



**Cascade Natural Gas Corporation  
Pipeline Replacement Program Plan  
June 2019**

**Docket No. UG-120715**

**Table of Contents**

|       |   |    |
|-------|---|----|
| I.    | Introduction.....   | 2  |
| II.   | Cascade’s Distribution Integrity Management Program (DIMP)..... | 2  |
| III.  | Cascade’s Transmission Integrity Management Program (TIMP)..... | 3  |
| IV.   | Integrity Management Analysis and Quantification.....           | 3  |
| V.    | Identification of Pipelines for Replacement .....               | 4  |
| VI.   | Obtaining New Information.....                                  | 4  |
| VII.  | Cascade’s PRP Plan Progress .....                               | 5  |
| VIII. | Early Vintage Steel Pipe (EVSP).....                            | 5  |
| IX.   | Public Interest .....   | 10 |

## **I. Introduction**

On December 31, 2012, the Washington Utilities and Transportation Commission (WUTC) issued a policy statement, in Docket UG-120715, for the accelerated replacement of natural gas pipeline facilities with elevated risk. This policy statement requires each gas company requesting a special pipe replacement cost recovery mechanism (CRM) to file with the Commission a pipe replacement program plan containing the following elements:

1. *A “master” plan for addressing all pipes with an elevated risk of failure*
2. *A two-year plan that specifically identifies the goals for the upcoming two-year period*
3. *A plan for identifying the location of pipe that presents elevated risk of failure*

In accordance with this policy statement, Cascade Natural Gas Corporation (Cascade) has previously submitted pipeline replacement program (PRP) plans, beginning in 2013, for pipe that poses an elevated risk of failure. Through Cascade’s Distribution Integrity Management Program (DIMP) and Transmission Integrity Management Program (TIMP), Cascade continually analyzes the performance of its gas distribution systems and through a detailed analysis indicate certain categories of Cascade’s gas system which present an elevated risk of failure. These categories are included as part of Cascade’s PRP plan.

## **II. Cascade’s Distribution Integrity Management Program (DIMP)**

The requirement for Cascade to have a DIMP became effective on February 12, 2010. Operators were given until August 2, 2011, to write and implement a DIMP that demonstrates an understanding of the distribution system design and material characteristics; describes the operating conditions and environment; provides the maintenance and operating history; identifies existing and potential threats; evaluates and rank risks; identifies and implements measures to address risks; measures program performance; monitors results; evaluates effectiveness; and periodically assesses and improves the plan. The threats that are identified and evaluated in DIMP include:

- Corrosion
- Natural Forces
- Excavation Damage

- Other Outside Force Damage
- Material, Weld, or Joint Failure
- Equipment Failure
- Incorrect Operation
- Missing Data
- Other – Forces unique to a particular area on the system

Cascade's DIMP Plan describes these risks and steps in greater detail. Cascade's DIMP Plan is on file with the WUTC's Pipeline Safety Division.

### **III. Cascade's Transmission Integrity Management Program (TIMP)**

PHMSA rules required Cascade to create and implement a TIMP by December 17, 2004. The purpose of TIMP is to identify, prioritize, assess, evaluate, repair, and validate the integrity of transmission pipelines that could, in the event of a leak or failure, affect High Consequence Areas (HCAs). The threats that are identified and evaluated in TIMP include:

- Corrosion (External, Internal, Stress Corrosion Cracking)
- Material
- Construction
- Equipment
- Excavation Damage
- Incorrect Operations
- Vandalism
- Weather and Outside Forces
- Cyclical Fatigue

Cascade's TIMP Plan describes these risks and steps in greater detail. Cascade's TIMP Plan is on file with the WUTC's Pipeline Safety Division.

### **IV. Integrity Management Analysis and Quantification**

As part of Cascade's DIMP and TIMP Plans, a risk analysis has been created and is maintained. Information collected as part of DIMP and TIMP are inputted into the risk analysis, where it is analyzed to find areas of concern and trends. This allows Cascade to quantify the risk associated with each pipeline based on factors that are pertinent to this PRP Plan. Cascade's DIMP and TIMP contains a more detailed explanation of this process.

## **V. Identification of Pipelines for Replacement**

DIMP and TIMP risk analysis results and SME input are used to identify the locations of pipelines that should be addressed in the PRP Plan.

For pipelines identified by DIMP, samples of the DIMP risk analysis for the areas identified in the PRP Plan are included in Appendix A. Once replacement locations are identified, specific projects within these areas are planned and prioritized based on coordination with district and on-site personnel considered to be Subject Matter Experts (SMEs). This helps ensure the replacement of pipeline segments with an elevated risk within the identified areas.

## **VI. Obtaining New Information**

Cascade obtains new information for their DIMP and TIMP risk analysis and PRP Plan through the following methods:

1. Observing trending – DIMP and TIMP are analyzed on a yearly basis. The analysis includes reviewing leak information, failure analysis, and system condition data to identify trends. The analysis provides insight into the risks associated with pipe identified as having an elevated risk of failure that are included in the PRP plan.
2. New information is gathered through normal activities. Gathering new information from forms or other methods used to collect information related to the physical attributes and/or operating and maintenance activities. Integrating newly collected information into DIMP and TIMP.
3. Subject Matter Expert (SME) panel meetings – SME panel meetings are held on an appropriate basis. Information from the panel meetings are used to validate the DIMP and TIMP risk analysis and new information is inputted into the DIMP and TIMP risk analysis.
4. Updating risk analysis – Cascade’s DIMP and TIMP risk analysis is updated annually. Results of the risk analysis are used to prioritize pipeline replacement projects.
5. Continuous improvement – The assessment, prioritization, and mitigation of system risks continue to be refined as new and additional risk knowledge is incorporated into DIMP and TIMP through normal O&M and DIMP and TIMP activities. Activities related to DIMP and TIMP could include gathering data, conducting targeted inspections and assessments, and

completing remediation and replacement work associated with integrity management driven programs.

Based on new information that is obtained, the Master Plan may be modified appropriately to further accelerate or decelerate the pipe replacement schedule. Additionally, Cascade is actively monitoring system threats and performance and may identify additional pipeline segments that have an elevated risk of failure. If any changes are made to the PRP plan, Cascade will submit the changes to the WUTC as required by the policy statement.

## VII. Cascade's PRP Plan Progress

The following table summarizes the miles of main replaced under the replacement programs according to the Master Plan since 2013.

**Table 1. Summary of Replacement Programs from 2013-2018**

| <b>Year</b>  | <b>Miles of Main</b> |
|--------------|----------------------|
| 2013         | 3.0                  |
| 2014         | 4.8                  |
| 2015         | 5.9                  |
| 2016         | 11.9                 |
| 2017         | 16.1                 |
| 2018         | 19.3                 |
| <b>Total</b> | <b>61.0</b>          |

## VIII. Early Vintage Steel Pipe (EVSP)

### Master Plan

This Master Plan will serve as the guide that Cascade will use to determine which pipelines should be addressed as part of the PRP plan. This Master Plan will describe the possible risks that can be associated with Early Vintage Steel Pipe (EVSP).

### *Risk Assessment*

Cascade has identified an increased risk of failure on different subsets of early vintage steel pipe (EVSP). EVSP is steel mains, service lines, and associated fittings installed earlier than 1/1/1970. These pipeline segments present an increased risk of failure due to aging and/or obsolete pipelines.

The primary risks on EVSP include external corrosion, material, weld, or joint failure, equipment failure, and missing data. External corrosion on EVSP is

attributed to bare, disbonded, damaged or poorly performing pipe coatings, poor soil and backfill conditions, ineffective cathodic protection, and other factors. Material, weld, or joint failure on EVSP is typically associated with issues with pipe welds made during installation (lack of weld standards and welder qualification), vintage acetylene gas welds, or pipe and fitting material leaks. Equipment failures on EVSP are normally contributed to leaks at main to service connections where O-rings have failed, mechanical couplings and fittings, and on other aging equipment installed when the pipe was originally installed. EVSP also has increased risk associated with pipe with unknown attributes or missing data, which includes unknown physical infrastructure (i.e. pipe material, pipe specifications, construction information) and historical information (i.e. corrosion control records, maintenance records, leak records).

Ongoing analysis of EVSP continues to show this pipe has a greater likelihood to leak, have corrosion, and/or substandard pipe conditions. These segments of main and their associated service piping have an elevated risk of failure as validated by DIMP and TIMP risk analysis. The different subsets of EVSP include:

***Pre-CNG***

Cascade operates pipeline segments that are classified as Pre-CNG pipe segments. Pre-CNG pipe segments are distribution systems that were constructed to distribute manufactured gas or natural gas. These pipelines were originally installed, owned, operated, and maintained by others prior to 1955. Cascade acquired many of these systems in the late 1950s and throughout the 1960s. The condition of the Pre-CNG pipe is typically bare steel or coal tar wrapped. This pipe is of concern since it is over 60 years old and operated with no or inadequate cathodic protection until the early 1970s, leaving the pipe suspect to elevated corrosion risk. Pre-CNG pipe also has elevated risks associated with missing data with not fully knowing the physical infrastructure and historical information of the Pre-CNG pipe. The extent of this pipe varies throughout Cascade’s and depends on the history of the system and how it was acquired by Cascade. The total miles of Pre-CNG in Washington is shown in Table 2 below.

**Table 2. Total Miles of Pre-CNG in Washington**

|  |          |
|--|----------|
| Total Miles of Pre-CNG Distribution Main | 145.03 * |
| Total Miles of Pre-CNG Transmission Main | 2.91     |

\* Includes 144.97 miles with missing or unknown install date.

DIMP maps showing the 2013 and 2018 DIMP risk analysis for Longview/Kelso, Anacortes, and Shelton pipe replacement projects are shown in Appendix B. Through Pre-CNG pipe replacement projects Cascade has removed approximately 65 miles of Pre-CNG pipe as of the end of 2018.

***FISH***

Cascade operates pipeline segments that are classified as FISH pipe segments. FISH pipe segments are distribution systems that were installed by Fish Service & Management Corporation in the 1950’s through the early 1960’s. FISH pipe is normally coal tar wrapped. FISH pipe is of concern since it is around 60 years old and may have operated with no or inadequate cathodic protection until the early 1970s, leaving the pipe suspect to elevated corrosion risk. FISH pipe also tends to have an elevated likelihood to have leaks associated with material and welds. The extent of this pipe varies throughout Cascade’s system and depends on the history of the system and how Cascade built out the system in the late 1950’s and early 1960’s. The total miles of FISH in Washington is shown in Table 3 below.

**Table 3. Total Miles of FISH in Washington**

|                                       |          |
|---------------------------------------|----------|
| Total Miles of FISH Distribution Main | 205.99 * |
| Total Miles of FISH Transmission Main | 0.00     |

\* Includes 115.03 miles with missing or unknown install date.

***Pre-1970***

Cascade operates pipeline segments installed earlier than 1/1/1970 that are not classified as either Pre-CNG or FISH. These pipeline segments were originally installed by either Cascade employees or other contractors hired by Cascade. These pipeline segments are typically coal tar wrapped. This pipe is of concern due to its overall age may have had no or inadequate cathodic protection until the early 1970s, leaving the pipe suspect to corrosion risk. This pipe also has a elevated weld failure risk associated with leaks on vintage metal arc welds and acetylene gas welds. The total miles of Pre-1970 in Washington is shown in Table 4 below.

**Table 4. Total Mile of Pre-1970 in Washington**

|   |           |
|---|-----------|
| Total Miles of Pre-1970 Distribution Main | 1177.58 * |
| Total Miles of Pre-1970 Transmission Main | 93.58     |

\* Includes 242.83 miles with missing or unknown install date.



### ***EVSP Replacement Program Plan***

Cascade is actively replacing EVSP that poses an elevated risk of failure. Cascade will continue monitoring the performance of EVSP through DIMP and TIMP, and appropriately update the replacement schedule and timeframe as necessary. For pipe currently not identified as having an elevated risk of failure, Cascade will continue to incorporate new risk knowledge and evaluate whether this population warrants replacement under PRP in the future.

### **Two-Year Plan**

The two-year plan is to continue replacing EVSP according to the Master Plan. The following table shows the planned replacement miles of EVSP for the next two years. Cascade’s two-year plan has been divided into two separate time periods. The time periods and the work that are proposed for each are listed below.

| <i>November 1, 2018 – October 31, 2019 Capital Replacement Projects</i> |                 |                                    |
|---|-----------------|------------------------------------|
| <b>PROJECT</b>  | <b>DISTRICT</b> | <b>TYPE OF PIPE TO BE REPLACED</b> |
| ANACORTES IP EVSP REPLACEMENT, PHASE 7                                  | MT. VERNON      | EVSP (PRE-CNG, FISH)               |
| LONGVIEW IP EVSP REPLACEMENT, PHASE 8                                   | LONGVIEW        | EVSP (PRE-CNG)                     |
| KELSO IP EVSP REPLACEMENT, PHASE 2                                      | LONGVIEW        | EVSP (PRE-CNG)                     |
| KELSO IP EVSP GRADE ST. REPLACEMENT                                     | LONGVIEW        | EVSP (PRE-CNG)                     |
| SHELTON IP EVSP REPLACEMENT, PHASE 3                                    | ABERDEEN        | EVSP (PRE-CNG)                     |
| WALLA WALLA IP EVSP 9 <sup>TH</sup> AVE MILL CREEK REPLACEMENT          | WALLA WALLA     | EVSP (FISH)                        |
| 12” LONGVIEW KELSO HP DISTRIBUTION EVSP REPLACEMENT, PHASE 3            | LONGVIEW        | EVSP (PRE-CNG) *                   |
| 4” OTHELLO HP EVSP REPLACEMENT  | WENATCHEE       | EVSP (PRE-1970) *                  |
| 6” ANACORTES HP DISTRIBUTION EVSP REPLACEMENT, PHASE 2                  | MT. VERNON      | EVSP (FISH) *                      |
| BELLINGHAM IP EVSP. ALLEYWAY REPLACEMENTS                               | BELLINGHAM      | EVSP (FISH, PRE-1970)              |
| LYNDEN IP EVSP ALLEYWAY REPLACEMENTS                                    | BELLINGHAM      | EVSP (PRE-CNG)                     |

\* PIPELINE SEGMENT IDENTIFIED IN SETTLEMENT AGREEMENT DOCKET PG-150120.

| <i>November 1, 2019 – October 31, 2020 Capital Replacement Projects</i> |                 |                                    |
|---|-----------------|------------------------------------|
| <b>PROJECT</b>  | <b>DISTRICT</b> | <b>TYPE OF PIPE TO BE REPLACED</b> |
| ANACORTES IP EVSP REPLACEMENT, PHASE 8                                  | MT. VERNON      | EVSP (PRE-CNG, FISH)               |
| LONGVIEW IP EVSP REPLACEMENT, PHASE 9                                   | LONGVIEW        | EVSP (PRE-CNG)                     |
| KELSO IP EVSP REPLACEMENT, PHASE 3                                      | LONGVIEW        | EVSP (PRE-CNG)                     |
| SHELTON IP EVSP REPLACEMENT, PHASE 4                                    | ABERDEEN        | EVSP (PRE-CNG)                     |
| 2" NOOKSACK HP DISTRIBUTION EVSP REPLACEMENT                            | BELLINGHAM      | EVSP (PRE-1970) *                  |
| 3" ZILLAH HP EVSP REPLACEMENT   | YAKIMA          | EVSP (FISH) *                      |
| 4" ARLINGTON HP EVSP REPLACEMENT  | MT. VERNON      | EVSP (FISH) *                      |
| 8" BREMERTON HP EVSP REPLACEMENT  | BREMERTON       | EVSP (PRE-1970) *                  |
| 12" LONGVIEW KELSO HP DISTRIBUTION EVSP REPLACEMENT, PHASE 4            | LONGVIEW        | EVSP (PRE-CNG) *                   |
| 6" ANACORTES HP DISTRIBUTION EVSP REPLACEMENT, PHASE 3                  | MT. VERNON      | EVSP (FISH) *                      |
| 8" MARCH POINT TRANSMISSION EVSP REPLACEMENT, PHASE 2                   | MT. VERNON      | EVSP (PRE-1970) *                  |
| 8" YAKIMA HP EVSP REPLACEMENT   | YAKIMA          | EVSP (FISH) *                      |

\* PIPELINE SEGMENT IDENTIFIED IN SETTLEMENT AGREEMENT DOCKET PG-150120.

The projects listed in these tentative schedules are based on the best information available at this time. As more information becomes available and risk analysis is updated, the prioritization of the projects may change. DIMP output for replacement projects is shown in Appendix A.

Summary of the previous two-year plan from November 1, 2016 – October 31, 2018 is shown in Appendix C.

### **Identification Plan**

The location of EVSP that presents an elevated risk of failure is continually monitored by reviewing system information that includes leak repairs, active leaks, and exposed pipe condition reports. In conjunction with reviewing system performance data, the geographic information system (GIS) and risk analysis is

being utilized to proactively identify any new areas that may present an elevated risk of failure.

## **IX. Public Interest**

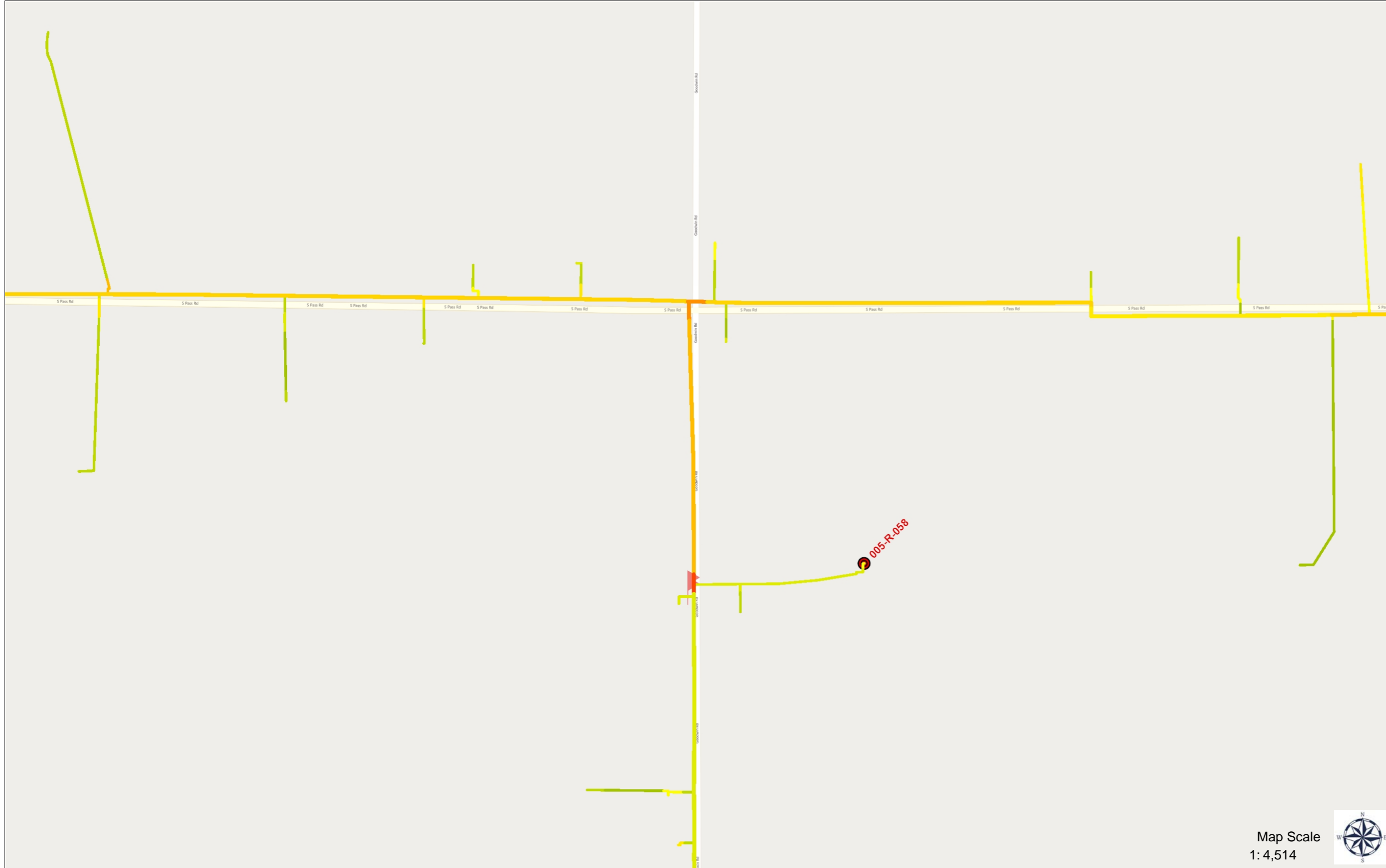
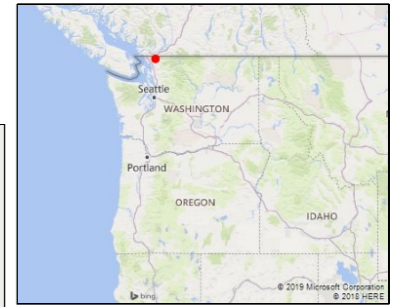
The pipe replacement plans for the portion of Cascade's gas distribution system that pose an elevated risk of failure included in this PRP plan have been developed considering many factors. These factors include:

- Improving the safety of the distribution system by replacing pipe based on the relative level of risk presented for each material and location.
- Minimizing the replacement costs by maximizing efficiencies and productivity.
- Minimizing the impacts to municipalities and the general public.

