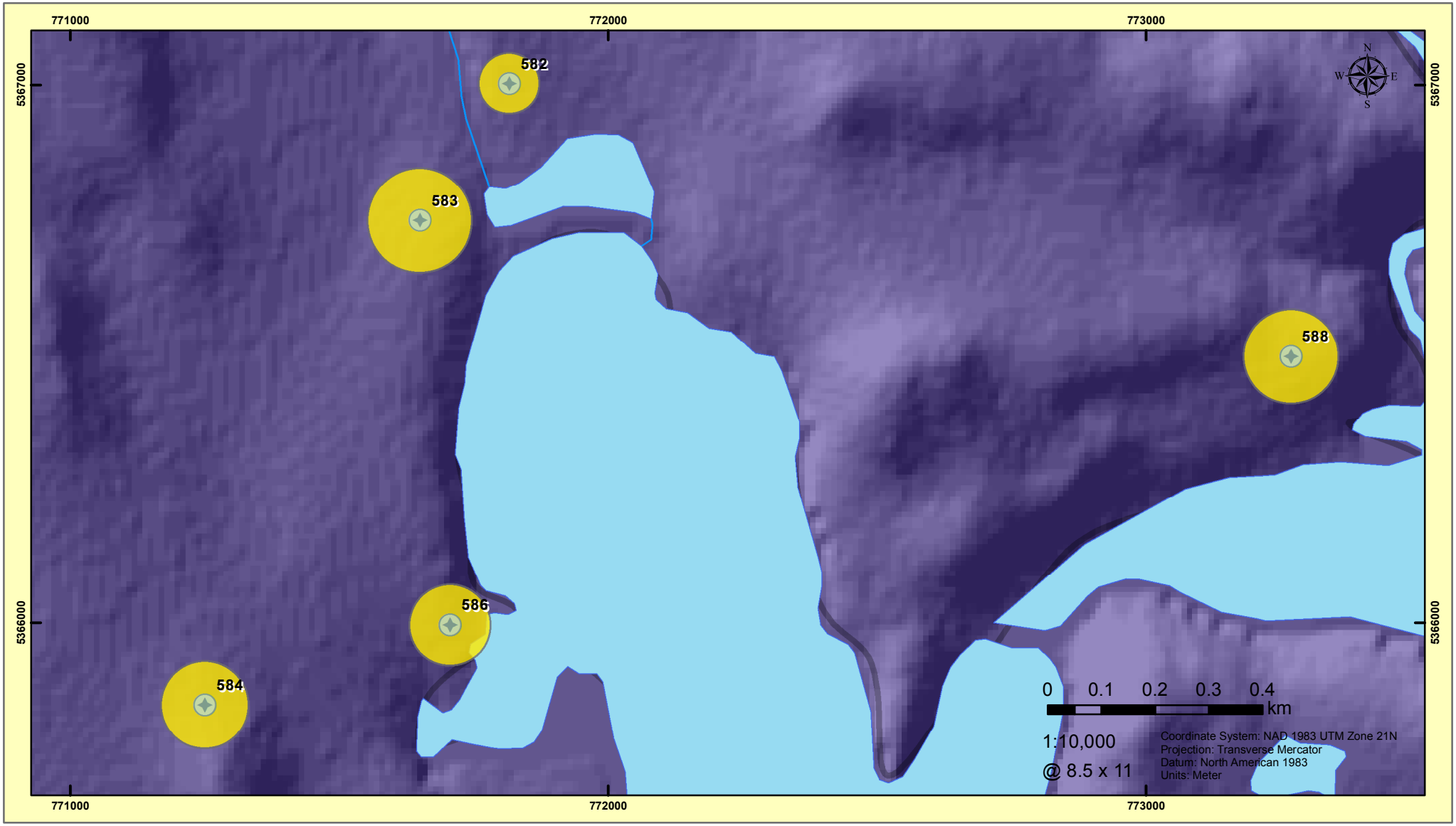



# Port Rexton

Bedrock Well

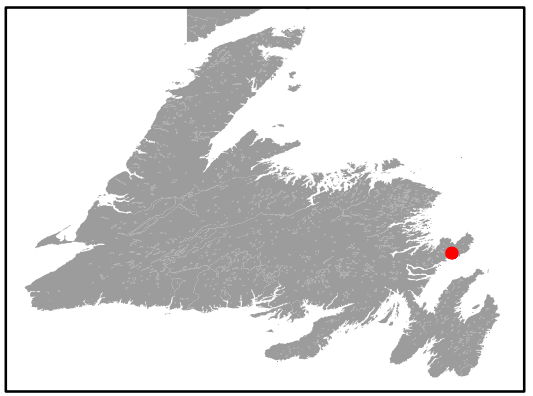
WHPA

Well Field Study Area

**Bedrock Geology** Alternating Sedimentary

Musgravetown Group,

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 582 | #1 Well - Lois Long Well | 43 | 7 | 4 | 0.0000000117 |
| 583 | #2 Well - Edmund Brown's Well | 37 | 18 | 11 | 0.0000000117 |
| 584 | #3 Well - Harold Vivian's Well | 61 | 21 | 13 | 0.0000000117 |
| 586 | #5 Well - Mabel Clarke's Well | 61 | 18 | 11 | 0.0000000117 |
| 588 | Champney's Arm Well | 67 | 27 | 17 | 0.0000000117 |
| | | | | | |



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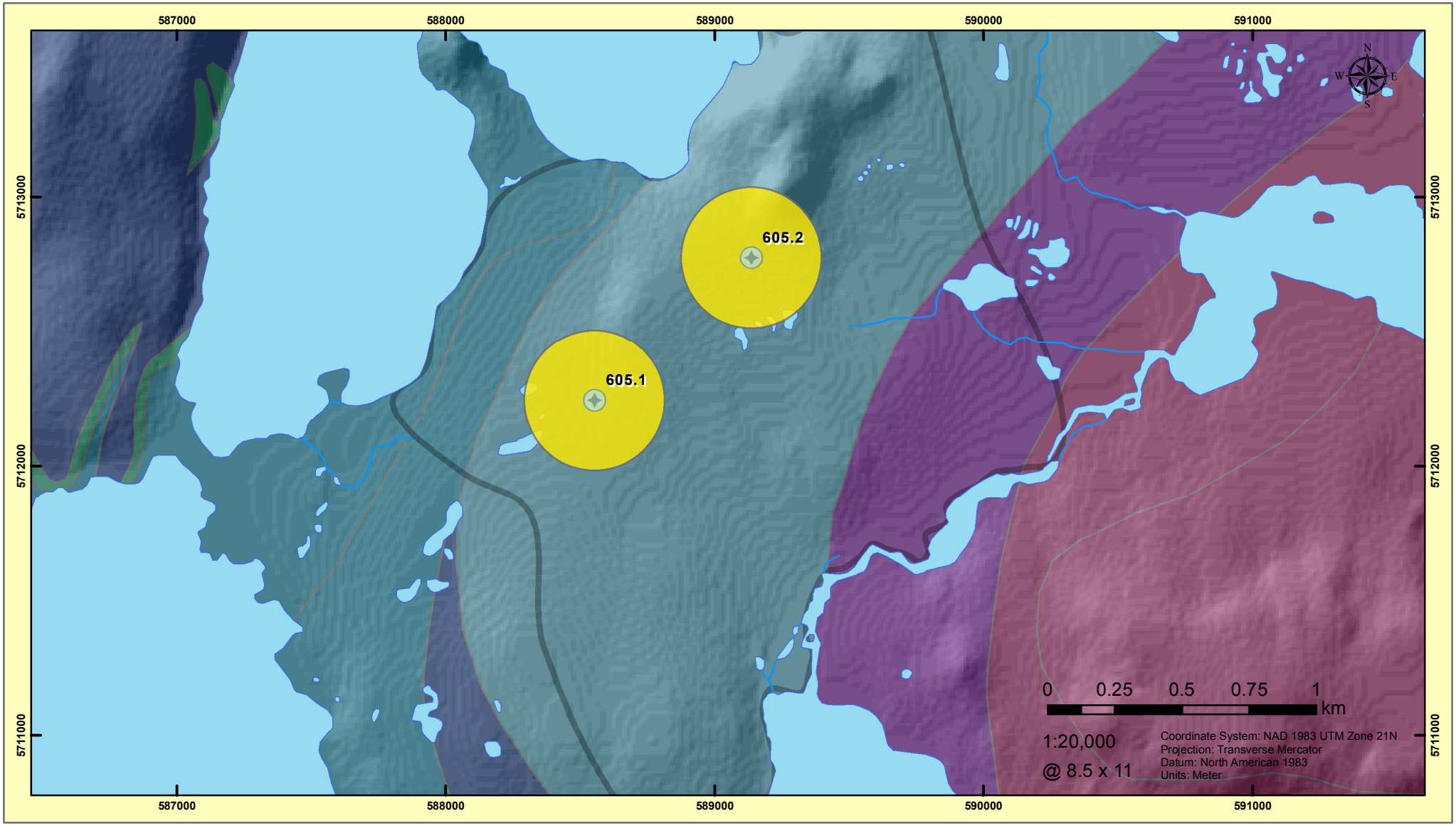



# Raleigh

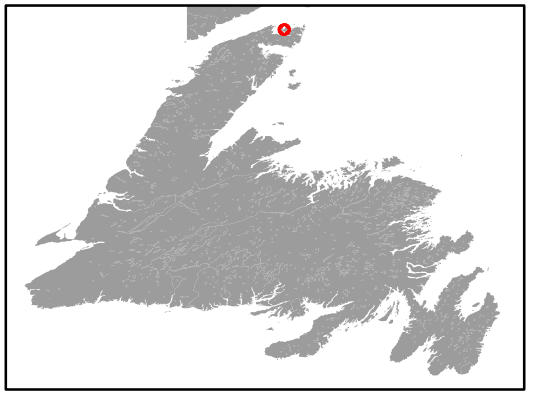
- Bedrock Well
- WHPA
- Well Field Study Area

## Bedrock Geology

Volcanic

- Cape Onion Slice, Cape Onion Formation
- Goose Tickle Group, American Tickle Formation
- Goose Tickle Group, Black Cove Formation
- Maiden Point Slice Assemblage, Maiden Point Formation
- Melange,
- Melange, Milan Arm Melange
- Table Head Group, Table Point Formation

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 605.1 | #1 Well - Town of Raleigh | 35 | 124 | 77 | 0.000000198 |
| 605.2 | #4 Well - Town of Raleigh | 35 | 124 | 77 | 0.000000198 |
| | | | | | |



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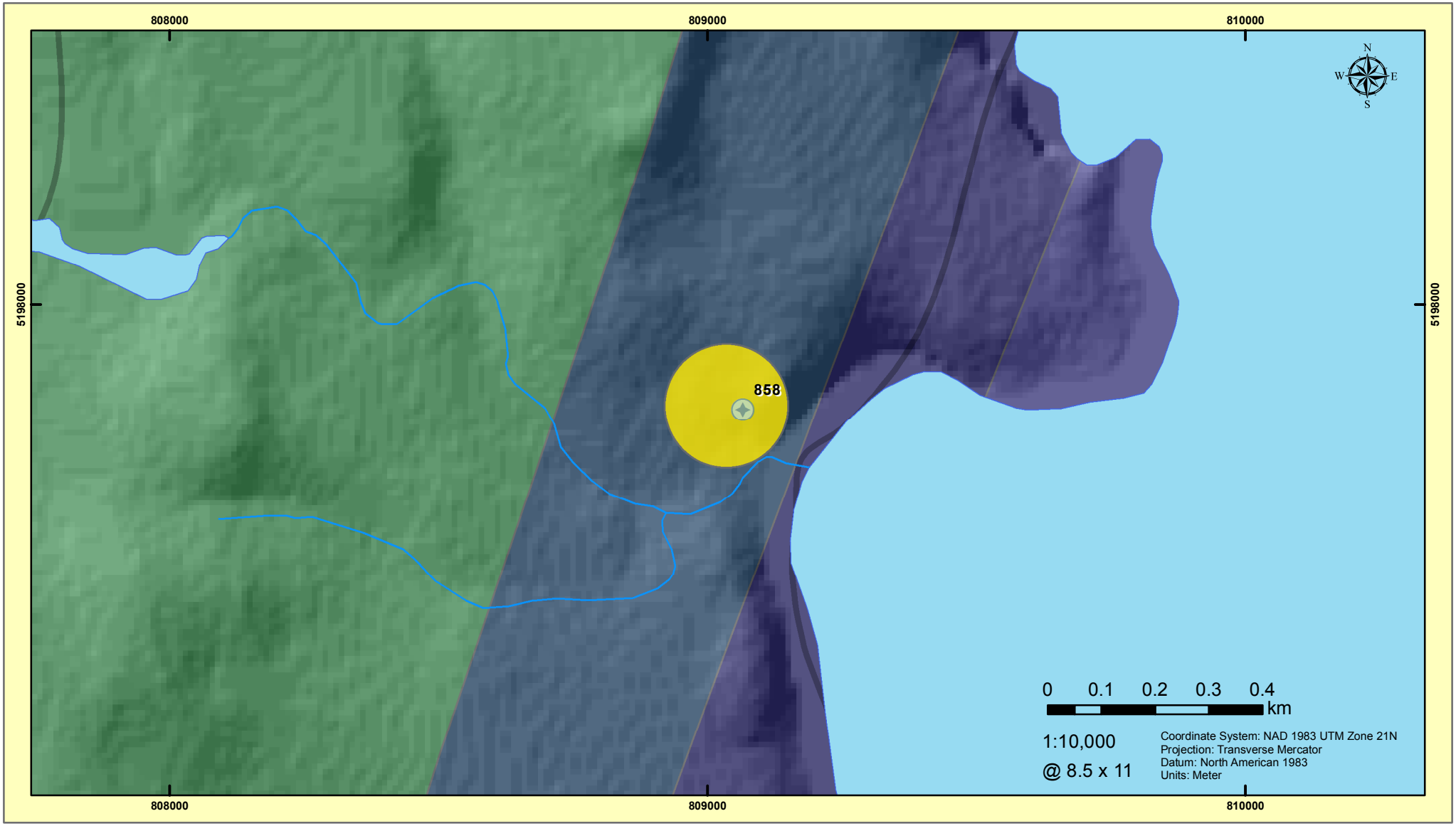


# Renews

Bedrock Well

WHPA

Well Field Study Area

**Bedrock Geology** Sandstone/FG

Signal Hill Group, Cappahayden Formation

Signal Hill Group, Gibbett Hill Formation

St. John's Group, Fermeuse Formation

St. John's Group, Renews Head Formation

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 858 | #1 Dinn's Well | 58 | 50 | 31 | 0.000000141 |
| | | | | | |

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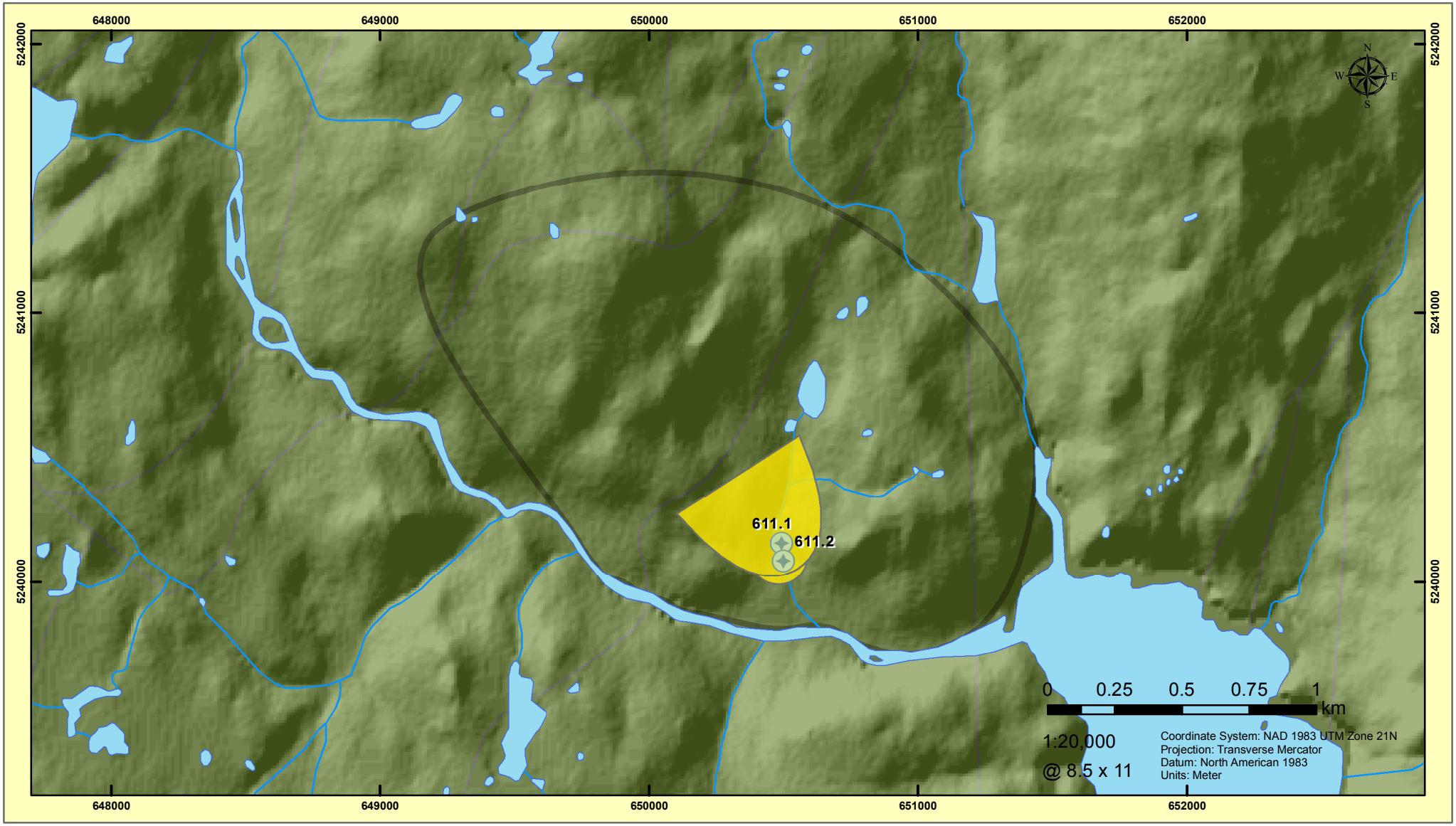



# Red Harbour

Bedrock Well

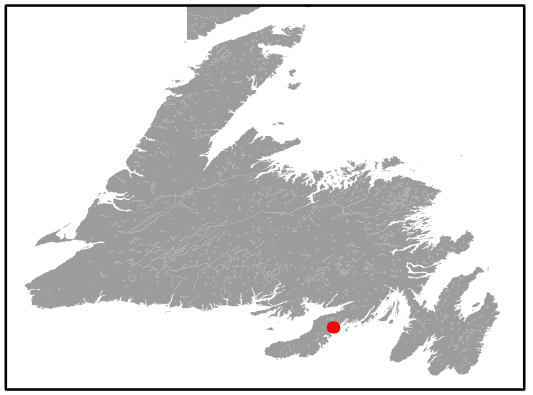
WHPA

Well Field Study Area

**Bedrock Geology** Volcanic

Marystown Group, Cashel Lookout Formation

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 611.1 | Drilled | 46 | 105 | 65 | 0.000000151 |
| 611.2 | Drilled (Backup Well) | 137 | 105 | 65 | 0.0000000506 |
| | | | | | |



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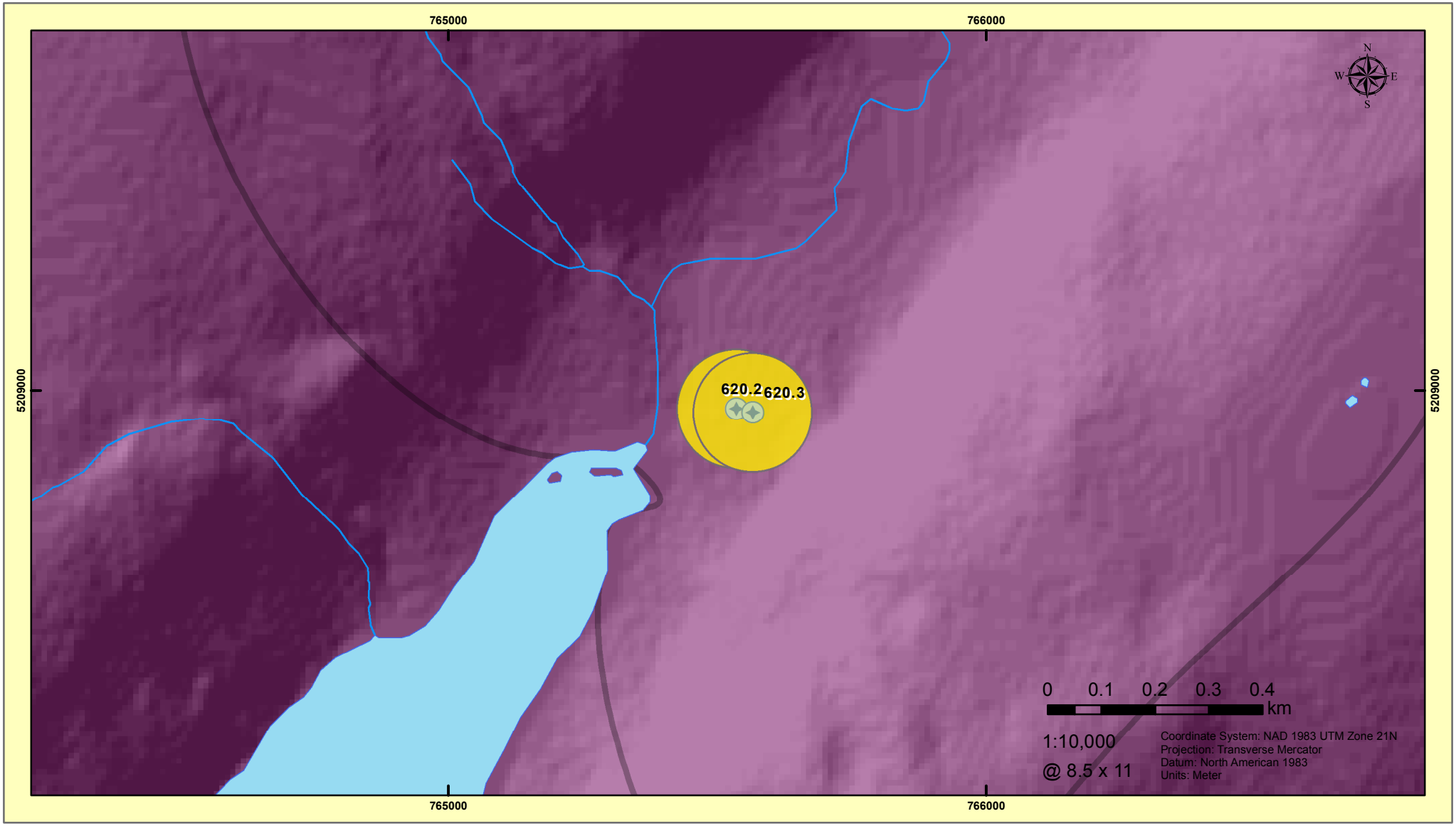



# Riverhead

Bedrock Well

WHPA

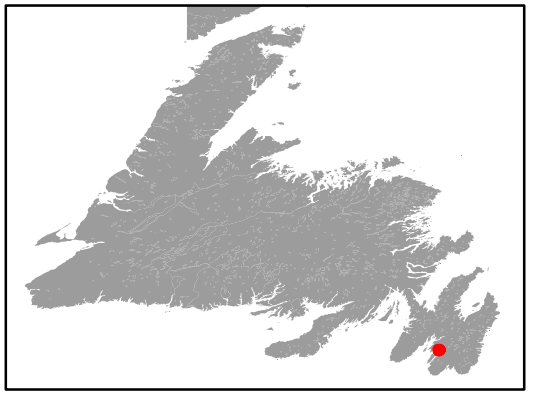
Well Field Study Area

**Bedrock Geology**

Alternating Sedimentary

Conception Group, Drook Formation

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 620.2 | #2 Well | 116 | 73 | 46 | 0.0000000252 |
| 620.3 | #3 Well | 116 | 73 | 46 | 0.0000000252 |
| | | | | | |



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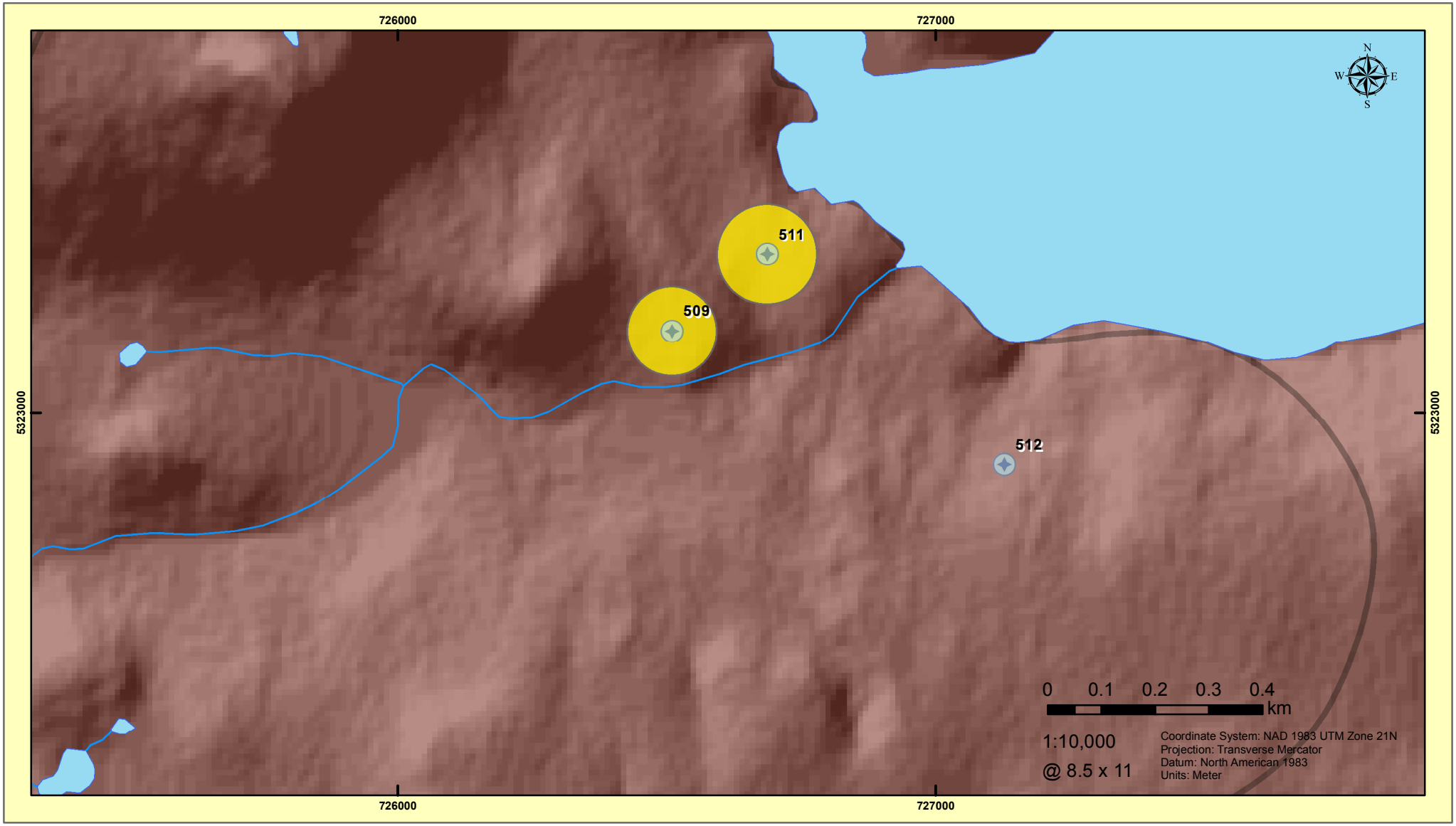



# Random Sound West

Bedrock Well

WHPA

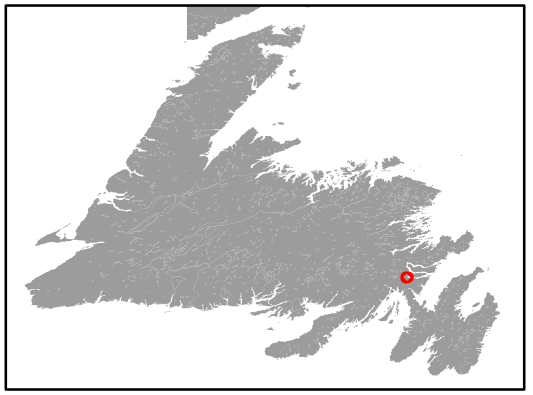
Well Field Study Area

**Bedrock Geology**

Sandstone/FG

Musgravetown Group, Bull Arm Formation

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 509 | #1 Well - Cabot Road South Well | 122 | 44 | 27 | 0.0000000361 |
| 511 | #3 Well - Harbour Well | 122 | 55 | 34 | 0.0000000361 |
| 512 | #4 Well (Inactive, not hooked up) | 85 | 52 | 32 | 0.0000000518 |
| | | | | | |



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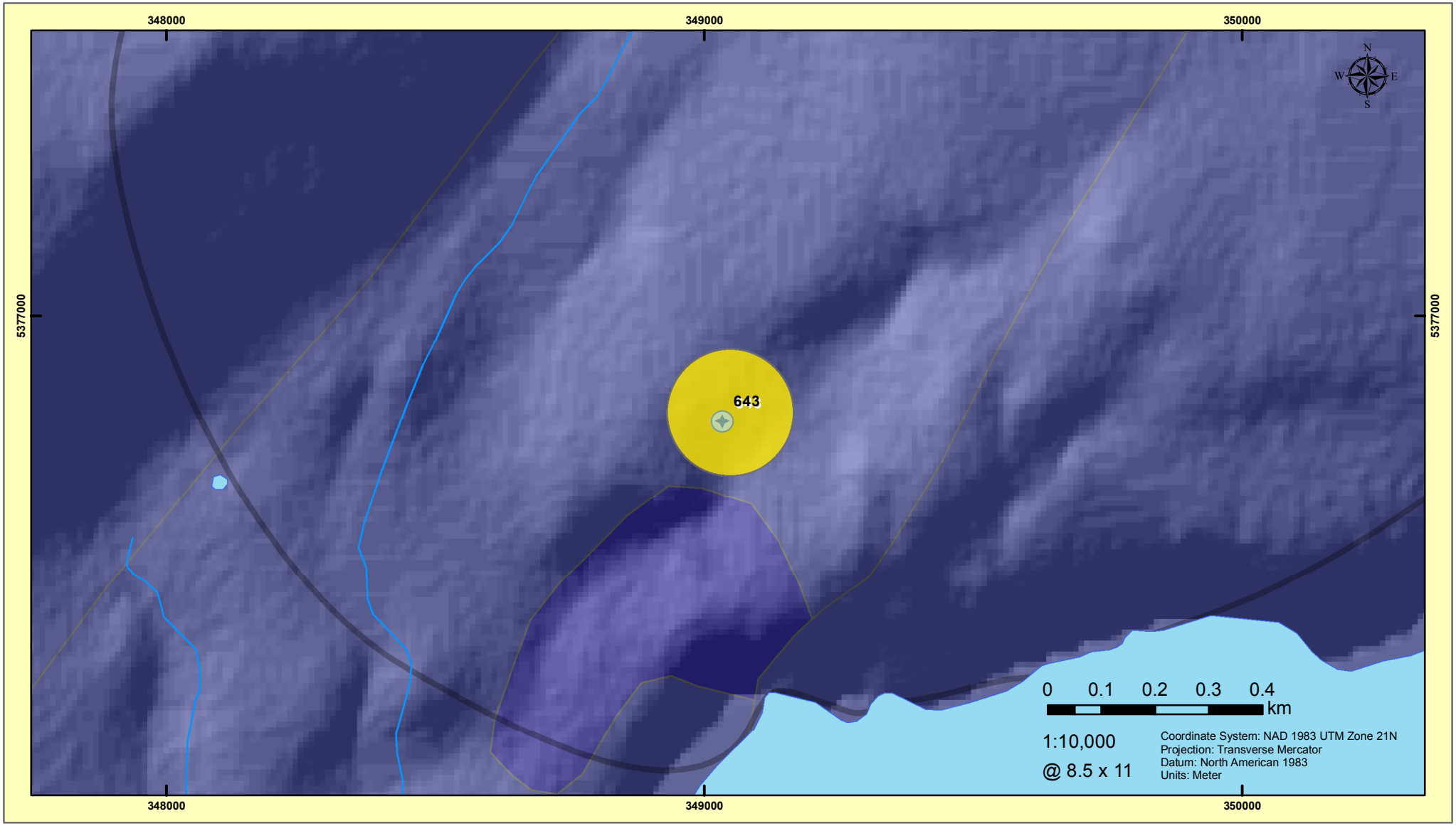


