

Municipal Infrastructure Asset Inventories:

A Guide for Municipalities

Part II: Water and Wastewater Infrastructure



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1 – INTRODUCTION

In the first part of phase 1, Island municipalities documented all municipal assets pertaining to the categories of Buildings, Parks, Athletic Fields, Cultural/Tourism Infrastructure, Trails and Land. This was accomplished by filling out easy to navigate forms and submitting them to the Asset Management Coordinator for filing. Now, the 26 municipalities who provide water and/or wastewater services to their residents will document all water and wastewater infrastructure.

While it will require a substantial amount of effort, municipalities should recognize that this process will produce a very preliminary inventory. It is expected that some information may be too difficult to obtain due to lost records of aging equipment or inaccessibility (buried infrastructure). An important thing to keep in mind is that more descriptive and qualitative data can be added in the future and the main focus should be to create a list of municipally-owned infrastructure assets.

Upon completing their inventories, municipalities can then expect to have the information they provided returned to them in spreadsheet format. The reason for this is to open the door for municipalities to explore geographic information system (GIS) and asset management software solutions. Typically, these databases utilize data that has been pre-arranged in column/row format so it should be very easily adapted into whatever system a municipality would like to use.

There is also a possibility that the Infrastructure Secretariat will purchase or develop an in-house GIS-based system, which will house the municipalities' data and allow them to access it when considering long term funding plans.

Regarding pipe networks, a few municipalities have indicated that they have plans to collect information on the current condition of their pipes by way of video inspection. By having a complete inventory of their buried pipe network, it will be a lot easier for municipalities to manage and organize this condition data.

2 – OBJECTIVE

Local governments on PEI have an obligation to not only provide safe and useful infrastructure to their ratepayers, but to also **maintain it** in a cost effective manner. Often the focus is placed largely on the initial price tag of an asset, while less emphasis is made on costs for operation, maintenance and servicing.

Asset management brings these often undetected costs to the forefront and considers them in every decision for municipal planning. AM evaluates risk by examining the probability and impact of failure, prioritizes spending and provides a municipality with the tools to efficiently manage and maintain its infrastructure.

The Federal and Provincial Governments recognize that asset management is a valuable tool for long-term strategic planning and have incorporated it into the latest Gas Tax Agreement. While it's not currently a prerequisite for receiving funds, the agreement indicates that it will be by March 2018. In an effort to aid municipalities on their path to better asset management, the Infrastructure Secretariat has created a plan which will be carried out over the next several years. The plan will see each municipality develop a comprehensive infrastructure asset inventory, evaluate the current condition and performance of their infrastructure and outline all anticipated costs associated with operation and maintenance.

We are now halfway through the first phase, which entails assembling an inventory of all municipally-owned assets. Some of the most valuable resources for collecting this information will be the operators who deal with the infrastructure and equipment on a routine basis via maintenance or inspections. More often than not, much of the important information regarding a water or sewer system exists in the heads of those operators and technicians, and leaves with them when they walk out the door for retirement or for another job. This phase aims to tap into that knowledge and create a database that can be easily shared between new and existing personnel, council and other municipal staff.

Upon completing their inventories, municipalities will continue to be guided through the next few phases which will include evaluating the current condition of assets, and performing a risk-based analysis to identify projects of higher priority.

Asset management is not intended to be a one-time exercise. Over time, the infrastructure in our communities will deteriorate, while populations will grow and decline. As a result, the needs of residents will change. Having a good asset management plan in place will allow municipalities to continuously re-evaluate their long term plans to keep up with the needs of their residents.