**APPENDIX A**  
**DIMP MODEL OUTPUT**

**Areas in red represent highest risk areas.**

# 2" NOOKSACK HP DISTRIBUTION EVSP REPLACEMENT



**Map Legend**

**Risk Mains 2018**

- < -0.83 Std. Dev.
- 0.83 - -0.50 Std. Dev.
- 0.50 - -0.17 Std. Dev.
- 0.17 - 0.17 Std. Dev.
- 0.17 - 0.50 Std. Dev.
- 0.50 - 0.83 Std. Dev.
- 0.83 - 1.2 Std. Dev.
- 1.2 - 1.5 Std. Dev.
- 1.5 - 1.8 Std. Dev.
- 1.8 - 2.2 Std. Dev.
- 2.2 - 2.5 Std. Dev.
- 2.5 - 2.8 Std. Dev.
- > 2.8 Std. Dev.

**Risk Mains 2018 PRECNG**

**Risk Services 2018**

- < -0.83 Std. Dev.
- 0.83 - -0.50 Std. Dev.
- 0.50 - -0.17 Std. Dev.
- 0.17 - 0.17 Std. Dev.
- 0.17 - 0.50 Std. Dev.
- 0.50 - 0.83 Std. Dev.
- 0.83 - 1.2 Std. Dev.
- 1.2 - 1.5 Std. Dev.
- 1.5 - 1.8 Std. Dev.
- 1.8 - 2.2 Std. Dev.
- 2.2 - 2.5 Std. Dev.
- 2.5 - 2.8 Std. Dev.
- > 2.8 Std. Dev.

**Odorizer**

**Leak Report**

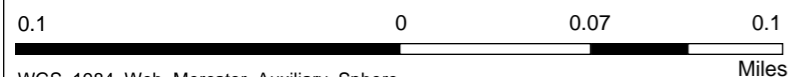
- <all other values>
- Above Ground
- Below Ground
- Retired

**Regulator Station**

**Gas Pipe Casing**

**Transmission Main**

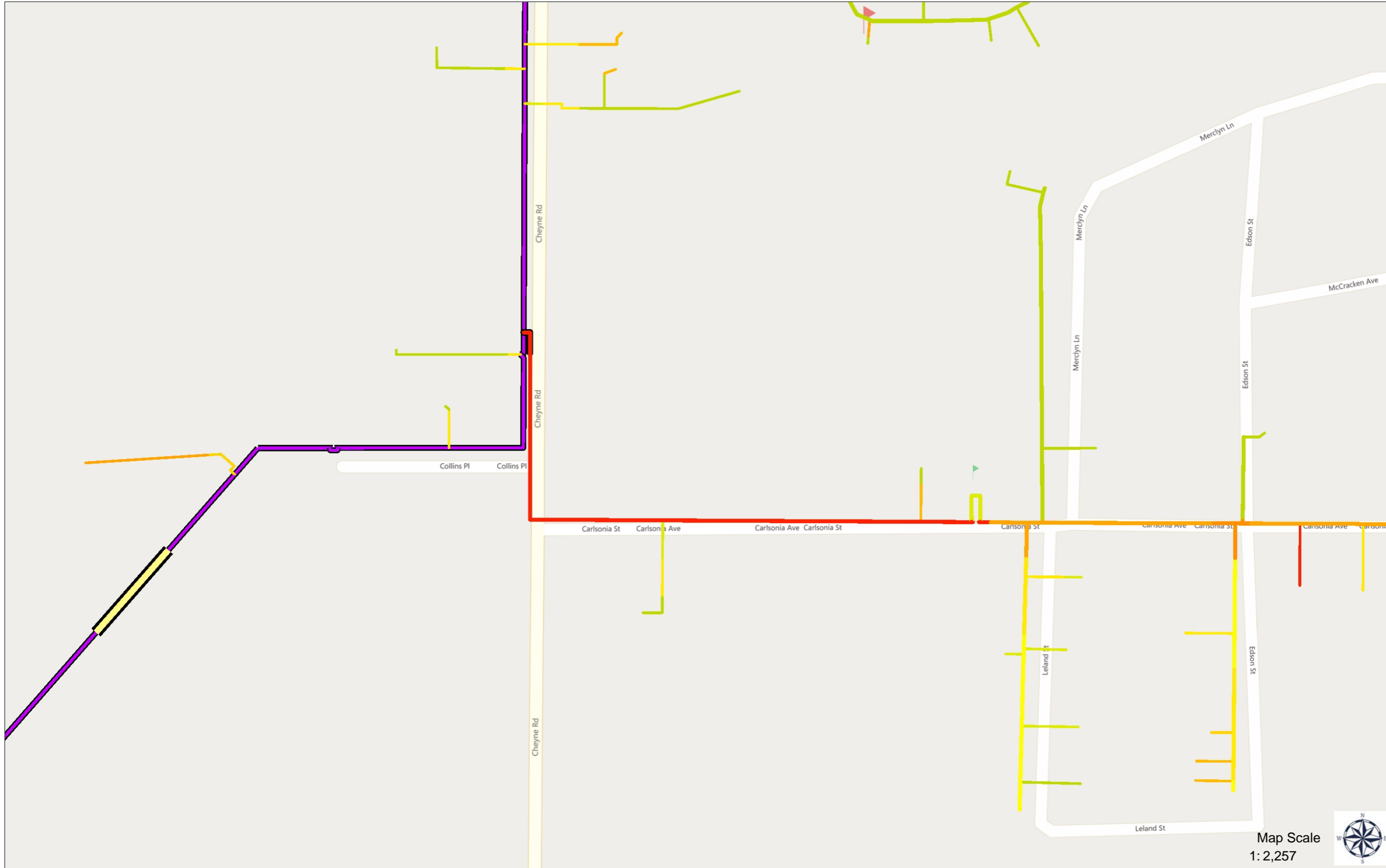
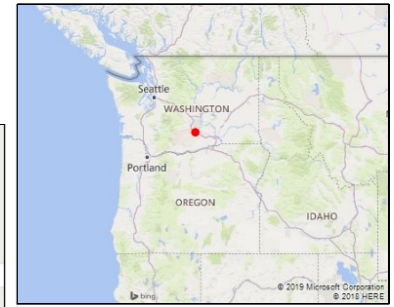
Map Scale  
1: 4,514



This map is a user generated static output from the GIS Web Viewer mapping website and is for reference only. It is not to be relied upon for construction purposes. It is provided for planning purposes only.  
FIELD LOCATES ARE REQUIRED FOR LOCATION OF UTILITY FACILITIES

**Notes:**  
BELLINGHAM  
EVSP (OTHER)

# 3" ZILLAH HP EVSP REPLACEMENT



**Map Legend**

**Risk Mains 2018**

- < -0.83 Std. Dev.
- 0.83 - -0.50 Std. Dev.
- 0.50 - -0.17 Std. Dev.
- 0.17 - 0.17 Std. Dev.
- 0.17 - 0.50 Std. Dev.
- 0.50 - 0.83 Std. Dev.
- 0.83 - 1.2 Std. Dev.
- 1.2 - 1.5 Std. Dev.
- 1.5 - 1.8 Std. Dev.
- 1.8 - 2.2 Std. Dev.
- 2.2 - 2.5 Std. Dev.
- 2.5 - 2.8 Std. Dev.
- > 2.8 Std. Dev.

**Risk Mains 2018 PRECNG**

**Risk Services 2018**

- < -0.83 Std. Dev.
- 0.83 - -0.50 Std. Dev.
- 0.50 - -0.17 Std. Dev.
- 0.17 - 0.17 Std. Dev.
- 0.17 - 0.50 Std. Dev.
- 0.50 - 0.83 Std. Dev.
- 0.83 - 1.2 Std. Dev.
- 1.2 - 1.5 Std. Dev.
- 1.5 - 1.8 Std. Dev.
- 1.8 - 2.2 Std. Dev.
- 2.2 - 2.5 Std. Dev.
- 2.5 - 2.8 Std. Dev.
- > 2.8 Std. Dev.

**Leak Report**

- <all other values>
- Above Ground
- Below Ground
- Retired

**Gas Pipe Casing**

**Transmission Main**

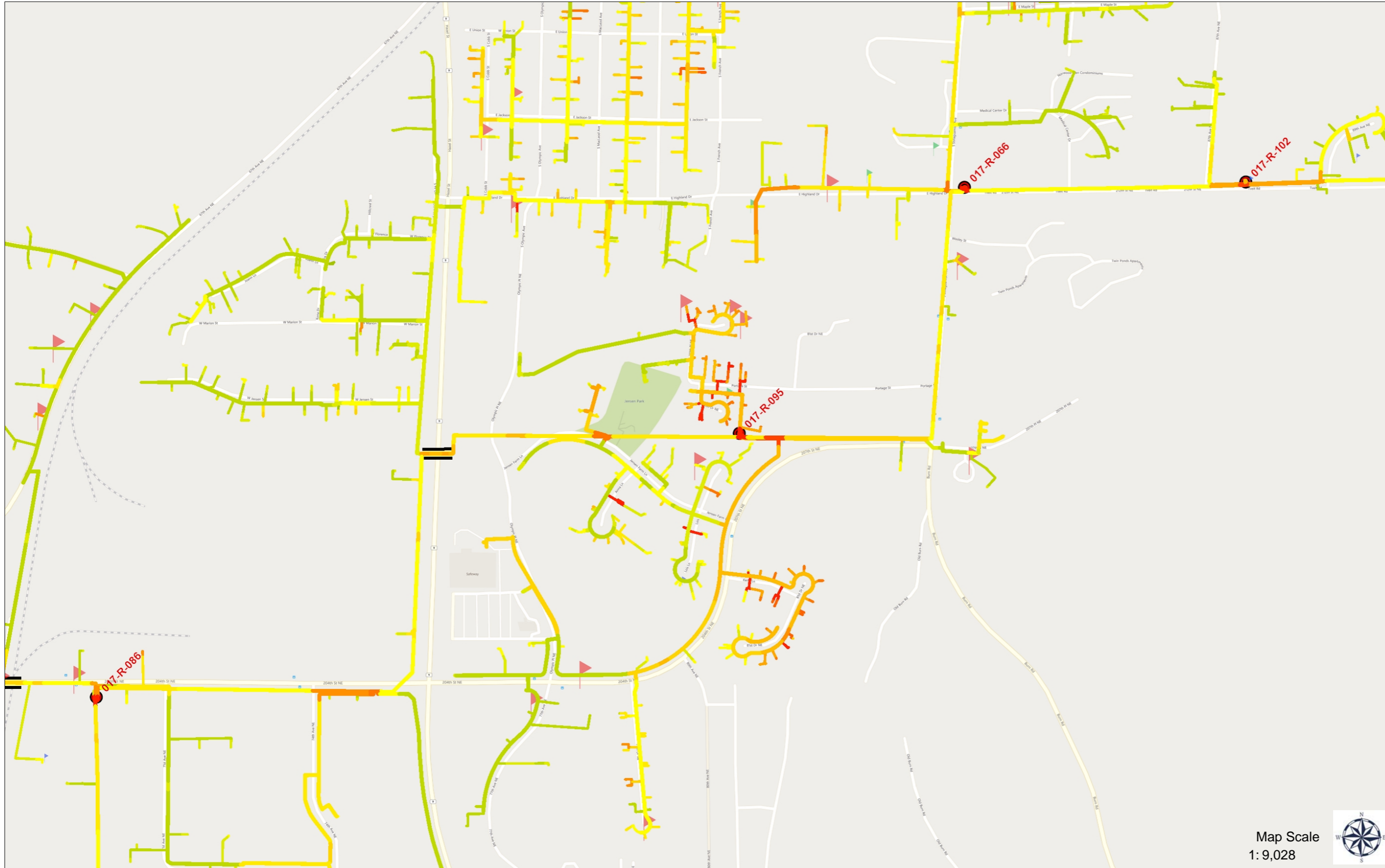
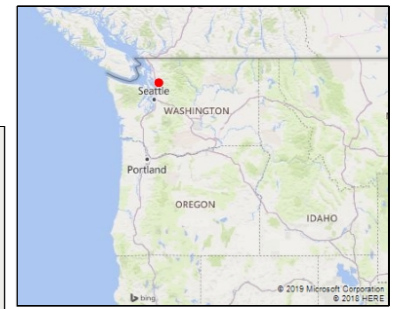
Map Scale  
1: 2,257



This map is a user generated static output from the GIS Web Viewer mapping website and is for reference only. It is not to be relied upon for construction purposes. It is provided for planning purposes only.  
FIELD LOCATES ARE REQUIRED FOR LOCATION OF UTILITY FACILITIES

**Notes:**  
YAKIMA  
EVSP (FISH)

# 4" ARLINGTON HP EVSP REPLACEMENT



**Map Legend**

**Risk Mains 2018**

- < -0.83 Std. Dev.
- 0.83 - -0.50 Std. Dev.
- 0.50 - -0.17 Std. Dev.
- 0.17 - 0.17 Std. Dev.
- 0.17 - 0.50 Std. Dev.
- 0.50 - 0.83 Std. Dev.
- 0.83 - 1.2 Std. Dev.
- 1.2 - 1.5 Std. Dev.
- 1.5 - 1.8 Std. Dev.
- 1.8 - 2.2 Std. Dev.
- 2.2 - 2.5 Std. Dev.
- 2.5 - 2.8 Std. Dev.
- > 2.8 Std. Dev.

**Risk Mains 2018 PRECNG**

**Risk Services 2018**

- < -0.83 Std. Dev.
- 0.83 - -0.50 Std. Dev.
- 0.50 - -0.17 Std. Dev.
- 0.17 - 0.17 Std. Dev.
- 0.17 - 0.50 Std. Dev.
- 0.50 - 0.83 Std. Dev.
- 0.83 - 1.2 Std. Dev.
- 1.2 - 1.5 Std. Dev.
- 1.5 - 1.8 Std. Dev.
- 1.8 - 2.2 Std. Dev.
- 2.2 - 2.5 Std. Dev.
- 2.5 - 2.8 Std. Dev.
- > 2.8 Std. Dev.

**Odorizer**

**Leak Report**

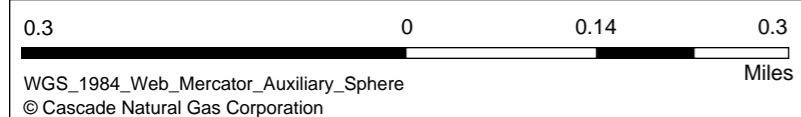
- <all other values>
- Above Ground
- Below Ground
- Retired

**Regulator Station**

**Gas Pipe Casing**

**Transmission Main**

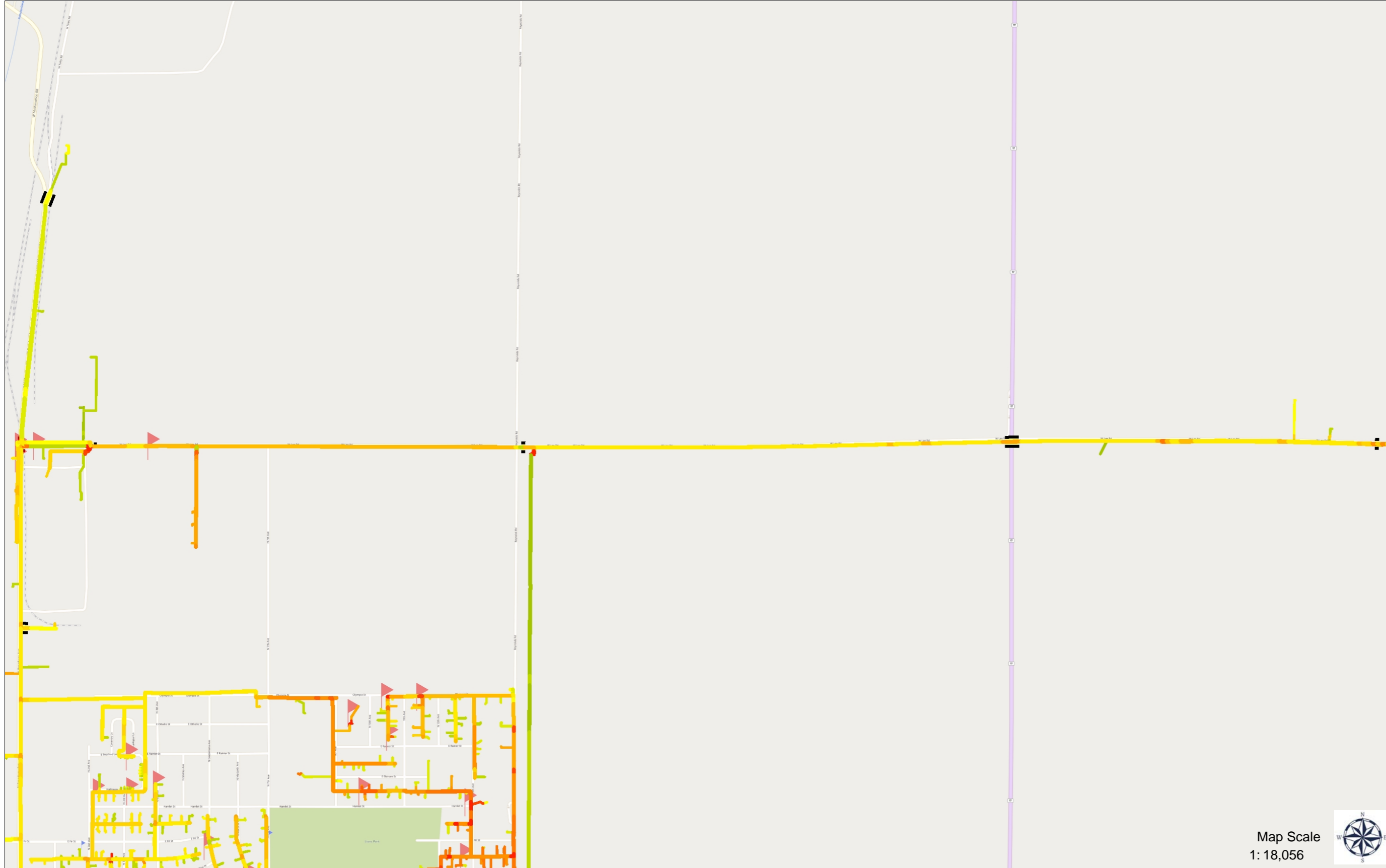
Map Scale  
1: 9,028



This map is a user generated static output from the GIS Web Viewer mapping website and is for reference only. It is not to be relied upon for construction purposes. It is provided for planning purposes only.  
FIELD LOCATES ARE REQUIRED FOR LOCATION OF UTILITY FACILITIES

**Notes:**  
MT. VERNON  
EVSP (FISH)

# 4" OTHELLO HP EVSP REPLACEMENT



**Map Legend**

**Risk Mains 2018**

- < -0.83 Std. Dev.
- 0.83 - -0.50 Std. Dev.
- 0.50 - -0.17 Std. Dev.
- 0.17 - 0.17 Std. Dev.
- 0.17 - 0.50 Std. Dev.
- 0.50 - 0.83 Std. Dev.
- 0.83 - 1.2 Std. Dev.
- 1.2 - 1.5 Std. Dev.
- 1.5 - 1.8 Std. Dev.
- 1.8 - 2.2 Std. Dev.
- 2.2 - 2.5 Std. Dev.
- 2.5 - 2.8 Std. Dev.
- > 2.8 Std. Dev.

**Risk Mains 2018 PRECNG**

**Risk Services 2018**

- < -0.83 Std. Dev.
- 0.83 - -0.50 Std. Dev.
- 0.50 - -0.17 Std. Dev.
- 0.17 - 0.17 Std. Dev.
- 0.17 - 0.50 Std. Dev.
- 0.50 - 0.83 Std. Dev.
- 0.83 - 1.2 Std. Dev.
- 1.2 - 1.5 Std. Dev.
- 1.5 - 1.8 Std. Dev.
- 1.8 - 2.2 Std. Dev.
- 2.2 - 2.5 Std. Dev.
- 2.5 - 2.8 Std. Dev.
- > 2.8 Std. Dev.

