WYOMING LEAD SERVICE LINE PRIORITIZATION MAP METHODOLOGY REPORT

Developed for:

US Environmental Protection Agency

Community Solutions Teams Pilot Effort

Developed by:

Region 9 Environmental Finance Center at California State University, Sacramento housed in the Office of Water Programs

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Table of Contents

1.0 INTRODUCTION

This report outlines the development of a lead service line prioritization map that supports Wyoming water systems in inventorying and replacing lead service lines. Map creation was conducted as part the Environmental Protection Agency's (EPA's) Community Solutions Team (CST) pilot program, which involved partnering with the Environmental Finance Center (EFC) at California State University, Sacramento (Sacramento State) to assemble practitioners and support disadvantaged and underserved communities in addressing drinking water and wastewater infrastructure needs throughout the western United States.

As part of the CST pilot, staff from EPA Region 8 recommended that the EFC at Sacramento State help water systems in Sweetwater County, WY develop lead service line inventories. The project, however, expanded to cover all counties in WY. A particular task for this effort involved developing a geographic information system (GIS) map, which was generated using parcel-level data and relied on the construction dates of structures as a surrogate measure for assessing the potential presence of lead within water service lines. The analytical approach operated on the premise that older structures on parcels indicated a higher likelihood of lead presence, while more recently constructed buildings implied a reduced probability. The primary goal of this analysis was to identify areas where the presence of lead service lines was expected, primarily based on the age of structures. Such areas could then be prioritized by water systems for field verification and eventual removal of lead service lines.

This report provides a comprehensive overview of the data sources and formats, primarily obtained from the Wyoming Department of Revenue. The key datasets included property assessment Information, which offers parcel identification, ownership details, and construction dates, and a parcel GIS shapefile, which provides essential spatial information for parcel boundaries. Additionally, two socioeconomic datasets were incorporated, namely 2023 population density and median household income (2017-2021, 5-Year) data, to enhance the analysis by identifying areas with specific demographic profiles and income levels.

The methodology section discusses critical data attributes, such as parcel identification and structure build date. It also presents a step-by-step account of the data processing and analysis, ensuring transparency and replicability. Key steps include merging attributes, data cleaning for accuracy, assigning single structure build dates, determining the number of structures or improvements on each parcel, and merging this data with GIS files. An optional addition incorporates socioeconomic parameters such as population density and median household income.

Furthermore, the report addresses two limitations, primarily related to assumptions in assigning build dates. In cases where parcels have only one structure, the assigned date may not accurately reflect the construction date. Similarly, when parcels have multiple build dates due to improvements or multiple structures, the oldest date is considered, potentially underestimating the actual age in some cases.

Finally, the report discusses the deliverables and data formats generated as a result of the data analysis in this project. It provides a detailed description of various files and datasets created and distributed to project stakeholders.

2.0 ACTIVITIES AND OUTCOMES

This section describes the datasets crucial for achieving the goal of this analysis, which is to assess the likelihood of lead service line (LSL) presence based on the age of structures constructed on land parcels or improvements made to such structures.

The purpose of the data collection and assembly was to link historical parcel-level construction and improvement dates of structures with their precise geographical coordinates. The analysis relies on the following datasets:

- Property Assessment Information Database (Wyoming Department of Revenue 2023a)
- Parcel GIS Shapefile (Wyoming Department of Revenue 2023b)
- Population Density Online Database (Esri Demographics 2023)
- Median Household Income Table (2017-2021, 5-Year) (Steven Manson et al. 2022)

Details describing each set of data, their sources, formatting, and attributes are provided below.

2.1 Property Assessment Information Database

This dataset is comprised of computer-assisted mass appraisal (CAMA) information, including unique parcel account numbers, identification numbers (IDs) and addresses, as well as ownership details and age of building construction/improvements. The data used in the analysis is derived from the last completed assessment in the 2023 tax year (Wyoming Department of Revenue 2023a). Typically, the assessment data available for download is collected around June 1 and encompasses assessment information for the previous calendar year.

The data is in a Microsoft Access 2003 database, compressed for a smaller download. Most tables can be linked by joining the JURISDICTION, ACCOUNTNO, and TAXYEAR fields. Any questions or concerns regarding the data should be directed to the individual county Assessor's Department for consideration.

