THE BOARD OF TRUSTEES OF THE GRANGER-HUNTER IMPROVEMENT DISTRICT

PUBLIC NOTICE is hereby given by the Board of Trustees that Granger-Hunter Improvement District will hold a Board Meeting at 3:00 p.m. on Tuesday, June 21, 2022, at its main office located at 2888 South 3600 West, West Valley City, Utah. Trustees and members of the public are able to attend this meeting in person or electronically through www.ghid.org.

Agenda

A. PUBLIC HEARING

1. Call to Order and Welcome Visitors
2. Verification of Legal Notification Requirements
3. Motion to Open Public Hearing
4. Staff Presentation
5. Questions by Trustees
6. Invitation for Public Comments
   (a) Acknowledgement of Public Comments Received
   (b) Comments from Visitors
7. Motion to Close Public Comment Session
8. Staff Response and Summary
9. Motion to Close Public Hearing

B. FINANCIAL MATTERS

1. Consider approval of RESOLUTION 6-21-22.1 ADOPTING AMENDED AND UPDATED IMPACT FEE FACILITIES PLANS AND IMPACT FEE ANALYSES FOR MUNICIPAL WATER AND SANITARY SEWER; ADOPTING AMENDED AND UPDATED IMPACT FEES FOR MUNICIPAL WATER AND SANITARY SEWER; ESTABLISHING CERTAIN POLICIES RELATED TO MUNICIPAL WATER AND SANITARY SEWER IMPACT FEES; ESTABLISHING SERVICE AREAS; AND/OR OTHER RELATED MATTERS.

C. GENERAL

1. Public Comments
2. Consider approval of the May 17, 2022 Board Meeting Minutes
3. Discuss potential conflicts of interest

D. OUR COMMUNITY

1. Consider approval of RESOLUTION 6-21-22.3 ADOPTING A DROUGHT CONTIGENCY PLAN FOR GRANGER-HUNTER IMPROVEMENT DISTRICT.

E. OUR TEAM

1. Consider approval of Member Agency Water Conservation Funding Agreement.

F. OUR OPERATIONS

1. Consider approval of the District's property, liability and auto insurance in the amount of $203,004.67 to Utah Local Governments Trust.
2. Review & discuss Financial Report for year end 2021 and May 2022
3. Review & discuss Paid Invoice Report for May 2022
4. Consider approval of RESOLUTION 6-21-22.2 ADOPTING GRANGER-HUNTER IMPROVEMENT DISTRICT DRINKING WATER SYSTEM AND WASTEWATER COLLECTION SYSTEM PLANS.
5. Consider approval of RESOLUTION 6-21-22.4 APPROVING AN APPLICATION FOR A UNITED STATE BUREAU OF RECLAMATION WATERSMART DROUGHT RESILIENCY PROJECT GRANT.
6. Consider approval of a Construction Contract to Vancon Inc. for the 20D: Kent Booster Pump Station Project in the amount of $17,174,996.00.

G. CLOSED SESSION

1. Strategy session to discuss the purchase of real property.

H. BOARD MEMBERS INPUT, REPORTS, FOLLOW-UP ITEMS OR QUESTIONS

I. CALENDAR

1. The next board meeting, if needed, will be July 19, 2022

PUBLIC HEARING

- RESOLUTION 6-21-22.1 APPROVAL

RESOLUTION NO. 6-21-22.1

A RESOLUTION ADOPTING AMENDED AND UPDATED IMPACT FEE FACILITIES PLANS AND IMPACT FEE ANALYSES FOR MUNICIPAL WATER AND SANITARY SEWER; ADOPTING AMENDED AND UPDATED IMPACT FEES FOR MUNICIPAL WATER AND SANITARY SEWER; ESTABLISHING CERTAIN POLICIES RELATED TO MUNICIPAL WATER AND SANITARY SEWER IMPACT FEES; ESTABLISHING SERVICE AREAS; AND RELATED MATTERS

WHEREAS, Granger-Hunter Improvement District (the "District") is a political subdivision of the State of Utah, duly authorized and organized under the provisions of Utah law, acting through its duly elected Board of Trustees (the "Board"); and

WHEREAS, the District has legal authority, pursuant to the Utah Impact Fee Act, Title 11, Chapter 36a Utah Code Annotated, as amended ("Impact Fees Act" or "Act"), to impose municipal water and sanitary sewer impact fees, as defined in the Act ("Impact Fees"), as a condition of development approval, which Impact Fees are imposed upon new development activity as a condition of development approval to mitigate the impact of new development on the District's municipal water and sanitary sewer infrastructure; and

WHEREAS, the District has historically assessed Impact Fees as a condition precedent to development approval in order to assign capital infrastructure costs to new development in an equitable and proportionate manner; and

WHEREAS, the District properly noticed its intent to prepare amended and updated Impact Fee Facilities Plans and amended and updated Impact Fee Analyses, as defined in Section 2 hereof, with respect to its municipal water and sanitary sewer systems; and

WHEREAS, the District has completed updated Impact Fee Facilities Plans and Impact Fee Analyses for both its municipal water and sanitary sewer systems in compliance with the applicable requirements of the Impact Fees Act; and

WHEREAS, in conformance with the requirements of the Act, a public hearing was convened by the Board on June 21, 2022, to hear public comment on the District's intent to amend and update its Impact Fee Facilities Plans and Impact Fee Analyses for its municipal water and sanitary sewer systems, and of the District's intent to adopt this Resolution; notice of said hearing being given at least fourteen (14) days before the date of said hearing by posting notice on the Utah Public Notice website, on the District's website, and the two public libraries within the District's service area. Copies of the Impact Fee Facilities Plans, Impact Fee Analyses, and the Impact Fee Enactment have been available for public review beginning June 2, 2022, on the District's website and at the public libraries listed below. In accordance with the Americans with Disabilities Act, the District will make reasonable accommodations to participants in the hearing. Requests for assistance can be made by calling (801) 968-3551 at least 48 hours in advance of the hearing to be attended.

Public Libraries:

West Valley Library
2880 W 3650 S
West Valley City, UT 84119
(801) 943-4636

Hunter Library
4740 W 4100 S
West Valley City, UT 84120
(801) 943-4636

WHEREAS, the Board has found and determined that it is in the best interest of the District to adopt the amended and restated Impact Fee Facilities Plans and amended and restated Impact Fee Analyses, and to impose its Municipal Water Impact Fee and Sanitary Sewer Impact Fee in conformance therewith pursuant to the Municipal Water Impact Fee Schedule and the Sanitary Sewer Impact Fee Schedule set forth herein;

NOW THEREFORE, BE IT HEREBY RESOLVED BY THE BOARD AS FOLLOWS:

SECTION 1. PURPOSE

This Impact Fee Resolution ("Resolution"), establishes the District's Municipal Water and Sanitary Sewer Impact Fee policies and procedures and conforms to the requirements of the §11-36a-401 et seq. of the Act. This Resolution supersedes and replaces, in their entirety, any prior impact fee resolutions related to District Municipal Water and Sanitary Sewer Impact Fees; provides a schedule of Municipal Water and Sanitary Sewer Impact Fees to be imposed for differing types of land-use development within the District, and sets forth directions for challenging, modifying and appealing the District's Municipal Water and Sanitary Sewer Impact Fees. This Resolution does not replace, supersede, or modify any resolution regarding Impact Fees unrelated to Municipal Water and Sanitary Sewer.

SECTION 2. DEFINITIONS

Words and phrases that are defined in the Act shall have the same definition in this Resolution, including, without limitation, the following:

1. "Impact Fee Facilities Plan" or "IFFP" means the District's Amended and Updated Impact Fee Facilities Plans which addresses its municipal water system and its sanitary sewer system, prepared in conformance with the requirements of Section 11-36a-301 of the Act. The Impact Fee Facilities Plans are attached hereto as a part of **Exhibit A** attached hereto.

2. "Development Activity" means any construction or expansion of building, structure or use, any change in use of building or structure, or any change in the use of land that creates additional demand and need for public facilities.

3. "Development Approval" means any written authorization from the City that authorizes the commencement of Development Activity (typically in the form of a building permit issued by a City's building department), within the District.

4. "City" means West Valley City, a political subdivision of the State of Utah, having jurisdictional authority over the commencement of Development Activity within the District.

5. "Impact Fee" means a payment of money imposed upon new Development Activity as a condition of development approval to mitigate the impact of the new development on public infrastructure. "Impact Fee" does not mean a tax, a special assessment, a hookup fee, a building permit fee, a fee for project improvements, or other reasonable permit or application fee.

6. "Impact Fee Analysis" or "IFA" means the District's written analyses which addresses its municipal water and sanitary sewer systems, prepared in conformance with the requirements of Section 11-36a-303 of the Act. The Impact Fee Analyses are attached hereto as a part of Exhibit A.

7. "Project Improvements" means site improvements and facilities that are: (i) planned and designed to provide service for development resulting from a Development Activity; and (ii) are necessary for the use and convenience of the occupants or users of said development resulting from a Development Activity. "Project Improvements" does not mean "System Improvements," as defined below.

8. "Proportionate Share" means the cost of public facility improvements that is roughly proportionate and reasonably related to the service demands and needs of any Development Activity.

9. "Public Facilities" includes, as applicable to this Resolution, the Municipal Water and Sanitary Sewer facilities of the District.

10. "Service Area" means a geographic area designated by the District on the basis of sound planning and engineering principles in which the District provides service, as set forth in Section 3 of this Resolution.

11. "System Improvements" means: (i) existing Public Facilities of the District identified in the IFFPs designed to provide services to the Service Area within the District at large, and (ii) future Public Facilities identified in the IFFPs that are intended to provide service to the Service Area within the District at large. "System Improvements" does not mean "Project Improvements," as defined above.

SECTION 3. DESIGNATION OF SERVICE AREA

The Service Area within which the Municipal Water and Sanitary Sewer Impact Fees levied hereby shall apply includes the entire area served by the District's Municipal Water or Sanitary Sewer systems.

SECTION 4. AMENDED AND UPDATED IMPACT FEE FACILITIES PLAN

1. Amended and Updated Impact Fee Facilities Plans. The IFFPs, included in Exhibit A, identify the existing level of service, establishes proposed levels of service, identifies any excess capacity to accommodate future growth at the proposed levels of service, identifies demands placed upon existing Public Facilities by new development activity at the proposed levels of service, and identifies the means by which the District will meet those growth demands. The District has considered all revenue sources to finance the impacts on System Improvements, including grants, bonds, inter-fund loans, impact fees and anticipated or accepted dedications of System Improvements. The District's plan for financing System Improvements establishes that Impact Fees are necessary to maintain a proposed level of service that complies with Subsection 11-36a-302(1)(b) or 11-36a-302(1)(c) of the Act. The IFFPs have been prepared based on reasonable growth assumptions for the Service Area, and analyzes the general demand characteristics of current and future users of the municipal water and sanitary sewer systems. Furthermore, the IFFPs identify the impact on System Improvements created by Development Activity and estimates the Proportionate Share of the costs of impacts on System Improvements that are reasonably related to new Development Activity. A copy of the IFFPs have been available for public inspection at least fourteen (14) days prior to the adoption of this Resolution.

2. Adoption of Amended and Updated IFFP. The Board hereby finds that the IFFPs, as contained in Exhibit A, are in conformance with the requirements of the Act and the same are hereby adopted and approved by the Board as the Municipal Water System and Sanitary Sewer System IFFPs for the Service Area.

SECTION 5. AMENDED AND UPDATED IMPACT FEE ANALYSIS

1. Amended and Updated Impact Fee Analysis.

(a) Executive Summary. A summary of the IFAs designed to be understood by a lay person (the "Executive Summary") are included in Exhibit A, and demonstrate the need for Impact Fees to be assessed on Development Activity. The Executive Summary has been available for public inspection at least fourteen (14) days prior to the adoption of this Resolution.

(b) Impact Fee Analysis. The IFAs identify the impacts on any existing capacity of the Public Facilities required by anticipated Development Activity and the anticipated impacts on System Improvements required by anticipated Development Activity to maintain the established level of service for each Public Facility; demonstrates how such anticipated impacts are reasonably related to the anticipated Development Activity; estimates the proportionate share of the costs for existing capacity that will be recouped and the costs of impacts on System Improvements that are reasonably related to the new Development Activity, and in conformance with the requirements of the Act identifies how the Impact Fees are calculated. Copies of the IFAs have been available for public inspection at least fourteen (14) days prior to the adoption of this Resolution.

(c) Proportionate Share Analysis. The District has prepared a Proportionate Share analysis which analyzes whether or not the proportionate share of the costs of Public Facilities is

reasonably related to new Development Activity. The Proportionate Share analysis identifies, as applicable: (i) the costs of each existing Public Facility that has excess capacity to serve the anticipated development resulting from new Development Activity; (ii) the cost of System Improvements for each Public Facility; (iii) the manner of financing for each Public Facility (such as user charges, special assessments, bonded indebtedness, general taxes or funded grants) other than impact fees; (iv) the relative extent to which Development Activity will contribute to financing the excess capacity of and System Improvements for each existing Public Facility by such means as user charges, special assessments or payment from the proceeds of general taxes; (v) the relative extent to which Development Activity will contribute to the cost of existing Public Facilities and System Improvements in the future; (vi) the extent to which Development Activity is entitled to a credit against Impact Fees because the Development Activity will dedicate System Improvements or Public Facilities that will offset the demand for System Improvements, inside or outside the proposed development; (vii) any extraordinary costs in servicing the newly developed properties; and (viii) the time-price differential inherent in fair comparisons of amounts paid at different times. A copy of the Proportionate Share analysis is included in the IFA, Exhibit A, and has been available for public inspection at least fourteen (14) days prior to the adoption of this Resolution.

2. Amended and Updated Impact Fee Analysis. The IFAs, as contained in Exhibit A, are in conformance with the requirements of the Act and the same are hereby adopted and approved by the Board as the Municipal Water System and Sanitary Sewer System IFAs for the Service Area.

SECTION 6. IMPOSITION OF MUNICIPAL WATER AND SANITARY SEWER IMPACT FEES

1. Findings; Imposition of Impact Fees. The Board hereby finds and determines that that Impact Fees are necessary to maintain a proposed level of service that complies with the requirements of the Act; accordingly, the Board hereby imposes new Municipal Water and Sanitary Sewer Impact Fees within the Service Area, to be levied in conformance with and subject to the provisions of this Section, pursuant to the Impact Fees Schedule and Formulas set forth in Section 7.

2. General Provisions.

(a) Calculation of Impact Fees. In calculating the Impact Fees, the District has duly considered and included construction costs, land acquisition improvements, materials and fixtures costs, costs of improvements, fees for planning, surveying, and engineering services provided for and directly related to the construction of System Improvements, and outstanding or future debt service charges given the fact that the District may use Impact Fees as a revenue stream to pay principal and interest on bonds or other obligations to finance the cost of System Improvements. The amounts calculated in determining the amount of Impact Fees to be levied are based on realistic estimates, and the assumptions underlying such estimates are disclosed in the IFAs.

(b) Adjustments. The standard Impact Fees may be adjusted at the time the fees are assessed due to inflation and/or in response to unusual circumstances, to fairly allocate costs associated with impacts created by a Development Activity or project, or due to a request for a prompt and

individualized impact fee review for the development activity of the state or a school district or charter school and an offset or credit for Public Facilities for which an impact fee has been or will be collected. The standard Impact Fees may also be adjusted to ensure that Impact Fees are imposed fairly for Development Activities attributable to low income housing or other development activities with broad public purposes. The Impact Fee assessed to a particular development may also be adjusted should the developer supply sufficient written studies and data to the District showing a discrepancy between the fee being assessed and the actual impact on the Municipal Water and Sanitary Sewer Systems.

(c) Previously Incurred Costs. To the extent that new growth and Development Activity will be served by previously constructed improvements, the Impact Fees may include Public Facility costs and outstanding bond costs related to improvements previously incurred by the District. These costs may include all projects included in the IFFPs which are under construction or completed but have not been utilized to their capacity, as evidenced by outstanding debt obligations. Any future debt obligations determined to be necessitated by growth activity may also be included to offset the costs of future capital projects.

3. Developer Credits. Developers which are subject to the levy of Impact Fees shall be allowed a credit against Impact Fees otherwise due or a proportionate reimbursement of an Impact Fee if said developer (i) dedicates land for a System Improvement, (ii) builds and dedicates some or all of a System Improvement, (iii) dedicates a Public Facility that the District and the developer agree will reduce the need for a System Improvement, (iv) dedicates land for, makes improvement to or newly constructs any System Improvement if the facilities are System Improvements or are dedicated to the public and offset the need for an identified System Improvement.

4. Impact Fees Accounting. The District will establish a separate interest-bearing ledger account for each type of Public Facility for which an Impact Fee is collected, deposit all Impact Fees in the appropriate ledger account, retain the interest earned on each account in the ledger account, and otherwise conform to the accounting requirements provided in the Impact Fees Act. Impact Fees collected prior to the effective date of this Resolution need not meet the requirements of this Section.

(a) Reporting. At the end of each fiscal year, the District shall prepare a report pursuant to §11-36a-601 of the Act.

(b) Impact Fee Expenditures. The District may expend Impact Fees pursuant to §11-36-602 of the Act only for System Improvements that are (i) identified in the IFFPs and (ii) for the specific Public Facility type for which the fee was collected.

(c) Time of Expenditure. Impact Fees collected pursuant to the requirements of this Resolution are to be expended, dedicated or encumbered for a permissible use within six (6) years of the receipt of those funds by the District, unless the District identifies in writing an extraordinary and compelling reason why the fees should be held longer than six (6) years and an absolute date by which the fees will be expended. Impact Fees will be expended on a First-In First-Out ("FIFO") basis, with the first funds received deemed to be the first funds expended.

5. Refunds. The District shall refund any Impact Fees paid by a developer, plus interest actually earned, when: (i) the developer does not proceed with the Development Activity and files a written request for a refund; (ii) the fees have not been spent or encumbered; and (iii) no impact has resulted. An impact that would preclude a developer from a refund from the District may include any impact reasonably identified by the District, including, but not limited to, the District having sized facilities and/or paid for, installed and/or caused the installation of facilities based in whole or in part upon the developer's planned Development Activity even though that capacity may, at some future time, be utilized by another development.

6. Other Impact Fees. To the extent allowed by law, the District Board may negotiate or otherwise impose Impact Fees and other fees different from those currently charged. Those charges may, at the discretion of the District Board, include but not be limited to reductions or increases in Impact Fees, all or part of which may be reimbursed to the developer who installed improvements that service the land to be connected with the District's Municipal Water or Sanitary Sewer System.

7. Additional Fees and Costs. The Impact Fees authorized hereby are separate from and in addition to user fees and other charges lawfully imposed by the District and other fees and costs that may not be included as itemized component parts of the Impact Fee Schedule set forth in Section 7 below. In charging any such fees as a condition of development approval, the District recognizes that the fees must be a reasonable charge for the service provided.

8. Fees Effective at Time of Payment. Unless the District is otherwise bound by a contractual requirement, the Impact Fee shall be determined from the fee schedule in effect at the time of payment in accordance with the provisions of Section 7 below.

9. Imposition of Additional Fee or Refund after Development. Should any developer undertake a Development Activity such that the ultimate density or other impact of the Development Activity is not revealed to the District, either through inadvertence, neglect, a change in plans, or any other cause whatsoever, and/or the Impact Fee is not initially charged against all units or the total density within the development, the District shall be entitled to recover the total Impact Fee pursuant the IFFP and IFA from the developer or other appropriate person covering the density for which an Impact Fee was not previously paid.

SECTION 7. IMPACT FEE SCHEDULES AND FORMULAS

1. Imposition of Impact Fees; Schedule. Impact Fees shall be levied in conformance with the following Impact Fee schedule and formula:

MUNICIPAL WATER IMPACT FEE SCHEDULE
Based on Size of Water Meter – in Inches

METER SIZE (IN)	CAPACITY RATIO	IMPACT FEE
¾	1.00	$3,772.61
1	2.00	$7,545.22
1 ½	5.00	$18,863.05

2	8.00	$30,180.88
4	25.00	$94,315.25
6	50.00	$188,630.50
8	80.00	$301,808.80
10	115.00	$433,850.15
12	155.00	$584,754.55

SANITARY SEWER IMPACT FEE SCHEDULE
Based on Equivalent Calculation of Residential Equivalent Connections

PROPOSED FEE PER ERC
$2,604.34

2. Maximum Supportable Impact Fees. The fee schedule included in the IFFPs and IFAs indicate the maximum Impact Fee set forth in Exhibit A which the District may impose on development within the Service Area, and is based upon general demand characteristics and potential demand that can be created by each class of user. The District reserves the right under the Impact Fees Act to assess an adjusted fee to respond to unusual circumstances to ensure that fees are equitably assessed. Formulas that can be used to calculate and adjusted Impact Fee are set forth in Exhibit A.

SECTION 8. IMPACT FEE EXEMPTIONS AND ADJUSTMENTS

1. "Public Purpose" Exemptions and Adjustments. The District Board may, on a project by project basis, authorize exemption or adjustments to the Impact Fees due from development for those projects the Board determines to be of such benefit to the community as a whole to justify the exemption or adjustment. Such projects may include facilities being funded by the state, school districts, charter schools, low income housing projects, facilities of a temporary nature, or other development activity with a broad public purpose, as provided in the Act. The District Board may elect to grant an exemption of or adjust Impact Fees otherwise due in consideration of economic benefits to be received from the Development Activity. In considering impact fee exemptions for school districts and charter schools, school districts and charter schools shall qualify for the exemption or adjustment on the same basis.

2. Exemption Procedures. Applications for exemptions or adjustments are to be filed with the District at the time the applicant first requests the extension of service to the applicant's development or property.

SECTION 9. APPEAL PROCEDURE

Subject to the time limitations as provided in §11-36a-702 of the Act, any person or entity that has paid an Impact Fee pursuant to this Resolution may challenge the Impact Fee as provided in and in conformance with the requirements of §11-36a-701 et seq., of the Act, by filing:

(a) A written administrative appeal to the District, setting forth the name of the person or entity challenging the impact fee or fees, the specific impact fee or fees challenged, evidence that impact fee or fees challenged have been paid by the person or entity, and alleged grounds for such challenge, which appeal shall be considered and decided by the District within thirty (30) days after the day on which the appeal is filed;

(b) A request for mediation or arbitration as provided in §11-36a-704 and 705; or

(c) An action in district court.

SECTION 10. MISCELLANEOUS

1. Severability. If any section, subsection, paragraph, clause or phrase of this Resolution shall be declared invalid for any reason, such decision shall not affect the remaining portions of this Resolution, which shall remain in full force and effect, and for this purpose, the provisions of this Resolution are declared to be severable.

2. Interpretation. This Resolution has been divided into sections, subsections, paragraphs and clauses for convenience only and the interpretation of this Resolution shall not be affected by such division or by any heading contained herein.

3. Effective Date. Except as otherwise specifically provided herein, this shall not repeal, modify or affect any Impact Fee of the District in existence as of the effective date of this Resolution, other than those expressly referenced in Section 1 above. All Impact Fees established, including amendments and modifications to previously existing Impact Fees, after the effective date of this Resolution shall comply with the requirements of this Resolution. This Resolution shall take effect ninety (90) days after the date hereof.

4. Incorporation of Recitals and Exhibit. The Recitals first set forth above and Exhibit A are incorporated and made a part hereof as though fully set forth herein.

ADOPTED AND APPROVED this ____ day of _____, 2022.

GRANGER-HUNTER IMPROVEMENT DISTRICT

By: _____
Chair, Board of Trustees

Attest:

_____
Secretary/Treasurer

EXHIBIT A

IMPACT FEE FACILITIES PLANS & IMPACT FEE ANALYSES

PREPARED FOR:

GRANGER-HUNTER
IMPROVEMENT DISTRICT

PREPARED BY:

BOWEN COLLINS & ASSOCIATES

SEWER IMPACT FEE FACILITIES PLAN

MAY 2022

SEWER IMPACT FEE FACILITIES PLAN

May 2022

Prepared for:

GRANGER-HUNTER
IMPROVEMENT DISTRICT

Prepared by:

BOWEN COLLINS & ASSOCIATES

TABLE OF CONTENTS

Page No.

TABLE OF CONTENTS
(continued)

LIST OF TABLES

No. Title **Page No.**

EXECUTIVE SUMMARY
SEWER IMPACT FEE FACILITIES PLAN

The purpose of an Impact Fee Facilities Plan (IFFP) is to identify demands placed upon Granger-Hunter Improvement District (District) facilities by future development and evaluate how these demands will be met by the District. The IFFP is also intended to outline the improvements which may be funded through impact fees.

WHY IS AN IFFP NEEDED

The IFFP provides a technical basis for assessing updated impact fees throughout the District. This document addresses the future infrastructure needed to serve the District. The existing and future capital projects documented in this IFFP will ensure that level of service standards are maintained for all existing and future residents who reside within the service area. Local governments must pay strict attention to the required elements of the Impact Fee Facilities Plan which are itemized in the Impact Fees Act.

PROJECTED FUTURE GROWTH

Before evaluating system capacity, it is first necessary to calculate the demand associated with existing development and projected growth. Using available information for existing development and growth projections from the District's Sewer Master Plan, projected growth in system demand is summarized in Table ES-1 in terms of Equivalent Residential Connections (ERCs).

Table ES-1
District Service Area Projections

Year	District Area ERCs	Domestic Wastewater (mgd)	Max Month Infiltration (mgd)	Total Max Month, Average Day Flow (mgd)	Peak Hour Flows – District Area (MGD)
2021	44,141	7.99	7.80	15.79	21.14
2031	49,667	8.99	7.98	16.97	23.00
2040	54,648	9.89	8.15	18.04	24.67
2050	61,150	11.07	8.36	19.43	26.85
2060	68,287	12.36	8.60	20.96	29.24

An ERC represents the demand that a typical single-family residence places on the system. The basis of an ERC for historical flow rates is summarized in Table ES-2.

Table ES-2
Service Area Historic Flows

Item	Value for Existing Conditions	Value for 10-Year Growth	Total 10-Year Conditions
Equivalent Residential Connections (ERCs)	44,141	5,526	49,667
Domestic Wastewater Production (mgd)	7.99	1.00	8.99
Infiltration, Maximum Month (mgd)	7.80	0.18	7.98
Average Day, Maximum Month Flow (mgd)	15.79	1.18	16.97
Peak Hour Flow (mgd)	21.14	1.85	23.00
Flows per ERC			
Domestic Wastewater Production (gpd/ERC)	181.0	181.0	181.0
Average Day, Maximum Month Flow (gpd/ERC)	357.7	214.0	341.7
Peak Hour Flow (gpd/ERC)	479.0	335.3	463.0
Average Indoor Water Use (gpd/ERC)	201.1	201.1	201.1

LEVEL OF SERVICE

Level of service is defined in the Impact Fees Act as "the defined performance standard or unit of demand for each capital component of a public facility within a service area". Summary values for both existing and proposed levels of service are contained in Table ES-3.

Table ES-3
Level of Service for Various System Requirements

	Existing Level of Service	Proposed Level of Service
Pipeline Capacity		
Maximum Ratio of Flow* to Pipeline Capacity/Percent of Collection System that Currently Meets the Standard	0.75/99.36%	0.75/100%
Treatment Capacity		
Average Day, Maximum Month Flow (gpd/ERC)	214	214
General Assets		
Adequacy of Existing Facilities to Serve Customers	Sufficient	Sufficient

[1] Peak hour, dry weather flow

EXISTING CAPACITY AVAILABLE TO SERVE FUTURE GROWTH

Projected future growth will be met through a combination of available excess capacity in existing facilities and construction of additional capacity in new facilities. Defining existing system capacity in terms of a single number is difficult. To improve the accuracy of the analysis, the system was divided into three different components (collection, treatment, and general assets). Excess capacity in each component of the system is summarized in Table ES-4.

Table ES-4
Available Excess Capacity

Use Category	Collection System Percent Use	Treatment Percent Use	General Assets Percent Use
Existing Use	79.60%	76.66%	64.64%
Use By 10-Year Growth	3.92%	5.74%	8.09%
Use By Growth Beyond 10 years	16.48%	17.60%	27.27%
Total	100.00%	100.00%	100.0%

REQUIRED SYSTEM IMPROVEMENTS

Beyond available existing capacity, additional improvements required to serve new growth are summarized in Table ES-5. To satisfy the requirements of state law, Table ES-5 provides a breakdown of the percentage of the project costs attributed to existing and future users. For future use, capacity has been divided between capacity to be used by growth within the 10-year planning horizon of this IFFP and capacity that will be available for growth beyond the 10-year horizon.

Table ES-5
Project Costs Allocated to Projected Development, 10 Year Planning Horizon

Project ID	Project	Total Project Cost	Percent to Existing	Percent to 10-Year Growth	Percent to Growth Beyond 10-Year	Cost to Existing	Cost to 10-Year Growth	Cost to Growth Beyond 10-Year
	Collection System Projects							
S1	Redwood Road Improvements (D01, D02, D04)	$8,750,000	24.09%	55.88%	20.03%	$2,107,530	$4,889,899	$1,752,570
S2	4000 W, Continental Dr to 4100 S (1200') (D15)	$630,000	87.79%	0.00%	12.21%	$553,060	$0	$76,940
S4	Decker Lake Dr @ City Center Ct (2-27" between 30") (1500') (D27)	$1,560,000	58.95%	26.10%	14.95%	$919,594	$407,208	$233,198
S5	3100 S, 2040 W to Armstrong PS (1000') (D28)	$600,000	70.41%	2.82%	26.77%	$422,476	$16,899	$160,625
S7	3500 S, 3200 W to W of Decker Lake Dr (5300') (D10)	$6,000,000	43.46%	6.52%	50.03%	$2,607,339	$390,938	$3,001,723
S8	4100 S, 6780 W to 6400 W (2.680')	$1,400,000	10.35%	0.00%	89.65%	$144,900	$0	$1,255,100
LS1	Replace Pleasant Valley Lift Station	$5,000,000	41.18%	9.62%	49.20%	$2,058,824	$481,185	$2,459,991
	Subtotal	**$23,940,000**				**$8,813,723**	**$6,186,129**	**$8,940,148**
	Treatment Plant Projects							
T1	CVWRF Improvements	$113,282,400	76.66%	5.74%	17.60%	$86,842,366	$6,503,526	$19,936,509
	Subtotal	**$113,282,400**				**$86,842,366**	**$6,503,526**	**$19,936,509**
	Total	**$137,222,400**				**$95,656,088**	**$12,689,654**	**$28,876,657**

SEWER IMPACT FEE FACILITIES PLAN

INTRODUCTION

Granger-Hunter Improvement District (GHID or District) has retained Bowen Collins & Associates (BC&A) to prepare an Impact Fee Facilities Plan (IFFP) for sewer collection services provided by the District. The purpose of an IFFP is to identify demands placed upon District facilities by future development and evaluate how these demands will be met by the District. The IFFP is also intended to outline the improvements which may be funded through impact fees.

Much of the analysis forming the basis of this IFFP has been taken from the District's Sewer Master Plan prepared by BC&A. The reader should refer to that document for additional discussion of planning and evaluation methodology beyond what is contained in this report.

SERVICE AREA

For the purpose of impact fee calculations, the District system will be treated as a single service area.

IMPACT FEE FACILITY PLAN COMPONENTS

Requirements for the preparation of an IFFP are outlined in Title 11, Chapter 36a of the Utah Code Annotated (the Impact Fees Act). Under these requirements, an IFFP shall accomplish the following for each facility:

1. Identify the existing level of service
2. Establish a proposed level of service
3. Identify excess capacity to accommodate future growth at the proposed level of service
4. Identify demands placed upon existing public facilities by new development
5. Identify the means by which demands from new development will be met
6. Consider the following additional issues:
    a. revenue sources to finance required system improvements
    b. necessity of improvements to maintain the proposed level of service
    c. need for facilities relative to planned locations of schools

The following sections of this report have been organized to address each of these requirements.

EXISTING LEVEL OF SERVICE – Utah Code Annotated 11-36a-302(1)(a)(i)

Level of service is defined in the Impact Fees Act as "the defined performance standard or unit of demand for each capital component of a public facility within a service area". This section discusses the level of service being currently provided to existing users.

Unit of Demand

For the purposes of this analysis, it is useful to define these various demands in terms of Equivalent Residential Connections (ERCs). An ERC represents the demand that a typical single-family residence places on the system. An equivalent residential connection was developed based on indoor billing data across the District along with the number of connections defined as "domestic". Based on this

information, the number of ERCs in the District was estimated and the flow rate basis of an ERC could be calculated for historic flows as summarized in Table 1.

Table 1
Service Area Historic Flows and Definition of an ERC

Item	Value for Existing Conditions	Value for 10-Year Growth	Total 10-Year Conditions
Equivalent Residential Connections (ERCs)	44,141	5,526	49,667
Domestic Wastewater Production (mgd)	7.99	1.00	8.99
Infiltration, Maximum Month (mgd)	7.80	0.18	7.98
Average Day, Maximum Month Flow (mgd)	15.79	1.18	16.97
Peak Hour Flow (mgd)	21.14	1.85	23.00
Flows per ERC			
Domestic Wastewater Production (gpd/ERC)	181.0	181.0	181.0
Average Day, Maximum Month Flow (gpd/ERC)	357.7	214.0	341.7
Peak Hour Flow (gpd/ERC)	479.0	335.3	463.0
Average Indoor Water Use (gpd/ERC)	201.1	201.1	201.1

Included in the table is the definition of an existing ERC in terms of both average and peak flows. The projected flow used to design and evaluate system components will vary depending on the nature of each component. For example, most wastewater treatment facility processes are designed based on average day, maximum month flow. Conversely, conveyance pipelines must be designed based on peak hour flow (function of daily flow and diurnal flow variation). It should be noted that peak hour flow reported here is as measured at the Central Valley Water Reclamation Facility and reflects the effects of flow attenuation and offsetting peaks throughout the collection system. Peaking factors (and corresponding peak flows) will be higher for individual connections and pipelines higher in the system.

Also included in the table is a projection of future flows. As shown in the table, projected design flows associated with future connections include a lower amount of infiltration than observed for the existing system. This is associated with projected lower infiltration rates resulting from new construction materials and techniques. Thus, only the infiltration that is directly associated with new growth has been included for new connections. Any additional infiltration associated with older materials or system maintenance are specifically excluded from the future growth calculations. Impact fees will be based on only the lower level of infiltration directly associated with new growth as identified in the table.

Performance Standard

Performance standards are those standards that are used to design and evaluate the performance of facilities. This section discusses the existing performance standards for the District.

To improve the accuracy of the analysis, this Impact Fee Facilities Plan has divided the system into three different components (pipeline capacity, treatment capacity, and general assets). Each of these components has its own set of performance standards:

Pipeline Capacity. District engineering standards require that all sewer mains be designed such that the peak flow in the pipe is less than or equal to 75 percent of the pipe's full capacity using a Manning's roughness factor[1] of 0.013. This design standard was used as the level of service for system evaluation.

Wastewater Treatment Facility Capacity. A wastewater treatment facility consists of a large number of different components. Each component may have different criteria for design depending on the nature of the component. For most treatment related components, however, design is based on treating the average daily flow during the maximum month. This is the same standard used by the State of Utah Department of Environmental Quality (UDEQ) when rating the overall capacity of a treatment plant.

General Assets. In addition to the sewer system needs, Granger-Hunter Improvement District personnel need to be able to provide administrative, operation, and maintenance functions for the District to satisfy a level of service for customers. The District's current administrative and service facilities are composed of a number of different components, including office space, open storage space, maintenance bays, etc., and does not have a specific performance standard. However, it is expected that the District's existing facilities will be satisfactory to provide space for personnel through the District's buildout planning window. This means there is excess capacity available today available to support the needs of future users. Thus, it is proposed that both existing and future users pay for these facilities in proportion to their overall use in the system at buildout. This will result in the level of service provided by the facility being the same for existing and new users.

Existing Level of Service Summary

Existing level of service has been divided into the same three components as identified for the system performance standard (pipeline capacity, treatment capacity, and general assets). Existing level of service values are summarized in Table 2 below.

Table 2
Existing Level of Service
for Various System Requirements

	Existing Level of Service
Pipeline Capacity	
Maximum Ratio of Flow* to Pipeline Capacity/Percent of Collection System that Currently Meets the Standard	0.75/99.36%
Treatment Capacity	
Capacity Required for Existing Connections – Average Day, Maximum Month Flow (gpd/ERC)	214
General Assets	
Adequacy of Existing Facilities to Serve Customers	Sufficient

*Peak hour

[1] Manning's roughness is an empirical measure of roughness or friction used to calculate hydraulic capacity.

As shown in the table, only a small percentage of sewer pipelines in the system fall below the desired performance standard. In most cases, there is excess capacity in District pipes that may be used to accommodate some of future growth. Excess capacity and curing of deficiencies will be discussed in subsequent sections of this report. Costs for projects to correct deficiencies that do not meet the required level of service will not be included as part of the impact fee, consistent with the Impact Fees Act.

PROPOSED LEVEL OF SERVICE - Utah Code Annotated 11-36a-302(1)(a)(ii)

The proposed level of service is the performance standard used to evaluate system needs in the future. The Impact Fee Act indicates that the proposed level of service may:

1. diminish or equal the existing level of service; or
2. exceed the existing level of service if, independent of the use of impact fees, the District implements and maintains the means to increase the level of service for existing demand within six years of the date on which new growth is charged for the proposed level of service.

In the case of this IFFP, no changes are proposed to the existing level of service for design standards except relative to treatment capability. Thus, future growth will essentially be evaluated based on the same design standards level of service as identified for existing.

The Utah Division of Water Quality has been developing new criteria for the Utah Pollutant Discharge Elimination System (UPDES) Permit related to treatment plant nutrient removal requirements. As a result of the new permit requirements, several improvements will be needed at the District's wastewater treatment facility. As part of these improvements, the District will also be adding some new facilities at the treatment plant that will improve redundancy and the resulting reliability of the plant. These improvements represent an increased level of service that will benefit existing and future users alike. Increases in the level of service for the District will be funded in accordance with the requirements of the Impact Fees Act. As a result, projects associated with these treatment plant improvements will be paid for by all users at proportional rates.

Proposed Level of Service Summary

The resulting proposed level of service for the District is summarized in Table 3.

Table 3
Proposed Level of Service for Various System Requirements

	Proposed Level of Service
Pipeline Capacity	
Maximum Ratio of Flow* to Pipeline Capacity/Percent of Collection System that Currently Meets the Standard	0.75/99.36%
Treatment Capacity	
Capacity Required for Future Connections – Average Day, Maximum Month Flow (gpd/ERC)	214
General Assets	
Adequacy of Existing Facilities to Serve Customers	Sufficient

* Peak hour

EXCESS CAPACITY TO ACCOMMODATE FUTURE GROWTH - Utah Code Annotated 11-36a-302(1)(a)(iii)

Because most of the sewer collection facilities within the District have adequate or excess capacity through the long-term planning horizon of the District, capacity for most future growth will be met through available excess capacity in existing facilities. There are two components of assets to discuss within the District: collections system facilities and treatment facilities. Excess capacity in the collection and treatment facilities are described as follows:

Collection

To calculate the percentage of existing capacity to be used by future growth in existing facilities, existing and future flows were examined in the system model for each collection pipeline. The method used to calculate excess capacity available for use by future flows is as follows:

1. **Calculate Flows –** The peak flow in each facility was calculated in the model for both existing and future flows and compared to the pipeline performance standard of a 0.75 peak flow to capacity ratio.
2. **Identify Available Capacity –** Where a facility has capacity in excess of projected flows at buildout, the available capacity in the facility was defined as the difference between existing flows and buildout flows. Where the facility has capacity less than projected flows at buildout, the available capacity in the facility was defined as the difference between existing flows and the facility's maximum capacity.
3. **Eliminate Facilities without Excess Capacity –** For the 10-year planning horizon period, the projected growth in flow was compared against the facility's available capacity. Where the future flow exceeded the capacity of the facility, the available excess capacity was assumed to be zero. By definition, this corresponds to those facilities with deficiencies that are identified for replacement in the facilities plan. By assigning a capacity of zero to new users, this eliminated double counting those facilities against new users.
4. **Calculate Percent of Excess Capacity Used in Remaining Facilities –** Where the future flow was less than the capacity of the facility, the percent of excess capacity being used in each facility was calculated by dividing the growth in flow in the facility (future flow less existing flow) by the total capacity (existing flow plus available capacity).
5. **Calculate Excess Capacity for the System as a Whole –** Each pipeline in the system has a different quantity of excess capacity to be used by future growth. To develop an estimate of excess capacity on a system wide basis, the capacities of each of these pipelines and their contribution to the system as a whole must be considered. To do this, each pipeline must first be weighted based on its relative cost. The excess capacity in the system as a whole can then be calculated as the sum of the weighted capacity used by future growth divided by the sum of total weighted capacity in the system.

Based on the method described above, the amount of excess capacity in existing facilities available to accommodate future growth and the demands placed on the existing facilities by new development activity has been calculated for each element in the system by BC&A. This is summarized in Table 4.

Table 4
Collection System Excess Capacity

Use Category	District Area Percent Use
Existing Use	79.60%
Use By 10-Year Growth	3.92%
Use By Growth Beyond 10 years	16.48%
Total	100.00%

Treatment

The Central Valley Water Reclamation Facility (CVWRF) has a current capacity of 75 mgd but is in the process of completing a series of projects that will ultimately bring the total capacity to 84 mgd. Because of the difficultly of assigning specific capacities to individual components (both existing and future), this evaluation takes the approach of considering all components to be working together toward the final capacity. Thus, excess capacity in existing treatment facilities will be calculated simply based on the proportional use of the total future capacity of 84 mgd. The same approach will be used for future treatment facilities (see subsequent section) so that total treatment costs are equitably distributed between existing and future users.

With this in mind, the District's current percent ownership in the treatment plant is 24.52 percent. Applied to the future capacity of the plant, this results in a total capacity for the District of 20.60 mgd. Projected peak month, average day flows for existing development are 15.79 mgd, and are projected to be 16.97 mgd in 10 years and 20.96 mgd at buildout. While these numbers would seem to suggest that District capacity may be just short of projected flows, it is expected that additional capacity will become available as other entities with less potential for growth reach full development. For this analysis, however, projected flows in the District service area relative to the expected treatment plant capacity based on current ownership are summarized in Table 5.

Table 5
Excess Wastewater Treatment Facility Capacity

Use Category	Flow to Treatment Plant (MGD)	District Area Percent Use
Existing Use	15.79	76.66%
Use by 10-Year Growth	1.18	5.74%
Use by Projected Growth Beyond 10 years	3.62	17.60%
Additional Reserve Capacity*	0.00	0.00%
Total	**20.60**	**100.0%**

General Assets

As discussed under the existing and proposed level of service sections, Granger-Hunter Improvement District's general assets have sufficient capacity through the District's long-term planning window. Thus, excess capacity can be simply calculated based on proportional use per ERC as shown in Table 6.

Table 6
General Assets Excess Capacity

Use Category	District Area ERCs	District Area Percent Use
Existing Use	44,141	64.64%
Use by 10-Year Growth	5,526	8.09%
Use by Growth Beyond 10 years	18,621	27.27%
Total	68,287	100.0%

DEMANDS PLACED ON FACILITIES BY NEW DEVELOPMENT - Utah Code Annotated 11-36a-302(a)(iv)

Growth within the District's service area, and projections of sewer flows resulting from said growth is discussed in detail in the District's Sewer Master Plan[2]. Growth in terms of both Equivalent Residential Connections and corresponding sewer flows are summarized in Table 7.

[2] Note that the Sewer Master Plan includes multiple different growth scenarios. Projections contained here are based on the "High Density" growth scenario as this scenario has been used as the basis for capital facility planning in the master plan.

Table 7
District Projections of Growth

Year	District Area ERCs	Domestic Wastewater (mgd)	Max Month Infiltration (mgd)	Total Max Month, Average Day Flow (mgd)	Peak Hour Flows – District Area (MGD)
2021	44,141	7.99	7.80	15.79	21.14
2031	49,667	8.99	7.98	16.97	23.00
2040	54,648	9.89	8.15	18.04	24.67
2050	61,150	11.07	8.36	19.43	26.85
2060	68,287	12.36	8.60	20.96	29.24

INFRASTRUCTURE REQUIRED TO MEET DEMANDS OF NEW DEVELOPMENT – Utah Code Annotated 11-36a-302(1)(a)(v)

To satisfy the requirements of state law, demands placed upon existing system facilities by future development was projected using the process outlined below. Each of the steps were completed as part of this plan's development:

1. **Existing Demand** – The demand existing development places on the District's system was estimated based on historic water use and flow records.
2. **Existing Capacity** – The capacities of existing collection system facilities were estimated using size data provided by the District and a hydraulic computer model.
3. **Existing Deficiencies** – Existing deficiencies in the system were looked for by comparing defined levels of service against calculated capacities. A few deficiencies were identified in the Sewer Master Plan.
4. **Future Demand** - The demand future development will place on the system was estimated based on development projections (discussed in the Sewer Master Plan).
5. **Future Deficiencies** - Future deficiencies in the collection system (portions of the system that are inadequate to accommodate the demand created by future growth) were identified using the defined level of service and results from a hydraulic computer model (discussed in the Sewer Master Plan).
6. **Recommended Improvements** – Needed system improvements were identified to meet demands associated with future development.

The steps listed above "identify demands placed upon existing public facilities by new development activity at the proposed level of service; and… the means by which the political subdivision or private entity will meet those growth demands" (Section 11-36a-302(1)(a) of the Utah Code Annotated).

10 Year Improvement Plan

In the District's Sewer Master Plan, capital facility projects needed to provide service to customers of the District were identified. Some of the projects identified in the plan will not be needed within the next 10 years. Only infrastructure to be constructed within a 10-year horizon will be considered in the calculation of impact fees to avoid uncertainty surrounding improvements further into the future. Table 8 summarizes the components of projects identified in the capital facilities plan that will need to be constructed within the next ten years.

Table 8
Project Costs Allocated to Projected Development, 10-Year Planning Horizon

Project ID	Project	Total Project Cost	Percent to Existing	Percent to 10-Year Growth	Percent to Growth Beyond 10-Year	Cost to Existing	Cost to 10-Year Growth	Cost to Growth Beyond 10-Year
	Collection System Projects							
S1	Redwood Road Improvements (D01, D02, D04)	$8,750,000	24.09%	55.88%	20.03%	$2,107,530	$4,889,899	$1,752,570
S2	4000 W, Continental Dr to 4100 S (1200') (D15)	$630,000	87.79%	0.00%	12.21%	$553,060	$0	$76,940
S4	Decker Lake Dr @ City Center Ct (2-27" between 30") (1500') (D27)	$1,560,000	58.95%	26.10%	14.95%	$919,594	$407,208	$233,198
S5	3100 S, 2040 W to Armstrong PS (1000') (D28)	$600,000	70.41%	2.82%	26.77%	$422,476	$16,899	$160,625
S7	3500 S, 3200 W to W of Decker Lake Dr (5300') (D10)	$6,000,000	43.46%	6.52%	50.03%	$2,607,339	$390,938	$3,001,723
S8	4100 S, 6780 W to 6400 W (2.680')	$1,400,000	10.35%	0.00%	89.65%	$144,900	$0	$1,255,100
LS1	Replace Pleasant Valley Lift Station	$5,000,000	41.18%	9.62%	49.20%	$2,058,824	$481,185	$2,459,991
	Subtotal	**$23,940,000**				**$8,813,723**	**$6,186,129**	**$8,940,148**
	Treatment Plant Projects							
T1	CVWRF Improvements	$113,282,400	76.66%	5.74%	17.60%	$86,842,366	$6,503,526	$19,936,509
	Subtotal	**$113,282,400**				**$86,842,366**	**$6,503,526**	**$19,936,509**
	Total	**$137,222,400**				**$95,656,088**	**$12,689,654**	**$28,876,657**

Project Cost Attributable to Future Growth

To satisfy the requirements of state law, Table 8 provides a breakdown of the capital facility projects and the percentage of the project costs attributed to existing and future users. As defined in Utah Code Annotated 11-36a-102(15), the Impact Fee Facilities Plan should only include the proportionate share of "the cost of public facilities that are roughly proportionate and reasonably related to the service demands and needs of any development activity." Some projects identified in the table are required solely to meet future growth, but some projects also provide a benefit to existing users. Projects that benefit existing users include those projects addressing existing capacity needs and maintenance related projects.

For many projects, the division of costs between existing and future users is easy because 100 percent of the project costs can be attributed to one category or the other (e.g. infrastructure needed solely to serve new development can be 100 percent attributed to new growth, while projects related to existing condition or capacity deficiencies can be 100 percent attributed to existing user needs). For projects needed to address both existing deficiencies and new growth or where a higher level of service is being proposed, costs have been divided proportionally between existing and future users based on their use of the facility. One additional notes regarding a specific project is as follows:

- **Treatment Plant Projects –** As can be seen in the table, CVWRF treatment related projects have been grouped on a single line with a single percentage of cost assigned to each growth category for all the treatment plant projects. The reason for this is that, consistent with the approach used to evaluate excess capacity in existing facilities, this capacity evaluation looks at all the treatment projects as contributing to the total performance of the plant. Correspondingly, all improvements will have the same percentage of use by different growth categories based on the proportional use of total capacity by each category. This approach allows equitable allocation of cost, regardless of whether any individual improvement is for increased level of service or additions to capacity. CVWRF system value and future costs relative to impact fees have been documented in a separate memorandum attached as an appendix to this IFFP.

Project Cost Attributable to 10 Year Growth

Included in Table 8 is a breakdown of capacity use associated with growth both through buildout and through the next 10 years. This is necessary because the projects identified in the tables will be built with capacity to accommodate flows beyond the 10-year growth horizon. This has been done following the same general process as described above.

Basis of Construction Cost Estimates

The costs of pipe and planning projects have been based on engineering cost estimates contained in the Sewer Master Plan. Additional detail regarding the basis of these estimates can be found in that report.

ADDITIONAL CONSIDERATIONS

MANNER OF FINANCING – Utah Code Annotated 11-36a-302(2)

The District may fund the infrastructure identified in this IFFP through a combination of different revenue sources.

Federal and State Grants and Donations

Impact fees cannot reimburse costs funded or expected to be funded through federal grants and other funds that the District has received for capital improvements without an obligation to repay. Grants and donations are not currently contemplated in this analysis. If grants become available for constructing facilities, impact fees will need to be recalculated and an appropriate credit given. Any existing infrastructure funded through past grants will be removed from the system value during the impact fee analysis.

Bonds

None of the costs contained in this IFFP include the cost of bonding. The cost of bonding required to finance impact fee eligible improvements identified in the IFFP may be added to the calculation of the impact fee. This will be considered in the impact fee analysis.

User Rate Revenue

Because infrastructure must generally be built ahead of growth, there often arises situations in which projects must be funded ahead of expected impact fee revenues. In some cases, the solution to this issue will be bonding. In others, funds from existing user rate revenue will be used to complete initial construction of impact fee eligible projects and will be reimbursed later as impact fees are received. Consideration of potential use of user rate revenue to pay for impact fee eligible expenditures will be included in the impact fee analysis and should also be considered in subsequent accounting of impact fee expenditures.

Impact Fees

It is recommended that impact fees be used to fund growth-related capital projects as they help to maintain the proposed level of service and prevent existing users from subsidizing the capital needs for new growth. Based on this IFFP, an impact fee analysis will be able to calculate a fair and legal fee that new growth should pay to fund the portion of the existing and new facilities that will benefit new development.

Developer Dedications and Exactions

Developer exactions are not the same as grants. Developer exactions may be considered in the inventory of current and future infrastructure. If a developer constructs facilities or dedicates land within the development for the construction of facilities identified in this IFFP, the value of the dedication is credited against that particular developer's impact fee liability.

If the value of the dedication/exaction is less than the development's impact fee liability, the developer will owe the balance of the liability to the District. If the value of the improvements dedicated is worth more than the development's impact fee liability, the District must reimburse the difference to the developer from impact fee revenues collected from other developments.

It should be emphasized that the concept of impact fee credits pertains to system level improvements only. For project level improvement (i.e. projects not identified in the impact fee facility plan),

developers will be responsible for the construction of the improvements without credit against the impact fee.

NECESSITY OF IMPROVEMENTS TO MAINTAIN LEVEL OF SERVICE - Utah Code Annotated 11-36a-302(3)

According to State statute, impact fees cannot be used to correct deficiencies in the District's system and must be necessary to maintain the proposed level of service established for all users. Only those facilities or portions of facilities that are required to maintain the proposed level of service for future growth have been included in this IFFP. This will result in an equitable fee as future users will not be expected to fund any portion of the facilities that will benefit existing residents.

SCHOOL RELATED INFRASTRUCTURE - Utah Code Annotated 11-36a-302(2)

As part of the noticing and data collection process for this plan, information was gathered regarding future school district and charter school development. Where the District is aware of the planned location of a school, required public facilities to serve the school have been included in the impact fee facility plan.

NOTICING AND ADOPTION REQUIREMENTS - Utah Code Annotated 11-36a-502

The Impact Fees Act requires that entities must publish a notice of intent to prepare or modify any IFFP. If an entity prepares an independent IFFP rather than include a capital facilities element in the general plan, the actual IFFP must be adopted by enactment. Before the IFFP can be adopted, a reasonable notice of the public hearing must be published in a local newspaper at least 10 days before the actual hearing. A copy of the proposed IFFP must be made available in each public library within the District during the 10-day noticing period for public review and inspection. Utah Code requires that the District must post a copy of the ordinance in at least three places. These places may include the District offices and the public libraries within the District's jurisdiction. Following the 10-day noticing period, a public hearing will be held, after which the District may adopt, amend and adopt, or reject the proposed IFFP.

IMPACT FEE CERTIFICATION - Utah Code Annotated 11-36a-306(1)

This IFFP has been prepared in accordance with Utah Code Annotated Title 11, Chapter 36a (the "Impact Fees Act"), which prescribes the laws pertaining to the imposition of impact fees in Utah. The accuracy of this IFFP relies in part upon planning, engineering, and other source data, provided by the District and its designees.

In accordance with Utah Code Annotated, 11-36a-306(1), Bowen Collins & Associates makes the following certification:

I certify that the attached Impact Fee Facilities Plan:

1. Includes only the costs of public facilities that are:
    a. allowed under the Impact Fees Act; and
    b. actually incurred; or
    c. projected to be incurred or encumbered within six years after the day on which each impact fee is paid;
2. does not include:
    a. costs of operation and maintenance of public facilities;
    b. cost for qualifying public facilities that will raise the level of service for the facilities, through impact fees, above the level of service that is supported by existing residents; and
3. complies in each and every relevant respect with the Impact Fees Act.

Keith Larson, P.E.

DRAPER, UTAH OFFICE
154 E 14075 S
DRAPER, UTAH 84020
PHONE: 801.495.2224

BOISE, IDAHO OFFICE
776 E RIVERSIDE DRIVE
SUITE 250
EAGLE, IDAHO 83616
PHONE: 208.939.9561

ST. GEORGE, UTAH OFFICE
20 NORTH MAIN
SUITE 107
ST.GEORGE, UTAH 84770
PHONE: 435.656.3299

OGDEN, UTAH OFFICE
2036 LINCOLN AVENUE
SUITE 104
OGDEN, UTAH 84401
PHONE: 801.495.2224

BOWEN COLLINS & ASSOCIATES

WWW.BOWENCOLLINS.COM

PREPARED FOR:

GRANGER-HUNTER
IMPROVEMENT DISTRICT

PREPARED BY:

BOWEN COLLINS & ASSOCIATES

WATER IMPACT FEE FACILITIES PLAN

MAY 2022

WATER IMPACT FEE FACILITIES PLAN

May 2022

Prepared for:

GRANGER-HUNTER
IMPROVEMENT DISTRICT

Prepared by:

BOWEN COLLINS & ASSOCIATES

TABLE OF CONTENTS

Page No.

TABLE OF CONTENTS
(continued)

LIST OF TABLES

No. Title **Page No.**

EXECUTIVE SUMMARY
WATER IMPACT FEE FACILITIES PLAN

The purpose of an impact fee facilities plan is to identify demands placed upon Granger-Hunter Improvement District (District) facilities by future development and evaluate how these demands will be met by the District. The IFFP is also intended to outline the improvements which may be funded through impact fees.

WHY IS AN IFFP NEEDED?

The IFFP provides a technical basis for assessing updated impact fees throughout the District. This document addresses the future infrastructure needed to serve the District. The existing and future capital projects documented in this IFFP will ensure that level of service standards are maintained for all existing and future residents who reside within the service area. Local governments must pay strict attention to the required elements of the Impact Fee Facilities Plan which are enumerated in the Impact Fees Act.

PROJECTED FUTURE GROWTH

To evaluate the use of existing capacity and the need for future capacity, it is first necessary to calculate the demand associated with existing development and projected growth. Using available information for existing development and growth projections from the District's Water Master Plan, projected growth in system demand is summarized in Table ES-1.

Table ES-1
District Projections of Growth

Year	Total ERCs	Average Day (gpm)	Peak Day (gpm)
2021	46,142	18,888	40,521
2031	49,053	19,638	42,139
2040	51,974	20,305	43,579
2050	55,814	21,072	45,236
2060	60,137	21,785	46,776

Demands are projected in terms of Equivalent Residential Connections (ERCs). An ERC represents the demand that a typical single family residence places on the system. The basis of an ERC for historical flow rates is summarized in Table ES-2.

Table ES-2
Service Area Historic Flows and Definition of an ERC

Item	Value for Existing Conditions
Population	132,107
Equivalent Residential Connections (ERCs)	46,142
Average Day Flow (mgd)	27.20
Peak Day Flow (mgd)	58.35
Flows per ERC	
Average Day Flow (gpd/ERC)	589.5
Peak Day Flow (gpd/ERC)	1,264.6

LEVEL OF SERVICE

Level of service is defined in the Impact Fees Act as "the defined performance standard or unit of demand for each capital component of a public facility within a service area". Summary values for both existing and proposed levels of service are contained in Table ES-3.

Table ES-3
Existing Level of Service for Various System Requirements

	Existing Level of Service	Proposed Level of Service
Production		
Production Yield – Average Day (gpd/ERC)[1]	589.5	589.5
Production Capacity (gpd/ERC)[1]	1,264.6	1,264.6
Storage		
Storage (gallons/ERC)	583.8[2]	583.8[2]
Conveyance (Transmission, Pumping, and Distribution)		
Peak Hour Demand Pressure (psi) / Percent of System that Meets the Standard	50 / 99.7%	50 / 100%
Minimum Available Fire Flow at 20 psi during Peak Day Demand (gpm) / Percent of System that Meets the Standard	1,500[3] / 99.5%	1,500[3] / 100%
General Assets		
Adequacy of Existing Facilities to Serve Customers	Sufficient	Sufficient

[1] Includes applicable redundancy for supply reliability.
[2] Does not include fire storage volumes in calculation.
3 Required fire flow indicated is for newer residential neighborhood. Fire flow may be lower or higher based on Fire Authority requirements.

EXISTING CAPACITY AVAILABLE TO SERVE FUTURE GROWTH

Projected future growth will be met through a combination of available excess capacity in existing facilities and construction of additional capacity in new facilities. Defining existing system capacity in terms of a single number is difficult. To improve the accuracy of the analysis, the system was divided into four different components (production capacity, storage, transmission, and general assets). Excess capacity in each component of the system is summarized in Table ES-4.

Table ES-4
Available Excess Capacity

Use Category	Well Production Percent Use	Storage Percent Use	Transmission Capacity Percent Use	General Assets Percent Use
Existing Use	68.58%	88.78%	79.25%	76.73%
Use By 10-Year Growth	17.87%	3.95%	4.32%	4.84%
Use By Growth Beyond 10 years	13.55%	7.27%	16.44%	18.43%
Total	**100.0%**	100.00%	100.00%	100.0%

REQUIRED SYSTEM IMPROVEMENTS

Beyond available existing capacity, additional improvements required to serve new growth are summarized in Table ES-5. To satisfy the requirements of state law, Table ES-5 provides a breakdown of the percentage of the project costs attributed to existing and future users. For future use, capacity has been divided between capacity to be used by growth within the 10-year planning window of this IFFP and capacity that will be available for growth beyond the 10-year window.

Table ES-5
Project Costs Allocated to Projected Development, 10-year Planning Window

Project ID	Project	Total Project Cost	Percent to Existing	Percent to 10-Year Growth	Percent to Growth Beyond 10-Year	Cost to Existing	Cost to 10 Year Growth	Cost to Growth Beyond 10-Year
	Transmission System Projects							
P1	Parkway Blvd / Bangerter Hwy	$1,270,000	0.00%	95.32%	4.68%	$0	$1,210,597	$59,403
P2	3600 W/2400 S - Outside of Ridgeland PS	$560,000	0.00%	95.32%	4.68%	$0	$533,806	$26,194
P3	3600 W/4400 S - Southeast portion of Zone 3E	$30,000	0.00%	95.32%	4.68%	$0	$28,597	$1,403
P4	500 W/4700 S - JV #50	$1,320,000	0.00%	95.32%	4.68%	$0	$1,258,258	$61,742
P5	4800 W/4415 S - Tank Farm to Zone 2	$200,000	0.00%	95.32%	4.68%	$0	$190,645	$9,355
	Subtotal	**$3,380,000**				**$0**	**$3,221,903**	**$158,097**
	Production Projects							
S1	Iron/Manganese Removal Facility (w/1&17)	$11,000,000	68.58%	17.87%	13.55%	$7,544,268	$1,965,495	$1,490,237
S2	Iron/Manganese Removal Facility	$4,000,000	68.58%	17.87%	13.55%	$2,743,370	$714,725	$541,904
S3	Iron/Manganese Removal Facility	$4,000,000	68.58%	17.87%	13.55%	$2,743,370	$714,725	$541,904
S4	Drill New Well	$2,000,000	0.00%	0.00%	100.00%	$0	$0	$2,000,000
S5	Well House Construction	$2,750,000	0.00%	0.00%	100.00%	$0	$0	$2,750,000
	Subtotal	**$23,750,000**				**$13,031,009**	**$3,394,945**	**$7,324,046**
	Storage Projects							
ST1	New Reservoir Construction	$9,350,000	43.62%	19.83%	36.55%	$4,078,613	$1,854,121	$3,417,265
	Subtotal	**$9,350,000**				**$4,078,613**	**$1,854,121**	**$3,417,265**
	Total	**$36,480,000**				**$17,109,622**	**$8,470,970**	**$10,899,409**

WATER IMPACT FEE FACILITIES PLAN

INTRODUCTION

Granger-Hunter Improvement District (GHID or District) has retained Bowen Collins & Associates (BC&A) to prepare an impact fee facilities plan (IFFP) for water supply and distribution provided by the District. The purpose of an IFFP is to determine the public facilities required to service development resulting from new development activity. The IFFP is also intended to outline the improvements which may be funded through impact fees.

Much of the analysis forming the basis of this IFFP has been taken from the previous sections of the District's latest Waster Master Plan. The reader should refer to the Water Master Plan for additional discussion of planning and evaluation methodology beyond what is contained here.

Requirements for the preparation of an IFFP are outlined in Title 11, Chapter 36a of the Utah Code (the Impact Fees Act). Under these requirements, an IFFP shall accomplish the following for each facility:

1. Identify the existing level of service
2. Establish a proposed level of service
3. Identify excess capacity to accommodate future growth at the proposed level of service
4. Identify demands placed upon existing public facilities by new development
5. Identify the means by which demands from new development will be met
6. Consider the following additional issues
    a. revenue sources to finance required system improvements
    b. necessity of improvements to maintain the proposed level of service
    c. need for facilities relative to planned locations of schools

The following sections of this report have been organized to address each of these requirements.

EXISTING LEVEL OF SERVICE - 11-36a-302(1)(a)(i)

Level of service is defined in the Impact Fees Act as "the defined performance standard or unit of demand for each capital component of a public facility within a service area". This section discusses the level of service being currently provided to existing users.

Unit of Demand

The projected flow used to design and evaluate system components will vary depending on the nature of each component. For example, water supply is often evaluated based on average annual yields. Conversely, transmission pipelines must be designed based on peak hour flow. For the purposes of this analysis, it is useful to define these various demands in terms of Equivalent Residential Connections (ERCs). An ERC represents the demand that a typical single family residence places on the system with a recommended safety factor for supply reliability and redundancy as identified in the master plan. The basis of an ERC for historical flow rates is summarized in Table 1. Additional detail regarding the calculation of values used in the definition of an ERC are contained in the District's Water Master Plan.

Table 1
Service Area Historic Flows and Definition of an ERC

Item	Value for Existing Conditions
Population	132,107
Equivalent Residential Connections (ERCs)	46,142
Average Day Flow (mgd)	27.20
Peak Day Flow (mgd)	58.35
Flows per ERC	
Average Day Flow (gpd/ERC)	589.5
Peak Day Flow (gpd/ERC)	1,264.6

Performance Standard

Performance standards are those standards that are used to design and evaluate the performance of facilities. This section discusses the existing performance standards for the District.

To improve the accuracy of the analysis, this impact fee facilities plan has divided the system into four different components (production capacity, storage, transmission, and general assets). Each of these components has its own set of performance standards:

Production Capacity. Water production must be adequate to satisfy demands on both an annual and peak day basis. Production of supplies must take into account seasonal limitations in supply availability and reductions in yield because of dry year conditions. Production capacity should include an appropriate safety factor to account for supply redundancy and reliability as defined in the Water Master Plan.

Storage. Three major criteria are generally considered when sizing storage facilities for a water distribution system: operational or equalization storage, fire flow storage, and emergency or standby storage.

1. **Operational/Equalization Storage:** Operational/equalization storage is the storage required to satisfy the difference between the maximum rate of supply and the rate of demand during peak conditions. Sources, major transmission pipelines, and pump stations are usually sized to convey peak day demands to optimize the capital costs of infrastructure. During peak hour demands, storage is needed to meet the difference in source/conveyance capacity and the increased peak instantaneous demands. As described in the Water Master Plan, minimum operational storage sizing recommendations have been based on 25 percent of peak day water demand[1].
2. **Fire Flow Storage*:*** Fire flow storage is the amount of water needed to combat fires occurring in the distribution system. This storage is calculated based on the fire flow rate for structures in each area of the system multiplied by a specified duration as required by the fire authority.

[1] Note that this does not include the same source redundancy requirement as identified for production capacity above.

There primary governing fire authority in the District service area is the West Valley City Fire Department. Based on the requirements of the department, residential homes require a fire flow of 1,500 gpm for a duration of 2 hours (180,000 gallons), typical commercial facilities require a fire flow of at least 2,000 gpm for a duration of 2 hours (240,000 gallons), and some buildings in the District require even greater fire flow. The fire flow required for each pressure zone is defined in the Water master plan with a maximum of 8,000 gpm for 4 hours (1,920,000 gallons).

3. **Emergency Storage:** Emergency or standby storage is the storage needed to meet demands in the event of an unexpected emergency situation such as a line break, treatment plant failure, or other unexpected event. As described in the Water Master Plan minimum emergency storage sizing recommendations have been based on 6 hours (25 percent) of peak day water demand.

Total combined storage required is equal to 50 percent of peak day water demand plus fire flow. Storage requirements are calculated for the system as a whole and for each individual zone.

Transmission and Distribution. Based on input from District staff, the following criteria were used as the performance standards for major conveyance facilities:

1. The system was evaluated for existing conditions and projected conditions at buildout. Each demand scenario included model runs at both peak day and peak hour demand.
2. Under peak day demand, the system must be capable of maintaining constant levels at all system tanks and reservoirs.
3. The system should be capable of maintaining 50 psi during peak hour demand.
4. If any major source fails or is off-line, the system must be capable of conveying water from the remaining sources to all points of demand (including the offline source) with demands equal to the production rate of the remaining sources. If any major transmission line fails or is off-line, the system must be capable of delivering water from other delivery points sufficient to satisfy average day demand conditions.
5. Per requirements of the State of Utah, the system must be able to meet fire flow demands and still maintain greater than 20-psi residual pressure in the distribution system under peak day demand conditions. Fire flow demands were set at 1,500 gpm for residential areas, with higher custom fire flows for a few other large structures as established by the fire authority.

General Assets

In addition to the water system needs, Granger-Hunter Improvement District personnel need to be able to provide administrative, operation, and maintenance functions for the District to satisfy a level of service for customers. The District's current administrative and service facilities are composed of a number of different components, including office space, open storage space, maintenance bays, etc., and does not have a specific performance standard. However, it is expected that the District's existing facilities will be satisfactory to provide space for personnel through the District's buildout planning window. This means there is excess capacity available today available to support the needs of future users. Thus, it is proposed that both existing and future users pay for these facilities in proportion to their overall use in the system at buildout. This will result in the level of service provided by the facility being the same for existing and new users.

Existing Level of Service Summary

Existing level of service has been divided into the same four components as identified for the system performance standard (production, storage, transmission, and general assets). Existing level of service values are summarized in Table 2 below.

Table 2
Existing Level of Service for Various System Requirements

	Existing Level of Service
Production	
Production Yield – Average Day (gpd/ERC)[1]	589.5
Production Capacity (gpd/ERC)[1]	1,264.4
Storage	
Storage (gallons/ERC)	583.8[2]
Conveyance (Transmission, Pumping, and Distribution)	
Peak Hour Demand Pressure (psi) / Percent of System that Meets the Standard	50 / 99.7%
Minimum Available Fire Flow at 20 psi during Peak Day Demand (gpm) / Percent of System that Meets the Standard	1,500[3] / 99.5%
General Assets	
Adequacy of Existing Facilities to Serve Customers	Sufficient

[1] Includes applicable redundancy for supply reliability.
[2] Does not include fire storage volumes in calculation.
3 Required fire flow indicated is for newer residential neighborhood. Fire flow may be lower or higher based on Fire Authority requirements.

As shown in the table, only a small percentage of the system falls below the desired performance standard. In most cases, this is associated with limited locations in the existing system and excess capacity still may exist in other parts of the system. Excess capacity and curing of deficiencies will be discussed in subsequent sections of this report. Costs for projects to correct deficiencies that do not meet the required level of service will not be included as part of the impact fee as required by the Impact Fee Act.

PROPOSED LEVEL OF SERVICE - 11-36a-302(1)(a)(ii)

The proposed level of service is the performance standard used to evaluate system needs in the future. The Impact Fees Act indicates that the proposed level of service may:

1. diminish or equal the existing level of service; or
2. exceed the existing level of service if, independent of the use of impact fees, the District implements and maintains the means to increase the level of service for existing demand within six years of the date on which new growth is charged for the proposed level of service.

In the case of this IFFP, no changes are proposed to the existing level of service for performance standards. Thus, future growth will essentially be evaluated based on the same performance standards level of service as identified for existing.

Table 3
Proposed Level of Service for Various System Requirements

	Proposed Level of Service
Production	
Production Yield – Average Day (gpd/ERC)[1]	589.5
Production Capacity (gpd/ERC)[1]	1,264.6
Storage	
Storage (gallons/ERC)	583.8[2]
Conveyance (Transmission, Pumping, and Distribution)	
Peak Hour Demand Pressure (psi) / Percent of System that Meets the Standard	50 / 100%
Minimum Available Fire Flow at 20 psi during Peak Day Demand (gpm) / Percent of System that Meets the Standard	1,500[3] / 100%
General Assets	
Adequacy of Existing Facilities to Serve Customers	Sufficient

[1] Includes applicable redundancy for supply reliability.
[2] Does not include fire storage volumes in calculation.
3 Required fire flow indicated is for newer residential neighborhood. Fire flow may be lower or higher based on Fire Authority requirements.

It should be noted that demand per ERC in the system is expected to gradually diminish over time as a result of conservation activities. For simplicity, the values shown here are for current demands but all subsequent calculations include expected reductions through conservation as described in the Water Master Plan.

EXCESS CAPACITY TO ACCOMMODATE FUTURE GROWTH (11-36A-302(1)(A)(III)

Projected future growth will be met through a combination of available excess capacity in existing facilities and construction of additional capacity in new facilities. Defining existing system capacity in terms of a single number is difficult. To improve the accuracy of the analysis, we have divided the system into the same four components used to define level of service (production capacity, storage, transmission, and general assets). The purpose of this breakdown is to consider the available capacity for each component individually. Excess capacity in each component of the system is as follows:

Production Capacity

The Water Master Plan includes an analysis of available supply to service existing and projected demands. This analysis includes consideration of annual supply and peak production capacity. On an annual basis, the District has adequate water available to meet projected demand[2] but will require additional improvements relative to peak production. Thus, for the purpose of impact fees, evaluation of production capacity should be based on peak day demands.

Base demands in the District are supplied via contracts with Jordan Valley Water Conservancy District (JVWCD). JVWCD connections have a useable capacity of 29,992 gpm. Capital costs for JVWCD water are built into the contract and rate costs and are not included as part of the impact fee facilities plan. Thus, as additional demand is added to the system, it will be satisfied through increased use of the District's wells. Existing wells within the District have a reliable peak production capacity of 14,050 gpm. The excess portion of this capacity that is available for use is summarized in Table 4[3].

Table 4
Excess Well Production Capacity

Use Category	Peak Day Demand w/ Conservation (gpm)	Demand on Wells (gpm)	Percent Use
Existing Use	39,628	9,636	68.58%
Use by 10-Year Growth	2,510	2,510	17.87%
Use by Projected Growth Beyond 10 years	4,638	1,903	13.55%
Total	**46,776**	**14,050**	**100.0%**

Storage

The Water Master Plan includes an analysis of available storage to service existing and projected demands. This analysis indicates that the District has an existing deficiency in Zone 1, but excess capacity in all other zones. Correspondingly, excess storage has been examined based on needs outside the Zone 1 deficiency with the understanding that the Zone 1 deficiency will be addressed through a future project (see subsequent section on new infrastructure). Using this approach, the excess portion of existing storage capacity that is available for use is summarized in Table 5.

[2] The District may choose to expand its annual contract with JVWCD to optimize operational flexibility associated with its wells. However, this is not required from an annual capacity standpoint.
[3] As noted previously, this and all subsequent calculations have adjusted demands to reflect conservation within the 10-year planning window.

Table 5
Excess Storage Capacity

Use Category	Needed Storage w/ Conservation (MG)	Needed Storage Less Zone 1 Deficit (MG)	Use of Existing Storage (MG)	Percent Use
Existing Use	28.26	27.27	27.27	88.78%
Use by 10-Year Growth	1.66	1.66	1.21	3.95%
Use by Projected Growth Beyond 10 years	3.06	3.06	2.23	7.27%
Total	**32.99**	**32.00**	**30.72**	**100.0%**

Transmission

To calculate the percentage of existing capacity to be used by future growth in existing facilities, existing and future flows were examined in system model. Because pipelines and pump stations are closely related within the operation of the system, these two components were grouped for the purposes of this analysis. The method used to calculate excess capacity available for use by future flows is as follows:

1. **Calculate Flows –** The peak flow in each facility was calculated in the model for both existing and future flows. The maximum capacity of each facility was also calculated. Defining an absolute maximum capacity in water system facility is difficult because capacity is a function of both pipeline size (with corresponding velocity) and required delivery pressure. In water distribution systems, however, a common design guideline is to limit velocities to less than 7 ft/sec. This has been used as the definition for maximum capacity of pipelines in this analysis.
2. **Identify Available Capacity –** Where a facility has capacity in excess of projected flows at buildout, the available capacity in the facility was defined as the difference between existing flows and buildout flows. Where the facility has capacity less than projected flows at buildout, the available capacity in the facility was defined as the difference between existing flows and the facility's maximum capacity.
3. **Eliminate Facilities without Excess Capacity –** For the planning window period (in this case, 10 years), the projected growth in flow during the planning window was compared against the facility's available capacity. Where the future flow exceeded the capacity of the facility, the available excess capacity is zero. By definition, this corresponds to those facilities with deficiencies that are identified in the facilities plan. By assigning a capacity of zero, this eliminated double counting those facilities against new users.
4. **Calculate Percent of Excess Capacity Used in Remaining Facilities –** Where the future flow was less than the capacity of the facility, the percent of excess capacity being used in each facility was calculated by dividing the growth in flow in the facility (future flow less existing flow) by the total capacity (existing flow plus available capacity).
5. **Calculate Excess Capacity for the System as a Whole –** Each pipeline in the system has a different quantity of excess capacity to be used by future growth. To develop an estimate of excess capacity on a system wide basis, the capacities of each of these pipelines and their

contribution to the system as a whole must be considered. To do this, each pipeline must first be weighted based on its estimated cost. The excess capacity in the system as a whole can then be calculated as the sum of the weighted capacity used by future growth divided by the sum of total weighted capacity in the system.

Based on the method described above, the amount of excess capacity in existing facilities available to accommodate future growth and the demands placed on the existing facilities by new development activity has been calculated for each element in the system by BC&A. This is summarized in Table 6.

Table 6
Transmission System Excess Capacity

Use Category	District Area Percent Use
Existing Use	79.25%
Use By 10-Year Growth	4.32%
Use By Growth Beyond 10 years	16.44%
Total	100.0%

General Assets

As discussed under the existing and proposed level of service sections, Granger-Hunter Improvement District's general assets have sufficient capacity through the District's long-term planning window. Thus, excess capacity can be simply calculated based on proportional use per ERC as shown in Table 7.

Table 7
General Assets Excess Capacity

Use Category	District Area ERCs	District Area Percent Use
Existing Use	46,142	76.73%
Use by 10-Year Growth	2,911	4.84%
Use by Growth Beyond 10 years	11,084	18.43%
Total	60,137	100.0%

DEMANDS PLACED ON FACILITIES BY NEW DEVELOPMENT - 11-36A-302(1)(A)(IV)

Growth and new development in the District is discussed in the District's Water Master Plan. These growth projections are based on the most recent version of growth projections developed by the Wasatch Front Regional Council (WFRC), development plans submitted to the District, and planning guidance provided by West Valley City personnel. These projections include consideration of developable area, zoning, the nature of surrounding development, designated open space and other

factors. Additional information on growth projections is included in the Water Master Plan[4]. Future growth as projected in the Water Master Plan is shown in Table 8.

Table 8
District Projections of Growth

Year	Total ERCs	Average Day (gpm)	Peak Day (gpm)
2021	46,142	18,888	40,521
2031	49,053	19,638	42,139
2040	51,974	20,305	43,579
2050	55,814	21,072	45,236
2060	60,137	21,785	46,776

INFRASTRUCTURE REQUIRED TO MEET DEMANDS OF NEW DEVELOPMENT - 11-36a-302(1)(a)(v)

To satisfy the requirements of state law, the effect of demand placed upon existing system facilities by future development was evaluated using the process outlined below. Each of the steps was completed as part of this plan's development. More description of the methodology used in the process outlined below can be found in the Water Master Plan.

1. **Existing Demand** – The demand existing development places on the District's system was estimated based on historic water use and flow records.
2. **Existing Capacity** – The capacities of existing system collection facilities were estimated using size data provided by the District and a hydraulic computer model. The capacities of existing production and pumping facilities were taken from the District's water system model.
3. **Existing Deficiencies** – Existing deficiencies in the system were looked for by comparing defined levels of service against calculated capacities.
4. **Future Demand** - The demand future development will place on the system was estimated based on development projections as discussed in a previous section.
5. **Future Deficiencies** - Future deficiencies in the collection system were identified using defined level of service and results from the computer model.
6. **Recommended Improvements** – Needed system improvements were identified to remedy existing deficiencies and meet demands associated with future development.

The steps listed above "identify demands placed upon existing public facilities by new development activity at the proposed level of service; and… the means by which the political subdivision or private entity will meet those growth demands" (Section 11-36a-302(1)(a) of the Utah Code).

[4] Note that the Water Master Plan includes multiple different growth scenarios. Projections contained here are based on the "Recommended Planning" scenario as this scenario has been used as the basis for capital facility planning in the master plan. This scenario covers growth associated with either lower density development patterns with little to no conservation savings or higher density development patterns with conservation.

10-Year Improvement Plan

In the District's Water Master Plan, capital facility projects needed to provide service to various parts of the District at projected ten-year and buildout scenarios were identified. Most of these projects will need to be constructed in phases as development occurs. Only infrastructure to be constructed within a ten-year horizon will be considered in the calculation of these impact fees to avoid uncertainty surrounding improvements further into the future. Table 9 summarizes the components of projects identified in the Water Master Plan that will need to be constructed within the next ten years. Details associated with the costs used for each project are contained in the Water Master Plan.

Project Cost Attributable to Future Growth

To satisfy the requirements of state law, Table 9 provides a breakdown of the capital facility projects and the percentage of the project costs attributed to existing and future users. As defined in Section 11-36a-102(16), the impact fee facilities plan should only include the proportionate share of "the cost of public facilities that are roughly proportionate and reasonably related to the service demands and needs of any development activity." While several of the projects identified in the table are required solely to meet future growth, some projects also provide a benefit to existing users. Projects that benefit existing users include those projects addressing existing capacity needs and maintenance related projects.

For most projects, the division of costs between existing and future users is easy because 100 percent of the project costs can be attributed to one category or the other (e.g. infrastructure needed solely to serve new development can be 100 percent attributed to new growth, while projects related to existing condition or capacity deficiencies can be 100 percent attributed to existing user needs). For projects needed to address both existing deficiencies and new growth or where a higher level of service is being proposed, costs have been divided proportionally between existing and future users based on their needs in the facility. These percentages have been calculated based on flows in each facility as calculated in the hydraulic model. A few additional notes regarding specific projects are as follows:

- **Transmission System Projects:** One unique aspects of pressured pipe systems such as water is that flow in any given pipe will change both direction and magnitude depending on system conditions. Variations in time of year, time of day, and system operational parameters will affect how much capacity is needed in each pipeline. Thus, for many water pipelines, the best approach to assessing usage of capacity is to look at needs as a whole and then allocate percentages equally to all projects based on overall needs. This has been done for projects in this analysis. After eliminating projects required strictly for maintenance or projects outside the 10-year planning window, the overall usage of capacity in the new projects was calculated as a whole. The proportional use of each development type was then assigned to all projects assuming the projects will all work in conjunction with one another to meet system needs.
- **Well Improvements.** Existing well capacity is adequate to meet existing demands and projected demands through the next 10 years. Thus, no portion of the planned new well is assigned to these categories. Conversely, iron and manganese removal projects at existing wells will directly benefit all users needing capacity associated with these wells. Correspondingly, costs associated with these projects have been assigned proportional to use of capacity in the existing wells.

Table 9
Project Costs Allocated to Projected Development, 10-year Planning Window

Project ID	Project	Total Project Cost	Percent to Existing	Percent to 10-Year Growth	Percent to Growth Beyond 10-Year	Cost to Existing	Cost to 10 Year Growth	Cost to Growth Beyond 10-Year
	Transmission System Projects							
P1	Parkway Blvd / Bangerter Hwy	$1,270,000	0.00%	95.32%	4.68%	$0	$1,210,597	$59,403
P2	3600 W/2400 S - Outside of Ridgeland PS	$560,000	0.00%	95.32%	4.68%	$0	$533,806	$26,194
P3	3600 W/4400 S - Southeast portion of Zone 3E	$30,000	0.00%	95.32%	4.68%	$0	$28,597	$1,403
P4	500 W/4700 S - JV #50	$1,320,000	0.00%	95.32%	4.68%	$0	$1,258,258	$61,742
P5	4800 W/4415 S - Tank Farm to Zone 2	$200,000	0.00%	95.32%	4.68%	$0	$190,645	$9,355
	Subtotal	**$3,380,000**				**$0**	**$3,221,903**	**$158,097**
	Production Projects							
S1	Iron/Manganese Removal Facility (w/1&17)	$11,000,000	68.58%	17.87%	13.55%	$7,544,268	$1,965,495	$1,490,237
S2	Iron/Manganese Removal Facility	$4,000,000	68.58%	17.87%	13.55%	$2,743,370	$714,725	$541,904
S3	Iron/Manganese Removal Facility	$4,000,000	68.58%	17.87%	13.55%	$2,743,370	$714,725	$541,904
S4	Drill New Well	$2,000,000	0.00%	0.00%	100.00%	$0	$0	$2,000,000
S5	Well House Construction	$2,750,000	0.00%	0.00%	100.00%	$0	$0	$2,750,000
	Subtotal	**$23,750,000**				**$13,031,009**	**$3,394,945**	**$7,324,046**
	Storage Projects							
ST1	New Reservoir Construction	$9,350,000	43.62%	19.83%	36.55%	$4,078,613	$1,854,121	$3,417,265
	Subtotal	**$9,350,000**				**$4,078,613**	**$1,854,121**	**$3,417,265**
	Total	**$36,480,000**				**$17,109,622**	**$8,470,970**	**$10,899,409**

- **New Reservoir Construction.** As noted previously, even though the District has excess storage in other areas, there is an existing storage deficiency in Zone 1. The percentage of cost assigned to existing users for this project reflects this deficiency.

Table 8 does not include bond costs related to paying for impact fee eligible improvements. These costs are calculated as part of the impact fee analysis.

Project Cost Attributable to 10-Year Growth

Included in Table 9 is a breakdown of capacity associated with growth both at full build-out and through the next 10-years. This is necessary because many of the projects identified in the table will be built with capacity to accommodate flows or service beyond the 10-year growth window. This has been done following the same general process as described above.

Basis of Construction Cost Estimates

The costs of construction for projects to be completed within ten years have been estimated based on past District experience with projects of a similar nature and other projects outside of the District.

ADDITIONAL CONSIDERATIONS

MANNER OF FINANCING - 11-36a-302(2)

The District may fund the infrastructure identified in this IFFP through a combination of different revenue sources.

Federal and State Grants and Donations

Impact fees cannot reimburse costs funded or expected to be funded through federal grants and other funds that the District has received for capital improvements without an obligation to repay. Grants and donations are not currently contemplated in this analysis. If grants become available for constructing facilities, impact fees will need to be recalculated and an appropriate credit given. Any existing infrastructure funded through past grants will be removed from the system value during the impact fee analysis.

Bonds

None of the costs contained in this IFFP include the cost of bonding. The cost of bonding required to finance impact fee eligible improvements identified in the IFPP may be added to the calculation of the impact fee. This will be considered in the impact fee analysis.

Interfund Loans

Because infrastructure must generally be built ahead of growth, there often arise situations in which projects must be funded ahead of expected impact fee revenues. In some cases, the solution to this issue will be bonding. In others, funds from existing user rate revenue will be loaned to the impact fee fund to complete initial construction of the project and will be reimbursed later as impact fees are received. Consideration of potential interfund loans will be included in the impact fee analysis and should be considered in subsequent accounting of impact fee expenditures.

Impact Fees

It is recommended that impact fees be used to fund growth-related capital projects as they help to maintain the proposed level of service and prevent existing users from subsidizing the capital needs for new growth. Based on this IFFP, an impact fee analysis will be able to calculate a fair and legal fee

that new growth should pay to fund the portion of the existing and new facilities that will benefit new development.

Developer Dedications and Exactions

Developer exactions are not the same as grants. If a developer constructs a system improvement or dedicates land for a system improvement identified in this IFFP, or dedicates a public facility that is recognized to reduce the need for a system improvement, the developer will be entitled to an appropriate credit against that particular developer's impact fee liability or a proportionate reimbursement.

If the value of the credit is less than the development's impact fee liability, the developer will owe the balance of the liability to the District. If the recognized value of the improvements/land dedicated is more than the development's impact fee liability, the District must reimburse the difference to the developer from impact fee revenues collected from other developments.

It should be emphasized that the concept of impact fee credits pertains to system level improvements only. Developers will be responsible for the construction of project improvements (i.e. improvements not identified in the impact fee facilities plan) without credit against the impact fee.

NECESSITY OF IMPROVEMENTS TO MAINTAIN LEVEL OF SERVICE - 11-36a-302(3)

According to State statute, impact fees cannot be used to correct deficiencies in the District's system and must be necessary to maintain the proposed level of service established for all users. Only those facilities or portions of facilities that are required to maintain the proposed level of service for future growth have been included in this IFFP. Additionally, any portion of projects being used to cure existing deficiencies that will be paid for through future user rates will be accounted for through an impact fee credit to be calculated as part of the impact fee analysis. This will result in an equitable fee as future users will not be expected to fund any portion of the facilities that will benefit existing residents.

SCHOOL RELATED INFRASTRUCTURE - Utah Code Annotated 11-36a-302(2)

As part of the noticing and data collection process for this plan, information was gathered regarding future school district and charter school development. Where the District is aware of the planned location of a school, required public facilities to serve the school have been included in the impact fee facility plan.

NOTICING AND ADOPTION REQUIREMENTS - Utah Code Annotated 11-36a-502

The Impact Fees Act requires that entities must publish a notice of intent to prepare or modify any IFFP. If an entity prepares an independent IFFP rather than include a capital facilities element in the general plan, the actual IFFP must be adopted by enactment. Before the IFFP can be adopted, a reasonable notice of the public hearing must be published in a local newspaper at least 10 days before the actual hearing. A copy of the proposed IFFP must be made available in each public library within the District during the 10-day noticing period for public review and inspection. Utah Code requires that the District must post a copy of the ordinance in at least three places. These places may include the District offices and the public libraries within the District's jurisdiction. Following the 10-day

noticing period, a public hearing will be held, after which the District may adopt, amend and adopt, or reject the proposed IFFP.

IMPACT FEE CERTIFICATION 11-36A-306(1)

This IFFP has been prepared in accordance with Utah Code Title 11 Chapter 36a (the "Impact Fees Act"), which prescribes the laws pertaining to the imposition of impact fees in Utah. The accuracy of this IFFP relies in part upon planning, engineering, and other source data, provided by the District and its designees.

In accordance with Utah Code Annotated, 11-36a-306(1), Bowen Collins & Associates makes the following certification:

I certify that the attached impact fee facilities plan:

1. Includes only the costs of public facilities that are:
    a. allowed under the Impact Fees Act; and
    b. actually incurred; or
    c. projected to be incurred or encumbered within six years after the day on which each impact fee is paid;
2. does not include:
    a. costs of operation and maintenance of public facilities;
    b. costs for qualifying public facilities that will raise the level of service for the facilities, through impact fees, above the level of service that is supported by existing residents; and
3. complies in each relevant respect with the Impact Fees Act.

_____

Keith J. Larson, P.E.

DRAPER, UTAH OFFICE
154 E 14075 S
DRAPER, UTAH 84020
PHONE: 801.495.2224

BOISE, IDAHO OFFICE
776 E RIVERSIDE DRIVE
SUITE 250
EAGLE, IDAHO 83616
PHONE: 208.939.9561

ST. GEORGE, UTAH OFFICE
20 NORTH MAIN
SUITE 107
ST.GEORGE, UTAH 84770
PHONE: 435.656.3299

OGDEN, UTAH OFFICE
2036 LINCOLN AVENUE
SUITE 104
OGDEN, UTAH 84401
PHONE: 801.495.2224

BOWEN COLLINS & ASSOCIATES

WWW.BOWENCOLLINS.COM

Granger-Hunter Improvement District

Wastewater Impact Fee Analysis

GRANGER-HUNTER
IMPROVEMENT DISTRICT

Zions Public Finance, Inc.
May 2022

TABLE OF CONTENTS

Contents

EXECUTIVE SUMMARY

Granger-Hunter Improvement District ("GHID") commissioned Zions Public Finance, Inc. (Zions) to calculate the District's impact fees in accordance with Utah State Law. An impact fee is a payment of money imposed upon new development activity to mitigate the impact of new development on public infrastructure. In conjunction with this project, Bowen Collins & Associates prepared the *Granger-Hunter Improvement District Wastewater Collection System Impact Fee Facilities Plan* (IFFP) dated May 2022.

The recommended impact fee structure presented in this analysis has been prepared to satisfy the Impact Fees Act, Utah Code Ann. § 11-36a-101 et. seq., and represents the maximum impact fees that the District may assess. The District will be required to use revenue sources other than impact fees to fund any projects identified in the IFFP that constitute repair and replacement, cure any existing deficiencies, or increase the level of service for existing users.

Wastewater System Overview

Level of Service – Equivalent Residential Connection

Level of service (LOS) defines the wastewater demands that a typical residential user, expressed as an Equivalent Residential Connection (ERC), will require and should pay for through impact fees. Impact fee law prohibits the use of impact fees to increase the LOS above the current demands. At times, a wastewater system may need to increase the LOS to cure an existing deficiency, but projects that fix deficiencies must be paid for through non-impact fee revenues and a credit must be provided to the impact fee payer. In this analysis, a credit has been calculated to offset the portion of the future capital projects that will benefit existing users.

TABLE 1: LEVEL OF SERVICE

Criteria	Existing LOS	Proposed LOS
Pipeline Capacity		
Maximum Ratio of Flow to Pipeline Capacity/Percent of Collection System that currently meets the standard	.75/99.36%	.75/100%
Treatment Capacity		
Average Day, Maximum Month Flow (gpd/ERC)	214	214
General Assets		
Adequacy of Existing Facilities to Serve Costumers	Sufficient	Sufficient
Source: GHID Water Impact Fee Facilities Plan, May 2022		

A residential unit is equated to one ERC and non-residential properties are converted to the appropriate number of ERCs.

In 2021 the District serves 44,141 ERCs and is anticipated to grow to approximately 49,667 ERCs by 2031, for an increase of 5,526 ERCs over the 10-year period.

Wastewater Service Area

The Service Area covers the entire District for the purpose of calculating impact fees.

Existing Excess Capacity

Collection System

The IFFP identifies the percentage of existing excess capacity in the wastewater collection system. Acquired at an actual cost of $61,936,535, the wastewater collection system has existing use of 79.6% with 3.92% of the capacity available for 10-year growth. The remaining 16.48% is available for growth beyond 10 years.

Treatment System

The District is served by Central Valley Water Reclamation Facility (CVWRF) for wastewater treatment. A portion of CVWRF's existing capital costs are allocated to the District according to GHID's 24.52% ownership in the CVWRF treatment plant. CVWRF capital improvements have been bond funded and GHID is responsible for repayment of a portion of the outstanding bonds. The IFFP further identifies the percentage of existing excess capacity in the wastewater treatment system. Acquired at an actual cost of $50,264,000, the wastewater treatment system has an existing use of 76.66% with 5.74% of the capacity available for 10-year growth. The remaining 17.60% is available for growth beyond 10 years.

General Assets

The IFFP identifies the percentage of existing excess capacity in the District's general assets. The general assets include land assets such as certain land and shared facility assets. Acquired at an actual cost of $4,895,613, the District's general assets have existing capacity of 64.64% with 8.09% of the capacity available for 10-year growth. The remaining 27.27% is available for growth beyond 10 years.

TABLE 2: EXISTING EXCESS CAPACITY

Available Excess Capacity	Collection	Treatment	General Assets
Existing Use	79.60%	76.66%	64.64%
10-Yr Growth	3.92%	5.74%	8.09%
Beyond 10 Yrs	16.48%	17.60%	27.27%
TOTAL	**100.00%**	**100.00%**	**100.00%**
Source: GHID Water Impact Fee Facilities Plan, May 2022			

New Construction Costs

The IFFP identifies a total of $137,222,400 in new construction costs over the next 10 years, of which $95,656,088 is necessary to cure existing deficiencies. A total cost of $12,689,654 is planned for 10-year growth. Credits must be made for the cost of the projects that cure deficiencies so that new development does not pay twice.

Wastewater Impact Fee Calculation

The maximum impact fee calculation is shown in the table below and results in a maximum fee of $2,604.34 per ERC.

TABLE 3: PROPORTIONATE SHARE ANALYSIS

SUMMARY	
Existing Excess Capacity	$1,080.28
New Construction	$2,686.27

SUMMARY	
Consultant Costs	$11.10
Credit - Impact Fee Fund Balance	$0.00
Credit - Future Projects	($121.52)
Credit - CVWRF Bond	($999.45)
Credit - Outstanding Bonds	($52.34)
Maximum Fee Per ERC	**$2,604.34**

Non-Standard Demand Adjustments

The District reserves the right under the Impact Fees Act (Utah Code Ann. § 11-36a-402(1)(c, d)) to assess an adjusted fee to respond to unusual circumstances and to ensure that the impact fees are assessed fairly. The impact fee ordinance should include a provision that permits adjustment of the fee for a development based upon studies and data submitted by the developer that indicate a more realistic and accurate impact upon the District's infrastructure.

CHAPTER 1: OVERVIEW OF THE WASTEWATER IMPACT FEES

Summary

An impact fee is intended to recover the District's costs of building excess wastewater capacity from new residential or non-residential development rather than passing these growth-related costs on to existing users through rates.

The Utah Impact Fees Act allows only certain costs to be included in an impact fee so that only the fair cost of expansionary projects or existing unused capacity paid by the District is assessed through an impact fee. Eligible costs include future projects, historic costs of existing assets that still have capacity available to serve growth, future or outstanding debt related to these eligible projects, and certain professional expenses related to planning for growth. Project improvements that only serve a specific development or subdivision cannot be included. System improvements that cure a deficiency or enhance the Level of Service (LOS) cannot be included without an appropriate credit.

The impact fee analysis provides documentation of a fair comparison, or rational nexus, between the impact fee charged to new development and the demands that new growth will have on the system.

Costs to be Included in the Impact Fee

The impact fees proposed in this analysis are calculated based upon:

- Buy-in to existing, excess capacity;
- New capital infrastructure that will serve new development; and
- Professional and planning expenses related to the construction of system improvements that will serve new development.

The costs that cannot be included in the impact fee are as follows:

- Projects that cure system deficiencies for existing users;
- Projects that increase the level of service above that which is currently provided;
- Operations and maintenance costs;
- Costs of facilities funded by grants or other funds that the District does not have to repay;
- Interest costs related to outstanding or future bonds that have been issued to fund non-impact fee eligible projects such as repair and replacement and curing deficiency; and
- Costs of reconstruction of facilities that do not have capacity to serve new growth.

Utah Code Legal Requirements

Utah law requires that entities prepare an Impact Fee Analysis (IFA) before enacting an impact fee. Utah law also requires that entities give notice of their intent to prepare and adopt an IFA. This IFA follows all legal requirements as outlined below. The District has retained Zions Public Finance, Inc. (ZPFI) to prepare this Impact Fee Analysis in accordance with legal requirements.

Notice of Intent to Prepare Impact Fee Analysis

A local political subdivision must provide written notice of its intent to prepare an IFA before preparing the Plan (Utah Code §11-36a-503). This notice must be posted on the Utah Public Notice website.

Preparation of Impact Fee Analysis

Utah Code requires that each local political subdivision, before imposing an impact fee, prepare an impact fee analysis. (Utah Code 11-36a-304).

Section 11-36a-304 of the Utah Code outlines the requirements of an impact fee analysis:

(1) An impact fee analysis shall:

(a) identify the anticipated impact on or consumption of any existing capacity of a public facility by the anticipated development activity;

(b) identify the anticipated impact on system improvements required by the anticipated development activity to maintain the established level of service for each public facility;

(c) demonstrate how the anticipated impacts described in subsections (1)(a) and (b) are reasonably related to the anticipated development activity;

(d) estimate the proportionate share of:
(i) the costs for existing capacity that will be recouped; and
(ii) the costs of impacts on system improvements that are reasonably related to the new development activity; and

(e) identify how the impact fee was calculated.

(2) In analyzing whether or not the proportionate share of the costs of public facilities are reasonably related to the new development activity, the local political subdivision or private entity, as the case may be, shall identify, if applicable:

(a) the cost of each existing public facility that has excess capacity to serve the anticipated development resulting from the new development activity;

(b) the cost of system improvements for each public facility;

(c) other than impact fees, the manner of financing for each public facility, such as user charges, special assessments, bonded indebtedness, general taxes, or federal grants;

(d) the relative extent to which development activity will contribute to financing the excess capacity of and system improvements for each existing public facility, by such means as user charges, special assessments, or payment from the proceeds of general taxes;

(e) the relative extent to which development activity will contribute to the cost of existing public facilities and system improvements in the future;

(f) the extent to which the development activity is entitled to a credit against impact fees because the development activity will dedicate system improvements or public facilities that will offset the demand for system improvements, inside or outside the proposed development;

(g) extraordinary costs, if any, in servicing the newly-developed properties; and

(h) the time-price differential inherent in fair comparisons of amounts paid at different times.

Certification of Impact Fee Analysis

Utah Code states that an Impact Fee Analysis shall include a written certification from the person or entity that prepares the Impact Fee Analysis. This certification is included at the conclusion of this analysis.

CHAPTER 2: IMPACT FROM GROWTH UPON THE DISTRICT'S FACILITIES AND LEVEL OF SERVICE

Utah Code 11-36a-304(1)(a)

Service Area

The service area includes all areas within the District boundaries.

Wastewater Demands

The table below shows Equivalent Residential Connection (ERC) growth projections.

TABLE 4: GROWTH IN DEMAND

Year	ERCs
2021	44,141
2022	44,665
2023	45,195
2024	45,731
2025	46,274
2026	46,823
2027	47,378
2028	47,940
2029	48,509
2030	49,085
2031	49,667

Existing and Proposed LOS Analysis

Level of service defines how much of the wastewater system a typical residential user, defined as an ERC, will require and can fairly fund through impact fee revenue. LOS is based upon historic observed wastewater demands per ERC. Impact fee law prohibits the use of impact fees to increase the LOS above the current demands. At times, a wastewater system may need to increase a LOS to cure an existing deficiency, but projects that fix deficiencies must be paid for by non-impact fee revenues and a credit must be provided to the impact fee payer. In this analysis, a credit has been calculated to offset the portion of the future capital projects which will benefit existing users.

TABLE 5: SERVICE LEVELS

Criteria	Existing LOS	Proposed LOS
Pipeline Capacity		
Maximum Ratio of Flow to Pipeline Capacity/Percent of Collection System that currently meets the standard	.75/99.36%	.75/100%
Treatment Capacity		
Average Day, Maximum Month Flow (gpd/ERC)	214	214
General Assets		
Adequacy of Existing Facilities to Serve Costumers	Sufficient	Sufficient

Source: GHID Water Impact Fee Facilities Plan, May 2022

CHAPTER 3: IMPACT ON CAPACITY FROM DEVELOPMENT ACTIVITY

Utah Code 11-36a-304(1)(b)(c)

Excess Capacity

The District has the right to increase the established LOS in the future by constructing facilities that will provide greater capacity per ERC, but such LOS increases cannot be funded through impact fees. If the proposed LOS is higher than the existing LOS, then a deficiency exists and will be cured through sources of funding other than impact fees. Many of the future projects identified in the IFFP will serve existing residents, as well as new development which means a credit has been included in the impact fee calculation to offset the cost of constructing infrastructure that cures deficiencies for existing users.

With growth of 5,526 ERCs over the next 10 years (2021-2031), new growth represents 3.92% of the total capacity of the existing collection system. This means that new development between 2021 and 2031 is responsible for 3.92% of the costs of the existing collection system, or $2,427,912.

TABLE 6: EXISTING EXCESS CAPACITY–COLLECTION SYSTEM

Collection	
Existing Capacity Cost - Collection	$61,936,535
Percent to 10-Yr Growth	3.92%
Collection Cost to 10-Yr Growth	$2,427,912

New growth represents 5.74% of the total capacity of the existing treatment system. This means that new development between 2021 and 2031 is responsible for 5.74% of the costs of the existing treatment system, or $2,885,154.

TABLE 7: EXISTING EXCESS CAPACITY-TREATMENT

Treatment	
Existing Capacity Cost - Treatment	$50,264,000
Percent to 10-Yr Growth	5.74%
Treatment Cost to 10-Yr Growth	$2,885,154

The District has general assets with excess capacity to serve new growth. The IFFP shows that 8.09% of the existing general assets will benefit 10-year growth at a cost of $396,055.

TABLE 8: EXISTING EXCESS CAPACITY-GENERAL ASSETS

General Assets	
Existing Capacity Cost - General Assets	$4,895,613
Percent to 10-Yr Growth	8.09%
General Asset Cost to 10-Yr Growth	$396,055

CHAPTER 4: SYSTEM IMPROVEMENTS REQUIRED FROM DEVELOPMENT ACTIVITY

Utah Code 11-36a-304(1)(b)(c)

Future 10-Year Wastewater Capital Projects

The District intends to build the following projects within the impact fee planning horizon to serve the demands of new growth.

TABLE 9: IMPACT-FEE ELIGIBLE CAPITAL PROJECTS – COLLECTION SYSTEM PROJECTS

Collection System Projects	Project Description	Total Project Cost	Cost to Existing	Cost to Beyond 10-year Growth	Impact Fee Eligible Cost to 10-Year Growth
S1	Redwood Road Improvements	$8,750,000	$2,107,530	$1,752,570	**$4,889,899**
S2	4000 W, Continental Dr to 4100 S	$630,000	$553,060	$76,940	**$0**
S4	Decker Lake Dr @ City Center Ct	$1,560,000	$919,594	$233,198	**$407,208**
S5	3100 S, 2040 W to Armstrong PS	$600,000	$422,476	$160,625	**$16,899**
S7	3500 S, 3200 W to W of Decker Lake Dr	$6,000,000	$2,607,339	$3,001,723	**$390,938**
S8	4100 S, 6780 W to 6400 W (2.680')	$1,400,000	$144,900	$1,255,100	**$0**
LS1	Replace Lift Station	$5,000,000	$2,058,824	$2,459,991	**$481,185**
				Impact Fee Eligible 10-Year Costs:	**$6,186,129**

TABLE 10: IMPACT-FEE ELIGIBLE CAPITAL PROJECTS – TREATMENT SYSTEM PROJECTS

Treatment System Projects	Project Description	Total Project Cost	Cost to Existing	Cost to Beyond 10-year Growth	Impact Fee Eligible Cost to 10-Year Growth
T1	CVWRF Improvements	$113,282,400	$86,842,366	$19,936,509	**$6,503,526**
				Impact Fee Eligible 10-Year Costs:	**$ 6,503,526**

The IFFP shows $8,813,723 of the total $23,940,000 collection new project costs is needed to benefit existing users. Credits against the gross impact fee must be calculated for the future project costs that benefit existing users so that new development does not pay twice. The deficiency credit calculation is detailed later in this IFA. Bonds have been issued to fund the CVWRF treatment improvements and a bond credit calculation is also included later in this IFA to account for the portions of the treatment projects that benefit existing users.

CHAPTER 5: PROPORTIONATE SHARE ANALYSIS

The Impact Fees Act requires the Impact Fee Analysis to estimate the proportionate share of the future and historic cost of existing system improvements that benefit new growth and can be recouped through impact fees. The impact fee for existing assets must be based on the actual costs while the fees for construction of new facilities must be based on reasonable future costs of the system. This chapter will show that the proposed impact fee for system improvements is reasonably related to the impact on the wastewater system from future development activity.

Maximum Legal Wastewater Impact Fee per ERC

Existing Projects with Excess Capacity

The existing excess capacity to be consumed over the next ten years is $2,427,912 for the collection system, $2,885,154 for the treatment system, $396,055 of general assets and financing costs of $260,488 (excludes CVWRF financing costs which can be found in the treatment section of Table 13 below). With projected growth of 5,526 ERCs over the next 10 years, the cost per ERC is $439.36 for buy-in to the collection system, $522.11 to the treatment system, $71.67 to general assets, and $47.14 for financing costs.

TABLE 11: PROPORTIONATE SHARE ANALYSIS-EXCESS CAPACITY BUY-IN

Collection	
Existing Capacity Cost - Collection	$61,936,535
Percent to 10-Yr Growth	3.92%
Collection Cost to 10-Yr Growth	$2,427,912
Collection Cost per ERC	**$439.36**
Treatment	
Existing Capacity Cost - Treatment	$50,264,000
Percent to 10-Yr Growth	5.74%
Treatment Cost to 10-Yr Growth	$2,885,154
Treatment Cost per ERC	**$522.11**
General Assets	
Existing Capacity Cost - General Assets	$4,895,613
Percent to 10-Yr Growth	8.09%
General Asset Cost to 10-Yr Growth	$396,055
General Asset Cost per ERC	**$71.67**
Financing Costs	
Total Cost to 10-Yr Growth (not incl. treatment)	$2,823,967
% Interest	9.22%
Financing Cost to 10-Yr Growth	$260,488
General Asset Cost per ERC	**$47.14**
Total Buy-In Costs per ERC:	**$1,080.28**

New Construction

Tables 12 and 13 summarize the cost of future system improvements to be constructed within the next 10 years and what portion of these costs are attributable to 10-year growth.

TABLE 12: PROPORTIONATE SHARE ANALYSIS- COLLECTION NEW CONSTRUCTION

Collection	
New Improvements	$23,940,000
10-Yr Growth Amount	$6,186,129
Growth in ERCs, 2021-2031	5,526
Collection Cost per ERC	**$1,119.46**

TABLE 13: PROPORTIONATE SHARE ANALYSIS- TREATMENT NEW CONSTRUCTION

Treatment	
New Improvements	$113,282,400
Percent to 10-Yr Growth	5.74%
10-Year Growth Amount	$6,503,526
CVWRF Interest Cost Attributable to 10-Year Growth	$2,154,678
Growth in ERCs, 2021-2031	5,526
Treatment Cost per ERC	**$1,566.81**

Consultant Fees

The Impact Fees Act allows for fees charged to include the reimbursement of engineering and consultant costs incurred in the preparation of the IFFP and IFA.

TABLE 14: PROPORTIONATE SHARE ANALYSIS – CONSULTANT FEES

Consultant Costs	
Consultant Costs	$61,335
Growth in ERCs, 2021-2031	5,526
Consultant Cost per ERC	**$11.10**

Summary of Gross Impact Fee

The gross impact fee is the impact calculated before credits for deficiencies are taken into account.

TABLE 15: PROPORTIONATE SHARE ANALYSIS- GROSS IMPACT FEE PER ERC

SUMMARY OF IMPACT FEE CALCULATION	
Existing Excess Capacity	$1,080.28
New Construction	$2,686.27
Consultant Costs	$11.10
GROSS IMPACT FEE PER ERC	**$3,777.65**

Credits Against Impact Fees

Three separate credits must be made against the gross impact fee. The first credit is to offset the portion of new GHID projects that will benefit existing deficiencies. There are existing deficiencies of $8,813,723 based on the collection LOS. New development cannot be expected to pay the full impact fees and then also contribute to this existing deficiency in the system through user rate revenues or other sources.

Therefore, credits have been made for the portion of the projects that will be used to cure existing deficiencies. Table 16 shows these credits based on the increased cost per ERC per year to cure existing deficiencies, as well as the net present value of these credits.

The second credit that must be made is for GHID's 2021 Refunding of 2012 bond for collection facilities. These credits are shown in Table 17 below.

This analysis assumes that costs are spread equally over 20 years.

TABLE 16: DEFICIENCY CREDIT AMOUNT FOR NEW DEVELOPMENT – COLLECTION FACILITIES

Year	ERCs	Cost per ERC	NPV* of Credits
2021	44,141		
2022	44,665	$9.87	$133.37
2023	45,195	$9.75	$127.51
2024	45,731	$9.64	$121.58
2025	46,274	$9.52	$115.59
2026	46,823	$9.41	$109.53
2027	47,378	$9.30	$103.41
2028	47,940	$9.19	$97.21
2029	48,509	$9.08	$90.93
2030	49,085	$8.98	$84.58
2031	49,667	$8.87	$78.14
2032	50,197	$8.78	$71.61
2033	50,733	$8.69	$64.98
2034	51,275	$8.59	$58.24
2035	51,822	$8.50	$51.39
2036	52,375	$8.41	$44.43
2037	52,935	$8.33	$37.35
2038	53,500	$8.24	$30.14
2039	54,071	$8.15	$22.81
2040	54,648	$8.06	$15.35
2041	55,266	$7.97	$7.74
	5-Year Average Outstanding Bonds Credit (2022-2026):		**$121.52**

*NPV = NET PRESENT VALUE DISCOUNTED AT A RATE OF 3 PERCENT

TABLE 17: CREDIT FOR OUTSTANDING DEBT (SERIES 2021 REFUNDING BOND) – COLLECTION FACILITIES

Year	Annual Debt Service	Amount to Existing	ERCs	Cost per ERC	NPV* of Credits
2022	$377,376.25	$298,618	44,665	$6.73	$63.82
2023	$375,035.00	$296,765	45,195	$6.61	$58.06
2024	$373,190.00	$295,305	45,731	$6.50	$52.32
2025	$374,300.00	$296,184	46,274	$6.44	$46.61
2026	$374,320.00	$296,199	46,823	$6.36	$40.87
2027	$377,265.00	$298,530	47,378	$6.34	$35.12

Year	Annual Debt Service	Amount to Existing	ERCs	Cost per ERC	NPV* of Credits
2028	$377,090.00	$298,391	47,940	$6.26	$29.31
2029	$377,840.00	$298,985	48,509	$6.20	$23.49
2030	$377,500.00	$298,716	49,085	$6.12	$17.64
2031	$377,085.00	$298,387	49,667	$6.04	$11.78
2032	$378,595.00	$299,582	50,197	$6.00	$5.91
			5-Year Average Outstanding Bonds Credit (2022-2026):		**$52.34**

*NPV = NET PRESENT VALUE DISCOUNTED AT A RATE OF 1.5 PERCENT

The CVWRF bond was issued to pay for treatment facilities. GHID is responsible for 24.25 percent of bond payments. Existing development benefits from 66.40 percent and therefore this percentage must be credited against the gross impact fee.

TABLE 18: CREDIT FOR OUTSTANDING CVWRF DEBT (SERIES 2017,2019, 2020, AND 2021 BONDS)

Year	Annual Debt Service (GHID Portion)	Amount to Existing	ERCs	Cost per ERC	NPV* of Credits
2022	$4,082,837	$2,711,083	44,665	$1,089.53	$1,089.53
2023	$4,766,456	$3,165,019	45,195	$1,050.63	$1,050.63
2024	$4,767,092	$3,165,442	45,731	$1,001.61	$1,001.61
2025	$4,766,286	$3,164,907	46,274	$952.42	$952.42
2026	$4,766,723	$3,165,196	46,823	$903.07	$903.07
2027	$4,766,874	$3,165,297	47,378	$853.54	$853.54
2028	$4,766,359	$3,164,955	47,940	$803.80	$803.80
2029	$4,767,086	$3,165,438	48,509	$753.85	$753.85
2030	$4,766,704	$3,165,184	49,085	$703.68	$703.68
2031	$4,765,898	$3,164,649	49,667	$653.27	$653.27
2032	$4,765,795	$3,164,581	50,197	$602.61	$602.61
2033	$4,766,280	$3,164,903	50,733	$551.62	$551.62
2034	$4,766,413	$3,164,991	51,275	$500.27	$500.27
2035	$4,766,153	$3,164,818	51,822	$448.55	$448.55
2036	$4,766,286	$3,164,907	52,375	$396.45	$396.45
2037	$4,766,704	$3,165,184	52,935	$343.95	$343.95
2038	$4,245,293	$2,818,957	53,500	$291.04	$291.04
2039	$4,234,471	$2,811,771	54,071	$244.17	$244.17
2040	$3,579,509	$2,376,864	54,648	$197.05	$197.05
2041	$3,579,509	$2,376,864	55,266	$157.50	$157.50
2042	$2,871,288	$1,906,591	55,891	$117.64	$117.64
2043	$1,951,775	$1,296,016	56,522	$85.88	$85.88
2044	$1,951,775	$1,296,016	57,161	$64.67	$64.67
2045	$1,951,775	$1,296,016	57,808	$43.29	$43.29
2046	$1,951,775	$1,296,016	58,461	$21.73	$21.73
			5-Year Average Outstanding Bonds Credit (2022-2026):		**$999.45**

*NPV = NET PRESENT VALUE DISCOUNTED AT A RATE OF 2 PERCENT

TABLE 19: SUMMARY OF IMPACT FEE CREDITS

Summary of Credits	
Impact Fee Fund Balance	$0
Future Projects - Avg 5 Years	($121.52)
Outstanding Bonds - CVWRF	($999.45)
Outstanding Bond - GHID	($52.34)

Impact Fee per ERC

The average annual impact fee credit for deficiencies for 2022 through 2026 is $1,173.31. Therefore, the maximum impact that can be charged per ERC is calculated by subtracting $1,173.31 from the gross fee of $3,777.65 to arrive at a **maximum impact fee of $2,604.34 per ERC.**

TABLE 20: PROPORTIONATE SHARE ANALYSIS – IMPACT FEE PER ERC

SUMMARY OF IMPACT FEE CALCULATION	
Existing Excess Capacity	$1,080.28
New Construction	$2,686.27
Consultant Costs	$11.10
Impact Fee Fund Balance Credit	$0.00
Deficiency Credit - Future Projects	($121.52)
Bond Credit - CVWRF Bonds	($999.45)
Bond Credit – GHID Outstanding Bonds	($52.34)
TOTAL IMPACT FEE PER ERC	**$2,604.34**

Non-Standard Demand Adjustments

The District reserves the right under the Impact Fees Act (Utah Code Ann. § 11-36a-402(1)(c, d)) to assess an adjusted fee to respond to unusual circumstances and to ensure that the impact fees are assessed fairly. The impact fee ordinance should include a provision that permits adjustment of the fee for a development based upon studies and data submitted by the developer that indicate a more realistic and accurate impact upon the District's infrastructure.

CERTIFICATION

In accordance with Utah Code Annotated, 11-36a-306(2), Zions Public Finance, Inc., makes the following certification:

Zions Public Finance, Inc. certifies that the attached impact fee analysis:

1. includes only the cost of public facilities that are:
    a. allowed under the Impact Fees Act; and
    b. actually incurred; or
    c. projected to be incurred or encumbered within six years after the day on which each impact fee is paid;
2. does not include:
    a. costs of operation and maintenance of public facilities; or
    b. cost for qualifying public facilities that will raise the level of service for the facilities, through impact fees, above the level of service that is supported by existing residents;
3. offset costs with grants or other alternate sources of payment; and
4. complies in each and every relevant respect with the Impact Fees Act.

ZIONS PUBLIC FINANCE, INC.

Granger-Hunter Improvement District
Water Impact Fee Analysis

GRANGER-HUNTER
IMPROVEMENT DISTRICT

Zions Public Finance, Inc.
May 25, 2022

TABLE OF CONTENTS

Contents

EXECUTIVE SUMMARY

Granger Hunter Improvement District (GHID) commissioned Zions Public Finance, Inc. (Zions) to calculate the District's impact fees in accordance with Utah State Law. An impact fee is a payment of money imposed upon new development activity to mitigate the impact of new development on public infrastructure. In conjunction with this project, Bowen Collins & Associates prepared the *Granger-Hunter Improvement District Water Impact Fee Facilities Plan* (IFFP) dated May 2022.

The recommended impact fee structure presented in this analysis has been prepared to satisfy the Impact Fees Act, Utah Code Ann. § 11-36a-101 et. seq., and represents the maximum impact fees that the District may assess. The District will be required to use revenue sources other than impact fees to fund any projects identified in the IFFP that constitute repair and replacement, cure any existing deficiencies, or increase the level of service for existing users.

Water System Overview

Level of Service – Equivalent Residential Connection

Level of service (LOS) defines the water demands that a typical residential user, expressed as an Equivalent Residential Connection (ERC), will require and should pay for through impact fees. Impact fee law prohibits the use of impact fees to increase the LOS above the current demands. At times, a water system may need to increase the LOS to cure an existing deficiency, but projects that fix deficiencies must be paid for through non-impact fee revenues and a credit must be provided to the impact fee payer in order to avoid double payment. In this analysis, a credit has been calculated to offset the portion of the future capital projects that will benefit existing users.

TABLE 1: LEVEL OF SERVICE

Criteria	Existing LOS	Proposed LOS
Production Yield-Average Day (gpd/ERC)	589.5	589.5
Production Capacity (gpd/ERC)	1,264.6	1,264.6
Storage (gallons/ERC)	583.8	583.8
Peak Hour demand Pressure (psi) / Percent of System that Meets the Standard	50/99.7%	50/100%
Minimum Available Fire flow at 20 psi during Peak Day demand (gpm) / Percent of System that Meets the Standard	1,500/99.5%	1,500/100%
Adequacy of Existing Facilities to Serve Customers	Sufficient	Sufficient

Source: GHID Water Impact Fee Facilities Plan, May 2022

A residential unit is equated to one ERC and non-residential properties are converted to the appropriate number of ERCs.

In 2021 the District served 46,142 ERCs and is anticipated to grow to approximately 49,053 ERCs by 2031, for an increase of 2,911 ERCs over the 10-year period.

Water Service Area

The Service Area covers the entire District for the purpose of calculating impact fees.

Existing Excess Capacity

The IFFP identifies existing excess capacity in the water well/production system. Acquired at an actual cost of $10,235,367 the well/production system has an existing use of 68.58% with 17.87% of the capacity available for 10-year growth. The remaining 13.55% is available for growth beyond 10 years.

The IFFP identifies existing excess capacity in the water storage system. Acquired at an actual cost of $2,358,700, the water storage system has an existing use of 88.78% with 3.95% of the capacity available for 10-year growth. The remaining 7.27% is available for growth beyond 10 years.

The IFFP identifies the percentage of existing excess capacity in the water transmission system. Acquired at an actual cost of $44,949,671, the water transmission system has an existing use of 79.25% with 4.32% of the capacity available for 10-year growth. The remaining 16.44% is available for growth beyond 10 years.

The IFFP identifies the percentage of existing excess capacity in general assets. Acquired at an actual cost of $10,066,654, general assets have an existing use of 76.73% with 4.84% of the capacity available for 10-year growth. The remaining 18.43% is available for growth beyond 10 years.

TABLE 2: EXISTING EXCESS CAPACITY

EXISTING CAPACITY	Well Production % Use	Storage Percent Use	Transmission Capacity Percent Use	General Assets Percent Use
Existing Use	68.58%	88.78%	79.25%	76.73%
Use by 10-Year Growth	17.87%	3.95%	4.32%	4.84%
Use by Growth Beyond 10 Years	13.55%	7.27%	16.44%	18.43%
TOTAL	100.00%	100.00%	100.00%	100.00%

Source: GHID Water Impact Fee Facilities Plan, May 2022

New Construction Costs

The IFFP identifies a total of $36,480,000 in new construction costs within the next 10 years. There are several new capital projects including a new well and reservoir. The IFFP also notes construction projects in the amount of $17,109,622 that are necessary to cure existing deficiencies and a total cost of $8,470,969 for 10-year growth. Credits must be made for the cost of the projects that cure deficiencies so that new development does not pay twice.

Water Impact Fee Calculation

The maximum impact fee calculation is shown in the table below and results in a maximum fee of $3,772.61 per ERC.

TABLE 3: PROPORTIONATE SHARE ANALYSIS

SUMMARY	
Existing Excess Capacity	$1,537.87
New Construction	$2,909.99
Consultant Costs	$24.71

SUMMARY	
Fund Balance	($269.08)
Credit - Future Projects	($168.72)
Credit - Outstanding Bonds	($262.15)
Maximum Fee Per ERC	**$3,772.61**

Non-Standard Demand Adjustments

The District reserves the right under the Impact Fees Act (Utah Code Ann. § 11-36a-402(1)(c, d)) to assess an adjusted fee to respond to unusual circumstances and to ensure that the impact fees are assessed fairly. The impact fee ordinance should include a provision that permits adjustment of the fee for a development based upon studies and data submitted by the developer that indicate a more realistic and accurate impact upon the District's infrastructure.

CHAPTER 1: OVERVIEW OF THE WATER IMPACT FEES

Summary

An impact fee is intended to recover the District's costs of building excess water capacity from new residential or non-residential development rather than passing these growth-related costs on to existing users through rates.

The Utah Impact Fees Act allows only certain costs to be included in an impact fee so that only the fair cost of expansionary projects or existing unused capacity paid by the District is assessed through an impact fee. Eligible costs include future projects, historic costs of existing assets that still have capacity available to serve growth, future or outstanding debt related to these eligible projects, and certain professional expenses related to planning for growth. Project improvements that only serve a specific development or subdivision cannot be included. System improvements that cure a deficiency or enhance the LOS cannot be included without an appropriate credit.

The impact fee analysis provides documentation of a fair comparison, or rational nexus, between the impact fee charged to new development and the demands that new growth will have on the system.

Costs to be Included in the Impact Fee

The impact fees proposed in this analysis are calculated based upon:

- Buy-in to existing, excess capacity;
- New capital infrastructure that will serve new development; and
- Professional and planning expenses related to the construction of system improvements that will serve new development.

The costs that cannot be included in the impact fee are as follows:

- Projects that cure system deficiencies for existing users;
- Operations and maintenance costs;
- Costs of facilities funded by grants or other funds that the District does not have to repay;
- Interest costs related to outstanding or future bonds that have been issued to fund non-impact fee eligible projects such as repair and replacement and curing deficiency; and
- Costs of reconstruction of facilities that do not have capacity to serve new growth.

Utah Code Legal Requirements

Utah law requires that entities prepare an Impact Fee Analysis (IFA) before enacting an impact fee. Utah law also requires that entities give notice of their intent to prepare and adopt an IFA. This IFA follows all legal requirements as outlined below. The District has retained Zions Public Finance, Inc. (ZPFI) to prepare this Impact Fee Analysis in accordance with legal requirements.

Notice of Intent to Prepare Impact Fee Analysis

A local political subdivision must provide written notice of its intent to prepare an IFA before preparing the Plan (Utah Code §11-36a-503). This notice must be posted on the Utah Public Notice website.

Preparation of Impact Fee Analysis

Utah Code requires that each local political subdivision, before imposing an impact fee, prepare an impact fee analysis. (Utah Code 11-36a-304).

Section 11-36a-304 of the Utah Code outlines the requirements of an impact fee analysis:

(1) An impact fee analysis shall:

(a) identify the anticipated impact on or consumption of any existing capacity of a public facility by the anticipated development activity;

(b) identify the anticipated impact on system improvements required by the anticipated development activity to maintain the established level of service for each public facility;

(c) demonstrate how the anticipated impacts described in subsections (1)(a) and (b) are reasonably related to the anticipated development activity;

(d) estimate the proportionate share of:
(i) the costs for existing capacity that will be recouped; and
(ii) the costs of impacts on system improvements that are reasonably related to the new development activity; and

(e) identify how the impact fee was calculated.

(2) In analyzing whether or not the proportionate share of the costs of public facilities are reasonably related to the new development activity, the local political subdivision or private entity, as the case may be, shall identify, if applicable:

(a) the cost of each existing public facility that has excess capacity to serve the anticipated development resulting from the new development activity;

(b) the cost of system improvements for each public facility;

(c) other than impact fees, the manner of financing for each public facility, such as user charges, special assessments, bonded indebtedness, general taxes, or federal grants;

(d) the relative extent to which development activity will contribute to financing the excess capacity of and system improvements for each existing public facility, by such means as user charges, special assessments, or payment from the proceeds of general taxes;

(e) the relative extent to which development activity will contribute to the cost of existing public facilities and system improvements in the future;

(f) the extent to which the development activity is entitled to a credit against impact fees because the development activity will dedicate system improvements or public facilities that will offset the demand for system improvements, inside or outside the proposed development;

(g) extraordinary costs, if any, in servicing the newly-developed properties; and

(h) the time-price differential inherent in fair comparisons of amounts paid at different times.

Certification of Impact Fee Analysis

Utah Code states that an Impact Fee Analysis shall include a written certification from the person or entity that prepares the Impact Fee Analysis. This certification is included at the conclusion of this analysis.

CHAPTER 2: IMPACT FROM GROWTH UPON THE DISTRICT'S FACILITIES AND LEVEL OF SERVICE

Utah Code 11-36a-304(1)(a)

Service Area

The service area includes all areas within the District boundaries.

Water Demands

The table below shows Equivalent Residential Connection (ERC) growth projections.

TABLE 4: GROWTH IN DEMAND

Year	ERCs
2021	46,142
2022	46,425
2023	46,710
2024	46,997
2025	47,285
2026	47,575
2027	47,867
2028	48,161
2029	48,456
2030	48,754
2031	49,053

Existing and Proposed LOS Analysis

Level of service defines how much of the water system a typical residential user, defined as an ERC, will require and can fairly fund through impact fee revenue. LOS is based upon historic observed water demands per ERC. Impact fee law prohibits the use of impact fees to increase the LOS above the current demands. At times, a water system may need to increase a LOS to cure an existing deficiency, but projects that fix deficiencies must be paid for by non-impact fee revenues and a credit must be provided to the impact fee payer in order to avoid double payment. In this analysis, a credit has been calculated to offset the portion of the future capital projects which will benefit existing users.

TABLE 5: SERVICE LEVELS

Criteria	Existing LOS	Proposed LOS
Production Yield-Average Day (gpd/ERC)	589.5	589.5
Production Capacity (gpd/ERC)	1,264.6	1,264.6
Storage (gallons/ERC)	583.8	583.8
Peak Hour demand Pressure (psi) / Percent of System that Meets the Standard	50/99.7%	50/100%
Minimum Available Fire flow at 20 psi during Peak Day demand (gpm) / Percent of System that Meets the Standard	1,500/99.5%	1,500/100%
Adequacy of Existing Facilities to Serve Customers	Sufficient	Sufficient

Source: GHID Water Impact Fee Facilities Plan, May 2022

CHAPTER 3: IMPACT ON CAPACITY FROM DEVELOPMENT ACTIVITY

Utah Code 11-36a-304(1)(b)(c)

Excess Capacity

The District has the right to increase the established LOS in the future by constructing facilities that will provide greater capacity per ERC, but such LOS increases cannot be funded through impact fees. If the proposed LOS is higher than the existing LOS, then a deficiency exists and will be cured through sources of funding other than impact fees. Many of the future projects identified in the IFFP will serve existing residents, as well as new development which means a credit has been included in the impact fee calculation to offset the cost of constructing infrastructure that cures deficiencies for existing users.

With growth of 2,911 ERCs over the next 10 years (2021-2031), new growth represents 17.87 percent of the total capacity of the existing well production. This means that new development between 2021 and 2031 is responsible for 17.87 percent of the costs of the existing well production, or $1,829,060.

TABLE 6: EXCESS CAPACITY-WELL PRODUCTION

Well Production	
Existing Capacity Cost - Well Production	$10,235,367
Percent to 10-Yr Growth	17.87%
Well Production Cost to 10-Yr Growth	$1,829,060

New growth represents 3.95 percent of the total capacity of the existing storage system. This means that new development between 2021 and 2031 is responsible for 3.95 percent of the cost of the existing storage system, or $93,169.

TABLE 7: EXCESS CAPACITY-STORAGE

Storage	
Existing Capacity Cost - Storage	$2,358,700
Percent to 10-Yr Growth	3.95%
Storage Cost to 10-Yr Growth	$93,169

New growth represents 4.32 percent of the total capacity of the existing transmission system. This means that new development between 2021 and 2031 is responsible for 4.32 percent of the cost of the existing transmission system, or $1,941,826.

TABLE 8: EXCESS CAPACITY-TRANSMISSION

Transmission	
Existing Capacity Cost - Transmission	$44,949,671
Percent to 10-Yr Growth	4.32%
Transmission Cost to 10-Yr Growth	$1,941,826

The District also has general assets with excess capacity to serve new growth. The IFFP shows that 4.84% of the existing general assets will benefit 10-year growth at a cost of $487,226.