**Leak Report**

- <all other values>
- Above Ground
- Below Ground
- Retired

**Gas Pipe Casing**

**Transmission Main**

Map Scale  
1: 18,056

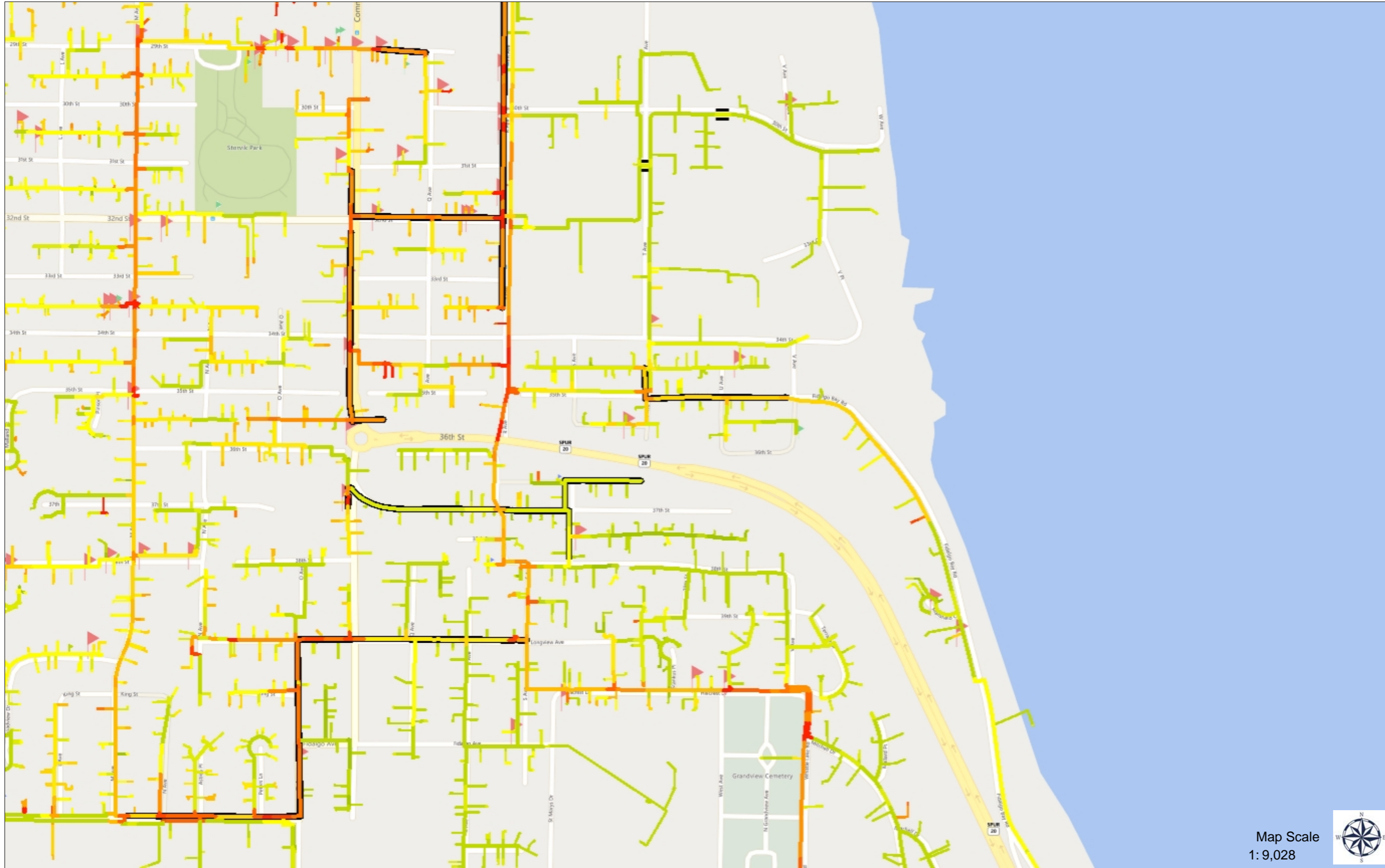
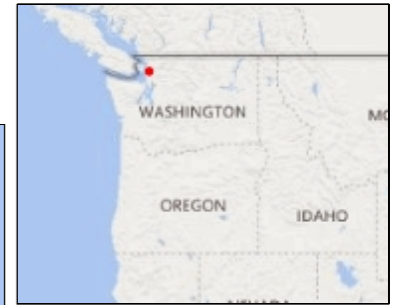
0.6                      0                      0.28                      0.6  
Miles  
WGS\_1984\_Web\_Mercator\_Auxiliary\_Sphere  
© Cascade Natural Gas Corporation

This map is a user generated static output from the GIS Web Viewer mapping website and is for reference only. It is not to be relied upon for construction purposes. It is provided for planning purposes only.  
FIELD LOCATES ARE REQUIRED FOR LOCATION OF UTILITY FACILITIES

**Notes:**  
WENATCHEE  
EVSP (OTHER)



# 6" ANACORTES HP DISTRIBUTION EVSP REPLACEMENT, PHASE 2 & 3



**Map Legend**

**Risk Mains 2018**

- < -0.83 Std. Dev.
- 0.83 - -0.50 Std. Dev.
- 0.50 - -0.17 Std. Dev.
- 0.17 - 0.17 Std. Dev.
- 0.17 - 0.50 Std. Dev.
- 0.50 - 0.83 Std. Dev.
- 0.83 - 1.2 Std. Dev.
- 1.2 - 1.5 Std. Dev.
- 1.5 - 1.8 Std. Dev.
- 1.8 - 2.2 Std. Dev.
- 2.2 - 2.5 Std. Dev.
- 2.5 - 2.8 Std. Dev.
- > 2.8 Std. Dev.

**Risk Mains 2018 PRECNG**

**Risk Services 2018**

- < -0.83 Std. Dev.
- 0.83 - -0.50 Std. Dev.
- 0.50 - -0.17 Std. Dev.
- 0.17 - 0.17 Std. Dev.
- 0.17 - 0.50 Std. Dev.
- 0.50 - 0.83 Std. Dev.
- 0.83 - 1.2 Std. Dev.
- 1.2 - 1.5 Std. Dev.
- 1.5 - 1.8 Std. Dev.
- 1.8 - 2.2 Std. Dev.
- 2.2 - 2.5 Std. Dev.
- 2.5 - 2.8 Std. Dev.
- > 2.8 Std. Dev.

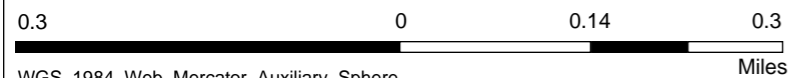
**Leak Report**

- <all other values>
- Above Ground
- Below Ground
- Retired

**Gas Pipe Casing**

**Transmission Main**

Map Scale  
1: 9,028

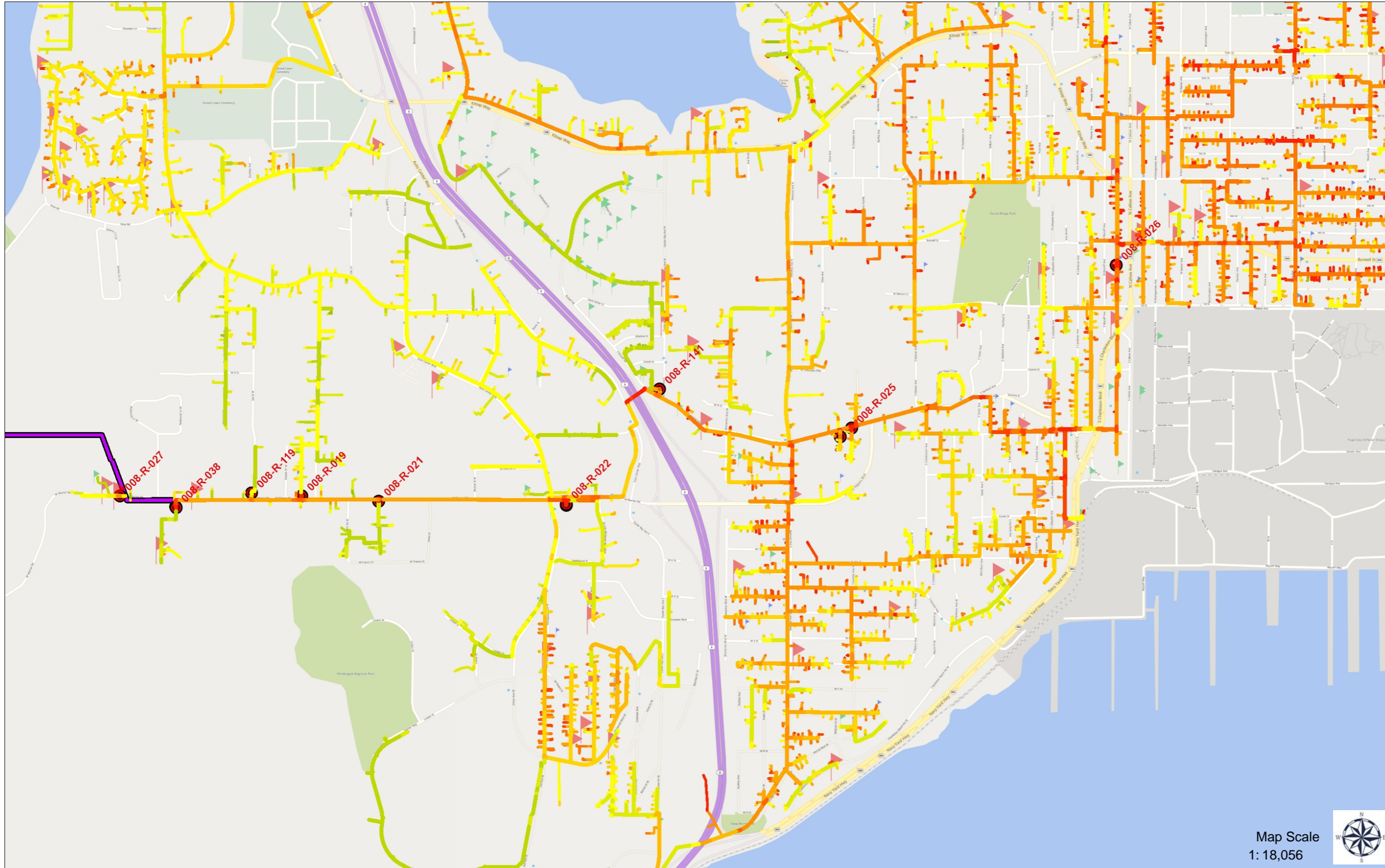


WGS\_1984\_Web\_Mercator\_Auxiliary\_Sphere  
© Cascade Natural Gas Corporation

This map is a user generated static output from the GIS Web Viewer mapping website and is for reference only. It is not to be relied upon for construction purposes. It is provided for planning purposes only.  
FIELD LOCATES ARE REQUIRED FOR LOCATION OF UTILITY FACILITIES

**Notes:**  
MT. VERNON  
EVSP (FISH)

# 8" BREMERTON HP EVSP REPLACEMENT



**Map Legend**

**Risk Mains 2018**

- < -0.83 Std. Dev.
- 0.83 - -0.50 Std. Dev.
- 0.50 - -0.17 Std. Dev.
- 0.17 - 0.17 Std. Dev.
- 0.17 - 0.50 Std. Dev.
- 0.50 - 0.83 Std. Dev.
- 0.83 - 1.2 Std. Dev.
- 1.2 - 1.5 Std. Dev.
- 1.5 - 1.8 Std. Dev.
- 1.8 - 2.2 Std. Dev.
- 2.2 - 2.5 Std. Dev.
- 2.5 - 2.8 Std. Dev.
- > 2.8 Std. Dev.

**Risk Mains 2018 PRECNG**

**Risk Services 2018**

- < -0.83 Std. Dev.
- 0.83 - -0.50 Std. Dev.
- 0.50 - -0.17 Std. Dev.
- 0.17 - 0.17 Std. Dev.
- 0.17 - 0.50 Std. Dev.
- 0.50 - 0.83 Std. Dev.
- 0.83 - 1.2 Std. Dev.
- 1.2 - 1.5 Std. Dev.
- 1.5 - 1.8 Std. Dev.
- 1.8 - 2.2 Std. Dev.
- 2.2 - 2.5 Std. Dev.
- 2.5 - 2.8 Std. Dev.
- > 2.8 Std. Dev.

**Odorizer**

**Leak Report**

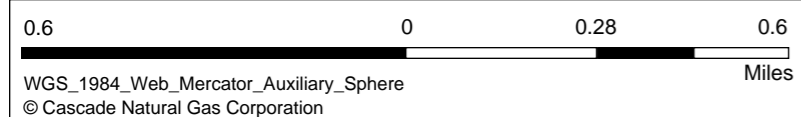
- <all other values>
- Above Ground
- Below Ground
- Retired

**Regulator Station**

**Gas Pipe Casing**

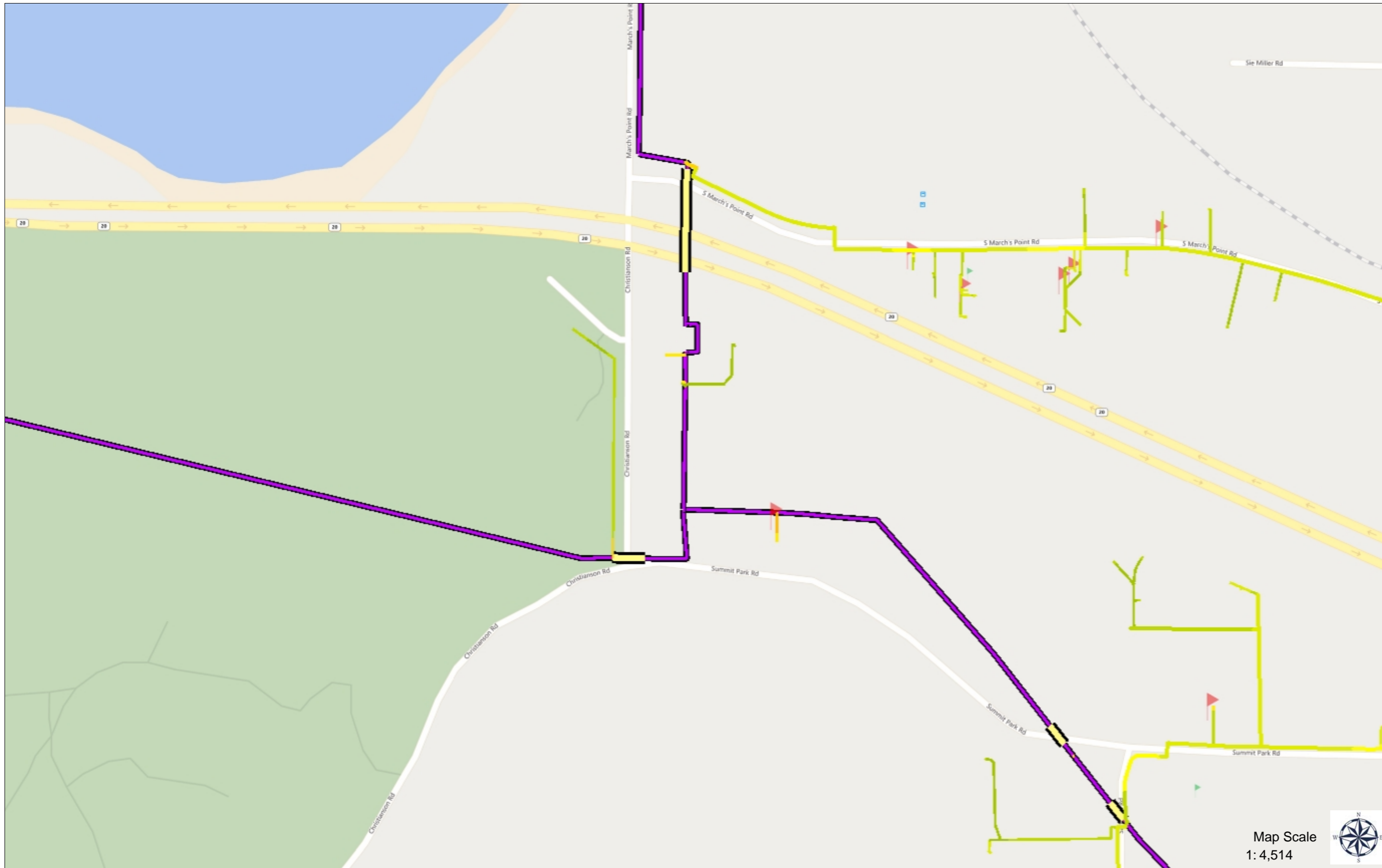
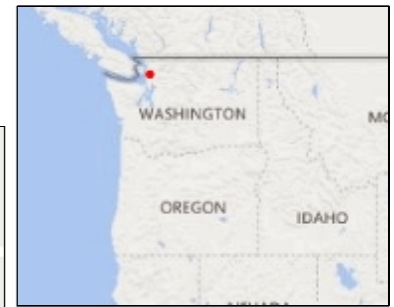
**Transmission Main**

Map Scale  
1: 18,056



This map is a user generated static output from the GIS Web Viewer mapping website and is for reference only. It is not to be relied upon for construction purposes. It is provided for planning purposes only.  
FIELD LOCATES ARE REQUIRED FOR LOCATION OF UTILITY FACILITIES

**Notes:**  
BREMERTON  
EVSP (OTHER)



**Map Legend**

**Risk Mains 2018**

- < -0.83 Std. Dev.
- 0.83 - -0.50 Std. Dev.
- 0.50 - -0.17 Std. Dev.
- 0.17 - 0.17 Std. Dev.
- 0.17 - 0.50 Std. Dev.
- 0.50 - 0.83 Std. Dev.
- 0.83 - 1.2 Std. Dev.
- 1.2 - 1.5 Std. Dev.
- 1.5 - 1.8 Std. Dev.
- 1.8 - 2.2 Std. Dev.
- 2.2 - 2.5 Std. Dev.
- 2.5 - 2.8 Std. Dev.
- > 2.8 Std. Dev.

**Risk Mains 2018 PRECNG**

**Risk Services 2018**

- < -0.83 Std. Dev.
- 0.83 - -0.50 Std. Dev.
- 0.50 - -0.17 Std. Dev.
- 0.17 - 0.17 Std. Dev.
- 0.17 - 0.50 Std. Dev.
- 0.50 - 0.83 Std. Dev.
- 0.83 - 1.2 Std. Dev.
- 1.2 - 1.5 Std. Dev.
- 1.5 - 1.8 Std. Dev.
- 1.8 - 2.2 Std. Dev.
- 2.2 - 2.5 Std. Dev.
- 2.5 - 2.8 Std. Dev.
- > 2.8 Std. Dev.

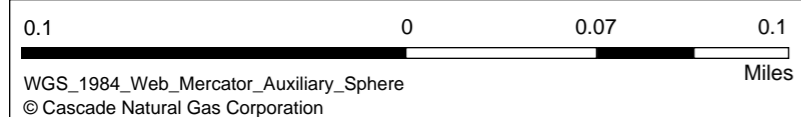
**Leak Report**

- <all other values>
- Above Ground
- Below Ground
- Retired

**Gas Pipe Casing**

**Transmission Main**

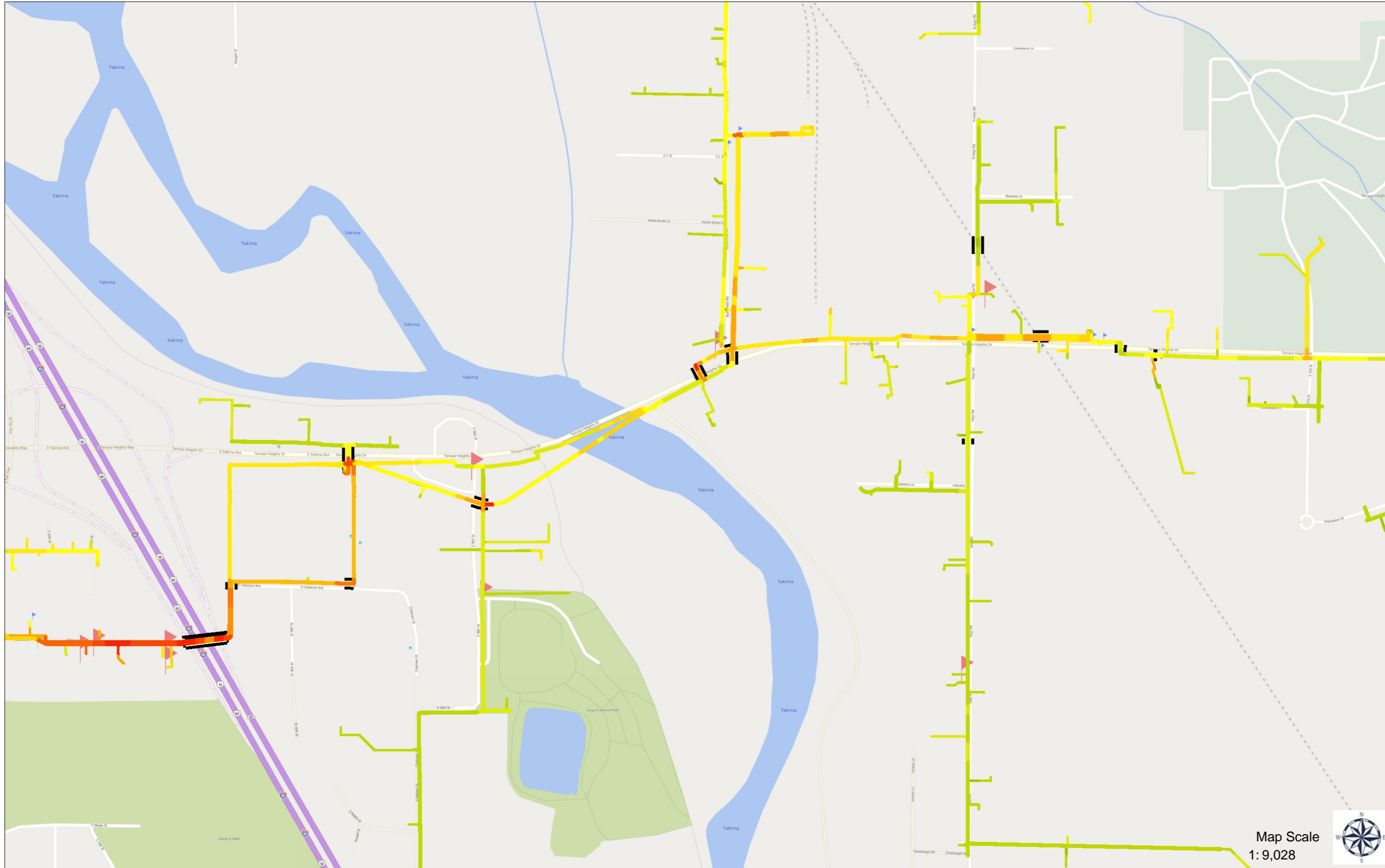
Map Scale  
1: 4,514



This map is a user generated static output from the GIS Web Viewer mapping website and is for reference only. It is not to be relied upon for construction purposes. It is provided for planning purposes only.  
FIELD LOCATES ARE REQUIRED FOR LOCATION OF UTILITY FACILITIES

**Notes:**  
MT. VERNON  
EVSP (OTHER)

# 8" YAKIMA HP EVSP REPLACEMENT



**Map Legend**

**Risk Mains 2018**

- < -0.83 Std. Dev.
- 0.83 - -0.50 Std. Dev.
- 0.50 - -0.17 Std. Dev.
- 0.17 - 0.17 Std. Dev.
- 0.17 - 0.50 Std. Dev.
- 0.50 - 0.83 Std. Dev.
- 0.83 - 1.2 Std. Dev.
- 1.2 - 1.5 Std. Dev.
- 1.5 - 1.8 Std. Dev.
- 1.8 - 2.2 Std. Dev.
- 2.2 - 2.5 Std. Dev.
- 2.5 - 2.8 Std. Dev.
- > 2.8 Std. Dev.

