

Community MT Lead Service Line Inventory (LSL) Technical Assistance

Utility Solutions Zoot North Star Public Water System Gallatin County, Montana

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Water

Purpose

Allied Engineering Services, Inc (AESI) supported the Utility Solutions Zoot North Star Public Water System to complete a preliminary Lead Service Line (LSL) inventory for the Montana Department of Commerce and Montana Department of Environmental Quality (MDEQ). Throughout the inventory, AESI collaborated with the Zoot North Star lead operator, Louie Cevasco (louie@fcwsd.org) to complete the survey.

The primary purpose of the LSL inventory is to identify and inventory the material of all service line pipes and connections, with particular attention to service lines constructed with lead material. The goal of this memo is to summarize the data collected from the Public Water System service locations and to include any assumptions during the completion of the LSL inventory. Data collection included the history of the water system, residential layout, current water sources, and available utility documents/knowledge. This memo details the methodology that was developed by AESI to complete the LSL inventory for the Zoot North Star Public Water System and any applicable assumptions made.

AESI followed guidance outlined by the Montana Department of Environmental Quality in “MT Guidance for Developing and Maintaining a Service Line Inventory” (Montana Department of Environmental Quality, 2022) and the Environmental Protection Agency (EPA) in “Guidance for Developing and Maintaining a Service Line Inventory” (United States Environmental Protection Agency, 2022).

Background

The Four Corners County Water and Sewer District (FCWSD) was established in 2003 to oversee water and wastewater services in Four Corners, Montana. The District acquired Utility Solutions’ assets which provide service to both the Four Corners District and the Elk Grove Subdivision. As illustrated in Figure 1, the Utility Solutions Zoot North Star Public Water System (PWS) is located approximately 7 miles west of Bozeman in the Four Corners area. The water system is sourced from six groundwater wells, two common headers, three treatment plants, two above-ground storage tanks, two pumping facilities, and three pressure control facilities (Campbell, 2012). The system is served by approximately 57 miles of distribution mains and currently provides service to 2,260 connections.