# Sheaves Cove

Bedrock Well

WHPA

Well Field Study Area

**Bedrock Geology**

Carbonate

Codroy Group,

Port au Port Group,

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 643 | Drilled Well | 61 | 59 | 37 | 0.000000114 |
| | | | | | |

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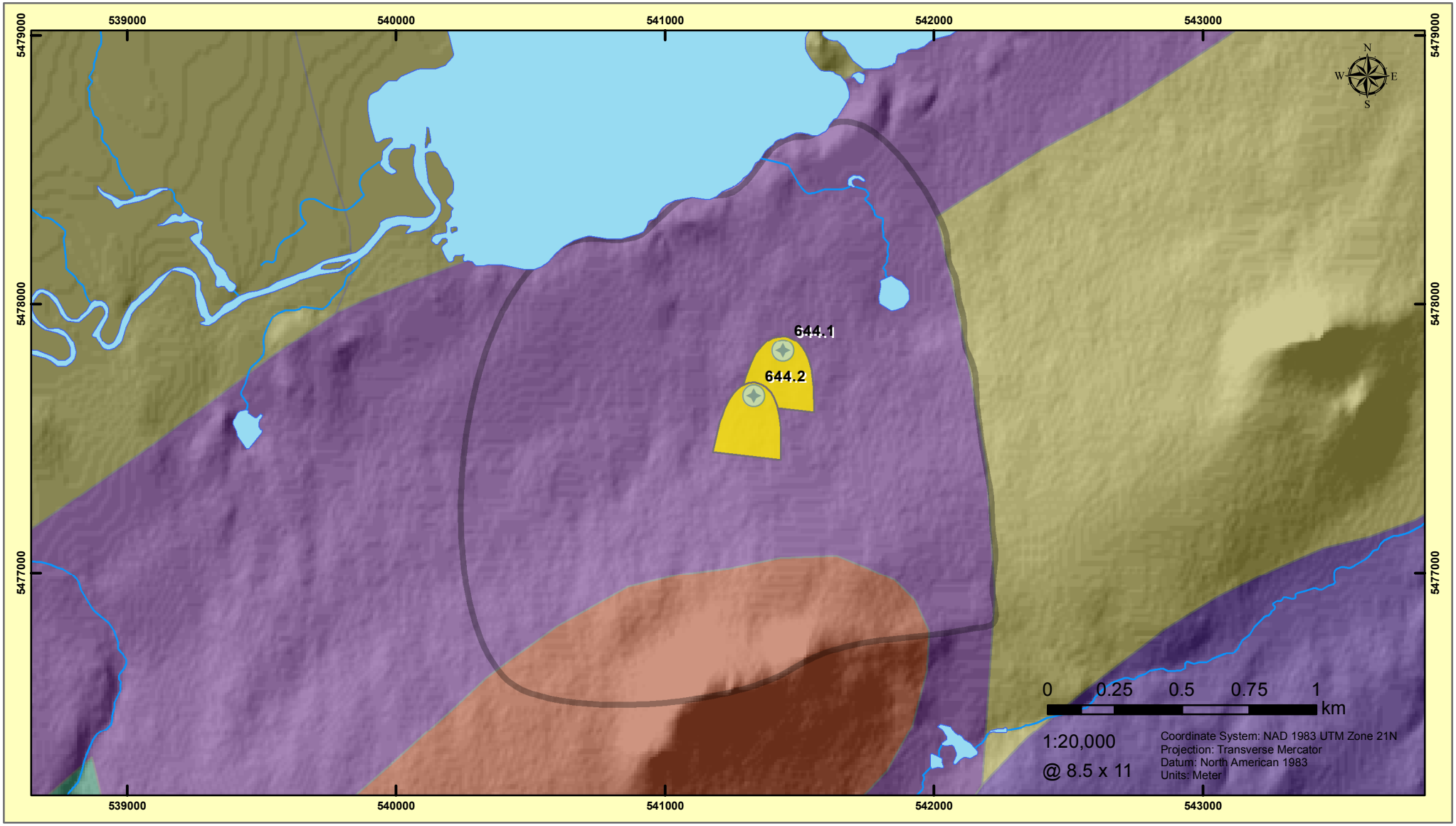



# Sheppardville

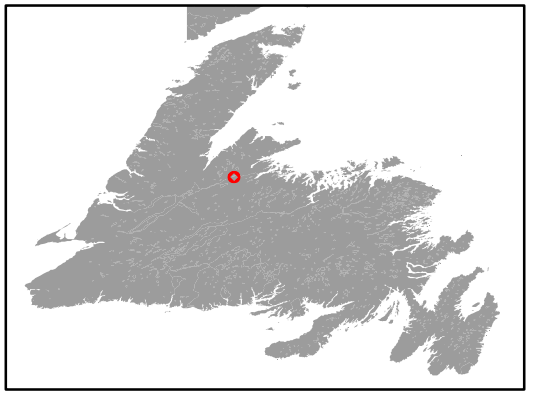
- Bedrock Well
- WHPA
- Well Field Study Area

**Bedrock Geology**

Volcanic

- , (NFMAP 94-226 Carboniferous sediments)
- , Burlington granodiorite
- Catchers Pond Group,
- Sheffield Lake Complex, Intrusive rocks
- Sheffield Lake Complex, Volcanic rocks
- Topsails Igneous Suite, Intrusive rocks

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 644.1 | Drilled | 61 | 59 | 36 | 0.000000114 |
| 644.2 | Drilled (Backup Well) | 61 | 59 | 36 | 0.000000114 |
| | | | | | |



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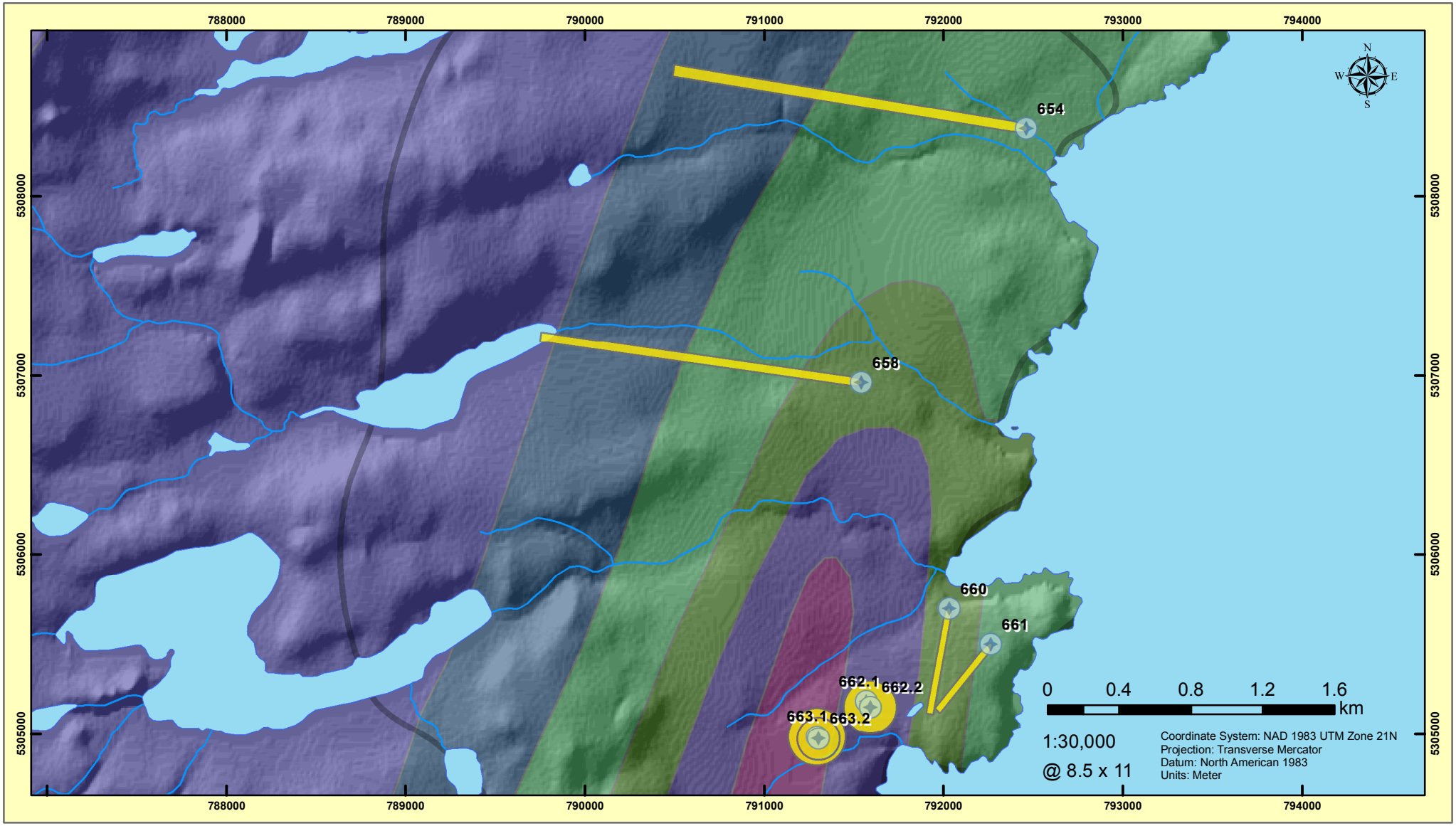


## Small Point

- Bedrock Well
- WHPA
- Well Field Study Area

**Bedrock Geology** FG_Sedimentary

- Conception Group, Drook Formation
- Conception Group, Mistaken Point Formation
- Musgravetown Group, Big Head Formation
- Signal Hill Group, Gibbett Hill Formation
- St. John's Group, Fermeuse Formation
- St. John's Group, Renews Head Formation
- St. John's Group, Trepassey formation

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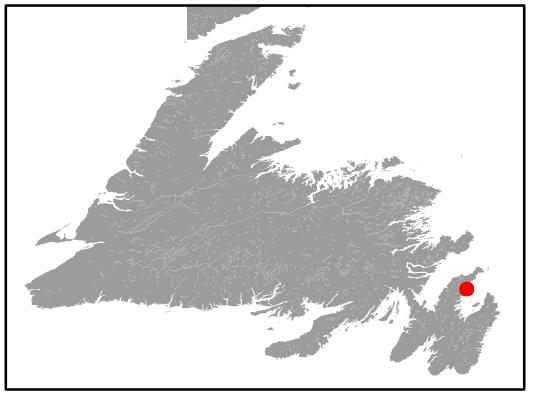
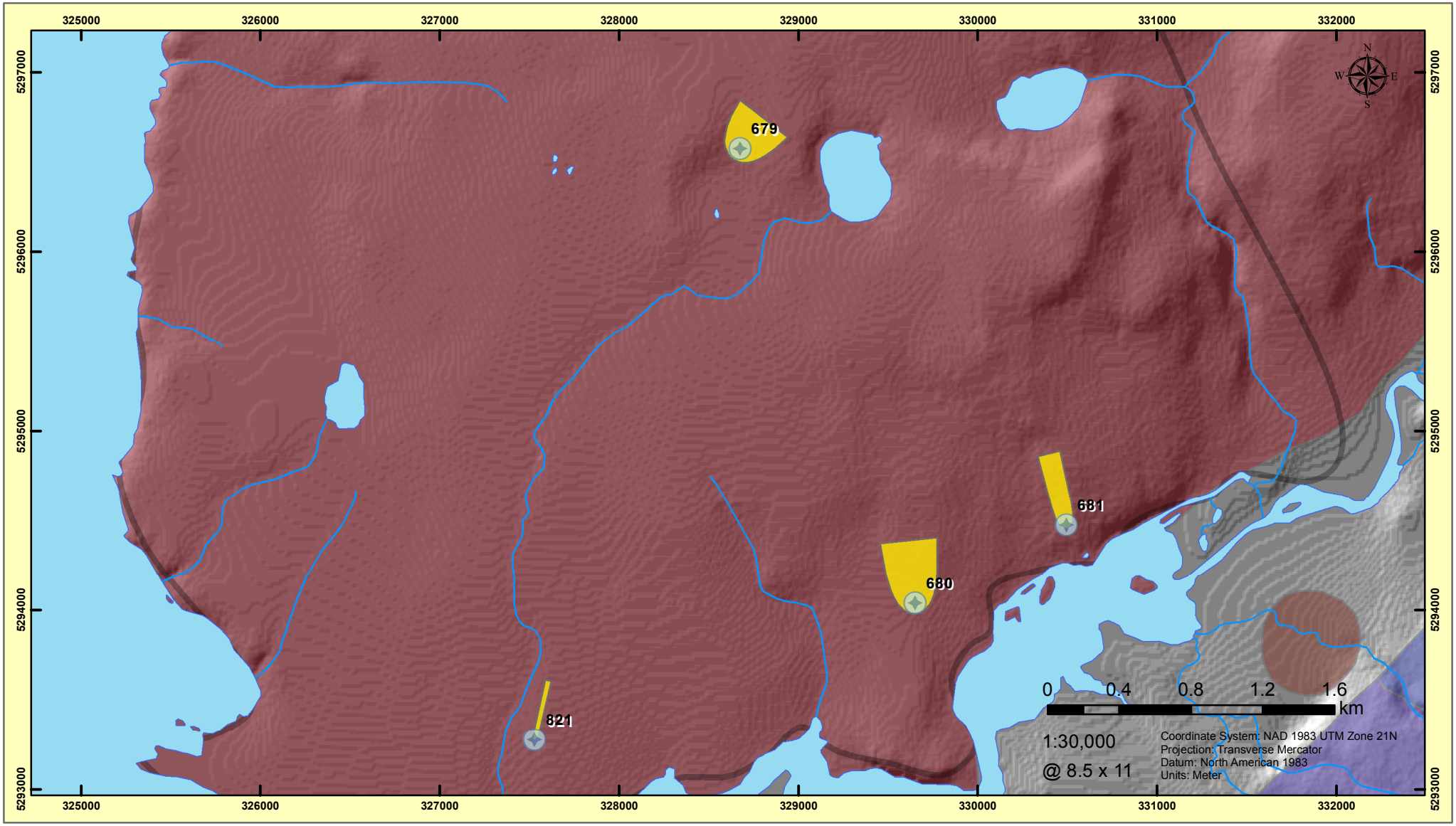
| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 654 | #1 Well - Reg Bursey Well | 58 | 73 | 45 | 0.00000435 |
| 658 | #4 Well - Leonard King Well | 91 | 182 | 113 | 0.00000435 |
| 660 | #6 Well - Herb Trickett Well | 92 | 32 | 20 | 0.00000435 |
| 661 | #7 Well - Gin Badcock Well | 83 | 53 | 33 | 0.00000435 |
| 662.1 | #8 Well - Effie Flight Wells (Inside Well) | 101 | 64 | 40 | 0.0000000517 |
| 662.2 | #8 Well - Effie Flight Wells (Outside Well) | 57 | 64 | 40 | 0.0000000517 |
| 663.1 | #9 Well - Walter Reynolds Well (Inside Well) | 64 | 85 | 53 | 0.0000000517 |
| 663.2 | #9 Well - Walter Reynolds Well (Outside Well) | 116 | 85 | 53 | 0.0000000517 |
| | | | | | |






# St. Andrews

Bedrock Well

WHPA

Well Field Study Area

**Bedrock Geology** Alternating Sedimentary

Barachois Group,

Barachois Group, Searston Formation

Long Range Mafic-Ultramafic Complex,

Southwest Brook complex,

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 679 | #1 Well | 61 | 66 | 41 | 0.000000543 |
| 680 | #2 Well | 50 | 98 | 61 | 0.000000662 |
| 681 | #3 Well | 32 | 33 | 20 | 0.00000103 |
| 821 | #4 Well Strip Road Well | 31 | 7 | 4 | 0.00000107 |
| | | | | | |

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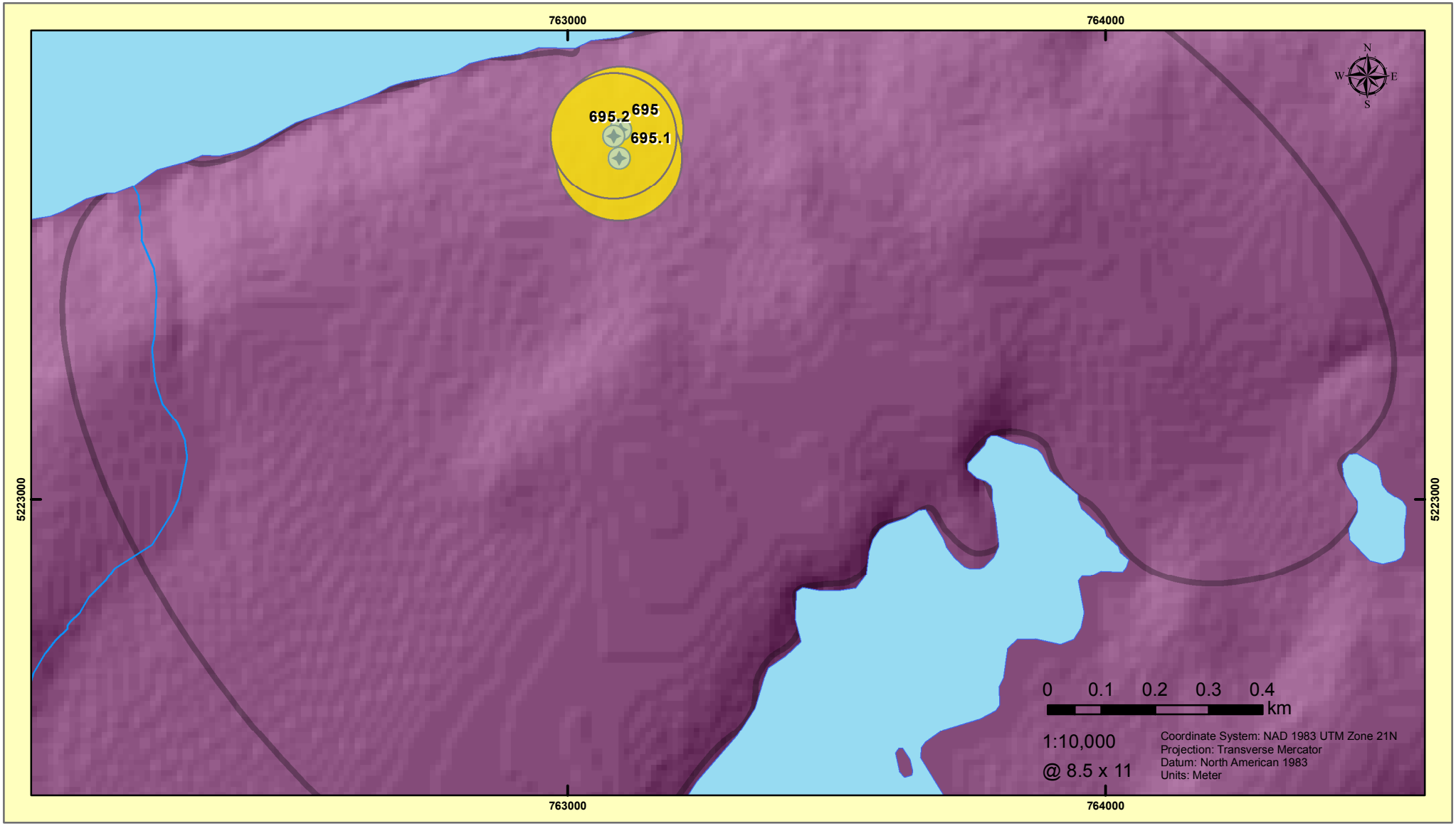



# St. Joseph's

Bedrock Well

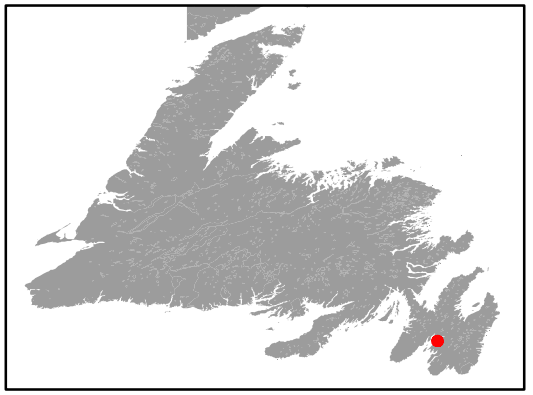
WHPA

Well Field Study Area

**Bedrock Geology** Alternating Sedimentary

Conception Group, Drook Formation

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 695 | Supply Well #1 | 76 | 54 | 34 | 0.0000000385 |
| 695.1 | Backup Well #1 | 76 | 54 | 34 | 0.0000000385 |
| 695.2 | Backup Well #2 | 76 | 54 | 34 | 0.0000000385 |
| | | | | | |



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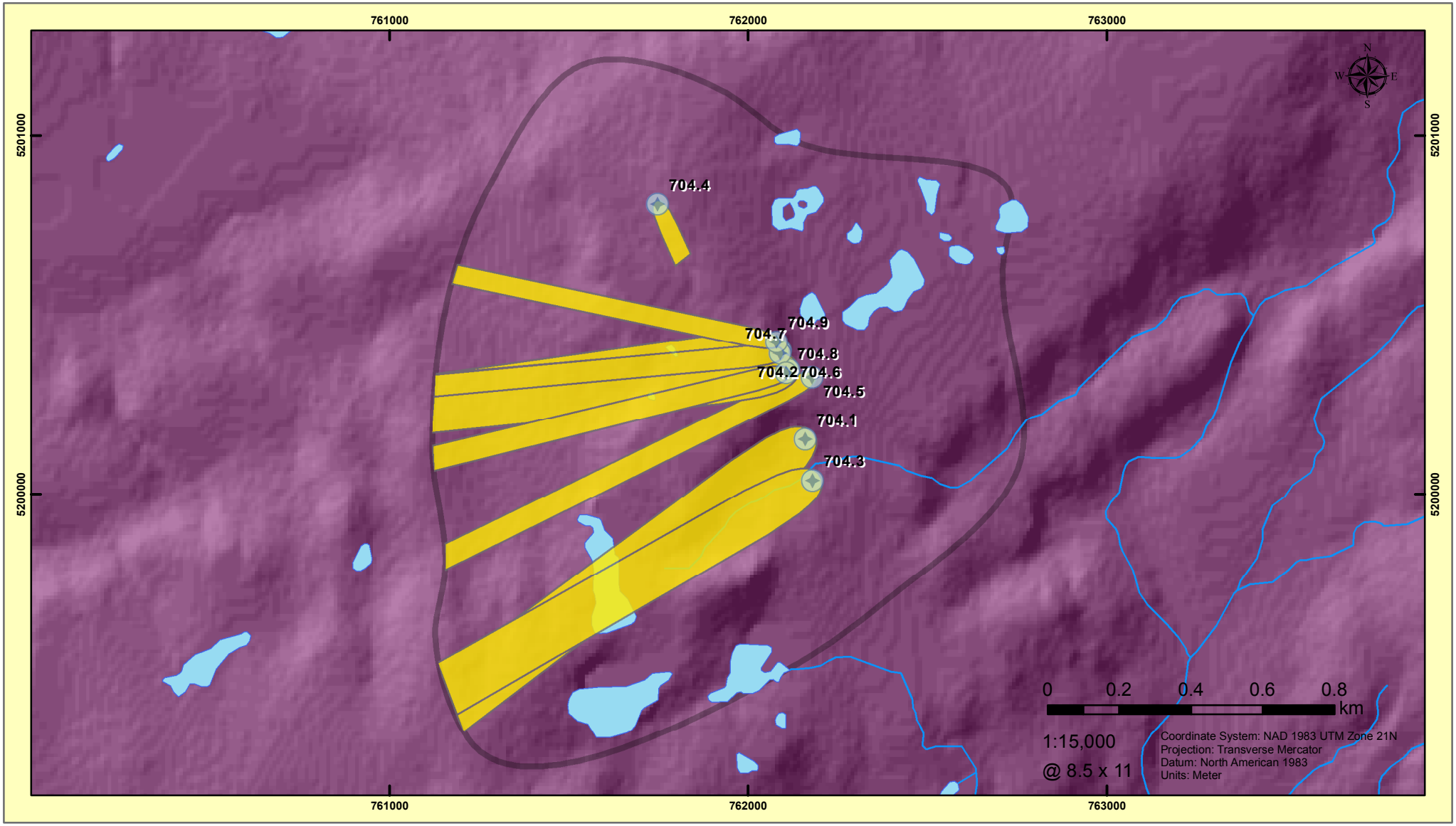


# St. Mary's

Bedrock Well

WHPA

Well Field Study Area

**Bedrock Geology**

Alternating Sedimentary

Conception Group, Drook Formation

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 704.1 | | 46 | 50 | 31 | 0.0000477 |
| 704.2 | #2 Well | 46 | 50 | 31 | 0.0000477 |
| 704.3 | #3 Well | 61 | 50 | 31 | 0.0000477 |
| 704.4 | #4 Well | 122 | 50 | 31 | 0.0000477 |
| 704.5 | #5 Well | 116 | 50 | 31 | 0.0000477 |
| 704.6 | Wellhead | 46 | 50 | 31 | 0.0000477 |
| 704.7 | Wellhead | 116 | 50 | 31 | 0.0000477 |
| 704.8 | Wellhead | 116 | 50 | 31 | 0.0000477 |
| 704.9 | Wellhead | 116 | 50 | 31 | 0.0000477 |
| | | | | | |

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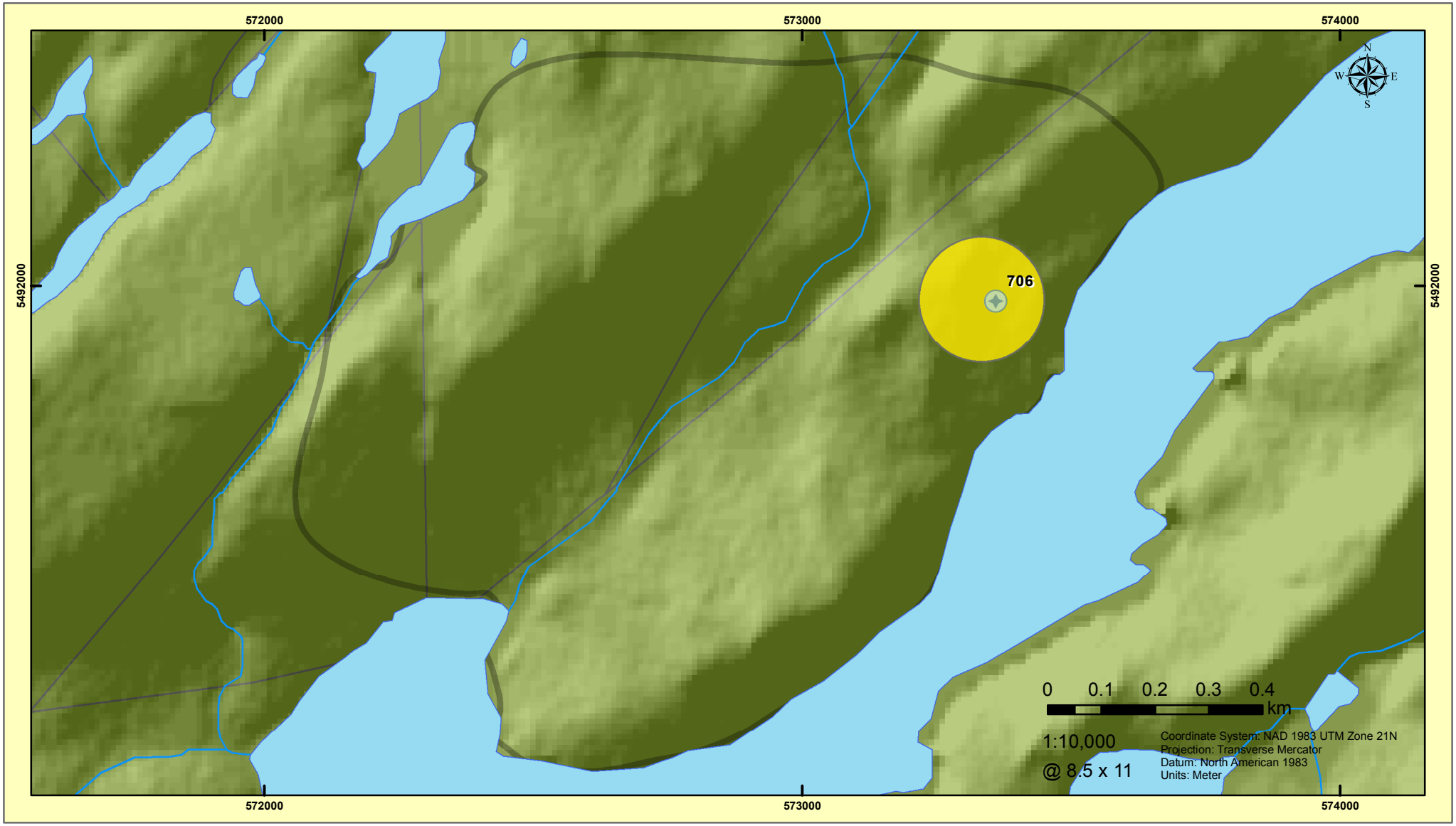