**Risk Mains 2018 PRECNG**

**Risk Services 2018**

- < -0.83 Std. Dev.
- 0.83 - -0.50 Std. Dev.
- 0.50 - -0.17 Std. Dev.
- 0.17 - 0.17 Std. Dev.
- 0.17 - 0.50 Std. Dev.
- 0.50 - 0.83 Std. Dev.
- 0.83 - 1.2 Std. Dev.
- 1.2 - 1.5 Std. Dev.
- 1.5 - 1.8 Std. Dev.
- 1.8 - 2.2 Std. Dev.
- 2.2 - 2.5 Std. Dev.
- 2.5 - 2.8 Std. Dev.
- > 2.8 Std. Dev.

**Leak Report**

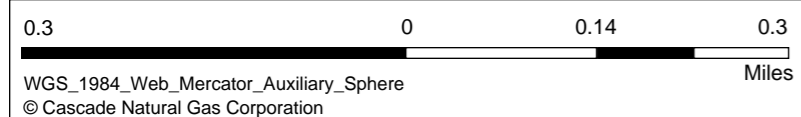
- <all other values>
- Above Ground
- Below Ground
- Retired

**Gas Pipe Casing**

**Transmission Main**



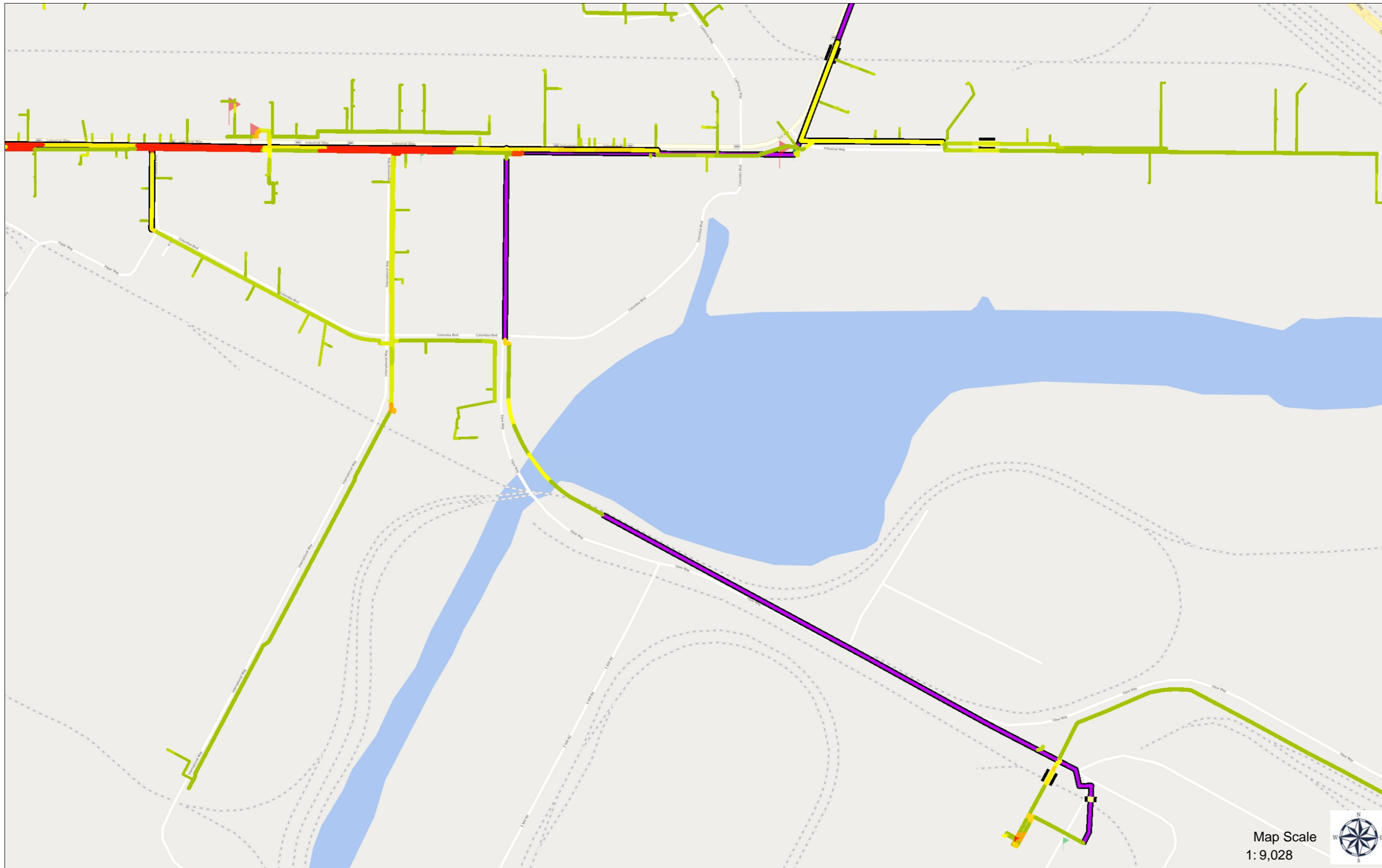
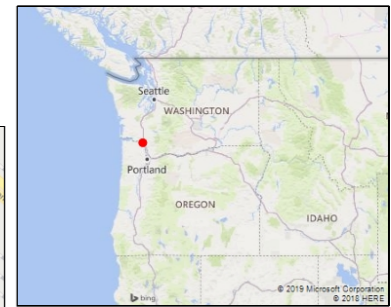
Map Scale  
1: 9,028



This map is a user generated static output from the GIS Web Viewer mapping website and is for reference only. It is not to be relied upon for construction purposes. It is provided for planning purposes only.  
FIELD LOCATES ARE REQUIRED FOR LOCATION OF UTILITY FACILITIES

**Notes:**  
YAKIMA  
EVSP (FISH)

# 12" LONGVIEW KELSO HP DISTRIBUTION EVSP REPLACEMENT, PHASE 3



**Map Legend**

**Risk Mains 2018**

- < -0.83 Std. Dev.
- 0.83 - -0.50 Std. Dev.
- 0.50 - -0.17 Std. Dev.
- 0.17 - 0.17 Std. Dev.
- 0.17 - 0.50 Std. Dev.
- 0.50 - 0.83 Std. Dev.
- 0.83 - 1.2 Std. Dev.
- 1.2 - 1.5 Std. Dev.
- 1.5 - 1.8 Std. Dev.
- 1.8 - 2.2 Std. Dev.
- 2.2 - 2.5 Std. Dev.
- 2.5 - 2.8 Std. Dev.
- > 2.8 Std. Dev.

**Risk Mains 2018 PRECNG**

**Risk Services 2018**

- < -0.83 Std. Dev.
- 0.83 - -0.50 Std. Dev.
- 0.50 - -0.17 Std. Dev.
- 0.17 - 0.17 Std. Dev.
- 0.17 - 0.50 Std. Dev.
- 0.50 - 0.83 Std. Dev.
- 0.83 - 1.2 Std. Dev.
- 1.2 - 1.5 Std. Dev.
- 1.5 - 1.8 Std. Dev.
- 1.8 - 2.2 Std. Dev.
- 2.2 - 2.5 Std. Dev.
- 2.5 - 2.8 Std. Dev.
- > 2.8 Std. Dev.

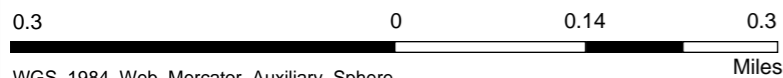
**Leak Report**

- <all other values>
- Above Ground
- Below Ground
- Retired

**Gas Pipe Casing**

**Transmission Main**

Map Scale  
1: 9,028

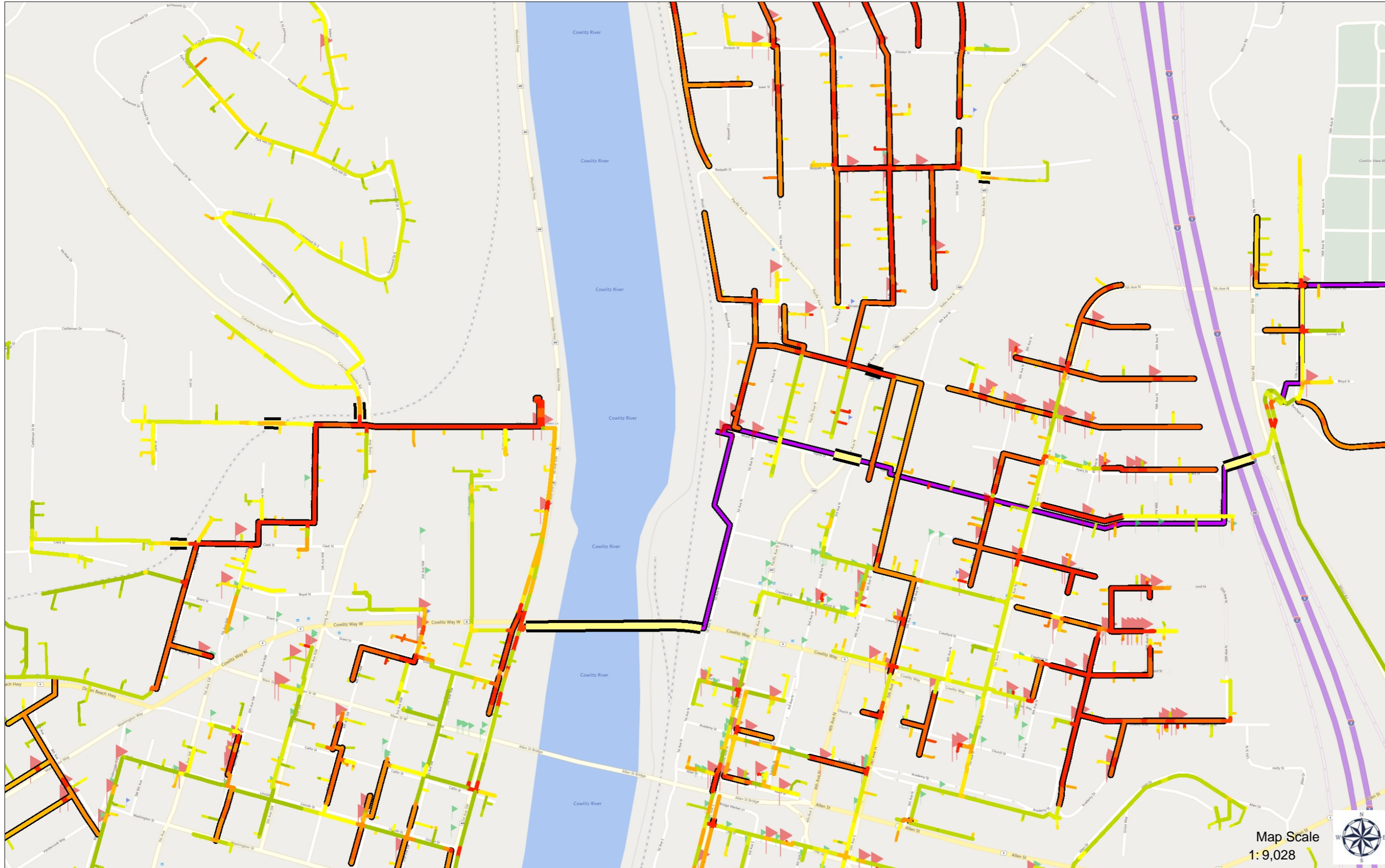


WGS\_1984\_Web\_Mercator\_Auxiliary\_Sphere  
© Cascade Natural Gas Corporation

This map is a user generated static output from the GIS Web Viewer mapping website and is for reference only. It is not to be relied upon for construction purposes. It is provided for planning purposes only.  
FIELD LOCATES ARE REQUIRED FOR LOCATION OF UTILITY FACILITIES

**Notes:**  
LONGVIEW  
EVSP (PRE-CNG)

# 12" LONGVIEW KELSO HP DISTRIBUTION EVSP REPLACEMENT, PHASE 4



**Map Legend**

**Risk Mains 2018**

- < -0.83 Std. Dev.
- 0.83 - -0.50 Std. Dev.
- 0.50 - -0.17 Std. Dev.
- 0.17 - 0.17 Std. Dev.
- 0.17 - 0.50 Std. Dev.
- 0.50 - 0.83 Std. Dev.
- 0.83 - 1.2 Std. Dev.
- 1.2 - 1.5 Std. Dev.
- 1.5 - 1.8 Std. Dev.
- 1.8 - 2.2 Std. Dev.
- 2.2 - 2.5 Std. Dev.
- 2.5 - 2.8 Std. Dev.
- > 2.8 Std. Dev.

**Risk Mains 2018 PRECNG**

**Risk Services 2018**

- < -0.83 Std. Dev.
- 0.83 - -0.50 Std. Dev.
- 0.50 - -0.17 Std. Dev.
- 0.17 - 0.17 Std. Dev.
- 0.17 - 0.50 Std. Dev.
- 0.50 - 0.83 Std. Dev.
- 0.83 - 1.2 Std. Dev.
- 1.2 - 1.5 Std. Dev.
- 1.5 - 1.8 Std. Dev.
- 1.8 - 2.2 Std. Dev.
- 2.2 - 2.5 Std. Dev.
- 2.5 - 2.8 Std. Dev.
- > 2.8 Std. Dev.

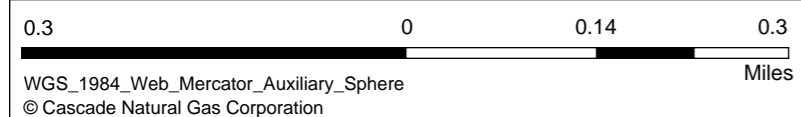
**Leak Report**

- <all other values>
- Above Ground
- Below Ground
- Retired

**Gas Pipe Casing**

- Gas Pipe Casing
- Transmission Main

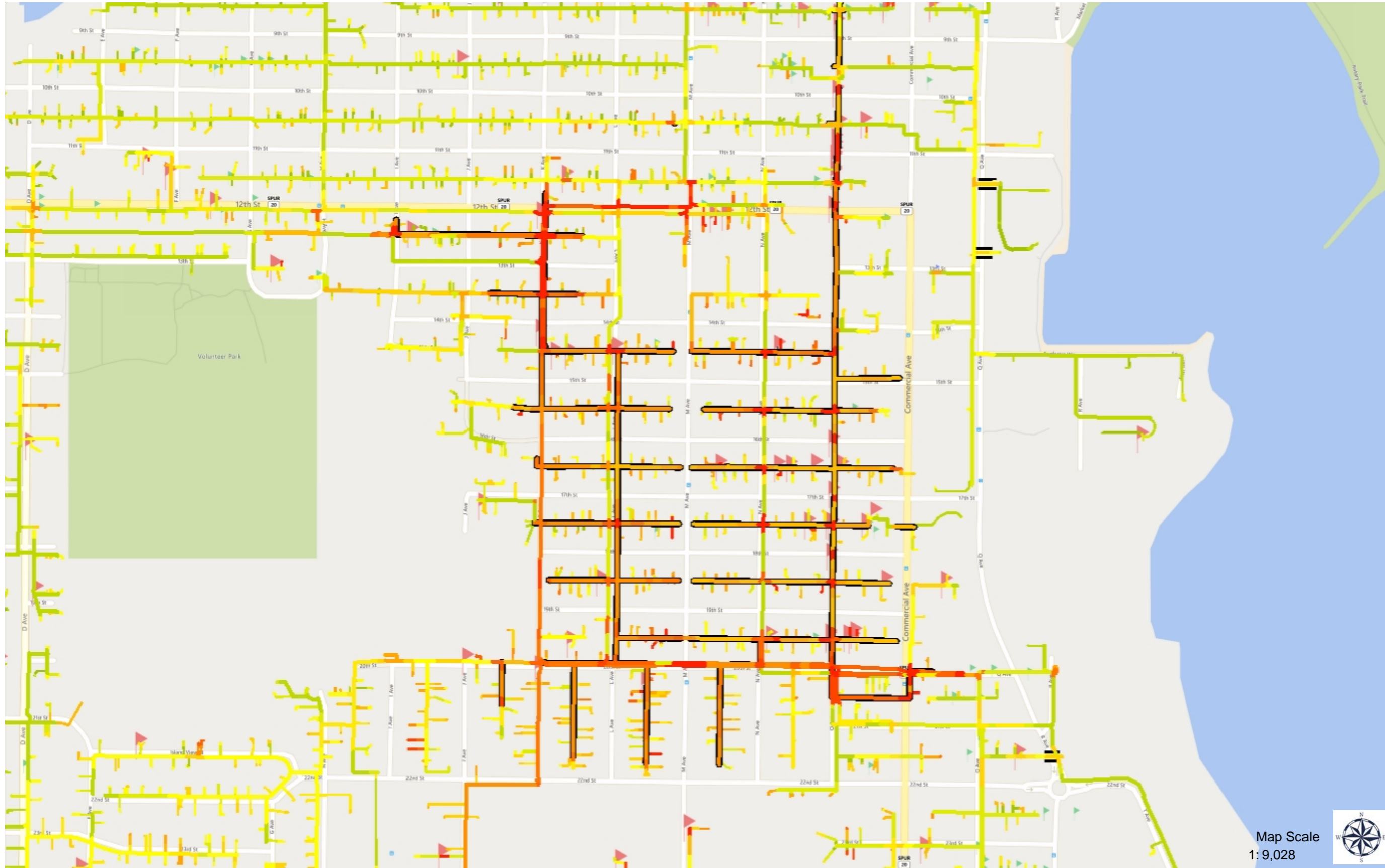
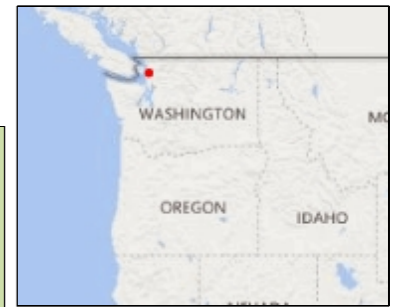
Map Scale  
1:9,028



This map is a user generated static output from the GIS Web Viewer mapping website and is for reference only. It is not to be relied upon for construction purposes. It is provided for planning purposes only.  
FIELD LOCATES ARE REQUIRED FOR LOCATION OF UTILITY FACILITIES

**Notes:**  
LONGVIEW  
EVSP (PRE-CNG)

# ANACORTES IP EVSP REPLACEMENT, PHASE 7



**Map Legend**

**Risk Mains 2018**

- < -0.83 Std. Dev.
- 0.83 - -0.50 Std. Dev.
- 0.50 - -0.17 Std. Dev.
- 0.17 - 0.17 Std. Dev.
- 0.17 - 0.50 Std. Dev.
- 0.50 - 0.83 Std. Dev.
- 0.83 - 1.2 Std. Dev.
- 1.2 - 1.5 Std. Dev.
- 1.5 - 1.8 Std. Dev.
- 1.8 - 2.2 Std. Dev.
- 2.2 - 2.5 Std. Dev.
- 2.5 - 2.8 Std. Dev.
- > 2.8 Std. Dev.

**Risk Mains 2018 PRECNG**

**Risk Services 2018**

- < -0.83 Std. Dev.
- 0.83 - -0.50 Std. Dev.
- 0.50 - -0.17 Std. Dev.
- 0.17 - 0.17 Std. Dev.
- 0.17 - 0.50 Std. Dev.
- 0.50 - 0.83 Std. Dev.
- 0.83 - 1.2 Std. Dev.
- 1.2 - 1.5 Std. Dev.
- 1.5 - 1.8 Std. Dev.
- 1.8 - 2.2 Std. Dev.
- 2.2 - 2.5 Std. Dev.
- 2.5 - 2.8 Std. Dev.
- > 2.8 Std. Dev.