3 – GENERAL GUIDELINES FOR FILLING OUT ASSET INVENTORY FORMS

- Municipalities are asked to complete and submit these forms by **January 29, 2016**. Electronic copies of the forms can be submitted via email to Alex Dalziel - **jadalziel@gov.pe.ca**. Alternatively, hard copies of the completed forms can be delivered in person or mailed to:

**Infrastructure Secretariat
75 Fitzroy Street, Suite 301
P.O. Box 2000
Charlottetown, PE C1A 7N8**

- **Complete one (1) form for each individual asset.** This only applies to forms which are not formatted as a table and include: Well Fields, Buildings, Pumping/Booster Stations, Water Storage Tanks, and Wastewater Treatment Lagoons.
- **Water/Wastewater Pipes:** There are no forms for documenting water and wastewater pipes. These assets are to be documented using the excel spreadsheet titled:
“Municipal Water, Wastewater Pipes”
- **Wastewater Lift Stations/Pumping Stations:** There is no form for documenting lift stations as the Department of Environment plans to assemble a list of every station on PEI in the summer/fall of 2015. All information gathered for their inventory will be shared with this initiative.
- This document is to be filled out to the best of the municipality’s ability in order to ensure that the most accurate and up to date information is being presented. In the case where information is not able to be obtained for one reason or another, municipalities may skip over that section or field.
- Not all municipalities will have assets in each asset class. Please ignore those forms that do not pertain to your municipality.
- **Report on only the infrastructure that your municipality is responsible for.** Inventories can be expanded later to include infrastructure owned by not-for-profits and other non-governmental groups. For now only focus on what your municipality owns.
- Definitions of various terms on the forms and throughout this document can be found in Appendix A.

4 – WORKING THROUGH THE FORMS

The information being requested in these forms is very technical and often complicated to understand and interpret. The following section explains some of the more common terms found throughout the forms.

4.1 – Common Fields

The following section discusses common terms found on all of the forms. For further definitions to these terms, as well as definitions for all of the other terms found throughout the forms please consult the **index section**.

Asset ID – An asset ID is a unique identifier which is assigned to each asset. For larger assets such as buildings, parks, well fields, etc., their common name is usually enough to distinguish them from every other asset in that particular class of assets (*Ex. John A. Arsenault Building; Joseph Ghiz Park*). An ID numbering system becomes essential however, when you are dealing with asset classes with hundreds or thousands of similar assets. Examples here include pumps, valves and pipes.

Related Asset ID – Not all assets will have a related asset ID. A related asset ID identifies an asset that **belongs to or is part of a larger asset**. A simple example of how related asset IDs are used is in the case of a water well and a pump. Even though the pump may be connected to the well, these should be considered separate assets as they have different useful life expectancies and will be replaced at different times. The well would be documented on **Form B.2** and the pump on **Form B.4**. When completing the form for the pump, you would enter the wells' asset ID in the related asset field to show that the pump is connected to that particular well. Further to that point, if the well is one of many wells located on a well field, then its related asset ID would be the asset ID of the well field.

It is important to note that **this process works in hierarchical order**, where smaller assets have related asset IDs that associate them with larger assets. The purpose of the related asset ID won't be fully utilized until the municipality adopts some form of a database or software system. Once in place, municipalities will be able to select an asset and see every asset that is associated with it.

Year Installed/Constructed/Manufactured – It is important to note the year in which the asset was built or installed, as the age is often the only way to assess the remaining useful life. The Province will eventually compile a list of each type of infrastructure asset/equipment, along with the corresponding estimated service life and provide it to the municipalities to use. For certain types of equipment, specifically pumps and valves, this information will vary depending

on the manufacturer's specifications, so it may be a good idea to consult as-built drawings or maintenance manuals for more accurate life expectancies.

GPS Coordinates – Municipalities are requested to provide GPS coordinates for each of their assets. The datum to be used is NAD1983.

Another way to differentiate between similar assets is by their spatial location. Some larger assets will have their own civic address or PID but this is rarely the case for most water and wastewater infrastructure. Although most municipalities do not operate a geographic information system (GIS), there may be an option to “share” one amongst multiple municipalities, with the Province being the host.

The Asset Management Coordinator will be available to assist any municipalities with gathering this data by using GPS tools owned by the Department of Transportation, Infrastructure and Energy.

4.2 – Filling in the forms

Municipalities are advised to go through the forms and determine which ones will apply to their municipality. From there, all the other forms can be discarded.