TABLE 9: EXCESS CAPACITY-GENERAL ASSETS

General Assets	
Existing Capacity Cost - General Assets	$10,066,654
Percent to 10-Yr Growth	4.84%
General Asset Cost to 10-Yr Growth	$487,226

CHAPTER 4: SYSTEM IMPROVEMENTS REQUIRED FROM DEVELOPMENT ACTIVITY

Utah Code 11-36a-304(1)(b)(c)

Future 10-Year Water Capital Projects

The District intends to build the following projects within the impact fee planning horizon to serve the demands of new growth.

TABLE 10: IMPACT-FEE ELIGIBLE CAPITAL PROJECTS –WELL PRODUCTION PROJECTS

Well Production Project	Project Description	Total Project Cost	Cost to Existing	Cost to Growth Beyond 10-Years	Impact Fee Cost to 10-Year Growth
S1	Iron/Manganese Removal Facility (w/1 & 17)	$11,000,000	$7,544,268	$1,490,237	**$1,965,495**
S2	Iron/Manganese Removal Facility	$4,000,000	$2,743,370	$541,904	**$714,725**
S3	Iron/Manganese Removal Facility	$4,000,000	$2,743,370	$541,904	**$714,725**
S4	Drill New Well	$2,000,000	$0	$2,000,000	**$0**
S5	Well House Construction	$2,750,000	$0	$2,750,000	**$0**
				10-Year Impact Fee Eligible Cost:	**$3,394,945**

TABLE 11: IMPACT-FEE ELIGIBLE CAPITAL PROJECTS – STORAGE PROJECTS

Storage Project	Project Description	Total Project Cost	Cost to Existing	Cost to Growth Beyond 10-Years	Impact Fee Cost to 10-Year Growth
ST1	New Reservoir Construction	$9,350,000	$4,078,613	$3,417,265	**$1,854,121**
				10-Year Impact Fee Eligible Cost:	**$1,854,121**

TABLE 12: IMPACT-FEE ELIGIBLE CAPITAL PROJECTS – TRANSMISSION SYSTEM PROJECTS

Transmission System Projects	Project Description	Total Project Cost	Cost to Existing	Cost to Growth Beyond 10-Years	Impact Fee Cost to 10-Year Growth
P1	Parkway Blvd./Bangerter Hwy	$1,270,000	$0	$59,403	**$1,210,597**
P2	3600 W/2400 S - Outside of Ridgeland PS	$560,000	$0	$26,194	**$533,806**
P3	3600 W/4400 S - Southeast portion of Zone 3E	$30,000	$0	$1,403	**$28,597**

Transmission System Projects	Project Description	Total Project Cost	Cost to Existing	Cost to Growth Beyond 10-Years	Impact Fee Cost to 10-Year Growth
P4	500 W/4700 S - JV #50	$1,320,000	$0	$61,742	**$1,258,258**
P5	4800 W / 4415 S - Tank Farm to Zone 2	$200,000	$0	$9,355	**$190,645**
			10-Year Impact Fee Eligible Cost:		**$3,221,903**

The IFFP shows a total of $17,109,621 of the total $36,480,000 new project costs benefitting existing users. The District has $4.5M set aside to partially offset these costs. Credits against the gross impact fee must be calculated for the remaining $12,609,621 future project costs that benefit existing users so that new development does not pay twice. The deficiency credit calculation is detailed later in this IFA.

CHAPTER 5: PROPORTIONATE SHARE ANALYSIS

The Impact Fees Act requires the Impact Fee Analysis to estimate the proportionate share of the future and historic cost of existing system improvements that benefit new growth that can be recouped through impact fees. The impact fee for existing assets must be based on the actual costs while the fees for construction of new facilities can be based on reasonable future costs of the system. This chapter will show that the proposed impact fee for system improvements is reasonably related to the impact on the water system from future development activity.

Maximum Legal Water Impact Fee per ERC

Existing Projects with Excess Capacity

Over the next 10 years, new development will consume 17.87 percent of well production capacity ($1,829,060), 3.95 percent of storage ($93,169), 4.32 percent ($1,941,826) of transmission, and 4.84 percent ($487,226) of general assets. With projected growth of 2,911 ERCs over the next 10 years, the cost per ERC is $628.33 for buy-in to well production, $32.01 for storage, $667.06 for transmission, and $0.27 for general assets.

TABLE 13: PROPORTIONATE SHARE ANALYSIS-EXCESS CAPACITY BUY-IN

BUY-IN TO EXISTING EXCESS CAPACITY	
Well Production	
Existing Capacity Cost - Well Production	$10,235,367
Percent to 10-Yr Growth	17.87%
Well Production Cost to 10-Yr Growth	$1,829,060
Well Production Cost per ERC	**$628.33**
Storage	
Existing Capacity Cost - Storage	$2,358,700
Percent to 10-Yr Growth	3.95%
Storage Cost to 10-Yr Growth	$93,169
Storage Cost per ERC	**$32.01**
Transmission	
Existing Capacity Cost - Transmission	$44,949,671
Percent to 10-Yr Growth	4.32%
Transmission Cost to 10-Yr Growth	$1,941,826
Transmission Cost per ERC	**$667.06**
General Assets	
Existing Capacity Cost - General Assets	$10,066,654
Percent to 10-Yr Growth	4.84%
General Asset Cost to 10-Yr Growth	$487,226
General Asset Cost per ERC	**$0.27**

New Construction

Table 14 summarizes the cost of future system improvements to be constructed within the next 10 years and what portion of these costs are attributable to 10-year growth.

TABLE 14: PROPORTIONATE SHARE ANALYSIS

Transmission Costs	**Amount**
New Improvements	$3,380,000
10-Yr Growth Amount	$3,221,903
Growth in ERCs, 2021-2031	2,911
Transmission Cost per ERC	**$1,106.80**
Production Costs	**Amount**
New Improvements	$23,750,000
10-Year Growth Amount	$3,394,945
Growth in ERCs, 2021-2031	2,911
Production Cost per ERC	**$1,166.25**
Storage Costs	**Amount**
New Improvements	$9,350,000
10-Year Growth Amount	$1,854,121
Growth in ERCs, 2021-2031	2,911
Storage Cost per ERC	**$636.94**
TOTAL New Construction Costs per ERC	**$2,909.99**

Consultant Fees

The Impact Fees Act allows for fees charged to include the reimbursement of engineering and consultant costs incurred in the preparation of the IFFP and IFA.

TABLE 15: PROPORTIONATE SHARE ANALYSIS – CONSULTANT FEES

Consultant Costs	**Amount**
Consultant Costs	$71,921
Growth in ERCs, 2021-2031	2,911
Consultant Cost per ERC	**$24.71**

Impact Fee Fund Balance

A credit needs to be made for unspent funds in the impact fees account that can be used to offset the costs of the future capital improvements. These funds were collected to meet the needs of new growth and development.

TABLE 16: PROPORTIONATE SHARE ANALYSIS – IMPACT FEE FUND BALANCE

Impact Fee Fund Balance	
Fund Balance	$783,288.64[1]
Growth in ERCs, 2021-2031	2,911
Fund Balance Credit per ERC	**($269.08)**

[1] Source: GHID

Credits Against Impact Fees

There are existing deficiencies of $17,109,621 based on the LOS and the District has $4.5M set aside to help fund these deficiency projects. New development cannot be expected to pay the full impact fees and then also contribute to this existing deficiency in the system through user rate revenues or other sources. Therefore, credits have been made for the portion of the projects that will be used to cure existing deficiencies. The table below shows these credits and the maximum fee that may be charged each year.

This analysis assumes that costs are spread equally over 20 years.

TABLE 17: DEFICIENCY CREDIT AMOUNT FOR NEW DEVELOPMENT

Year	ERCs	Cost per ERC	NPV* of Credits
2021	46,142		
2022	46,425	$13.58	$185.10
2023	46,710	$13.50	$177.07
2024	46,997	$13.42	$168.88
2025	47,285	$13.33	$160.53
2026	47,575	$13.25	$152.02
2027	47,867	$13.17	$143.32
2028	48,161	$13.09	$134.45
2029	48,456	$13.01	$125.40
2030	48,754	$12.93	$116.15
2031	49,053	$12.85	$106.70
2032	49,369	$12.77	$97.05
2033	49,688	$12.69	$87.19
2034	50,008	$12.61	$77.11
2035	50,330	$12.53	$66.82
2036	50,655	$12.45	$56.30
2037	50,982	$12.37	$45.54
2038	51,310	$12.29	$34.54
2039	51,641	$12.21	$23.29
2040	51,974	$12.13	$11.78

*NPV = net present value discounted at a rate of 3 percent

The District also has an outstanding bond which requires credits to be made for the portion of the bond payments that benefit existing users. Based on information provided by the engineers, approximately 74 percent of the bond payments benefit existing development.

TABLE 18: CREDIT FOR OUTSTANDING DEBT (SERIES 2019 BOND)

Year	2019 Bond % to Existing	ERCs	Cost per ERC	NPV
2022	$733,588	46,425	$15.80	$289.91
2023	$824,938	46,710	$17.66	$277.73

Year	2019 Bond % to Existing	ERCs	Cost per ERC	NPV
2024	$898,058	46,997	$19.11	$263.54
2025	$897,725	47,285	$18.99	$247.73
2026	$898,021	47,575	$18.88	$231.84
2027	$898,197	47,867	$18.76	$215.86
2028	$898,252	48,161	$18.65	$199.79
2029	$898,187	48,456	$18.54	$183.64
2030	$898,003	48,754	$18.42	$167.40
2031	$897,698	49,053	$18.30	$151.07
2032	$898,012	49,369	$18.19	$134.66
2033	$898,197	49,688	$18.08	$118.15
2034	$898,252	50,008	$17.96	$101.55
2035	$898,178	50,330	$17.85	$84.86
2036	$897,975	50,655	$17.73	$68.08
2037	$897,642	50,982	$17.61	$51.20
2038	$897,919	51,310	$17.50	$34.23
2039	$897,319	51,641	$17.38	$17.16

The sum of the average impact fee credit for deficiencies for 2022 through 2026, the bond credit, and the impact fee fund balance credit is $699.95. Therefore, the maximum impact that can be charged per ERC is calculated by subtracting $699.95 from the gross fee of $4,472.56[2] to arrive at a **maximum fee of $3,772.61 per ERC.**

Summary of Maximum Impact Fee

The maximum impact fee is shown in the table below.

TABLE 19: PROPORTIONATE SHARE ANALYSIS – GROSS FEE

SUMMARY	
Existing Excess Capacity	$1,537.87
New Construction	$2,909.99
Consultant Costs	$24.71
Fund Balance	($269.08)
Credit - Future Projects Portion Benefitting Existing Users	($168.72)
Credit - Outstanding Bonds	($262.15)
TOTAL	**$3,772.61**

[2]The gross fee is the sum of the existing excess capacity, new construction and consultant costs. It is the fee calculated before credits are made.

Non-Standard Demand Adjustments

The District reserves the right under the Impact Fees Act (Utah Code Ann. § 11-36a-402(1)(c, d)) to assess an adjusted fee to respond to unusual circumstances and to ensure that the impact fees are assessed fairly. The impact fee ordinance should include a provision that permits adjustment of the fee for a development based upon studies and data submitted by the developer that indicate a more realistic and accurate impact upon the District's infrastructure.

CERTIFICATION

In accordance with Utah Code Annotated, 11-36a-306(2), Zions Public Finance, Inc., makes the following certification:

Zions Public Finance, Inc. certifies that the attached impact fee analysis:

1. includes only the cost of public facilities that are:
    a. allowed under the Impact Fees Act; and
    b. actually incurred; or
    c. projected to be incurred or encumbered within six years after the day on which each impact fee is paid;
2. does not include:
    a. costs of operation and maintenance of public facilities; or
    b. cost for qualifying public facilities that will raise the level of service for the facilities, through impact fees, above the level of service that is supported by existing residents;
3. offset costs with grants or other alternate sources of payment; and
4. complies in each and every relevant respect with the Impact Fees Act.

ZIONS PUBLIC FINANCE, INC.

BOARD MEETING

- MAY 17, 2022 BOARD MEETING MINUTES APPROVAL

MINUTES OF THE
GRANGER-HUNTER IMPROVEMENT DISTRICT
BOARD MEETING

The Meeting of the Board of Trustees of the Granger-Hunter Improvement District (GHID) was held Tuesday, May 17, 2022, at 3:04 P.M. at the District office located at 2888 S. 3600 W., West Valley City, Utah.

This meeting was conducted electronically in accordance with the Utah Open and Public Meetings Act (Utah Code Ann. (1953) §§ 52-4-1 et seq.) and Chapter 7.12 of the Administrative Policy and Procedures Manual ("Electronic Meetings").

Trustees Present:

Debra Armstrong	Chair
Corey Rushton	Trustee
Roger Nordgren	Trustee

Staff Members Present:

Jason Helm	General Manager/Treasurer
Todd Marti	Assistant General Manager/District Engineer
Troy Stout	Assistant General Manager/Chief Operating Officer
Michelle Ketchum	Director of Administration
Dustin Martindale	Director of Water Systems
Ricky Necaise	Director of Wastewater
Victor Narteh	Director of Engineering
Justin Gallegos	Director of Information Technology
Austin Ballard	Controller/Clerk
Dakota Cambruzzi	Human Resource Manager
Kristy Johnson	Executive Assistant
Brent Rose	Legal Counsel – Clyde Snow & Sessions PC

Guests:

Kyle Dean	Wastewater Systems Division Manager, GHID – *Left after WEAU award presentation*
Steven Rowley	Partner/CPA, Keddington & Christensen, CPAS – *Left meeting following presentation*
Randy Zollinger	Carollo Engineers – *Left before meeting ended*
Adam Spackman	Information Technology, GHID - *Electronically*
Ian Bailey	Information Technology, GHID - *Electronically*
Debra Jones	Customer Service, GHID – *Electronically*
Idanely Avalos	Customer Service, GHID – *Electronically*
Taylor Gomm	Customer Service, GHID - *Electronically*
Michael Wear	Fleet Division Supervisor, GHID - *Electronically*
Darcy Brantly	Accountant, GHID – *Electronically*
Justin Brewer	Community Member – *Electronically*

A copy of the exhibits referred to in these minutes is attached and incorporated by this reference. The exhibits are also included in the official minute books maintained by Granger-Hunter Improvement District.

CALL TO ORDER

At 3:04 P.M. Debra Armstrong called the meeting to order and recognized all those present.

Public Comments

There were none.

Approval of the April 19, 2022 Board Meeting Minutes

A motion to approve the Board Meeting Minutes from April 19, 2022, was made by Debra Armstrong. Followed a second from Roger Nordgren, the motion passed as follows:

Armstrong – aye Rushton – *had not arrived*** Nordgren – aye

***Once Corey Rushton arrived, he mentioned that he didn't have any changes to the minutes.*

Conflicts of interest

There were none.

OUR COMMUNITY

Recognition of WEAU Award

Jason Helm recognized Kyle Dean for being awarded the Water Environment Association of Utah's (WEAU) Top Supervisor of the Year. Mr. Helm also commended Mr. Dean on his success with teaching the District's Wastewater Certification Exam prep classes. The state had 47 participants take the exam in April with a pass rate of 36%. Seven participants were from the District and all seven passed the exam.

Consider Approval of 2021 Audit and Supplementary Reports

Steven Rowley of Keddington & Christensen, LLC, presented the 2021 audit report to the Board. Mr. Rowley highlighted the findings which included the following: there were no significant difficulties, there were no disagreements with management, the financial statements present fairly, in all material respects, the financial position of the District, and the District complied with state and federal compliance requirements. Corey Rushton discussed grant funding and inquired about the auditing process for controls on those programs. Austin Ballard noted that the single audit is for federally received funds. Corey Rushton made a motion to approve the 2021 audit and supplementary reports as noted. Following a second from Roger Nordgren, the motion passed as follows;

Armstrong - aye Rushton - aye. Nordgren - aye

Consider Amendments to Rules & Regulations Section 7.9 – Cross-Connection & Back-flow Control

Mr. Helm asked the Board to consider Amendments to the Rules and Regulations Section 7.9 – Cross-Connection and Back-Flow Control. After a discussion regarding the notification process and plumbing code for expansion tanks, Corey Rushton noted the importance of consistency with the policy, the need for documentation of notification and the importance of working with homeowners versus renters. Mr. Rushton made a motion to approve the amendments as noted. Following a second from Debra Armstrong, the motion passed as follows:

Armstrong – aye Rushton – aye Nordgren – aye

OUR TEAM

Jordan Valley Water Conservancy District Review

Mr. Helm presented the Jordan Valley Water Conservancy District (JVWCD) review. A discussion took place regarding water conservation and drought updates. – See JVWCD Review attached to these minutes for details.

Central Valley Water Reclamation Facility Review

Mr. Helm presented the Central Valley Water Reclamation Facility (CVWRF) review. – See CVWRF Review attached to these minutes for details.

OUR OPERATIONS

Consider Approval of District's Plan to Surplus Unit #57, an International Vactor 2100i Truck

Austin Ballard asked the Board to consider Approval of the District's plan to surplus Unit #57, an International Vactor 2100i truck. Roger Nordgren made a motion to approve the surplus as noted. Following a second from Debra Armstrong, the motion passed as follows:

Armstrong – aye Rushton – aye Nordgren – aye

Consider Approval of District's Plan to Surplus Unit #42, a Case 580SN Backhoe

Mr. Ballard asked the Board to consider Approval of the District's plan to surplus Unit #42, a Case 580SN Backhoe. Roger Nordgren made a motion to approve the surplus as noted. Following a second from Debra Armstrong, the motion passed as follows:

Armstrong – aye Rushton – aye Nordgren – aye

Review & Discuss Financial Report for April 2022

Mr. Ballard summarized the April Financial Report. Mr. Ballard noted that the net revenues are below what they were this time last year due to CVWRF bonds, the utilization of the JVWCD contract, the purchase of equipment, and an increase in the District's debt service. Mr. Ballard mentioned that summer water sales were down in 2021 and are forecasted to be lower this year as well which will cause lower overall revenues. – See April 2022 Financial Report attached to these minutes for details.

Review & Discuss Paid Invoice Report for April 2022

Mr. Ballard discussed the April check report. The April check report totaled $2,735,653.00 coming from five categories; Central Valley (39%), infrastructure (23%), Jordan Valley (19%), payroll taxes and employee benefits (9%), and other (10%). – See April 2022 Paid Invoice Report attached to these minutes for details.

Water Maintenance Update

Troy Stout presented the water maintenance report. – See the Water Systems Update report attached to these minutes for details.

Wastewater Maintenance Update

Mr. Stout presented the wastewater maintenance report. – See the Wastewater Systems Update report attached to these minutes for details.

Water Supply Review

Todd Marti discussed the water supply report. – See the Water Supply Review report attached to these minutes for details.

Capital Projects Update

Mr. Marti presented the capital projects update. – See the Capitol Projects Update report attached to these minutes for details.

Consider Approval of Construction Contract to Lyndon Jones Construction, Inc. for the 22C: Lake Park & Merry Lane Subdivisions Waterline Replacements

Mr. Marti asked the Board to consider Approval of a Construction Contract with Lyndon Jones, Inc. in the amount of $1,984,790.00 for the 22C: Lake Park & Merry Lane Subdivision Waterline Replacements. Roger Nordgren made a motion to approve the contract as noted. Following a second from Corey Rushton, the motion passed as follows:

Armstrong – aye Rushton – aye Nordgren – aye

Engineering Department Update

Mr. Marti discussed the engineering department update. Mr. Marti noted the Public Hearing that was to be held in May will now take place in the June 21, 2022 meeting to raise impact fees. – See the Engineering Department Update report attached to these minutes for details.

CLOSED SESSION

At 4:56 P.M., Corey Rushton made a motion to enter into a closed session to discuss the purchase of real property. Following a second from Roger Nordgren, the motion passed as follows;

Armstrong – aye Rushton – aye Nordgren – aye

All Trustees; Jason Helm, General Manager; Todd Marti, Assistant General Manager; Troy Stout, Assistant General Manager; Brent Rose, District legal counsel; Austin Ballard, Controller; Victor Narteh, Director of Engineering; and Kristy Johnson, Executive Assistant, were present during closed session.

At 6:16 P.M., Roger Nordgren made a motion to end the closed session and enter back into an open session. Following a second from Corey Rushton, the motion passed as follows;

Armstrong – aye Rushton – aye Nordgren – aye

BOARD MEMBERS INPUT, REPORTS, FOLLOW-UP ITEMS OR QUESTIONS

The Board and District staff discussed the date of the June board meeting and verified that the June 21, 2022 scheduled meeting will still be the best date.

ADJOURNED

Inasmuch as all agenda items have been satisfied, Roger Nordgren made a motion to adjourn the meeting. Following a second from Debra Armstrong, the motion passed as follows and the meeting adjourned at 6:19 P.M.

Armstrong – aye Rushton – aye Nordgren – aye

Debra K. Armstrong, Chair

_____

Austin Ballard, Clerk

_____

OUR COMMUNITY

- RESOLUTION 6-21-22.3 APPROVAL

RESOLUTION NO. 6-21-22.3

A RESOLUTION ADOPTING A DROUGHT CONTINGENCY PLAN FOR GRANGER-HUNTER IMPROVEMENT DISTRICT

WHEREAS, Northern Utah is experiencing severe drought conditions, the Board of Trustees ("Board"), of Granger-Hunter Improvement District ("District"), has determined that it is in the best interest of the District and its citizens to adopt a drought contingency plan ("Plan") for the District; and

WHEREAS, the purpose of the Plan is to assist the District in recognizing the early stages of drought, understanding drought impacts and developing plans to hedge against reduced water supplies; and

WHEREAS, the intent of the Plan is to foster long-term resilience to drought by analyzing potential water supply reductions, better understanding customer reactions to drought levels and to plan for and develop projects to protect against the impacts of long-term drought conditions; and

WHEREAS, the District's consulting engineers, J-U-B Engineers, Inc, has prepared the District's Drought Contingency Plan, dated June 2022, in furtherance of the purpose and intent of the District as stated herein;

NOW, THEREFORE, be it hereby resolved by the Board as follows:

1. The Drought Contingency Plan, dated June 2022, a copy of which is attached as EXHIBIT "A" hereto, is hereby adopted as the drought contingency plan for the District.

2. This Resolution shall become effective immediately upon passage.

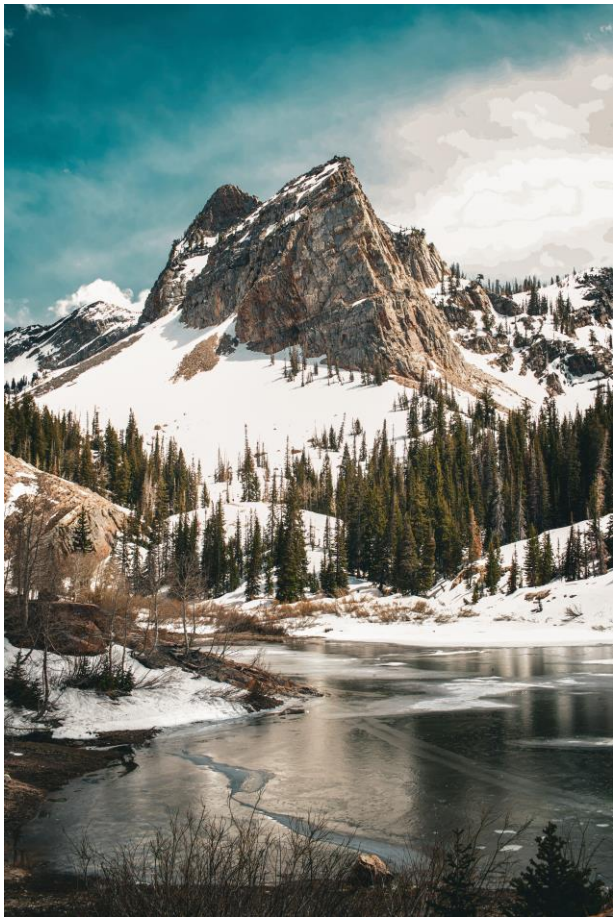
PASSED AND ADOPTED this _____ day of _____, 2022.

_____

Debra Armstrong, Board Chair

EXHIBIT "A"

DROUGHT CONTINGENCY PLAN, JUNE 2022



DROUGHT CONTINGENCY PLAN

Prepared by J-U-B Engineers, Inc.

GRANGER-HUNTER
IMPROVEMENT DISTRICT

Improving Quality of Life Today, Creating a Better Tomorrow

June 2022

Contents

EXECUTIVE SUMMARY

This Drought Contingency Plan prepared for Granger-Hunter Improvement District (District) will assist in recognizing the early stages of drought, understanding drought impacts and developing plans to hedge against reduced water supplies. The District has developed this plan to foster long-term resilience to drought by analyzing potential water supply reductions, better understanding customer reactions to drought levels, and to plan for and develop projects to protect against long-term drought.

The District provides water and wastewater service to 130,000 residents of West Valley City, Utah. The District currently utilizes a water wholesaler, Jordan Valley Water Conservancy District (JVWCD), for approximately 75 percent of its water supply. The remaining 25 percent comes from its own wells in the Salt Lake Valley aquifer. During times of drought, JVWCD may request reductions or reduce the contract by up to 30 percent or more depending on the severity of the drought. In 2022, JVWCD declared a Level 1 Drought.

Drought Level	Targeted % Reduction in JVWCD Contract	Targeted Annual Volume from JVWCD (Acre-ft)	Max Delivered % of JVWCD Contract	Max Delivered Annual Volume from JVWCD (Acre-ft)
0	0%	18,500	-	-
1	5%	17,575	120%	22,200
2	10%	16,650	110%	20,350
3	20%	14,800	100%	18,500
4	30%	12,950	>100%	>18,500

Notes:
1 – At Level 4, JVWCD will determine the water supply availability as a ratio to wholesale contract amounts (i.e., 90 percent, 85 percent, etc.) at the time that this level of water supply availability is established.
2 – Reduction targets and max delivered volumes are taken from Table 6-1 of the JVWCD Drought Contingency Plan.

Fig.1: JVWCD Contract Reductions during Drought

Due to the potential for supply reductions, the District has determined a strategy for reducing demand and increasing its drought-resilient supply by accessing additional groundwater resources. The District owns additional groundwater rights that can be utilized to make up for a supply shortage, though the groundwater contains higher levels of iron, manganese and ammonia that need to be removed to reduce water quality complaints and concerns.

During a drought, the District will implement one of 5 Drought Levels:

Level 0: Education and Public Awareness of water use within the District's boundaries, and a focus on water loss reduction. This is the default level unless additional restrictions are warranted.
Level 1: Voluntary water conservation, including suggestions for outdoor irrigation and additional public outreach.
Level 2: Voluntary time of day, watering frequency and/or other voluntary water restrictions, in addition to public outreach.
Level 3: Mandatory time of day, watering frequency and/or other voluntary water restrictions, in addition to public outreach. Temporary increases to Tier III and IV water rates.
Level 4: Emergency water use restrictions, including bans on certain types of outdoor irrigation and a reduction to the size of Tier III.

Based on these Drought Levels, it is anticipated that water use reductions will occur in the range of 5 to 30 percent. In 2021, the District saw a demand reduction from 10 to 15 percent without declaring a drought level, just based on outreach from the State of Utah and the media. For planning purposes, the District should not count on long-term demand reductions if summers become hotter and drier due to climate change. Snow levels are also expected to reduce long-term, leading to less surface water available for the Wasatch Front. Based on potential cutbacks and marginal groundwater quality, the District should pursue the construction of an additional well and an additional groundwater treatment plant to reduce reliance on surface water supplies from JVWCD and increase drought resiliency.

1. INTRODUCTION

Granger-Hunter Improvement District (District) provides potable water distribution and wastewater collection services to approximately 130,000 residents in a 24.5 square mile area in West Valley City, Utah. The District's mission is: "Stewards of Water: delivered clean and safe for daily use and collected responsibly to protect public health and the environment." The District has approximately 375 miles of potable water piping, ranging in size from 4-inch to 30-inch, along with nine storage reservoirs and eight deep wells. The wastewater system consists of 12 lift stations along with 300 miles of collection piping. The District is governed by a 3-member Board of Trustees, with 75 staff handling the day-to-day operations. The District's eight deep wells provide approximately 25 percent of its potable water, with the remainder coming from Jordan Valley Water Conservancy District (JVWCD). The District's wastewater is treated by Central Valley Water Reclamation Facility (CVWRF).

The District purchases approximately 75 percent of its potable water from Jordan Valley Water Conservancy District (JVWCD) through a wholesale "take-or-pay contract." JVWCD's water sources include the Central Utah Project, the Provo Reservoir Water Users Company, the Central Water Project (groundwater from Utah County), the Utah Lake System (storage in Strawberry Reservoir), groundwater, and other smaller sources. JVWCD generally allows for a yearly overage of 20% of the contract, though generally the District remains close to utilizing 18,500 Acre-feet per year (AFY). In addition, JVWCD's yearly increases include a factor for 'peaking', which encourages the District to utilize JVWCD water at a similar amount throughout the year and peak on its own supplies.

The remaining 25 percent of potable water is self-supplied through seven deep wells, as shown below. For planning purposes, Well No. 4 is not currently utilized due to water quality issues.

Well Name	Pumping Capacity[1] (gpm)	Annual Yield 6-Month Operation (Acre-Ft/Year)	Annual Yield Year-Round[2] (Acre-Ft/Year)
Well No. 1	1,000	807	1,613
Well No. 4	0	0	0
Well No. 8	1,700	1,371	2,742
Well No. 12	2,300	1,855	3,710
Well No. 14	650	524	1,048
Well No. 15	2,600	2,097	4,194
Well No. 16	2,500	2,016	4,033
Well No. 17	3,300	2,661	5,323
Total Capacity	**14,050**	**11,331**	**22,663**

Table 1-1: District Well Supply

The entire 22,663 AFY shown in Table 1-1 is not currently able to be utilized, due to limitations on pumping capacity in the summer and that water demand in the non-irrigation season is significantly less than the pumping capacity. In addition, many of the District's wells have higher levels of ammonia, manganese, and iron. These constituents impact water quality in the District by creating taste, odor and aesthetic complaints. Iron and Manganese are currently secondary standards, and as such there are only guidelines for aesthetic considerations. It is possible that Manganese becomes a primary drinking water standard in the future, therefore the District is planning on treating its wells with the highest amounts, starting with Wells No. 1, 12 and 17 with a treatment plant that is already under construction.

The District's wholesale supply is contingent on JVWCD supplying the full contract amount (18,500 acre-feet). JVWCD has indicated, in times of drought, that they may set water demand targets as follows:

Water Supply Availability Level	Water Shortage Description	Water Demand Reduction Target
 Level 0	Normal	None
 Level 1	Moderate	5% reduction in typical use for wholesale Member Agencies and JVWCD retail customers, but in any event, JVWCD will not supply more than 120% of wholesale contract amounts
 Level 2	Severe	10% reduction in typical use for wholesale Member Agencies and JVWCD retail customers, but in any event, JVWCD will not supply more than 110% of wholesale contract amounts
 Level 3	Extreme	20% reduction in typical use for wholesale Member Agencies and JVWCD retail customers, but in any event, JVWCD will not supply more than wholesale contract amounts
 Level 4	Critical/Exceptional	30% reduction in typical use for wholesale Member Agencies and JVWCD retail customers. JVWCD will determine the water supply availability as a ratio to wholesale contract amounts (i.e. 90%, 85%, etc.) at the time that this water supply availability is established

Table 1-2: JVWCD Drought Water Demand Reduction Targets

In addition, JVWCD has indicated they may temporarily increase the wholesale dollar rate of water during times of drought, specifically water taken above the reduced contract amount. Due to the possible curtailment of the contract amount, appropriate actions need to be taken to ensure an adequate water supply is available.

2. DROUGHT HISTORY

Utah has experienced periods of water shortages since the pioneers first settled in the Salt Lake Valley. The lengthy droughts of the 1930s and 1950s caused significant economic problems for the state. While the drought of 1976-77 was not as long, the consequences were still intense and costly. In 2016, after several years of drought conditions that started in 2012, Utah Lake dropped to levels causing the Utah State Engineer to prohibit diversions of more than 100,000 acre-feet (AF) of secondary storage rights (junior water rights holders) in Utah Lake. The low water levels also intensified a widespread algal bloom in Utah Lake, prompting public health advisories. Declining water levels and algal blooms caused by drought conditions are chronic issues.

The recently completed Weber River and Bear River tree-ring stream flow reconstructive studies and JVWCD's *Preparing for Climate Change—A Management Plan* forecast the likelihood of much more severe and longer-term droughts in the future. Per “Rapid Intensification of the emerging southwestern North American megadrought in 2020-2021”, Nature Climate Change, Mar. 2022, Williams, Park A. et. Al., “the drought will very likely persist through 2022, matching the duration of the late-1500s megadrought,” which lasted for 22 years, and modeling shows the current drought may last for another 2-8 years. Figure 2-1 shows the history of soil moisture from 800 CE onward, with a clear reduction since 2000.

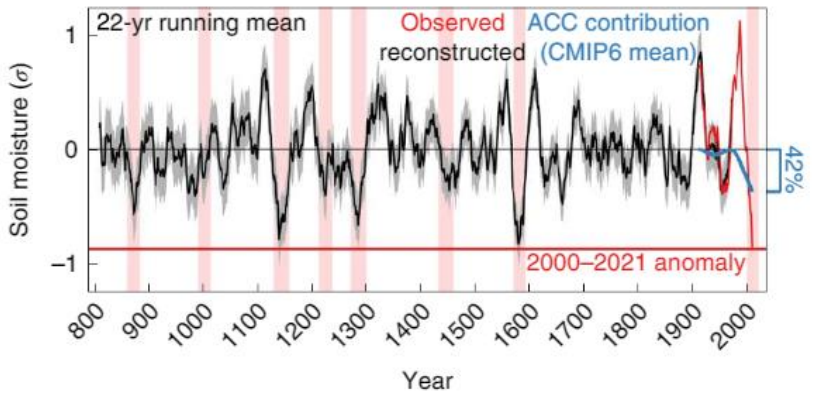


Fig. 2-1: Soil Moisture History from 800 CE, "Rapid Intensification of the emerging southwestern North American megadrought in 2020-2021", Nature Climate Change, Mar. 2022, Williams, Park A. et. Al.

In April of 2022, the Utah Department of Natural Resources indicated that 99.39 percent of the state was in severe drought or worse, with 43.46 percent of Utah in extreme drought with the snowpack at only 75 percent of normal. Of Utah's largest 45 reservoirs, 19 were below 55 percent of available capacity, and overall statewide storage was only at 59 percent of capacity. Of the 94 measured streams, 59 were flowing below normal despite spring runoff, and two streams were flowing at record low conditions. On April 21, 2022, Governor Spencer J. Cox declared a state of emergency due to the dire drought conditions affecting the entire state.

3. PURPOSE OF DROUGHT PLANNING

The 2012 drought contributed to public-health issues threatening state economic growth, agricultural users and recreational activities restrictions, and damage to the vibrant ecosystems surrounding the shrinking Great Salt Lake and Utah Lake. In May 2017, JVWCD completed a study called *Preparing for Climate Change—A Management Plan* (revised March 2018), which indicates that the drought mitigation projects of the 20th century are likely inadequate to compensate for the impacts of climate change and to mitigate the area's longest droughts. JVWCD stakeholders, including the District, agreed that planning to mitigate the risks associated with a severe drought could no longer be delayed. JVWCD assembled stakeholders from the municipal, industrial, agricultural, recreational, and environmental communities and developed its 2021 Drought Contingency Plan, which includes projects, actions, and partnerships to prepare for and reduce water shortages and provide better drought resilience for the area's diverse water users.

In 2021 after participating in the drought planning with JVWCD, the District implemented drought water rates to address when and if, in times of drought, JVWCD may curtail a percentage of the water contract dependent on the severity of the drought. In addition, JVWCD has indicated they may temporarily increase the wholesale rate of water during times of drought, specifically water taken above the reduced contract amount. DISTRICT felt that due to the possible curtailment of the contract amount, appropriate actions must be taken to ensure an adequate water supply is available to District customers.

In 2022, the District decided to create its own Drought Contingency Plan (DCP) to evaluate its system vulnerabilities and impacts further and identify the most effective and efficient mitigation actions that will reduce the effects of drought in the future. The DCP has been added as an appendix to the District's Water Master Plan.

The DCP provides a practical and systematic means for the District to manage emergency supply conditions within its own service area. This plan is intended to serve as a guiding document for managing water supply and delivery in the event of severe or prolonged drought and will be monitored and adjusted as more information becomes available.

4. DISTRICT WATER CONSERVATION AND SUPPLY

During preparation of the District's Water Master Plan in 2022, the District analyzed its gallons per capita/day (gpcd) rate. This was compared to the State of Utah's Regional Water Conservation Goals for the Salt Lake Region. Table 4-1 shows the compiled information. Based on the analysis, the District is already well ahead of the regional goals but has committed to reducing gpcd use by another 6% by 2030 and 10% by 2040.

Year	State of Utah (gpcd)	State of Utah (%)	GHID (gpcd)	GHID (%)
2015	210			
2020	-		187	
2030	187	11%	176	6%
2040	178	15%	169	10%
2065	169	19%	161	14%

Table 4-1: District Conservation Goals

During the preparation of the 2022 District Water Master Plan, the hydraulic model was used to determine if the current water system could support the full summertime demand given the potential for reductions in JVWCD supply. The most likely source loss for the District is a reduction of the supply due to the JVWCD Drought Contingency Plan. At the different drought levels, JVWCD could implement voluntary or mandatory reductions in supplied water between 5 and 30% of typical use. Between 2014 and 2021, the District's typical use of JVWCD wholesale water was 18,900 AFY. The targeted volume and max deliveries from JVWCD are different because many member agencies routinely exceed their contract amounts by large percentages. Because the District routinely uses close to its contract amount, less significant reductions are mandatory, but are still targeted and suggested.

The District currently has 27 million gallons (MG) of storage with plans to purchase and/or construct an additional 8 MG. Due to the long-term nature of the drought, storage is not a critical element for drought mitigation, and as such is not included in the plan.

As shown below, a Drought Level 3 would reduce supply by up to 3,700 AFY, requiring additional use of DISTRICT wells.

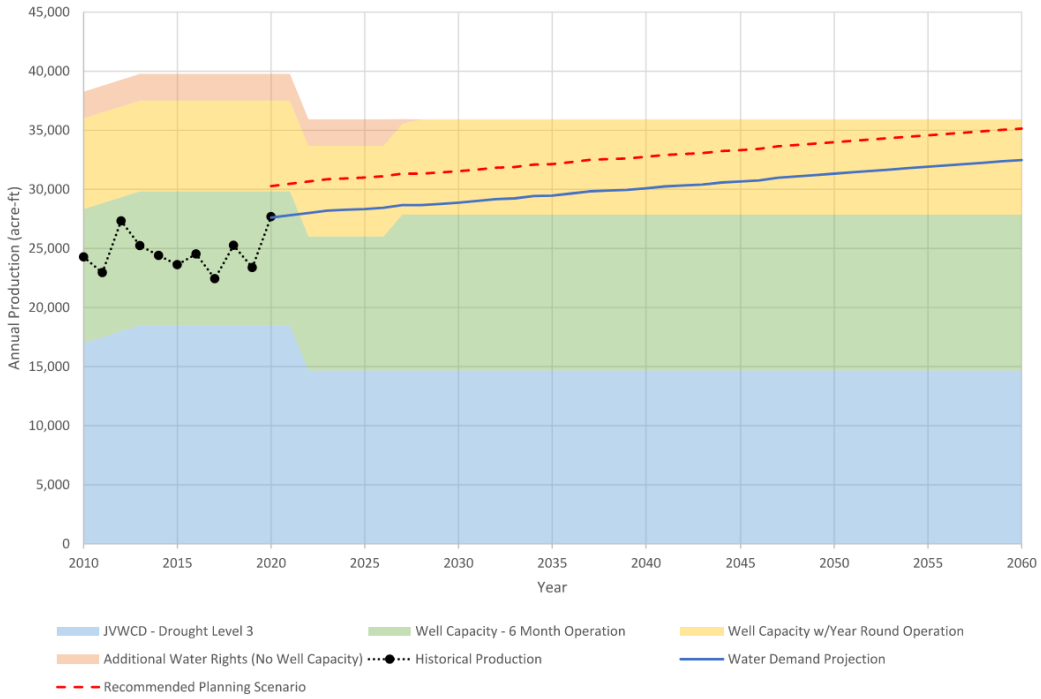


Fig. 4-1: Projected Annual Production Requirements at JVWCD Drought Level 3 in 2022

The Recommended Planning Scenario above is greater than the Water Demand Projection because it assumes that one of the District's largest wells, Well No. 17, is offline and not available all summer. This graph also assumes year-around use of the District's wells, which may not be possible given that demand during the non-irrigation season is less than be supplied by the District's wells. The District's Well No. 16 is the only well that can pump to the higher pressure zones on the south-western portion of the District, and if this well was out of service, supply to approximately 25 percent of the District's service area would be disrupted if the JVWCD max delivery had been reached. In addition, JVWCD does not declare a drought level until May, which would make it difficult to predict if year-round operation of District wells is necessary.

4.1 Water Tiered Rates

Starting in 2018, the District adopted a three-tiered water rate in order to promote conservation. While the incremental rates were small at first, in 2022 they were increased, and a fourth tier was added. The first two tiers, as shown in Table 4-2, are designed to keep rates low for indoor use (Tier I) and responsible outdoor use (Tier II). Tiers III and IV are designed to encourage responsible use of water, especially since any use above 45,000 gallons per month would be considered excessive for most single-family residential homes.

Water Tiers	Price (per 1,000 gallons)
Tier 1 (Less than 7,000 gallons)	$1.77
Tier 2 (7,001 - 15,000 gallons)	$1.90
Tier 3 (15,001 - 45,000 gallons)	$2.20
Tier 4 (45,001 gallons and above)	$3.00
Multi-Unit (apartments, condos, etc.)	$2.10

Table 4-2: District Water Rates

It is the District's intention to continue to assess rates that assign a higher cost to high outdoor water use. In addition, the District has adopted Drought Level 3 and 4 temporary water rate increases and reductions in Tier size. At Drought Level 3, Tier III increases from $2.20/1,000 gallons to $3.30, and Tier IV increases from $3.00 to $6.00. At Drought Level 4, Tier III reduces from 45,000 gallons to 35,000 gallons, and Tier IV begins at 35,001 gallons.

Drought Contingency Rates	
Level 3: As defined by Jordan Valley Water/Board of Trustee	
Tier 3 Rates	$3.30
Tier 4 Rates	$6.00
Level 4: As defined by Jordan Valley Water/Board of Trustee	
Tier 3 Rates - 15,001 - 35,000 gallons per month	$3.30
Tier 4 Rates - All > 35,000 gallons per month	$6.00

Table 4-3: Tiered Water Rates During Drought Levels

4.2 Salt Lake Valley Aquifer Safe Yield

The District's seven wells pull water from the deep Salt Lake Valley Aquifer. This aquifer has provided water to Salt Lake County residents for many years. In 2002, a coalition of stakeholders prepared a final "Salt Lake Valley Groundwater Management Plan" in which the objectives were to promote the wise use of groundwater resources, protect existing water rights, and address water quality issues and over-appropriation of groundwater in the valley. The Salt Lake Valley is closed to new appropriations. From 1986 to 2000, water-level declines in the aquifer were noted in the south portion of the valley, but none in the north-western portion where the District operates its wells. In addition, it noted that the safe use of the aquifer was 165,000 AFY and that the current use was 130,000 AFY.

The report also determined safe aquifer yields by section as part of their analysis:

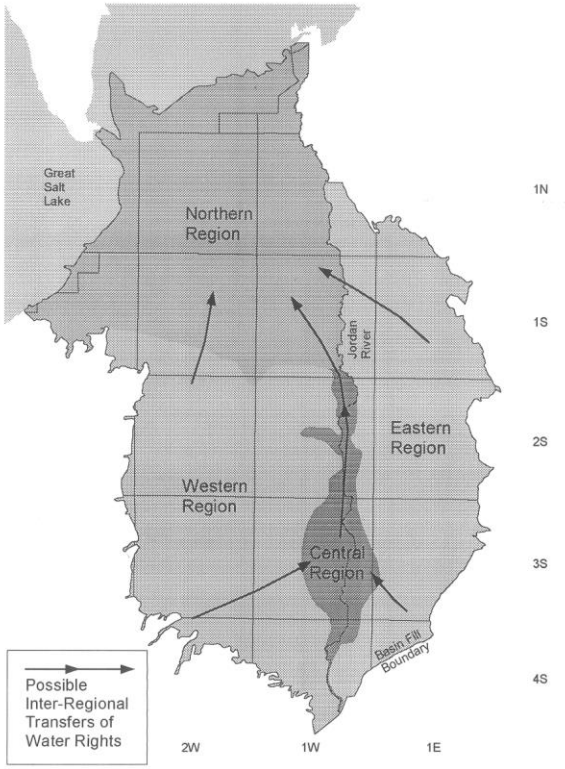


Figure 4-2: Salt Lake Valley Aquifer Regions

Region	Safe Yield (acre-feet per year)
Western	25,000
Eastern	90,000
Central	20,000
Northern	30,000

Table 4-4: Safe Aquifer Yields

The District utilizes groundwater from both the Northern and Western sections, where the total safe yield is 55,000 AFY. The AFY amounts pumped by others are currently unknown, but the maximum the District has recently pumped is 7,400 AFY.

Other agencies in the Northern and Western sections include Magna Water District, Taylorsville-Bennion Improvement District, Kearns Improvement District, West Jordan City, Riverton, Herriman and Bluffdale. While it is unknown the exact quantities other agencies are pumping, averages of annual water use data are available from waterrights.utah.gov. Based on these averages, approximately 42,000 AFY is being used in the Northern and Western areas for potable water. It is unknown how much is used for secondary irrigation systems.

AGENCY	ESTIMATED ANNUAL WITHDRAWAL
DISTRICT	8,000 AFY
TBID	8,000 AFY
KID	2,000 AFY
MAGNA	5,000 AFY
WEST JORDAN	2,000 AFY
RIVERTON	SECONDARY ONLY
HERRIMAN	5,000 AFY
BLUFFDALE	SECONDARY ONLY
JVWCD	7,000 AFY
OTHER	5,000 AFY
TOTAL	**42,000 AFY**

Table 4-5: Average Groundwater Use by Agencies in the Northern and Western Sections of the Salt Lake Aquifer

Based on this analysis, there are 13,000 AFY of safe yield remaining in the Northern and Western regions of the aquifer, which would give the District an allowance to use its entire 22,000 AFY of water rights during a drought year without impairment of the aquifer. The District, through its Supervisory Control and Data Acquisition (SCADA) system, would monitor aquifer levels to ensure no regional drawdown is occurring. If drawdown is occurring, yields would need to be reduced in order to ensure the long-term sustainability of the aquifer.

4.3 Salt Lake Valley Aquifer Water Quality

The District's seven wells are generally higher in TDS, manganese, iron and ammonia than JVWCD water quality. As shown in Figure 4-4, the total dissolved solids (TDS) of groundwater in the District's area ranges from 250 to greater than 1,000 milligrams per liter, with the TDS generally increasing since 1988.

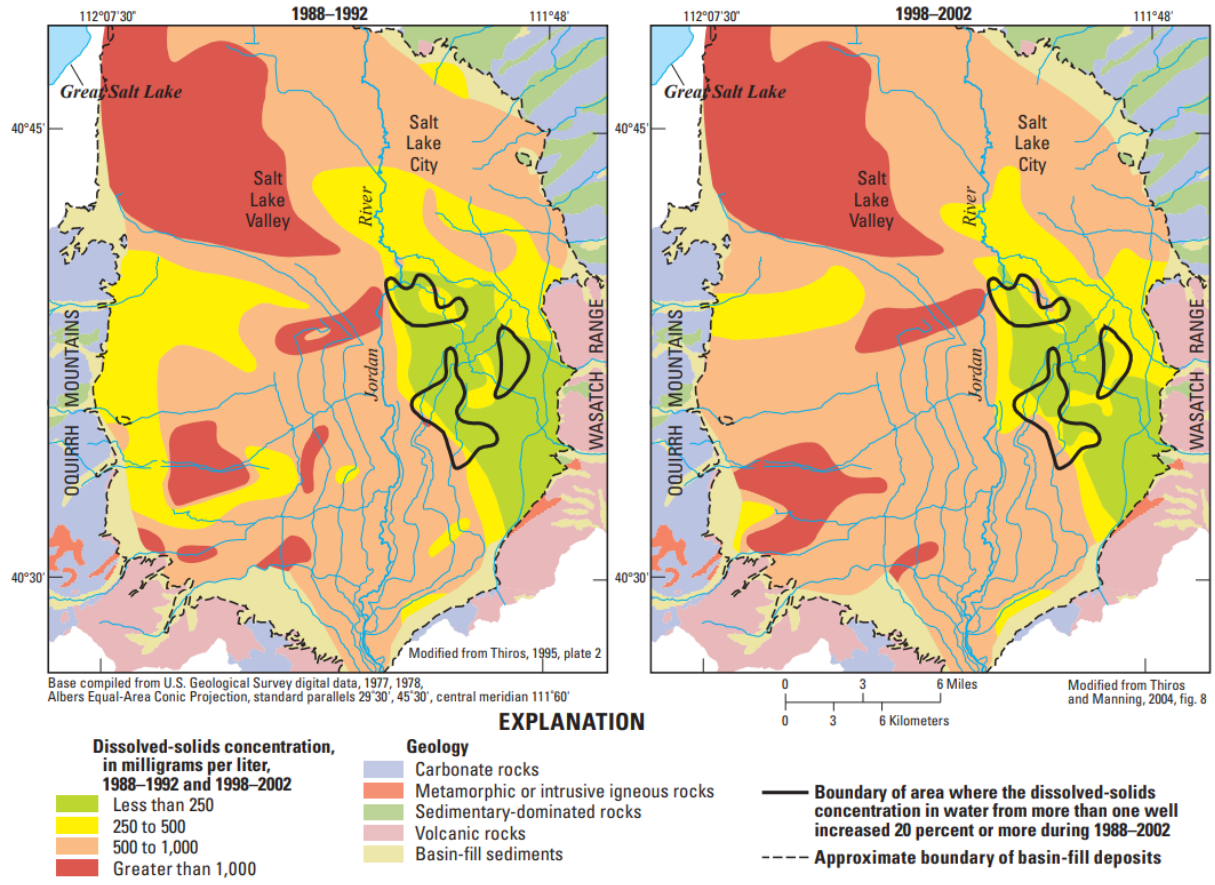


Figure 4-4: TDS Concentrations in the Salt Lake Valley Aquifer, Conceptual Understanding and Groundwater Quality of Selected Basin-Fill Aquifer in Salt Lake Valley, Utah, USGS, Paper 1781

While the TDS levels have not yet reached levels that have caused large issues, the levels of iron, manganese and ammonia in the groundwater can cause aesthetic problems and lead to excessive water quality complaints. A study conducted by the District and Confluence Engineering Group determined that the level of manganese entering the system from several wells was above 0.05 mg/L. Often, other metals (iron, lead, and arsenic) can co-accumulate, causing a potential health risk if scaling on pipe walls is released. Table 4-6 shows a summary of water quality conditions in 2018.

Parameter (units)	Well Number (and number of Data Points)							USEPA Standard	Recommended Limit*
	Well 1 (n=7)	Well 8 (n=2)	Well 12 (n=5)	Well 14 (n=0)	Well 15 (n=6)	Well 16 (n=1)	Well 17 (n=7)		
Ammonia (mg/L as N)	0.22 (0.02 - 0.34)	-- (0.38 - 0.39)	0.34 (0.30 - 0.38)	NM	0.40 (0.36 - 0.44)	0.60 (--)	0.17 (0.13 - 0.34)	NA	NA
Conductivity (µS/cm)	596 (560 - 630)	-- (473 - 474)	732 (688 - 796)	NM	636 (541 - 706)	913 (--)	902 (828 - 972)	NA	NA
Iron (mg/L)	0.06 (0.02 - 0.12)	-- (0.09 - 0.10)	0.12 (0.01 - **0.40**)	NM	0.17 (0.10 - **0.36**)	0.05 (--)	0.12 (0.08 - 0.23)	0.3 ‡	0.1
Manganese (mg/L)	0.04 (0.01 - **0.09**)	-- (**0.06 - 0.07**)	**0.10** (0.03 - **0.20**)	NM	**0.05** (0.04 - **0.07**)	**0.06** (--)	0.04 (0.01 - **0.06**)	0.05 ‡	0.02
pH (units)	7.7 (7.5 - 7.9)	-- (7.7 - 7.9)	7.7 (7.6 - 7.9)	NM	7.8 (7.0 - 8.1)	7.8 (--)	7.8 (7.6 - 7.9)	6.5 - 8.5 ‡	NA
Total Dissolved Solids (mg/L)†	371 (348 - 393)	-- (292 - 293)	458 (430 - 499)	NM	396 (336 - 441)	**573** (--)	**566** (**519 - 611**)	500 ‡	NA
Turbidity (NTU)	0.7 (0.2 - 1.2)	NM	0.9 (0.3 - 3.4)	NM	0.7 (0.2 - 1.8)	NM	0.4 (0.2 - 1.0)	5 ‡	NA

Methods: Ammonia (HACH Method 10205 ULR TNTplus 830), Iron (HACH Method 8008 FerroVer pillows), and Manganese (HACH Method 8149 PAN pillows).

Bolded, red data are above the USEPA Standard

NA = No standard / not applicable

NM = Not measured

-- Not calculated due to lack of data

† TDS calculated based on conductivity

‡ Secondary (aesthetic) standard

* Recommended limits based on industry best practices

Based on the conclusions of the study, well water treatment was recommended in order to remove iron, manganese, and ammonia, reduce water quality complaints and reduce the likelihood of non-compliance if the US EPA adopts manganese primary drinking water standards. The District has proceeded with constructing a water treatment plan for Wells No. 1, 12, and 17, but Wells No. 15 and No. 16 both have elevated levels as well and require treatment.

5. Operational and Administrative Framework

The operational and administrative framework lays out how the District will monitor and determine its drought level and who will oversee implementation of the drought response. The District's General Manager, under the direction of the District's Board of Trustees, will oversee implementation of the plan with assistance from staff.

5.1 Drought Monitoring

As most of the District's potable water is supplied from JVWCD (75 percent) on a take-or-pay contract, the District's drought monitoring process will follow that of JVWCD's, outlined in their Drought Contingency Plan. The JVWCD drought monitoring process includes five water supply conditions or drought levels that are based on three drought monitoring triggers including:

- JVWCD supply availability of CUP with storage in Jordanelle reservoir as provided by CUWCD
- JVWCD supply availability of Provo River Project as determined by PRWUA
- JVWCD supply availability of high-quality groundwater as reported by Utah DEQ.

Since the remaining 25 percent of the District's water is supplied through seven deep wells, these three drought monitoring sources were found to be sufficient to accurately identify the drought level the District will implement throughout the year. The five water supply conditions/drought levels are generally described in Table 5-1 below.

Water Supply Conditions / Drought Level	Water Shortage Description	Triggering Criteria Applied to Water Supply Availability Levels		
		CUWCD Supply Availability (Jordanelle Storage of CUP)	PRWUA Supply Allocation (in the Provo River Project)	Salt Lake Valley Groundwater Conditions
0	Normal	At least 95 percent supply availability	At least an 80 percent supply allocation	3-year average diversions less than safe yield
1	Moderate	At least 95 percent supply availability	75 – 80 percent supply allocation	JVWCD groundwater diversions to compensate for shortage exceeds 12,000 AF, or 3-year average exceeds safe yield
2	Severe	At least 90 – 95 percent supply availability	75 – 80 percent supply allocation	JVWCD groundwater diversions to compensate for shortage exceeds 16,000 AF, or 3-year average exceeds safe yield
3	Extreme	At least 90 – 95 percent supply availability	Less than 75 percent supply allocation	JVWCD groundwater diversions to compensate for shortage exceeds 20,000 AF, or 3-year average exceeds safe yield
4	Critical / Exceptional	Less than 90 percent supply availability	Less than 45 percent supply allocation	JVWCD groundwater diversions to compensate for shortage exceeds 20,000 AF, or 3-year average exceeds safe yield

Table 5-1: JVWCD Water Supply Conditions and Triggers

Each year JVWCD considers feedback and updated water supply forecast information and determines a final drought level recommendation no later than May 1. JVWCD establishes the water supply availability level by formal action of its Board of Trustees at its May Board Meeting and encourages each Member Agency to similarly establish the water supply availability level by formal action of their respective governing bodies.

The District will monitor the water supply availability level set by JVWCD in May of each calendar year and will follow a similar process for implementing the drought level and associated response actions to be followed by DISTRICT water users. At the May Board Meeting, the District's Board of Trustees will analyze JVWCD's drought level and determine the District's Drought Level. The General Manager will be responsible for recommending a drought level.

5.2 Drought Response Implementation

As laid out in Section 8, the levels of drought response set guidelines for action for District staff to implement. The General Manager will oversee the implementation of the guidelines as directed by the District's Board of Trustees. The District's Director of Administrative Services will be responsible for implementing outreach with the District's customers utilizing the Customer Service and Meter Department staff. The District Operations and I.T. staff will be responsible for monitoring overall water use and providing information to Management on current supply and demand.

6. VULNERABILITY ASSESSMENT

As part of this drought planning effort, a vulnerability assessment was conducted to evaluate the likelihood of a prolonged drought based on historical data and evaluate potential risks and impacts that a drought would present to the District's service area. The vulnerabilities to JVWCD's water supply are well documented within their

Drought Contingency Plan. It includes risk factors that contribute to reduced supply which were identified and weighted based on their likelihood of occurrence and the reliance JVWCD has on that particular supply source as a percentage of its portfolio. The risk factors that JVWCD identified are also risk factors to the District's system due to its reliance on the same sources for water supply.

The key drought vulnerabilities identified, along with the associated risks and their potential impacts by sector, are outlined in Table 6-1 below.

Key Drought Vulnerabilities	Risks	Impacts by Sector		
		Municipal	Agricultural	Environmental
Available Water Supply	• JVWCD contract curtailment • Reliance on surface flows subject to minimum flow requirements • Local mountain streams lack holdover storage • Climate Change • Groundwater Overpumping	✓	✓	✓
Source Water Quality Degradation	– Algal by-products/blooms impacting usability of JVWCD sources	✓	✓	✓
Increased Water Costs	– Tiered rate structure with JVWCD contract – JVWCD contract costs are 50% greater than groundwater production costs prior to treatment	✓	✓	
Inability to Utilize Available Supply due to Aging Infrastructure	• Aging wells • Mechanical failure of wells or treatment equipment	✓	✓	
Heavy Reliance on JVWCD	• Currently, 75 percent of water supplied from JVWCD	✓	✓	✓

Table 6-1: Key Vulnerabilities, Risks, and Impacts by Sector

6.1 Key Drought Risks and Impacts by Sector

Municipal and Industrial (M&I) - The M&I sector relies on each water source in the District's portfolio and the various assets used to store, convey, or treat the water. Any form of disruption to these sources can heavily impact this sector. Outdoor landscaping is particularly susceptible to disruption, as reductions in outdoor use may lead to the death of plants and groundcover.

Agricultural - Groups within this sector rely on quality water, and any adverse impacts to the water quality due to drought can quickly interrupt water sources in this sector. The previously mentioned 2016 algal blooms in Utah Lake that prompted secondary water systems to shut down are an example of this. Without the ability to use these secondary water systems, this sector's demand on JVWCD's system is increased.

Environmental - Lower stream and groundwater flows and altered runoff patterns impact ecosystems that rely on these water sources. During drought, water quality can also be compromised, affecting ecosystems and critical aquatic habitats such as the lower Provo River, a critical habitat for the June Sucker, an endangered species.

6.2 High Water Users

The District's service area also includes food manufacturing and bottling plants, whose entire business is reliant on water. Any disruptions to their supply could prove detrimental to their continued operations in the West Valley City area. High water users also include West Valley City (parks, government facilities) and the Granite School District (2 high schools and multiple middle and elementary schools).

It is the District's intention, during a drought, to work closely with both Industrial/Commercial and Governmental users to assist the District in meeting it's conservation goals. This would take the form of outreach to the organizations with information on their water use and methods to reduce it, while ensuring that these vital uses have enough supply to continue their viability as employers and to preserve our vital open space.

6.3 Possible Future Climate Change Scenarios

Climate change impacts are anticipated to exacerbate existing extreme weather events, including the length and intensity of drought and floods, through changes in precipitation and temperature. Although there is uncertainty in the degree of potential changes in the hydrologic cycle, projected trends according to the Intergovernmental Panel on Climate Change (IPCC) indicate a high likelihood of increases in temperature and changes in the severity and intensity of precipitation events. IPCC prepared studies at the regional and local levels using dendrochronology along the Weber and Bear Rivers. This study yielded relevant information on paleohydrology and has demonstrated significant annual and decadal climate variability, including drought periods that are much longer and drier than those experienced in recorded history.

JVWCD, within their Drought Contingency Plan, has used these studies and past palaeohydrological data to understand how past severe droughts occurred and the potential impacts if they were to recure in the future. These impacts include changes in precipitation and general hydrologic patterns, reduction of snowpack and water supply, water quality impacts, and potential increases in water demand.

The climate of the State of Utah has seen high variability across the past 1,000 years, with more significant variability in terms of extremes for both wet and dry periods experienced in the recent study Period. Utah has demonstrated an increasing trend in temperature that corresponds to trends predicted by global climate models. The impacts of this changing condition include changes in snowmelt flows and the anticipation of greater inefficiencies of these flows in the future. Early snowmelt resulting in the inefficient conversion of snowmelt runoff to reservoir inflow occurred between 2000-2004 during a drought that affected most Utah watersheds and is an example of what could be expected to continue with increasing temperatures. This early snowmelt shifts average peak streamflow periods currently relied upon by existing water supplies. Other impacts include the potential increase in evapotranspiration rate due to increased temperatures and an increase in the intensity of rainfall events.

Research from the University of Utah Department of Atmospheric Sciences summarizes and indicates potential key changes in temperature and precipitation may result in the following by the year 2100:

- Temperature increases between 1.5 to 5 degrees Celsius (°C)
- Precipitation increase between 5 to 10 percent (Wasatch), 20 percent (Uinta)
- Snowpack increase of 10 percent above 8,500 feet and decrease of 11 percent below 8,500 ft.

7. MITIGATION ACTIONS

7.1 Identification of Mitigation Actions

Key Drought Vulnerabilities	Risks	Possible Mitigation Actions
Available Water Supply	– JVWCD contract curtailment – Reliance on surface flows subject to minimum flow requirements – Local mountain streams lack holdover storage – Climate Change	– Drill additional wells and build treatment facilities to provide multiple water sources, including additional groundwater. – Improve public awareness and overall conservation through education.
Source Water Quality Degradation	– Algal by-products/blooms impacting the usability of JVWCD sources – High manganese/iron/ammonia levels in groundwater.	– Build additional water treatment facilities to remove iron and manganese in existing wells.
Increased Water Costs	– Tiered rate structure with JVWCD contract. JVWCD contract costs are approximately 50% greater than groundwater production costs	– Drill additional wells and treatment facilities to provide less reliance on JVWCD. – Educate the public about the cost of overuse of water for outdoor use. Develop guidance for how much water is required for outdoor use based on acreage.
Inability to Utilize Available Supply due to Aging Infrastructure	– Reduced production of wells and aging pumps and/or mechanical failure of wells or treatment equipment	– Improve drought reliability through system improvements that include replacing aging pipes, pumps, generators, and other equipment. Upgrade technology for monitoring, measuring, and providing security of the delivery system.
Heavy Reliance on JVWCD	– 75 percent of District's water supply is dependent on JVWCD	– Drill and equip new wells to fully utilize the District water rights to reduce dependency and provide drought resiliency.

Table 7-1: Key Vulnerabilities, Risks, Possible Mitigation Actions

8. DROUGHT RESPONSE ACTIONS AND LEVELS

Response actions have been developed within the District's Drought Mitigation Plan, which was begun in 2021. These response actions are triggered by JVWCD's associated drought levels used in times of drought, and the District has used them as a guide to their response actions and to mitigate the resulting impacts. These actions will be monitored, evaluated, and adjusted based on their effectiveness in reducing usage targets.

Level 0 – Normal Water Supply

At this level, no additional water conservation actions are required. The District has adopted a tiered water rate system that encourages conservation through water pricing, including higher pricing for outdoor use in Tiers III and IV.

The District will continue its other conservation programs, including:

- Assisting with public education and outreach, including promulgating the Utah Outdoor Weekly Watering Guide.
- Continuing to remove turf areas from District property.

- Encouraging no outdoor watering during the middle of the day, using drought-tolerant plants and grasses, and using low water-use fixtures.
- Reaching out to customers whose water use trends indicate they may have a water leak.
- Looking for and repairing leaks in the distribution system by utilizing third-party contractors.
- Purchasing leak detection equipment for District maintenance crews.

Level 0 is always in effect unless the District's Board of Trustees adopts a higher level.

Level 1 – Voluntary Water Conservation

At Level 1, the District will contact customers to request a voluntary reduction in water use. This drought action level aims to draw attention to the reduced water supply and for customers to use this resource wisely. The District's Board of Trustees shall define the means of communication with customers at the time of adoption of the drought level. These actions may include, in addition to those found in Level 0:

- E-mailing customers requesting voluntary water reductions.
- Mailing flyers requesting voluntary water reductions.
- Postings on social media and the District website requesting voluntary water reductions.

In addition, customers will be requested to follow the State of Utah Division of Water Resources lawn watering guide, which gives outdoor watering recommendations, including time of day of watering and length of watering.

JVWCD, if adopting a Level 1 restriction, expects to seek to voluntarily reduce the District's water contract by approximately 5 percent or approximately 1,000 AFY and in no case provide more than 120% of the contracted amount. The District's groundwater supply can provide the additional volume without additional cutbacks required if no savings are achieved. It is anticipated this drought level will lead to a minimum 5 to 10 percent decrease in water demand.

In 2021, the Governor of the State of Utah issued a drought emergency and the District’s customers responded by cutting their use. Figure 8-1 shows the reduction (in yellow) from the District’s customers compared to the blue line which represents the 5-year average. Taking into account the amount of rainfall and climate of 2021 versus the 5 previous years, it is likely District customers reduced their use by 10 to 15 percent. Based on these years of data, it seems probable that a 5 to 10 percent reduction in demand will be achievable at Level 1.

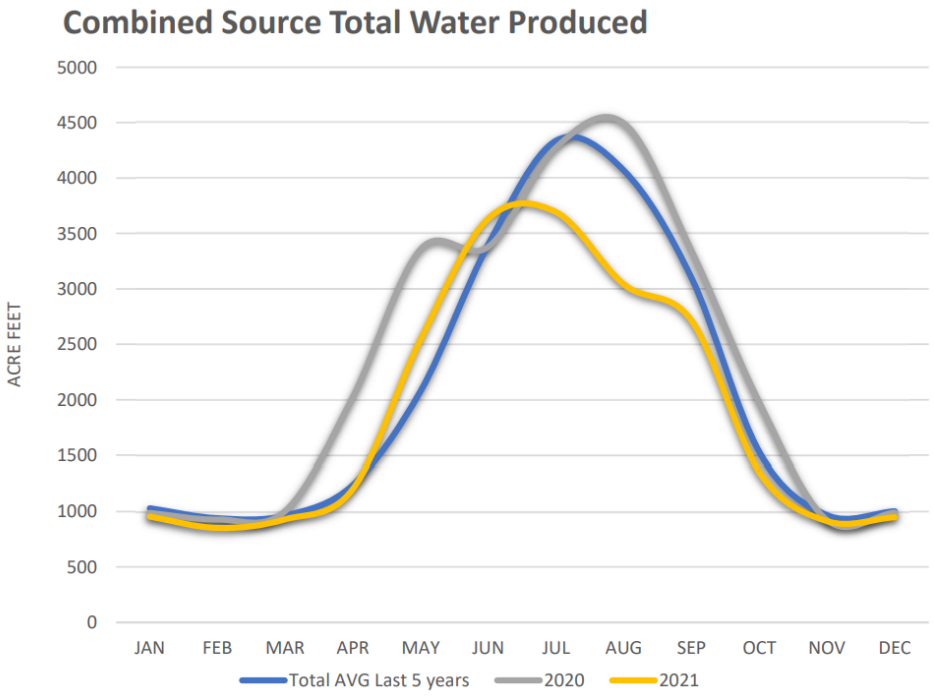


Figure 8-1: 2021 Drought Year Water Use

Level 2 – Voluntary Water Restrictions

At this level, the District will begin contacting customers to request additional voluntary reductions in water use. The purpose of this drought action level is to continue to draw attention to reduced water supplies and to attempt to reduce water use even more than Level 1. The District's Board of Trustees shall define the additional means of communication, and the actions requested to reduce water use at the time of adoption of the drought level. These actions may include, in addition to those found in Levels 0 and 1:

- Voluntary time of day, watering frequency and/or other voluntary water restrictions. This may include even/odd watering based on address or other criteria and restrictions based on the Utah Division of Water Resources lawn watering guide. Outreach for these voluntary restrictions will begin with mailers/e-mail may escalate to phone calls or home visits.
- Additional e-mails, flyers, social media, and website postings requesting further water use reductions, including voluntary restrictions as defined above.

There are no penalties associated with these voluntary water restrictions.

JVWCD, if adopting a Level 2 restriction, expects to seek to voluntarily reduce the District's water contract by approximately 10 percent or approximately 2,000 AFY and in no case provide more than 110% of the contracted amount. The District's groundwater supply can provide the additional volume without additional cutbacks required even if no savings are achieved. It is anticipated this drought level will lead to a 10 to 15 percent decrease in water demand.

Level 3 – Mandatory Water Restrictions

This level may include directives imposed by the District's Board of Trustees which may limit the manner of use of water, such as mandatory time of day and watering days per week limitations. The purpose of this drought action level is to reduce overall use by 20% throughout the year, specifically reducing outdoor water use. The District's

Board of Trustees shall define the requirements of Level 3 to reduce water use at the time of adoption of the drought level. These actions may include, in addition to the actions from Levels 0, 1, and 2:

- Mandatory time of day, watering frequency, and/or other water restrictions. This may include mandatory restrictions based on the Utah Division of Water Resources lawn watering guide or other limitations imposed by the Board of Trustees.
- Warnings and/or fines for violating the mandatory watering restrictions. Fines shall be assessed on customer water bills monthly.
    - First notice of violation – communication with customer with a reminder about restrictions.
    - Second notice of violation – communication with customer with a reminder about restrictions, and door flyer at the property.
    - Third notice of violation – communication with customer with a reminder about restrictions, door flyer at the property, site visit by customer service representative.
    - Fourth Notice and beyond – communication with customer with a reminder about restrictions, door flyer at the property, site visit by customer service representative, and/or fine.
- Temporary rate increases to the upper tier of water rates, as adopted in the 2022 water rates.
- Additional e-mails, flyers, social media, and website postings outlining the mandatory water use restrictions.

The District Board of Trustees may impose any additional limitations upon the adoption of Level 3. Notice of Level 3 Mandatory Water Restrictions shall be provided to customers by mailer, social media, and website updates.

JVWCD, if adopting a Level 3 restriction, expects to curtail the District's water contract by approximately 20 percent, or 4,000 AFY, and in any event will not supply more than the contracted amount. The District's groundwater supply can provide an additional 4,000 AFY, but it is anticipated this drought level will lead to a 15 to 20 percent reduction in water demand, so no water shortage is predicted.

Level 4 – Emergency Water Restrictions

This level may include directives imposed by the District's Board of Trustees which may limit the manner of use of water, such as mandatory time of day and watering days per week limitations, and temporary reductions in size of the top one or two water tiers. The purpose of this drought action level is to reduce overall use by 20% throughout the year, specifically targeting outdoor water use. The District's Board of Trustees shall define the requirements of Level 4 to reduce water use at the time of adoption of the drought level. These actions may include, in addition to those from Levels 0, 1, 2, and 3:

- Extreme restrictions and/or bans on outdoor watering of turf areas at private residential properties.
- Extreme restrictions on outdoor watering of turf areas at commercial, industrial and institutional properties.
- Warnings and/or fines for violating the emergency watering restrictions. Fines shall be assessed on customer water bills monthly.
    - First notice of violation – communication with customer with a reminder about restrictions.
    - Second notice of violation – communication with customer with a reminder about restrictions, and door flyer at the property.
    - Third notice of violation – communication with customer with a reminder about restrictions, door flyer at the property, site visit by customer service representative.

- Fourth Notice and beyond – communication with customer with a reminder about restrictions, door flyer at the property, site visit by customer service representative, potential fine.

- Temporary tier size reductions, as approved in the 2022 Rates and Fees. Any other changes to rates, fees or tier sizes may occur after a public hearing process.
- Additional e-mails, flyers, social media, and website postings outline the mandatory water use restrictions.

JVWCD, if adopting a Level 4 restriction, expects to curtail the District's water contract by approximately 30%, or 6,000 acre-feet. Because the Drought Level determination from JVWCD does not arrive until May, it is possible the District's groundwater supply may not be able to provide adequate supply if one or more of the wells are offline, and if little to no conservation is achieved. If conservation of 20 to 30 percent is achieved, there may be adequate supply to meet demands.

In the following planning scenario, JVWCD declares a Drought Level 4 in May and requests a cutback of 30 percent of the contract. The District activates all its wells in May, but Well No. 17 is down for pump repairs and no parts are available until the fall. Based on flow rate limitations, the District would need approximately 13,700 AFY from JVWCD but would only be provided 12,900 AFY, given a total demand of 24,300 AFY (5-year average). A shortfall of almost 1,000 AFY would occur, necessitating mandatory water use restrictions as outlined above. In order to increase emergency supply and reduce risk due to lack of redundancy, mitigating actions were determined as outlined in Section 9.

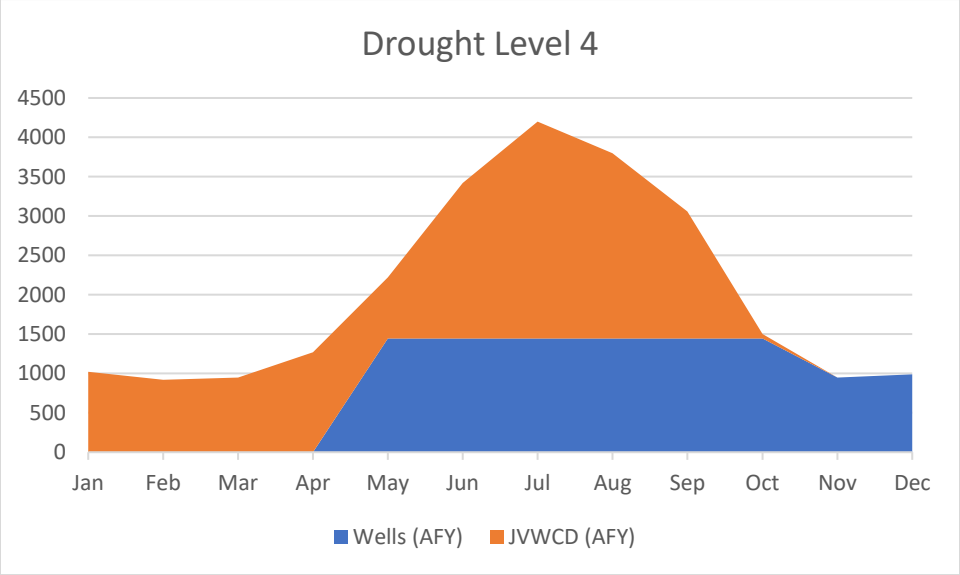


Figure 8-2: Drought Level 4 Water Supply

9. PRIORITY PROJECTS FOR DROUGHT RESILIENCY

Potential mitigation actions were evaluated based on what would best address the identified vulnerabilities. The estimated costs to complete actions were not part of the evaluation.

Prioritized Drought Mitigation Actions			
	Project Specifics	**Vulnerabilities Addressed**	**Opinion of Probable Cost**
1	**Anderson Water Treatment Plant Well No. 16 and Well No. 18:** Remove iron and manganese from an existing 3,000 GPM well No. 16 and treat New Well No. 18.	– Available Water Supply – Source Water Quality Degradation – Increased Water Costs – Heavy Reliance on JVWCD	$9,229,000.00
2	**Well No. 18:** Drill and equip a new well to utilize District water rights fully and for drought resiliency.	– Available Water Supply – Increased Water Costs – Heavy Reliance on JVWCD	$4,071,000.00
3	**Construction of new 4 MG buried concrete reservoir:** Help to meet existing and future water and fire suppression requirements.	– Available Water Supply – Increased Water Costs – Heavy Reliance on JVWCD	$6,000,000.00
4	**Well No. 15 Water Treatment Plant:** Remove iron and manganese from an existing 2,500 GPM well.	– Available Water Supply – Source Water Quality Degradation	$3,500,000.00
5	**Annual Distribution Pipeline Replacements:** Multiple-year cast iron pipe replacements, anticipating approximately $5 million yearly for ten years.	– Inability to Utilize Available Supply due to Aging Infrastructure	$5,000,000 per year
6	**Well No. 1 Replacement:** Redrill and re-equip the existing 1,000 GPM well to increase capacity to 3,000 GPM.	– Available Water Supply – Increased Water Costs – Heavy Reliance on JVWCD	$2,500,000.00

OUR TEAM

- MEMBER AGENCY WATER CONSERVATION FUNDING AGREEMENT APPROVAL

MEMBER AGENCY WATER CONSERVATION FUNDING AGREEMENT

This Agreement is made and entered into as of June 8, 2022 (the "Effective Date"), by and between the Jordan Valley Water Conservancy District, a Utah local district ("District"), and Granger-Hunter Improvement District, a Utah local district ("Member Agency").

RECITALS:

A. The District desires to provide funding assistance to the Member Agency for a water conservation project within the Member Agency's retail service area relating to leak detection services and a public information campaign (the "Project");

B. The Member Agency wishes to obtain funding assistance from the District and represents that it has met the eligibility requirements; and,

C. The Member Agency has submitted to the District a proposal outlining the Project and requesting funding assistance, and the District is willing to provide funding assistance, consistent with the terms of this Agreement.

TERMS:

The parties agree as follows:

1. Project Description. A description of the Project to be completed by the Member Agency is set forth in attached Exhibit A.

2. Project Schedule. The Project shall be completed by the Member Agency in accordance with the schedule set forth in attached Exhibit A, notwithstanding any other provision or Exhibit of this Agreement to the contrary.

3. Project Administration and Correspondence.

(a) The person designated to administer the Project and to act as the chief contact for the Member Agency is:

Michelle Ketchum, Director of Administrative Services
Granger-Hunter Improvement District
2888 South 3600 West
P.O. Box 701110
West Valley City, Utah 84170

(b) The person designated to represent the District in connection with this Agreement is:

Courtney Brown, Conservation Programs Manager
Jordan Valley Water Conservancy District
8275 South 1300 West
West Jordan, Utah 84088

4. Eligibility for Project Funding. The Member Agency represents it has:

(a) Adopted, by formal resolution, a water conservation goal of reducing per capita water use in its service area by at least twenty-five percent (25%) by year 2025, using year 2000 as a baseline year for comparison purposes; and,

(b) Complied with the Utah Water Conservation Plan Act, Utah Code Ann. § 73-10-32, and has filed a water conservation plan with the State of Utah, Division of Water Resources.

5. Member Agency Responsibilities and Ownership.

(a) The Member Agency and/or its representatives shall provide all labor, services, supplies, and materials to implement and complete the Project,

including but not limited to administration, promotion, marketing, management, data collection, analysis, and reporting.

(b) All materials and supplies necessary to implement and complete the Project shall be the exclusive property of the Member Agency. The District shall have no ownership, right, title, security interest, or other interest in any Project facilities, materials, or supplies, nor in any rights, duties, or responsibilities for operation or maintenance thereof.

(c) The Member Agency shall comply with all applicable federal, state, and local requirements to implement and complete the Project.

(d) The Member Agency shall be solely responsible for the performance of its staff and/or representatives in complying with the terms of this Agreement, and for the proper allocation of funds received from the District for implementing and completing the Project.

(e) The Member Agency shall timely prepare and submit invoices and reports to the District as further described herein.

(f) The Member Agency shall timely pay its share of the costs of the Project.

6. Cost Estimate and Funding.

(a) The funds to be provided by the District to the Member Agency shall not exceed Sixty-Seven Thousand Four Hundred and 00/100 Dollars ($67,400.00).

(b) The costs for the Project to be paid by the District and by the Member Agency are set forth in attached Exhibit B. All costs greater than those shown in Exhibit B, which are necessary to implement and complete the Project pursuant to

this Agreement, if any, shall be paid by the Member Agency. The Member Agency shall pay no less than twenty percent (20%) of the total cost of the Project.

7. Invoicing Requirements.

(a) The Member Agency shall invoice the District on a quarterly basis pursuant to the following schedule:

QUARTERLY BILLING PERIOD	INVOICE DUE DATE
January 1-March 31	April 20
April 1-June 30	July 20
July 1-September 30	October 20
October 1-December 31	January 20

(b) Invoices shall be sufficiently detailed to allow for review and approval by the District and each shall include the following: a cover letter indicating the billing period; a detailed breakdown of the costs submitted for reimbursement, including man hours and billing rates; documentation supporting the invoice, such as invoices for supplies, consulting services, etc.; and, an accounting of the amount(s) previously invoiced with respect to the total funding amount provided under this Agreement. The final invoice for the Project, or a component of the Project, shall provide information and documentation sufficient to demonstrate that it has been completed in accordance with the requirements and conditions of this Agreement.

8. Periodic Meetings. The District, at its discretion, may request periodically a meeting for review of the Member Agency's progress toward implementation and completion of the Project, including an initial meeting prior to commencement of the Project.

9. Reporting Requirements.

(a) Beginning with 2022, and for five (5) consecutive years following completion of the Project, the Member Agency shall provide to the District an annual calculation of per capita water use within its retail service area. The calculation shall include an estimate of the population served and the volume of water delivered. This information shall be provided to the District by February 15 following the specific calendar year for which the report is made.

(b) If records are available, the Member Agency shall provide to the District, on or before July 1, 2023, the information requested in subparagraph 9(a) for each calendar year between 2000 and 2022.

(c) Within forty-five (45) days following termination of this Agreement and prior to final payment, the Member Agency shall submit to the District a final, written report, including a summary of the Project; problems/challenges encountered; customer responses; Project benefits; a breakdown of final Project costs; and, an evaluation regarding the effectiveness of the Project.

(d) If a retail customer of the Member Agency receives and installs a water-conserving device, fixture, or equipment as part of the Project, the Member Agency shall provide to the District the customer's water use information for three (3) full years prior to and following installation of the device, fixture, or equipment.

(e) The provisions of this paragraph 9 shall survive expiration or termination of the term of the Agreement.

10. Term. The term of this Agreement shall commence on the Effective Date, and it shall expire without further notice or condition on June 30, 2023, except all

reporting obligations required by this Agreement shall survive its expiration or earlier termination for five (5) consecutive years.

11. Termination. Either party may terminate this Agreement upon sixty (60) days written notice to the other party.

12. Indemnification. The Member Agency shall indemnify, hold harmless, and defend the District, its Trustees, officers, employees, and agents against any claim or asserted liability arising out of the Member Agency's actions, either willful or negligent, or the actions of the Member Agency's officers, employees, or agents, in providing labor, services, supplies, and materials pursuant to this Agreement, including any losses related to any claim made, whether or not court action is filed, and will include attorney fees and administrative and overhead costs related to, or arising out of, such claim or asserted liability.

13. Notices. All notices, requests, demands, and other communications required or allowed by this Agreement shall be in writing and shall be given by personal delivery or by certified mail, with return receipt requested, to the following addresses or to such other addresses as the parties may designate in writing:

If to District, to:

Jordan Valley Water Conservancy District
Attn: General Manager
8215 South 1300 West
West Jordan, Utah 84088

If to Member Agency, to:

Granger-Hunter Improvement District
Attn: Michelle Ketchum, Director of Administrative Services
2888 South 3600 West
P.O. Box 701110
West Valley City, Utah 84170

Notice shall be effective on the date it is received by the other party.

14. Amendment. This Agreement may be amended only by written instrument signed by both parties.

15. Binding Nature. All of the grants, covenants, terms, provision, and conditions in this Agreement shall be binding upon and inure to the benefit of the successors and permitted assigns of the parties.

16. Assignment. The Member Agency shall not assign this Agreement or any of its rights under this Agreement without the prior written consent of the District. The District may assign this Agreement and/or any of its rights under this Agreement.

17. Whole Agreement. This Agreement, including exhibits, constitutes the entire agreement of the parties and supersedes all prior understandings, representations, or agreement of the parties regarding the subject matter in this document.

18. Authorization. The Member Agency represents and warrants that it has authority to enter into this Agreement. In addition, each individual executing this Agreement does hereby represent and warrant that he or she has been duly authorized to sign this Agreement in the capacity and for the entities shown.

19. Miscellaneous. The parties shall perform those acts and/or sign all documents required by this Agreement and which may be reasonably necessary to effectuate the terms of this Agreement.

[SIGNATURE PAGE FOLLOWS]

"District":

Jordan Valley Water Conservancy District

Dated: _____ By: _____

Corey L. Rushton
Its Chair, Board of Trustees

Address: 8215 South 1300 West
West Jordan, Utah 84088

ATTEST:

_____

Barton A. Forsyth
Clerk

"Member Agency":

Granger-Hunter Improvement District

Dated: _____ By: _____

Its: _____

Address: 2888 South 3600 West
P.O. Box 701110
West Valley City, Utah 84170

ATTEST:

_____

EXHIBIT A

PROJECT DESCRIPTION AND SCHEDULE

Measure 1: Water System Leak Detection Project

Description: In 2016 GHID participated in a Water Audit Pilot Training exercise which confirmed water loss but did not pinpoint where the loss was occurring throughout the system. Since that time, GHID has taken steps to improve infrastructure, billing procedures, and replace aging meters. Beginning in 2020, JVWCD grant funding was used to locate leaks on a portion of the water system.

This measure is a continuation of the 2020 project involving the use of the latest acoustic and sonic leak detection technology to discover and locate leaks on a different portion of the system so they can be repaired. The work will be completed by a consultant. The project involves working directly with customers to ensure leaks are repaired.

Funding Tier: Tier 1

Schedule for implementation:

- January 2023 – Award contract to the most effective leak detection company.
- February to June 2023 – Assist leak detection company in providing information and navigating the system, obtain results, and repair leaks.

Cost:

- JVWCD 80%: $64,000
- GHID 20%: $16,000
- Total: $80,000

Measure 2: Conservation Calendars

Description: Public awareness efforts will include production of a 2023 conservation calendar with waterwise tips, promotion of conservation programs, Utah Water Savers, and community outreach events.

Funding Tier: Tier 3

Schedule for implementation:

- September 2022 – Design conservation calendar
- October 2022 – Obtain printing quotes for conservation calendar
- November 2022 – Conservation calendar available to hand out

Cost:

- JVWCD 40%: $800
- GHID 60%: $1,200
- Total: $2,000

Measure 3: Conservation Welcome Packets

Description: This measure involves printing and distributing a welcome packet that includes conservation information and devices for new customers. Specifically, the packet includes a booklet with information on how to use the customer web portal so residents know how much water they are using hour by hour. The booklet also shows customers how to check for leaks and avoid frozen pipes that can break and lead to water loss. The packet also includes a water-saving device and information about where to apply for Utah Water Savers programs.

Funding Tier: Tier 3

Schedule for implementation:

- December 2022 – Obtain quotes for printing
- January 2023 – Begin distribution

Cost:

- JVWCD 40%: $600
- GHID 60%: $900
- Total: $1,500

Measure 4: Conservation Promotional Materials

Description: To better build conservation awareness, GHID would like to enhance education efforts at community events and directly to customers. Promotional materials will include better conservation signage, literature, swag items and water-saving tools to be handed out.

Funding Tier: Tier 3

Schedule for implementation:

- July 2022 to December 2022 – Purchase promotional materials
- July 2022 to May 2023 – Distribute promotional materials

Cost:

- JVWCD 40%: $2,000
- GHID 60%: $3,000
- Total: $5,000

EXHIBIT B

PROJECT COSTS

ITEM DESCRIPTION	UNIT	QUANTITY	MEMBER AGENCY COST SHARE	JVWCD COST SHARE	TOTAL COST
EMPLOYEE WAGES (including benefits) - Employee 1 (name) - Employee 2 (name)					
EQUIPMENT - Item A - Item B - Item C					
SUPPLIES/MATERIALS - Calendars - Welcome Packets - Promotional Materials			 $1,200.00 $900.00 $3,000.00	 $800.00 $600.00 $2,000.00	 $2,000.00 $1,500.00 $5,000.00
CONTRACTUAL - Professional Consulting Services - Contractor Leak Detection Services - Other (please specify)			 $16,000.00	 $64,000.00	 $80,000.00
OTHER (please specify)					
TOTAL PROJECT COST ESTIMATE			$21,100.00	$67,400.00	$88,500.00

OUR OPERATIONS

- LIABILITY, PROPERTY AND AUTO INSURANCE RENEWAL
- YEAR END 2021 FINANCIAL REPORT
- MAY 2022 FINANCIAL REPORT
- MAY 2022 PAID INVOICE REPORT
- RESOLUTION 6-21-22.2 APPROVAL
- RESOLUTION 6-21-22.4 APPROVAL
- CAPITAL PROJECT APPROVAL

Liability, Property and Auto Insurance Renewal

UTAH LOCAL GOVERNMENTS TRUST

1. Coverage Type: Liability, Property and Auto
2. Coverage Term: 7/1/22 to 6/30/23
3. Deductible: $0 Liability/$10k Property/$500 Auto
4. Premium: $203,004.67
   - $105,967.00 Liability
   - $76,798.78 Property
   - $20,238.89 Auto
5. Budgeted amount: $199,598.00
   - $3,407 higher than budgeted premium. Committing to 6 months of expenditures in 2023.

Approval Requested: Consider approval of the District's liability, property and auto insurance premiums in the amount of $203,004.67 to Utah Local Governments Trust.

GRANGER-HUNTER IMPROVEMENT DISTRICT

YEAR-END 2021 FINANCIAL REPORT

GRANGER-HUNTER
IMPROVEMENT DISTRICT

REVENUES

	Actual 12/31/2020	Amended Budget 2020	% of Budget	Actual 12/31/2021	Budget 2021	% of Budget
REVENUES						
Operating Revenues:						
Water Sales	$ 21,433,758	**$ 19,728,000**	108.6%	$ 19,207,513	**$ 19,884,000**	96.6%
Sewer Service Charges	11,584,087	**11,807,000**	98.1%	11,656,156	**11,677,000**	99.8%
Central Valley Assessmt	2,687,030	**2,700,000**	99.5%	2,704,602	**2,700,000**	100.2%
Engineering Fees	7,542	**6,000**	125.7%	9,649	**7,000**	137.8%
Connection fees	41,271	**34,000**	121.4%	30,193	**40,000**	75.5%
Inspection	77,394	**49,000**	157.9%	85,985	**55,000**	156.3%
Delinquent/Turn-on Fees	10,390	**35,000**	29.7%	9,650	**35,000**	27.6%
Conservation Grant	62,869	**68,500**	91.8%	40,566	**41,300**	98.2%
Total Operating Revenue	35,904,341	**34,427,500**	104.3%	33,744,314	**34,439,300**	98.0%
Property Tax Revenue:						
Property Tax	3,386,741	**3,400,000**	99.6%	3,411,403	**3,400,000**	100.3%
Motor Vehicle	215,789	**250,000**	86.3%	218,994	**250,000**	87.6%
Personal Property	333,213	**325,000**	102.5%	322,712	**325,000**	99.3%
Delinquent Tax/Interest	73,016	**80,000**	91.3%	64,410	**80,000**	80.5%
Tax Increment for RDA	158,840	**200,000**	79.4%	165,357	**200,000**	82.7%
Total Property Tax Revenue	4,167,599	**4,255,000**	97.9%	4,182,876	**4,255,000**	98.3%
Non-operating Revenue:						
Impact Fees - Water	796,642	**300,000**	265.5%	570,987	**450,000**	126.9%
Impact Fees - Sewer	396,138	**150,000**	264.1%	301,911	**200,000**	151.0%
Interest	336,820	**525,000**	64.2%	170,221	**250,000**	68.1%
Sale of Surplus Equipment	77,086	**59,000**	130.7%	21,967	**40,000**	54.9%
Other	101,474	**120,000**	84.6%	115,294	**120,000**	96.1%
Total Non-operating Revenue	1,708,160	**1,154,000**	148.0%	1,180,380	**1,060,000**	111.4%
Total Revenues	$ 41,780,100	**$ 39,836,500**	104.9%	$ 39,107,570	**$ 39,754,300**	98.4%

Percent of Year Completed: 100.00%

GRANGER-HUNTER
IMPROVEMENT DISTRICT

EXPENSES

EXPENSES	Actual 12/31/2020	Amended Budget 2020	% of Budget	Actual 12/31/2021	Budget 2021	% of Budget
Payroll Wages:						
Salaries & Wages	$ 4,967,707	**$ 5,028,072**	98.8%	$ 4,741,656	**$ 4,893,240**	96.9%
Overtime Wages	128,652	**175,000**	73.5%	95,079	**175,000**	54.3%
On-call Pay	69,934	**71,280**	98.1%	70,166	**71,280**	98.4%
Incentive Pay	11,694	**15,000**	78.0%	12,440	**15,000**	82.9%
Vehicle Allowance	6,160	**9,000**	68.4%	6,314	**9,000**	70.2%
Other/OPEB	371,150	**250,000**	148.5%	17,659	**250,000**	7.1%
Clothing Allowance	18,975	**22,000**	86.3%	20,625	**21,450**	96.2%
Total Payroll Wages	5,574,272	**5,570,352**	100.1%	4,963,939	**5,434,970**	91.3%
Payroll Benefits:						
State Retirement Plan	828,473	**955,045**	86.7%	846,538	**947,920**	89.3%
401K Plan	609,799	**598,677**	101.9%	570,079	**594,210**	95.9%
Health/Dental Insurance	1,243,872	**1,670,320**	74.5%	1,310,218	**1,670,257**	78.4%
Medicare	75,721	**73,547**	103.0%	70,280	**72,730**	96.6%
Workers Compensation Ins	18,091	**40,000**	45.2%	30,003	**40,000**	75.0%
Life/LTD/LTC Insurance	67,411	**75,000**	89.9%	91,766	**91,766**	100.0%
State Unemployment	8,937	**5,000**	178.7%	-	**10,000**	0.0%
Total Payroll Benefits	2,852,304	**3,417,589**	83.5%	2,918,884	**3,426,883**	85.2%
Operations & Maintenance:						
Repair & Replacement	467,933	**655,560**	71.4%	1,122,984	**1,122,984**	100.0%
Building & Grounds	68,809	**82,450**	83.5%	63,780	**82,450**	77.4%
Vehicle Maint & Fuel	152,831	**189,431**	80.7%	210,579	**210,579**	100.0%
Vehicle Lease	13,254	**254,600**	5.2%	15,883	**225,800**	7.0%
Tools & Supplies	66,787	**73,400**	91.0%	86,221	**89,750**	96.1%
Water Purchases	11,246,892	**11,010,400**	102.1%	9,773,599	**10,395,676**	94.0%
Treatment Chemicals	36,867	**41,300**	89.3%	40,011	**41,300**	96.9%
Water Lab Testing Fees	39,298	**76,750**	51.2%	20,021	**66,500**	30.1%
Utilities	932,878	**982,000**	95.0%	806,044	**888,101**	90.8%
Total O&M	13,025,549	**13,365,891**	97.5%	12,139,122	**13,123,140**	92.5%
CVWRF:						
Facility Operations	4,381,700	**4,494,860**	97.5%	4,798,089	**5,517,471**	87.0%
Project Betterments	752,854	**1,360,725**	55.3%	1,790,400	**1,748,831**	102.4%
Interceptor Monitoring	(2,967)	**-**	0.0%	-	**-**	0.0%
Pre-treatment Field	263,883	**283,675**	93.0%	346,901	**286,024**	121.3%
Laboratory	237,994	**227,418**	104.7%	258,745	**251,563**	102.9%
CVW Debt Service	2,073,345	**1,954,999**	106.1%	3,925,301	**3,311,053**	118.6%
Total CVWRF	$ 7,706,809	**$ 8,321,677**	92.6%	$ 11,119,436	**$ 11,114,942**	100.0%

GRANGER-HUNTER
IMPROVEMENT DISTRICT

	Actual 12/31/2020	Budget 2020	% of Budget	Actual 12/31/2021	Budget 2021	% of Budget
General & Administrative:						
Office Supplies/Printing	$ 21,109	**$ 33,940**	62.2%	$ 12,841	**$ 27,840**	46.1%
Postage & Mailing	145,160	**159,500**	91.0%	157,970	**157,970**	100.0%
General Administrative	60,661	**61,000**	99.4%	76,424	**109,548**	69.8%
Computer Supplies	389,921	**494,243**	78.9%	409,240	**471,167**	86.9%
General Insurance	367,777	**439,612**	83.7%	294,192	**360,595**	81.6%
Utilities	79,273	**95,500**	83.0%	77,778	**95,500**	81.4%
Telephone	103,775	**120,200**	86.3%	126,597	**126,597**	100.0%
Training & Education	62,192	**133,200**	46.7%	48,161	**80,451**	59.9%
Safety	41,201	**39,620**	104.0%	42,227	**42,227**	100.0%
Legal fees	44,978	**44,000**	102.2%	43,255	**54,000**	80.1%
Auditing Fees	12,000	**12,000**	100.0%	12,000	**12,000**	100.0%
Professional Consulting	83,604	**97,400**	85.8%	248,305	**347,400**	71.5%
Public Relations/Conservation	43,221	**55,000**	78.6%	88,686	**98,500**	90.0%
Banking & Bonding	357,516	**330,900**	108.0%	357,162	**357,162**	100.0%
Admin Contingency	-	**180,000**	0.0%	-	**180,000**	0.0%
Total General Administrative	1,812,388	**2,296,115**	78.9%	1,994,838	**2,520,957**	79.1%
Total Operating Expenses	30,971,322	**32,971,624**	93.9%	33,136,219	**35,620,892**	93.0%
Net Operating Revenues	10,808,778	**6,864,876**	157.5%	5,971,351	**4,133,408**	144.5%
Indirect Operating Expenses:						
Depreciation	7,821,047	**7,700,000**	101.6%	8,010,624	**8,000,000**	100.1%
RDA Pass-Through	158,840	**200,000**	79.4%	165,357	**200,000**	82.7%
Total Indirect Operating Exp	7,979,887	**7,900,000**	101.0%	8,175,981	**8,200,000**	99.7%
Equipment and Infrastructure:						
Infrastructure	9,259,131	**15,746,152**	58.8%	6,297,754	**21,142,000**	29.8%
New Vehicles & Equipment	414,785	**409,747**	101.2%	599,810	**625,810**	95.8%
Total Equipment	9,673,916	**16,155,899**	59.9%	6,897,564	**21,767,810**	31.7%
Debt Service:						
Bond Interest and Fees	133,837	**244,995**	54.6%	151,085	**207,388**	72.9%
Bond Principal Pmt ('12 Bond)	288,000	**288,000**	100.0%	295,000	**311,000**	94.9%
Bond Princ Pmt (2019 DEQ)	435,525	**310,000**	140.5%	532,000	**532,000**	100.0%
Total Debt Service	857,362	**842,995**	101.7%	978,085	**1,050,388**	93.1%
Total Equip & Debt Service	10,531,278	**16,998,894**	62.0%	7,875,649	**22,818,198**	34.5%
Net Revenues	(7,702,387)	**(18,034,018)**	42.7%	(10,080,279)	**(26,884,790)**	37.5%
Infrastructure and Debt						
Add back Depreciation	7,821,047	**7,700,000**	101.6%	8,010,624	**8,000,000**	100.1%
Add back Infrastructure	9,259,131	**15,746,152**	58.8%	6,297,754	**21,142,000**	29.8%
Net Revenues, net of Infr & Depr	$ 9,377,791	**$ 5,412,134**	173.3%	$ 4,228,099	**$ 2,257,210**	187.3%

MAY 2022 FINANCIAL REPORT

GRANGER-HUNTER
IMPROVEMENT DISTRICT

REVENUES

	Actual 5/31/2021	Amended Budget 2021	% of Budget	Actual 5/31/2022	Budget 2022	% of Budget
REVENUES						
Operating Revenues:						
Water Sales	$ 4,616,206	**$ 19,884,000**	23.2%	$ 4,559,397	**$ 21,276,000**	21.4%
Sewer Service Charges	4,013,175	**11,677,000**	34.4%	4,637,737	**13,779,000**	33.7%
Central Valley Assessmt	1,124,399	**2,700,000**	41.6%	1,130,709	**2,700,000**	41.9%
Engineering Fees	4,727	**7,000**	67.5%	52,820	**7,000**	754.6%
Connection fees	11,134	**40,000**	27.8%	20,603	**40,000**	51.5%
Inspection	25,690	**55,000**	46.7%	56,565	**55,000**	102.8%
Delinquent/Turn-on Fees	2,090	**35,000**	6.0%	22,185	**35,000**	63.4%
Conservation Grant	2,446	**41,300**	5.9%	626	**51,000**	1.2%
Total Operating Revenue	9,799,867	**34,439,300**	28.5%	10,480,642	**37,943,000**	27.6%
Property Tax Revenue:						
Property Tax	(22,006)	**3,400,000**	-0.6%	35,329	**4,974,000**	0.7%
Motor Vehicle	89,806	**250,000**	35.9%	65,792	**260,000**	25.3%
Personal Property	289,065	**325,000**	88.9%	247,701	**392,000**	63.2%
Delinquent Tax/Interest	39,696	**80,000**	49.6%	29,116	**80,000**	36.4%
Tax Increment for RDA	-	**200,000**	0.0%	-	**170,000**	0.0%
Total Property Tax Revenue	396,561	**4,255,000**	9.3%	377,938	**5,876,000**	6.4%
Non-operating Revenue:						
Impact Fees - Water	199,211	**450,000**	44.3%	246,218	**500,000**	49.2%
Impact Fees - Sewer	107,788	**200,000**	53.9%	121,424	**275,000**	44.2%
Interest	60,532	**250,000**	24.2%	52,749	**125,000**	42.2%
Sale of Surplus Equipment	1,209	**40,000**	3.0%	604	**40,000**	1.5%
Other	61,932	**120,000**	51.6%	45,832	**120,000**	38.2%
Total Non-operating Revenue	430,672	**1,060,000**	40.6%	466,827	**1,060,000**	44.0%
Total Revenues	$ 10,627,100	**$ 39,754,300**	26.7%	$ 11,325,407	**$ 44,879,000**	25.2%

*2021 amounts have been adjusted from what was presented during 2021 board meetings. The adjustments include removing accruals made to the 2021 amounts.

Percent of Year Completed: 41.67%

GRANGER-HUNTER IMPROVEMENT DISTRICT

EXPENSES

EXPENSES	Actual 5/31/2021	Amended Budget 2021	% of Budget	Actual 5/31/2022	Budget 2022	% of Budget
Payroll Wages:						
Salaries & Wages	$ 1,806,283	**$ 4,893,240**	36.9%	$ 1,881,900	**$ 5,175,735**	36.4%
Overtime Wages	37,298	**175,000**	21.3%	30,038	**150,000**	20.0%
On-call Pay	25,677	**71,280**	36.0%	25,411	**71,280**	35.6%
Incentive Pay	4,955	**15,000**	33.0%	5,214	**4,000**	130.4%
Vehicle Allowance	2,121	**9,000**	23.6%	2,809	**7,200**	39.0%
Other/OPEB	-	**250,000**	0.0%	-	**40,000**	0.0%
Clothing Allowance	-	**21,450**	0.0%	-	**21,450**	0.0%
Total Payroll Wages	1,876,334	**5,434,970**	34.5%	1,945,372	**5,469,665**	35.6%
Payroll Benefits:						
State Retirement Plan	327,947	**947,920**	34.6%	341,048	**990,339**	34.4%
401K Plan	216,859	**594,210**	36.5%	225,149	**627,040**	35.9%
Health/Dental Insurance	783,166	**1,687,023**	46.4%	901,841	**1,825,000**	49.4%
Medicare	26,729	**72,730**	36.8%	27,722	**76,367**	36.3%
Workers Compensation Ins	15,336	**40,000**	38.3%	28,145	**40,000**	70.4%
Life/LTD/LTC Insurance	46,328	**75,000**	61.8%	17,707	**68,400**	25.9%
State Unemployment	-	**10,000**	0.0%	-	**5,000**	0.0%
Total Payroll Benefits	1,416,365	**3,426,883**	41.3%	1,541,612	**3,632,146**	42.4%
Operations & Maintenance:						
Repair & Replacement	248,886	**801,400**	31.1%	285,311	**1,182,300**	24.1%
Building & Grounds	31,469	**82,450**	38.2%	26,210	**79,450**	33.0%
Vehicle Maint & Fuel	76,740	**193,680**	39.6%	119,189	**286,390**	41.6%
Vehicle Lease	109,875	**225,800**	48.7%	52,757	**118,000**	44.7%
Tools & Supplies	26,038	**89,750**	29.0%	36,680	**67,957**	54.0%
Water Purchases	2,410,230	**10,717,260**	22.5%	2,490,394	**10,824,567**	23.0%
Treatment Chemicals	18,412	**41,300**	44.6%	3,179	**43,500**	7.3%
Water Lab Testing Fees	6,600	**66,500**	9.9%	7,452	**74,500**	10.0%
Utilities	218,269	**905,000**	24.1%	122,996	**923,900**	13.3%
Total O&M	3,146,519	**13,123,140**	24.0%	3,144,168	**13,600,564**	23.1%
CVWRF:						
Facility Operations	2,066,434	**5,517,471**	37.5%	1,646,892	**5,546,334**	29.7%
Project Betterments	564,068	**1,748,831**	32.3%	361,322	**1,660,415**	21.8%
Interceptor Monitoring	-	**-**	0.0%	-	**-**	0.0%
Pre-treatment Field	128,825	**286,024**	45.0%	119,237	**363,160**	32.8%
Laboratory	111,284	**251,563**	44.2%	87,137	**274,019**	31.8%
CVW Debt Service	1,095,740	**3,311,053**	33.1%	1,696,481	**6,522,160**	26.0%
Total CVWRF	$ 3,966,351	**$ 11,114,942**	35.7%	$ 3,911,069	**$ 14,366,088**	27.2%

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GRANGER-HUNTER
IMPROVEMENT DISTRICT

	Actual 5/31/2021	Budget 2021	% of Budget	Actual 5/31/2022	Budget 2022	% of Budget
General & Administrative:						
Office Supplies/Printing	$ 8,733	**$ 27,840**	31.4%	$ 6,116	**$ 24,210**	25.3%
Postage & Mailing	48,546	**155,550**	31.2%	49,773	**155,775**	32.0%
General Administrative	14,488	**133,810**	10.8%	18,762	**76,660**	24.5%
Computer Supplies	162,553	**471,167**	34.5%	155,735	**473,660**	32.9%
General Insurance	294,192	**360,595**	81.6%	194,689	**394,830**	49.3%
Utilities	27,994	**95,500**	29.3%	34,784	**87,288**	39.8%
Telephone	32,635	**113,600**	28.7%	38,450	**127,200**	30.2%
Training & Education	18,930	**97,475**	19.4%	40,566	**102,500**	39.6%
Safety	12,277	**40,620**	30.2%	10,868	**41,425**	26.2%
Legal fees	16,915	**54,000**	31.3%	16,765	**53,000**	31.6%
Auditing Fees	12,000	**12,000**	100.0%	12,000	**12,000**	100.0%
Professional Consulting	66,395	**347,400**	19.1%	71,221	**156,500**	45.5%
Public Relations/Conservation	53,742	**98,500**	54.6%	47,925	**87,500**	54.8%
Banking & Bonding	120,443	**332,900**	36.2%	106,686	**337,280**	31.6%
Payments to Other Gov't Agencies	-	**-**	0.0%	92,034	**171,000**	53.8%
Admin Contingency	-	**180,000**	0.0%	-	**180,000**	0.0%
Total General Administrative	889,843	**2,520,957**	35.3%	896,374	**2,480,828**	36.1%
Total Operating Expenses	11,295,412	**35,620,892**	31.7%	11,438,595	**39,549,291**	28.9%
Net Operating Revenues	(668,312)	**4,133,408**	-16.2%	(113,188)	**5,329,709**	-2.1%
Indirect Operating Expenses:						
Depreciation	3,295,785	**8,000,000**	41.2%	-	**8,250,000**	0.0%
RDA Pass-Through	-	**200,000**	0.0%	-	**170,000**	0.0%
Total Indirect Operating Exp	3,295,785	**8,200,000**	40.2%	-	**8,420,000**	0.0%
Equipment and Infrastructure:						
Infrastructure	1,392,966	**21,142,000**	6.6%	3,923,634	**36,358,000**	10.8%
New Vehicles & Equipment	29,832	**625,810**	4.8%	454,833	**728,660**	62.4%
Total Equipment	1,422,798	**21,767,810**	6.5%	4,378,467	**37,086,660**	11.8%
Debt Service:						
Bond Interest and Fees	36,781	**207,388**	17.7%	35,710	**703,278**	5.1%
Bond Principal Pmt ('21 Bond)	295,000	**311,000**	94.9%	321,000	**321,000**	100.0%
Bond Principal Pmt ('19 Bond)	532,000	**532,000**	100.0%	753,000	**753,000**	100.0%
Total Debt Service	863,781	**1,050,388**	82.2%	1,109,710	**1,777,278**	62.4%
Total Equip & Debt Service	2,286,579	**22,818,198**	10.0%	5,488,177	**38,863,938**	14.1%
Net Revenues	(6,250,676)	**(26,884,790)**	23.2%	(5,601,365)	**(41,954,229)**	13.4%
Infrastructure and Debt						
Add back Depreciation	3,295,785	**8,000,000**	41.2%	-	**8,250,000**	0.0%
Add back Infrastructure	1,392,966	**21,142,000**	6.6%	3,923,634	**36,358,000**	10.8%
Net Revenues, net of Infr & Depr	$ (1,561,925)	**$ 2,257,210**	-69.2%	$ (1,677,731)	**$ 2,653,771**	-63.2%

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MAY 2022 PAID INVOICE REPORT

Granger-Hunter Improvement District, UT

Paid Check Report

By Vendor Name

Payment Dates 5/1/2022 - 5/31/2022

Vendor Name	Payment Date	Payment Number	Description (Item)	Account Number	Account Name	Amount
Vendor: 1064 - ACE RECYCLING & DISPOSAL						
ACE RECYCLING & DISPOSAL	05/19/2022	125079	MAY 2022 MONTHLY CHARGES	01-260-510220	BUILDING & GROUNDS	332.22
					Vendor 1064 - ACE RECYCLING & DISPOSAL Total:	**332.22**
Vendor: 1106 - AFLAC GROUP INSURANCE						
AFLAC GROUP INSURANCE	05/05/2022	125004	AFLAC GROUP INS AFTER TAX	01-000-220500	HEALTH INSURANCE PAYABLE	28.73
AFLAC GROUP INSURANCE	05/05/2022	125004	AFLAC GROUP INS AFTER TAX	01-000-220500	HEALTH INSURANCE PAYABLE	28.73
AFLAC GROUP INSURANCE	05/05/2022	125004	AFLAC GROUP INS AFTER TAX	01-000-220500	HEALTH INSURANCE PAYABLE	28.73
AFLAC GROUP INSURANCE	05/05/2022	125004	AFLAC GROUP INS PRE TAX	01-000-220500	HEALTH INSURANCE PAYABLE	64.86
AFLAC GROUP INSURANCE	05/05/2022	125004	AFLAC GROUP INS PRE TAX	01-000-220500	HEALTH INSURANCE PAYABLE	64.86
AFLAC GROUP INSURANCE	05/05/2022	125004	AFLAC GROUP INS PRE TAX	01-000-220500	HEALTH INSURANCE PAYABLE	64.86
AFLAC GROUP INSURANCE	05/26/2022	125115	AFLAC GROUP INS AFTER TAX	01-000-220500	HEALTH INSURANCE PAYABLE	28.73
AFLAC GROUP INSURANCE	05/26/2022	125115	AFLAC GROUP INS PRE TAX	01-000-220500	HEALTH INSURANCE PAYABLE	64.86
AFLAC GROUP INSURANCE	05/26/2022	125115	AFLAC GROUP INS AFTER TAX	01-000-220500	HEALTH INSURANCE PAYABLE	28.73
AFLAC GROUP INSURANCE	05/26/2022	125115	AFLAC GROUP INS PRE TAX	01-000-220500	HEALTH INSURANCE PAYABLE	64.86
					Vendor 1106 - AFLAC GROUP INSURANCE Total:	**467.95**
Vendor: 1142 - ALLIANZ CONSULTING SOLUTIONS, LLC						
ALLIANZ CONSULTING SOLUTI...	05/26/2022	125116	APR 22 CC FEE REDUC SRVCS	01-110-510540	BANKING & BONDING EXPENSE	293.06
					Vendor 1142 - ALLIANZ CONSULTING SOLUTIONS, LLC Total:	**293.06**
Vendor: 1210 - AMERICAN EXPRESS						
AMERICAN EXPRESS	05/05/2022	125005	APR 2022 PURCHASES	01-000-210150	AMEX/MC PAYABLE	108,204.43
AMERICAN EXPRESS	05/05/2022	125005	LT GOV/ENTITY REGISTRATION	01-110-510430	GENERAL ADMINISTRATIVE	25.00
AMERICAN EXPRESS	05/05/2022	125005	AWWA/REGISTRATION - ANN ...	01-110-510480	TRAINING & EDUCATION - M...	895.00
AMERICAN EXPRESS	05/05/2022	125005	OFF DPT/PAPER	01-130-510410	OFFICE SUPPLIES/PRINTING	170.65
AMERICAN EXPRESS	05/05/2022	125005	AMZN/SHIPPING LABELS	01-130-510410	OFFICE SUPPLIES/PRINTING	32.59
AMERICAN EXPRESS	05/05/2022	125005	AMZN/NOTEPADS	01-130-510410	OFFICE SUPPLIES/PRINTING	39.58
AMERICAN EXPRESS	05/05/2022	125005	AMZN/ACRYLIC SIGN HOLDERS	01-130-510410	OFFICE SUPPLIES/PRINTING	41.98
AMERICAN EXPRESS	05/05/2022	125005	VISTA PRINT/BUSINESS CARDS	01-130-510410	OFFICE SUPPLIES/PRINTING	24.49
AMERICAN EXPRESS	05/05/2022	125005	AMZN/PHONE CORD REPLAC...	01-130-510410	OFFICE SUPPLIES/PRINTING	26.15
AMERICAN EXPRESS	05/05/2022	125005	ZAZZLE/EMP ID CARD/RFD TAX	01-130-510410	OFFICE SUPPLIES/PRINTING	-3.94
AMERICAN EXPRESS	05/05/2022	125005	REGISTRATION/UT WTR CONS -...	01-130-510480	TRAINING & EDUCATION - CUS...	50.00
AMERICAN EXPRESS	05/05/2022	125005	RWAU/WATER CERT EXAM - ...	01-140-510480	TRAINING & EDUCATION - ME...	150.00
AMERICAN EXPRESS	05/05/2022	125005	RWAU/WATER CERT EXAM - ...	01-140-510480	TRAINING & EDUCATION - ME...	150.00
AMERICAN EXPRESS	05/05/2022	125005	AMZN/METER TOOLS	01-140-520210	REPAIR SUPPLIES - METER	30.44
AMERICAN EXPRESS	05/05/2022	125005	AWWA/REGISTRATION - ANN ...	01-220-510480	TRAINING & EDUCATION - WTR..	895.00
AMERICAN EXPRESS	05/05/2022	125005	RWAU/WATER CERT EXAM - ...	01-220-510480	TRAINING & EDUCATION - WTR..	150.00
AMERICAN EXPRESS	05/05/2022	125005	WVC PT/APP CODE #243880	01-220-520210	REPAIR SUPPLIES - WTR R&R	200.00
AMERICAN EXPRESS	05/05/2022	125005	WVC PT/APP CODE #209724	01-220-520210	REPAIR SUPPLIES - WTR R&R	200.00

Ferguson	$ 84,657.10
Clyde, Snow	$ 8,557.50
Magna Wtr	$ 6,653.26
Verizon	$ 3,191.71
Other	$ 5,144.86

Vendor Name	Payment Date	Payment Number	Description (Item)	Account Number	Account Name	Amount
AMERICAN EXPRESS	05/05/2022	125005	WVC PT/APP CODE #243883	01-220-520210	REPAIR SUPPLIES - WTR R&R	200.00
AMERICAN EXPRESS	05/05/2022	125005	WVC PT/APP CODE #245251	01-220-520210	REPAIR SUPPLIES - WTR R&R	200.00
AMERICAN EXPRESS	05/05/2022	125005	WVC PT/APP CODE #227371	01-220-520210	REPAIR SUPPLIES - WTR R&R	300.00
AMERICAN EXPRESS	05/05/2022	125005	AWWA/REGISTRATION - ANN ...	01-230-510480	TRAINING & EDUCATION - WTR..	895.00
AMERICAN EXPRESS	05/05/2022	125005	RWAU/WTR CERT EXAM - EMP...	01-230-510480	TRAINING & EDUCATION - WTR..	150.00
AMERICAN EXPRESS	05/05/2022	125005	AMZN/NUT SPLITTER	01-230-520240	TOOLS & SUPPLIES - WTR MAI...	39.99
AMERICAN EXPRESS	05/05/2022	125005	WEA/REGISTRATION-2022 AN...	01-240-510480	TRAINING & EDUCATION - WW..	440.00
AMERICAN EXPRESS	05/05/2022	125005	RWAU/WATER CERT EXAM - ...	01-240-510480	TRAINING & EDUCATION - WW..	150.00
AMERICAN EXPRESS	05/05/2022	125005	BCSP/TRAINING-EMP #61	01-240-510480	TRAINING & EDUCATION - WW..	25.00
AMERICAN EXPRESS	05/05/2022	125005	SCOTT HALE/DRINKING FOUN...	01-260-510220	BUILDING & GROUNDS	809.00
AMERICAN EXPRESS	05/05/2022	125005	AWWA/REGISTRATION - ANN ...	01-340-510480	TRAINING & EDUCATION - ENG	1,095.00
AMERICAN EXPRESS	05/05/2022	125005	AWWA/REGISTRATION - ANN ...	01-340-510480	TRAINING & EDUCATION - ENG	-200.00
AMERICAN EXPRESS	05/05/2022	125005	WVC PT/APP CODE #245799	01-340-520920	INFRASTRUCTURE PURCHASES	5,350.00
AMERICAN EXPRESS	05/05/2022	125005	AWWA/REGISTRATION - ANN ...	01-350-510480	TRAINING & EDUCATION - OP...	1,095.00
AMERICAN EXPRESS	05/05/2022	125005	AWWA/REGISTRATION - ANN ...	01-350-510480	TRAINING & EDUCATION - OP...	-200.00
AMERICAN EXPRESS	05/05/2022	125005	AMZN/PHONE CASE	01-360-510440	COMPUTER SUPPLIES/EQUIP...	11.99
AMERICAN EXPRESS	05/05/2022	125005	ZOOM/ONLINE MTGS	01-360-510440	COMPUTER SUPPLIES/EQUIP...	199.90
AMERICAN EXPRESS	05/05/2022	125005	AMZN/PHONE CASE	01-360-510440	COMPUTER SUPPLIES/EQUIP...	11.98
AMERICAN EXPRESS	05/05/2022	125005	AMZN/PHONE CASE	01-360-510440	COMPUTER SUPPLIES/EQUIP...	15.99
AMERICAN EXPRESS	05/05/2022	125005	AMZN/LAPTOP CAR CHARGER	01-360-510440	COMPUTER SUPPLIES/EQUIP...	41.99
AMERICAN EXPRESS	05/05/2022	125005	GODADDY/UCC SSL (5) RENE...	01-360-510440	COMPUTER SUPPLIES/EQUIP...	249.99
AMERICAN EXPRESS	05/05/2022	125005	AMZN/TABLET VEHICLE MOU...	01-360-510440	COMPUTER SUPPLIES/EQUIP...	-28.79
AMERICAN EXPRESS	05/05/2022	125005	AWWA/REGISTRATION - ANN ...	01-360-510480	TRAINING & EDUCATION - SYS...	895.00
					Vendor 1210 - AMERICAN EXPRESS Total:	**123,028.41**
Vendor: 5118 - ANY HOUR SERVICES						
ANY HOUR SERVICES	05/26/2022	125117	SWR INSPECTION FEE REFUND	01-000-410500	INSPECTION FEES	150.00
					Vendor 5118 - ANY HOUR SERVICES Total:	**150.00**
Vendor: 1087 - APCO INC						
APCO INC	05/05/2022	125006	21F:SCADA MODIFICATION	01-340-520920	INFRASTRUCTURE PURCHASES	28,480.00
APCO INC	05/19/2022	125080	21F:SCADA UPGRADES	01-340-520920	INFRASTRUCTURE PURCHASES	12,640.00
					Vendor 1087 - APCO INC Total:	**41,120.00**
Vendor: 1267 - APELLO						
APELLO	05/05/2022	DFT0000006	MAY 2022 ANSWERING SERVI...	01-360-510470	TELEPHONE	554.00
					Vendor 1267 - APELLO Total:	**554.00**
Vendor: 1268.1 - APPLICANTPRO						
APPLICANTPRO	05/26/2022	125118	JUN 2022 MONTHLY CHARGES	01-110-510430	GENERAL ADMINISTRATIVE	169.00
					Vendor 1268.1 - APPLICANTPRO Total:	**169.00**
Vendor: 1306 - ASAP AUTO PARTS WAREHOUSE						
ASAP AUTO PARTS WAREHOU...	05/05/2022	125007	#30/FILTER	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	21.14
ASAP AUTO PARTS WAREHOU...	05/05/2022	125007	#22, #19/OIL FILTER	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	7.48
ASAP AUTO PARTS WAREHOU...	05/05/2022	125007	REGISTRATION/TRAINING CLIN...	01-260-510480	TRAINING & EDUCATION - BLD...	198.00
ASAP AUTO PARTS WAREHOU...	05/05/2022	125007	#39/AIR FILTER, FUEL CAP, WI...	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	20.60

Vendor Name	Payment Date	Payment Number	Description (Item)	Account Number	Account Name	Amount
ASAP AUTO PARTS WAREHOU...	05/05/2022	125007	#30/CLR-MKR LAMP	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	16.75
ASAP AUTO PARTS WAREHOU...	05/05/2022	125007	#25/WIPER	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	13.06
ASAP AUTO PARTS WAREHOU...	05/05/2022	125007	#7/OIL FILTER	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	1.75
ASAP AUTO PARTS WAREHOU...	05/05/2022	125007	PLASTIC REPAIR CLIPS	01-260-520210	REPAIR SUPPLIES - BLD/FLT MA..	15.25
ASAP AUTO PARTS WAREHOU...	05/05/2022	125007	#7/WATER PUMP, THERMOST...	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	70.86
ASAP AUTO PARTS WAREHOU...	05/05/2022	125007	SHOP BRK CLEANER	01-260-520210	REPAIR SUPPLIES - BLD/FLT MA..	23.25
ASAP AUTO PARTS WAREHOU...	05/05/2022	125007	#7/SEAL	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	8.50
ASAP AUTO PARTS WAREHOU...	05/05/2022	125007	#3/AIR FILTER	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	11.21
ASAP AUTO PARTS WAREHOU...	05/05/2022	125007	#7/SEAL-RETURNED	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	-8.50
ASAP AUTO PARTS WAREHOU...	05/19/2022	125081	#30 PERMATEX	01-260-520210	REPAIR SUPPLIES - BLD/FLT MA..	26.94
ASAP AUTO PARTS WAREHOU...	05/19/2022	125081	#41 POWER BEAD	01-260-520210	REPAIR SUPPLIES - BLD/FLT MA..	43.72
					Vendor 1306 - ASAP AUTO PARTS WAREHOUSE Total:	**470.01**
Vendor: 1320 - ASPHALT MATERIALS INC						
ASPHALT MATERIALS INC	05/19/2022	125082	Asphalt for Repairs	01-220-520210	REPAIR SUPPLIES - WTR R&R	181.63
ASPHALT MATERIALS INC	05/19/2022	125082	Asphalt for Repairs	01-220-520210	REPAIR SUPPLIES - WTR R&R	874.68
ASPHALT MATERIALS INC	05/19/2022	125082	Asphalt for Repairs	01-220-520210	REPAIR SUPPLIES - WTR R&R	974.04
ASPHALT MATERIALS INC	05/19/2022	125082	Asphalt for Repairs	01-220-520210	REPAIR SUPPLIES - WTR R&R	929.46
					Vendor 1320 - ASPHALT MATERIALS INC Total:	**2,959.81**
Vendor: 1413.5 - BALLARD, AUSTIN						
BALLARD, AUSTIN	05/19/2022	125083	LODGING/UGFOA CONF - EMP...	01-110-510480	TRAINING & EDUCATION - M...	400.98
					Vendor 1413.5 - BALLARD, AUSTIN Total:	**400.98**
Vendor: 1425 - BATTERIES PLUS BULBS						
BATTERIES PLUS BULBS	05/05/2022	125008	BATTERIES	01-330-520240	TOOLS & SUPPLIES - BLUE STKS..	19.64
					Vendor 1425 - BATTERIES PLUS BULBS Total:	**19.64**
Vendor: 1470 - BLUE STAKES OF UTAH UTILITY						
BLUE STAKES OF UTAH UTILITY	05/05/2022	125009	MAR 2022 MONTHLY CHARGES	01-340-510520	PROFESSIONAL CONSULTING -...	875.16
					Vendor 1470 - BLUE STAKES OF UTAH UTILITY Total:	**875.16**
Vendor: 1500 - BOWEN COLLINS AND ASSOCIATES						
BOWEN COLLINS AND ASSOCI...	05/05/2022	125010	20A/20I RDWOOD ROD WTR/...	01-340-520920	INFRASTRUCTURE PURCHASES	13,576.25
BOWEN COLLINS AND ASSOCI...	05/05/2022	125010	20A/20I RDWOOD ROD WTR/...	01-340-520920	INFRASTRUCTURE PURCHASES	1,993.13
BOWEN COLLINS AND ASSOCI...	05/05/2022	125010	20E:PIONEER WWPS REPLAC...	01-340-520920	INFRASTRUCTURE PURCHASES	7,374.13
BOWEN COLLINS AND ASSOCI...	05/05/2022	125010	2021 MASTER PLAN UPDATE	01-340-510520	PROFESSIONAL CONSULTING -...	17,766.00
BOWEN COLLINS AND ASSOCI...	05/19/2022	125084	20E:PIONEER WWPS REPLAC...	01-340-520920	INFRASTRUCTURE PURCHASES	2,503.88
BOWEN COLLINS AND ASSOCI...	05/26/2022	125119	20A/20I RDWOOD RD WTR/S...	01-340-520920	INFRASTRUCTURE PURCHASES	882.88
BOWEN COLLINS AND ASSOCI...	05/26/2022	125119	20A/20I RDWOOD RD WTR/S...	01-340-520920	INFRASTRUCTURE PURCHASES	10,322.50
					Vendor 1500 - BOWEN COLLINS AND ASSOCIATES Total:	**54,418.77**
Vendor: 1520 - BRADFIELD, DOUG						
BRADFIELD, DOUG	05/26/2022	125120	AIRFARE/BLUEBEAM CONF - ...	01-330-510480	TRAINING & EDUCATION - BLU...	317.20
					Vendor 1520 - BRADFIELD, DOUG Total:	**317.20**

Vendor Name	Payment Date	Payment Number	Description (Item)	Account Number	Account Name	Amount
Vendor: 1526 - BRANTLY, DARCY						
BRANTLY, DARCY	05/05/2022	125011	10X10 CANOPY/CUSTOMER SE...	01-110-510430	GENERAL ADMINISTRATIVE	214.88
					Vendor 1526 - BRANTLY, DARCY Total:	**214.88**
Vendor: 1527 - BRIDGESTONE HOSEPOWER, LLC						
BRIDGESTONE HOSEPOWER, L...	05/26/2022	125121	HIGH PRESSURE WATER LINE #...	01-260-520210	REPAIR SUPPLIES - BLD/FLT MA..	57.18
					Vendor 1527 - BRIDGESTONE HOSEPOWER, LLC Total:	**57.18**
Vendor: 1535 - BRODERICK & HENDERSON CONST, L.C.						
BRODERICK & HENDERSON C...	05/19/2022	125085	RETENTION/20G - PMT NO 5	01-000-210110	RETAINAGE	-4,705.07
BRODERICK & HENDERSON C...	05/19/2022	125085	RETENTION/20G - PMT NO 5	01-340-520920	INFRASTRUCTURE PURCHASES	4,705.07
BRODERICK & HENDERSON C...	05/19/2022	125085	PMT #5/20G:BLDG B REMODEL	01-340-520920	INFRASTRUCTURE PURCHASES	89,396.35
					Vendor 1535 - BRODERICK & HENDERSON CONST, L.C. Total:	**89,396.35**
Vendor: 1604 - CAMBRUZZI, DAKOTA						
CAMBRUZZI, DAKOTA	05/19/2022	125086	401(K) SELECTION LUNCH	01-110-510430	GENERAL ADMINISTRATIVE	80.46
					Vendor 1604 - CAMBRUZZI, DAKOTA Total:	**80.46**
Vendor: 1670 - CENTRAL VALLEY WATER REC FACILITY						
CENTRAL VALLEY WATER REC ...	05/19/2022	125087	FACILITY OPERATION	01-400-580310	FACILITY OPERATION - C.V.	341,400.61
CENTRAL VALLEY WATER REC ...	05/19/2022	125087	MONTHLY CIP	01-400-580320	PROJECT BETTERMENTS- C.V.	77,962.61
CENTRAL VALLEY WATER REC ...	05/19/2022	125087	PRETREATMENT FIELD	01-400-580340	PRETREATMENT FIELD - C.V.	27,367.04
CENTRAL VALLEY WATER REC ...	05/19/2022	125087	NET LAB COSTS	01-400-580350	LABORATORY - C.V.	15,701.22
CENTRAL VALLEY WATER REC ...	05/19/2022	125087	ENTITY LAB WORK	01-400-580350	LABORATORY - C.V.	2,280.00
CENTRAL VALLEY WATER REC ...	05/19/2022	125087	LOAN PAYMENT	01-400-580380	CVW DEBT SERVICE	456,853.56
					Vendor 1670 - CENTRAL VALLEY WATER REC FACILITY Total:	**921,565.04**
Vendor: 1680 - CENTURY EQUIPMENT CO						
CENTURY EQUIPMENT CO	05/19/2022	125088	#42 REPAIR WORK	01-260-520210	REPAIR SUPPLIES - BLD/FLT MA..	295.48
CENTURY EQUIPMENT CO	05/19/2022	125088	#42 REPAIR WORK	01-260-520210	REPAIR SUPPLIES - BLD/FLT MA..	22.42
					Vendor 1680 - CENTURY EQUIPMENT CO Total:	**317.90**
Vendor: 1723 - CHEMTECH-FORD, INC.						
CHEMTECH-FORD, INC.	05/19/2022	125089	2558 EVENING DOVE SAMPLI...	01-310-530270	WATER TESTING FEES	245.00
CHEMTECH-FORD, INC.	05/19/2022	125089	2755 S DECKER LAKE DR SAMP...	01-310-530270	WATER TESTING FEES	66.00
					Vendor 1723 - CHEMTECH-FORD, INC. Total:	**311.00**
Vendor: 1725.5 - CINTAS CORPORATION						
CINTAS CORPORATION	05/05/2022	125012	MATS	01-260-510220	BUILDING & GROUNDS	66.60
CINTAS CORPORATION	05/12/2022	125061	MATS	01-260-510220	BUILDING & GROUNDS	66.60
CINTAS CORPORATION	05/26/2022	125122	MATS	01-260-510220	BUILDING & GROUNDS	66.60
					Vendor 1725.5 - CINTAS CORPORATION Total:	**199.80**
Vendor: 1730 - CLYDE SNOW & SESSIONS						
CLYDE SNOW & SESSIONS	05/26/2022	DFT0000051	MATTER 006400/GENERAL	01-110-510500	LEGAL EXPENSE	8,207.50
					Vendor 1730 - CLYDE SNOW & SESSIONS Total:	**8,207.50**