**Leak Report**

- <all other values>
- Above Ground
- Below Ground
- Retired

**Gas Pipe Casing**

**Transmission Main**

Map Scale  
1: 9,028

0.3                      0                      0.14                      0.3

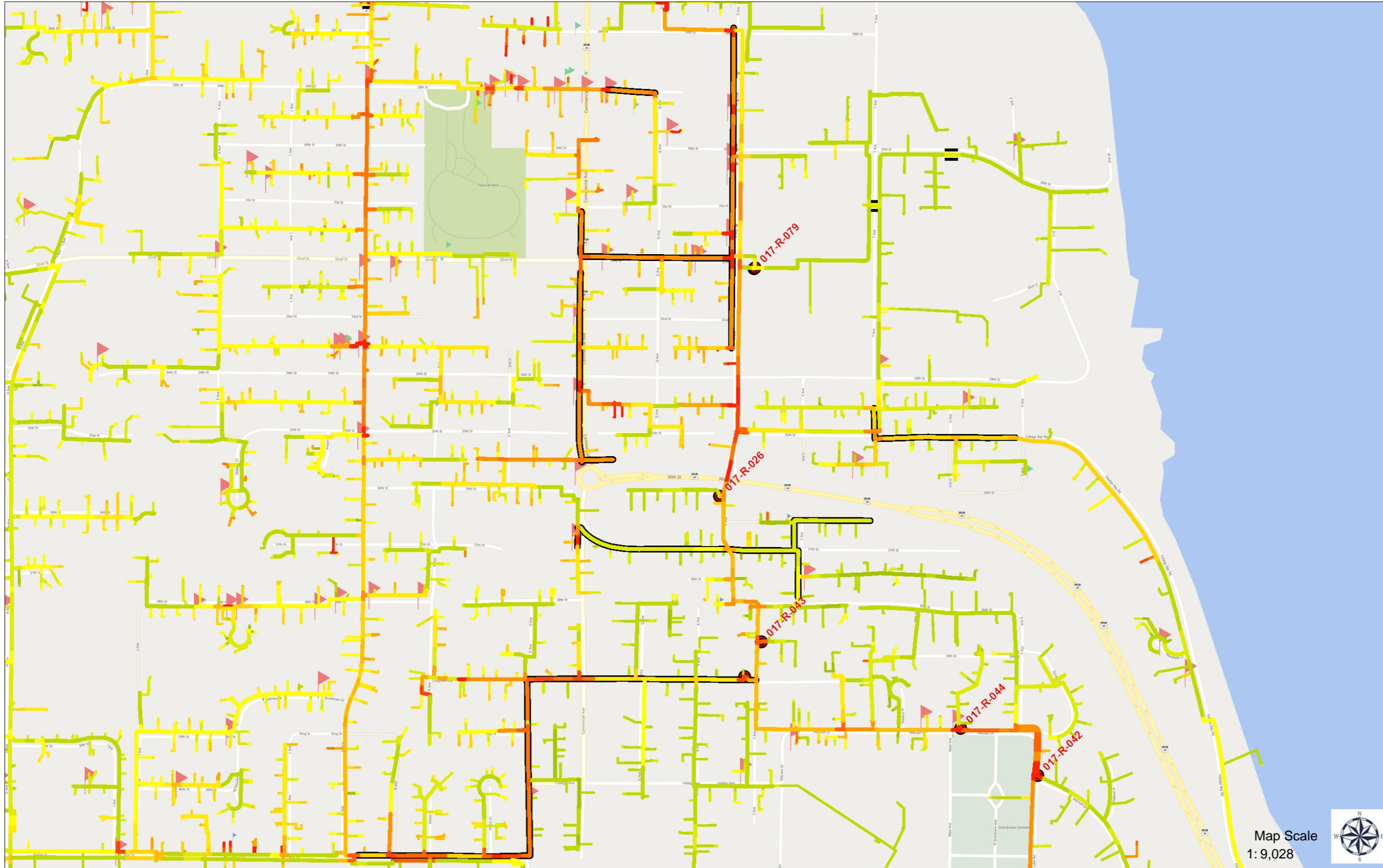
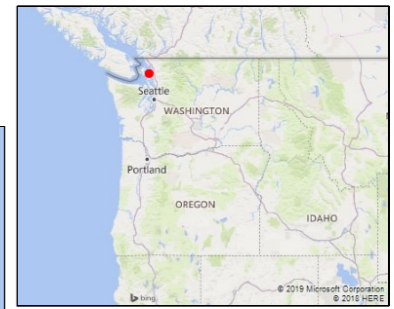
WGS\_1984\_Web\_Mercator\_Auxiliary\_Sphere  
© Cascade Natural Gas Corporation

Miles

This map is a user generated static output from the GIS Web Viewer mapping website and is for reference only. It is not to be relied upon for construction purposes. It is provided for planning purposes only.  
FIELD LOCATES ARE REQUIRED FOR LOCATION OF UTILITY FACILITIES

**Notes:**  
MT. VERNON  
EVSP (PRE-CNG, FISH)

# ANACORTES IP EVSP REPLACEMENT, PHASE 8



**Map Legend**

**Risk Mains 2018**

- < -0.83 Std. Dev.
- 0.83 - -0.50 Std. Dev.
- 0.50 - -0.17 Std. Dev.
- 0.17 - 0.17 Std. Dev.
- 0.17 - 0.50 Std. Dev.
- 0.50 - 0.83 Std. Dev.
- 0.83 - 1.2 Std. Dev.
- 1.2 - 1.5 Std. Dev.
- 1.5 - 1.8 Std. Dev.
- 1.8 - 2.2 Std. Dev.
- 2.2 - 2.5 Std. Dev.
- 2.5 - 2.8 Std. Dev.
- > 2.8 Std. Dev.

**Risk Mains 2018 PRECNG**

**Risk Services 2018**

- < -0.83 Std. Dev.
- 0.83 - -0.50 Std. Dev.
- 0.50 - -0.17 Std. Dev.
- 0.17 - 0.17 Std. Dev.
- 0.17 - 0.50 Std. Dev.
- 0.50 - 0.83 Std. Dev.
- 0.83 - 1.2 Std. Dev.
- 1.2 - 1.5 Std. Dev.
- 1.5 - 1.8 Std. Dev.
- 1.8 - 2.2 Std. Dev.
- 2.2 - 2.5 Std. Dev.
- 2.5 - 2.8 Std. Dev.
- > 2.8 Std. Dev.

**Odorizer**

**Leak Report**

- <all other values>
- Above Ground
- Below Ground
- Retired

**Regulator Station**

**Gas Pipe Casing**

**Transmission Main**

Map Scale  
1: 9,028

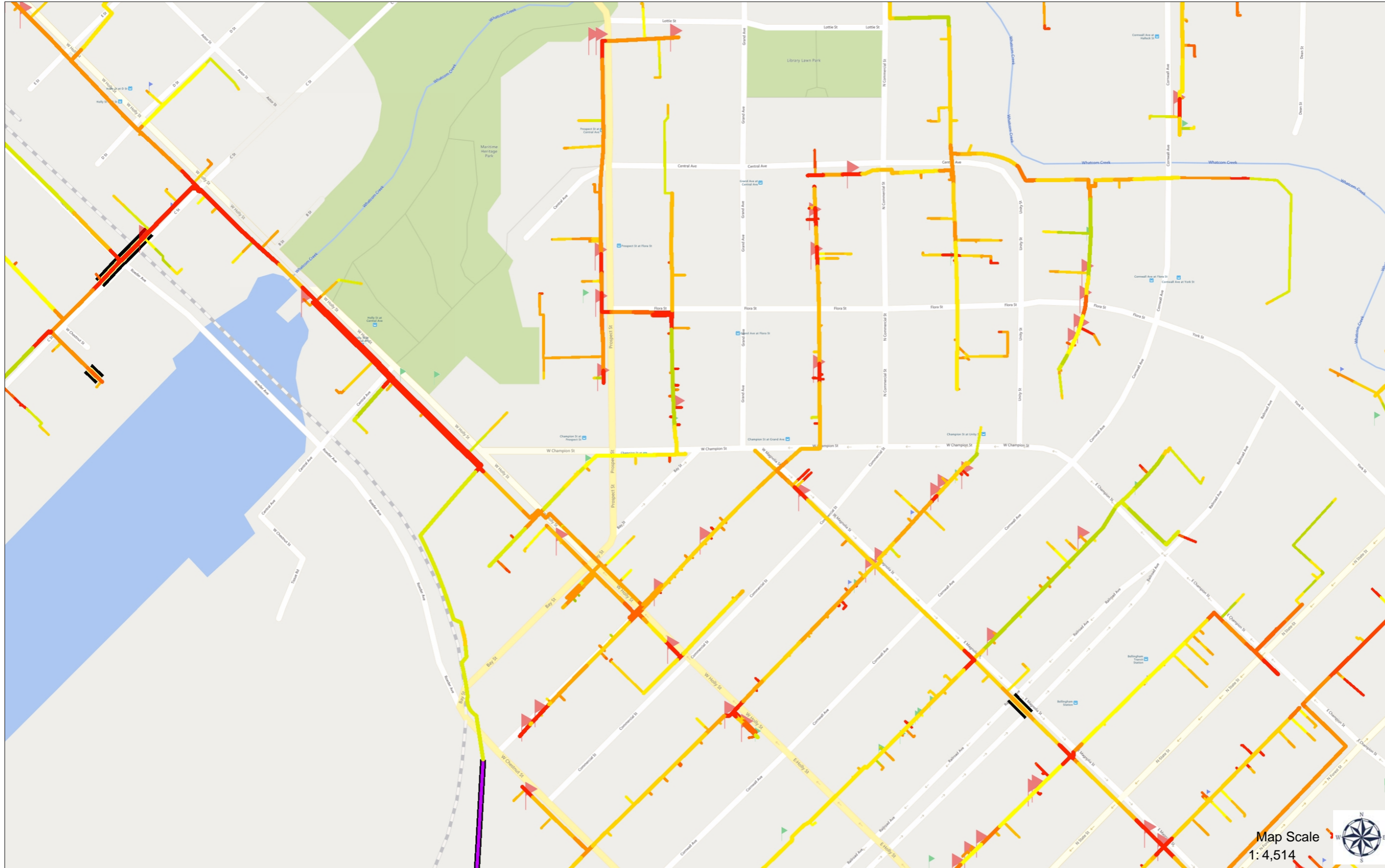
0.3                      0                      0.14                      0.3  
 WGS\_1984\_Web\_Mercator\_Auxiliary\_Sphere  
 © Cascade Natural Gas Corporation                      Miles

This map is a user generated static output from the GIS Web Viewer mapping website and is for reference only. It is not to be relied upon for construction purposes. It is provided for planning purposes only.  
 FIELD LOCATES ARE REQUIRED FOR LOCATION OF UTILITY FACILITIES

**Notes:**  
 MT. VERNON  
 EVSP (PRE-CNG, FISH)



# BELLINGHAM IP EVSP. ALLEYWAY REPLACEMENTS



**Map Legend**

**Risk Mains 2018**

- < -0.83 Std. Dev.
- 0.83 - -0.50 Std. Dev.
- 0.50 - -0.17 Std. Dev.
- 0.17 - 0.17 Std. Dev.
- 0.17 - 0.50 Std. Dev.
- 0.50 - 0.83 Std. Dev.
- 0.83 - 1.2 Std. Dev.
- 1.2 - 1.5 Std. Dev.
- 1.5 - 1.8 Std. Dev.
- 1.8 - 2.2 Std. Dev.
- 2.2 - 2.5 Std. Dev.
- 2.5 - 2.8 Std. Dev.
- > 2.8 Std. Dev.

**Risk Mains 2018 PRECNG**

**Risk Services 2018**

- < -0.83 Std. Dev.
- 0.83 - -0.50 Std. Dev.
- 0.50 - -0.17 Std. Dev.
- 0.17 - 0.17 Std. Dev.
- 0.17 - 0.50 Std. Dev.
- 0.50 - 0.83 Std. Dev.
- 0.83 - 1.2 Std. Dev.
- 1.2 - 1.5 Std. Dev.
- 1.5 - 1.8 Std. Dev.
- 1.8 - 2.2 Std. Dev.
- 2.2 - 2.5 Std. Dev.
- 2.5 - 2.8 Std. Dev.
- > 2.8 Std. Dev.

**Odorizer**

**Leak Report**

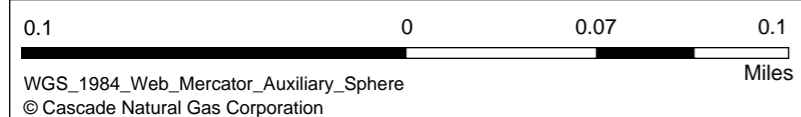
- <all other values>
- Above Ground
- Below Ground
- Retired

**Regulator Station**

**Gas Pipe Casing**

**Transmission Main**

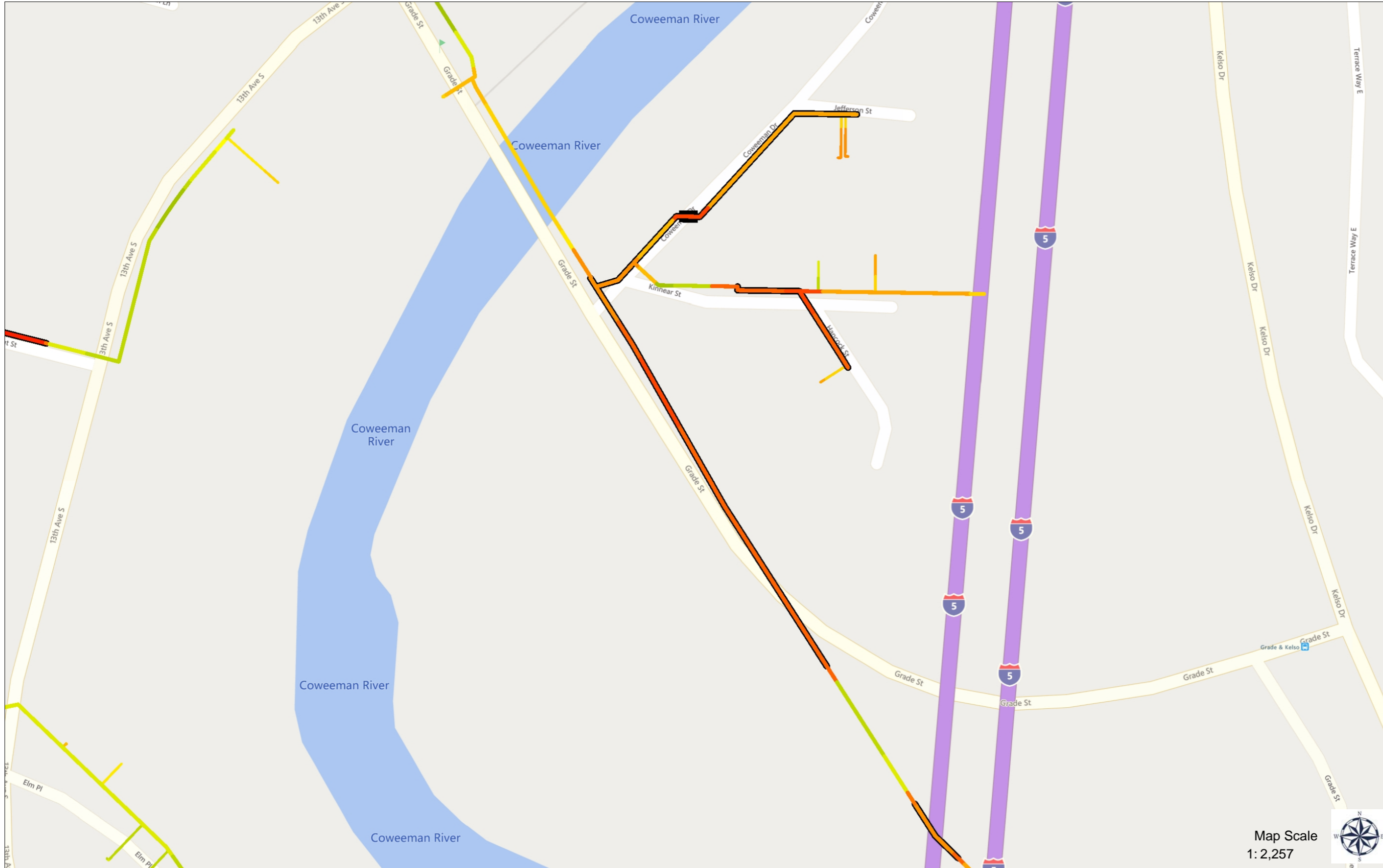
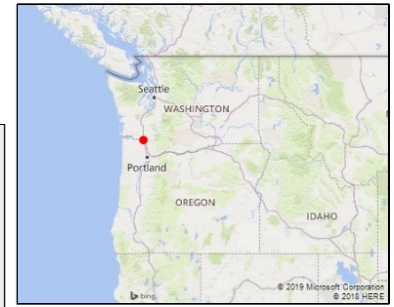
Map Scale  
1:4,514



This map is a user generated static output from the GIS Web Viewer mapping website and is for reference only. It is not to be relied upon for construction purposes. It is provided for planning purposes only.  
FIELD LOCATES ARE REQUIRED FOR LOCATION OF UTILITY FACILITIES

**Notes:**  
BELLINGHAM  
EVSP (FISH, OTHER)

# KELSO IP EVSP GRADE ST. REPLACEMENT



**Map Legend**

**Risk Mains 2018**

- < -0.83 Std. Dev.
- 0.83 - -0.50 Std. Dev.
- 0.50 - -0.17 Std. Dev.
- 0.17 - 0.17 Std. Dev.
- 0.17 - 0.50 Std. Dev.
- 0.50 - 0.83 Std. Dev.
- 0.83 - 1.2 Std. Dev.
- 1.2 - 1.5 Std. Dev.
- 1.5 - 1.8 Std. Dev.
- 1.8 - 2.2 Std. Dev.
- 2.2 - 2.5 Std. Dev.
- 2.5 - 2.8 Std. Dev.
- > 2.8 Std. Dev.

**Risk Mains 2018 PRECNG**

**Risk Services 2018**

- < -0.83 Std. Dev.
- 0.83 - -0.50 Std. Dev.
- 0.50 - -0.17 Std. Dev.
- 0.17 - 0.17 Std. Dev.
- 0.17 - 0.50 Std. Dev.
- 0.50 - 0.83 Std. Dev.
- 0.83 - 1.2 Std. Dev.
- 1.2 - 1.5 Std. Dev.
- 1.5 - 1.8 Std. Dev.
- 1.8 - 2.2 Std. Dev.
- 2.2 - 2.5 Std. Dev.
- 2.5 - 2.8 Std. Dev.
- > 2.8 Std. Dev.

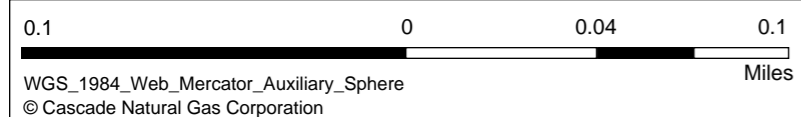
**Leak Report**

- <all other values>
- Above Ground
- Below Ground
- Retired

**Gas Pipe Casing**

**Transmission Main**

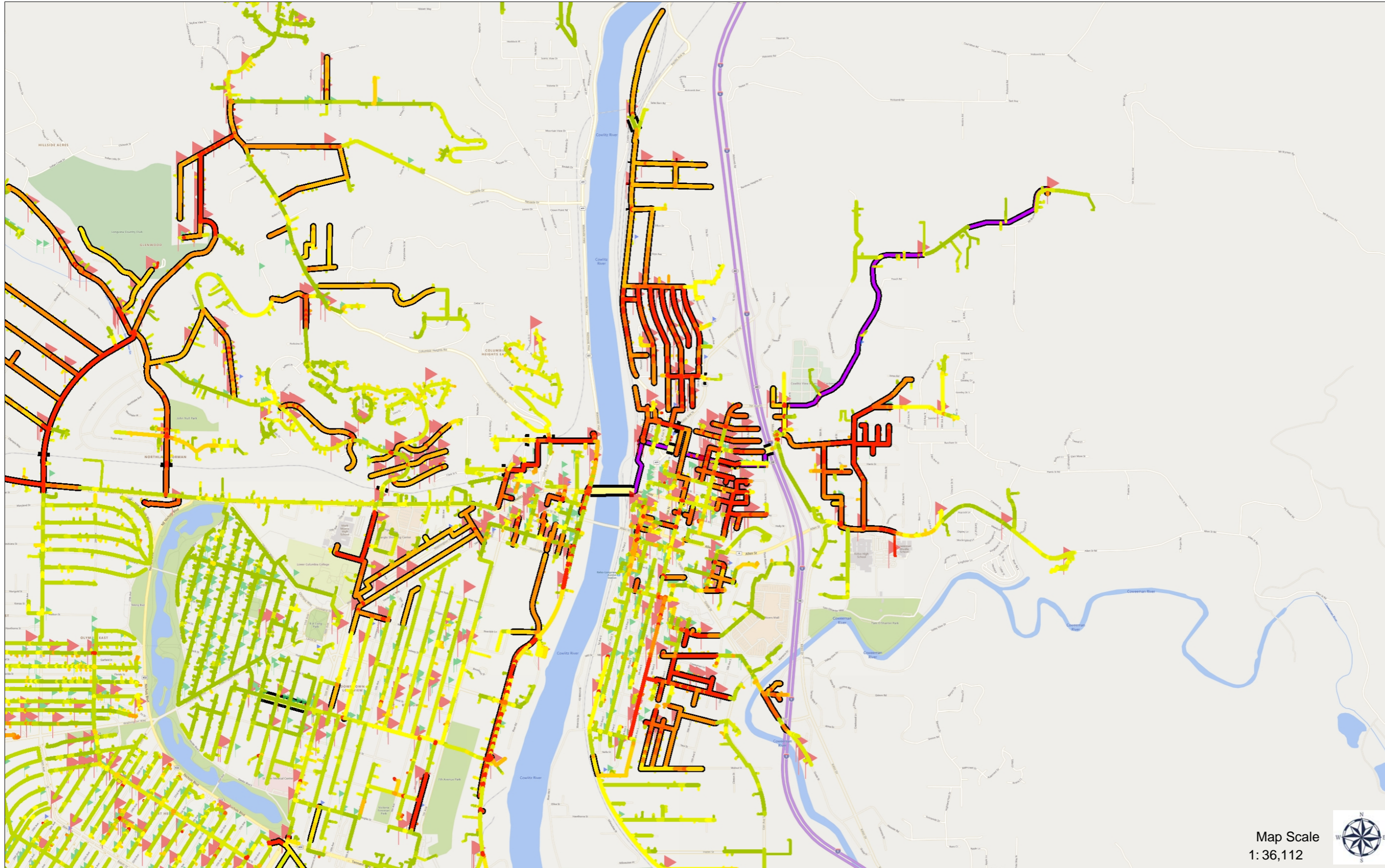
Map Scale  
1:2,257



This map is a user generated static output from the GIS Web Viewer mapping website and is for reference only. It is not to be relied upon for construction purposes. It is provided for planning purposes only.  
FIELD LOCATES ARE REQUIRED FOR LOCATION OF UTILITY FACILITIES

**Notes:**  
LONGVIEW  
EVSP (PRE-CNG)

# KELSO IP EVSP REPLACEMENT, PHASE 2 & 3



**Map Legend**

**Risk Mains 2018**

- < -0.83 Std. Dev.
- 0.83 - -0.50 Std. Dev.
- 0.50 - -0.17 Std. Dev.
- 0.17 - 0.17 Std. Dev.
- 0.17 - 0.50 Std. Dev.
- 0.50 - 0.83 Std. Dev.
- 0.83 - 1.2 Std. Dev.
- 1.2 - 1.5 Std. Dev.
- 1.5 - 1.8 Std. Dev.
- 1.8 - 2.2 Std. Dev.
- 2.2 - 2.5 Std. Dev.
- 2.5 - 2.8 Std. Dev.
- > 2.8 Std. Dev.