There is no correct order for filling out the forms but for ease of filling in **Related Asset ID**, it may be beneficial to start at the top. As mentioned in the previous section, the process for documenting related asset ID works in hierarchical order. Only the smaller assets are going to have related asset IDs, so that they can be associated with a larger asset. Because of this, it is advised to complete forms for larger infrastructure first. Adversely, municipalities may choose to proceed in any order and leave assigning Asset IDs and Related Asset IDs until after everything is documented. Either method will be acceptable.

Before filling in asset information, be sure to fill in “Municipality” and “Date”, as well as “Page ___ of ___”.

For forms which are formatted as a list, you may end up needing more than one page. Form B.2 – Wells only has room for 18 wells. Should your municipality have more than 18 water wells, you will need to continue the list on a new blank version of the form. This new page should be filled out similar to the first one with Municipality, Date and Page number clearly marked at the top.

4.3 – Saving the Forms

It is recommended that you save your work periodically to prevent losing any progress you have made. For forms that address individual assets (well field, water storage tank, wastewater lagoon, etc) you should save the file under a name that can easily identify the asset.

Examples: Victoria_WW_Lagoon.pdf; NorthRustico_WaterStgTank2.pdf

For assets that are documented as a list, a suitable filename would be:

Summerside_Wells.pdf; BordenCarleton_Pumps.pdf

In some cases, not all of the listed assets are going to fit onto one form. When this happens, you will need to start a new sheet for the extra assets as shown in the following example:

*Souris_Hydrants1.pdf
Souris_Hydrants2.pdf
Souris_Hydrants3.pdf*

You might also find it beneficial to group like assets together that **pertain to a larger asset** such as the following:

*A group of 10 wells located at the “Mill Road Well Field” are saved under the file name:
Tyne_Valley_MillRdWellField_Wells.pdf*

The municipality in that example might have two or three different well fields, each with their own set of wells however, for sorting purposes, the wells are grouped according to the well field that they belong to. If there were two other well fields, the lists of wells may be saved under the following names:

*Tyne_Valley_CentralWellField_Wells.pdf
Tyne_Valley_SouthSideWellField_Wells.pdf*

Assets may also be grouped together **by area** like the following example:

*A group of 25 hydrants are located on the north end of town and are named:
NorthEnd_Hydrants.pdf*

NOTE: These are suggestions only; if your municipality already has a system in place for naming and sorting electronic files, or if you develop a better method then please feel free to use it.

5 – Working Through the Spreadsheets

While the majority of water and sewer infrastructure can be documented using the fill-able PDF forms, this is not possible for underground pipe. Rather than being looked at as one asset, pipe networks need to be broken down into smaller segments. Depending on the size of municipality, and the number of dwellings serviced, there may be thousands of meters of buried water or wastewater pipe. Pipes have many different variables such as size, use and age that heavily influence the overall useful life.

In some cases, underground pipes are documented on paper but have not been located in the field. The reverse is also true, where technicians and operators know the locations of these pipes in the field but there is no supporting documentation. The end goal of identifying and examining individual pipe segments is to enable municipalities to eliminate surprises and unknowns in the future and ultimately anticipate more accurately when they will need to invest in repair/rehabilitation projects.

5.1 – Filling in the Spreadsheets

To start on the spreadsheets, enter all applicable information on the Introduction tab. This includes municipality name, number, CAO contact information and current date. The first thing to note is that the majority of the spreadsheet is locked, which is mainly to keep users from mistakenly editing or mixing up formulas throughout the sheet. As a rule of thumb, if you attempt to edit a cell and an error message pops up that says:

The cell or chart that you are trying to change is protected and therefore read only

you know that you are not responsible for filling out that particular cell.

The next tab on the spreadsheet pertains to the **Asset ID Number**. Municipalities do not have to provide any information on this tab, as it is just there for reference.

Aside from the asset identification number and the location/length of the segment, there are also columns for documenting secondary information. These columns include diameter, material of pipe, and for wastewater pipes specifically, buried depth and force/gravity. The main focus of this phase is to create a list of all pipe segments, so if some of this secondary information is missing then please leave those columns blank.