Vendor Name	Payment Date	Payment Number	Description (Item)	Account Number	Account Name	Amount
Vendor: 1740 - COLONIAL FLAG AND SPECIALTY CO						
COLONIAL FLAG AND SPECIAL...	05/05/2022	125013	FLAG ROTATION	01-260-510220	BUILDING & GROUNDS	97.00
					Vendor 1740 - COLONIAL FLAG AND SPECIALTY CO Total:	**97.00**
Vendor: 1741 - COLONIAL LIFE & ACCIDENT INSURANCE						
COLONIAL LIFE & ACCIDENT IN...	05/05/2022	125014	APR 2022 W/H ADJ	01-000-220500	HEALTH INSURANCE PAYABLE	-19.51
COLONIAL LIFE & ACCIDENT IN...	05/05/2022	125014	COLONIAL LIFE INS AFTER TAX	01-000-220500	HEALTH INSURANCE PAYABLE	281.60
COLONIAL LIFE & ACCIDENT IN...	05/05/2022	125014	COLONIAL LIFE INS AFTER TAX	01-000-220500	HEALTH INSURANCE PAYABLE	281.60
COLONIAL LIFE & ACCIDENT IN...	05/05/2022	125014	COLONIAL LIFE INS PRETAX	01-000-220500	HEALTH INSURANCE PAYABLE	113.73
COLONIAL LIFE & ACCIDENT IN...	05/05/2022	125014	COLONIAL LIFE INS PRETAX	01-000-220500	HEALTH INSURANCE PAYABLE	94.22
					Vendor 1741 - COLONIAL LIFE & ACCIDENT INSURANCE Total:	**751.64**
Vendor: 5121 - CONNECTIONZ ACQUISITIONS LLC						
CONNECTIONZ ACQUISITIONS ...	05/26/2022	125123	SEWER FEE REFUND	01-000-410500	INSPECTION FEES	150.00
					Vendor 5121 - CONNECTIONZ ACQUISITIONS LLC Total:	**150.00**
Vendor: 1785 - COP CONSTRUCTION LLC						
COP CONSTRUCTION LLC	05/12/2022	125062	RETENTION/20E - PMT NO 2	01-000-210110	RETAINAGE	-37,575.16
COP CONSTRUCTION LLC	05/12/2022	125062	PMT #2/20E: PIONEER WWPS ...	01-340-520920	INFRASTRUCTURE PURCHASES	361,240.35
COP CONSTRUCTION LLC	05/12/2022	125062	RETENTION/20E - PMT NO 2	01-340-520920	INFRASTRUCTURE PURCHASES	37,575.16
COP CONSTRUCTION LLC	05/26/2022	125124	RETENTION/20E - PMT NO 3 + ...	01-000-210110	RETAINAGE	13,322.51
COP CONSTRUCTION LLC	05/26/2022	125124	RETENTION/20E - PMT NO 3 + ...	01-340-520920	INFRASTRUCTURE PURCHASES	-13,322.51
COP CONSTRUCTION LLC	05/26/2022	125124	PMT #3/20E:PIONEER WWPS ...	01-340-520920	INFRASTRUCTURE PURCHASES	99,560.00
					Vendor 1785 - COP CONSTRUCTION LLC Total:	**460,800.35**
Vendor: 1837 - CRS ENGINEERS						
CRS ENGINEERS	05/05/2022	125015	22C:LAKE PARK/MERRY LANE...	01-340-520920	INFRASTRUCTURE PURCHASES	14,490.00
					Vendor 1837 - CRS ENGINEERS Total:	**14,490.00**
Vendor: 1845 - CRUS OIL, INC.						
CRUS OIL, INC.	05/12/2022	125063	DRUM CHARGE	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	36.00
CRUS OIL, INC.	05/12/2022	125063	15W/40 RESTOCK	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	657.80
CRUS OIL, INC.	05/12/2022	125063	DRUM CHARGE	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	36.00
CRUS OIL, INC.	05/12/2022	125063	15W/40 RESTOCK	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	657.80
CRUS OIL, INC.	05/19/2022	125090	FILTER RESTOCK FOR SHOP	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	91.30
					Vendor 1845 - CRUS OIL, INC. Total:	**1,478.90**
Vendor: 1911 - DATA SERVICES - SLCO						
DATA SERVICES - SLCO	05/26/2022	125125	PLAT/PARCEL/TAX INFO	01-110-510430	GENERAL ADMINISTRATIVE	36.74
					Vendor 1911 - DATA SERVICES - SLCO Total:	**36.74**
Vendor: 1930 - DENTAL SELECT						
DENTAL SELECT	05/05/2022	125016	RETIREE DENTAL INS	01-110-500130	HEALTH INSURANCE - MGMT	624.43
DENTAL SELECT	05/05/2022	125016	TERM EMPLOYEE DENTAL	01-110-500130	HEALTH INSURANCE - MGMT	-296.40
DENTAL SELECT	05/05/2022	125016	DENTAL INSURANCE FAMILY	01-110-500130	HEALTH INSURANCE - MGMT	6,224.40
DENTAL SELECT	05/05/2022	125016	DENTAL INSURANCE SINGLE	01-110-500130	HEALTH INSURANCE - MGMT	221.41
					Vendor 1930 - DENTAL SELECT Total:	**6,773.84**

Vendor Name	Payment Date	Payment Number	Description (Item)	Account Number	Account Name	Amount
Vendor: 2072 - EDA ARCHITECTS, INC.						
EDA ARCHITECTS, INC.	05/12/2022	125064	20G:BLDG B REMODEL & EXPS...	01-340-520920	INFRASTRUCTURE PURCHASES	7,468.12
					Vendor 2072 - EDA ARCHITECTS, INC. Total:	**7,468.12**
Vendor: 2102 - ENTERPRISE FM TRUST						
ENTERPRISE FM TRUST	05/19/2022	125091	UNIT 30 LEASE CHARGES	01-260-510235	VEHICLE LEASE	995.67
ENTERPRISE FM TRUST	05/19/2022	125091	UNIT 47 LEASE CHARGES	01-260-510235	VEHICLE LEASE	712.53
ENTERPRISE FM TRUST	05/19/2022	125091	UNIT 54 LEASE CHARGES	01-260-510235	VEHICLE LEASE	684.80
ENTERPRISE FM TRUST	05/19/2022	125091	UNIT 53 LEASE CHARGES	01-260-510235	VEHICLE LEASE	623.32
ENTERPRISE FM TRUST	05/19/2022	125091	UNIT 12 LEASE CHARGES	01-260-510235	VEHICLE LEASE	541.91
ENTERPRISE FM TRUST	05/19/2022	125091	UNIT 55 LEASE CHARGES	01-260-510235	VEHICLE LEASE	533.84
ENTERPRISE FM TRUST	05/19/2022	125091	UNIT 52 LEASE CHARGES	01-260-510235	VEHICLE LEASE	533.84
ENTERPRISE FM TRUST	05/19/2022	125091	UNIT 27 LEASE CHARGES	01-260-510235	VEHICLE LEASE	533.84
ENTERPRISE FM TRUST	05/19/2022	125091	UNIT 28 LEASE CHARGES	01-260-510235	VEHICLE LEASE	289.09
ENTERPRISE FM TRUST	05/19/2022	125091	UNIT 30 MAINT CHARGES	01-260-510235	VEHICLE LEASE	8.00
ENTERPRISE FM TRUST	05/19/2022	125091	UNIT 21 LEASE CHARGES	01-260-510235	VEHICLE LEASE	2,052.07
ENTERPRISE FM TRUST	05/19/2022	125091	UNIT 60 LEASE CHARGES	01-260-510235	VEHICLE LEASE	616.91
ENTERPRISE FM TRUST	05/19/2022	125091	UNIT 1 LEASE CHARGES	01-260-510235	VEHICLE LEASE	731.33
ENTERPRISE FM TRUST	05/19/2022	125091	UNIT 14 LEASE CHARGES	01-260-510235	VEHICLE LEASE	621.10
ENTERPRISE FM TRUST	05/19/2022	125091	UNIT 5 LEASE CHARGES	01-260-510235	VEHICLE LEASE	621.10
					Vendor 2102 - ENTERPRISE FM TRUST Total:	**10,099.35**
Vendor: 2105 - ENVIRONMENTAL RESPONSE & REMEDIATION						
ENVIRONMENTAL RESPONSE &..	05/26/2022	125126	2023 INS RENEWAL/UNDRGR...	01-260-520240	TOOLS & SUPPLIES - BLD/FLT ...	240.00
ENVIRONMENTAL RESPONSE &..	05/26/2022	125126	2023 UST REG FEE/UNDRGRND..	01-260-520240	TOOLS & SUPPLIES - BLD/FLT ...	220.00
					Vendor 2105 - ENVIRONMENTAL RESPONSE & REMEDIATION Total:	**460.00**
Vendor: 2140 - ERIKS NORTH AMERICA, INC.						
ERIKS NORTH AMERICA, INC.	05/05/2022	125017	Hose for Generator	01-240-520210	REPAIR SUPPLIES - WW MAINT	35.70
ERIKS NORTH AMERICA, INC.	05/19/2022	125092	UNIT 30/SPRAY WAND	01-230-510910	MACHINERY & EQUIPMENT - ...	97.71
ERIKS NORTH AMERICA, INC.	05/26/2022	125127	OFFICE SUMP PUMP FITTINGS	01-260-510220	BUILDING & GROUNDS	239.31
ERIKS NORTH AMERICA, INC.	05/26/2022	125127	OFFICE SUMP PUMP FITTINGS	01-260-510220	BUILDING & GROUNDS	233.60
					Vendor 2140 - ERIKS NORTH AMERICA, INC. Total:	**606.32**
Vendor: 2184 - FARRER, NATHAN						
FARRER, NATHAN	05/05/2022	125018	MEALS/PRE-TREATMENT SU...	01-250-510480	TRAINING & EDUCATION - WW..	133.00
					Vendor 2184 - FARRER, NATHAN Total:	**133.00**
Vendor: 2184.1 - FASTENAL COMPANY						
FASTENAL COMPANY	05/05/2022	125019	PPE VENDING SUPPLIES	01-210-510490	SAFETY EXPENSE	20.00
FASTENAL COMPANY	05/12/2022	125065	PPE VENDING SUPPLIES	01-210-510490	SAFETY EXPENSE	893.22
FASTENAL COMPANY	05/26/2022	125128	PPE VENDING SUPPLIES	01-210-510490	SAFETY EXPENSE	20.00
					Vendor 2184.1 - FASTENAL COMPANY Total:	**933.22**
Vendor: 2188 - FERGUSON ENTERPRISES, INC						
FERGUSON ENTERPRISES, INC	05/19/2022	DFT0000030	WS Capital Improvements	01-340-520920	INFRASTRUCTURE PURCHASES	2,969.00
FERGUSON ENTERPRISES, INC	05/19/2022	DFT0000030	THRD SWG CHK VLV	01-140-520210	REPAIR SUPPLIES - METER	195.88
FERGUSON ENTERPRISES, INC	05/19/2022	DFT0000030	THRD SWG CHK VLV	01-140-520210	REPAIR SUPPLIES - METER	14.92

Vendor Name	Payment Date	Payment Number	Description (Item)	Account Number	Account Name	Amount
FERGUSON ENTERPRISES, INC	05/19/2022	DFT0000030	Large Meter Capital	01-340-520920	INFRASTRUCTURE PURCHASES	9,592.00
FERGUSON ENTERPRISES, INC	05/19/2022	DFT0000030	Emergency Repair Parts	01-220-520210	REPAIR SUPPLIES - WTR R&R	644.52
FERGUSON ENTERPRISES, INC	05/19/2022	DFT0000030	Emergency Repair Parts	01-220-520210	REPAIR SUPPLIES - WTR R&R	986.28
FERGUSON ENTERPRISES, INC	05/19/2022	DFT0000030	WS Capital 2200 w	01-340-520920	INFRASTRUCTURE PURCHASES	3,183.30
FERGUSON ENTERPRISES, INC	05/19/2022	DFT0000030	Emergency Repair Parts	01-220-520210	REPAIR SUPPLIES - WTR R&R	49.50
FERGUSON ENTERPRISES, INC	05/19/2022	DFT0000030	Emergency Repair Parts	01-220-520210	REPAIR SUPPLIES - WTR R&R	245.81
FERGUSON ENTERPRISES, INC	05/19/2022	DFT0000030	Emergency Repair Parts	01-220-520210	REPAIR SUPPLIES - WTR R&R	301.75
FERGUSON ENTERPRISES, INC	05/19/2022	DFT0000030	Emergency Repair Parts	01-220-520210	REPAIR SUPPLIES - WTR R&R	17.95
					Vendor 2188 - FERGUSON ENTERPRISES, INC Total:	**18,200.91**
Vendor: 5115 - FIRST DIGITAL COMMUNICATIONS, LLC						
FIRST DIGITAL COMMUNICATI...	05/26/2022	125129	APR 2022 LAND LINE/INTERNET	01-360-510470	TELEPHONE	2,723.07
					Vendor 5115 - FIRST DIGITAL COMMUNICATIONS, LLC Total:	**2,723.07**
Vendor: 2241 - FLEET PRIDE						
FLEET PRIDE	05/05/2022	125020	Unit 8 hydraulic filters	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	20.98
FLEET PRIDE	05/05/2022	125020	#41 OIL FILTER	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	62.74
FLEET PRIDE	05/12/2022	125066	TRANS MOUNTS	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	275.00
FLEET PRIDE	05/12/2022	125066	TRANS MOUNTS	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	275.00
FLEET PRIDE	05/12/2022	125066	FRONT MAIN SEAL	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	215.00
FLEET PRIDE	05/12/2022	125066	FAN HUB BELT	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	71.49
FLEET PRIDE	05/12/2022	125066	RT SIDE DRAG LINK	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	150.00
FLEET PRIDE	05/12/2022	125066	LFT SIDE DRAGE LINK	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	195.00
FLEET PRIDE	05/12/2022	125066	CORE CHARGE	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	894.00
FLEET PRIDE	05/12/2022	125066	VGT TURBO #41	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	1,652.35
FLEET PRIDE	05/19/2022	125093	#20 TRANSMISSION FLUSH, FL...	01-260-520210	REPAIR SUPPLIES - BLD/FLT MA..	79.98
FLEET PRIDE	05/19/2022	125093	#20 TRANSMISSION FLUSH, FL...	01-260-520210	REPAIR SUPPLIES - BLD/FLT MA..	484.81
FLEET PRIDE	05/19/2022	125093	05-04-22_Fleet_Unit 26_ Air D...	01-260-520210	REPAIR SUPPLIES - BLD/FLT MA..	31.04
					Vendor 2241 - FLEET PRIDE Total:	**4,407.39**
Vendor: 5108 - FLEETWASH INC						
FLEETWASH INC	05/05/2022	125021	FLEETWASH INC/FIRE HYDRAN...	01-000-430990	MISC INCOME	304.64
					Vendor 5108 - FLEETWASH INC Total:	**304.64**
Vendor: 2326 - GALLEGOS, JUSTIN						
GALLEGOS, JUSTIN	05/05/2022	125022	REFRESHMENTS/WATER,IT,OP...	01-110-510430	GENERAL ADMINISTRATIVE	49.40
GALLEGOS, JUSTIN	05/05/2022	125022	AIRFARE/ACE CONF-EMP #154	01-360-510480	TRAINING & EDUCATION - SYS...	617.20
					Vendor 2326 - GALLEGOS, JUSTIN Total:	**666.60**
Vendor: 2340 - GENEVA ROCK PRODUCTS						
GENEVA ROCK PRODUCTS	05/19/2022	DFT0000031	Fill Dirt	01-340-520920	INFRASTRUCTURE PURCHASES	7,127.48
GENEVA ROCK PRODUCTS	05/19/2022	DFT0000031	Fill Dirt	01-340-520920	INFRASTRUCTURE PURCHASES	5,216.01
GENEVA ROCK PRODUCTS	05/19/2022	DFT0000031	Fill Dirt	01-340-520920	INFRASTRUCTURE PURCHASES	1,093.27
GENEVA ROCK PRODUCTS	05/19/2022	DFT0000031	Fill Dirt	01-340-520920	INFRASTRUCTURE PURCHASES	4,859.87
GENEVA ROCK PRODUCTS	05/19/2022	DFT0000031	Fill Dirt	01-340-520920	INFRASTRUCTURE PURCHASES	1,703.37
GENEVA ROCK PRODUCTS	05/19/2022	DFT0000031	FILL DIRT	01-340-520920	INFRASTRUCTURE PURCHASES	3,667.27

Vendor Name	Payment Date	Payment Number	Description (Item)	Account Number	Account Name	Amount
GENEVA ROCK PRODUCTS	05/19/2022	DFT0000031	FILL DIRT	01-340-520920	INFRASTRUCTURE PURCHASES	5,839.49
					Vendor 2340 - GENEVA ROCK PRODUCTS Total:	**29,506.76**
Vendor: 2380 - GRAINGER INC					Lake Park/Merry Lane Capital Project	
GRAINGER INC	05/05/2022	125023	Sump Float	01-220-520210	REPAIR SUPPLIES - WTR R&R	128.01
GRAINGER INC	05/19/2022	125094	FILTER CARTRIDGE	01-310-530270	WATER TESTING FEES	97.70
GRAINGER INC	05/19/2022	125094	WATER FILTER PITCHER SYST...	01-310-530270	WATER TESTING FEES	52.20
GRAINGER INC	05/19/2022	125094	WATER FILTER PITCHER SYST...	01-310-530270	WATER TESTING FEES	130.50
GRAINGER INC	05/19/2022	125094	WATER FILTER PITCHER SYST...	01-310-530270	WATER TESTING FEES	1,122.30
GRAINGER INC	05/26/2022	125130	Window Suction Cup Tool.	01-260-510220	BUILDING & GROUNDS	29.10
					Vendor 2380 - GRAINGER INC Total:	**1,559.81**
Vendor: 2400 - GRANGER HUNTER IMP DIST						
GRANGER HUNTER IMP DIST	05/04/2022	DFT0000001	GHID-4 MAR 2022	01-110-510460	UTILITIES - MGMT	1,134.97
GRANGER HUNTER IMP DIST	05/04/2022	DFT0000001	GHID-4 MAR 2022	01-230-510460	UTILITIES - WTR	91.00
GRANGER HUNTER IMP DIST	05/04/2022	DFT0000001	GHID-4 MAR 2022	01-240-510460	UTILITIES - WW	59.00
GRANGER HUNTER IMP DIST	05/04/2022	DFT0000002	GHID-1 MAR 2022	01-230-510460	UTILITIES - WTR	117.00
GRANGER HUNTER IMP DIST	05/04/2022	DFT0000003	GHID-2 MAR 2022	01-230-510460	UTILITIES - WTR	26.00
GRANGER HUNTER IMP DIST	05/04/2022	DFT0000004	GHID-3 APR 2022	01-230-510460	UTILITIES - WTR	121.20
GRANGER HUNTER IMP DIST	05/04/2022	DFT0000004	GHID-3 APR 2022	01-240-510460	UTILITIES - WW	50.00
GRANGER HUNTER IMP DIST	05/03/2022	DFT0000005	GHID-4 APR 2022	01-110-510460	UTILITIES - MGMT	1,141.27
GRANGER HUNTER IMP DIST	05/03/2022	DFT0000005	GHID-4 APR 2022	01-230-510460	UTILITIES - WTR	93.10
GRANGER HUNTER IMP DIST	05/03/2022	DFT0000005	GHID-4 APR 2022	01-240-510460	UTILITIES - WW	59.00
					Vendor 2400 - GRANGER HUNTER IMP DIST Total:	**2,892.54**
Vendor: 2405 - GRANITE INLINER, LLC						
GRANITE INLINER, LLC	05/26/2022	125131	RETENTION PMT/20C:SWR RE...	01-000-210110	RETAINAGE	28,891.30
GRANITE INLINER, LLC	05/26/2022	125131	RETENTION PMT/20C:SWR RE...	01-340-520920	INFRASTRUCTURE PURCHASES	198.06
					Vendor 2405 - GRANITE INLINER, LLC Total:	**29,089.36**
Vendor: 2440.3 - GREGORY, JEREMY						
GREGORY, JEREMY	05/05/2022	125024	AIRFARE/ACE CONF-EMP #202	01-340-510480	TRAINING & EDUCATION - ENG	114.66
					Vendor 2440.3 - GREGORY, JEREMY Total:	**114.66**
Vendor: 2443 - GS TRACKME LLC						
GS TRACKME LLC	05/05/2022	125025	MAY 2022 GPS TRACKING	01-360-510440	COMPUTER SUPPLIES/EQUIP...	1,099.78
					Vendor 2443 - GS TRACKME LLC Total:	**1,099.78**
Vendor: 2480 - HACH COMPANY						
HACH COMPANY	05/19/2022	125095	KTO CHEMKEYS	01-310-530270	WATER TESTING FEES	1,116.96
					Vendor 2480 - HACH COMPANY Total:	**1,116.96**
Vendor: 5100 - HALLMARK HOMES						
HALLMARK HOMES	05/05/2022	125026	FEE REFUND/8" FIRELINE	01-000-430100	IMPACT FEES - WATER Developer downsized pipe	11,223.00
					Vendor 5100 - HALLMARK HOMES Total:	**11,223.00**
Vendor: 2490 - HANSEN, ALLEN & LUCE, INC.						
HANSEN, ALLEN & LUCE, INC.	05/05/2022	125027	20D:KENT BOOSTER RPLCMNT...	01-340-520920	INFRASTRUCTURE PURCHASES	5,896.75

Vendor Name	Payment Date	Payment Number	Description (Item)	Account Number	Account Name	Amount
HANSEN, ALLEN & LUCE, INC.	05/12/2022	125067	20D:KENT BOOSTER RPLCMNT...	01-340-520920	INFRASTRUCTURE PURCHASES	2,683.80
					Vendor 2490 - HANSEN, ALLEN & LUCE, INC. Total:	**8,580.55**
Vendor: 5109 - HARLINE, ANDREW						
HARLINE, ANDREW	05/05/2022	125028	2022 BOOT REIMBURSEMENT	01-210-510490	SAFETY EXPENSE	58.97
					Vendor 5109 - HARLINE, ANDREW Total:	**58.97**
Vendor: 2532 - HEALTHEQUITY INC						
HEALTHEQUITY INC	05/12/2022	DFT0000016	HEALTH SAVINGS ACCOUNT	01-000-220900	CAFETERIA PLAN PAYABLE	4,244.73
HEALTHEQUITY INC	05/26/2022	DFT0000043	HEALTH SAVINGS ACCOUNT	01-000-220900	CAFETERIA PLAN PAYABLE	5,274.73
					Vendor 2532 - HEALTHEQUITY INC Total:	**9,519.46**
Vendor: 2562 - HILDEBRAND, JASON G						
HILDEBRAND, JASON G	05/12/2022	125068	2022 BOOT REIMBURSEMENT	01-210-510490	SAFETY EXPENSE	100.00
					Vendor 2562 - HILDEBRAND, JASON G Total:	**100.00**
Vendor: 2590 - HOME DEPOT CREDIT SERVICES						
HOME DEPOT CREDIT SERVICES	05/12/2022	125069	BATTERIES/DISHWASHER SOAP	01-130-510410	OFFICE SUPPLIES/PRINTING	96.18
HOME DEPOT CREDIT SERVICES	05/12/2022	125069	KEY TAGS & HOLDERS	01-140-520210	REPAIR SUPPLIES - METER	9.71
HOME DEPOT CREDIT SERVICES	05/12/2022	125069	BUCKETS	01-220-520210	REPAIR SUPPLIES - WTR R&R	9.96
HOME DEPOT CREDIT SERVICES	05/12/2022	125069	SERVICE TRUCK HITCHES	01-220-520210	REPAIR SUPPLIES - WTR R&R	27.35
HOME DEPOT CREDIT SERVICES	05/12/2022	125069	LONG IMPACT SOCKET	01-220-520240	TOOLS & SUPPLIES - WTR R&R	74.00
HOME DEPOT CREDIT SERVICES	05/12/2022	125069	COMBINATION CHROME WRE...	01-220-520240	TOOLS & SUPPLIES - WTR R&R	55.95
HOME DEPOT CREDIT SERVICES	05/12/2022	125069	COMBINATION WRENCH	01-220-520240	TOOLS & SUPPLIES - WTR R&R	136.00
HOME DEPOT CREDIT SERVICES	05/12/2022	125069	SOCKET IMPACT	01-220-520240	TOOLS & SUPPLIES - WTR R&R	125.96
HOME DEPOT CREDIT SERVICES	05/12/2022	125069	COMBINATION CHROME WRE...	01-220-520240	TOOLS & SUPPLIES - WTR R&R	379.75
HOME DEPOT CREDIT SERVICES	05/12/2022	125069	UNIT 21/BATTERY, U-JOINT, C...	01-220-520240	TOOLS & SUPPLIES - WTR R&R	324.91
HOME DEPOT CREDIT SERVICES	05/12/2022	125069	UNIT 9/SLEDGE HAMMER	01-230-520240	TOOLS & SUPPLIES - WTR MAI...	59.98
HOME DEPOT CREDIT SERVICES	05/12/2022	125069	UNIT 2, 38/RAKE, BROOM	01-230-520240	TOOLS & SUPPLIES - WTR MAI...	48.91
HOME DEPOT CREDIT SERVICES	05/12/2022	125069	UNIT 50/TOOLS	01-230-520240	TOOLS & SUPPLIES - WTR MAI...	21.24
HOME DEPOT CREDIT SERVICES	05/12/2022	125069	UNIT 2/TANK CLEANING BRUS...	01-230-520240	TOOLS & SUPPLIES - WTR MAI...	10.98
HOME DEPOT CREDIT SERVICES	05/12/2022	125069	WEEK KILLER/SPRAY NOZZLE	01-250-520210	REPAIR SUPPLIES - WW PUMP ...	97.92
HOME DEPOT CREDIT SERVICES	05/12/2022	125069	UNIT 33/BROOM	01-330-520240	TOOLS & SUPPLIES - BLUE STKS..	30.97
HOME DEPOT CREDIT SERVICES	05/12/2022	125069	PAINT SUPPLIES	01-340-520920	INFRASTRUCTURE PURCHASES	32.66
HOME DEPOT CREDIT SERVICES	05/12/2022	125069	CEMENT, TROWEL, BRUSH	01-340-520920	INFRASTRUCTURE PURCHASES	106.35
HOME DEPOT CREDIT SERVICES	05/12/2022	125069	PLYWOOD	01-340-520920	INFRASTRUCTURE PURCHASES	101.80
HOME DEPOT CREDIT SERVICES	05/12/2022	125069	KEY SAFE	01-360-510440	COMPUTER SUPPLIES/EQUIP...	79.96
					Vendor 2590 - HOME DEPOT CREDIT SERVICES Total:	**1,830.54**
Vendor: 2592 - HORROCKS ENGINEERS INC						
HORROCKS ENGINEERS INC	05/26/2022	125132	ON-CALL ENG SOQ 2021-2022	01-340-510520	PROFESSIONAL CONSULTING -...	3,742.50
					Vendor 2592 - HORROCKS ENGINEERS INC Total:	**3,742.50**
Vendor: 2615 - HYDRAPAK SEALS INC						
HYDRAPAK SEALS INC	05/26/2022	125133	SEALS FOR TAILGATE AIR CYLI...	01-260-520210	REPAIR SUPPLIES - BLD/FLT MA..	19.01
					Vendor 2615 - HYDRAPAK SEALS INC Total:	**19.01**

Vendor Name	Payment Date	Payment Number	Description (Item)	Account Number	Account Name	Amount
Vendor: 2630 - IFM EFFECTOR, INC						
IFM EFFECTOR, INC	05/19/2022	125096	E30402-Weight for submersibl...	01-360-510440	COMPUTER SUPPLIES/EQUIP...	213.30
IFM EFFECTOR, INC	05/19/2022	125096	E30399-Cable clamp fastener	01-360-510440	COMPUTER SUPPLIES/EQUIP...	133.43
IFM EFFECTOR, INC	05/19/2022	125096	E30400-Filter element	01-360-510440	COMPUTER SUPPLIES/EQUIP...	46.80
IFM EFFECTOR, INC	05/19/2022	125096	PS3617-Submersible Pressure ...	01-360-510440	COMPUTER SUPPLIES/EQUIP...	758.70
IFM EFFECTOR, INC	05/19/2022	125096	PS3427-Submersible Pressure ...	01-360-510440	COMPUTER SUPPLIES/EQUIP...	2,138.40
					Vendor 2630 - IFM EFFECTOR, INC Total:	**3,290.63**
Vendor: 2637 - INDUSTRIAL SAFETY EQUIPMENT, LLC.						
INDUSTRIAL SAFETY EQUIPME...	05/05/2022	125029	PPE/WELDING JACKET	01-210-510490	SAFETY EXPENSE	96.65
					Vendor 2637 - INDUSTRIAL SAFETY EQUIPMENT, LLC. Total:	**96.65**
Vendor: 2654 - INTEGRA REALTY RESOURCES-SLC LLC						
INTEGRA REALTY RESOURCES-...	05/05/2022	125030	APPRAISAL SERVICE	01-340-510520	PROFESSIONAL CONSULTING -...	2,800.00
					Vendor 2654 - INTEGRA REALTY RESOURCES-SLC LLC Total:	**2,800.00**
Vendor: 2700 - INTERMOUNTAIN SALES OF DENVER						
INTERMOUNTAIN SALES OF D...	05/12/2022	125070	#15 CLUTCH FOR VACUUM	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	695.00
INTERMOUNTAIN SALES OF D...	05/12/2022	125070	FREIGHT	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	100.00
INTERMOUNTAIN SALES OF D...	05/12/2022	125070	FREIGHT	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	20.00
INTERMOUNTAIN SALES OF D...	05/12/2022	125070	PARTS FOR #30, #15	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	18.75
INTERMOUNTAIN SALES OF D...	05/12/2022	125070	PARTS FOR #30, #15	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	470.00
INTERMOUNTAIN SALES OF D...	05/12/2022	125070	SHIPPING	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	65.00
					Vendor 2700 - INTERMOUNTAIN SALES OF DENVER Total:	**1,368.75**
Vendor: 2772 - JOHNSON, KRISTY						
JOHNSON, KRISTY	05/05/2022	125031	GM LUNCHEON	01-110-510430	GENERAL ADMINISTRATIVE	60.63
JOHNSON, KRISTY	05/26/2022	125134	MAY BOARD MTG	01-110-510430	GENERAL ADMINISTRATIVE	25.27
JOHNSON, KRISTY	05/26/2022	125134	GM LUNCH/IT LUNCH/MID-YR ...	01-110-510430	GENERAL ADMINISTRATIVE	241.88
					Vendor 2772 - JOHNSON, KRISTY Total:	**327.78**
Vendor: 2780 - JONES & DEMILLE ENGINEERING						
JONES & DEMILLE ENGINEERI...	05/05/2022	125032	22D:4100 & 4700 S WTRLINE/...	01-340-520920	INFRASTRUCTURE PURCHASES	10,583.07
					Vendor 2780 - JONES & DEMILLE ENGINEERING Total:	**10,583.07**
Vendor: 2790 - JORDAN VALLEY WATER CONSERVANCY DISTRICT						
JORDAN VALLEY WATER CONS...	05/12/2022	125071	APR 2022 WATER DELIVERIES	01-350-530250	WATER SUPPLY EXPENSE	535,391.15
JORDAN VALLEY WATER CONS...	05/19/2022	125097	APR 2022 LABORATORY SERVI...	01-310-530270	WATER TESTING FEES	597.31
					Vendor 2790 - JORDAN VALLEY WATER CONSERVANCY DISTRICT Total:	**535,988.46**
Vendor: 2734 - J-U-B ENGINEERS, INC.						
J-U-B ENGINEERS, INC.	05/05/2022	125033	GHID STRATEGIC FUNDING PL...	01-340-510520	PROFESSIONAL CONSULTING -...	500.00
J-U-B ENGINEERS, INC.	05/05/2022	125033	20B:RUSHTON WTR TRTMT PL...	01-340-520920	INFRASTRUCTURE PURCHASES	44,310.06
J-U-B ENGINEERS, INC.	05/05/2022	125033	21J:GHID HDQTRS LANDSCAPE...	01-340-520920	INFRASTRUCTURE PURCHASES	10,226.20
J-U-B ENGINEERS, INC.	05/05/2022	125033	20B-1:RGWTP WATERLINES/...	01-340-520920	INFRASTRUCTURE PURCHASES	3,134.90
J-U-B ENGINEERS, INC.	05/05/2022	125033	20B:RUSHTON WTR TRTMT PL...	01-340-520920	INFRASTRUCTURE PURCHASES	37,009.29
J-U-B ENGINEERS, INC.	05/05/2022	125033	GHID STRATEGIC FUNDING PL...	01-340-510520	PROFESSIONAL CONSULTING -...	2,500.00
J-U-B ENGINEERS, INC.	05/26/2022	125135	21J:GHID HDQTRS LANDSCAPE...	01-340-520920	INFRASTRUCTURE PURCHASES	3,782.80

Vendor Name	Payment Date	Payment Number	Description (Item)	Account Number	Account Name	Amount
J-U-B ENGINEERS, INC.	05/26/2022	125135	21J:GHID HDQTRS LANDSCAPE...	01-340-520920	INFRASTRUCTURE PURCHASES	729.90
J-U-B ENGINEERS, INC.	05/26/2022	125135	20B:RUSHTON WTR TRTMT PL...	01-340-520920	INFRASTRUCTURE PURCHASES	3,758.50
					Vendor 2734 - J-U-B ENGINEERS, INC. Total:	**105,951.65**
Vendor: 2844 - KDK CONSTRUCTION						
KDK CONSTRUCTION	05/26/2022	125136	FIRE HYDRANT REFUND	01-000-430990	MISC INCOME	185.93
					Vendor 2844 - KDK CONSTRUCTION Total:	**185.93**
Vendor: 2855 - KEDDINGTON & CHRISTENSEN, LLC						
KEDDINGTON & CHRISTENSEN,...	05/19/2022	125098	2021 AUDIT SERVICES	01-110-510510	ACCOUNTING & AUDIT	12,000.00
					Vendor 2855 - KEDDINGTON & CHRISTENSEN, LLC Total:	**12,000.00**
Vendor: 2881 - KEN GARFF WEST VALLEY FORD						
KEN GARFF WEST VALLEY FORD	05/26/2022	125137	UNIT #8 BCM REPAIRS.	01-260-520210	REPAIR SUPPLIES - BLD/FLT MA..	191.90
					Vendor 2881 - KEN GARFF WEST VALLEY FORD Total:	**191.90**
Vendor: 2967 - LAWN BUTLER						
LAWN BUTLER	05/05/2022	125034	Grounds Maint 2022	01-220-520210	REPAIR SUPPLIES - WTR R&R	632.71
LAWN BUTLER	05/05/2022	125034	Grounds Maint 2022	01-220-520210	REPAIR SUPPLIES - WTR R&R	1,184.29
LAWN BUTLER	05/05/2022	125034	Grounds Maint 2022	01-220-520210	REPAIR SUPPLIES - WTR R&R	1,873.78
LAWN BUTLER	05/05/2022	125034	Grounds Maint 2022	01-220-520210	REPAIR SUPPLIES - WTR R&R	365.03
LAWN BUTLER	05/05/2022	125034	Grounds Maint 2022	01-220-520210	REPAIR SUPPLIES - WTR R&R	2,623.10
LAWN BUTLER	05/05/2022	125034	Grounds Maint 2022	01-220-520210	REPAIR SUPPLIES - WTR R&R	219.02
LAWN BUTLER	05/05/2022	125034	Grounds Maint 2022	01-220-520210	REPAIR SUPPLIES - WTR R&R	705.72
LAWN BUTLER	05/05/2022	125034	Grounds Maint 2022	01-220-520210	REPAIR SUPPLIES - WTR R&R	438.03
LAWN BUTLER	05/05/2022	125034	Grounds Maint 2022	01-220-520210	REPAIR SUPPLIES - WTR R&R	365.03
					Vendor 2967 - LAWN BUTLER Total:	**8,406.71**
Vendor: 2971 - LEGALSHIELD						
LEGALSHIELD	05/05/2022	125035	TERM EMPLOYEE LEGAL SHIELD	01-110-500170	LIFE/LTD/LTC INSURANCE - M...	15.64
LEGALSHIELD	05/05/2022	125035	APR 22 W/H ROUNDING ADJ	01-110-500170	LIFE/LTD/LTC INSURANCE - M...	0.08
LEGALSHIELD	05/05/2022	125035	LEGAL SHIELD PAYABLE	01-000-220610	LEGAL SHIELD PAYABLE	111.32
LEGALSHIELD	05/05/2022	125035	LEGAL SHIELD PAYABLE	01-000-220610	LEGAL SHIELD PAYABLE	95.68
LEGALSHIELD	05/26/2022	125138	LEGAL SHIELD PAYABLE	01-000-220610	LEGAL SHIELD PAYABLE	95.68
LEGALSHIELD	05/26/2022	125138	LEGAL SHIELD PAYABLE	01-000-220610	LEGAL SHIELD PAYABLE	95.68
LEGALSHIELD	05/26/2022	125138	MAY 22 ROUNDING ADJ	01-110-500170	LIFE/LTD/LTC INSURANCE - M...	0.07
					Vendor 2971 - LEGALSHIELD Total:	**414.15**
Vendor: 2980 - LES OLSON CO						
LES OLSON CO	05/12/2022	125072	2022 1ST QTR CONTRACT BILL...	01-130-510410	OFFICE SUPPLIES/PRINTING	335.22
					Vendor 2980 - LES OLSON CO Total:	**335.22**
Vendor: 3003 - LINCOLN NATIONAL LIFE INSURANCE COMPANY						
LINCOLN NATIONAL LIFE INSU...	05/05/2022	125036	ACCT:BL-1579923/DEC 2021 F...	01-000-220620	VOLUNTARY LIFE PAYABLE	534.97
					Vendor 3003 - LINCOLN NATIONAL LIFE INSURANCE COMPANY Total:	**534.97**
Vendor: 3040 - MAGNA WATER CO						
MAGNA WATER CO	05/11/2022	DFT0000028	7200 WEST SEWER	01-110-510591	PAYMENTS TO OTHER GOV AG...	186.54
MAGNA WATER CO	05/11/2022	DFT0000028	HUNTER VILLAGE PH 16	01-110-510591	PAYMENTS TO OTHER GOV AG...	621.80

Vendor Name	Payment Date	Payment Number	Description (Item)	Account Number	Account Name	Amount
MAGNA WATER CO	05/11/2022	DFT0000028	ORCHARDVIEW SUBDIV	01-110-510591	PAYMENTS TO OTHER GOV AG...	963.79
MAGNA WATER CO	05/11/2022	DFT0000028	HUNTER VILLAGE PH 17	01-110-510591	PAYMENTS TO OTHER GOV AG...	2,331.75
MAGNA WATER CO	05/11/2022	DFT0000028	MAJESTIC VILLAS PASS-THRU	01-110-510591	PAYMENTS TO OTHER GOV AG...	2,549.38
					Vendor 3040 - MAGNA WATER CO Total:	**6,653.26**
Vendor: 3129 - MIDWEST HOSE & SPECIALTY, INC.						
MIDWEST HOSE & SPECIALTY, ...	05/19/2022	125099	WS 5-4-22 MIDWEST HOSE	01-220-520240	TOOLS & SUPPLIES - WTR R&R	40.84
MIDWEST HOSE & SPECIALTY, ...	05/19/2022	125099	Water Systems Hydro Ex	01-220-520240	TOOLS & SUPPLIES - WTR R&R	20.35
MIDWEST HOSE & SPECIALTY, ...	05/19/2022	125099	Water Systems Hydro Ex	01-220-520240	TOOLS & SUPPLIES - WTR R&R	175.65
					Vendor 3129 - MIDWEST HOSE & SPECIALTY, INC. Total:	**236.84**
Vendor: 3167 - MOEAKIOLA, DAVID						
MOEAKIOLA, DAVID	05/05/2022	125037	REFUND COLONIAL GROUP AC...	01-000-220500	HEALTH INSURANCE PAYABLE	19.51
					Vendor 3167 - MOEAKIOLA, DAVID Total:	**19.51**
Vendor: 3225 - MOUNTAIN WEST TRUCK CENTER						
MOUNTAIN WEST TRUCK CEN...	05/19/2022	125100	#20 PM SERVICE, OIL AND CO...	01-260-520210	REPAIR SUPPLIES - BLD/FLT MA..	45.20
MOUNTAIN WEST TRUCK CEN...	05/19/2022	125100	#26 BELT	01-260-520210	REPAIR SUPPLIES - BLD/FLT MA..	71.85
MOUNTAIN WEST TRUCK CEN...	05/19/2022	125100	05-04-22_Fleet_Unit 26_Drive...	01-260-520210	REPAIR SUPPLIES - BLD/FLT MA..	70.45
MOUNTAIN WEST TRUCK CEN...	05/19/2022	125100	#26 BELT	01-260-520210	REPAIR SUPPLIES - BLD/FLT MA..	-71.85
					Vendor 3225 - MOUNTAIN WEST TRUCK CENTER Total:	**115.65**
Vendor: 3210 - MOUNTAINLAND SUPPLY COMPANY						
MOUNTAINLAND SUPPLY CO...	05/19/2022	125101	FREIGHT CHARGES	01-140-520210	REPAIR SUPPLIES - METER	29.97
MOUNTAINLAND SUPPLY CO...	05/19/2022	125101	FREIGHT REFUND	01-140-520210	REPAIR SUPPLIES - METER	-29.97
MOUNTAINLAND SUPPLY CO...	05/19/2022	125101	SENSUS FREIGHT	01-140-520210	REPAIR SUPPLIES - METER	12.10
MOUNTAINLAND SUPPLY CO...	05/19/2022	125101	WS 5-4-22 Mountainland Supp...	01-340-520920	INFRASTRUCTURE PURCHASES	3,042.22
MOUNTAINLAND SUPPLY CO...	05/19/2022	125101	WS 5-4-22 Mountainland Supp...	01-340-520920	INFRASTRUCTURE PURCHASES	3,011.60
MOUNTAINLAND SUPPLY CO...	05/19/2022	125101	WS 5-4-22 Mountainland Supp...	01-340-520920	INFRASTRUCTURE PURCHASES	24,337.81
MOUNTAINLAND SUPPLY CO...	05/19/2022	125101	FIRE HYDRANTS REFUND	01-340-520920	INFRASTRUCTURE PURCHASES	-24,337.81
MOUNTAINLAND SUPPLY CO...	05/19/2022	125101	FIRE HYDRANTS	01-340-520920	INFRASTRUCTURE PURCHASES	24,337.81
MOUNTAINLAND SUPPLY CO...	05/19/2022	125101	FIRE HYDRANTS REFUND	01-340-520920	INFRASTRUCTURE PURCHASES	-3,011.59
MOUNTAINLAND SUPPLY CO...	05/19/2022	125101	FIRE HYDRANTS REFUND	01-340-520920	INFRASTRUCTURE PURCHASES	-3,042.23
MOUNTAINLAND SUPPLY CO...	05/19/2022	125101	FIRE HYDRANTS	01-340-520920	INFRASTRUCTURE PURCHASES	3,042.23
MOUNTAINLAND SUPPLY CO...	05/19/2022	125101	FIRE HYDRANTS	01-340-520920	INFRASTRUCTURE PURCHASES	3,011.59
MOUNTAINLAND SUPPLY CO...	05/19/2022	125101	Reed stick pump	01-140-520240	TOOLS & SUPPLIES - METERS	451.72
MOUNTAINLAND SUPPLY CO...	05/26/2022	125139	WS 5-16-22 Mountainland Sup...	01-220-520210	REPAIR SUPPLIES - WTR R&R	2,704.95
MOUNTAINLAND SUPPLY CO...	05/26/2022	125139	CORRECTING ENTRY	01-220-520210	REPAIR SUPPLIES - WTR R&R	0.01
					Vendor 3210 - MOUNTAINLAND SUPPLY COMPANY Total:	**33,560.41**
Vendor: 3240 - NAPA AUTO PARTS					Mostly in-house capital projects	
NAPA AUTO PARTS	05/12/2022	125073	PARTS FOR #40 REPAIR	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	273.04
NAPA AUTO PARTS	05/12/2022	125073	PARTS FOR #40 REPAIR	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	90.58
NAPA AUTO PARTS	05/12/2022	125073	PARTS FOR #40 REPAIR	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	134.50
NAPA AUTO PARTS	05/12/2022	125073	PARTS FOR #40 REPAIR	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	139.35
NAPA AUTO PARTS	05/12/2022	125073	PARTS FOR #40 REPAIR	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	155.42
NAPA AUTO PARTS	05/12/2022	125073	PARTS FOR #40 REPAIR	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	57.99

Vendor Name	Payment Date	Payment Number	Description (Item)	Account Number	Account Name	Amount
NAPA AUTO PARTS	05/12/2022	125073	PARTS FOR #40 REPAIR	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	159.38
NAPA AUTO PARTS	05/12/2022	125073	PARTS FOR #40 REPAIR	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	179.96
NAPA AUTO PARTS	05/12/2022	125073	PARTS FOR #40 REPAIR	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	117.30
NAPA AUTO PARTS	05/12/2022	125073	PARTS FOR #40 REPAIR	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	292.22
NAPA AUTO PARTS	05/12/2022	125073	PARTS FOR #40 REPAIR	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	77.98
NAPA AUTO PARTS	05/12/2022	125073	PARTS FOR #40 REPAIR	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	21.99
NAPA AUTO PARTS	05/12/2022	125073	PARTS FOR #40 REPAIR	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	57.99
NAPA AUTO PARTS	05/12/2022	125073	PARTS FOR #40 REPAIR	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	17.38
NAPA AUTO PARTS	05/12/2022	125073	PARTS FOR #40 REPAIR	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	19.30
NAPA AUTO PARTS	05/12/2022	125073	PARTS FOR #40 REPAIR	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	31.67
NAPA AUTO PARTS	05/12/2022	125073	#15 VACUUM PUMP REPAIR	01-260-520210	REPAIR SUPPLIES - BLD/FLT MA..	3.69
NAPA AUTO PARTS	05/12/2022	125073	#7 HVAC CONTROLS	01-260-520210	REPAIR SUPPLIES - BLD/FLT MA..	20.77
NAPA AUTO PARTS	05/26/2022	125140	AC DYE TEST KIT FOR UNIT #8. ...	01-260-520210	REPAIR SUPPLIES - BLD/FLT MA..	17.15
NAPA AUTO PARTS	05/26/2022	125140	REFUND SALES TAX INV #4698...	01-260-520210	REPAIR SUPPLIES - BLD/FLT MA..	-1.16
					Vendor 3240 - NAPA AUTO PARTS Total:	**1,866.50**
Vendor: 3245 - NATIONAL BENEFIT SERVICES LLC						
NATIONAL BENEFIT SERVICES L...	05/05/2022	125038	APR 2022 COBRA ADMIN FEE	01-110-510520	PROFESSIONAL CONSULTING -...	79.04
NATIONAL BENEFIT SERVICES L...	05/12/2022	125074	401K/2021 PARTICIPANT FEE	01-110-510520	PROFESSIONAL CONSULTING -...	3,744.00
					Vendor 3245 - NATIONAL BENEFIT SERVICES LLC Total:	**3,823.04**
Vendor: 3270 - NECAISE, RICKY						
NECAISE, RICKY	05/05/2022	125039	MILEAGE,LODGING,TRANS/RT...	01-240-510480	TRAINING & EDUCATION - WW..	1,401.58
					Vendor 3270 - NECAISE, RICKY Total:	**1,401.58**
Vendor: 3272 - NELSON BROS CONSTRUCTION CO						
NELSON BROS CONSTRUCTION...	05/05/2022	125040	RETENTION/20B - PMT NO 2	01-000-210110	RETAINAGE	-13,078.45
NELSON BROS CONSTRUCTION...	05/05/2022	125040	RETENTION/20B - PMT NO 2	01-340-520920	INFRASTRUCTURE PURCHASES	13,078.45
NELSON BROS CONSTRUCTION...	05/05/2022	125040	PMT 2/20B:RUSHTON WTR TR...	01-340-520920	INFRASTRUCTURE PURCHASES	248,490.55
NELSON BROS CONSTRUCTION...	05/26/2022	125141	PMT 3/20B:RUSHTON WTR TR...	01-000-210110	RETAINAGE	-21,658.60
NELSON BROS CONSTRUCTION...	05/26/2022	125141	PMT 3/20B:RUSHTON WTR TR...	01-340-520920	INFRASTRUCTURE PURCHASES	411,513.40
NELSON BROS CONSTRUCTION...	05/26/2022	125141	RETENTION/20B - PMT NO 3	01-340-520920	INFRASTRUCTURE PURCHASES	21,658.60
					Vendor 3272 - NELSON BROS CONSTRUCTION CO Total:	**660,003.95**
Vendor: 5116 - NLH TREASURE ISLE LLC						
NLH TREASURE ISLE LLC	05/26/2022	125142	FIRE HYDRANT REFUND	01-000-430990	MISC INCOME	392.60
					Vendor 5116 - NLH TREASURE ISLE LLC Total:	**392.60**
Vendor: 3360 - NUTTALL, JASON						
NUTTALL, JASON	05/19/2022	125102	PR - RETURNED DIRECT DEPOS...	01-130-500010	SALARIES & WAGES - CUST SR...	150.00
					Vendor 3360 - NUTTALL, JASON Total:	**150.00**
Vendor: 3375 - OCCUPATIONAL HEALTH CENTERS						
OCCUPATIONAL HEALTH CENT...	05/26/2022	125143	PRE-EMP SCREENING	01-110-510520	PROFESSIONAL CONSULTING -...	76.00
OCCUPATIONAL HEALTH CENT...	05/26/2022	125143	PRE-EMP SCREENING	01-110-510520	PROFESSIONAL CONSULTING -...	76.00
					Vendor 3375 - OCCUPATIONAL HEALTH CENTERS Total:	**152.00**

Vendor Name	Payment Date	Payment Number	Description (Item)	Account Number	Account Name	Amount
Vendor: 3389.5 - OPTICARE VISION SERVICES						
OPTICARE VISION SERVICES	05/05/2022	125041	TERM EMP OPTICARE W/H	01-000-220500	HEALTH INSURANCE PAYABLE	10.83
OPTICARE VISION SERVICES	05/05/2022	125041	APR OPTICARE ROUNDING ADJ	01-110-500130	HEALTH INSURANCE - MGMT	0.23
OPTICARE VISION SERVICES	05/05/2022	125041	TERM EMP OPTICARE	01-110-500130	HEALTH INSURANCE - MGMT	10.83
OPTICARE VISION SERVICES	05/05/2022	125041	OPTICARE VISION INS	01-000-220500	HEALTH INSURANCE PAYABLE	347.21
OPTICARE VISION SERVICES	05/05/2022	125041	OPTICARE VISION INS	01-000-220500	HEALTH INSURANCE PAYABLE	361.39
OPTICARE VISION SERVICES	05/26/2022	125144	MAY 2022 NEW EMP ADJ	01-000-220500	HEALTH INSURANCE PAYABLE	-7.88
OPTICARE VISION SERVICES	05/26/2022	125144	MAY 2022 ROUNDING ADJ	01-110-500130	HEALTH INSURANCE - MGMT	0.22
OPTICARE VISION SERVICES	05/26/2022	125144	OPTICARE VISION INS	01-000-220500	HEALTH INSURANCE PAYABLE	343.86
OPTICARE VISION SERVICES	05/26/2022	125144	OPTICARE VISION INS	01-000-220500	HEALTH INSURANCE PAYABLE	343.86
					Vendor 3389.5 - OPTICARE VISION SERVICES Total:	**1,410.55**
Vendor: 3401 - OWEN EQUIPMENT COMPANY						
OWEN EQUIPMENT COMPANY	05/19/2022	125103	5-3-2022 WS Owen Equipment...	01-230-520240	TOOLS & SUPPLIES - WTR MAI...	300.39
					Vendor 3401 - OWEN EQUIPMENT COMPANY Total:	**300.39**
Vendor: 5111 - PFLB, LLC						
PFLB, LLC	05/26/2022	125145	REPAIR AND WARRANTY #9	01-260-520210	REPAIR SUPPLIES - BLD/FLT MA..	403.55
					Vendor 5111 - PFLB, LLC Total:	**403.55**
Vendor: 3523 - PREMIER TRUCK GROUP						
PREMIER TRUCK GROUP	05/26/2022	125146	#18 PM SERVICE	01-260-520210	REPAIR SUPPLIES - BLD/FLT MA..	38.21
PREMIER TRUCK GROUP	05/26/2022	125146	05_05_2022_Fleet-Unit#04_H...	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	15.64
					Vendor 3523 - PREMIER TRUCK GROUP Total:	**53.85**
Vendor: 3630 - RASMUSSEN EQUIPMENT						
RASMUSSEN EQUIPMENT	05/26/2022	125147	Safety Latch Kit	01-220-520240	TOOLS & SUPPLIES - WTR R&R	51.00
					Vendor 3630 - RASMUSSEN EQUIPMENT Total:	**51.00**
Vendor: 3657 - READY MADE CONCRETE						
READY MADE CONCRETE	05/19/2022	DFT0000032	Cement For Repairs	01-220-520210	REPAIR SUPPLIES - WTR R&R	197.00
READY MADE CONCRETE	05/19/2022	DFT0000032	Cement For Repairs	01-220-520210	REPAIR SUPPLIES - WTR R&R	355.00
					Vendor 3657 - READY MADE CONCRETE Total:	**552.00**
Vendor: 3747 - ROCKY MTN POWER						
ROCKY MTN POWER	05/05/2022	125042	MAR 2022 MONTHLY CHARGES	01-110-510460	UTILITIES - MGMT	3,133.40
ROCKY MTN POWER	05/05/2022	125042	MAR 2022 MONTHLY CHARGES	01-230-510460	UTILITIES - WTR	9,342.54
ROCKY MTN POWER	05/05/2022	125042	MAR 2022 MONTHLY CHARGES	01-240-510460	UTILITIES - WW	12,336.46
ROCKY MTN POWER	05/26/2022	125148	APR 2022 MONTHLY CHARGES	01-110-510460	UTILITIES - MGMT	3,207.36
ROCKY MTN POWER	05/26/2022	125148	APR 2022 MONTHLY CHARGES	01-230-510460	UTILITIES - WTR	15,928.87
ROCKY MTN POWER	05/26/2022	125148	APR 2022 MONTHLY CHARGES	01-240-510460	UTILITIES - WW	15,397.06
					Vendor 3747 - ROCKY MTN POWER Total:	**59,345.69**
Vendor: 3803 - RUSH TRUCK CENTERS OF UTAH INC						
RUSH TRUCK CENTERS OF UT...	05/26/2022	125149	COOLANT TUBING SEAL FOR ...	01-260-520210	REPAIR SUPPLIES - BLD/FLT MA..	27.90
					Vendor 3803 - RUSH TRUCK CENTERS OF UTAH INC Total:	**27.90**

Vendor Name	Payment Date	Payment Number	Description (Item)	Account Number	Account Name	Amount
Vendor: 3804 - RUSHTON, COREY L						
RUSHTON, COREY L	05/26/2022	125150	AIRFARE/2022 ACE CONF	01-105-510480	TRAINING & EDUCATION - BO...	427.20
					Vendor 3804 - RUSHTON, COREY L Total:	**427.20**
Vendor: 5110 - SAGE DEMOLITION LLC						
SAGE DEMOLITION LLC	05/12/2022	125075	SAGE DEMO/FIRE HYDRANT R...	01-000-430990	MISC INCOME	1,585.70
					Vendor 5110 - SAGE DEMOLITION LLC Total:	**1,585.70**
Vendor: 3850 - SALT LAKE CEMENT CUTTING						
SALT LAKE CEMENT CUTTING	05/19/2022	DFT0000033	Cement Cutting	01-220-520210	REPAIR SUPPLIES - WTR R&R	350.00
SALT LAKE CEMENT CUTTING	05/19/2022	DFT0000033	Cement Cutting	01-220-520210	REPAIR SUPPLIES - WTR R&R	522.00
SALT LAKE CEMENT CUTTING	05/19/2022	DFT0000033	Cement Cutting	01-220-520210	REPAIR SUPPLIES - WTR R&R	180.00
SALT LAKE CEMENT CUTTING	05/19/2022	DFT0000033	Cement Cutting	01-220-520210	REPAIR SUPPLIES - WTR R&R	360.00
					Vendor 3850 - SALT LAKE CEMENT CUTTING Total:	**1,412.00**
Vendor: 3890 - SALT LAKE VALLEY LANDFILL						
SALT LAKE VALLEY LANDFILL	05/19/2022	125104	DUMP FEES	01-340-520920	INFRASTRUCTURE PURCHASES	1,013.77
					Vendor 3890 - SALT LAKE VALLEY LANDFILL Total:	**1,013.77**
Vendor: 3950 - SELECTHEALTH						
SELECTHEALTH	05/05/2022	125043	TERM EMPLOYEE HEALTH INS	01-110-500130	HEALTH INSURANCE - MGMT	-3,148.40
SELECTHEALTH	05/05/2022	125043	RETIREE HEALTH INS	01-110-500130	HEALTH INSURANCE - MGMT	11,719.20
SELECTHEALTH	05/05/2022	125043	HEALTH INS FAM. SELECT MED	01-110-500130	HEALTH INSURANCE - MGMT	94,452.00
SELECTHEALTH	05/05/2022	125043	SINGLE SELECT MED	01-110-500130	HEALTH INSURANCE - MGMT	4,853.70
SELECTHEALTH	05/05/2022	125044	JAN-MAR 22 HEALTHY LIV RE...	01-110-510430	GENERAL ADMINISTRATIVE	22.95
					Vendor 3950 - SELECTHEALTH Total:	**107,899.45**
Vendor: 3952 - SEMI SERVICE INC						
SEMI SERVICE INC	05/05/2022	125045	NEW HYD. LIFT	01-260-510230	VEHICLE MAINT & FUEL - BLD/... Dump truck lift bed repair	10,201.00
					Vendor 3952 - SEMI SERVICE INC Total:	**10,201.00**
Vendor: 3970 - SHERWIN WILLIAMS						
SHERWIN WILLIAMS	05/26/2022	125151	WS 5-16-2022 Sherwin Williams	01-230-520210	REPAIR SUPPLIES - WTR MAINT	82.45
SHERWIN WILLIAMS	05/26/2022	125151	WS 5-19-2022 Sherwin William...	01-230-520210	REPAIR SUPPLIES - WTR MAINT	87.11
SHERWIN WILLIAMS	05/26/2022	125151	WS 5-19-2022 Sherwin William...	01-230-520210	REPAIR SUPPLIES - WTR MAINT	204.95
					Vendor 3970 - SHERWIN WILLIAMS Total:	**374.51**
Vendor: 3980 - SHRED-IT USA						
SHRED-IT USA	05/05/2022	125046	APR 2022 DOCUMENT SHREDD...	01-110-510430	GENERAL ADMINISTRATIVE	86.94
					Vendor 3980 - SHRED-IT USA Total:	**86.94**
Vendor: 4100 - SNAP-ON INDUSTRIAL DIV OF IDSC HOLDINGS LLC						
SNAP-ON INDUSTRIAL DIV OF ...	05/12/2022	125076	DIAGNOSTIC TOOL	01-260-520240	TOOLS & SUPPLIES - BLD/FLT ...	3,099.04
					Vendor 4100 - SNAP-ON INDUSTRIAL DIV OF IDSC HOLDINGS LLC Total:	**3,099.04**
Vendor: 4238 - STEP SAVER INC						
STEP SAVER INC	05/26/2022	125152	SALT/WELL 12	01-350-530260	WATER TREATMENT CHEMICA...	1,391.50
STEP SAVER INC	05/26/2022	125152	SALT/WELL 1	01-350-530260	WATER TREATMENT CHEMICA...	785.29
					Vendor 4238 - STEP SAVER INC Total:	**2,176.79**

Vendor Name	Payment Date	Payment Number	Description (Item)	Account Number	Account Name	Amount
Vendor: 4248 - STREAMLINE						
STREAMLINE	05/05/2022	125047	MAY 2022 WEBSITE HOSTING	01-360-510440	COMPUTER SUPPLIES/EQUIP...	1,080.00
					Vendor 4248 - STREAMLINE Total:	**1,080.00**
Vendor: 4350 - THE DATA CENTER						
THE DATA CENTER	05/05/2022	125048	APR 2022 FULL SERVICE PRINT...	01-130-510420	POSTAGE & MAILING	2,968.30
THE DATA CENTER	05/05/2022	125048	APR 2022 POSTAGE & HANDLI...	01-130-510420	POSTAGE & MAILING	8,817.68
					Vendor 4350 - THE DATA CENTER Total:	**11,785.98**
Vendor: 4405 - THOMAS PETROLEUM						
THOMAS PETROLEUM	05/19/2022	125105	850 GALLONS OF DIESEL FOR ...	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	2,971.15
THOMAS PETROLEUM	05/19/2022	125105	SURCHARGE/TAXES/FEES	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	237.10
THOMAS PETROLEUM	05/19/2022	125105	ADDTL FUEL CHARGE - 850 GAL..	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	23.38
THOMAS PETROLEUM	05/19/2022	125105	FUEL SURCHARGE/TAX/FEES	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	285.41
THOMAS PETROLEUM	05/19/2022	125105	850 GALLONS OF DIESEL FOR ...	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	3,600.00
THOMAS PETROLEUM	05/19/2022	125105	ADDTL FUEL AMT - 850 GALLO...	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	68.64
					Vendor 4405 - THOMAS PETROLEUM Total:	**7,185.68**
Vendor: 4430 - TIRE WORLD						
TIRE WORLD	05/05/2022	125049	#13 LUG STUDS AND NUTS	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	140.00
TIRE WORLD	05/05/2022	125049	#13 LUG STUDS AND NUTS	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	72.40
TIRE WORLD	05/05/2022	125049	NEW FRONT TIRES #9	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	778.88
TIRE WORLD	05/05/2022	125049	#22 NEEDS REAR TIRES	01-260-510230	VEHICLE MAINT & FUEL - BLD/...	331.12
TIRE WORLD	05/19/2022	125106	NEW TIRES FOR UNIT #40	01-260-520210	REPAIR SUPPLIES - BLD/FLT MA..	895.74
TIRE WORLD	05/19/2022	125106	TIRES FOR CEMENT BOARD W...	01-260-520210	REPAIR SUPPLIES - BLD/FLT MA..	242.00
TIRE WORLD	05/26/2022	125153	FRONT TIRES FOR UNIT #54	01-260-520210	REPAIR SUPPLIES - BLD/FLT MA..	257.88
					Vendor 4430 - TIRE WORLD Total:	**2,718.02**
Vendor: 4437.5 - TNEMEC CO, INC						
TNEMEC CO, INC	05/05/2022	125050	Fire Hydrant Paint	01-220-520210	REPAIR SUPPLIES - WTR R&R	6,449.40
					Vendor 4437.5 - TNEMEC CO, INC Total:	**6,449.40**
Vendor: 4452 - TP VENDING						
TP VENDING	05/05/2022	125051	SODA ORDER	01-110-510430	GENERAL ADMINISTRATIVE	47.06
					Vendor 4452 - TP VENDING Total:	**47.06**
Vendor: 4479 - TYLER TECHNOLOGIES						
TYLER TECHNOLOGIES	05/05/2022	125052	21D:ERP REPLACEMENT	01-340-520920	INFRASTRUCTURE PURCHASES	910.00
TYLER TECHNOLOGIES	05/05/2022	125052	21D:ERP REPLACEMENT	01-340-520920	INFRASTRUCTURE PURCHASES	250.00
TYLER TECHNOLOGIES	05/19/2022	125107	ANNL MTN/PROJECT ACCOUN...	01-340-520920	INFRASTRUCTURE PURCHASES	2,411.00
TYLER TECHNOLOGIES	05/26/2022	125154	21D:ERP REPLACEMENT	01-340-520920	INFRASTRUCTURE PURCHASES	10,050.00
					Vendor 4479 - TYLER TECHNOLOGIES Total:	**13,621.00**
Vendor: 4510 - UNITED PARCEL SERVICE					Incode 10 Replacement	
UNITED PARCEL SERVICE	05/19/2022	125108	SHIPPING/WTR QLTY	01-310-530270	WATER TESTING FEES	27.83
UNITED PARCEL SERVICE	05/26/2022	125155	SHIPPING/WTR QLTY	01-310-530270	WATER TESTING FEES	1.67
					Vendor 4510 - UNITED PARCEL SERVICE Total:	**29.50**

Vendor Name	Payment Date	Payment Number	Description (Item)	Account Number	Account Name	Amount
Vendor: 4545 - UNUM LIFE INSURANCE CO OF AMER						
UNUM LIFE INSURANCE CO OF...	05/05/2022	125053	APR 2022 LTC NEW EMP	01-110-500170	LIFE/LTD/LTC INSURANCE - M...	-2.40
UNUM LIFE INSURANCE CO OF...	05/05/2022	125053	APR 2022 LTC TERM EMP	01-110-500170	LIFE/LTD/LTC INSURANCE - M...	6.60
UNUM LIFE INSURANCE CO OF...	05/05/2022	125053	APR 2022 VOL LIFE RND ADJ	01-110-500170	LIFE/LTD/LTC INSURANCE - M...	0.22
UNUM LIFE INSURANCE CO OF...	05/05/2022	125053	APR 2022 VOL LIFE TERM EMP	01-110-500170	LIFE/LTD/LTC INSURANCE - M...	19.56
UNUM LIFE INSURANCE CO OF...	05/05/2022	125053	MAR 2022 VOL LIFE ADJ	01-110-500170	LIFE/LTD/LTC INSURANCE - M...	-63.00
UNUM LIFE INSURANCE CO OF...	05/05/2022	125053	JAN/FEB/MAR 2022 RATE ADJ	01-110-500170	LIFE/LTD/LTC INSURANCE - M...	265.68
UNUM LIFE INSURANCE CO OF...	05/05/2022	125053	APR 2022 EMPLOYER LIFE TE...	01-110-500170	LIFE/LTD/LTC INSURANCE - M...	51.57
UNUM LIFE INSURANCE CO OF...	05/05/2022	125053	APR 2022 EMPLOYER LIFE RND...	01-110-500170	LIFE/LTD/LTC INSURANCE - M...	0.15
UNUM LIFE INSURANCE CO OF...	05/05/2022	125053	LIFE INSURANCE	01-000-220620	VOLUNTARY LIFE PAYABLE	636.62
UNUM LIFE INSURANCE CO OF...	05/05/2022	125053	LIFE INSURANCE	01-110-500170	LIFE/LTD/LTC INSURANCE - M...	1,426.54
UNUM LIFE INSURANCE CO OF...	05/05/2022	125053	LIFE INSURANCE	01-000-220620	VOLUNTARY LIFE PAYABLE	445.17
UNUM LIFE INSURANCE CO OF...	05/05/2022	125053	LIFE INSURANCE	01-110-500170	LIFE/LTD/LTC INSURANCE - M...	1,639.79
UNUM LIFE INSURANCE CO OF...	05/05/2022	125053	LONG TERM CARE	01-000-220600	OTHER INSURANCE PAYABLE	1.90
UNUM LIFE INSURANCE CO OF...	05/05/2022	125053	LONG TERM CARE	01-110-500170	LIFE/LTD/LTC INSURANCE - M...	109.00
UNUM LIFE INSURANCE CO OF...	05/05/2022	125053	LONG TERM CARE	01-000-220600	OTHER INSURANCE PAYABLE	1.90
UNUM LIFE INSURANCE CO OF...	05/05/2022	125053	LONG TERM CARE	01-110-500170	LIFE/LTD/LTC INSURANCE - M...	107.80
UNUM LIFE INSURANCE CO OF...	05/26/2022	125156	TERM EMP CREDIT	01-000-220600	OTHER INSURANCE PAYABLE	-11.00
UNUM LIFE INSURANCE CO OF...	05/26/2022	125156	NEW EMPLOYEE - W/H NOT O...	01-000-220600	OTHER INSURANCE PAYABLE	-4.80
UNUM LIFE INSURANCE CO OF...	05/26/2022	125156	APR 2022 EMPLOYER LIFE TE...	01-110-500170	LIFE/LTD/LTC INSURANCE - M...	15.71
UNUM LIFE INSURANCE CO OF...	05/26/2022	125156	APR 2022 EMPLOYER LIFE PAY...	01-110-500170	LIFE/LTD/LTC INSURANCE - M...	-3.73
UNUM LIFE INSURANCE CO OF...	05/26/2022	125156	APR 2022 EMPLOYER LIFE NEW...	01-110-500170	LIFE/LTD/LTC INSURANCE - M...	-55.42
UNUM LIFE INSURANCE CO OF...	05/26/2022	125156	APR 2022 EMPLOYER LIFE RND...	01-110-500170	LIFE/LTD/LTC INSURANCE - M...	0.12
UNUM LIFE INSURANCE CO OF...	05/26/2022	125156	LIFE INSURANCE	01-000-220620	VOLUNTARY LIFE PAYABLE	2,123.13
UNUM LIFE INSURANCE CO OF...	05/26/2022	125156	LONG TERM CARE	01-000-220600	OTHER INSURANCE PAYABLE	116.90
UNUM LIFE INSURANCE CO OF...	05/26/2022	125156	LIFE INSURANCE	01-000-220620	VOLUNTARY LIFE PAYABLE	2,119.57
UNUM LIFE INSURANCE CO OF...	05/26/2022	125156	LONG TERM CARE	01-000-220600	OTHER INSURANCE PAYABLE	112.10
UNUM LIFE INSURANCE CO OF...	05/26/2022	125156	MAY 2022 VOL LIFE RND ADJ	01-110-500170	LIFE/LTD/LTC INSURANCE - M...	0.22
UNUM LIFE INSURANCE CO OF...	05/26/2022	125156	MAY 2022 VOL LIFE TERM EMP	01-110-500170	LIFE/LTD/LTC INSURANCE - M...	22.68
					Vendor 4545 - UNUM LIFE INSURANCE CO OF AMER Total:	**9,082.58**
Vendor: 5113 - UPPER LIMIT, INC.						
UPPER LIMIT, INC.	05/19/2022	125109	Employee Gym Equipment	01-000-220700	EMPLOYEE RESERVE - GYM	3,932.00
					Vendor 5113 - UPPER LIMIT, INC. Total:	**3,932.00**
Vendor: 0001 - US TREASURY						
US TREASURY	05/12/2022	DFT0000022	MEDICARE WITHHOLDING	01-000-230100	FEDERAL W/H & MEDICARE P...	5,451.60
US TREASURY	05/12/2022	DFT0000023	FEDERAL WITHHOLDING	01-000-230100	FEDERAL W/H & MEDICARE P...	15,784.84
US TREASURY	05/10/2022	DFT0000026	MEDICARE WITHHOLDING	01-000-230100	FEDERAL W/H & MEDICARE P...	7.82
US TREASURY	05/10/2022	DFT0000027	FEDERAL WITHHOLDING	01-000-230100	FEDERAL W/H & MEDICARE P...	30.81
US TREASURY	05/26/2022	DFT0000049	MEDICARE WITHHOLDING	01-000-230100	FEDERAL W/H & MEDICARE P...	5,610.04
US TREASURY	05/26/2022	DFT0000050	FEDERAL WITHHOLDING	01-000-230100	FEDERAL W/H & MEDICARE P...	16,614.66
					Vendor 0001 - US TREASURY Total:	**43,499.77**

Vendor Name	Payment Date	Payment Number	Description (Item)	Account Number	Account Name	Amount
Vendor: 4620 - UTAH LOCAL GOVERNMENTS TRUST						
UTAH LOCAL GOVERNMENTS ...	05/19/2022	125110	20120-PROP/MOBILE EQ END...	01-110-510450	GENERAL INSURANCE	20.80
					Vendor 4620 - UTAH LOCAL GOVERNMENTS TRUST Total:	**20.80**
Vendor: 4640 - UTAH RETIREMENT SYSTEMS						
UTAH RETIREMENT SYSTEMS	05/12/2022	DFT0000007	TIER 2 DEFINED CONTRIBUTION	01-000-220400	RETIREMENT CONTRIB PAYAB...	1,305.43
UTAH RETIREMENT SYSTEMS	05/12/2022	DFT0000008	TIER 2 HYBRID CONTRIBUTION	01-000-220400	RETIREMENT CONTRIB PAYAB...	10,618.59
UTAH RETIREMENT SYSTEMS	05/12/2022	DFT0000009	457 CONTRIBUTION %	01-000-220400	RETIREMENT CONTRIB PAYAB...	183.36
UTAH RETIREMENT SYSTEMS	05/12/2022	DFT0000010	457 CONTRIBUTION AMOUNT	01-000-220400	RETIREMENT CONTRIB PAYAB...	115.00
UTAH RETIREMENT SYSTEMS	05/12/2022	DFT0000011	457 CONTRIB - BOARD	01-000-220400	RETIREMENT CONTRIB PAYAB...	103.34
UTAH RETIREMENT SYSTEMS	05/12/2022	DFT0000012	457 CONTRIB - TIER 2	01-000-220400	RETIREMENT CONTRIB PAYAB...	150.87
UTAH RETIREMENT SYSTEMS	05/12/2022	DFT0000013	401(K) $ TIER 2 EMP CONTRIB	01-000-220400	RETIREMENT CONTRIB PAYAB...	20.00
UTAH RETIREMENT SYSTEMS	05/12/2022	DFT0000014	401(K) % CONTRIBUTION AM...	01-000-220400	RETIREMENT CONTRIB PAYAB...	145.73
UTAH RETIREMENT SYSTEMS	05/12/2022	DFT0000015	TIER 2 DC 401K	01-000-220400	RETIREMENT CONTRIB PAYAB...	1,951.31
UTAH RETIREMENT SYSTEMS	05/12/2022	DFT0000017	TIER 2 HYBRID 401K	01-000-220400	RETIREMENT CONTRIB PAYAB...	409.69
UTAH RETIREMENT SYSTEMS	05/12/2022	DFT0000018	TIER 2 ROTH IRA CONTRIB AM...	01-000-220400	RETIREMENT CONTRIB PAYAB...	610.00
UTAH RETIREMENT SYSTEMS	05/12/2022	DFT0000019	ROTH IRA CONTRIBUTION AM...	01-000-220400	RETIREMENT CONTRIB PAYAB...	430.00
UTAH RETIREMENT SYSTEMS	05/12/2022	DFT0000020	TIER 2 - 457 CONTRIB	01-000-220400	RETIREMENT CONTRIB PAYAB...	5.00
UTAH RETIREMENT SYSTEMS	05/12/2022	DFT0000021	UT STATE RET CONTRIBUTION	01-000-220400	RETIREMENT CONTRIB PAYAB...	19,165.15
UTAH RETIREMENT SYSTEMS	05/10/2022	DFT0000024	TIER 2 HYBRID CONTRIBUTION	01-000-220400	RETIREMENT CONTRIB PAYAB...	43.39
UTAH RETIREMENT SYSTEMS	05/10/2022	DFT0000025	TIER 2 HYBRID 401K	01-000-220400	RETIREMENT CONTRIB PAYAB...	1.67
UTAH RETIREMENT SYSTEMS	05/26/2022	DFT0000035	TIER 2 DEFINED CONTRIBUTION	01-000-220400	RETIREMENT CONTRIB PAYAB...	1,385.73
UTAH RETIREMENT SYSTEMS	05/26/2022	DFT0000036	TIER 2 HYBRID CONTRIBUTION	01-000-220400	RETIREMENT CONTRIB PAYAB...	11,296.41
UTAH RETIREMENT SYSTEMS	05/26/2022	DFT0000037	457 CONTRIBUTION %	01-000-220400	RETIREMENT CONTRIB PAYAB...	181.17
UTAH RETIREMENT SYSTEMS	05/26/2022	DFT0000038	457 CONTRIBUTION AMOUNT	01-000-220400	RETIREMENT CONTRIB PAYAB...	115.00
UTAH RETIREMENT SYSTEMS	05/26/2022	DFT0000039	457 CONTRIB - TIER 2	01-000-220400	RETIREMENT CONTRIB PAYAB...	198.40
UTAH RETIREMENT SYSTEMS	05/26/2022	DFT0000040	401(K) $ TIER 2 EMP CONTRIB	01-000-220400	RETIREMENT CONTRIB PAYAB...	20.00
UTAH RETIREMENT SYSTEMS	05/26/2022	DFT0000041	401(K) % CONTRIBUTION AM...	01-000-220400	RETIREMENT CONTRIB PAYAB...	180.72
UTAH RETIREMENT SYSTEMS	05/26/2022	DFT0000042	TIER 2 DC 401K	01-000-220400	RETIREMENT CONTRIB PAYAB...	2,071.33
UTAH RETIREMENT SYSTEMS	05/26/2022	DFT0000044	TIER 2 HYBRID 401K	01-000-220400	RETIREMENT CONTRIB PAYAB...	435.82
UTAH RETIREMENT SYSTEMS	05/26/2022	DFT0000045	TIER 2 ROTH IRA CONTRIB AM...	01-000-220400	RETIREMENT CONTRIB PAYAB...	660.00
UTAH RETIREMENT SYSTEMS	05/26/2022	DFT0000046	ROTH IRA CONTRIBUTION AM...	01-000-220400	RETIREMENT CONTRIB PAYAB...	430.00
UTAH RETIREMENT SYSTEMS	05/26/2022	DFT0000047	TIER 2 - 457 CONTRIB	01-000-220400	RETIREMENT CONTRIB PAYAB...	5.00
UTAH RETIREMENT SYSTEMS	05/26/2022	DFT0000048	UT STATE RET CONTRIBUTION	01-000-220400	RETIREMENT CONTRIB PAYAB...	19,271.64
					Vendor 4640 - UTAH RETIREMENT SYSTEMS Total:	**71,509.75**
Vendor: 4657 - UTAH TAP MASTER						
UTAH TAP MASTER	05/19/2022	125111	2200 W Capital Project	01-340-520920	INFRASTRUCTURE PURCHASES	1,275.00
					Vendor 4657 - UTAH TAP MASTER Total:	**1,275.00**
Vendor: 4680 - UTAH WATER USERS ASSOCIATION						
UTAH WATER USERS ASSOCIAT..	05/05/2022	125054	2022 ANNUAL DUES	01-110-510430	GENERAL ADMINISTRATIVE	200.00
					Vendor 4680 - UTAH WATER USERS ASSOCIATION Total:	**200.00**

Vendor Name	Payment Date	Payment Number	Description (Item)	Account Number	Account Name	Amount
Vendor: 4691 - UTILITY COST SOLUTIONS, INC.						
UTILITY COST SOLUTIONS, INC.	05/26/2022	125157	UTIL BILL AUDIT SVG/FEB-APR ...	01-240-510460	UTILITIES - WW	1,202.50
					Vendor 4691 - UTILITY COST SOLUTIONS, INC. Total:	**1,202.50**
Vendor: 4693 - UTOPIA						
UTOPIA	05/12/2022	125077	MAY 2022 FIBER OPTICS	01-360-510470	TELEPHONE	1,000.00
					Vendor 4693 - UTOPIA Total:	**1,000.00**
Vendor: 4704 - VERIZON WIRELESS						
VERIZON WIRELESS	05/19/2022	DFT0000034	APR 2022 CELL PHONE	01-360-510470	TELEPHONE	2,955.43
					Vendor 4704 - VERIZON WIRELESS Total:	**2,955.43**
Vendor: 4698 - VLCM						
VLCM	05/19/2022	125112	SOPHOS SUITE RENEWAL	01-360-510440	COMPUTER SUPPLIES/EQUIP...	6,479.70
					Vendor 4698 - VLCM Total:	**6,479.70**
Vendor: 4732 - WACHS WATER SERVICES						
WACHS WATER SERVICES	05/12/2022	125078	Leak Detection	01-110-510530	PUBLIC RELATIONS/CONSERV...	32,580.50
					Vendor 4732 - WACHS WATER SERVICES Total:	**32,580.50**
Vendor: 4865 - WEIDNER AND ASSOCIATES						
WEIDNER AND ASSOCIATES	05/05/2022	125055	Well15 Flow meter	01-360-510440	COMPUTER SUPPLIES/EQUIP...	1,294.43
					Vendor 4865 - WEIDNER AND ASSOCIATES Total:	**1,294.43**
Vendor: 4870 - WELLS FARGO ADVISORS						
WELLS FARGO ADVISORS	05/11/2022	125060	401(K) CONTRIBUTIONS	01-000-220400	RETIREMENT CONTRIB PAYAB...	22,137.39
WELLS FARGO ADVISORS	05/11/2022	125060	401(K) LOAN PAYMENT	01-000-220400	RETIREMENT CONTRIB PAYAB...	690.64
WELLS FARGO ADVISORS	05/11/2022	125060	401(K) LOAN PAYMENT	01-000-220400	RETIREMENT CONTRIB PAYAB...	1,026.78
WELLS FARGO ADVISORS	05/11/2022	125060	401(K) CONTRIBUTIONS	01-000-220400	RETIREMENT CONTRIB PAYAB...	31.13
WELLS FARGO ADVISORS	05/24/2022	125114	401(K) CONTRIBUTIONS	01-000-220400	RETIREMENT CONTRIB PAYAB...	22,692.65
WELLS FARGO ADVISORS	05/24/2022	125114	401(K) LOAN PAYMENT	01-000-220400	RETIREMENT CONTRIB PAYAB...	690.64
WELLS FARGO ADVISORS	05/24/2022	125114	401(K) LOAN PAYMENT	01-000-220400	RETIREMENT CONTRIB PAYAB...	1,026.78
					Vendor 4870 - WELLS FARGO ADVISORS Total:	**48,296.01**
Vendor: 4880 - WEST VALLEY CITY						
WEST VALLEY CITY	05/12/2022	DFT0000029	2824 S 3600 W	01-110-510460	UTILITIES - MGMT	396.00
WEST VALLEY CITY	05/12/2022	DFT0000029	2888 S 3600 W	01-110-510460	UTILITIES - MGMT	387.00
WEST VALLEY CITY	05/12/2022	DFT0000029	3222 S CULTURAL CENTER DR	01-230-510460	UTILITIES - WTR	39.00
WEST VALLEY CITY	05/12/2022	DFT0000029	1629 W 2320 S	01-230-510460	UTILITIES - WTR	45.00
WEST VALLEY CITY	05/12/2022	DFT0000029	2386 S 3600 W	01-230-510460	UTILITIES - WTR	90.00
WEST VALLEY CITY	05/12/2022	DFT0000029	2117 W 2343 S (2359 S DECKE...	01-230-510460	UTILITIES - WTR	72.00
WEST VALLEY CITY	05/12/2022	DFT0000029	4404 S 4800 W	01-230-510460	UTILITIES - WTR	63.00
WEST VALLEY CITY	05/12/2022	DFT0000029	6551 W 4100 S	01-230-510460	UTILITIES - WTR	30.00
WEST VALLEY CITY	05/12/2022	DFT0000029	4381 S NUGGET DR	01-230-510460	UTILITIES - WTR	24.00
WEST VALLEY CITY	05/12/2022	DFT0000029	4525 S 6000 W	01-230-510460	UTILITIES - WTR	21.00
WEST VALLEY CITY	05/12/2022	DFT0000029	4080 S 2200 W	01-230-510460	UTILITIES - WTR	21.00
WEST VALLEY CITY	05/12/2022	DFT0000029	1313 W 3300 S	01-230-510460	UTILITIES - WTR	21.00
WEST VALLEY CITY	05/12/2022	DFT0000029	1460 W 3100 S	01-230-510460	UTILITIES - WTR	39.00

Vendor Name	Payment Date	Payment Number	Description (Item)	Account Number	Account Name	Amount
WEST VALLEY CITY	05/12/2022	DFT0000029	2911 S 2910 W	01-240-510460	UTILITIES - WW	9.00
WEST VALLEY CITY	05/12/2022	DFT0000029	2250 S CONSTITUTION BLVD	01-240-510460	UTILITIES - WW	9.00
WEST VALLEY CITY	05/12/2022	DFT0000029	1155 W 2320 S	01-240-510460	UTILITIES - WW	9.00
WEST VALLEY CITY	05/12/2022	DFT0000029	1360 W 3100 S	01-240-510460	UTILITIES - WW	6.00
WEST VALLEY CITY	05/12/2022	DFT0000029	1247 W 2320 S B	01-240-510460	UTILITIES - WW	30.00
WEST VALLEY CITY	05/12/2022	DFT0000029	2149 W 3100 S	01-240-510460	UTILITIES - WW	51.00
WEST VALLEY CITY	05/12/2022	DFT0000029	2212 W 3100 S	01-240-510460	UTILITIES - WW	36.00
WEST VALLEY CITY	05/12/2022	DFT0000029	3100 S DECKER LAKE DR	01-240-510460	UTILITIES - WW	30.00
WEST VALLEY CITY	05/12/2022	DFT0000029	2557 S 5370 W	01-240-510460	UTILITIES - WW	14.10
WEST VALLEY CITY	05/12/2022	DFT0000029	1247 W 2320 S A	01-240-510460	UTILITIES - WW	6.00
					Vendor 4880 - WEST VALLEY CITY Total:	**1,448.10**
Vendor: 4899 - WESTERN WATER WORKS SUPPLY COMPANY						
WESTERN WATER WORKS SUP...	05/05/2022	125056	Fire hydrant parts	01-220-520210	REPAIR SUPPLIES - WTR R&R	5,276.70
WESTERN WATER WORKS SUP...	05/05/2022	125056	Fire hydrant parts	01-220-520210	REPAIR SUPPLIES - WTR R&R	143.40
					Vendor 4899 - WESTERN WATER WORKS SUPPLY COMPANY Total:	**5,420.10**
Vendor: 4910 - WHEELER MACHINERY CO						
WHEELER MACHINERY CO	05/05/2022	125057	WS Equipment	01-230-510910	MACHINERY & EQUIPMENT - ...	80,200.00
WHEELER MACHINERY CO	05/26/2022	125158	WS Equipment	01-230-510910	MACHINERY & EQUIPMENT - ...	7,717.00
WHEELER MACHINERY CO	05/26/2022	125158	05/03/2022_WWPS_DECKER ...	01-250-520210	REPAIR SUPPLIES - WW PUMP ...	813.59
					Vendor 4910 - WHEELER MACHINERY CO Total:	**88,730.59**
Vendor: 4927 - WILHELMSEN, MARK W						
WILHELMSEN, MARK W	05/26/2022	125159	CDL WRITTEN TEST/TANKER E...	01-230-510480	TRAINING & EDUCATION - WTR..	61.00
					Vendor 4927 - WILHELMSEN, MARK W Total:	**61.00**
Vendor: 4943 - WIN-911 SOFTWARE						
WIN-911 SOFTWARE	05/05/2022	125058	WIN-911 SOFTWARE LICENSE	01-340-520920	INFRASTRUCTURE PURCHASES	660.00
					Vendor 4943 - WIN-911 SOFTWARE Total:	**660.00**
Vendor: 4938 - WINGFOOT CORPORATION						
WINGFOOT CORPORATION	05/05/2022	125059	FEB 2022 JANITORIAL SVCS	01-260-510220	BUILDING & GROUNDS	1,535.00
WINGFOOT CORPORATION	05/19/2022	125113	CARPET CLEANING	01-260-510220	BUILDING & GROUNDS	261.00
					Vendor 4938 - WINGFOOT CORPORATION Total:	**1,796.00**
					Grand Total:	**3,822,594.75**

Mini Excavator
Hydraulic Hammer

Report Summary

Fund Summary

Fund	Payment Amount
01 - GENERAL FUND	3,822,594.75
Grand Total:	**3,822,594.75**

Account Summary

Account Number	Account Name	Payment Amount
01-000-210110	RETAINAGE	-34,803.47
01-000-210150	AMEX/MC PAYABLE	108,204.43
01-000-220400	RETIREMENT CONTRIB PA...	119,805.76
01-000-220500	HEALTH INSURANCE PAY...	2,638.37
01-000-220600	OTHER INSURANCE PAYA...	217.00
01-000-220610	LEGAL SHIELD PAYABLE	398.36
01-000-220620	VOLUNTARY LIFE PAYABLE	5,859.46
01-000-220700	EMPLOYEE RESERVE - GYM	3,932.00
01-000-220900	CAFETERIA PLAN PAYABLE	9,519.46
01-000-230100	FEDERAL W/H & MEDICA...	43,499.77
01-000-410500	INSPECTION FEES	300.00
01-000-430100	IMPACT FEES - WATER	11,223.00
01-000-430990	MISC INCOME	2,468.87
01-105-510480	TRAINING & EDUCATION -...	427.20
01-110-500130	HEALTH INSURANCE - M...	114,661.62
01-110-500170	LIFE/LTD/LTC INSURANCE ...	3,556.88
01-110-510430	GENERAL ADMINISTRATIVE	1,260.21
01-110-510450	GENERAL INSURANCE	20.80
01-110-510460	UTILITIES - MGMT	9,400.00
01-110-510480	TRAINING & EDUCATION -...	1,295.98
01-110-510500	LEGAL EXPENSE	8,207.50
01-110-510510	ACCOUNTING & AUDIT	12,000.00
01-110-510520	PROFESSIONAL CONSULT...	3,975.04
01-110-510530	PUBLIC RELATIONS/CONS...	32,580.50
01-110-510540	BANKING & BONDING EX...	293.06
01-110-510591	PAYMENTS TO OTHER GO...	6,653.26
01-130-500010	SALARIES & WAGES - CUST..	150.00
01-130-510410	OFFICE SUPPLIES/PRINTI...	762.90
01-130-510420	POSTAGE & MAILING	11,785.98
01-130-510480	TRAINING & EDUCATION -...	50.00
01-140-510480	TRAINING & EDUCATION -...	300.00
01-140-520210	REPAIR SUPPLIES - METER	263.05
01-140-520240	TOOLS & SUPPLIES - MET...	451.72
01-210-510490	SAFETY EXPENSE	1,188.84
01-220-510480	TRAINING & EDUCATION -...	1,045.00

Payroll Taxes and Employee Benefits $304,238.68

Account Summary

Account Number	Account Name	Payment Amount
01-220-520210	REPAIR SUPPLIES - WTR R...	31,416.11
01-220-520240	TOOLS & SUPPLIES - WTR ...	1,384.41
01-230-510460	UTILITIES - WTR	26,184.71
01-230-510480	TRAINING & EDUCATION -...	1,106.00
01-230-510910	MACHINERY & EQUIPME...	88,014.71
01-230-520210	REPAIR SUPPLIES - WTR ...	374.51
01-230-520240	TOOLS & SUPPLIES - WTR...	481.49
01-240-510460	UTILITIES - WW	29,304.12
01-240-510480	TRAINING & EDUCATION -...	2,016.58
01-240-520210	REPAIR SUPPLIES - WW ...	35.70
01-250-510480	TRAINING & EDUCATION -...	133.00
01-250-520210	REPAIR SUPPLIES - WW P...	911.51
01-260-510220	BUILDING & GROUNDS	3,736.03
01-260-510230	VEHICLE MAINT & FUEL - ...	27,372.83
01-260-510235	VEHICLE LEASE	10,099.35
01-260-510480	TRAINING & EDUCATION -...	198.00
01-260-520210	REPAIR SUPPLIES - BLD/FL...	3,312.36
01-260-520240	TOOLS & SUPPLIES - BLD/...	3,559.04
01-310-530270	WATER TESTING FEES	3,457.47
01-330-510480	TRAINING & EDUCATION -...	317.20
01-330-520240	TOOLS & SUPPLIES - BLUE...	50.61
01-340-510480	TRAINING & EDUCATION -...	1,009.66
01-340-510520	PROFESSIONAL CONSULT...	28,183.66
01-340-520920	INFRASTRUCTURE PURCH...	1,593,742.91
01-350-510480	TRAINING & EDUCATION -...	895.00
01-350-530250	WATER SUPPLY EXPENSE	535,391.15
01-350-530260	WATER TREATMENT CHE...	2,176.79
01-360-510440	COMPUTER SUPPLIES/EQ...	13,827.55
01-360-510470	TELEPHONE	7,232.50
01-360-510480	TRAINING & EDUCATION -...	1,512.20
01-400-580310	FACILITY OPERATION - C.V.	341,400.61
01-400-580320	PROJECT BETTERMENTS- C..	77,962.61
01-400-580340	PRETREATMENT FIELD - C...	27,367.04
01-400-580350	LABORATORY - C.V.	17,981.22
01-400-580380	CVW DEBT SERVICE	456,853.56
	Grand Total:	**3,822,594.75**

Infrastructure

Jordan Valley Water

Central Valley Water $921,565.04

Project Account Summary

Project Account Key	Payment Amount
None	2,228,851.84
19CCONSTRUCTION	240.81

Project Account Summary

Project Account Key	Payment Amount
20ADESIGN	23,898.75
20BCONSTMGMT	88,212.75
20BCONSTRUCTION	694,741.00
20CRETAINAGE	198.06
20DDESIGNCONTRACT	8,580.55
20ECONSTMGT	9,878.01
20ECONSTRUCTION	485,053.00
20GCONSTMGT	7,468.12
20GCONSTRUCTION	94,101.42
20IDESIGN	2,876.01
21DCONTRACT	13,621.00
21FCONTRACT	41,120.00
21FWIN911	660.00
21JCONSTMGMT	3,782.80
21JDESIGNCONTRACT	10,956.10
22CDESIGN	14,490.00
22DDESIGNCONTRACT	10,583.07
22EMATERIALS	83,281.46
Grand Total:	**3,822,594.75**

		% of Total
Infrastructure	$ 1,593,742.91	42%
Central Valley Water	$ 921,565.04	24%
Jordan Valley Water	$ 535,391.15	14%
Payroll Taxes and Employee Benefits	$ 304,238.68	8%
Other	$ 470,656.97	12%

RESOLUTION 6-21-22.2

RESOLUTION NO. 6-21-22.2

A RESOLUTION ADOPTING GRANGER-HUNTER IMPROVEMENT DISTRICT DRINKING WATER SYSTEM AND WASTEWATER COLLECTION SYSTEM MASTER PLANS

WHEREAS, the Board of Trustees ("Board"), of Granger-Hunter Improvement District ("District"), has determined that in order to adequately plan for the future operations and management of the District, it is in the best interest of the District and the citizens it serves to prepare and adopt master plans for District's wastewater collection system and its drinking water system; and

WHEREAS, the District heretofore implemented a Wastewater Collection System Master Plan, dated January, 2016, and a Drinking Water System Master Plan, dated February, 2016 (the "Prior Master Plans"); and

WHEREAS, the District has reviewed and determined it to be necessary to update the 2016 Wastewater Collection System Master Plan in order to identify recommended improvements that resolve existing and projected future deficiencies in the wastewater collection system throughout the District's service area, including a wastewater system infrastructure maintenance plan which identifies future maintenance needs and funding levels, and an implementation plan for wastewater projects determined to be most pressing over the next 10 years; and

WHEREAS, the District has reviewed and determined it to be necessary to update the 2016 Drinking Water System Master Plan in order to identify recommended improvements that resolve existing and projected future deficiencies in the drinking water system throughout the District's service area, including a water system infrastructure maintenance plan which identifies future maintenance needs and funding levels, and an implementation plan for water projects determined to be most pressing over the next 10 years; and

WHEREAS, the District's consulting engineers, Bowen Collins Associates, has prepared the District's Sewer Master Plan, dated June 2022, and the District's Water Master Plan, dated June 2022, in furtherance of the purpose and intent of the District as stated herein; and

WHEREAS, the Sewer Master Plan, dated June 2022 and the Water Master Plan, dated June 2022 adopted hereby are intended to supersede and replace the Prior Master Plans;

NOW, THEREFORE, be it hereby resolved by the Board of Trustees of Granger-Hunter Improvement District as follows:

1. The Sewer Master Plan, dated June 2022, a copy of which is attached as EXHIBIT "A" hereto, is hereby adopted as the District's wastewater collection master plan for the District.

2. The Water Master Plan, dated June 2022, a copy of which is attached as EXHIBIT "B" hereto, is hereby adopted as the District's drinking water system master plan for the District.

3. This Resolution shall become effective immediately upon passage.

PASSED AND ADOPTED this _____ day of _____, 2022.

_____

Debra Armstrong, Board Chair

EXHIBIT "A"

SEWER MASTER PLAN, JUNE 2022

PREPARED FOR:

GRANGER-HUNTER
IMPROVEMENT DISTRICT

PREPARED BY:

BOWEN COLLINS & ASSOCIATES

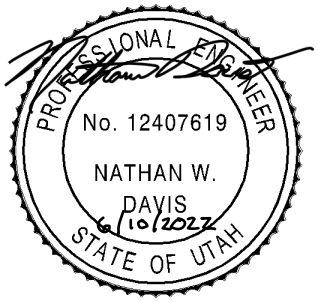
GRANGER HUNTER IMPROVEMENT DISTRICT SEWER MASTER PLAN

JUNE 2022

GRANGER HUNTER IMPROVEMENT DISTRICT

SEWER MASTER PLAN

JUNE 2022



Prepared for:

GRANGER-HUNTER
IMPROVEMENT DISTRICT

Prepared by:

BOWEN COLLINS & ASSOCIATES

TABLE OF CONTENTS

TABLE OF CONTENTS
(continued)

Page No.

TABLE OF CONTENTS
(continued)

LIST OF APPENDICES

LIST OF TABLES

TABLE OF CONTENTS
(continued)

LIST OF FIGURES

CHAPTER 1
INTRODUCTION

The Granger-Hunter Improvement District (GHID or District) desires to develop an updated master plan for its sewer collection system in order to adequately plan for the future. This sewer collection system master plan identifies recommended improvements that resolve existing and projected future deficiencies in the collection system throughout the District's service area. Included in the plan is an Infrastructure Maintenance Plan that looks at future maintenance needs and funding levels. Finally, an Implementation Plan is presented to plan for and complete the most pressing projects over the next ten years.

BACKGROUND

The primary previous master planning document addressing the needs of the water system is:

- *Wastewater Collection System Master Plan – Prepared by Hansen, Allen & Luce, January 2016*

This document has been used as a starting point for this analysis. However, it has been augmented by additional data and new information collected by the District over the last several years. All analysis contained in this master plan supersedes the information contained in the previous master plan document.

SCOPE OF SERVICES

The general scope of this project involved a thorough analysis of the District's sewer collection system and its ability to meet the present and future wastewater needs of its residents. As part of the Sewer Master Plan, Bowen Collins & Associates (BC&A) completed the following tasks.

- **Task 1:** Collect information as needed to develop the sewer master plan based on the District's existing facilities, known developments, and current and potential future land use for the District.
- **Task 2:** Update population projections and estimated growth in sewer flow to evaluate future growth needs.
- **Task 3:** Update the District's hydraulic computer model of the sewer collection system to evaluate existing and projected future system deficiencies. This includes a calibration check using the District's treatment plant flow data.
- **Task 4:** Identify existing and projected future operating deficiencies and evaluate improvements to resolve these issues.
- **Task 5:** Develop an Infrastructure Maintenance Plan. This report examines the condition and need for replacement of the District's sewer assets, including a pipeline analysis based on the District's PACP inspections which is used to develop an ongoing maintenance plan. This maintenance plan is used to recommend an annual maintenance budget.
- **Task 6:** Develop an Implementation Plan. Based on the results of the analysis discussed in the tasks above, this report develops an implementation plan for budgeting and planning purposes. This includes consideration of growth, maintenance, and asset management issues. This plan is detailed for projects needed in the next 10 years and generalized for the following 10 years to allow for adjustments as needed.

REPORT ASSUMPTIONS

As a long-term planning document, this report is based on a number of assumptions relative to future growth patterns, service area expansion, and source availability. Of special significance to the District are a number of assumptions relative to wastewater flows associated with development densities and the impact of conservation throughout the District. If any variables are significantly different than what has been assumed, the results of this report will need to be adjusted accordingly. Because of these uncertainties, this report and the associated recommendations should be updated every five to ten years or sooner if significant changes occur such as annexation or changes in development patterns.

Of particular importance to the District is the largest undeveloped parcel remaining in the southwest corner of the service area, currently owned by Northrup Grumman Innovation Systems LLC. Previous and current planning documents, including projections by WFRC and those contained in this document, assume that this property will remain zoned as it currently is and will not require wastewater service from the District. Should this assumption change at any point in the future, a new study will need to be completed to determine if the District has capacity to serve this area.

CHAPTER 2
FUTURE GROWTH AND FLOW PROJECTIONS

There are several methods that can be used to estimate future wastewater flows. This study developed flow projections using equivalent residential connections (ERCs). The methodology of this approach can be summarized as follows:

1. Define the service area
2. Project both residential populations and non-residential growth for the service area based on existing and projected patterns of development
3. Project equivalent residential connections (including non-residential growth) for the service area based on existing and projected patterns of development
4. Estimate the contribution of various wastewater flow components including domestic flow, infiltration, inflow and other contributions of wastewater on a per equivalent residential connection basis.
5. Convert projections of equivalent residential connections to wastewater flows based on their historic contributions.

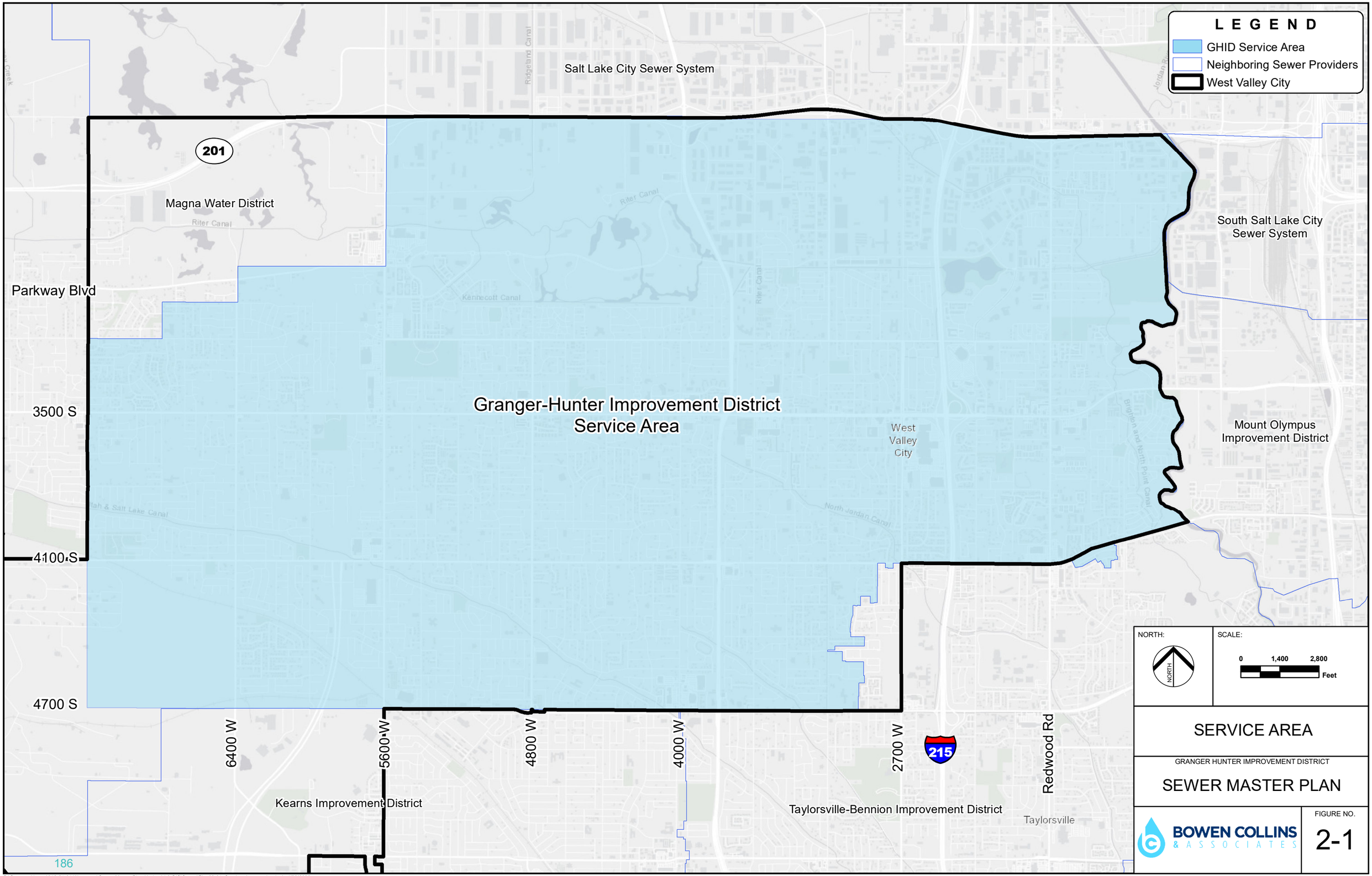
Each step of this process is summarized in the sections below.

SERVICE AREA

Granger-Hunter Improvement District currently provides all sewer collection service within its defined service area as shown in Figure 2-1. The service area incorporates a large portion of West Valley City, but not all. There are no known service area expansions planned at this time.

PROJECTED GROWTH

There are a number of planning agencies that produce growth estimates covering the area included in the Granger-Hunter Improvement District: the State of Utah Governor's Office of Planning and Budget (GOPB), the Kem C. Gardner Policy Institute, and the Wasatch Front Regional Council (WFRC). The first two agencies generally plan on a county or state level. As a result, planning estimates at those scales are often unhelpful for service district's because boundaries often do not line up with service district boundaries. The WFRC does planning on a smaller scale as a result of needing to conduct traffic modeling of future conditions. The WFRC develops traffic analysis zones (TAZ) that include sub-areas that include residential and employment projections divided into relatively small areas representative of collector roads. As a result, the WFRC projections are more helpful than State of Utah estimates for projecting rates of growth for population and employment growth for service districts.



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Existing Service Area Population Growth

BC&A reviewed the most recent WFRC TAZ projections for the Granger-Hunger Improvement District service area. The existing population estimates and growth rate for each TAZ within the District were then used to help define the rate of growth for the existing service area through the year 2050. The WFRC does not have population projections beyond the year 2050, so the rate of growth was extrapolated through 2060 based on the 2050 growth rate for the existing service area.

The WFRC TAZ projections show a slow and fairly steady average growth rate of 0.3% over the next 40 years. Table 2-1 and Figure 2-2 identify the TAZ population projection for the District service area.

Table 2-1
TAZ Population Projections for GHID

Year	GHID Population	Rate of Growth
2021	132,107	
2026	133,320	0.2%
2031	134,121	0.1%
2036	135,477	0.2%
2040	136,636	0.2%
2045	138,124	0.2%
2050	140,590	0.4%
2055	143,224	0.4%
2060	145,858	0.4%

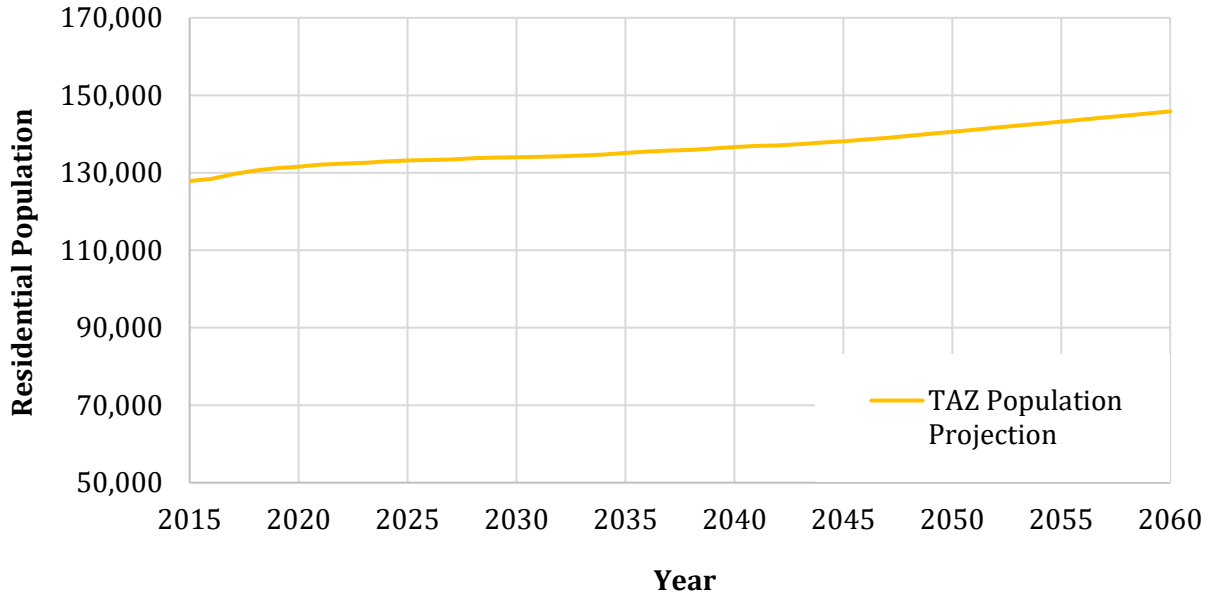
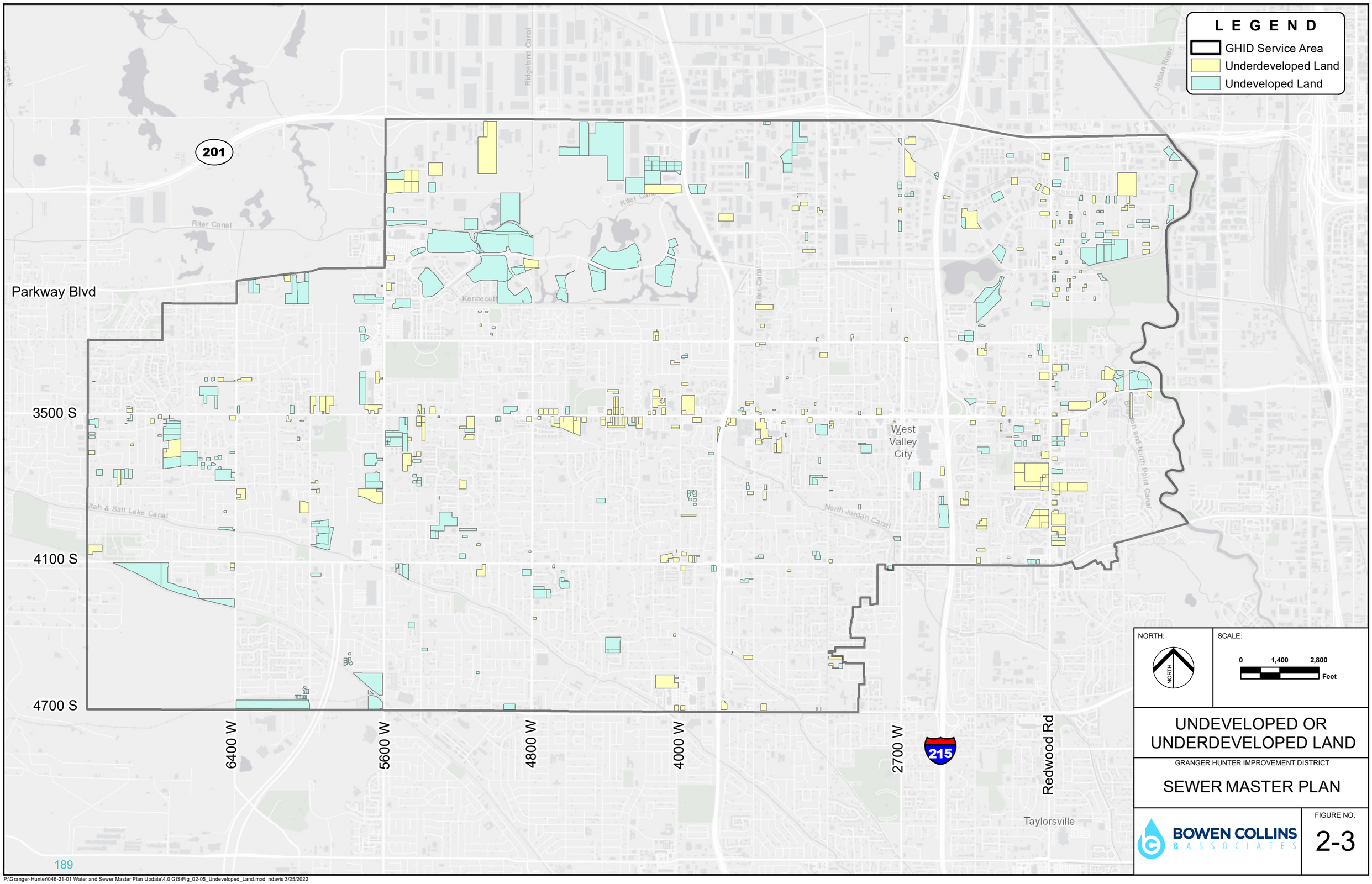


Figure 2-2 TAZ Population Projections

Impacts of Increasing Densities

While useful in many circumstances, TAZ population projections can be more conservative than how areas actually develop, especially where significant redevelopment is occurring. This appears to be the case in GHID where TAZ projections of density are well below recent observed development trends in some areas. The District has observed an increase of housing density in recent developments, which has increased its overall growth rate.

BC&A has taken this increased density into account and provided a second estimate for population growth over the next 40 years. A large portion of the District's service area is built out, with smaller parcels available for development rather than large, open sections of land. In addition, as portions of the area age, redevelopment is occurring, typically at much higher densities than the original development. BC&A met with the West Valley City planning group to identify parcels that the City considers underdeveloped. These are parcels where the value of the existing development is significantly less than surrounding parcels and represent a prime opportunity for redevelopment. Undeveloped and underdeveloped parcels as identified by the City are shown in Figure 2-3. West Valley City also provided the City's land use map, which is shown in Figure 2-4.



UNDEVELOPED OR UNDERDEVELOPED LAND

GRANGER HUNTER IMPROVEMENT DISTRICT

SEWER MASTER PLAN

BOWEN COLLINS & ASSOCIATES

FIGURE NO. 2-3

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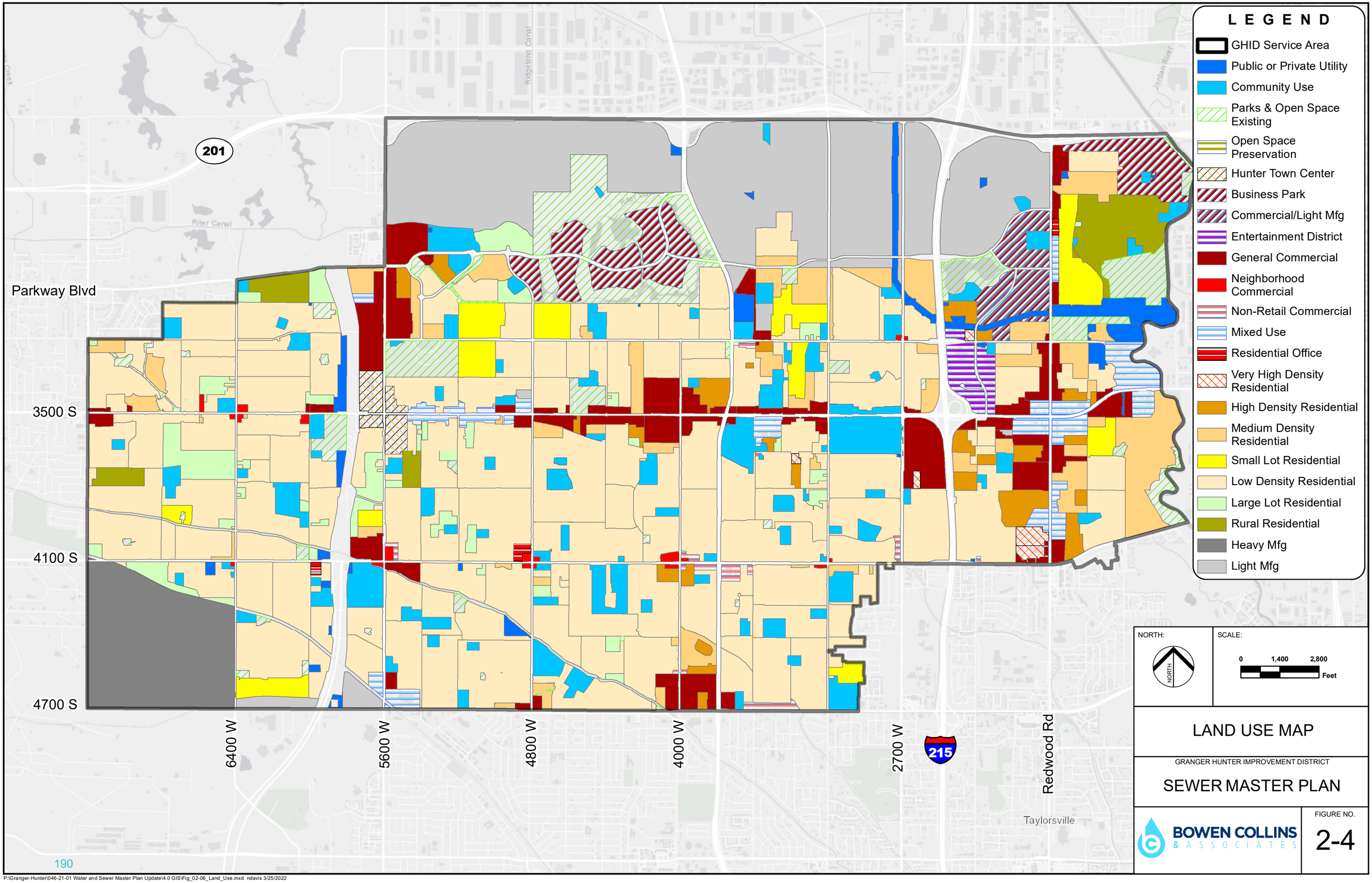

LAND USE MAP

GRANGER HUNTER IMPROVEMENT DISTRICT

SEWER MASTER PLAN

BOWEN COLLINS & ASSOCIATES

FIGURE NO. 2-4

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To estimate the potential density the District might see, BC&A examined the actual density of recent and/or planned redevelopment projects in the District. The District is aware of current plans for four developments of high density, summarized in Table 2-2.

Table 2-2
Recent Known Developments

	Area (acres)	Units	Density (units/acre)
Development A	2.79	219	78.5
Development B	27.18	450	16.6
Development C	13.56	430	31.7
Development D	3.59	200	55.7

Developments A & D are small parcels with very high densities that may not be representative of larger scale redevelopment. However, Developments B & C appear to be a reasonable representation of recent redevelopment in the area and what the District might expect in the future. As shown in the table, Developments B & C have an average density of 24.1 units/acre.

Using this value as a planning density, BC&A did an analysis of undeveloped & underdeveloped parcels in the District. It was determined that there is a combined nearly 680 acres that may develop or redevelop at higher density. Table 2-3 is a summary of this analysis. At a redevelopment density of 24.1 units/acre, the GHID service area could see an increase of 16,381 additional units of development (62,423 people at 3.81 persons per unit). In contrast, the TAZ growth projections identify a population increase of only 14,276 people. This higher amount of growth and the difference between these two projections is summarized in Table 2-4 and shown in Figure 2-5.

Table 2-3
High Density Population Analysis Summary

Potential High Density Undeveloped Parcel Area	446.9 acres
Potential High Density Underdeveloped Parcel Area	232.0 acres
Total Potential High Development Area	679 acres
Development Density	24.1 units/acre
Potential Connections	16,384 units
Population/Unit	3.81
Population	62,423 People

Table 2-4
Population Projections for Granger-Hunter Improvement District

Year	GHID TAZ Population	Rate of Growth	GHID Population with High Density Development	Rate of Growth
2021	132,107		133,878	
2026	133,320	0.2%	139,181	0.8%
2031	134,121	0.1%	142,683	0.5%
2036	135,477	0.2%	150,850	1.1%
2040	136,636	0.2%	160,631	1.3%
2045	138,124	0.2%	173,194	1.6%
2050	140,590	0.4%	182,777	1.1%
2055	143,224	0.4%	189,817	0.8%
2060	145,858	0.4%	194,005	0.4%

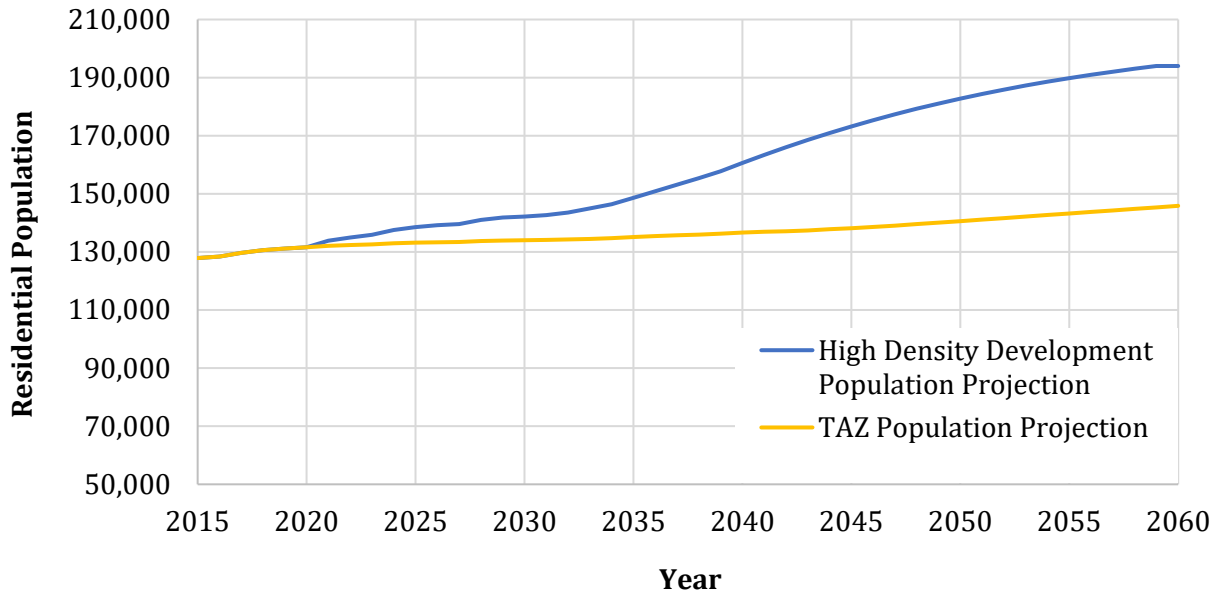


Figure 2-5 High Density Population Projections

Non-Residential Growth

In addition to population growth, it is important to look at non-residential growth coming from increased commercial and employment in the service area. The TAZ data is presented as the number of employees and is shown in Figure 2-6.

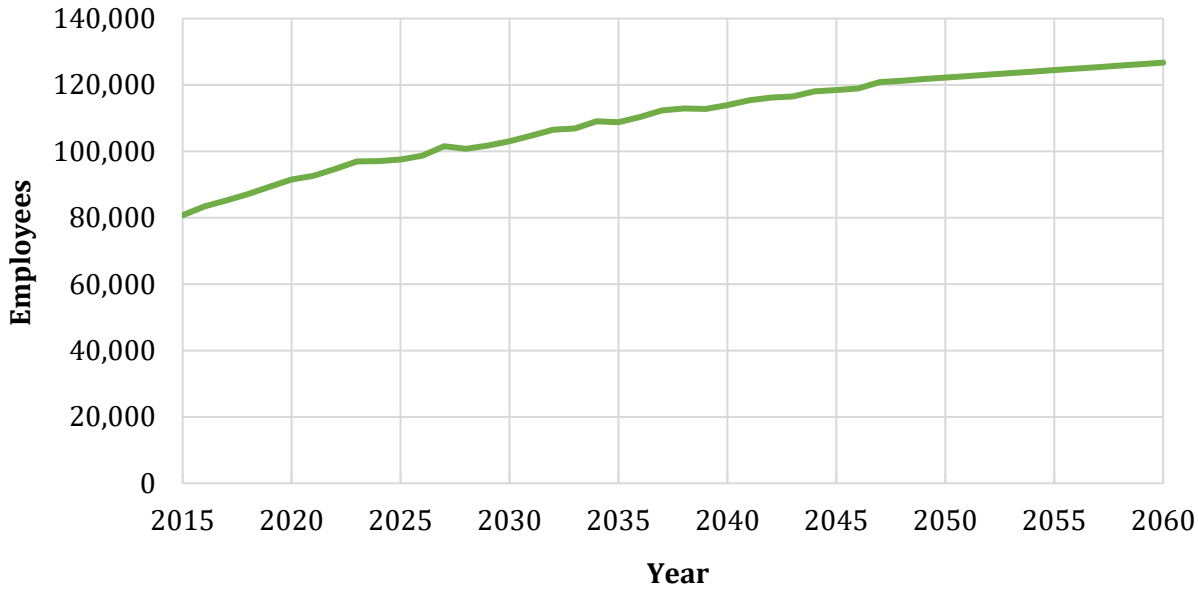


Figure 2-6 TAZ Employment Projections

EQUIVALENT RESIDENTIAL CONNECTIONS (ERC)

To be able to project sewer flows associated with both residential and non-residential growth, it is useful to define growth in terms of equivalent residential connections (ERCs). An ERC represents the amount of wastewater flow associated with an average, single-family residential unit.

- **Residential ERCs** – Calculation of residential ERCs from population growth projections is relatively straight forward. Based on WFRC estimates of the existing population within the District service area, the average persons per residential connection was calculated to be 3.81. Correspondingly, residential ERCs are calculated as projected population divided by 3.81.
- **Non-Residential ERCs** – Calculation of non-residential ERCs is a little more difficult. BC&A conducted an analysis of 2021 water billing data. Based on this analysis, estimated indoor water use was estimated to be approximately 190 gpd for residential connections (with an associated domestic wastewater production rate of approximately 181 gpd per connection). This value was divided into the metered indoor water use for non-residential connections to calculate the equivalent number of non-residential ERCs.

Based on these calculations, the estimated number of existing ERCs for 2017 was calculated to be 44,141. This value represents all existing domestic wastewater flows in the system. Future growth can be determined based on the projected densities and growth rates discussed in the previous section. For residential growth, the increase in ERCs has been based on projected population growth. For non-residential growth, the increase in ERCs has been based on projected employment growth.

Based on these calculations, growth projections were projected through 2060 and are detailed in Table 2-5.

Table 2-5
Equivalent Residential Connection Projections

Year	Low-Density Residential ERCs	High-Density Residential ERCs	Non-Residential ERCs	Total Low-Density ERCs	Total High-Density ERCs
2021	32,355	32,355	11,786	44,141	44,141
2026	32,853	34,882	12,489	45,342	47,371
2031	33,074	36,511	13,155	46,229	49,667
2036	33,364	38,473	13,847	47,211	52,319
2040	33,675	40,317	14,331	48,006	54,648
2045	34,070	42,689	14,975	49,045	57,664
2050	34,663	45,728	15,422	50,085	61,150
2055	35,354	49,024	15,695	51,049	64,719
2060	36,046	52,320	15,967	52,013	68,287

WASTEWATER COMPONENTS

Before projecting future growth in wastewater, one must first have an accurate understanding of wastewater flows. This includes an estimate of both the quantity and distribution of existing and future flows. Wastewater Flows can be grouped into three major components: domestic wastewater, infiltration, and inflow.

Domestic Wastewater

Domestic flow consists of the wastewater contributions of residential and nonresidential customers. While domestic flow varies significantly throughout the day, it is relatively consistent from month to month and its growth can be closely tied to the growth of development in the District. Correspondingly, estimating existing and projected domestic flows in the District is relatively straightforward. For this study, domestic flows have been estimated based on ERCs as defined previously. As discussed in the previous section, the approximate value for indoor water consumption was calculated to be 190 gallons per day per ERC with an estimated 181 gallons per day of domestic wastewater production per ERC. This equates to an estimated domestic flow of approximately 7.99 mgd in 2021.

Infiltration

The next component of wastewater flow that must be considered is infiltration. Infiltration is defined as water that enters into the sewer system which is not directly or indirectly related to either domestic wastewater or to a specific storm event. This flow can enter as a result of open pipe joints, cracks in pipes, pipes poorly connected at manholes, leaky lateral connections, roots, etc. Temporary increases in the amount of water that enters the system after a storm because of an increase in ground water or direct connection to collection lines will be considered as inflow (discussed next section).

Factors that can affect infiltration include pipe age, material, and number and condition of lateral connections. Age can contribute to infiltration in two ways. First, older pipes are more likely to be in poor conditions. Cracks, separated joints, and other defects can contribute significantly to increased infiltration. Second, older pipes do not have the benefit of improvements in construction techniques

that have occurred over time. Gasketed pipe joints, rubber boots at manholes and laterals, and other improvements have contributed greatly to reducing system infiltration over time.

Infiltration can be difficult to estimate because it can vary over time. Infiltration is generally a function of groundwater levels. Groundwater levels in the service area fluctuate depending on climate and season. Infiltration rates will correspondingly change seasonally and from year to year depending on climate.

To account for these challenges, infiltration must be estimated by looking at long-term flow trends. Table 2- and Figure 2-7 show the average wastewater flow at the District's CVWRF flow meter from 2015 through 2020. Included in the figure is a breakdown of flow between domestic and infiltration flows, as well as recorded precipitation. Domestic flows have been estimated as described previously. Infiltration correspondingly becomes the difference between total flow and the flow accounted for through other components.