# St. Patrick's

Bedrock Well

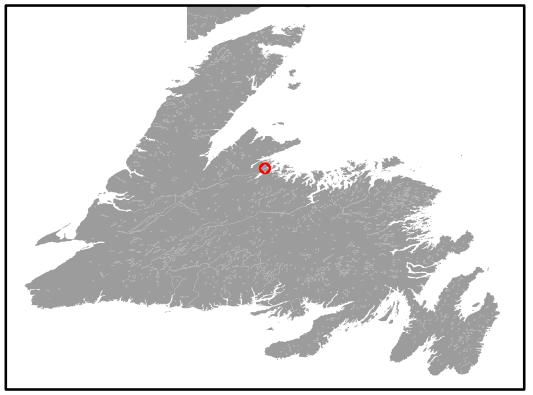
WHPA

Well Field Study Area

**Bedrock Geology** Volcanic

Lushs Bight Group,

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 706 | David Joy Well | 40 | 37 | 23 | 0.0000000453 |
| | | | | | |



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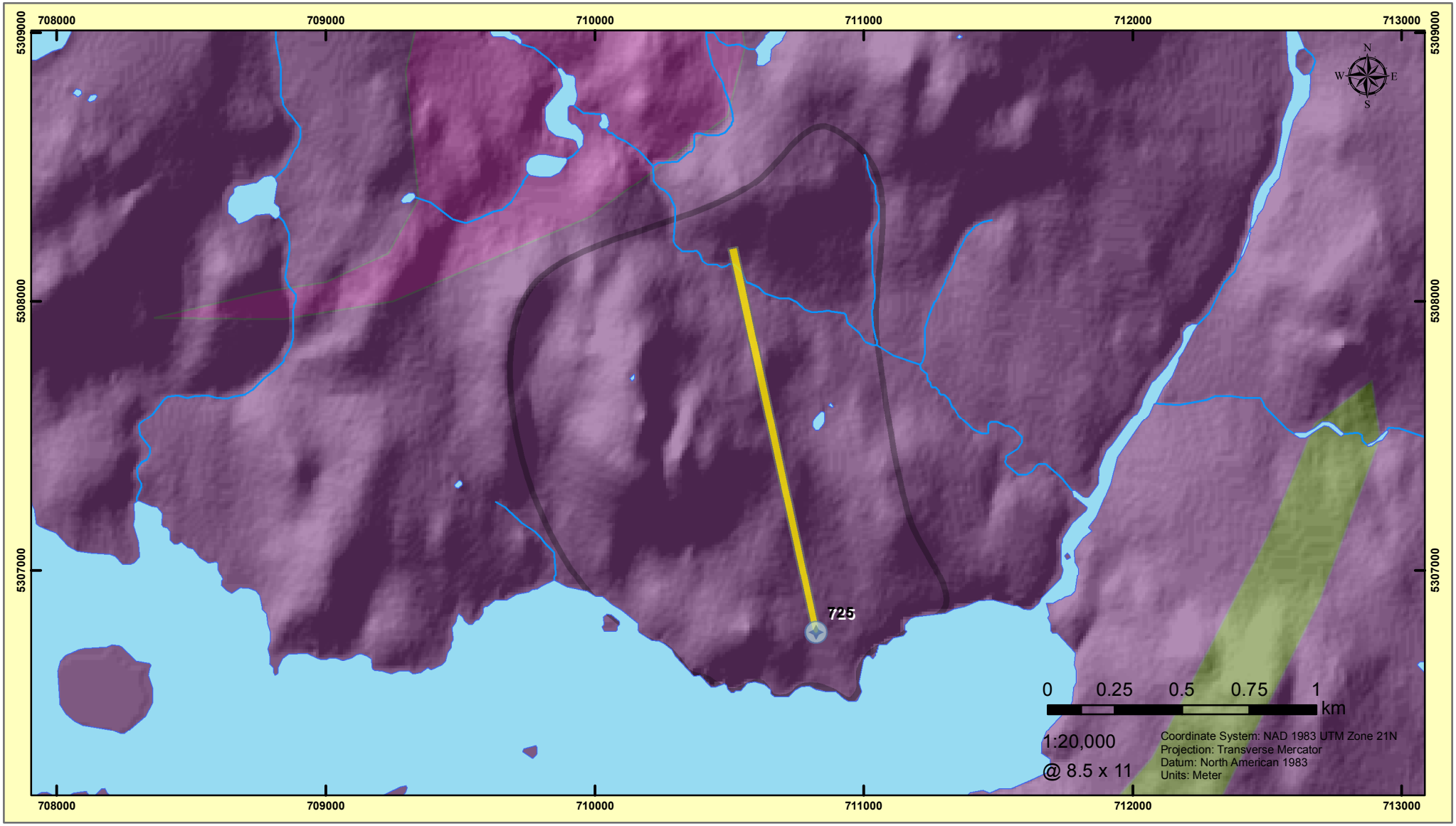



# Swift Current

Bedrock Well

WHPA

Well Field Study Area

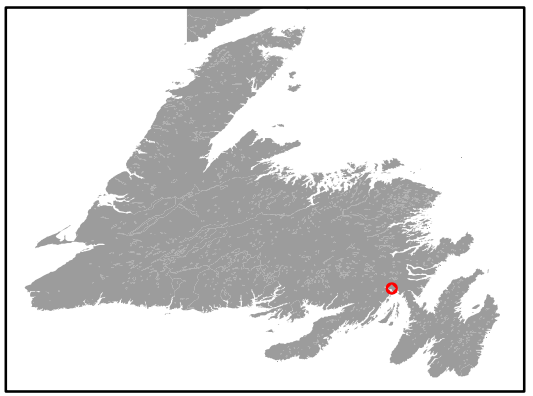
**Bedrock Geology** Plutonic

Marystown Group, Cashel Lookout Formation

Swift Current Intrusive Suite, Swift Current Gabbro

Swift Current Intrusive Suite, Swift Current Granite

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 725 | Drilled | 73 | 21 | 13 | 0.000000861 |
| | | | | | |



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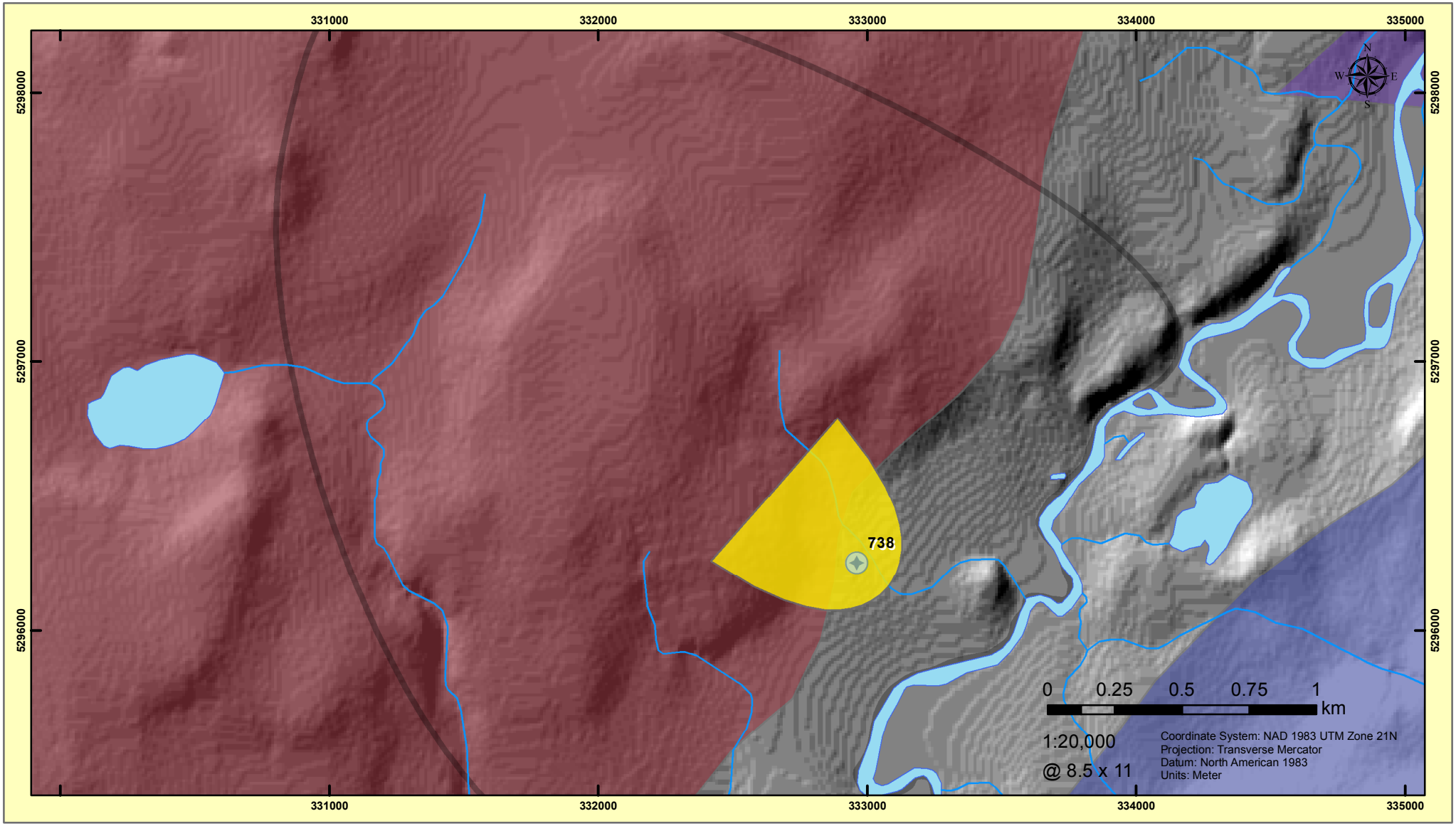


# Tompkins

Bedrock Well

WHPA

Well Field Study Area

**Bedrock Geology** FG_Sedimentary

Barachois Group, Searston Formation

Codroy Group, Woody Cape Formation

Long Range Mafic-Ultramafic Complex,

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 738 | Greg Wall Well | 21 | 87 | 54 | 0.00000033 |
| | | | | | |

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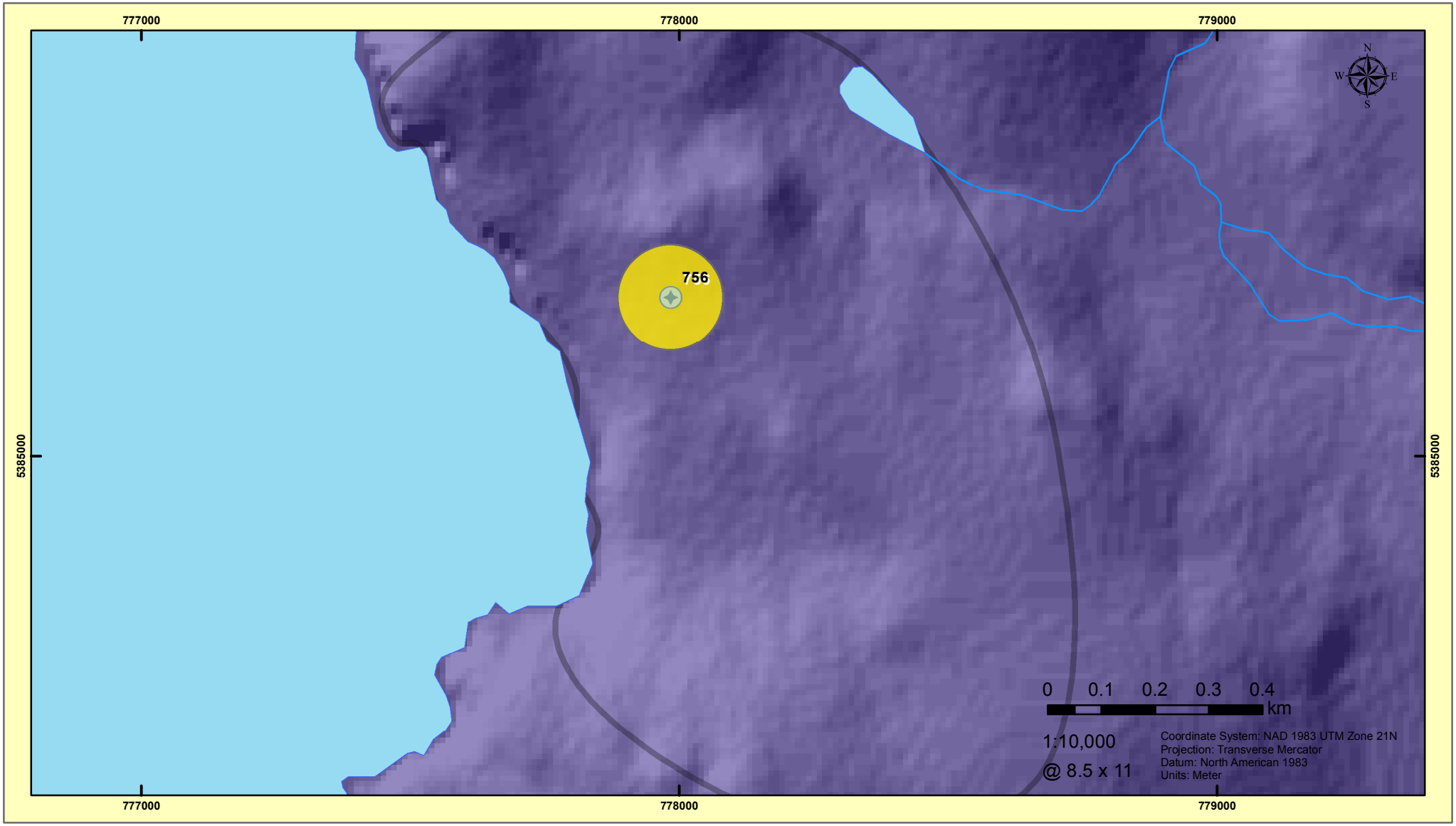



# Upper Amherst Cove

Bedrock Well

WHPA

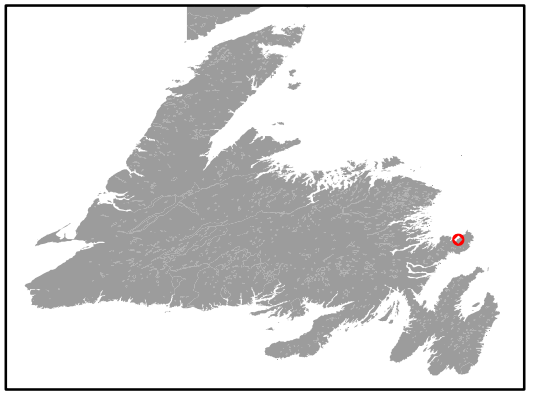
Well Field Study Area

**Bedrock Geology**

Alternating Sedimentary

Musgravetown Group,

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 756 | Drilled | 88 | 44 | 27 | 0.0000000255 |
| | | | | | |



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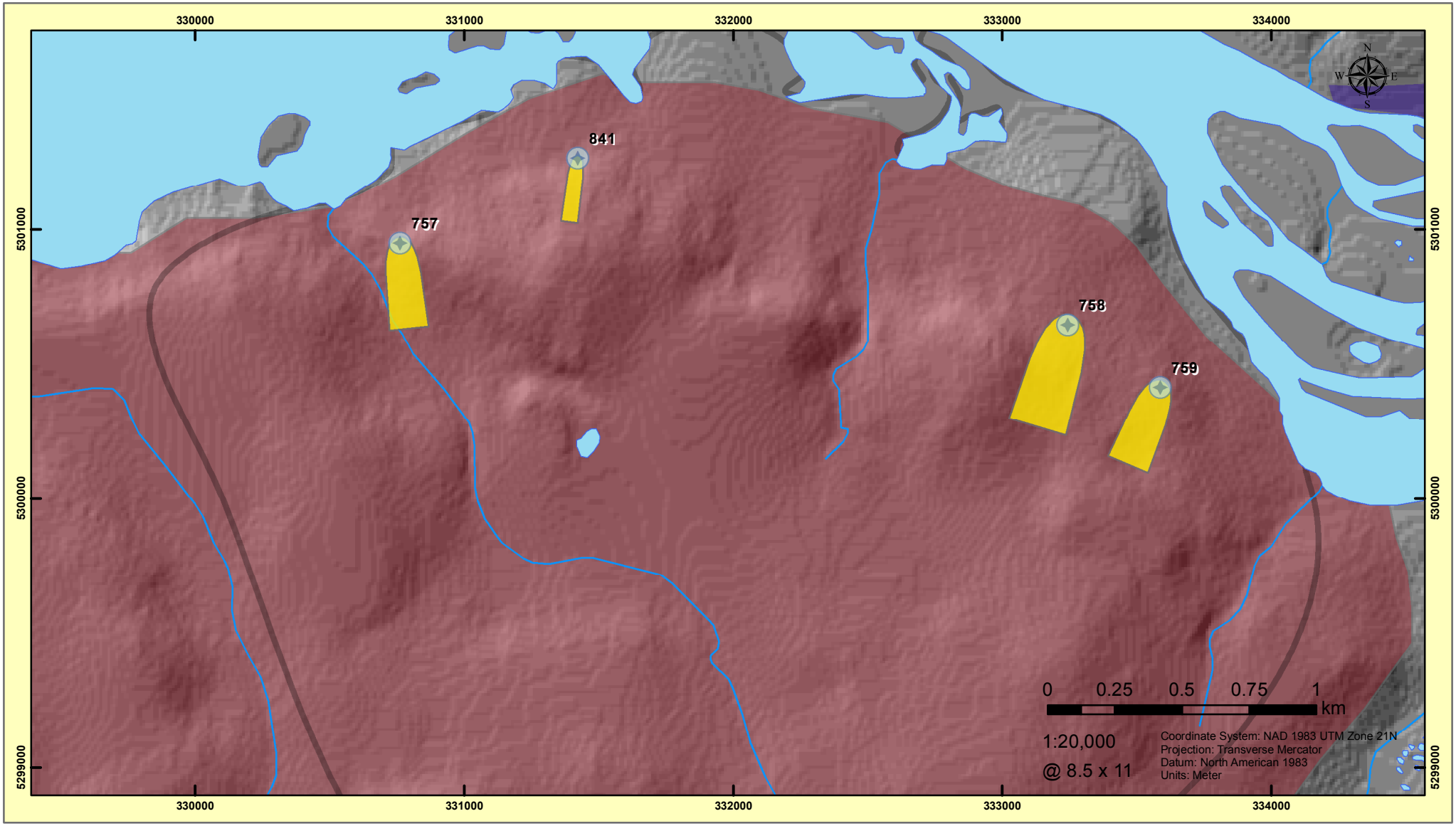


# Upper Ferry

Bedrock Well

WHPA

Well Field Study Area

**Bedrock Geology** Alternating Sedimentary

Barachois Group, Searston Formation

Codroy Group, Codroy Road Formation

Codroy Group, Robinsons River Formation

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 757 | #1 Well - Gerard Brownrigg Well | 56 | 49 | 30 | 0.000000591 |
| 758 | #2 Well - Hughie MacIssac Well | 32 | 52 | 32 | 0.00000103 |
| 759 | #3 Well - Marshall Devoe Well | 44 | 41 | 25 | 0.000000752 |
| 841 | #4 Well - Angus MacNeil Well | 74 | 22 | 14 | 0.000000447 |
| | | | | | |

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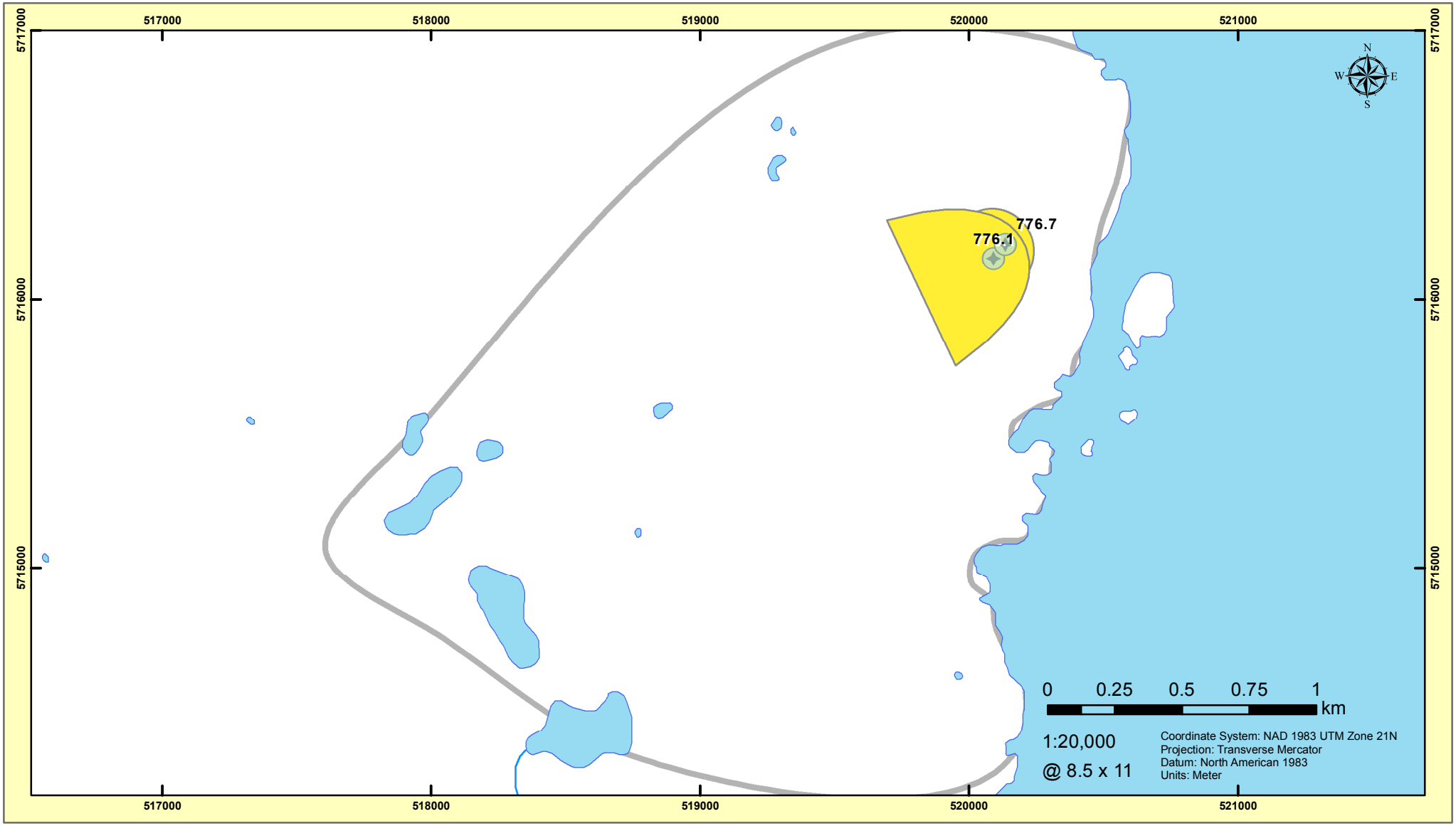



# West St. Modeste

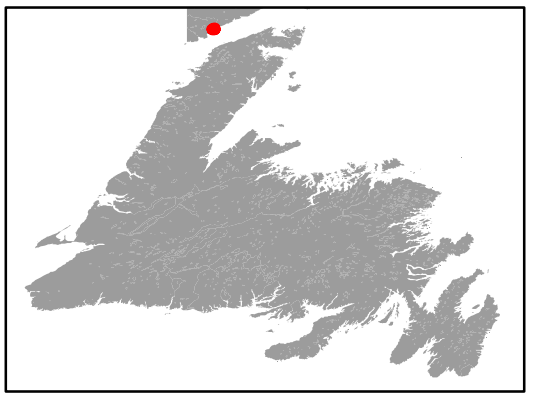
Bedrock Well

WHPA

Well Field Study Area

Plutonic

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 776.1 | Well Field (well #1) | 61 | 70 | 43 | 0.000000114 |
| 776.7 | Well Field (well #7) | 92 | 70 | 43 | 0.0000000754 |
| | | | | | |



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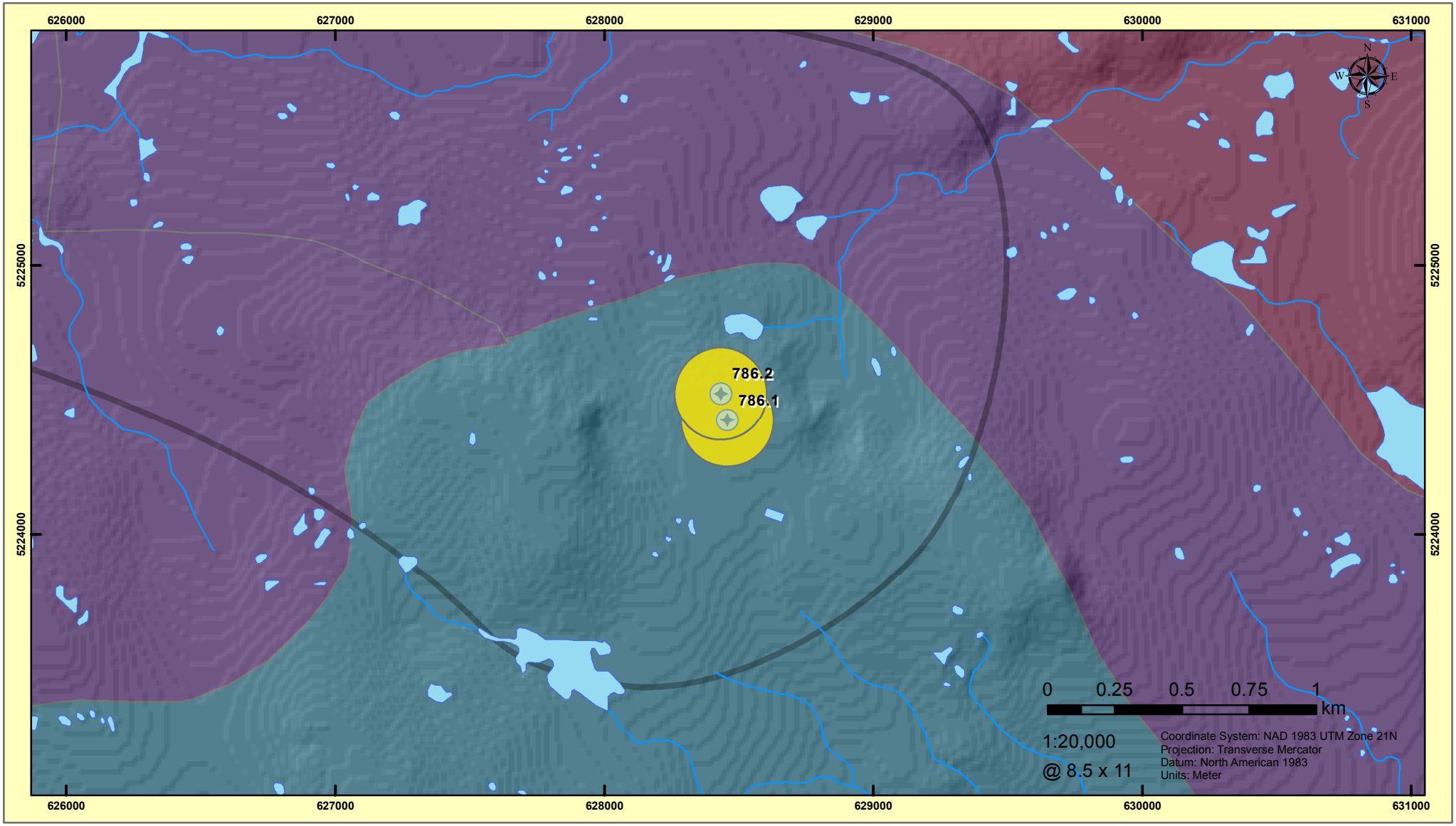



# Winterland

Bedrock Well

WHPA

Well Field Study Area

**Bedrock Geology**

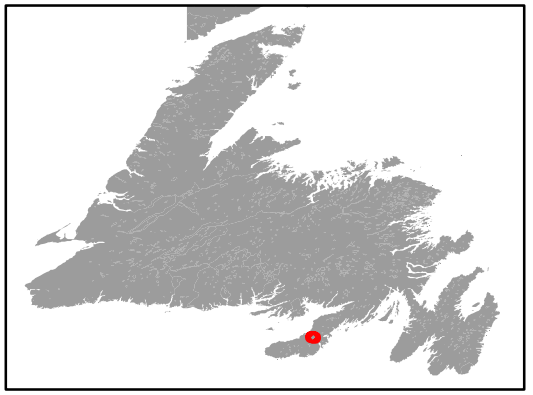
Alternating Sedimentary

, St. Lawrence Granite

Marystown Group, Barasway Formation

Marystown Group, Taylors Bay Formation

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 786.1 | #1 Well | 107 | 164 | 102 | 0.0000000394 |
| 786.2 | #2 Well | 107 | 164 | 102 | 0.0000000394 |
| | | | | | |



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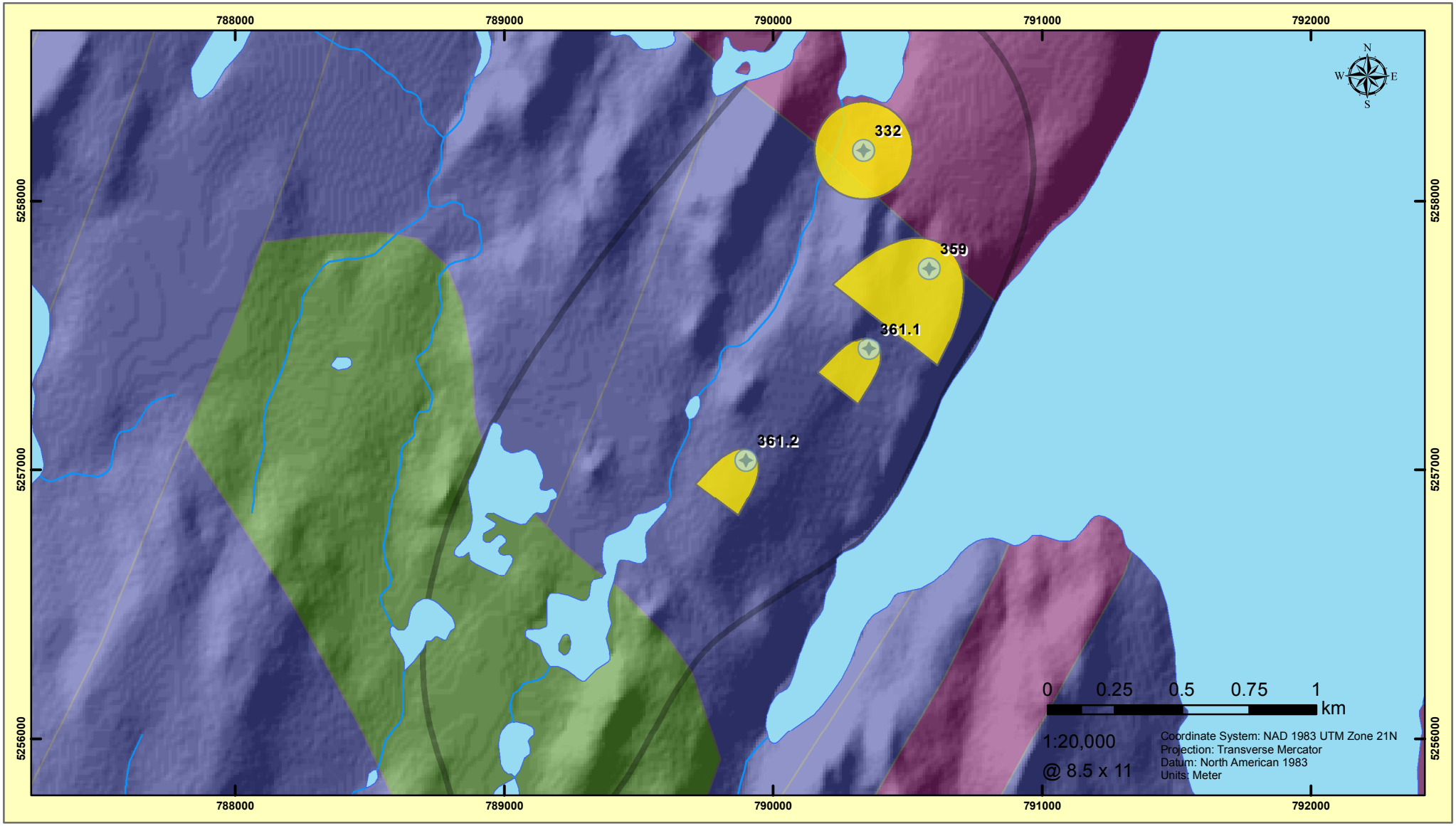