Keeping data consistent in a spreadsheet is very important for future functionality. An example of this is under the column, “Road Type”. Here, municipalities are asked to verify whether the pipe falls on a Street, Boulevard, Avenue, Crescent, Drive, etc. When selecting the type of road,

be sure to **avoid abbreviations**. This can lead to inconsistencies where some municipalities may write it as “St.” while others use “Street”.

NOTE: *The following section outlines methods for defining pipe segments. These are **suggestions only**. If your municipality already uses a different approach, or would prefer another method, please feel free to use it.*

5.2 – Defining Water Pipe Segments

A water pipe segment is suggested to be defined as a length of pipe with consistent size, material and age, that connects two water fixtures, such as valves, pumps, storage tanks or dwellings. Note that a segment in this case can consist of multiple smaller lengths, as long as they have consistent properties as listed above (size, material, age).

On the spreadsheet, you have 3 options for identifying the segment length/location. Please note that **you only have to use one of the following**.

1. Street address: Indicate the address that the segment starts in the “Starting Point” column and the address where the segment ends in the “End Point” column;
2. Asset ID: Indicate the asset ID of the asset which is located at the start of the segment, as well as the asset ID at the end of the segment. The two asset IDs in this case could belong to a valve, meter, pump, etc.;
3. GPS Coordinates: Indicate the easting/northing coordinates for where the pipe segment begins as well as the easting/northing for where it ends.

It is also important to note that you **may use two different methods** for identifying the start and end points of a pipe segment.

Ex. Starting Point: Asset # 1234-35-00234; End Point: Easting 447075.9567, Northing 5121741.4915

Identifying segments using street addresses offers a good preliminary location, but is not near as accurate as using GPS coordinates or asset IDs of other assets which have also been located using GPS coordinates

5.3 – Defining Wastewater Pipe Segments

A wastewater pipe segment most simply defined as the length between two fixtures such as manholes, lift stations or lagoons. Please note that a segment in this case can consist of many smaller lengths (10’, 20’, etc).

Similar to water pipes, you have 3 options for identifying the segment length/location. Please note that **you only have to use one of the following**.

1. Street address: Indicate the address that the segment starts in the “Starting Point” column and the address where the segment ends in the “End Point” column
2. Manhole #: Indicate manhole number where the pipe segment begins as well as the manhole number where it ends.
3. GPS Coordinates: Indicate the easting/northing coordinates for where the pipe segment begins as well as the easting/northing for where it ends.

Similar to water pipe segments, **you may use two different methods** above for defining Start/End points, if it makes it easier.

The recommended option is to use manhole-to-manhole identification system. Street addresses should be a last resort, as this option will carry the largest variance. Also, pipe may run in areas where there are no street/road addresses (only PIDs). By applying the manhole-to-manhole method, you afford yourself the opportunity to use GPS coordinates already collected for manholes, as the start/end points of the pipe segments.

6 – LIST OF FORMS, ASSET CLASSES

Each form is listed in the table below, along with the type of asset and corresponding asset class number. As explained in Section 4, the asset class number found on the table below makes up the middle part of an asset ID.

Ex: 1234-**32**-00005

A list was released in October 2014 that accompanied the forms for Buildings, Parks, Athletic Fields, etc. This list has various categories pertaining to water/wastewater infrastructure with assigned asset class numbers. **Please disregard that list and use the updated numbers shown below.**

Form	Asset Type	Asset Class Number
Water		
B.1	Well Field	32
B.2	Well	33
B.3	Buildings	11 – Buildings: Water
B.4	Pumps	34
B.5	Water Storage Tank	36
B.6	Valves	37
B.7	Hydrants	35
B.8	Pumping/Booster Stations	38
B.9	Chambers	39
B.10	Water Meters	40
B.11	Supplementary/Miscellaneous	41
W, WW Pipes Spreadsheet	Pipes	31
Wastewater		
B.3	Buildings	13 – Buildings: Wastewater
B.12	Manholes	47
B.13	Wastewater Lagoons	43
B.14	Supplementary/Miscellaneous	46
W, WW Pipes Spreadsheet	Pipes	42

NOTE: Not every piece of equipment or infrastructure asset will fit into one of the categories above. In those cases, please use either B.11 or B.15 for supplementary or miscellaneous assets.