Table 2-6
Wastewater Influent by Month and Year

Month	2015	2016	2017	2018	2019	2020
January	11.4	12.9	14.6	11.8	11.9	12.5
February	11.1	13.4	14.6	11.8	13.4	13.8
March	11.3	13.4	14.9	13.1	14.3	13.0
April	12.1	13.4	15.4	13.0	15.8	12.8
May	14.8	13.3	14.0	12.9	14.8	12.7
June	12.5	12.8	12.9	11.9	13.2	12.3
July	12.9	11.9	12.3	11.1	11.9	10.1
August	12.6	12.0	12.2	10.9	11.6	9.8
September	12.5	12.2	12.2	10.6	11.5	10.0
October	12.1	11.7	12.0	11.2	11.4	10.9
November	11.8	12.1	11.7	10.8	11.2	10.8
December	12.2	12.9	11.6	11.3	12.3	11.5
Average Day	*12.3*	*12.7*	*13.2*	*11.7*	*12.8*	*11.7*
Max Month	*14.8*	*13.4*	*15.4*	*13.1*	*15.8*	*13.8*

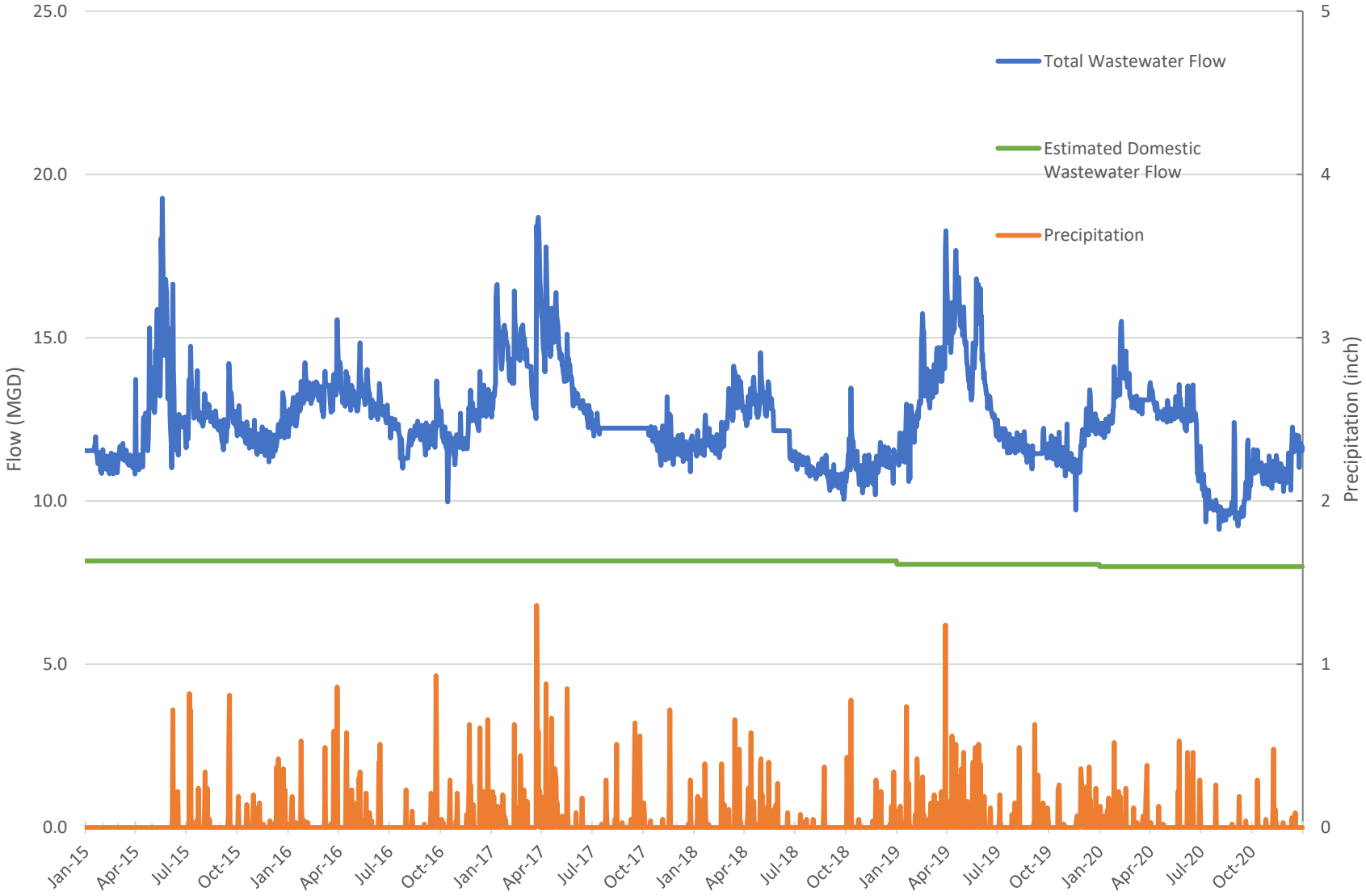


Figure 2-7 Historic Wastewater Flows & Precipitation

As can be seen in the figure, flows to the treatment plant in winter months (December, January, February) are approximately 3 to 5 mgd lower than peak times of the year when flow approaches 18 mgd. These peak flows are also approximately 6 to 8 mgd higher than the estimated domestic wastewater flows. Based on this analysis, the max month planning infiltration was estimated to be approximately 8 mgd for existing conditions. This value represents significant infiltration equal to almost 100% of estimated domestic wastewater flows. However, this is consistent with observed data and estimates from past master plans.

Inflow

Similar to infiltration, inflow is also the intrusion of unwanted water into the sewer system. In the case of inflow, however, this water comes from rainfall and snowmelt instead of groundwater. Inflow may enter the sewer system through roof and foundation drains, yard and area drains, manhole covers, and illicit storm drain connections. In the case of the assorted roof and yard drains, discharge into the sanitary system is against District ordinances. However, illegal connections often exist and can significantly affect the performance of the sewer system.

Inflow into a collection system can be highly variable and depends on the placement and construction of sewer collection systems as well as the type of storm events that occur. In addition, a long record of rainfall and flow monitoring data is needed to accurately predict how storm events may impact the District's collection system. Thus, no inflow is specifically shown in the projections used in this report. Instead, inflow is accounted for in the sewer master plan by reserving a portion of capacity in pipelines. In other words, a pipe will be identified as having inadequate capacity at projected flows less than the full flow capacity of the pipe. For this master plan, a 25 percent capacity buffer for all pipes will be used. This buffer provides capacity for inflow and other unusual flow events when sewer production may peak (e.g. Super Bowl, holidays, etc.).

WASTEWATER GROWTH PROJECTIONS

With the contribution of each type of flow identified and growth in the District projected through the planning window, it is possible to project future wastewater flows in the District as follows:

- **Domestic Flow** – The projected domestic flow in future years can be estimated as the number or ERCs in that year times the average observed domestic flow per ERC (181 gallons per day)
- **Infiltration** – Although future infiltration will be a function of many different variables (water table, pipe depth, pipe diameter, pipe length, construction materials, etc), projections of future infiltration have been simplified by assuming a specific amount of infiltration per growth in population or ERCs. For planning purposes, it is assumed that future infiltration will increase at a rate of approximately 33 gallons per day for each added equivalent residential connection. It will be noted that this is significantly less than estimates of existing infiltration (177 gallons per day per ERC). Future infiltration is anticipated to be less than historic infiltration due to improvements in construction materials and technologies. The estimate for future development is based on recommended infiltration allowances for current construction materials and methods and average development density in the District.

Based on these projections, Table 2-, Table 2- and
Figure 2-8 show the expected growth in wastewater flows in the District through the year 2060 for both the low-density and high-density planning scenarios.

Table 2-7
Low-Density Projected Wastewater Flows

Year	District Area ERCs	Domestic Wastewater (mgd)	Max Month Infiltration (mgd)	Total Max Month, Average Day Flow (mgd)
2021	44,141	7.99	7.80	15.79
2026	45,342	8.45	7.84	16.29
2031	46,229	8.61	7.87	16.47
2036	47,211	8.78	7.90	16.68
2040	48,006	8.93	7.93	16.86
2045	49,045	9.12	7.96	17.08
2050	50,085	9.30	8.00	17.30
2055	51,049	9.48	8.03	17.51
2060	52,013	9.65	8.06	17.71

Table 2-8
High-Density Projected Wastewater Flows

Year	District Area ERCs	Domestic Wastewater (mgd)	Max Month Infiltration (mgd)	Total Max Month, Average Day Flow (mgd)
2021	44,141	7.99	7.80	15.79
2026	47,371	8.57	7.91	16.48
2031	49,667	8.99	7.98	16.97
2036	52,319	9.47	8.07	17.54
2040	54,648	9.89	8.15	18.04
2045	57,664	10.44	8.25	18.68
2050	61,150	11.07	8.36	19.43
2055	64,719	11.71	8.48	20.19
2060	68,287	12.36	8.60	20.96

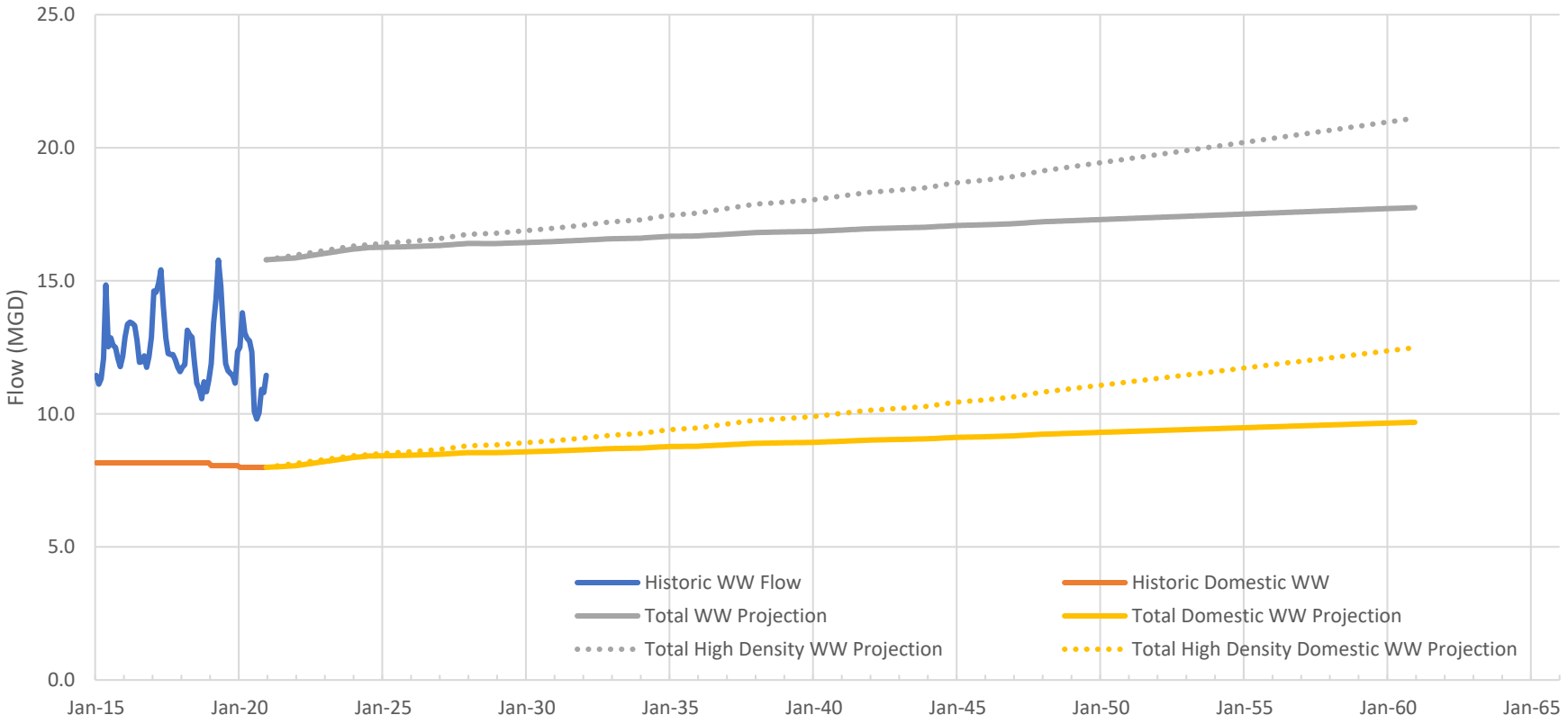


Figure 2-8 Max Month Projected Wastewater Flows

CHAPTER 3
EXISTING SYSTEM FEATURES

INTRODUCTION

As part of this Master Plan, BC&A has assembled an inventory of existing infrastructure within the sewer collection system. The purpose of this chapter is to present a summary of the inventory of the District's existing sewer collection system that can be used as a reference for future studies.

SERVICE AREA

Granger-Hunter Improvement District provides all wastewater services within its defined service area as shown previously in Chapter 2. The service area incorporates a large portion of West Valley City, but not all. In 2021, this equated to an approximate GHID service population of 132,000 permanent residents. In addition to permanent residents, the District also serves many commercial, industrial, and institutional entities.

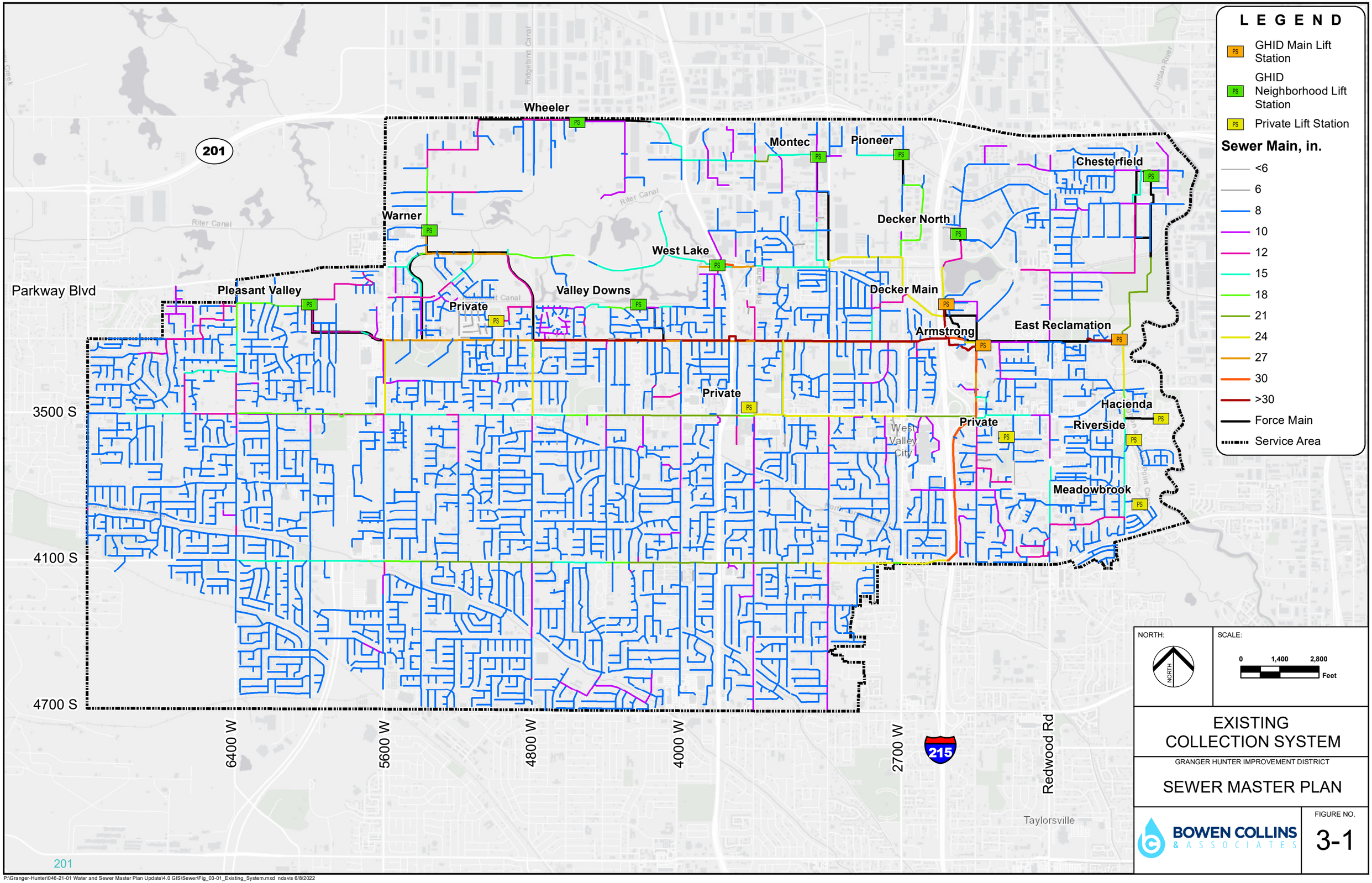
TOPOGRAPHY

The Granger-Hunter Improvement District existing service area is approximately 24.7 square miles and is bordered by the following sewer service providers: Magna Water District, Salt Lake City Sewer System, South Salt Lake City Sewer System, Mount Olympus Improvement District, Taylorsville-Bennion Improvement District, and Kearns Improvement District.

The topography of the District generally slopes from south to north and west to east, however grades are quite modest. Wastewater is conveyed by gravity and lift stations to the District's three main lift stations (Armstrong, Decker Main, and East Reclamation), where it is pumped to the Central Valley Water Reclamation Facility located at 800 West Central Valley Road, South Salt Lake City, UT.

COLLECTION SYSTEM

A map of the GHID sewer system is shown in Figure 3-2. Major attributes of the various components of the collection system are summarized in the following sections.



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SEWER COLLECTION PIPES

There are about 338 miles of sewer mains and over 8,100 manholes in the Granger-Hunter Improvement District sewer system that are cataloged in the GIS database. Table 3-1 contains a summary of the sewer pipes for the GHID sewer collection system. As can be seen in the table, nearly 80 percent of the pipe in the system is 8 inches in diameter or smaller. This represents the vast network of small collection mains in neighborhoods throughout the District.

Table 3-1 Sewer Collection System Sizes and Lengths

Diameter	Length (ft)	Length (mi)	Percentage
Unknown	814	0.2	0.0%
6	15,917	3.0	0.9%
8	1,405,584	266.2	78.9%
10	116,022	22.0	6.5%
12	59,267	11.2	3.3%
15	53,370	10.1	3.0%
18	25,632	4.9	1.4%
21	22,837	4.3	1.3%
24	28,078	5.3	1.6%
27	22,016	4.2	1.2%
30	12,930	2.4	0.7%
36	1,399	0.3	0.1%
42	727	0.1	0.0%
48	16,365	3.1	0.9%
54	705	0.1	0.0%
Total	**1,780,959**	**337.4**	**100%**

COLLECTION SYSTEM CONNECTIVITY

The District's collection system has many locations where multiple outlets may be possible from a single manhole. Flow directions for pipes were identified by District personnel as part of a previous study and were used for this study as well, as directed by GHID staff.

LIFT STATIONS

There are several areas within the District's boundaries that require sewer lift stations due to elevation challenges:

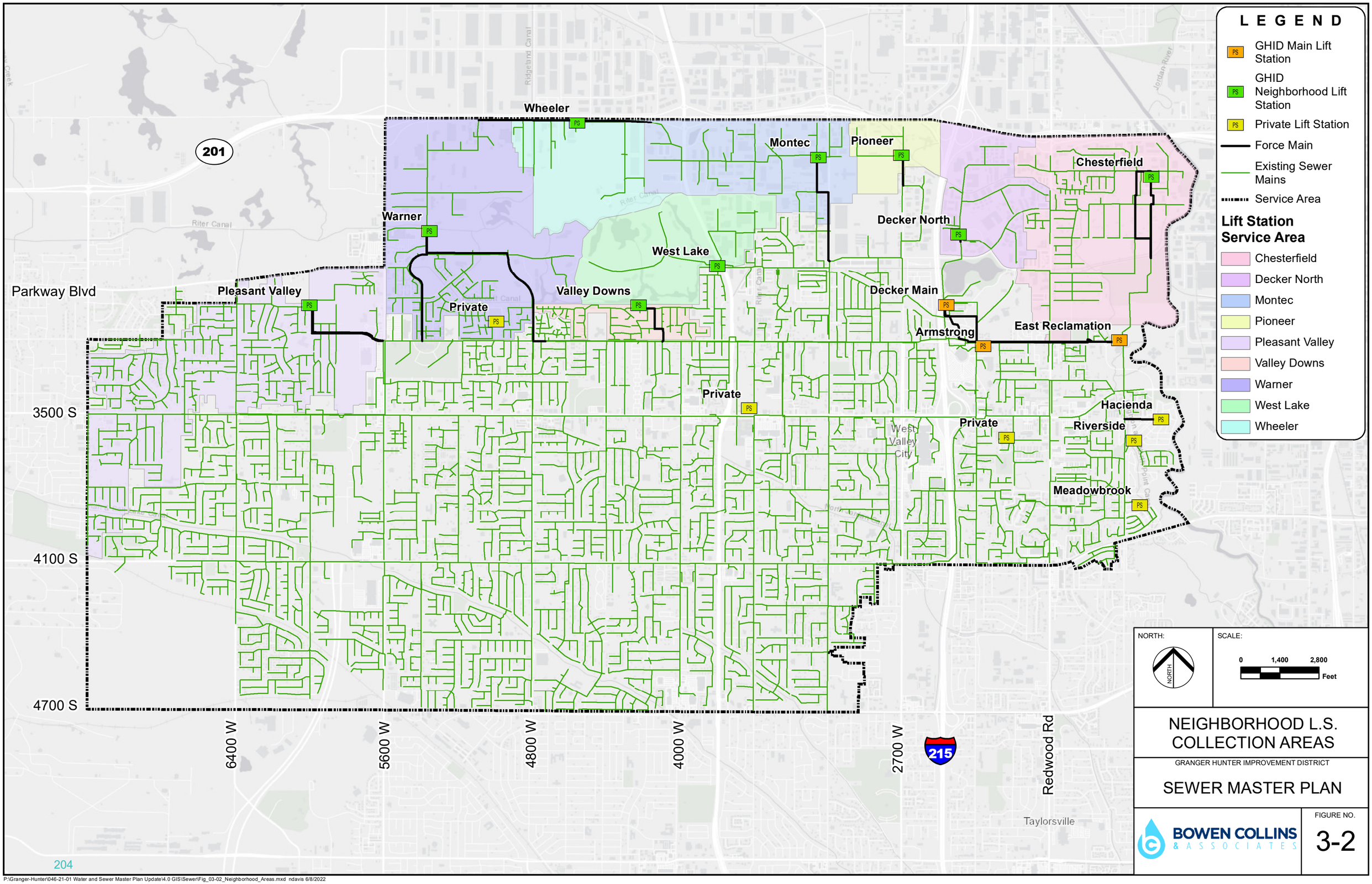
- The District has nine neighborhood lift stations that collect sewer flows from regional areas and then discharge within the District's boundaries. These contributing areas are shown in Figure 3-2.
- Within the District's service area, there are several private lift stations. The District has no responsibility for these private facilities, however three are included for modeling purposes.

- The District has three main lift stations. All sewer flows within the service area flow to one of these three main lift stations: Armstrong, Decker Main, and East Reclamation. Flows into these lift stations include areas that have already passed through one of the smaller neighborhood lift stations. Each of the main lift stations discharge to a pipeline near the Acord Water Pump Station on Rosa Parks Drive, where flows are then conveyed to the CVWRF. The contributing areas for the three main lift stations are shown in Figure 3-3.

Table 3-2 provides a summary of the District's lift stations.

Table 3-2 Lift Station Summary

Name	Type	Pumps	Rated Capacity (gpm)	Force Mains Size (in) / Length (ft)
Armstrong	Main	(4) @ 5,000 gpm (VFD)	15,000	24" / 3,985' 36" / 3,985'
Chesterfield	Neighborhood	1,000 gpm (VFD) 1,000 gpm (VFD)	1,000	12" / 3,075' 12" / 4,445'
Decker Main	Main	(4) @ 5,000 gpm (VFD)	15,000	24" / 6,335' 24" / 6,585'
Decker North	Neighborhood	1,200 gpm 1,200 gpm	1,200	8" / 220'
East Reclamation	Main	(3) @ 2,000 gpm (VFD)	4,000	12" / 1,285' 12" / 1,285'
Hacienda	Private	250 gpm 250 gpm	250	6" / 1,315'
Meadowbrook	Private	350 gpm 350 gpm	350	Unknown
Montec	Neighborhood	1,100 gpm (VFD) 1,100 gpm (VFD)	1,100	8" / 4,205'
Pioneer	Neighborhood	500 gpm 500 gpm	500	10" / 1,145'
Pleasant Valley	Neighborhood	500 gpm 500 gpm 1,500 gpm (VFD)	1,000	12" / 3,665' 12" / 3,665'
Riverside	Private	Unknown	Unknown	8" / 30'
Valley Downs	Neighborhood	400 gpm 400 gpm	400	8" / 2,165'
Warner	Neighborhood	(3) @ 1,800 gpm (VFD)	3,600	12" / 4,655' 12" / 7,685'
West Lake	Neighborhood	1,200 gpm 1,200 gpm	1,200	8" / 60'
Wheeler	Neighborhood	650 gpm 650 gpm	650	8" / 2,335' 8" / 2,610'



NEIGHBORHOOD L.S. COLLECTION AREAS

GRANGER HUNTER IMPROVEMENT DISTRICT

SEWER MASTER PLAN

BOWEN COLLINS & ASSOCIATES

FIGURE NO. 3-2

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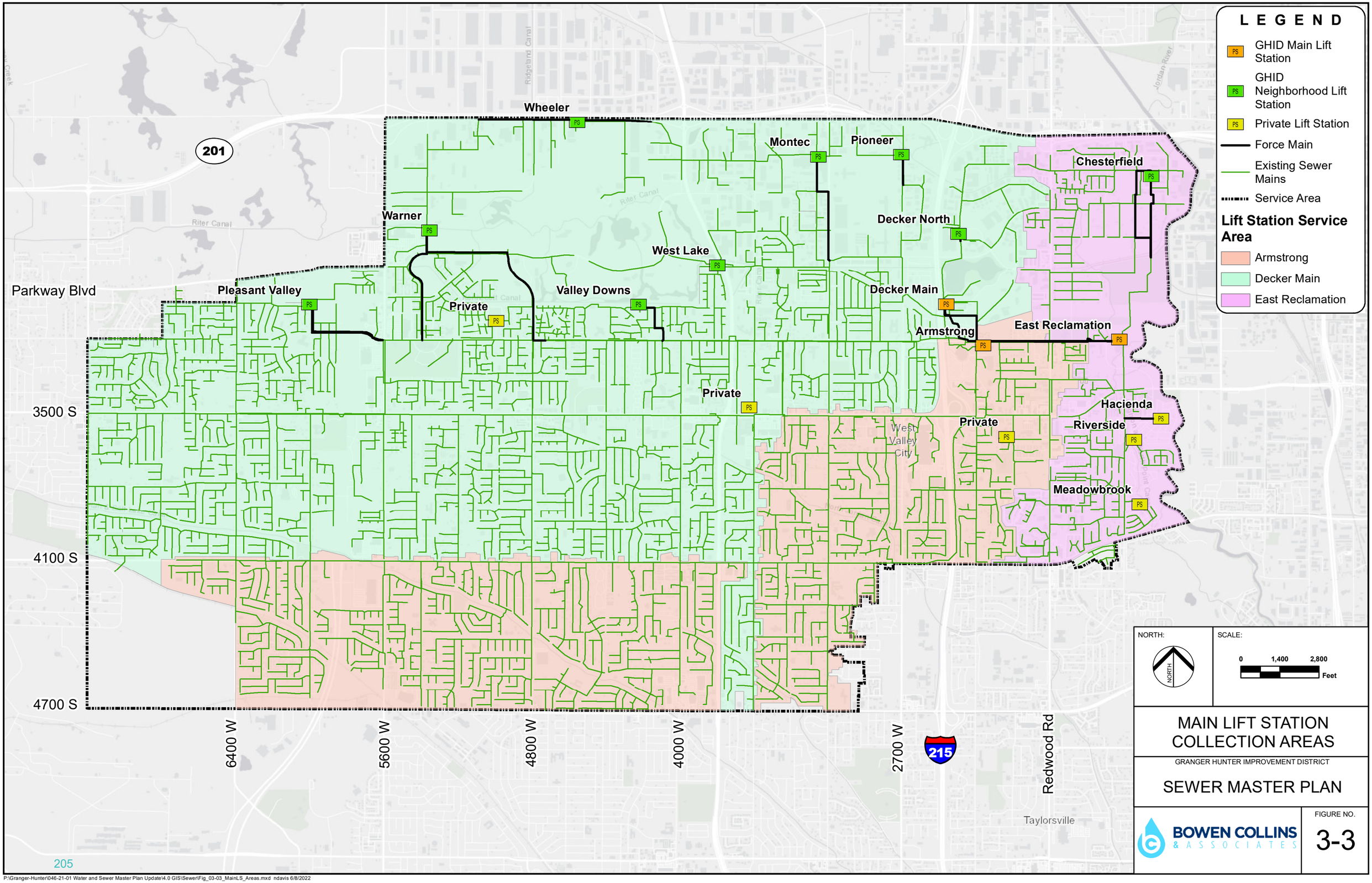

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CHAPTER 4
HYDRAULIC MODELING

INTRODUCTION

A critical component in evaluating performance of the District collection system is the use of a hydraulic computer model. The District has an existing model that is an extended period simulation (EPS) hydraulic model developed in the Autodesk Storm and Sanitary Analysis (SSA) software.

GEOMETRIC MODEL DATA

There are two major types of data required to develop a hydraulic model for a sewer system: geometric data and flow data. Geometric data consists of information on the location and size of system facilities including pipes, manholes, and lift stations. It also includes the physical characteristics of the facilities including pipe roughness, invert elevations at manholes, pump settings in lift stations, and a description of any diversions present. This information is generally collected from system inventory data or through direct field measurement. The following sections describe how geometric data was assembled for use in the hydraulic model.

PIPELINE AND MANHOLE LOCATIONS

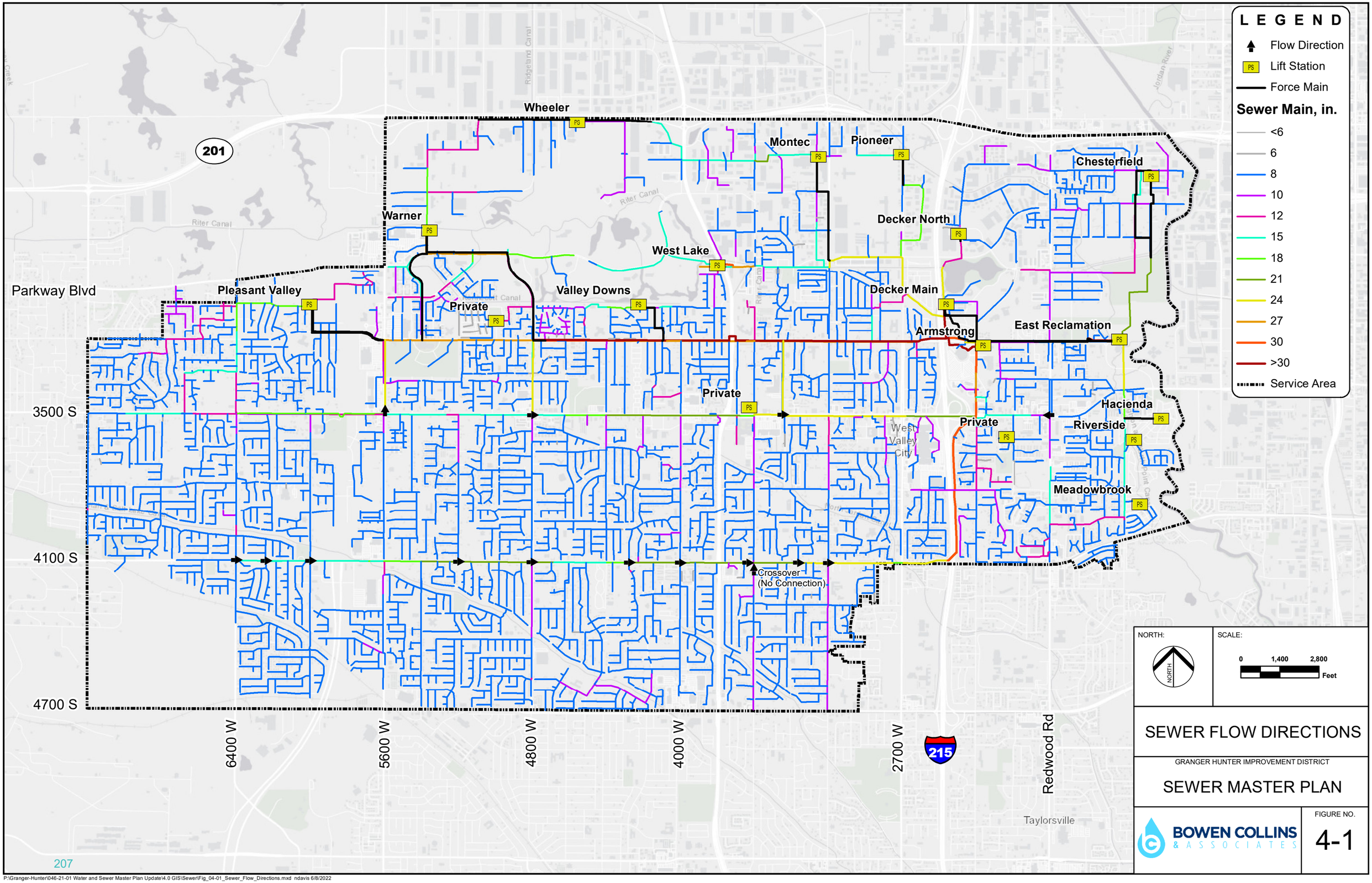
The District has maintained a GIS inventory of its existing sewer facilities. That database includes information on the location and size of manholes and pipelines in the District collection system. The District has used this information previously to create the hydraulic model and the model's characteristics are described in the following sections.

Pipe Flow Coefficients

Pipes throughout the hydraulic model are assigned a Manning's flow coefficient of 0.013. This is approximately equal to the flow coefficient of concrete and clay pipe. While there are other materials in the system with lower published flow coefficients (e.g. PVC), 0.013 was used throughout the system as a conservative approach for estimating pipe capacity. In addition, most collection pipes develop thin layers of bacteria and solids (a slime layer) over time that result in relatively similar flow coefficients between pipes despite varying materials.

Overflows/Diversions

There are a number of manholes that have two potential flow directions based on the available invert information provided by the District. These manholes were reviewed as part of a previous study and the flow routing determined as part of that study is used in the District's current model. The location and primary flow direction of the manholes that have potential overflows are shown in Figure 4-1. These potential overflows were identified so that the hydraulic model would correctly simulate the proper flow path for wastewater through the collection system. It is recommended that the District verify the correct routing prior to updating the model in the future, as this can have large impacts on flows in the collection system.



NORTH:

SCALE: 0 1,400 2,800 Feet

SEWER FLOW DIRECTIONS

GRANGER HUNTER IMPROVEMENT DISTRICT

SEWER MASTER PLAN

BOWEN COLLINS & ASSOCIATES

FIGURE NO. 4-1

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Sediment and Debris

Because of the transportable nature of grease and debris in a sewer collection system, it is not possible to identify the exact location and quantity of grease or debris accumulation in the system for any specific point in time. Similarly, the build-up and erosion rates of sediment in sanitary sewer systems are not always well understood. As a result, the detailed modeling of sediment, grease, and debris on a system wide basis is not possible because of continually changing conditions. Therefore, no sediment was included in the various runs of the hydraulic model. Instead, the design and evaluation criteria for the district collection system is based on "clean" pipes, with an allowance for capacity lost to the accumulation of sediment (See Chapter 5).

It should be noted that the hydraulic modeling software used to simulate the operation of the District wastewater collection system does have the ability to set sediment depth in pipes. Therefore, if the District does collect detailed sediment data for a given section of pipe, the sediment may be added to the model and its effects evaluated. However, it should be emphasized that any sediment levels defined today will change in the future as flow conditions change.

FLOW DATA

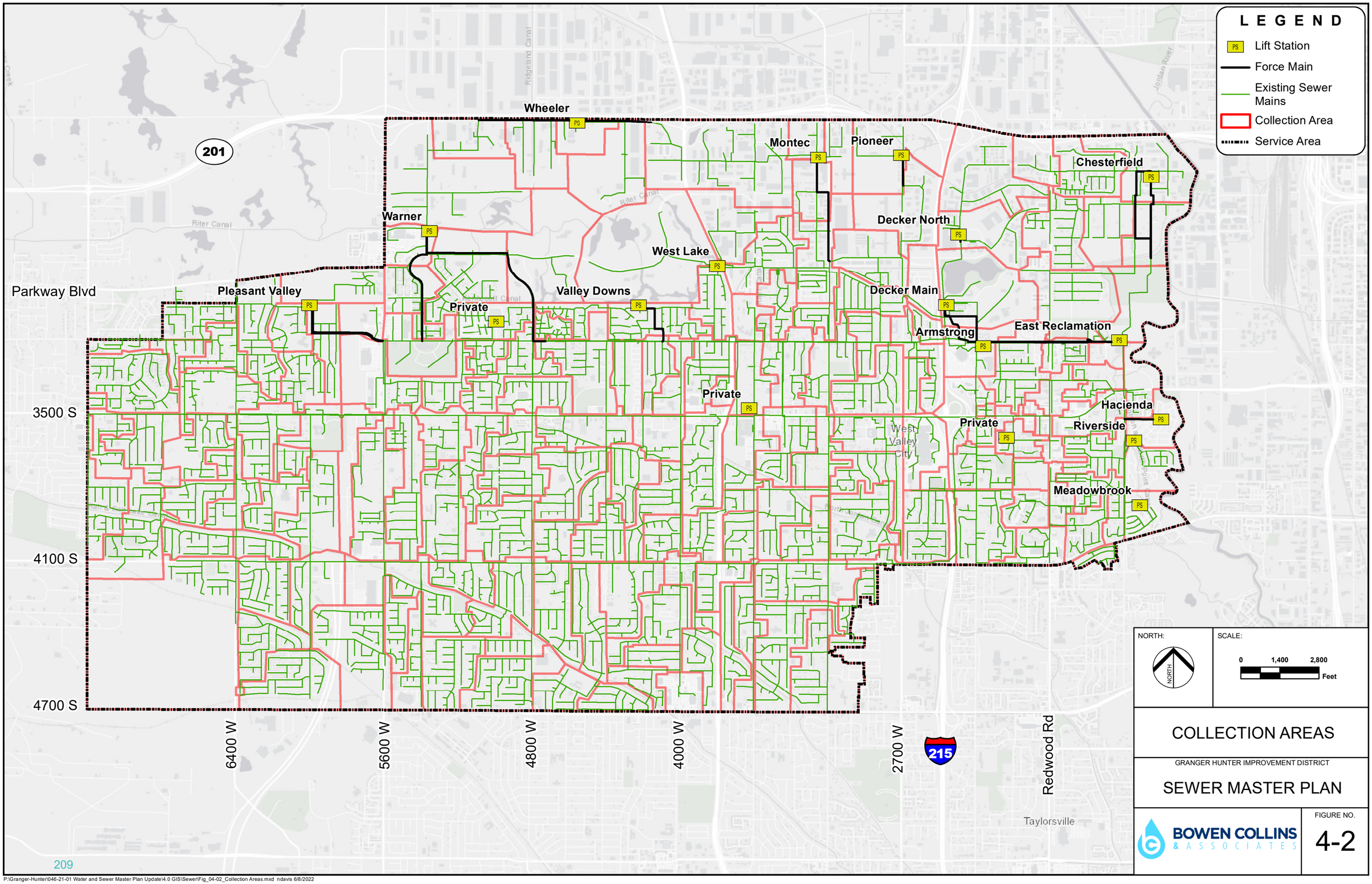
Once all required geometric data is verified in the developed model of the system, flow data is used to model the system hydraulics. Three types of flow information are required for hydraulic modeling: domestic wastewater magnitude and distribution, domestic wastewater flow timing, and infiltration magnitude and distribution. Each of these flow characteristics is discussed below.

Domestic Wastewater Magnitude & Distribution

The total magnitude of domestic wastewater was discussed in detail in Chapter 2. Distribution of these domestic flows was as follows:

- For existing conditions, domestic flows were previously distributed in the calibrated model provided by the District for this project. This distribution was based primarily on metered indoor water use. For typical connections, indoor water use is closely related to domestic wastewater production. While this is not exactly true for highly consumptive uses such as food processing/bottling, it is representative of most other uses.
- For future flows, areas were defined and used to assign flows associated with growth to specific manholes. Figure 4-2 shows the collection areas that were used for future flow distribution.

The District's existing model includes a majority of the District's pipes. However, flows were distributed only to major trunklines, such that not every neighborhood pipeline includes flows. District staff directed BC&A to continue this method for this study. The District recently worked with a separate consultant to develop rough estimates for flows on all of the neighborhood pipes using a GIS based method. A copy of these results are included in the Appendix for reference.



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Domestic Wastewater Timing

The pattern of fluctuating domestic water use is often referred to as a diurnal pattern. These patterns vary depending on the type of user, and the District has developed a typical residential pattern and a typical non-residential pattern. For residential customers, peak flows are generated during the morning hours as residents prepare for the day (including showers for one portion of the population). There is another peak in the early evening as residents return from work and clean up from the day (including showers for another portion of the population). Domestic sewer flows are generally lower throughout the remainder of the day and are just a trickle during the early morning hours when most residents are asleep. The District also has some commercial or non-residential users for which flow patterns can be different. For non-residential customers, wastewater production in fairly consistent throughout all waking hours of the day, but also drop substantially during the early morning hours when most businesses are closed. Figure 4-3 and Table 4-1 show the two diurnal patterns used in the District's hydraulic model.

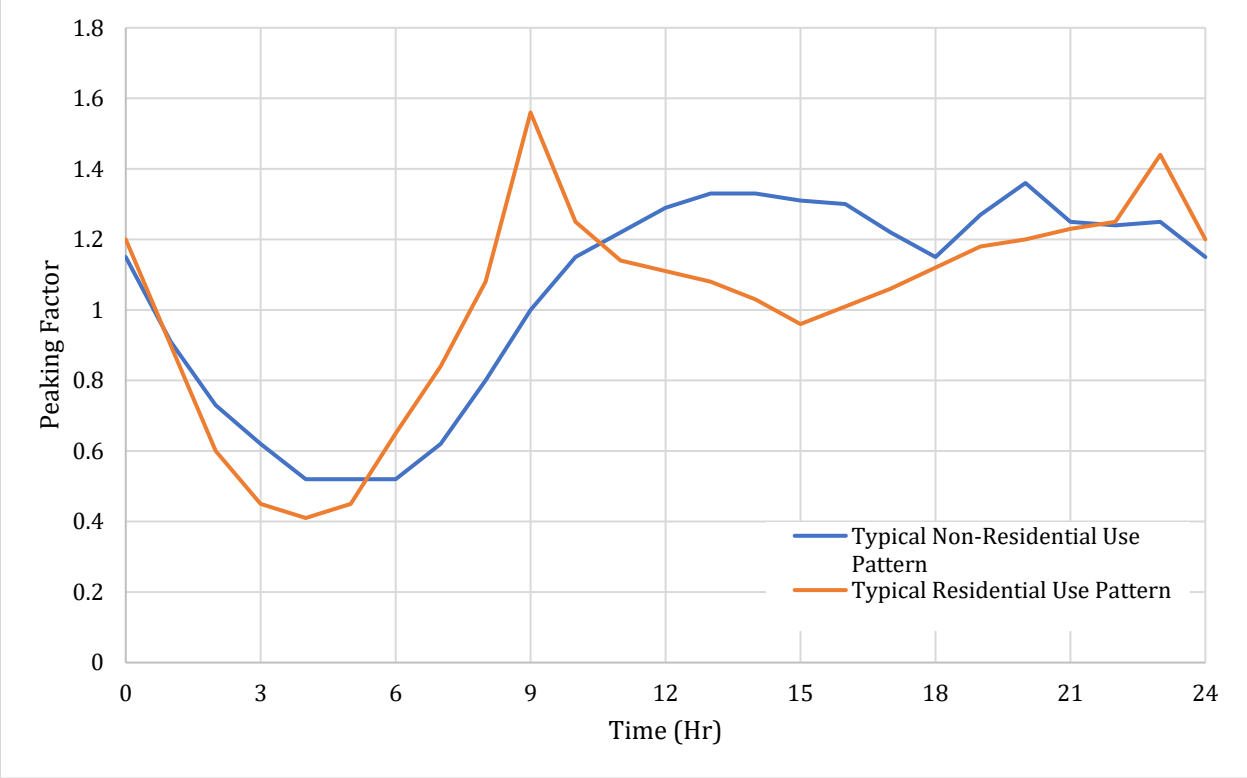


Figure 4-3 Diurnal Patterns Applied to Hydraulic Model

Table 4-1
Hydraulic Model Diurnal Pattern

Hour	Ratio of Average Day Flow	
	Non-Residential	Residential
0	1.15	1.2
1	0.91	0.9
2	0.73	0.6
3	0.62	0.45
4	0.52	0.41
5	0.52	0.45
6	0.52	0.65
7	0.62	0.84
8	0.8	1.08
9	1	1.56
10	1.15	1.25
11	1.22	1.14
12	1.29	1.11
13	1.33	1.08
14	1.33	1.03
15	1.31	0.96
16	1.3	1.01
17	1.22	1.06
18	1.15	1.12
19	1.27	1.18
20	1.36	1.2
21	1.25	1.23
22	1.24	1.25
23	1.25	1.44
24	1.15	1.2

Infiltration Magnitude & Distribution

For existing flows, infiltration was included in the calibrated distribution contained in the District's existing model. Unfortunately, this was not broken out from other flows which creates a bit of a challenge for modeling. As discussed in Chapter 2, infiltration may vary on a seasonal basis but does not generally vary on a daily basis. The existing model had flows distributed equal to average annual flow. For this study, the existing flows were scaled up to match the max month average day flow (to capture seasonal infiltration variation). This means that the model will predict slightly higher flows than seen throughout the year on average but will accurately represent flows during maximum infiltration periods. This is appropriate for infrastructure capacity analysis.

For future flows, growth of infiltration within the District was added to the future hydraulic model simulations at a rate of approximately 33 gpd per new connection. Infiltration is typically a function of pipe length, size, and depth, but can reasonably be represented on a per connection basis for future growth.

Collection System Inflow

For this study, inflow has not been modeled directly because of the wide variability in storm events and inflow response possible in the District. For design purposes, the District has included a capacity allowance in its design criteria to account for inflow into its collection system (see Chapter 5).

MODEL CALIBRATION

Additional detailed flow monitoring and re-calibration of the model is beyond of the scope of this study. However, model flows can be compared against the Central Valley flow meter to evaluate their accuracy. Figure 4-4 shows the District's average day model (both annual average and peak month, average day) compared to the CVWRF measured flow. In addition, the District has a portable temporary flow meter that they deployed during this project as part of data collection for other projects. Figure 4-5 shows a comparison of observed versus modeled flows this location on Parliament Avenue.

Based on the data collected from both these sources, it can be observed that the model generally follows the trend of metered flows but predicts slightly higher peak flows overall. This is as expected due to the model intending to represent a max month, average day flow. Based on the previous calibration and these comparisons, the model appears to be reasonably calibrated and can be used to making planning level decisions as part of this master plan.

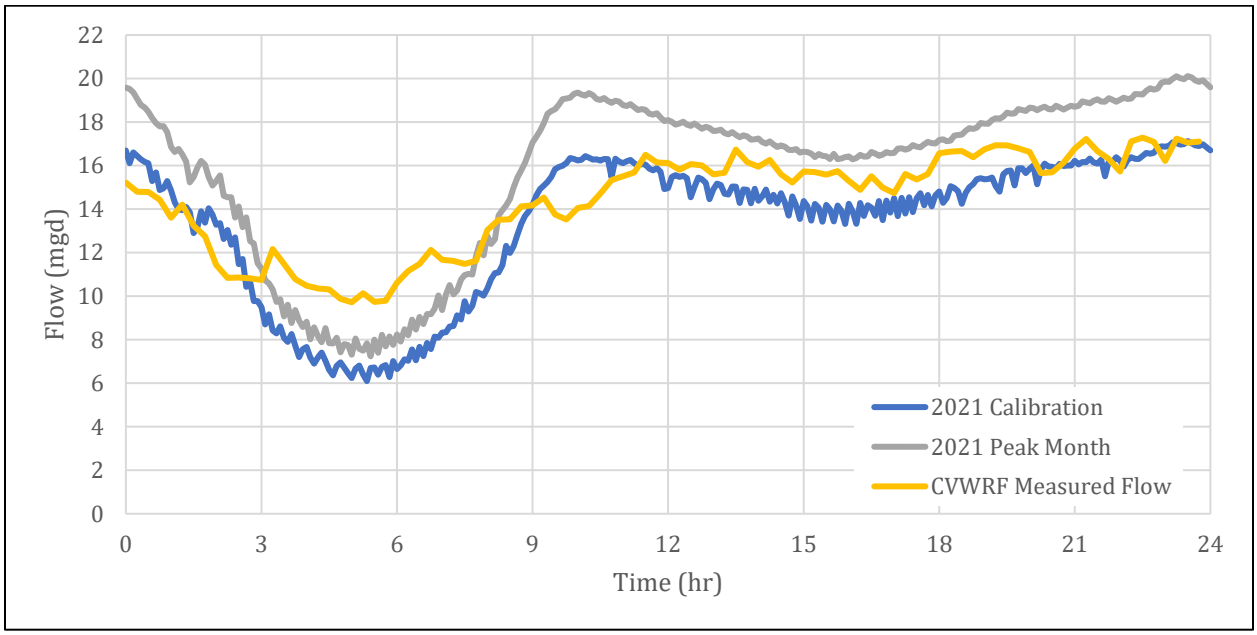


Figure 4-4 Observed vs Calibrated Model vs Peak Month Average Day Model

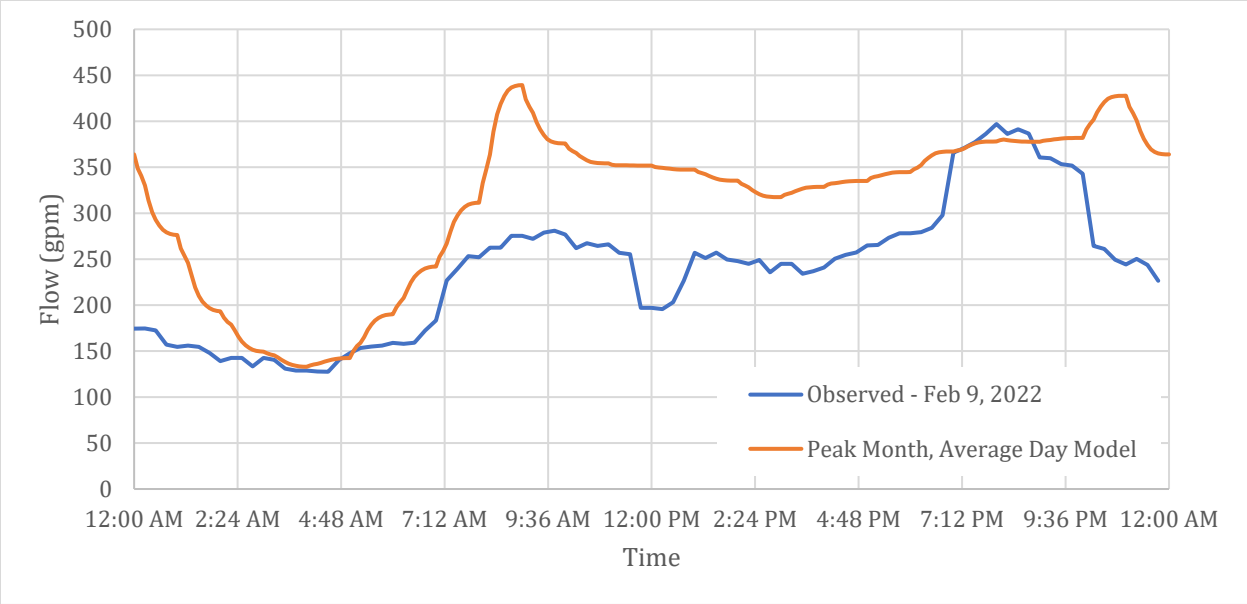


Figure 4-5 Parliament Ave Observed Flow vs Peak Month Average Day Model

CHAPTER 5
COLLECTION SYSTEM EVALUATION

With the development and calibration of a hydraulic sewer model, it is possible to simulate sewer system operating conditions for both present and future conditions. The purpose of this chapter is to evaluate hydraulic performance of the collection system and identify potential hydraulic deficiencies.

EVALUATION CRITERIA

In defining what constitutes a hydraulic deficiency, it is important to consider the assumptions made in estimating sewer flows in the model. As described in Chapters 3 and 4, the sewer flow included in the model is composed of two parts: domestic sewer flow and infiltration. These inputs are based on available historic data. Based on the nature of this data, the hydraulic criteria used for evaluating hydraulic performance must take the following issues into account:

- **Dry Weather vs. Wet Weather Flows** – As noted above, the sewer flows modeled in the system include only domestic flows and infiltration. For reasons enumerated previously, inflow is not included. This means that model results are essentially for dry weather conditions. In wet weather, inflow will be added to the system and must be accounted for. The criteria established for identifying deficiencies should leave some unused capacity available for inflow during wet weather events.
- **Flow Variability** – Because these estimates are based on average values and a limited data set, actual flows will fluctuate and may be greater or lower than the model estimates. For example, infiltration during extremely wet years could be more than estimated in the model (e.g. 1983 was a statewide historically wet year that led to high infiltration and flooding in many areas). Events such as holidays might also create domestic flows that are temporarily higher than generally expected. The criteria established for identifying deficiencies should be sufficiently conservative to account for occasional flows higher than those estimated in the model.

With these issues in mind, the following criteria have been established to identify capacity deficiencies in the system.

PIPELINES

There are multiple evaluation criteria that can be used to evaluate pipelines. Two common methods are the peak depth over the total depth of the pipe (d/D) or the peak flow over the max possible flow (q/Q). For this evaluation, the following criterion is generally used:

- **Pipeline Capacity (All sizes) –** Peak flow in the pipe must be less than 75 percent of the full flow pipe capacity ($q/Q < 0.75$).

By using a criterion of 75 percent, all pipelines include a portion of the pipeline that is reserved for inflow and/or unaccounted for fluctuations in domestic flow and infiltration.

It should be noted that there are occasionally situations in which a relatively short section of pipe is installed at flat slope comparative to the pipes around it. In this case, a strict review of the flat section of pipe's capacity against existing or projected flows may identify it as hydraulically deficient. However, it may not actually cause any problems in the field because the overall slope of the larger reach of pipeline has adequate capacity and the flat section of pipeline is not long enough to appreciably restrict the flow. In this situation, the flat section of pipeline will only be considered

deficient if the maximum depth of flow at its upstream end exceeds 65 percent of the pipeline depth (d/D).

LIFT STATIONS

For evaluation of lift stations, two criteria should be considered:

- **Lift Station capacity –** Based on industry standards and good design practice, it is recommended that peak daily flow into a lift station not exceed 85 percent of the lift station's hydraulic pumping capacity. Allowing for a modest amount of capacity above projected flows accounts for unknowns associated with flow projections and mechanical wear at each lift station.
- **Wet Well Capacity –** The minimum wet well volume for lift stations should be large enough to prevent excessive cycling of lift station pumps. Based on manufacture recommendations for pump operation, the maximum number of cycles per hour should be six or less. Exceeding this value will significantly shorten the lifespan of the lift station pumps. This criterion does not apply to self-cleaning trench style wet wells that address the cycling of pumps through the use of VFDs.

FORCE MAINS

Force main evaluation is typically directly tied to the size of the pumps in the lift station. The following criteria should be considered:

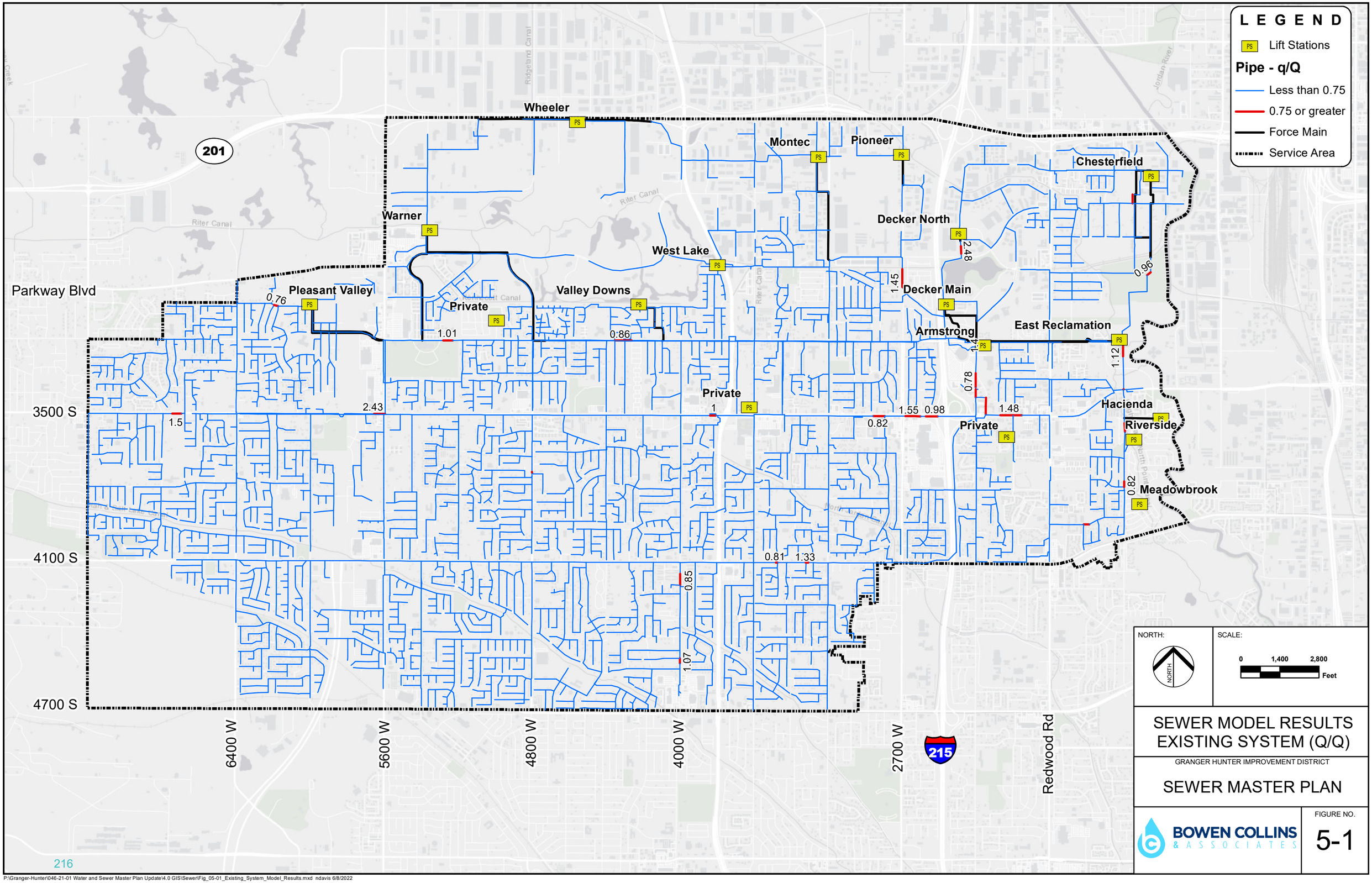
- **Average Velocity –** Per State of Utah standards, a velocity of not less than 2 feet per second shall be maintained at the average design flow, to avoid septic sewage and resulting odors.
- **Minimum Velocity –** The pump station should be capable of producing a flushing velocity in the force main of not less than 3 feet per second to mobilize and transport any sediment that accumulates in the force main.
- **Maximum Velocity –** Peak velocity through the force main should not exceed 7 feet per second.

EXISTING SYSTEM ANALYSIS

Figure 5-1 displays the hydraulic capacity of the sewer system under existing peak hour flow conditions. Pipes in red show a peak flow that is above 75% of the pipe's full capacity. Based on peak flow and pipe capacities alone, there are a few areas in the District that do not meet the evaluation criteria, as shown in red on Figure 5-1. In general, areas of concern for existing conditions include the following:

- 3500 S near 2700 W
- 3500 S at Decker Lake Drive
- Miscellaneous small segments

As mentioned in the evaluation criteria, there are several areas in the service area that have one or two pipe segments that show as above capacity. This may be due to a flat pipe or could be due to low accuracy of the surveyed inverts. Seeing how the results change over time is helpful to know if the pipe warrants a correction or if it just an area that should be watched.



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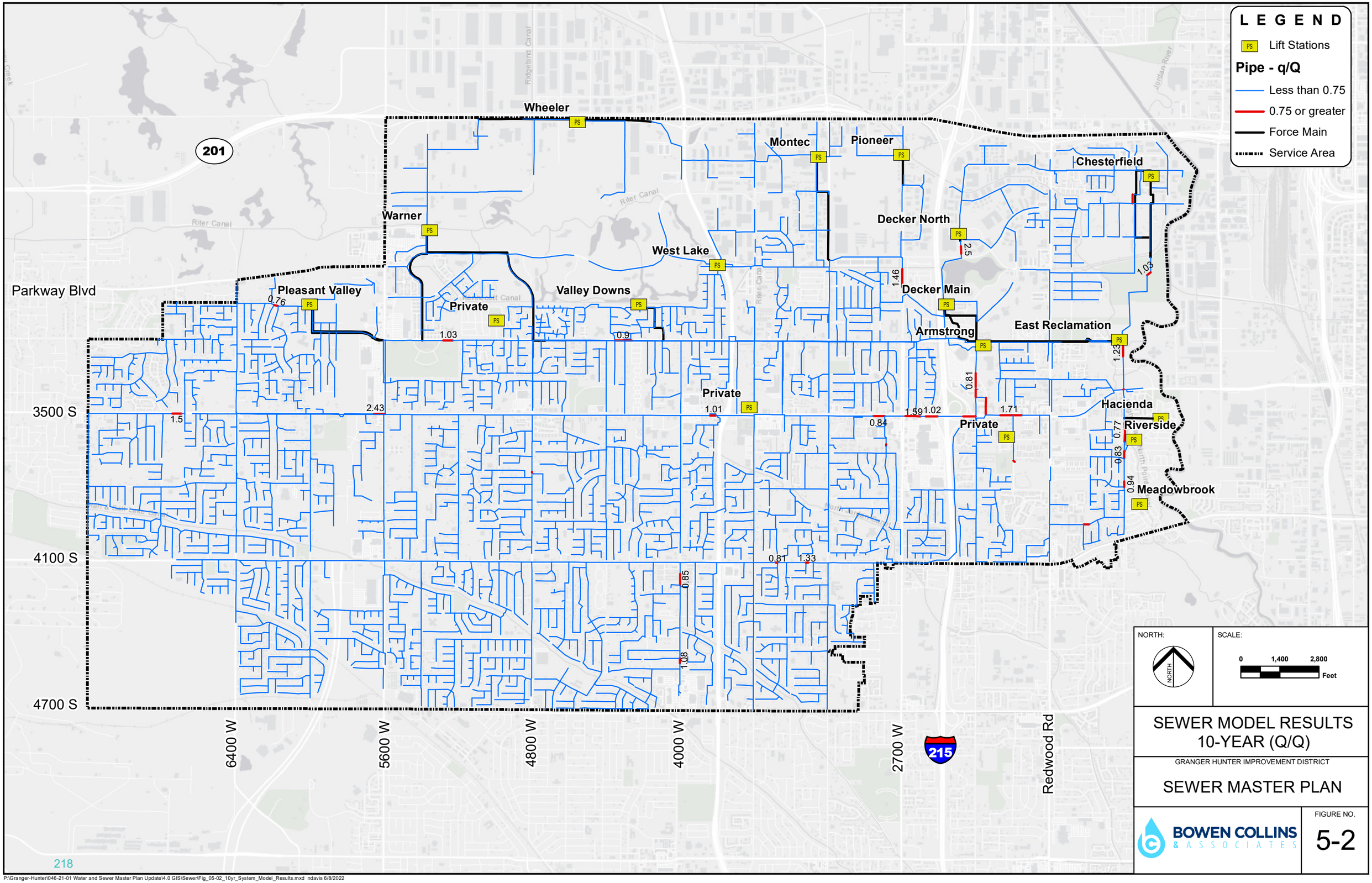
FUTURE SYSTEM ANALYSIS

Figure 5-2 and Figure 5-3 show the hydraulic performance as calculated in the hydraulic model for sewer flows as projected through the full buildout conditions if no improvements are made to the existing system. These results assume that sewer flows associated with future development will flow to the nearest manhole in the existing system. While much of the system under buildout conditions has adequate capacity, some significant deficiencies can be observed in the modeled results. Typically, additional deficiencies in later years are extensions of the existing deficiencies. However, there are some deficiencies that are in new areas.



SEWER MODEL RESULTS 10-YEAR (Q/Q)

GRANGER HUNTER IMPROVEMENT DISTRICT

SEWER MASTER PLAN

BOWEN COLLINS & ASSOCIATES

FIGURE NO. 5-2

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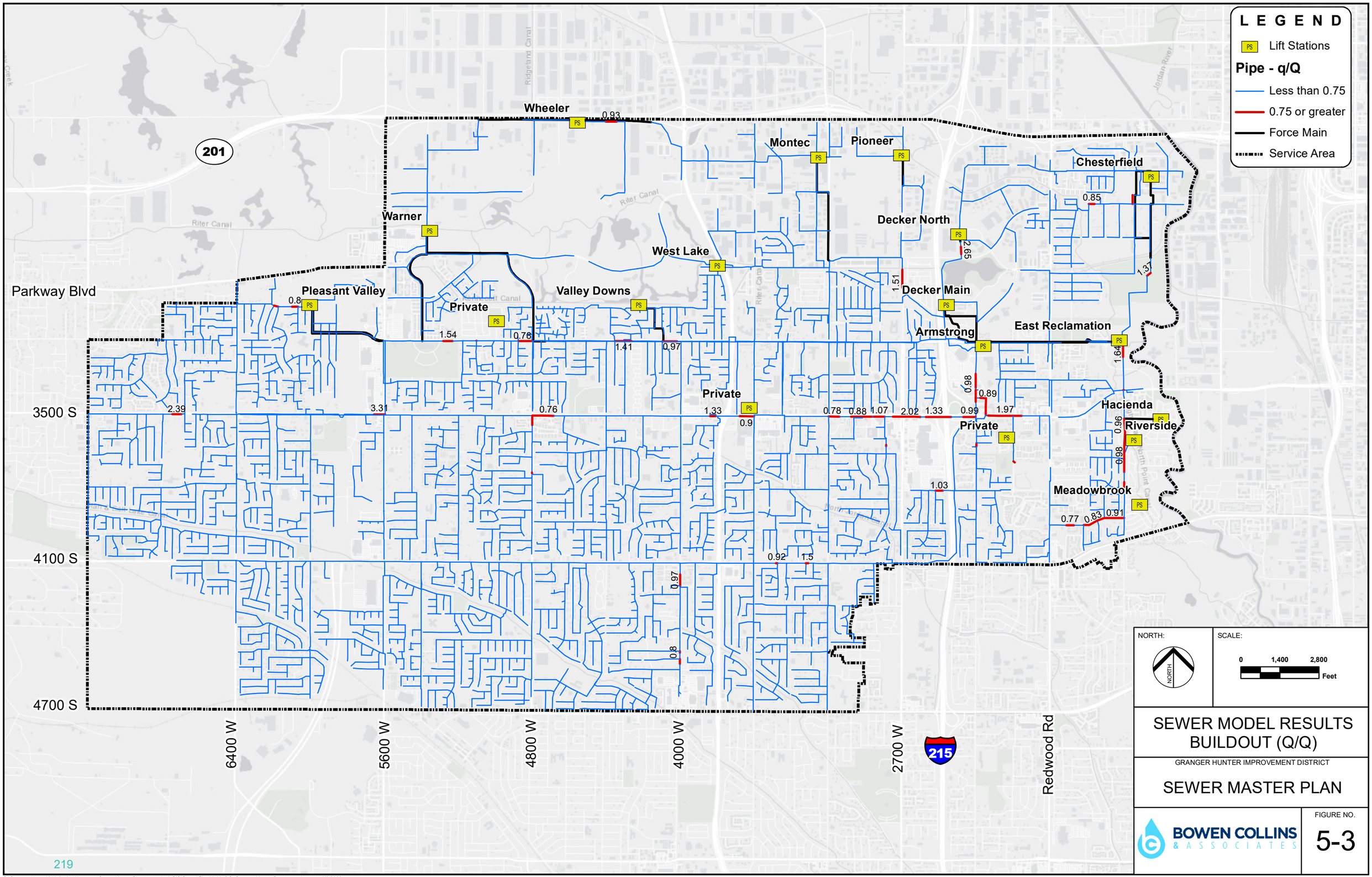
LEGEND
Lift Stations
Pipe - q/Q
Less than 0.75
0.75 or greater
Force Main
Service Area
Wheeler
Warner
Montec
Pioneer
Chesterfield
Decker North
West Lake
Pleasant Valley
Private
Valley Downs
Decker Main
Armstrong
East Reclamation
Private
Hacienda
Riverside
Private
Meadowbrook
Parkway Blvd
3500 S
4100 S
4700 S
6400 W
5600 W
4800 W
4000 W
2700 W
Redwood Rd
201
215
Riter Canal
Ridgeland Canal
Jordan River
NORTH:
SCALE:
0
1,400
2,800
Feet
SEWER MODEL RESULTS
BUILDOUT (Q/Q)
GRANGER HUNTER IMPROVEMENT DISTRICT
SEWER MASTER PLAN
BOWEN COLLINS & ASSOCIATES
FIGURE NO.
5-3
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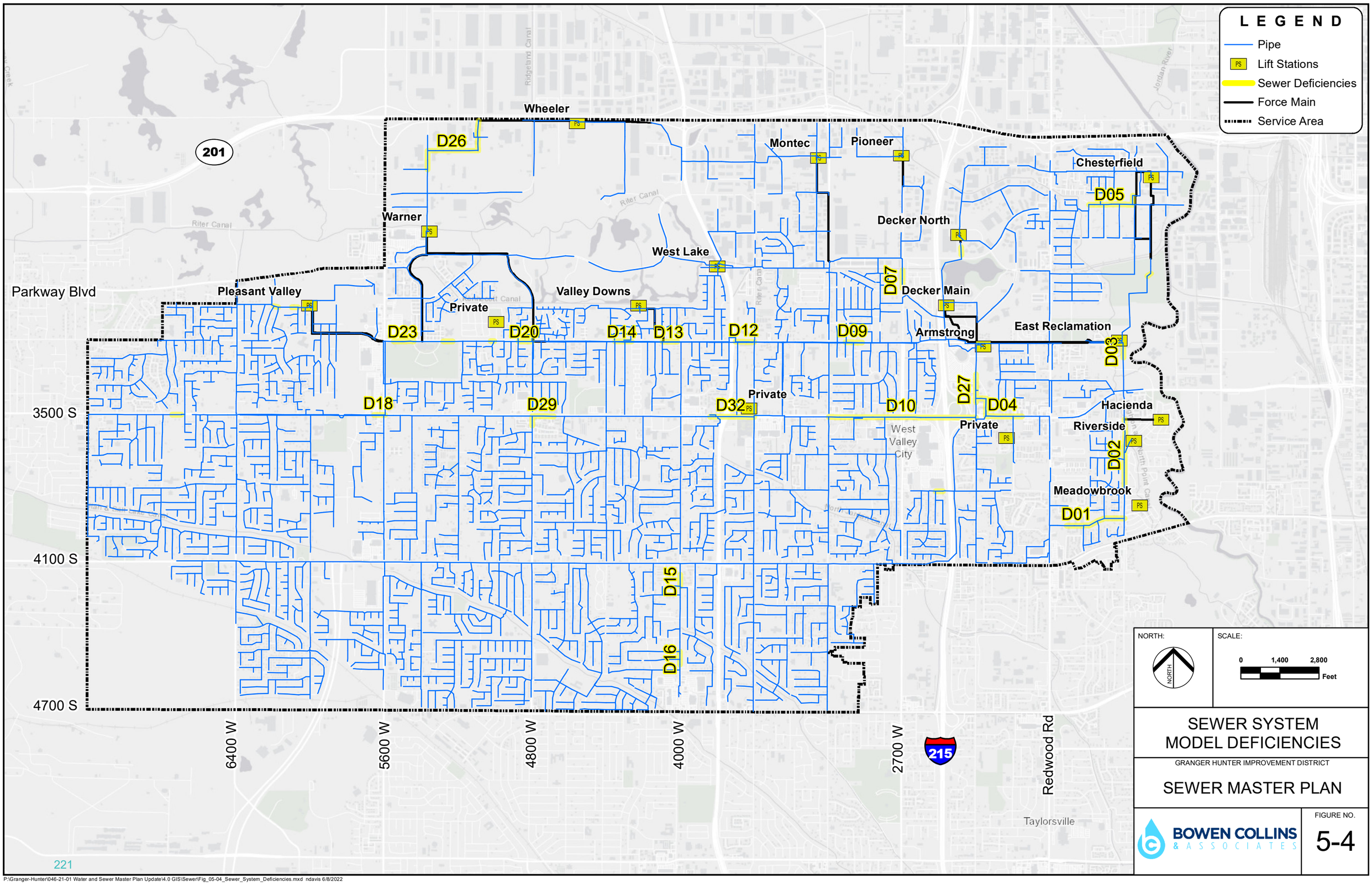
Table 5-1 shows the list of all deficiencies through the three modeling scenarios and which scenarios the deficiency is present in. Figure 5-4 shows the location of these deficiencies in the map.

Table 5-1
Sewer System Model Deficiencies

ID	Problem Location	Problem	Existing	10-year	Buildout
D01	Parliament Ave (3940 S)	Insufficient capacity (q/Q > 0.75)	Yes	Yes	Yes
D02	1300 W	Insufficient capacity (q/Q > 0.75)	Yes	Yes	Yes
D03	South of East Rec PS	Flat pipe			
D04	3500 S & Decker Lake Dr	Flat pipe, insufficient size			
D05	Parkway Ave	Insufficient capacity in 8", flat 15"	Partial	Partial	Yes
D06	South of Decker North PS	Flat pipe downstream of PS	Yes	Yes	Yes
D07	2700 W, South of Parkway Blvd	Flat pipe	Yes	Yes	Yes
D08	Pipe into Montec PS	Large flows from Coca-Cola	Yes	Yes	Yes
D09	3100 S at 3080 W	Insufficient capacity (q/Q = 0.78)	No	No	Yes
D10	3500 S at 2700 W	Insufficient capacity due to slope	Yes	Yes	Yes
D11	3800 S at 2475 W	Flat (adverse) pipe	No	No	Yes
D12	3100 S at 3600 W	Flat pipe	No	No	Yes
D13	3100 S at Maxine St	Flat pipe	No	Yes	Yes
D14	3100 S at 4355 W	Flat pipe	Yes	Yes	Yes
D15	4000 W at4200 S	Insufficient capacity	Yes	Yes	Yes
D16	4000 W at 4490 S	Insufficient capacity. Flat pipe.	Yes	Yes	Yes
D17	4800 W at 3500 S	Insufficient capacity (q/Q = 0.76)	No	No	Yes
D18	3500 S at 5600 W	Flat pipe	Yes	Yes	Yes
D19	3500 S at 6680 W	Flat pipe	Yes	Yes	Yes
D20	3100 s at 4800 W	Insufficient capacity (q/Q = 0.83)	No	No	Yes
D21	3100 S at 5000 W	Insufficient capacity (q/Q = 0.76)	No	No	Yes
D22	3100 S at Newington Ln	Insufficient capacity - flat pipe	Yes	Yes	Yes
D23	3100 S at 5600 W	Insufficient capacity (q/Q = 0.76)	No	No	Yes
D24	2920 S at 6070 W	Insufficient capacity (q/Q = 0.80)	Yes	Yes	Yes
D25	2920 S at Putnam Dr	Flat Pipe	No	No	Yes
D26	2100 S at 5370 W	Insufficient when Wheeler P.S. is pumping west (not typical).	Yes	Yes	Yes
D27	Decker Lake Dr at City Center Ct	Insufficient capacity	Yes	Yes	Yes
D28	Prior to Armstrong PS	Flat (adverse) pipe	Yes	Yes	Yes
D29	3500 S at 4800 W	Insufficient capacity (q/Q = 0.76)	No	No	Yes
D31	Downstream of Chesterfield Force Main	Flat (adverse) pipe	Yes	Yes	Yes
D32	3500 S at 3600 W	Insufficient capacity	Yes	Yes	Yes



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LIFT STATION ANALYSIS

With the three model scenarios, lift station inflows can be compared to the pumping capacity of the lift station. Table 5-2 details the incoming average and peak flows for each lift station. The values in red are flows that are greater than the pumping capacity. Pleasant Valley Lift Station is shown to have a pumping deficit at buildout. Montec Pump Station is also shown to have a deficit, but this is heavily influenced by Swire Coca-Cola's discharge rate. For this analysis, Swire has a concentrated discharge time and the peak flow may not be appropriate for lift station sizing. The District should continue to monitor this lift station to ensure adequate pumping capacity.

Table 5-2
Lift Station Pumping Analysis

Name	Rated Capacity (gpm)	Existing		10-Year		Buildout	
		Average (gpm)	Peak (gpm)	Average (gpm)	Peak (gpm)	Average (gpm)	Peak (gpm)
Armstrong	15,000	4,908	6,621	5,095	6,838	6,257	8,293
Chesterfield	1,000	361	485	384	515	622	829
Decker Main	15,000	4,940	6,055	5,127	6,322	6,902	8,509
Decker North	1,200	112	146	115	150	138	178
East Reclamation	4,000	1,192	1,593	1,291	1,705	1,848	2,414
Montec	1,100	477	1,903	478	1,905	513	1,935
Pioneer	500	14	18	14	19	19	24
Pleasant Valley	1,000	703	977	718	996	1,034	1,451
Valley Downs	400	109	168	113	172	128	188
Warner	3,600	732	1,049	793	1,112	1,483	1,920
West Lake	1,200	145	189	166	216	212	276
Wheeler	650	194	464	207	480	280	561

CHAPTER 6
SYSTEM IMPROVEMENTS

The hydraulic model results were used to evaluate various alternatives to eliminate projected deficiencies in the sewer system under existing and build-out conditions. This chapter identifies all required system improvements to solve deficiencies as the District approaches build-out. Prioritization, phasing, and other issues relative to project timing will be addressed as part of the implementation plan for the improvements as a later section of this report.

COLLECTION SYSTEM IMPROVEMENTS

System improvements required to resolve hydraulic deficiencies and improve system operation as identified in the hydraulic model are shown in Figure 6-1. A summary of the major purposes of each project are as follows:

- **Project S1 –** Modeling of the sewer system shows multiple deficiencies on 3500 South west of Redwood Road, as well as on Parliament Avenue east of Redwood Road and along the path the East Reclamation Lift Station. This portion of Redwood Road has been identified as an area where significant redevelopment will occur and these deficiencies will grow. This project addresses these deficiencies by rerouting flow from the Parliament Avenue line and directing it north. This project includes the construction of an 18-inch pipeline from the Redwood Apartments connection (south of Parliament Avenue) flowing north to 3800 South. The pipeline turns west on 3800 South and then North on 1950 West to 3500 South. At 3500 South the new pipeline increases to 24-inch and turns west until it connects to the 30-inch pipeline flowing north, which is west of Decker Lake Drive.
- **Project S2 –** This project is upsizing the existing 8-inch pipe in 4000 West from Continental Drive to 4100 South to a 12-inch pipeline. This will increase the capacity of the line for current and future flows.
- **Project S3 –** This project is upsizing the existing 27-inch pipe in 3100 South, from 4960 West to 4800 West to 36-inch. The pipeline that this project flows into is 48-inch with multiple pipes flowing into it just upstream. This project upsizes the portion of the pipe that can act as a bottleneck prior to the 48-inch pipe.
- **Project S4 –** On 3500 South, east of I-215, the District has a 30-inch pipeline that flows north through the parking lot of multiple hotels before following the alignment of Decker Lake Drive. There are 2 sections of pipe that are 27-inch and restrict capacity of this line. This project upsizes the existing pipeline to 30-inch and regrades the pipeline to have a consistent slope.
- **Project S5 –** An existing 10-inch pipe in 3100 South from 2040 West to the Armstrong Pump Station is flat and has reduced capacity. This project upsizes the line to a 15-inch.
- **Project S6 –** On 3500 South, west of Bangerter Highway to 3600 West, an existing 21-inch flows into an 18-inch and does not have sufficient capacity. This project upsizes the line to 24-inch from the existing 24-inch at 3600 West to the west side of Bangerter Highway. The specific timing of this project should be coordinated with other work being done at Bangerter Highway to reduce traffic disruption in the area.
- **Project S7 –** This project upsizes the existing 24-inch and 18-inch pipeline in 3500 South from 3200 West to west of Decker Lake Drive to 30-inch. Currently a 24-inch pipe flows into an 18-inch pipe and modeling has shown existing deficiencies that expand as the District approaches buildout. The project involves crossing I-215 and timing should be coordinated

with other work in the area to reduce disruptions and cost if possible. It should be noted that there is a possibility of routing flow north in 3450 West to reduce flow in 3500 South, which should be evaluated further prior to completing this project.

- **Project S8 –** The area south of 4100 South has some remaining land to be developed and be added to the collection system. This project involves upsizing the existing 8-inch line in 4100 S from 6780 West to 6400 West to 12-inch. The area is not shown as being deficient in the modeling analysis because it is upstream of the last loading manhole. As development plans become more specific in this area of the system, the pipeline should be analyzed and this project adjusted as necessary.
- **Project LS1 –** The analysis of the pump station capacities show that, as development increases in the western portion of the service area, flows will increase to the Pleasant Valley Lift Station and its capacity will need to be increased. Additionally, GHID staff have indicated that the lift station is in need of significant repair and it will likely be more economical to replace the lift station than try to repair it. This project involves the complete replacement and increase in capacity of the Pleasant Valley Lift Station.
- **Watch Areas –** The collection system evaluation determined that there were several areas where a pipe or two is shown to be deficient. Many of these have been determined to be flat pipes. No specific projects have been identified in these areas, but the District will want to continue to monitor the areas to make sure they don't become problems in the future.

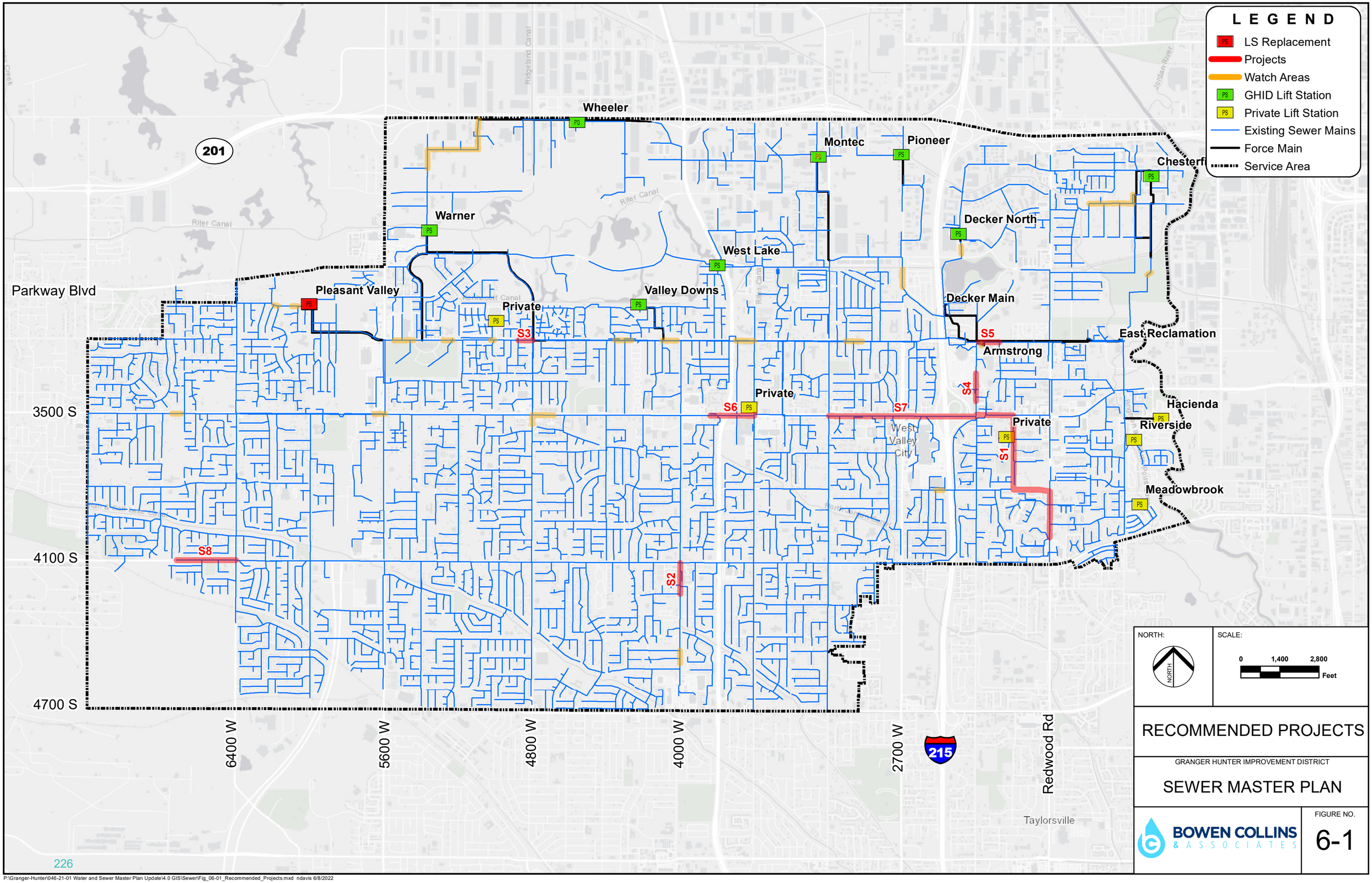
PROJECT COSTS

Project costs are summarized in Table 6-1. Project costs are based on average unit costs for projects of a similar nature. Costs include consideration of all components of the sanitary sewer system including pipelines, manholes, and surface restoration as appropriate. Costs also include 15 percent of the estimated total construction price for engineering, legal, and administrative services.

Also included in the table is an estimate of the required size of each project. These sizes are based on estimated pipe slopes (per inverts in the model) and projected capacity needs at build-out. Once design of sewer mains commences, the actual size of pipe should be revisited based on surveyed field conditions, needed phasing, etc.

Table 6-1
Proposed Collection System Improvements

Project No.	Project Timing	Diameter (inch)	Length (ft)	Project Description	Project Cost (2022 $s)
S1	0-5	12, 18, 24	6,970	Redwood Road Improvements (D01, D02, D04)	$8,750,000
S2	0-5	12	1,200	4000 W, Continental Dr to 4100 S (1200') (D15)	$630,000
S3	10+	36	1,000	3100 S, West of 4800 W (1000') (D20)	$1,400,000
S4	5-10	30	1,500	Decker Lake Dr @ City Center Ct (2-27" between 30") (1500') (D27)	$1,560,000
S5	5-10	15	1,000	3100 S, 2040 W to Armstrong PS (1000') (D28)	$600,000
S6	10+	24	1,700	3500 S, W of Bangerter to 3600 W (1700') (D32)	$1,900,000
S7	5-10	30	5,300	3500 S, 3200 W to W of Decker Lake Dr (5300') (D10)	$6,000,000
S8	5-10	12	2,680	4100 S, 6780 W to 6400 W	$1,400,000
LS1	0-5	-	-	Replace Pleasant Valley Lift Station	$5,000,000
				TOTAL	**$27,240,000**



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CHAPTER 7
WASTEWATER TREATMENT FACILITY PLAN

As part of the sewer master plan, it is important to review the treatment of the collected wastewater. All flows collected in the Granger-Hunter Improvement District Service Area pass through one of the District's three main pump stations. These pump stations discharge into a sewer line that flows to the Central Valley Water Reclamation Facility (CVWRF) where the District's wastewater is treated, along with wastewater from other nearby utilities. CVWRF is located at 800 Central Valley Road, South Salt Lake, UT 84119.

CVWRF does their own planning for maintaining and upgrading facilities and is currently in the process of a large upgrade. The District is responsible to contribute financially but is not responsible for the planning associated with the upgrade. Thus, this plan does not include any additional discussion of these needs. However, projects at the treatment plant and their associated costs will be included in the District's updated Impact Fee Facilities Plan.

CHAPTER 8
ASSET MANAGEMENT PLAN

As part of this sewer master plan, GHID has requested that BC&A prepare an asset management plan for the District's sewer collection system. In order to do this, assets are separated into horizontal assets and vertical assets. This chapter describes the District's existing sewer collection asset inventory and documents the expected condition of these assets based on inspection results.

HORIZONTAL ASSETS ASSESSMENT AND PLANNING

In a wastewater system, horizontal assets generally refer to the pipelines in the system and their appurtenances (manholes, laterals, etc.). This section describes the District's existing sewer collection asset inventory and documents the expected condition of these assets based on inspection results.

EXISTING COLLECTION SYSTEM

The first step in preparing an asset management plan is to collect data on the nature and condition of the District's sewer collection system. The District provided GIS shapefile data that include the following information related to asset management:

- Pipe identification number
- Diameter and length of individual pipes
- Installation and (where applicable) rehabilitation year of individual pipes
- Material of individual pipes

The following sections summarize the attributes noted above.

Pipe Identification Number

In general, the pipe identification number is derived by concatenating the identification numbers of the upstream and downstream manholes with a hyphen (ie, "UpstreamID – DownstreamID").

Pipe Diameter, Length, and Material

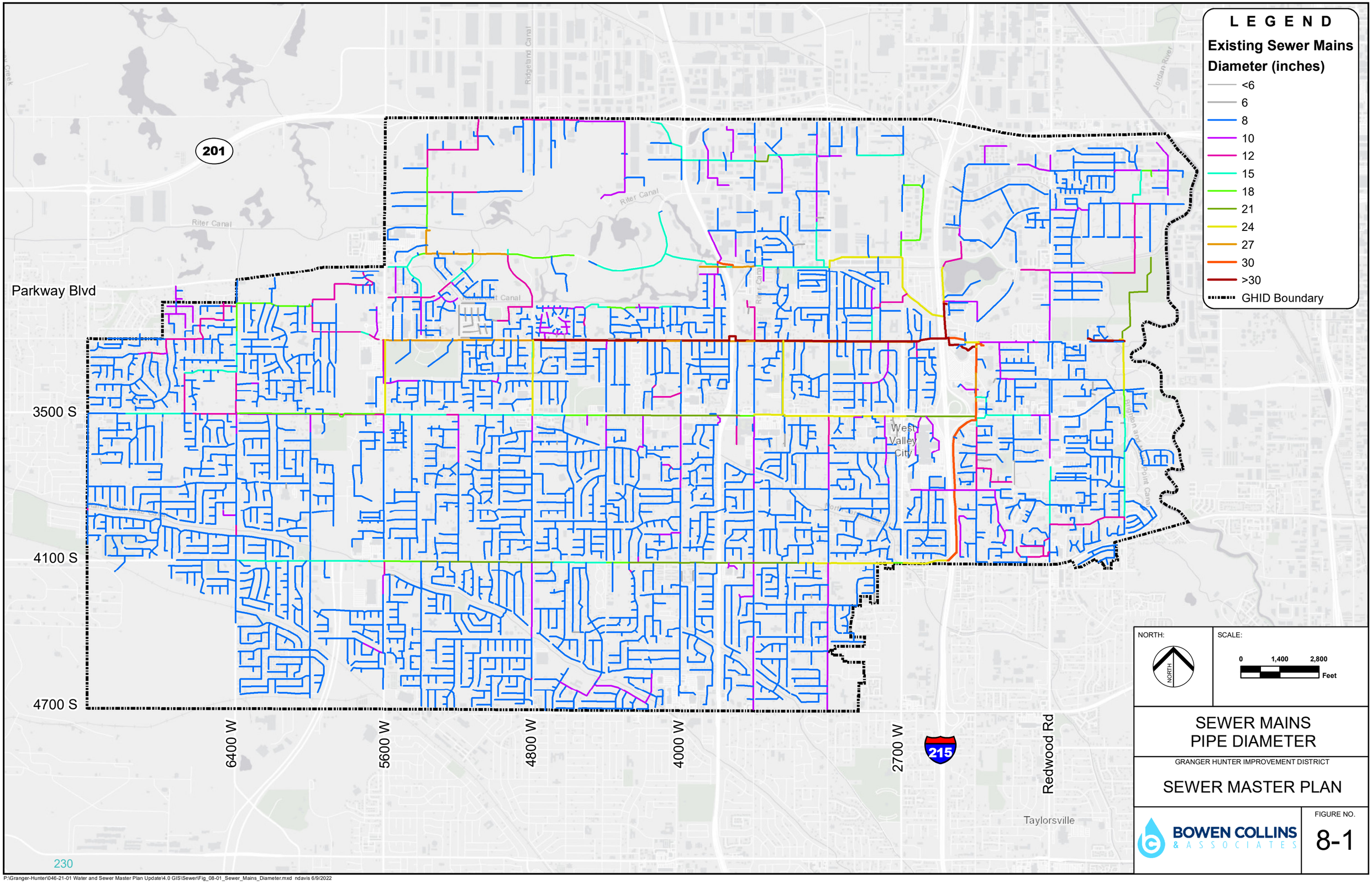
The pipe diameter, length, and material attributes within the GIS shapefile data was mostly complete and believed to be accurate. All pipes had lengths associated with the feature. Only 0.05 percent of pipes in the system did not have a diameter assigned, and only one pipe in the system did not have a material attribute assigned. Figure 8-1 shows the pipe diameter and Figure 8-2 shows the pipe material as assigned in the GIS shapefile data. This information is also summarized in Table 8-1.

Table 8-1
Pipe Length (miles) by Diameter and Material

Diameter (in)	Concrete	Clay	PVC	Lined	Other	Total
6	0.53	0.40	2.07	0.00	0.02	3.01
8	91.63	58.82	94.94	20.59	0.17	266.16
10	6.36	3.75	6.65	5.18	0.03	21.97
12	1.95	0.00	7.45	1.80	0.02	11.22
15	4.18	0.00	3.03	2.90	0.00	10.11
18	2.13	0.00	2.23	0.49	0.00	4.85
21	2.36	0.00	0.13	1.84	0.00	4.33
24	0.84	0.00	3.00	1.48	0.00	5.32
27	2.35	0.00	0.74	1.08	0.00	4.17
30	0.37	0.00	0.05	2.03	0.00	2.45
36	0.00	0.00	0.26	0.00	0.00	0.26
42	0.12	0.00	0.00	0.02	0.00	0.14
48	0.00	0.00	3.10	0.00	0.00	3.10
54	0.13	0.00	0.00	0.00	0.00	0.13
Unknown	0.15	0.00	0.00	0.00	0.00	0.15
Percentage	33.5%	18.7%	36.6%	11.1%	0.1%	100.0%

Installation Year and Age

Pipeline age is a critical component in determining the replacement or rehabilitation timeline of sewer collection pipes. The District's sewer collection system GIS data included information on the installation year and (where applicable) the rehabilitation year of pipes in the system. Many liner materials have estimated service lifetimes equal to that of new pipelines, and relining a sewer pipeline essentially creates a new pipe bonded to and within the old main. For this reason, BC&A calculated pipeline age based on its rehabilitation year instead of the installation year for relined and rehabilitated pipelines. Installation or rehabilitation year was present in the data for 7,900 of 7,963 (99.2 percent) of pipes. For the remaining 63 pipes, age was estimated based on the installation year of surrounding pipes of the same material. If none of the surrounding pipes were of the same material, the average age of the pipe type throughout the system was assumed. Figure 8-3 shows the age of each pipe calculated from the installation year in the GIS shapefile.



SEWER MAINS PIPE DIAMETER

GRANGER HUNTER IMPROVEMENT DISTRICT

SEWER MASTER PLAN

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FIGURE NO. 8-1

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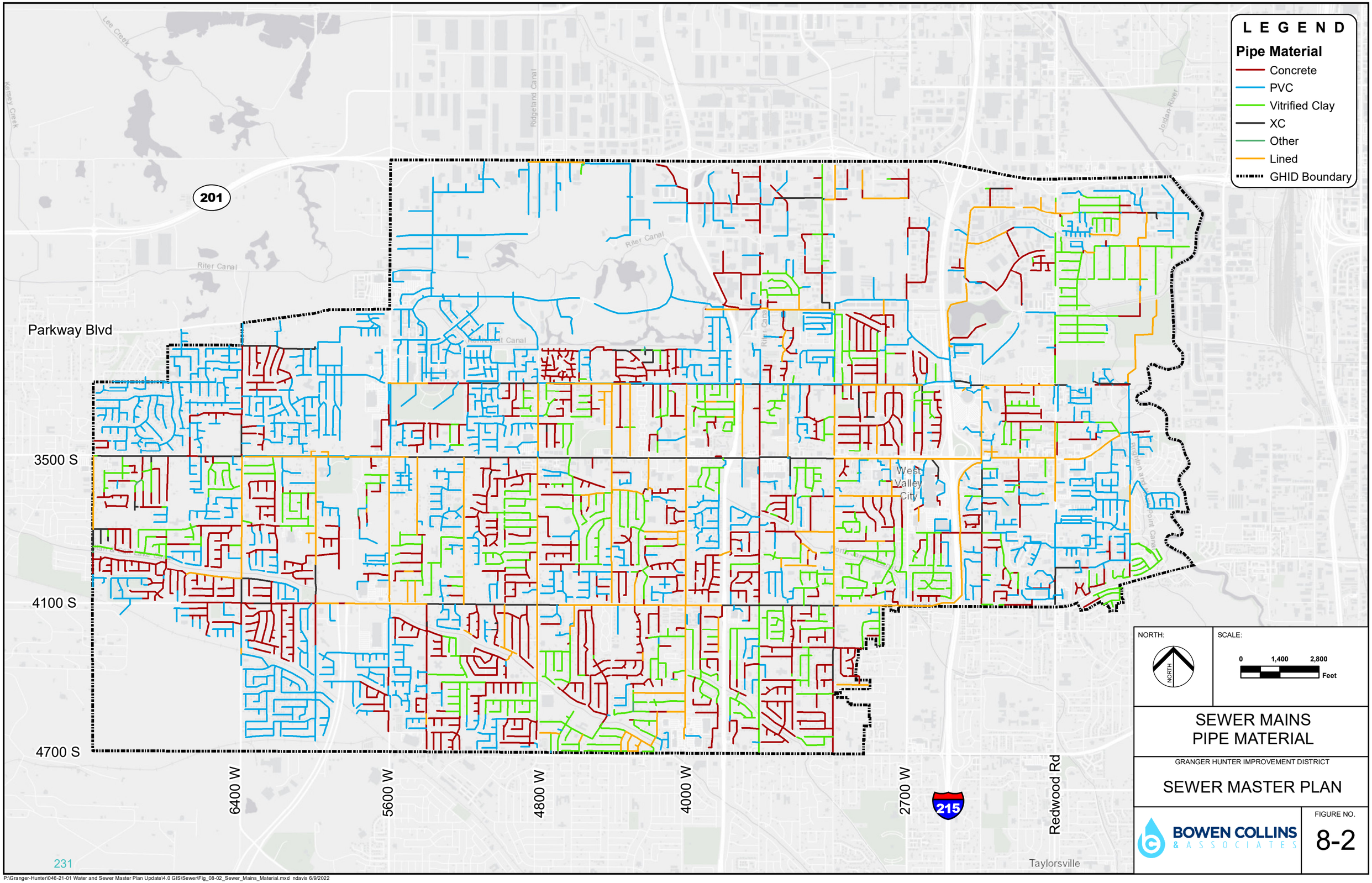

SEWER MAINS PIPE MATERIAL

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FIGURE NO. 8-2

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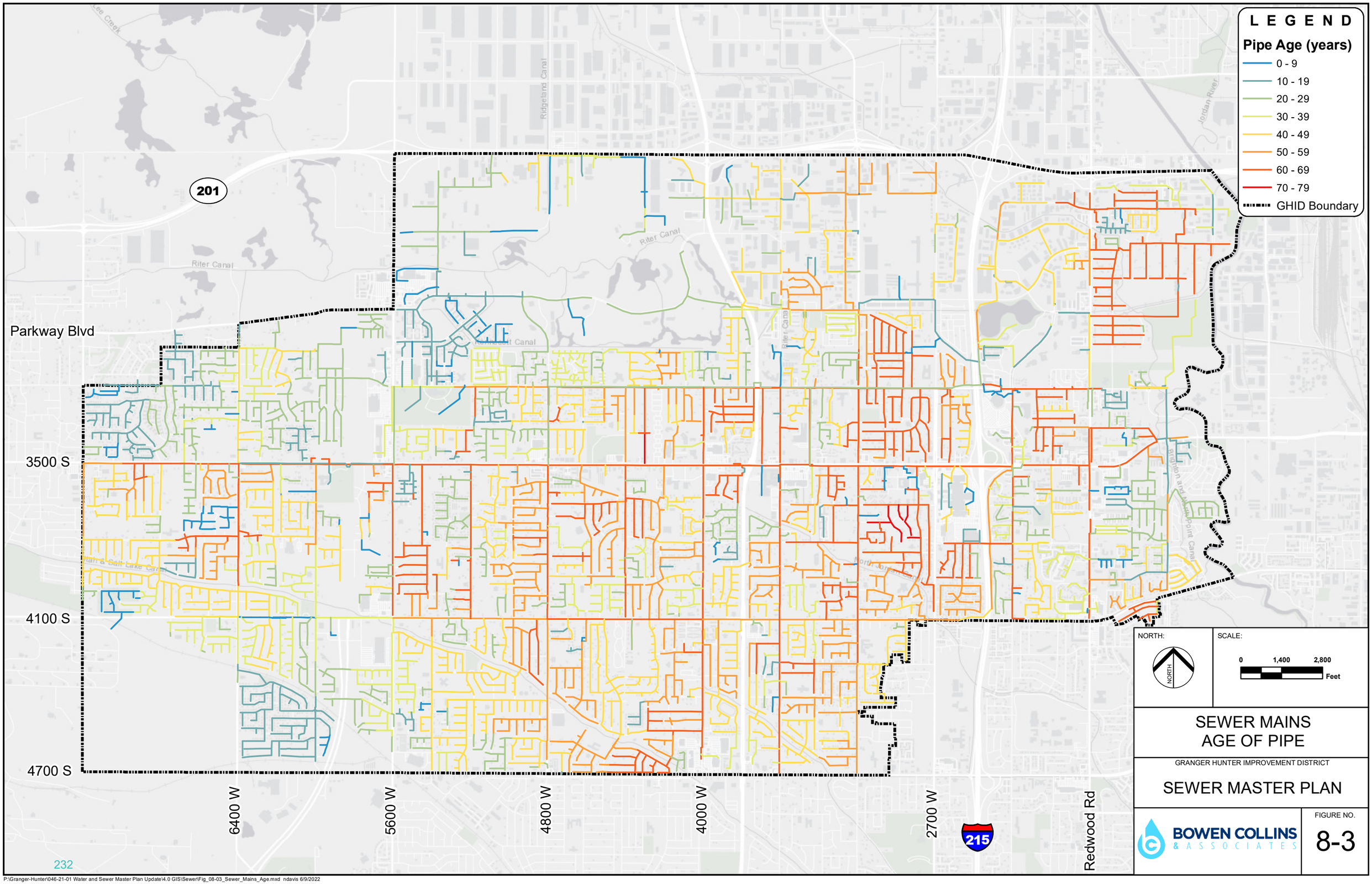

NORTH:

SCALE: 0 1,400 2,800 Feet

SEWER MAINS AGE OF PIPE

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SEWER MASTER PLAN

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FIGURE NO. 8-3

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PIPELINE CONDITION ASSESSMENT

Determining the existing condition of pipes in the collection system is arguably the most important step of any collection system asset management plan. The most common way to determine the existing condition of pipes in a collection system is to have a trained crew use their equipment to video inspect the inside of the pipes. The crew is trained to recognize defects in the pipe and code them accordingly.

Historic District Condition Assessment Practices

The District has used the Pipeline Assessment and Certification Program (PACP) scoring system to assess the condition of sewer pipes in the District's collection system in recent years. The PACP inspection procedures use specific rubrics to identify a structural score and maintenance score for each pipe, which are then combined to produce an overall assessment score. Official PACP structural condition scoring needs to be performed by someone who is certified by PACP and has been through the training to recognize all the types of deficiencies and how to score them accordingly.

PACP structural scoring works by first identifying a specific, standardized type of deficiency (e.g. a circumferential crack will have a PACP deficiency code of CC, hydrogen sulfide corrosion resulting in visible aggregate will have a PACP deficiency code of SAVC, etc.). The location and extent of each of these deficiencies is also identified and all deficiency data is stored in a standardized, searchable database. Associated with each standardized deficiency is a numerical structural deficiency value that represents the level of concern associated with each deficiency (e.g. a circumferential crack has a PACP structural code of 1, hydrogen sulfide corrosion resulting in visible aggregate has a PACP structural code of 3, etc.). This structural scoring provides a numeric value that can be objectively determined for each pipe following established standards. Table 8-2 summarizes the PACP structural scoring categories.

Table 8-2
PACP Structural Condition Scoring Categories

PACP Structural Rating (SPRI)	General Condition
0	No observable deficiencies
1	Pipe segment has minor defects – failure unlikely in the foreseeable future
2	Pipe segment has minor defects – failure unlikely for at least 20 years
3	Pipe segment has moderate defects – continued deterioration may result in failure in less than a 20-year timeframe
4	Pipe segment has severe defects – it is near the end of its useful life
5	Pipe segment is beyond its useful life – failure has occurred or is imminent

The District provided inspection result data in a collection of Microsoft Access databases. Although some minor inconsistencies in the dataset exist, 79.9 percent of the pipelines in the District's shapefile could be successfully connected to recent inspection data. An additional 1.7 percent of pipes in the system had inspection data but were not able to join with the shapefile data.

BC&A based pipeline condition assessment solely on the inspection results in the provided data tables. The data were joined to the pipeline shapefile information by using common identification numbers. The following list is an excerpt of the most relevant inspection data for asset management:

- Pipe identification number
- Inspection ID and Date
- PACP structural ratings (SPRI)

These parameters are summarized in the following sections.

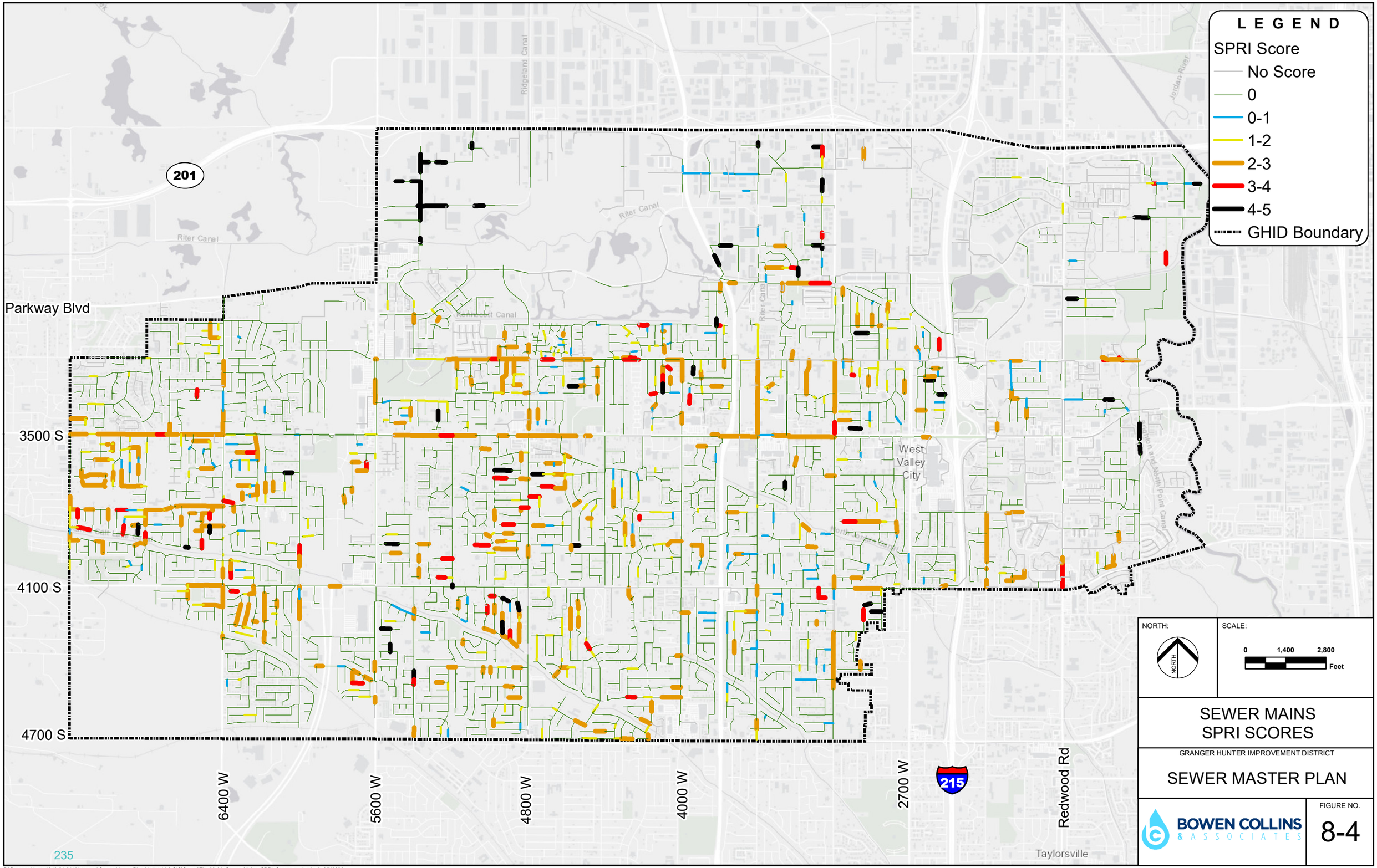
Inspection Identification Number and Date

The District provided BC&A with inspection data from the last four years (2018 – 2021). From an asset management perspective, inspection data may be tracked over time, but the most recent inspection of a pipeline will most accurately reflect current conditions and is the most important data point. The inspection data provided to BC&A contained inspection data for 81.6 percent of all pipelines in the District's collection system, and only the most recent inspection was considered.

Due to discrepancies between pipe identification numbers in the inspection and shapefile data, 1.7 percent of collection pipes were inspected but could not be joined to a pipe in the shapefile. Additionally, a subset of pipelines were inspected multiple times on their most recent inspection date. For these pipes, the maximum structural condition rating given out of any of the most recent inspections was taken and visualized. Aside from these minor notes, this dataset appears reasonably complete and comprehensive.

PACP Structural Condition Ratings

The PACP structural condition rating (SPRI) is the most important indicator of pipeline condition from the inspection data. Structural defects in a pipeline accelerate failure in a pipeline and reduce the useful life of sewer collection assets. Figure 8-4 shows the pipes with scores by location in the collection system.



SEWER MAINS SPRI SCORES

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FIGURE NO. 8-4

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Expected Life

One deliverable of this asset management plan is an evaluation of the current age and condition of the sewer infrastructure within the District. The end goal of this task is to generate an estimate of when pieces of the District's sewer infrastructure require improvements. However, it should be noted that lifespan of sewer pipelines depends on a variety of factors not directly addressed by the assumed lifespan estimates in Table 8-3. These factors include the quality of pipe installation, surcharge and seismic loads the pipes may experience throughout its lifespan, migration of soil and voids around the pipe exterior, and more. Additionally, pipeline inspectors generally cannot assess these exterior factors without disturbing the original environment or employing destructive testing methods. In other words, it makes little sense to excavate a pipe to verify the installation conditions if the surrounding soil and bedding are removed in the inspection process.

Table 8-3
Typical Lifespan of Sewer Pipe by Material

Pipe Material	Typical Lifespan (Assumed unless otherwise noted)
Vitrified Clay	50 - 100 years
PVC	50 - 100 years
Concrete	75 - 100 years*

For this reason, BC&A recommends continuing to prioritize sewer asset management on the basis of actual inspection results rather than a theoretical value of estimated remaining life. However, estimated remaining life, though uncertain, must be calculated to provide guidance regarding the timing of replacement costs for long-term planning.

To calculate estimated remaining life for each sewer pipe, BC&A first categorically grouped pipelines into anticipated remaining life based on PACP structural condition ratings. Table 8-4 contains the estimated remaining life groups based on PACP structural ratings. Figure 8-5 maps the distribution system according to estimated remaining life categories.

Table 8-4
Estimated Remaining Life Groups and Pipe Lengths

PACP Structural Rating (SPRI)	Estimated Remaining Life	Linear Feet of Pipe (% of Collection System)
N/A	Needs Inspection	341,590 (19%)
0 - 2	20+ years	1,298,690 (73%)
3	10-20 years	108,210 (6%)
4	5-10 years	17,380 (1%)
5	0-5 years	16,820 (1%)

* The American Concrete Pipe Association (ACPA) Design Data 25 cites the U.S. Army Corps of Engineers (USACE) as a reference a service life of 70-100 years for concrete pipe. The same document quotes the USACE as stating "the designer should not expect a material service life greater than 50 years for any plastic pipe." However, PVC manufacturing has improved drastically in recent years and up to 100 years is commonly used as a starting estimate of service life for PVC materials.

LEGEND

Estimated Remaining Life

- Needs Inspection
- 20+ Years
- 10 - 20 Years
- 5 - 10 Years
- 0 - 5 Years
- GHID Boundary

201

Parkway Blvd

3500 S

4100 S

4700 S

6400 W

5600 W

4800 W

4000 W

2700 W

215

Redwood Rd

West Valley City

Riter Canal

Kennecott Canal

Ridgeland Canal

Jordan and Salt Lake City Canal

237

NORTH:

SCALE: 0 1,400 2,800 Feet

SEWER MAINS ESTIMATED REMAINING LIFE

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SEWER MASTER PLAN

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FIGURE NO. 8-5

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Next, pipes with PACP scores were assigned an estimated remaining life as shown in Table 8-5. For pipes with PACP structural ratings of 3 or greater, the remaining life estimates take the lower limit of the groupings in the previous table to plan conservatively for replacement needs. Pipes with ratings of 2 or less (minimal or no structural damage) and pipes without a PACP score were assumed to have 100-year lifespans, which is the upper end of the age range for the major pipe materials in the system.

Table 8-5
Estimated Remaining Life Groups and Pipe Lengths

ERL (years)	Length (ft)	Length (mi)	% of System
0-9	29,403	5.57	1.6%
10-19	90,687	17.18	5.1%
20-29	81,877	15.51	4.6%
30-39	238,355	45.14	13.4%
40-49	284,557	53.89	16.0%
50-59	330,296	62.56	18.5%
60-69	214,594	40.64	12.0%
70-79	265,959	50.37	14.9%
80-89	175,555	33.25	9.8%
90-100	71,373	13.52	4.0%
Total	**1,782,657**	**337.62**	**100.0%**

PIPELINE ASSET MANAGEMENT PLANNING

Two important components of an asset management plan for collection systems are consequence of failure and probability of failure. Each of these are discussed in the following sections. Once consequence of failure and probability of failure are analyzed for the collection systems, the product of these two factors can be used to establish asset criticality. Asset criticality is a measurement of the priority for rehabilitation of an asset and can be used to then create a detailed asset management plan.

Consequence of Failure

A standardized method for rating the importance of individual pipes and manholes in the District's sewer collection system is needed to prioritize maintenance and condition assessment activities in the system. This section outlines a proposed procedure for rating the relative importance of pipes and manholes in the District's collection system based on the consequences of their failure.

Importance of Consequence of Failure

Consequence of Failure (COF) is an estimate of the importance of a pipe based on the probable impacts resulting from a potential failure. A sudden failure can influence public safety, public perception of public works infrastructure, public health, financial and economic vitality, and more. For example, a pipe repair below a freeway would likely require heavy disruption on regional transportation networks, which could result in more dangerous travel and repair conditions both for commuters and for repairmen.

COF also considers the level at which the overall collection system depends on the pipe or manhole for reliable and sufficient performance. For example, an 8-inch sewer main collecting wastewater from a cul-de-sac is not as vital to the reliability and performance of the collection system as the trunkline entering a lift station or the wastewater treatment plant.

This metric does not consider the existing condition of the pipeline, which is considered separately as "probability of failure." The District will need to consider both consequence of failure and probability of failure to make wise decisions regarding pipeline maintenance. Both concepts are discussed separately to consider and weight both issues appropriately in the context of sewer asset management.

Proposed Consequence of Failure Rating System

Implementing a rating system to accurately represent consequence of failure is difficult because some consequences are not directly quantifiable or associated with a monetary amount. For example, pipe replacements costs can be reasonably estimated, but externalities related to health and safety are hard to quantify directly. For this reason, BC&A proposes using a few easily measurable factors to indicate relative pipe COF from flow estimates and categorical multipliers based on pipe attributes. Four factors are proposed to estimate the consequence of failure of a sewer pipe: the flow rate in the pipe, the class of road over the pipe, the type of zoning in the area, and the depth of the pipe invert.

Sewer Flow Rate. Flow rate in a sewer pipe is the most important indicator of the importance of a pipe. Pipes with high flow rates are generally larger and pose greater risks of significant property damage, environmental and regulatory consequences, high replacement costs, and serious sewer backups into basements and streets in the event of a failure. Such events are costly and hazardous to public and environmental health. Additionally, pipes with higher flow rates generally, but not always, have larger service areas, meaning that the impacts of failure could be more widespread with large flow rates.

BC&A proposes the average day flow rate be used as the base rating for COF estimates for each pipe in the District's collection system. This chapter uses 2021 model flow estimates in its estimations.

Other COF Factors. The other three factors adjust the rating with multipliers based on the pipe's attribute in each category. Table 5-1 lists the proposed multipliers assigned to each rating factor. After computing a COF rating from these four factors, the pipes are ranked and divided into three categorical levels. These levels are discussed in further detail after the following explanations of each factor class and its multipliers.

Table 8-6
Consequence of Failure (COF) Multipliers

Road Class	Multiplier	Zone	Multiplier	Depth	Multiplier
No Road or Local	1	Open Space/ Industrial	1	0-12 feet	1
Collector	2	Residential	1.5	12-20 feet	1.2
Arterial	4	Commercial/ Institutional	1.7		
Freeway	10				
Canal X-ing	5				
Rail X-ing	10				

Road Class. Traffic density on a roadway is directly connected with the cost and time associated with maintenance and repairs on sewer pipes. Based on GIS information available from the Utah AGRC, the District, and UDOT road class maps, BC&A classified roadways within the District into four categories: Freeways (including Interstates), Arterials (major and minor), Collectors (major and minor), and Local roadways. Canal and rail crossings are also included in this category because the multipliers are of similar magnitude as other road multipliers and, like pipes intersecting freeways and arterials, the impacts of a pipe failing under a crossing are very significant.

- **Freeways** – Interstates and major highways are assigned the highest multiplier ranking because the cost of crossing the freeway is significantly higher than traditional pipe installation methods. This categorization also reflects the magnitude of potential property damage risks and social disruption if traffic is affected by a repair to a pipe in these locations. This multiplier is intentionally set high enough to generally force all freeway crossings into the highest COF level.
- **Arterials** – Major and minor arterials are assigned the next highest multiplier. These roads are major streets and experience greater disruption from traffic control for repair work on pipes within their right of way. The time and money associated with pipe maintenance in these streets is fairly high. The multiplier associated with this attribute reflects both the increased traffic volume on these streets, the increased cost, and moderate disruption caused by traffic control on these roadways for repairs.
- **Collectors** – Major and minor collector roads convey traffic from residential areas to arterial roads for access to busier, more commercial areas. These roads do not convey the traffic volume major arterials do but still see greater and more consistent traffic volumes than residential areas. The multiplier associated with this attribute reflects the increase in traffic volume from local roadways.
- **Local Roadways** – Local roads within the District are primarily residential or within industrial parks and do not carry large traffic volumes. Repairs to sewer mains in these roads are not likely to cause any significant disruption to the overall roadway network and are generally safer; therefore, this attribute did not multiply the COF rating of any pipes. Pipes located in open spaces were also assigned this road class attribute.
- **Canal Crossings** – Sewer pipes crossing canals have more risk of contamination and regulatory violations than sewer pipes in other locations. Traditional pipe repair/installation methods via trenching is also impractical while the canal is in operation, complicating the repair and any required environmental mitigation. The multiplier associated with this attribute reflects the priority placed on preventing contamination and environmental hazards.
- **Rail Crossings** – Sewer pipes experiencing structural failures or settlement underneath rail lines could potentially cause train derailments or stop transportation of essential goods while repairs are completed. The potential impacts to public safety and welfare are large. The multiplier associated with this attribute reflects the severity of potential disruptions or derailments within rail systems.

Zoning. Zoning is also a factor that impacts COF ratings. Sewer pipes set in open fields imply smaller consequences of failure than pipes of the same size in residential or commercial areas. For this analysis, the District was grouped into three zoning categories:

- **Commercial –** Sewer pipes in commercial areas see higher traffic volumes and could potentially see costly impacts. The multiplier associated with commercial zoning attributes is the highest out of the three zoning categories.

- **Residential –** Sewer pipes in residential areas are generally less costly to repair, but they do have more potential for adverse health effects for residents than pipes in industrial zones or open space.
- **Open Space and Industrial –** Sewer pipes in industrial zones or open space are the most removed from areas with higher population densities and are assumed to have the least amount of impact from a failed pipe.

Depth of Pipe. The depth of the pipe can have a significant impact on the cost of repairs and rehabilitation of sewer pipe. Extensions on backhoes, very wide trenches, possible dewatering, etc. make repairs and maintenance much more expensive and time consuming on deeper pipes. For the purpose of this analysis, the depth of pipe was grouped into two categories:

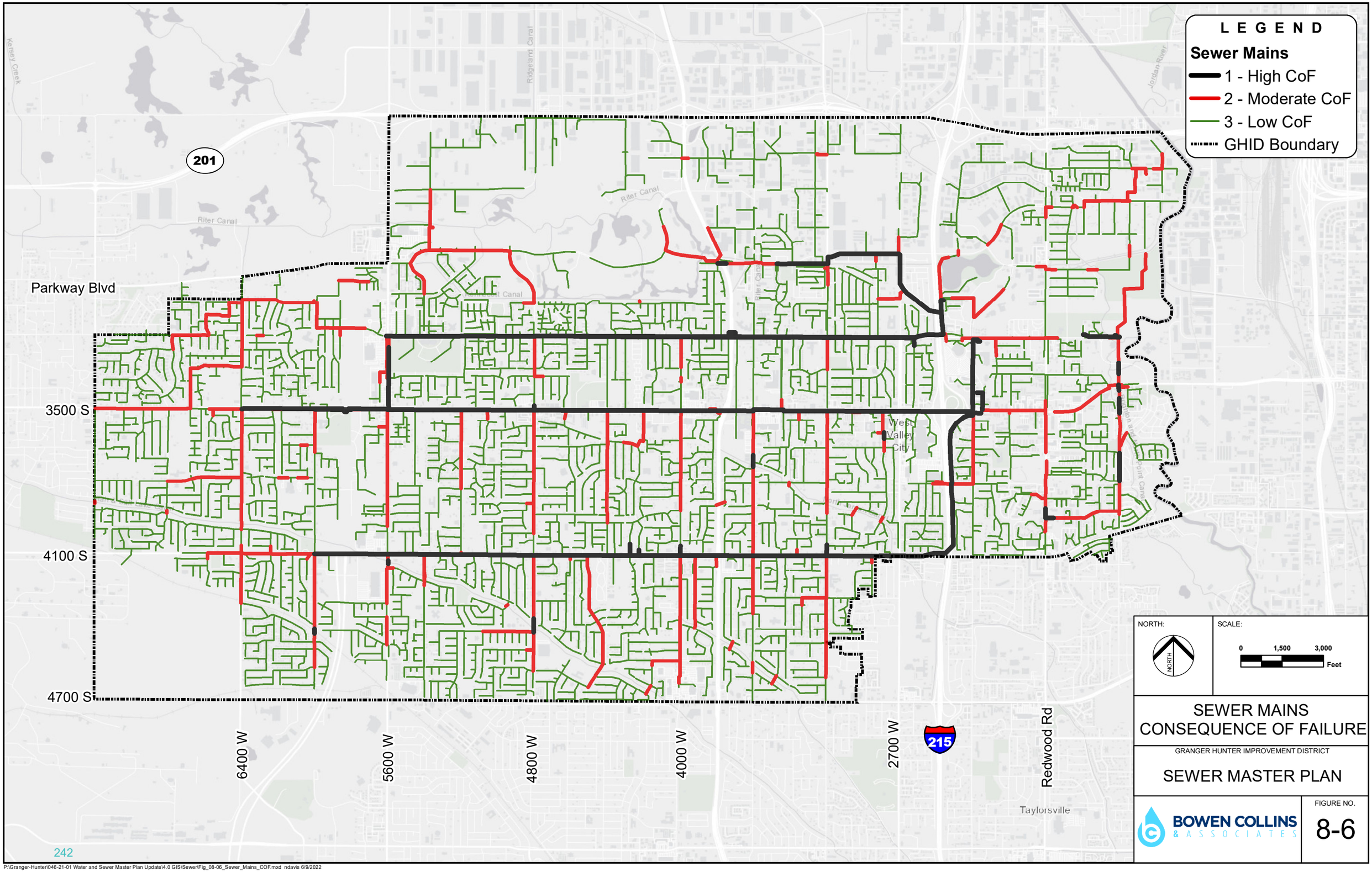
- 0 to 12 feet – Pipes that are less than 12 feet deep can generally be maintained and repaired using standard construction techniques.
- 12+ feet – Once the depth of a pipeline exceeds 12 feet, repairs and maintenance begin to become more expensive and can be more time consuming. Additional equipment and special construction techniques add to the cost of working on these deep pipes.

Consequence of Failure Results

Based on the proposed approach described above, BC&A developed pipe ratings for the District's sewer collection system and divided pipe ratings into three levels as shown in Figure 8-6. The top 5 percent of pipe ratings are classified as COF Level 1, representing the group of most important pipes in the system. The next 10 percent of pipe ratings are classified as COF Level 2. The remaining 85 percent of pipes in the system are classified as COF Level 3 pipes.

Table 8-7
Consequence of Failure Levels

COF Level	Total Length of Pipe (ft)
1 - Highest Consequence of Failure	112,880
2 - Moderate Consequence of Failure	186,110
3 - Lowest consequence of Failure	1,483,670
Total	**1,782,660**



SEWER MAINS CONSEQUENCE OF FAILURE

GRANGER HUNTER IMPROVEMENT DISTRICT

SEWER MASTER PLAN

BOWEN COLLINS & ASSOCIATES

FIGURE NO. 8-6

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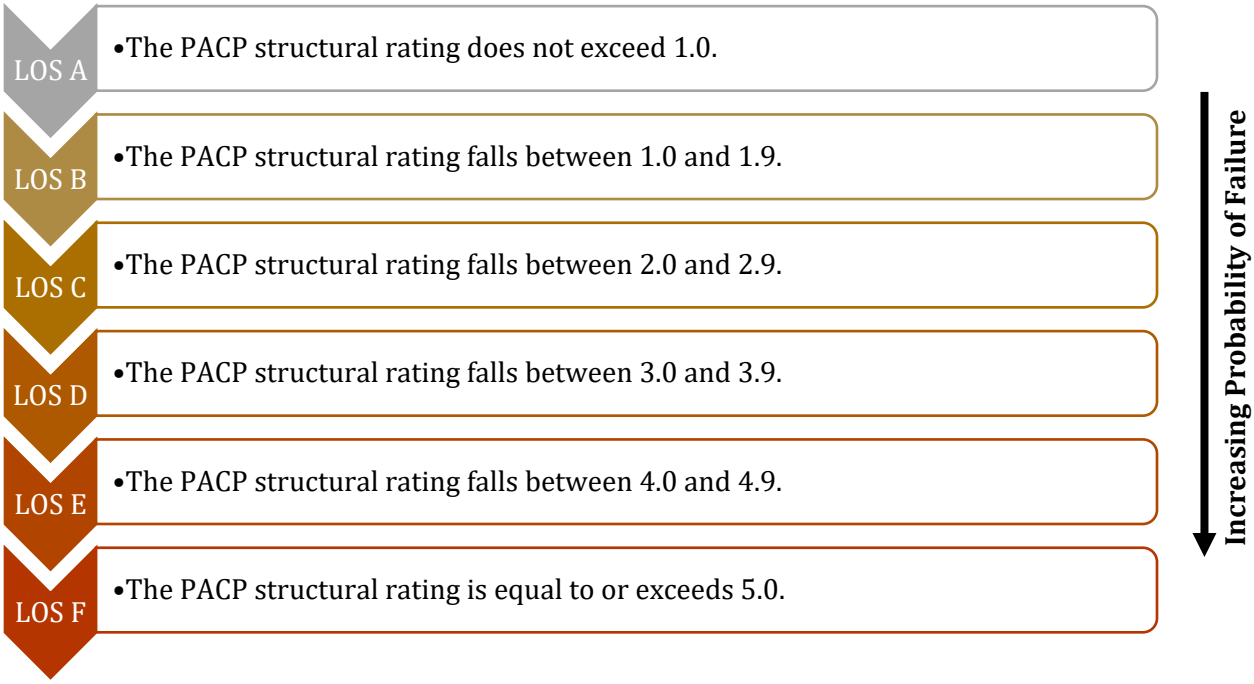
PROBABILITY OF FAILURE

The only cause of failure considered in this evaluation of probability of failure is failure based on loss of structural integrity. Other failure causes such as natural disasters, vandalism, or damage by contractors are not included in this evaluation because there is no way to predict these types of events for individual pipe segment.

Ideally, probability of failure would be defined in terms of an actual probability (i.e. a given segment of pipe has an estimated __% chance of failure in a given year). This would allow for a statistical evaluation of each pipe which would compare the expected cost of continuing without rehabilitation verses the cost of rehabilitation. As noted previously, PACP structural index scores produced through inspection of the collection system were connected with approximately 79.9 percent of the pipes in the system. However, statistical regression analyses of key pipe properties (material, diameter, flow rate) indicated most of the variability in PACP scores is unexplained by these variables. In general, concrete and clay pipes either experience no structural issues throughout their lifetime (most pipes in the District's collection system) or experienced failure-inducing issues beginning at a service age of around 35-40 years (a relatively small portion of the District's pipes). The spatial distribution of PACP scores throughout the collection system also indicates an absence of a strong pattern.

The general lack of correlation between SPRI score and age, material, diameter, and flow, complicates estimating remaining useful life and probability of failure for pipes in the District collection system. While the PACP scores are useful for assessing structural defects of the pipe, the inspections examine only the interior of the pipe. There is no direct way to determine which external factors, such as soil migration or installation defects, are causing structural deficiencies in pipeline assets from PACP inspection protocols at this time.