Source and formatting properties for this dataset are as follows:

- **Data Access (URL):** https://wyo-prop-div.wyo.gov/assessment-data-download
- **Data Source:** Wyoming Department of Revenue
- **Resolution:** Parcel
- **Update Frequency:** Annual
- **Data Format:** Microsoft Access Database (.db)
- **Data Structure:** Tables, fields, and relationships between tables
- **Export/Import Formats:** Support exporting data in various file formats, such as CSV and Excel.

Table 1 presents an inventory of tables used from the property assessment information access database (Wyoming Department of Revenue 2023a). The "Attribute Name" column provides field names that exist within the department's database tables. The "Attribute Alias" column provides corresponding names of these attributes in the final analysis GIS products, such as prioritization maps and Excel spreadsheets created by the EFC at Sacramento State for the lead service line prioritization map effort.

Table 1. Property Assessment Information Data Attributes

Database Table	Attribute Name*	Attribute Alias**	Description
ACCOUNT	*ACCOUNTNO*	Account Number	Seven-digit number used by the Assessor's Office to identify a parcel
	PARCELNO	Parcel ID	14-digit number, based on Township and Range, used to identify a parcel
	JURISDICTION	County	County in which parcel is located
	ACCTTYPE	Parcel Classification	Refers to the categorization or type of parcel (e.g., residential, agricultural, industrial, commercial).
PROPERTY ADDRESS	*ACCOUNTNO*	Account Number	Seven-digit number used by the Assessor's Office to identify a parcel
	PARCELNO	Parcel ID	14-digit number, based on Township and Range, used to identify a parcel
	JURISDICTION	County	County in which parcel is located
	STREETNO	Street Number	Street number of the parcel address
	STREETNAME	Street Name	Street name of the parcel address
	STREETTYPE	Street Type	Street type of parcel address
	UNITENAME	Unit Name	Unit name of the parcel address
	CITY	-	City in which parcel is located
	ZIPCODE	Zip code	Zip code of the parcel address
IMPROVEMENT	*ACCOUNTNO*	Account Number	Seven-digit number used by the Assessor's Office to identify a parcel
	PARCELNO	Parcel ID	14-digit number, based on Township and Range, used to identify a parcel
	JURISDICTION	County	County in which parcel is located
	BLTASYEARBUILT	Build Date (Yr.)	Refers to the latest recorded year of modification for a structure due to applied improvements Each construction or improvement on a specific parcel is documented as a distinct and separate entry within the dataset. For instance, if Parcel ID XXXX has three recorded improvement dates, the Improvement table will display three separate rows, each providing detailed information about a specific improvement event.

** Field names used in database tables. Names shown in italics indicate unique identifiers to link various tables. See Section 3.1.1 for details.*

***Corresponding names in the final analysis GIS products (see Section 5 of this report).*

2.2 Parcel GIS Shapefile

This dataset contains location information collected and published each June and is derived from the county assessor's GIS data (Wyoming Department of Revenue 2023b). It offers spatial details like coordinates and polygon outlines defining parcel boundaries. It also includes parcel identification numbers (IDs), which serve as a way to link parcel shapefiles with property assessment data.

Any questions regarding this data should be directed to the individual county assessor for assistance.

Source and formatting properties for this dataset are as follows:

- **Data Access (URL):** https://wyo-prop-div.maps.arcgis.com/home/index.html
- **Data Source:** Wyoming Department of Revenue
- **Resolution:** Parcel
- **Update Frequency:** Annual
- **Data Format:** Shapefile (.shp)
- **Data Structure:** Records and fields for attribute data; Geometric shapes for spatial data
- **Export/Import Formats:** Support for export to various formats, such as KML and GeoJSON, and import from other GIS data sources

Table 1 lists relevant field names in the parcel GIS shapefile dataset that geolocates parcels across all 23 counties in Wyoming. Field names in italics signify unique identifiers that link property assessment information with parcel location shapefiles. The "Attribute Alias" column lists the corresponding names of these field names in the final analysis GIS products, such as Prioritization maps and Excel spreadsheets created by the EFC at EFC at Sacramento State for the lead service line prioritization map effort.