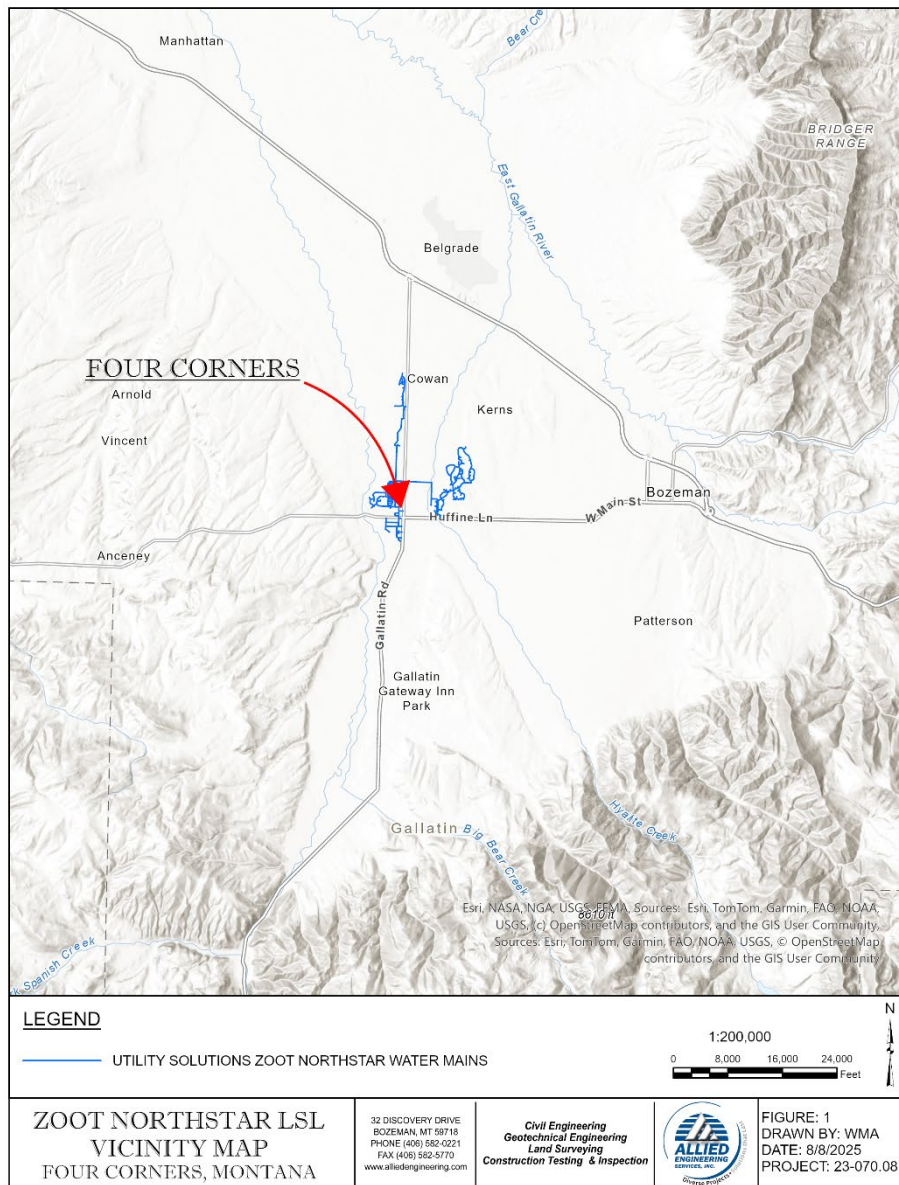


Figure 1 – Project Vicinity Map

A significant portion of the Four Corners community has been developed in recent years, reflecting the broader growth trend in Gallatin County. Currently, there are over 110 subdivisions and condominium complexes within the Four Corners area. For the purposes of the Lead Service Line (LSL) inventory, the Community System Zoot North Star was categorized based on subdivision development dates as shown in Figure 2 below. All evaluated subdivisions and condominiums within the Four Corners Water and Sewer District were constructed after 1988, with the majority of development occurring after 2000.