**Risk Mains 2018 PRECNG**

**Risk Services 2018**

- < -0.83 Std. Dev.
- 0.83 - -0.50 Std. Dev.
- 0.50 - -0.17 Std. Dev.
- 0.17 - 0.17 Std. Dev.
- 0.17 - 0.50 Std. Dev.
- 0.50 - 0.83 Std. Dev.
- 0.83 - 1.2 Std. Dev.
- 1.2 - 1.5 Std. Dev.
- 1.5 - 1.8 Std. Dev.
- 1.8 - 2.2 Std. Dev.
- 2.2 - 2.5 Std. Dev.
- 2.5 - 2.8 Std. Dev.
- > 2.8 Std. Dev.

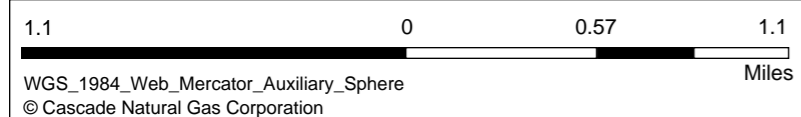
**Leak Report**

- <all other values>
- Above Ground
- Below Ground
- Retired

**Gas Pipe Casing**

**Transmission Main**

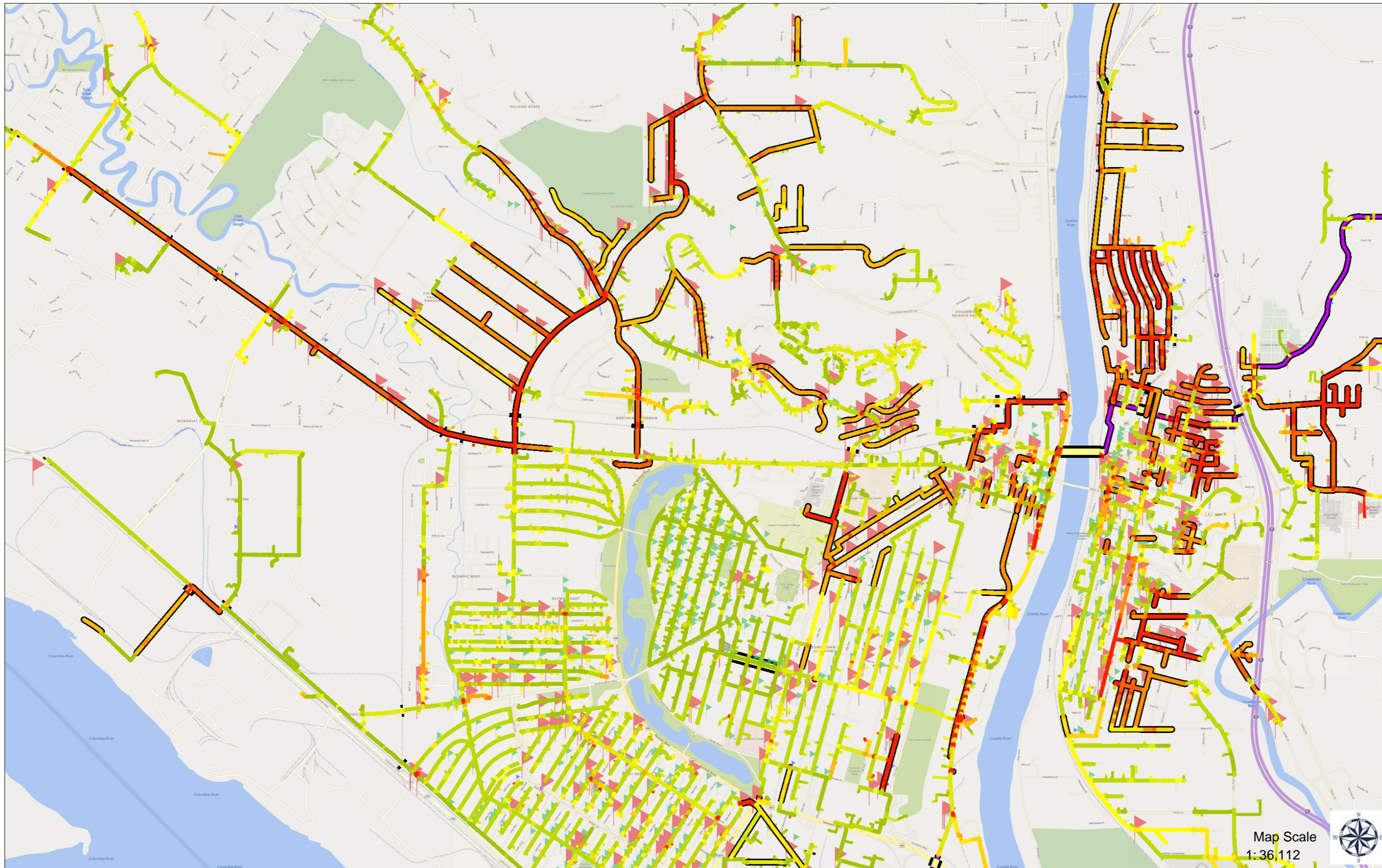
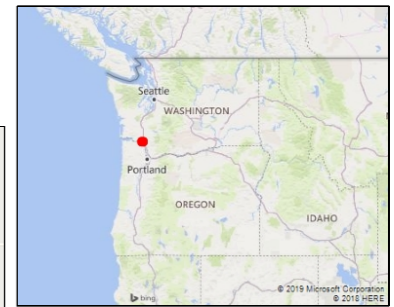
Map Scale  
1: 36,112



This map is a user generated static output from the GIS Web Viewer mapping website and is for reference only. It is not to be relied upon for construction purposes. It is provided for planning purposes only.  
FIELD LOCATES ARE REQUIRED FOR LOCATION OF UTILITY FACILITIES

**Notes:**  
LONGVIEW  
EVSP (PRE-CNG)

# LONGVIEW IP EVSP REPLACEMENT, PHASE 8 & 9



**Map Legend**

**Risk Mains 2018**

- < -0.83 Std. Dev.
- 0.83 - -0.50 Std. Dev.
- 0.50 - -0.17 Std. Dev.
- 0.17 - 0.17 Std. Dev.
- 0.17 - 0.50 Std. Dev.
- 0.50 - 0.83 Std. Dev.
- 0.83 - 1.2 Std. Dev.
- 1.2 - 1.5 Std. Dev.
- 1.5 - 1.8 Std. Dev.
- 1.8 - 2.2 Std. Dev.
- 2.2 - 2.5 Std. Dev.
- 2.5 - 2.8 Std. Dev.
- > 2.8 Std. Dev.

**Risk Mains 2018 PRECNG**

**Risk Services 2018**

- < -0.83 Std. Dev.
- 0.83 - -0.50 Std. Dev.
- 0.50 - -0.17 Std. Dev.
- 0.17 - 0.17 Std. Dev.
- 0.17 - 0.50 Std. Dev.
- 0.50 - 0.83 Std. Dev.
- 0.83 - 1.2 Std. Dev.
- 1.2 - 1.5 Std. Dev.
- 1.5 - 1.8 Std. Dev.
- 1.8 - 2.2 Std. Dev.
- 2.2 - 2.5 Std. Dev.
- 2.5 - 2.8 Std. Dev.
- > 2.8 Std. Dev.

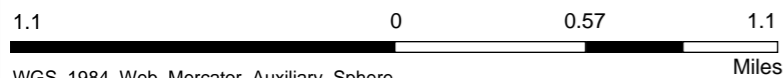
**Leak Report**

- <all other values>
- Above Ground
- Below Ground
- Retired

**Gas Pipe Casing**

**Transmission Main**

Map Scale  
1:36,112

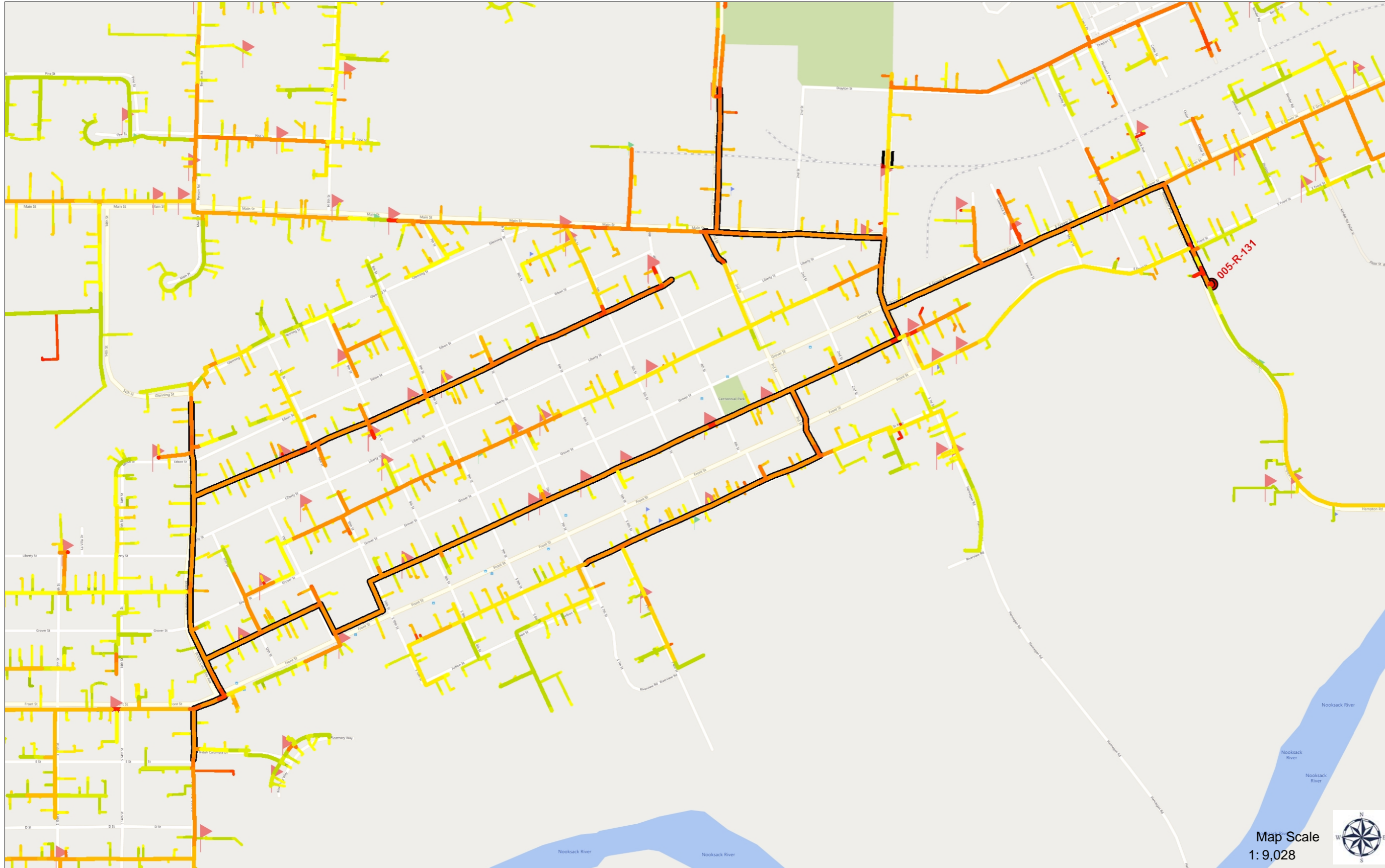
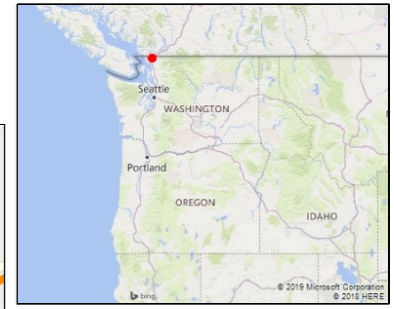


WGS\_1984\_Web\_Mercator\_Auxiliary\_Sphere  
© Cascade Natural Gas Corporation

This map is a user generated static output from the GIS Web Viewer mapping website and is for reference only. It is not to be relied upon for construction purposes. It is provided for planning purposes only.  
FIELD LOCATES ARE REQUIRED FOR LOCATION OF UTILITY FACILITIES

**Notes:**  
LONGVIEW  
EVSP (PRE-CNG)

# LYNDEN IP EVSP ALLEYWAY REPLACEMENTS



**Map Legend**

**Risk Mains 2018**

- < -0.83 Std. Dev.
- 0.83 - -0.50 Std. Dev.
- 0.50 - -0.17 Std. Dev.
- 0.17 - 0.17 Std. Dev.
- 0.17 - 0.50 Std. Dev.
- 0.50 - 0.83 Std. Dev.
- 0.83 - 1.2 Std. Dev.
- 1.2 - 1.5 Std. Dev.
- 1.5 - 1.8 Std. Dev.
- 1.8 - 2.2 Std. Dev.
- 2.2 - 2.5 Std. Dev.
- 2.5 - 2.8 Std. Dev.
- > 2.8 Std. Dev.

**Risk Mains 2018 PRECNG**

**Risk Services 2018**

- < -0.83 Std. Dev.
- 0.83 - -0.50 Std. Dev.
- 0.50 - -0.17 Std. Dev.
- 0.17 - 0.17 Std. Dev.
- 0.17 - 0.50 Std. Dev.
- 0.50 - 0.83 Std. Dev.
- 0.83 - 1.2 Std. Dev.
- 1.2 - 1.5 Std. Dev.
- 1.5 - 1.8 Std. Dev.
- 1.8 - 2.2 Std. Dev.
- 2.2 - 2.5 Std. Dev.
- 2.5 - 2.8 Std. Dev.
- > 2.8 Std. Dev.

**Odorizer**

**Leak Report**

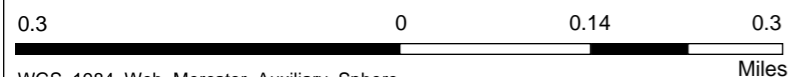
- <all other values>
- Above Ground
- Below Ground
- Retired

**Regulator Station**

**Gas Pipe Casing**

**Transmission Main**

Map Scale  
1: 9,028

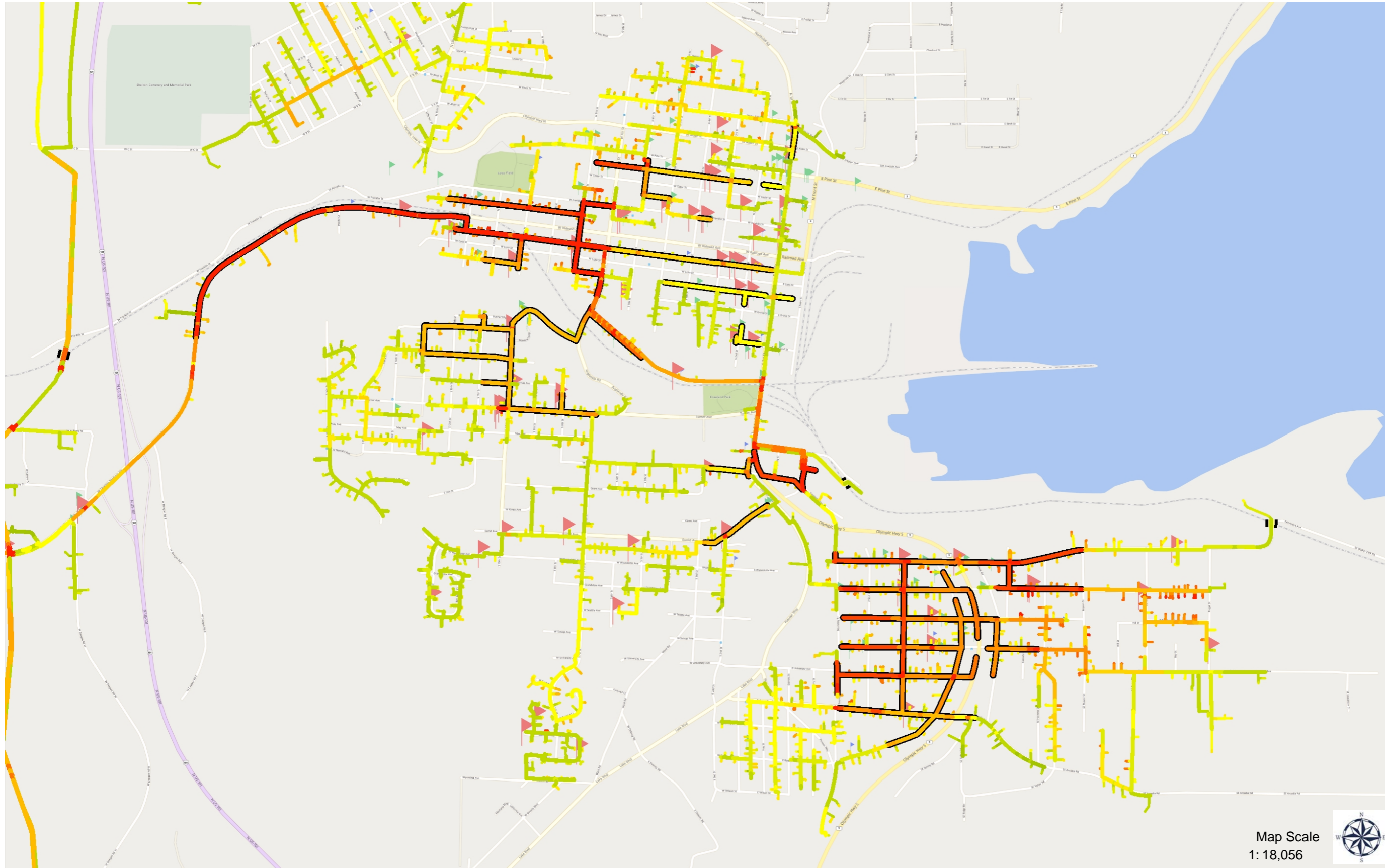
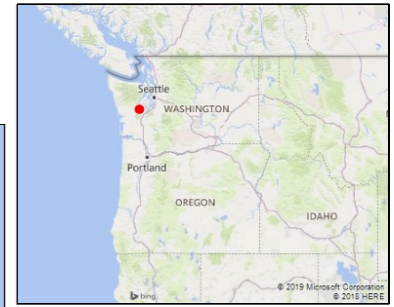


WGS\_1984\_Web\_Mercator\_Auxiliary\_Sphere  
© Cascade Natural Gas Corporation

This map is a user generated static output from the GIS Web Viewer mapping website and is for reference only. It is not to be relied upon for construction purposes. It is provided for planning purposes only.  
FIELD LOCATES ARE REQUIRED FOR LOCATION OF UTILITY FACILITIES

**Notes:**  
BELLINGHAM  
EVSP (PRE-CNG)

# SHELTON IP EVSP REPLACEMENT, PHASE 3 & 4



**Map Legend**

**Risk Mains 2018**

- < -0.83 Std. Dev.
- 0.83 - -0.50 Std. Dev.
- 0.50 - -0.17 Std. Dev.
- 0.17 - 0.17 Std. Dev.
- 0.17 - 0.50 Std. Dev.
- 0.50 - 0.83 Std. Dev.
- 0.83 - 1.2 Std. Dev.
- 1.2 - 1.5 Std. Dev.
- 1.5 - 1.8 Std. Dev.
- 1.8 - 2.2 Std. Dev.
- 2.2 - 2.5 Std. Dev.
- 2.5 - 2.8 Std. Dev.
- > 2.8 Std. Dev.

**Risk Mains 2018 PRECNG**

**Risk Services 2018**

- < -0.83 Std. Dev.
- 0.83 - -0.50 Std. Dev.
- 0.50 - -0.17 Std. Dev.
- 0.17 - 0.17 Std. Dev.
- 0.17 - 0.50 Std. Dev.
- 0.50 - 0.83 Std. Dev.
- 0.83 - 1.2 Std. Dev.
- 1.2 - 1.5 Std. Dev.
- 1.5 - 1.8 Std. Dev.
- 1.8 - 2.2 Std. Dev.
- 2.2 - 2.5 Std. Dev.
- 2.5 - 2.8 Std. Dev.
- > 2.8 Std. Dev.