7 – ASSIGNING ASSET IDENTIFICATION NUMBERS

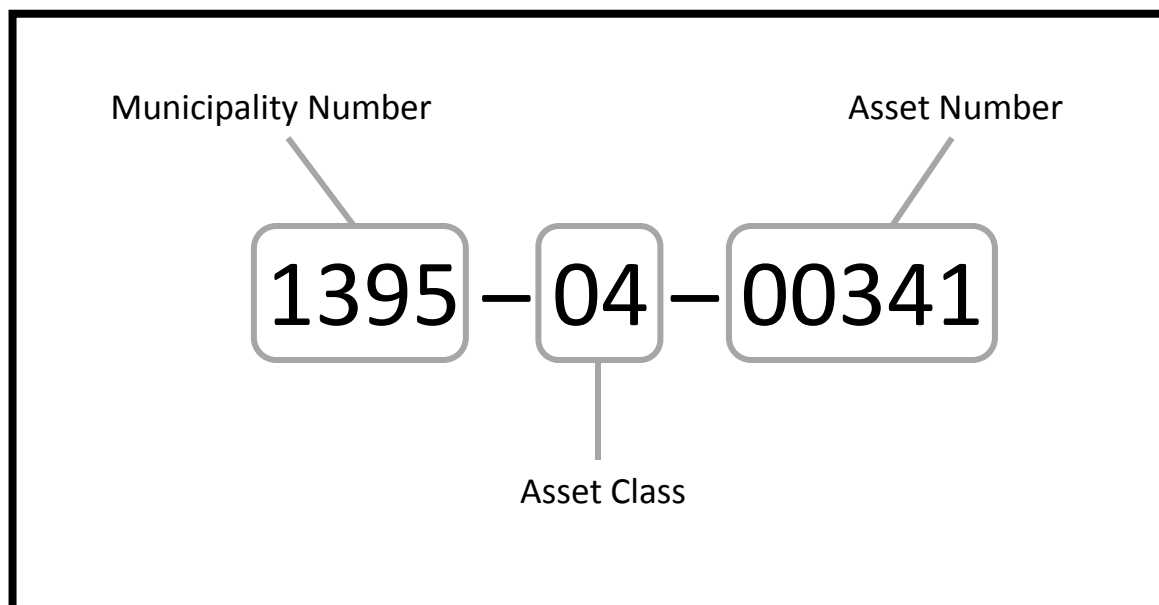
The following section refers to assigning individual identifiers to each asset **on the forms only**. Asset IDs are automatically generated on the spreadsheets for documenting water and wastewater pipes.

Assigning each of your infrastructure assets their own serial or identification number is very important when compiling an asset inventory. It is necessary to have a distinct and individual number for lengths of pipe, road, sidewalk, etc., as they often have no other means of identification. Larger items like buildings or facilities are also easier to manage when they each have their own reference number.

Having a unique identification number for each of your assets will also be very important should your municipality adopt an asset management software package in the future.

7.1 – The Three Parts of Asset Identification Numbers

Asset IDs are divided into three parts; municipality number, asset class and asset number. The diagram below shows how asset numbers are assigned:



MUNICIPALITY NUMBER

The **municipality number** is a number that was assigned by Municipal Affairs and can be found on the list below:

2450	Charlottetown	1425	Kinkora
1480	Summerside	1435	Miscouche
1405	Alberton	3420	Morell
2415	Cornwall	2425	Mount Stewart
3410	Georgetown	3425	Murray Harbour
1420	Kensington	2430	North Rustico
3415	Montague	1440	O'Leary
3440	Souris	2525	Resort Municipality
2475	Stratford	3435	St. Peters Bay
1408	Abram-Village	1460	Tignish
1410	Borden-Carleton	1465	Tyne Valley
2420	Crapaud	2445	Victoria
2413	Hunter River	1470	Wellington