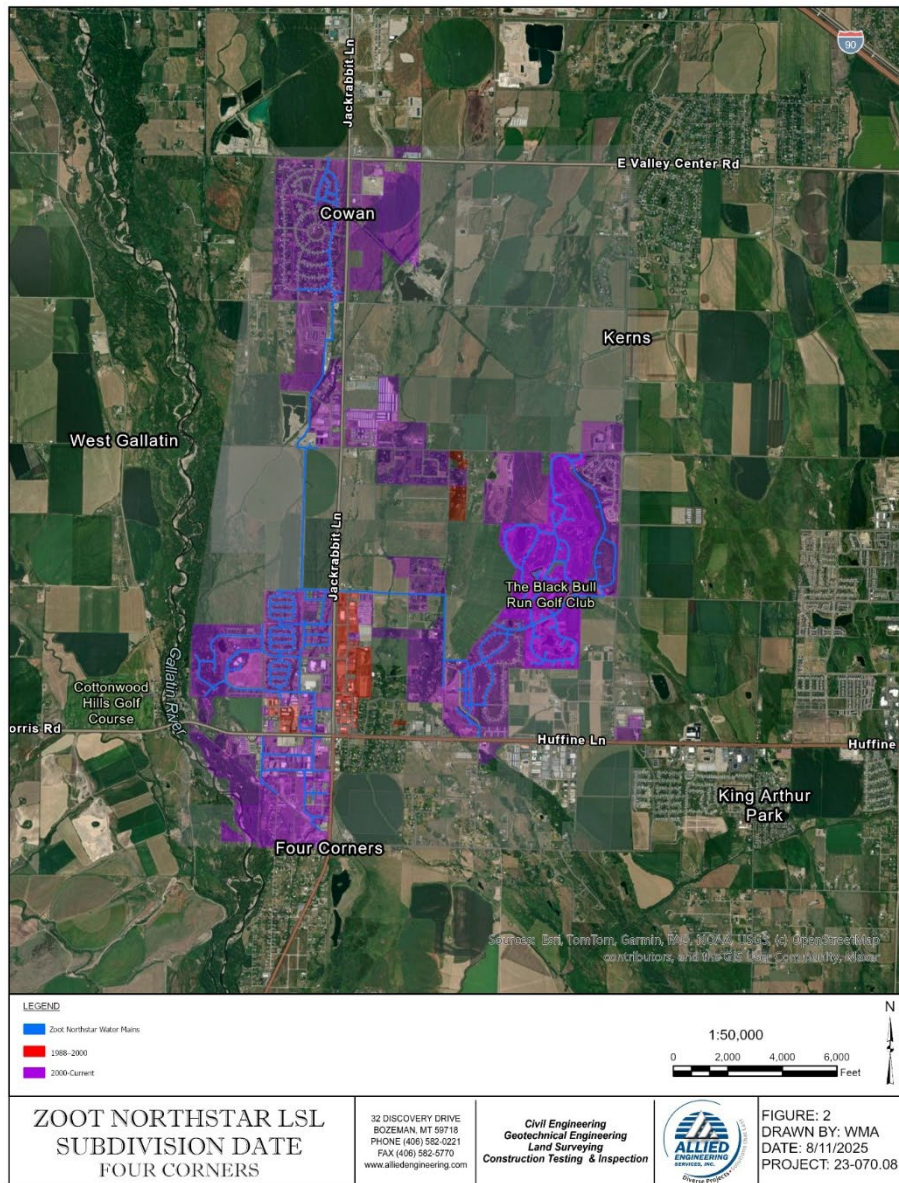


Figure 2 – Four Corners Subdivision Construction Date

Summary of Inventory Results

Table 1 - LSL Inventory Summary below summarizes the results of the LSL inventory investigation.

Table 1 - LSL Inventory Summary

Service Line Material Classification	Definition	Total Number of Service Lines (REQUIRED to be reported under the LCRR)
Lead	Any portion of the service line is known to be made of lead.	0
Galvanized Requiring Replacement (GRR)	The service line is not made of lead, but a portion is galvanized and the system is unable to demonstrate that the galvanized line was never downstream of a lead service line.	0
Non-Lead	All portions of the service line are known NOT to be lead or GRR through an evidence-based record, method, or technique.	2243
Lead Status Unknown	The service line material is not known to be lead or GRR. For the entire service line or a portion of it (in cases of split ownership), there is not enough evidence to support material classification.	17
TOTAL		2,260

Data Sources, Analysis, and Assumptions

Due to both the amount of water service connections and the community's young age, the following sources were utilized to complete the LSL inventory as comprehensively as possible. The data sources used are summarized in Table 2 below.

Table 2 - Data Sources Summary

Data Source	Description
Federal, State, and Local Standards	EPA 1988 Lead and Copper Rule, MDEQ 1988 Lead Ban, and FCWSD 2019 Design Standards.
As-Built Construction Documents	Various subdivisions as-built documents.
Cadastral Construction Records	The initial deed dates for subdivided parcels were used to estimate the initial date of construction.
Historic Aerial Imagery	1995 and 2004 Google Earth Pro Aerial Imagery for construction date estimation.
Assumptions	Assumptions AESI made through the LSL process.

Federal, State, and Local Standards

To utilize records providing information about construction dates, we reviewed federal, state, and local standards and regulations regarding lead service lines. Under the June 1988 Lead and Copper Rule (LCR), the EPA banned the use of lead material in all public water systems. MDEQ was proactive in adopting this ban, putting legislation into place January of 1988. Therefore, any located service lines can be classified as “Non-Lead-Other” unless surveys or as-built documents from the Four Corners Water and Sewer Department indicate otherwise. The 17 sources listed as “Lead Status Unknown” were addresses from FCWSD that could not be located.