# Holyrood - Harbour Main

Bedrock Well

WHPA

Well Field Study Area

**Bedrock Geology**

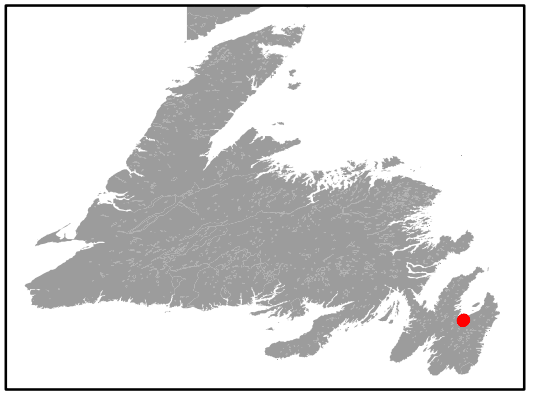
Alternating Sedimentary

Conception Group, Drook Formation

Harbour Main Group,

Holyrood Intrusive Suite,

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 332 | Flynn's Hill Well | 44 | 76 | 47 | 0.0000000666 |
| 359 | O'Connell's Well | 81 | 144 | 89 | 0.000000351 |
| 361.1 | Woodford Station - Quinlan's Well | 81 | 49 | 30 | 0.000000351 |
| 361.2 | Woodford Station - Healey's Well | 81 | 49 | 30 | 0.000000351 |
| | | | | | |



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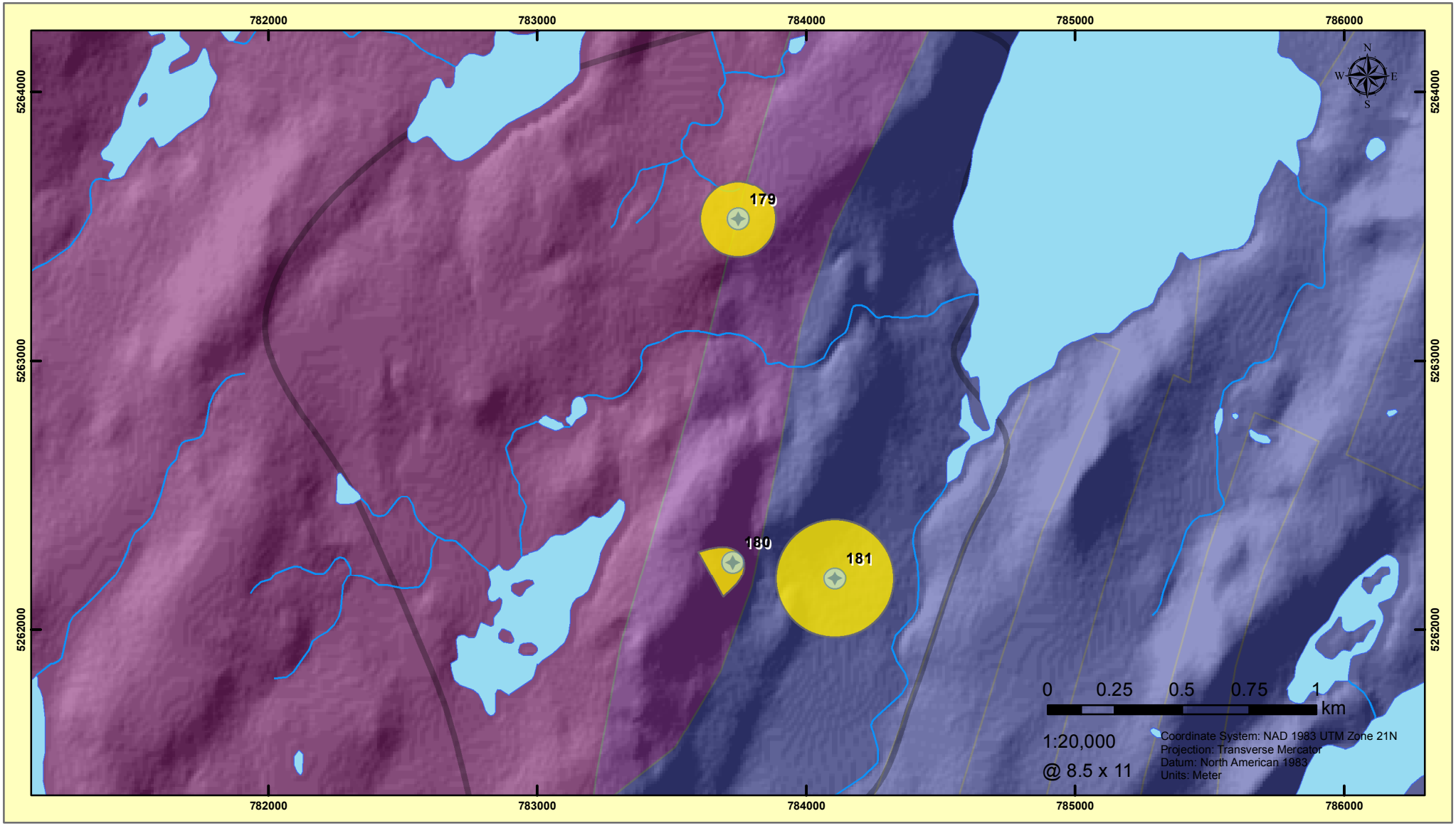



# Colliers

Bedrock Well

WHPA

Well Field Study Area

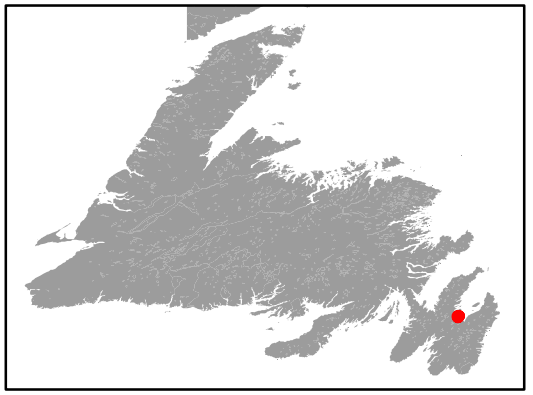
**Bedrock Geology** FG_Sedimentary

Adeyton Group, Bonavista Formation

Conception Group, Drook Formation

Harbour Main Group,

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 179 | #1 Mahoney's Well | 91 | 93 | 58 | 0.0000000748 |
| 180 | #2 Merrigan's Well | 146 | 34 | 21 | 0.0000000466 |
| 181 | #3 Griffin's Well | 67 | 168 | 104 | 0.0000000817 |
| | | | | | |



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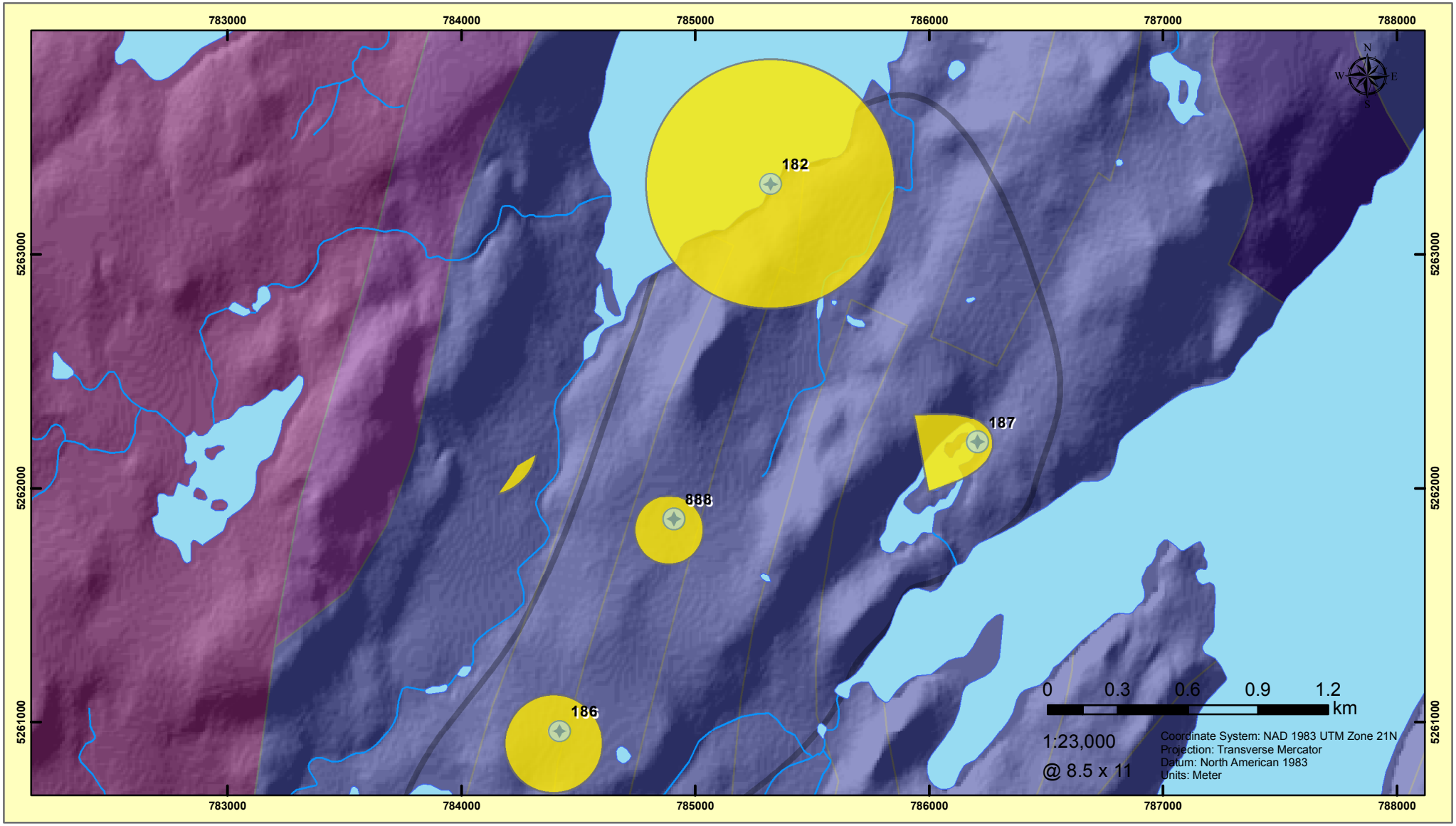



# Conception Harbour-Colliers

Bedrock Well

WHPA

Well Field Study Area

**Bedrock Geology** Alternating Sedimentary

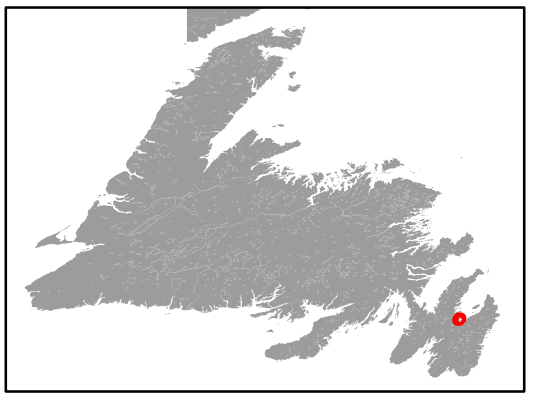
Adeyton Group, Bonavista Formation

Conception Group, Drook Formation

Harbour Main Group,

Whalesback Gabbro,

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 182 | #4 Flynn's Well | 49 | 722 | 448 | 0.000000112 |
| 186 | Healey's Pond Road Well | 46 | 132 | 82 | 0.000000183 |
| 187 | Cemetery Road Well | 61 | 79 | 49 | 0.000000183 |
| 888 | Old Road Well | 43 | 58 | 36 | 0.000000183 |
| | | | | | |



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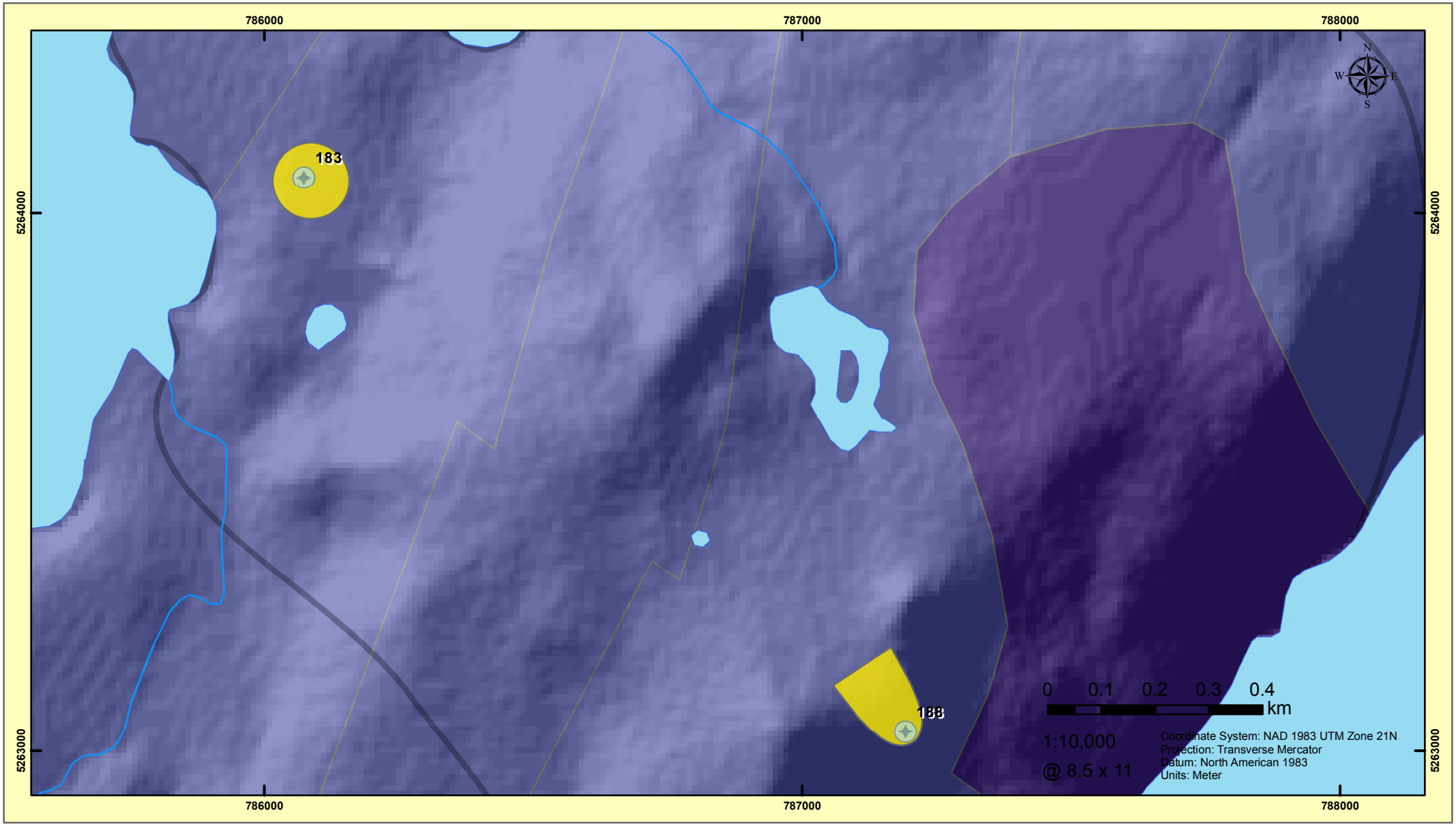



# Lower Conception Harbour Bacon Cove

Bedrock Well

WHPA

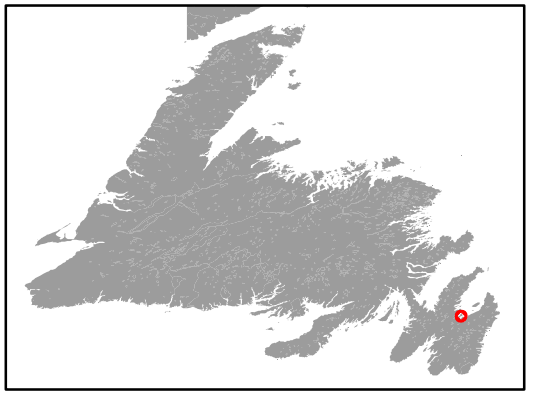
Well Field Study Area

**Bedrock Geology** Sandstone/FG

Harbour Main Group,

Whalesback Gabbro,

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 183 | #5 Whalen's Well | 91 | 32 | 20 | 0.0000000602 |
| 188 | Upper Bacon Cove Well | 152 | 50 | 31 | 0.000000183 |
| | | | | | |



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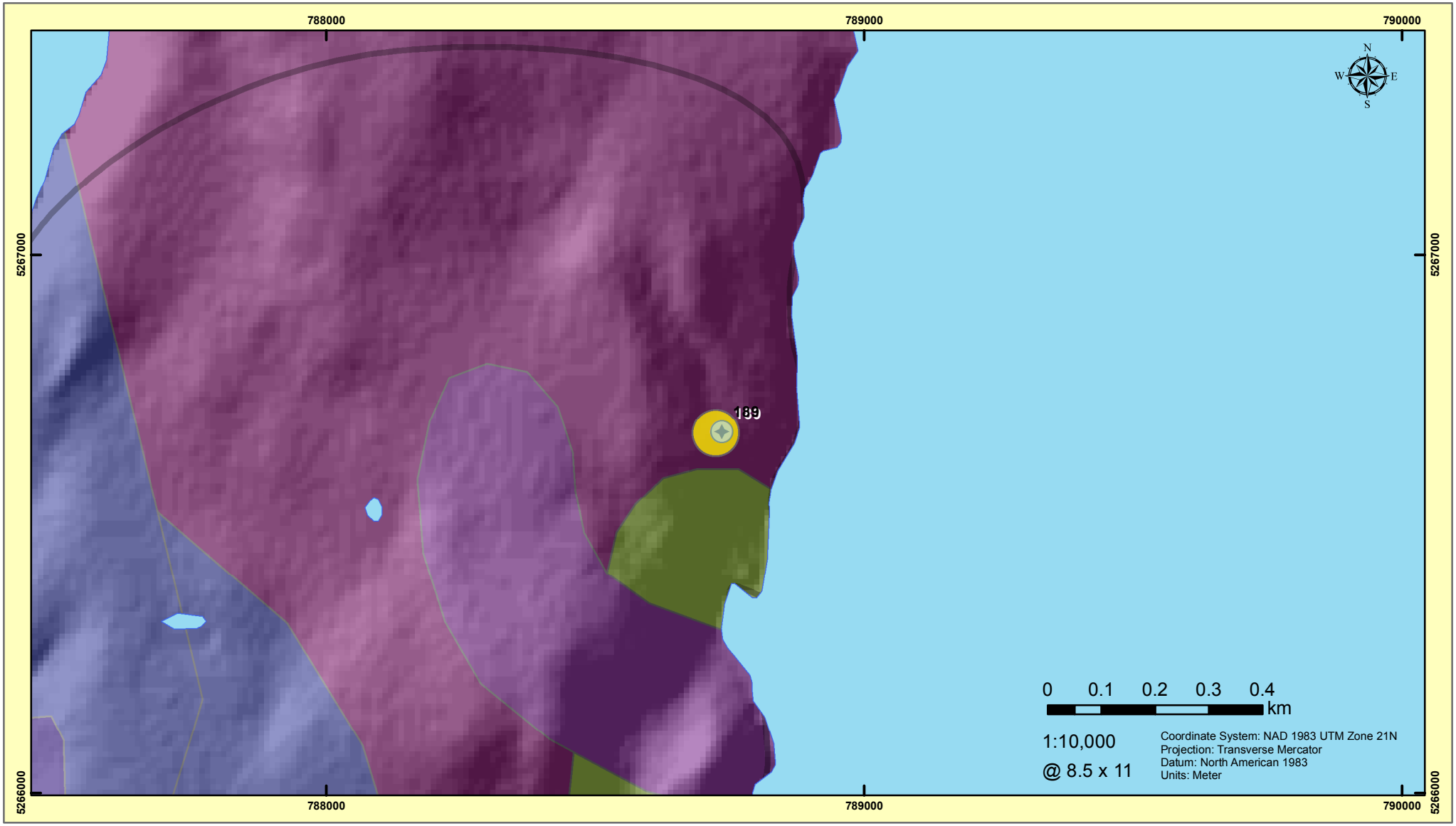


# Upper Conception Harbour Bacon Cove

Bedrock Well
WHPA
Well Field Study Area

**Bedrock Geology** Sandstone/FG

- Adeyton Group, Bonavista Formation
- Conception Group, Drook Formation
- Conception Group, Gaskiers Formation
- Harbour Main Group,
- Whalesback Gabbro,

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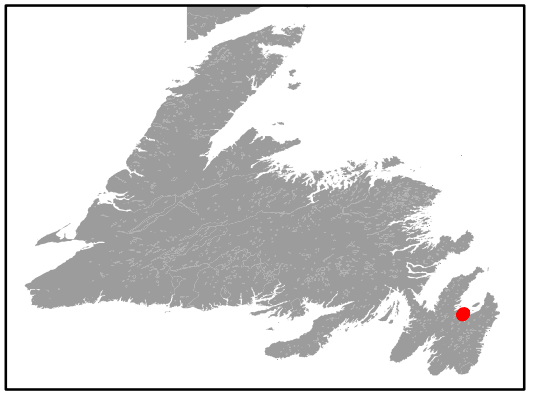
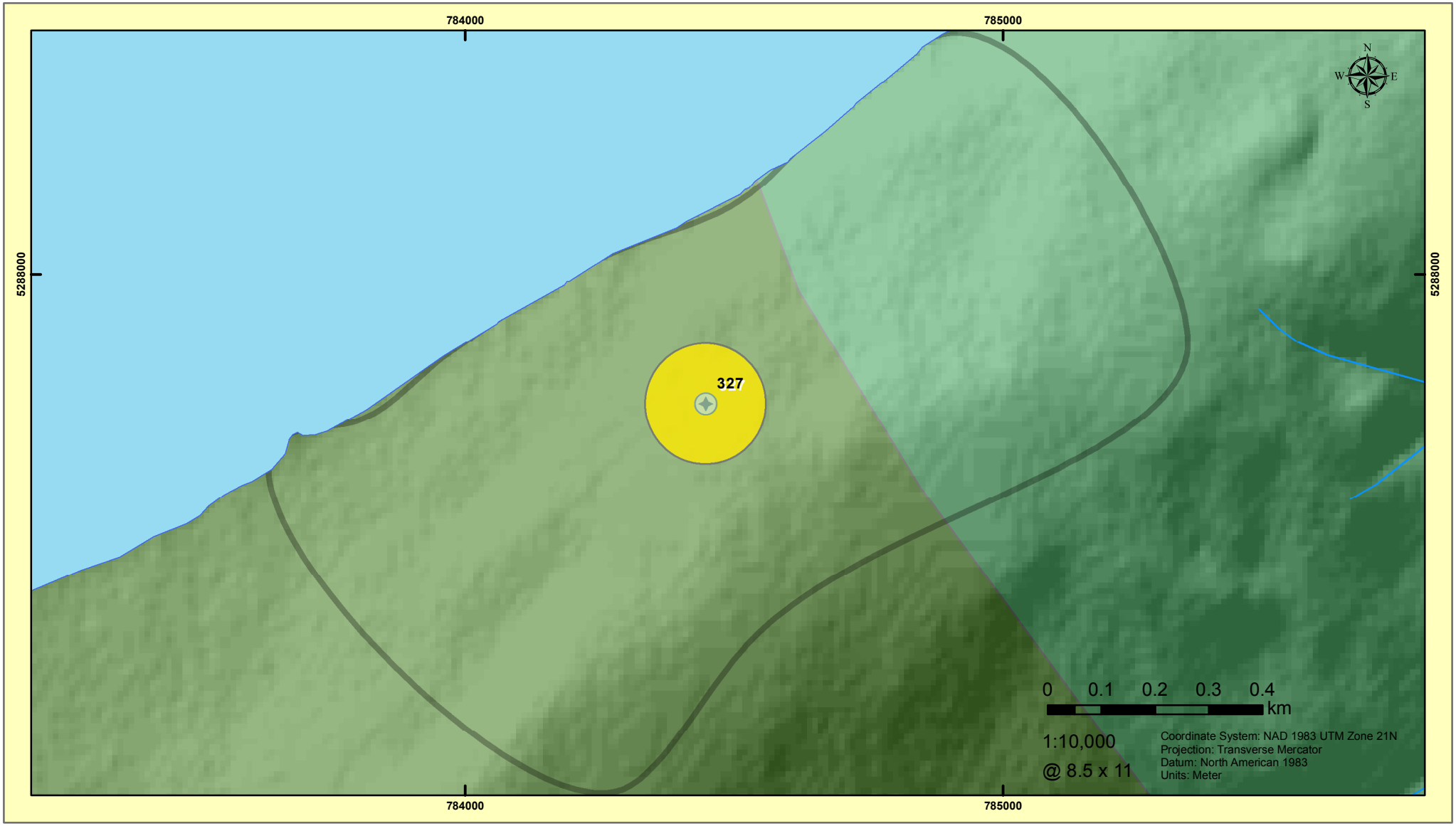
| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 189 | Lower Bacon Cove Well | 97 | 12 | 7 | 0.0000000125 |
| | | | | | |






# Harbour Grace South

Bedrock Well

WHPA

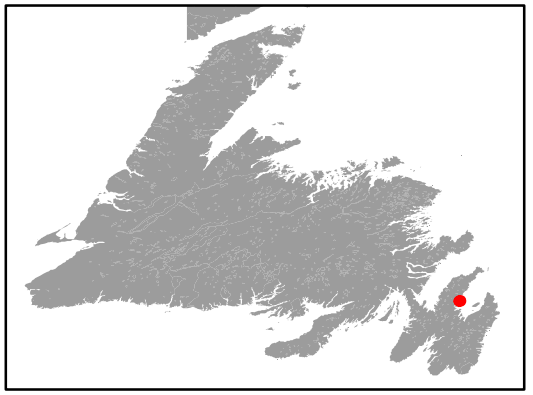
Well Field Study Area

**Bedrock Geology** Sandstone/FG

St. John's Group, Fermeuse Formation

St. John's Group, Trepassey formation

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 327 | Southside Well | 116 | 76 | 47 | 0.0000000184 |
| | | | | | |



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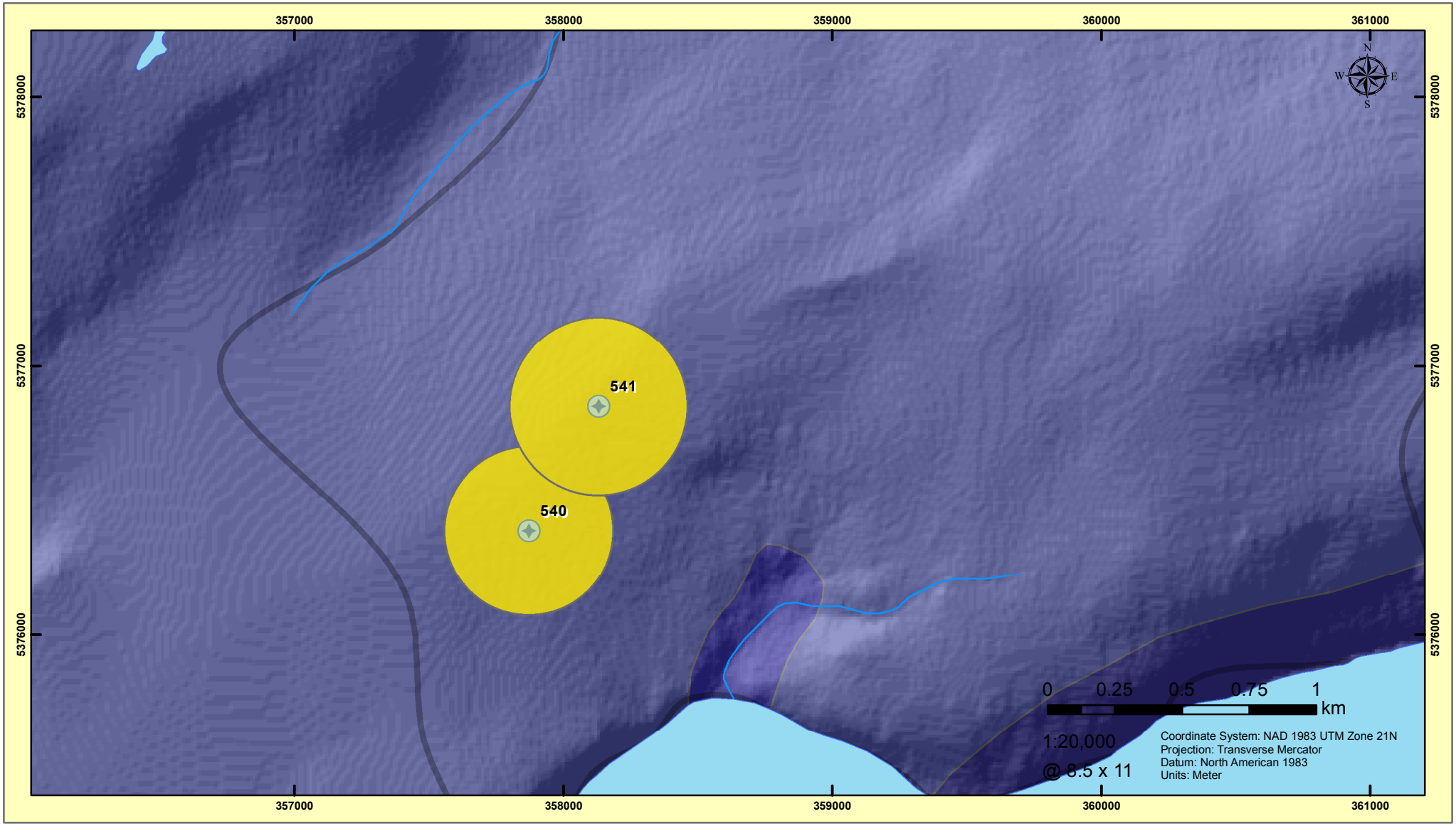