ASSET CLASS NUMBER

The second part of the number describes the asset class, or type of asset. **Asset class numbers** can be found in the following list:

11	Buildings – Utility – Water	42	Wastewater – Pipe
31	Water – Pipe	43	Wastewater – Treatment Lagoon
32	Water – Well Field	44	Wastewater – Pumping Stations
33	Water – Wells	45	Wastewater – Water Lagoons/Treatment Facilities
34	Water – Pumps	46	Wastewater – Misc. Wastewater Equipment
35	Water – Fire Hydrant	47	Wastewater – Manholes
36	Water – Storage Tanks	13	Buildings – Utility – Wastewater
37	Water – Valves		
38	Water – Pumping/Booster Stations		
39	Water – Chambers		
40	Water – Water Meters		
41	Water – Misc. Water Equipment		

ASSET NUMBER

The third number on the list is arbitrarily assigned by the municipality. This number is simply meant to differentiate the asset from all the other assets in the asset class and is by no means an indication of the asset's priority or importance. To assign **Asset Numbers**, start at 00001 and proceed in increasing order until all of your assets in that class have their own unique number.

Example: If North Rustico has two well fields, their corresponding asset ID numbers should be:

2430-32-00001 and **2430-32-00002**.

7.2 – Assigning Asset IDs in the Spreadsheets

Spreadsheets have been set up to document water and wastewater pipe networks. These sheets have been set up in a way that you do not have to worry about assigning asset ID numbers. After entering the municipality number on the INTRODUCTION tab of the spreadsheet, the asset IDs will be created.

7.3 – Assigning Asset IDs in the Forms

Unlike the spreadsheets, asset numbers are not automatically generated. Follow the instructions above and assign asset ID numbers by combining the **municipality number**, the **asset class number** and the **asset number**.

Where requested, enter the **Related Asset ID**. For further clarification on Related Asset ID, see section 4.2, or the index of this guide.

A

Asset – In the case of infrastructure asset management, an asset is a tangible item of value that provides a service to a community or municipality.

Asset Class – Asset classes distinguish between the different categories or types of assets. For example: buildings, parks, athletic fields, water/wastewater are all different types, or classes, of assets. For a list of asset classes please see Section 3. For a list of asset classes for Asset ID purposes, consult Section 4.

Asset Identification Number – A unique number which is assigned to each individual infrastructure asset. Asset IDs are made up of three parts: Municipality number, asset class and asset numbers. Directions for how to assign asset IDs can be found in Section 4.

B

Buildings – Infrastructure that houses or provides shelter for any water/wastewater infrastructure or equipment.

C

CAO – Chief Administrative Officer. Hired by the municipality, the CAO assumes all administrative duties on behalf of the municipality.

Capital Cost – The overall cost for the design and construction, or the purchase price.

Chamber Type – The type or purpose of the chamber.

Examples: air release chamber, pressure reduction, valve chamber, etc.

Chamber Size – An approximation of the size of the chamber. Indicate the height, width and length of the chamber.

Civic Address – Civic address is a provincially-assigned address; the street address of the asset.

Community – Located on the inventory forms, this field describes the community in which the asset is located. This is mainly intended for larger municipalities, which are often comprised of several smaller communities. For smaller municipalities, the name of the municipality will suffice for this part of the form.

D

Description of Asset – A brief description explaining what the asset is. Include type of construction (wood frame, steel, brick, etc) if applicable.

Direct Allocation Group – A group of 26 municipalities that provide the services of either water or sewer, or both, to their residents.

E

Easting – Pertaining to GPS coordinates. The Province of PEI uses **Easting** and **Northing** coordinates of the NAD83 system for all geographic locations.

F

Flow Meter – A device installed in line to measure the flow of a fluid through a pipe.