To address this issue, BC&A recommends continuing to utilize the structural PACP condition rating to give a general indication of pipe conditions and prioritize sewer mainline replacements. The PACP structural condition ratings do not give a probability of failure but may be used to approximately determine a replacement timeline for specific pipes and establish appropriate inspection schedules. To be consistent with asset management assessment convention, PACP scores have been used to define a level of service (LOS) from A to F as summarized in the following graphic.



CRITICALITY

Criticality is defined as the combined consideration of the consequence of failure and the probability of failure of an asset. The term "criticality" is often used interchangeably in asset management with the term "risk" because criticality is used to compare the risk of failure associated with a given asset relative to the rest of the assets in the system. Criticality calculations are the key component used in decision making for asset management and prioritize the attention and resources of the District in collection system maintenance. The purpose of this section is to identify an approach to calculate criticality for District assets.

Figure 8-7 depicts the theory of criticality. Criticality is the combined consideration of consequence of failure and probability of failure. As shown in Figure 8-7, the greater the probability of failure, and the more important a pipe is, the higher it will be ranked in criticality.

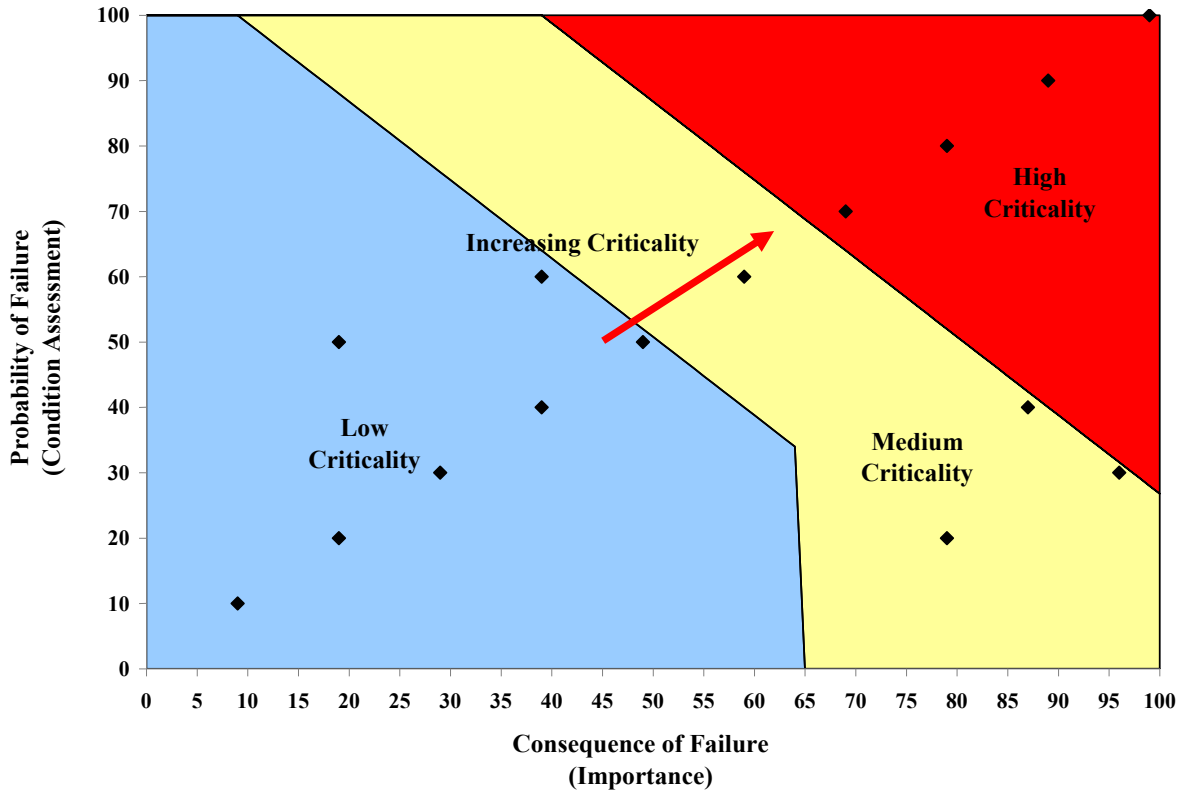


Figure 8-7 Criticality (Risk)

Criticality Analysis of District Collection System

Criticality can be calculated once probability of failure and consequence of failure for each pipe segment is defined. Given the current limitations in the data for estimating a likelihood of failure, BC&A proposes using the criticality matrix shown in Figure 8-7 to begin prioritizing asset replacement timelines and inspection schedules. Instead of using discrete data points for probability of failure and consequence of failure, this matrix groups this information into basic level of service grades for probability of failure and consequence of failure levels. As additional information is gathered in the future, this matrix can be refined. Criticality in the matrix increases from the lower left corner to the upper right.

Structural Level of Service	Pipe Importance Level 3 Recommended Action	Pipe Importance Level 2 Recommended Action	Pipe Importance Level 1 Recommended Action
F	Short Term Pipe Replacement / Rehabilitation	Immediate Pipe Replacement / Rehabilitation	Immediate Pipe Replacement / Rehabilitation
E	Mid Term Pipe Replacement / Rehabilitation	Short Term Pipe Replacement / Rehabilitation	Immediate Pipe Replacement / Rehabilitation
D	Short Term Inspection Schedule	Mid Term Pipe Replacement / Rehabilitation	Short Term Pipe Replacement / Rehabilitation
C	Mid Term Inspection Schedule	Short Term Inspection Schedule	Short Term Inspection Schedule
B	Long Term Inspection Schedule	Mid Term Inspection Schedule	Mid Term Inspection Schedule
A	Long Term Inspection Schedule	Long Term Inspection Schedule	Mid Term Inspection Schedule

Increasing Probability of Failure

Increasing Consequence of Failure

Figure 8-8 Criticality Matrix

The matrix includes recommend actions based on pipe criticality. The intent of the recommended actions is to provide guidelines for the decision-making process and focus resources on the assets which are most critical. The recommended actions include both inspection activities and rehabilitation activities. In both cases, the recommended schedule for the time frames listed in the table are as follows:

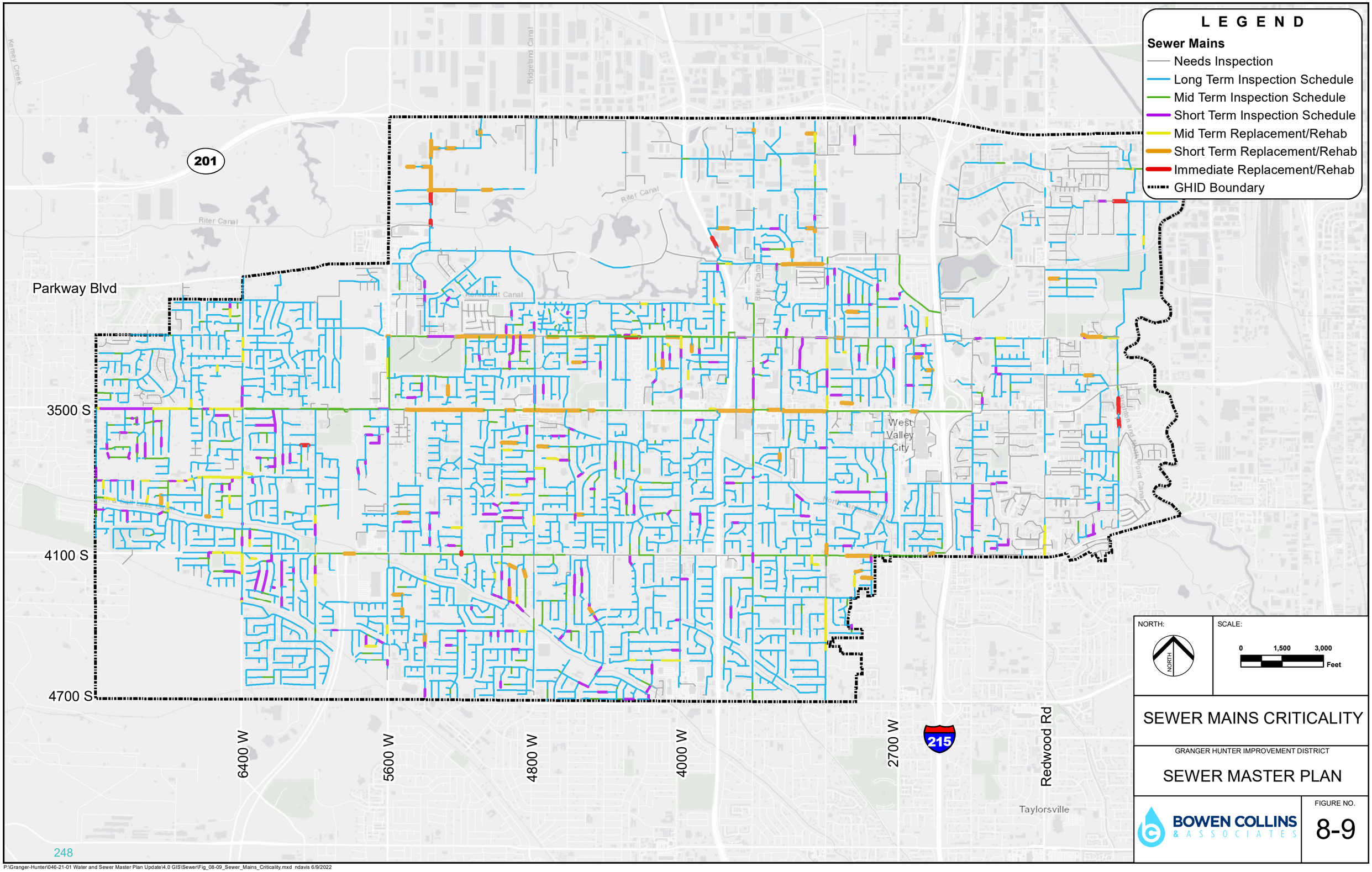
Immediate	0-1 year
Short Term	1-4 years
Mid Term	4-8 years
Long Term	More than 8 years

This matrix is only a starting point and two things should be remembered as it is used to help develop future rehabilitation and inspection schedules:

- First, the matrix is not intended as a replacement for engineering judgment. As each pipeline is evaluated, additional issues not covered by the matrix will need to be considered by District personnel when making final rehabilitation and replacement decisions. For example, if a pipe is generally good condition, but has one isolated structural problem, its overall level of service rating may be relatively high. As a result, it may be classified as a low criticality pipeline even though the isolated problem may merit immediate attention. In these cases, it is expected that District personnel will use their judgment to increase the criticality of the pipeline and accelerate resolution of the problem. Despite this limitation, it is believed that using the matrix to augment engineering judgment will enable better asset management than relying on institutional knowledge only.

- Second, the proposed matrix has been developed from previous project experience and in response to difficulty determining statistical relationships to estimate likelihood of failure. As additional data is collected, including repair histories, soil conditions, etc., there is significantly more analysis the District will be able to do regarding criticality. Some sewer agencies are using the criticality information and cost data to assign a cost of failure and rating the payback of inspections and other maintenance activity. This type of analysis can provide an agency with the best operation and maintenance returns on limited budget resources. It is recommended that the District review this matrix periodically to review the recommended actions and identify possible improvements to the evaluation procedure. Ultimately, the District's goal is to adopt best practices and maximize the use of resources in addressing system management needs.

The results of this criticality analysis are shown in Figure 8-9.



SEWER MAINS CRITICALITY

GRANGER HUNTER IMPROVEMENT DISTRICT

SEWER MASTER PLAN

BOWEN COLLINS & ASSOCIATES

FIGURE NO. 8-9

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RECOMMENDED FUNDING LEVELS

The previous sections have described pipelines in the system and planning for areas to focus on. It is also important to consider an appropriate funding level so that the District is able to complete the projects when they are needed.

In a sewer system, there are two options to consider when a pipe reaches the end of its useful life, rehabilitation by pipe lining or complete replacement of the pipe. The two options have significantly different costs. A complete replacement of the District's sewer lines is estimated to cost $755 million. A complete rehabilitation of the District's sewer lines is estimated to cost $165 million. As each pipeline nears the end of its useful life the District will need to evaluate the appropriate method of rehab. For this study it is assumed that 50% of pipes will need to be completely replaced and 50% of pipes can be lined. Using this breakdown, a complete renovation of the system (rehab or replacement as appropriate) would have an estimated cost of $460 million.

BC&A combined this cost data with the estimated remaining life discussed previously to determine an appropriate funding level for pipe rehabilitation and replacement. Based on this assessment the District should be averaging $3.7 million long term. Figure 8-10 shows this data in graph form. As shown in the figure, there are a number of immediate needs that should be addressed as soon as possible. After those needs are attended to, average investment needs are estimated to be lower than average (just over $2 million per year) for the next three decades. Thus, if the District can find some extra funding to address the most immediate needs, it may be able to keep system renewal investment at a more modest level in the short-term as it addresses other needs. However, if rehabilitation and replacement is delayed for too long, future funding levels will increase drastically.

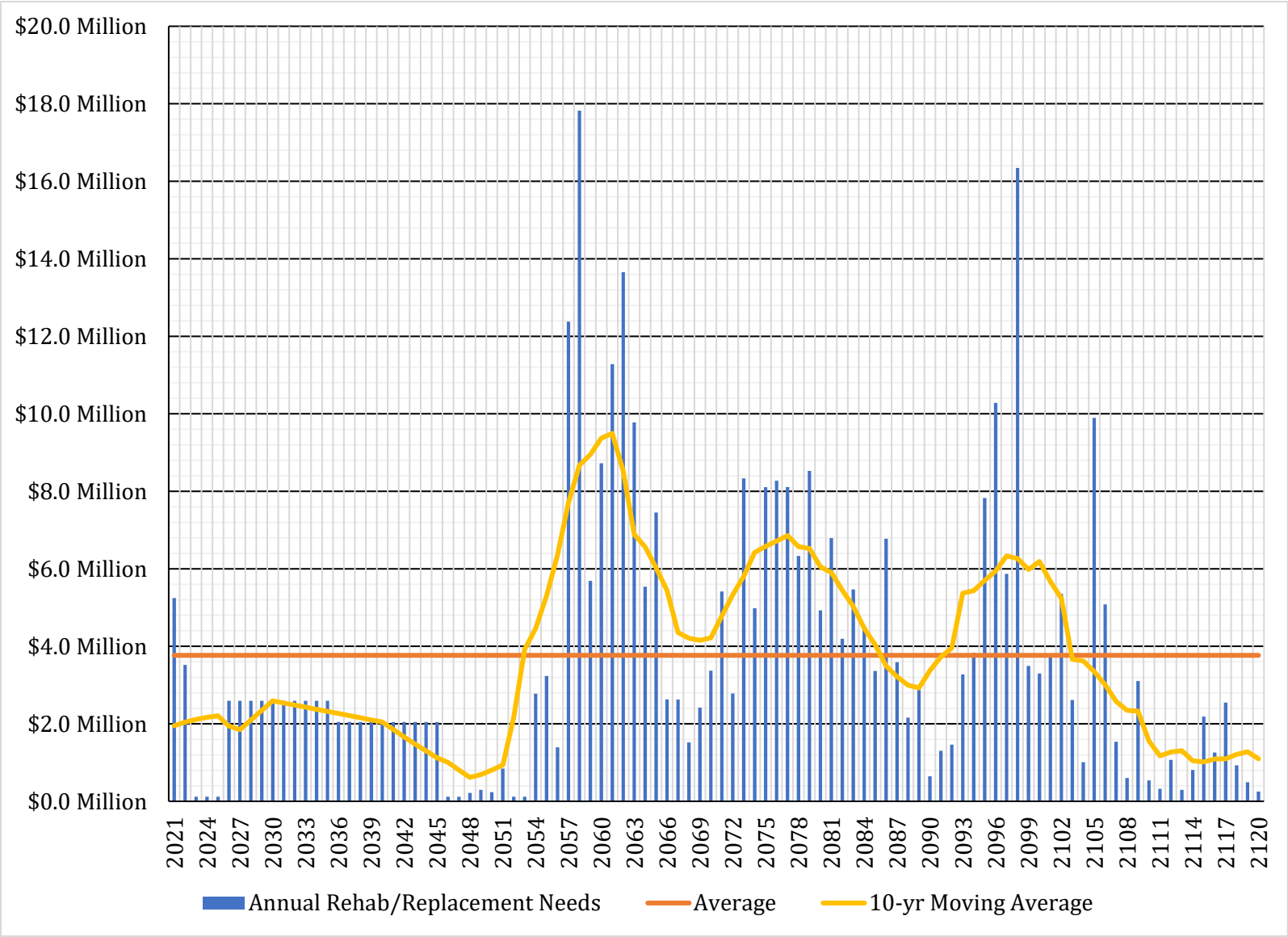


Figure 8-10 Expected Sewer Pipeline Replacement and Rehabilitation Needs

VERTICAL ASSETS ASSESSMENT AND PLANNING

Vertical assets in a wastewater collection system are mainly comprised of wastewater lift stations or pump stations, and this is the case for GHID. The District has 12 lift stations that represent a significant investment by the District. This section details the efforts to assess the condition of these lift stations and recommended future asset management activities.

LIFT STATION INSPECTIONS

Determining the condition of lift stations compared to the horizontal assets is quite different because the lift stations can be visually inspected much easier. The District and BC&A worked together to determine appropriate criteria which would be used during the inspections. The lift station was divided into five main categories as described below:

- **Building & Site –** This category includes the building interior & exterior, landscape & enclosure, and the site asphalt/concrete condition. Condition of the site is important to protect the other equipment and help the sites blend in with their neighbors and be good neighbors.
- **Pump & Mechanical –** This category includes the pump, motor, piping, and isolation valves. As the "heart" of the lift station, it is imperative that this equipment be in good working order and that necessary maintenance be performed when needed.
- **Wet Well –** The wet well is one of the difficult items to inspect while the lift station is in operation. The wet well is in direct contact with the wastewater, which can sometimes deteriorate the concrete quickly. It is important to catch needed repairs quickly so that an issue here does not become more serious than when it is first observed.
- **Grinders –** This category includes inspection of the grinder assembly as well as the bypass structure. Grinders reduce the wear and tear on the pumps and are an important part of the lift station. Grinders can wear out quickly and should be inspected frequently.
- **Electrical –** This category includes the generator & transfer switch, switchboard, transformer, MCC, panelboard, VFD/motor starters, PLC/RTU, and HMI. The electrical components are what drive the other equipment and are essential to lift station operation.

Each item was rated on a scale of 1 to 5 for general condition and was reviewed for specific common issues. Review forms also included a space for general notes. The rating definitions are as follows:

1. Excellent; like-new conditions, no issues notes; routine maintenance adequate
2. Adequate; minor wear, no equipment issues; schedule routine maintenance soon
3. Fair; worn, but no pressing equipment issues; mid-term replacement/rehabilitation recommended
4. Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5. Bad; equipment severely damaged/halting operation; immediate replacement/maintenance required

Inspections were completed by both District staff and BC&A engineers, with District staff accompanying BC&A engineers to several locations and District staff completing many inspections on their own. Where District staff completed the evaluations, inspection forms were then provided to BC&A. Table 8-8 is a compilation of the results of the site inspections. A table with the complete assessment and a copy of the completed inspection forms is included in the appendix.

Table 8-8
Lift Station Assessment Ratings

Lift Station	Armstrong	Chesterfield	Decker Main	Decker North	East Rec	Montec	Pleasant Valley	Valley Downs	Warner	West Lake	Wheeler
SS-LS-1: Building and Site Assessment											
General	1	2.5	2.5		1	1	3.5		1		
Building/Vault Exterior	1	2.5	1		1	1	4.5	2.5	1	2	3
Building/Vault Interior	1.5	2	2.5	2.5	1.5	1		1.5	1	2	2
Landscape & Enclosure	1	2	1		1		2	1	2		
Asphalt/Concrete (Parking, Walkways, Access)	1	2	1	2	1		2	1	1	1	
SS-LS-2: Pumps and Mechanical											
Pump 1	1	2.5	1	2	3	1	3	1.5		2	2
Pump 2	1	1	1	1	3	1	3	1.5	2.5	2	2
Pump 3	1		1		3		5		2.5		
Pump 4	1		1								
Pump 5											
Pump 6											
Motor 1	1	2.5	1	1	3	1	3	1.5		2	2
Motor 2	1	1	1	1	3	1	3	1.5	2.5	2	2
Motor 3	1		1		3		5		2.5		
Motor 4	5		1								
Motor 5											
Motor 6											
Piping	1	2	2	2	3	1	3	1	1	2	2
Isolation Valves	1	1	2	2	3	1	3	2	2	2.5	1
HVAC System	1		2		3	1	3		1		
SS-LS-3: Wet Well Assessment											
Structure	1		2.5	3	3	3	4	2.5	1	2	2

Lift Station	Armstrong	Chesterfield	Decker Main	Decker North	East Rec	Montec	Pleasant Valley	Valley Downs	Warner	West Lake	Wheeler
SS-LS-4: Grinder Assessment											
Grinder	2	1			3	1	3		3		
Bypass Structure (if applicable)				2				2	1		2
SS-LS-5: Electrical Assessment											
Overall Electrical	2	4		3	2	2		3	1	4	3
Generator and Transfer Switch	2	3	2	2		2	3	3	1	4	3
Switchboard	2		2	3	2	2	3	3	1	4	3
Transformer	2		2.5	2	2	2	3	3	1	4	3
Motor Control Center (MCC)	2			2	2	2		3	1	4	3
Panelboard	2		2	2	2	2	4	3	1	4	3
VFD 1 (If applicable)	2	1	2	1	2	2	3.5	2	1		1
VFD 2 (If applicable)	2	1	2	1	2	2	1	2	1		1
VFD 3 (If applicable)	2		2		2		1		1		
VFD 4 (If applicable)	2		2								
VFD 5 (If applicable)											
VFD 6 (If applicable)											
Motor Starter 1 (If applicable)	2									4	
Motor Starter 2 (If applicable)										4	
Motor Starter 3 (If applicable)											
Motor Starter 4 (If applicable)											
Motor Starter 5 (If applicable)											
Motor Starter 6											

Lift Station	Armstrong	Chesterfield	Decker Main	Decker North	East Rec	Montec	Pleasant Valley	Valley Downs	Warner	West Lake	Wheeler
(If applicable)											
PLC Panel/RTU	2		2	1	2	2	3	3	1	4	2
HMI	2		2	4	2	2	3	2	1		2
Security System (if applicable; if not present, leave comment)	2	3		2	2	2	3	3	1	4	3

EQUIPMENT EXPECTED LIFESPAN

Visual inspection of equipment gives a good snapshot of how an asset is performing at the given time, but more information is needed in order to plan for maintenance and repairs or replacement in the future. BC&A worked with District staff to determine an expected lifespan for each asset category. These values are only estimates and it is recommended that the District continue to collect information and refine these values as appropriate. Table 8-9 shows the equipment and its expected lifespan.

Table 8-9
Asset Expected Lifespan

Asset Group	Assessment Items	Expected Lifespan (yrs)
Building & Site (Inspection)	Building Interior & Exterior	60
	Landscape & Enclosure	-
	Asphalt/Concrete	25
Pump & Mechanical (Inspection)	Pump	20 Rebuild @ 10
	Motor	20
	Piping	50
	Isolation Valves	40
Wet Well (Inspection)	Wet Well Structure	50
Grinders (Inspection)	Grinder Assembly	5
	Bypass Structure	50
Electrical (Inspection)	Generator & Transfer Switch	20
	Switchboard	25
	Transformer	25
	MCC	20
	Panelboard	20
	VFD/Motor Starters	15
	PLC/RTU	10
	HMI	10

10-YEAR PLANNING

The most basic way of planning for rehabilitation and replacement would be to take an equipment's install year and add the expected lifespan to that. However, many variables can impact the lifespan of a specific piece of equipment. An asset in an extreme environment can require rehabilitation or replacement much sooner than expected, whereas another asset that is used infrequently may long outlive its expected lifespan. Both are important to plan for and this is where the visual inspections become extremely valuable. An expected lifespan combined with the assets current condition allows the District to adjust the timing of rehab or replacement and maximize the investment in the asset.

Following the inspection of the lift stations, results were analyzed and specific items that are anticipated to be needed in the next ten years were identified, as shown in Table 8-10, along with a cost estimate.

Table 8-10
Suggested Lift Station Projects

Site Name	Suggested Action	Cost Estimate
Armstrong Lift Station	Pump Rebuild	$200,000
Chesterfield Lift Station	Pump Replacement / Electrical	$725,000
Decker Main Lift Station	Pump Rebuild / Building	$700,000
Decker North Lift Station	Pumps (1 Rebuild/1 Replace) / Electrical	$600,000
East Rec Lift Station	Pump Rebuilds / Generator	$325,000
Montec Lift Station	Pump Rebuild	$75,000
Valley Downs Lift Station	Pump Rebuild / Electrical	$700,000
Warner Lift Station	Pumps (1 Rebuild/2 Replace)	$275,000
West Lake Lift Station	Pump Replacement / Electrical	$675,000
Wheeler Lift Station	Pump Rebuild / Electrical	$675,000
Decker North Force Main	Additional Force Main	$1,200,000
Lift Stations (All)	Grinder Repair/Replacement (3/year)	$1,100,000
Pleasant Valley Lift Station	Replace Lift Station	$5,000,000
	TOTAL	**$12,250,000**

RECOMMENDED LONG TERM FUNDING LEVELS

While specific rehabilitation and replacement items may be adjusted as needed, it is important for the District to plan for appropriate funding levels. The total replacement cost of the District's lift stations is estimated to be $97.5 million dollars. While individual pieces of the lift station have differing life expectancies, a lift station is expected to be operable between 40 and 60 years overall. Using this information, a recommended funding level can be calculated as shown in Table 8-11.

Table 8-11
Recommended Lift Station Renewal Budget

Replacement Value	Service Life (years)	Recommended Annual Investment Range	
$97,500,000	40 - 60	$2,400,000	$1,600,000

ON-GOING INSPECTIONS

Visual inspections are valuable insight into the performance of specific assets within the District's wastewater system. Their biggest limitation is the fact that they are simply a snapshot taken on a specific day. For continued planning it is imperative that sites continue to be inspected and data be recorded. For this purpose, BC&A recommends that District staff complete inspections approximately every two years. To assist with this effort, blank forms that were used for this round of inspections are included in the appendix of this report.

CHAPTER 9
IMPLEMENTATION PLAN

Previous chapters of this sewer master plan have identified improvements to resolve future deficiencies and to accommodate wastewater flow from future growth while providing an acceptable level of service. The purpose of this chapter is to assemble a 10-year capital improvement program to implement the recommended improvements. This plan should be updated at least every five years to re-prioritize system improvements to achieve District Goals.

CAPITAL IMPROVEMENT PRIORITIZATION

A discussion of each of the major budget categories and how they will be prioritized in the 10-year implementation plan is included below:

- **Collection System Capacity Improvements –** BC&A used the growth projections discussed in Chapter 2 of this report and the existing collection system hydraulic model to determine when collection system capacity improvements are needed. There is not much flexibility with the scheduling of these projects. While moving a project a few years forward or a few years back may be a possibility, major changes in timing cannot be accommodated. Unless growth occurs at rates significantly different than those projected, failure to complete the projects at the recommended dates will result in the District running out of available capacity and being forced to implement restrictions on development.
- **Collection System Rehabilitation Improvements –** A recommended budget level for collection system rehabilitation improvements was developed in Chapter 8. Although this exact amount does not need to be spent in every single year, failure to invest in this system at approximately this level over time will result in system degradation and costly system failures. While the District does have some flexibility with these expenditures, this implementation plan assumes annual rehab and replacement investments through the entire 10-year planning window based on the recommended funding level.

RECOMMENDED 10-YEAR CAPITAL IMPROVEMENT PROGRAM

Based on the system improvements identified in Chapter 6 and the recommended prioritization approach discussed above, Table 9-1 lists improvement projects that are recommended within the next 10-years, the budget required to complete those projects, and the recommended timing of those projects. For budgeting purposes, capital costs for some major capital improvements have been split up into two years.

GHID budgets for water and wastewater projects on a combined basis. A similar prioritization has been done for water projects as part of the water master plan. For comparison of the District's total capital expenditures, both water and wastewater projects are shown in Figure 9-1, which summarizes the annual capital expenditures that will be required to support the recommended capital improvement plan. Expenditures have been grouped by major category for reference.

For comparison purposes, Figure 9-1 also includes anticipated level of funding available for capital improvements based on data from the rate study being conducted at the same time as this master plan. The table and figure both include an assumed inflation rate of 3% per year.

Table 9-1
Recommended 10-Year Capital Improvement Plan

Site Name	Project Description	Cost Estimate (2022 $s)	Year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	10+	10-yr Total
Wastewater - Rehab & Replacement															
Armstrong Lift Station	Pump Rebuild	$225,000	2022	$75,000	$77,250	$79,568									$231,818
Chesterfield Lift Station	Pump Replacement / Electrical	$725,000	2027						$840,474						$840,474
Decker Main Lift Station	Pump Rebuild / Building	$700,000	2031										$913,341		$913,341
Decker North Lift Station	Pumps (1 Rebuild/1 Replace) / Electrical	$600,000	2029								$737,924				$737,924
East Rec Lift Station	Pump Rebuilds / Generator	$325,000	2029								$399,709				$399,709
Montec Lift Station	Pump Rebuild	$75,000	2027						$86,946						$86,946
Valley Downs Lift Station	Pump Rebuild / Electrical	$700,000	2026					$787,856							$787,856
Warner Lift Station	Pumps (1 Rebuild/2 Replace)	$275,000	2028							$328,364					$328,364
West Lake Lift Station	Pump Replacement / Electrical	$675,000	2022	$40,000		$673,672									$713,672
Wheeler Lift Station	Pump Rebuild / Electrical	$675,000	2028							$805,985					$805,985
Decker North Force Main	Additional Force Main	$1,200,000	2028							$1,432,863					$1,432,863
Lift Stations (All)	Grinder Repair/Replacement (3/year)	$1,100,000	2022	$110,000	$114,000	$117,000	$121,000	$124,000	$128,000	$132,000	$136,000	$140,000	$144,000	$148,000	$1,414,000
Collection System	High-Priority Pipe Repairs ($1.1M/yr)	$7,750,000	2022	$1,108,000	$1,141,000	$1,175,000	$1,210,000	$1,247,000	$1,284,000	$1,322,000					$8,487,000
Collection System	High-Priority Pipe Lining	$3,645,000	2029								$1,495,000	$1,540,000	$1,586,000		$4,621,000
Collection System	High Priority Manhole Lining	$405,000	2024								$167,000	$172,000	$177,000		$516,000
Collection System	Ongoing Pipe Replacement	$700,000	10+											$941,000	$941,000
Collection System	Ongoing Manhole Lining	$70,000	10+											$94,074	$94,074
	Sub-Total	***$19,845,000***		***$1,333,000***	***$1,332,250***	***$2,045,239***	***$1,331,000***	***$2,158,856***	***$2,339,419***	***$4,021,212***	***$2,935,633***	***$1,852,000***	***$2,820,341***	***$1,183,074***	***$23,352,026***
Wastewater - Capacity Expansion															
Collection System	S1 - Redwood Road Improvements (D01, D02, D03 D04)	$8,750,000	2022	$2,712,500	$6,218,625										$8,931,125
Collection System	S2 - 4000 W, Continental Dr to 4100 S (1200') (D15)	$630,000	2025				$688,418								$688,418
Collection System	S3 - 3100 S, West of 4800 W (1000') (D20)	$1,400,000	10+											$1,881,483	$1,881,483
Collection System	S4 - Decker Lake Dr @ City Center Ct (2-27" between 30") (1500') (D27)	$1,560,000	2031										$2,035,446		$2,035,446

Site Name	Project Description	Cost Estimate (2022 $s)	Year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	10+	10-yr Total
Collection System	S5 - 3100 S, 2040 W to Armstrong PS (1000') (D28)	$600,000	2029								$737,924				$737,924
Collection System	S6 - 3500 S, W of Bangerter to 3600 W (1700') (D32)	$1,900,000	10+											$2,553,441	$2,553,441
Collection System	S7 - 3500 S, 3200 W to W of Decker Lake Dr (5300') (D10)	$6,000,000	2028							$7,164,314					$7,164,314
Collection System	S8 - 4100 S from 6780 W to 6400 W (2,680')	$1,400,000	2029								$1,721,823				$1,721,823
Pleasant Valley Lift Station	LS1 - Replace Lift Station	$5,000,000	2026					$3,939,281	$1,738,911						$5,678,192
	Sub-Total	***$27,240,000***		***$2,712,500***	***$6,218,625***	***$0***	***$688,418***	***$3,939,281***	***$1,738,911***	***$7,164,314***	***$2,459,748***	***$0***	***$2,035,446***	***$4,434,924***	***$31,392,167***
	TOTAL	**$47,060,000**		**$4,045,500**	**$7,550,875**	**$2,045,239**	**$2,019,418**	**$6,098,137**	**$4,078,330**	**$11,185,526**	**$5,395,381**	**$1,852,000**	**$4,855,787**	**$5,617,998**	**$54,744,192**

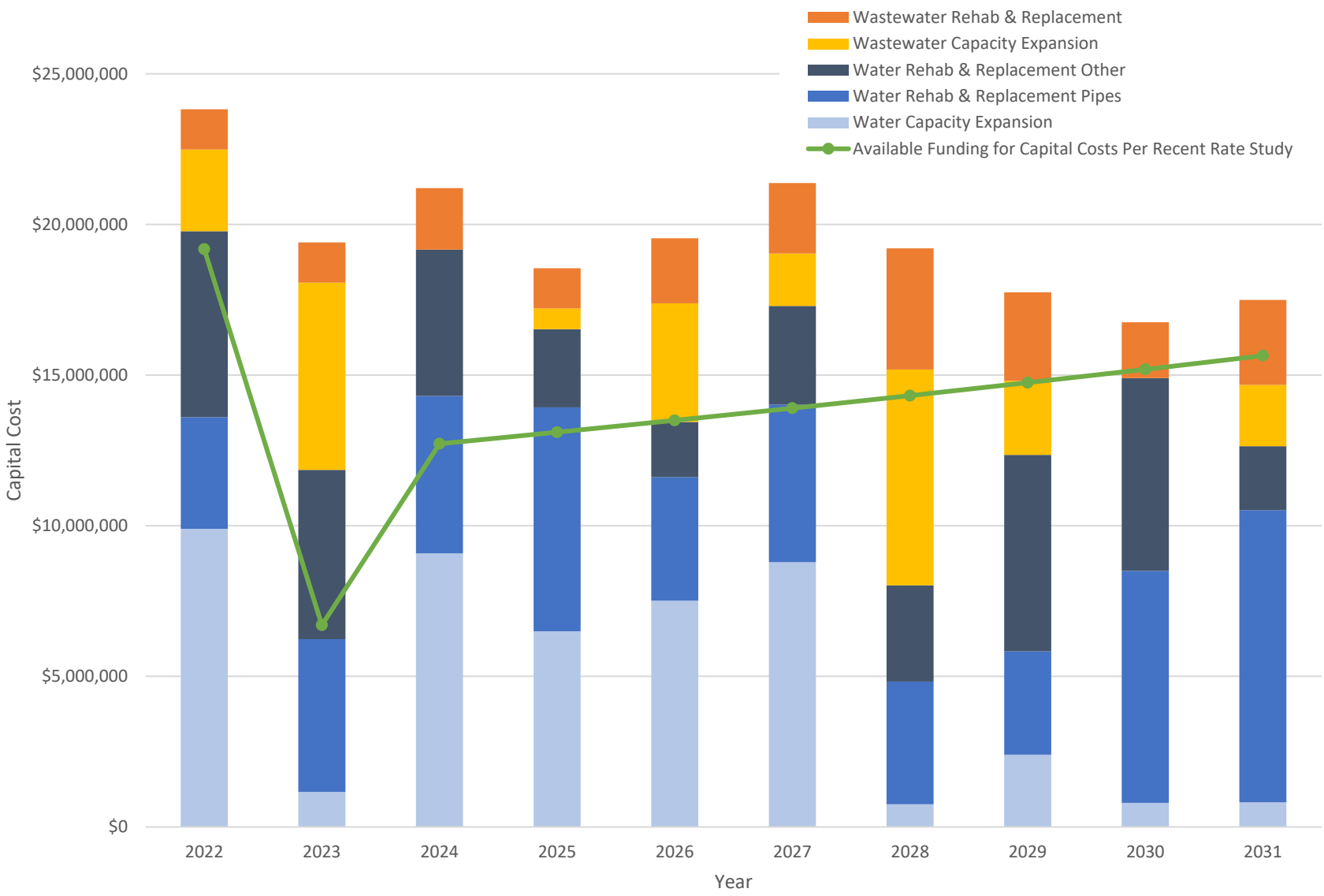


Figure 9-1 10-Year Revenue and Expenditures

A few conclusions can be made based on Table 9-1 and Figure 9-1:

- **Short-term Level of Funding –** As shown in Figure 9-1, the recommended projected identified in this plan are estimated to cost more than the funding that is projected to be available based on the District's most recent rate study. This can largely be explained by the recent historic inflation rates and contractor availability driving up the cost of projects. It also likely reflects greater than average immediate needs that have resulted from projects being deferred in the past. Additional funding through bonding or increased rates (or a combination of both) will be necessary to cover costs for the needed short-term projects. The District should maintain a close eye on market conditions to plan for both short- and long-term pricing changes.
- **Long-term Level of Funding –** While the District's historic level of funding for capital projects may have been adequate in the past, a significant increase in investment is projected to be needed in the future. As the service area ages and more pipes begin to reach the end of their expect life, it will be important that funding levels related specifically to rehabilitation and replacement increase and be a priority for the District. The District's recent rate study identified increases in funding to bring the District more in line with expected needs; however, recent inflation means that rates will likely need to increase even more to sustainably fund long-term needs.

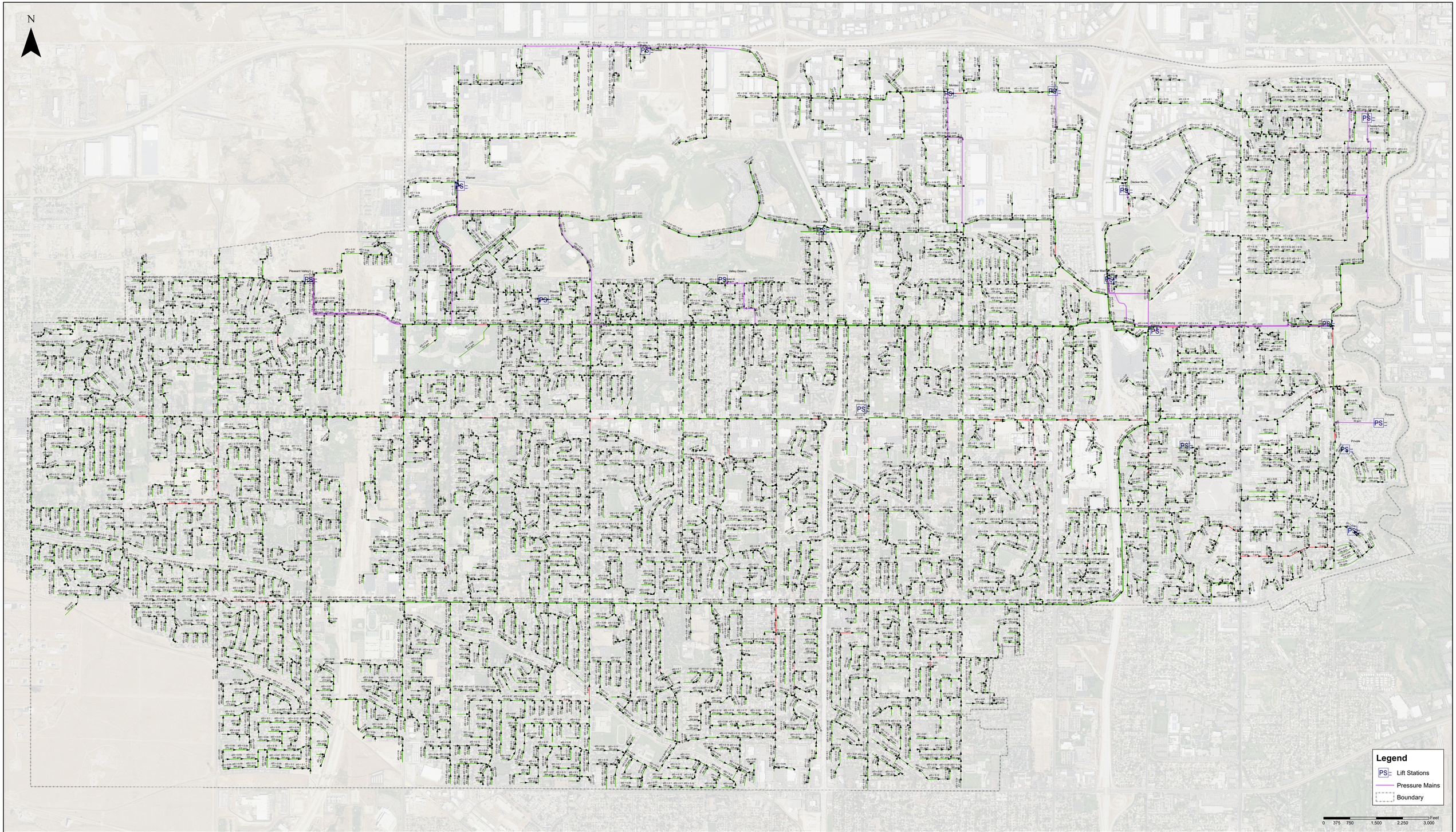
RECOMMENDATIONS

Based on the analysis contained in this report and the conclusions above, the following actions are recommended:

- **Adopt the Proposed Implementation Plan –** The 10-year capital improvement plan summarized in Table 9-1 represents the best available assessment of District capital needs in the upcoming years. It is recommended that this plan be adopted for budgeting, staffing, rate making and impact fee calculation purposes. As a planning document it is recognized that circumstances and needs will change over time and the details of the plan will need to be reviewed on an annual basis.
- **Update the Rate Plan to Match the Implementation Plan –** While the District's recent rate study identified increases in funding to bring the District more in line with expected needs, recent inflation means that rates need to increase even more to sustainably fund the proposed implementation plan. The District should periodically relook at its rates and consider additional bonding options to complete the projects identified in the implementation plan.
- **Develop a Plan for Project Completion –** In addition to having adequate funding to complete the needed projects in upcoming years, the District will also need to make sure it has adequate help to manage and execute the needed projects. There may be too many capital projects for the District's existing staff to manage. It is recommended that the District identify a plan for increasing its capacity in this regard, either through the acquisition of additional staff or securing assistance from a consultant.
- **Update this Sewer Master Plan Regularly –** This sewer master plan should be viewed as a living document. The conclusions contained herein are based on several assumptions that will assuredly change from time to time. Examples of this include assumptions associated with development patterns, regulatory requirements, economic conditions, inflation, etc. As changes occur in these areas, the conclusions and recommendations in this report may need to be revised. For this reason, it is recommended that this report be updated on a regular

basis. This should be at least once every 5 years and more often if necessitated by a major change in the District (e.g. major new regulatory requirement, annexation of a new area, etc).

APPENDIX A
HAL SEWER SYSTEM REMAINING CAPACITY



HANSEN ALLEN & LUCE inc
ENGINEERS

GRANGER HUNTER IMPROVEMENT DISTRICT

EXISTING d/D WITHOUT INFLOW
REMAINING PEAK CAPACITY BASED ON PROVIDED DIAMETER, SLOPE, AND 2019-2020 BILLING DATA

2019 - 2020

APPENDIX B
SEWER ASSESSMENT RESULTS

Asset ID:		Armstrong	Chesterfield	Decker Main	Decker North	East Rec	Montec	Pleasant Valley	Valley Downs	Warner	West Lake	Wheeler
SS-LS-1: Building and Site Assessment												
Component Ratings	**Expected Lifespan**											
General		**1**	**2.5**	**2.5**		**1**	**1**	**3.5**		**1**		
Building Age	60	8	39	49	25	6	6	-	17	3	35	17
Building/Vault Exterior	**60**	**1**	**2.5**	**1**		**1**	**1**	**4.5**	**2.5**	**1**	**2**	**3**
Roofing improvement needed		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Aesthetic improvement needed		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Minor component improvement needed		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE
Not applicable (No building)		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	TRUE	TRUE
Building/Vault Interior	**60**	**1.5**	**2**	**2.5**	**2.5**	**1.5**	**1**		**1.5**	**1**	**2**	**2**
Needs cleaning		FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE
Aesthetic improvement needed		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Updates needed to meet code		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Structural improvements needed (check below)		**TRUE**	**FALSE**	**TRUE**	**FALSE**	**TRUE**	**FALSE**	**TRUE**	**FALSE**	**FALSE**	**FALSE**	**FALSE**
Seismic upgrades		TRUE	FALSE	TRUE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE
Repair		FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Complete replacement		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Landscape & Enclosure	**60**	**1**	**2**	**1**		**1**		**2**	**1**	**2**		
Landscape dead or dying (needs rehab/replant)		FALSE	FALSE	FALSE	FALSE	FALSE		TRUE	FALSE	TRUE	FALSE	FALSE
Landscape needs complete replacement		FALSE	FALSE	FALSE	FALSE	FALSE		FALSE	FALSE	FALSE	FALSE	FALSE
Fencing/enclosure requires repair		FALSE	FALSE	FALSE	FALSE	FALSE		FALSE	FALSE	FALSE	FALSE	FALSE
Not applicable (No landscaping)		FALSE	TRUE	FALSE	TRUE	FALSE		FALSE	FALSE	FALSE	TRUE	TRUE
Asphalt/Concrete (Parking, Walkways, Access)	**25**	**1**	**2**	**1**	**2**	**1**		**2**	**1**	**1**	**1**	
Alligator cracking/aggregate visible/spalling		FALSE	TRUE	FALSE	FALSE	FALSE		FALSE	FALSE	FALSE	FALSE	
Large cracks and/or uplifts		FALSE	FALSE	FALSE	FALSE	FALSE		FALSE	FALSE	FALSE	FALSE	
Potholes or noticable settlement		FALSE	FALSE	FALSE	FALSE	FALSE		FALSE	FALSE	FALSE	FALSE	
Drainage issues (standing water, depressions, etc.)		FALSE	FALSE	FALSE	FALSE	FALSE		FALSE	FALSE	FALSE	FALSE	
Comments												
General									2004 Tube Style (No building)	2018		Tube style (No building)
Building Vault/Exterior			1982 cement building. Minor cracks in cement.		Tube/Vault 1996			Roof rusted Minor spalling	Door to tube starting to show rust		Tube style (no building) 1986	Door to tube major rust damage 2004
Building/Vault Interior		Anchor electrical panels		Brace duct work Anchor lower grating Bent grating Expansion caulk	Slight rust on door	Anchor electrical panels		Anchor furnace and panels Attach vertical pipes to braces		Tube/vault built 1996		
Landscape & Enclosure								Some needs	Dryscape (xeroscape)	3 dead trees		No landscaping
Asphalt/Concrete (Parking, Walkways, Access)							Not GHID Asphalt					No asphalt
Other												
SS-LS-2: Pumps and Mechanical												
Inspected by:		B. Mayer	Ricky & Kyle	B. Mayer	Ricky & Kyle	B. Mayer	Ricky & Kyle	B. Mayer	Ricky & Kyle		Ricky & Kyle	Ricky & Kyle
Inspection Date:		7/29/2021	8/12/2021	7/29/2021	8/12/2021	7/29/2021	8/12/2021	7/29/2021	8/11/2021		8/11/2021	8/11/2021
Component Ratings												
Pump 1		**1**	**2.5**	**1**	**2**	**3**	**1**	**3**	**1.5**		**2**	**2**
Age	20 - Rebuild @ 10	8	39	-	1	-	6	-	17	25	35	17
Check if submersible (no feasible visual inspection)		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE		FALSE	
Pump surface - corrosion		FALSE		FALSE	FALSE	TRUE	FALSE	TRUE	FALSE		FALSE	FALSE
Pump surface - chipped coating		FALSE		FALSE	FALSE	TRUE	FALSE	TRUE	FALSE		FALSE	FALSE
Pump seals leaking		FALSE		FALSE	TRUE	FALSE	FALSE	FALSE	FALSE		FALSE	FALSE
Worn nuts/lugs on bolted connections		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE		FALSE	FALSE
Loose connections		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE		FALSE	FALSE
Cracked or damaged foundation supports		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE		FALSE	FALSE
Unusual vibrations or noise		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE		FALSE	FALSE
Impeller - pitting or heavy wear		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE		FALSE	FALSE
Pump performance significantly below rating		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE		FALSE	FALSE
Past usefule life -> replace		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE		FALSE	FALSE
Pump 2		**1**	**1**	**1**	**1**	**3**	**1**	**3**	**1.5**	**2.5**	**2**	**2**
Age	20 - Rebuild @ 10	8	39	-	25	-	6	-	17	1	35	17
Check if submersible (no feasible visual inspection)		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE		FALSE	
Pump surface - corrosion		FALSE		FALSE	FALSE	TRUE	FALSE	TRUE	FALSE		FALSE	FALSE
Pump surface - chipped coating		FALSE		FALSE	FALSE	TRUE	FALSE	TRUE	FALSE		FALSE	FALSE
Pump seals leaking		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE		FALSE	FALSE
Worn nuts/lugs on bolted connections		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE		FALSE	FALSE
Loose connections		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE		FALSE	FALSE
Cracked or damaged foundation supports		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE		FALSE	FALSE
Unusual vibrations or noise		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE		FALSE	FALSE
Impeller - pitting or heavy wear		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE		FALSE	FALSE
Pump performance significantly below rating		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE		FALSE	FALSE
Past usefule life -> replace		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE		FALSE	FALSE
Pump 3		**1**		**1**		**3**		**5**		**2.5**		
Age	20 - Rebuild @ 10	8	-	-	-	-	-	-	-	25	-	-
Check if submersible (no feasible visual inspection)		FALSE		FALSE		FALSE		FALSE				
Pump surface - corrosion		FALSE		FALSE		TRUE		TRUE				
Pump surface - chipped coating		FALSE		FALSE		TRUE		TRUE				
Pump seals leaking		FALSE		FALSE		FALSE		FALSE				
Worn nuts/lugs on bolted connections		FALSE		FALSE		FALSE		FALSE				
Loose connections		FALSE		FALSE		FALSE		FALSE				
Cracked or damaged foundation supports		FALSE		FALSE		FALSE		FALSE				
Unusual vibrations or noise		FALSE		FALSE		FALSE		FALSE				
Impeller - pitting or heavy wear		FALSE		FALSE		FALSE		FALSE				

Pump performance significantly below rating		FALSE		FALSE		FALSE		FALSE				
Past usefule life -> replace		FALSE		FALSE		FALSE		FALSE				
Pump 4		**1**		**1**								
Age	20 - Rebuild @ 10	8	-	-	-	-	-	-	-	-	-	-
Check if submersible (no feasible visual inspection)		FALSE		FALSE								
Pump surface - corrosion		FALSE		FALSE								
Pump surface - chipped coating		FALSE		FALSE								
Pump seals leaking		FALSE		FALSE								
Worn nuts/lugs on bolted connections		FALSE		FALSE								
Loose connections		FALSE		FALSE								
Cracked or damaged foundation supports		FALSE		FALSE								
Unusual vibrations or noise		FALSE		FALSE								
Impeller - pitting or heavy wear		FALSE		FALSE								
Pump performance significantly below rating		FALSE		FALSE								
Past usefule life -> replace		FALSE		FALSE								
Pump 5												
Age	20 - Rebuild @ 10	-	-	-	-	-	-	-	-	-	-	-
Check if submersible (no feasible visual inspection)												
Pump surface - corrosion												
Pump surface - chipped coating												
Pump seals leaking												
Worn nuts/lugs on bolted connections												
Loose connections												
Cracked or damaged foundation supports												
Unusual vibrations or noise												
Impeller - pitting or heavy wear												
Pump performance significantly below rating												
Past usefule life -> replace												
Pump 6												
Age	20 - Rebuild @ 10	-	-	-	-	-	-	-	-	-	-	-
Check if submersible (no feasible visual inspection)												
Pump surface - corrosion												
Pump surface - chipped coating												
Pump seals leaking												
Worn nuts/lugs on bolted connections												
Loose connections												
Cracked or damaged foundation supports												
Unusual vibrations or noise												
Impeller - pitting or heavy wear												
Pump performance significantly below rating												
Past usefule life -> replace												
Motor 1		**1**	**2.5**	**1**	**1**	**3**	**1**	**3**	**1.5**		**2**	**2**
Age	20	8	39	-	1	-	6	-	17	25	35	17
Check if submersible (no feasible visual inspection)		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE		FALSE	
Dirty inspection ports		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE		FALSE	
Oil reservoir low		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE		FALSE	
Discoloration (potential overheating)		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE		FALSE	
Unusual vibrations or noise		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE		FALSE	
Past useful life -> replace		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE		FALSE	
Motor 2		**1**	**1**	**1**	**1**	**3**	**1**	**3**	**1.5**	**2.5**	**2**	**2**
Age	20	8	39	-	25	-	6	-	17	1	35	17
Check if submersible (no feasible visual inspection)		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE		FALSE	
Dirty inspection ports		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE		FALSE	
Oil reservoir low		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE		FALSE	
Discoloration (potential overheating)		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE		FALSE	
Unusual vibrations or noise		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE		FALSE	
Past useful life -> replace		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE		FALSE	
Motor 3		**1**		**1**		**3**		**5**		**2.5**		
Age	20	8	-	-	-	-	-	-	-	25	-	-
Check if submersible (no feasible visual inspection)		FALSE		FALSE		FALSE		FALSE				
Dirty inspection ports		FALSE		FALSE		FALSE		FALSE				
Oil reservoir low		FALSE		FALSE		FALSE		FALSE				
Discoloration (potential overheating)		FALSE		FALSE		FALSE		FALSE				
Unusual vibrations or noise		FALSE		FALSE		FALSE		FALSE				
Past useful life -> replace		FALSE		FALSE		FALSE		FALSE				
Motor 4		**5**		**1**								
Age	20	8	-	-	-	-	-	-	-	-	-	-
Check if submersible (no feasible visual inspection)		FALSE		FALSE								
Dirty inspection ports		FALSE		FALSE								
Oil reservoir low		FALSE		FALSE								
Discoloration (potential overheating)		FALSE		FALSE								
Unusual vibrations or noise		FALSE		FALSE								
Past useful life -> replace		FALSE		FALSE								
Motor 5												
Age	20	-	-	-	-	-	-	-	-	-	-	-
Check if submersible (no feasible visual inspection)												
Dirty inspection ports												
Oil reservoir low												
Discoloration (potential overheating)												
Unusual vibrations or noise												
Past useful life -> replace												
Motor 6												
Age	20	-	-	-	-	-	-	-	-	-	-	-
Check if submersible (no feasible visual inspection)												
Dirty inspection ports												

Oil reservoir low												
Discoloration (potential overheating)												
Unusual vibrations or noise												
Past useful life -> replace												
Piping	**50**	**1**	**2**	**2**	**2**	**3**	**1**	**3**	**1**	**1**	**2**	**2**
Needs minor touch-up paint		FALSE	FALSE	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE
Needs complete repaint		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE
Needs replacement		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Isolation Valves	**40**	**1**	**1**	**2**	**2**	**3**	**1**	**3**	**2**	**2**	**2.5**	**1**
Leaking		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Recoating needed		FALSE	FALSE	TRUE	TRUE	FALSE	FALSE	TRUE	TRUE	TRUE	FALSE	FALSE
Needs replacement		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
HVAC System		**1**		**2**		**3**	**1**	**3**		**1**		
Age	-	8	-	-	-	-	-	-	-	-	-	-
Type - Ventilation only		TRUE		TRUE		TRUE		TRUE			FALSE	
Type - Air conditioning		TRUE		TRUE		FALSE		FALSE			FALSE	
Upgrade required		FALSE		FALSE		FALSE		FALSE		FALSE	FALSE	
Comments												
Pumps												
Motors		Pump 4 motor out for repair										
Piping												
Isolation Valves			New valves		Paint on wheel valve				Wheel valve couse use touch-up paint		West valve discharge side shift (exercise)	
HVAC System			N/A		N/A		Wall mount system		N/A	Minor touch up paint on wheel valve.	N/A	N/A
Other												
SS-LS-3: Wet Well Assessment												
Inspected by:		S. Pugh	Ricky & Kyle	S. Pugh	Ricky & Kyle	S. Pugh	Ricky & Kyle	S. Pugh	Ricky & Kyle	Ricky	2	Ricky & Kyle
Inspection Date:		7/29/2021	8/12/2021	7/29/2021	8/12/2021	7/29/2021	8/12/2021	7/29/2021	8/11/2021	8/11/2021		8/11/2021
Component Ratings												
Structure	**50**	**1**		**2.5**	**3**	**3**	**3**	**4**	**2.5**	**1**	**2**	**2**
Cracks		**FALSE**	**FALSE**	**TRUE**	**FALSE**	**FALSE**	**FALSE**	**TRUE**	**FALSE**	**FALSE**	**FALSE**	**FALSE**
Single		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Multiple		FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE
Broken/Collapsing Section		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Infiltration/Inflow		**FALSE**	**FALSE**	**FALSE**	**TRUE**	**TRUE**	**FALSE**	**TRUE**	**FALSE**	**FALSE**	**FALSE**	**TRUE**
None		FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE
Stain		FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE
Seeping		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Dripping		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Running		FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Surface Condition		**FALSE**	**FALSE**	**TRUE**	**TRUE**	**TRUE**	**FALSE**	**TRUE**	**FALSE**	**FALSE**	**TRUE**	**FALSE**
Surface Spalling		FALSE	FALSE	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE
Aggregate Visible		FALSE	FALSE	TRUE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE
Aggregate Projecting		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Reinforcement Visible		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Reinforcement Corroded		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Holes Visible		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Lid/Hatches need replacement		FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
Vent function impaired		FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Comments												
Structure			Lid showing corrosion. Ladder & anchor bolts for ladder are corroded. Corrosion on vent tub lid.		Decent amount of infiltration all around. Minimal spalling.	Corrosion at electrical pips	Lid is bent inward. Needs replacement.		Surface spalling on concrete slab (root) of wet well (outside). Small spalling on wet well walls.			Slight infiltration stain near one seam on wet well.
Other												
SS-LS-4: Grinder Assessment												
Inspected by:		B. Mayer	Ricky & Kyle	B. Mayer	Ricky & Kyle	B. Mayer	Ricky & Kyle	B. Mayer	Ricky & Kyle	Ricky	Ricky & Kyle	Ricky & Kyle
Inspection Date:		7/29/2021	8/12/2021	7/29/2021	8/12/2021	7/29/2021	8/12/2021	7/29/2021	8/11/2021	8/11/2021	8/11/2021	8/11/2021
Grinder ID:												
Component Ratings												
Grinder	**5**	**2**	**1**			**3**	**1**	**3**		**3**		
Grinder age:	-	8	2	-	-	-	6	-	-	-	-	-
Cutter stack age:	-	-	-	-	-	-	-	-	-	-	-	-
Grinder improperly seated		FALSE	FALSE			FALSE	FALSE	FALSE		FALSE		
Plastric strips (front/back) not flush with drum		FALSE	FALSE			FALSE	FALSE	FALSE		FALSE		
Interference between screens/cutter stacks		FALSE	FALSE			FALSE	FALSE	FALSE		FALSE		
Damage to drum/screen material		FALSE	FALSE			FALSE	FALSE	FALSE		FALSE		
Leaks present (inline grinders)		FALSE	FALSE			FALSE	FALSE	FALSE		TRUE		
Rotation issues (bump grinders)		FALSE	FALSE			FALSE	FALSE	FALSE		FALSE		
Cutter stack insufficiently torqued		FALSE	FALSE			FALSE	FALSE	FALSE		FALSE		
Leaks to power pack and/or torque motor		FALSE	FALSE			FALSE	FALSE	FALSE		FALSE		
Tank Oil Level	-	-	-	-	-	-	-	-	-	-	-	-
Clear		FALSE	FALSE			FALSE	FALSE	FALSE		FALSE		
Milky		FALSE	FALSE			FALSE	FALSE	FALSE		FALSE		
Bubbles		FALSE	FALSE			FALSE	FALSE	FALSE		FALSE		
Bypass Structure (if applicable)	**50**				**2**				**2**	**1**		**2**
Not Applicable		TRUE			FALSE	TRUE	TRUE		FALSE	FALSE	TRUE	

Control Gates need replacement		FALSE			FALSE	FALSE	FALSE		FALSE	FALSE		
Cracks		FALSE			FALSE	FALSE	FALSE		FALSE	FALSE		
Single		FALSE			FALSE	FALSE	FALSE		FALSE	FALSE		
Multiple		FALSE			FALSE	FALSE	FALSE		FALSE	FALSE		
Broken/Collapsing Section		FALSE			FALSE	FALSE	FALSE		FALSE	FALSE		
Structure Surface Conditions		FALSE			FALSE	FALSE	FALSE		FALSE	FALSE		
Surface Spalling		FALSE			FALSE	FALSE	FALSE		FALSE	FALSE		
Aggregate Visible		FALSE			FALSE	FALSE	FALSE		FALSE	FALSE		
Aggregate Projecting		FALSE			FALSE	FALSE	FALSE		FALSE	FALSE		
Reinforcement Visible		FALSE			FALSE	FALSE	FALSE		FALSE	FALSE		
Reinforcement Corroded		FALSE			FALSE	FALSE	FALSE		FALSE	FALSE		
Comments												
Grinders				3 grinders; 2 in service, 1 out for repair	N/A				N/A	Small leak from connections	N/A	N/A
Bypass Structure			Manhole with quick connect		Manhole with flange connection.				Manhole with quick connect	Manhole with quick connect	No bypass	Manhole with a quick connect coupling
Other												
SS-LS-5: Electrical Assessment												
Inspected by:		D. Ovard/N. Davis	SC	D. Ovard/N. Davis	SC	D. Ovard/N. Davis	SC	D. Ovard/N. Davis	SC	SC	SC	SC
Inspection Date:		7/29/2021		7/29/2021		7/29/2021		7/29/2021				
Component Ratings												
Overall Electrical		**2**	**4**		**3**	**2**	**2**		**3**	**1**	**4**	**3**
Age (years)	25	9	20	11	-	6	7	-	-	4	-	-
% Usage time												
Generator and Transfer Switch		**2**	**3**	**2**	**2**		**2**	**3**	**3**	**1**	**4**	**3**
Age (years)	20	9	20	11	18	19	7	16	-	4	-	-
% Usage time												
Switchboard		**2**		**2**	**3**	**2**	**2**	**3**	**3**	**1**	**4**	**3**
Age (years)	25	9	20	11	-	6	7	30	-	4	-	-
% Usage time												
Transformer		**2**		**2.5**	**2**	**2**	**2**	**3**	**3**	**1**	**4**	**3**
Age (years)	25	9	20	-	-	6	7	32	-	4	-	-
% Usage time												
Motor Control Center (MCC)		**2**			**2**	**2**	**2**		**3**	**1**	**4**	**3**
Age (years)	20	9	20	-	-	6	7	-	-	4	-	-
% Usage time												
Panelboard		**2**		**2**	**2**	**2**	**2**	**4**	**3**	**1**	**4**	**3**
Age (years)	20	9	20	11	-	6	6	42	-	4	-	-
% Usage time												
VFD 1 (If applicable)		**2**	**1**	**2**	**1**	**2**	**2**	**3.5**	**2**	**1**		**1**
Age (years)	15	-	1	11	2	6	7	30	-	4	-	-
% Usage time												
VFD 2 (If applicable)		**2**	**1**	**2**	**1**	**2**	**2**	**1**	**2**	**1**		**1**
Age (years)	15	-	1	11	2	6	7	1	-	4	-	-
% Usage time												
VFD 3 (If applicable)		**2**		**2**		**2**		**1**		**1**		
Age (years)	15	-	-	11	-	6	-	1	-	4	-	-
% Usage time												
VFD 4 (If applicable)		**2**		**2**								
Age (years)	15	-	-	11	-	-	-	-	-	-	-	-
% Usage time												
VFD 5 (If applicable)												
Age (years)	15	-	-	-	-	-	-	-	-	-	-	-
% Usage time												
VFD 6 (If applicable)												
Age (years)	15	-	-	-	-	-	-	-	-	-	-	-
% Usage time												
Motor Starter 1 (If applicable)		**2**									**4**	
Age (years)	15	-	20	-	-	-	-	-	-	-	--	-
% Usage time												
Motor Starter 2 (If applicable)											**4**	
Age (years)	15	-	20	-	-	-	-	-	-	-	-	-
% Usage time												
Motor Starter 3 (If applicable)												
Age (years)	15	-	-	-	-	-	-	-	-	-	-	-
% Usage time												
Motor Starter 4 (If applicable)												
Age (years)	15	-	-	-	-	-	-	-	-	-	-	-
% Usage time												
Motor Starter 5 (If applicable)												
Age (years)	15	-	-	-	-	-	-	-	-	-	-	-
% Usage time												
Motor Starter 6 (If applicable)												
Age (years)	15	-	-	-	-	-	-	-	-	-	-	-
% Usage time												
PLC Panel/RTU		**2**		**2**	**1**	**2**	**2**	**3**	**3**	**1**	**4**	**2**
Age (years)	10	9	-	3	2	6	7	9	-	4	-	5
% Usage time												
HMI		**2**		**2**	**4**	**2**	**2**	**3**	**2**	**1**		**2**
Age (years)	10	9	-	3	2	6	7	9	-	4	-	5
% Usage time												
Security System (if applicable; if not present, leave comment)		**2**	**3**		**2**	**2**	**2**	**3**	**3**	**1**	**4**	**3**

Age (years)	10	9	-	22	-	6	7	-	-	4	-	-
Status (1 = New, 0 = Outdated)				0	0			0				
Comments												
Overall Electrical									Original			Original equipment
Generator and Transfer Switch						25-yr cycle with electrical switch 2015						
Switchboard												Original equipment
Transformer				Locked - not visible. No issues								Original
Motor Control Center (MCC)												
Panelboard												
VFDs (If applicable)				Capacitors - 2 replaced, 2 to be replaced		1860 gpm @ 15 psi @ 10, pump 3 on @ 9, pump 2 on @ 8, pump 1 on @ 5, pump off		For pump 1: No parts, old.				
Motor Starters (If applicable)												
PLC Panel/RTU			N/A								Original	
HMI			N/A								Original	
Security System (if applicable; if not present, leave comment)		Door contacts. No cameras - coming this year	Intrustion	Door switches, no cameras.	Intrusion	Cameras coming this year Instrusion alarm	Intrusion	Door alarms	Intrusion		Intrusion	Intrusion
Other		2415 gpm		Original construction in 1970s VFD to keep wet well at 8ft		50 years - evaluate & replace as needed		Original construction 1979				

APPENDIX C
SEWER ASSESSMENT FORMS

Armstrong Lift Station

Site Assessment

Building and Site Assessment
Lift Station

Lift Station ID:	Armstrong	**Address:**	
Inspected By:	S. Pugh	**Image Ref:**	
Date:	7/29/2021		

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

General	**Rating:** 1 2 3 4 5
▒ Building age: _____	**Comments:**

Building Exterior	**Rating:** 1 2 3 4 5
☐ Roofing improvement needed	**Comments:**
☐ Aesthetic improvement needed	
☐ Minor component improvement eeded	
☐ Not applicable (No building)	

Building/Vault Interior	**Rating:** 1 2 3 4 5
☐ Needs cleaning	**Comments:** anchor electrical panels
☐ Aesthetic improvement needed	
☐ Updates needed to meet code	
▒ Structural improvements needed (check below)	
☒ Seismic upgrades	
☐ Repair	
☐ Complete replacement	

Landscape & Enclosure	**Rating:** 1 2 3 4 5
☐ Landscape dead or dying (needs rehab/replant)	**Comments:**
☐ Landscape needs complete replacement	
☐ Fencing/enclosure requires repair	
☐ Not applicable (No landscaping)	

Asphalt/Concrete (Parking, Walkways, Access)	**Rating:** 1 2 3 4 5
☐ Alligator cracking/aggregate visible/spalling	**Comments:**
☐ Large cracks and/or uplifts	
☐ Potholes or noticable settlement	
☐ Drainage issues (standing water, depressions, etc.)	

Pumps and Mechanical Assessment
Lift Station

Pump Station ID:	ARMSTRONG WWPS	**Address:**	
Inspected By:	B. Meyer	**Image Ref:**	
Date:	07/29/21		

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Pumps

	Pump ID Age (years)	Pump ID (Checklist):	Condition Rating:
	1		(1) 2 3 4 5
	2		(1) 2 3 4 5
	3		(1) 2 3 4 5
	4		(1) 2 3 4 5
	5		1 2 3 4 5
	6		1 2 3 4 5

	Condition Checklist (Mark pumps w/ issues at right)	1	2	3	4	5	6	Comments:
	Check if Submersible (no feasible visual inspection)							Pump 4 motor outer Repair
	Pump surface - corrosion							
	Pump surface - chipped coating							
	Pump seals leaking							
	Worn nuts/lugs on bolted connections							
	Loose connections							
	Cracked or damaged foundation supports							
	Unusual vibrations or noise							
	Impeller - pitting or heavy wear							
	Pump performance significantly below rating							
	Past usefule life -> replace							

Motors

	Motor ID Age (years)	Motor ID (Checklist):	Condition Rating:
	1		(1) 2 3 4 5
	2		(1) 2 3 4 5
	3		(1) 2 3 4 5
	4		1 2 3 4 (5)
	5		1 2 3 4 5
	6		1 2 3 4 5

	Condition Checklist (Mark motors w/ issues at right)	1	2	3	4	5	6	Comments:
	Check if Submersible (no feasible visual inspection)							
	Dirty inspection ports							
	Oil reservoir low							
	Discoloration (potential overheating)							
	Unusual vibrations or noise							
	Past useful life -> replace							

Armstrong

SS-LS-2

Pumps and Mechanical Assessment
Lift Station

Sewer Utility Assets
Lift Stations

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

	Piping	Condition Rating: (1) 2 3 4 5
	Needs minor touch-up paint	Comments:
	Needs complete repaint	
	Needs replacement	

	Isolation Valves	Condition Rating: (1) 2 3 4 5
	Leaking	Comments:
	Recoating needed	
	Needs replacement	

	HVAC System	Condition Rating: (1) 2 3 4 5
	System Age:	Comments:
	Type	
✓	Ventilation Only	
✓	Air conditioning	
	Upgrade required (comment)	

Wet Well Assessment Form

Lift Station ID:	Armstrong	**Address:**	
Inspected By:	S. Pugh	**Image Ref:**	
Date:	7/29/2021		

Overall Condition Rating (Circle rating below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Structure	**Rating:** 1 2 3 4 5
▒ Cracks	**Comments:**
☐ Single	
☐ Multiple	
☐ Broken/Collapsing Section	
▒ Infiltration/Inflow	
☐ None	
☐ Stain	
☐ Seeping	
☐ Dripping	
☐ Running	
▒ Surface Condition	
☐ Surface Spalling	
☐ Aggregate Visible	
☐ Aggregate Projecting	
☐ Reinforcement Visible	
☐ Reinforcement Corroded	
☐ Holes Visible	
☐ Lid/Hatches need replacement	
☐ Vent function impaired	

Grinder Assessment
Lift Station

Lift Station ID:	ARMSTRONG	**Address:**	
Inspected By:	B. Mayer	**Image Ref:**	
Date:	07/29/19	**Grinder ID:**	

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Grinder condition		**Rating:** 1 (2) 3 4 5
☐	Grinder age: _____	**Comments:**
☐	Cutter stack age: _____	
☐	Grinder improperly seated	
☐	Plastric strips (front/back) not flush with drum	
☐	Interference between screens/cutter stacks	
☐	Damage to drum/screen material	
☐	Leaks present (inline grinders)	
☐	Rotation issues (bump grinders)	
☐	Cutter stack insufficiently torqued	
☐	Leaks to power pack and/or torque motor	
☒	Tank Oil Level _____	
☐	Clear	
☐	Milky	
☐	Bubbles	

Bypass Structure (if applicable)		**Rating:** 1 2 3 4 5
✓	Not Applicable	**Comments:**
☐	Control Gates need replacement	
☒	Cracks	
☐	Single	
☐	Multiple	
☐	Broken/Collapsing Section	
☒	Structure Surface Conditions	
☐	Surface Spalling	
☐	Aggregate Visible	
☐	Aggregate Projecting	
☐	Reinforcement Visible	
☐	Reinforcement Corroded	

Electrical Assessment
Lift Station

Lift Station ID:	Armstrong	**Address:**	
Inspected By:	D. Ward / N. Davis	**Image Ref:**	
Date:	7/29		

Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; no wear or equipment issues; all hardware present
2	Adequate: minor wear, no equipment issues; all hardware present
3	Fair; worn, no major equipment issues; missing non-critical hardware
4	Poor; old and worn; missing important hardware; replacement recommended
5	Bad; hardware gone or failed; replacement required to continue operation

Overall Electrical

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	2012	1 (2) 3 4 5		

Generators & Transfer Switches

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	2012	1 (2) 3 4 5		

Switchboard

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	2012	1 (2) 3 4 5		

Transformer

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	2012	1 (2) 3 4 5		

Motor Control Center (MCC)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	2012	1 (2) 3 4 5		

Panelboards

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	2012	1 (2) 3 4 5		

VFD (If applicable; one per pump motor)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
1		1 (2) 3 4 5		
2		1 (2) 3 4 5		
3		1 (2) 3 4 5		
4		1 (2) 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		

2.415 gpm

Electrical Assessment
Lift Station

Armstrong

Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; no wear or equipment issues; all hardware present
2	Adequate: minor wear, no equipment issues; all hardware present
3	Fair; worn, no major equipment issues; missing non-critical hardware
4	Poor; old and worn; missing important hardware; replacement recommended
5	Bad; hardware gone or failed; replacement required to continue operation

Motor Starter(s) (If applicable; one per pump motor)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 (2) 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		

PLC Panel/RTU

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	2012	1 (2) 3 4 5		

HMI

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	2017	1 (2) 3 4 5		

Security System (if applicable; if not present, leave comment)

Equipment No.	Age (yrs)	Condition (circle)	Status (Circle)	Comments:
	2017	1 (2) 3 4 5	New Outdated	Door Contacts.

No cameras - coming this year

Chesterfield Lift Station

Site Assessment

Building and Site Assessment
Lift Station

Lift Station ID:	Chesterfield	**Address:**	
Inspected By:	Ricky & Kyle	**Image Ref:**	
Date:	8/12/2021		

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

General	**Rating:** 1 (2) 3 4 5
▒ Building age: 1982	**Comments:**

Building Exterior	**Rating:** 1 (2) 3 4 5
☐ Roofing improvement needed	**Comments:** 1982 cement building
☐ Aesthetic improvement needed	minor cracks in cement
☐ Minor component improvement eeded	
☐ Not applicable (No building)	

Building/Vault Interior	**Rating:** 1 (2) 3 4 5
☒ Needs cleaning	**Comments:**
☐ Aesthetic improvement needed	
☐ Updates needed to meet code	
▒ Structural improvements needed (check below)	
☐ Seismic upgrades	
☐ Repair	
☐ Complete replacement	

Landscape & Enclosure	**Rating:** 1 (2) 3 4 5
☐ Landscape dead or dying (needs rehab/replant)	**Comments:**
☐ Landscape needs complete replacement	
☐ Fencing/enclosure requires repair	
☒ Not applicable (No landscaping)	

Asphalt/Concrete (Parking, Walkways, Access)	**Rating:** 1 (2) 3 4 5
☒ Alligator cracking/aggregate visible/spalling	**Comments:**
☐ Large cracks and/or uplifts	
☐ Potholes or noticable settlement	
☐ Drainage issues (standing water, depressions, etc.)	

Pumps and Mechanical Assessment
Lift Station

Pump Station ID:	Chesterfield	**Address:**	
Inspected By:	Ricky & Kyle	**Image Ref:**	
Date:	8/12/2021		

Overall Condition Rating (Circle rating for individual components in sections below)

1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Pumps

	Pump ID Age (years)	Pump ID (Checklist):	Condition Rating:
	1 1982		1 (2) (3) 4 5
	2 1982		(1) 2 3 4 5
	3		1 2 3 4 5
	4		1 2 3 4 5
	5		1 2 3 4 5
	6		1 2 3 4 5

	Condition Checklist (Mark pumps w/ issues at right)	1	2	3	4	5	6	Comments:
	Check if Submersible (no feasible visual inspection)							
	Pump surface - corrosion							
	Pump surface - chipped coating							
	Pump seals leaking							
	Worn nuts/lugs on bolted connections							
	Loose connections							
	Cracked or damaged foundation supports							
	Unusual vibrations or noise							
	Impeller - pitting or heavy wear							
	Pump performance significantly below rating							
	Past usefule life -> replace							

Motors

	Motor ID Age (years)	Motor ID (Checklist):	Condition Rating:
	1 1982		1 (2) (3) 4 5
	2 1982		(1) 2 3 4 5
	3		1 2 3 4 5
	4		1 2 3 4 5
	5		1 2 3 4 5
	6		1 2 3 4 5

	Condition Checklist (Mark motors w/ issues at right)	1	2	3	4	5	6	Comments:
	Check if Submersible (no feasible visual inspection)							
	Dirty inspection ports							
	Oil reservoir low							
	Discoloration (potential overheating)							
	Unusual vibrations or noise							
	Past useful life -> replace							

Pumps and Mechanical Assessment
Lift Station

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Piping	Condition Rating: 1 (2) 3 4 5
☐ Needs minor touch-up paint	Comments:
☐ Needs complete repaint	
☐ Needs replacement	

Isolation Valves	Condition Rating: (1) 2 3 4 5
☐ Leaking	Comments:
☐ Recoating needed	New valves
☐ Needs replacement	

HVAC System	Condition Rating: 1 2 3 4 5
☐ System Age:	Comments:
☐ Type	N/A
☐ Ventilation Only	
☐ Air conditioning	
☐ Upgrade required (comment)	

Wet Well Assessment Form

Lift Station ID:	Chesterfield	**Address:**	
Inspected By:	Ricky & Kyle	**Image Ref:**	
Date:	8/12/2021		

Overall Condition Rating (Circle rating below)

1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Structure		**Rating:** 1 2 3 4 5
▒	Cracks	**Comments:**
	Single	Lid showing corrosion
	Multiple	Ladder & anchor bolts
	Broken/Collapsing Section	for ladder are
▒	Infiltration/Inflow	corroded.
	None	
	Stain	
	Seeping	
	Dripping	
	Running	
▒	Surface Condition	
	Surface Spalling	
	Aggregate Visible	
	Aggregate Projecting	
	Reinforcement Visible	
	Reinforcement Corroded	
	Holes Visible	
	Lid/Hatches need replacement	
X	Vent function impaired	Corrosion on vent tube on lid.

Grinder Assessment
Lift Station

Lift Station ID:	Chesterfield	**Address:**	
Inspected By:	Ricky & Kyle	**Image Ref:**	
Date:	8/12/2021	**Grinder ID:**	

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Grinder condition		**Rating:** 1 2 3 4 5
	Grinder age: 2019	**Comments:**
	Cutter stack age:	
	Grinder improperly seated	
	Plastric strips (front/back) not flush with drum	
	Interference between screens/cutter stacks	
	Damage to drum/screen material	
	Leaks present (inline grinders)	
	Rotation issues (bump grinders)	
	Cutter stack insufficiently torqued	
	Leaks to power pack and/or torque motor	
▒	Tank Oil Level	
	Clear	
	Milky	
	Bubbles	

Bypass Structure (if applicable)		**Rating:** 1 2 3 4 5
	Not Applicable	**Comments:**
	Control Gates need replacement	
▒	Cracks	Manhole with quick connect.
	Single	
	Multiple	
	Broken/Collapsing Section	
▒	Structure Surface Conditions	
	Surface Spalling	
	Aggregate Visible	
	Aggregate Projecting	
	Reinforcement Visible	
	Reinforcement Corroded	

Electrical Assessment
Lift Station

Lift Station ID:	Chesterfield	**Address:**	
Inspected By:	SC	**Image Ref:**	
Date:			

Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; no wear or equipment issues; all hardware present
2	Adequate: minor wear, no equipment issues; all hardware present
3	Fair; worn, no major equipment issues; missing non-critical hardware
4	Poor; old and worn; missing important hardware; replacement recommended
5	Bad; hardware gone or failed; replacement required to continue operation

Overall Electrical

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	20	1 2 3 (4) 5		

Generators & Transfer Switches

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
50DSEJB	20	1 2 (3) 4 5		

Switchboard

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	20	1 2 3 4 5		

Transformer

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	20	1 2 3 4 5		

Motor Control Center (MCC)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	20	1 2 3 4 5		

Panelboards

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	20	1 2 3 4 5		

VFD (If applicable; one per pump motor)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
ATV630D15N4	1	(1) 2 3 4 5		
ATV630D15N4	1	(1) 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		

Electrical Assessment
Lift Station

Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; no wear or equipment issues; all hardware present
2	Adequate: minor wear, no equipment issues; all hardware present
3	Fair; worn, no major equipment issues; missing non-critical hardware
4	Poor; old and worn; missing important hardware; replacement recommended
5	Bad; hardware gone or failed; replacement required to continue operation

Motor Starter(s) (If applicable; one per pump motor)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	20	1 2 3 4 5		
	20	1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		

PLC Panel/RTU

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
NA		1 2 3 4 5		

HMI

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
NA		1 2 3 4 5		

Security System (if applicable; if not present, leave comment)

Equipment No.	Age (yrs)	Condition (circle)	Status (Circle)	Comments:
		1 2 (3) 4 5	New Outdated	intrusion

Decker Main Lift Station

Site Assessment

Building and Site Assessment
Lift Station

Lift Station ID:	Deckers Main	**Address:**	
Inspected By:	S. Pugh	**Image Ref:**	
Date:	7/29/2021		

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

General	**Rating:** 1 (2) (3) 4 5
▨ Building age: ~1972	**Comments:**

Building Exterior	**Rating:** (1) 2 3 4 5
☐ Roofing improvement needed	**Comments:**
☐ Aesthetic improvement needed	
☐ Minor component improvement eeded	
☐ Not applicable (No building)	

Building/Vault Interior	**Rating:** 1 (2) 3 4 5
☐ Needs cleaning	**Comments:**
☐ Aesthetic improvement needed	brace duct work
☐ Updates needed to meet code	anchor lower grating
▨ Structural improvements needed (check below)	bent grating
☒ Seismic upgrades	expansion cath
☒ Repair	
☐ Complete replacement	

Landscape & Enclosure	**Rating:** (1) 2 3 4 5
☐ Landscape dead or dying (needs rehab/replant)	**Comments:**
☐ Landscape needs complete replacement	
☐ Fencing/enclosure requires repair	
☐ Not applicable (No landscaping)	

Asphalt/Concrete (Parking, Walkways, Access)	**Rating:** (1) 2 3 4 5
☐ Alligator cracking/aggregate visible/spalling	**Comments:**
☐ Large cracks and/or uplifts	
☐ Potholes or noticable settlement	
☐ Drainage issues (standing water, depressions, etc.)	

Pumps and Mechanical Assessment
Lift Station

Pump Station ID:	DECKER MAIN	**Address:**	
Inspected By:	B. Mayer	**Image Ref:**	
Date:	07/29/21		

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Pumps

	Pump ID Age (years)	Pump ID (Checklist):	Condition Rating:
	1		(1) 2 3 4 5
	2		(1) 2 3 4 5
	3		(1) 2 3 4 5
	4		(1) 2 3 4 5
	5		1 2 3 4 5
	6		1 2 3 4 5

	Condition Checklist (Mark pumps w/ issues at right)	1	2	3	4	5	6	Comments:
	Check if Submersible (no feasible visual inspection)							
	Pump surface - corrosion							
	Pump surface - chipped coating							
	Pump seals leaking							
	Worn nuts/lugs on bolted connections							
	Loose connections							
	Cracked or damaged foundation supports							
	Unusual vibrations or noise							
	Impeller - pitting or heavy wear							
	Pump performance significantly below rating							
	Past usefule life -> replace							

Motors

	Motor ID Age (years)	Motor ID (Checklist):	Condition Rating:
	1		(1) 2 3 4 5
	2		(1) 2 3 4 5
	3		(1) 2 3 4 5
	4		(1) 2 3 4 5
	5		1 2 3 4 5
	6		1 2 3 4 5

	Condition Checklist (Mark motors w/ issues at right)	1	2	3	4	5	6	Comments:
	Check if Submersible (no feasible visual inspection)							
	Dirty inspection ports							
	Oil reservoir low							
	Discoloration (potential overheating)							
	Unusual vibrations or noise							
	Past useful life -> replace							

Decker Main

Pumps and Mechanical Assessment
Lift Station

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Piping		Condition Rating:	1	2	3	4	5
✓	Needs minor touch-up paint	Comments:					
	Needs complete repaint						
	Needs replacement						

Isolation Valves		Condition Rating:	1	2	3	4	5
	Leaking	Comments:					
✓	Recoating needed						
	Needs replacement						

HVAC System		Condition Rating:	1	2	3	4	5
	System Age:	Comments:					
	Type						
✓	Ventilation Only						
✓	Air conditioning						
	Upgrade required (comment)						

Wet Well Assessment Form

Lift Station ID:	Decker Main	**Address:**	
Inspected By:	S. Pugh	**Image Ref:**	
Date:	7/29/2021		

Overall Condition Rating (Circle rating below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Structure		**Rating:**	1	2	3	4	5
▒	Cracks	**Comments:**					
☐	Single						
☒	Multiple						
☐	Broken/Collapsing Section						
▒	Infiltration/Inflow						
☐	None						
☐	Stain						
☐	Seeping						
☐	Dripping						
☐	Running						
▒	Surface Condition						
☒	Surface Spalling						
☒	Aggregate Visible						
☐	Aggregate Projecting						
☐	Reinforcement Visible						
☐	Reinforcement Corroded						
☐	Holes Visible						
☐	Lid/Hatches need replacement						
☐	Vent function impaired						

Grinder Assessment
Lift Station

Lift Station ID:	DECKER MAIN	**Address:**	
Inspected By:	B. Mayer	**Image Ref:**	
Date:	07/29/21	**Grinder ID:**	

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Grinder condition		**Rating:** 1 2 3 4 5
☐	Grinder age: _____	**Comments:** 3 grinders 2 in service 1 out for repair
☐	Cutter stack age: _____	
☐	Grinder improperly seated	
☐	Plastric strips (front/back) not flush with drum	
☐	Interference between screens/cutter stacks	
☐	Damage to drum/screen material	
☐	Leaks present (inline grinders)	
☐	Rotation issues (bump grinders)	
☐	Cutter stack insufficiently torqued	
☐	Leaks to power pack and/or torque motor	
☐	Tank Oil Level _____	
☐	Clear	
☐	Milky	
☐	Bubbles	

Bypass Structure (if applicable)		**Rating:** 1 2 3 4 5
✓	Not Applicable	**Comments:**
☐	Control Gates need replacement	
☐	Cracks	
☐	Single	
☐	Multiple	
☐	Broken/Collapsing Section	
☐	Structure Surface Conditions	
☐	Surface Spalling	
☐	Aggregate Visible	
☐	Aggregate Projecting	
☐	Reinforcement Visible	
☐	Reinforcement Corroded	

Electrical Assessment
Lift Station

Lift Station ID:	Decker Main	**Address:**	
Inspected By:	D. Ovard / N. Davis	**Image Ref:**	
Date:	7/29		

Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; no wear or equipment issues; all hardware present
2	Adequate: minor wear, no equipment issues; all hardware present
3	Fair; worn, no major equipment issues; missing non-critical hardware
4	Poor; old and worn; missing important hardware; replacement recommended
5	Bad; hardware gone or failed; replacement required to continue operation

Overall Electrical

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	2010	1 2 3 4 5		

Generators & Transfer Switches

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	2010	1 (2) 3 4 5		

Switchboard

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	2010	1 (2) 3 4 5		

Transformer

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 (2) (3) 4 5		Locked - not visible. No issues

Motor Control Center (MCC)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		

Panelboards

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	2010	1 (2) 3 4 5		

VFD (If applicable; one per pump motor)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
1	2010	1 (2) 3 4 5		Capacitors - 2 replaced, 2 to be replaced
2	|	1 (2) 3 4 5		
3	|	1 (2) 3 4 5		
4	|	1 (2) 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		

Original constructions ~ 1970s

VFD to keep wet well @ 8'

Decker Main

Electrical Assessment
Lift Station

Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; no wear or equipment issues; all hardware present
2	Adequate: minor wear, no equipment issues; all hardware present
3	Fair; worn, no major equipment issues; missing non-critical hardware
4	Poor; old and worn; missing important hardware; replacement recommended
5	Bad; hardware gone or failed; replacement required to continue operation

Motor Starter(s) (If applicable; one per pump motor)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		

PLC Panel/RTU

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	2018	1 (2) 3 4 5		

HMI

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	2018	1 (2) 3 4 5		

Security System (if applicable; if not present, leave comment)

Equipment No.	Age (yrs)	Condition (circle)	Status (Circle)	Comments:
	1999	1 2 3 4 5	New (Outdated)	Door switches No cameras

Decker North Lift Station

Site Assessment

Building and Site Assessment
Lift Station

Lift Station ID:	Decker North	**Address:**	
Inspected By:	Ricky & Kyle	**Image Ref:**	
Date:	8/12/2021		

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

General	**Rating:** 1 2 3 4 5
▒ Building age: _____	**Comments:**

Building Exterior	**Rating:** 1 2 3 4 5
☐ Roofing improvement needed	**Comments:** Tube / Vault 1996
☐ Aesthetic improvement needed	
☐ Minor component improvement eeded	
☐ Not applicable (No building)	

Building/Vault Interior	**Rating:** 1 (2) 3 4 5
☒ Needs cleaning	**Comments:** Slight rust on door
☐ Aesthetic improvement needed	
☐ Updates needed to meet code	
▒ Structural improvements needed (check below)	
☐ Seismic upgrades	
☐ Repair	
☐ Complete replacement	

Landscape & Enclosure	**Rating:** 1 2 3 4 5
☐ Landscape dead or dying (needs rehab/replant)	**Comments:**
☐ Landscape needs complete replacement	
☐ Fencing/enclosure requires repair	
☒ Not applicable (No landscaping)	

Asphalt/Concrete (Parking, Walkways, Access)	**Rating:** 1 (2) 3 4 5
☐ Alligator cracking/aggregate visible/spalling	**Comments:**
☐ Large cracks and/or uplifts	
☐ Potholes or noticable settlement	
☐ Drainage issues (standing water, depressions, etc.)	

Pumps and Mechanical Assessment
Lift Station

Pump Station ID:	Decker North	**Address:**	
Inspected By:	Ricky & Kyle	**Image Ref:**	
Date:	8/12/2021		

Overall Condition Rating (Circle rating for individual components in sections below)

1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Pumps

	Pump ID Age (years)	Pump ID (Checklist):	Condition Rating:
	1 2020		1 (2) 3 4 5
	2 1996		(1) 2 3 4 5
	3		1 2 3 4 5
	4		1 2 3 4 5
	5		1 2 3 4 5
	6		1 2 3 4 5

	Condition Checklist (Mark pumps w/ issues at right)	1	2	3	4	5	6	Comments:
	Check if Submersible (no feasible visual inspection)							
	Pump surface - corrosion							
	Pump surface - chipped coating							
X	Pump seals leaking							
	Worn nuts/lugs on bolted connections							
	Loose connections							
	Cracked or damaged foundation supports							
	Unusual vibrations or noise							
	Impeller - pitting or heavy wear							
	Pump performance significantly below rating							
	Past usefule life -> replace							

Motors

	Motor ID Age (years)	Motor ID (Checklist):	Condition Rating:
	1 2020		(1) 2 3 4 5
	2 1996		(1) 2 3 4 5
	3		1 2 3 4 5
	4		1 2 3 4 5
	5		1 2 3 4 5
	6		1 2 3 4 5

	Condition Checklist (Mark motors w/ issues at right)	1	2	3	4	5	6	Comments:
	Check if Submersible (no feasible visual inspection)							
	Dirty inspection ports							
	Oil reservoir low							
	Discoloration (potential overheating)							
	Unusual vibrations or noise							
	Past useful life -> replace							

Pumps and Mechanical Assessment
Lift Station

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Piping		Condition Rating:	1	2	3	4	5
X	Needs minor touch-up paint	Comments:					
	Needs complete repaint						
	Needs replacement						

Isolation Valves		Condition Rating:	1	2	3	4	5
	Leaking	Comments: Paint on wheel valve.					
X	Recoating needed						
	Needs replacement						

HVAC System		Condition Rating:	1	2	3	4	5
	System Age:	Comments: N/A					
	Type						
	Ventilation Only						
	Air conditioning						
	Upgrade required (comment)						

Wet Well Assessment Form

Lift Station ID:	Decker North	**Address:**	
Inspected By:	Ricky & Kyle	**Image Ref:**	
Date:	8/12/2021		

Overall Condition Rating (Circle rating below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Structure		**Rating:**	1	2	(3)	4	5
▒	Cracks	**Comments:**					
	Single						
	Multiple						
	Broken/Collapsing Section						
▒	Infiltration/Inflow						
	None						
	Stain						
	Seeping						
	Dripping						
X	Running						
▒	Surface Condition						
X	Surface Spalling						
	Aggregate Visible						
	Aggregate Projecting						
	Reinforcement Visible						
	Reinforcement Corroded						
	Holes Visible						
	Lid/Hatches need replacement						
	Vent function impaired						

Decent amount of infiltration all around.

Minimal spalling.

Grinder Assessment
Lift Station

Lift Station ID:	Decker North	**Address:**	
Inspected By:	Ricky & Kyle	**Image Ref:**	
Date:	8/12/2021	**Grinder ID:**	

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

	Grinder condition	**Rating:** 1 2 3 4 5
	Grinder age: _____	**Comments:**
	Cutter stack age: _____	
	Grinder improperly seated	
	Plastric strips (front/back) not flush with drum	
	Interference between screens/cutter stacks	
	Damage to drum/screen material	N/A
	Leaks present (inline grinders)	
	Rotation issues (bump grinders)	
	Cutter stack insufficiently torqued	
	Leaks to power pack and/or torque motor	
▒	Tank Oil Level _____	
	Clear	
	Milky	
	Bubbles	

	Bypass Structure (if applicable)	**Rating:** 1 2 3 4 5
	Not Applicable	**Comments:**
	Control Gates need replacement	
▒	Cracks	
	Single	Manhole with flange connection.
	Multiple	
	Broken/Collapsing Section	
▒	Structure Surface Conditions	
	Surface Spalling	
	Aggregate Visible	
	Aggregate Projecting	
	Reinforcement Visible	
	Reinforcement Corroded	

Electrical Assessment
Lift Station

Lift Station ID:	Decker North	**Address:**	7600 South 2300 W
Inspected By:	SC	**Image Ref:**	
Date:			

Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; no wear or equipment issues; all hardware present
2	Adequate: minor wear, no equipment issues; all hardware present
3	Fair; worn, no major equipment issues; missing non-critical hardware
4	Poor; old and worn; missing important hardware; replacement recommended
5	Bad; hardware gone or failed; replacement required to continue operation

Overall Electrical

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 (3) 4 5		

Generators & Transfer Switches

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
07584 83	2003	1 (2) 3 4 5		

Switchboard

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 (3) 4 5		

Transformer

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 (2) 3 4 5		

Motor Control Center (MCC)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 (2) 3 4 5		

Panelboards

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 (2) 3 4 5		

VFD (If applicable; one per pump motor)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
ATV630D22N4	2	(1) 2 3 4 5		
ATV630D22N4	2	(1) 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		

Electrical Assessment
Lift Station

Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; no wear or equipment issues; all hardware present
2	Adequate: minor wear, no equipment issues; all hardware present
3	Fair; worn, no major equipment issues; missing non-critical hardware
4	Poor; old and worn; missing important hardware; replacement recommended
5	Bad; hardware gone or failed; replacement required to continue operation

Motor Starter(s) (If applicable; one per pump motor)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		

PLC Panel/RTU

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
211533134716	2	(1) 2 3 4 5		

HMI

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
1534B05053	2	1 2 3 (4) 5		

Security System (if applicable; if not present, leave comment)

Equipment No.	Age (yrs)	Condition (circle)	Status (Circle)	Comments:
		1 (2) 3 4 5	New (Outdated)	intrusion

East Reclamation Lift Station

Site Assessment

Building and Site Assessment
Lift Station

Lift Station ID:	East Rec	**Address:**	
Inspected By:	S. Pugh	**Image Ref:**	
Date:	7/29		

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

General	**Rating:** (1) 2 3 4 5
▒ Building age: _____	**Comments:**

Building Exterior	**Rating:** (1) 2 3 4 5
☐ Roofing improvement needed	**Comments:**
☐ Aesthetic improvement needed	
☐ Minor component improvement eeded	
☐ Not applicable (No building)	

Building/Vault Interior	**Rating:** 1 (2) 3 4 5
☐ Needs cleaning	**Comments:**
☐ Aesthetic improvement needed	anchor electrical panels
☐ Updates needed to meet code	
▒ Structural improvements needed (check below)	
☒ Seismic upgrades	
☐ Repair	
☐ Complete replacement	

Landscape & Enclosure	**Rating:** (1) 2 3 4 5
☐ Landscape dead or dying (needs rehab/replant)	**Comments:**
☐ Landscape needs complete replacement	
☐ Fencing/enclosure requires repair	
☐ Not applicable (No landscaping)	

Asphalt/Concrete (Parking, Walkways, Access)	**Rating:** (1) 2 3 4 5
☐ Alligator cracking/aggregate visible/spalling	**Comments:**
☐ Large cracks and/or uplifts	
☐ Potholes or noticable settlement	
☐ Drainage issues (standing water, depressions, etc.)	

Pumps and Mechanical Assessment
Lift Station

Pump Station ID:	EAST REC	**Address:**	
Inspected By:	B. Mayer	**Image Ref:**	
Date:	07/29/21		

Overall Condition Rating (Circle rating for individual components in sections below)

1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Pumps

	Pump ID Age (years)	Pump ID (Checklist):	Condition Rating:
	1		1 2 (3) 4 5
	2		1 2 (3) 4 5
	3		1 2 (3) 4 5
	4		1 2 3 4 5
	5		1 2 3 4 5
	6		1 2 3 4 5

	Condition Checklist (Mark pumps w/ issues at right)	1	2	3	4	5	6	Comments:
	Check if Submersible (no feasible visual inspection)							
✓	Pump surface - corrosion							
✓	Pump surface - chipped coating							
	Pump seals leaking							
	Worn nuts/lugs on bolted connections							
	Loose connections							
	Cracked or damaged foundation supports							
	Unusual vibrations or noise							
	Impeller - pitting or heavy wear							
	Pump performance significantly below rating							
	Past usefule life -> replace							

Motors

	Motor ID Age (years)	Motor ID (Checklist):	Condition Rating:
	1		1 2 (3) 4 5
	2		1 2 (3) 4 5
	3		1 2 (3) 4 5
	4		1 2 3 4 5
	5		1 2 3 4 5
	6		1 2 3 4 5

	Condition Checklist (Mark motors w/ issues at right)	1	2	3	4	5	6	Comments:
	Check if Submersible (no feasible visual inspection)							
	Dirty inspection ports							
	Oil reservoir low							
	Discoloration (potential overheating)							
	Unusual vibrations or noise							
	Past useful life -> replace							

East Rec

SS-LS-2

Pumps and Mechanical Assessment
Lift Station

Sewer Utility Assets
Lift Stations

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Piping		Condition Rating:	1	2	3	4	5
✓	Needs minor touch-up paint	Comments:					
	Needs complete repaint						
	Needs replacement						

Isolation Valves		Condition Rating:	1	2	3	4	5
	Leaking	Comments:					
	Recoating needed						
	Needs replacement						

HVAC System		Condition Rating:	1	2	3	4	5
	System Age:	Comments:					
	Type						
✓	Ventilation Only						
	Air conditioning						
	Upgrade required (comment)						

Wet Well Assessment Form

Lift Station ID:	East Rec	**Address:**	
Inspected By:	S. Pugh	**Image Ref:**	
Date:	7/29		

Overall Condition Rating (Circle rating below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Structure		**Rating:** 1 2 (3) 4 5
▒	Cracks	**Comments:** Corrosion of electrical pipes
	Single	
	Multiple	
	Broken/Collapsing Section	
▒	Infiltration/Inflow	
	None	
✓	Stain	
	Seeping	
	Dripping	
	Running	
▒	Surface Condition	
✓	Surface Spalling	
✓	Aggregate Visible	
	Aggregate Projecting	
	Reinforcement Visible	
	Reinforcement Corroded	
	Holes Visible	
	Lid/Hatches need replacement	
	Vent function impaired	

Grinder Assessment
Lift Station

Lift Station ID:	EAST REC	**Address:**	
Inspected By:	B. Mayer	**Image Ref:**	
Date:	07/29/21	**Grinder ID:**	

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Grinder condition		**Rating:** 1 2 (3) 4 5
☐	Grinder age: _____	**Comments:**
☐	Cutter stack age: _____	
☐	Grinder improperly seated	
☐	Plastric strips (front/back) not flush with drum	
☐	Interference between screens/cutter stacks	
☐	Damage to drum/screen material	
☐	Leaks present (inline grinders)	
☐	Rotation issues (bump grinders)	
☐	Cutter stack insufficiently torqued	
☐	Leaks to power pack and/or torque motor	
▒	Tank Oil Level _____	
☐	Clear	
☐	Milky	
☐	Bubbles	

Bypass Structure (if applicable)		**Rating:** 1 2 3 4 5
✓	Not Applicable	**Comments:**
☐	Control Gates need replacement	
▒	Cracks	
☐	Single	
☐	Multiple	
☐	Broken/Collapsing Section	
▒	Structure Surface Conditions	
☐	Surface Spalling	
☐	Aggregate Visible	
☐	Aggregate Projecting	
☐	Reinforcement Visible	
☐	Reinforcement Corroded	

Electrical Assessment
Lift Station

Lift Station ID:	East Rec	**Address:**	
Inspected By:	D. Overall / N. Davis	**Image Ref:**	
Date:	7/29		

Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; no wear or equipment issues; all hardware present
2	Adequate: minor wear, no equipment issues; all hardware present
3	Fair; worn, no major equipment issues; missing non-critical hardware
4	Poor; old and worn; missing important hardware; replacement recommended
5	Bad; hardware gone or failed; replacement required to continue operation

Overall Electrical

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	2015	1 (2) 3 4 5		

Generators & Transfer Switches

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	2002	1 2 3 4 5		25 yr cycle with Electrical Switch 2015

Switchboard

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	2015	1 (2) 3 4 5		

Transformer

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	2015	1 (2) 3 4 5		

Motor Control Center (MCC)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	2015	1 (2) 3 4 5		

Panelboards

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	2015	1 (2) 3 4 5		

VFD (If applicable; one per pump motor)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
1	2015	1 (2) 3 4 5		
2	2015	1 (2) 3 4 5		
3	2015	1 (2) 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		

1460 gpm 15 psi

10 Pump 3 on
9 Pump 2 on
8 Pump 1 on
5 Pump off

50 years - Evaluate + replace as needed.

East Rec

SS-LS-5

Electrical Assessment
Lift Station

Sewer Utility Assets
Lift Stations

Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; no wear or equipment issues; all hardware present
2	Adequate: minor wear, no equipment issues; all hardware present
3	Fair; worn, no major equipment issues; missing non-critical hardware
4	Poor; old and worn; missing important hardware; replacement recommended
5	Bad; hardware gone or failed; replacement required to continue operation

Motor Starter(s) (If applicable; one per pump motor)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		

PLC Panel/RTU

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	2015	1 (2) 3 4 5		

HMI

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	2015	1 (2) 3 4 5		

Security System (if applicable; if not present, leave comment)

Equipment No.	Age (yrs)	Condition (circle)	Status (Circle)	Comments:
	2016	1 (2) 3 4 5	New Outdated	Cameras coming this year. Intrusion alarm

Montec Lift Station

Site Assessment

Grinder Assessment
Lift Station

Lift Station ID:	Montec	**Address:**	
Inspected By:	Ricky & Kyle	**Image Ref:**	
Date:	8/12/2021	**Grinder ID:**	

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

	Grinder condition	**Rating:** 1 2 3 4 5
	Grinder age: 2015	**Comments:**
	Cutter stack age:	
	Grinder improperly seated	
	Plastric strips (front/back) not flush with drum	
	Interference between screens/cutter stacks	
	Damage to drum/screen material	
	Leaks present (inline grinders)	
	Rotation issues (bump grinders)	
	Cutter stack insufficiently torqued	
	Leaks to power pack and/or torque motor	
▒	Tank Oil Level	
	Clear	
	Milky	
	Bubbles	

	Bypass Structure (if applicable)	**Rating:** 1 2 3 4 5
X	Not Applicable	**Comments:**
	Control Gates need replacement	
▒	Cracks	N/A
	Single	
	Multiple	
	Broken/Collapsing Section	
▒	Structure Surface Conditions	
	Surface Spalling	
	Aggregate Visible	
	Aggregate Projecting	
	Reinforcement Visible	
	Reinforcement Corroded	

Building and Site Assessment
Lift Station

Lift Station ID:	Montec	**Address:**	
Inspected By:	Ricky & Kyle	**Image Ref:**	
Date:	8/12/2021		

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

General	**Rating:** (1) 2 3 4 5
▒ Building age: 2015	**Comments:**

Building Exterior	**Rating:** (1) 2 3 4 5
☐ Roofing improvement needed	**Comments:**
☐ Aesthetic improvement needed	
☐ Minor component improvement eeded	
☐ Not applicable (No building)	

Building/Vault Interior	**Rating:** (1) 2 3 4 5
☐ Needs cleaning	**Comments:**
☐ Aesthetic improvement needed	
☐ Updates needed to meet code	
▒ Structural improvements needed (check below)	
☐ Seismic upgrades	
☐ Repair	
☐ Complete replacement	

Landscape & Enclosure	**Rating:** 1 2 3 4 5
☐ Landscape dead or dying (needs rehab/replant)	**Comments:**
☐ Landscape needs complete replacement	
☐ Fencing/enclosure requires repair	
☐ Not applicable (No landscaping)	

Asphalt/Concrete (Parking, Walkways, Access)	**Rating:** 1 2 3 4 5
☐ Alligator cracking/aggregate visible/spalling	**Comments:** Not GHID Asphalt
☐ Large cracks and/or uplifts	
☐ Potholes or noticable settlement	
☐ Drainage issues (standing water, depressions, etc.)	

Pumps and Mechanical Assessment
Lift Station

Pump Station ID:	Montec	**Address:**	
Inspected By:	Ricky & Kyle	**Image Ref:**	
Date:	8/12/2021		

Overall Condition Rating (Circle rating for individual components in sections below)

1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Pumps

	Pump ID Age (years)	Pump ID (Checklist):	Condition Rating:
	1 2015		(1) 2 3 4 5
	2 2015		(1) 2 3 4 5
	3		1 2 3 4 5
	4		1 2 3 4 5
	5		1 2 3 4 5
	6		1 2 3 4 5

	Condition Checklist (Mark pumps w/ issues at right)	1	2	3	4	5	6	Comments:
	Check if Submersible (no feasible visual inspection)							
	Pump surface - corrosion							
	Pump surface - chipped coating							
	Pump seals leaking							
	Worn nuts/lugs on bolted connections							
	Loose connections							
	Cracked or damaged foundation supports							
	Unusual vibrations or noise							
	Impeller - pitting or heavy wear							
	Pump performance significantly below rating							
	Past usefule life -> replace							

Motors

	Motor ID Age (years)	Motor ID (Checklist):	Condition Rating:
	1 2015		(1) 2 3 4 5
	2 2015		(1) 2 3 4 5
	3		1 2 3 4 5
	4		1 2 3 4 5
	5		1 2 3 4 5
	6		1 2 3 4 5

	Condition Checklist (Mark motors w/ issues at right)	1	2	3	4	5	6	Comments:
	Check if Submersible (no feasible visual inspection)							
	Dirty inspection ports							
	Oil reservoir low							
	Discoloration (potential overheating)							
	Unusual vibrations or noise							
	Past useful life -> replace							

Pumps and Mechanical Assessment
Lift Station

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

	Piping	**Condition Rating:** 1 2 3 4 5
	Needs minor touch-up paint	**Comments:**
	Needs complete repaint	
	Needs replacement	

	Isolation Valves	**Condition Rating:** 1 2 3 4 5
	Leaking	**Comments:**
	Recoating needed	
	Needs replacement	

	HVAC System	**Condition Rating:** 1 2 3 4 5
	System Age:	**Comments:**
	Type	Wall Mount System
	Ventilation Only	
	Air conditioning	
	Upgrade required (comment)	

Wet Well Assessment Form

Lift Station ID:	Montec	**Address:**	
Inspected By:	Ricky & Kyle	**Image Ref:**	
Date:	8/12/2021		

Overall Condition Rating (Circle rating below)

1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Structure	**Rating:** 1 2 (3) 4 5
▒ Cracks	**Comments:**
☐ Single	Lid is bent inward.
☐ Multiple	Needs replacement.
☐ Broken/Collapsing Section	
▒ Infiltration/Inflow	
☐ None	
☐ Stain	
☐ Seeping	
☐ Dripping	
☐ Running	
▒ Surface Condition	
☐ Surface Spalling	
☐ Aggregate Visible	
☐ Aggregate Projecting	
☐ Reinforcement Visible	
☐ Reinforcement Corroded	
☐ Holes Visible	
☒ Lid/Hatches need replacement	
☐ Vent function impaired	

Electrical Assessment
Lift Station

Lift Station ID:	Montec	**Address:**	
Inspected By:	SC	**Image Ref:**	
Date:			

Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; no wear or equipment issues; all hardware present
2	Adequate: minor wear, no equipment issues; all hardware present
3	Fair; worn, no major equipment issues; missing non-critical hardware
4	Poor; old and worn; missing important hardware; replacement recommended
5	Bad; hardware gone or failed; replacement required to continue operation

Overall Electrical

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	7 yrs	1 (2) 3 4 5		

Generators & Transfer Switches

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
MTU 4R0113 D440	7	1 (2) 3 4 5		

Switchboard

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	7 yrs	1 (2) 3 4 5		

Transformer

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	7	1 (2) 3 4 5		

Motor Control Center (MCC)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	7	1 (2) 3 4 5		

Panelboards

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
A02121420	2015	1 (2) 3 4 5		

VFD (If applicable; one per pump motor)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	7	1 (2) 3 4 5		
	7	1 (2) 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		

Electrical Assessment
Lift Station

Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; no wear or equipment issues; all hardware present
2	Adequate: minor wear, no equipment issues; all hardware present
3	Fair; worn, no major equipment issues; missing non-critical hardware
4	Poor; old and worn; missing important hardware; replacement recommended
5	Bad; hardware gone or failed; replacement required to continue operation

Motor Starter(s) (If applicable; one per pump motor)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		

PLC Panel/RTU

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	7	1 (2) 3 4 5		

HMI

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	7	1 (2) 3 4 5		

Security System (if applicable; if not present, leave comment)

Equipment No.	Age (yrs)	Condition (circle)	Status (Circle)	Comments:
	7	1 (2) 3 4 5	New Outdated	INTRUSION

Pleasant Valley Lift Station

Site Assessment

Building and Site Assessment
Lift Station

Lift Station ID:	Pleasant Valley	**Address:**	
Inspected By:	S. Pugh	**Image Ref:**	
Date:	7/29/2021		

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

General	**Rating:** 1 2 (3) (4) 5
▒ Building age: _____	**Comments:**

Building Exterior	**Rating:** 1 2 3 (4) (5)
☐ Roofing improvement needed	**Comments:** not rusted – minor spalling
☐ Aesthetic improvement needed	
☒ Minor component improvement eeded	
☐ Not applicable (No building)	

Building/Vault Interior	**Rating:** 1 2 3 4 5
☐ Needs cleaning	**Comments:** anchor furnace anchor panels attach vertical pipes to board
☐ Aesthetic improvement needed	
☐ Updates needed to meet code	
▒ Structural improvements needed (check below)	
☒ Seismic upgrades	
☐ Repair	
☐ Complete replacement	

Landscape & Enclosure	**Rating:** 1 (2) 3 4 5
☒ Landscape dead or dying (needs rehab/replant)	**Comments:** some weeds
☐ Landscape needs complete replacement	
☐ Fencing/enclosure requires repair	
☐ Not applicable (No landscaping)	

Asphalt/Concrete (Parking, Walkways, Access)	**Rating:** 1 (2) 3 4 5
☐ Alligator cracking/aggregate visible/spalling	**Comments:**
☐ Large cracks and/or uplifts	
☐ Potholes or noticable settlement	
☐ Drainage issues (standing water, depressions, etc.)	

Pumps and Mechanical Assessment
Lift Station

Pump Station ID:	Pleasant Valley	**Address:**	
Inspected By:	B. Mayer	**Image Ref:**	
Date:	07/29/21		

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Pumps

	Pump ID Age (years)	Pump ID (Checklist):	Condition Rating:
	1		1 2 **3** 4 5
	2		1 2 **3** 4 5
	3		1 2 3 4 **5**
	4		1 2 3 4 5
	5		1 2 3 4 5
	6		1 2 3 4 5

	Condition Checklist (Mark pumps w/ issues at right)	1	2	3	4	5	6	Comments:
	Check if Submersible (no feasible visual inspection)							
✓	Pump surface - corrosion							
✓	Pump surface - chipped coating							
	Pump seals leaking							
	Worn nuts/lugs on bolted connections							
	Loose connections							
	Cracked or damaged foundation supports							
	Unusual vibrations or noise							
	Impeller - pitting or heavy wear							
	Pump performance significantly below rating							
	Past usefule life -> replace							

Motors

	Motor ID Age (years)	Motor ID (Checklist):	Condition Rating:
	1		1 2 **3** 4 5
	2		1 2 **3** 4 5
	3		1 2 3 4 **5**
	4		1 2 3 4 5
	5		1 2 3 4 5
	6		1 2 3 4 5

	Condition Checklist (Mark motors w/ issues at right)	1	2	3	4	5	6	Comments:
	Check if Submersible (no feasible visual inspection)							
	Dirty inspection ports							
	Oil reservoir low							
	Discoloration (potential overheating)							
	Unusual vibrations or noise							
	Past useful life -> replace							

Pleasant Valley

SS-LS-2

Pumps and Mechanical Assessment
Lift Station

Sewer Utility Assets
Lift Stations

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

	Piping	Condition Rating: 1 2 (3) 4 5
	Needs minor touch-up paint	Comments:
✓	Needs complete repaint	
	Needs replacement	

	Isolation Valves	Condition Rating: 1 2 (3) 4 5
	Leaking	Comments:
✓	Recoating needed	
	Needs replacement	

	HVAC System	Condition Rating: 1 2 (3) 4 5
	System Age:	Comments:
	Type	
✓	Ventilation Only	
	Air conditioning	
	Upgrade required (comment)	

Wet Well Assessment Form

Lift Station ID:	Pleasant Valley	**Address:**	
Inspected By:	S. Pugh	**Image Ref:**	
Date:	7/29		

Overall Condition Rating (Circle rating below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Structure		**Rating:** 1 2 3 4 5
▒	Cracks	**Comments:**
	Single	
X	Multiple	
	Broken/Collapsing Section	
▒	Infiltration/Inflow	
	None	
X	Stain	
	Seeping	
	Dripping	
	Running	
▒	Surface Condition	
	Surface Spalling	
X	Aggregate Visible	
	Aggregate Projecting	
	Reinforcement Visible	
	Reinforcement Corroded	
	Holes Visible	
	Lid/Hatches need replacement	
	Vent function impaired	

Grinder Assessment
Lift Station

Lift Station ID:	Pleasant Valley	**Address:**	
Inspected By:	B. Mayer	**Image Ref:**	
Date:	7/29/21	**Grinder ID:**	

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

	Grinder condition	**Rating:** 1 2 (3) 4 5
	Grinder age: _____	**Comments:**
	Cutter stack age: _____	
	Grinder improperly seated	
	Plastric strips (front/back) not flush with drum	
	Interference between screens/cutter stacks	
	Damage to drum/screen material	
	Leaks present (inline grinders)	
	Rotation issues (bump grinders)	
	Cutter stack insufficiently torqued	
	Leaks to power pack and/or torque motor	
▒	Tank Oil Level _____	
	Clear	
	Milky	
	Bubbles	

	Bypass Structure (if applicable)	**Rating:** 1 2 3 4 5
	Not Applicable	**Comments:**
	Control Gates need replacement	
▒	Cracks	
	Single	
	Multiple	
	Broken/Collapsing Section	
▒	Structure Surface Conditions	
	Surface Spalling	
	Aggregate Visible	
	Aggregate Projecting	
	Reinforcement Visible	
	Reinforcement Corroded	

Electrical Assessment
Lift Station

Lift Station ID:	Pleasant Valley	**Address:**	
Inspected By:	D. Ovard / N. Davis	**Image Ref:**	
Date:	7/29		

Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; no wear or equipment issues; all hardware present
2	Adequate: minor wear, no equipment issues; all hardware present
3	Fair; worn, no major equipment issues; missing non-critical hardware
4	Poor; old and worn; missing important hardware; replacement recommended
5	Bad; hardware gone or failed; replacement required to continue operation

Overall Electrical

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		

Generators & Transfer Switches

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	2005	1 2 (3) 4 5		

Switchboard

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	1990s	1 2 (3) 4 5		

Transformer

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	1979	1 2 (3) 4 5		

Motor Control Center (MCC)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		

Panelboards

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	1979	1 2 3 (4) 5		

VFD (If applicable; one per pump motor)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
1	~1990s	1 2 (3 4) 5		No parts - old
2	2020	(1) 2 3 4 5		
3	2020	(1) 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		

Original 1979

Pleasant Valley

SS-LS-5

Electrical Assessment
Lift Station

Sewer Utility Assets
Lift Stations

Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; no wear or equipment issues; all hardware present
2	Adequate: minor wear, no equipment issues; all hardware present
3	Fair; worn, no major equipment issues; missing non-critical hardware
4	Poor; old and worn; missing important hardware; replacement recommended
5	Bad; hardware gone or failed; replacement required to continue operation

Motor Starter(s) (If applicable; one per pump motor)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		

PLC Panel/RTU

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	2012	1 2 (3) 4 5		

HMI

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	2017	1 2 (3) 4 5		

Security System (if applicable; if not present, leave comment)

Equipment No.	Age (yrs)	Condition (circle)	Status (Circle)	Comments:
		1 2 (3) 4 5	New / Outdated	Door alarms

Valley Downs Lift Station

Site Assessment

Building and Site Assessment
Lift Station

Lift Station ID:	Valley Downs	**Address:**	
Inspected By:	Ricky & Kyle	**Image Ref:**	
Date:	8/11/2021		

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

General	**Rating:** 1 2 3 4 5
▒ Building age: 2004	**Comments:**

Building Exterior	**Rating:** 1 (2) 3 4 5
☐ Roofing improvement needed	**Comments:** Tube Style (No building)
☐ Aesthetic improvement needed	
☐ Minor component improvement eeded	Door to tube starting to show Rust
☒ Not applicable (No building)	

Building/Vault Interior	**Rating:** (1) 2 3 4 5
☐ Needs cleaning	**Comments:**
☐ Aesthetic improvement needed	
☐ Updates needed to meet code	
▒ Structural improvements needed (check below)	
☐ Seismic upgrades	
☐ Repair	
☐ Complete replacement	

Landscape & Enclosure	**Rating:** (1) 2 3 4 5
☐ Landscape dead or dying (needs rehab/replant)	**Comments:** Dryscape (Xeroscape)
☐ Landscape needs complete replacement	
☐ Fencing/enclosure requires repair	
☐ Not applicable (No landscaping)	

Asphalt/Concrete (Parking, Walkways, Access)	**Rating:** (1) 2 3 4 5
☐ Alligator cracking/aggregate visible/spalling	**Comments:**
☐ Large cracks and/or uplifts	
☐ Potholes or noticable settlement	
☐ Drainage issues (standing water, depressions, etc.)	

Pumps and Mechanical Assessment
Lift Station

Pump Station ID:	Valley Downs	**Address:**	
Inspected By:	Ricky & Kyle	**Image Ref:**	
Date:	8/11/2021		

Overall Condition Rating (Circle rating for individual components in sections below)

1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Pumps

	Pump ID Age (years)	Pump ID (Checklist):	Condition Rating:
	1 2004		1 2 3 4 5
	2 2004		1 2 3 4 5
	3		1 2 3 4 5
	4		1 2 3 4 5
	5		1 2 3 4 5
	6		1 2 3 4 5

	Condition Checklist (Mark pumps w/ issues at right)	1	2	3	4	5	6	Comments:
	Check if Submersible (no feasible visual inspection)							
	Pump surface - corrosion							
	Pump surface - chipped coating							
	Pump seals leaking							
	Worn nuts/lugs on bolted connections							
	Loose connections							
	Cracked or damaged foundation supports							
	Unusual vibrations or noise							
	Impeller - pitting or heavy wear							
	Pump performance significantly below rating							
	Past usefule life -> replace							

Motors

	Motor ID Age (years)	Motor ID (Checklist):	Condition Rating:
	1 2004		1 2 3 4 5
	2 2004		1 2 3 4 5
	3		1 2 3 4 5
	4		1 2 3 4 5
	5		1 2 3 4 5
	6		1 2 3 4 5

	Condition Checklist (Mark motors w/ issues at right)	1	2	3	4	5	6	Comments:
	Check if Submersible (no feasible visual inspection)							
	Dirty inspection ports							
	Oil reservoir low							
	Discoloration (potential overheating)							
	Unusual vibrations or noise							
	Past useful life -> replace							

Pumps and Mechanical Assessment
Lift Station

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Piping		Condition Rating:	1	2	3	4	5
	Needs minor touch-up paint	Comments:					
	Needs complete repaint						
	Needs replacement						

Isolation Valves		Condition Rating:	1	2	3	4	5
	Leaking	Comments: wheel valve could use touch-up paint					
X	Recoating needed						
	Needs replacement						

HVAC System		Condition Rating:	1	2	3	4	5
	System Age:	Comments: N/A					
	Type						
	Ventilation Only						
	Air conditioning						
	Upgrade required (comment)						

Wet Well Assessment Form

Lift Station ID:	Valley Downs	**Address:**	
Inspected By:	Ricky & Kyle	**Image Ref:**	
Date:	8/11/2021		

Overall Condition Rating (Circle rating below)

1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Structure		**Rating:**	1	2	3	4	5
▒	Cracks	**Comments:**					
	Single	Surface spalling on concrete slab (roof) wet well. (outside)					
	Multiple						
	Broken/Collapsing Section	Small spalling on wet well walls.					
▒	Infiltration/Inflow						
	None						
	Stain						
	Seeping						
	Dripping						
	Running						
▒	Surface Condition						
X	Surface Spalling						
	Aggregate Visible						
	Aggregate Projecting						
	Reinforcement Visible						
	Reinforcement Corroded						
	Holes Visible						
	Lid/Hatches need replacement						
	Vent function impaired						

Grinder Assessment
Lift Station

Lift Station ID:	Valley Downs	**Address:**	
Inspected By:	Ricky & Kyle	**Image Ref:**	
Date:	8/11/2021	**Grinder ID:**	

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Grinder condition		**Rating:** 1 2 3 4 5
	Grinder age: _____	**Comments:** N/A
	Cutter stack age: _____	
	Grinder improperly seated	
	Plastric strips (front/back) not flush with drum	
	Interference between screens/cutter stacks	
	Damage to drum/screen material	
	Leaks present (inline grinders)	
	Rotation issues (bump grinders)	
	Cutter stack insufficiently torqued	
	Leaks to power pack and/or torque motor	
▒	Tank Oil Level _____	
	Clear	
	Milky	
	Bubbles	

Bypass Structure (if applicable)		**Rating:** 1 (2) 3 4 5
	Not Applicable	**Comments:** Manhole with quick connect
	Control Gates need replacement	
▒	Cracks	
	Single	
	Multiple	
	Broken/Collapsing Section	
▒	Structure Surface Conditions	
	Surface Spalling	
	Aggregate Visible	
	Aggregate Projecting	
	Reinforcement Visible	
	Reinforcement Corroded	

Electrical Assessment
Lift Station

Lift Station ID:	Valley Downs	**Address:**	
Inspected By:	SCI	**Image Ref:**	
Date:			

Condition Rating (Circle rating for individual components in sections below)

1	Excellent; no wear or equipment issues; all hardware present
2	Adequate: minor wear, no equipment issues; all hardware present
3	Fair; worn, no major equipment issues; missing non-critical hardware
4	Poor; old and worn; missing important hardware; replacement recommended
5	Bad; hardware gone or failed; replacement required to continue operation

Overall Electrical

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 (3) 4 5		original

Generators & Transfer Switches

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
80DSEJB		1 2 (3) 4 5		

Switchboard

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 (3) 4 5		

Transformer

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
Outcode N0408		1 2 (3) 4 5		

Motor Control Center (MCC)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 (3) 4 5		

Panelboards

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
03357		1 2 (3) 4 5		

VFD (If applicable; one per pump motor)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
ATV630D15N4		1 (2) 3 4 5		
"		1 (2) 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		

Electrical Assessment
Lift Station

Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; no wear or equipment issues; all hardware present
2	Adequate: minor wear, no equipment issues; all hardware present
3	Fair; worn, no major equipment issues; missing non-critical hardware
4	Poor; old and worn; missing important hardware; replacement recommended
5	Bad; hardware gone or failed; replacement required to continue operation

Motor Starter(s) (If applicable; one per pump motor)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		

PLC Panel/RTU

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
71CBV98090		1 2 (3) 4 5		

HMI

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
2400334		1 (2) 3 4 5		

Security System (if applicable; if not present, leave comment)

Equipment No.	Age (yrs)	Condition (circle)	Status (Circle)	Comments:
		1 2 (3) 4 5	New Outdated	intrusion

Warner Lift Station

Site Assessment

Building and Site Assessment
Lift Station

Lift Station ID:	Warner	**Address:**	
Inspected By:	Ricky	**Image Ref:**	
Date:	8/11/2021		

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

General	**Rating:** (1) 2 3 4 5
▒ Building age: 2018	**Comments:**

Building Exterior	**Rating:** (1) 2 3 4 5
☐ Roofing improvement needed	**Comments:**
☐ Aesthetic improvement needed	
☐ Minor component improvement eeded	
☐ Not applicable (No building)	

Building/Vault Interior	**Rating:** (1) 2 3 4 5
☐ Needs cleaning	**Comments:** Tube/Vault built 1996
☐ Aesthetic improvement needed	
☐ Updates needed to meet code	
▒ Structural improvements needed (check below)	
☐ Seismic upgrades	
☐ Repair	
☐ Complete replacement	

Landscape & Enclosure	**Rating:** 1 (2) 3 4 5
☒ Landscape dead or dying (needs rehab/replant)	**Comments:** 3 dead trees
☐ Landscape needs complete replacement	
☐ Fencing/enclosure requires repair	
☐ Not applicable (No landscaping)	

Asphalt/Concrete (Parking, Walkways, Access)	**Rating:** (1) 2 3 4 5
☐ Alligator cracking/aggregate visible/spalling	**Comments:**
☐ Large cracks and/or uplifts	
☐ Potholes or noticable settlement	
☐ Drainage issues (standing water, depressions, etc.)	