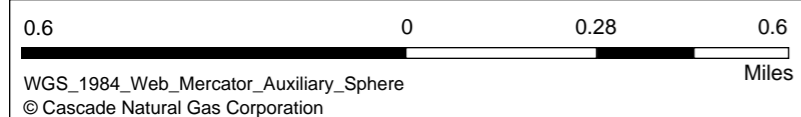
**Leak Report**

- <all other values>
- Above Ground
- Below Ground
- Retired

**Gas Pipe Casing**

**Transmission Main**

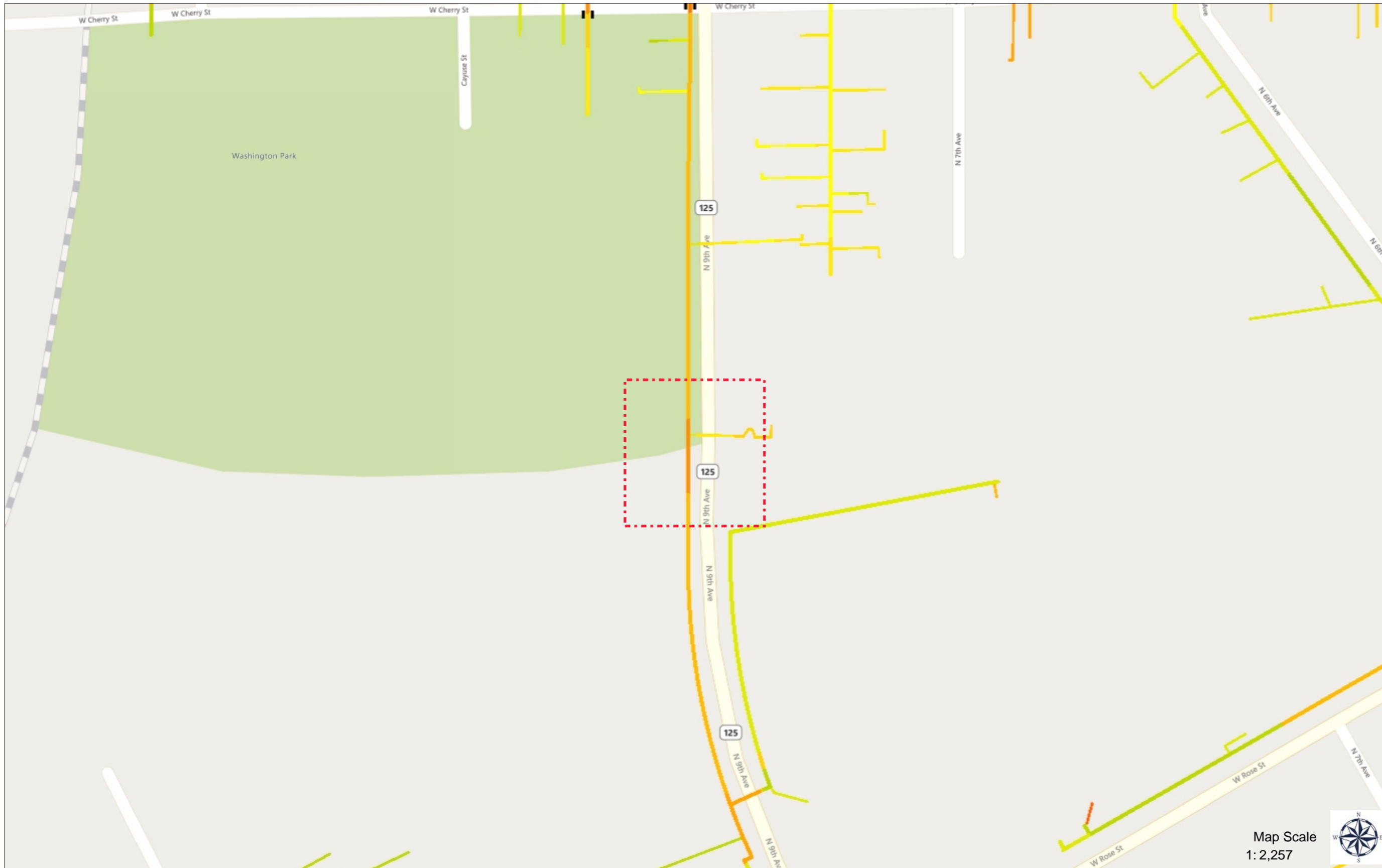
Map Scale  
1: 18,056



This map is a user generated static output from the GIS Web Viewer mapping website and is for reference only. It is not to be relied upon for construction purposes. It is provided for planning purposes only.  
FIELD LOCATES ARE REQUIRED FOR LOCATION OF UTILITY FACILITIES

**Notes:**  
ABERDEEN  
EVSP (PRE-CNG)

# WALLA WALLA IP EVSP 9TH AVE MILL CREEK REPLACEMENT



**Map Legend**

**Risk Mains 2018**

- < -0.83 Std. Dev.
- 0.83 - -0.50 Std. Dev.
- 0.50 - -0.17 Std. Dev.
- 0.17 - 0.17 Std. Dev.
- 0.17 - 0.50 Std. Dev.
- 0.50 - 0.83 Std. Dev.
- 0.83 - 1.2 Std. Dev.
- 1.2 - 1.5 Std. Dev.
- 1.5 - 1.8 Std. Dev.
- 1.8 - 2.2 Std. Dev.
- 2.2 - 2.5 Std. Dev.
- 2.5 - 2.8 Std. Dev.
- > 2.8 Std. Dev.

**Risk Mains 2018 PRECNG**

**Risk Services 2018**

- < -0.83 Std. Dev.
- 0.83 - -0.50 Std. Dev.
- 0.50 - -0.17 Std. Dev.
- 0.17 - 0.17 Std. Dev.
- 0.17 - 0.50 Std. Dev.
- 0.50 - 0.83 Std. Dev.
- 0.83 - 1.2 Std. Dev.
- 1.2 - 1.5 Std. Dev.
- 1.5 - 1.8 Std. Dev.
- 1.8 - 2.2 Std. Dev.
- 2.2 - 2.5 Std. Dev.
- 2.5 - 2.8 Std. Dev.
- > 2.8 Std. Dev.

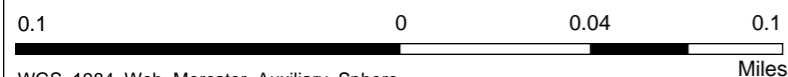
**Leak Report**

- <all other values>
- Above Ground
- Below Ground
- Retired

**Gas Pipe Casing**

**Transmission Main**

Map Scale  
1: 2,257



WGS\_1984\_Web\_Mercator\_Auxiliary\_Sphere  
© Cascade Natural Gas Corporation

This map is a user generated static output from the GIS Web Viewer mapping website and is for reference only. It is not to be relied upon for construction purposes. It is provided for planning purposes only.  
FIELD LOCATES ARE REQUIRED FOR LOCATION OF UTILITY FACILITIES

**Notes:**  
WALLA WALLA  
EVSP (FISH)

**APPENDIX B**  
**KELSO/LONGVIEW, ANACORTES, SHELTON DIMP**  
**MODEL OUTPUT**



**Anacortes DIMP Map  
2013 Model Run (2012 Data)  
7/27/2017**

Scale: 1:12500 on 24x36

**2012 DIMP\_RiskMains\_WA**

**TotalRisk**

- < -0.83 Std. Dev.
- -0.83 - -0.50 Std. Dev.
- -0.50 - -0.17 Std. Dev.
- -0.17 - 0.17 Std. Dev.
- 0.17 - 0.50 Std. Dev.
- 0.50 - 0.83 Std. Dev.
- 0.83 - 1.2 Std. Dev.
- 1.2 - 1.5 Std. Dev.
- 1.5 - 1.8 Std. Dev.
- 1.8 - 2.2 Std. Dev.
- 2.2 - 2.5 Std. Dev.
- 2.5 - 2.8 Std. Dev.
- > 2.8 Std. Dev.

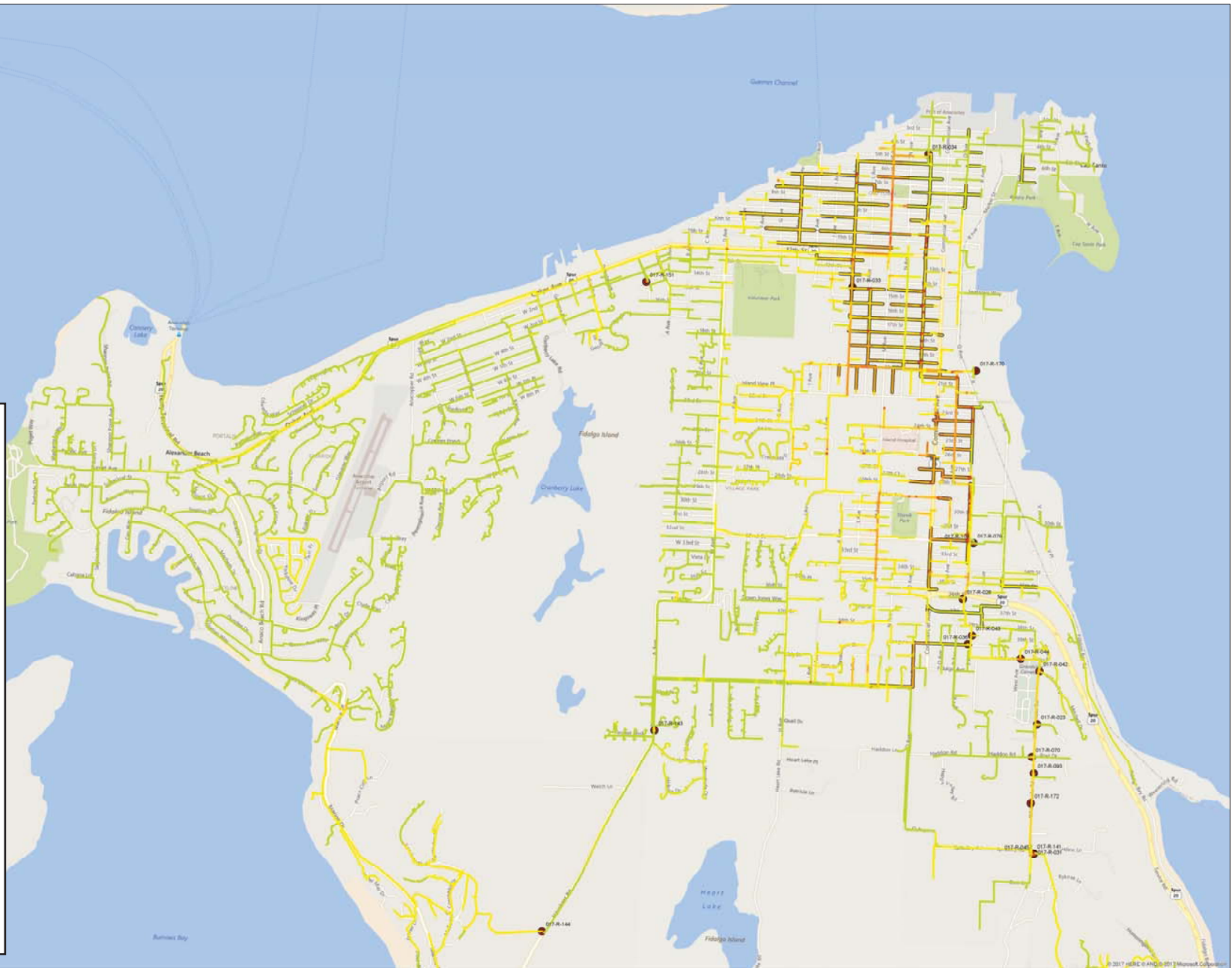
**2012 DIMP\_RiskMains\_WA PRECNG**

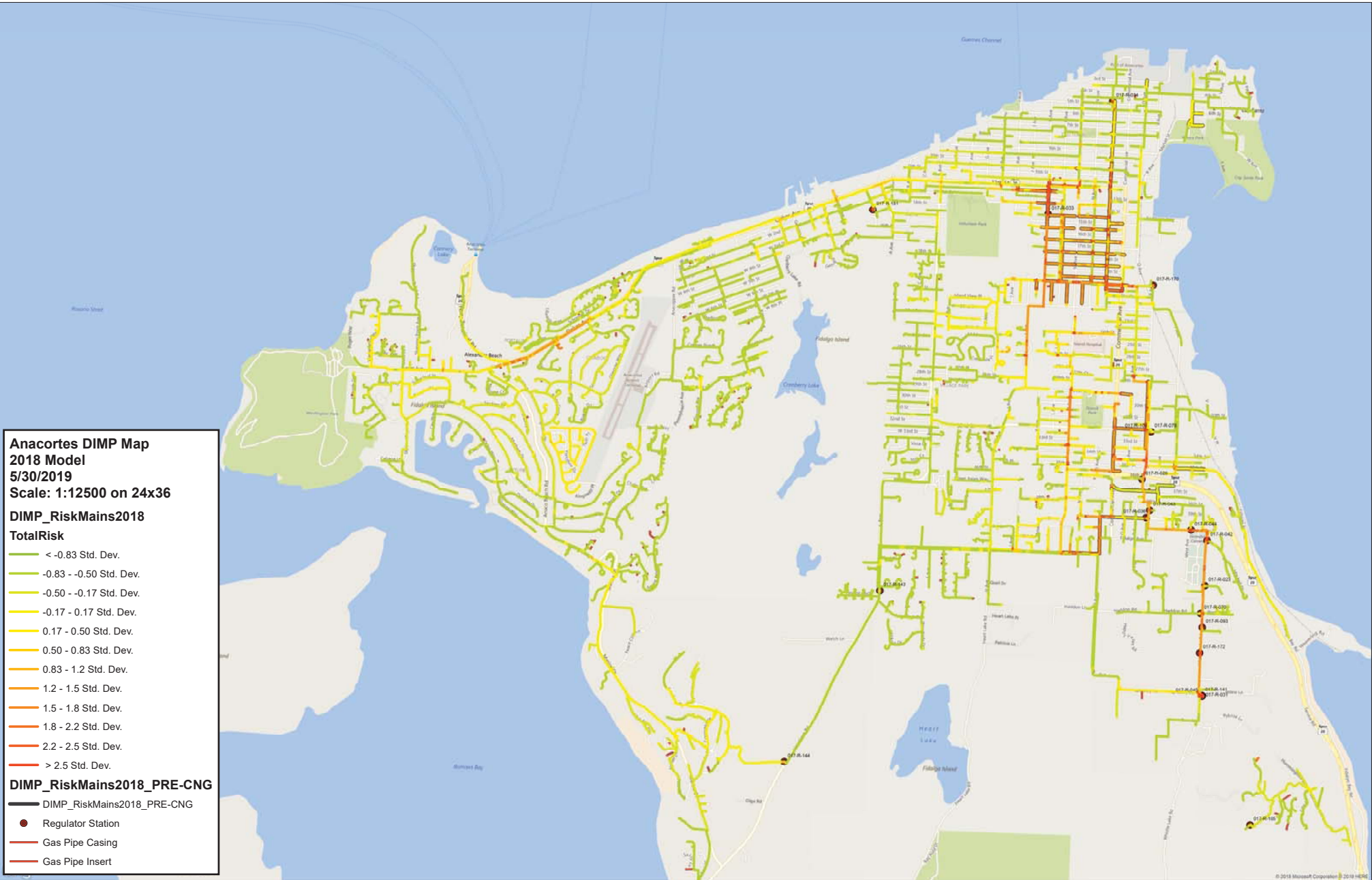
- <all other values>

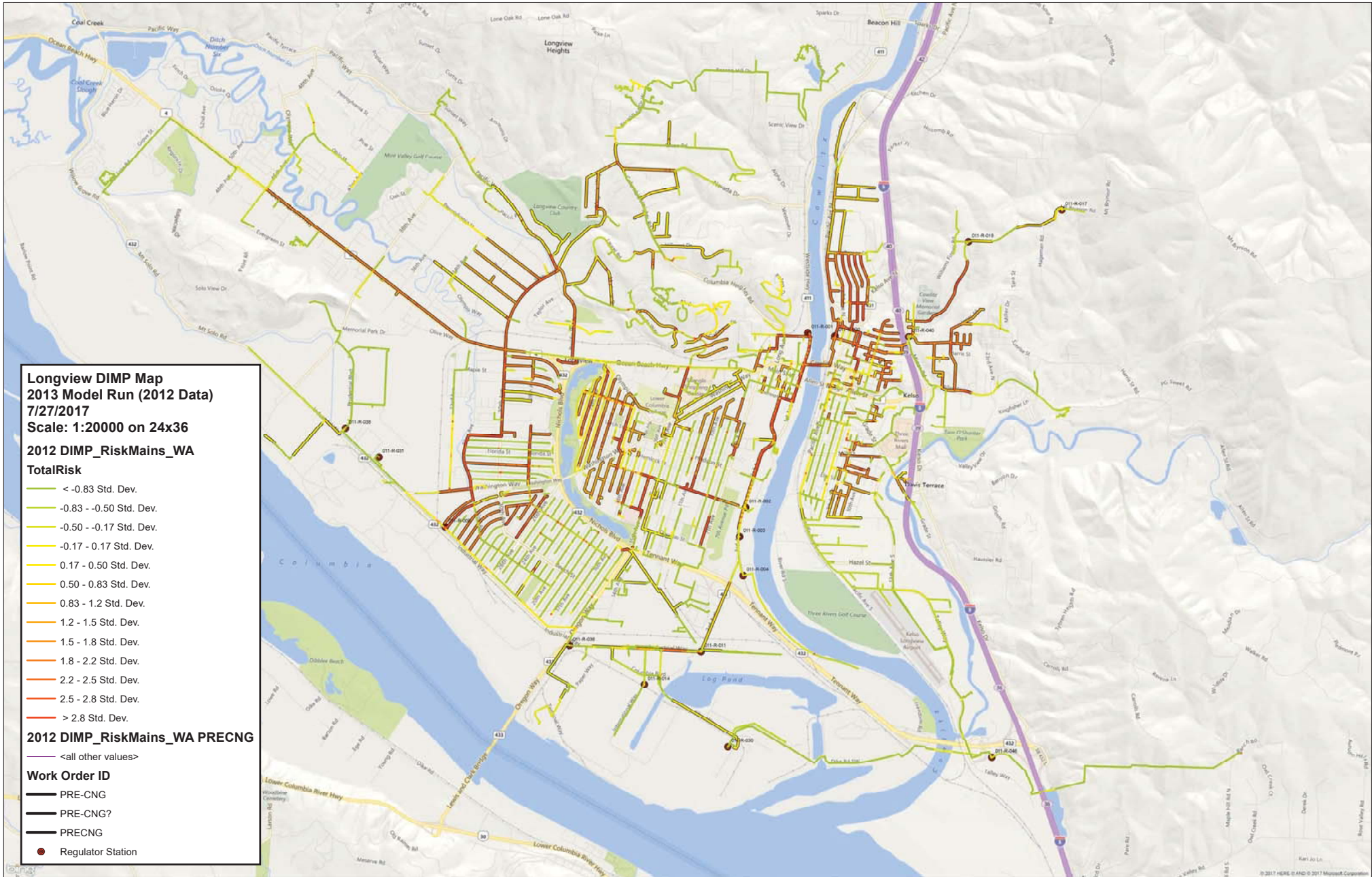
**Work Order ID**

- PRE-CNG
- PRE-CNG?
- PRECNG

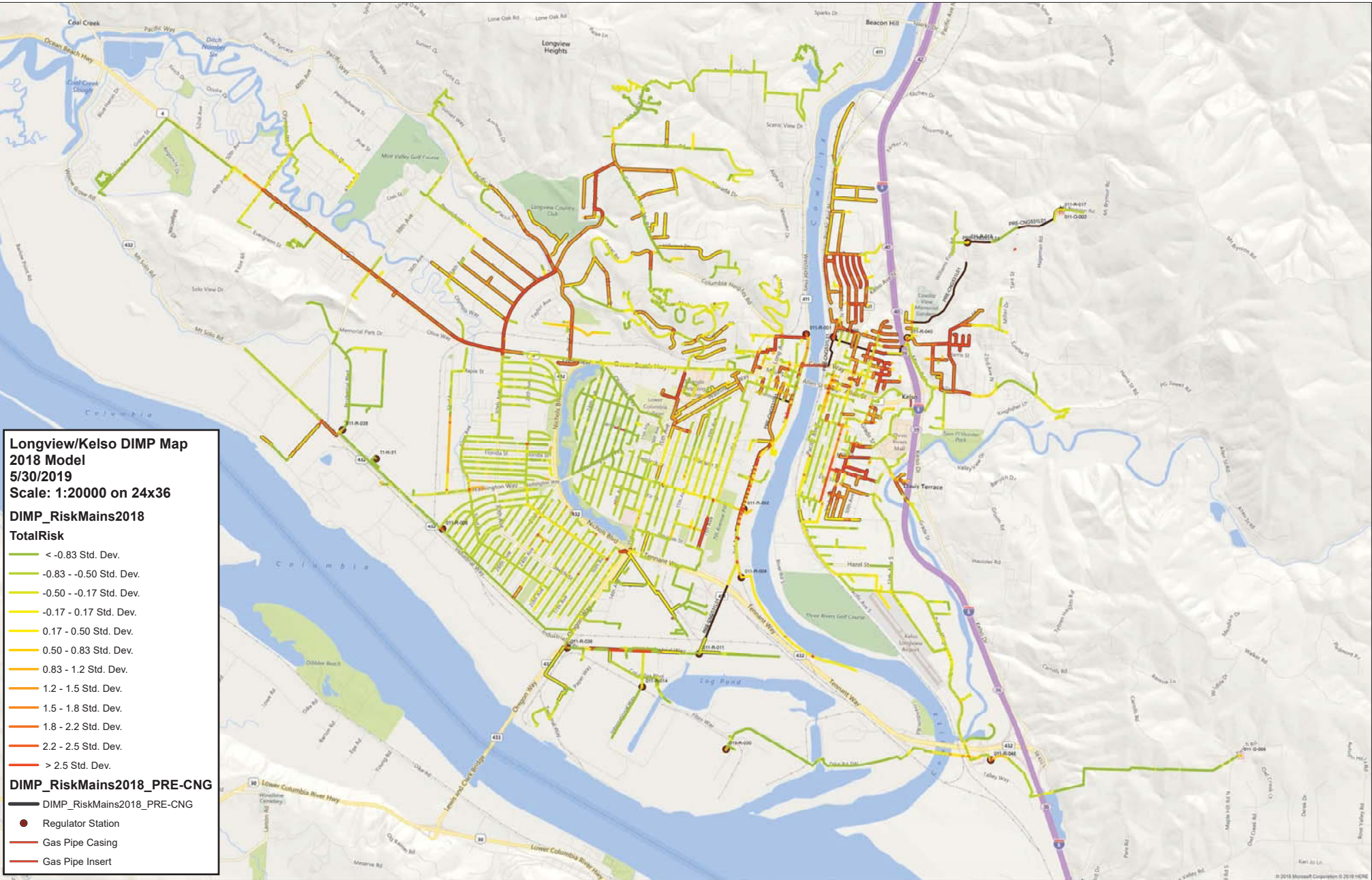
- Regulator Station







**Longview DIMP Map**  
**2013 Model Run (2012 Data)**  
**7/27/2017**  
**Scale: 1:20000 on 24x36**  
**2012 DIMP\_RiskMains\_WA**  
**TotalRisk**  
 < -0.83 Std. Dev.  
 -0.83 - -0.50 Std. Dev.  
 -0.50 - -0.17 Std. Dev.  
 -0.17 - 0.17 Std. Dev.  
 0.17 - 0.50 Std. Dev.  
 0.50 - 0.83 Std. Dev.  
 0.83 - 1.2 Std. Dev.  
 1.2 - 1.5 Std. Dev.  
 1.5 - 1.8 Std. Dev.  
 1.8 - 2.2 Std. Dev.  
 2.2 - 2.5 Std. Dev.  
 2.5 - 2.8 Std. Dev.  
 > 2.8 Std. Dev.  
**2012 DIMP\_RiskMains\_WA PRECNG**  
 <all other values>  
**Work Order ID**  
 PRE-CNG  
 PRE-CNG?  
 PRECNG  
 ● Regulator Station



Shelton DIMP Map  
2013 Model Run (2012 Data)  
5/30/2019  
Scale: 1:8500 on 24x36

**2012 DIMP\_RiskMains\_WA**

**TotalRisk**

- < -0.83 Std. Dev.
- -0.83 - -0.50 Std. Dev.
- -0.50 - -0.17 Std. Dev.
- -0.17 - 0.17 Std. Dev.
- 0.17 - 0.50 Std. Dev.
- 0.50 - 0.83 Std. Dev.
- 0.83 - 1.2 Std. Dev.
- 1.2 - 1.5 Std. Dev.
- 1.5 - 1.8 Std. Dev.
- 1.8 - 2.2 Std. Dev.
- 2.2 - 2.5 Std. Dev.
- 2.5 - 2.8 Std. Dev.
- > 2.8 Std. Dev.