G

Gas Tax Fund – Part of the New Building Canada Plan; it provides population-based funding to the municipalities of Canadian Provinces and Territories. Further information can be found here:

<http://www.infrastructure.gc.ca/plan/gtf-fte-eng.html>

Gas Tax Agreement – The contract pertaining to the Gas Tax Fund that outlines the terms and conditions which must be adhered to by the Provinces and Municipalities.

L

Life Cycle Costs – Costs which are incurred over the entire lifespan of an asset. Costs include capital, operating, maintenance and decommissioning.

Linear Assets – Assets that can be measured in lineal units (feet, meters) and do not have one specific address. Examples include: pipe networks, data cables, roads, sidewalks.

Log 4 Reduction – A requirement for water suppliers that ensures water coming from a source (well) must have 99.99% reduction of viruses prior to reaching the first customer. Reduction of viruses is usually achieved by chlorine contact.

M

Maintenance Costs – Costs that are usually incurred on a less routine basis and are a result of the asset’s age, usage and condition.

Material – Indicate the material of which the asset is made of (concrete, steel, PVC, ABS, etc)

N

Non-Linear Assets – Also referred to as “Fixed Assets”. Assets that can’t be measured in linear units (feet, meters) and have one specific address or location. Examples include: buildings, parks, facilities, land, athletic fields, etc.

Northing – Pertaining to GPS coordinates. The Province of PEI uses **Easting** and **Northing** coordinates of the NAD83 system for all geographic locations.

Notional Allocation Group – The group of 48 municipalities of PEI that do not offer water or sewer services to their residents.

O

Operating Costs – Costs that are often incurred on a routine basis such as monthly or annually. These costs are essential for the day to day operation of the asset.

Overflow Elevation – The height in the storage tank at which an overflow pipe is present. The purpose of this pipe is to regulate the water level inside the storage tank.

P

PID Number – PID (Property Identification Number) is the government-issued number used to identify a piece of property.

Pumping Rate – Pumping rate is a unit of measurement to describe the amount of fluid moved over a specified time. There are many units to convey pumping rate so please provide in the units requested.

R

Replacement Cost – This can be found using a number of methods:

- Inflated Capital Cost: Using the cost of construction, inflate the price from the year of construction to the current year
- Insurance Replacement Cost: Talk to your insurance provider to determine what they consider the estimated replacement cost to be
- Appraisal Cost: Consult a contractor or engineer to determine what the cost would be to completely reconstruct the asset

Remaining Service Life – An estimate, in years, for how long the asset will serve the municipality. This can be found by using the current age of the asset and comparing it to the average service life of similar assets.

Related Asset ID – See also “Asset ID”. An identifier used to link assets to one another. Relating assets to one another works in a hierarchical order (smaller assets relate to larger assets).

*Example: A water pump with an asset ID: 1234-34-00001 pumps water from a well with an asset ID: 1234-33-00001. The water pump’s **Related Asset ID** would be 1234-33-00001, as it is connected to the well.*

Road Name – see Street/Road Name.

Road Type – Road type is part of the overall name of a street or road. For database purposes, the **name** and **type** of road are documented separately. Examples of road types include: avenue, street, road, boulevard, crescent, highway, drive, circle, lane, etc.

Roof Construction – Indicate what the roof was constructed with. Examples: wood truss, steel truss, concrete deck, etc.

Roof Type – Indicate the type of the roof on the building. Examples: peaked, flat, sloped, etc.

S

Street/Road Name – Indicate only the name of the road, and exclude the type of road.

Example: University Avenue → Street Name = University

For more information see **Road Type**.

T

Total Annual Operating and Maintenance Costs – The total amount of expenses or costs allotted to the routine operation of maintenance of an asset, on a yearly basis.

W

Wall Construction – Indicate what the walls of the building have been constructed with.

Examples: wood frame, concrete, steel, wood/steel combination, masonry block, etc.

Water Meters – A device for measuring water use for a residential, commercial or industrial property. These should not be confused with **Flow Meters**, which would typically measure the output of a well or well field.

Y

Year Built/Installed – The year in which the asset was constructed, acquired or installed.