Table 2. Parcel GIS Shapefile Data Attributes

Attribute Name*	Attribute Alias**	Data Type	Description
OBJECTID	OBJECT ID	Object ID	A unique, not null integer field used to identify rows in tables in a geodatabase uniquely
Shape	Shape	Geometry	-
parcelnb	Parcel ID	Text	14-digit number, based on Township and Range, used to identify a parcel
accountno	Account Number	Text	Seven-digit number used by the Assessor's Office to identify a parcel
jurisdicti	County	Text	County in which parcel is located

* *Field names used in dataset. Names shown in italics indicate unique identifiers to link various tables.*

*** Corresponding names in the final analysis GIS products (see Section 5 of this report).*

2.3 Population Density Online Database

This dataset was obtained from Esri Demographics (2023), the "Urban and Rural Population Dot Density Patterns in the US (2020 Census)" dataset, which includes data from the 2020 US Census. Population density refers to the regional population count divided by total regional sq. kilometers/miles.

Note that multiple sources beyond the Esri version used offer similar datasets. This dataset was selected for the WY LSL mapping effort based on availability and compatibility with the mapping program's analytical framework and software infrastructure. Future analytical mapping effort should choose sources that best align with the project's specific needs. Source and formatting properties for the dataset used are as follows:

- **Data Access (URL):** ArcGIS Enrichment services (accessed via Esri ArcGIS products)
- **Data Source:** ESRI Demographics
- **Resolution:** Variable
- **Update Frequency:** Annual
- **Data Format:** Geospatial Calculation
- **Data Structure:** Records and fields for attribute data; Geometric shapes for spatial data
- **Export/Import Formats:** Support for export to various formats (e.g., KML, GeoJSON) and import from other GIS data sources

Attribute information for the population density dataset can be accessed through the following link: https://storymaps.arcgis.com/stories/dd6c5388d48c448798613778644a1eaa

2.4 Median Household Income Table

This dataset was collected and published by the American Community Survey (ACS, Steven Manson et al. 2022). The data represents the average median income earned by households in the United States between 2017 and 2021. It serves as a key socioeconomic indicator, reflecting households' financial well-being and aiding in policy and economic analysis.

Note that multiple sources beyond ACS offer similar datasets. The ACS dataset was selected for the WY LSL mapping effort based on availability and compatibility with the mapping program's analytical framework and software infrastructure. Future analytical mapping effort should choose sources that best align with the project's specific needs. Source and formatting properties for the dataset used are as follows:

- **Data Access (URL):** https://www.nhgis.org/
- **Data Source:** ACS
- **Resolution:** Census Track
- **Update Frequency:** 5 Years
- **Data Format:** Geospatial; Tabular
- **Data Structure:** Records and fields for attribute data; Geometric shapes for spatial data
- **Export/Import Formats:** Support for export to various formats (e.g., KML, GeoJSON) and import from other GIS data sources

Attribute information for the ACS 5-Year median household income estimates (2017-2021) can be accessed through the following link: https://www.census.gov/programs-surveys/acs/technical-documentation/table-and-geography-changes/2021/5-year.html

3.0 METHODOLOGY

This section details the crucial steps to process the property assessment information dataset for incorporation into the GIS Shapefiles.

3.1 Preprocessing the Property Assessment Information Dataset

Two main steps were followed to preprocess the property assessment information data:

a) **Attribute Merging:** Merge attributes from multiple tables into a single table for easy export to Excel for further analysis.

b) **Data Cleaning:** Clean the property assessment information to ensure data accuracy and consistency before integrating it with the parcel polygons in the Parcel GIS Shapefile.

Each step is described below.

3.1.1 Attribute Merging

Data from the three property assessment information tables (ACCOUNT, PROPERTYADDRESS, and IMPROVEMENT) were merged to create a single dataset that could be integrated with the other datasets. To do this, one county was processed at a time using parcel numbers (PARCELNO) as unique data identifiers.

Attributes from the ACCOUNT and PROPERTYADDRESS tables were merged first using an INNER JOIN operation in Microsoft Access 2003. This concatenated table was then merged with the IMPROVEMENT table's attributes to create a single parcel information dataset for each county, consisting of the following data attributes:

- ACCOUNT NO
- PARCELNO
- JURISDICTION
- STREETNO
- STREETNAME
- STREETTYPE
- UNITNAME
- CITY
- ZIPCODE
- BLTASYEARBUILT

The resulting county tables were then exported as separate worksheets into an Excel workbook.