Pumps and Mechanical Assessment
Lift Station

Pump Station ID:	Warner	**Address:**	
Inspected By:	Ricky	**Image Ref:**	
Date:	8/11/2021		

Overall Condition Rating (Circle rating for individual components in sections below)

1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Pumps

	Pump ID Age (years)	Pump ID (Checklist):	Condition Rating:
	1 1996	out for repair	1 2 3 4 5
	2 2020		1 **2** **3** 4 5
	3 1996		1 **2** **3** 4 5
	4		1 2 3 4 5
	5		1 2 3 4 5
	6		1 2 3 4 5

	Condition Checklist (Mark pumps w/ issues at right)	1	2	3	4	5	6	Comments:
	Check if Submersible (no feasible visual inspection)							
	Pump surface - corrosion							
	Pump surface - chipped coating							
	Pump seals leaking							
	Worn nuts/lugs on bolted connections							
	Loose connections							
	Cracked or damaged foundation supports							
	Unusual vibrations or noise							
	Impeller - pitting or heavy wear							
	Pump performance significantly below rating							
	Past usefule life -> replace							

Motors

	Motor ID Age (years)	Motor ID (Checklist):	Condition Rating:
	1 1996	out for repair	1 2 3 4 5
	2 2020		1 **2** **3** 4 5
	3 1996		1 **2** **3** 4 5
	4		1 2 3 4 5
	5		1 2 3 4 5
	6		1 2 3 4 5

	Condition Checklist (Mark motors w/ issues at right)	1	2	3	4	5	6	Comments:
	Check if Submersible (no feasible visual inspection)							
	Dirty inspection ports							
	Oil reservoir low							
	Discoloration (potential overheating)							
	Unusual vibrations or noise							
	Past useful life -> replace							

Pumps and Mechanical Assessment
Lift Station

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Piping		Condition Rating: (1) 2 3 4 5
	Needs minor touch-up paint	Comments:
	Needs complete repaint	
	Needs replacement	

Isolation Valves		Condition Rating: 1 (2) 3 4 5
	Leaking	Comments: minor touch up paint on wheel valve.
X	Recoating needed	
	Needs replacement	

HVAC System		Condition Rating: (1) 2 3 4 5
	System Age:	Comments:
	Type	
	Ventilation Only	
	Air conditioning	
	Upgrade required (comment)	

Wet Well Assessment Form

Lift Station ID:	Warner	**Address:**	
Inspected By:	Ricky	**Image Ref:**	
Date:	8/11/2021		

Overall Condition Rating (Circle rating below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Structure		**Rating:** (1) 2 3 4 5
▒	Cracks	**Comments:**
	Single	
	Multiple	
	Broken/Collapsing Section	
▒	Infiltration/Inflow	
	None	
	Stain	
	Seeping	
	Dripping	
	Running	
▒	Surface Condition	
	Surface Spalling	
	Aggregate Visible	
	Aggregate Projecting	
	Reinforcement Visible	
	Reinforcement Corroded	
	Holes Visible	
	Lid/Hatches need replacement	
	Vent function impaired	

Grinder Assessment
Lift Station

Lift Station ID:	Warner	**Address:**	
Inspected By:	Ricky	**Image Ref:**	
Date:	8/11/2021	**Grinder ID:**	

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Grinder condition		**Rating:** 1 2 (3) 4 5
	Grinder age: _____	**Comments:**
	Cutter stack age: _____	Small leak from connections.
	Grinder improperly seated	
	Plastric strips (front/back) not flush with drum	
	Interference between screens/cutter stacks	
	Damage to drum/screen material	
X	Leaks present (inline grinders)	
	Rotation issues (bump grinders)	
	Cutter stack insufficiently torqued	
	Leaks to power pack and/or torque motor	
	Tank Oil Level _____	
	Clear	
	Milky	
	Bubbles	

Bypass Structure (if applicable)		**Rating:** (1) 2 3 4 5
	Not Applicable	**Comments:**
	Control Gates need replacement	Manhole with quick connect
	Cracks	
	Single	
	Multiple	
	Broken/Collapsing Section	
	Structure Surface Conditions	
	Surface Spalling	
	Aggregate Visible	
	Aggregate Projecting	
	Reinforcement Visible	
	Reinforcement Corroded	

Electrical Assessment
Lift Station

Lift Station ID:	Warner	**Address:**	
Inspected By:	SC	**Image Ref:**	
Date:			

Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; no wear or equipment issues; all hardware present
2	Adequate: minor wear, no equipment issues; all hardware present
3	Fair; worn, no major equipment issues; missing non-critical hardware
4	Poor; old and worn; missing important hardware; replacement recommended
5	Bad; hardware gone or failed; replacement required to continue operation

Overall Electrical

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	2017	(1) 2 3 4 5		

Generators & Transfer Switches

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	2017	(1) 2 3 4 5		

Switchboard

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	2017	(1) 2 3 4 5		

Transformer

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	2017	(1) 2 3 4 5		

Motor Control Center (MCC)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	2017	(1) 2 3 4 5		

Panelboards

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
P1A30MC250A	2017	(1) 2 3 4 5		

VFD (If applicable; one per pump motor)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	2017	(1) 2 3 4 5		
	2017	(1) 2 3 4 5		
	2017	(1) 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		

Electrical Assessment
Lift Station

Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; no wear or equipment issues; all hardware present
2	Adequate: minor wear, no equipment issues; all hardware present
3	Fair; worn, no major equipment issues; missing non-critical hardware
4	Poor; old and worn; missing important hardware; replacement recommended
5	Bad; hardware gone or failed; replacement required to continue operation

Motor Starter(s) (If applicable; one per pump motor)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		

PLC Panel/RTU

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	2017	(1) 2 3 4 5		

HMI

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	2017	(1) 2 3 4 5		

Security System (if applicable; if not present, leave comment)

Equipment No.	Age (yrs)	Condition (circle)	Status (Circle)	Comments:
	2017	(1) 2 3 4 5	New Outdated	

West Lake Lift Station

Site Assessment

Building and Site Assessment
Lift Station

Lift Station ID:	West Lake	**Address:**	
Inspected By:	Ricky & Kyle	**Image Ref:**	
Date:	8/11/21		

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

General	**Rating:** 1 2 3 4 5
▒ Building age: _____	**Comments:**

Building Exterior	**Rating:** 1 (2) 3 4 5
☐ Roofing improvement needed	**Comments:** Tube Style (No Building) 1986
☐ Aesthetic improvement needed	
☐ Minor component improvement eeded	
☒ Not applicable (No building)	

Building/Vault Interior	**Rating:** 1 (2) 3 4 5
☒ Needs cleaning	**Comments:**
☐ Aesthetic improvement needed	
☐ Updates needed to meet code	
▒ Structural improvements needed (check below)	
☐ Seismic upgrades	
☐ Repair	
☐ Complete replacement	

Landscape & Enclosure	**Rating:** 1 2 3 4 5
☐ Landscape dead or dying (needs rehab/replant)	**Comments:**
☐ Landscape needs complete replacement	
☐ Fencing/enclosure requires repair	
☒ Not applicable (No landscaping)	

Asphalt/Concrete (Parking, Walkways, Access)	**Rating:** (1) 2 3 4 5
☐ Alligator cracking/aggregate visible/spalling	**Comments:**
☐ Large cracks and/or uplifts	
☐ Potholes or noticable settlement	
☐ Drainage issues (standing water, depressions, etc.)	

Pumps and Mechanical Assessment
Lift Station

Pump Station ID:	West Lake	**Address:**	
Inspected By:	Ricky & Kyle	**Image Ref:**	
Date:	8/11/2021		

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Pumps

	Pump ID Age (years)	Pump ID (Checklist):	Condition Rating:
	1 1986		1 (2) 3 4 5
	2 1986		1 (2) 3 4 5
	3		1 2 3 4 5
	4		1 2 3 4 5
	5		1 2 3 4 5
	6		1 2 3 4 5

	Condition Checklist (Mark pumps w/ issues at right)	1	2	3	4	5	6	Comments:
	Check if Submersible (no feasible visual inspection)							
	Pump surface - corrosion							
	Pump surface - chipped coating							
	Pump seals leaking							
	Worn nuts/lugs on bolted connections							
	Loose connections							
	Cracked or damaged foundation supports							
	Unusual vibrations or noise							
	Impeller - pitting or heavy wear							
	Pump performance significantly below rating							
	Past usefule life -> replace							

Motors

	Motor ID Age (years)	Motor ID (Checklist):	Condition Rating:
	1 1986		1 (2) 3 4 5
	2 1986		1 (2) 3 4 5
	3		1 2 3 4 5
	4		1 2 3 4 5
	5		1 2 3 4 5
	6		1 2 3 4 5

	Condition Checklist (Mark motors w/ issues at right)	1	2	3	4	5	6	Comments:
	Check if Submersible (no feasible visual inspection)							
	Dirty inspection ports							
	Oil reservoir low							
	Discoloration (potential overheating)							
	Unusual vibrations or noise							
	Past useful life -> replace							

Pumps and Mechanical Assessment
Lift Station

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Piping		Condition Rating:	1	2	3	4	5
X	Needs minor touch-up paint	Comments:					
	Needs complete repaint						
	Needs replacement						

Isolation Valves		Condition Rating:	1	2	3	4	5
	Leaking	Comments: West valve discharge side stiff (exercise)					
	Recoating needed						
	Needs replacement						

HVAC System		Condition Rating:	1	2	3	4	5
	System Age:	Comments: N/A					
	Type						
	Ventilation Only						
	Air conditioning						
	Upgrade required (comment)						

Wet Well Assessment Form

Lift Station ID:	West Lake	**Address:**	
Inspected By:	Ricky & Kyle	**Image Ref:**	
Date:	8/11/2021		

Overall Condition Rating (Circle rating below)

1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

	Structure	**Rating:** 1 (2) 3 4 5
▒	Cracks	**Comments:**
	Single	
	Multiple	
	Broken/Collapsing Section	
▒	Infiltration/Inflow	
X	None	
	Stain	
	Seeping	
	Dripping	
	Running	
▒	Surface Condition	
X	Surface Spalling	
	Aggregate Visible	
	Aggregate Projecting	
	Reinforcement Visible	
	Reinforcement Corroded	
	Holes Visible	
	Lid/Hatches need replacement	
	Vent function impaired	

Grinder Assessment
Lift Station

Lift Station ID:	West Lake	**Address:**	
Inspected By:	Ricky & Kyle	**Image Ref:**	
Date:	8/11/2021	**Grinder ID:**	

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

	Grinder condition	**Rating:** 1 2 3 4 5
	Grinder age: _____	**Comments:**
	Cutter stack age: _____	
	Grinder improperly seated	N/A
	Plastric strips (front/back) not flush with drum	
	Interference between screens/cutter stacks	
	Damage to drum/screen material	
	Leaks present (inline grinders)	
	Rotation issues (bump grinders)	
	Cutter stack insufficiently torqued	
	Leaks to power pack and/or torque motor	
▒	Tank Oil Level _____	
	Clear	
	Milky	
	Bubbles	

	Bypass Structure (if applicable)	**Rating:** 1 2 3 4 5
X	Not Applicable	**Comments:**
	Control Gates need replacement	
▒	Cracks	No Bypass
	Single	
	Multiple	
	Broken/Collapsing Section	
▒	Structure Surface Conditions	
	Surface Spalling	
	Aggregate Visible	
	Aggregate Projecting	
	Reinforcement Visible	
	Reinforcement Corroded	

Electrical Assessment
Lift Station

Lift Station ID:	West Lake SL	**Address:**	
Inspected By:		**Image Ref:**	
Date:			

Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; no wear or equipment issues; all hardware present
2	Adequate: minor wear, no equipment issues; all hardware present
3	Fair; worn, no major equipment issues; missing non-critical hardware
4	Poor; old and worn; missing important hardware; replacement recommended
5	Bad; hardware gone or failed; replacement required to continue operation

Overall Electrical

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 (4) 5		

Generators & Transfer Switches

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 (4) 5		

Switchboard

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 (4) 5		

Transformer

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 (4) 5		

Motor Control Center (MCC)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 (4) 5		

Panelboards

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 (4) 5		

VFD (If applicable; one per pump motor)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		

Electrical Assessment
Lift Station

Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; no wear or equipment issues; all hardware present
2	Adequate: minor wear, no equipment issues; all hardware present
3	Fair; worn, no major equipment issues; missing non-critical hardware
4	Poor; old and worn; missing important hardware; replacement recommended
5	Bad; hardware gone or failed; replacement required to continue operation

Motor Starter(s) (If applicable; one per pump motor)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 (4) 5		
		1 2 3 (4) 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		

PLC Panel/RTU

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 (4) 5		original

HMI

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		original

Security System (if applicable; if not present, leave comment)

Equipment No.	Age (yrs)	Condition (circle)	Status (Circle)	Comments:
		1 2 3 (4) 5	New Outdated	intrusion

Wheeler Lift Station

Site Assessment

Building and Site Assessment
Lift Station

Lift Station ID:	Wheeler	**Address:**	
Inspected By:	Ricky & Kyle	**Image Ref:**	
Date:	8/11/2021		

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

General	**Rating:** 1 2 3 4 5
▒ Building age: 2004	**Comments:** Tube Style (No Building)

Building Exterior	**Rating:** 1 2 (3) 4 5
☐ Roofing improvement needed	**Comments:**
☐ Aesthetic improvement needed	Door to tube major rust
☐ Minor component improvement eeded	damage 2004
☒ Not applicable (No building)	

Building/Vault Interior	**Rating:** 1 (2) 3 4 5
☒ Needs cleaning	**Comments:**
☐ Aesthetic improvement needed	Rust
☐ Updates needed to meet code	
▒ Structural improvements needed (check below)	
☐ Seismic upgrades	
☐ Repair	
☐ Complete replacement	

Landscape & Enclosure	**Rating:** (1) 2 3 4 5
☐ Landscape dead or dying (needs rehab/replant)	**Comments:**
☐ Landscape needs complete replacement	
☐ Fencing/enclosure requires repair	
☒ Not applicable (No landscaping)	

Asphalt/Concrete (Parking, Walkways, Access)	**Rating:** 1 2 3 4 5
☐ Alligator cracking/aggregate visible/spalling	**Comments:**
☐ Large cracks and/or uplifts	No asphalt
☐ Potholes or noticable settlement	
☐ Drainage issues (standing water, depressions, etc.)	

Pumps and Mechanical Assessment
Lift Station

Pump Station ID:	Wheeler	**Address:**	
Inspected By:	Ricky & Kyle	**Image Ref:**	
Date:	8/11/2021		

Overall Condition Rating (Circle rating for individual components in sections below)

1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Pumps

	Pump ID Age (years)	Pump ID (Checklist):	Condition Rating:
	1 2004		1 (2) 3 4 5
	2 2004		1 (2) 3 4 5
	3		1 2 3 4 5
	4		1 2 3 4 5
	5		1 2 3 4 5
	6		1 2 3 4 5

	Condition Checklist (Mark pumps w/ issues at right)	1	2	3	4	5	6	Comments:
	Check if Submersible (no feasible visual inspection)							
	Pump surface - corrosion							
	Pump surface - chipped coating							
	Pump seals leaking							
	Worn nuts/lugs on bolted connections							
	Loose connections							
	Cracked or damaged foundation supports							
	Unusual vibrations or noise							
	Impeller - pitting or heavy wear							
	Pump performance significantly below rating							
	Past usefule life -> replace							

Motors

	Motor ID Age (years)	Motor ID (Checklist):	Condition Rating:
	1 2004		1 (2) 3 4 5
	2 2004		1 (2) 3 4 5
	3		1 2 3 4 5
	4		1 2 3 4 5
	5		1 2 3 4 5
	6		1 2 3 4 5

	Condition Checklist (Mark motors w/ issues at right)	1	2	3	4	5	6	Comments:
	Check if Submersible (no feasible visual inspection)							
	Dirty inspection ports							
	Oil reservoir low							
	Discoloration (potential overheating)							
	Unusual vibrations or noise							
	Past useful life -> replace							

Pumps and Mechanical Assessment
Lift Station

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Piping		Condition Rating: 1 2 3 4 5
X	Needs minor touch-up paint	Comments:
	Needs complete repaint	
	Needs replacement	

Isolation Valves		Condition Rating: 1 2 3 4 5
	Leaking	Comments:
	Recoating needed	
	Needs replacement	

HVAC System		Condition Rating: 1 2 3 4 5
	System Age:	Comments: N/A
	Type	
	Ventilation Only	
	Air conditioning	
	Upgrade required (comment)	

Wet Well Assessment Form

Lift Station ID:	Wheeler	**Address:**	
Inspected By:	Ricky & Kyle	**Image Ref:**	
Date:	8/11/2021		

Overall Condition Rating (Circle rating below)

1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Structure		**Rating:** 1 (2) 3 4 5
▒	Cracks	**Comments:**
	Single	slight infiltration stain
	Multiple	near one seem on
	Broken/Collapsing Section	wet well.
▒	Infiltration/Inflow	
	None	
X	Stain	
	Seeping	
	Dripping	
	Running	
▒	Surface Condition	
	Surface Spalling	
	Aggregate Visible	
	Aggregate Projecting	
	Reinforcement Visible	
	Reinforcement Corroded	
	Holes Visible	
	Lid/Hatches need replacement	
	Vent function impaired	

Grinder Assessment
Lift Station

Lift Station ID:	Wheeler	**Address:**	
Inspected By:	Ricky & Kyle	**Image Ref:**	
Date:	8/11/2021	**Grinder ID:**	

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Grinder condition		**Rating:** 1 2 3 4 5
	Grinder age: _____	**Comments:** N/A
	Cutter stack age: _____	
	Grinder improperly seated	
	Plastric strips (front/back) not flush with drum	
	Interference between screens/cutter stacks	
	Damage to drum/screen material	
	Leaks present (inline grinders)	
	Rotation issues (bump grinders)	
	Cutter stack insufficiently torqued	
	Leaks to power pack and/or torque motor	
▒	Tank Oil Level _____	
	Clear	
	Milky	
	Bubbles	

Bypass Structure (if applicable)		**Rating:** 1 2 3 4 5
	Not Applicable	**Comments:** Manhole with a quick connect coupling.
	Control Gates need replacement	
▒	Cracks	
	Single	
	Multiple	
	Broken/Collapsing Section	
▒	Structure Surface Conditions	
	Surface Spalling	
	Aggregate Visible	
	Aggregate Projecting	
	Reinforcement Visible	
	Reinforcement Corroded	

Electrical Assessment
Lift Station

Lift Station ID:	Wheeler	**Address:**	4600 West 2100 South
Inspected By:	SC	**Image Ref:**	
Date:			

Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; no wear or equipment issues; all hardware present
2	Adequate: minor wear, no equipment issues; all hardware present
3	Fair; worn, no major equipment issues; missing non-critical hardware
4	Poor; old and worn; missing important hardware; replacement recommended
5	Bad; hardware gone or failed; replacement required to continue operation

Overall Electrical

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 (3) 4 5		original equip.

Generators & Transfer Switches

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
20076169		1 2 (3) 4 5		

Switchboard

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 (3) 4 5		original equip

Transformer

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
411-0151-000		1 2 (3) 4 5		original

Motor Control Center (MCC)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 (3) 4 5		

Panelboards

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
NQOD20L100		1 2 (3) 4 5		

VFD (If applicable; one per pump motor)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
ATV630D22N4		(1) 2 3 4 5		
ATV630D22N4		(1) 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		

Electrical Assessment
Lift Station

Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; no wear or equipment issues; all hardware present
2	Adequate: minor wear, no equipment issues; all hardware present
3	Fair; worn, no major equipment issues; missing non-critical hardware
4	Poor; old and worn; missing important hardware; replacement recommended
5	Bad; hardware gone or failed; replacement required to continue operation

Motor Starter(s) (If applicable; one per pump motor)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		

PLC Panel/RTU

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
7ICBU98091	5	1 (2) 3 4 5		

HMI

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
240034	5	1 (2) 3 4 5		

Security System (if applicable; if not present, leave comment)

Equipment No.	Age (yrs)	Condition (circle)	Status (Circle)	Comments:
		1 2 (3) 4 5	New Outdated	intrusion

APPENDIX D
SEWER ASSESSMENT FORM TEMPLATES

GRANGER HUNTER IMPROVEMENT DISTRICT ASSET MANAGEMENT PLAN
CONDITION ASSESSMENT FORMS AND EXPECTED ASSET LIFE

Sewer Utility Assets				
Asset Name (Code)	**Form Code**	**Asset Component (Evaluation Method)**	**Assessment Items**	**Expected Lifespan (yrs)**
Collection System (SS-CS)	**-**	**Manholes (Inspection)**	GHID Scoring System	100
	-	**Pipes (Inspection)**	PACP Structural Assessment	100
Sewer Lift Stations (SS-LS)	**SS-LS-1**	**Building & Site (Inspection)**	Building Interior & Exterior	60
			Landscape & Enclosure	-
			Asphalt/Concrete	25
	SS-LS-2	**Pump & Mechanical (Inspection)**	Pump	20 Rebuild @ 10
			Motor	20
			Piping	50
			Isolation Valves	40
	SS-LS-3	**Wet Well (Inspection)**	Wet Well Structure	50
	SS-LS-4	**Grinders (Inspection)**	Grinder Assembly	5
			Bypass Structure	50
	SS-LS-5	**Electrical (Inspection)**	Generator & Transfer Switch	20
			Switchboard	25
			Transformer	25
			MCC	20
			Panelboard	20
			VFD/Motor Starters	15
			PLC/RTU	10
			HMI	10

Building and Site Assessment
Lift Station

Lift Station ID:		**Address:**	
Inspected By:		**Image Ref:**	
Date:			

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

General	**Rating:** 1 2 3 4 5
☐ Building age: _____	**Comments:**

Building Exterior	**Rating:** 1 2 3 4 5
☐ Roofing improvement needed	**Comments:**
☐ Aesthetic improvement needed	
☐ Minor component improvement eeded	
☐ Not applicable (No building)	

Building/Vault Interior	**Rating:** 1 2 3 4 5
☐ Needs cleaning	**Comments:**
☐ Aesthetic improvement needed	
☐ Updates needed to meet code	
☐ Structural improvements needed (check below)	
☐ Seismic upgrades	
☐ Repair	
☐ Complete replacement	

Landscape & Enclosure	**Rating:** 1 2 3 4 5
☐ Landscape dead or dying (needs rehab/replant)	**Comments:**
☐ Landscape needs complete replacement	
☐ Fencing/enclosure requires repair	
☐ Not applicable (No landscaping)	

Asphalt/Concrete (Parking, Walkways, Access)	**Rating:** 1 2 3 4 5
☐ Alligator cracking/aggregate visible/spalling	**Comments:**
☐ Large cracks and/or uplifts	
☐ Potholes or noticable settlement	
☐ Drainage issues (standing water, depressions, etc.)	

Pumps and Mechanical Assessment
Lift Station

Pump Station ID:		**Address:**	
Inspected By:		**Image Ref:**	
Date:			

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Pumps

	Pump ID Age (years)	**Pump ID (Checklist):**	**Condition Rating:**
	1		**1 2 3 4 5**
	2		**1 2 3 4 5**
	3		**1 2 3 4 5**
	4		**1 2 3 4 5**
	5		**1 2 3 4 5**
	6		**1 2 3 4 5**

	Condition Checklist (Mark pumps w/ issues at right)	**1**	**2**	**3**	**4**	**5**	**6**	**Comments:**
	Check if Submersible (no feasible visual inspection)							
	Pump surface - corrosion							
	Pump surface - chipped coating							
	Pump seals leaking							
	Worn nuts/lugs on bolted connections							
	Loose connections							
	Cracked or damaged foundation supports							
	Unusual vibrations or noise							
	Impeller - pitting or heavy wear							
	Pump performance significantly below rating							
	Past usefule life -> replace							

Motors

	Motor ID Age (years)	**Motor ID (Checklist):**	**Condition Rating:**
	1		**1 2 3 4 5**
	2		**1 2 3 4 5**
	3		**1 2 3 4 5**
	4		**1 2 3 4 5**
	5		**1 2 3 4 5**
	6		**1 2 3 4 5**

	Condition Checklist (Mark motors w/ issues at right)	**1**	**2**	**3**	**4**	**5**	**6**	**Comments:**
	Check if Submersible (no feasible visual inspection)							
	Dirty inspection ports							
	Oil reservoir low							
	Discoloration (potential overheating)							
	Unusual vibrations or noise							
	Past useful life -> replace							

Pumps and Mechanical Assessment
Lift Station

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Piping		Condition Rating:	1	2	3	4	5
	Needs minor touch-up paint	Comments:					
	Needs complete repaint						
	Needs replacement						

Isolation Valves		Condition Rating:	1	2	3	4	5
	Leaking	Comments:					
	Recoating needed						
	Needs replacement						

HVAC System		Condition Rating:	1	2	3	4	5
	System Age:	Comments:					
	Type						
	Ventilation Only						
	Air conditioning						
	Upgrade required (comment)						

Wet Well Assessment Form

Lift Station ID:		**Address:**	
Inspected By:		**Image Ref:**	
Date:			

Overall Condition Rating (Circle rating below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

	Structure	**Rating:** 1 2 3 4 5
	Cracks	**Comments:**
	Single	
	Multiple	
	Broken/Collapsing Section	
	Infiltration/Inflow	
	None	
	Stain	
	Seeping	
	Dripping	
	Running	
	Surface Condition	
	Surface Spalling	
	Aggregate Visible	
	Aggregate Projecting	
	Reinforcement Visible	
	Reinforcement Corroded	
	Holes Visible	
	Lid/Hatches need replacement	
	Vent function impaired	

Grinder Assessment
Lift Station

Lift Station ID:		**Address:**	
Inspected By:		**Image Ref:**	
Date:		**Grinder ID:**	

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

	Grinder condition	**Rating:** 1 2 3 4 5
	Grinder age: _____	**Comments:**
	Cutter stack age: _____	
	Grinder improperly seated	
	Plastric strips (front/back) not flush with drum	
	Interference between screens/cutter stacks	
	Damage to drum/screen material	
	Leaks present (inline grinders)	
	Rotation issues (bump grinders)	
	Cutter stack insufficiently torqued	
	Leaks to power pack and/or torque motor	
	Tank Oil Level _____	
	Clear	
	Milky	
	Bubbles	

	Bypass Structure (if applicable)	**Rating:** 1 2 3 4 5
	Not Applicable	**Comments:**
	Control Gates need replacement	
	Cracks	
	Single	
	Multiple	
	Broken/Collapsing Section	
	Structure Surface Conditions	
	Surface Spalling	
	Aggregate Visible	
	Aggregate Projecting	
	Reinforcement Visible	
	Reinforcement Corroded	

Electrical Assessment
Lift Station

Lift Station ID:		**Address:**	
Inspected By:		**Image Ref:**	
Date:			

Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; no wear or equipment issues; all hardware present
2	Adequate: minor wear, no equipment issues; all hardware present
3	Fair; worn, no major equipment issues; missing non-critical hardware
4	Poor; old and worn; missing important hardware; replacement recommended
5	Bad; hardware gone or failed; replacement required to continue operation

Overall Electrical

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		

Generators & Transfer Switches

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		

Switchboard

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		

Transformer

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		

Motor Control Center (MCC)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		

Panelboards

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		

VFD (If applicable; one per pump motor)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		

Electrical Assessment
Lift Station

Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; no wear or equipment issues; all hardware present
2	Adequate: minor wear, no equipment issues; all hardware present
3	Fair; worn, no major equipment issues; missing non-critical hardware
4	Poor; old and worn; missing important hardware; replacement recommended
5	Bad; hardware gone or failed; replacement required to continue operation

Motor Starter(s) (If applicable; one per pump motor)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		

PLC Panel/RTU

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		

HMI

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		

Security System (if applicable; if not present, leave comment)

Equipment No.	Age (yrs)	Condition (circle)	Status (Circle)	Comments:
		1 2 3 4 5	New Outdated	

OGDEN, UTAH OFFICE
2036 LINCOLN AVENUE
SUITE 104
OGDEN, UTAH 84401
PHONE: 801.495.2224

DRAPER, UTAH OFFICE
154 E 14075 S
DRAPER, UTAH 84020
PHONE: 801.495.2224

BOISE, IDAHO OFFICE
776 E RIVERSIDE DRIVE
SUITE 250
EAGLE, IDAHO 83616
PHONE: 208.939.9561

ST. GEORGE, UTAH OFFICE
20 NORTH MAIN
SUITE 107
ST.GEORGE, UTAH 84770
PHONE: 435.656.3299

BOWEN COLLINS & ASSOCIATES

WWW.BOWENCOLLINS.COM

EXHIBIT "B"

WATER MASTER PLAN, JUNE 2022

PREPARED FOR:

GRANGER-HUNTER IMPROVEMENT DISTRICT

PREPARED BY:

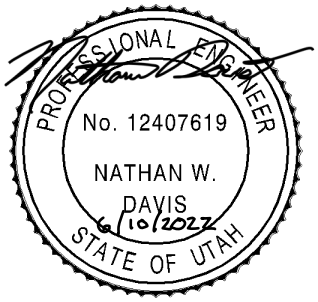
BOWEN COLLINS & ASSOCIATES

GRANGER-HUNTER IMPROVEMENT DISTRICT WATER MASTER PLAN

JUNE 2022

GRANGER-HUNTER IMPROVEMENT DISTRICT WATER MASTER PLAN

JUNE 2022



Prepared for:

GRANGER-HUNTER
IMPROVEMENT DISTRICT

Prepared by:

BOWEN COLLINS & ASSOCIATES

TABLE OF CONTENTS

TABLE OF CONTENTS
(continued)

Page No.

TABLE OF CONTENTS
(continued)

Page No.

LIST OF APPENDICES

TABLE OF CONTENTS
(continued)

LIST OF TABLES

TABLE OF CONTENTS
(continued)

LIST OF TABLES

LIST OF FIGURES

TABLE OF CONTENTS
(continued)

LIST OF FIGURES

CHAPTER 1
INTRODUCTION

The Granger-Hunter Improvement District (GHID or District) desires to develop an updated master plan for its water system in order to adequately plan for the future. This water master plan identifies recommended improvements that resolve existing and projected future deficiencies in the water system throughout the District's service area. Included in the plan is an Infrastructure Maintenance Plan that looks at future maintenance needs and funding levels. Finally, an Implementation Plan is presented to plan for and complete the most pressing projects over the next ten years.

BACKGROUND

The primary previous master planning document addressing the needs of the water system is:

- Drinking Water System Master Plan – Prepared by Hansen, Allen & Luce, February 2016

This document has been used as a starting point for this analysis. However, it has been augmented by additional data and new information collected by the District over the last several years. All analysis contained in this master plan supersedes the information contained in the previous master plan document.

SCOPE OF SERVICES

The scope of the work completed by Bowen Collins & Associates (BC&A) and documented in this report includes five major tasks:

Task 1 – Water Demand Projections

This report will use and compare the Wasatch Front Regional Council (WFRC) populations projections to projected future residential and employment populations in the GHID service area thru 2060. Available GIS mapping of the District will be used to examine the geographic distribution of existing and future demands. There are some specific issues that will be considered as part of the demand analysis:

- Annual demands will be converted to peak day demands based on existing and projected future peaking ratios.
- Conservation goals and their impact on projected demands will be considered.
- The impact to demand from drought will be estimated.

Task 2 – Evaluate Available Water Supply

The report will examine all identified potential water sources for GHID including groundwater production and wholesale water purchases. This will include consideration of how the supplies will be impacted in drought scenarios and climate change.

Task 3 - Evaluate the Adequacy of the Projected Supply of the District to Meet Projected Demands

With updated system demands and an understanding of available supply, the adequacy of existing supplies and master planned future supply development to meet projected demands will be evaluated as follows:

- The adequacy of District sources to meet projected demands on an annual volumetric basis will be evaluated.
- The adequacy of District sources to meet projected peak demands will also be evaluated.
- Operating conditions for both existing and future demands will be modeled to evaluate the performance of existing District conveyance and storage facilities.
- All evaluations will consider the effects of conservation and source reliability/redundancy.

Task 4 – Develop Infrastructure Maintenance Plan

This report will examine the condition and need for replacement of the District's water assets, including a pipeline condition analysis completed by Fracta. Results of the analysis will be used to develop an ongoing maintenance plan. This maintenance plan will be used to recommend an annual maintenance budget.

Task 5 – Develop Implementation Plan

Based on the results of the analysis discussed in the tasks above, this report will develop an implementation plan for budgeting and planning purposes. This will include consideration of growth, maintenance, and asset management issues. This plan will be detailed for projects needed in the next 10 years and generalized for the following 10 years to allow for adjustments as needed.

Subsequent chapters of this report document the execution of these tasks along with the corresponding results.

REPORT ASSUMPTIONS

As a long-term planning document, this report is based on a number of assumptions relative to future growth patterns, service area expansion, and source availability. Of special significance to the District are a number of assumptions relative to water demands associated with development densities and the impact of conservation throughout the District. If any variables are significantly different than what has been assumed, the results of this report will need to be adjusted accordingly. Because of these uncertainties, this report and the associated recommendations should be updated every five to ten years or sooner if significant changes occur such as annexation or changes in development patterns.

Of particular importance to the District is the largest undeveloped parcel remaining in the southwest corner of the service area, currently owned by Northrup Grumman Innovation Systems LLC. Previous and current planning documents, including projections by WFRC and those contained in this document, assume that this property will remain zoned as it currently is and will not require water service from the District. Should this assumption change at any point in the future, a new study will need to be completed to determine if the District has capacity to serve this area.

CHAPTER 2
DEMAND PROJECTIONS

There are several methods that can be used to estimate future water demand. This study developed demand projections using equivalent residential connections (ERCs). The methodology of this approach can be summarized as follows:

1. Define the service area
2. Project both residential populations and non-residential growth for the service area based on existing and projected patterns of development
3. Project equivalent residential connections (including non-residential growth) for the service area based on existing and projected patterns of development
4. Estimate the contribution of equivalent residential connections based on a statistical analysis of existing levels of development and historic water use. Adjust projected demands as necessary to account for conservation trends and goals.
5. Convert projections of equivalent residential connections to water demands based on their historic contributions and consideration of conservation.

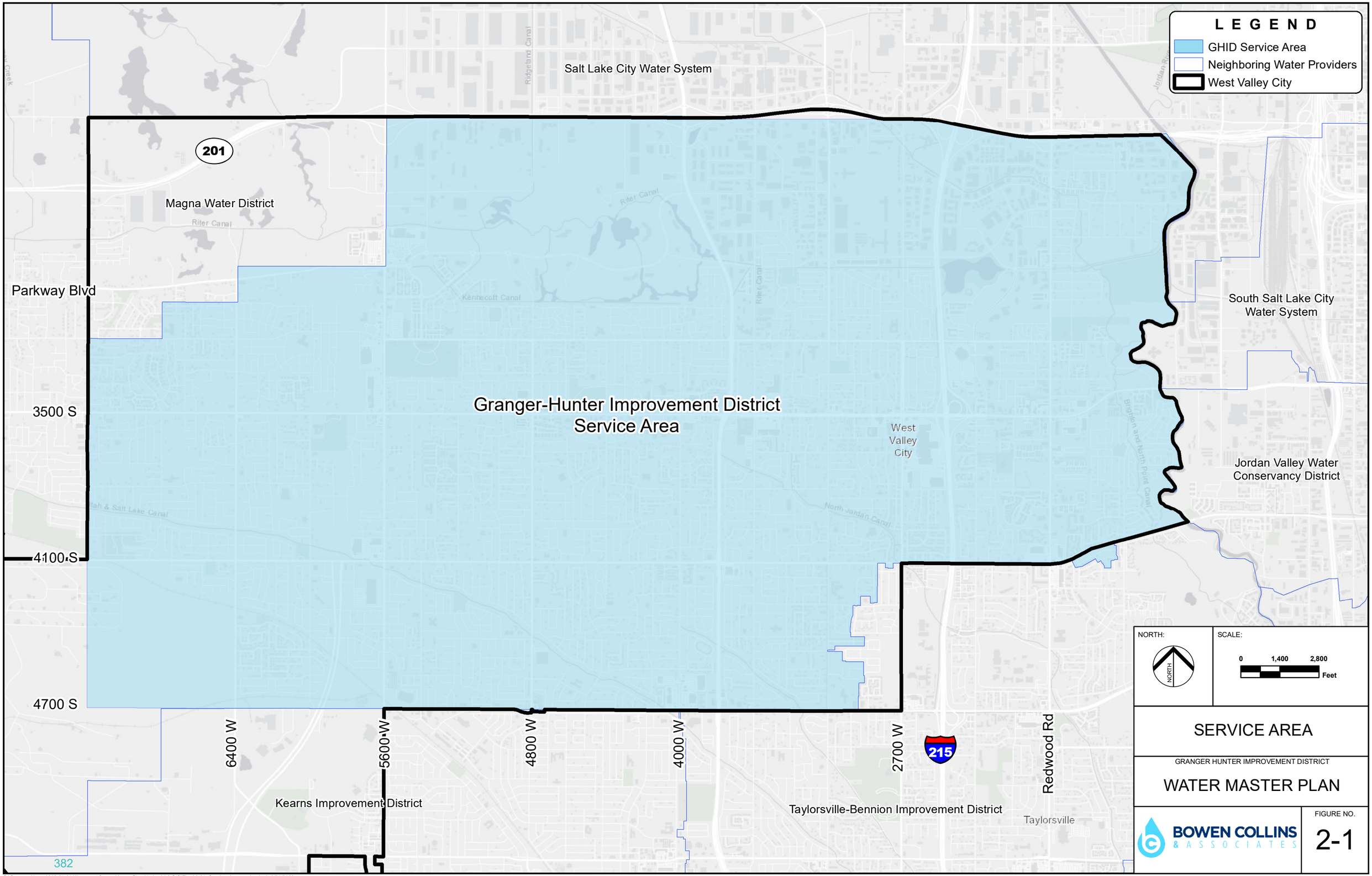
Each step of this process is summarized in the sections below.

SERVICE AREA

Granger-Hunter Improvement District currently provides all retail water service within its defined service area as shown in Figure 2-1. The service area incorporates a large portion of West Valley City, but not all. There are no known service area expansions planned at this time.

PROJECTED GROWTH

There are a number of planning agencies that produce growth estimates covering the area included in the Granger-Hunter Improvement District: the State of Utah Governor's Office of Planning and Budget (GOPB), the Kem C. Gardner Policy Institute, and the Wasatch Front Regional Council (WFRC). The first two agencies generally plan on a county or state level. As a result, planning estimates at those scales are often unhelpful for service district's because boundaries often do not line up with service district boundaries. The WFRC does planning on a smaller scale as a result of needing to conduct traffic modeling of future conditions. The WFRC develops traffic analysis zones (TAZ) that include sub-areas that include residential and employment projections divided into relatively small areas representative of collector roads. As a result, the WFRC projections are more helpful than State of Utah estimates for projecting rates of growth for population and employment growth for service districts.



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Existing Service Area Population Growth

BC&A reviewed the most recent WFRC TAZ projections for the Granger-Hunger Improvement District service area. The existing population estimates and growth rate for each TAZ within the District were then used to help define the rate of growth for the existing service area through the year 2050. The WFRC does not have population projections beyond the year 2050, so the rate of growth was extrapolated through 2060 based on the 2050 growth rate for the existing service area.

The WFRC TAZ projections show a slow and fairly steady average growth rate of 0.3% over the next 40 years. Table 2-1 and Figure 2-2 identify the TAZ population projection for the District service area.

Table 2-1
TAZ Population Projections for GHID

Year	GHID Population	Rate of Growth
2021	132,107	
2026	133,320	0.2%
2031	134,121	0.1%
2036	135,477	0.2%
2040	136,636	0.2%
2045	138,124	0.2%
2050	140,590	0.4%
2055	143,224	0.4%
2060	145,858	0.4%

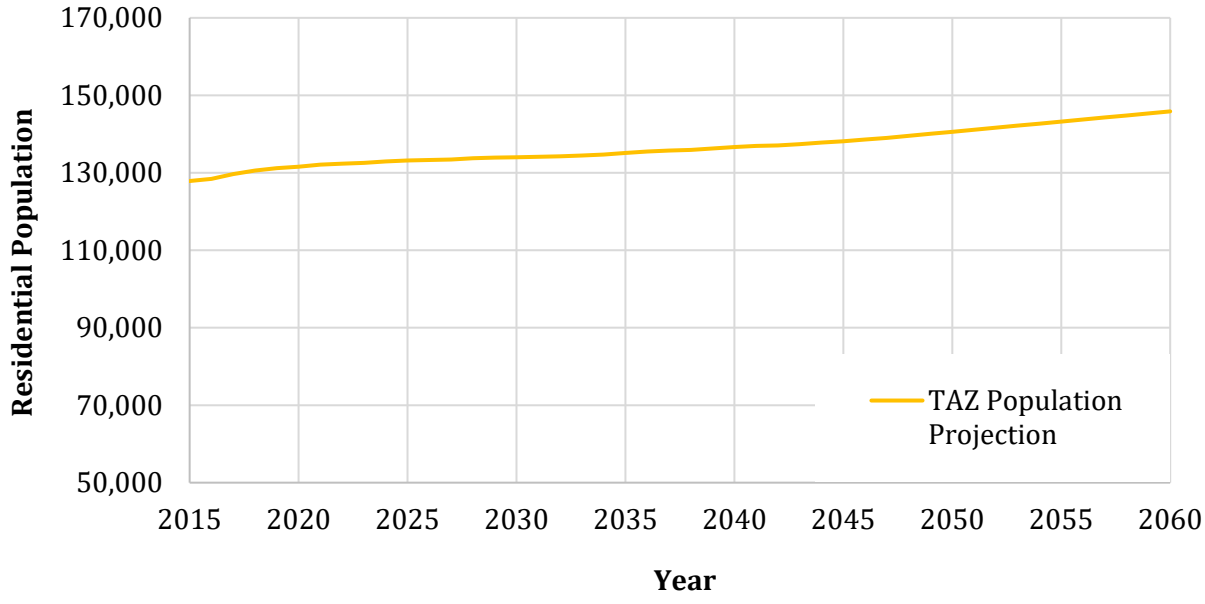
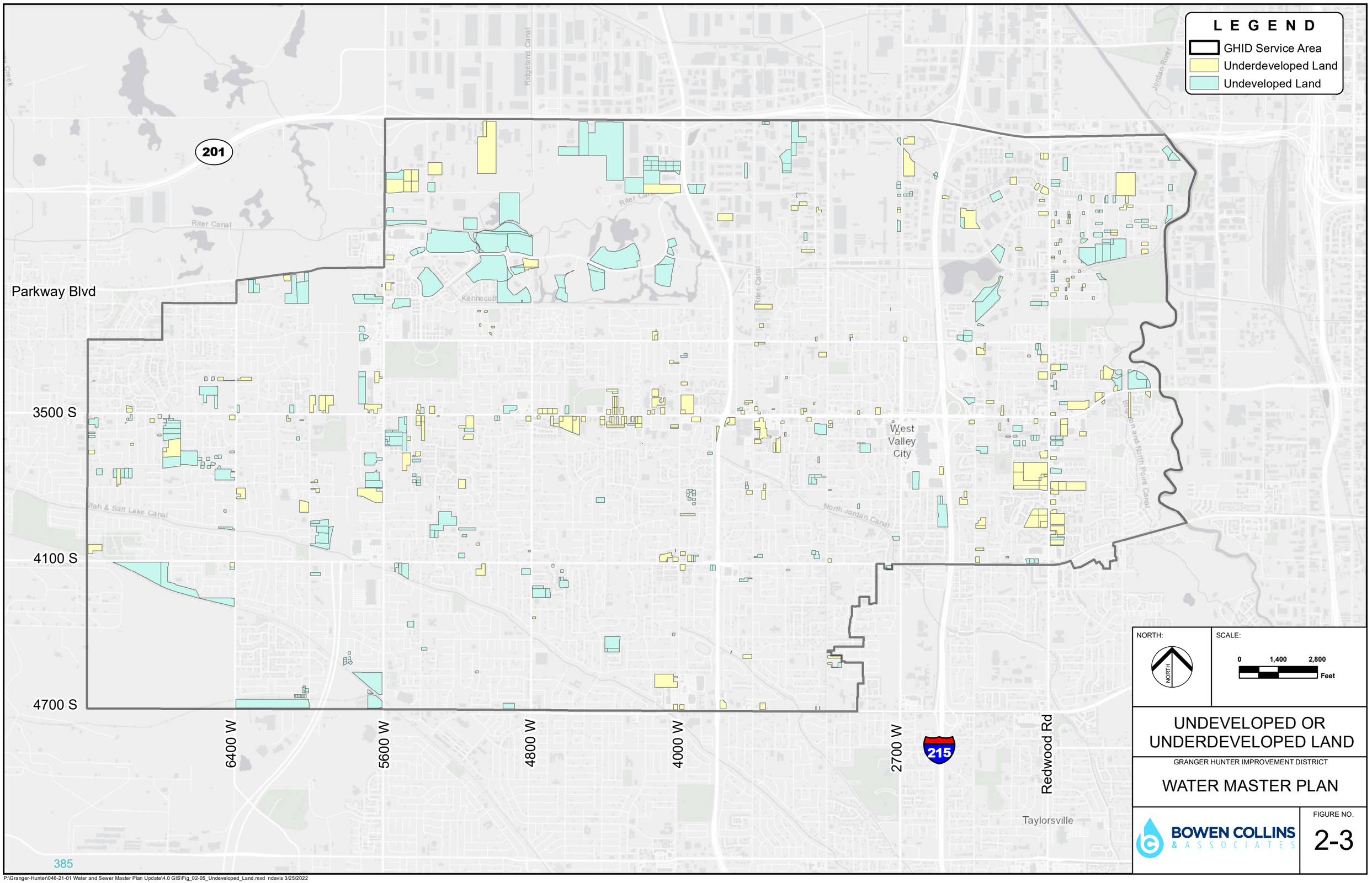


Figure 2-2 TAZ Population Projections

Impacts of Increasing Densities

While useful in many circumstances, TAZ population projections can be more conservative than how areas actually develop, especially where significant redevelopment is occurring. This appears to be the case in GHID where TAZ projections of density are well below recent observed development trends in some areas. The District has observed an increase of housing density in recent developments, which has increased its overall growth rate.

BC&A has taken this increased density into account and provided a second estimate for population growth over the next 40 years. A large portion of the District's service area is built out, with smaller parcels available for development rather than large, open sections of land. In addition, as portions of the area age, redevelopment is occurring, typically at much higher densities than the original development. BC&A met with the West Valley City planning group to identify parcels that the City considers underdeveloped. These are parcels where the value of the existing development is significantly less than surrounding parcels and represent a prime opportunity for redevelopment. Undeveloped and underdeveloped parcels as identified by the City are shown in Figure 2-3. West Valley City also provided the City's land use map, which is shown in Figure 2-4.



UNDEVELOPED OR UNDERDEVELOPED LAND

GRANGER HUNTER IMPROVEMENT DISTRICT

WATER MASTER PLAN

BOWEN COLLINS & ASSOCIATES

FIGURE NO. 2-3

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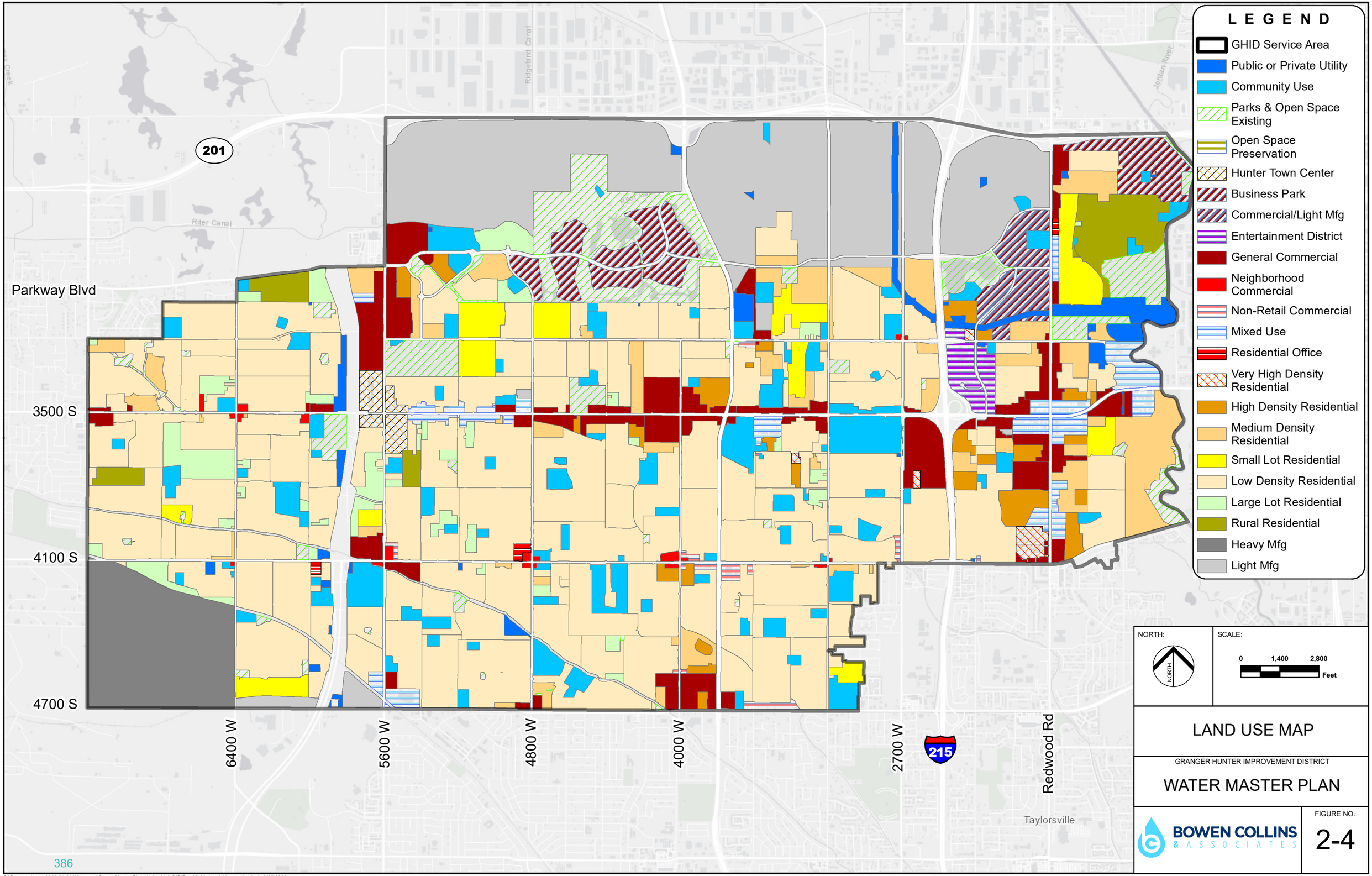

LAND USE MAP

GRANGER HUNTER IMPROVEMENT DISTRICT

WATER MASTER PLAN

BOWEN COLLINS & ASSOCIATES

FIGURE NO. 2-4

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To estimate the potential density the District might see, BC&A examined the actual density of recent and/or planned redevelopment projects in the District. The District is aware of current plans for four developments of high density, summarized in Table 2-2.

Table 2-2
Recent Known Developments

	Area (acres)	Units	Density (units/acre)
Development A	2.79	219	78.5
Development B	27.18	450	16.6
Development C	13.56	430	31.7
Development D	3.59	200	55.7

Developments A & D are small parcels with very high densities that may not be representative of larger scale redevelopment. However, Developments B & C appear to be a reasonable representation of recent redevelopment in the area and what the District might expect in the future. As shown in the table, Developments B & C have an average density of 24.1 units/acre.

Using this value as a planning density, BC&A did an analysis of undeveloped & underdeveloped parcels in the District. It was determined that there is a combined nearly 680 acres that may develop or redevelop at higher density. Table 2-3 is a summary of this analysis. At a redevelopment density of 24.1 units/acre, the GHID service area could see an increase of 16,381 additional units of development (62,423 people at 3.81 persons per unit). In contrast, the TAZ growth projections identify a population increase of only 14,276 people. This higher amount of growth and the difference between these two projections is summarized in Table 2-4 and shown in Figure 2-5.

Table 2-3
High Density Population Analysis Summary

Potential High Density Undeveloped Parcel Area	446.9 acres
Potential High Density Underdeveloped Parcel Area	232.0 acres
Total Potential High Development Area	679 acres
Development Density	24.1 units/acre
Potential Connections	16,384 units
Population/Unit	3.81
Population	62,423 People

Table 2-4
Population Projections for Granger-Hunter Improvement District

Year	GHID TAZ Population	Rate of Growth	GHID Population with High Density Development	Rate of Growth
2021	132,107		133,878	
2026	133,320	0.2%	139,181	0.8%
2031	134,121	0.1%	142,683	0.5%
2036	135,477	0.2%	150,850	1.1%
2040	136,636	0.2%	160,631	1.3%
2045	138,124	0.2%	173,194	1.6%
2050	140,590	0.4%	182,777	1.1%
2055	143,224	0.4%	189,817	0.8%
2060	145,858	0.4%	194,005	0.4%

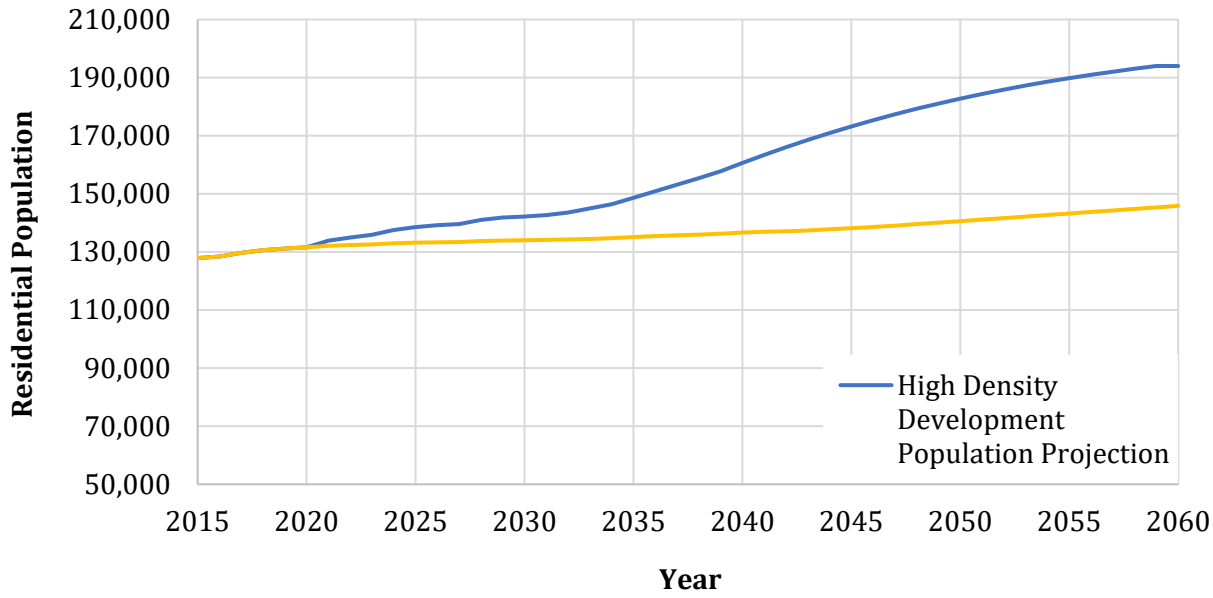


Figure 2-5 High Density Population Projections

Non-Residential Growth

In addition to population growth, it is important to look at non-residential growth coming from increased commercial and employment in the service area. The TAZ data is presented as the number of employees and is shown in Figure 2-6.

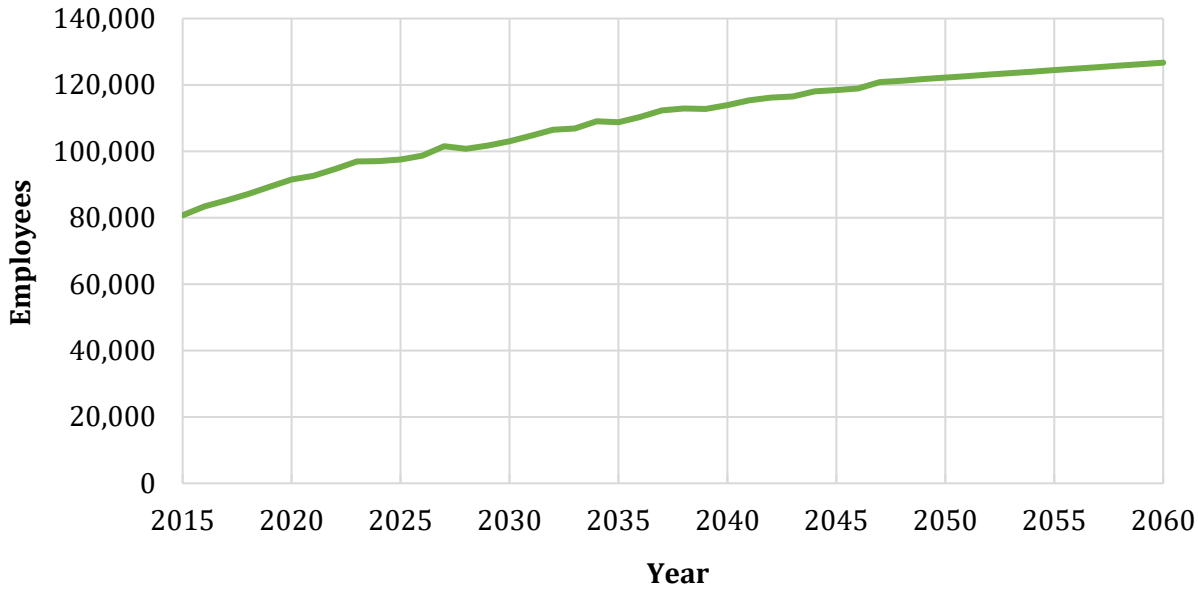


Figure 2-6 TAZ Employment Projections

EQUIVALENT RESIDENTIAL CONNECTIONS (ERC)

To be able to project water demands associated with both residential and non-residential growth, it is useful to define growth in terms of equivalent residential connections (ERCs). An ERC represents the demand associated with an average, single-family residential unit. In 2020, the Districted calculated a total of 45,749 ERCs in its service area. Based on observed growth, this was used to estimate a 2021 ERC value of 45,903. This value represents all existing water demand on the system. Future growth can be determined based on the projected densities and growth rates discussed in the previous section. For residential growth, the increase in ERCs has been based on projected population growth. In the case of the high-density scenario, appropriate adjustments have been made to account for the population increase without additional outdoor irrigation being added. For non-residential growth, the increase in ERCs has been based on projected employment growth.

Based on these calculations, growth projections were projected through 2060 and are detailed in Table 2-4 and shown in Figure 2-7.

Table 2-4
Equivalent Residential Connection Projections

Year	Low-Density Residential ERCs	High-Density Residential ERCs	Non-residential ERCs	Total Low-Density ERCs	Total High-Density ERCs
2021	34,684	34,684	11,219	45,903	45,903
2026	35,002	35,793	11,960	46,962	47,752
2031	35,213	36,367	12,686	47,898	49,053
2036	35,569	37,340	13,370	48,938	50,710
2040	35,873	38,171	13,802	49,675	51,974
2045	36,264	39,238	14,352	50,615	53,590
2050	36,911	41,007	14,807	51,718	55,814
2055	37,603	42,896	15,079	52,682	57,976
2060	38,266	44,786	15,351	53,618	60,137

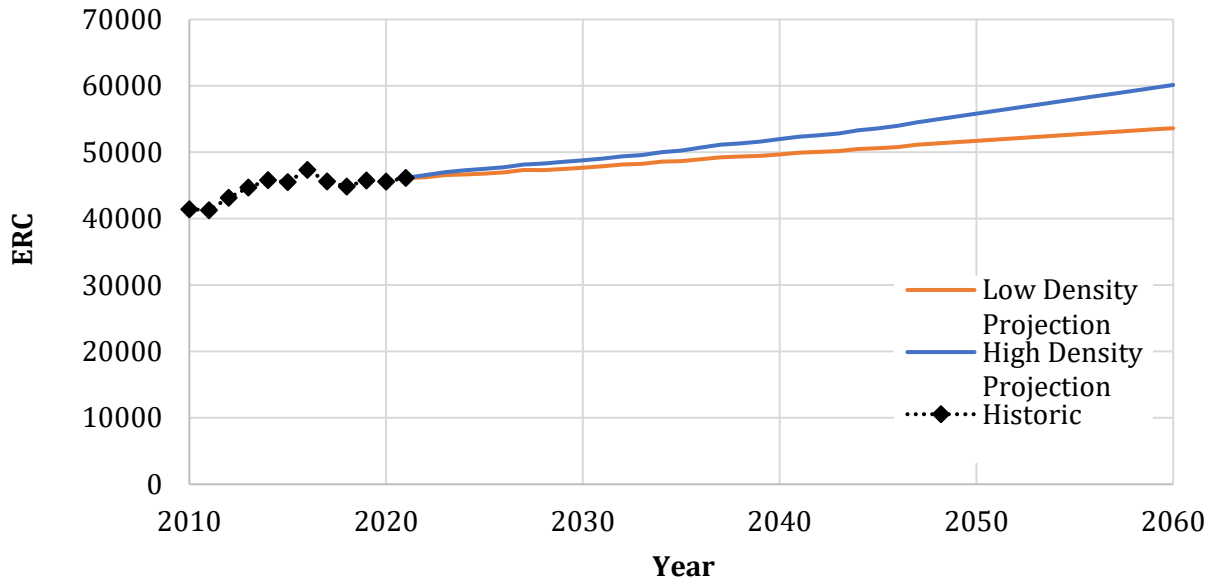


Figure 2-7 Equivalent Residential Connection Projections

HISTORICAL WATER PRODUCTION

The final step in developing annual water production requirement projections is to convert the ERC projections into actual water production requirements by multiplying the projection by historic water production requirements.

Historical Production Requirements

In order to predict future water production requirements for Granger Hunter Improvement District, historical water use data was used to determine the appropriate contribution per ERC. Historic water use for the years 2016 through 2020 is summarized in Table 2-5.

Table 2-5
GHID Historical Water Production

Year	Population	ERCs	Total Water Production (Acre-Ft)	Acre-Ft/ERC	gpd/ERC	Peak Water Production (mgd)	Peaking Factor
2016	128,417	47,350	24,529	0.52	462	51.8	2.37
2017	129,692	45,610	22,438	0.49	439	49.9	2.49
2018	130,599	44,915	25,300	0.56	503	48.0	2.13
2019	131,180	45,749	23,378	0.51	456	51.4	2.46
2020	131,582	45,581	27,688	0.61	541	53.2	2.16

As is evident in the table above, per ERC demand can vary from year to year depending on many different factors. For planning purpose, BC&A would recommend using the highest annual water use per ERC as occurred in 2020. This equates to 541 gal/day/ERC, with a peaking factor of 2.16. The peak day requirement is correspondingly 1,168 gal/day/ERC.

While historical demands are a useful starting point, future projections should consider a few other specific issues:

- **State of Utah Minimum System-Specific Minimum Sizing Standards.** Recent State legislation has directed the Department of Environmental Quality, Division of Drinking Water (DDW) to determine system-specific minimum sizing standards. GHID received a notice on June 24, 2020 that these standards had been set for their system. DDW determined that the minimum sizing standard would be 209,147 gal/year/ERC (573 gal/day/ERC) for average annual demand and 1,116 gal/day/ERC for peak day source demand. While additional supply may be recommended for other reasons, available supply should be no less than these minimums.
- **Recommended Redundancy Requirements.** When determining future water supply projections, it is necessary to consider source reliability and availability. This is typically done by implementing a safety factor that would allow the District to still meet demands if one of its water supplies is out of service. GHID is supplied by both groundwater and multiple connections to the Jordan Valley Water Conservancy District (JVWCD). For this analysis, it is recommended that the District plan its supplies to accommodate the potential loss of it's largest well, Well No. 17. Recent data shows that Well No. 17 produces 2,661 acre-ft/year at 3,300 gpm. If these values are added to the per ERC values noted above, the District's annual production requirement increases to 592.5 gal/day/ERC and the peak production requirement increases to 1,271.1 gal/day/ERC.
- **Water Conservation.** For both annual and peak day demands, the expected impact of conservation should be considered. Future demand with conservation was projected using the State of Utah's Regional Water Conservation Goals for the Salt Lake Region. The regional goals are based on a gallon per capita value, which, the District is already ahead of. GHID's gallon per capita/day (gpcd) was calculated to be 187 gpcd, significantly lower than the average regional value of 210 gpcd in 2015 and equal to the State's goal for 2030. Even though the District has already met the 2030 goal, it is understood that conservation is important to the sustainability of both the District and the region. Thus, it will be important to continue to conserve moving format. Correspondingly, the District has set a goal to save an additional 6

percent in the remaining time before 2030 and will then follow the percent savings identified in the regional goals for the periods thereafter. A comparison of the goals for the District and the State are shown in Table 2-6.

Table 2-6
Water Conservation Goals

Year	State of Utah (gpcd)	State of Utah (%)	GHID (gpcd)	GHID (%)
2015	210			
2020	-		187	
2030	187	11%	176	6%
2040	178	15%	169	10%
2065	169	19%	161	14%

WATER PRODUCTION REQUIREMENT

Based on the several factors discussed above, Figure 2-8 shows the annual demand projections for the District. Included in this figure are several potential variations in demand depending on the scenario of interest:

- Actual demand at WFRC projected densities, both with and without conservation
- Demand at the State of Utah Minimum Sizing Standard (includes recommended 14% reliability factor)
- Recommended demand planning scenario (including appropriate source redundancy factor) for baseline conditions (WFRC projected densities without conservation)
- Recommended demand planning scenario for maximum demand conditions (High density development without conservation)
- Recommended demand planning scenario for minimum demand conditions (WFRC projected densities with conservation)

Figure 2-9 shows the peak day demand projections for the same scenarios. Which scenario to plan for will vary depending on circumstances and will be discussed in subsequent sections of this report.

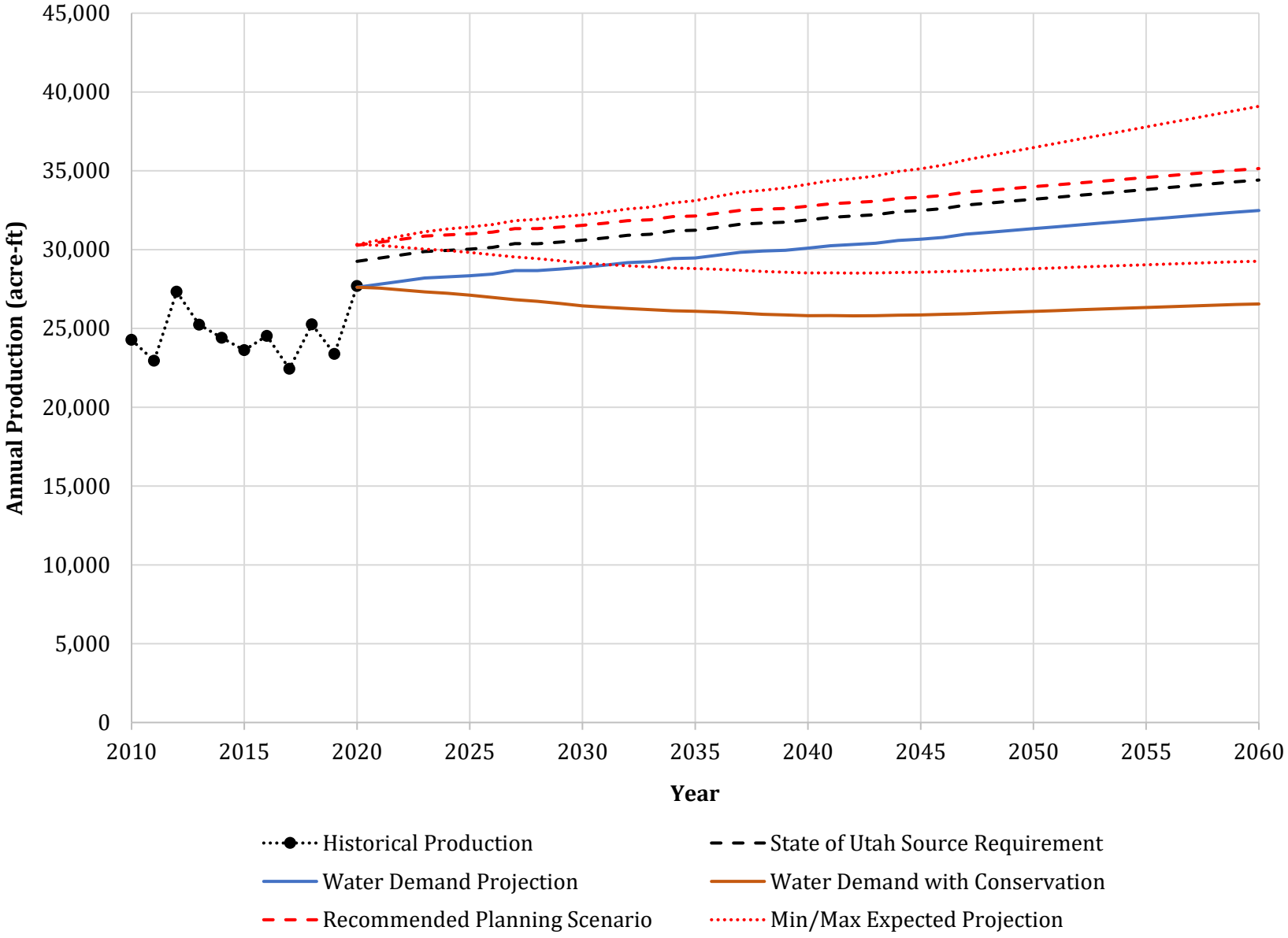


Figure 2-8 Annual Water Production Demand Projections

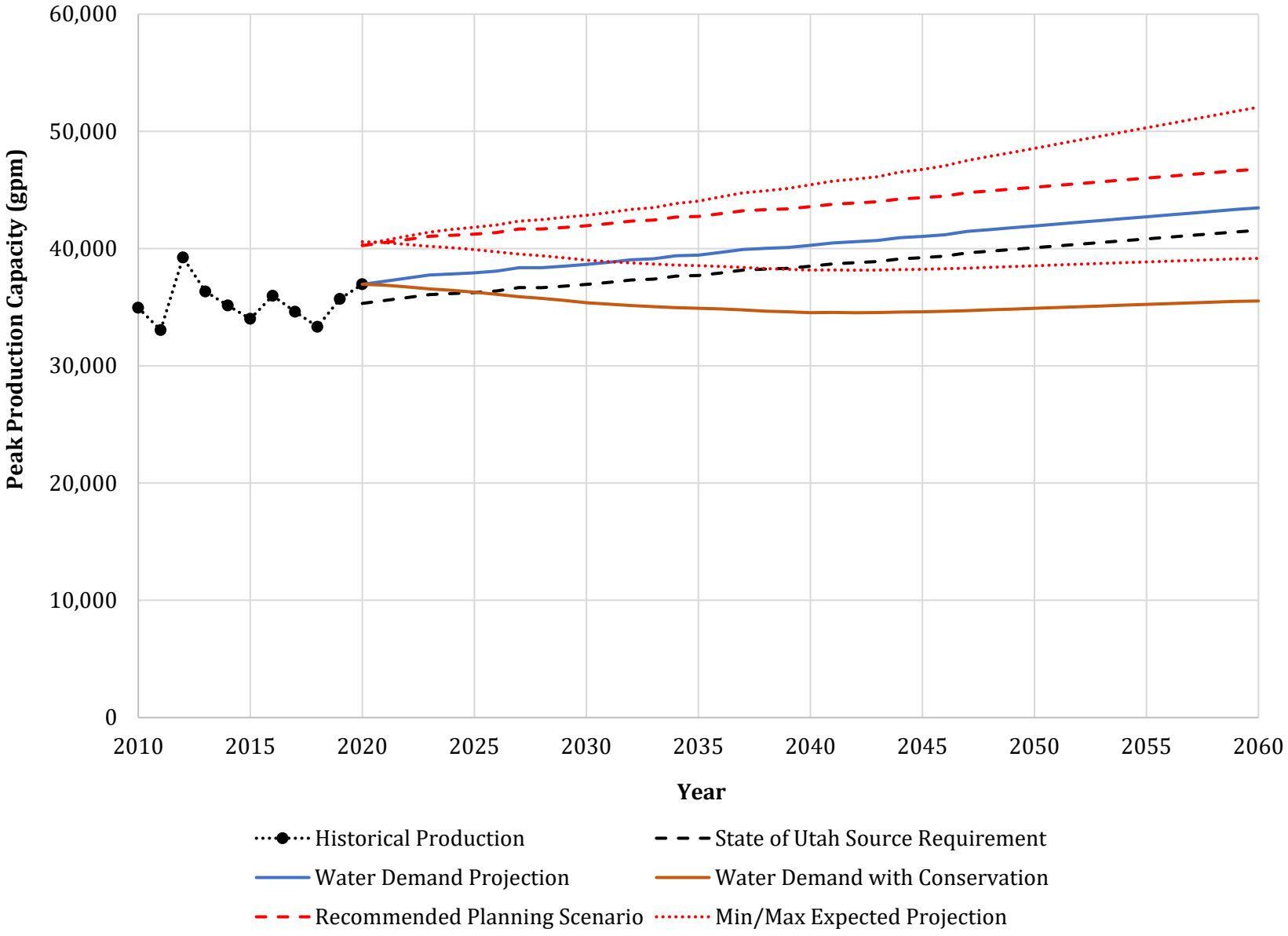


Figure 2-9 Peak Day Production Demand Projections

CHAPTER 3
WATER SUPPLY PROJECTIONS

This chapter will describe the District's sources and discuss the adequacy of existing and future supplies to meet the projected demand discussed in Chapter 2. Additional details regarding each of the District's water sources can be found in the "Existing Facilities" chapter of this master plan.

WATER SUPPLY – EXISTING SOURCES

The City's existing supply comes from two main sources, a wholesale contract with Jordan Valley Water Conservancy District (JVWCD) and District owned and operated wells.

Jordan Valley Water Conservancy District Supply

JVWCD provides water to multiple entities throughout the Salt Lake Valley, including Granger-Hunter Improvement District. The District's contracted supply amount is equal to 18,500 acre-ft per year which the District takes year-round. Historically, JVWCD has allowed the District (and all its customers) to purchase additional water in any given year of up to 20 percent above its contract amount. If this additional purchase option is included, the total volume of water available from JVWCD is 22,200 acre-ft/year.

In the past, JVWCD has always been able to deliver the full amount of the District's contract, even in drought years. However, JVWCD has recently updated its Drought Contingency Plan to include drought mitigation and response actions for each community within its service area. This may result in some reduction in available water during periods of drought. This will be discussed further in Chapter 4.

JVWCD encourages the District to take the water it provides at a constant flow by charging increased rates for water taken at higher peaking factors. Correspondingly, the District does generally try to us JVWCD as it base supply and peak off of its wells. However, the District does have the flexibility to vary its flow rate from JVWCD as needed to meet peak demands. Based on the contracted maximum day flow rate, the City has a reliable peak day delivery capacity from JVWCD equal to 26,749 gpm.

GHID Wells

The District has seven active wells and one inactive well that it uses to supplement the water that is taken from JVWCD. Potential yield and capacity associated with each of the wells is summarized in Table 3-1 and a summary of groundwater rights held by the District is summarized in Table 3-2.

Table 3-1
Well Capacity

Well Name	Pumping Capacity[1] (gpm)	Annual Yield 6-Month Operation (Acre-Ft/Year)	Annual Yield Year-Round[2] (Acre-Ft/Year)
Well No. 1	1,000	807	1,613
Well No. 4	0	0	0
Well No. 8	1,700	1,371	2,742
Well No. 12	2,300	1,855	3,710
Well No. 14	650	524	1,048
Well No. 15	2,600	2,097	4,194
Well No. 16	2,500	2,016	4,033
Well No. 17	3,300	2,661	5,323
Total Capacity	**14,050**	**11,331**	**22,663**

Notes: 1-Based on 2018 – 2020 observed pumping data 2-This value is based on operation of the well year-round, regardless of demand. However, current winter demands are lower than well capacity, so the full yield is not currently available to the District. Based on 2020 water demand, the annual yield with year-round operation is approximately 19,000 acre-ft. See the District's 40 Year Groundwater Plan for additional information.

Table 3-2
GHID Groundwater Rights

Water Right No.	Flow Right (cfs)	Flow Right (gpm)	Flow Right Volume (acre-feet/year)
59-1203	3	1,346	2,172
59-1516	5	2,244	3,620
59-3434	3	1,409	2,273
59-3435	2	898	1,448
59-1204	1	449	724
59-1207	2	835	1,347
57-8776	2	799	1,289
59-1517	5	2,244	3,620
59-1545	1	446	223
59-1639	0.3	135	114
59-5132	6	2,693	2,000
59-5144	5	2,244	1,497
57-2851	1	583	941
Total	**36**	**16,325**	**21,266**

As can be seen in the tables, the District's water rights are more than adequate to cover the full peak production of the existing wells. The water rights are not quite enough to cover the maximum potential annual yield of the wells if they are pumped year-round. However, they are more than enough to cover the yield associates with irrigation season pumping only, the normal mode of operation for the District.

It should be noted that there are a few water quality issues with the wells. Well No. 4 has high arsenic to the point that the District no longer uses the well. Well No. 14 has high arsenic and TDS levels and must be blended with Well No. 8 when in use. All of the wells have higher levels of iron, manganese and ammonia that impact the aesthetics of the water. The District is currently in the process of building a treatment facility for Wells No.1, 12 & 17 to improve water quality coming from these wells.

It should also be noted that this report does not include consideration of actual water availability in the aquifer. While the District may have groundwater rights in excess of 21,000 acre-ft, actual well production has typically been in the range of 5,000 to 7,000 acre-ft. While the District has not reported significant concerns regarding the current aquifer health and water availability, it is unknown how the aquifer would respond to significant increases in water use above the historic volumes. The western portion of the Salt Lake Valley Aquifer is limited to 90,000 acre-ft per year. It is unknown the amount of withdrawals of other water users, but it appears that historic use is below that. The District has noticed small (less than 5 feet) declines in static water level in a couple of its wells, but it is unknown if the decreases are permanent or due to the current drought.

WATER SUPPLY – FUTURE SOURCES

Extended Operation of Wells - The District typically operates their wells for approximately six months of the year, during the peak water demand period. Doing so helps them to use a more consistent amount of their JVWCD contracted water, however, this limits the amount of their water rights that they can access. Six-month operation limits the District to a maximum of 11,331 acre-ft as shown in the table above, even though the District has rights to 21,266 acre-ft/year. The District could increase the amount of groundwater used by operating the wells during the winter months. This would increase the yield from the wells but would likely still be short of the 22,663 acre-ft/year maximum shown in Table 3-1 as the winter water demand is often lower than the total capacity of the wells.

Additional Well Capacity – Another option to access more of the District's groundwater rights is to drill additional wells. This would allow the District to continue to operate their wells for approximately six months per year, but since the wells would be operating at a higher total flow rates, the overall yield of groundwater would increase. This could be done by drilling a new well, No. 18, or redrilling Wells No. 1 or 4 for higher capacity. Increasing the well capacity will also allow the District to reduce the amount of JVWCD water used during peak times, which may help reduce peaking charges as well.

JVWCD – The District's contract with Jordan Valley was last updated in 2005 with the last increase in water amount being in 2013. Should the District need additional water, it is possible that Jordan Valley would be willing to update the contract to a higher amount. However, the JVWCD contracted amount is a take or pay contract, meaning that the District will pay for the amount of water in the contract regardless of how much is used. While this is an option, it is expected that this would be more expensive than using existing groundwater rights. Thus, it is a lower priority and should only be considered if growth cannot be addressed via conservation or additional groundwater.

ANNUAL WATER SUPPLY & DEMAND

Using the projected demands from Chapter 2 and the available supply identified above, the adequacy of supply to meet future demands (with appropriate reliability and redundancy buffers) can be evaluated. Figure 3-1 shows the supply, including necessary increases with the water demand projection and recommended planning scenario demand curves overlain.

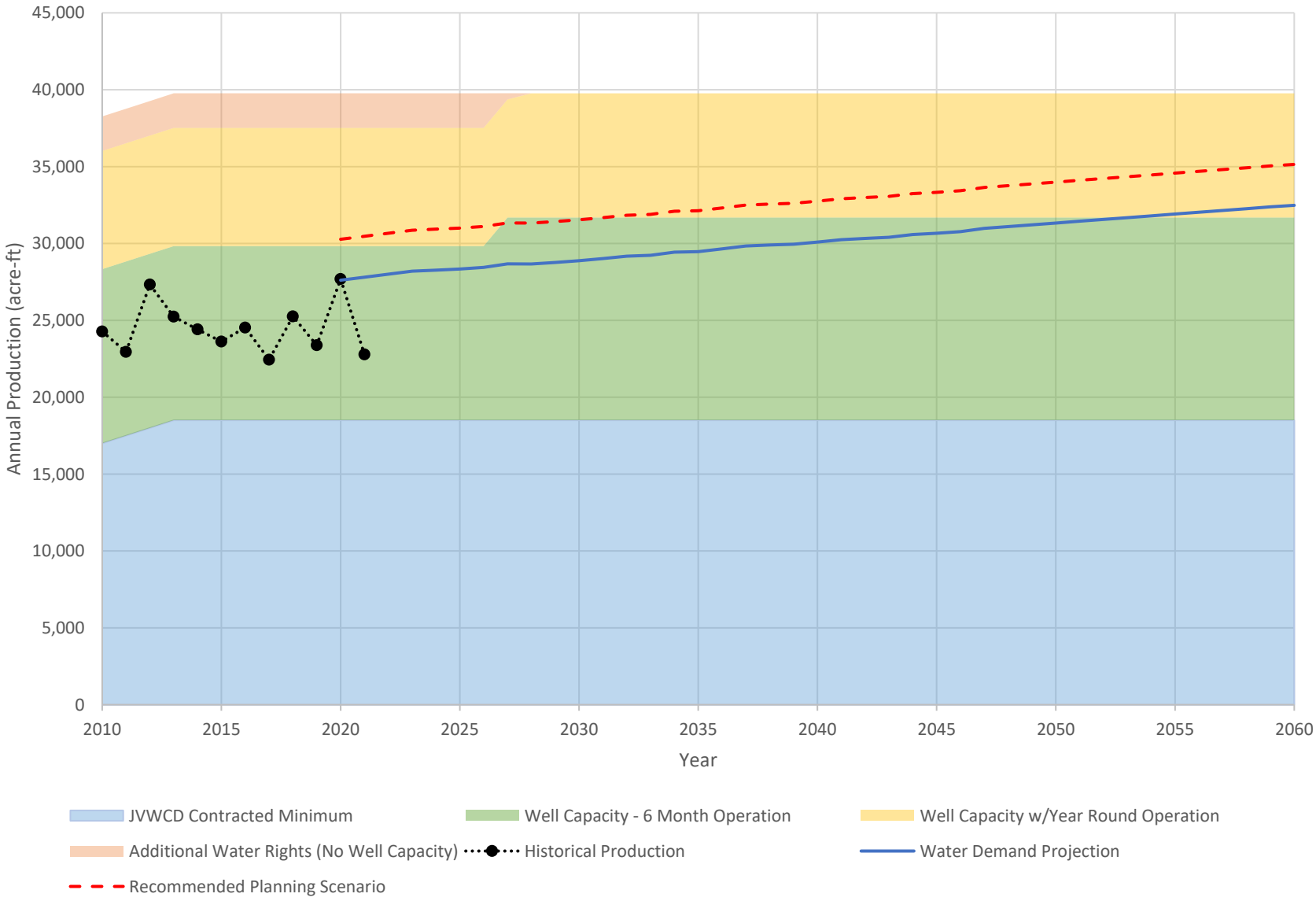


Figure 3-1 Annual Water Supply Requirements

Annual Supply Conclusions

From the comparison of annual demands to annual supplies through 2060, a few observations can be made:

1. **Additional Well Source.** The District can currently supply the projected water demand while operating wells for 6 months out of the year. However, to meet demands under the recommended planning scenario, well operation will need to be extended outside the period of peak demands. Additionally, even if the District were to operate its exist wells year-round, it would not be able to utilize its full water right. To preserve operational flexibility moving forward and to provide access to its full water right if ever needed, it is recommended that the District drill a new well in the next few years. This will allow the District to meet the recommended planning scenario in the short term and will extend the time frame where the projected water demand can be met while still limiting well operation to approximately six months of the year.
2. **Long-Term Source Considerations.** After 2050, current projections indicate the District will need a little additional supply if it wants to continue to limit well operation to six months of the year. Because this potential need is so far into the future, it is recommended that the District preserve future options where possible, but not commit significant resources for additional source at this time. Changes in densities, water use patterns, or conservation could affect this need moving forward. It is recommended that the District continue to monitor water demands and reevaluate this need over time. At some point, another additional source may be needed.

   This new source would likely come through an expansion of the contract with JVWCD or installation of another future well. As discussed previously, the District should proceed carefully with any options that increase groundwater withdrawals above historic values. As the District evaluates the need for an additional long-term source, it should also monitor an evaluate the health of its aquifer to determine in increased withdrawals from the aquifer can be supported.
3. **Water Conservation an Important Focus.** The projections shown in Figure 3-1 are based on the scenarios discussed in Chapter 2 including conservation. If conservation efforts are insufficient to meet the District's conservation goals, the necessary supply will need to be larger than discussed in these conclusions. Correspondingly, it is essential that the District make conservation a critical component of its overall water supply plan and commit the resources necessary to achieve its conservation goals.

PEAK DAY WATER SUPPLY & DEMAND

In addition to meeting annual demand volumes, the District's water system will also need to be capable of delivering water at capacities sufficient to satisfy peak demands. Figure 3-2 shows the peak day water demand projection and recommended planning scenario from Chapter 2 compared to the existing and anticipated future supply.

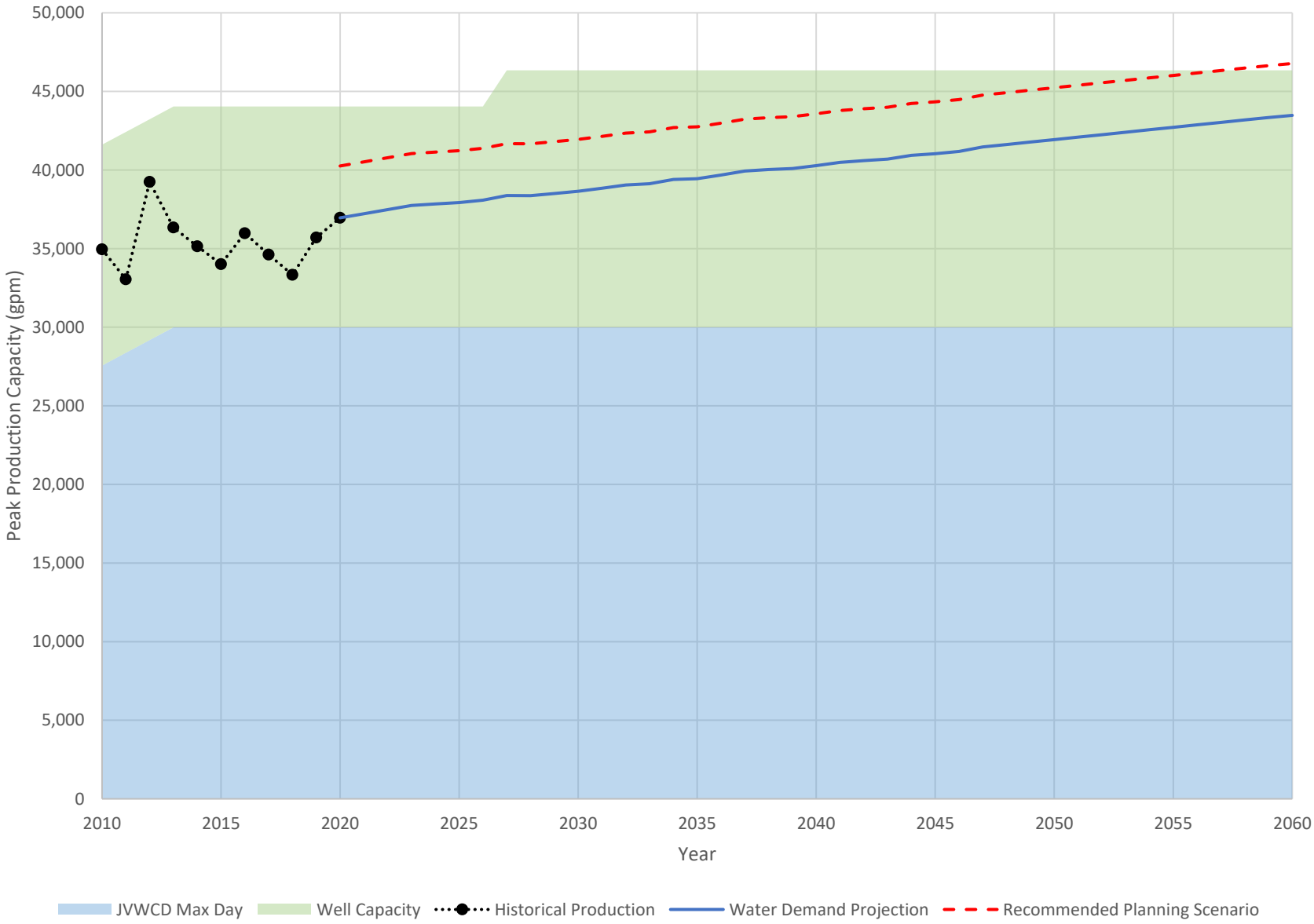


Figure 3-2 Peak Day Water Supply

Peak Day Supply Conclusions

From the comparison of peak day demands to peak day supplies through 2060, similar observations to annual supply conclusions can be made.

1. **Additional Source.** The addition of another well as recommended in the annual supply analysis allows the District to have adequate peak day supply through nearly 2060. This additional source also allows the District to reduce its peak draws from the Jordan Valley system, which allows the peaking factor charges to be reduced.
2. **Water Conservation an Important Focus.** As with annual demands, peak projections shown are also based on the conservation scenarios discussed in Chapter 2. Correspondingly, the projected peak capacity needs shown here further emphasize the importance of making conservation a critical component of the District's overall water supply plan.

CHAPTER 4
WATER SUPPLY RISK AND PLANNING

WATER SUPPLY VARIATION – NOW AND IN THE FUTURE

The information presented in Chapters 2 and 3 of this report is based on the most up-to-date data available. Intrinsic to this analysis is the assumption that sources are expected to produce well into the future in accordance with past performance. This begs questions such as:

- Is the modern historical record sufficient to account for variation in water availability to be used for planning purposes?
- Will drought or other factors likely affect water availability or system demands and, if so, in what ways?

This section is dedicated to considering these types of questions to better inform the conclusions reached elsewhere in this report, and ultimately to assist the District in understanding the long-term water supply and demand characteristics of their system inclusive of these types of considerations.

Groundwater

The District pumps its wells well below its available water rights due to the operating method chosen; the District peaks off its own wells and takes Jordan Valley water at a more consistent rate. At the lower levels of pumping, the District has not observed any long-term trends of declines in the groundwater table. Therefore, there is little current concern regarding groundwater availability at the levels assumed for planning in this document. For planning purposes, it has been assumed that this volume will continue to be available, even during periods of drought. Even with that, the District should continue to monitor groundwater levels due to pumping from surrounding agencies. Due to the small percentage of total supply, it is expected that the District could adjust to a groundwater supply disruption if it were to occur.

JVWCD

The District's existing contract with JVWCD is generally considered reliable for planning purposes because JVWCD has its own contingencies to account for source interruption. However, JVWCD has recently produced a Drought Contingency Plan (still in draft form as of the writing of this chapter). This contingency plan includes drought mitigation and response actions for each community within its service area. JVWCD has created Water Supply Availability Levels and corresponding Drought Response Action Levels ranging from 1 to 4 (4 being the most severe drought level). If enacted by JVWCD, these response actions will result in a reduction in the water that will be delivered to member agencies and JVWCD retail customers. Table 4-1 shows these levels with the associated targeted reduction in water deliveries for each level.

Table 4-1
JVWCD Supply Availability

Drought Level	Targeted % Reduction in JVWCD Contract	Targeted Annual Volume from JVWCD (Acre-ft)	Max Delivered % of JVWCD Contract	Max Delivered Annual Volume from JVWCD (Acre-ft)
0	0%	18,500	-	-
1	5%	17,575	120%	22,200
2	10%	16,650	110%	20,350
3	20%	14,800	100%	18,500
4	30%	12,950	>100%	>18,500

Notes:
1 – At Level 4, JVWCD will determine the water supply availability as a ratio to wholesale contract amounts (i.e., 90 percent, 85 percent, etc.) at the time that this level of water supply availability is established.
2 – Reduction targets and max delivered volumes are taken from Table 6-1 of the JVWCD Drought Contingency Plan.

While annual delivery volume targets may be reduced in drought years, the plan does not identify any reduction in the delivery capacity from JVWCD. Thus, it has been assumed that the peak delivery capacity from JVWCD will remain about the same, even in drought years. Correspondingly, the remainder of this chapter will focus primarily on the annual supply implication of drought.

RISK TO ANNUAL WATER SUPPLY

The District's water supply could be reduced if a source were lost – either temporarily or permanently. While there are many ways this could occur, the most likely imaginable ways at this time are:

- Unexpected mechanical failure of pumps or other system components limit the District's ability to treat or convey water temporarily.
- An earthquake disables conveyance infrastructure or disturbs availability by adversely affecting aquifer characteristics.
- A water source becomes suddenly contaminated – either intentionally through an act of terrorism or accidentally through an industrial spill or similar event.
- Drought or other environmental changes reduce water supply, increase water demand, or both.

For discussion purposes, annual water supply risk is categorized into two scenarios: Minor Source Loss and Catastrophic Source Loss. The management of these risk scenarios will define the Recommended Supply Planning Scenario for the District's long term annual water supply planning.

Minor Source Loss Scenario

This scenario covers the vast majority of potential source loss situation such as mechanical failure, pipe breaks, a single well becoming contaminated, etc. For this type of scenario, it is recommended that the District have water supply sufficient to handle this type of loss without disruption to customers, even during peak periods of demand. In other words, the District should always have enough extra supply that it can weather the loss of sources that are the most vulnerable to any of the risks listed above.

As discussed in Chapter 2, the recommended planning scenario value of 592.5 gal/day/ERC includes an appropriate source redundancy factor which is equal to the largest well being out of service. This additional supply buffer is large enough that it covers all likely minor source loss scenarios. Loss of any given well or interruption to a single JVWCD connection point all fall within this buffer and no additional modifications to the supply plan are needed for this purpose.

Severe Source Loss Scenario

Beyond the more frequent, small supply disruptions discussed above, the District must also be prepared for more severe source losses. For example, it is conceivable to think that an extremely large earthquake on the Wasatch Front or other extreme event could cause the loss of more supply than discussed in the section above. In such a situation, it is not reasonable to expect the District to deliver water at the same level of service as it was prior to the severe event.

However, an earthquake is likely an extreme example. In the case of an earthquake, the District would likely move to an emergency mode of operation, limiting water delivery to essential indoor functions. A more likely source of periodic severe source loss is drought. As discussed above, the District's primary supply of water from JVWCD could be reduced by up to 30 percent in an extreme drought. Even in lesser droughts, reductions in supply could be observed that will affect how the District can use water. Therefore, for GHID, drought becomes the most concerning water supply risk and should be reviewed and considered in addition to the overall supply planning discussed previously.

RECOMMENDED DROUGHT PLANNING

The most likely potential source loss for the District is a reduction of supply due to the JVWCD Drought Contingency Plan. At the different drought levels, JVWCD could implement voluntary or mandatory reductions in supplied water by between 5 and 30 percent of typical use. Figure 4-1 through Figure 4-4 show the projected use versus the available supply with the Level 1 through 4 targeted drought reductions from JVWCD[1]. These figures illustrate the effect on the total District supply at each of the drought level scenarios. For perspective and based on information from JVWCD, a Level 4 drought is extreme and expected to occur very rarely, if ever. Conversely, Level 2 drought represents a significant but not unlikely level of drought, typical of what might be observed periodically as a result of normal variability in water supply. The most recent water year (2020-21) may have been around a Level 2 drought had JVWCD's Drought Contingency Plan been in place at the time.

[1] The effect of a potential drought is represented in the figures beginning in 2022 and shown for all years moving forward. This is not meant to infer that supplies will be permanently reduced beginning in 2022, but is to show what would happen in any given future year if a certain level of drought were observed.

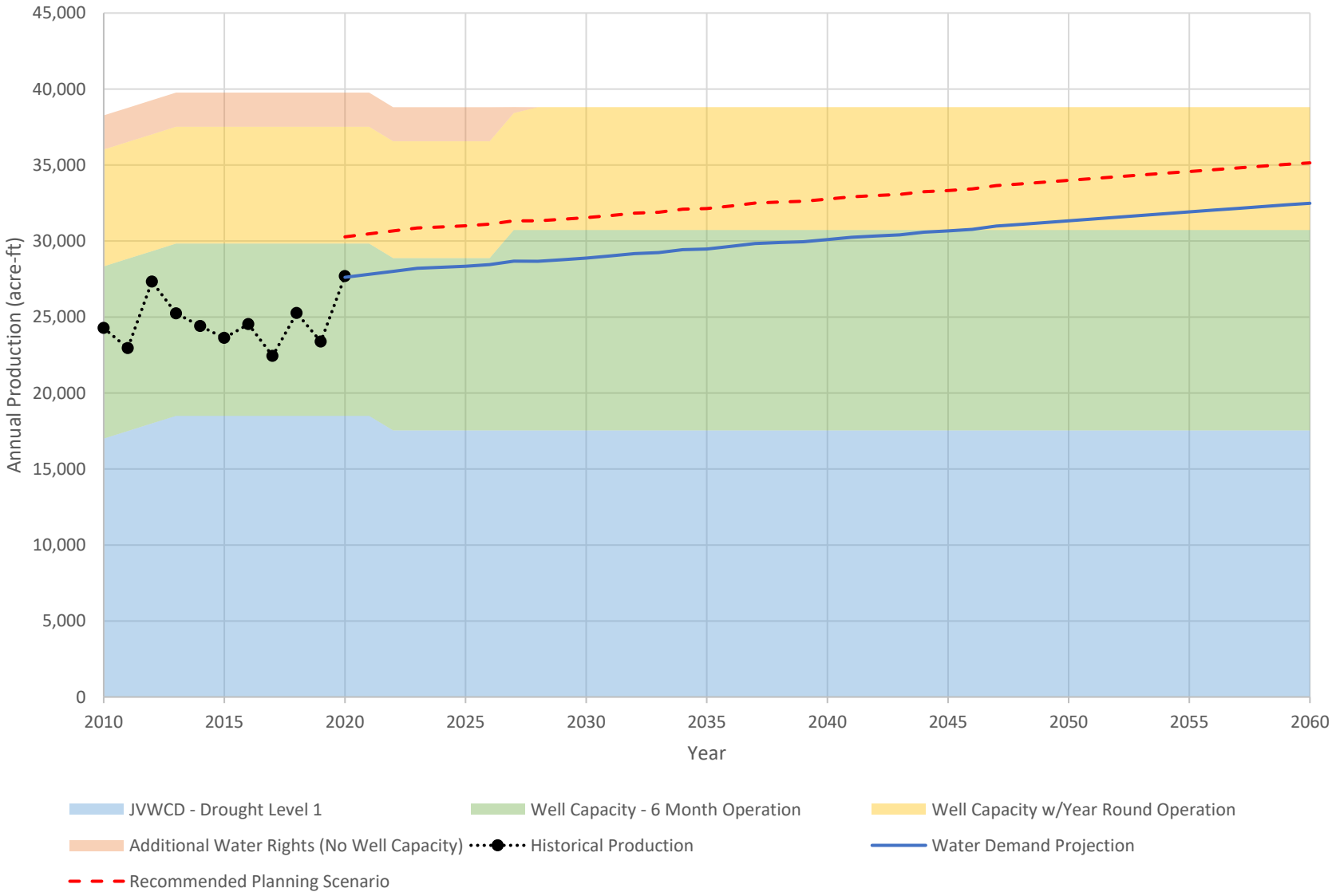


Figure 4-1 Projected Annual Production Requirements at JVWCD Drought Level 1

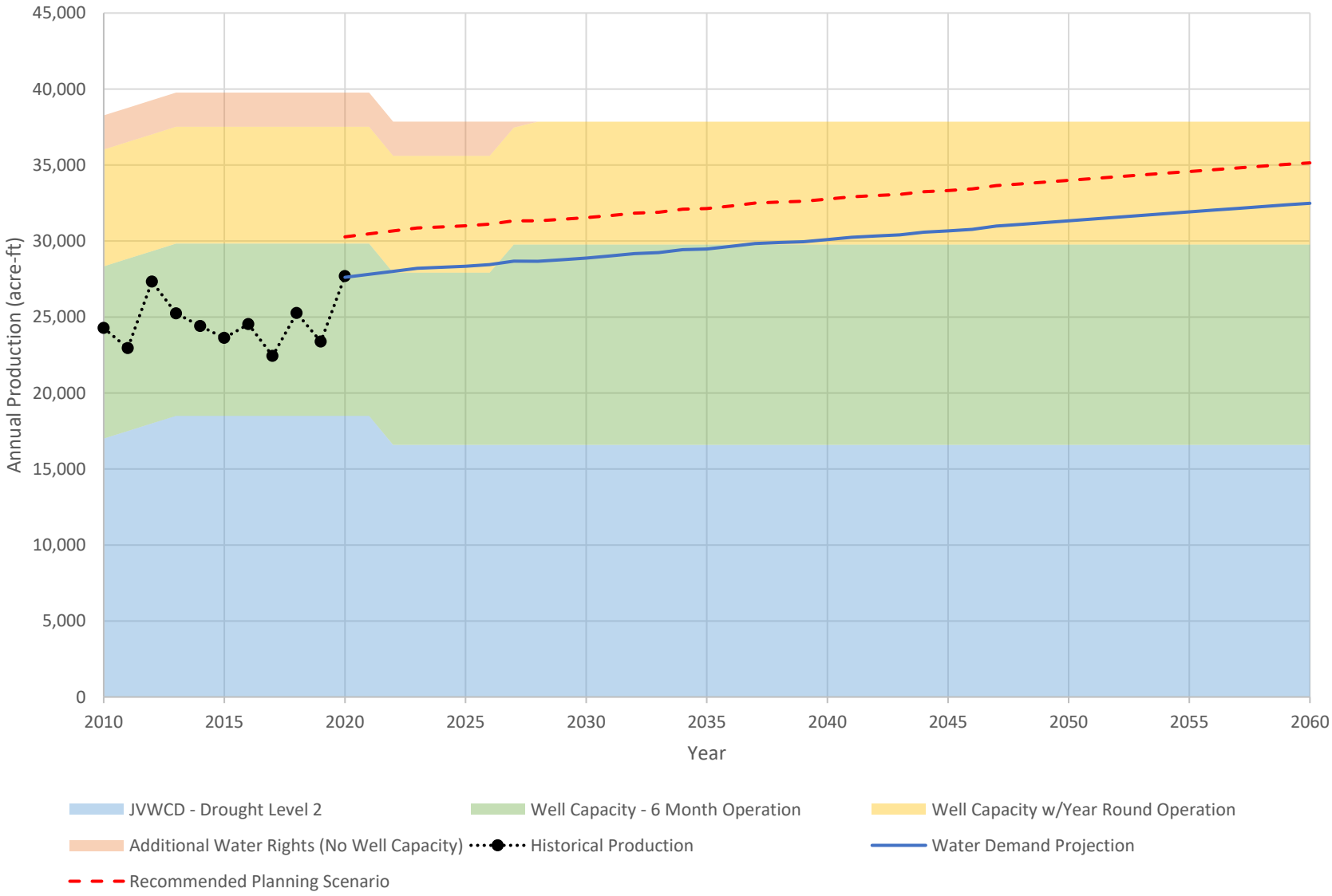


Figure 4-2 Projected Annual Production Requirements at JVWCD Drought Level 2

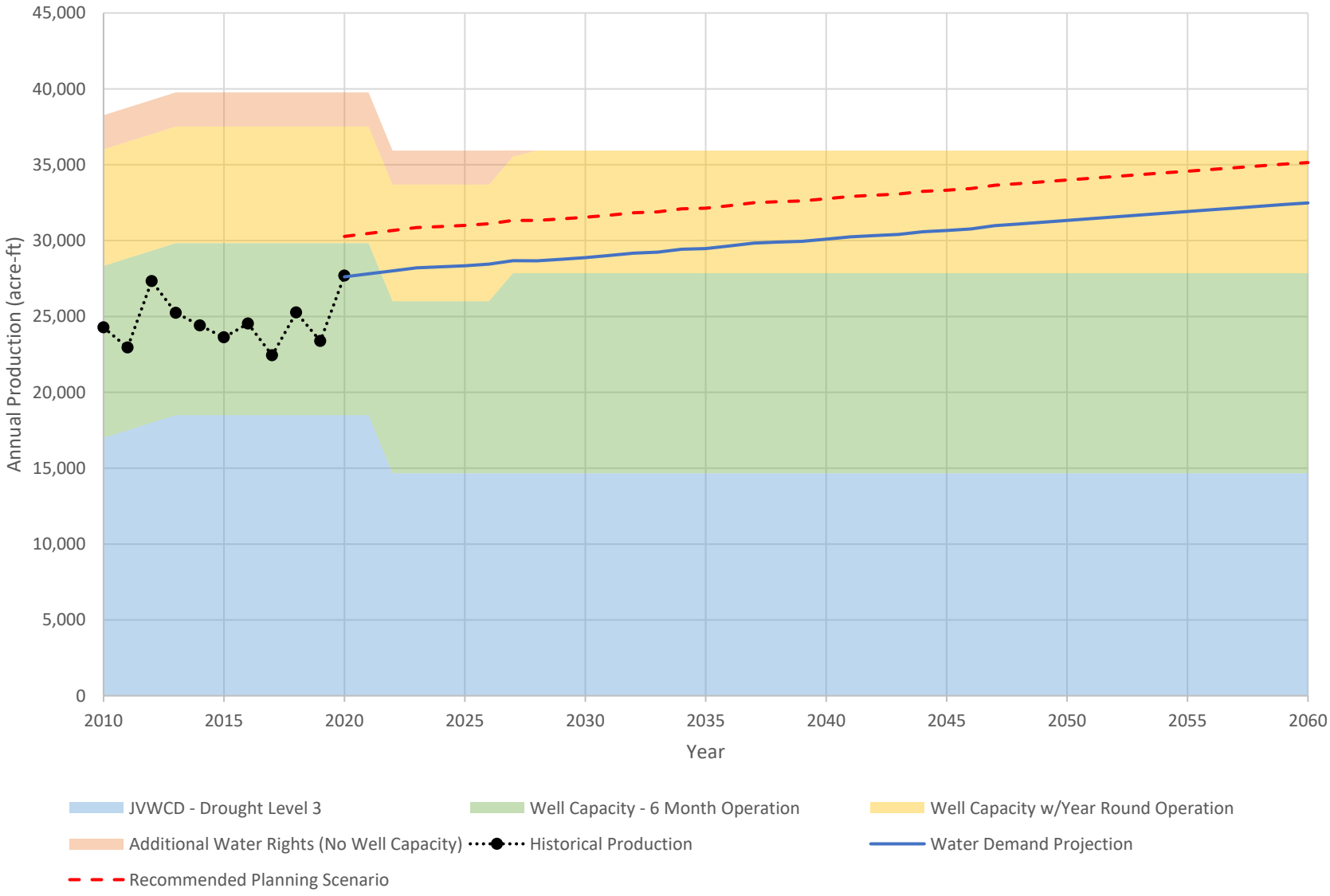


Figure 4-3 Projected Annual Production Requirements at JVWCD Drought Level 3

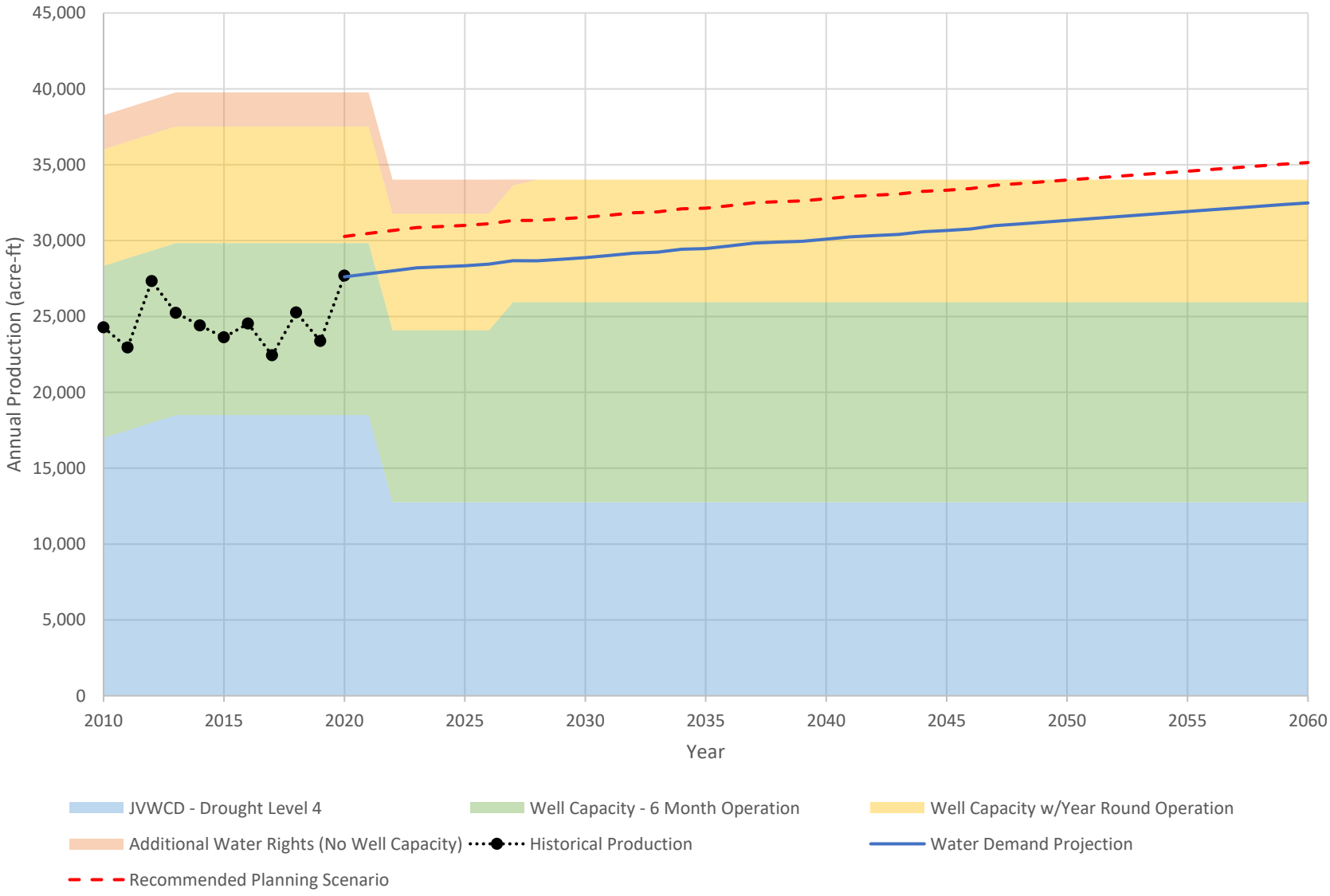


Figure 4-4 Projected Annual Production Requirements at JVWCD Drought Level 4

As shown in the figures, expected supply under typical operation during drought conditions is not expected to be adequate to meet normal District demands, even without the recommended supply planning buffer identified in the previous chapter. However, the District does have the option to increase its groundwater use during drought conditions. If the District's wells are used year-round, it will have an adequate supply to meet typical demands. While this is possible, putting increased pressure on the aquifer during a dry year should be avoided as much as possible and the District should also work with customers to reduce demands in drought years.

To encourage water conservation during times of drought, the District should develop specific actions that are put in place at each drought level. Some ideas that have been discussed with the District include the following:

1. Level 1 – Voluntary Water Conservation
    a. Mass communications (email, mail, social media postings) to customers informing them of the drought level and requesting voluntary water reductions
    b. Suggest following the UDWR lawn watering guidelines
2. Level 2 – Voluntary Water Conservation
    a. Additional mass communications and postings noting the increased drought level and requesting additional voluntary water reductions
    b. Voluntary time of day and frequency water restrictions for lawn watering
    c. Contact top water users directly to request water reductions
3. Level 3 – Mandatory Water Restrictions
    a. Mandatory lawn watering restrictions, including time of day, frequency and other restrictions.
    b. Warnings and/or fines for violating mandatory watering restrictions.
    c. Temporary rate increase to the upper tiers of water rates
    d. Additional mass communications and postings
4. Level 4 – Emergency Water Restrictions
    a. Increased mandatory lawn watering restrictions
    b. Increased warning and/or fines for violating mandatory watering restrictions
    c. Temporary rate increase to the upper tiers of water rates
    d. Additional mass communications and postings

The District has implemented drought tier rate increases and tier size reductions for Level 3 and Level 4 drought levels in its 2022 rates.

CONCLUSIONS AND RECOMMENDATIONS

Based on this analysis, the following conclusions can be drawn:

1. Drought conditions could significantly reduce the volume of water the District receives from JVWCD.
2. The District has options to adjust the operation of its wells that could allow it to increase the annual supply, such as increasing the length of time during the year that the wells are running.

To make this adjustment, the District will need to anticipate drought reductions and begin running the wells earlier in the year. While this is possible and may be needed on occasion, the District should make efforts to limit how often this is done and focus on reducing demand during drought years.

3. To make sure that the District can successfully conserve additional water during a drought year, the District should develop a drought mitigation plan to address how it will encourage customers to reduce their water use should JVWCD implement one of their drought levels. The plan can include items such as those listed in the previous section. The drought mitigation plan should be carefully designed to achieve a level of demand reduction equal to or greater than the reduction in supply where possible.

CHAPTER 5
EXISTING WATER FACILITIES

As part of this Master Plan, BC&A has assembled an inventory of existing infrastructure within the Water system. The purpose of this chapter is to present a summary of this inventory that can be used as a reference for future studies. Additional information regarding District facilities is also contained in Chapter 9 – Asset Management Plan.

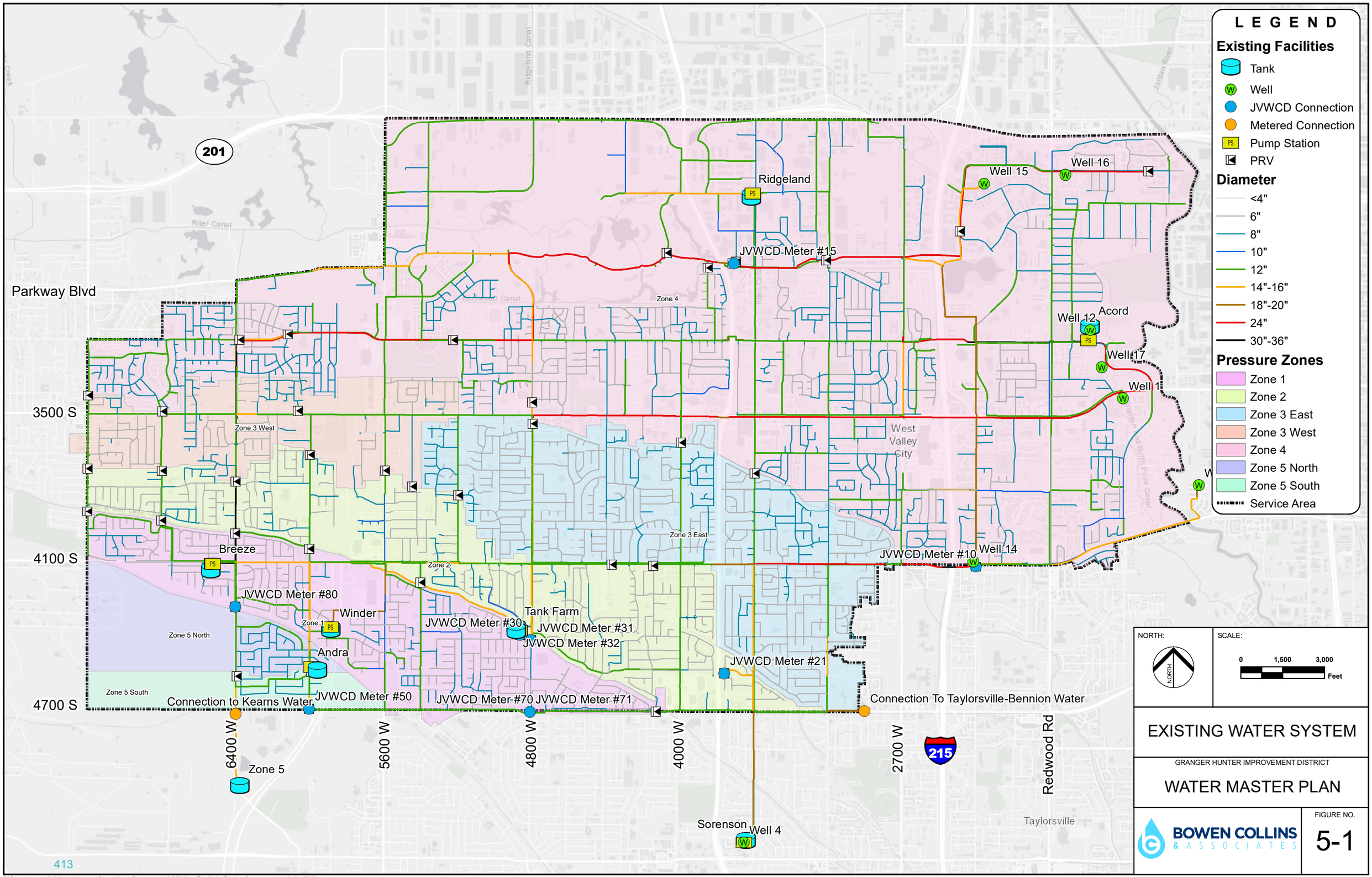
EXISTING SERVICE AREA AND TOPOGRAPHY

Granger-Hunter Improvement District currently provides all retail water service within its defined service area as shown in Figure 5-1. The service area incorporates a large portion of West Valley City, but not all. There are no known service area expansions planned at this time. The District's water service area is approximately 24.7 square miles and is bordered by the following:

- Salt Lake City to the north
- Jordan Valley Water Conservancy District (Retail) and South Salt Lake City to the east
- Kearns Improvement District and Taylorsville-Bennion Improvement District to the south/southeast
- Magna Water District and the Oquirrh Mountain Range to the west

The topography of the District generally slopes from southwest to northeast such that most of the District's storage reservoirs are located southwest of the pressure zone that they serve by gravity.

In 2021, GHID had a population of approximately 132,107 permanent residents. In addition to permanent residents, the service area also includes many commercial, industrial and institutional entities. Much of the District is mostly built out, however there are some smaller areas remaining that will likely develop in the future. Much of the District's growth will come as older areas redevelop at higher density. Figure 5-2 shows a schematic of how the sources, storage reservoirs, and pump stations in the District are connected.



EXISTING WATER SYSTEM

GRANGER HUNTER IMPROVEMENT DISTRICT

WATER MASTER PLAN

BOWEN COLLINS & ASSOCIATES

FIGURE NO. 5-1

P:\Granger-Hunter\046-21-01 Water and Sewer Master Plan Update\4.0 GIS\Water\Fig_05-01_Existing_System.mxd ndavis 6/10/2022

LEGEND

- WATER SOURCE
- PUMP STATION
- PRESSURE REDUCING VALVE STATION OR ISOLATION VALVE
- WATER STORAGE TANK OR RESERVOIR
- PRV REGULATED TRANSMISSION LINE
- PUMP FED TRANSMISSION LINE
- GRAVITY FED TRANSMISSION LINE
- PRESSURE ZONE IDENTIFIER

PRESSURE ZONE INFO:
—ELEVATIONS LISTED WITHIN THE PRESSURE ZONE BOX INDICATE THE ELEVATIONS OF ASSOCIATED TANKS OR THE EQUIVALENT PRV SETTINGS EXPRESSED AS A TANK ELEVATION
—ELEVATIONS AT THE TOP LEFT CORNER REPRESENT THE ELEVATION OF THE HIGHEST ELEVATION WATER CONNECTION WITHIN THE ZONE. THE LOWER CORNER REPRESENTS THE LOWEST ELEVATION WATER CONNECTION WITHIN THE ZONE.
—PEAK DAY DEMANDS LISTED ARE REPRESENTATIVE OF 2020 PEAK DAY DEMANDS.

4950 4900 4850 4800 4750 4700 4650 4600 4550 4500 4450 4400 4350 4300 4250 4200 4150 4100

ZONE 5 (2.0 MG) 4863–4893

JVWCD #70–71 4,000 GPM HGL=4732

JVWCD #50,60 2,500 GPM HGL=4732

14" CLOSED

12" 12" 14"

EL 4724

ZONE 5 N/S 4863–4893 EXISTING ERCS 709

EL 4576

ANDRA BOOSTER 1,100 GPM

ANDRA (3.0 MG) 4600–4630

16" CLOSED

JVWCD #80 4,000 GPM HGL=4731

BREEZE 1,2 2,700 GPM

BREEZ 1,900

WINDER (4.0 MG) 4530–4556

14"

BREEZE (9.0 MG) 4490–4514

EL 4609

ZONE 1 (REGULATED) HGL 4769 EXISTING 4,075 ERCS

EL 4457

SORENSON BOOSTER 1,000 GPM

SORENSON (2.0 MG) 4505–4537

WELL 4 0 GPM

KENT 1,2 BOOSTER 3,200 GPM

16"

KENT 3,4 BOOSTER 4,100 GPM

JVWCD #30–32 11,500 GPM HGL=4520

FARM 1 (1.0 MG) 4556–4486

FARM 2 (2.0 MG) 4556–4486

EL 4460

ZONE 2

EL 4340

BREEZE BOOSTER #3 1,000 GPM

16" CLOSED?

WELL 14 650 GPM

JVWCD #20–21 4000 GPM HGL=4591

WELL 8 1,700 GPM

EL 4410

ZONE 3 EAST WINDER 4530–4556 HGL 4578 W/ KENT BOOSTER ON EXISTING 5,415 ERCS

EL 4270

ZONE 2 ANDRA TANK (4600–4630) EXISTING 4,885 ERCS

14" 16"

30"

EL 4395

ZONE 3 WEST (REGULATED) HGL 4589 EXISTING 1,999 ERCS

EL 4266

24" ANDERSON TRANSMISSION LINE

EL 4314

10,000 GPM

ZONE 4 BREEZE TANK 4490–4514 HGL 4521 W/ SOURCES ON EXISTING 28,544 ERCS

EL 4228

3,000 GPM

ZONE 4

WELL 12 2,300 GPM

ACORD (2.0 MG) 4250–4275

ACORD BOOSTER 4,000 GPM

RIDGELAND (2.0 MG) 4244–4284

RIDGELAND BOOSTER NO.1,2 4,000 GPM

JVWCD #15 7000 GPM HGL=4584

WELL 16 2,500 GPM

JVWCD #10 4000 GPM HGL=4543

WELL 1 1,000 GPM

WELL 17 3,000 GPM

WELL 15 2,600 GPM

BOWEN COLLINS & ASSOCIATES

WATER MASTER PLAN
GRANGER-HUNTER IMPROVEMENT DISTRICT
Figure 5–2
WATER SYSTEM SCHEMATIC

P:\Granger-Hunter\046-21-01 Water and Sewer Master Plan Update\7.0 CAD\SCHEMATIC.dwg Plotted: 6/10/2022 11:14 AM By: Nathan Davis

CULINARY SOURCES

Jordan Valley Water Conservancy District

The District's main source of water is through its connections to the Jordan Valley Water Conservancy District. The District has nine physical connections to JVWCD as summarized by Table 5-1.

Table 5-1
Existing JVWCD Connections

Connection	JVWCD Zone	GHID Zone	Max Capacity (gpm)	Max Day Contract[1] (gpm)
10	A North (Non-Pumped)	Zone 4	4,000	3,745
15	A North (Non-Pumped)	Anderson / Breeze (Zones 1,2,4, & 5)	7,000	6,955
20	A North (Non-Pumped)	Zone 3	4,000	1,070
30	A North (Non-Pumped)	Tank Farm (Zones 2, 3, & 4)	5,000	5,885
32	A North (Non-Pumped)	Tank Farm (Zones 2, 3, &4)	6,500	6,150
50	B North (Pumped)	Zone 1	2,500	535
70	B North (Pumped)	Zone 1	2,000	2,140
71	B North (Pumped)	Zone 1	2,000	269
80	B North (Pumped)	Breeze (Zones 1, 2, 4, & 5)	4,000	0
		Total	**37,000**	**26,749**
Annual Contract Volume (acre-ft)			**18,500**	
20% Additional Option (acre-ft)			**3,700**	

[1]The JVWCD contract details the max day contract by connection for 2005 - 2008. After that it increases 4 separate times to a total max day contract capacity of 29,992 gpm from 2013 and thereafter. However, these increases are not detailed by connection, so the 2005 values are shown.

The District last updated their JVWCD contract in 2005, bringing the contract volume to 18,500 acre-ft. The contract value is a minimum value, and the District is allowed to take an additional 20%, bringing the total volume to 22,200.

The Jordan Valley contract also details a capacity at each of the physical connections between JVWCD and the District. The capacity shown is based on the average use over the previous years and is not the physical limit of the connection. The actual capacity of the connection has been provided by JVWCD and is also listed in the table.

Wells

In addition to the District's Jordan Valley water, there are eight wells that contribute to the system. These wells are summarized in Table 5-2 with the pumping capacity based on recently observed data.

Table 5-2
Existing Wells

Well Name	Zone	Pumping Capacity (gpm)
Well No. 1	Zone 4	1,000
Well No. 4	Sorenson (Zone 2)	0
Well No. 8	Zone 3	1,700
Well No. 12	Acord (Zone 4)	2,300
Well No. 14	Zone 3	650
Well No. 15	Zone 4	2,600
Well No. 16	Anderson (Zone 4)	2,500
Well No. 17	Zone 4	3,300
	Total Capacity	**14,050**

Many of the District's wells have water quality concerns that affect the way that the wells are operated. Well No. 4 has high arsenic that requires blending, which has caused the District to no longer use it. Well No. 14 has high arsenic and TDS and is not generally used. When it is in use, it must be blended with Well 8. All of the wells have higher levels of iron, manganese and ammonia that impact the aesthetics of the water Wells 1, 12, & 17 will be sent to a treatment facility that is currently under design.

STORAGE FACILITIES

The District has storage reservoirs in each of its water pressure zones. Table 5-3 summarizes the characteristics of each storage facility. The location of storage facilities in the District are shown in Figure 5-1. A representation of how each of the storage facilities is connected within the District's water system is shown in the system schematic (Figure 5-2).

Table 5-3
Storage Facilities

Name	Type	Diameter (ft)	Height (ft)	Volume (MG)	Outlet Level	Overflow/ Equalization Level
Acord	Steel	117	25	2	4250	4275
Ridgeland	Steel	92	15	2	4243.7	4258.7
Tank Farm 1	Steel	50	30	1	4456	4486
Tank Farm 2	Steel	107	30	2	4456	4486
Tank Farm 3	Steel	168	30	5	4456	4486
Sorenson	Steel	103	32	2	4505	4537
Breeze	Concrete	180 x 275	24	9	4490	4514
Winder	Concrete	100 x 220	26	4	4529.7	4555.7
Andra	Concrete	130	30	3	4600	4630
Zone 5	Concrete	130	30	2	4862.7	4892.7
Total				**32**		

BOOSTER PUMPING FACILITIES

Table 5-4 summarizes the characteristics of the booster pumps within the District's water system.

Table 5-4
Booster Pump Stations

Booster Station	Capacity (gpm)	Number of Pumps	Emergency Backup Power	Pressure Zone Delivery
Breeze Zone 1	2,700	2 x 1,350 gpm	Yes	1
Breeze Zone 2	1,000	1 x 1,000 gpm	Yes	2
Breeze Zone 5	1,900	1 x 1,900 gpm	Yes	5
Kent Zone 2	4,100	1 x 2,500 gpm 1 x 1,600 gpm	Yes	2
Kent Zone 3	3,200	1 x 1,200 gpm 1 x 2,000 gpm	Yes	3
Sorenson	1,000	1 x 1,000 gpm	Yes	2
Ridgeland	4,000	2 x 2,000 gpm	Yes	4
Acord	4,000	2 x 2,000 gpm	Yes	4
Andra	1,100	1 x 1,100 gpm	-	5

DISTRIBUTION PIPING

Table 5-5 lists the reported pipe diameters and corresponding lengths of distribution facilities in the GHID system. Pipe materials include asbestos concrete, cast iron, copper, ductile iron, HDPE, PVC, bar-wrapped, prestressed concrete and coated steel pipe. Location and sizing of distribution pipes are shown in Figure 5-1.

Table 5-5
Distribution Piping

Diameter (in)	Length (ft)	Length (mi)	Percentage
<=4	19,382	3.67	1.0%
6	761,469	144.22	38.0%
8	553,692	104.87	27.6%
10	38,946	7.38	1.9%
12	401,686	76.08	20.0%
14	29,499	5.59	1.5%
15	1,431	0.27	0.1%
16	75,768	14.35	3.8%
18	11,131	2.11	0.6%
20	20,001	3.79	1.0%
24	76,827	14.55	3.8%
28	4,428	0.84	0.2%
30	9,600	1.82	0.5%
Total	**2,003,859**	**379.52**	**100%**

PRESSURE ZONES

The GHID service area is divided up into six main pressure zones as shown in Figure 5-1. Pressure Zones 1 through 4 are in decreasing elevation and then Zone 5, which was added later, is higher than Zone 1. Zone 3 has been divided into an east and west pressure zone to better control pressure swings. Zone 5 has a north and south area to reduce high pressures, though for storage and demand planning purposes it is treated as one zone. Table 5-6 lists the approximate elevation for each pressure zone along with the approximate existing peak day demand for each zone. Also included in the table is the approximate percentage of total demand associated with each zone. As can be seen in the table, more than half of the District's total demand is in Pressure Zone 4.

Table 5-6
Pressure Zone Summary

Pressure Zone	Approximate Elevations (ft)	Existing Peak Day Demand (gpm)	Existing Percentage of Peak Day Demand
5	4,576 ft - 4,724 ft	833	2%
1	4,457 ft - 4,609 ft	4,231	11%
2	4,340 ft - 4,460 ft	4,762	13%
3 East	4,270 ft - 4,410 ft	6,402	17%
3 West	4,266 ft - 4,395 ft	1,280	3%
4	4,228 ft - 4,314 ft	19,450	53%
TOTAL	**4,314 ft - 4,724 ft**	**36,959**	**100%**

PRESSURE REDUCING VALVES

Each of the District's pressure zones is connected to the neighboring pressure zones by multiple pressure reducing valves (PRV). Table 5-6 details each of the PRVs in the system.

Table 5-7
Pressure Reducing Valves

Zone Boundary	Name	Address	Diameter (inch)	Elevation (ft)	Setting (psi)	HGL (ft)	RTU
Zone 5 to Zone 2	Radio Station/Andra	6000 W 4525 S	-	4625.9	closed	-	-
Zone 1 to Zone 2	4700 Park	4130 W 4700 S	8	4464.7	58	4598.5	43
	Canal - Zone 2	4176 S 5400 W	8	4459	53	4581.3	38
	Canal - Zone 2	3980 S 6400 W	10	4459.4	63	4604.8	35
	Canal - Zone 2	4040 S 6000 W	10	4460.1	50	4575.5	37
	Canal - Zone 2	3940 S 6820 W	10	4458.6	55	4585.5	33
	Canal - Zone 2	3900 S 7200 W	8	4459.6	50	4575	49
Zone 2 to Zone 3	-	3830 S 5200 W	8	4349.7	74	4520.5	60
	Canal - Zone 3	3750 S 7200 W	8	4390	53	4512.3	50
	Church	3672 S 6000 W	8	4340	73	4508.5	58
	Evans	3790 S 5450 W	6	4355.3	74	4526.1	61
	Orchard	3720 S 6800 W	10	4393.7	52	4513.7	34
	-	3774 S 6400 W	8	4398.8	50	4514.2	57
	Church	3747 S 5600 W	8	4345	74	4515.8	59
	Falcon St	4129 S Falcon St.	8	4349.1	76	4524.5	
Zone 3 to Zone 4	Pleasant Valley West	6400 W 3100 S	12	4256.3	75	4429.4	54
	Hunter Village	3499 S 6805 W	8	4314	50	4429.4	55
	Granger Seminary	3732 S 3600 W	8	4286	62	4429.1	24

Zone Boundary	Name	Address	Diameter (inch)	Elevation (ft)	Setting (psi)	HGL (ft)	RTU
	Rawhide Drive	3597 S 4000 W	8	4282.8	64	4430.5	23
	Meadow Breeze	3487 S Meadow Breeze Way	6	4304.8	55	4431.7	62
	-	3400 S 7200 W	8	4316	50	4431.4	51
Anderson to Zone 4	Pleasant Valley East	6135 W 3100 S	8	4257.5	77	4435.2	64
	Crown Burger	2650 S 3200 W	6	4243.5	72	4409.7	53
	New Haven	3860 W 2700 S	8	4250	80	4434.6	27
	Eerie	2655 S 3800 W	6	4248.5	81	4435.4	67
	Valley Crest	5240 W 3100 S	10	4257.9	77	4435.6	48
	Chesterfield	1160 W 2320 S	6	4231	74	4401.8	66
	Franklin	2500 S 2300 W	10	4236.8	72	4403.0	17
	Golf Course	4028 Parkway Blvd	8	4252.4	79	4434.7	36
Tank Farm to Zone 4	Shopko	3430 S 4800 W	12	Tank Farm	71	-	54
	Valley View	3550 S 4800 W	12	Tank Farm	64	-	56

CHAPTER 6
STORAGE AND BOOSTING EVALUATION

The purpose of this chapter is to evaluate the District's water storage capacity. This chapter provides an overview of State rules and regulations pertaining to public water system storage facilities. As part of this evaluation, the sizes and locations of existing storage reservoirs were analyzed to determine if the District has sufficient storage to adequately meet demands and to provided recommended emergency and fire flow storage.