# Piccadilly Slant

Bedrock Well

WHPA

Well Field Study Area

**Bedrock Geology** Carbonate

Codroy Group,

Port au Port Group,

Port au Port Group, March Point Formation

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 540 | #2 Well - Abraham's Cove | 81 | 414 | 257 | 0.0000000856 |
| 541 | #1 Well - Piccadilly Slant | 64 | 364 | 226 | 0.000000108 |
| | | | | | |

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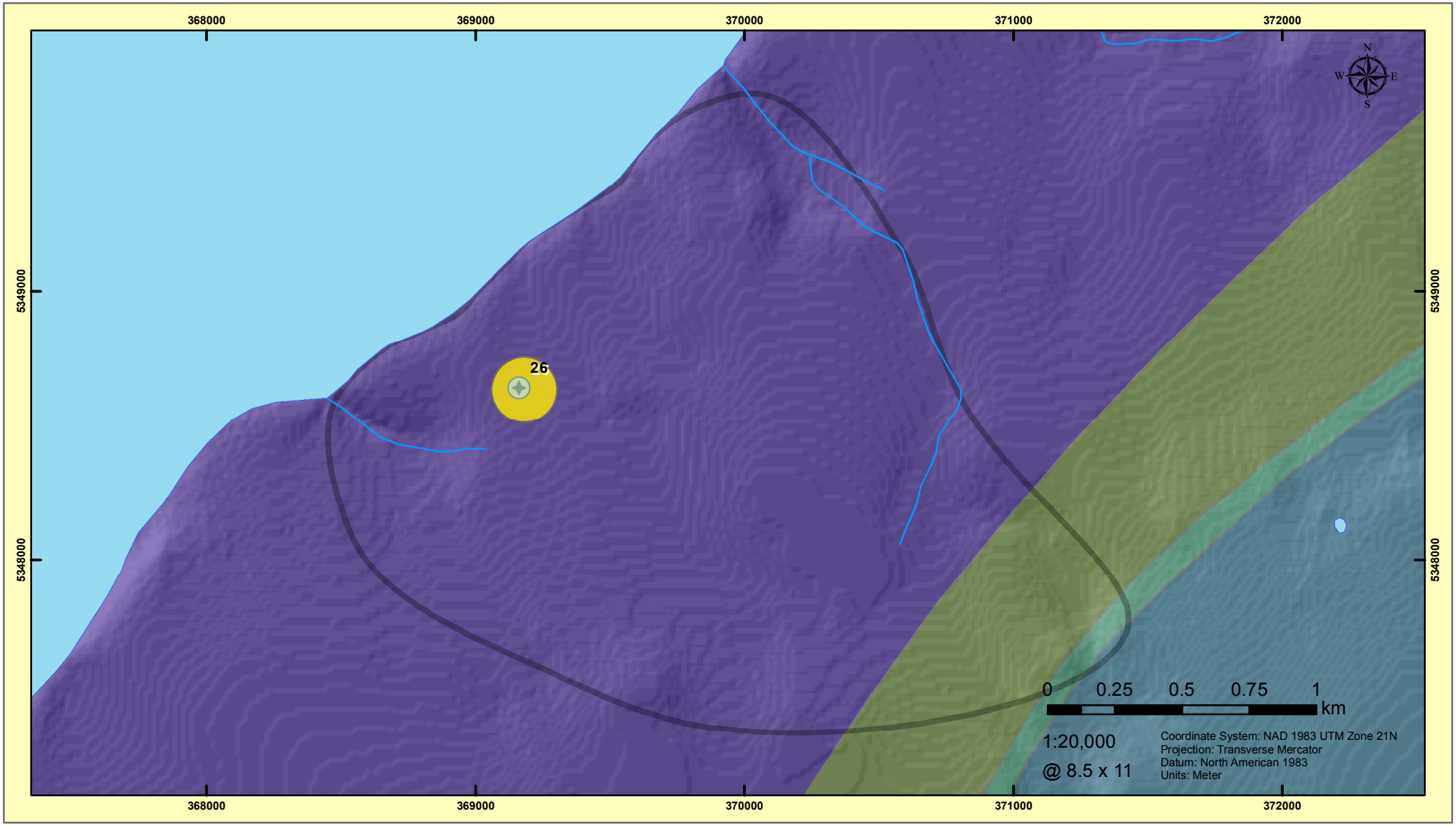



# Heatherton

Bedrock Well

WHPA

Well Field Study Area

**Bedrock Geology** FG_Sedimentary

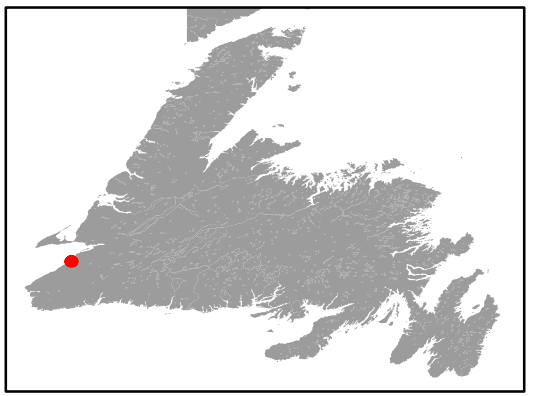
Anguille Group (Bay St. George Subbasin), Spout Falls Formation

Codroy Group, Codroy Road Formation

Codroy Group, Robinsons River Formation

Codroy Group, Ship Cove Formation

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 26 | #1 Well Heatherton | 40 | 42 | 26 | 0.0000002 |
| | | | | | |



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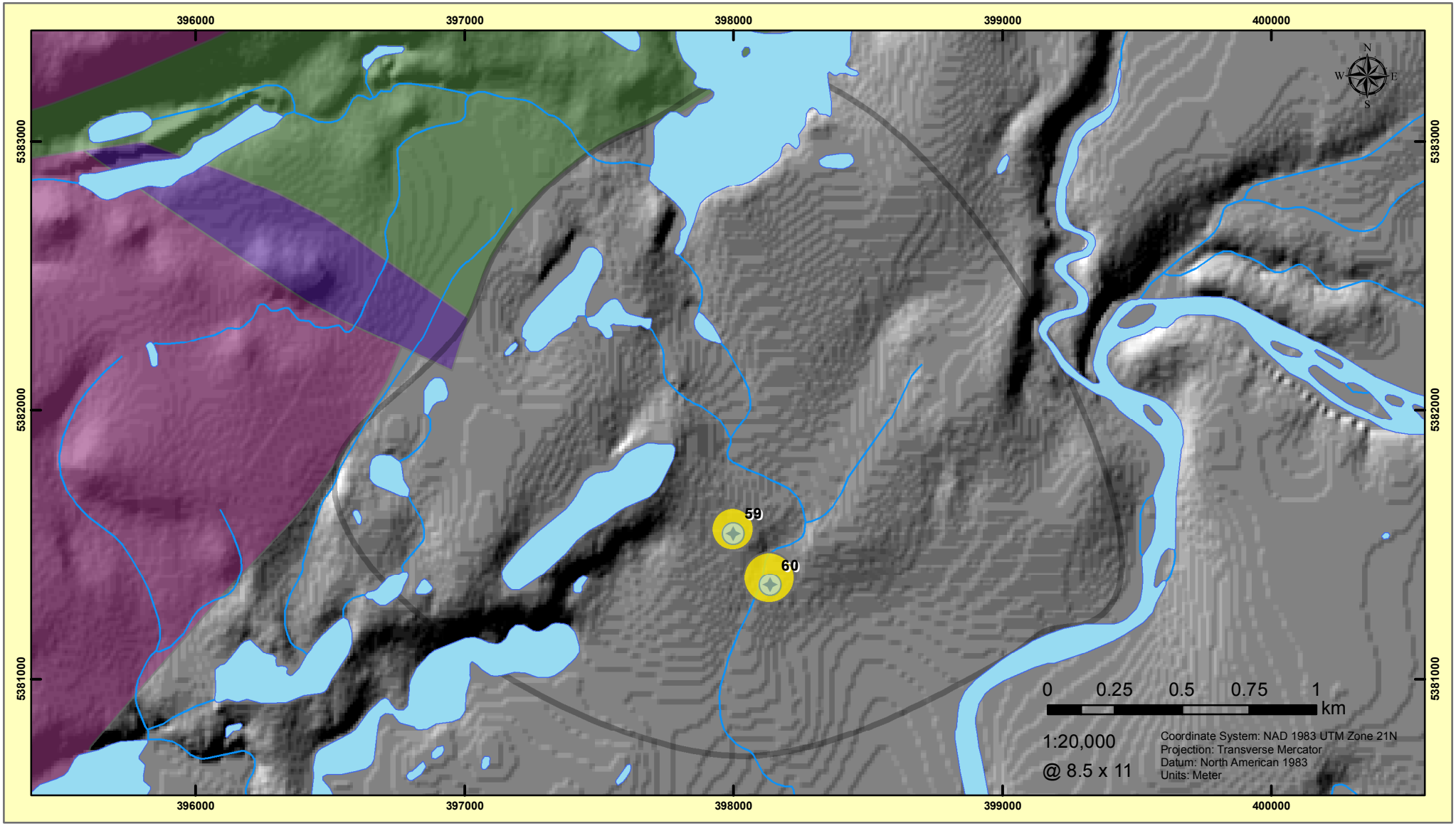



# Black Duck (Siding)

Bedrock Well

WHPA

Well Field Study Area

**Bedrock Geology**

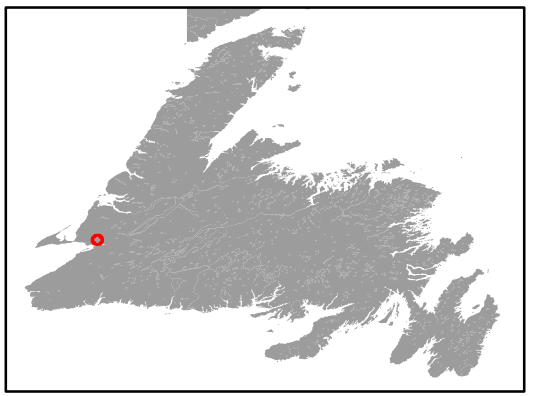
Sandstone/Conglomerate

Labrador Group, Bradore Formation

Labrador Group, Forteau Formation

Orthogneiss (may include some paragneiss), Indian Head Complex

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 59 | #1 Well | 30 | 25 | 16 | 0.000000178 |
| 60 | #2 Well | 25 | 29 | 18 | 0.000000214 |
| | | | | | |



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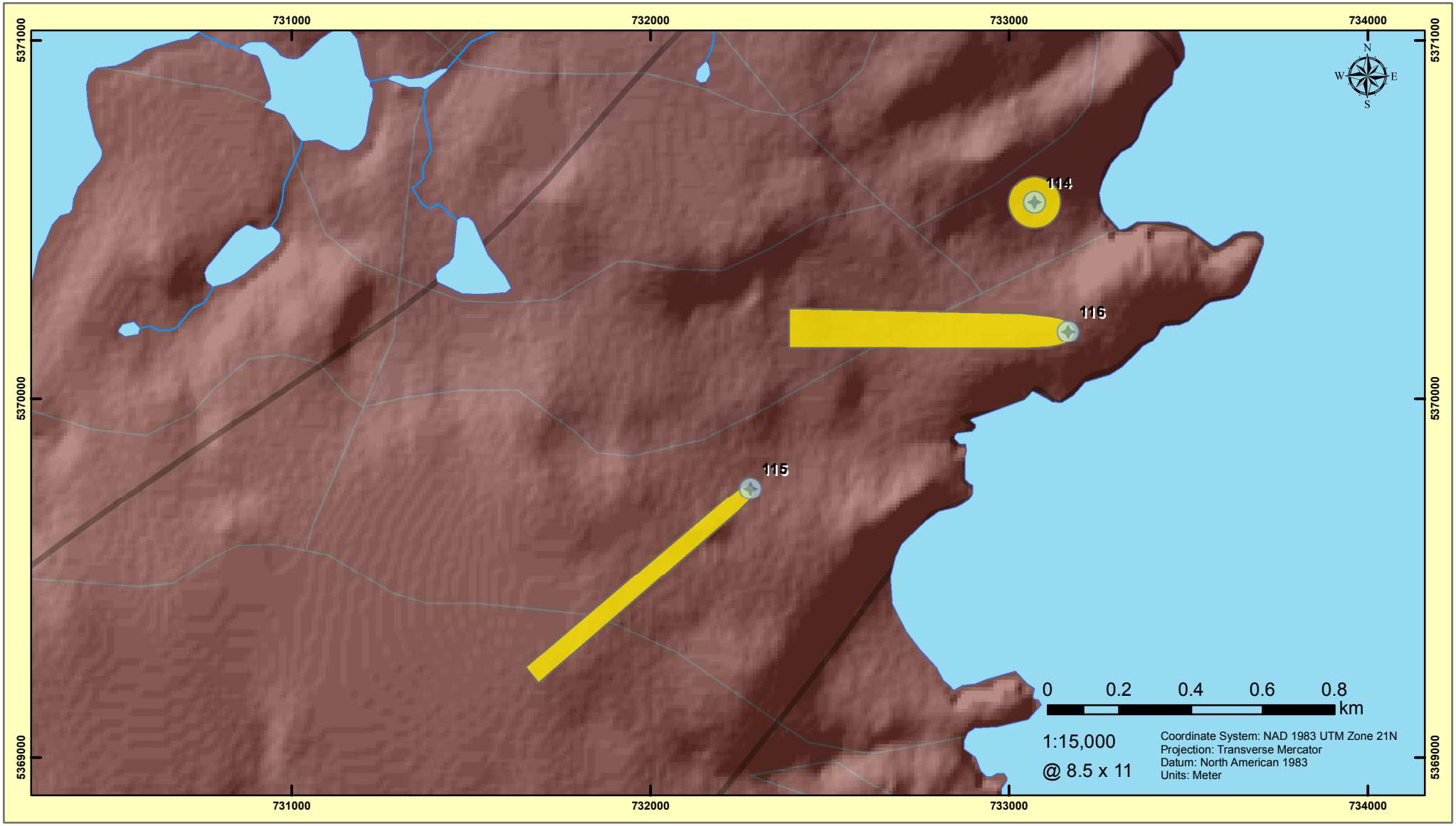



# Canning's Cove

Bedrock Well

WHPA

Well Field Study Area

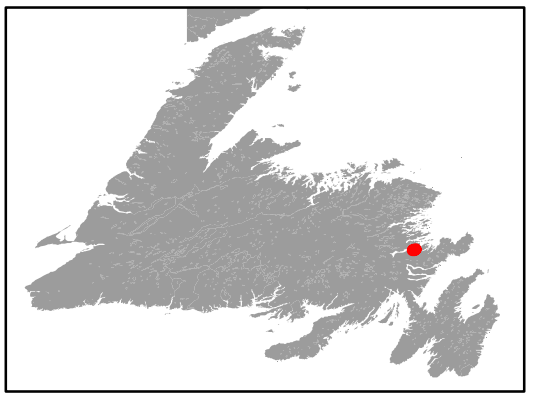
**Bedrock Geology**

Sandstone/Conglomerate

Connecting Point Group,

Musgravetown Group, Bull Arm Formation

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 114 | #1 Well - Pleman Pitts | 104 | 58 | 36 | 0.000000005 |
| 115 | #2 Well - Eugene Ellis | 87 | 41 | 25 | 0.00000144 |
| 116 | #3 Well - Glenda Penney | 44 | 39 | 24 | 0.00000144 |
| | | | | | |



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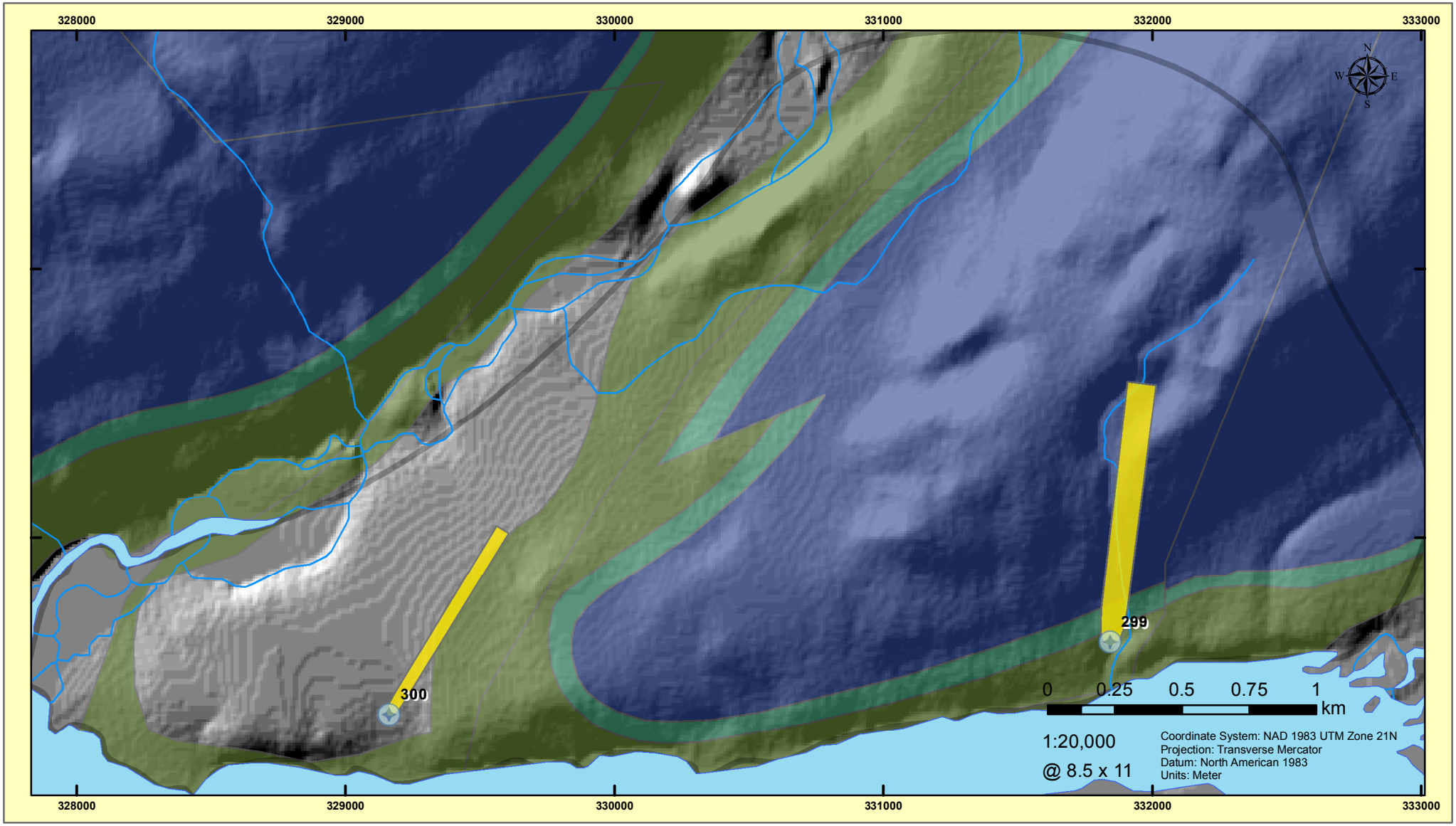


# Great Codroy

Bedrock Well

WHPA

Well Field Study Area

**Bedrock Geology** FG_Sedimentary

Anguille Group (Bay St. George Subbasin), Friars Cove Formation

Codroy Group, Codroy Road Formation

Codroy Group, Ship Cove Formation

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 299 | #1 Well | 62 | 67 | 42 | 0.00000343 |
| 300 | #2 Well | 50 | 22 | 14 | 0.00000343 |
| | | | | | |

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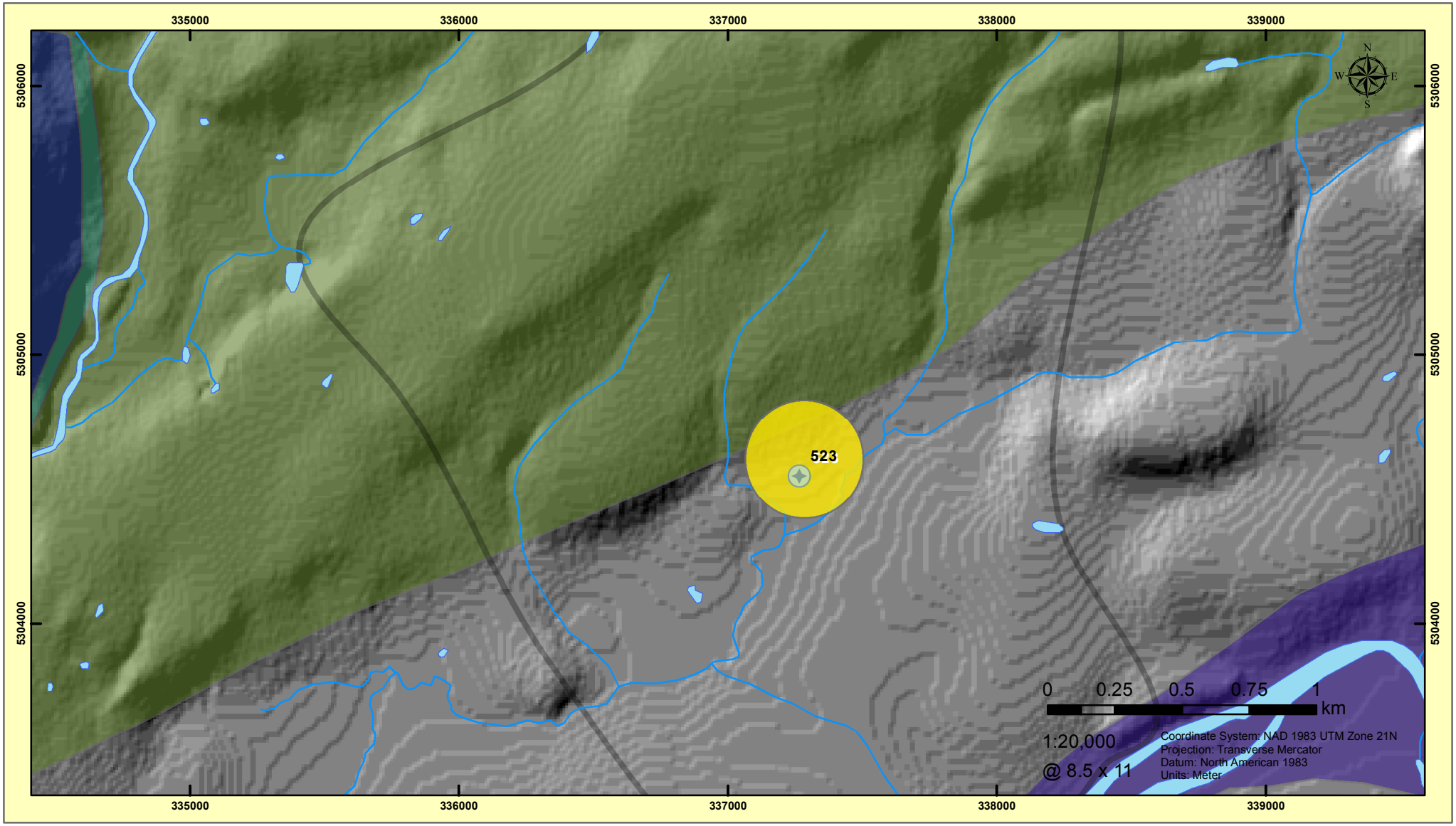


# O'Regan's East

Bedrock Well

WHPA

Well Field Study Area

**Bedrock Geology** FG_Sedimentary

- Anguille Group (Bay St. George Subbasin), Friars Cove Formation
- Codroy Group, Codroy Road Formation
- Codroy Group, Robinsons River Formation
- Codroy Group, Ship Cove Formation

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 523 | Drilled | 38 | 118 | 73 | 0.000000182 |
| | | | | | |

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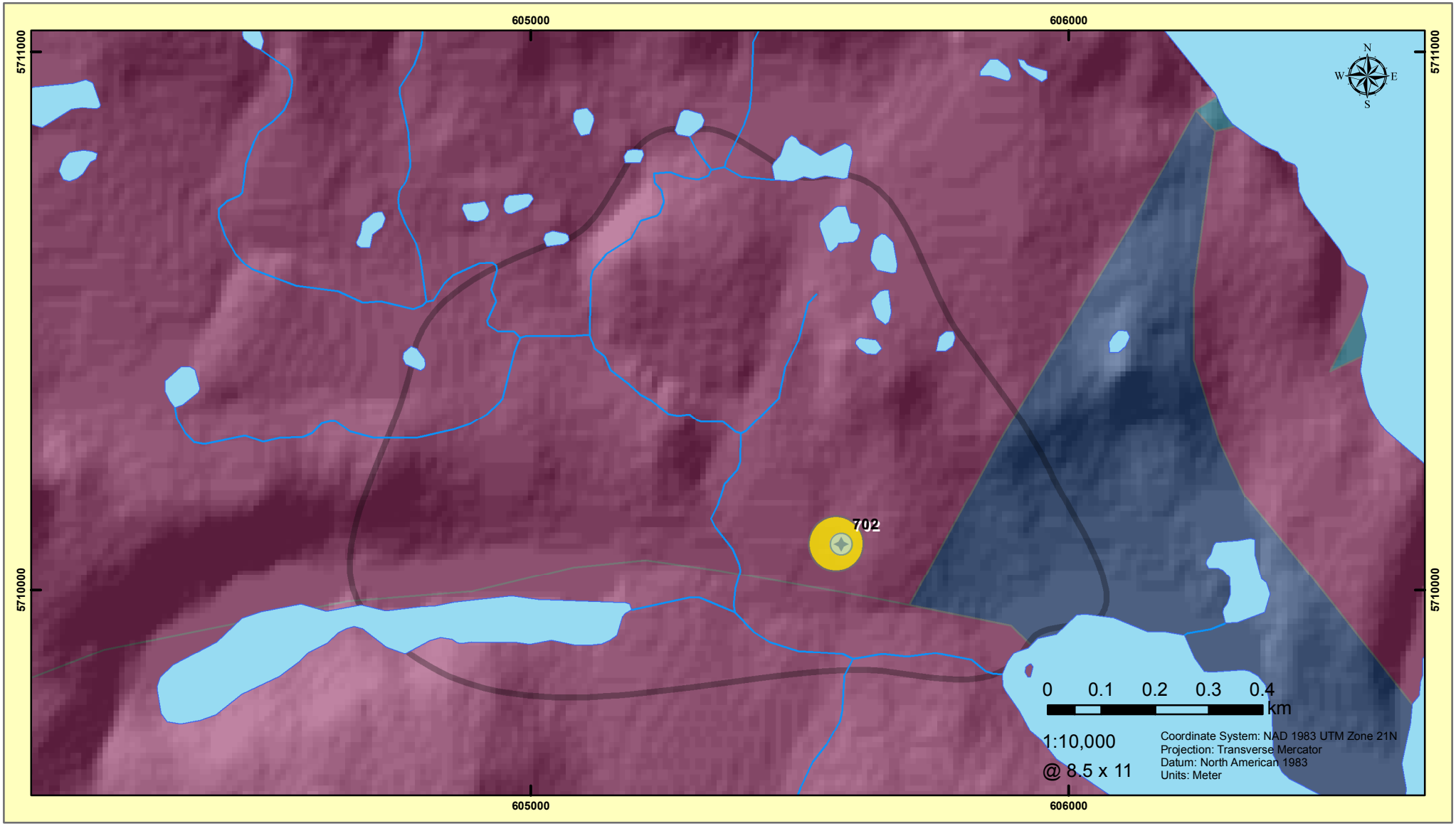


# St. Lunaire

Bedrock Well

WHPA

Well Field Study Area

**Bedrock Geology**

Sandstone/Conglomerate

Goose Tickle Group, American Tickle Formation

Maiden Point Slice Assemblage, Maiden Point Formation

Melange,

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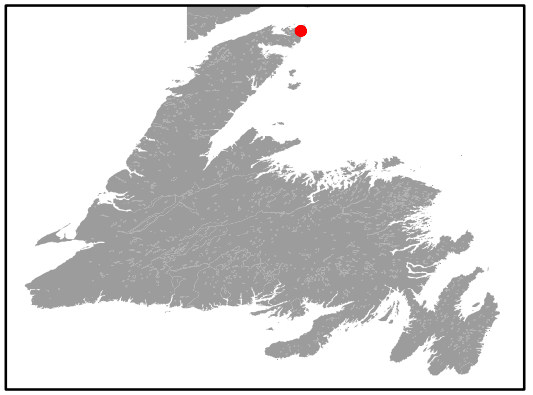
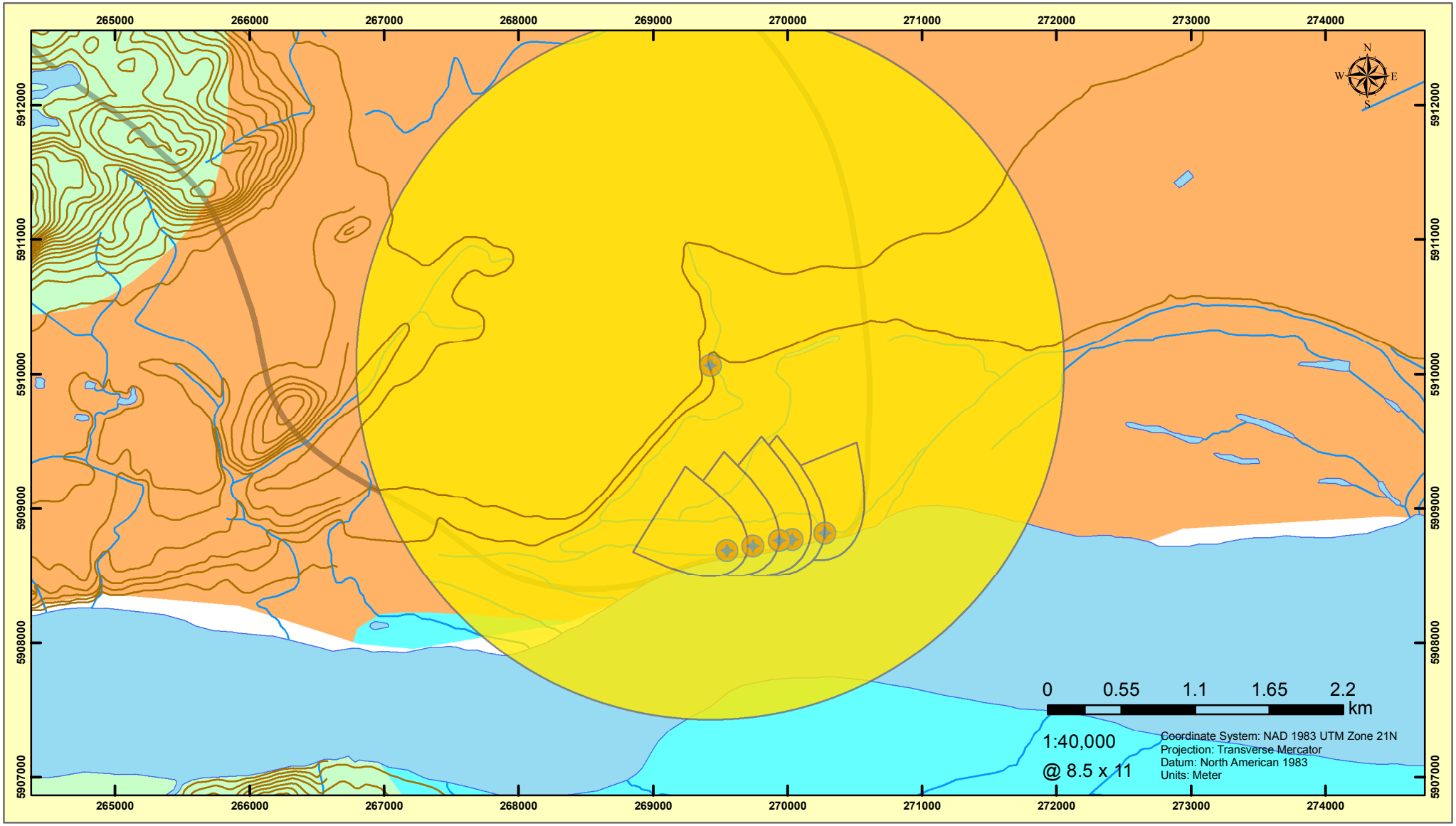
| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 702 | Drilled | 52 | 19 | 12 | 0.0000000846 |
| | | | | | |