If future attribute integration is to be performed for multiple counties using batch processing (i.e., all counties at once), it is recommended to establish a customized identifier, which could be named "Unique ID". This "Unique ID" could be created by combining the ACCOUNTNO, PARCELNO, and JURISDICTION data for each parcel. This can be done simply concatenating the data, with a period as the separator. For example, if a parcel has the following attributes: ACCOUNTNO: R0003552, PARCELNO: 47922020600300, and JURISDICTION: WASHAKIE, the resulting customized Unique ID would be R0003552.WASHAKIE.47922020600300. This Unique ID system provides a robust and standardized identifier for streamlined integration across various datasets and counties, ensuring data accuracy and consistency.

3.1.2 Data Cleaning

Cleaning the property assessment information dataset was conducted manually, using the merged parcel data for each county, with assistance from Excel's filter function. The objective was to refine the data by removing entries that lacked essential information. This was necessary for linking property assessment data to parcel polygon shapefiles in ArcGIS and determining structure build dates, which were used to estimate

the likelihood of LSL occurrence. The cleaning process involved dividing the data into three distinct categories where relevant data was missing:

- **Category One:** This category included property accounts that lacked both Structure Build Dates and parcel identification numbers. Data removed within this category can be found in worksheet UMP.01 within the "Unmapped Property Parcels" Excel file delivered as part of the final data delivery.

- **Category Two:** This category included property accounts with inaccurate and erroneous Structure Build Dates. Data removed within this category can be found in worksheet UMP.02, located in the "Unmapped Property Parcels" Excel file delivered as part of the final data delivery.

- **Category Three:** This category included property accounts sourced from county assessor offices in Wyoming. Although these accounts contained parcel details, including Structure Build Dates and Parcel Classification, they lacked the crucial Parcel Identification Numbers required to link them to Wyoming's Parcel geospatial shapefile. Data removed from this category can be found in worksheet UMP.03, located in the "Unmapped Property Parcels" Excel file delivered as part of the final data delivery.

3.2 Analyzing Parcel Build Date Data

The purpose of this data analysis was twofold. The first objective was to determine the number of structures or improvements built on a parcel. The second objective was to assign a singular structure build date to each parcel.

This analysis relied on the ACCOUNT-PROPERTYADDRESS-IMPROVEMENT merged single dataset, which was structured so that each row contained details about a single construction or improvement on a given parcel. For example, if a designated parcel had undergone three improvements with distinct construction dates, the dataset included three distinct rows, each dedicated to recording a specific improvement. The analytical steps were as follows:

1. **Column Selection and Pivot Table Creation:** the attribute columns in the consolidated parcel tables for ACCOUNT, PROPERTYADDRESS, and IMPROVEMENT were selected. Then, a pivot table was inserted to facilitate further analysis.

2. **Pivot Table Configuration:** The "PARCELNO" was chosen and placed in the rows section in the pivot table. This arrangement organized the Table by unique PARCELNO values.

3. **Counting Structures/Improvements:** In the pivot table's values section, the "PARCELNO" column was introduced, and the values were summarized by selecting "count." As a result, the "#Structures/Improvements per Parcel" attribute was generated, providing insight into the number of constructions or improvements executed within each parcel, with each count corresponding to the unique PARCELNO rows representing a single construction or improvement on a given parcel. This attribute offered a clear and concise representation of the number of structures or improvements associated with individual parcels, aiding in comprehensive data analysis and assessment.

4. **Determining Build Dates:** In the pivot table's values section, the "PARCELNO" column was reintroduced, and the values were summarized by selecting "count" This time. The values were summarized by selecting "Minimum." This step assigned the lowest value corresponding to the oldest construction year to the "Build Date (Yr.)" attribute. This attribute represented the conservative estimate of the oldest construction year, reflecting the "parcel date."

5. **Importing Additional Attributes to Pivot Table:** the INDEX & MATCH function was utilized To import the remaining attributes (e.g., Parcel classification, Account Number, Jurisdiction) from the consolidated tables into the pivot tables.

The outcome of these analytical steps yielded county-level pivot tables with the following parcel attributes: ACCOUNTNO (Account Number), PARCELNO (Parcel Number), ACCTTYPE (Parcel Classification), STREETNO (Street Number), STREETNAME (Street Name), STREETTYPE (Street Type), UNITNAME (Unit Name), City, ZIPCODE (Zip Code), Build Date (Yr.), and # Structure Constructions/Improvements.

3.3 Incorporating Parcel Build Date Data into Parcel GIS Shapefiles

The final phase of analysis involved merging the county-level parcel pivot tables with the parcel GIS file, which provides geographical information for each parcel's location. This merging process, like all previous analytical steps, is carried out on a county-specific basis.