STORAGE EVALUATION CRITERIA

Regulations regarding required system storage are found in Section R309-510-8 of the Utah Administrative Code. The first portion of the code outlines the types of storage required:

> "(1) General. Each public water system, or storage facility servicing connections within a specific area shall provide:
>
> (a) Equalization storage volume, to satisfy average day demands for water for indoor use and irrigation use,
>
> (b) fire flow storage volume, if the water system is equipped with fire hydrants intended to provide fire suppression water or as required by the local fire code official, and
>
> (c) emergency storage, if deemed appropriate by the water supplier or the Director."

For several decades, minimum storage requirements per the State of Utah (excluding fire storage) were a uniform 400 gallons per ERC for indoor water use plus outdoor water use based on location and irrigated area. For GHID, the total required storage (not including fire storage) was calculated as 694 gallons/ERC in the District's 2016 master plan. State storage requirements have changed significantly since that time.

In 2018, the Utah State Legislature passed an updated Utah Code 19-4-14, which supersedes most of the previous statewide requirements by directing the Division of Drinking Water to establish system-specific source and storage sizing requirements for public water systems. These standards are typically based on the last 3 years of water use data that the District has reported to DWRi. The District received a letter from the Division of Drinking Water dated June 24, 2020, which establishes the minimum storage requirements for their system. The standards set in this letter are based on the District's water use data for 2016 through 2018. The system-specific minimum storage requirement (not including fire storage) as provided by the Division of Drinking Water is 573 gallons per ERC.

To evaluate the adequacy of this standard relative to actual District needs, the following sections discuss how each of the three types of storage listed above should be addressed within the District's water system.

Equalization Storage

Sources, major conveyance pipelines, and pump stations are usually sized to convey peak day demands. During peak hour demands, storage must be used to meet the increased demands. Equalization or operational storage is the storage required to cover the difference between the maximum rate of supply and the rate of demand during peak conditions.

To determine appropriate equalization storage volumes, storage should be sufficient to accommodate the amount of water during the day that is above the average use for the day. Based on

historic demand patterns, this is calculated to be approximately 25% of the peak day demand. As discussed previously, the GHID peak day demand has been determined to be 1,168 gallons per ERC. Based on this flow rates, the District should have a minimum of 291.9 gallons per ERC for equalization storage.

Fire Flow Storage

Fire Flow storage is the amount of water needed to combat fires occurring in the distribution system. As stated in the code, the primary authority responsible for establishing needed fire flows and fire flow storage is the local fire code official. The West Valley City Fire Department is the fire marshal for West Valley City. Based on guidance from the Fire Department, the fire storage requirements for each zone have been identified at between 0.5 and 1.92 million gallons (see Table 6-2 later in this report for additional details).

Although not specifically outlined in the code, State Division of Drinking Water officials have historically allowed for the fire flow for individual water pressure zones to come from storage within the zone itself or from storage in higher zones in the system. For this evaluation, preference will be to have fire storage in each zone. If needed, however, the fire storage may be considered available if it is in any higher zone and adequate conveyance exists to deliver the water down to the lower zone during a fire event.

Emergency Storage

Emergency or standby storage is the storage needed to meet demands when sources are interrupted as the result of unexpected events (power outages, equipment failure, etc.). It is recommended that the District have adequate emergency storage to meet demands during a peak day for a period long enough to address typical a power outage. Thus, it is recommended that the District's storage criteria include emergency storage equal to about 6 hours of peak day demand. Six hours of peak demand calculates to 291.9 gallons per ERC, based on a max day demand of 1,168 gallons per ERC.

Total Combined Storage

Adding the equalization and emergency storage as calculated above results in a recommended total storage requirement of 583.8 gallons per ERC (plus fire flow). This is slightly higher than the State's minimum requirement of 573 gallons per ERC. Thus, for the purpose of this study, 583.8 gallons per ERC will be used to determine the District's storage requirements for equalization and emergencies.

TOTAL EXISTING AND FUTURE STORAGE REQUIREMENTS

Many of the District's storage tanks are available to multiple zones. To determine the amount of storage for each zone, storage was assigned to the highest zone it is connected to. If the tank is connected to the zone by booster pumps, the amount of storage available to a particular zone was limited to the capacity of the booster pumps. Table 6-1 shows a summary of the District's existing storage by zone.

Table 6-1
Existing Storage Capacity by Zone

Zone	Associated Tank(s)	Total Tank Volume	% Available to Zone	Available Tank Volume[1] (MG)
Zone 5 South	Zone 5 (1)	2.0	100%	2
	Sub-total	-	-	*2.00*
Zone 1	Breeze (0.2)	9.0	18%	1.66
	Sub-total	**-**	**-**	***1.66***
Zone 2	Andra	3.0	100%	3.00
	Breeze	9.0	8%	0.72
	Sorenson[2]	2.0	36%	0.72
	Tank Farm (1 MG)	1.0	88%	0.88
	Tank Farm (2 MG)	2.0	100%	2.00
	Sub-total	**-**	**-**	***7.32***
Zone 3 East	Winder	4.0	100%	4.00
	Tank Farm (1 MG)	1.0	12%	0.12
	Sub-total	**-**	**-**	**4.12**
Zone 4	Accord	2.0	100%	2.00
	Ridgeland	2.0	100%	2.00
	Breeze	9.0	74%	6.62
	Tank Farm (5 MG)[3]	5.0	100%	5.00
	Sub-total	**-**	**-**	***15.62***
Total				**30.72**

[1]Available tank volume is based on the tank connected to the zone and the pumping capacity of the associated BPS.

[2]The Sorenson tank is 2 MG, but the BPS is only 1,000 gpm (1.4 mgd), for a peaking volume of 0.72 MG. The Sorenson tank is only connected to Zone 2.

[3]The Tank Farm 5 MG is currently owned by JVWCD, but is in the process of being purchased by the District. It has been included here as storage available to the District since the sale is expected to be completed in the near future.

The total available tank volume shown in Table 6-1 of 30.72 MG is slightly lower than the District's total storage volume of 32 MG as shown in Chapter 5. This is due to pumping capacity limitations at the Sorenson Tank site. This tank fills and delivers to Zone 2. At most, this pump station will be able to deliver water for half of the day at the maximum capacity of the pump station. Thus, its available tank volume for this storage evaluation has been reduced to 0.72 MG.

The evaluation of equalization, fire, and emergency storage for existing conditions is shown in Table 6-2. The evaluation for storage for the 10-year scenario is shown in Table 6-3 and for buildout scenario in Table 6-4. For simplicity in the table, equalization and emergency storage are combined and labeled as operational storage.

Table 6-2
Existing Storage Evaluation

Pressure Zone	ERCs[3]	Required Operational Storage (MG)	Required Fire Storage[2] (MG)	Total Required Storage (MG)	Available Tank Volume[1] (MG)	Cumulative Tank Volume (MG)	Surplus / (Deficit) (MG)
Zone 5 South	293	0.17	0.54	0.71	2	2.00	1.29
Zone 5 North	416	0.24	0.00	0.95		2.00	1.05
Zone 1	4,075	2.38	1.38	4.71	1.66	3.66	(1.05)
Zone 2	4,885	2.85	0.00	7.56	7.32	10.98	3.42
Zone 3 West	1,999	1.17	0.00	8.73		10.98	2.25
Zone 3 East	5,415	3.16	0.00	11.89	4.12	15.10	3.21
Zone 4	28,544	16.66	0.00	28.56	15.62	30.72	2.16
TOTAL	**45,625**	**26.64**	**1.92**	**28.56**	**-**	**30.72**	**2.16**

[1]Available tank volume is based on the tank connected to the zone and the pumping capacity of the associated BPS as shown in Table 6-1.

[2]Assumes that fire storage required in zone is available to any lower zone.

[3]WFRC shows a population decrease in some zones. The ERC value will remain unchanged if a decrease occurs.

Table 6-3
10-Year Storage Evaluation

Pressure Zone	ERCs[3]	Required Operational Storage (MG)	Required Fire Storage[2] (MG)	Total Required Storage (MG)	Available Tank Volume[1] (MG)	Cumulative Tank Volume (MG)	Surplus / (Deficit) (MG)
Zone 5 South	297	0.17	0.54	0.71	2	2.00	1.29
Zone 5 North	416	0.24	0.00	0.96		2.00	1.04
Zone 1	4,075	2.38	1.38	4.72	1.66	3.66	(1.06)
Zone 2	4,885	2.85	0.00	7.57	7.32	10.98	3.41
Zone 3 West	2,090	1.22	0.00	8.79		10.98	2.19
Zone 3 East	5,415	3.16	0.00	11.95	4.12	15.10	3.15
Zone 4	30,765	17.96	0.00	29.91	15.62	30.72	0.81
TOTAL	**47,942**	**27.99**	**1.92**	**29.91**		**30.72**	**0.81**

[1]Available tank volume is based on the tank connected to the zone and the pumping capacity of the associated BPS as shown in Table 6-1.

[2]Assumes that fire storage required in zone is available to any lower zone.

[3]WFRC shows a population decrease in some zones. The ERC value will remain unchanged if a decrease occurs.

Table 6-4
Buildout Storage Evaluation

Pressure Zone	ERCs[3]	Required Operational Storage (MG)	Required Fire Storage[2] (MG)	Total Required Storage (MG)	Available Tank Volume[1] (MG)	Cumulative Tank Volume (MG)	Surplus / (Deficit) (MG)
Zone 5 South	302	0.18	0.54	0.72	2	2.00	1.28
Zone 5 North	416	0.24	0.00	0.96		2.00	1.04
Zone 1	4,075	2.38	1.38	4.72	1.66	3.66	(1.06)
Zone 2	4,885	2.85	0.00	7.57	7.32	10.98	3.41
Zone 3 West	2,186	1.28	0.00	8.85		10.98	2.13
Zone 3 East	5,522	3.22	0.00	12.07	4.12	15.10	3.03
Zone 4	36,671	21.41	0.00	33.48	15.62	30.72	(2.76)
TOTAL	**54,056**	**31.56**	**1.92**	**33.48**		**30.72**	**(2.76)**

[1]Available tank volume is based on the tank connected to the zone and the pumping capacity of the associated BPS as shown in Table 6-1.

[2]Assumes that fire storage required in zone is available to any lower zone.

[3]WFRC shows a population decrease in some zones. The ERC value will remain unchanged if a decrease occurs.

The tables show a storage evaluation by zone, as well as for the system as a whole. As mentioned previously, it is not required that all storage be in the exact zone that it is needed, as long as the water can be transferred to the zone. The District's pressure zones are all connected by PRVs, such that any higher zone could pass water to the zone below it.

In the District's existing system, the analysis shows a deficit in Zone 1 of 1.05 MG, with an overall surplus of 2.16 MG. Because the deficit is in a higher zone, the surplus is not available to that area. Additional storage will be required to address this deficit.

In the future planning scenarios the deficit in Zone 1 increases very slightly to 1.06 MG and the overall surplus changes to a deficit of 2.76 MG in Zone 4.

STORAGE RECOMMENDATION

Prior to the initiation of this master plan report, Jordan Valley offered the District the opportunity to purchase one or both of JVWCD's 5 MG tanks located at the Tank Farm site, which is shared between GHID and JVWCD. BC&A recommended the purchase of one of the tanks to address projected storage deficits. It was not recommended the second tank be purchased by the District because the additional storage would not be located in a zone high enough to satisfy the District's additional needs. Though the sale of the tank has not been completed as of the writing of this report, that storage tank volume has been included in the analysis above.

In addition to newly acquired storage at the Tank Farm site, it is recommended that the District build a 3 MG storage reservoir in Zone 1 to address the current deficit in the zone and provide enough capacity for the District in all zones through buildout.

BOOSTING EVALUATION

The District has a very interconnected distribution system with each zone connected to the surrounding zones by PRVs, tanks connected to multiple zones through gravity or boosters, and the Anderson Transmission Line (which delivers water to the Breeze Tank as well as Zones 3 West and 4). This provides District staff with multiple options when they are operating the system. For the purpose of this evaluation, BC&A will look to determine if there is sufficient capacity for each zone to be able to meet the peak day demands.

Each zone may receive water directly from a well, directly from a Jordan Valley tank, or through a booster pump station. Table 6-5 compares the different sources coming into each zone with the existing max day demand for that zone and Table 6-6 shows the same comparison but with the buildout demand.

Table 6-5
Existing Boosting Capacity

Pressure Zone	Existing Max Day Demand (gpm)	Direct Well (gpm)	Direct JV (gpm)	Direct Pumping (gpm)	Total Direct Source	Surplus / (Deficit)
5	833	0	0	3,000	3,000	2,167
1	4,231	0	6,500	2,700	9,200	4,969
2	4,762	0	0	6,100	6,100	1,338
3 East	6,402	2,350	4,000	3,200	9,550	3,148
3 West	1,280	0	0	0	0	(1,280)
4	19,450	6,600	4,000	8,000	18,600	(850)

Table 6-6
Buildout Boosting Capacity

Pressure Zone	Buildout Max Day Demand (gpm)	Direct Well (gpm)	Direct JV (gpm)	Direct Pumping (gpm)	Total Direct Source	Surplus / (Deficit)
5	847	0	0	3,000	3,000	2,153
1	4,320	0	6,500	2,700	9,200	4,880
2	5,010	0	0	6,100	6,100	1,090
3 East	6,720	2,350	4,000	3,200	9,550	2,830
3 West	1,405	0	0	0	0	(1,405)
4	25,005	6,600	4,000	8,000	18,600	(6,405)

Based on the tables above, each zone has sufficient capacity to convey the required demand for each zone except for Zones 3 West and 4. However, both of these zones are connected to the Anderson Transmission Line and can receive water from that line through PRVs. This capacity is not accounted for in the other connections and is sufficient to meet the deficit shown. Thus, no pumping capacity deficiencies exist for either existing or buildout conditions.

CHAPTER 7
DISTRIBUTION SYSTEM EVALUATION

HYDRAULIC MODEL HISTORY

A hydraulic computer model is a digital representation of physical features and characteristics of the water system, including sources, pipes, valves, storage tanks, and pumps. Key physical components of a water system are represented by a set of user-defined parameters that represent the characteristics of the system. The computer model utilizes the digital representation of physical system characteristics to mathematically simulate operating conditions of a water distribution system. Computer model output includes pressures at each node, flow rate for each pipe in the water system, and water surface levels in storage tanks.

The District maintains a water model of its system and has used this model for previous master planning. A copy of this model was provided to BC&A for evaluation of the existing and future water system. The District's existing model was developed as an EPANET model using the InfoWater software developed by Innovyze.

To update the model for this study, recently constructed pipes were added to the model and existing pipe sizes were checked. Demand scenarios were updated based on the analysis contained in this report and the model was calibrated using tank level SCADA information collected by the District. No additional field tests were conducted.

Diurnal Patterns

The District's hydraulic model is setup to run extended period simulations. With this type of modeling a diurnal pattern is used to vary the demand throughout the day according to typical use. The District's model has multiple diurnal patterns developed as part of previous studies which have a changing multiplier every 15 minutes. These patterns are shown in Figure 7-1.

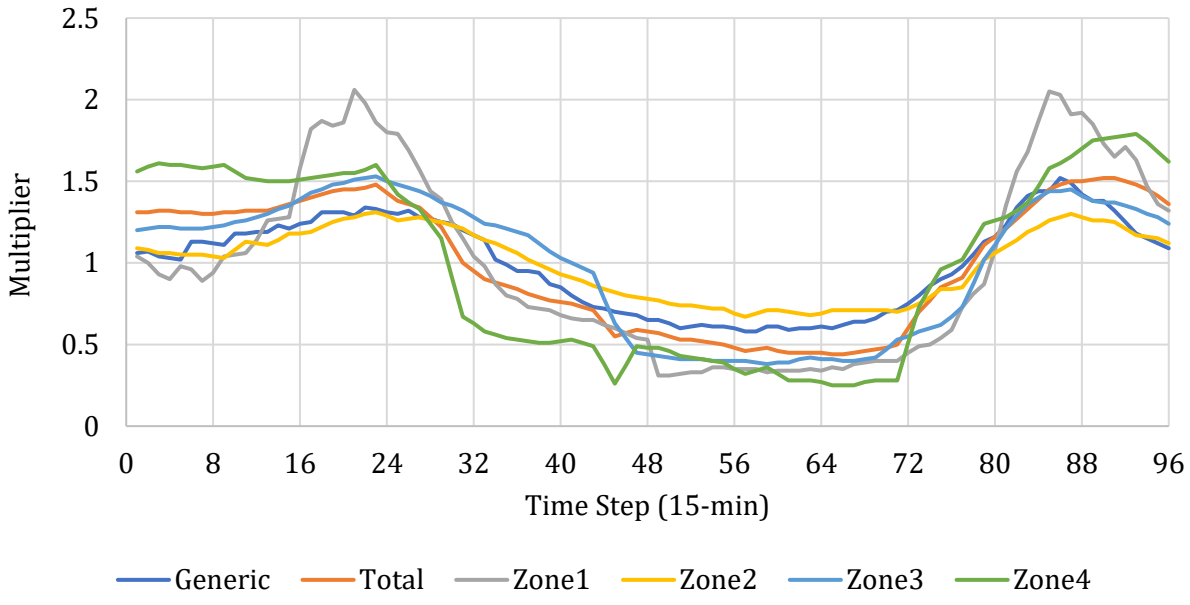


Figure 7-1 Model Diurnal Patterns

MODEL SCENARIOS

The District's hydraulic model is setup to run extended period simulations. The model results that are most useful for evaluating the distribution system performance include operating conditions for several conditions: peak day demands with fire flow, peak hour demands, and buildout peak demands with improvements. Model results for the following scenarios have been documented to aid in evaluating system performance.

- **Peak Day Demand –** This scenario represents the average daily demands on the system during the peak usage day of the year. This scenario is primarily used to simulate fire flows to identify areas that do not meet fire flow requirements. It can also be used to identify source deficiencies within tank service areas to determine if sufficient production and conveyance capacity exists to fill and drain tanks properly during peak demands.
- **Peak Hour Demands –** The purpose of this scenario is to identify existing pressure deficiencies under peak hour demand conditions. For the culinary water system, a peak hour to peak day peaking factor of between 1.3 and 2.1 was used depending on the specific zone the demand is in. As an extended period model simulation, these patterns are applied to the average demand for the peak day and minimum pressures throughout the simulation are used for evaluation.
- **Buildout Peak Day Demand -** This scenario represents the buildout projected average daily demands on the system during the peak usage day of the year. Similar to the previous scenario, the purpose of this scenario is to illustrate how the system will respond to increased demands with no infrastructure changes.
- **Buildout Peak Demands with Improvements –** This scenario includes an extended period model that captures both peak day and peak hour demands. It includes improvement projects that will be recommended to help the District maintain level of service standards discussed in the following section. Modeling results from this scenario will be detailed in the following chapter.

The performance of the system was evaluated using the following criteria:

- **Pressure within the system during peak demands –** The State of Utah requires that a public water system maintain a minimum pressure standard of 30 psi during peak hour demands and 40 psi during peak day demands. This is the minimum design standard the District maintains. However, the District tries to maintain pressures above 50 psi for both peak day and peak hour demands in most of the distribution system.
- **Pressure within the system during peak day demands with fire flow –** The State of Utah requires that a public water system be capable of conveying required fire flow with a residual pressure of 20 psi. Any node in a residential area incapable of supplying 1,000 gpm with a 20 psi residual was identified as deficient. It should be noted that 1,000 gpm was the typical residential fire requirement up until the 1990s when changes in the fire code and increasing home sizes resulted in an increase to 1,500 gpm. Large portions of West Valley City were constructed prior to this change and are satisfactorily served by available fire flow of 1,000 gpm. For this reason, 1,000 gpm has been used for evaluation generally, but new construction and larger residential properties will need to meet the 1,500 gpm requirement. Commercial areas were evaluated using a specific list of requirements which ranged between 3,000 gpm and 8,000 gpm with a 20 psi residual.
- **Maximum pipe velocities –** High instantaneous velocities in a pipeline are not generally as much of a concern to the system as low pressures. However, they can help indicate areas

where additional conveyance improvements will have the most benefit. Pipelines with velocities above 7 ft/sec have been identified to indicate areas where additional conveyance improvements would be beneficial. However, they have not specifically been identified as a deficiency unless they have a maximum velocity greater than 10 ft/sec during peak hour demands. In this case, the extreme velocity can cause damage to pipe linings, increase potential for hydraulic surges, and potentially lead to pipe failure.

EXISTING SYSTEM EVALUATION RESULTS

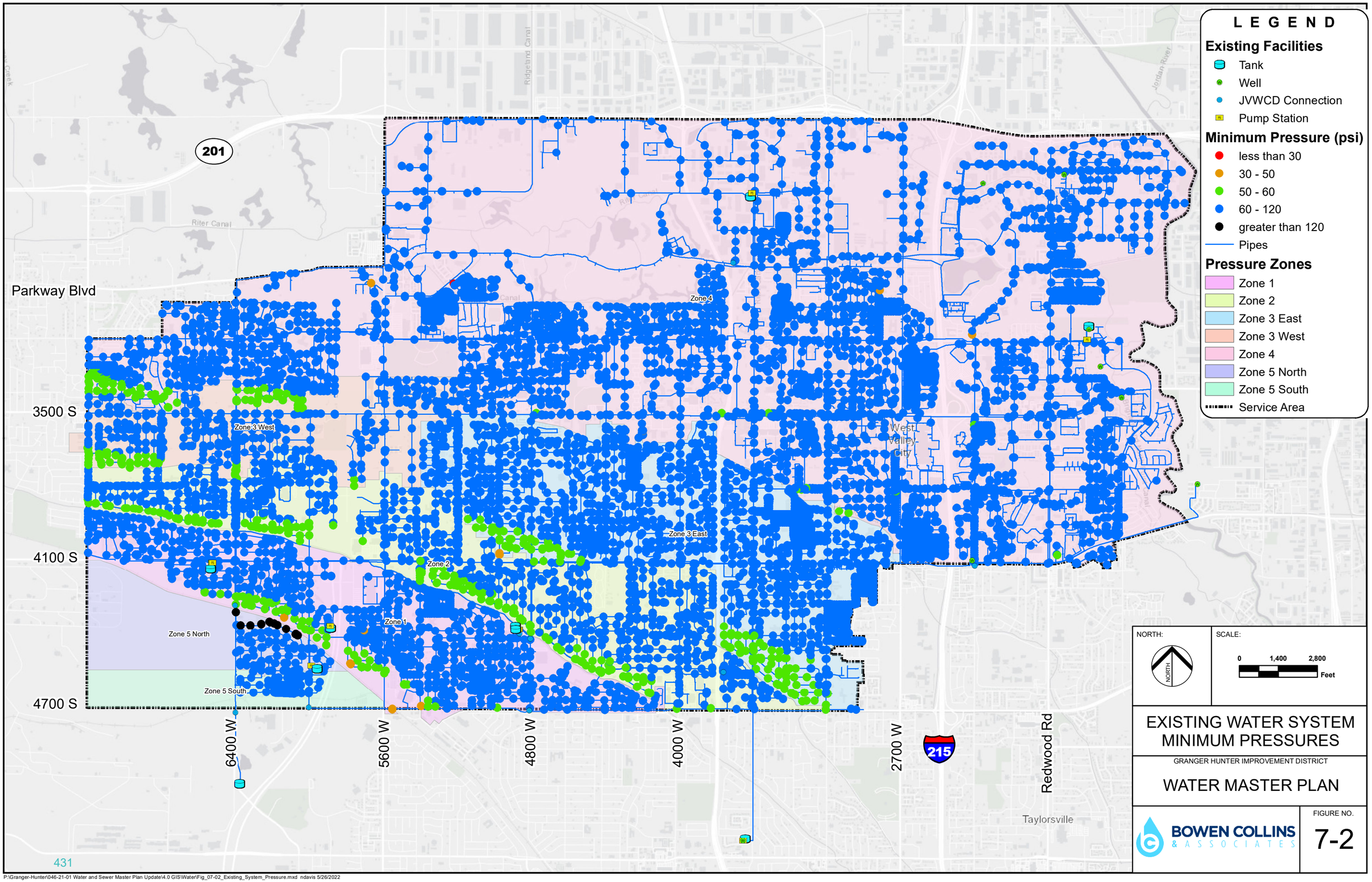
The hydraulic computer model was used to simulate system conditions for existing demands. The model was set up as an extended period peak day model to capture both peak day and peak hour demand periods. Peak day demands with fire flow were also modeled. Model results for these scenarios are included in the following figures:

1. Figure 7-2 shows minimum pressures for the existing water system with peak day demands.
    a. Pressures for the existing peak day scenario are generally very good.
    b. Zones 1, 2, 3 East, and 3 West see slightly lower pressures at the top end of the zones, but typically still above 50 psi.
    c. Zone 1 and 3 East see a few areas drop below 50 psi, but still above 30 at the peak hour.
2. Figure 7-3 shows maximum pipe velocities for the existing water system with peak day demands.
    a. No pipes in the system are seen to exceed 10 ft/sec.
    b. Increased velocities are observed near some of the sources, including JV Meter 15, 50 & 70, and near the Breeze BPS, but these are all lower than 10 ft/sec.
3. Figure 7-4 shows available fire flows during the peak day of demand with a residual pressure of 20 psi.
    a. In general, most of the distribution system exceeds the residential requirement of 1,000 gpm. Though not clearly visible on the map, areas with 4-inch neighborhood piping are areas of concern. The District is already planning to replace 4-inch piping, which will help improve these localized fire flow issues.
    b. A large majority of the commercial locations are located on major roads, which also have larger pipelines and are able to provide adequate fire flow. There are several schools in the service area that West Valley Fire has assigned a larger fire demand. Of this list, there are four locations where the modeled available fire flow is below the requirement set by the Fire Chief, as shown in Table 7-1. For these locations the District is able to provide a significant flow, however the requirement is even higher, likely due to the use of older, less fire resistant building materials and a lack of fire suppression systems in the schools. It will likely be more cost effective to install fire suppression systems in the schools than to add additional piping improvements. GHID should coordinate with the school district to identify the best way to address these locations.

Table 7-1
Schools With Inadequate Fire Flow

Type	Name	Address	Required Flow (gpm)	Modeled Available Flow (gpm)
School	Academy Park	4580 W Westpoint Dr	4,750	3,450
School	Philo T. Farnsworth	3751 S 4225 W	5,000	4,040
School	Carl Sandburg	3900 S 5325 W	4,750	2,751
School	John F. Kennedy	4495 S 480 W	8,000	4,782

4. Figure 7-5 shows minimum pressures for the existing water system with the buildout peak day demand projections.
    a. At buildout, areas seeing pressures in the 50-60 psi range grow as well as increased areas with pressures between 30-50 psi.
    b. Throughout the system there are no areas where the model predicts peak hour pressures less than 30 psi.



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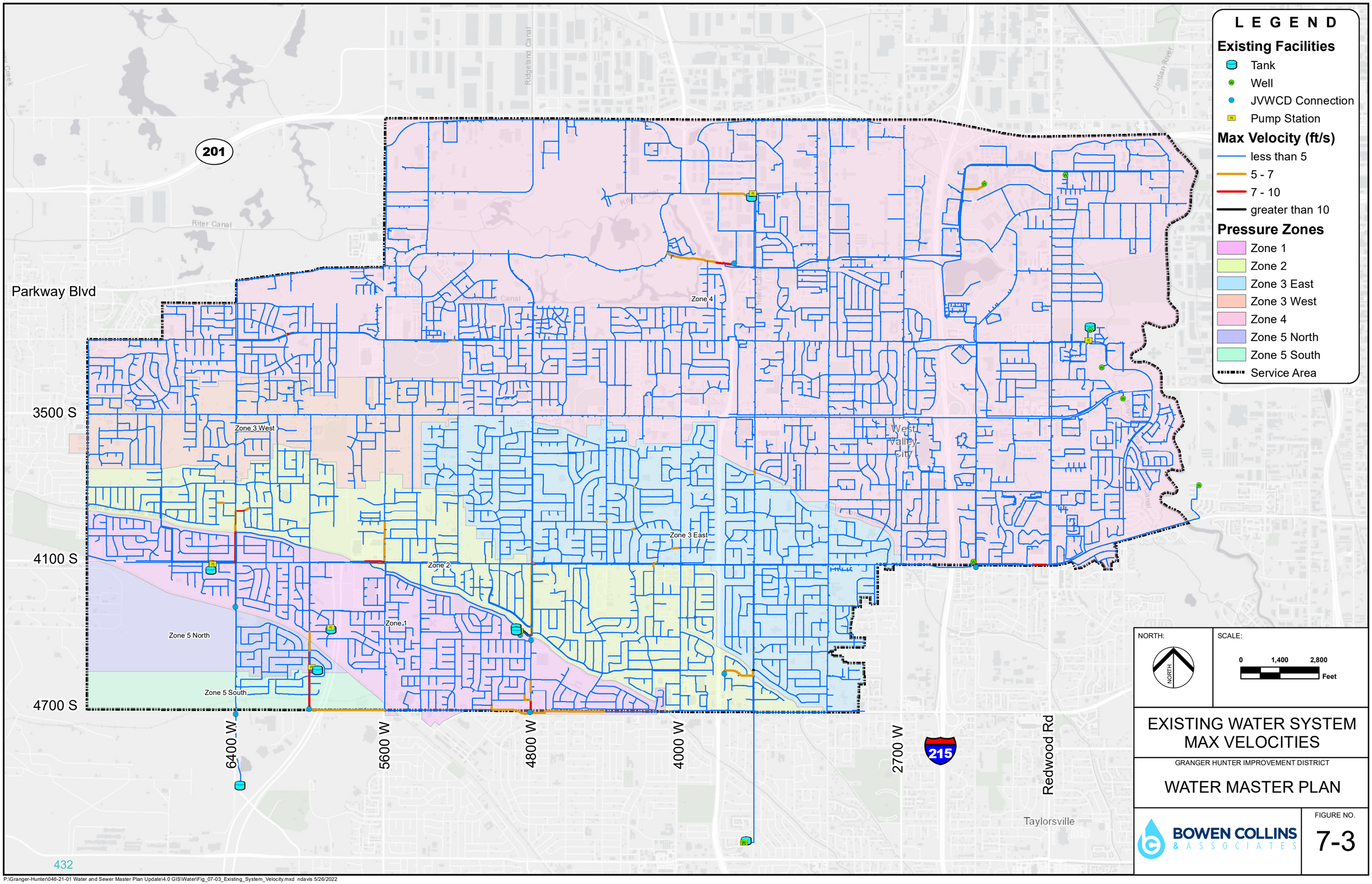

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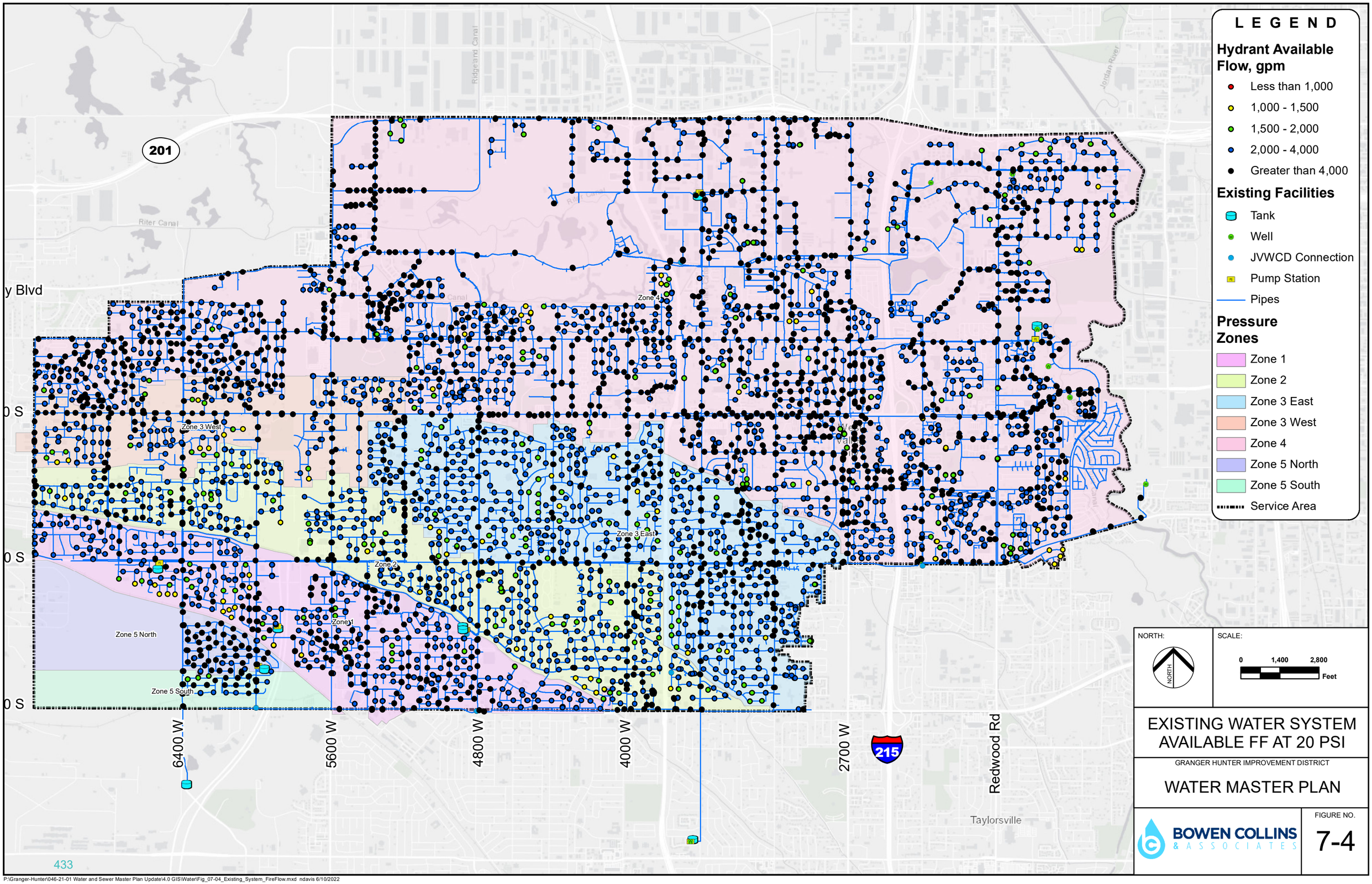

EXISTING WATER SYSTEM AVAILABLE FF AT 20 PSI

GRANGER HUNTER IMPROVEMENT DISTRICT

WATER MASTER PLAN

BOWEN COLLINS & ASSOCIATES

FIGURE NO. 7-4

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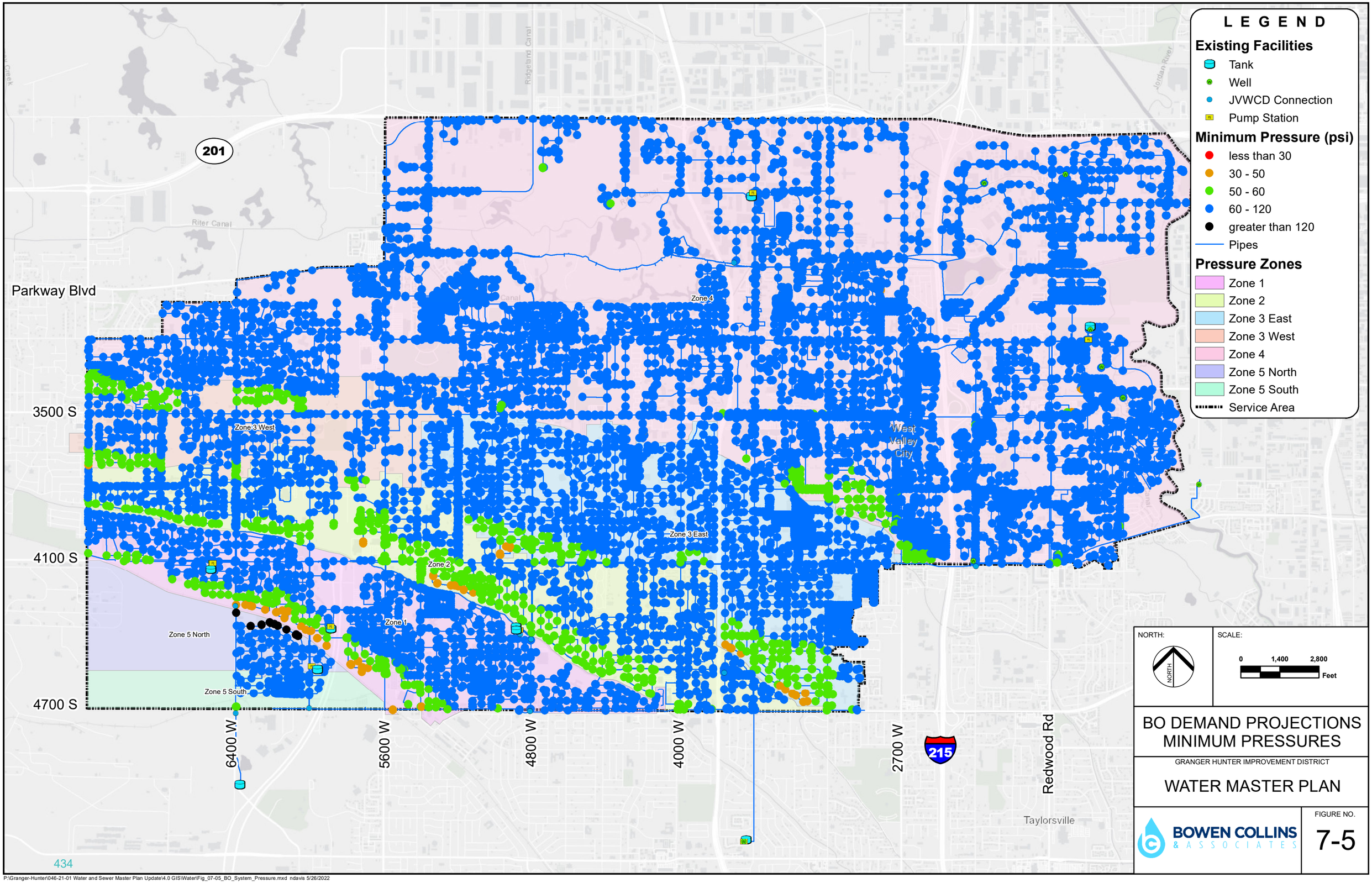

BO DEMAND PROJECTIONS MINIMUM PRESSURES

GRANGER HUNTER IMPROVEMENT DISTRICT

WATER MASTER PLAN

BOWEN COLLINS & ASSOCIATES

FIGURE NO. 7-5

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CHAPTER 8
DISTRIBUTION SYSTEM IMPROVEMENTS

The hydraulic model results were used to evaluate various alternatives to eliminate projected deficiencies in the water system under existing and build-out conditions. This chapter identifies all required system improvements to solve deficiencies as the District approaches build-out. Prioritization, phasing, and other issues relative to project timing will be addressed as part of the implementation plan for the improvements as a later section of this report.

DISTRIBUTION SYSTEM IMPROVEMENTS

System improvements required to resolve hydraulic capacity deficiencies and improve system operation as identified in the hydraulic model are shown in Figure 8-1. A summary of the major purposes of each project are as follows:

- **Project P1 –** This project is upsizing the existing 20-inch line in Parkway Boulevard to a 30-inch pipeline. The project extends from the Jordan Valley 15 connection to Lake Park Boulevard. Modeling shows very high velocities in this area limiting the flow taken from the Jordan Valley connection into the Anderson transmission line.
- **Project P2 –** The line leaving the Ridgeland Pump station is currently 12-inch, but quickly reduces to an 8-inch before returning to a 12-inch. This project replaces the existing 8-inch in 2400 South between east of 3600 West to 3200 West.
- **Project P3 –** Existing 16-inch and 12-inch pipelines run north/south in 3600 West at Crestfield Drive and are currently connected by a pipeline. This project increases the size of the connection between the two lines to 12-inch. This improvement increases the distribution capacity in the area.
- **Project P4 –** This project increases the size of the existing line in 6000 West between the Jordan Valley 50 connection and 4385 South from a 14-inch pipeline to a 20-inch. As demands increase, this pipeline will have higher velocities and the increased pressure loss results in lower pressures in Zone 1. Increase the of this pipeline improves pressures.
- **Project P5 –** A project currently underway will increase the capacity in the Zone 2 pipeline from the Tank Farm site to just past the canal crossing at 4800 West. This project extends this improvement in capacity by replacing the existing 10-inch pipeline in 4800 West between West Palmer Drive and West Valley View Drive with a new 16-inch pipeline. After this location, flow splits into two 12-inch pipelines. This project helps reduce head loss in the transmission piping and keep pressures from dropping at the high end of Zone 2.
- **Project P6 –** This project increases capacity between the Tank Farm Site and Zone 4 to utilize more of the storage at the site by gravity. This project increases the size of the pipeline in 4800 West from the Tank Farm to 3500 South to 36-inch; in 3500 South from 4800 West to 5600 West to 12-inch; in 3500 South from 4800 West to 4640 West to 16-inch; in 3500 South from 4640 West to 4400 West to 12-inch; and in 4800 West from 3500 South to 3100 South to 24-inch. It is recommended that this project be implemented when existing pipes in the area are in need to rehabilitation, which is not likely to be in the 10-year window. This project will allow the District to utilize more of the storage at the Tank Farm site, however the District does have the option to increase pumping from the site if additional turnover is needed in the near term.

- **Project P7 –** This project is an ongoing project to remove 4-inch piping from the District's distribution system. Based on GIS data, there is approximately 16,000 ft of 4-inch pipe in the system. The District will replace approximately 2,000 linear ft per year as funding is available.

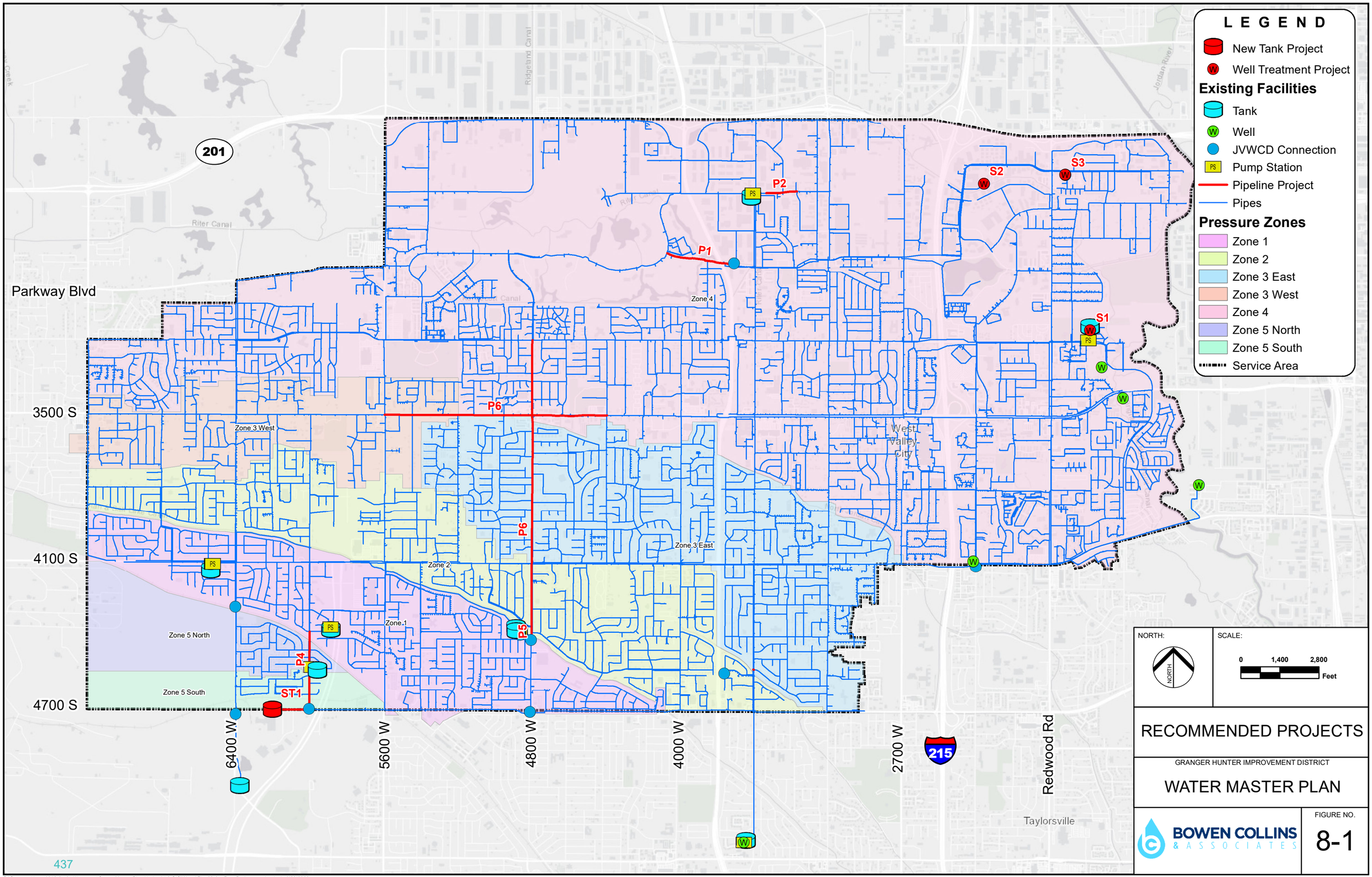
Figure 8-2 shows the minimum pressures in the buildout system with these recommended projects.

PROJECT COSTS

Project costs are summarized in Table 8-1. Project costs are based on average unit costs for projects of a similar nature. Costs include consideration of all components of the water distribution system including pipelines, valves, and surface restoration as appropriate. Costs also include 15 percent of the estimated total construction price for engineering, legal, and administrative services.

Table 8-1
Proposed Distribution System Improvements

Project No.	Project Timing	Diameter (inch)	Length (ft)	Project Description	Project Cost (2022 $s)
P1	0-5	30	1,830	Parkway Blvd / Bangerter Hwy	$1,270,000
P2	0-5	12	1,470	3600 W/2400 S - Outside of Ridgeland PS	$560,000
P3	0-5	12	50	3600 W/4400 S - Southeast portion of Zone 3E	$30,000
P4	5-10	20	2,760	500 W/4700 S - JV #50	$1,320,000
P5	5-10	16	240	4800 W/4415 S - Tank Farm to Zone 2	$200,000
P6	10+	12, 16, 24, 36	19,400	4800 W/4415 S - Tank Farm to Zone 4	$12,110,000
P7	5-10	8	2,000	Upsize 4" mains (2,000 LF/yr)	$6,300,000



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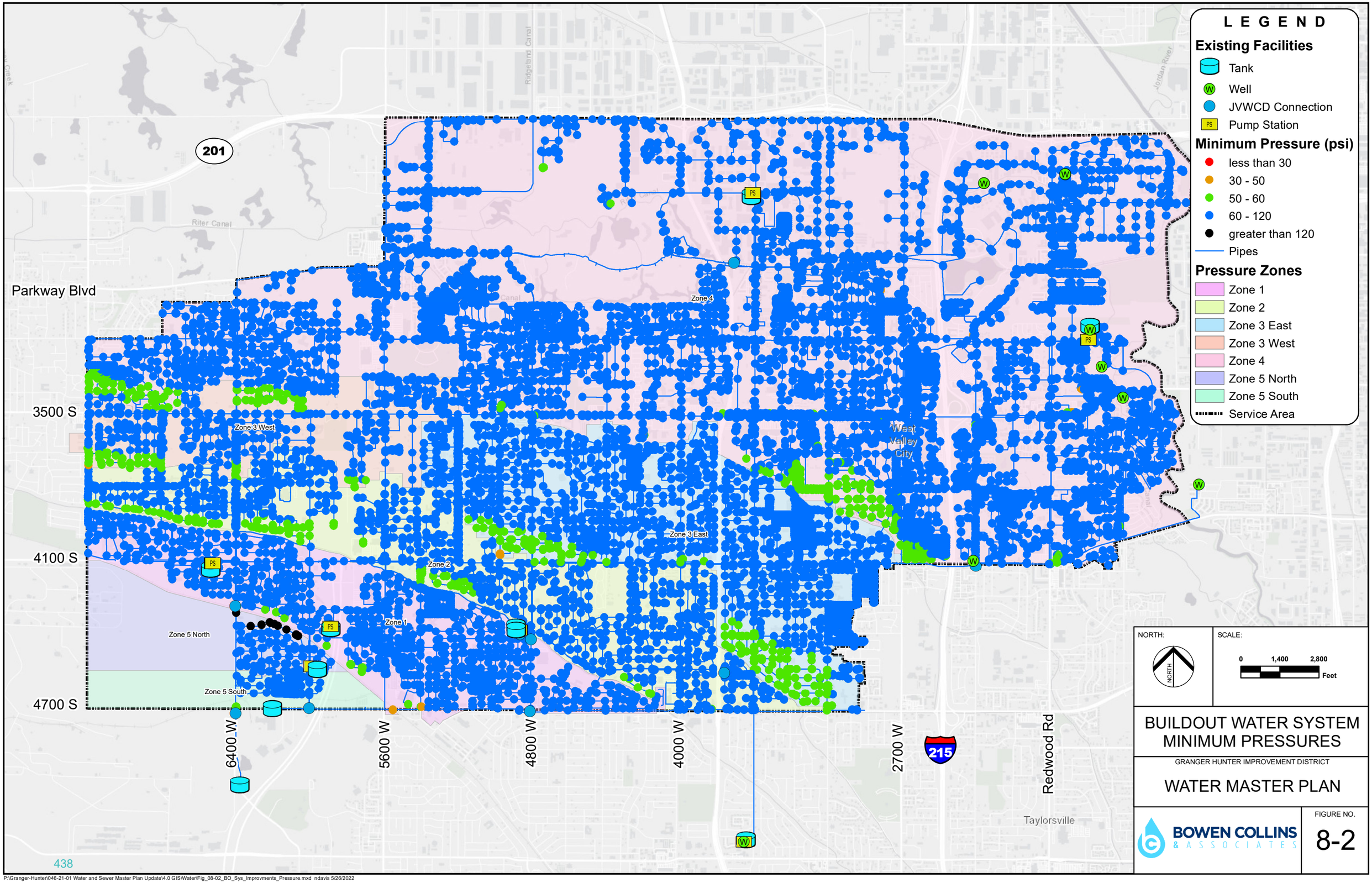

BUILDOUT WATER SYSTEM MINIMUM PRESSURES

GRANGER HUNTER IMPROVEMENT DISTRICT

WATER MASTER PLAN

BOWEN COLLINS & ASSOCIATES

FIGURE NO. 8-2

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CHAPTER 9
ASSET MANAGEMENT PLAN

As part of this water master plan, GHID has requested that BC&A prepare an asset management plan for the District's water distribution system. In order to do this, assets are separated into horizontal assets and vertical assets. This chapter describes the District's existing water distribution asset inventory and documents the expected condition of these assets based on inspection results.

HORIZONTAL ASSETS ASSESSMENT AND PLANNING

In a water system, horizontal assets generally refer to the pipelines in the system and their appurtenances (valves, service connections, hydrants, etc.). This section describes the District's existing water distribution asset inventory and documents the expected condition of these assets based on the completed analysis.

Existing Distribution System

The first step in preparing an asset management plan is to collect data on the nature and condition of the District's water distribution system. The District provided GIS shapefile data that include the following information related to asset management:

- Pipe identification number
- Diameter and length of individual pipes
- Installation year of individual pipes
- Material of individual pipes

The following sections summarize the attributes noted above.

Pipe Identification Number

The pipe identification number is taken from the junction ID numbers on either end of the pipe ("Start Junction – End Junction"). This field is mostly complete and correct based on the efficacy of joining operations in the GIS analysis.

Pipe Diameter, Length, and Material

The pipe diameter, length, and material within the GIS shapefile data was mostly complete and believed to be accurate. All pipes had lengths associated with the feature. All pipes in the system had a diameter and material attribute assigned. Figure 9-1 shows the pipe diameter of pipes within the GHID distribution system and Figure 9-2 shows the pipe material. This information is also summarized in Table 9-1.

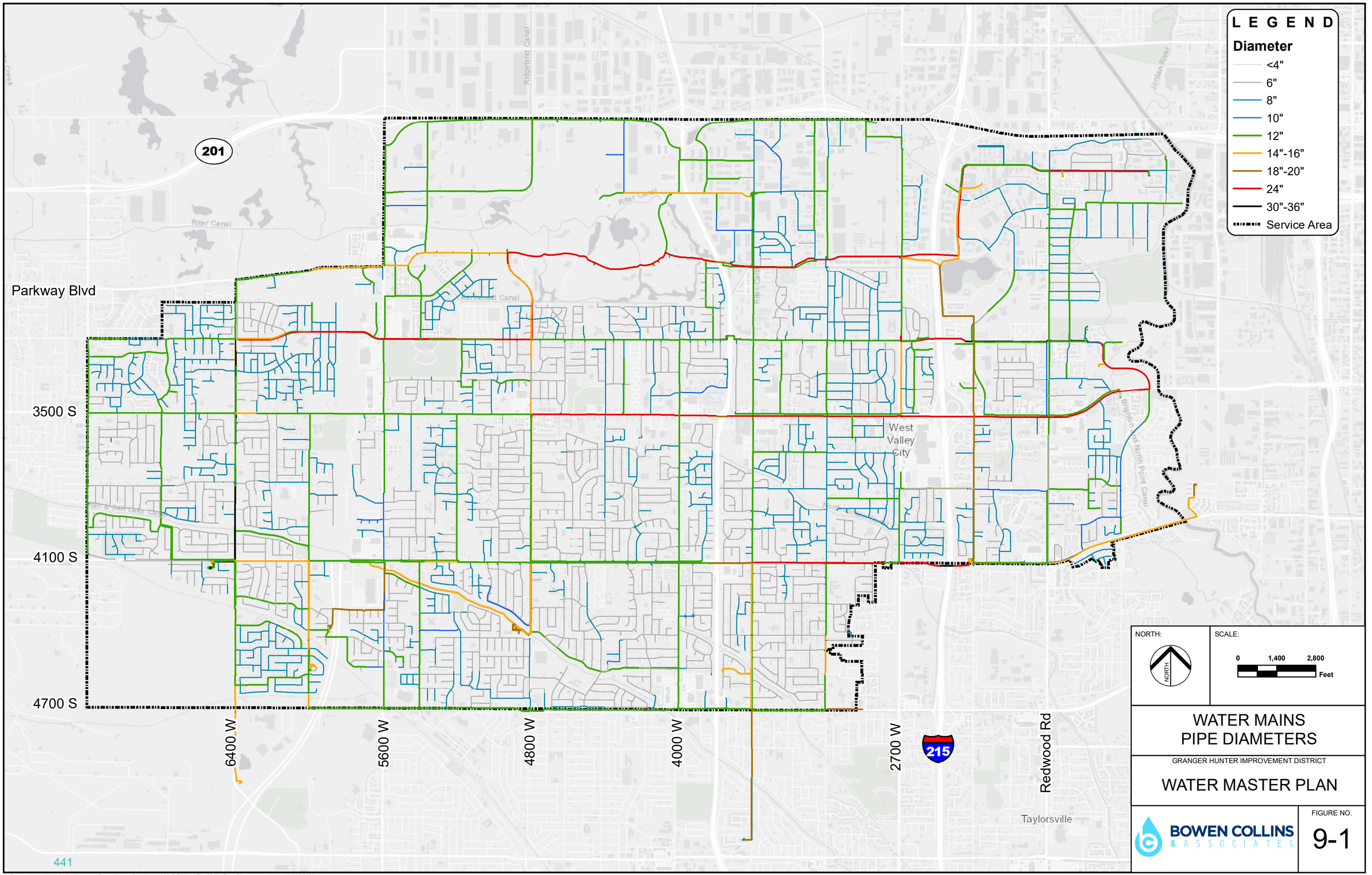
Table 9-1
Pipe Length (miles) by Diameter and Material

Diameter (in)	Asbestos Concrete	Cast Iron	Ductile Iron	PVC	Bar-Wrapped, Prestressed Concrete	Other	Total	Percentage
<=4	0.0	1.0	0.0	2.4	0.0	0.2	3.7	1.0%
6	1.5	74.2	1.8	66.7	0.0	0.0	144.2	38.0%
8	1.2	5.3	0.4	97.7	0.0	0.3	104.9	27.6%
10	0.2	1.3	0.3	4.6	0.0	1.1	7.4	1.9%
12	5.2	4.7	0.5	61.0	1.0	3.7	76.1	20.0%
14	4.2	0.5	0.3	0.0	0.6	0.0	5.6	1.5%
15	0.0	0.0	0.0	0.0	0.3	0.0	0.3	0.1%
16	2.8	0.0	0.2	6.3	3.5	1.5	14.4	3.8%
18	0.0	0.0	0.1	1.9	0.0	0.1	2.1	0.6%
20	0.1	0.0	0.1	0.1	3.5	0.0	3.8	1.0%
24	0.0	0.0	3.6	10.1	0.4	0.5	14.6	3.8%
28	0.0	0.0	0.0	0.0	0.0	0.8	0.8	0.2%
30	0.0	0.0	0.0	0.0	1.7	0.1	1.8	0.5%
Total	15.2	87.0	7.3	250.7	10.9	8.3	380	100.0%
Percentage	4.0%	22.9%	1.9%	66.1%	2.9%	2.2%	100.0%	

Installation Year and Age

Pipeline age is a critical component in determining the replacement timeline of water distribution pipes. The District's water distribution system GIS data included information on the installation year of pipes in the system. Figure 9-3 shows the pipe system by age.

Installation dates were present in the data for 4,425 of 4,437 (99.7%) of pipes. For the remaining 12 pipelines, pipe age was estimated based on the installation year of surrounding pipes of the same material. If none of the surrounding pipes were of the same material, the average age of the pipe type throughout the system was assumed.



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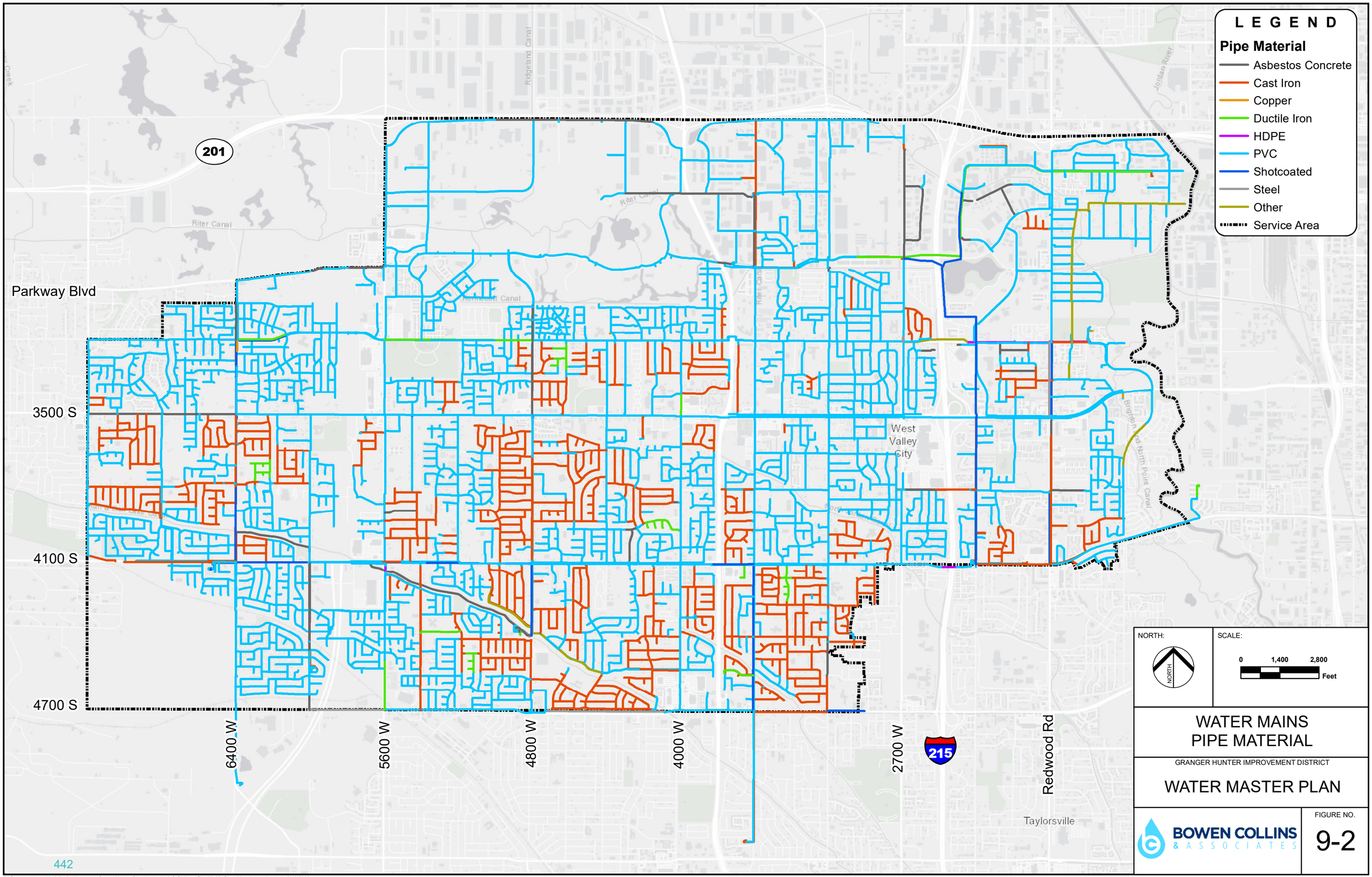

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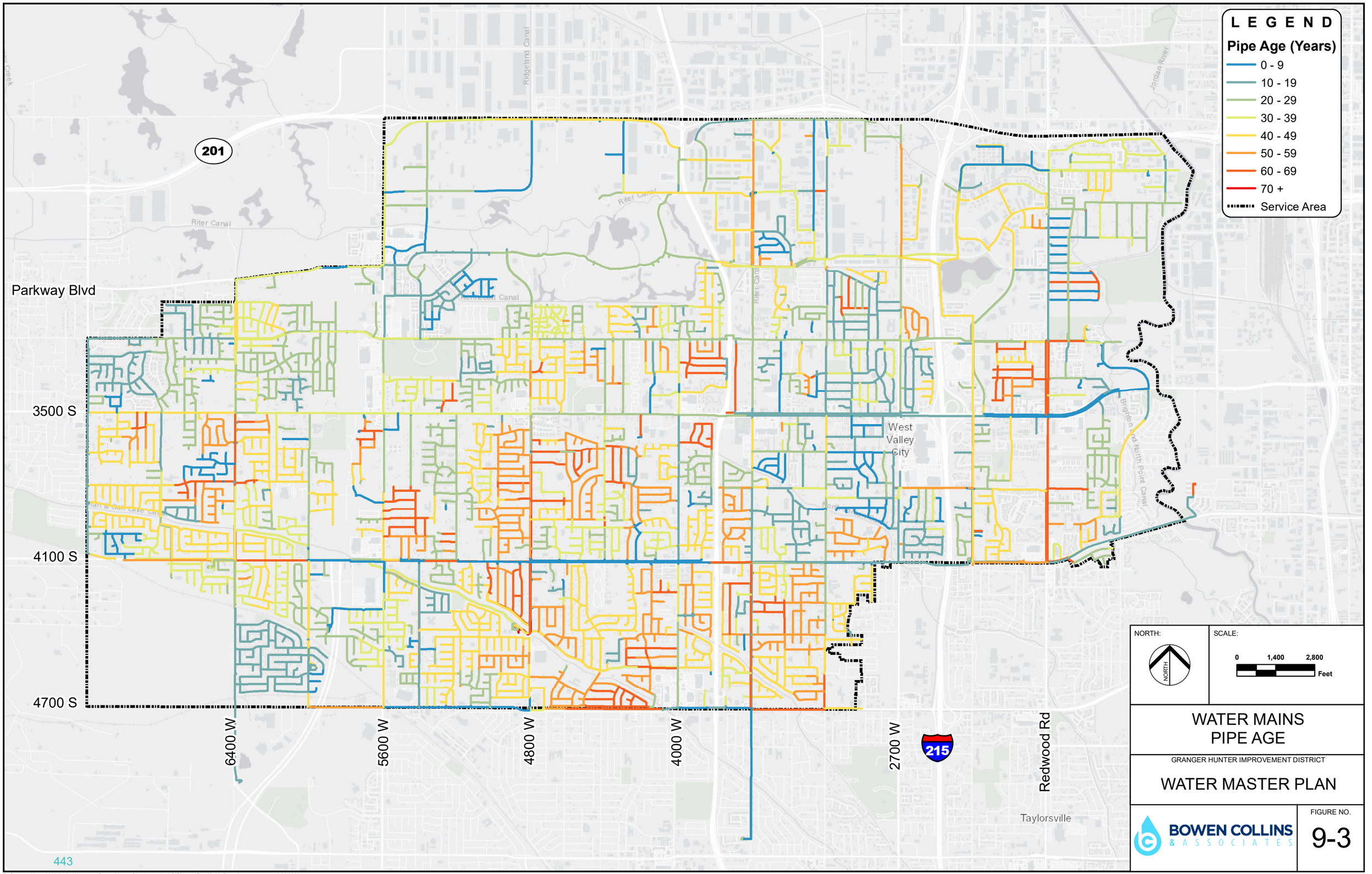

NORTH:

SCALE: 0 1,400 2,800 Feet

WATER MAINS PIPE AGE

GRANGER HUNTER IMPROVEMENT DISTRICT

WATER MASTER PLAN

BOWEN COLLINS & ASSOCIATES

FIGURE NO. 9-3

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PIPELINE CONDITION ASSESSMENT

Determining the existing condition of pipes in the distribution system is notoriously difficult without excavation and visual assessment. The anticipated need for replacement in water systems is therefore commonly determined by the age and the break/leak history of the pipe. Recent advances in machine learning techniques allow for some measure of risk assessment and prediction of breaks based on past data. The following section describes an analysis performed for the District and how the results were used to estimate the condition of pipelines within the distribution system.

Fracta AI Statistical Condition Assessment

Given the impracticality of inspecting buried water pipelines, condition assessment practices for water pipelines must focus on early leak detection and system statistics to prevent high-impact failures. The District retained Fracta AI to statistically analyze the water distribution system with machine learning tools to identify pipes most at risk of a failure (a break). Pipes with low or minimal risk of failure will generally be the pipes in the best structural condition; conversely, pipes with high risk of failure will generally be the pipes with structural deficiencies that lead to pipe failures.

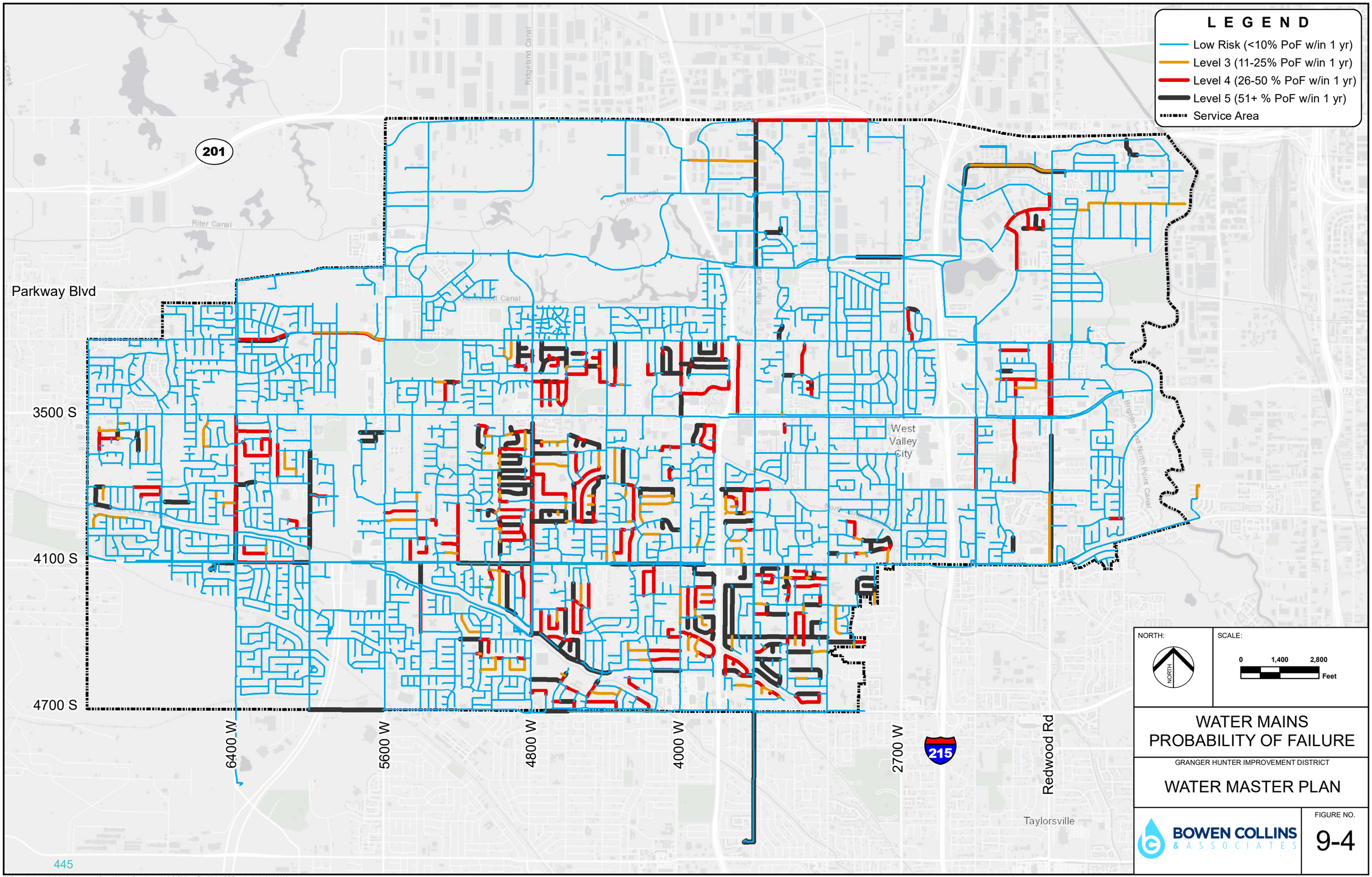
Fracta's machine learning inputs include break history, transportation network, building density, soil characteristics and many other locally available spatial datasets to train the machine-learning algorithm and estimate risk. The results provided by Fracta are calibrated for maximum accuracy for a one-year planning period, but other planning periods can be extrapolated with less certainty in the values. This risk level analysis is summarized in Table 9-2.

Table 9-2
Fracta Risk Level Results

Risk Level (LOF[1] within 1 year)	Length (ft)	Length (mi)	% of System
Level 1 (0 - 5% LOF)	1,419,123	268.8	70.9%
Level 2 (6 - 10% LOF)	218,725	41.4	10.9%
Level 3 (11 - 25% LOF)	69,384	13.1	3.5%
Level 4 (26 - 50% LOF)	147,992	28.0	7.4%
Level 5 (51+ % LOF)	146,315	27.7	7.3%
Total	**1,419,123**	**379**	**100%**

[1] LOF = Likelihood of Failure

The results indicate that much of the pipe system is in relatively good shape. About 70.9 percent of the system is at low risk of failure (Risk Level 1) and only 10.9 percent is listed at a slight risk of failure (Risk Level 2) within the next year. This leaves an estimated 18.2 percent of the system with more pressing structural issues that may require replacement sooner than the rest of the system. Figure 9-4 shows the pipes identified as the most at risk pipes (Levels 3 through 5). It should be noted that failure does not necessarily indicate a need for immediate replacement. In some cases, localized breaks may be repaired without replacing the pipeline.



WATER MAINS PROBABILITY OF FAILURE

GRANGER HUNTER IMPROVEMENT DISTRICT

WATER MASTER PLAN

BOWEN COLLINS & ASSOCIATES

FIGURE NO. 9-4

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Expected Remaining Life

To estimate the expected remaining life (ERL), BC&A considered pipeline age and the likelihood of failure (LOF) analysis as provided by Fracta AI for each pipeline, in which the LOF was extrapolated to various time periods. Figure 9-5 shows the estimated years to 90 percent LOF against the pipe age. Included in the figure is an "age line" based on an assumed 80-year life span (a typical assumption for the upper limit of pipeline design life). This line represents where data would fall on the graph for pipes with a life span of exactly 80 years.

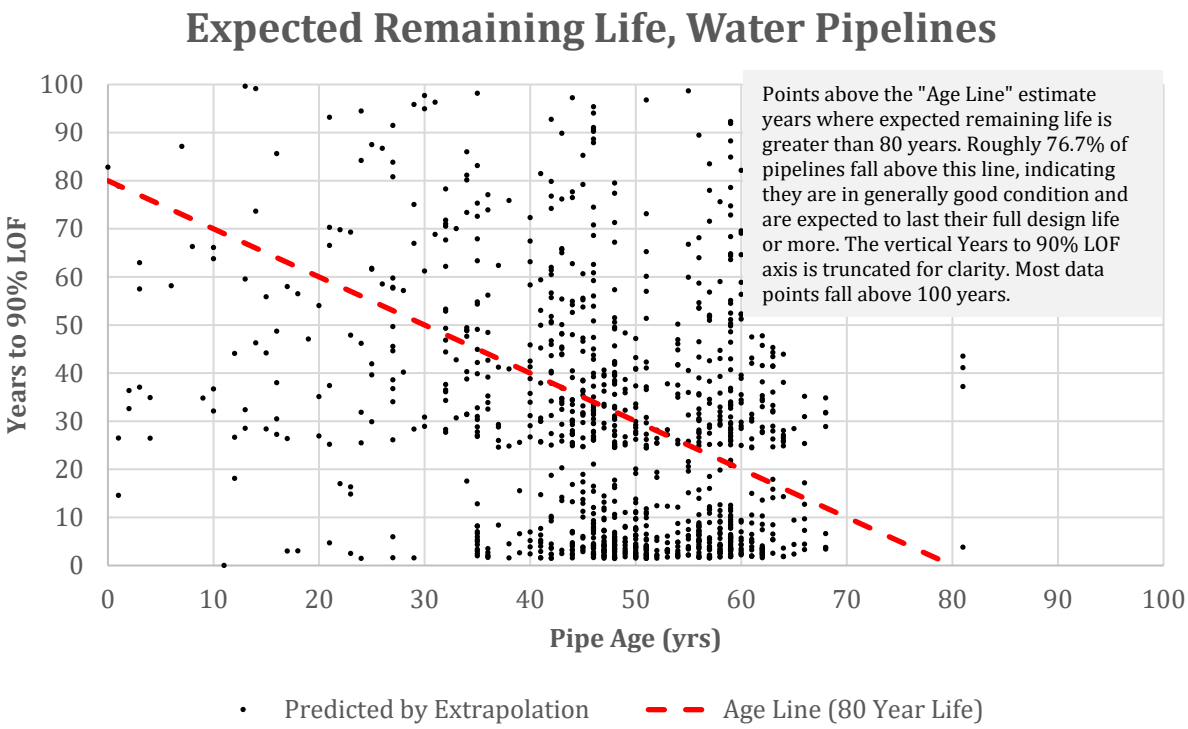


Figure 9-5 Expected Remaining Life Estimates, LOF Basis vs Age

Two distinguishing characteristics of the Fracta data and extrapolation methods are critical to the ERL estimates:

- **The meaning of LOF** – The LOF estimate considers the probability of a break. This value does not necessarily indicate that a full replacement instead of a repair is warranted. It was therefore necessary to determine a threshold LOF value where it was assumed the District would replace the water pipeline.
- **The 90 percent LOF threshold –** Using the LOF extrapolations to plan years until replacement involves setting a LOF threshold, then calculating the years until individual pipe assets reach that LOF. This can be a balancing act. Setting threshold values too low drastically increases the number of pipes that are flagged for replacement. Conversely, setting the threshold near 100 percent LOF delays the replacement time for critically at-risk pipes and underestimates short term replacement needs. BC&A discovered that thresholds between 85 and 90 percent LOF correctly placed those pipes most at-risk in short-term replacement periods. The 90 percent threshold also placed the pipes with minimal to no risk well outside a reasonable planning period (the points shown above the age line in Figure 9-5). Thus, a threshold of 90 percent LOF was chosen to perform project ERL analysis.

The final ERL value was conservatively set to the minimum between the projected ERL and the difference between 80 years and the pipe age (i.e. it was conservatively assumed no pipe would have a life of greater than 80 years). Table 9-3 summarizes the expected remaining life of the pipes in the system based on the methods described above.

Table 9-3
ERL of Water Pipes in GHID Distribution System

ERL (years)	Length (ft)	Length (mi)	% of System
0-9	320,867	60.8	16.0%
10-19	122,271	23.2	6.1%
20-29	171,097	32.4	8.5%
30-39	339,704	64.3	17.0%
40-49	259,641	49.2	13.0%
slipp	368,673	69.8	18.4%
60-69	284,912	54.0	14.2%
70-79	136,694	25.9	6.8%
Total	**2,003,859**	**379.5**	**100.0%**

Each pipe was then assigned a level of service based on the final ERL value:

- **LOS A:** ERL greater than 40 years
- **LOS B:** ERL between 20 and 40 years
- **LOS C:** ERL between 10 and 20 years
- **LOS D:** ERL between 5 and 10 years
- **LOS E:** ERL between 2 and 5 years
- **LOS F:** ERL less than 2 years

CONSEQUENCE OF FAILURE

A standardized method for rating the importance of individual pipes in the District's water collection system is needed to prioritize maintenance and condition assessment activities in the system. This section outlines a proposed procedure for rating the relative importance of pipes in the District's collection system based on the consequences of their failure.

Importance of Consequence of Failure

Consequence of failure (COF) is an estimate of the importance of a pipe based on the probable impacts resulting from a potential failure. A sudden failure can influence public safety, public perception of public works infrastructure, public health, and financial and economic vitality, and more. For example, a pipe repair below a freeway would likely result in heavy disruption on regional transportation networks, which could result in more dangerous travel and repair conditions both for commuters and for repairmen. High pressure leaks also pose a danger of soil erosion in the supporting layers of roadways and foundations.

COF also considers the level at which the overall distribution system depends on the pipe for reliable and sufficient performance. For example, a 2-inch lateral line is not as critical to the overall function of the water distribution system as a 18-inch transmission line between pressure zones.

This metric does not consider the existing condition of the pipeline, which is considered separately as "probability of failure." The District will need to consider both consequence of failure and probability of failure to make wise decisions regarding pipeline maintenance. Both concepts are discussed separately to consider and weight both issues appropriately in the context of water asset management.

Proposed Consequence of Failure Rating System

Implementing a rating system to accurately represent consequence of failure is difficult because some consequences are not directly quantifiable or associated with a monetary amount. For example, pipe replacements costs can be reasonably estimated, but externalities related to property damage in the event of a main break are more difficult to quantify. For this reason, BC&A proposes using a few easily measurable factors to indicate relative pipe COF from pipe characteristics and categorical multipliers based on its geographic attributes. Three factors are proposed to estimate the consequence of failure of a water pipe: the diameter of the pipe, the class of road over the pipe, and the type of zoning in the area.

Water Pipeline Diameter. Pipeline diameter is one of the most important indicators of the importance of a pipe. In general, larger diameter pipelines serve a greater portion of the population and are more likely to act as transmission lines. Failure in one of these lines poses greater risks of significant property damage, high replacement costs, and high-water losses.

BC&A proposes the pipeline diameter be used as the base rating for COF estimates for each pipe in the District's distribution system. The other two factors adjust the rating with multipliers based on the pipe's attribute in each category. Table 9-4 lists the proposed multipliers assigned to each rating factor. After computing a COF rating from these three factors, the pipes are ranked and divided into three categorical levels. These levels are discussed in further detail after the following explanations of each factor class and its multipliers.

Table 9-4
Consequence of Failure Multipliers

Road Class	Multiplier	Zone	Multiplier
No Road or Local	1	Open Space/ Industrial	1
Collector	2	Residential	1.5
Arterial	4	Commercial/ Institutional	1.7
Freeway	10		
Canal X-ing	5		
Rail X-ing	10		

Road Class. Traffic density on a roadway is directly connected with the cost and time associated with maintenance and repairs on water pipes. Based on GIS information available from the Utah AGRC, the District, and UDOT ArcGIS Online road class maps, BC&A classified roadways within the district into four categories: Freeways (including Interstates), Arterials (major and minor), Collectors (major and minor), and Local roadways. Canal and rail crossings are also included in this category because the multipliers are of similar magnitude as other road multipliers and, like pipes intersecting freeways and arterials, the impacts of a pipe failing under a crossing are very significant.

- **Freeways** – Interstates and major highways are assigned the highest multiplier ranking because the cost of crossing the freeway is significantly higher than traditional pipe installation methods. This categorization also reflects the magnitude of potential property damage risks and social disruption if traffic is affected by a repair to a pipe in these locations. This multiplier is intentionally set high enough to generally place freeway crossings within the highest COF level.
- **Arterials** – Major and minor arterials are assigned the next highest multiplier. These roads are major streets and experience greater disruption from traffic control for repair work on pipes within their right of way. The time and money associated with pipe maintenance in these streets is fairly high. The multiplier associated with this attribute reflects both the increased traffic volume on these streets, the increased cost, and moderate disruption caused by traffic control on these roadways for repairs.
- **Collectors** – Major and minor collector roads convey traffic from residential areas to arterial roads for access to busier, more commercial areas. These roads do not convey the traffic volume major arterials do but still see greater and more consistent traffic volumes than residential areas. The multiplier associated with this attribute reflects the increase in traffic volume from local roadways.
- **Local Roadways** – Local roads within the District are primarily residential or within industrial parks and do not carry large traffic volumes. Repairs to water mains in these roads are not likely to cause any significant disruption to the overall roadway network and are generally safer; therefore, this attribute did not multiply the COF rating of any pipes. Pipes located in open spaces were also assigned this road class attribute.
- **Canal Crossings** – Water pipes crossing canals have more risk of contamination and regulatory violations than water pipes in other locations. Traditional pipe repair/installation methods via trenching is also impractical while the canal is in operation, complicating the repair and any required environmental mitigation. The multiplier associated with this attribute reflects the priority placed on preventing contamination and environmental hazards.
- **Rail Crossings** – Water pipes experiencing structural failures or settlement underneath rail lines could potential cause train derailments or stop transportation of essential goods while repairs are completed. The potential impacts to public safety and welfare are large. The multiplier associated with this attribute reflects the severity of potential disruptions or derailments within rail systems.

Zoning. Zoning is also a factor that impacts COF ratings. Water pipes set in open fields imply smaller consequences of failure than pipes of the same size in residential or commercial areas. For this analysis, the District was grouped into three zoning categories:

- Commercial – Water pipes in commercial areas see higher traffic volumes and could potentially see costly impacts. The multiplier associated with commercial zoning attributes is the highest out of the three zoning categories.

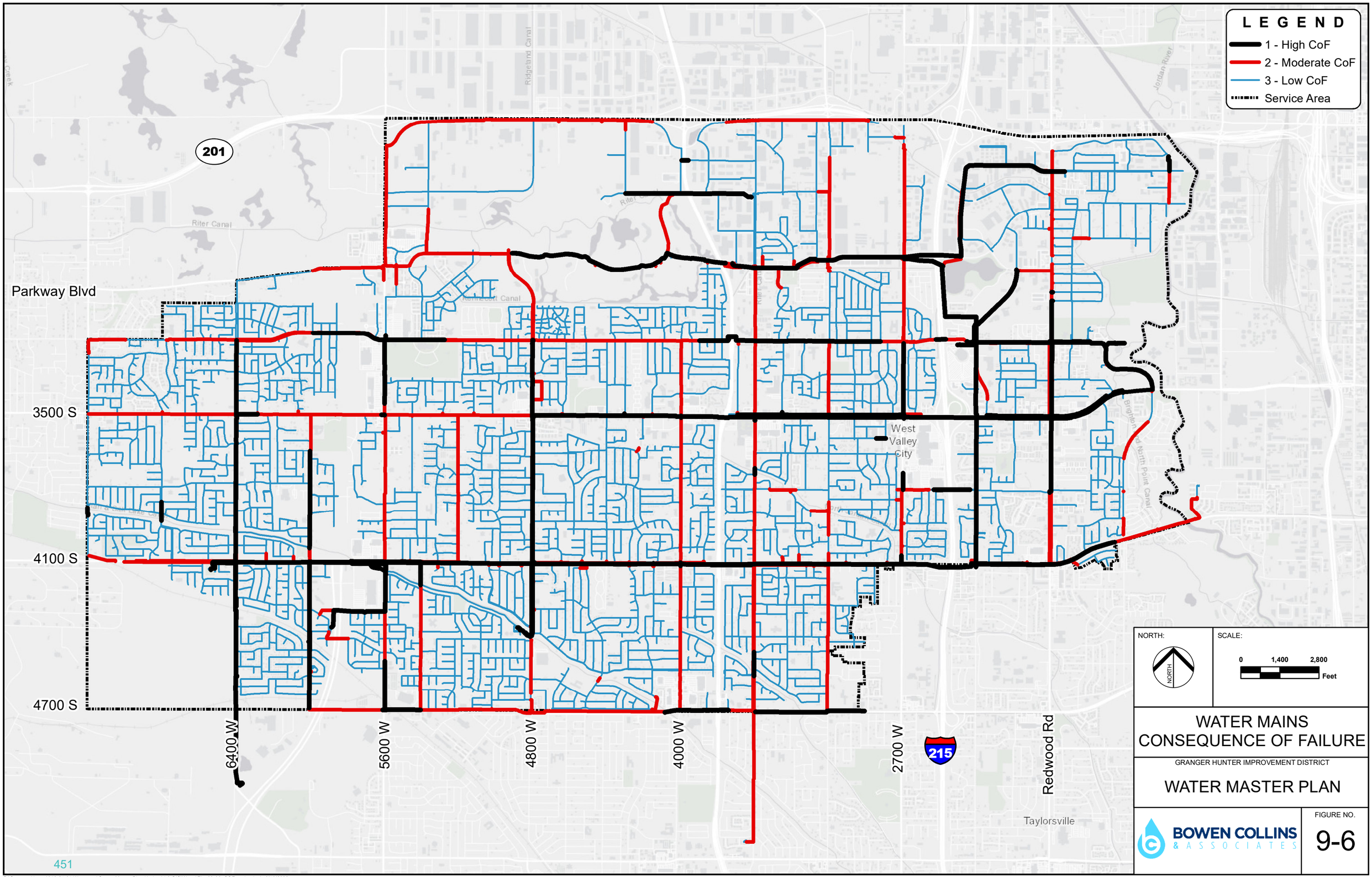
- Residential – Water pipes in residential areas are generally less costly to repair, but they do have more potential for adverse impacts on a greater number of residents than pipes in industrial zones or open space.
- Open Space and Industrial – Water pipes in industrial zones or open space are the most removed from areas with higher population densities and are assumed to have the least amount of impact from a failed pipe.

Consequence of Failure Results

Based on the proposed approach described above, BC&A developed pipe ratings for the District's water distribution system and divided pipe ratings into three levels as shown in Figure 9-6. The top 10 percent of pipe ratings (approximately) are classified as COF Level 1, representing the group of most important pipes in the system. The next 15 percent of pipe ratings are classified as COF Level 2. The remaining 75 percent of pipes in the system are classified as COF Level 3 pipes.

Table 9-5
Consequence of Failure Levels

COF Level	Total Length of Pipe (ft)
1 - Highest Consequence of Failure	236,430 (12%)
2 - Moderate Consequence of Failure	298,150 (15%)
3 - Lowest consequence of Failure	1,469,280 (73%)
Total	**2,003,860 (100%)**



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CRITICALITY

Criticality is defined as the combined consideration of the consequence of failure and the probability of failure of an asset. The term "criticality" is often used interchangeably in asset management with the term "risk" because criticality is used to compare the risk of failure associated with a given asset relative to the rest of the assets in the system. Criticality calculations are the key component used in decision making for asset management and prioritize the attention and resources of the District in collection system maintenance. The purpose of this chapter is to identify an approach to consider probability of failure and then use this to approach in the calculation of criticality for District assets.

Figure 9-7 depicts the theory of criticality. Criticality is the combined consideration of consequence of failure and probability of failure. As shown in Figure 9-7, the greater the probability of failure, and the more important a pipe is, the higher it will be ranked in criticality.

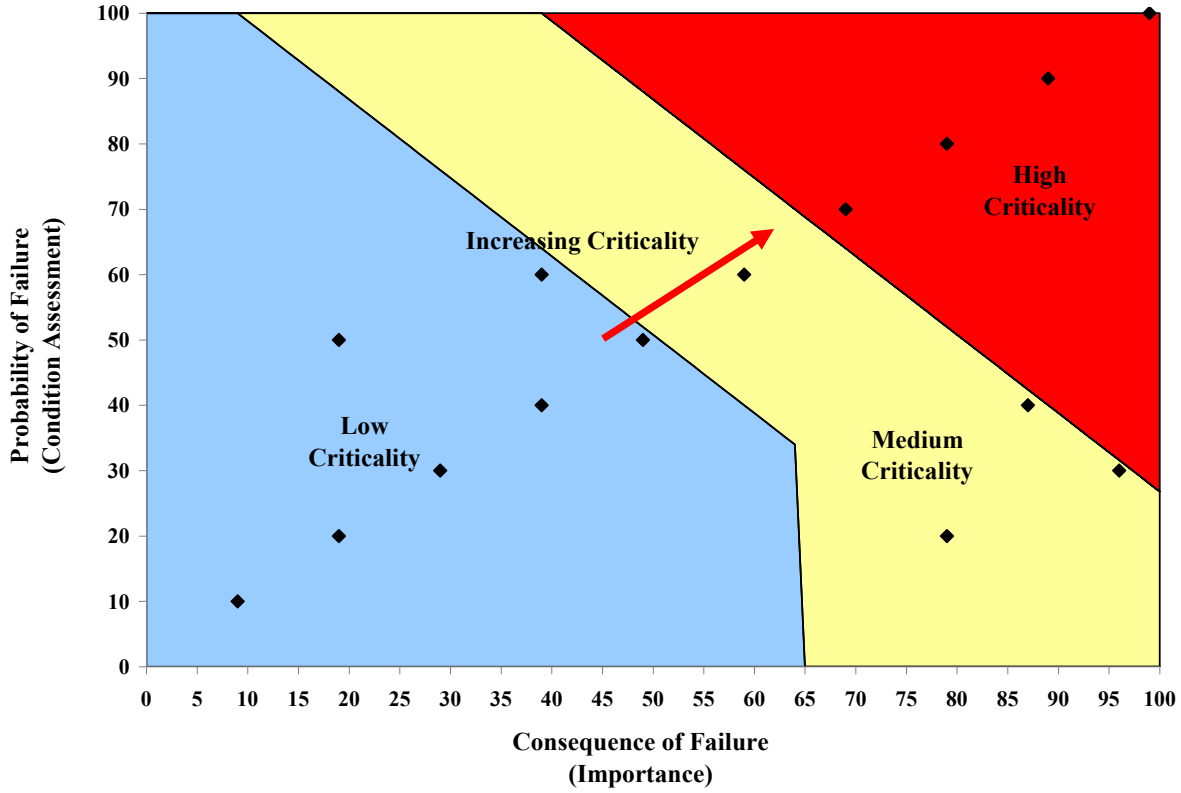


Figure 9-7 Criticality (Risk)

Analysis of Distribution Piping

Criticality can be calculated once probability of failure and consequence of failure for each pipe segment is defined. Given that consequence of failure is grouped categorically and not with a continuous variable, BC&A proposes using the criticality matrix shown in Figure 9-8 to begin prioritizing asset replacement timelines and inspection schedules. Instead of using discrete data points for probability of failure and consequence of failure, this matrix groups this information into basic level of service grades for probability of failure and consequence of failure levels. As additional information is gathered in the future, this matrix can be refined. Criticality in the matrix increases from the lower left corner to the upper right.

Structural Level of Service	Pipe Importance Level 3 Recommended Action	Pipe Importance Level 2 Recommended Action	Pipe Importance Level 1 Recommended Action
F	Short Term Pipe Replacement	Immediate Pipe Replacement	Immediate Pipe Replacement
E	Mid Term Pipe Replacement	Short Term Pipe Replacement	Immediate Pipe Replacement
D	Long Term Pipe Replacement	Mid Term Pipe Replacement	Short Term Pipe Replacement
C	Leak Detection	Long Term Pipe Replacement	Long Term Pipe Replacement
B	Routine Maintenance as Needed	Leak Detection	Leak Detection
A	Routine Maintenance as Needed	Routine Maintenance as Needed	Leak Detection

Increasing Probability of Failure

Increasing Consequence of Failure

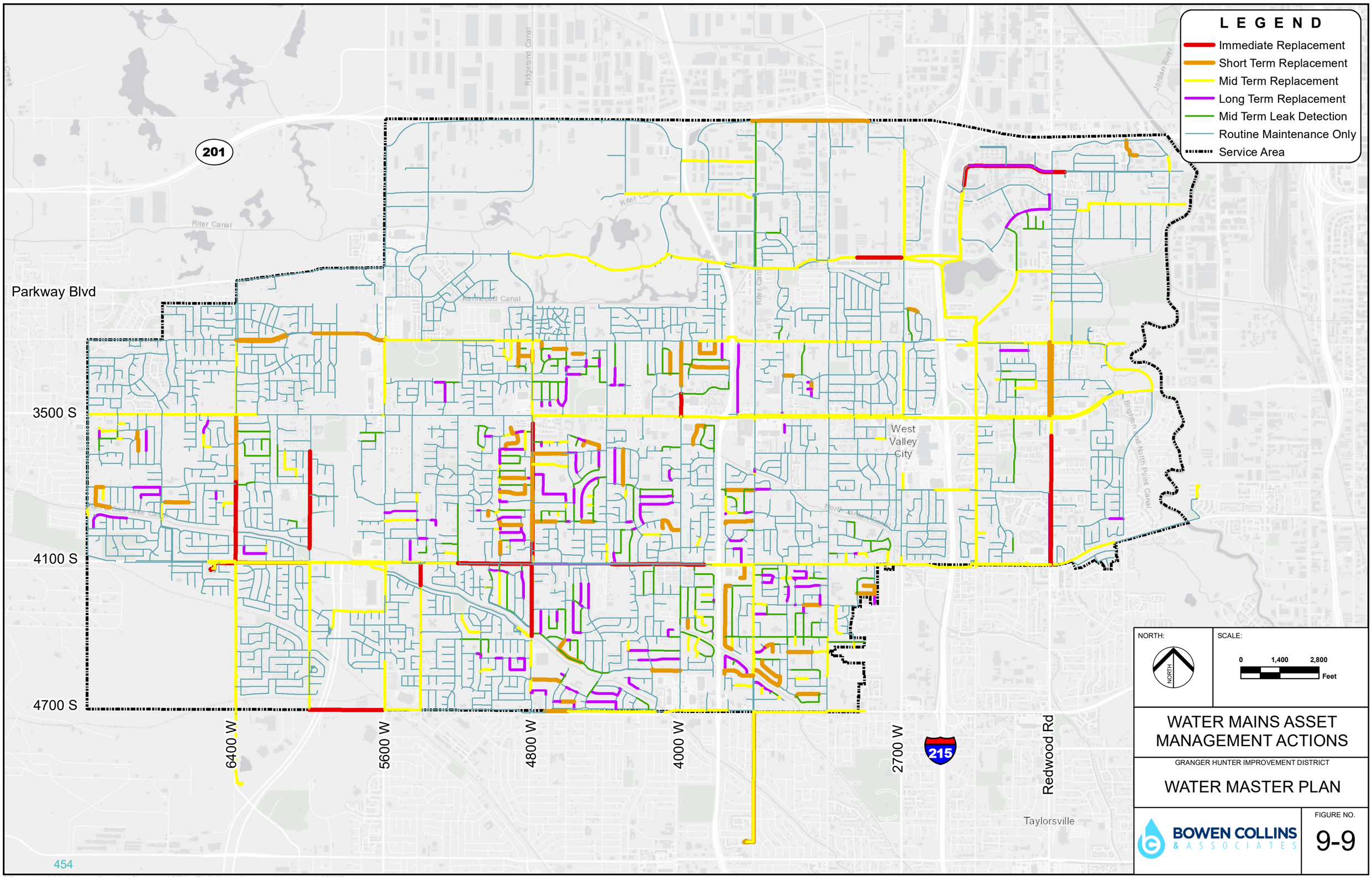
Figure 9-8 Criticality Matrix

The matrix includes recommended actions based on pipe criticality. The intent of the recommended actions is to provide guidelines for the decision-making process and focus resources on the assets which are most critical. The recommended actions include both inspection activities and rehabilitation activities. In both cases, the recommended schedule for the time frames listed in the table are as follows:

Immediate	0-1 year
Short Term	1-4 years
Mid Term	4-8 years
Long Term	More than 8 years

This matrix is only a starting point and is not intended as a replacement for engineering judgment. As each pipeline is evaluated, additional issues not covered by the matrix will need to be considered by District personnel when making final rehabilitation and replacement decisions. For example, if a pipe is generally good condition, but has one isolated structural problem, its overall level of service rating may be relatively high. As a result, it may be classified as a low criticality pipeline even though the isolated problem may merit immediate attention. In these cases, it is expected that District personnel will use their judgment to increase the criticality of the pipeline and accelerate resolution of the problem. Despite this limitation, it is believed that using the matrix to augment engineering judgment will enable better asset management than relying on institutional knowledge.

Figure 9-9 shows the results of this analysis with the pipes color coded according to the recommended actions in the criticality matrix.



WATER MAINS ASSET MANAGEMENT ACTIONS

GRANGER HUNTER IMPROVEMENT DISTRICT

WATER MASTER PLAN

BOWEN COLLINS & ASSOCIATES

FIGURE NO. 9-9

P:\Granger-Hunter\046-21-01 Water and Sewer Master Plan Update\4.0 GIS\Water\Fig_09-09_Asset_Management_Actions.mxd ndavis 5/26/2022

RECOMMENDED FUNDING LEVELS

The previous sections have described pipelines in the system, their condition, and areas to focus future repair and replacement efforts.. It is also important to consider an appropriate funding level so that the District is able to complete the projects when they are needed.

BC&A projected a replacement cost for each pipe segment based on length and pipe size. BC&A combined this cost data with the estimated remaining life discussed previously to determine an appropriate funding level for pipe rehabilitation and replacement. Figure 9-10 shows this data in graph form. As shown on the figure, this assessment indicates that the District should be averaging $4.7 million long term. There are a number of needs over the next 5 years that should be addressed as soon as possible. After those needs are attended to, average investment needs may be lower than average (moving average of between $2 million and $4 million per year) for the next three decades. Thus, if the District can find some extra funding to address the most immediate needs, it may be able to keep system renewal investment at a more modest level in the short-term as it addresses other needs. However, if rehabilitation and replacement is delayed for too long, future funding levels will increase drastically.

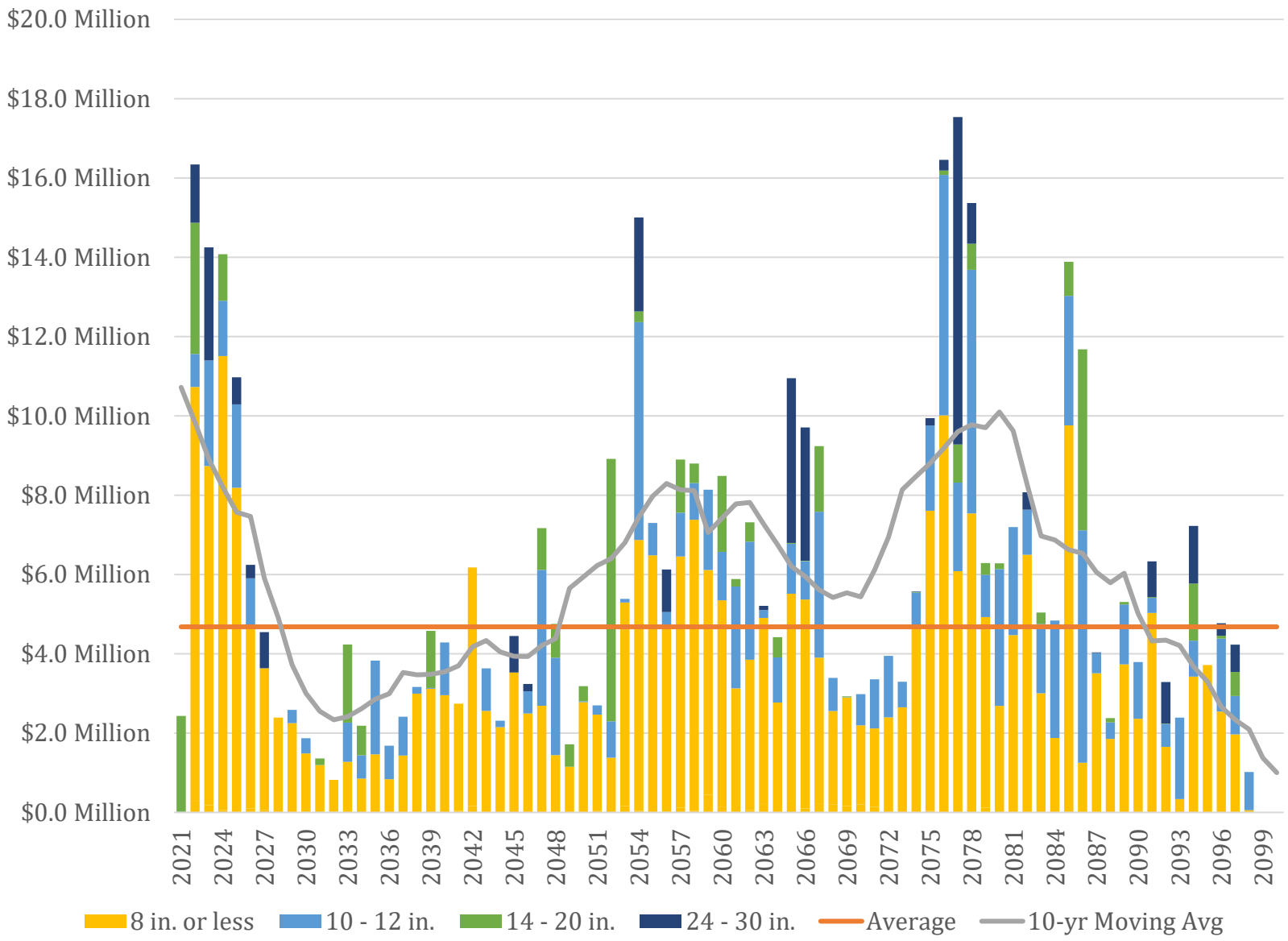


Figure 9-10 Expected Water Pipeline Replacement and Rehabilitation Needs

VERTICAL ASSETS ASSESSMENT AND PLANNING

Vertical assets in a water distribution system are mainly comprised of storage tanks, pump stations, and wells (and their well house). The District has several of each of these that represent a significant investment. This section details the efforts to assess the condition of these sites and recommended future asset management activities.

Site Inspections

Determining the condition of each of these assets compared to the horizontal assets is quite different because they can be visually inspected. The District and BC&A worked together to determine appropriate criteria which would be used during the inspections. The pump stations and wells were divided into three main categories with the wells having a few additional items. The tanks storage tanks only had one category. Each of these is described below:

- **Building & Site –** This category includes the building interior & exterior, landscape & enclosure, and the site asphalt/concrete condition. Condition of the site is important to protect the other equipment and help the sites blend in with their neighbors and be good neighbors.
- **Pump & Mechanical –** This category includes the pump(s), motor(s), piping, and isolation valves. For well sites, this also includes the casing, screens and secondary disinfection. As the "heart" of the sites, it is imperative that this equipment be in good working order and that necessary maintenance be performed when needed.
- **Electrical –** This category includes the generator & transfer switch, switchboard, transformer, MCC, panelboard, VFD/motor starters, PLC/RTU, and HMI. The electrical components are what drive the other equipment and are essential to the site operation.
- **Storage Tanks –** This category is specifically for the tank sites and includes the landscape, the site asphalt/concrete condition, appurtenances, and then then the tank itself. For steel tanks the coating is an important aspect and for concrete tanks, the condition of the tank concrete is paramount.

Each item was rated on a scale of 1 to 5 for general condition and was reviewed for specific common issues. Review forms also included a space for general notes. The rating definitions are as follows:

1. Excellent; like-new conditions, no issues noted; routine maintenance adequate
2. Adequate; minor wear, no equipment issues; schedule routine maintenance soon
3. Fair; worn, but no pressing equipment issues; mid-term replacement/rehabilitation recommended
4. Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5. Bad; equipment severely damaged/halting operation; immediate replacement/maintenance required

Inspections were completed by both District staff and BC&A engineers, with District staff accompanying BC&A engineers to several locations and District staff completing many inspections on their own. Where District staff completed the evaluations, inspection forms were then provided to BC&A. Table 9-6 through Table 9-8 are a compilation of the results of the site inspections. A table with the complete assessment and a copy of the completed inspection forms are included in the appendix.

Table 9-6
Pump Station Assessment Ratings

Pump Station	Acord BPS	Breeze BPS	Andra PS	Ridgeland PS	Kent BPS	Sorenson BPS
WU-PS-1: Building and Site Assessment						
General	1.5			3	2	2
Building/Vault Exterior	1	1.5	1.5	3	2	2
Building/Vault Interior	2	2	2	3	2	3
Landscape & Enclosure		2	2	1	2	2
Asphalt/Concrete (Parking, Walkways, Access)		2	2	3	2	1
WU-PS-2: Pumps and Mechanical						
Pump 1	1	2	1	2	2	2
Pump 2	1	2		2	2	
Pump 3		2			2	
Pump 4		2			2	
Motor 1	1	2	1	1	2	2
Motor 2	1	2		1	2	
Motor 3		2			2	
Motor 4		2			2	
Piping	1	3	1	1	3	2
Isolation Valves	1	3	1	1	3	2
HVAC System	2	2	1	1	2	
WU-PS-3: Electrical						
Overall Electrical	2	3	2			
Generator and Transfer Switch		3				
Switchboard	2	4	2			
Transformer	2	1	2			
Motor Control Center (MCC)			2			
Panelboard	2	1	2			
VFD 1 (If applicable)	2	4	2			
VFD 2 (If applicable)	2	4				
VFD 3 (If applicable)		4				
VFD 4 (If applicable)		1				
PLC Panel/RTU		2	2			
HMI		2	2			
Security System			2			

Table 9-7
Tank Assessment Ratings

Tank	Acord	Andra	Winder	Breeze	Ridgeland	Sorenson	Tank Farm (1 MG)	Tank Farm (2 MG)	Zone 5
WU-PS-1A: Steel Tank Building and Site Assessment									
Landscape & Enclosure	5				2	3			
Asphalt/Concrete (Parking, Walkways, Access)	5				3	1	1	1	
Structural Steel	3				2	2	3	3	
Exterior Coating	2				2	3	2	2	
Interior Coating	2				2	3	2	2	
Appurtenances	4				2	2	2	2	
WU-DS-1B: Concrete Tank Building and Site Assessment									
Landscape & Enclosure		2	1	2					
Asphalt/Concrete (Parking, Walkways, Access)		1	1	3					2
Exterior (if exposed)		2	1	3					1
Interior		2	1	3					1
Appurtenances		2	1	3					1

Table 9-8
Well Inspection Ratings

Well	Well 1	Well 4 (Sorensen)	Well 8 (Woodbury)	Well 12 - Acord	Well 14 (Wright)	Well 15 (Evans)	Well 16 (Taggart)	Well 17
WU-W-1: Building and Site Assessment								
General	1.5	See BPS Rating	2	2	2	1	1	1
Building/Vault Exterior	1.5		2	3	3	2	2	1
Building/Vault Interior	2		2	2	-	2	2	1.5
Landscape & Enclosure	2		2	5	2	1	1	1
Asphalt/Concrete (Parking, Walkways, Access)	2		2		2	3	1	1
WU-W-2: Pumps and Mechanical								
Pump	1		2	3	3	2	2	1
Motor	1		1	2	1	1	1	1
Exposed Piping	1		1	3	3	2	1	1
Isolation Valves	1		1	2	2	1	1	1
Well Casing (if recent video available)			2		2	1	2	
Well Screens (if recent video available)			1		2	2	2	
Secondary Disinfection (If Applicable)	2		1	2	3	3	3	1
Fluoridation System (If Applicable)			2	4	3	2	2	1
HVAC System			2	2	2	1	1	1
WU-W-3: Electrical Assessment								
Overall Electrical	3	3	2	3	-	4	3	1
Generator and Transfer Switch	1	5	1	1	-	2		1
Switchboard	2	5	2	3	-	4	4	1
Transformer	3	4	2	3	-	4	3	1
Motor Control Center (MCC)		4	3	3	-	4	3	1
Panelboard	2	1	3	3	-	4	3	1
VFD (If applicable)	3	5	1	1	-	3	1	1
Motor Starter (If applicable)		5	3	4	-	4	3	
PLC Panel/RTU	2	1	3	3	-	4	4	1
HMI	2	1	2	3	-	3	3	1
Security System (if applicable; if not present, leave comment)	4	5	3	3	-	4	3	1

Equipment Expected Lifespan

Visual inspection of equipment gives a good snapshot of how an asset is performing at the given time, but more information is needed in order to plan for maintenance and repairs or replacement in the future. BC&A worked with District staff to determine an expected lifespan for each asset category. These values are only estimates and it is recommended that the District continue to collect information and refine these values as appropriate. Table 9-9 shows the equipment and its expected lifespan.

Table 9-9
Asset Expected Lifespan

Asset Name	Asset Component	Assessment Items	Expected Lifespan (yrs)
Distribution System	**Storage Tanks**	Landscape & Enclosure	50
		Asphalt/Concrete	25
		Steel - Structural	75
		Steel - Exterior Coating	25
		Steel - Interior Coating	25
		Concrete - Exterior	80
		Concrete - Interior	80
		Appurtenances	50
Pump Stations	**Building & Site**	Building Interior & Exterior	60
		Landscape & Enclosure	60
		Asphalt/Concrete	25
	Pumps	Pump	20 Rebuild @ 10
		Motor	20
		Piping	50
		Isolation Valves	40
	Electrical	Generator & Transfer Switch	20
		Switchboard	25
		Transformer	25
		MCC	25
		Panelboard	20
		VFD/Motor Starters	15
		PLC/RTU	10
		HMI	10
Wells	**Building & Site**	Building Interior & Exterior	60
		Landscape & Enclosure	60
		Asphalt/Concrete	25

Asset Name	Asset Component	Assessment Items	Expected Lifespan (yrs)
	Pump & Mechanical	Pump	20 Rebuild @ 10
		Motor	15
		Piping	20
		Isolation Valves	15
		Casing	50
		Screens	50
		Secondary Disinfection	20
	Electrical	Generator & Transfer Switch	20
		Switchboard	25
		Transformer	25
		MCC	20
		Panelboard	20
		VFD/Motor Starters	15
		PLC/RTU	10
		HMI	10

10-YEAR PLANNING

The most basic way of planning for rehabilitation and replacement would be to take an equipment's install year and add the expected lifespan to that. However, many variables can impact the lifespan of a specific piece of equipment. An asset in an extreme environment can require rehabilitation or replacement much sooner than expected, whereas another asset that is used infrequently may long outlive its expected lifespan. Both are important to plan for and this is where the visual inspections become extremely valuable. An expected lifespan combined with the assets current condition allows the District to adjust the timing of rehab or replacement and maximize the investment in the asset.

Following the inspection of each of the sites, results were analyzed and specific items that are anticipated to be needed in the next ten years were identified, as shown in Table 9-10, along with a cost estimate.

Table 9-10
Suggested Rehabilitation and Replacement Projects

Site Name	Suggested Action	Cost Estimate
Storage Reservoirs		
Sorensen Reservoir	Recoating (internal/external)	$800,000
Tank Farm 1 MG Reservoir	Recoating (internal/external)	$300,000
Tank Farm 2 MG Reservoir	Recoating (internal/external)	$900,000
Acord Reservoir	Recoating (internal/external) & Repairs	$1,000,000
Breeze Reservoir	Landscaping Replacement	$1,000,000

Site Name	Suggested Action	Cost Estimate
Zone 5 Reservoir	Landscaping Replacement	$300,000
Tank Farm 5 MG Reservoir	Interior Recoating	$900,000
Tank Farm 5 MG Reservoir	Exterior Recoating	$600,000
Ridgeland Reservoir	Recoating (internal/external)	$750,000
	Sub-Total	***$6,550,000***
Pump Stations		
Kent P.S. (Tank Farm)	Replacement & Upsizing	$8,500,000
Breeze P.S.	Electrical Rehabilitation (VFD Replacement)	$350,000
Ridgeland P.S.	Replacement (including generator)	$4,000,000
Acord P.S.	Electrical Upgrades (VFD Replacement)	$300,000
Andra P.S.	Electrical Upgrades (VFD Replacement)	$300,000
	Sub-Total	***$13,450,000***
Wells		
Well No. 1	Well Replacement	$4,750,000
Well No. 4	Well Building Replacement (w/ generator)	$2,750,000
Well No. 4	Well Redevelopment	$250,000
Well No. 8	Well Redevelopment	$300,000
Well No. 8	Electrical Upgrades (VFD Replacement)	$200,000
Well No. 12	Well Redevelopment	$300,000
Well No. 14	Electrical Upgrades	$250,000
Well No. 14	Chlorinator Replacement	$400,000
Well No. 14	Well Redevelopment	$250,000
Well No. 15	Chlorinator Replacement	$300,000
Well No. 15	Electrical Upgrades (VFD Replacement)	$250,000
Well No. 16	Chlorinator Replacement	$300,000
Well No. 16	Well Redevelopment	$300,000
Well No. 16	Electrical Upgrades (VFD Replacement)	$250,000
Well No. 17	Chlorinator Replacement	$300,000
Well No. 17	Well Redevelopment	$350,000
	Sub-Total	***$11,500,000***
	TOTAL	**$31,500,000**

ADDITIONAL DISTRIBUTION COMPONENTS

The distribution system consists of several additional components that are lower value items, but typically exists in large quantities. This makes them important items to consider when planning for rehabilitation and replacement. These items have been discussed with District staff and plans are as follows:

- **Hydrants/Valves –**Valves are typically addressed as part of the pipelines while hydrants can be addressed with pipelines or on their own. It is recommended to replace 90 hydrants per year.
- **PRVs –** The District has multiple PRVs between each zone which play an integral part of the distribution system as a whole. In addition to routing maintenance, electrical upgrades are necessary and should be planned at approximately 2 per year.
- **Retail Meters –** Retail meters require regular replacement. While individual meters are not a significant amount, there are many throughout the system and should be accounted for. The District should plan to replace approximately 1,400 per year.
- **Meter Vaults –** The large meter vaults require routine maintenance and at times replacement. For planning, the District should plan to replace 3 per year.
- **SCADA –** The District's SCADA system requires continual upgrades and programming. This item will be planned for at $200K per year.

RECOMMENDED LONG TERM FUNDING LEVELS

While specific rehabilitation and replacement items may be adjusted as needed, it is important for the District to plan for appropriate funding levels. The total replacement cost of the District's sites is estimated to be $130 million dollars. While individual pieces of the sites have differing life expectancies, a site is expected to be operable between 40 and 60 years overall for pump stations and wells and between 60 and 80 years overall for storage tanks. Using this information, a recommended funding level can be calculated as shown in Table 9-11. As shown in the table, the annual sustainable system renewal budget for District tanks, pump stations, and wells is roughly between $2 million and $3 million.

Table 9-11
Recommended Water System Vertical Component Renewal Budget

Category	Replacement Value	Service Life (years)	Recommended Annual Investment Range	
Tanks	$72,500,000	60-100	$1,210,000	$730,000
Booster Pumps	$23,300,000	40-60	$590,000	$390,000
Wells	$38,200,000	40-60	$960,000	$640,000
Total	**$134,000,000**	**-**	**$2,760,000**	**$1,760,000**

ON-GOING INSPECTIONS

Visual inspections are valuable insight into the performance of specific assets within the District's water system. Their biggest limitation is the fact that they are simply a snapshot taken on a specific day. For continued planning it is imperative that sites continue to be inspected and data be recorded. For this purpose, BC&A recommends that District staff complete inspections approximately every two years. To assist with this effort blank forms that were used for this round of inspections are included in the appendix of this report.

CHAPTER 10
IMPLEMENTATION PLAN

Previous chapters of this water master plan have identified improvements to resolve future deficiencies and to accommodate water demands from future growth while providing an acceptable level of service. The purpose of this chapter is to assemble a 10-year capital improvement program to implement the recommended improvements. This plan should be updated at least every five years to re-prioritize system improvements to achieve District goals.

CAPITAL IMPROVEMENT PRIORITIZATION

A discussion of each of the major budget categories and how they will be prioritized in the 10-year implementation plan is included below:

- **Transmission and Distribution System Capacity Improvements –** BC&A used the growth projections discussed in Chapter 2 of this report and the existing distribution system hydraulic model to determine when water system capacity improvements are needed. There is not much flexibility with the scheduling of these projects. While moving a project a few years forward or a few years back may be a possibility, major changes in timing cannot be accommodated. Unless growth occurs at rates significantly different than those projected, failure to complete the projects at the recommended dates will result in the District running out of available capacity and being forced to implement restrictions on development.
- **Transmission and Distribution System Pipe Rehabilitation –** A recommended budget level for water system rehabilitation improvements was developed in Chapter 9 (for both horizontal and vertical infrastructure). Although this exact amount does not need to be spent in every single year, failure to invest in this system at approximately this level over time will result in system degradation and costly system failures. While the District does have some flexibility with these expenditures, this implementation plan assumes annual system investments across the entire 10-year planning window will be equal to the recommended funding level.

RECOMMENDED 10-YEAR CAPITAL IMPROVEMENT PROGRAM

Based on the system improvements identified in Chapter 8 and the recommended prioritization approach discussed above, Table 10-1 lists improvement projects that are recommended within the next 10-years, the budget required to complete those projects, and the recommended timing of those projects. For budgeting purposes, capital costs for some major capital improvements have been split up into multiple years.

GHID budgets for water and wastewater projects on a combined basis. A similar prioritization has been done for sewer projects as part of the sewer master plan. For comparison of the District's total capital expenditures, both water and wastewater projects are shown in Figure 10-1, which summarizes the annual capital expenditures that will be required to support the recommended capital improvement plan. Expenditures have been grouped by major category for reference.

For comparison purposes, Figure 10-1 also includes anticipated level of funding available for capital improvements based on data from the rate study being conducted at the same time as this master plan. The table and figure both include an assumed inflation rate of 3% per year. While this is a reasonable estimate of long-term inflation trends, it may not capture current economic conditions. It is recommended that the District closely track inflation over the next few years to see if an adjustment is needed in this regard.

Table 10-1
Recommended 10-Year Capital Improvement Plan

Site Name	Project Description	Cost Estimate (2022 $s)	Year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	10+
Water Reservoir - Rehab & Replacement														
Sorensen Reservoir	Recoating (internal/external)	$800,000	2028							$956,000				
Tank Farm 1 MG Reservoir	Recoating (internal/external)	$300,000	2026					$338,000						
Tank Farm 2 MG Reservoir	Recoating (internal/external)	$900,000	2029								$1,107,000			
Acord Reservoir	Recoating (internal/external) & Repairs	$1,000,000	2024			$1,061,000								
Breeze Reservoir	Landscaping Replacement	$1,000,000	10+											$1,344,000
Zone 5 Reservoir	Landscaping Replacement	$300,000	10+											$404,000
Tank Farm 5 MG Reservoir	Interior Recoating	$900,000	2030									$1,141,000		
Tank Farm 5 MG Reservoir	Exterior Recoating	$600,000	10+											$807,000
Ridgeland Reservoir	Recoating (internal/external)	$750,000	2031										$979,000	
	Sub-Total	***$6,550,000***		***$0***	***$0***	***$1,061,000***	***$0***	***$338,000***	***$0***	***$956,000***	***$1,107,000***	***$1,141,000***	***$0***	***$1,748,000***
Water Pump Station - Rehab & Replacement														
Kent P.S. (Tank Farm)	Replacement & Upsizing	$8,500,000	2022	$4,250,000	$2,189,000									
Breeze P.S.	Electrical Rehabilitation (VFD Replacement)	$350,000	2025				$383,000							
Ridgeland P.S.	Replacement (including generator)	$4,000,000	2023		$2,060,000	$2,122,000								
Acord P.S.	Electrical Upgrades (VFD Replacement)	$300,000	2029								$369,000			
Andra P.S.	Electrical Upgrades (VFD Replacement)	$300,000	2027						$348,000					
	Sub-Total	***$13,450,000***		***$4,250,000***	***$4,249,000***	***$2,122,000***	***$383,000***	***$0***	***$348,000***	***$0***	***$369,000***	***$0***	***$0***	***$0***
Water Wells - Rehab & Replacement														
Well No. 1	Well Replacement	$4,750,000	2029								$2,921,000	$3,009,000		
Well No. 4	Well Building Replacement (w/ generator)	$2,750,000	10+											$3,696,000
Well No. 4	Well Redevelopment	$250,000	10+											$336,000
Well No. 8	Well Redevelopment	$300,000	2028							$359,000				
Well No. 8	Electrical Upgrades (VFD Replacement)	$200,000	2030									$254,000		

Site Name	Project Description	Cost Estimate (2022 $s)	Year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	10+
Well No. 12	Well Redevelopment	$300,000	2031										$392,000	
Well No. 14	Electrical Upgrades	$250,000	2028							$299,000				
Well No. 14	Chlorinator Replacement	$400,000	2029								$492,000			
Well No. 14	Well Redevelopment	$250,000	2030									$317,000		
Well No. 15	Chlorinator Replacement	$300,000	2022	$300,000										
Well No. 15	Electrical Upgrades (VFD Replacement)	$250,000	2024			$266,000								
Well No. 16	Chlorinator Replacement	$300,000	2022	$300,000										
Well No. 16	Well Redevelopment	$300,000	2027						$348,000					
Well No. 16	Electrical Upgrades (VFD Replacement)	$250,000	2027						$290,000					
Well No. 17	Chlorinator Replacement	$300,000	2027						$348,000					
Well No. 17	Well Redevelopment	$350,000	2027						$406,000					
	Sub-Total	***$11,500,000***		***$600,000***	***$0***	***$266,000***	***$0***	***$0***	***$1,392,000***	***$658,000***	***$3,413,000***	***$3,580,000***	***$392,000***	***$4,032,000***
Water Miscellaneous - Rehab & Replacement														
Meter Vaults	Meter Vault Replacements (3/year - $250K/yr)	$2,500,000	2022	$250,000	$257,500	$265,225	$273,182	$281,377	$289,819	$298,513	$307,468	$316,693	$326,193	$335,979
PRVs	PRVs - Electrical Upgrades (2/year - $150K/yr)	$1,500,000	2022	$150,000	$154,500	$159,135	$163,909	$168,826	$173,891	$179,108	$184,481	$190,016	$195,716	$201,587
SCADA	SCADA Upgrades and Programming ($200K/yr)	$2,000,000	2022	$200,000	$206,000	$212,180	$218,545	$225,102	$231,855	$238,810	$245,975	$253,354	$260,955	$268,783
Retail Meters	Retail Meter Replacements (1,400/year - 725K/yr)	$7,250,000	2022	$725,000	$746,750	$769,153	$792,227	$815,994	$840,474	$865,688	$891,659	$918,408	$945,961	$974,339
HQ Landscaping	Waterwise Landscaping at GHID Office	$700,000	2025				$765,000							
	Sub-Total	***$13,950,000***		***$1,325,000***	***$1,364,750***	***$1,405,693***	***$2,212,863***	***$1,491,299***	***$1,536,038***	***$1,582,119***	***$1,629,583***	***$1,678,470***	***$1,728,824***	***$1,780,689***
Water Conveyance - Rehab & Replacement														
Hydrants/Valves	Replacements (90/year)	$1,500,000	2022	$150,000	$154,500	$159,135	$163,909	$168,826	$173,891	$179,108	$184,481	$190,016	$195,716	$201,587
Recurring In-house Pipeline Replacement	1 mile per year ($125/mile in-house cost)	$6,500,000	2023	$650,000	$669,500	$689,585	$710,273	$731,581	$753,528	$776,134	$799,418	$823,401	$848,103	$873,546
Distribution Pipelines	Redwood Waterline Replacements	$8,250,000	2023		$4,249,000	$4,377,000								
Distribution Pipelines	4100 S: 6000 W to 6400 W	$800,000	2022	$800,000										
Distribution Pipelines	4700 S: 5600 W to 6000 W	$700,000	2022	$700,000										

Site Name	Project Description	Cost Estimate (2022 $s)	Year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	10+
Distribution Pipelines	Rawhide/Cochise/ Blackhawk Replacements	$600,000	2022											
Distribution Pipelines	Hunter Drive/Lake Park	$1,400,000	2022	$1,400,000										
Distribution Pipelines	Westward Terrace/Sundown Replacement	$8,000,000	2025				$6,557,000	$2,252,000						
Distribution Pipelines	Parkcrest Drive and Lake Park Drive	$840,000	2026					$946,000						
Distribution Pipelines	Mockorange Drive and Maple way	$1,730,000	2027						$2,006,000					
Distribution Pipelines	3600 West Parkway Blvd to US - 201	$1,980,000	2027						$2,296,000					
Distribution Pipelines	Scottsdale Drive Area 3100 S to 3293 S	$2,610,000	2028							$3,117,000				
Distribution Pipelines	4100 West 3100 S Area	$1,990,000	2029								$2,448,000			
Distribution Pipelines	Greenmont Drive Area	$5,280,000	2030									$6,689,000		
Distribution Pipelines	Carnegie Tech Area	$2,820,000	2031										$3,680,000	
Distribution Pipelines	Cherry Wood Lane Area	$3,810,000	2031										$4,972,000	
Distribution Pipelines	Pavant Ave Area	$7,440,000	10+											$9,999,000
Distribution Pipelines	Janette Ave Area	$3,290,000	10+											$4,422,000
Distribution Pipelines	Valley View Drive Area	$3,780,000	10+											$5,081,000
Distribution Pipelines	Atlas Way Area	$6,560,000	10+											$8,817,000
Distribution Pipelines	Sunnyvale Drive Area	$3,920,000	10+											$5,269,000
Distribution Pipelines	Palmer Dr Area	$3,130,000	10+											$4,207,000
Distribution Pipelines	West Lake Ave Area	$7,720,000	10+											$10,376,000
Distribution Pipelines	EL Glen Avenue Area	$3,480,000	10+											$4,677,000
Distribution Pipelines	Orleans Way Area	$6,070,000	10+											$8,158,000
Distribution Pipelines	Karma Ave Area	$5,220,000	10+											$7,016,000
Distribution Pipelines	Hunter Drive Area	$1,260,000	10+											$1,694,000
Distribution Pipelines	King Valley Area	$1,400,000	10+											$1,882,000
	Sub-Total	***$102,080,000***		***$3,700,000***	***$5,073,000***	***$5,225,720***	***$7,431,182***	***$4,098,407***	***$5,229,419***	***$4,072,242***	***$3,431,899***	***$7,702,416***	***$9,695,819***	***$72,673,133***

Site Name	Project Description	Cost Estimate (2022 $s)	Year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	10+
Water - Conveyance Capacity Improvements														
Zone 1 Reservoir	ST1 - New Reservoir Construction	$9,350,000	2025				$5,109,000	$5,262,000						
Well No. 12	S1 - Iron/Manganese Removal Facility (w/1&17)	$11,000,000	2022	$9,900,000	$1,133,000									
Well No. 15	S2 - Iron/Manganese Removal Facility	$4,000,000	2027						$4,638,000					
Well No. 16	S3 - Iron/Manganese Removal Facility	$4,000,000	2024			$4,244,000								
Well No. 18	S4 - Drill New Well	$2,000,000	2026					$2,252,000						
Well No. 18	S5 - Well House Construction	$2,750,000	2027						$3,189,000					
Well No. 18	S6 – Iron/Manganese Removal Facility (Possibly with S3)	$4,000,000	2024			$4,244,000								
Distribution Pipelines	P1 - Parkway Blvd / Bangerter Hwy	$1,270,000	2025				$1,388,000							
Distribution Pipelines	P2 - 3600 W/2400 S: Outside of Ridgeland PS	$560,000	2024			$595,000								
Distribution Pipelines	P3 - 3600 W/4400 S: Southeast portion of Zone 3E	$30,000	2023		$31,000									
Distribution Pipelines	P4 - 500 W/4700 S: JV #50	$1,320,000	2029								$1,624,000			
Distribution Pipelines	P5 - 4800 W/4415 S: Tank Farm to Zone 2	$200,000	2027						$232,000					
Distribution Pipelines	P6 - 4800 W/4415 S: Tank Farm to Zone 4	$12,110,000	10+											$16,275,000
Distribution Pipelines	P7 - Upsize 4" mains (2,000 LF/yr)	$6,300,000	2027						$730,343	$752,253	$774,821	$798,065	$822,007	$4,234,000
	Sub-Total	***$58,890,000***		***$9,900,000***	***$1,164,000***	***$9,083,000***	***$6,497,000***	***$7,514,000***	***$8,789,343***	***$752,253***	***$2,398,821***	***$798,065***	***$822,007***	***$20,509,000***
	TOTAL	**$206,420,000**		**$19,775,000**	**$11,850,750**	**$19,163,413**	**$16,524,045**	**$13,441,706**	**$17,294,800**	**$8,020,614**	**$12,349,302**	**$14,899,952**	**$12,638,650**	**$100,742,822**

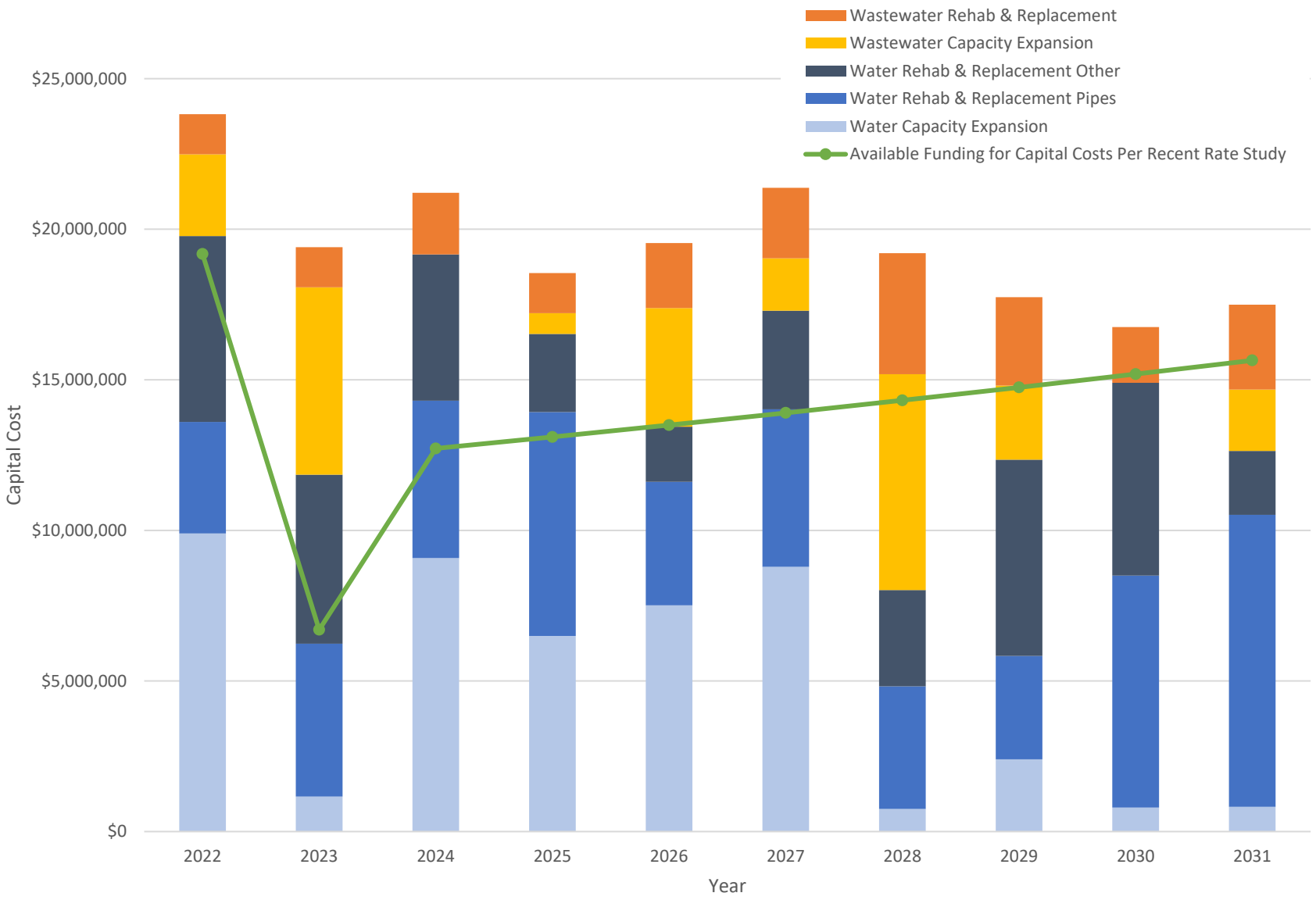


Figure 10-1 10-Year Revenue and Expenditures

A few conclusions can be made based on Table 10-1 and Figure 10-1:

- **Short term Level of Funding –** As shown in Figure 10-1, the recommended projects identified in this plan are estimated to cost more than the funding that is projected to be available based on the District's most recent rate study. This can largely be explained by recent observed inflation rates and contractor availability that are driving up the cost of projects. It also likely reflects greater than average immediate needs that have resulted from projects being deferred in the past. Additional funding through bonding or increased rates (or a combination of both) will be necessary to cover costs for the needed short-term projects. The District should maintain a close eye on market conditions to plan for both short- and long-term pricing changes.
- **Long-term Level of Funding –** While the District's historic level of funding for capital projects may have been adequate in the past, a healthy increase in investment is projected to be needed in the future. As the service area ages and more pipes begin to reach the end of their expected life, it will be important that funding levels related specifically to rehabilitation and replacement increase and be a priority for the District. The District's recent rate study identified increases in funding to bring the District more in line with expected needs, however, recent inflation means that rates will likely need to increase even more to sustainably fund long-term needs.