The Four Corners Water and Sewer department adopted the sixth edition of modifications to the Montana Public Works Standard Specifications in July of 2017. The FCWSD design standards require all residential water service pipe be $\frac{3}{4}$ ” minimum, made from IPS polyethylene pressure pipe, and conform to AWWA C901 (Four Corners Water & Sewer District, 2019). This design standard is the most current edition for the district. The fifth addition of modifications to the Montana Public Works Standard Specifications was used by Four Corners Water and Sewer District from 2006 to 2019 as a basis for their individual design criteria. The Utility Solutions Design Standards and Specifications Guide dated January 2006 required all residential water service lines be constructed with $\frac{3}{4}$ ” minimum diameter IPS polyethylene pressure pipe. Commercial water service stubs were to be 4-inch minimum or larger PVC (Four Corners Water & Sewer District, 2006).

As-Built Construction Documents

The Zoot North Star Public Water District provided as-built construction documents for 11 subdivisions, along with various additional communities and water main extensions. As noted previously, many of these documents pertain to more recently developed subdivisions. When applicable, the as-built records were incorporated into the inventory as a line of evidence, particularly if they specified the service line pipe material and/or diameter or referenced any of the standards mentioned above.

Cadastral Construction Records

Montana Cadastral is a digital mapping system that displays property parcel boundaries across Montana. The dataset includes detailed information on parcel lines, legal descriptions, ownership details, deed information, subdivision data, and land use or zoning classifications. Property addresses were queried to obtain deed dates and subdivision information. Using subdivision phases and their corresponding as-built drawings, pipe sizes and materials were assigned to specific property addresses for the inventory. Additionally, properties located on plots of land not associated with a subdivision were queried for deed dates to provide a conservative estimate of each parcel’s date of development.

Aerial Imagery

If a property lacked as-built drawings or a deed date in the Montana Cadastral system, Google Earth imagery was used to estimate the date of construction. Clear aerial imagery from 1995 and 2004 served as reference points. Properties not visible in the 2004 image were assigned a construction

date range of “2000–current” and designated pipe properties of “Non-Lead–Other.” The 1995 imagery represents the earliest discernible aerial imagery available. Structures visible in the 1995 imagery were cross-referenced with the FCWSD water distribution map to determine if they were serviced by the subject community system. See Appendix A for the FCWSD water distribution map. All structures absent from the 1995 imagery were classified as constructed between “1988–2000” with pipe properties assigned as “Non-Lead–Other.”



Figure 3 - 1995 Aerial Imagery taken from Google Earth Pro

AESI Assumptions

The following are assumptions about material classification, ownership, or other considerations made by AESI to complete the LSL inventory for the City of Belgrade.

1. Ownership is delineated at the property line according to the Four Corners Water and Sewer District (Four Corners Water & Sewer District, 2019). This means that most of the service lines are labeled as “combination” for the ownership because the city/public owns the “street side” and the property owns the “building side”.
2. The plumbing within the structure was stated as “unknown” unless there was a resident survey or alternative way to determine the material. This is not required for the inventory but rather to gather more information about the water system for future site sampling plans.
3. For addresses built after 1988 that do not have additional forms of evidence (construction documents, as-built records, etc.), the service line material on either “street side” or the “building side” of the service line was labeled as “non-lead-other.”

References

Campbell, B. (2012). *Utility Solutions Zoot North Star Public Water System*.

Four Corners Water & Sewer Department. (2006). *Modification to the MPWSS 5th Edition*.

Four Corners Water & Sewer District. (2019). *Design Standards and Specifications Guide*.

Montana Department of Environmental Quality. (2022). *MT Guidance for Developing and Maintaining a Service Line Inventory*.

United States Environmental Protection Agency. (2022). *Guidance for Developing and Maintaining a Service Line Inventory*.

Appendix A

1. Four Corners Water and Sewer District 2024 Water System Map.