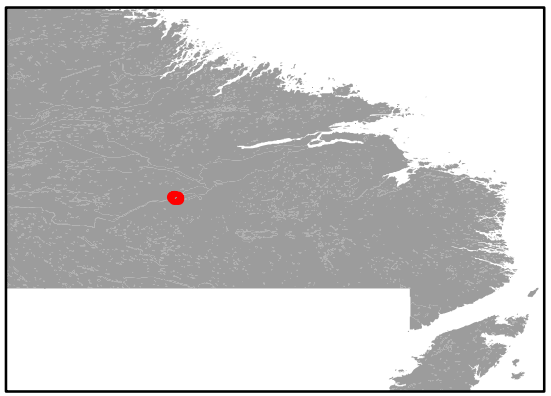

# Goose Bay

- Surficial Well
- Topographic Contour (20 m)
- WHPA
- Well Field Study Area

## Surficial Geology

- Glaciofluvial
- Glaciomarine and marine
- Till, undifferentiated

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 322 | Spring Gulch | 1 | 1262 | 784 | 0.00001 |
| 323.1 | #1 Well | 51 | 1262 | 784 | 0.00001 |
| 323.2 | #2 Well | 43 | 1262 | 784 | 0.00001 |
| 323.3 | #3 Well | 42 | 1262 | 784 | 0.00001 |
| 323.4 | #4 Well | 46 | 1262 | 784 | 0.00001 |
| 323.5 | #5 Well | 51 | 1262 | 784 | 0.00001 |



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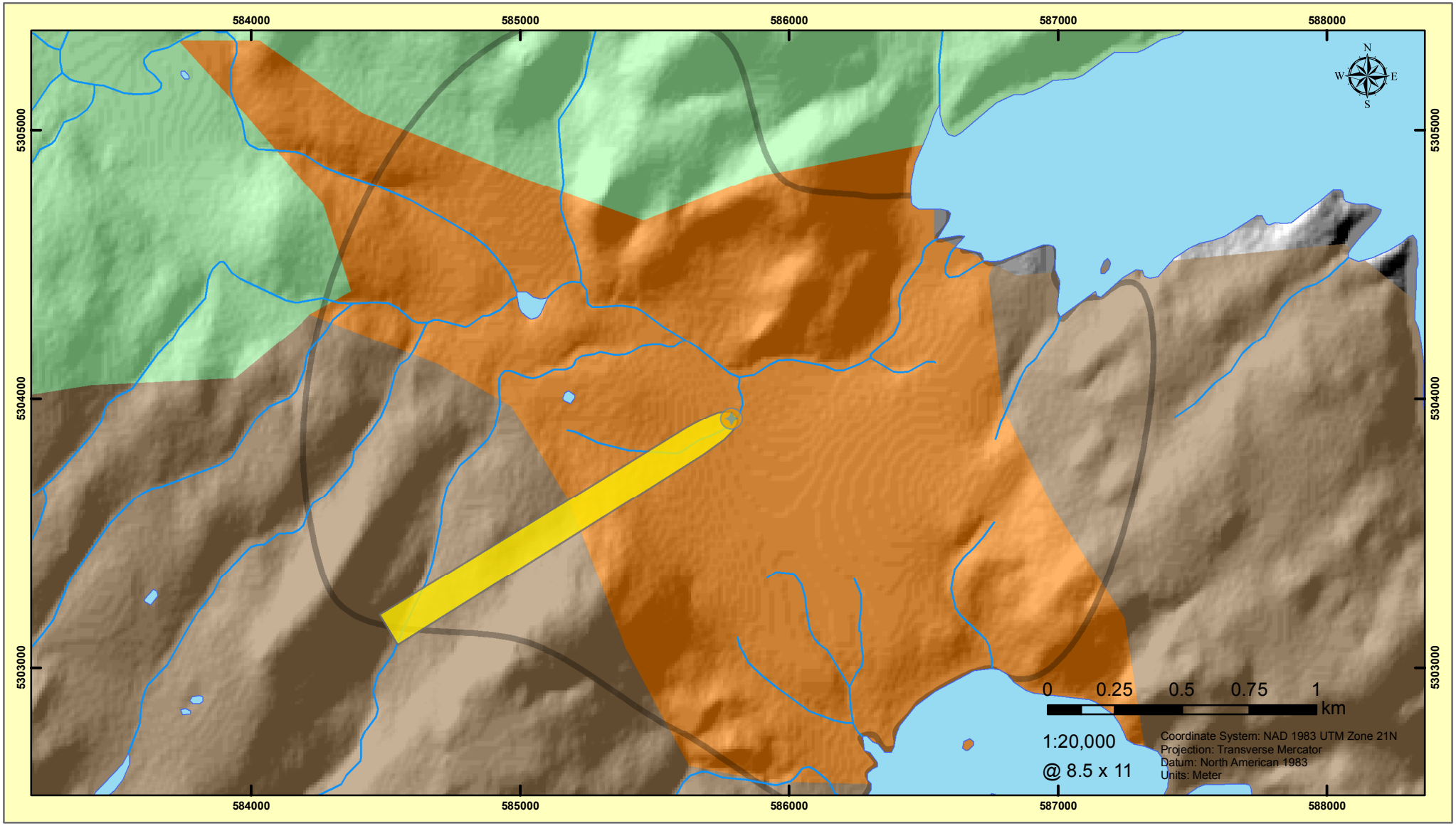



# St. Alban's

Surficial Well

WHPA

Well Field Study Area

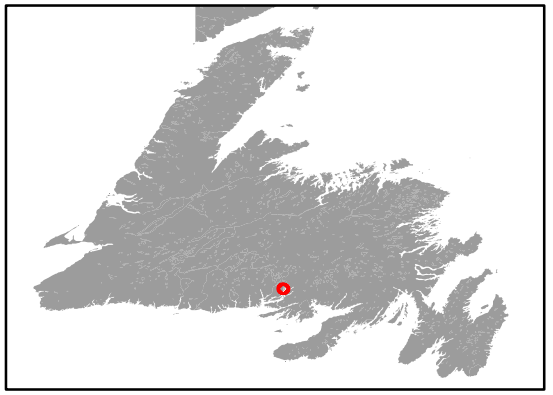
## Surficial Geology

Drift poor

Glaciofluvial

Till, undifferentiated

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per | Hydraulic Conductivity |
|---|---|---|---|---|---|
| 678.2 | Well #2 | 15 | 213 | 132 | 0.00001 |



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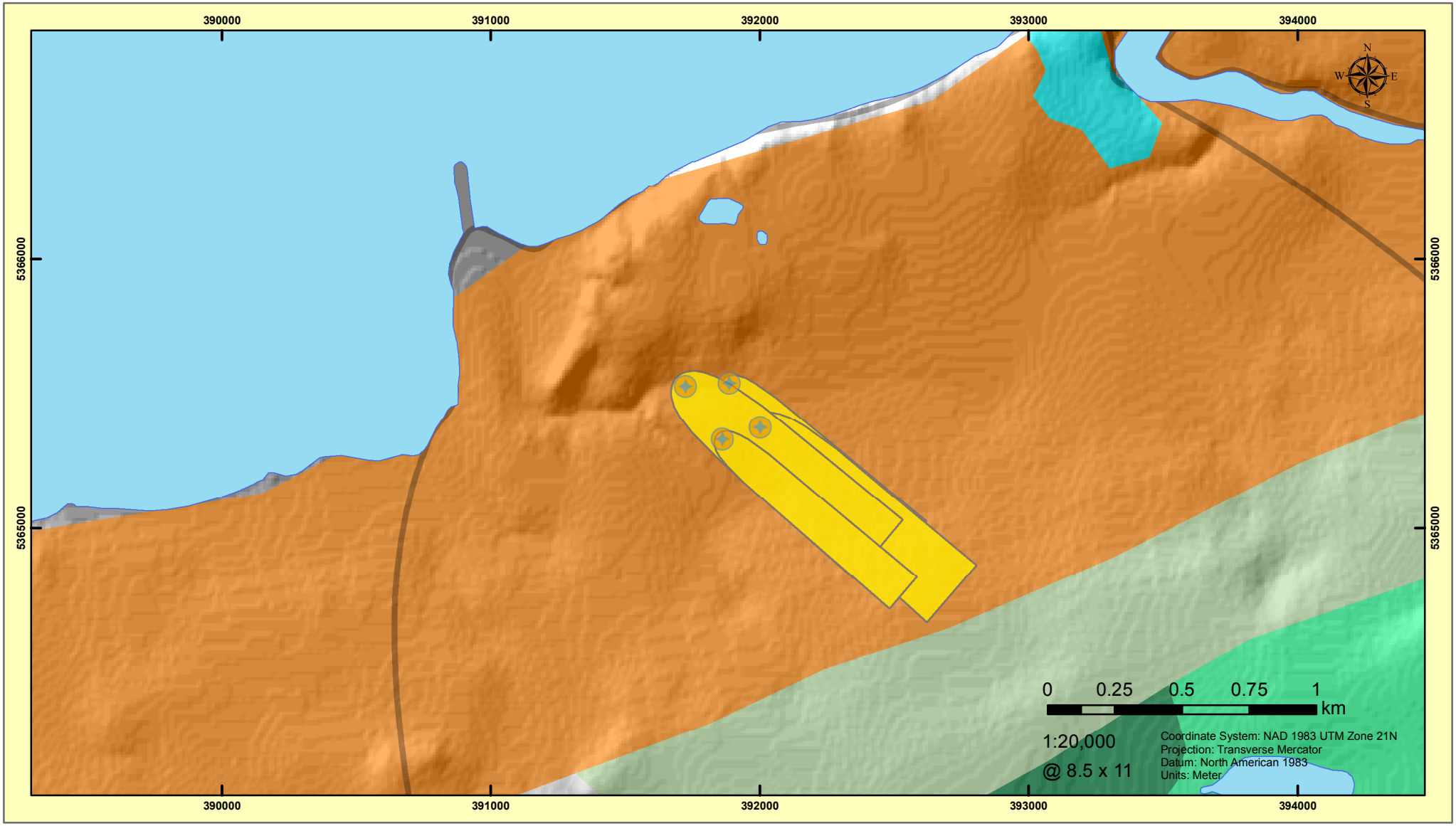


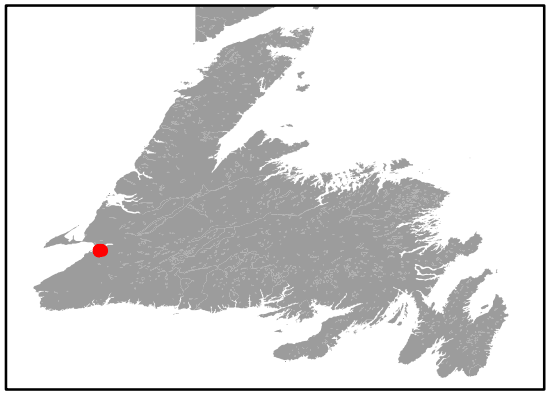

# St. George's

- Surficial Well
- WHPA
- Well Field Study Area

## Surficial Geology

- Ablation drift
- Bog
- Glaciofluvial
- Glaciomarine and marine
- Rogen moraine
- Till blanket

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per | Hydraulic Conductivity |
|---|---|---|---|---|---|
| 876.1 | #1 Well | 32 | 312 | 193 | 0.00001 |
| 876.2 | #2 Well | 17 | 312 | 193 | 0.00001 |
| 876.3 | #3 Well | 17 | 312 | 193 | 0.00001 |
| 876.4 | #4 Well | 32 | 312 | 193 | 0.00001 |



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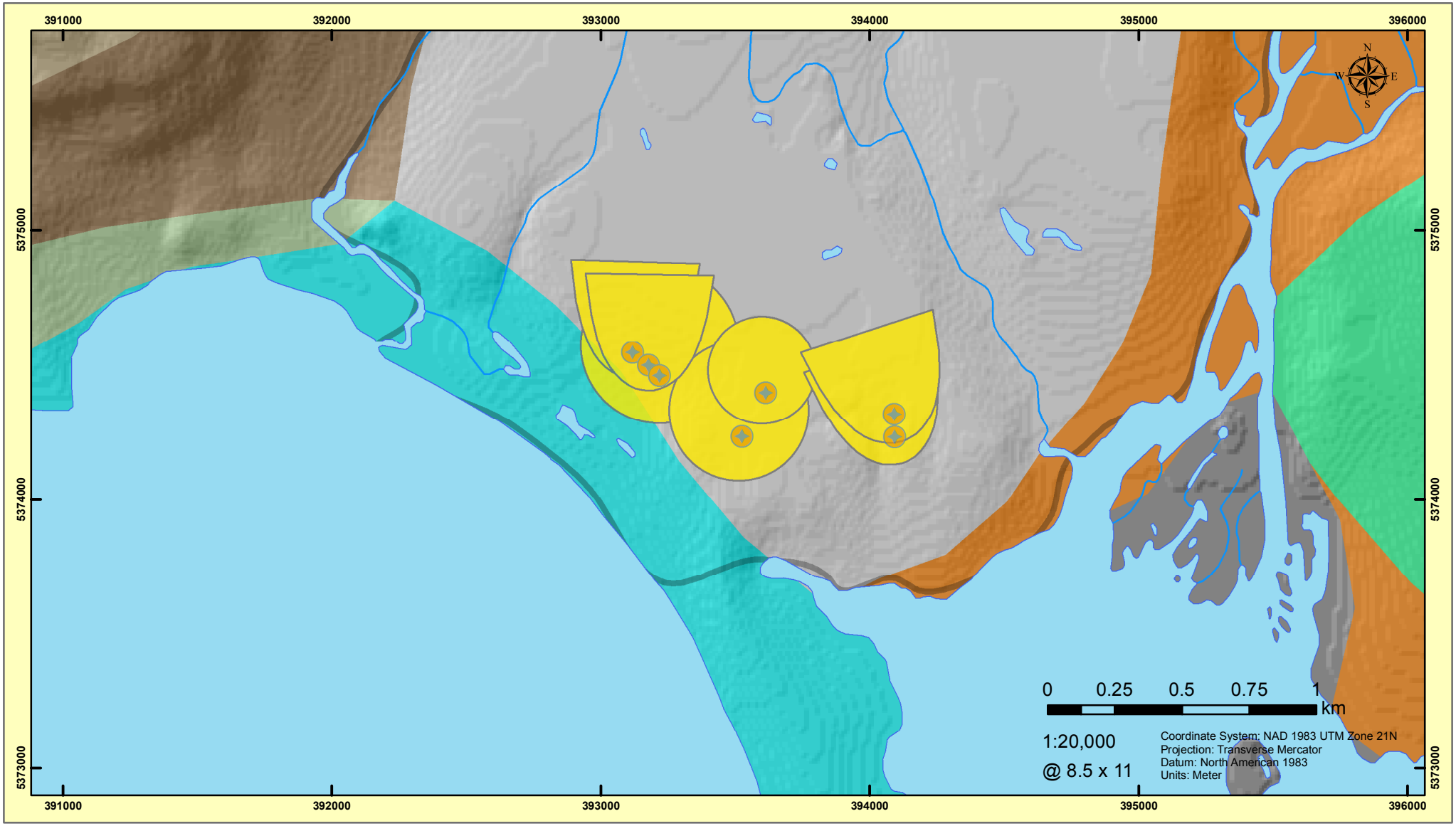



# Stephenville Crossing

Surficial Well

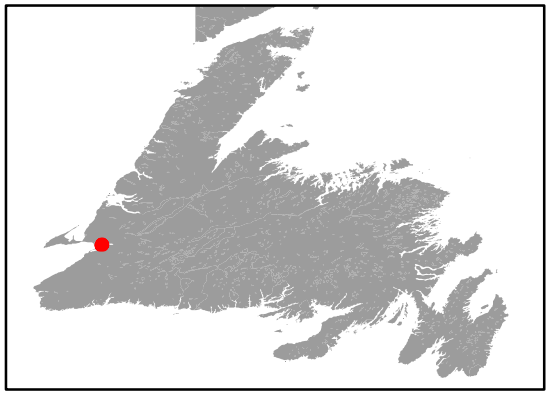
WHPA

Well Field Study Area

## Surficial Geology

- Bog
- Drift poor
- Exposed bedrock
- Glaciofluvial
- Glaciomarine and marine
- Rogen moraine
- Till blanket

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per | Hydraulic Conductivity |
|---|---|---|---|---|---|
| 717.1 | Well #1 | 32 | 280 | 174 | 0.00001 |
| 717.2 | Well #2 | 32 | 280 | 174 | 0.00001 |
| 717.3 | Well #3 | 15 | 280 | 174 | 0.00001 |
| 717.4 | Well #4 | 19 | 280 | 174 | 0.00001 |
| 717.5 | Well #5 | 32 | 280 | 174 | 0.00001 |
| 717.6 | Well #6 | 32 | 280 | 174 | 0.00001 |
| 717.7 | Well #7 | 32 | 280 | 174 | 0.00001 |



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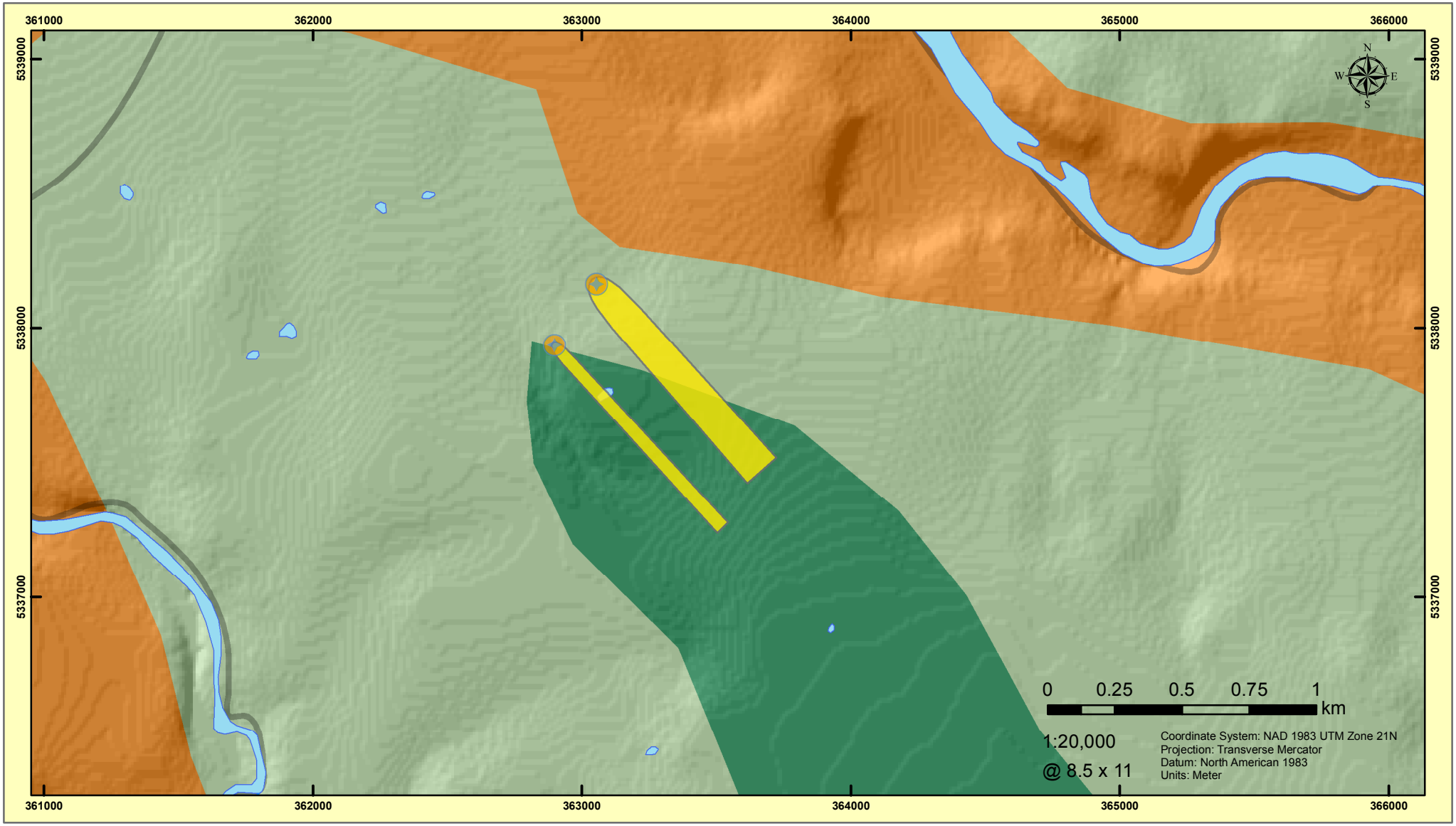


# St. Fintan's

Surficial Well

WHPA

Well Field Study Area

## Surficial Geology

Ablation drift

Glaciofluvial

Till blanket

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per | Hydraulic Conductivity |
|---|---|---|---|---|---|
| 27 | #1 Well St. Fintan's | 15 | 147 | 91 | 0.0000377 |
| 28 | #2 Well St. Fintan's | 15 | 55 | 34 | 0.0000377 |

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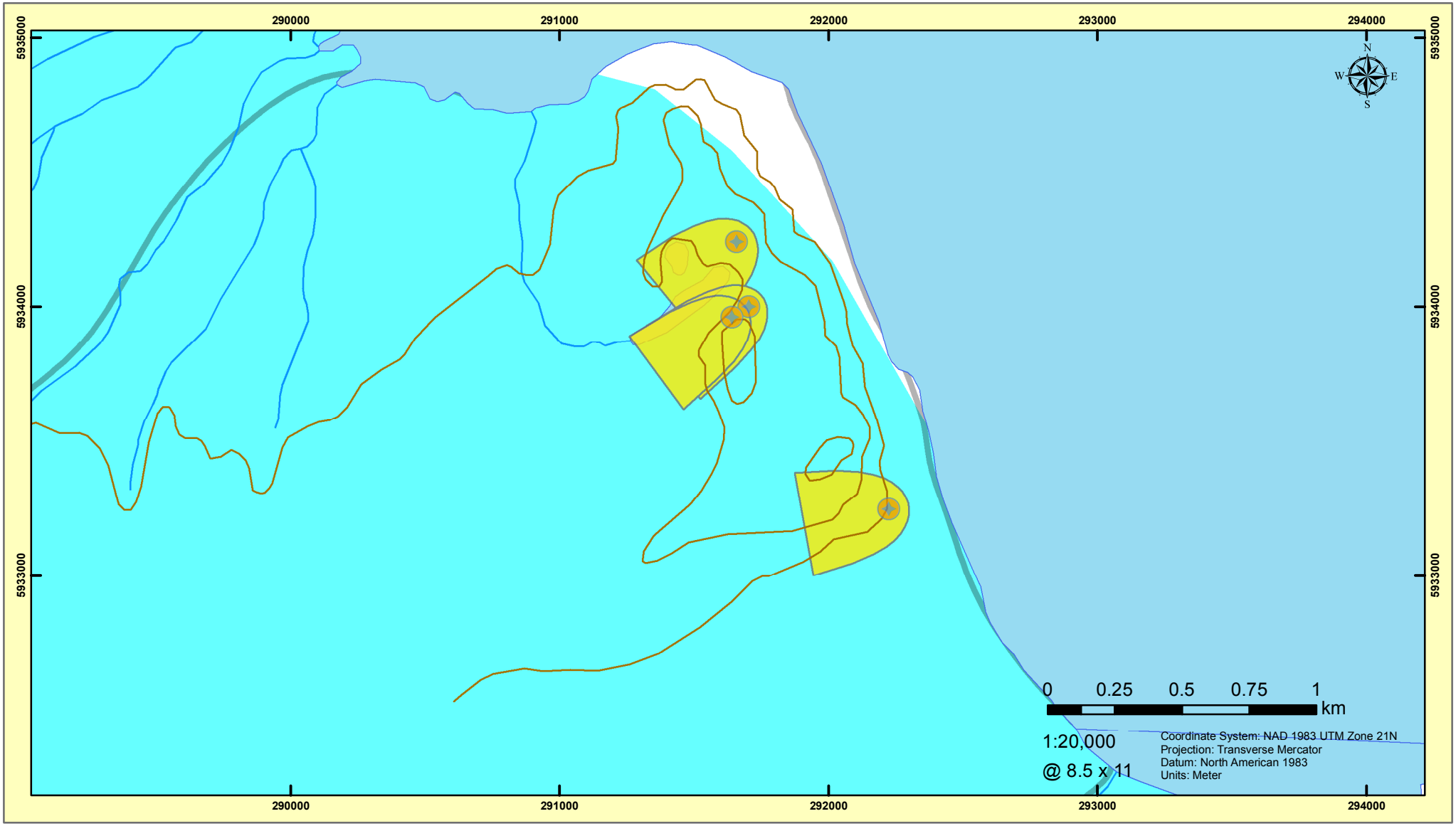


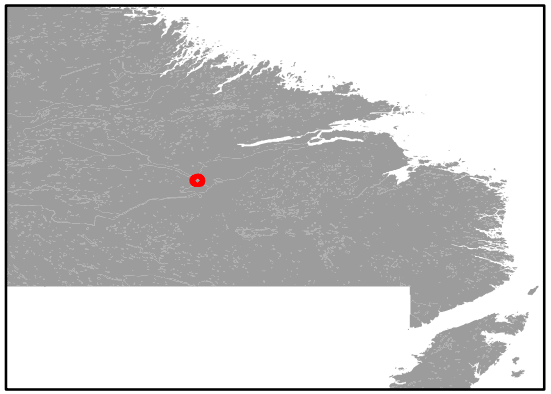

# Sheshasheits

- Surficial Well
- Topographic Contour (20 m)
- WHPA
- Well Field Study Area

## Surficial Geology

- Glaciomarine and marine

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 645.1 | #1 Well | 37 | 262 | 163 | 0.00001 |
| 645.2 | #2 Well | 37 | 262 | 163 | 0.00001 |
| 645.3 | #3 Well | 37 | 262 | 163 | 0.00001 |
| 645.4 | #3A Well | 37 | 262 | 163 | 0.00001 |



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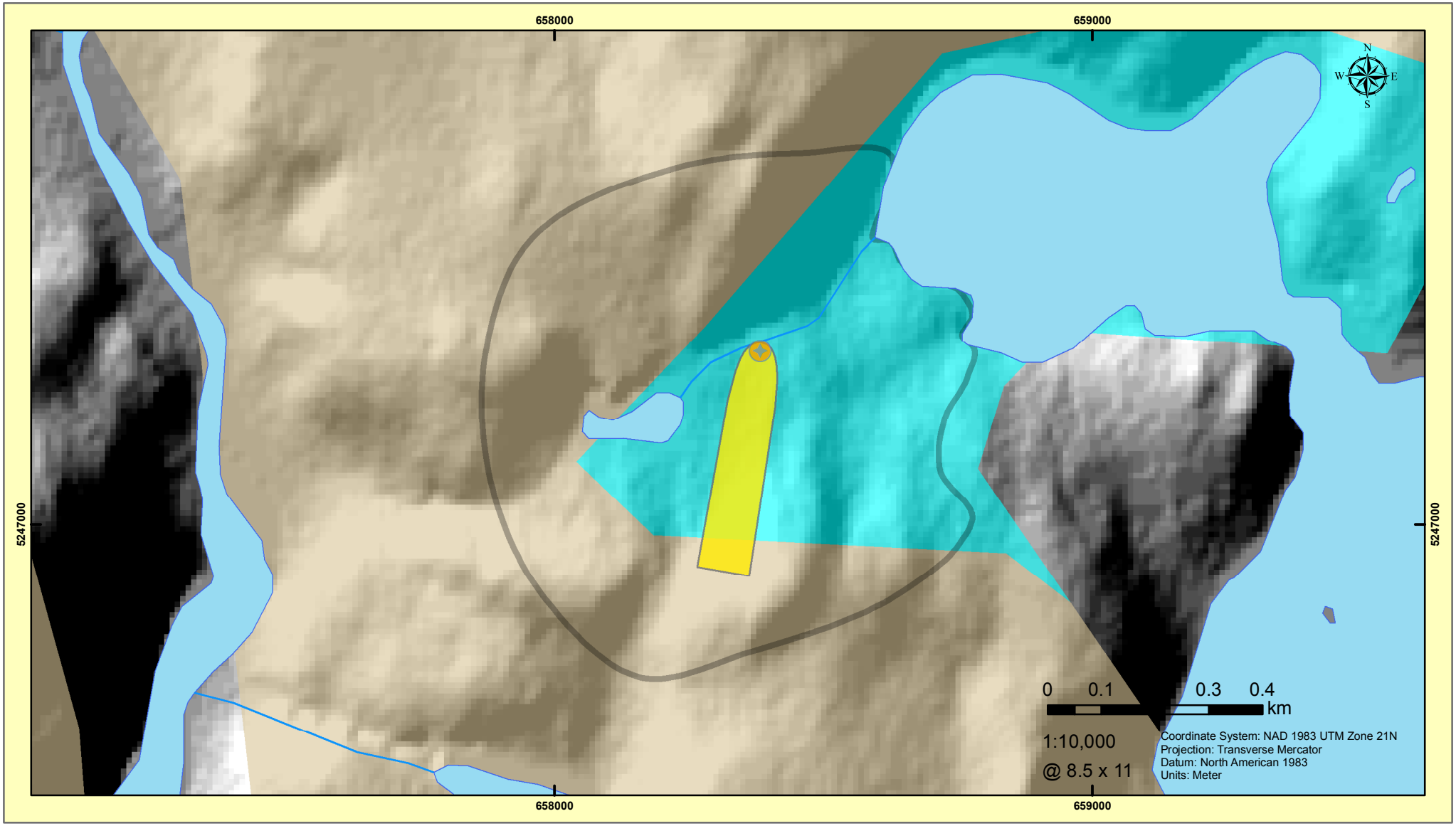