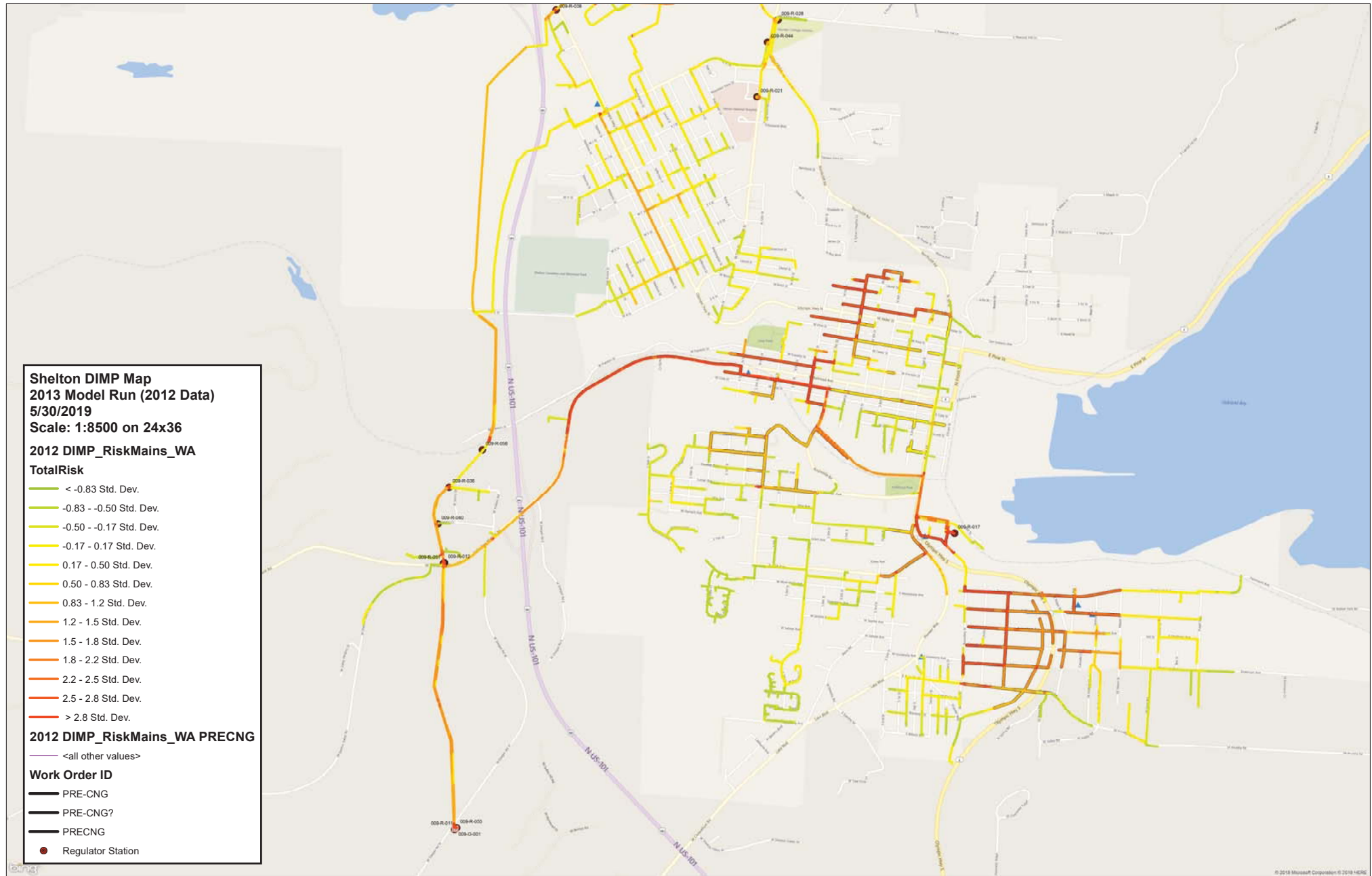
**2012 DIMP\_RiskMains\_WA PRECNG**

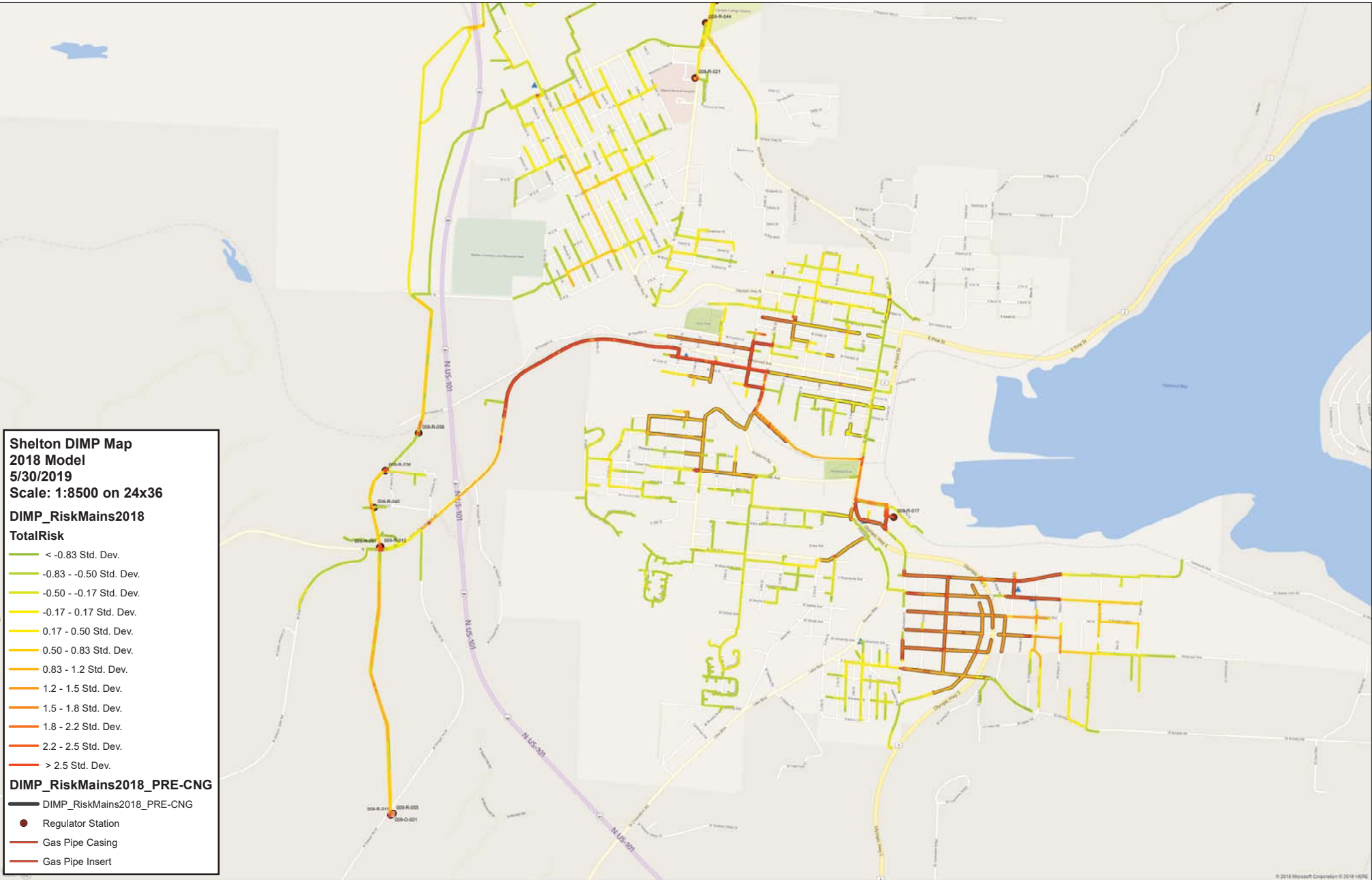
- <all other values>

**Work Order ID**

- PRE-CNG
- PRE-CNG?
- PRECNG

- Regulator Station





**APPENDIX C**  
**PREVIOUS TWO-YEAR PLAN SUMMARY**

**NOVEMBER 1, 2016 – OCTOBER 31, 2017**

| FUNDING PROJECT(S) | PROJECT                              | DISTRICT   | PROJECT DESCRIPTION  | IN-SERVICE DATE   |          | REPLACED MILEAGE | NEW MILEAGE |           | REPLACED MILEAGE | NEW MILEAGE |
|--------------------|--------------------------------------|------------|--|---|----------|------------------|-------------|-----------|------------------|-------------|
| 200687             | CRM RPL ANACORTES BARE STEEL PHASE V | MT. VERNON | BARE STEEL/PRE-CNG PIPE - IDENTIFIED HIGH (RED) RISK IN DIMP           | 12/6/2016, 10/4/2017  | 2" STL   | 3.90             | 0           | 2" PE     | 0                | 4.01        |
| 200686             | CRM RPL LONGVIEW BARE STEEL PHASE VI | LONGVIEW   | BARE STEEL/PRE-CNG PIPE - IDENTIFIED HIGH (RED) RISK IN DIMP           | 10/24/2017, 10/30/2017  | 2/6" STL | 7.32             | 1.15        | 2/4/6" PE | 0                | 6.17        |
| 306982             | CRM VANCE CREEK EXPOSURE REPLACE     | ABERDEEN   | EXPOSED PIPE (CORROSION) IN ADDITION TO MODERATE (ORANGE) RISK IN DIMP | 10/27/2016  | 8" STL   | 0.26             | 0.26        | --        | --               | --          |
| 306983             | CRM CAMP CREEK EXPOSURE REPLACEMENT  | ABERDEEN   | EXPOSED PIPE (CORROSION) IN ADDITION TO MODERATE (ORANGE) RISK IN DIMP | 10/28/2016  | 8" STL   | 0.25             | 0.26        | --        | --               | --          |
| 306986             | CRM 3" BURLINGTON HP LINE REPL       | MT. VERNON | PRE-CNG PIPE - IDENTIFIED HIGH (RED) RISK IN DIMP                      | 5/23/2017   | 4" STL   | 1.01 (3")        | 0.90 (4")   | --        | --               | --          |
| 302663             | CRM BELLINGHAM BRIDGE CROSSINGS RMV  | BELLINGHAM | PRE-CNG PIPE - IDENTIFIED HIGH (RED) & MODERATE (ORANGE) RISK IN DIMP  | PROJECT NOT COMPLETED IN THE NOVEMBER 1, 2016 - OCTOBER 31, 2017 TIME PERIOD DUE TO PERMITTING AND RIGHT OF WAY DELAYS. PROJECT SCHEDULED TO BE COMPLETED IN THE NOVEMBER 1, 2017 - OCTOBER 31, 2018 TIME PERIOD.                                     |          |                  |             |           |                  |             |
| 307212             | CRM KELSO GRADE ST BRIDGE RELOCATE   | LONGVIEW   | EXPOSED PIPE SUSCEPTIBLE TO CORROSION RISK - MODERATE (ORANGE)         | PROJECT NOT COMPLETED IN THE NOVEMBER 1, 2016 - OCTOBER 31, 2017 TIME PERIOD DUE TO DELAYS OBTAINING ARMY CORP OF ENGINEERS PERMIT TO CROSS COWEEMAN RIVER. PROJECT SCHEDULED TO BE COMPLETED IN THE NOVEMBER 1, 2017 - OCTOBER 31, 2018 TIME PERIOD. |          |                  |             |           |                  |             |
| 309001             | 2 IN STEEL IP BORE BELFAIR PL        | KENNEWICK  | MODERATE (ORANGE) RISK IN DIMP   | 1/6/2017  | 2" STL   | 0.04             | 0.05        | --        | --               | --          |
| 312041             | CRM 6" NOB HILL REPLACEMENT          | YAKIMA     | IDENTIFIED HIGH (RED) RISK IN DIMP                                     | 6/8/2017  | 6" STL   | 0.01             | 0.01        | --        | --               | --          |
| 312043             | KENNEWICK RR CROSS NEAR KAMIAKIN     | KENNEWICK  | MODERATE (ORANGE) RISK IN DIMP   | 8/1/2017  | 2" STL   | 0.08             | 0.12        | 2" PE     | 0                | 0.18        |
| 300346             | CRM RPL; 12" STL HP, KELSO           | LONGVIEW   | HIGH (RED) RISK IN DIMP  | 12/19/2017  | 12" STL  | 0.77             | 0.63        | --        | --               | --          |
| 300363             | CRM SHELTON PIPE REPLACEMENT         | ABERDEEN   | PRE-CNG PIPE - IDENTIFIED HIGH (RED) RISK IN DIMP                      | 9/18/2017   | 2/3" STL | 2.06             | 0           | 2/4" PE   | 0                | 2.14        |
| 315641             | VANCE CREEK REPLACEMENT (#2)         | ABERDEEN   | EXPOSED PIPE (CORROSION) IN ADDITION TO MODERATE (ORANGE) RISK IN DIMP | 12/8/2016   | 8" STL   | 0.24             | 0.24        | --        | --               | --          |
| 315731             | RPL 2" STL MN - BELLINGHAM           | BELLINGHAM | IDENTIFIED MODERATE (ORANGE) RISK IN DIMP,                             | 5/30/2017   | 2" STL   | 0.13             | 0.10        | 2" PE     | 0                | 0.09        |

PROJECT CANCELLED OR DELAYED FROM PLAN PERIOD  
 PROJECT CARRIED OVER FROM PREVIOUS YEAR  
 PROJECT ADDED TO PIPE REPLACEMENT PLAN



**NOVEMBER 1, 2017 – OCTOBER 31, 2018**

| FUNDING PROJECT(S)                             | PROJECT                                  | DISTRICT     | PROJECT DESCRIPTION  | IN-SERVICE DATE   |          | REPLACED MILEAGE | NEW MILEAGE |         | REPLACED MILEAGE | NEW MILEAGE |
|--|--|--------------|--|---|----------|------------------|-------------|---------|------------------|-------------|
| 200687<br>316687<br>316689<br>316690<br>316691 | ANACORTES BARE STEEL PHASE 5/6           | MT. VERNON   | BARE STEEL/PRE-CNG PIPE - IDENTIFIED HIGH (RED) RISK IN DIMP                           | 3/21/2018 (Phase 5)<br>7/24/2018 (Phase 6)  | 2/4" STL | 3.73             | 0           | 2/4" PE | 0                | 2.85        |
| 200686   | CRM RPL LONGVIEW BARE STEEL PHASE 7      | LONGVIEW     | BARE STEEL/PRE-CNG PIPE - IDENTIFIED HIGH (RED) RISK IN DIMP                           | PROJECT WAS CANCELED FOR THE NOVEMBER 1, 2017 – OCTOBER 31, 2018 TIME PERIOD TO ADDRESS PIPE REPLACEMENT IN KELSO, WA.  |          |                  |             |         |                  |             |
| 316568   | 12" STL HP REPLACEMENT, KELSO PHASE 2    | LONGVIEW     | PRE-CNG PIPE - HIGH (RED) RISK IN DIMP   | 9/11/2018   | 12" STL  | 0.85             | 0.90        | --      | --               | --          |
| 300363<br>316766<br>316767<br>316768           | SHELTON PIPE REPLACEMENT PHASE 2         | ABERDEEN     | PRE-CNG PIPE - IDENTIFIED HIGH (RED) RISK IN DIMP                                      | 7/9/2018  | 2/4" STL | 2.33             | 0           | 2/4" PE | 0                | 2.52        |
| 303140   | CRM YAKIMA PIPE REPLACEMENT PHASE 1      | YAKIMA       | IDENTIFIED HIGH (RED) RISK IN DIMP   | PROJECT WAS CANCELED FOR THE NOVEMBER 1, 2017 – OCTOBER 31, 2018 TIME PERIOD TO ADDRESS PIPE REPLACEMENT IN KELSO, WA.  |          |                  |             |         |                  |             |
| 302594<br>316775<br>316777<br>316778<br>316787 | KELSO BARE STEEL PHASE 1                 | LONGVIEW     | BARE STEEL/PRE-CNG PIPE - IDENTIFIED HIGH (RED) RISK IN DIMP                           | 8/13/2018<br>9/17/2018<br>8/29/2018   | 2/4" STL | 6.92             | 0           | 2/4" PE | 0                | 7.15        |
| 316323   | 7" STL IP REPLACEMENT, RICHLAND          | KENNEWICK    | PRE-CNG PIPE - IDENTIFIED HIGH (RED) RISK IN DIMP                                      | 3/21/2018   | 7" STL   | 0.23             | 0           | 6" PE   | 0                | 0.25        |
| 302663   | 8" STL HP, RETIRE BRIDGE CROSSINGS       | BELLINGHAM   | PRE-CNG PIPE - IDENTIFIED HIGH (RED) & MODERATE (ORANGE) RISK IN DIMP                  | 12/14/2018  | 8" STL   | 0.36             | --          | --      | --               | --          |
| 307212   | 2" STL IP GRADE ST BRIDGE REPLACEMENT    | LONGVIEW     | EXPOSED PIPE SUSCEPTIBLE TO CORROSION RISK - MODERATE (ORANGE)                         | PROJECT NOT COMPLETED IN THE NOVEMBER 1, 2016 - OCTOBER 31, 2017 TIME PERIOD DUE TO DELAYS OBTAINING ARMY CORP OF ENGINEERS PERMIT TO CROSS COWEEMAN RIVER. PROJECT SCHEDULED TO BE COMPLETED IN THE NOVEMBER 1, 2017 - OCTOBER 31, 2018 TIME PERIOD. |          |                  |             |         |                  |             |
| 316036<br>316713                               | 8" STL HP REPLACEMENT, ANACORTES PH 1    | MT. VERNON   | FISH PIPE WITH HIGH - MODERATE RISK IN DIMP  | 5/21/2018   | 8" STL   | 0.89             | 0.94        | 2" STL  | 0"               | 0.43        |
| 316037   | 6"/8" STL HP REPLACEMENT, MOSES LAKE     | WENATCHEE    | PRE-CNG TRANSMISSION PIPELINE  | 12/28/2018  | 8" STL   | 3.12             | 3.13        | --      | --               | --          |
| 316319   | 2" STL IP COAL CR SLOUGH REPLACEMENT     | LONGVIEW     | EXPOSED PIPE SUSCEPTIBLE TO HIGHER CORROSION RISK, PIPE IS POORLY COATED AND SUPPORTED | 8/30/2018   | 2" STL   | 0.06             | 0.06        | --      | --               | --          |
| 314964   | 8" HP RPL, MARCH POINT TRANSMISSION LINE | MOUNT VERNON | PRE-CODE TRANSMISSION MAIN, HISTORY OF CORROSION                                       | 10/30/2018  | 8" STL   | 0.76             | 0.79        | --      | --               | --          |

PROJECT CANCELLED FROM PLAN YEAR

PROJECT CARRIED OVER FROM PREVIOUS YEAR

PROJECT ADDED TO PIPE REPLACEMENT PLAN