These steps require a parcel-by-parcel analysis because the Parcel ID identifier is the most consistent and reliable attribute in the GIS file. Parcel ID was used as the key to ensure a reliable merging process. It's important to note that Parcel IDs are not necessarily unique across counties, especially when conducting batch analyses. Therefore, conducting the analysis parcel-by-parcel is essential to maintain accuracy and consistency throughout the process.

3.3.1 Splitting the Parcel GIS Shapefile by County

The "Split by Attribute (Analysis)" Geoprocessing tool was used to divide the Parcel GIS shapefile into distinct shapefiles for each of the 23 counties. This step is essential to facilitate subsequent parcel-level analyses.

3.3.2 Converting Parcel Pivot Tables from Excel to .dbf Format

Employed the "Excel to Table" Geoprocessing tool to convert parcel pivot tables from Excel to .dbf format. Imported these tables into ArcGIS for further processing.

3.3.3 Merging Data Attributes with the Parcel GIS Shapefile

- Combined data attributes from the parcel .dbf tables with the Parcel GIS Shapefile using the "Add Join" Data Management Geoprocessing tool. Employed the "PARCELNO" attribute from the Parcel Pivot Table and the "parcelnb" attribute from the Parcel GIS Shapefile as the Join Table fields for linking.

- The option "Keep All Target Features" was selected. This feature enabled the identification of parcel polygons in the parcel shapefiles that do not have corresponding entries in the parcel pivot tables derived from the ACCOUNT-PROPERTYADDRESS consolidated tables.

- To isolate these unassociated parcels, the "Select by Attribute" Geoprocessing tool was selected to identify parcels with <NULL> values in a joined field, such as "Build Date (Yr.)" or "# Structure(s)/Improvement(s)." The final data delivery will include These unassociated parcels in the "IS NULL" shapefile.

3.3.4 Exporting and Managing IS NULL Parcels

- The "IS NULL" parcels were exported into a separate shapefile for record-keeping purposes.

- Following export, "IS NULL" unassociated parcels were deleted from the attribute table, ensuring that the retained parcels contained associated data for "Build Date (Yr.)," "# Structure(s)/Improvement(s)," "Parcel Classification," and "Parcel Address Fields."

3.3.5 Identifying Parcels Not Included in Parcel Shapefiles

This additional section provides guidance on identifying parcels in the Department of Revenue's database but not in the Parcel Shapefiles, enhancing data completeness and accuracy.

The following steps were followed to determine parcels that are listed within Wyoming's Department of Revenue's Parcel Information Database but have not been included in Wyoming's Parcel Shapefiles with geospatial information:

- The attribute table of the parcel GIS shapefiles, which include merged parcel data attributes, was compared with the parcels in the parcel pivot table.
- Conditional formatting in Excel was utilized to highlight unique parcel numbers between the compared datasets.
- The unique parcels highlighted through this process represent those listed within Wyoming's Department of Revenue's Parcel Information Database but have not been included in Wyoming's Parcel Shapefiles with geospatial information. These unique highlighted parcels can be found in worksheet UMP.04, located in the "Unmapped Property Parcels" Excel file delivered as part of the final data delivery.

3.3.6 Data Visualization and Symbology

The "Build Date (Year)" field in the parcel GIS shapefiles that incorporated merged parcel data attributes was classified using the natural breaks classification method and represented using graduated colors. The decision-makers who conduct a future reanalysis within the framework of the project's goals and objectives should decide the selection of specific year intervals for the "Build Date (Year)" field and classification method.

3.3.7 Adding Socioeconomic Parameters (Optional)

This analysis included the following steps to augment the analysis with two socioeconomic datasets. This step was done to identify hotspot areas with a high likelihood of LSL availability, a high concentration of demographics, and low median household incomes.

It's important to note that this step is optional for any future reanalysis.

Adding 2023 Population Density Data

To add 2023 population density data, follow these instructions using the Enrich dataset tool in ArcGIS Pro:

- Access the "Enrich" geoprocessing tool in ArcGIS Pro.
- Choose the parcel GIS shapefile containing parcel build date attributes as the input feature.
- In the "Variables" option, select "Population," then choose "Common Population Variables."
- Specifically, select "2023 Population Density" from the available variables.