# Baine Harbour

Surficial Well

WHPA

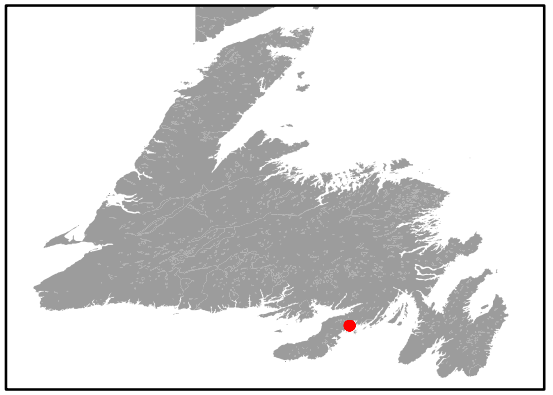
Well Field Study Area

## Surficial Geology

Exposed bedrock

Glaciomarine and marine

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per | Hydraulic Conductivity |
|---|---|---|---|---|---|
| 13 | Dug | 91 | 52 | 32 | 0.00001 |



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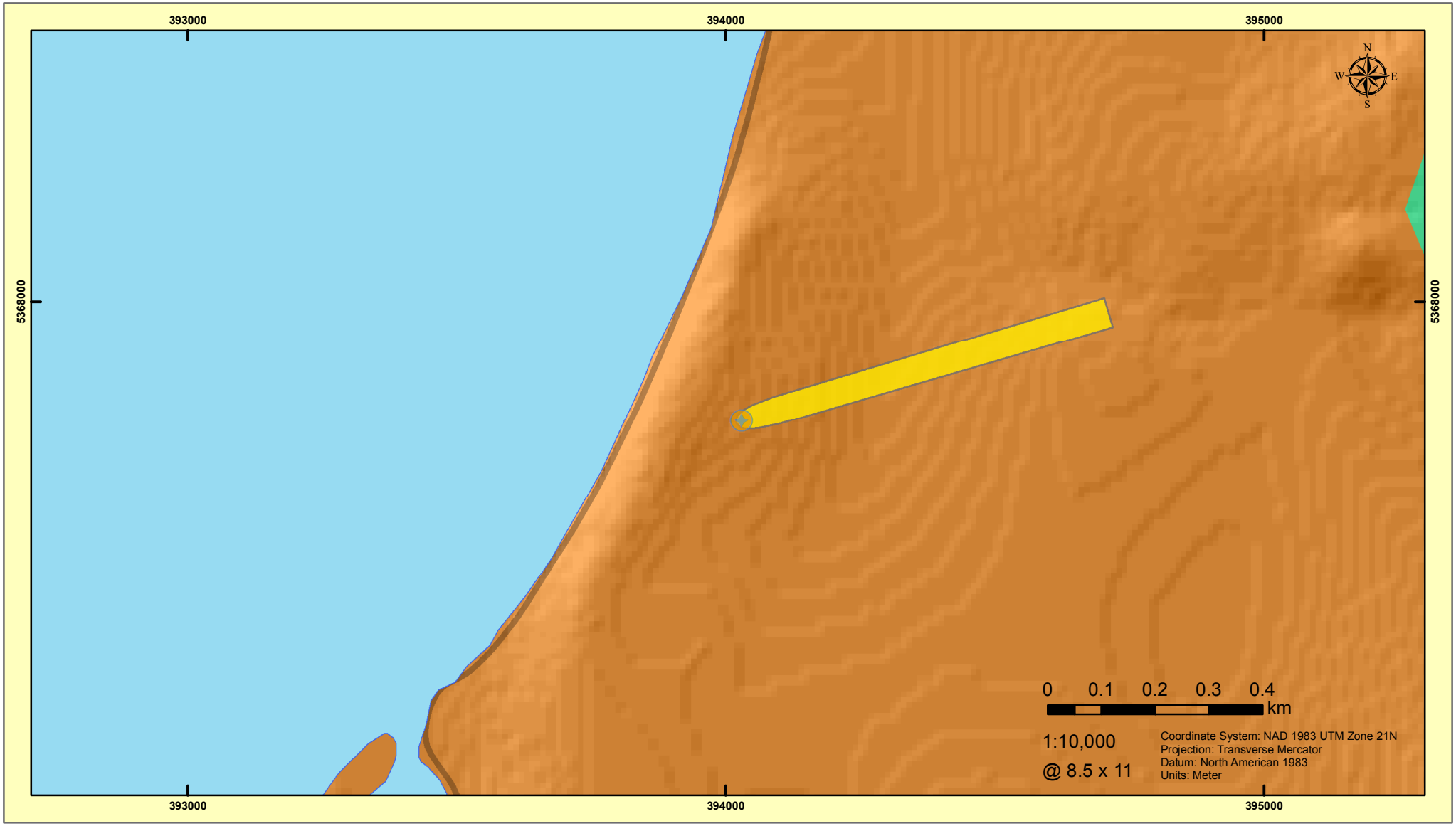


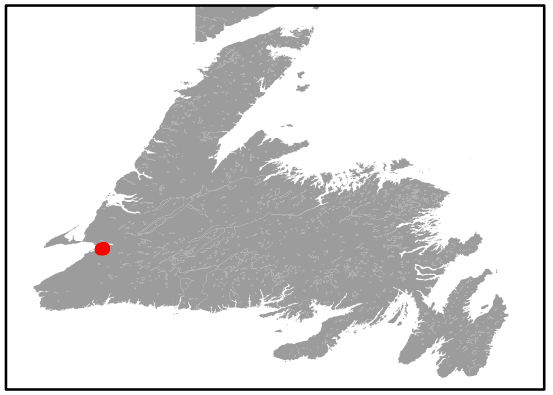

# Barachois Brook

Surficial Well
WHPA
Well Field Study Area

**Surficial Geology**

Glaciofluvial
Rogen moraine

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per | Hydraulic Conductivity |
|---|---|---|---|---|---|
| 14 | Barachois Brook Wellhead | 58 | 163 | 101 | 0.00001 |



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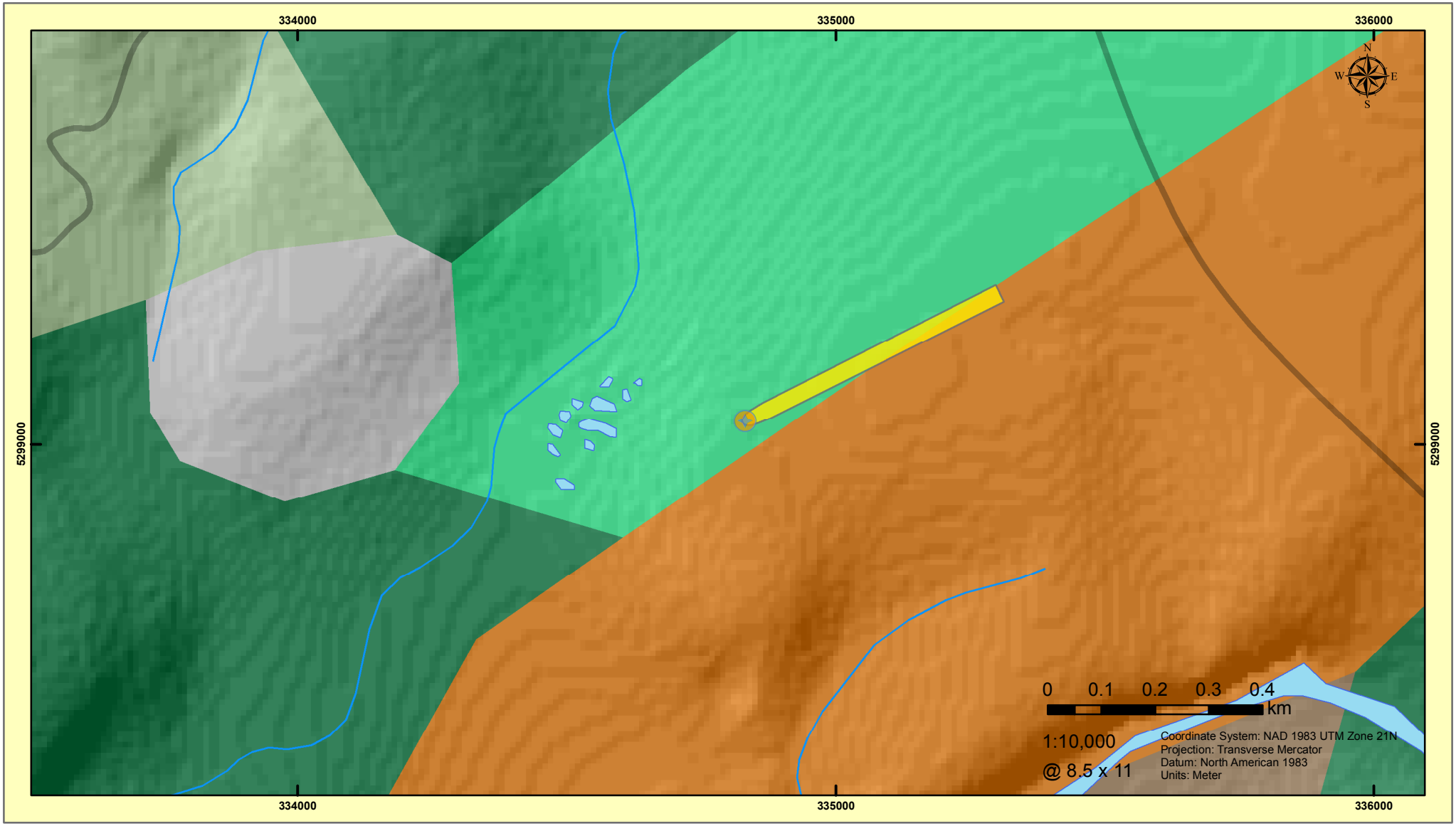


# Doyles

- Surficial Well
- WHPA
- Well Field Study Area

## Surficial Geology

- Ablation drift
- Bog
- Drift poor
- Glaciofluvial
- Rogen moraine
- Till blanket

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per | Hydraulic Conductivity |
|---|---|---|---|---|---|
| 873 | # 2 Well Doyles | 39 | 15 | 9 | 0.00001 |

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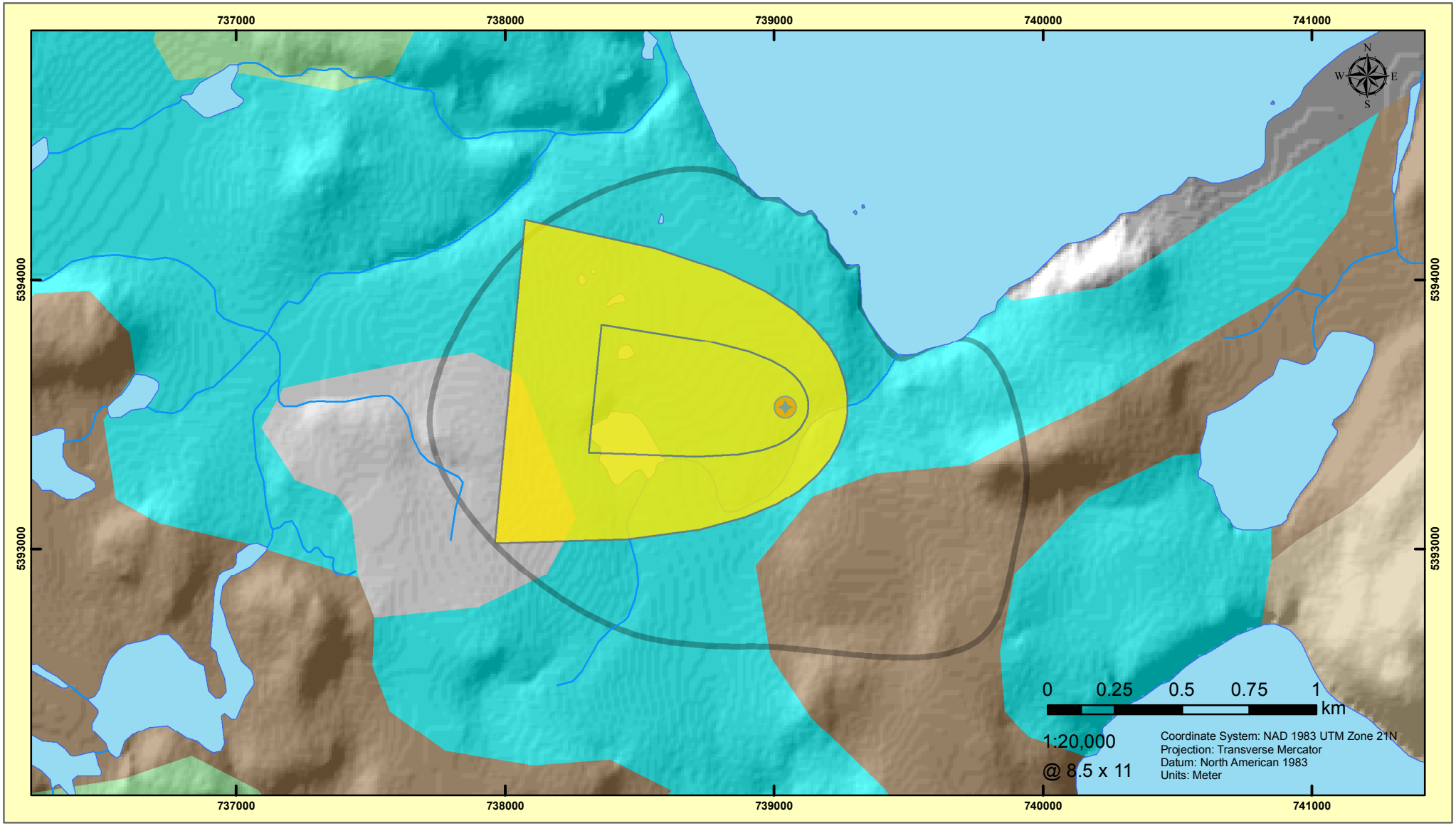



# Sandy Cove

Surficial Well

WHPA

Well Field Study Area

## Surficial Geology

Bog

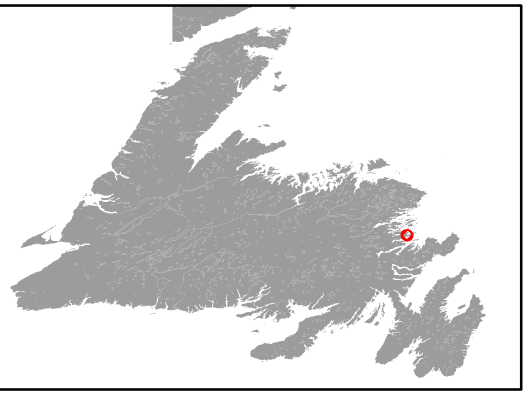
Drift poor

Exposed bedrock

Glaciomarine and marine

Till, undifferentiated

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per | Hydraulic Conductivity |
|---|---|---|---|---|---|
| 224.1 | Dug | 7 | 499 | 310 | 0.00001 |
| 224.2 | Dug | 7 | 152 | 94 | 0.00001 |



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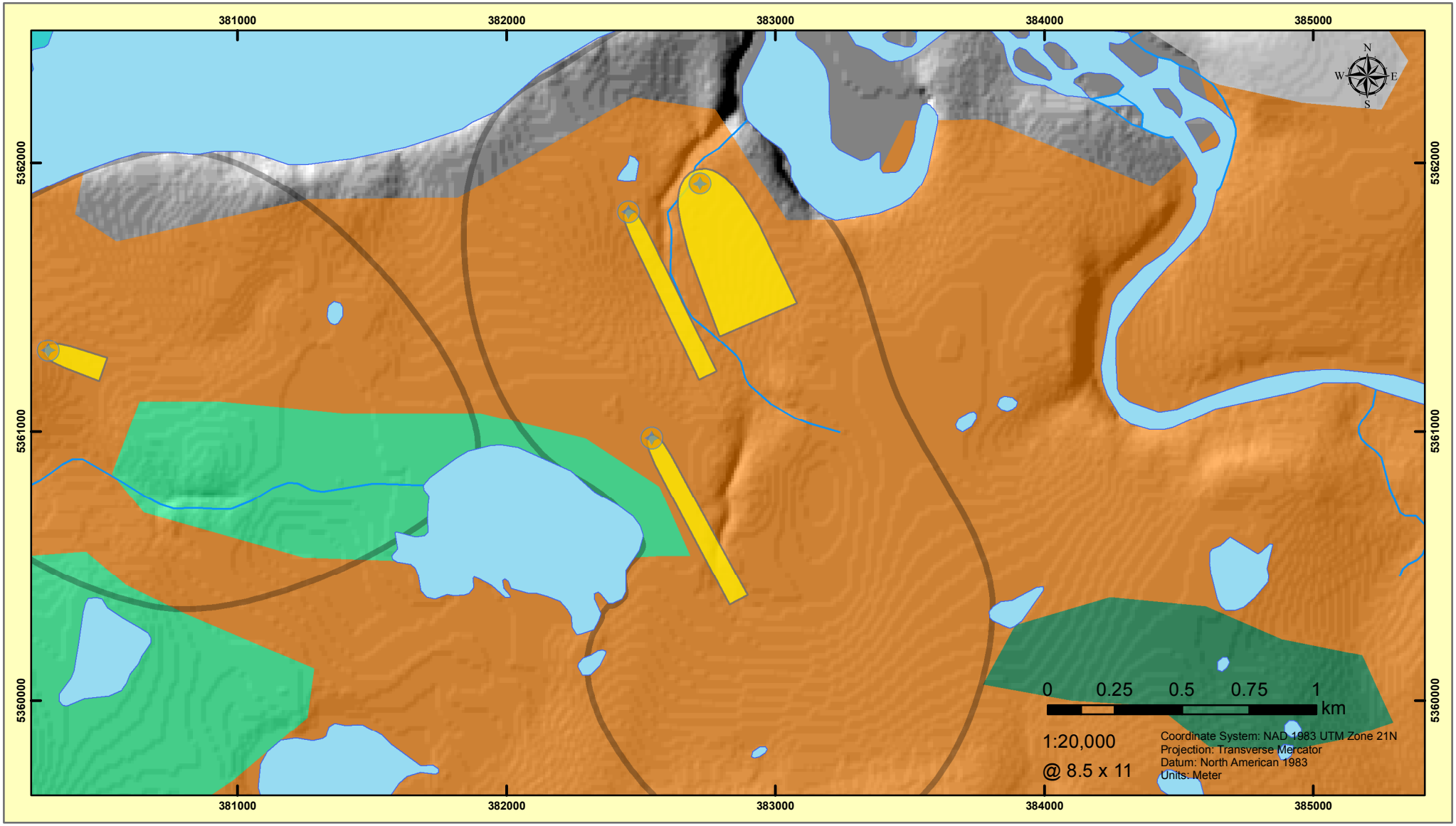



# Flat Bay East

Surficial Well

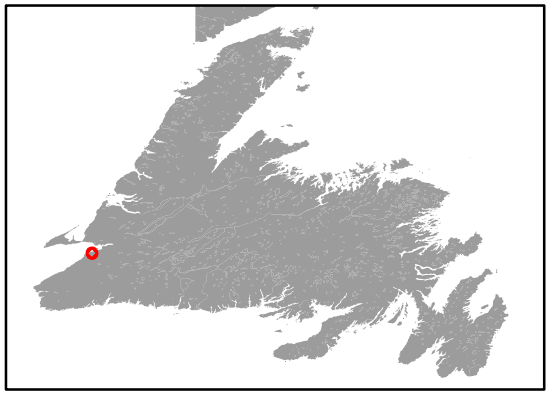
WHPA

Well Field Study Area

## Surficial Geology

- Ablation drift
- Bog
- Glaciofluvial
- Glaciomarine and marine
- Rogen moraine

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per | Hydraulic Conductivity |
|---|---|---|---|---|---|
| 240 | #3 Well | 21 | 235 | 146 | 0.00001 |
| 241 | #1 Well | 21 | 78 | 48 | 0.00001 |
| 242 | #2 Well | 22 | 78 | 48 | 0.00001 |
| 825 | #3 Well | 62 | 82 | 51 | 0.00001 |



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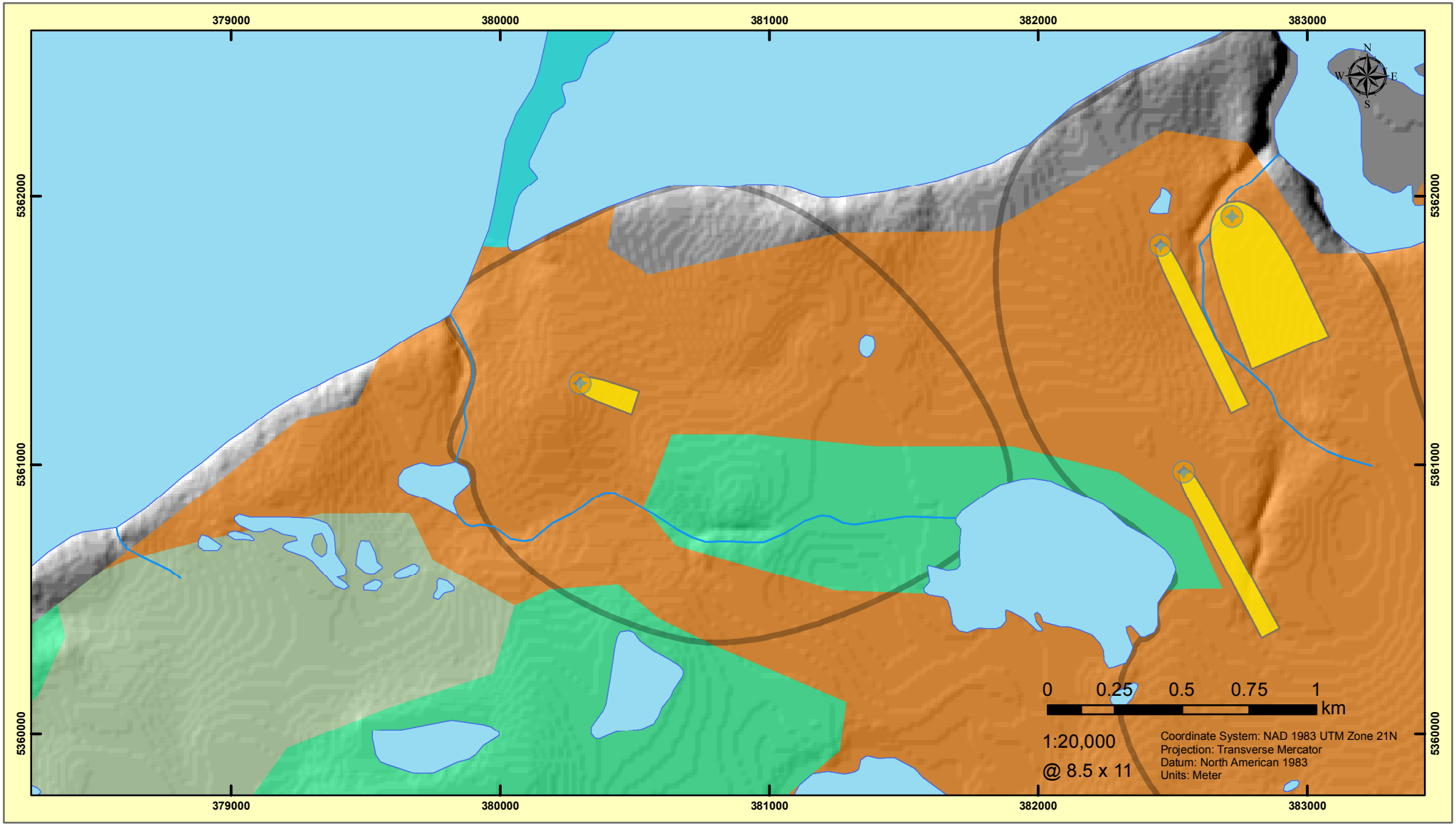



# Flat Bay West SRF

Surficial Well

WHPA

Well Field Study Area

## Surficial Geology

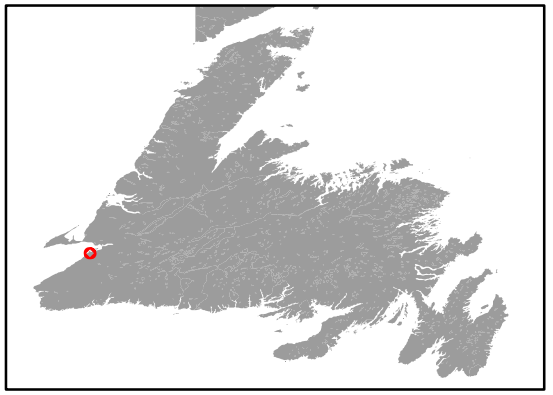
Glaciofluvial

Glaciomarine and marine

Rogen moraine

Till blanket

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per | Hydraulic Conductivity |
|---|---|---|---|---|---|
| 240 | #3 Well | 21 | 235 | 146 | 0.00001 |
| 241 | #1 Well | 21 | 78 | 48 | 0.00001 |
| 242 | #2 Well | 22 | 78 | 48 | 0.00001 |
| 825 | #3 Well | 62 | 82 | 51 | 0.00001 |



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# Frenchman's Cove

Surficial Well

WHPA

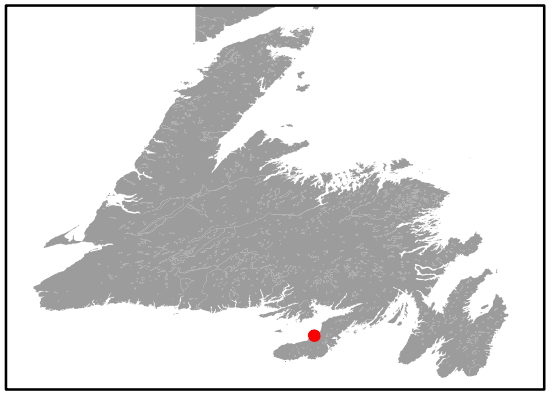
Well Field Study Area

**Surficial Geology**

Drift poor

Glaciomarine and marine

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per | Hydraulic Conductivity |
|---|---|---|---|---|---|
| 261 | Dug Well | 53 | 166 | 103 | 0.00001 |



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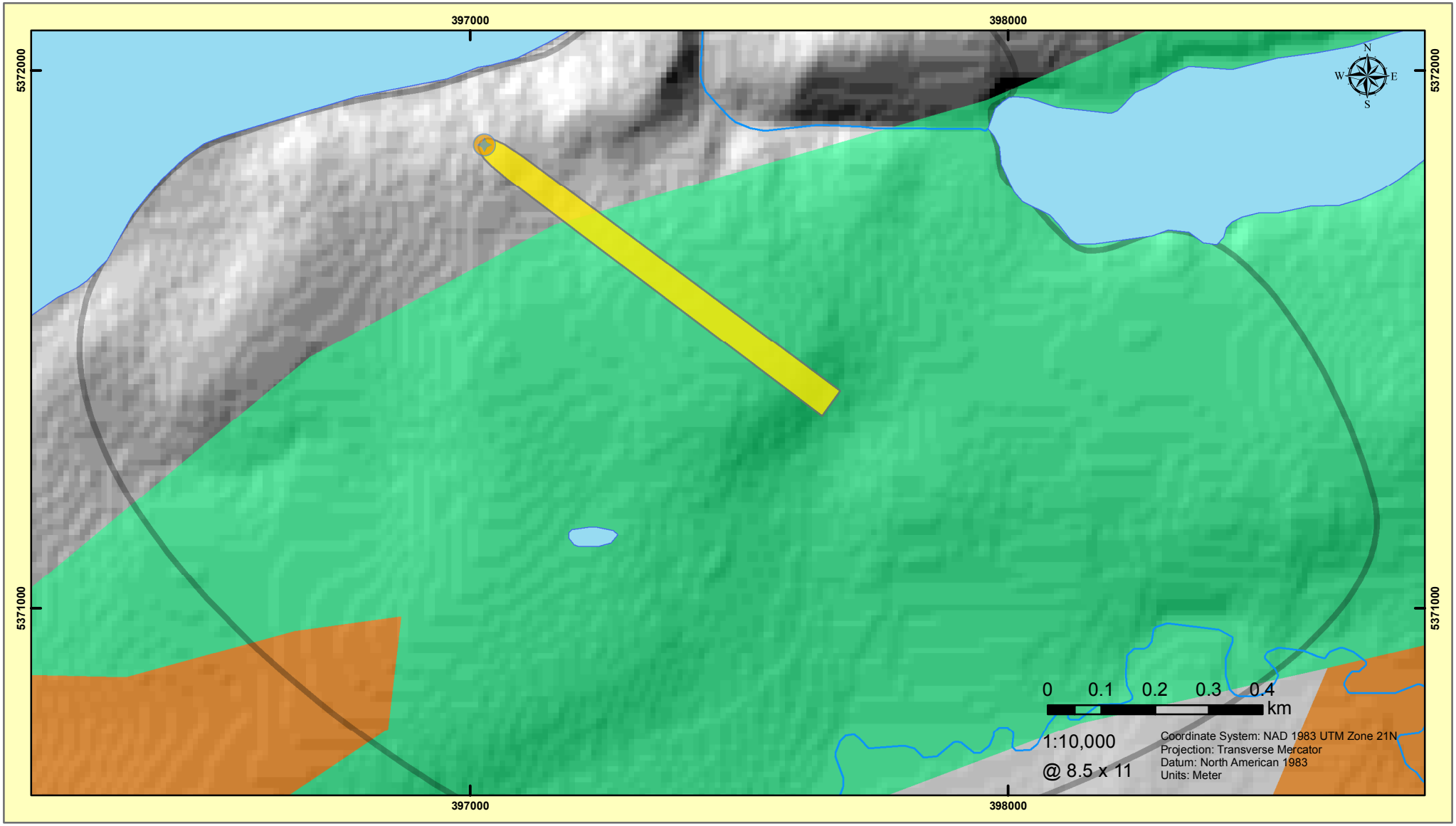


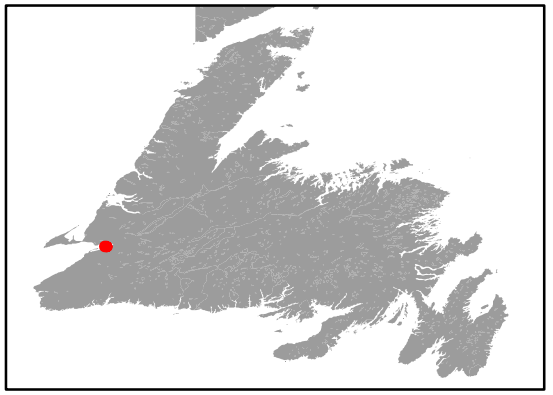

# Mattis Point

- Surficial Well
- WHPA
- Well Field Study Area

## Surficial Geology

- Bog
- Glaciofluvial
- Rogen moraine

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per | Hydraulic Conductivity |
|---|---|---|---|---|---|
| 451 | Drilled | 41 | 136 | 84 | 0.00001 |