Please note that this process requires ArcGIS credits to add 2023 population density data using the Enrich dataset tool in ArcGIS Pro. Additionally, it's worth mentioning that alternative sources of 2023 population density data can be equally reliable and viable for your analysis. Depending on your specific needs and resource availability, you may explore other data sources that suit your project's requirements.

Adding Median Household Income (2017-2021, 5-Year)

The following steps were taken to access ACS Median Household Income Data:

- The ACS Median Household Income Data was accessed from the source https://www.nhgis.org/.

- Two data types were obtained: (1) An Excel file containing Median household income data by census tract. The source name of the field displaying median household income data was AO0IE001, and (2) a shapefile of the census tracts.
- The "add join" geoprocessing tool incorporated the median household income values from the Excel files into their corresponding census-track shapefiles. The "GISJOIN" field served as the linking field for this operation.
- After obtaining a GIS shapefile of census tracks with joined median household income estimates, the "Select by Location" tool was employed. The "intersect" option was chosen to select and integrate the median household data values into the Parcel GIS Shapefile containing build date data.

Following these steps, the ACS Median Household Income data was successfully accessed, integrated, and enriched within the analysis from the specified source.

4.0 ASSUMPTIONS AND LIMITATIONS

There are two limitations to this analysis. Both of these limitations stem from assumptions made in determining the age of parcel fields using the proxy field "Build Date (Year)," which was derived from the "BLTASYEARBUILT" field in the property assessment database. These assumptions are as follows:

- In cases where a parcel has only one structure, the "Build Date (Year)" may not necessarily reflect the actual construction date of the structure but rather the date of the first improvement made to that structure. This discrepancy arises from how and what data were collected in the "BLTASYEARBUILT" field within the "IMPROVEMENT" table in the Property Assessment Information Data. To address this issue, the State of Wyoming is actively working on documenting the original construction dates.
- When a parcel has multiple build dates, whether due to multiple improvements on a single structure or the construction of multiple structures on the same parcel, the oldest date is considered to provide a conservative estimate of the parcel's "age."

As a result, while the parcel build dates may not be entirely accurate, as improvements can occur years after the initial construction of a structure, they are sufficiently accurate to assess the likelihood of LSL availability in most cases, except for parcels with build dates close to 1986 when lead pipes were banned.

5.0 LSL ANALYSIS PRODUCTS

The data analysis led to the creation of the following delivery packages, which were provided to the EPA CST Team and EPA Region 8 staff.

The deliverables were organized and distributed in the following formats:

- **ArcGIS Pro Package File (.aprx):** This project file can be opened locally using ArcGIS Pro. It includes the file geodatabase and maintains the data, as well as the symbology formatting and settings established by OWP. This file is intended for those using ArcGIS Pro as their software environment.
- **File Geodatabase (.gdb):** This folder-based geodatabase stores all the relevant products and items submitted. It can be accessed using Esri ArcMap. This file is intended for users who opt for software environments other than ArcGIS Pro.
- **Shapefile (.shp):** These geospatial vector data store all the relevant products and items submitted. They are made available to provide accessibility via non-proprietary Esri Software, such as QGIS.
- **Excel Worksheet (.xlxs):** A worksheet that describes and lists parcels excluded from the analysis or not mapped in the final LSL Prioritization ma. These specific parcels are also accessible as dBASE tables within the GIS Shapefiles. Including them in an Excel worksheet is a redundancy measure.

Below is a compilation of the submitted Analysis deliverables, along with pertinent information and details associated with each:

5.1 Wyoming County Boundaries

- **Shapefile Name:** WY_County_Boundaries
- **Shapefile Alias:** County Boundaries
- **File Type:** Shapefile (.shp)
- **File Description:** This shapefile comprises the administrative boundaries of the 23 counties in Wyoming. It provides essential geographic information for the state and serves as a foundational dataset for various spatial analyses, planning, and mapping activities. The dataset delineates the spatial extent and boundaries of each county within Wyoming.
- **Attribute Name and Aliases:**

Attribute Name	Attribute Alias (GIS)[1]	Attribute Name (Database)[2]
County	County	Jurisdiction

5.2 Wyoming Lead Service Line Prioritization Map

- **Shapefile Name:** WY_Parcel_BuildDate_withAg
- **Shapefile Alias:** Wyoming Lead Service Line Prioritization Map
- **File Type:** Shapefile (.shp)

[1] Refers to the attribute naming alias in the delivered analysis products in the GIS data delivery packages

[2] Refers to the attribute name in the Property Assessment Information Database (if available)

- **File Description:** The Wyoming Lead Service Line Prioritization Map employs parcel-level data (all parcel classifications) using structure build dates as a proxy for evaluating the potential existence of lead within water service lines. In this framework, an older structure on a parcel corresponds to a higher likelihood of lead presence in the water service lines. In contrast, more recent build dates indicate a reduced probability. The primary objective of the map is to identify and prioritize areas in Wyoming where the prevalence of lead service lines is anticipated, using the age of structures as the determining factor.

- **Attribute Names and Aliases:**

Attribute Name	Attribute Alias (GIS)	Attribute Name (Database)
accountno	Account Number	ACCOUNTNO
pidn	Parcel ID	PARCELNO
AccountClass	Parcel Classification	ACCTTYPE
STREETNO	Street Number	STREETNO
STREETNAME	Street Name	STREETNAME
STREETTYPE	Street Type	STREETTYPE
UnitName	Unit Name	UNITNAME
Zipcode	Zip Code	ZIPCODE
County	County	JURISDICTION
BuildDateYr	Build Date (Yr.)	BLTASYEARBUILT
StructureImprovNo	# Structure/Improvement(s)	NA, Calculated VIA Analysis
MHI2021_ACS5Yr	MHI (2017-2021, 5-Yr)	NA
PopDens2023	2023 Population Density	NA

5.3 Wyoming Lead Service Line Prioritization Map (Excluding Agricultural Parcels)

- **Shapefile Name:** WY_Parcel_BuildDate_withoutAg

- **Shapefile Alias:** Wyoming Lead Service Line Prioritization Map (Excluding Agricultural Parcels)

- **File Type:** Shapefile (.shp)

- **File Description:** The Wyoming Lead Service Line Prioritization Map employs parcel-level data (excluding agricultural parcels) using structure build dates as a proxy for evaluating the potential existence of lead within water service lines. In this framework, an older structure on a parcel corresponds to a higher likelihood of lead presence in the water service lines. In contrast, more recent build dates indicate a reduced probability. The primary objective of the map is to identify and prioritize areas in Wyoming where the prevalence of lead service lines is anticipated, using the age of structures as the determining factor.

- **Attribute Names and Aliases:**

Attribute Name	Attribute Alias (GIS)	Attribute Name (Database)
accountno	Account Number	ACCOUNTNO
pidn	Parcel ID	PARCELNO
AccountClass	Parcel Classification	ACCTTYPE
STREETNO	Street Number	STREETNO

Attribute Name	Attribute Alias (GIS)	Attribute Name (Database)
STREETNAME	Street Name	STREETNAME
STREETTYPE	Street Type	STREETTYPE
UnitName	Unit Name	UNITNAME
Zipcode	Zip Code	ZIPCODE
County	County	JURISDICTION
BuildDateYr	Build Date (Yr.)	BLTASYEARBUILT
StructureImprovNo	# Structure/Improvement(s)	NA, Calculated VIA Analysis
MHI2021_ACS5Yr	MHI (2017-2021, 5-Yr)	NA
PopDens2023	2023 Population Density	NA

5.4 Unrecorded Parcels ("IS NULL" Parcels)

- **Shapefile Name:** WY_Parcel_ISNULL
- **Shapefile Alias:** "IS NULL" Parcels
- **File Type:** Shapefile (.shp)
- **File Description:** This shapefile includes parcels in Wyoming that are geographically mapped in the Parcel GIS Shapefile but have no records in the Property Assessment Information Database. The absence of a parcel in the database can be attributed to various factors, including the lack of structures on a parcel or unique parcel classifications. This data highlights parcels that may require further attention or investigation due to their unrecorded status in the property assessment database.
- **Attribute Names and Aliases:**

Attribute Name	Attribute Alias (GIS)	Attribute Name (Database)
accountno	Account Number	ACCOUNTNO
pidn	Parcel ID	PARCELNO
County	County	JURISDICTION

5.5 Unmapped Property Accounts for LSL Analysis - UMP.01

- **Shapefile Name:** UMP_01
- **Shapefile Alias:** UMP.01
- **File Type:** dBase database file (.dbf), Microsoft Excel (.xlsx)
- **File Description:** Table containing property accounts that lack essential information required for Lead Service Line (LSL) analysis. Specifically, the missing data includes Parcel Identification Numbers, which are crucial for linking property assessment data to parcel polygon shapefiles in ArcGIS, and Structure Build Dates, which are necessary for estimating the likelihood of LSL availability. The dataset includes attributes such as Assessor Account Number, Account Classification, and Parcel Jurisdiction.
- **Attribute Names and Aliases:**