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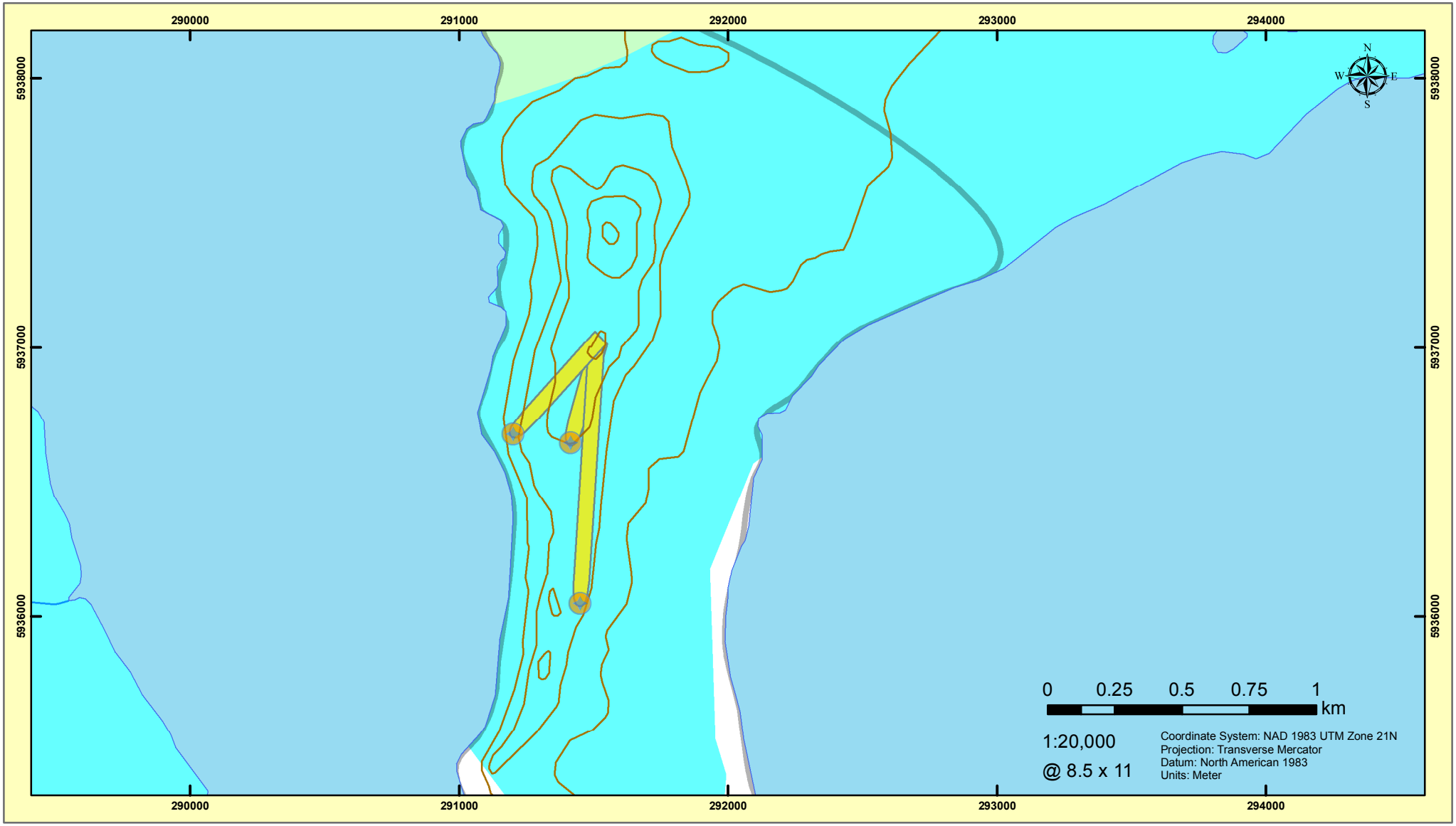


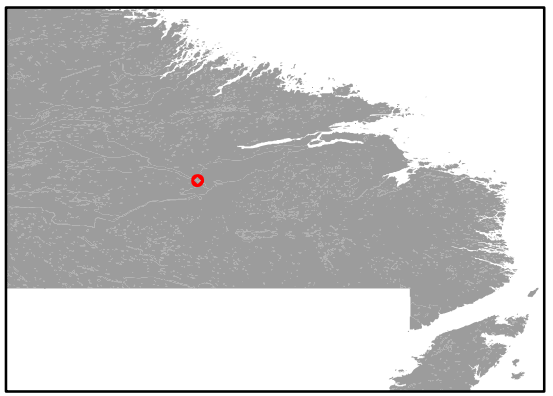

# North West River

- Surficial Well
- Topographic Contour (20 m)
- WHPA
- Well Field Study Area

## Surficial Geology

- Glaciomarine and marine
- Till, undifferentiated

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per day) | Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| 513.1 | #1 Well | 37 | 164 | 102 | 0.00001 |
| 513.2 | #2 Well | 37 | 164 | 102 | 0.00001 |
| 513.3 | #3 Well | 37 | 164 | 102 | 0.00001 |



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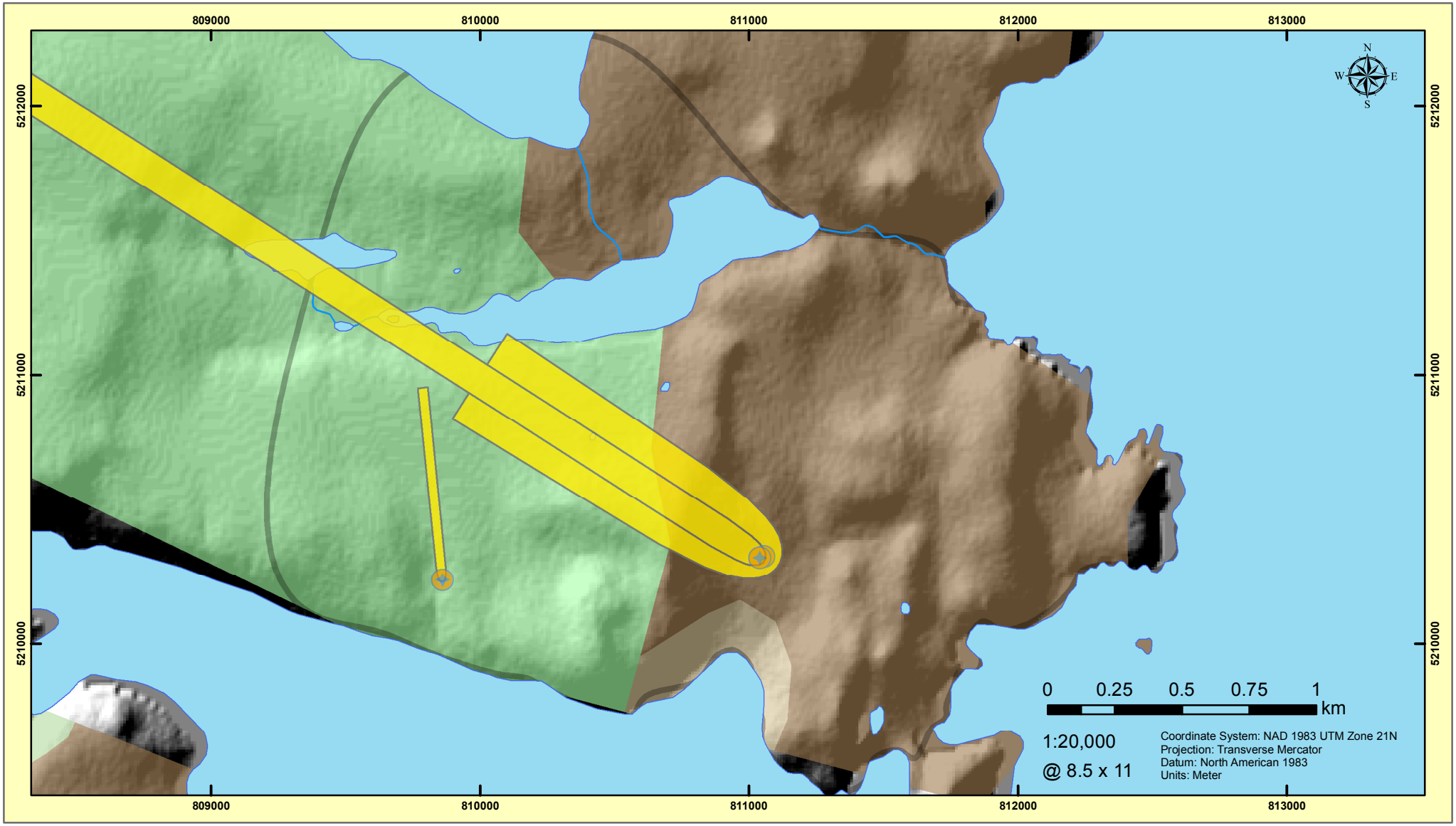


# Port Kirwan

Surficial Well

WHPA

Well Field Study Area

## Surficial Geology

Drift poor

Exposed bedrock

Till blanket

Till, undifferentiated

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per | Hydraulic Conductivity |
|---|---|---|---|---|---|
| 581.2 | Dug Well | 7 | 19 | 11 | 0.00001 |
| 581.3 | Spring | 1 | 33 | 20 | 0.00001 |
| 878 | Developed Spring | 1 | 33 | 20 | 0.00001 |

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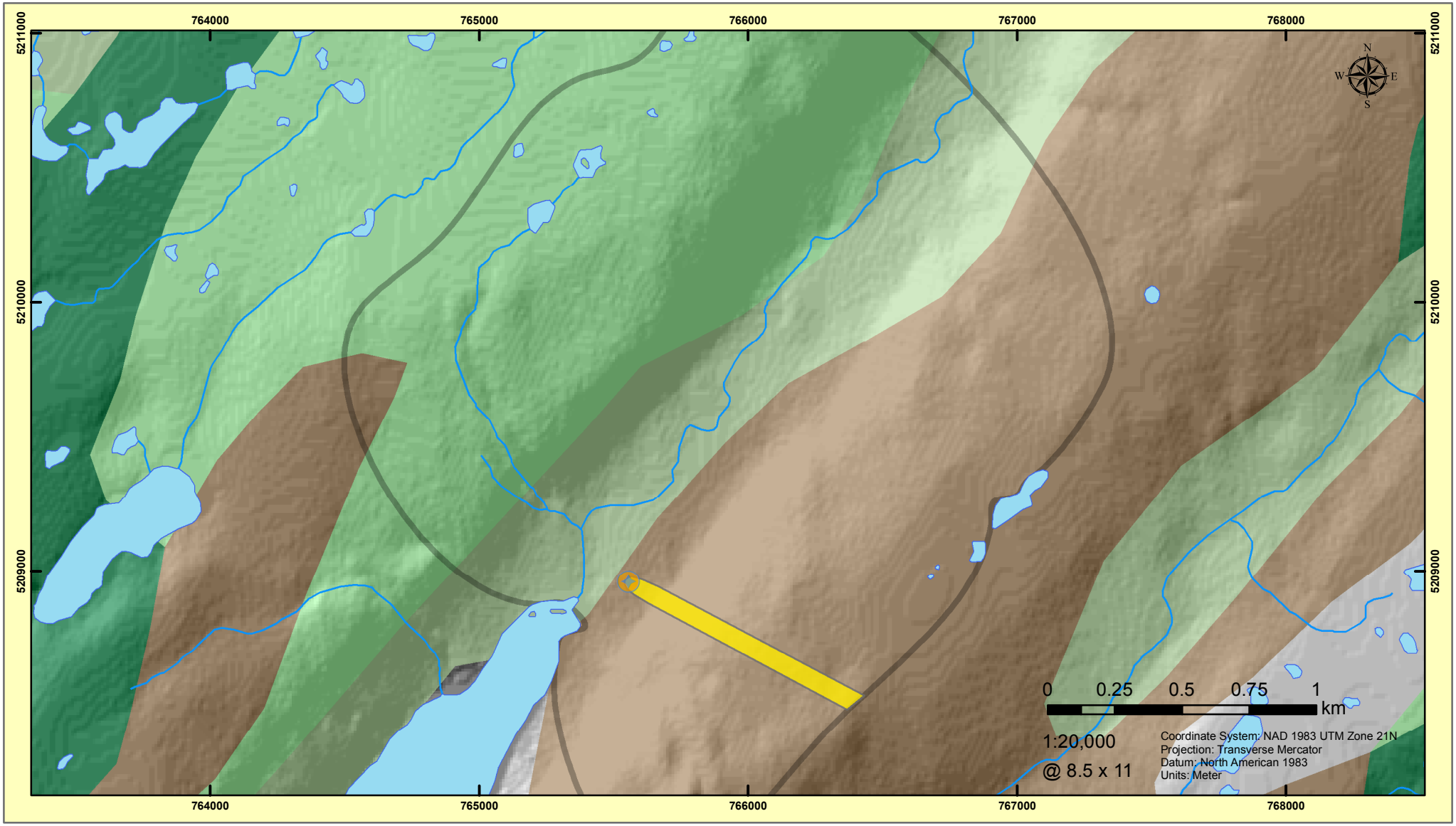


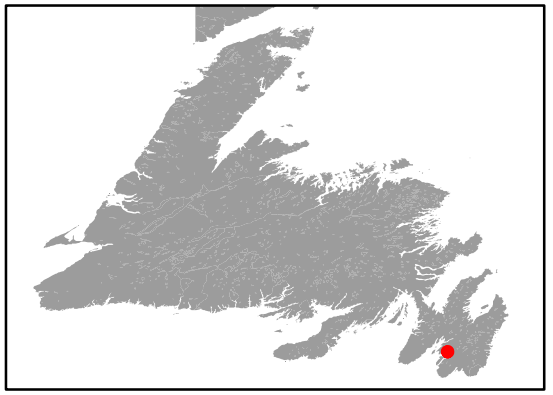

# Riverhead

- Surficial Well
- WHPA
- Well Field Study Area

## Surficial Geology

- Ablation drift
- Bog
- Drift poor
- Till blanket
- Till, undifferentiated

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per | Hydraulic Conductivity |
|---|---|---|---|---|---|
| 620.1 | #1 Well | 13 | 73 | 46 | 0.00001 |



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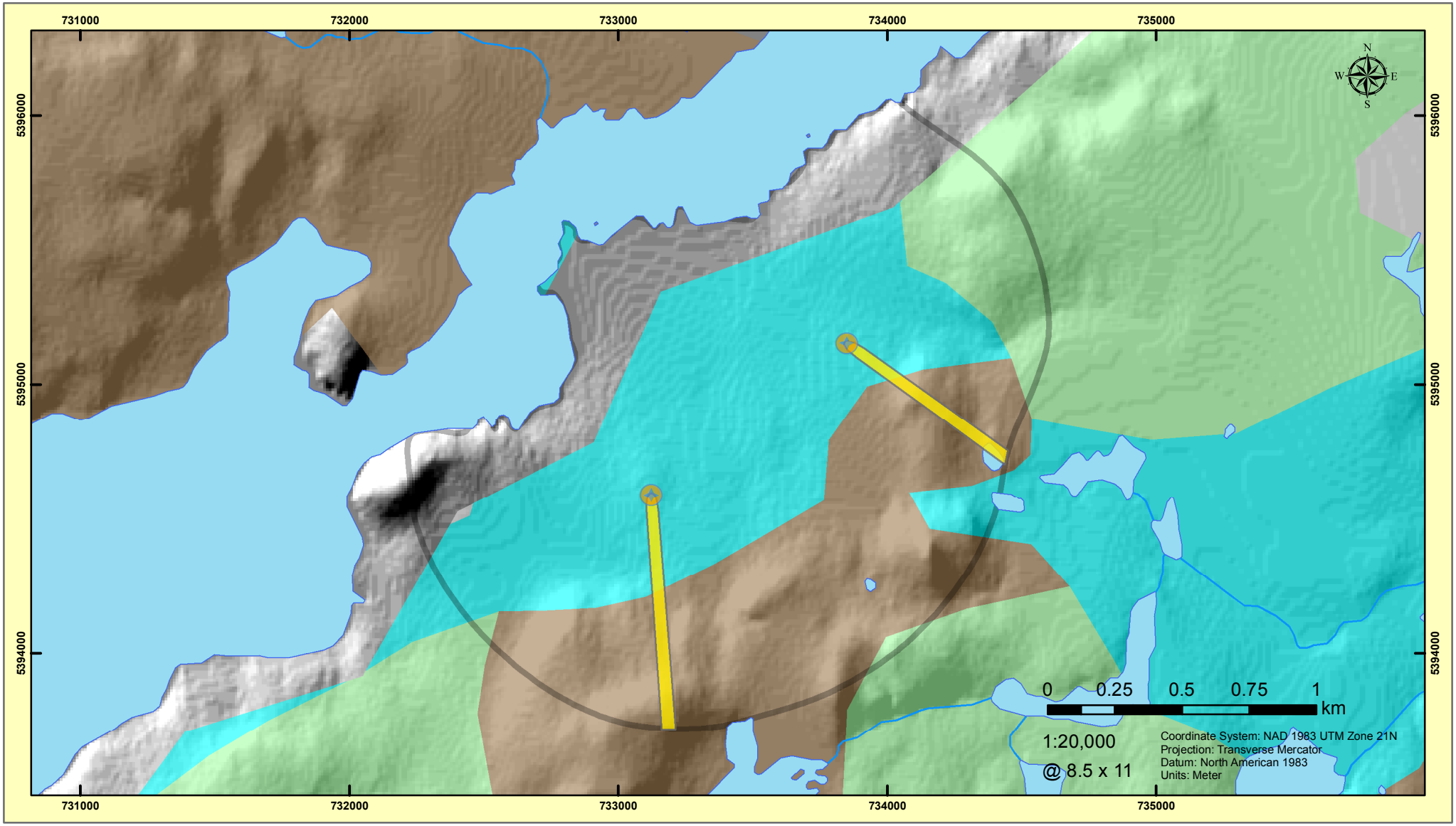



# Sandringham

Surficial Well

WHPA

Well Field Study Area

## Surficial Geology

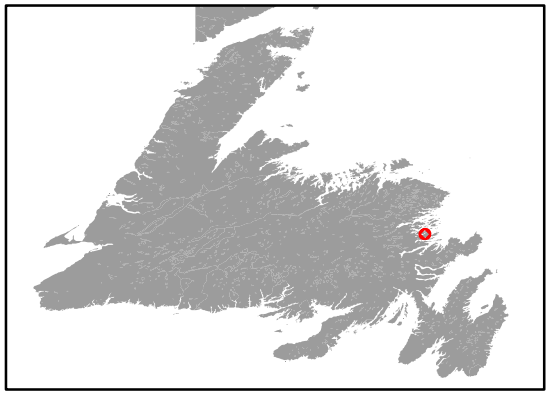
Bog

Drift poor

Glaciomarine and marine

Till, undifferentiated

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per | Hydraulic Conductivity |
|---|---|---|---|---|---|
| 633.1 | Drilled (#1 Well) | 74 | 128 | 79 | 0.00001 |
| 633.2 | Drilled (#2 Well) | 74 | 128 | 79 | 0.00001 |



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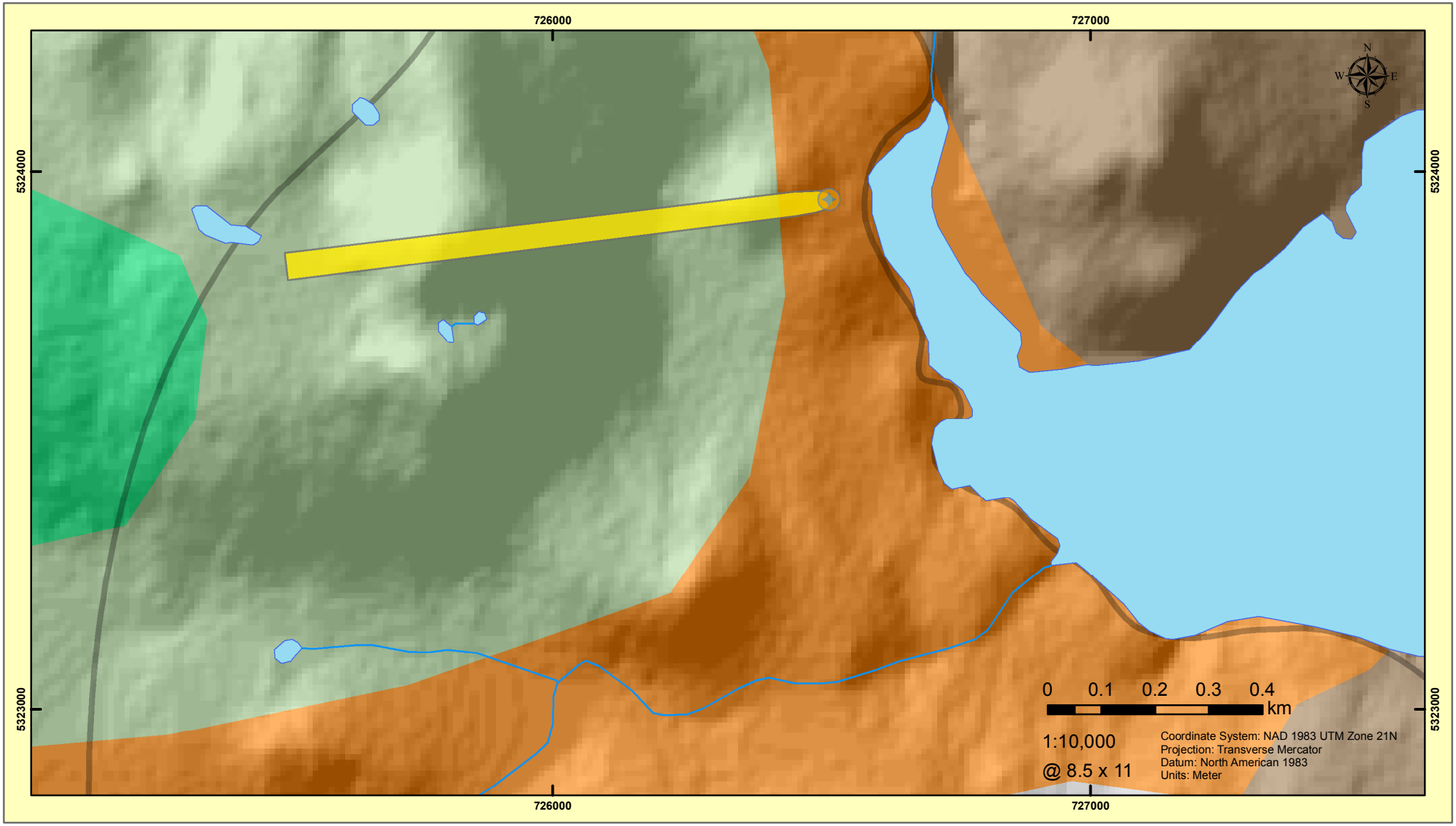



# Random Sound West

Surficial Well

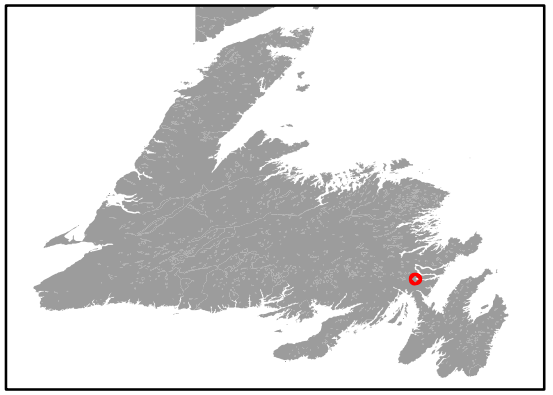
WHPA

Well Field Study Area

## Surficial Geology

- Bog
- Drift poor
- Glaciofluvial
- Rogen moraine
- Till blanket

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per | Hydraulic Conductivity |
|---|---|---|---|---|---|
| 510 | #2 Well | 31 | 55 | 34 | 0.00001 |



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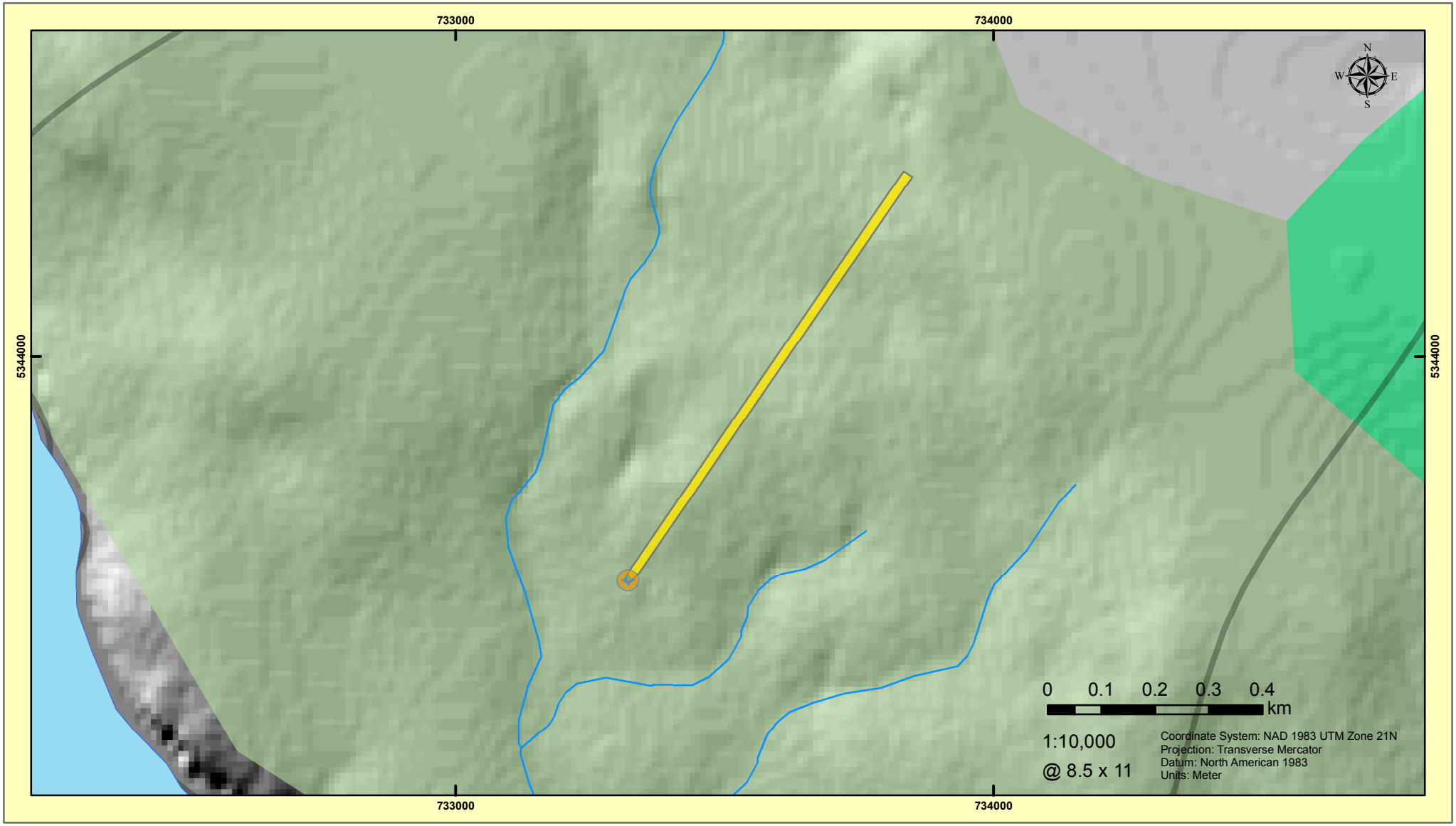



# Smith's Sound

Surficial Well

WHPA

Well Field Study Area

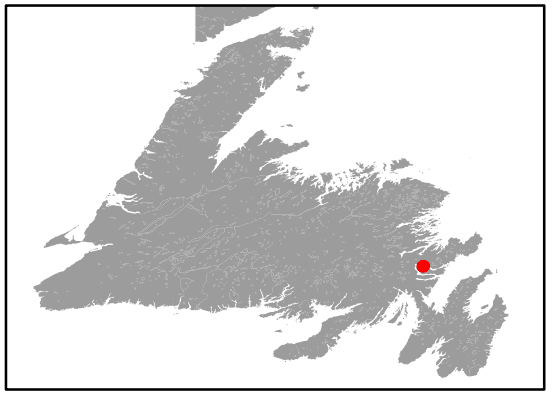
## Surficial Geology

Bog

Rogen moraine

Till blanket

| WS_SUB | Well ID | Well Depth (m) | Population | Pumping Rate (cubic metres per | Hydraulic Conductivity |
|---|---|---|---|---|---|
| 337 | Developed Spring | 87 | 40 | 25 | 0.00001 |



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# APPENDIX F

SOURCE WATER PROTECTION AND STANDARDS OF OPERATION

Source water protection is a comprehensive approach to providing communities with safe drinking water drawn from a central supply. In addition to delineation and protection of source water areas, the process requires training and certification of operators, a quality management system, and competent enforcement of standards.

A standard set of operating procedures are recommended for water supply systems to provide a check on performance of the wells, water use, and water quality from the aquifers that the towns and villages rely on for their Municipal Public Drinking Water Supplies. These procedures relate to supply wells, pumping equipment, reservoir storage, transmission lines, distribution systems, water treatment, chemical and bacterial water quality, water levels, and records of water use for supply systems.

A public drinking water supply is a system including source, intake, treatment, storage, transmission, and distribution components all working together provide water to the public. The system is intended to serve potable piped water to a given number of service connections and/or persons on a regular and dependable basis. Providing a safe drinking water supply to the public requires a diligent approach to managing and protecting the source and the system delivering the water. There are two main levels of responsibility for operating a public drinking water supply: the owner's responsibility, and the operator's responsibility.

The owner's responsibility is firstly to understand their obligations under provincial acts and regulations related to health and environmental issues that may affect the quality of water being delivered to the public. They also must define how they make diligent decision making authority over the system. One of the most important functions is to assign competent and certified operators to run the system. Along with this responsibility is the need to provide adequate financial resources to do the job, and provide adequate and timely training on the equipment used to assure a sustainable and safe water supply. The owner must also ensure that system operations reports and data be made available, and that appropriate steps be taken to address issues that arise within the system. In some jurisdictions, and for large supplies, a complete system report is prepared on a regular basis to assure compliance with government regulations.

The operator's responsibilities are firstly to assure that the system facility meets the most recent version of the Guidelines for Canadian Drinking Water Quality. To achieve this, the system facilities must operate in accordance with approved conditions and standards. All reasonable steps must be taken to protect the source of drinking water from natural and anthropogenic contamination. Accurate and detailed record keeping is an important part of an operator's job, and access to these data is open to the owner and government regulators. Reporting on a regular basis of the operations of the system is a prime function of the operator, along with highlighting concerns regarding the integrity of the system to the owner.

The province also has a responsibility to support and provide guidance to both the owners and the operators in exercising their due diligence to protect the public from drinking water contamination.

In summary, operating, managing, and providing a sustainable safe public drinking water supply requires three main steps often referred to as a multiple-barrier approach:

1. **Keeping the water clean.**
   This is achieved by selecting the highest quality of water available and protecting it from contamination.

2. **Making it safe.**
   This is achieved by treatment to remove natural and man-made impurities and good system operations.

3. **Proving it safe.**
   This achieved by consistently testing water quality, monitoring, and taking swift corrective action when deficiencies are identified.