Attribute Name	Attribute Alias (GIS)	Attribute Name (Database)
accountno	Account Number	ACCOUNTNO
ACCTTYPE	Parcel Classification	ACCTTYPE
County	County	JURISDICTION

5.6 Unmapped Accounts with Erroneous Build Year Dates - UMP.02

- **Shapefile Name:** UMP_02
- **Shapefile Alias:** UMP.02
- **File Type:** dBase database file (.dbf), Microsoft Excel (.xlsx)
- **File Description:** Table containing unmapped accounts with Parcel Identification numbers removed from the analysis due to erroneous Build Year Date values. The dataset includes attributes such as Assessor Account Number, Parcel Identification Number, Parcel Address, Parcel Type, and Structure Build Date (Year) on the Parcel. It documents and manages accounts that have been excluded from mapping and analysis processes due to data quality issues related to the Build Year Date.
- **Attribute Names and Aliases:**

Attribute Name	Attribute Alias (GIS)	Attribute Name (Database)
accountno	Account Number	ACCOUNTNO
pidn	Parcel ID	PARCELNO
AccountClass	Parcel Classification	ACCTTYPE
STREETNO	Street Number	STREETNO
STREETNAME	Street Name	STREETNAME
STREETTYPE	Street Type	STREETTYPE
UnitName	Unit Name	UNITNAME
Zipcode	Zip Code	ZIPCODE
County	County	JURISDICTION
BuildDateYr	Build Date (Yr.)	BLTASYEARBUILT

5.7 Unmapped Accounts without Parcel Identification Numbers - UMP.03

- **Shapefile Name:** UMP_03
- **Shapefile Alias:** UMP.03
- **File Type:** dBase database file (.dbf), Microsoft Excel (.xlsx)
- **File Description:** Table containing unmapped accounts sourced from county assessor offices in Wyoming. These accounts contain essential parcel details, such as Structure Build Dates and Parcel Type, but lack the Parcel Identification Numbers required for mapping with Wyoming's Parcel geospatial shapefiles. The dataset includes attributes such as Assessor Account Number, Parcel Address, Parcel Type, and Structure Build Date (Year).
- **Attribute Names and Aliases:**

Attribute Name	Attribute Alias (GIS)	Attribute Name (Database)
accountno	Account Number	ACCOUNTNO

Attribute Name	Attribute Alias (GIS)	Attribute Name (Database)
AccountClass	Parcel Classification	ACCTTYPE
STREETNO	Street Number	STREETNO
STREETNAME	Street Name	STREETNAME
STREETTYPE	Street Type	STREETTYPE
UnitName	Unit Name	UNITNAME
Zipcode	Zip Code	ZIPCODE
County	County	JURISDICTION
BuildDateYr	Build Date (Yr.)	BLTASYEARBUILT

5.8 Unmapped Accounts in Wyoming - UMP.04

- **Shapefile Name:** UMP_04
- **Shapefile Alias:** UMP.04
- **File Type: dBase database file (**.dbf), .xlsx
- **File Description:** Table containing unmapped accounts sourced from county assessor offices in Wyoming. These accounts lack Parcel Identification Numbers (PINs) for linking them to Wyoming's Parcel geospatial shapefiles. While they contain valuable parcel details, including Structure Build Dates and Parcel Type, the absence of a PIN hinders their inclusion in mapping processes.
- **Attribute Names and Aliases:**

Attribute Name	Attribute Alias (GIS)	Attribute Name (Database)
accountno	Account Number	ACCOUNTNO
pidn	Parcel ID	PARCELNO
AccountClass	Parcel Classification	ACCTTYPE
STREETNO	Street Number	STREETNO
STREETNAME	Street Name	STREETNAME
STREETTYPE	Street Type	STREETTYPE
UnitName	Unit Name	UNITNAME
Zipcode	Zip Code	ZIPCODE
County	County	JURISDICTION
BuildDateYr	Build Date (Yr.)	BLTASYEARBUILT
StructureImprovNo	# Structure/Improvement(s)	NA, Calculated via Analysis

6.0 REFERENCES

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