RECOMMENDATIONS

Based on the analysis contained in this report and the conclusions above, the following actions are recommended:

- **Adopt the Proposed Implementation Plan –** The 10-year capital improvement plan summarized in Table 10-1 represents the best available assessment of District capital needs in the upcoming years. It is recommended that this plan be adopted for budgeting, staffing, rate making and impact fee calculation purposes.
- **Update the Rate Plan to Match the Implementation Plan –** While the District's recent rate study identified increases in funding to bring the District more in line with expected needs, recent inflation means that rates need to increase even more to sustainably fund the proposed implementation plan. The District should relook at its rates and consider additional bonding options to complete the projects identified in the implementation plan.
- **Develop a Plan for Project Completion –** In addition to having adequate funding to complete the needed projects in upcoming years, the District will also need to make sure it has adequate help to manage and execute the needed projects. There may be too many capital projects for the District's existing staff to manage. It is recommended that the District identify a plan for increasing its capacity in this regard, either through the acquisition of additional staff or securing assistance from a consultant.
- **Update this Water Master Plan Regularly –** This water master plan should be viewed as a living document. The conclusions contained herein are based on several assumptions that will assuredly change from time to time. Examples of this include assumptions associated with development patterns, regulatory requirements, economic conditions, inflation, etc. As changes occur in these areas, the conclusions and recommendations in this report may need to be revised. For this reason, it is recommended that this report be updated on a regular basis. This should be at least once every 5 years and more often if necessitated by a major change in the District (e.g. major new regulatory requirement, annexation of a new area, etc).

APPENDIX A

TANK FARM EVALUATION

APPENDIX A

TANK FARM EVALUATION

MEMORANDUM

DATE: May 2, 2019
TO: Todd Marti, P.E.
Granger Hunter Improvement District
2888 South 3600 West
West Valley City, Utah 84119

FROM: Marv E Allen, P.E.
Michael M. Chambers, P.E.
Hansen, Allen & Luce, Inc. (HAL)
859 West So. Jordan Pkwy – Suite 200
South Jordan, Utah 84095

SUBJECT: Tank Farm Evaluation Study

PROJECT NO.: 019.50.100

BACKGROUND

Granger-Hunter Improvement District (GHID) has two drinking water storage tanks, a 1 MG and 2 MG capacity, located at their Tank Farm at approximately 4404 South and 4800 West in West Valley City. Jordan Valley Water Conservancy District (JVWCD) also owns four tanks at this site that supply the GHID Tank Farm and provides operational storage for JVWCD's booster pump station at the site. Figure 1 shows the existing Tank Farm site layout. The GHID tanks and the JVWCD Tanks are constructed at the same elevation. There are currently no controls between the JVWCD and GHID tanks, thus all of the tanks operate in parallel. This parallel operation results in little fluctuation in the GHID tanks, resulting in GHID peaking off of the JVWCD system instead of allowing their own tanks to provide equalization storage that would eliminate this peaking. GHID also owns and operates the Kent Booster Pump Station at the Tank Farm site. This booster pump station currently has four (4) 100 HP pumps which boost water into Pressure Zone 2 and Zone 3. The suction for the booster pump station is from the GHID tanks located at the Tank Farm.

GHID contracted with Hansen, Allen & Luce, Inc. (HAL) to evaluate alternatives for modifying the current tank arrangement that would allow them to more effectively utilize their tanks for their intended purpose, and to minimize peaking off of the JVWCD system.

In addition, an energy efficiency study completed by HAL for the District identified potential modifications to the combined GHID and JVWCD systems that would allow for a more efficient operation for both systems. Some of these potential modifications include:

1. The pressure head from the JVWCD 24-inch diameter supply pipeline is sufficient to directly serve GHID Pressure Zone 3. Currently, the pressure head is dissipated in the tanks, then pumped back out of the tanks to the required pressure head for Pressure Zone 2 and Pressure Zone 3 via the Kent Booster Pump Station. The JVWCD pressure head is not quite sufficient to serve Pressure Zone 2. But if the pressure were preserved, and supplied to the booster pump suction header for Pressure Zone 2 at a higher head, the total energy required to serve Pressure Zone 2 could be significantly reduced. Again, if

the water is taken from the JVWCD prior to dissipating the head and used to serve Zone 3 directly, then pumping into Pressure Zone 3 can be eliminated entirely. These modifications could qualify for Rocky Mountain Power incentives for GHID.

2. All of the tank storage could be used to serve Pressure Zone 4.

In addition to reviewing alternatives for better utilization of the Tank Farm, GHID requested HAL review other alternatives for energy savings and identify projects, costs and timing for those projects, versus the amount of money GHID would save in implementation of these alternatives.

In the process of evaluating the above referenced alternatives, which will require modifications to the existing Kent Booster Pumping Station, GHID requested that HAL evaluate replacement of the booster pumping station with a new pumping station.

ALTERNATIVES

HAL developed several potential alternatives for improving water service, storage, and energy savings at the existing Tank Farm in coordination with GHID and JVWCD. Based on these discussions, four alternatives were identified for further evaluation. The four alternatives evaluated are described as follows:

1. Operate all tanks in GHID favor to allow for fluctuations in all of the tanks. This would require a flow control valve upstream from all of the tanks on the JVWCD 24-inch pipeline. Figure 2 shows the proposed location of the flow control valve.
2. GHID to purchase one or both of the 5 MG tanks from JVWCD and operate all tanks in GHID favor to allow for fluctuations in all of the tanks. This would also require a flow control valve upstream from all of the tanks on the JVWCD 24-inch pipeline.
3. Place a control valve between the GHID tanks and the JVWCD tanks with a time control for inflow into the GHID tanks. This would allow GHID to peak off of their tanks and to fill the tanks during off-peak times. Figure 3 shows the locations of the control valves required for this alternative.
4. To allow for the energy savings option of using the JVWCD head prior to wasting it into the tanks, install a combination flow control/pressure sustaining valve in the JVWCD 24-inch pipeline upstream from all of the tanks. Piping would need to be constructed on site to tap the upstream JVWCD pressure and convey the water directly into the Pressure Zone 3 piping downstream from the Kent Booster Pumping Station and also convey flow into the Kent Booster Pumping Station to new lower head Pressure Zone 2 pumps. A connection would also be provided from the tanks with pumps for Zone 2 and Zone 3 as a back-up supply. This alternative also includes the option of purchasing one or both of the tanks from JVWCD. Figure 4 shows the location of the flow control/pressure sustaining valve and new piping required for Alternative 4.

Each alternative was modelled with the existing system hydraulic model to determine sizing and pressure. However, initial model results showed that the additional storage capacity gained by purchasing the tanks from JVWCD could not be fully utilized due to size limitations of the existing GHID transmission pipelines to Pressure Zone 4.

HAL revised the hydraulic model to include required changes to the transmission pipes from the tank to the service areas in Pressure Zone 4. The sizes and lengths of the required new piping varied depending on whether the District purchased one or both of the JVWCD 5 MG tanks. Figure 5 shows the proposed piping if the District purchased one tank and Figure 6 shows the piping required if the District purchased both of the JVWCD tanks.

Conceptual Level Cost Estimates

Conceptual level cost estimates for the construction of each of the four alternatives were prepared. Table 1 below shows a summary of conceptual level costs based in current 2019 dollars. More detailed costs are shown in Appendix A.

Table 1 – Conceptual Level Cost Estimates

Alternative	Estimated Costs (2019 dollars)
Alternative 1 Includes construction of new 16'x16' CIP vault, piping, flow control valve, and SCADA	$480,050
Alternative 2 Option 1 – Includes flow control valve with PSV, misc. valves and piping, purchase JVWCD East 5 MG tank, 8700 feet of 36" pipe, 2700 feet of 24" pipe, 1100 feet of 16" pipe, and 6900 feet of 12" pipe	$11,858,190
Option 2 – Includes flow control valve with PSV, misc. valves and piping, purchase both JVWCD 5 MG tanks, 8700 feet of 48" pipe, 10,700 feet of 24" pipe, 5800 feet of 16" pipe, and 4900 feet of 12" pipe	$20,180,425
Alternative 3 Includes two 8'x8' precast concrete vaults, electrically activated valves, and SCADA	$178,050
Alternative 4 Option 1 – Includes JVWCD flow meter station, control valve, misc. valves and piping, SCADA, new 750 HP pump station, demolish old pump station, purchase JVWCD east 5 MG tank, 8,700 feet of 36" pipe, 2,700 feet of 24" pipe, 1,100 feet of 16" pipe, and 6,900 feet of 12" pipe	$15,488,766
Option 2 - Includes JVWCD flow meter station, control valve, misc. valves and piping, SCADA, new 750 HP pump station, demolish old pump station, purchase JVWCD of both 5 MG tanks, 8,700 feet of 48" pipe, 10,700 feet of 24" pipe, 5,800 feet of 16" pipe, and 4,900 feet of 12" pipe	$23,654,286
Note: Cost estimates include 35% construction contingency and 18% for Engineering, Administrative, and Legal fees.	

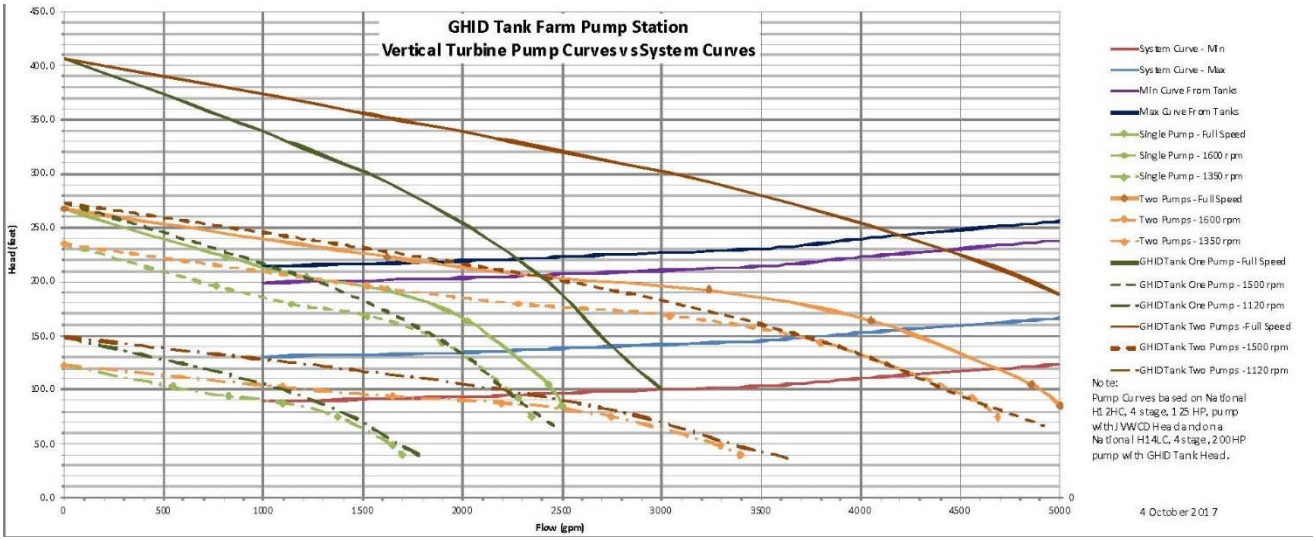
Pump Station Design Criteria

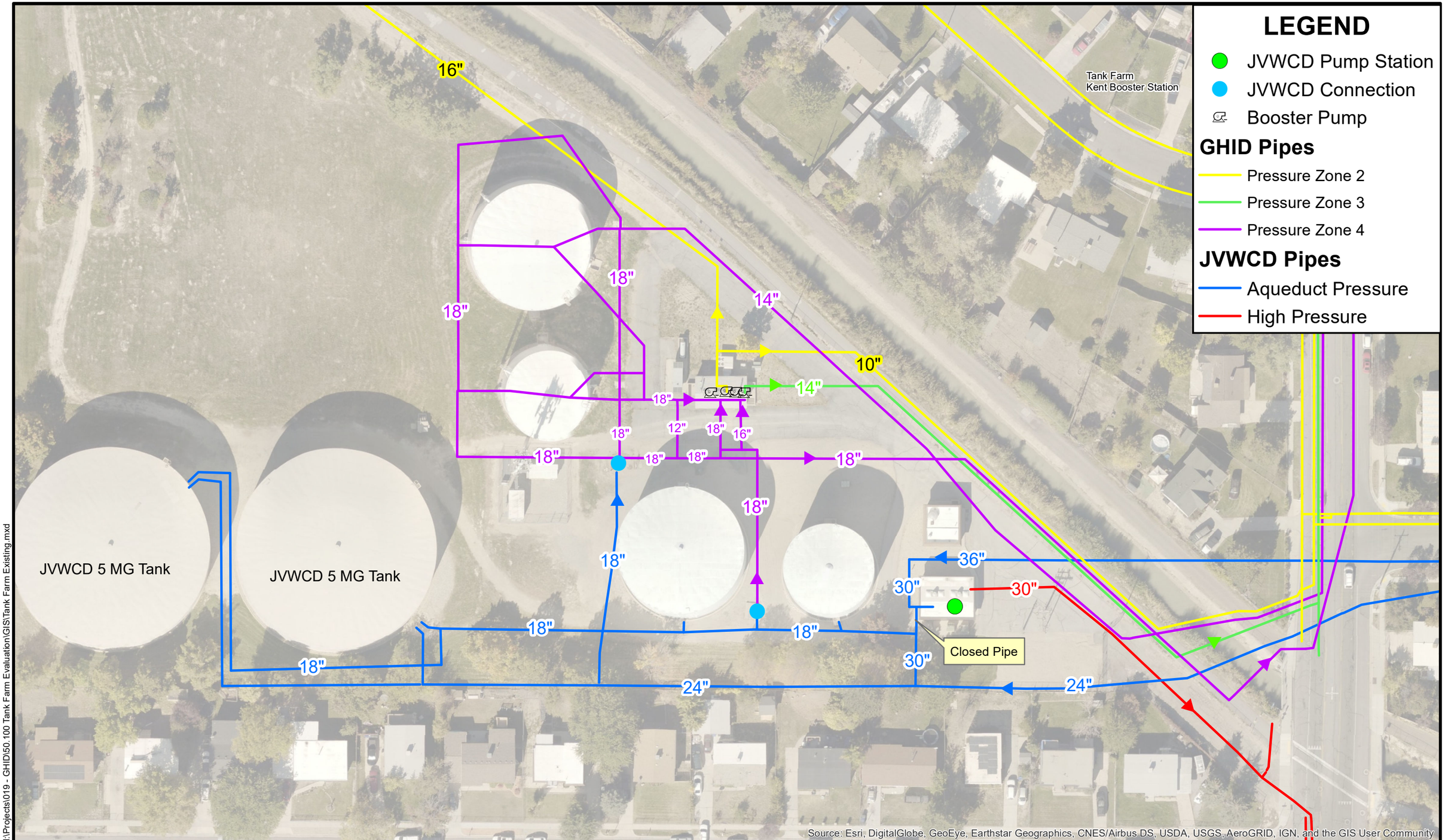
Preliminary design criteria was determined for the pump station identified in Alternative 4 above. The new pump station would be constructed adjacent to the existing pump station. The existing pump station would be demolished after the new pump station is operational. Drawing C-1 (attached) shows the proposed layout for pump station and piping. The new pump station is proposed to be designed based on the following criteria based for full build-out demands:

- Zone 2 High Suction Pressure Pumps
  - Q = 2,025 gpm; TDH = 160 feet; 125 HP
- Zone 2 Low Suction Pressure Pumps
  - Q = 2,025 gpm; TDH = 245 feet; 200 HP
- Zone 3 Low Suction Pressure Pumps
  - Q = 1,875 gpm; TDH = 95 feet; 60 HP
- High Suction Pressure Inlet Pipe = 20-inch Diameter
- Low Suction Pressure Inlet Pipe = 24-inch Diameter

The pump curves vs. system curves for the Zone 2 pumps is shown in Figure 1.

Figure 1 – Zone 2 Pump Curves vs System Curves





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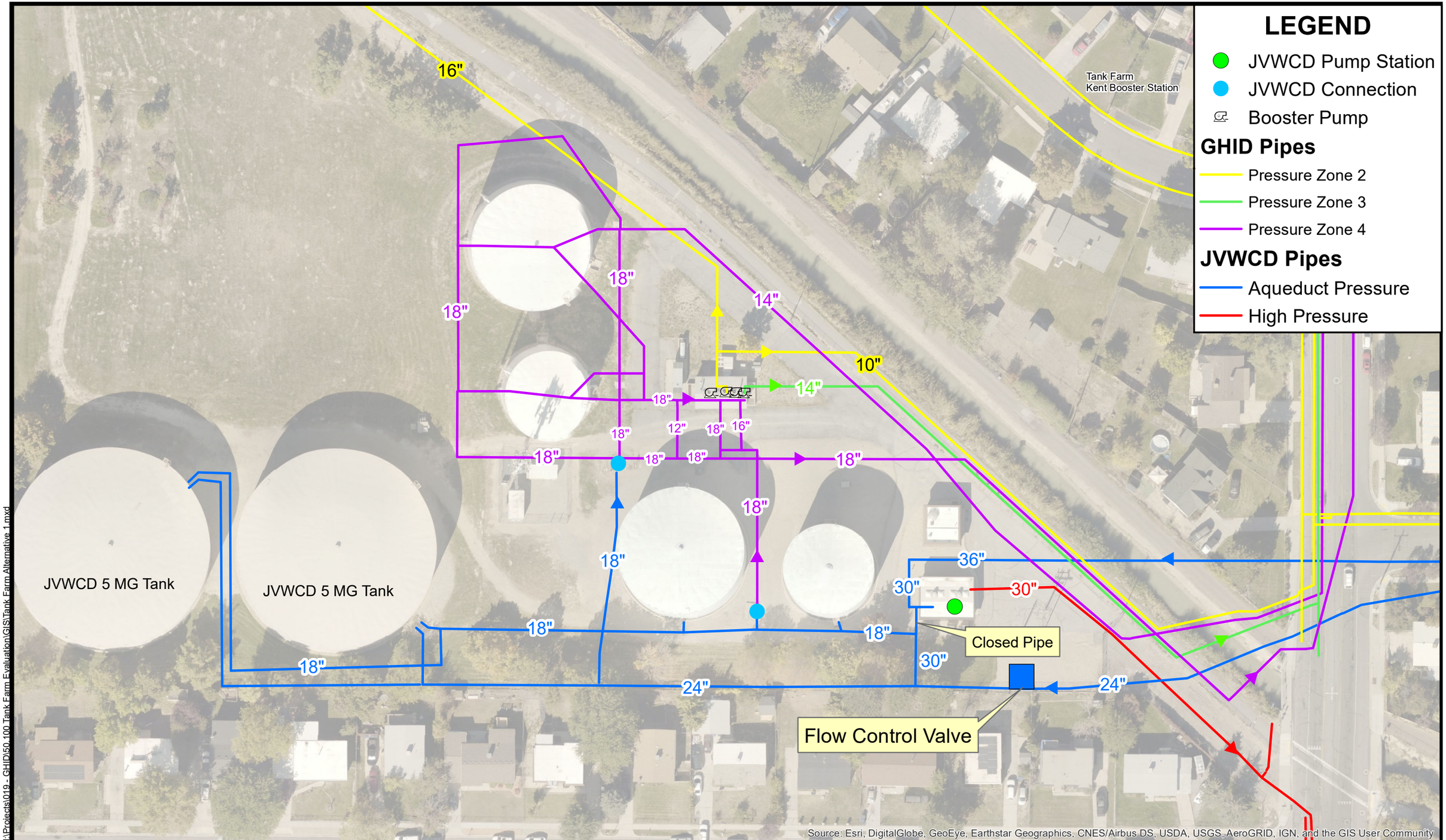
HANSEN ALLEN & LUCE INC ENGINEERS

478

GRANGER-HUNTER IMPROVEMENT DISTRICT

EXISTING TANK FARM

FIGURE 1



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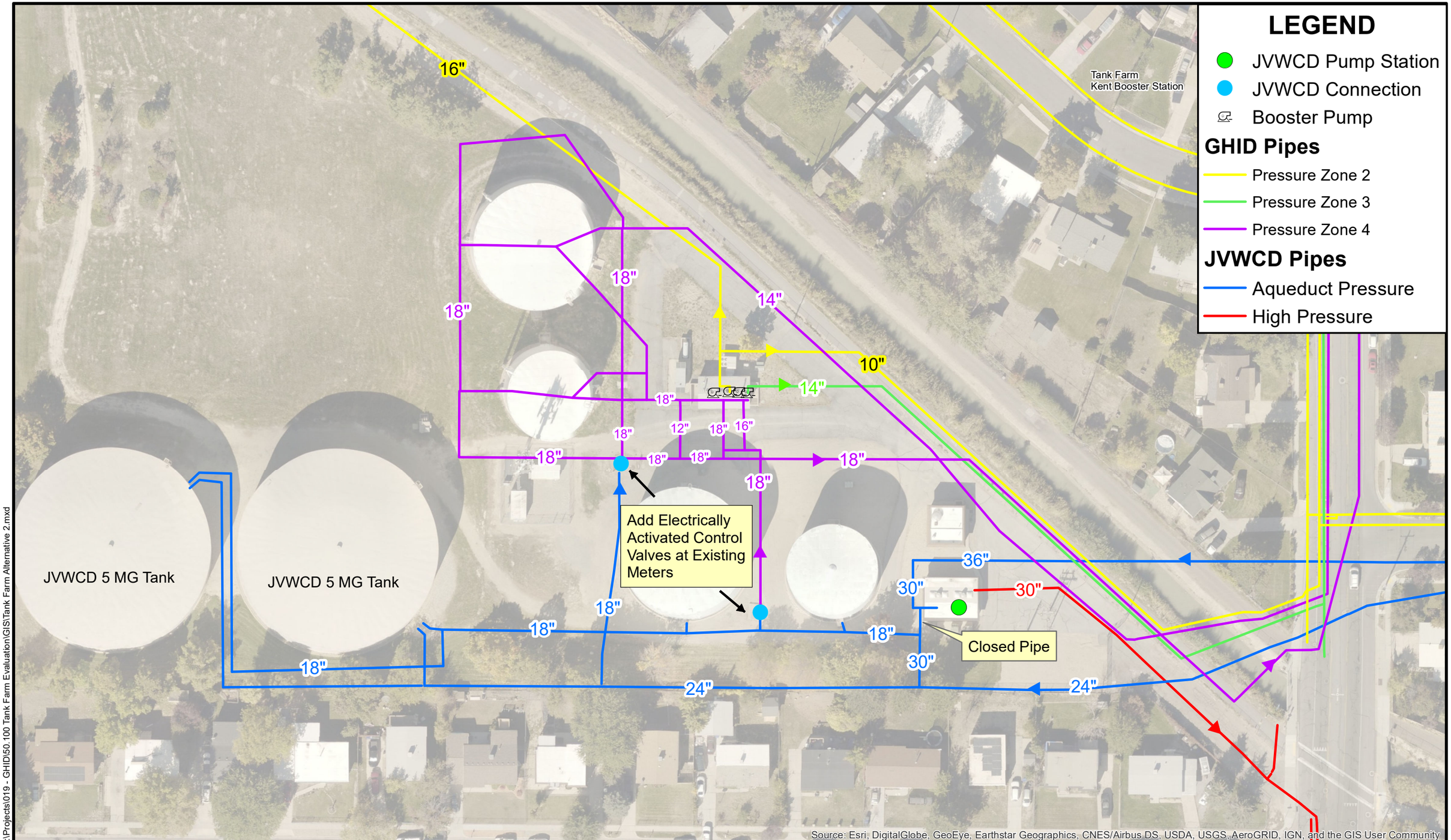
GRANGER-HUNTER IMPROVEMENT DISTRICT

TANK FARM ALTERNATIVE 1
FLOW CONTROL VALVE ON JVWCD 24" PIPELINE

FIGURE 2



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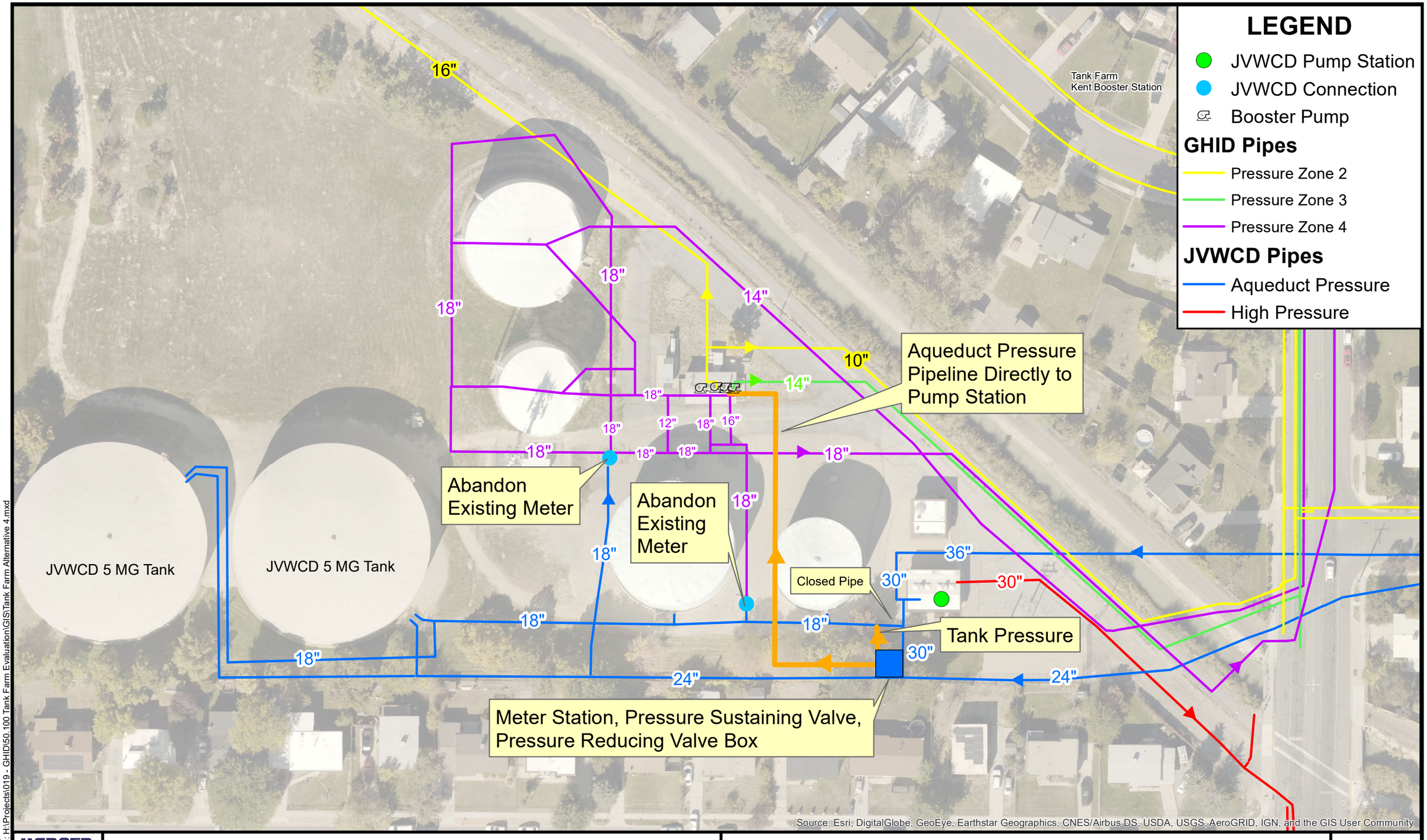
GRANGER-HUNTER IMPROVEMENT DISTRICT

TANK FARM ALTERNATIVE 3
ELECTRICALLY ACTIVATED CONTROL VALVES

FIGURE
3



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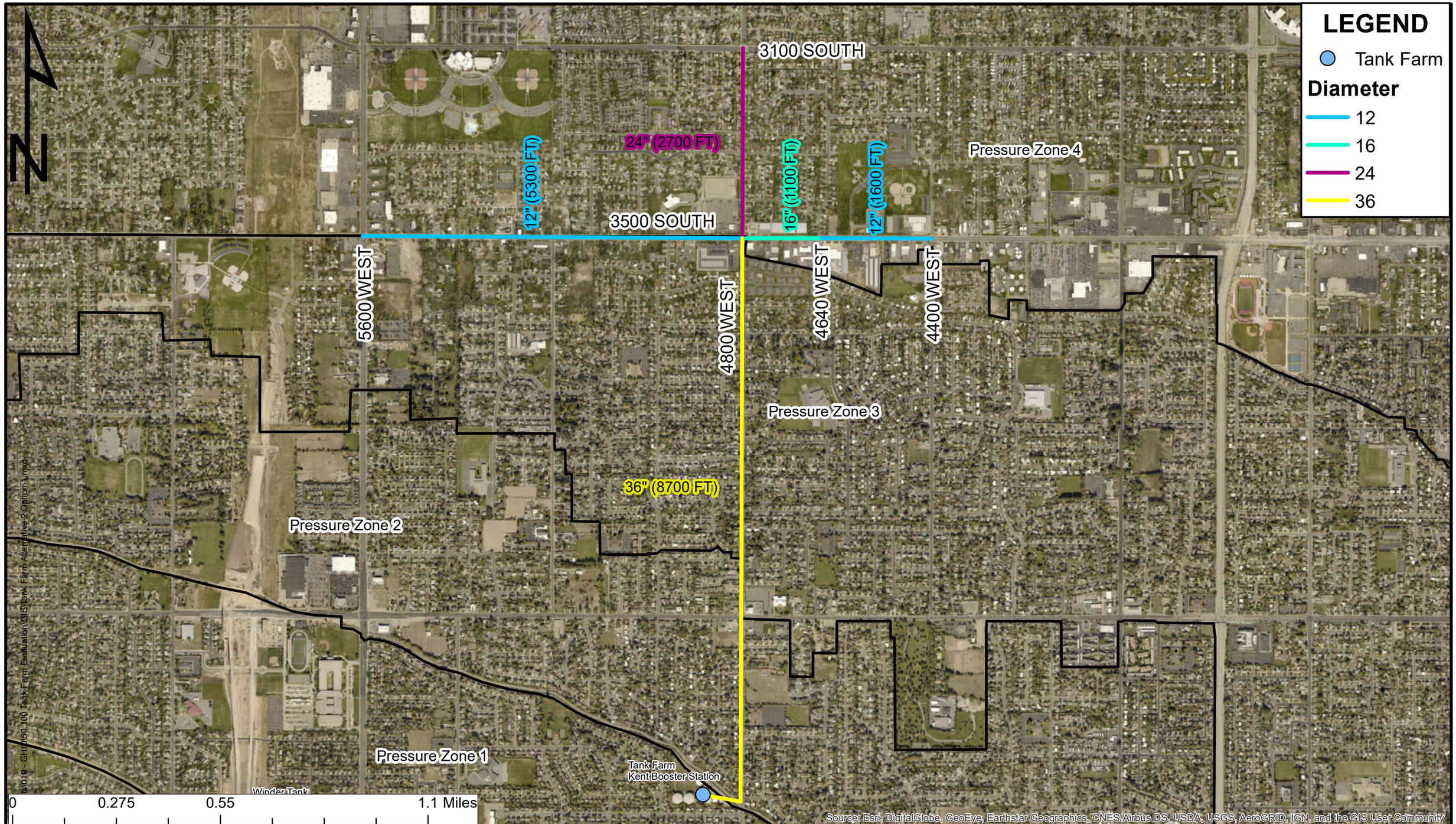
GRANGER-HUNTER IMPROVEMENT DISTRICT

TANK FARM ALTERNATIVE 4
PRESSURE SUSTAINING/REDUCING METER STATION

FIGURE
4



Date: 4/26/2019
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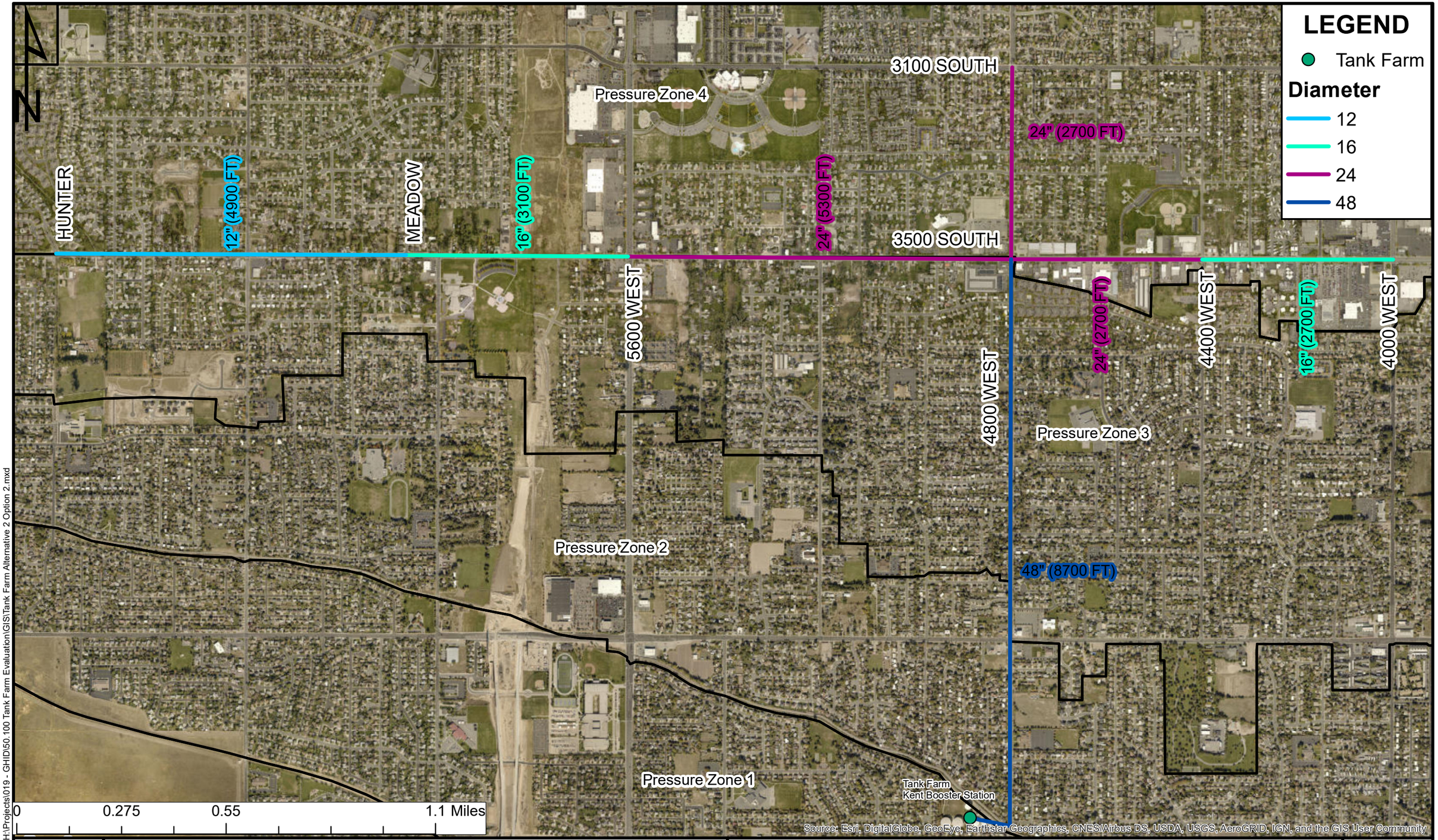
HANSEN ALLEN & LUCE INC
ENGINEERS

GRANGER-HUNTER IMPROVEMENT DISTRICT

TANK FARM ALTERNATIVE 2 OPTION 1
ONE JVWCD 5 MG TANKS TRANSMISSION PIPING

FIGURE
5



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HANSEN ALLEN & LUCE INC ENGINEERS

GRANGER-HUNTER IMPROVEMENT DISTRICT

TANK FARM ALTERNATIVE 2 OPTION 2
TWO JVWCD 5 MG TANKS TRANSMISSION PIPING

FIGURE 6

N

0 30 60
SCALE IN FEET

NEW GHID PUMP STATION

PUMP ID	TDH (FT)	FLOW (GPM)	HP
P-201	160	2,025	125
P-202	160	2,025	125
P-203	245	2,025	200
P-204	245	2,025	200
P-301	80	1,875	60
P-302	80	1,875	60

24" RCP DRAIN
GHID 2 MG TANK
GHID 1 MG TANK
14" PRESSURE PIPE FOR ZONE 4
EXISTING CHAIN LINK FENCE
18" OUTLET
NEW 16" DIP
18" FILL PIPE (TO REMAIN)
NEW 18" DIP
EXISTING GHID PUMP STATION
DRAIN
NEW GHID PUMP STATION
PP
10" PRESSURE PIPE FOR ZONE 2
UTAH AND SALT LAKE CANAL
NEW 14" DIP
NEW 24" BUTTERFLY VALVE AND 24" X 20" REDUCER
NEW 24" LOW PRESSURE SUCTION FOR ZONE 3 PUMPS
NEW 20" WSP
DRAIN
NEW 18" BUTTERFLY VALVE
NEW 14" C900 PVC
NEW 14" BUTTERFLY VALVE
NEW 24" WSP (HIGH HEAD SUCTION)
18" SUCTION PIPE (TO REMAIN)
JVWCD 5 MG TANK
JVWCD 5 MG TANK
JVWCD 2 MG TANK
JVWCD 1 MG TANK
JVWCD
14" PRESSURE PIPE FOR ZONE 3
18" PRESSURE PIPE FOR ZONE 4
18" FILL P;IPE (TO REMAIN)
JVWCD
EXISTING JVWCD PUMP STATION
NEW 24" DIP
NEW 24" DIP
NEW PRESSURE SUSTAINING/REDUCING METER STATION
18" SUCTION PIPE (TO REMAIN)
24" FILL PIPE (TO REMAIN)
4800 WEST
CHERRYWOOD LANE (4415 SOUTH)
4458
4460
4462
4464
4466

PROGRESS PRINT
4.30.2019
DATE
Not to be used for construction
Hansen, Allen, & Luce, Inc.
Consultants/Engineers

FILE NAME: PROJECTS\019 - GHID\50.100 TANK FARM EVALUATION\CAD\WORKING\C-1 SITE-PLAN.DWG
FILE DATE: 4-30-2019 14:50:41 (BKC)

HANSEN ALLEN & LUCE ENGINEERS	PROJECT ENGINEER	DESIGNED MMC	3					SCALE AS SHOWN	TANK FARM EVALUATION CIVIL SITE PLAN
		DRAFTED JRB	2						
		CHECKED MEA	1						
		DATE OCTOBER 2017	NO.	DATE	REVISIONS	BY	APVD.		

Granger-Hunter Improvement District

SHEET C-1
019.50.100

10/07

APPENDIX A

Granger Hunter Improvement District
Tank Farm Evaluation Study
Conceptual Level Opinion of Probable Construction Costs (2019)

Alternative 1 - Flow Control Valve on JVWCD 24-inch Pipeline

Description	Unit	Quantity	Unit Cost	Total Cost
Temp Construction Fence Rental (12 month)	LF	200	$ 7.25	$ 1,450.00
Asphalt Demolition	SY	100	$ 7.00	$ 696.89
Demolition Dump Fees	Ton	22	$ 80.00	$ 1,790.21
Dewatering	DAY	30	$ 1,050.00	$ 31,500.00
Excavation	CY	180	$ 3.00	$ 540.00
Hauling Off-Site	CY	180	$ 8.50	$ 1,530.00
Concrete Mat Foundation	CY	8.2	$ 550.00	$ 4,501.85
Concrete Walls	CY	13.8	$ 750.00	$ 10,369.96
Concrete Roof Deck	CY	7.9	$ 900.00	$ 7,110.83
8" Inlet Vent	LS	1.0	$ 3,500.00	$ 3,500.00
8" Exhaust Vent with Fan	LS	1.0	$ 4,500.00	$ 4,500.00
36"x36" Roof Hatch	EA	2.0	$ 4,000.00	$ 8,000.00
30"x30" Roof Hatch	EA	1	$ 3,500.00	$ 3,500.00
Access Ladder	EA	1	$ 575.00	$ 575.00
24" Dismantling Joint	EA	1	$ 5,900.00	$ 5,900.00
24" Butterfly Valve	EA	1	$ 9,500.00	$ 9,500.00
24" x 18" Steel Reducing Tee	EA	2	$ 8,500.00	$ 17,000.00
18" Butterfly Valve	EA	2	$ 6,500.00	$ 13,000.00
18" Dismantling Joints	EA	1	$ 3,200.00	$ 3,200.00
18" Mag Meter	EA	1	$ 14,000.00	$ 14,000.00
18" Flow Control Valve	EA	1	$ 38,000.00	$ 38,000.00
18" Steel Pipe	LF	44	$ 250.00	$ 11,000.00
SCADA and Controls	LS	1	$ 60,000.00	$ 60,000.00
Backfill	CY	123	$ 2.50	$ 307.78
Compaction	CY	123	$ 0.50	$ 61.56
Import Backfill Material	CY	123	$ 27.00	$ 3,324.00
Asphalt Restoration	SY	78	$ 35.00	$ 2,737.78
SWPPP	LS	1	$ 5,500.00	$ 5,500.00
Surveying	LS	1	$ 2,750.00	$ 2,750.00
Materials Testing	LS	1	$ 5,500.00	$ 5,500.00
Mobilization	LS	1	$ 30,000.00	$ 30,000.00

Sub-Total Construction	$	301,345.84
Contingency @ 35%	$	105,471.04
Total Construction	**$**	**406,816.89**
Engineering, Admin, & Legal Fees @ 18%	$	73,227.04
TOTAL ALTERNATIVE COSTS	**$**	**480,043.93**
Range (-10%)	$	432,000
Range (+50%)	$	721,000

Granger Hunter Improvement District
Tank Farm Evaluation Study
Conceptual Level Opinion of Probable Construction Costs (2019)

Alternative 2 - Tank Option 1

Description	Unit	Quantity	Unit Cost	Total Cost
Flow Control Valve with PSV	LS	1	$ 250,000.00	$ 250,000.00
18" Butterfly Valve	EA	2	$ 6,500.00	$ 13,000.00
Cutout Section of 18" Pipe	LS	1	$ 1,685.00	$ 1,685.00
18"x18"x18" Tee	EA	1	$ 3,650.00	$ 3,650.00
18" MJ Solid Sleeve	EA	1	$ 1,800.00	$ 1,800.00
24" Butterfly Valve	EA	3	$ 13,000.00	$ 39,000.00
24"x24"x24" Steel Tee and Connection	EA	1	$ 42,000.00	$ 42,000.00
30" Steel Pipe	LF	40	$ 370.00	$ 14,800.00
24" x 30" Steel Reducer	EA	2	$ 6,000.00	$ 12,000.00
18" x 30" Steel Reducer	EA	1	$ 5,350.00	$ 5,350.00
SCADA and Controls	LS	1	$ 28,000.00	$ 28,000.00
36" Pipe from Tank Farm to 3500 South	LF	8700	$ 438.00	$ 3,810,600.00
12" Pipe 3500 South from 4800 W to 5600 W	LF	5300	$ 135.00	$ 715,500.00
24" Pipe 4800 West from 3500 S to 3100 S	LF	2700	$ 235.00	$ 634,500.00
16" Pipe 3500 South from 4800 W to 4640 W	LF	1100	$ 152.00	$ 167,200.00
12" Pipe 3500 South from 4640 W to 4400 W	LF	1600	$ 135.00	$ 216,000.00
Purchase East 5 MG Tank from JVWCD	LS	1	$ 1,075,000.00	$ 1,075,000.00
SWPPP	LS	1	$ 5,500.00	$ 5,500.00
Surveying	LS	1	$ 2,750.00	$ 2,750.00
Materials Testing	LS	1	$ 5,600.00	$ 5,600.00
Mobilization	LS	1	$ 400,000.00	$ 400,000.00

Sub-Total Construction	$	7,443,935.00
Contingency @ 35%	$	2,605,377.25
Total Construction	**$**	**10,049,312.25**
Engineering, Admin, & Legal Fees @ 18%	$	1,808,876.21
TOTAL ALTERNATIVE COSTS	**$**	**11,858,188.46**
Range (0%)	$	11,858,000
Range (+50%)	$	17,788,000

Granger Hunter Improvement District
Tank Farm Evaluation Study
Conceptual Level Opinion of Probable Construction Costs (2019)

Alternative 2 - Tank Option 2

Description	Unit	Quantity	Unit Cost	Total Cost
Flow Control Valve with PSV	LS	1	$ 250,000.00	$ 250,000.00
18" Butterfly Valve	EA	2	$ 6,500.00	$ 13,000.00
Cutout Section of 18" Pipe	LS	1	$ 1,685.00	$ 1,685.00
18"x18"x18" Tee	EA	1	$ 3,650.00	$ 3,650.00
18" MJ Solid Sleeve	EA	1	$ 1,800.00	$ 1,800.00
24" Butterfly Valve	EA	3	$ 13,000.00	$ 39,000.00
24"x24"x24" Steel Tee and Connection	EA	1	$ 42,000.00	$ 42,000.00
36" Steel Pipe	LF	40	$ 370.00	$ 14,800.00
24" x 36" Steel Reducer	EA	2	$ 5,834.40	$ 11,668.80
18" x 36" Steel Reducer	EA	1	$ 5,284.40	$ 5,284.40
SCADA and Controls	LS	1	$ 28,000.00	$ 28,000.00
48" Pipe from Tank Farm to 3500 South	LF	8700	$ 590.00	$ 5,133,000.00
24" Pipe 3500 South from 4800 W to 5600 W	LF	5300	$ 235.00	$ 1,245,500.00
16" Pipe 3500 S from 5600 W to Meadow	LF	3100	$ 152.00	$ 471,200.00
12" Pipe 3500 S from Meadow to Hunter	LF	4900	$ 135.00	$ 661,500.00
24" Pipe 4800 W from 3500 S to 3100 S	LF	2700	$ 235.00	$ 634,500.00
24" Pipe 3500 South from 4800 W to 4400 W	LF	2700	$ 235.00	$ 634,500.00
16" Pipe 3500 South from 4400 W to 4000 W	LF	2700	$ 152.00	$ 410,400.00
Purchase East 5 MG Tank from JVWCD	LS	1	$ 1,075,000.00	$ 1,075,000.00
Purchase West 5 MG Tank from JVWCD	LS	1	$ 1,229,200.00	$ 1,229,200.00
SWPPP	LS	1	$ 5,000.00	$ 5,000.00
Surveying	LS	1	$ 2,500.00	$ 2,500.00
Materials Testing	LS	1	$ 5,000.00	$ 5,000.00
Mobilization	LS	1	$ 750,000.00	$ 750,000.00

Sub-Total Construction	$	12,668,188.20
Contingency @ 35%	$	4,433,865.87
Total Construction	**$**	**17,102,054.07**
Engineering, Admin, & Legal Fees @ 18%	$	3,078,369.73
TOTAL ALTERNATIVE COSTS	**$**	**20,180,423.80**
Range (0%)	$	20,180,000
Range (+50%)	$	30,271,000

Granger Hunter Improvement District
Tank Farm Evaluation Study
Conceptual Level Opinion of Probable Construction Costs (2019)

Alternative 3 - Electrically Activated Control Valves

Description	Unit	Quantity		Unit Cost		Total Cost
18" Butterfly Valve	EA	2	$	6,500.00	$	13,000.00
Electric Valve Actuator	EA	2	$	9,500.00	$	19,000.00
8 ft x 8 ft Precast Concrete Vault	EA	2	$	12,000.00	$	24,000.00
Cutout Section of 18" Pipe	LS	2	$	1,685.00	$	3,370.00
18" Restrained FCA	LS	2	$	2,700.00	$	5,400.00
SCADA and Controls	LS	1	$	35,000.00	$	35,000.00
Mobilization	LS	1	$	12,000.00	$	12,000.00

Sub-Total Construction	$	111,770.00
Contingency @ 35%	$	39,119.50
Total Construction	**$**	**150,889.50**
Engineering, Admin, & Legal Fees @ 18%	$	27,160.11
TOTAL ALTERNATIVE COSTS	**$**	**178,049.61**
Range (0%)	$	178,000
Range (+50%)	$	268,000

Granger Hunter Improvement District
Tank Farm Evaluation Study
Conceptual Level Opinion of Probable Construction Costs (2019)

Alternative 4 - Pressure Sustaining/Reducing Meter Station and New Pump Station and Tank Option 1

Description	Unit	Quantity	Unit Cost	Total Cost
Typical JVWCD Meter Station with PSV/PRV	LS	1	$ 225,000.00	$ 225,000.00
24" Control Valve and Insertion Meter	EA	1	$ 90,000.00	$ 90,000.00
24" Butterfly Valve	EA	3	$ 13,000.00	$ 39,000.00
24" DI Pipe	LF	300	$ 235.00	$ 70,500.00
30"x30"x24" Steel Tee and Connection	LS	1	$ 49,250.00	$ 49,250.00
24" DI 90 Degree Bend	EA	3	$ 11,350.00	$ 34,050.00
24"x24"x24" Steel Tee and Connection	EA	1	$ 42,000.00	$ 42,000.00
24" DI Pipe Joint Restraints	EA	8	$ 900.00	$ 7,200.00
Meter Vault SCADA and Controls	LS	1	$ 28,000.00	$ 28,000.00
Pump Station	HP	770	$ 2,500.00	$ 1,925,000.00
Demolish Existing Pump Station	LS	1	$ 56,000.00	$ 56,000.00
24" DI Pipe (Pump Low Head Suction)	LF	140	$ 235.00	$ 32,900.00
14" DI Pipe (Pump Discharge)	LF	35	$ 126.00	$ 4,410.00
Asphalt Restoration	SY	27	$ 34.00	$ 906.67
36" Pipe from Tank Farm to 3500 South	LF	8700	$ 438.00	$ 3,810,600.00
12" Pipe 3500 South from 4800 W to 5600 W	LF	5300	$ 135.00	$ 715,500.00
24" Pipe 4800 West from 3500 S to 3100 S	LF	2700	$ 235.00	$ 634,500.00
16" Pipe 3500 South from 4800 W to 4640 W	LF	1100	$ 152.00	$ 167,200.00
12" Pipe 3500 South from 4640 W to 4400 W	LF	1600	$ 135.00	$ 216,000.00
Purchase East 5 MG Tank from JVWCD	LS	1	$ 1,075,000.00	$ 1,075,000.00
Mobilization	LS	1	$ 500,000.00	$ 500,000.00

Sub-Total Construction	$	9,723,016.67
Contingency @ 35%	$	3,403,055.83
Total Construction	**$**	**13,126,072.50**
Engineering, Admin, & Legal Fees @ 18%	$	2,362,693.05
TOTAL ALTERNATIVE COSTS	**$**	**15,488,765.55**
Range (0%)	$	15,488,000
Range (+50%)	$	23,234,000

Granger Hunter Improvement District
Tank Farm Evaluation Study
Conceptual Level Opinion of Probable Construction Costs (2019)

Alternative 4 - Pressure Sustaining/Reducing Meter Station and New Pump Station and Tank Option 2

Description	Unit	Quantity	Unit Cost	Total Cost
Typical JVWCD Meter Station with PSV/PRV	LS	1	$ 225,000.00	$ 225,000.00
24" Control Valve and Insertion Meter	EA	1	$ 90,000.00	$ 90,000.00
24" Butterfly Valve	EA	3	$ 13,000.00	$ 39,000.00
24" DI Pipe	LF	300	$ 235.00	$ 70,500.00
30"x30"x24" Steel Tee and Connection	LS	1	$ 49,250.00	$ 49,250.00
24" DI 90 Degree Bend	EA	3	$ 11,350.00	$ 34,050.00
24"x24"x24" Steel Tee and Connection	EA	1	$ 42,000.00	$ 42,000.00
24" DI Pipe Joint Restraints	EA	8	$ 900.00	$ 7,200.00
Meter Vault SCADA and Controls	LS	1	$ 28,000.00	$ 28,000.00
Pump Station	HP	770	$ 2,500.00	$ 1,925,000.00
Demolish Existing Pump Station	LS	1	$ 56,000.00	$ 56,000.00
24" DI Pipe (Pump Low Head Suction)	LF	140	$ 235.00	$ 32,900.00
14" DI Pipe (Pump Discharge)	LF	35	$ 126.00	$ 4,410.00
Asphalt Restoration	SY	27	$ 29.36	$ 782.93
48" Pipe from Tank Farm to 3500 South	LF	8700	$ 590.00	$ 5,133,000.00
24" Pipe 3500 South from 4800 W to 5600 W	LF	5300	$ 235.00	$ 1,245,500.00
16" Pipe 3500 S from 5600 W to Meadow	LF	3100	$ 152.00	$ 471,200.00
12" Pipe 3500 S from Meadow to Hunter	LF	4900	$ 135.00	$ 661,500.00
24" Pipe 4800 W from 3500 S to 3100 S	LF	2700	$ 235.00	$ 634,500.00
24" Pipe 3500 South from 4800 W to 4400 W	LF	2700	$ 235.00	$ 634,500.00
16" Pipe 3500 South from 4400 W to 4000 W	LF	2700	$ 152.00	$ 410,400.00
Purchase East 5 MG Tank from JVWCD	LS	1	$ 1,075,000.00	$ 1,075,000.00
Purchase West 5 MG Tank from JVWCD	LS	1	$ 1,229,200.00	$ 1,229,200.00
Mobilization	LS	1	$ 750,000.00	$ 750,000.00

Sub-Total Construction	$	14,848,892.93
Contingency @ 35%	$	5,197,112.53
Total Construction	**$**	**20,046,005.46**
Engineering, Admin, & Legal Fees @ 18%	$	3,608,280.98
TOTAL ALTERNATIVE COSTS	**$**	**23,654,286.44**
Range (0%)	$	23,654,000
Range (+50%)	$	35,482,000

APPENDIX B

BPS ASSESSMENT RESULTS

APPENDIX B

BPS ASSESSMENT RESULTS

Asset ID:		Acord BPS	Breeze BPS	Andra PS	Ridgeland PS	Kent BPS	Sorenson BPS
WU-PS-1: Building and Site Assessment							
Inspected by:		S. Pugh	S. Pugh	S. Pugh	Dee Smolka	Dee Smolka	Dee Smolka
Inspection Date:		7/28/2021	7/28/2021	7/28/2021	8/10/2021	8/10/2021	8/9/2021
Component Ratings	**Expected Lifespan**						
General		**1.5**			**3**	**2**	**2**
Building Age	60	50	-	13	-	-	-
Building/Vault Exterior		**1**	**1.5**	**1.5**	**3**	**2**	**2**
Roofing improvement needed		FALSE	FALSE	FALSE	TRUE	FALSE	FALSE
Aesthetic improvement needed		FALSE	TRUE	FALSE	FALSE	FALSE	FALSE
Minor component improvement needed		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Not applicable (No building)		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Building/Vault Interior		**2**	**2**	**2**	**3**	**2**	**3**
Needs cleaning		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Aesthetic improvement needed		TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
Updates needed to meet code		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Structural improvements needed (check below)		**TRUE**	**TRUE**	**TRUE**	**FALSE**	**FALSE**	**FALSE**
Seismic upgrades		TRUE	TRUE	TRUE	FALSE	FALSE	FALSE
Repair		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Complete replacement		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Landscape & Enclosure	**60**		**2**	**2**	**1**	**2**	**2**
Landscape dead or dying (needs rehab/replant)		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Landscape needs complete replacement		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Fencing/enclosure requires repair		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Not applicable (No landscaping)		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Asphalt/Concrete (Parking, Walkways, Access)	**25**		**2**	**2**	**3**	**2**	**1**
Alligator cracking/aggregate visible/spalling		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Large cracks and/or uplifts		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Potholes or noticable settlement		FALSE	FALSE	FALSE	TRUE	FALSE	FALSE
Drainage issues (standing water, depressions, etc.)		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE

Comments							
General		Late 70s/80s					
Building Vault/Exterior		Check expansion caulk	Fill old bolt holes Anchorage - check panels, heater		Roofing cracking/bubbling	Future upgrades	
Building/Vault Interior		Spalling concrete on floor Bracing/anchorage of heater	Anchor tanks Chemical room anchor bolts rusty. Change to titanium or hastel[??]	chor duct work, heater, & electrical pa	wall needs gaps/cracks sealed	Future upgrades	Upgrades in process
Landscape & Enclosure		Will be replaced					
Asphalt/Concrete (Parking, Walkways, Access)					settlement near gas pump		Brand new asphalt
Other		2012 Rehab Treatment plant will bypass this site					

WU-PS-2: Pumps and Mechanical							
Inspected by:		B. Mayer	B. Mayer	B. Mayer	Dee Smolka	Dee Smolka	Dee Smolka
Inspection Date:		7/28/2021	7/28/2021	7/28/2021	8/9/2021	8/9/2021	8/9/2021
Component Ratings							
Pump 1		**1**	**2**	**1**	**2**	**2**	**2**
Age	20 - Rebuild @ 10	-	-	-	-	-	-
Pump surface - corrosion		FALSE	FALSE	FALSE	FALSE		FALSE
Pump surface - chipped coating		FALSE	FALSE	FALSE	FALSE	TRUE	FALSE
Pump seals leaking		FALSE	FALSE	FALSE	FALSE		FALSE
Worn nuts/lugs on bolted connections		FALSE	FALSE	FALSE	FALSE		FALSE
Loose connections		FALSE	FALSE	FALSE	FALSE		FALSE
Cracked or damaged foundation supports		FALSE	FALSE	FALSE	FALSE		FALSE
Unusual vibrations or noise		FALSE	FALSE	FALSE	FALSE		FALSE
Impeller - pitting or heavy wear		FALSE	FALSE	FALSE	FALSE		FALSE
Pump performance significantly below rating		FALSE	FALSE	FALSE	FALSE		FALSE
Past usefule life -> replace		FALSE	FALSE	FALSE	FALSE		FALSE

Pump 2		**1**	**2**		**2**	**2**	
Age	20 - Rebuild @ 10	-	-	-	-	-	-
Pump surface - corrosion		FALSE	FALSE		FALSE		
Pump surface - chipped coating		FALSE	FALSE		FALSE		
Pump seals leaking		FALSE	FALSE		FALSE		
Worn nuts/lugs on bolted connections		FALSE	FALSE		FALSE		
Loose connections		FALSE	FALSE		FALSE		
Cracked or damaged foundation supports		FALSE	FALSE		FALSE		
Unusual vibrations or noise		FALSE	FALSE		FALSE		
Impeller - pitting or heavy wear		FALSE	FALSE		FALSE		
Pump performance significantly below rating		FALSE	FALSE		FALSE		
Past usefule life -> replace		FALSE	FALSE		FALSE		
Pump 3			**2**			**2**	
Age	20 - Rebuild @ 10	-	-	-	-	-	-
Pump surface - corrosion			FALSE				
Pump surface - chipped coating			FALSE			TRUE	
Pump seals leaking			FALSE			TRUE	
Worn nuts/lugs on bolted connections			FALSE				
Loose connections			FALSE				
Cracked or damaged foundation supports			FALSE				
Unusual vibrations or noise			FALSE				
Impeller - pitting or heavy wear			FALSE				
Pump performance significantly below rating			FALSE				
Past usefule life -> replace			FALSE				
Pump 4			**2**			**2**	
Age	20 - Rebuild @ 10	-	-	-	-	-	-
Pump surface - corrosion			FALSE				
Pump surface - chipped coating			FALSE			TRUE	
Pump seals leaking			FALSE				
Worn nuts/lugs on bolted connections			FALSE				
Loose connections			FALSE				
Cracked or damaged foundation supports			FALSE				
Unusual vibrations or noise			FALSE				
Impeller - pitting or heavy wear			FALSE				
Pump performance significantly below rating			FALSE				
Past usefule life -> replace			FALSE				
Pump 5							
Age	20 - Rebuild @ 10	-	-	-	-	-	-
Pump surface - corrosion							
Pump surface - chipped coating							
Pump seals leaking							
Worn nuts/lugs on bolted connections							
Loose connections							
Cracked or damaged foundation supports							
Unusual vibrations or noise							
Impeller - pitting or heavy wear							
Pump performance significantly below rating							
Past usefule life -> replace							
Pump 6							
Age	20 - Rebuild @ 10	-	-	-	-	-	-
Pump surface - corrosion							
Pump surface - chipped coating							
Pump seals leaking							
Worn nuts/lugs on bolted connections							
Loose connections							
Cracked or damaged foundation supports							
Unusual vibrations or noise							
Impeller - pitting or heavy wear							
Pump performance significantly below rating							
Past usefule life -> replace							
Motor 1		**1**	**2**	**1**	**1**	**2**	**2**

Age	20	-	-	-	-	Rebuilt 2014	-
Dirty inspection ports		FALSE	FALSE	FALSE	FALSE		FALSE
Oil reservoir low		FALSE	FALSE	FALSE	FALSE		FALSE
Discoloration (potential overheating)		FALSE	FALSE	FALSE	FALSE		FALSE
Unusual vibrations or noise		FALSE	FALSE	FALSE	FALSE		FALSE
Past useful life -> replace		FALSE	FALSE	FALSE	FALSE		FALSE
Motor 2		**1**	**2**		**1**	**2**	
Age	20	-	-	-	-	Rebuilt 2015	-
Dirty inspection ports		FALSE	FALSE		FALSE		
Oil reservoir low		FALSE	FALSE		FALSE		
Discoloration (potential overheating)		FALSE	FALSE		FALSE		
Unusual vibrations or noise		FALSE	FALSE		FALSE		
Past useful life -> replace		FALSE	FALSE		FALSE		
Motor 3			**2**			**2**	
Age	20	-	-	-	-	Rebuilt 2016	-
Dirty inspection ports			FALSE				
Oil reservoir low			FALSE				
Discoloration (potential overheating)			FALSE				
Unusual vibrations or noise			FALSE				
Past useful life -> replace			FALSE				
Motor 4			**2**			**2**	
Age	20	-	-	-	-	Rebuilt 2015	-
Dirty inspection ports			FALSE				
Oil reservoir low			FALSE				
Discoloration (potential overheating)			FALSE				
Unusual vibrations or noise			FALSE				
Past useful life -> replace			FALSE				
Motor 5							
Age	20	-	-	-	-	-	-
Dirty inspection ports							
Oil reservoir low							
Discoloration (potential overheating)							
Unusual vibrations or noise							
Past useful life -> replace							
Motor 6							
Age	20	-	-	-	-	-	-
Dirty inspection ports							
Oil reservoir low							
Discoloration (potential overheating)							
Unusual vibrations or noise							
Past useful life -> replace							
Piping	**50**	**1**	**3**	**1**	**1**	**3**	**2**
Needs minor touch-up paint		FALSE	FALSE	FALSE	FALSE	TRUE	TRUE
Needs complete repaint		FALSE	TRUE	FALSE	FALSE	FALSE	FALSE
Needs replacement		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Isolation Valves	**40**	**1**	**3**	**1**	**1**	**3**	**2**
Leaking		FALSE	TRUE	FALSE	FALSE	FALSE	FALSE
Recoating needed		FALSE	TRUE	FALSE	FALSE	FALSE	FALSE
Needs replacement		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
HVAC System		**2**	**2**	**1**	**1**	**2**	
Age	-	-	-	-	-	-	-
Type - Ventilation only			FALSE	FALSE	FALSE		TRUE
Type - Air conditioning			TRUE	TRUE	TRUE	TRUE	FALSE
Upgrade required		FALSE	FALSE	FALSE	FALSE		FALSE
Comments							
Pumps							
Motors							
Piping							
Isolation Valves							
HVAC System						Lennox LCA240SN1G	

Other							
WU-PS-3: Electrical							
Inspected by:		D. Ovard/N. Davis	D. Ovard/N. Davis	D. Ovard/N. Davis			David Moeakiola
Inspection Date:		7/28/2021	7/28/2021	7/28/2021			8/5/2021
Component Ratings							
Overall Electrical		**2**	**3**	**2**			**3**
Age (years)	-	-	-	13	-	-	-
% Usage time							
Generator and Transfer Switch			**3**				**5**
Age (years)	20	-	16	-	-	-	-
% Usage time							
Switchboard		**2**	**4**	**2**			**5**
Age (years)	25	26	-	13	-	-	-
% Usage time							
Transformer		**2**	**1**	**2**			**4**
Age (years)	25	9	1	13	-	-	-
% Usage time							
Motor Control Center (MCC)				**2**			**4**
Age (years)	25	-	-	13	-	-	-
% Usage time							
Panelboard		**2**	**1**	**2**			**1**
Age (years)	20	26	2	13	-	-	-
% Usage time							
VFD 1 (If applicable)		**2**	**4**	**2**			**5**
Age (years)	15	9	-	13	-	-	-
% Usage time							
VFD 2 (If applicable)		**2**	**4**				
Age (years)	15	9	-	-	-	-	-
% Usage time							
VFD 3 (If applicable)			**4**				
Age (years)	15	-	-	-	-	-	-
% Usage time							
VFD 4 (If applicable)			**1**				
Age (years)	15	-	-	-	-	-	-
% Usage time							
VFD 5 (If applicable)							
Age (years)	15	-	-	-	-	-	-
% Usage time							
VFD 6 (If applicable)							
Age (years)	15	-	-	-	-	-	-
% Usage time							
Motor Starter 1 (If applicable)				**2**			**5**
Age (years)	15	-	40	13	-	-	-
% Usage time							
Motor Starter 2 (If applicable)							
Age (years)	15	-	40	-	-	-	-
% Usage time							
Motor Starter 3 (If applicable)							
Age (years)	15	-	-	-	-	-	-
% Usage time							
Motor Starter 4 (If applicable)							
Age (years)	15	-	-	-	-	-	-
% Usage time							
Motor Starter 5 (If applicable)							
Age (years)	15	-	-	-	-	-	-
% Usage time							
Motor Starter 6 (If applicable)							
Age (years)	15	-	-	-	-	-	-
% Usage time							
PLC Panel/RTU			**2**	**2**			**1**

Age (years)	10	-	6	13	-	-	2021
% Usage time							
HMI			**2**	**2**			**1**
Age (years)	10	-	6	13	-	-	2021
% Usage time							
Security System (if applicable; if not present, leave comment)				**2**			**5**
Age (years)	10	-	1	13	-	-	-
Status (1 = New, 0 = Outdated)				1			
Comments							
Overall Electrical			Mismatched	No issues			
Generator and Transfer Switch		See well form	Generator - 2005; Switch - Original				
Switchboard			Original				
Transformer							
Motor Control Center (MCC)							
Panelboard							
VFDs (If applicable)		All seem in good condition	Pump 4 - Hardly used				
Motor Starters (If applicable)			Pumps 3-4: No starters				Original
PLC Panel/RTU			Pumps 1 & 2: Original, installed in the 80's				
HMI							
Security System (if applicable; if not present, leave comment)			Magnetic badge unlock doesn't work Doors, Camera	Doors, Cameras installed 2020			
Other			Sodium Hypochlorite - completed 2020	Pump station installed 2008. Tank installed prior to 1999.			

APPENDIX C

TANK ASSESSMENT RESULTS

APPENDIX C

TANK ASSESSMENT RESULTS

Asset ID:	Expected Lifespan	Acord	Andra	Winder	Breeze	Ridgeland	Sorenson	Tank Farm (1 MG)	Tank Farm (2 MG)	Zone 5
WU-PS-1A: Steel Tank Building and Site Assessment										
Inspected by:		D. Smolka	D. Smolka	D. Smolka	D. Smolka	D. Smolka	D. Smolka	D. Smolka	D. Smolka	D. Smolka
Inspection Date:		8/9/2021	8/10/2021	8/10/2021	8/10/2021	8/10/2021	8/9/2021	8/9/2021	8/9/2021	8/10/2021
Steel Tank Age		42	n/a	n/a	n/a	52	43	45	45	n/a
Component Ratings										
Landscape & Enclosure	**50**	**5**				**2**	**3**			
Landscape dead or dying (needs rehab/replant)										
Landscape needs complete replacement										
Fencing/enclosure requires repair										
Not applicable (No landscaping)										
Asphalt/Concrete (Parking, Walkways, Access)	**25**	**5**				**3**	**1**	**1**	**1**	
Alligator cracking/aggregate visible/spalling										
Large cracks and/or uplifts										
Potholes or noticable settlement						TRUE				
Drainage issues (standing water, depressions, etc.)										
Structural Steel		**3**				**2**	**2**	**3**	**3**	
Age	75	42	n/a	n/a	n/a	52	43	45	45	n/a
Foundation & Anchors		**TRUE**				**FALSE**	**FALSE**	**TRUE**	**TRUE**	
Foundation - Concrete cracking/damage		TRUE				FALSE	FALSE	TRUE	TRUE	
Anchors - Evidence of Corrosion						FALSE	FALSE	FALSE	FALSE	
Other repairs needed (comment)		TRUE				FALSE	FALSE	FALSE	FALSE	
Exterior Coating		**2**				**2**	**3**	**2**	**2**	
Age	25	20	n/a	n/a	n/a	10	31	21	21	n/a
Signs of corrosion evident						FALSE	FALSE	FALSE	FALSE	
Interior Coating		**2**				**2**	**3**	**2**	**2**	
Age	25	13	n/a	n/a	n/a	10	16	21	21	n/a
Signs of corrosion evident										
Anodes present						TRUE				
If anodes present, anode replacement needed?										
Appurtenances		**4**				**2**	**2**	**2**	**2**	
Ladders/Piping/Miscellaneous Metals	50									
Evidence of Corrosion										
Needs repaint/replacement										
Hatches										
Wrong type (not shoe box)										
Not Secure										
Evidence of corrosion										
Vents - screening improvements needed										
Drains - screening improvements needed		TRUE								
Overflow - screening improvements needed										
WU-DS-1B: Concrete Tank Building and Site Assessment										
Inspected by:			D. Smolka	D. Smolka	D. Smolka					D. Smolka
Inspection Date:			8/10/2021	8/10/2021	8/10/2021					8/10/2021
Concrete Tank Age		n/a	41	8	35	n/a	n/a	n/a	n/a	15
Component Ratings										
Landscape & Enclosure	**50**		**2**	**1**	**2**					
Landscape dead or dying (needs rehab/replant)										
Landscape needs complete replacement										
Fencing/enclosure requires repair										
Not applicable (No landscaping)										
Asphalt/Concrete (Parking, Walkways, Access)	**25**		**1**	**1**	**3**					**2**
Alligator cracking/aggregate visible/spalling										
Large cracks and/or uplifts										
Potholes or noticable settlement										
Drainage issues (standing water, depressions, etc.)										
Exterior (if exposed)	**80**		**2**	**1**	**3**					**1**
Cracking										
Single										
Multiple										
Broken/Collapsing Section										
Surface										
Surface spalling										
Aggregate visible/projecting										
Reinforcement visible/corroded										
Interior	**80**		**2**	**1**	**3**					**1**
Sealants/Joins										
Daylight visible										
Need replacement										
Cracking										
Single										
Multiple										
Broken/Collapsing Section										
Surface										
Surface spalling										
Aggregate visible/projecting										
Reinforcement visible/corroded										
Appurtenances	**50**		**2**	**1**	**3**					**1**
Ladders/Piping/Miscellaneous Metals										
Evidence of Corrosion										
Replacements needed (comment required)										

Hatches											
Not Secure											
Evidence of corrosion											
Vents - screening improvements needed											
Drains - screening improvements needed											
Overflow - screening improvements needed											
Foundation & Anchors - repairs needed											
Comments											
General											
Building Vault/Exterior											
Building/Vault Interior											
Landscape & Enclosure											
Asphalt/Concrete (Parking, Walkways, Access)						Sidewalk settling around overflow pedestal e	Some settling near gas pumps.				
Structural Steel		Minor cracking around tank. Pooling on top of tank. Tank has crinkle					Pooling on top of tank.	Minor cracking in cement around 1 MG tan	or cracking in cement around 2 MG tank.		
Exterior Coating								Multiple colors - some touch up			
Interior Coating							Anodes are fairly new.	Some touch up needed			
Other		Lower drain has no air gap									

APPENDIX D

WELL ASSESSMENT RESULTS

APPENDIX D

WELL ASSESSMENT RESULTS

Asset ID:		Well 1	Well 4 (Sorensen)	Well 8 (Woodbury)	Well 12 (Acord)	Well 14 (Wright)	Well 15 (Evans)	Well 16 (Taggart)	Well 17
WU-W-1: Building and Site Assessment									
Inspected by:		S. Pugh		D. Smolka	S. Pugh	D. Smolka	D. Smolka	D. Smolka	S. Pugh
Inspection Date:		7/28/2021		8/9/2021	7/28/2021	8/9/2021	8/9/2021	8/9/2021	7/28/2021
Component Ratings	**Expected Lifespan**		**SEE BPS RATINGS**						
General		**1.5**		**2**	**2**	**2**	**1**	**1**	**1**
Building Age	60	-	-	-	22	-	-	16+	-
Building/Vault Exterior	**60**	**1.5**		**2**	**3**	**3**	**2**	**2**	**1**
Roofing improvement needed		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Aesthetic improvement needed		TRUE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Minor component improvement needed		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Not applicable (No building)		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Building/Vault Interior	**60**	**2**		**2**	**2**		**2**	**2**	**1.5**
Needs cleaning		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Aesthetic improvement needed		TRUE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Updates needed to meet code		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Structural improvements needed (check below)		**TRUE**	**Fill out below**	**FALSE**	**TRUE**	**FALSE**	**FALSE**	**FALSE**	**FALSE**
Seismic upgrades		TRUE		FALSE	TRUE	FALSE	FALSE	FALSE	FALSE
Repair		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Complete replacement		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Landscape & Enclosure	**60**	**2**		**2**	**5**	**2**	**1**	**1**	**1**
Landscape dead or dying (needs rehab/replant)		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Landscape needs complete replacement		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Fencing/enclosure requires repair		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Not applicable (No landscaping)		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Asphalt/Concrete (Parking, Walkways, Access)	**25**	**2**		**2**		**2**	**3**	**1**	**1**
Alligator cracking/aggregate visible/spalling		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Large cracks and/or uplifts		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Potholes or noticable settlement		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Drainage issues (standing water, depressions, etc.)		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Comments									
General					Replace in 20 years	Anti graffiti coating cracking/peeling			
Building Vault/Exterior		Grout/caulk - fill holes			Lost remaining life Expansion joint cracks		Anti graffiti coating cracking/peeling	Anti graffiti coating cracking/peeling	Anchor softener
Building/Vault Interior		Anchorage - tanks, heater, ductwork, Clortec			Spalling concrete on floor Bracing/anchorage of heater				
Landscape & Enclosure					Will be fully replaced				
Asphalt/Concrete (Parking, Walkways, Access)					To be replaced w/ landscaping Site to be updated in 18 months				
Other					Hypo - all new Pump & Motor - all new				
WU-W-2: Pumps and Mechanical									
Inspected by:		B. Mayer			B. Mayers	D. Smolka	D. Smolka		B. Mayer
Inspection Date:		7/28/2021			7/28/2021	8/9/2021	8/9/2021		7/28/2021
Component Ratings									
Pump		**1**		**2**	**3**	**3**	**2**	**2**	**1**
Age:	20 - Rebuild @ 10	6	-	6	-	-	-	-	15
Pump surface - corrosion		FALSE		FALSE	TRUE	FALSE	FALSE	FALSE	FALSE
Pump surface - chipped coating		FALSE		FALSE	TRUE	TRUE	FALSE	FALSE	FALSE
Pump seals leaking		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Worn nuts/lugs on bolted connections		FALSE		FALSE	TRUE	FALSE	FALSE	FALSE	FALSE
Loose connections		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Cracked or damaged foundation supports		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Unusual vibrations or noise		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Impeller - pitting or heavy wear		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Pump performance significantly below rating		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Past useful life -> replace		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Motor		**1**		**1**	**2**	**1**	**1**	**1**	**1**
Age:	15	11	-	6	3	0	Rebuilt 11/3/2017	-	15
Dirty inspection ports		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Oil reservoir low		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Discoloration (potential overheating)		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Unusual vibrations or noise		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Past useful life -> replace		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Exposed Piping	**20**	**1**		**1**	**3**	**3**	**2**	**1**	**1**
Needs minor touch-up paint		FALSE		FALSE	TRUE	FALSE	FALSE	FALSE	FALSE
Needs complete repaint		FALSE		FALSE	FALSE	TRUE	FALSE	FALSE	FALSE
Needs replacement		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Isolation Valves	**15**	**1**		**1**	**2**	**2**	**1**	**1**	**1**

Leaking		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Recoating needed		FALSE		FALSE	TRUE	FALSE	FALSE	FALSE	FALSE
Needs replacement		FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Well Casing (if recent video available)	**50**			**2**		**2**	**1**	**2**	
Corrosion						FALSE	FALSE	FALSE	
Holes present						FALSE	FALSE	FALSE	
Needs replacement						FALSE	FALSE	FALSE	
Well Screens (if recent video available)	**50**			**1**		**2**	**2**	**2**	
Needs cleaning						FALSE	FALSE	FALSE	
Corrosion/chemical buildup						FALSE	FALSE	FALSE	
Pitting/large holes						FALSE	FALSE	FALSE	
Excessive sand production						FALSE	FALSE	FALSE	
Clogged						FALSE	FALSE	FALSE	
Secondary Disinfection (If Applicable)	**20**	**2**		**1**	**2**	**3**	**3**	**3**	**1**
System Age:	-	-	-	-	FALSE	-	16+	16+	FALSE
Chlorine odor present?		FALSE			FALSE	FALSE	FALSE	FALSE	FALSE
Cleaning required (comment)		TRUE			FALSE	FALSE	FALSE	FALSE	FALSE
Repairs required (comment)		FALSE			FALSE	FALSE	FALSE	FALSE	FALSE
Replacement required (comment)		FALSE			FALSE	FALSE	FALSE	FALSE	FALSE
Fluoridation System (If Applicable)	**20**			**2**	**4**	**3**	**2**	**2**	**1**
System Age:	-	-	-	-	22	-	-	16+	FALSE
Cleaning required (comment)		TRUE			FALSE	FALSE	FALSE	FALSE	FALSE
Repairs required (comment)		FALSE			FALSE	FALSE	FALSE	FALSE	FALSE
Replacement required (comment)		FALSE			FALSE	FALSE	FALSE	FALSE	FALSE
HVAC System				**2**	**2**	**2**	**1**	**1**	**1**
System Age:	-	-	-	-	22	-	-	2	FALSE
Type					FALSE	Lennox LCA156HN1G	Lennox V9151		FALSE
Ventilation Only		FALSE			FALSE	FALSE			FALSE
Air conditioning		TRUE		TRUE	TRUE	TRUE	TRUE	TRUE	FALSE
Upgrade required (comment)		FALSE			FALSE	FALSE			FALSE
Comments									
Pump		Was oil lube, water lube			Surface corrosion limited Will be replaced in upcoming project.	Needs to be painted			
Motor					Will be replaced	Brand new			
Exposed Piping							Wipe down / remove hard water scale		
Isolation Valves									
Well Casing (if recent video available)					Not visible				
Well Screens (if recent video available)					Not visible				
Secondary Disinfection (If Applicable)				PSI New System	Sodium Hypochloride - Will be replaced			Run Hrs 30989	Chlorine is hard to maintain with the old technology. Would replace if available. PSI Microchlor - $200k - supply + install, 1/year
Fluoridation System (If Applicable)					Not being replaced with the rest.				
HVAC System								Sodium Room A/C 16+ Trane	
WU-W-3: Electrical Assessment									
Inspected by:		D. Ovard/N. Davis	David Moeakiola	David Moeakiola	D. Ovard/N. Davis	David Moeakiola	David Moeakiola	David Moeakiola	D. Ovard/N. Davis
Inspection Date:		7/28/2021	8/5/2021	8/5/2021	7/28/2021	8/5/2021	8/5/2021	8/5/2021	7/28/2021
Component Ratings									
Overall Electrical		**3**	**3**	**2**	**3**		**4**	**3**	**1**
Age (years)	-	-	-	18	-	-	19	18	4
% Usage time									
Generator and Transfer Switch		**1**	**5**	**1**	**1**		**2**		**1**
Age (years)	20	6	-	-	-	-	-	-	-
% Usage time									
Switchboard		**2**	**5**	**2**	**3**		**4**	**4**	**1**
Age (years)	25	18	-	18	18	-	19	18	-
% Usage time									
Transformer		**3**	**4**	**2**	**3**		**4**	**3**	**1**
Age (years)	25	18	-	18	18	-	19	18	-
% Usage time									
Motor Control Center (MCC)			**4**	**3**	**3**		**4**	**3**	**1**
Age (years)	20	-	-	18	18	-	19	18	-
% Usage time									
Panelboard		**2**	**1**	**3**	**3**		**4**	**3**	**1**
Age (years)	20	18	-	18	18	-	19	18	-
% Usage time									
VFD (If applicable)		**3**	**5**	**1**	**1**		**3**	**1**	**1**

Age (years)	15	18	-	-	3	-	-	0	-
% Usage time										
Motor Starter (If applicable)			**5**	**3**	**4**		**4**	**3**	
Age (years)	15	-	-	18	22	-	19	18	-
% Usage time									
PLC Panel/RTU		**2**	**1**	**3**	**3**		**4**	**4**	**1**
Age (years)	10	6	0	18	9	-	19	18	-
% Usage time									
HMI		**2**	**1**	**2**	**3**		**3**	**3**	**1**
Age (years)	10	6	0	-	9	-	-	-	-
% Usage time									
Security System (if applicable; if not present, leave comment)		**4**	**5**	**3**	**3**		**4**	**3**	**1**
Age (years)	10	-	-	18	-	-	-	-	-
Status (1 = New, 0 = Outdated)									
Comments									
Overall Electrical			Well not in use	2003			2002	2003	2017
Generator and Transfer Switch		2015	Generator and switch are originals		Combined w/ P.S.		Generator & Transfer Switch fairly new		
Switchboard		2003	Original with well but not in use	2003	2003		2002	2003	
Transformer		2003	Original but no dates found	2003	2003		2002	2003	
Motor Control Center (MCC)		n/a	Original but no dates found	2003	2003		2002	2003	
Panelboard		Panel 2003 - might be updated	Newly installed 2021	2003	2003		2002	2003	
VFD (If applicable)		2003 - old - no parts		Newer Sneider drive	2018		?	VFD installed 2021	2 - 1 for redundancy
Motor Starter (If applicable)		n/a	Original	2003	Old but not worn Before 1999 (Original)		2002	2003?	n/a
PLC Panel/RTU		2015 Design - 1,200 gpm Actual - 705 gpm @ 85%	2021	2003	2012? To be replaced		Old and new 2002 - Present	2003?	Running @ 1,900 gpm
HMI		2015	2021		2012?				
Security System (if applicable; if not present, leave comment)		Door alarms	None	Door switches 2003	New door switches going in.		Door switches Seem to fail in extreme heat	Door switches	Door contacts

APPENDIX E

WATER ASSESSMENT RESULTS

APPENDIX E

WATER ASSESSMENT RESULTS

Acord Well 12, Tank, & BPS

Site Assessment

Building and Site Assessment - Well

Well ID:	Well 12 - Acard	**Address:**	
Inspected By:	S. Pugh	**Image Ref:**	
Date:	7/28/21		

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

General	**Rating:** 1 (2) 3 4 5
▒ Building age: 22 at least	**Comments:** Replace in 20 years

Building Exterior	**Rating:** 1 (2) (3) 4 5
☐ Roofing improvement needed 2003 replaced	**Comments:** Last remaining life
☐ Aesthetic improvement needed	Expansion joint cracks.
☐ Minor component improvement eeded	
☐ Not applicable (No building)	

Building/Vault Interior	**Rating:** 1 (2) 3 4 5
☐ Needs cleaning	**Comments:**
☐ Aesthetic improvement needed	
☐ Updates needed to meet code	
▒ Structural improvements needed (check below)	
☑ Seismic upgrades	- Bracing - Furnaces / Ducts
☐ Repair	Anchor tanks
☐ Complete replacement	

Landscape & Enclosure	**Rating:** 1 2 3 4 (5)
☐ Landscape dead or dying (needs rehab/replant)	**Comments:** Will be fully replaced
☐ Landscape needs complete replacement	
☐ Fencing/enclosure requires repair	
☐ Not applicable (No landscaping)	

Asphalt/Concrete (Parking, Walkways, Access)	**Rating:** 1 2 3 4 5
☐ Alligator cracking/aggregate visible/spalling	**Comments:**
☐ Large cracks and/or uplifts	To be replaced w/ landscaping
☐ Potholes or noticable settlement	
☐ Drainage issues (standing water, depressions, etc.)	

- Site to be updated in the next year - 1.5 years

  Hypo - all new

  Pump + Motor - new

Pumps and Mechanical Assessment - Well

Well ID:	Well 12 - Acord	**Address:**	
Inspected By:	B. Mayer	**Image Ref:**	
Date:	7/28		

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Pump	**Rating:** 1 2 (3) 4 5
▒ Age:	**Comments:** Electrical system - Will be replaced in upcoming WO project.
✓ Pump surface - corrosion limited	
✓ Pump surface - chipped coating limited	
Pump seals leaking	
✓ Worn nuts/lugs on bolted connections	
Loose connections	
Cracked or damaged foundation supports	
Unusual vibrations or noise	
Impeller - pitting or heavy wear	
Pump performance significantly below rating	
Past useful life -> replace	

Motor	**Rating:** 1 (2) 3 4 5
▒ Age: (2018)	**Comments:** Will be replaced.
Dirty inspection ports	
Oil reservoir low	
Discoloration (potential overheating)	
Unusual vibrations or noise	
Past useful life -> replace	

Exposed Piping	**Rating:** 1 2 (3) 4 5
✓ Needs minor touch-up paint	**Comments:**
Needs complete repaint	
Needs replacement	

Isolation Valves	**Rating:** 1 (2) 3 4 5
Leaking	**Comments:**
✓ Recoating needed	
Needs replacement	

Well Casing (if recent video available)	**Rating:** 1 2 3 4 5
Corrosion	**Comments:** Not visible
Holes present	
Needs replacement	

Well 12 - Accord

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Well Screens (if recent video available)		Rating: 1 2 3 4 5
	Needs cleaning	Comments: Not visible
	Corrosion/chemical buildup	
	Pitting/large holes	
	Excessive sand production	
	Clogged	

Secondary Disinfection (If Applicable)		Rating: 1 (2) 3 4 5
	System Age: (1999)	Comments: Sodium Hypochlorite will be replaced
	Chlorine odor present?	
	Cleaning required (comment)	
	Repairs required (comment)	
	Replacement required (comment)	

Fluoridation System (If Applicable)		Rating: 1 2 3 (4) 5
	System Age: (1999)	Comments: Not being replaced with the rest.
	Cleaning required (comment)	
	Repairs required (comment)	
	Replacement required (comment)	

HVAC System		Rating: 1 (2) 3 4 5
	System Age: _____	Comments:
	Type	
	Ventilation Only	
✓	Air conditioning	
	Upgrade required (comment)	

Electrical Assessment - Well

Well ID:	Well 12 - Acord	**Address:**	
Inspected By:	D. Oard / N. Davis	**Image Ref:**	
Date:	7/28/21		

Condition Rating (Circle rating for individual components in sections below)

1	Excellent; no wear or equipment issues; all hardware present
2	Adequate: minor wear, no equipment issues; all hardware present
3	Fair; worn, no major equipment issues; missing non-critical hardware
4	Poor; old and worn; missing important hardware; replacement recommended
5	Bad; hardware gone or failed; replacement required to continue operation

Overall Electrical

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 (3) 4 5		

Generator and Transfer Switch

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		(1) 2 3 4 5		Combined w/ T.S.

Switchboard

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 (3) 4 5		2003

Transformer

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 (3) 4 5		2003

Motor Control Center (MCC)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 (3) 4 5		2003

Panelboard

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 (3) 4 5		2003

VFD (If applicable)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		(1) 2 3 4 5		2018

Motor Starter (If applicable)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 (3) (4) 5		Old but not worn Before 1999 (original

PLC Panel/RTU

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 (3) 4 5		2012? To be replaced

HMI

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 (3) 4 5		2012?

Security System (if applicable; if not present, leave comment)

Equipment No.	Age (yrs)	Condition (circle)	Status (Circle)	Comments:
		1 2 (3) 4 5	New Outdated	Door switches - new going in.

Building and Site Assessment
Pump Station

Pump Station ID:	Accord BPS	**Address:**	
Inspected By:	S. Pugh	**Image Ref:**	
Date:	7/28/21		

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

General	**Rating:** 1 (2) 3 4 5
▒ Building age: late 70s/80s	**Comments:**

Building/Vault Exterior	**Rating:** (1) 2 3 4 5
☐ Roofing improvement needed	**Comments:** check expansion caulk
☐ Aesthetic improvement needed	
☐ Minor component improvement needed	
☐ Not applicable (No building)	

Building/Vault Interior	**Rating:** 1 (2) 3 4 5
☐ Needs cleaning	**Comments:** spalling concrete on floor
☒ Aesthetic improvement needed	
☐ Updates needed to meet code	
▒ Structural improvements needed (check below)	bracing / anchorage of heater
☒ Seismic upgrades	
☐ Repair	
☐ Complete replacement	

Landscape & Enclosure	**Rating:** 1 2 3 4 5
☐ Landscape dead or dying (needs rehab/replant)	**Comments:** Will be replaced
☐ Landscape needs complete replacement	
☐ Fencing/enclosure requires repair	
☐ Not applicable (No landscaping)	

Asphalt/Concrete (Parking, Walkways, Access)	**Rating:** 1 2 3 4 5
☐ Alligator cracking/aggregate visible/spalling	**Comments:**
☐ Large cracks and/or uplifts	
☐ Potholes or noticable settlement	
☐ Drainage issues (standing water, depressions, etc.)	

2012 Rehab
Treatment plant will bypass this site

Pump and Mechanical Assessment
Pump Station

Pump Station ID:	Acord 375	**Address:**	
Inspected By:	B. Mayer	**Image Ref:**	
Date:	7/24		

Overall Condition Rating (Circle rating for individual components in sections below)

1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Pumps

	Pump ID	Age (years)	Pump ID (Checklist):	Condition Rating:
	1			(1) 2 3 4 5
	2			(1) 2 3 4 5
	3			1 2 3 4 5
	4			1 2 3 4 5
	5			1 2 3 4 5
	6			1 2 3 4 5

	Condition Checklist (Mark pumps w/ issues at right)	(1)	2	3	4	5	6	Comments:
	Pump surface - corrosion							
	Pump surface - chipped coating							
	Pump seals leaking							
	Worn nuts/lugs on bolted connections							
	Loose connections							
	Cracked or damaged foundation supports							
	Unusual vibrations or noise							
	Impeller - pitting or heavy wear							
	Pump performance significantly below rating							
	Past usefule life -> replace							

Motors

	Motor ID	Age (years)	Motor ID (Checklist):	Condition Rating:
	1			(1) 2 3 4 5
	2			(1) 2 3 4 5
	3			1 2 3 4 5
	4			1 2 3 4 5
	5			1 2 3 4 5
	6			1 2 3 4 5

	Condition Checklist (Mark motors w/ issues at right)	(1)	2	3	4	5	6	Comments:
	Dirty inspection ports							
	Oil reservoir low							
	Discoloration (potential overheating)							
	Unusual vibrations or noise							
	Past useful life -> replace							

Pump and Mechanical Assessment
Pump Station

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Piping	Condition Rating: (1) 2 3 4 5
☐ Needs minor touch-up paint	Comments:
☐ Needs complete repaint	
☐ Needs replacement	

Isolation Valves	Condition Rating: (1) 2 3 4 5
☐ Leaking	Comments:
☐ Recoating needed	
☐ Needs replacement	

HVAC System	Condition Rating: 1 (2) 3 4 5
☐ System Age: _____	Comments:
☐ Type	
☐ Ventilation Only	
☐ Air conditioning	
☐ Upgrade required (comment)	

Electrical Assessment
Pump Station

Pump Station ID:	Acord BPS	**Address:**	
Inspected By:	D. Oard / N. Davis	**Image Ref:**	
Date:	7/28		

Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; no wear or equipment issues; all hardware present
2	Adequate: minor wear, no equipment issues; all hardware present
3	Fair; worn, no major equipment issues; missing non-critical hardware
4	Poor; old and worn; missing important hardware; replacement recommended
5	Bad; hardware gone or failed; replacement required to continue operation

Overall Electrical

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 (2) 3 4 5		

Generators & Transfer Switches

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		See Pg Well Form

Switchboard

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	1995	1 (2) 3 4 5		

Transformer

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 (2) 3 4 5		~~2006~~ 2012

Motor Control Center (MCC)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		n/a

Panelboards

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 (2) 3 4 5		1995

VFD Control Panels (If applicable; one per pump motor)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
Pump 1	2012	1 (2) 3 4 5		
Pump 2	2012	1 (2) 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		

All seem in good condition.

Storage Tank Assessment
Steel Tanks

Storage Tank ID:	ST009 Acord	**Address:**	1490 West 3100 South
Inspected By:		**Image Ref:**	
Date:		**Tank Age:**	42 Years

Overall Condition Rating (Circle rating below)

1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Landscape & Enclosure	**Rating:** 1 2 3 4 (5)
☐ Landscape dead or dying (needs rehab/replant)	**Comments:** Replaced 1-2 yrs.
☐ Landscape needs complete replacement	
☐ Fencing/enclosure requires repair	
☐ Not applicable (No landscaping)	

Asphalt/Concrete (Parking, Walkways, Access)	**Rating:** 1 2 3 4 (5)
☐ Alligator cracking/aggregate visible/spalling	**Comments:** Replaced 1-2 yrs
☐ Large cracks and/or uplifts	
☐ Potholes or noticable settlement	
☐ Drainage issues (standing water, depressions, etc	

Exterior (if exposed)	**Rating:** 1 (2) 3 4 5
▨ Cracking	**Comments:**
☐ Single	
☐ Multiple	
☐ Broken/Collapsing Section	
▨ Surface	
☐ Surface spalling	
☐ Aggregate visible/projecting	
☐ Reinforcement visible/corroded	

Interior	**Rating:** 1 (2) 3 4 5
▨ Sealants/Joins	**Comments:**
☐ Daylight visible	
☐ Need replacement	
▨ Cracking	
☐ Single	
☐ Multiple	
☐ Broken/Collapsing Section	
▨ Surface	
☐ Surface spalling	
☐ Aggregate visible/projecting	
☐ Reinforcement visible/corroded	

Appurtenances	**Rating:** 1 2 3 (4) 5
▨ Ladders/Piping/Miscellaneous Metals	**Comments:** lower drain has no airgap
☐ Evidence of Corrosion	
☐ Replacements needed (comment required)	
▨ Hatches	
☐ Not Secure	
☐ Evidence of corrosion	
☐ Vents - screening improvements needed	
☒ Drains - screening improvements needed	
☐ Overflow - screening improvements needed	
☐ Foundation & Anchors - repairs needed	

Storage Tank Assessment
Steel Tanks

Storage Tank ID:	ST009 Acord	**Address:**	1490 West 3100 South
Inspected By:	Dee Smolka	**Image Ref:**	
Date:	8/17/21	**Tank Age:**	42 Years

Overall Condition Rating (Circle rating below)

1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Landscape & Enclosure		**Rating:**	1 2 3 4 (5)
	Landscape dead or dying (needs rehab/replant)	**Comments:**	Replaced 1-2 yrs
	Landscape needs complete replacement		
	Fencing/enclosure requires repair		
	Not applicable (No landscaping)		
Asphalt/Concrete (Parking, Walkways, Access)		**Rating:**	1 2 3 4 (5)
	Alligator cracking/aggregate visible/spalling	**Comments:**	Replaced 1-2 yrs
	Large cracks and/or uplifts		
	Potholes or noticable settlement		
	Drainage issues (standing water, depressions, etc		
Structural Steel		**Rating:**	1 2 (3) 4 5
	Age: _____	**Comments:**	minor cracking around tank, Pooling on top of tank, tank has crinkle top/side of tank.
	Foundation & Anchors		
X	Foundation - Concrete cracking/damage		
	Anchors - Evidence of Corrosion		
X	Other repairs needed (comment)		
Exterior Coating		**Rating:**	1 (2) 3 4 5
	Age: _____	**Comments:**	
	Signs of corrosion evident		
Interior Coating		**Rating:**	1 (2) 3 4 5
	Age: _____	**Comments:**	
	Signs of corrosion evident		
	Anodes present		
	If anodes present, anode replacement needed?		
Appurtenances		**Rating:**	1 2 3 (4) 5
	Ladders/Piping/Miscellaneous Metals	**Comments:**	lower drain has no air gap
	Evidence of Corrosion		
	Needs repaint/replacement		
	Hatches		
	Wrong type (not shoe box)		
	Not Secure		
	Evidence of corrosion		
	Vents - screening improvements needed		
X	Drains - screening improvements needed		
	Overflow - screening improvements needed		

Andra BPS & Tank

Site Assessment

Building and Site Assessment
Pump Station

Pump Station ID:	Andra PS	**Address:**	
Inspected By:	S. Pugh	**Image Ref:**	
Date:	7/28		

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

General	**Rating:** 1 2 3 4 5
▒ Building age: 2004	**Comments:**

Building/Vault Exterior	**Rating:** 1 2 3 4 5
☐ Roofing improvement needed	**Comments:**
☐ Aesthetic improvement needed	
☐ Minor component improvement needed	
☐ Not applicable (No building)	

Building/Vault Interior	**Rating:** 1 2 3 4 5
☐ Needs cleaning	**Comments:** anchor duct work + heater, electrical panels
☐ Aesthetic improvement needed	
☐ Updates needed to meet code	
▒ Structural improvements needed (check below)	
☒ Seismic upgrades	
☐ Repair	
☐ Complete replacement	

Landscape & Enclosure	**Rating:** 1 2 3 4 5
☐ Landscape dead or dying (needs rehab/replant)	**Comments:**
☐ Landscape needs complete replacement	
☐ Fencing/enclosure requires repair	
☐ Not applicable (No landscaping)	

Asphalt/Concrete (Parking, Walkways, Access)	**Rating:** 1 2 3 4 5
☐ Alligator cracking/aggregate visible/spalling	**Comments:**
☐ Large cracks and/or uplifts	
☐ Potholes or noticable settlement	
☐ Drainage issues (standing water, depressions, etc.)	

Pump and Mechanical Assessment
Pump Station

Pump Station ID:	Andra BPS 2014	**Address:**	
Inspected By:	B. Mayer	**Image Ref:**	
Date:	07/28/21		

Overall Condition Rating (Circle rating for individual components in sections below)

1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Pumps

	Pump ID	Age (years)	Pump ID (Checklist):	Condition Rating:
	1			(1) 2 3 4 5
	2			1 2 3 4 5
	3			1 2 3 4 5
	4			1 2 3 4 5
	5			1 2 3 4 5
	6			1 2 3 4 5

	Condition Checklist (Mark pumps w/ issues at right)	1	2	3	4	5	6	Comments:
	Pump surface - corrosion							
	Pump surface - chipped coating							
	Pump seals leaking							
	Worn nuts/lugs on bolted connections							
	Loose connections							
	Cracked or damaged foundation supports							
	Unusual vibrations or noise							
	Impeller - pitting or heavy wear							
	Pump performance significantly below rating							
	Past usefule life -> replace							

Motors

	Motor ID	Age (years)	Motor ID (Checklist):	Condition Rating:
	1			(1) 2 3 4 5
	2			1 2 3 4 5
	3			1 2 3 4 5
	4			1 2 3 4 5
	5			1 2 3 4 5
	6			1 2 3 4 5

	Condition Checklist (Mark motors w/ issues at right)	1	2	3	4	5	6	Comments:
	Dirty inspection ports							
	Oil reservoir low							
	Discoloration (potential overheating)							
	Unusual vibrations or noise							
	Past useful life -> replace							

Pump and Mechanical Assessment
Pump Station

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Piping		Condition Rating: (1) 2 3 4 5
☐	Needs minor touch-up paint	Comments:
☐	Needs complete repaint	
☐	Needs replacement	

Isolation Valves		Condition Rating: (1) 2 3 4 5
☐	Leaking	Comments:
☐	Recoating needed	
☐	Needs replacement	

HVAC System		Condition Rating: (1) 2 3 4 5
☐	System Age: _____	Comments:
☐	Type	
☐	✓ Ventilation Only	
☑	Air conditioning	
☐	Upgrade required (comment)	

Electrical Assessment
Pump Station

Pump Station ID:	Andra P.S.	**Address:**	
Inspected By:	D. Ovard / N. Davis	**Image Ref:**	
Date:	7/28		

Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; no wear or equipment issues; all hardware present
2	Adequate: minor wear, no equipment issues; all hardware present
3	Fair; worn, no major equipment issues; missing non-critical hardware
4	Poor; old and worn; missing important hardware; replacement recommended
5	Bad; hardware gone or failed; replacement required to continue operation

Overall Electrical

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	2008	1 (2) 3 4 5		No issues

Generators & Transfer Switches

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
n/a		1 2 3 4 5		

Switchboard

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	2008	1 (2) 3 4 5		

Transformer

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	2008	1 (2) 3 4 5		

Motor Control Center (MCC)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	2008	1 (2) 3 4 5		

Panelboards

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	2008	1 (2) 3 4 5		

VFD Control Panels (If applicable; one per pump motor)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
1	2008	1 (2) 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		

2008 [illegible] - for P.S.
Tank prior to 1999

Andra P.S.

Electrical Assessment
Pump Station

Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; no wear or equipment issues; all hardware present
2	Adequate: minor wear, no equipment issues; all hardware present
3	Fair; worn, no major equipment issues; missing non-critical hardware
4	Poor; old and worn; missing important hardware; replacement recommended
5	Bad; hardware gone or failed; replacement required to continue operation

Motor Starter(s) (If applicable; one per pump motor)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
1	2004	1 (2) 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		

PLC Panel/RTU

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	2004	1 (2) 3 4 5		

HMI

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	2004	1 (2) 3 4 5		

Security System (if applicable; if not present, leave comment)

Equipment No.	Age (yrs)	Condition (circle)	Status (Circle)	Comments:
	2004	1 (2) 3 4 5	New Outdated	Doors, Cameras - 2020

2020 - cam.

WU-DS-1B

Storage Tank Assessment
Concrete Tanks

Water Utility Assets
Distribution System

Storage Tank ID:	ST004 Andra	**Address:**	4535 South 6000 West
Inspected By:	Dee Smolka	**Image Ref:**	
Date:	8/10/21	**Tank Age:**	41

Overall Condition Rating (Circle rating below)

1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Landscape & Enclosure		**Rating:**	1 (2) 3 4 5
☐	Landscape dead or dying (needs rehab/replant)	**Comments:**	
☐	Landscape needs complete replacement		
☐	Fencing/enclosure requires repair		
☐	Not applicable (No landscaping)		
Asphalt/Concrete (Parking, Walkways, Access)		**Rating:**	(1) 2 3 4 5
☐	Alligator cracking/aggregate visible/spalling	**Comments:**	
☐	Large cracks and/or uplifts		
☐	Potholes or noticable settlement		
☐	Drainage issues (standing water, depressions, et		
Structural Steel		**Rating:**	1 (2) 3 4 5
▨	Age: _____	**Comments:**	
☐	Foundation & Anchors		
☐	Foundation - Concrete cracking/damage		
☐	Anchors - Evidence of Corrosion		
☐	Other repairs needed (comment)		
Exterior Coating		**Rating:**	1 (2) 3 4 5
▨	Age: _____	**Comments:**	
☐	Signs of corrosion evident		
Interior Coating		**Rating:**	1 (2) 3 4 5
▨	Age: _____	**Comments:**	
☐	Signs of corrosion evident		
☐	Anodes present		
☐	If anodes present, anode replacement needed?		
Appurtenances		**Rating:**	1 (2) 3 4 5
▨	Ladders/Piping/Miscellaneous Metals	**Comments:**	
☐	Evidence of Corrosion		
☐	Needs repaint/replacement		
▨	Hatches		
☐	Wrong type (not shoe box)		
☐	Not Secure		
☐	Evidence of corrosion		
☐	Vents - screening improvements needed		
☐	Drains - screening improvements needed		
☐	Overflow - screening improvements needed		

Breeze BPS & Tank

Site Assessment

Building and Site Assessment
Pump Station

Pump Station ID:	Breeze	**Address:**	
Inspected By:	S. Pugh	**Image Ref:**	
Date:	7/28		

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

General	**Rating:** 1 2 3 4 5
▒ Building age: _____	**Comments:**

Building/Vault Exterior	**Rating:** 1 2 3 4 5
☐ Roofing improvement needed	**Comments:** fill old bolt holes
☒ Aesthetic improvement needed	
☐ Minor component improvement needed	
☐ Not applicable (No building)	

Building/Vault Interior	**Rating:** 1 2 3 4 5
☐ Needs cleaning	**Comments:** elec panels heater anchorage anchor tanks chemical room anchor bolts rusty change to titanium or hastelloy
☐ Aesthetic improvement needed	
☐ Updates needed to meet code	
▒ Structural improvements needed (check below)	
☑ Seismic upgrades	
☐ Repair	
☐ Complete replacement	

Landscape & Enclosure	**Rating:** 1 2 3 4 5
☐ Landscape dead or dying (needs rehab/replant)	**Comments:**
☐ Landscape needs complete replacement	
☐ Fencing/enclosure requires repair	
☐ Not applicable (No landscaping)	

Asphalt/Concrete (Parking, Walkways, Access)	**Rating:** 1 2 3 4 5
☐ Alligator cracking/aggregate visible/spalling	**Comments:**
☐ Large cracks and/or uplifts	
☐ Potholes or noticable settlement	
☐ Drainage issues (standing water, depressions, etc.)	

Pump and Mechanical Assessment
Pump Station

Pump Station ID:	Breeze BPS	**Address:**	
Inspected By:	B. Mayer	**Image Ref:**	
Date:	07/28/21		

Overall Condition Rating (Circle rating for individual components in sections below)

1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Pumps

	Pump ID	Age (years)	Pump ID (Checklist):	Condition Rating:
	1			1 (2) 3 4 5
	2			1 (2) 3 4 5
	3			1 (2) 3 4 5
	4			1 (2) 3 4 5
	5			1 2 3 4 5
	6			1 2 3 4 5

	Condition Checklist (Mark pumps w/ issues at right)	1	2	3	4	5	6	Comments:
✓	Pump surface - corrosion							
✓	Pump surface - chipped coating							
	Pump seals leaking							
	Worn nuts/lugs on bolted connections							
	Loose connections							
	Cracked or damaged foundation supports							
	Unusual vibrations or noise							
	Impeller - pitting or heavy wear							
	Pump performance significantly below rating							
	Past usefule life -> replace							

Motors

	Motor ID	Age (years)	Motor ID (Checklist):	Condition Rating:
	1			1 (2) 3 4 5
	2			1 (2) 3 4 5
	3			1 (2) 3 4 5
	4			1 (2) 3 4 5
	5			1 2 3 4 5
	6			1 2 3 4 5

	Condition Checklist (Mark motors w/ issues at right)	1	2	3	4	5	6	Comments:
	Dirty inspection ports							
	Oil reservoir low							
	Discoloration (potential overheating)							
	Unusual vibrations or noise							
	Past useful life -> replace							

Pump and Mechanical Assessment
Pump Station

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Piping		Condition Rating:	1	2	3	4	5
	Needs minor touch-up paint	Comments:					
✓	Needs complete repaint						
	Needs replacement						

Isolation Valves		Condition Rating:	1	2	3	4	5
✓	Leaking	Comments:					
✓	Recoating needed						
	Needs replacement						

HVAC System		Condition Rating:	1	2	3	4	5
	System Age: _____	Comments:					
	Type						
	Ventilation Only						
✓	Air conditioning						
	Upgrade required (comment)						

Pumps and Mechanical Assessment - ~~Well~~ Breeze BPS

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Well Screens (if recent video available)	Rating: 1 2 3 4 5
☐ Needs cleaning	Comments:
☐ Corrosion/chemical buildup	
☐ Pitting/large holes	
☐ Excessive sand production	
☐ Clogged	

Secondary Disinfection (If Applicable)	Rating: 1 2 3 4 5
☐ System Age:	Comments:
☐ Chlorine odor present?	
☐ Cleaning required (comment)	
☐ Repairs required (comment)	
☐ Replacement required (comment)	

Fluoridation System (If Applicable)	Rating: 1 2 3 4 5
☐ System Age:	Comments:
☐ Cleaning required (comment)	
☐ Repairs required (comment)	
☐ Replacement required (comment)	

HVAC System	Rating: 1 2 3 4 5
☐ System Age: _____	Comments:
☐ Type	
☐ Ventilation Only	
☑ Air conditioning	
☐ Upgrade required (comment)	

Electrical Assessment
Pump Station

Pump Station ID:	Breeze	**Address:**	
Inspected By:	D. Ouard / N. Davis	**Image Ref:**	
Date:	7/28		

Condition Rating (Circle rating for individual components in sections below)

1	Excellent; no wear or equipment issues; all hardware present
2	Adequate: minor wear, no equipment issues; all hardware present
3	Fair; worn, no major equipment issues; missing non-critical hardware
4	Poor; old and worn; missing important hardware; replacement recommended
5	Bad; hardware gone or failed; replacement required to continue operation

Overall Electrical

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 (3) 4 5		Mis-Matched

Generators & Transfer Switches

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 (3) 4 5		2005-Gen Switch-original

Switchboard

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 (4) 5		Original

Transformer

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	2020	(1) 2 3 4 5		

Motor Control Center (MCC)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
n/a		1 2 3 4 5		

Panelboards

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
	2019	(1) 2 3 4 5		

VFD Control Panels (If applicable; one per pump motor)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
4 1	1994	1 2 3 (4) 5		
2	1994	1 2 3 (4) 5		
3	1994	1 2 3 (4) 5		
4	2018	1 2 3 4 5		- Hardly used
		1 2 3 4 5		
		1 (2) 3 4 5		

Res - 1960's

Sodium-Hypo - 2020 completed

Paint Panelboard

Transformer

Breeze P.S.

Electrical Assessment
Pump Station

Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; no wear or equipment issues; all hardware present
2	Adequate: minor wear, no equipment issues; all hardware present
3	Fair; worn, no major equipment issues; missing non-critical hardware
4	Poor; old and worn; missing important hardware; replacement recommended
5	Bad; hardware gone or failed; replacement required to continue operation

Motor Starter(s) (If applicable; one per pump motor)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
1		1 2 3 4 5		-Original 80's
2		1 2 3 4 5		-Original 80's
3 - none		1 2 3 4 5		
4 - none		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		

PLC Panel/RTU

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 (2) 3 4 5		~2015

HMI

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 (2) 3 4 5		~2015

Security System (if applicable; if not present, leave comment)

Equipment No.	Age (yrs)	Condition (circle)	Status (Circle)	Comments:
	2020	1 2 3 4 5	New Outdated	May doesn't work

Doors, Camera, Badge unlock

Storage Tank Assessment
Concrete Tanks

Storage Tank ID:	ST005 Breeze	**Address:**	6525 west 4100 South
Inspected By:	Dee Sinalka	**Image Ref:**	
Date:	8/10/21	**Tank Age:**	35

Overall Condition Rating (Circle rating below)

1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Landscape & Enclosure		**Rating:**	1 (2) 3 4 5
☐	Landscape dead or dying (needs rehab/replant)	**Comments:**	
☐	Landscape needs complete replacement		
☐	Fencing/enclosure requires repair		
☐	Not applicable (No landscaping)		
Asphalt/Concrete (Parking, Walkways, Access)		**Rating:**	1 2 (3) 4 5
☐	Alligator cracking/aggregate visible/spalling	**Comments:**	Sidewalk settling around overflow pedestal entrance.
☐	Large cracks and/or uplifts		
☒	Potholes or noticable settlement		
☐	Drainage issues (standing water, depressions, et		
Structural Steel		**Rating:**	1 2 (3) 4 5
▒	Age: _____	**Comments:**	
☐	Foundation & Anchors		
☐	Foundation - Concrete cracking/damage		
☐	Anchors - Evidence of Corrosion		
☐	Other repairs needed (comment)		
Exterior Coating		**Rating:**	1 2 (3) 4 5
▒	Age: _____	**Comments:**	
☐	Signs of corrosion evident		
Interior Coating		**Rating:**	1 2 (3) 4 5
▒	Age: _____	**Comments:**	
☐	Signs of corrosion evident		
☐	Anodes present		
☐	If anodes present, anode replacement needed?		
Appurtenances		**Rating:**	1 2 (3) 4 5
▒	Ladders/Piping/Miscellaneous Metals	**Comments:**	
☐	Evidence of Corrosion		
☐	Needs repaint/replacement		
▒	Hatches		
☐	Wrong type (not shoe box)		
☐	Not Secure		
☐	Evidence of corrosion		
☐	Vents - screening improvements needed		
☐	Drains - screening improvements needed		
☐	Overflow - screening improvements needed		

Ridgeland BPS & Tank

Site Assessment

WU-DS-1A

Storage Tank Assessment
Steel Tanks

Water Utility Assets
Distribution System

Storage Tank ID:	ST007 Ridgeland	**Address:**	2386 South 3600 West
Inspected By:		**Image Ref:**	
Date:		**Tank Age:**	52

Overall Condition Rating (Circle rating below)

1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Landscape & Enclosure	**Rating:** 1 (2) 3 4 5
☐ Landscape dead or dying (needs rehab/replant)	**Comments:**
☐ Landscape needs complete replacement	
☐ Fencing/enclosure requires repair	
☐ Not applicable (No landscaping)	

Asphalt/Concrete (Parking, Walkways, Access)	**Rating:** 1 2 (3) 4 5
☐ Alligator cracking/aggregate visible/spalling	**Comments:** Some Settling near gas pumps
☐ Large cracks and/or uplifts	
☒ Potholes or noticable settlement	
☐ Drainage issues (standing water, depressions, et	

Exterior (if exposed)	**Rating:** 1 (2) 3 4 5
▨ Cracking	**Comments:**
☐ Single	
☐ Multiple	
☐ Broken/Collapsing Section	
▨ Surface	
☐ Surface spalling	
☐ Aggregate visible/projecting	
☐ Reinforcement visible/corroded	

Interior	**Rating:** 1 (2) 3 4 5
▨ Sealants/Joins	**Comments:**
☐ Daylight visible	
☐ Need replacement	
▨ Cracking	
☐ Single	
☐ Multiple	
☐ Broken/Collapsing Section	
▨ Surface	
☐ Surface spalling	
☐ Aggregate visible/projecting	
☐ Reinforcement visible/corroded	

Appurtenances	**Rating:** 1 (2) 3 4 5
▨ Ladders/Piping/Miscellaneous Metals	**Comments:**
☐ Evidence of Corrosion	
☐ Replacements needed (comment required)	
▨ Hatches	
☐ Not Secure	
☐ Evidence of corrosion	
☐ Vents - screening improvements needed	
☐ Drains - screening improvements needed	
☐ Overflow - screening improvements needed	
☐ Foundation & Anchors - repairs needed	

Storage Tank Assessment
Steel Tanks

Storage Tank ID:	ST007 Ridgeland	**Address:**	2386 South 3600 West
Inspected By:		**Image Ref:**	
Date:		**Tank Age:**	52

Overall Condition Rating (Circle rating below)

1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

	Landscape & Enclosure	**Rating:** 1 (2) 3 4 5
	Landscape dead or dying (needs rehab/replant)	**Comments:**
	Landscape needs complete replacement	
	Fencing/enclosure requires repair	
	Not applicable (No landscaping)	

	Asphalt/Concrete (Parking, Walkways, Access)	**Rating:** 1 2 (3) 4 5
	Alligator cracking/aggregate visible/spalling	**Comments:** Some settling near gas pumps
	Large cracks and/or uplifts	
X	Potholes or noticable settlement	
	Drainage issues (standing water, depressions, etc	

	Structural Steel	**Rating:** 1 (2) 3 4 5
	Age: _____	**Comments:** Pooling on top of tank.
	Foundation & Anchors	
	Foundation - Concrete cracking/damage	
	Anchors - Evidence of Corrosion	
	Other repairs needed (comment)	

	Exterior Coating	**Rating:** 1 (2) 3 4 5
	Age: _____	**Comments:**
	Signs of corrosion evident	

	Interior Coating	**Rating:** 1 (2) 3 4 5
	Age: _____	**Comments:** Anodes are fairly new.
	Signs of corrosion evident	
X	Anodes present	
	If anodes present, anode replacement needed?	

	Appurtenances	**Rating:** 1 (2) 3 4 5
	Ladders/Piping/Miscellaneous Metals	**Comments:**
	Evidence of Corrosion	
	Needs repaint/replacement	
	Hatches	
	Wrong type (not shoe box)	
	Not Secure	
	Evidence of corrosion	
	Vents - screening improvements needed	
	Drains - screening improvements needed	
	Overflow - screening improvements needed	

Building and Site Assessment
Pump Station

Pump Station ID:	Ridgeland	**Address:**	
Inspected By:	Dee Smolka	**Image Ref:**	
Date:	8/9/21		

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

General	**Rating:** 1 2 (3) 4 5
▒ Building age: _____	**Comments:**

Building/Vault Exterior	**Rating:** 1 2 (3) 4 5
X Roofing improvement needed	**Comments:** Roofing cracking / bubbling
☐ Aesthetic improvement needed	
☐ Minor component improvement needed	
☐ Not applicable (No building)	

Building/Vault Interior	**Rating:** 1 2 (3) 4 5
☐ Needs cleaning	**Comments:** Wall needs gaps/cracks sealed
☐ Aesthetic improvement needed	
☐ Updates needed to meet code	
▒ Structural improvements needed (check below)	
☐ Seismic upgrades	
☐ Repair	
☐ Complete replacement	

Landscape & Enclosure	**Rating:** (1) 2 3 4 5
☐ Landscape dead or dying (needs rehab/replant)	**Comments:**
☐ Landscape needs complete replacement	
☐ Fencing/enclosure requires repair	
☐ Not applicable (No landscaping)	

Asphalt/Concrete (Parking, Walkways, Access)	**Rating:** 1 2 (3) 4 5
☐ Alligator cracking/aggregate visible/spalling	**Comments:** Settlement near gas pump.
☐ Large cracks and/or uplifts	
X Potholes or noticable settlement	
☐ Drainage issues (standing water, depressions, etc.)	

Pump and Mechanical Assessment
Pump Station

Pump Station ID:	Ridgeland	**Address:**	
Inspected By:	Dee Smolka	**Image Ref:**	
Date:	8/9/21		

Overall Condition Rating (Circle rating for individual components in sections below)

1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Pumps

	Pump ID	Age (years)	Pump ID (Checklist):	Condition Rating:
	1			1 (2) 3 4 5
	2			1 (2) 3 4 5
	3			1 2 3 4 5
	4			1 2 3 4 5
	5			1 2 3 4 5
	6			1 2 3 4 5

	Condition Checklist (Mark pumps w/ issues at right)	(1)	2	3	4	5	6	Comments:
	Pump surface - corrosion							
	Pump surface - chipped coating							
	Pump seals leaking							
	Worn nuts/lugs on bolted connections							
	Loose connections							
	Cracked or damaged foundation supports							
	Unusual vibrations or noise							
	Impeller - pitting or heavy wear							
	Pump performance significantly below rating							
	Past usefule life -> replace							

Motors

	Motor ID	Age (years)	Motor ID (Checklist):	Condition Rating:
	1			(1) 2 3 4 5
	2			(1) 2 3 4 5
	3			1 2 3 4 5
	4			1 2 3 4 5
	5			1 2 3 4 5
	6			1 2 3 4 5

	Condition Checklist (Mark motors w/ issues at right)	(1)	2	3	4	5	6	Comments:
	Dirty inspection ports							
	Oil reservoir low							
	Discoloration (potential overheating)							
	Unusual vibrations or noise							
	Past useful life -> replace							

Pump and Mechanical Assessment
Pump Station

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Piping	Condition Rating: (1) 2 3 4 5
☐ Needs minor touch-up paint	Comments:
☐ Needs complete repaint	
☐ Needs replacement	

Isolation Valves	Condition Rating: (1) 2 3 4 5
☐ Leaking	Comments:
☐ Recoating needed	
☐ Needs replacement	

HVAC System	Condition Rating: (1) 2 3 4 5
☐ System Age: _____	Comments:
☐ Type	
☐ Ventilation Only	
☒ Air conditioning	
☐ Upgrade required (comment)	

Sorenson BPS, Tank, & Well (4)

Site Assessment

Electrical Assessment
Pump Station

Pump Station ID:	WELL 4 (SORENSON)	**Address:**	3662 WEST GOOSEBERRY CT
Inspected By:	DAVID MOEAKIOLA	**Image Ref:**	
Date:	08/05/21		

Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; no wear or equipment issues; all hardware present
2	Adequate: minor wear, no equipment issues; all hardware present
3	Fair; worn, no major equipment issues; missing non-critical hardware
4	Poor; old and worn; missing important hardware; replacement recommended
5	Bad; hardware gone or failed; replacement required to continue operation

Overall Electrical

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 (3) 4 5		WELL NOT IN USE

Generators & Transfer Switches

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 (5)		GEN. AND SWITCH ARE ORIGINALS

Switchboard

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		(1) 2 3 4 (5)		ORIGINAL WITH WELL BUT NOT IN USE.

Transformer

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 (4) 5		ORIGINAL BUT NO DATES FOUND

Motor Control Center (MCC)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 (4) 5		" "

Panelboards

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		(1) 2 3 4 5		NEWLY INSTALLED 2021

VFD Control Panels (If applicable; one per pump motor)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 (5)		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		

 WELL 4

Electrical Assessment
Pump Station

Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; no wear or equipment issues; all hardware present
2	Adequate: minor wear, no equipment issues; all hardware present
3	Fair; worn, no major equipment issues; missing non-critical hardware
4	Poor; old and worn; missing important hardware; replacement recommended
5	Bad; hardware gone or failed; replacement required to continue operation

Motor Starter(s) (If applicable; one per pump motor)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 (5)		ORIGINAL.
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		

PLC Panel/RTU

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		(1) 2 3 4 5		2021

HMI

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		(1) 2 3 4 5		2021

Security System (if applicable; if not present, leave comment)

Equipment No.	Age (yrs)	Condition (circle)	Status (Circle)	Comments:
		1 2 3 4 (5)	New Outdated	NONE

Storage Tank Assessment
Steel Tanks

Storage Tank ID:	ST006 Sorenson	**Address:**	3662 west Gooseberry Court
Inspected By:	Dee Smolka	**Image Ref:**	
Date:	8/9/21	**Tank Age:**	43

Overall Condition Rating (Circle rating below)

1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Landscape & Enclosure	**Rating:** 1 2 (3) 4 5
☐ Landscape dead or dying (needs rehab/replant)	**Comments:**
☐ Landscape needs complete replacement	
☐ Fencing/enclosure requires repair	
☐ Not applicable (No landscaping)	

Asphalt/Concrete (Parking, Walkways, Access)	**Rating:** (1) 2 3 4 5
☐ Alligator cracking/aggregate visible/spalling	**Comments:** New Asphalt
☐ Large cracks and/or uplifts	
☐ Potholes or noticable settlement	
☐ Drainage issues (standing water, depressions, et	

Exterior (if exposed)	**Rating:** 1 (2) 3 4 5
☒ Cracking	**Comments:** multiple paint on exterior of tank
☐ Single	
☒ Multiple	
☐ Broken/Collapsing Section	
☒ Surface	
☐ Surface spalling	
☐ Aggregate visible/projecting	
☐ Reinforcement visible/corroded	

Interior	**Rating:** 1 (2) 3 4 5
☒ Sealants/Joins	**Comments:** multiple spots need to paint.
☐ Daylight visible	
☐ Need replacement	
☒ Cracking	
☐ Single	
☐ Multiple	
☐ Broken/Collapsing Section	
☒ Surface	
☐ Surface spalling	
☐ Aggregate visible/projecting	
☐ Reinforcement visible/corroded	

Appurtenances	**Rating:** 1 (2) 3 4 5
☒ Ladders/Piping/Miscellaneous Metals	**Comments:**
☐ Evidence of Corrosion	
☐ Replacements needed (comment required)	
☒ Hatches	
☐ Not Secure	
☐ Evidence of corrosion	
☐ Vents - screening improvements needed	
☐ Drains - screening improvements needed	
☐ Overflow - screening improvements needed	
☐ Foundation & Anchors - repairs needed	

Storage Tank Assessment
Steel Tanks

Storage Tank ID:	ST006 Sorenson	**Address:**	3662 West Gooseberry Court
Inspected By:	Dee Smolka	**Image Ref:**	
Date:	8/9/21	**Tank Age:**	43

Overall Condition Rating (Circle rating below)

1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

	Landscape & Enclosure	**Rating:** 1 2 (3) 4 5
	Landscape dead or dying (needs rehab/replant)	**Comments:**
	Landscape needs complete replacement	
	Fencing/enclosure requires repair	
	Not applicable (No landscaping)	

	Asphalt/Concrete (Parking, Walkways, Access)	**Rating:** (1) 2 3 4 5
	Alligator cracking/aggregate visible/spalling	**Comments:**
	Large cracks and/or uplifts	New Asphalt
	Potholes or noticable settlement	
	Drainage issues (standing water, depressions, etc	

	Structural Steel	**Rating:** 1 (2) 3 4 5
	Age: _____	**Comments:**
	Foundation & Anchors	
	Foundation - Concrete cracking/damage	
	Anchors - Evidence of Corrosion	
	Other repairs needed (comment)	

	Exterior Coating	**Rating:** 1 2 (3) 4 5
	Age: _____	**Comments:** Multiple Colors Some touchup.
	Signs of corrosion evident	

	Interior Coating	**Rating:** 1 2 (3) 4 5
	Age: _____	**Comments:**
	Signs of corrosion evident	Some touch up needed.
	Anodes present	
	If anodes present, anode replacement needed?	

	Appurtenances	**Rating:** 1 (2) 3 4 5
	Ladders/Piping/Miscellaneous Metals	**Comments:**
	Evidence of Corrosion	
	Needs repaint/replacement	
	Hatches	
	Wrong type (not shoe box)	
	Not Secure	
	Evidence of corrosion	
	Vents - screening improvements needed	
	Drains - screening improvements needed	
	Overflow - screening improvements needed	

Building and Site Assessment
Pump Station

Pump Station ID:	Booster Sorenson 4	**Address:**	
Inspected By:	Dee Smolka	**Image Ref:**	
Date:	8/9/21		

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

General	**Rating:** 1 (2) 3 4 5
☐ Building age: _____	**Comments:**

Building/Vault Exterior	**Rating:** 1 (2) 3 4 5
☐ Roofing improvement needed	**Comments:**
☐ Aesthetic improvement needed	
☐ Minor component improvement needed	
☐ Not applicable (No building)	

Building/Vault Interior	**Rating:** 1 2 (3) 4 5
☐ Needs cleaning	**Comments:** Upgrades in process
☐ Aesthetic improvement needed	
☐ Updates needed to meet code	
☐ Structural improvements needed (check below)	
☐ Seismic upgrades	
☐ Repair	
☐ Complete replacement	

Landscape & Enclosure	**Rating:** 1 (2) 3 4 5
☐ Landscape dead or dying (needs rehab/replant)	**Comments:**
☐ Landscape needs complete replacement	
☐ Fencing/enclosure requires repair	
☐ Not applicable (No landscaping)	

Asphalt/Concrete (Parking, Walkways, Access)	**Rating:** (1) 2 3 4 5
☐ Alligator cracking/aggregate visible/spalling	**Comments:** Brand new asphalt
☐ Large cracks and/or uplifts	
☐ Potholes or noticable settlement	
☐ Drainage issues (standing water, depressions, etc.)	

Pump and Mechanical Assessment
Pump Station

Pump Station ID:	Booster Sorenson 4	**Address:**	
Inspected By:	Doc Smalley	**Image Ref:**	
Date:	8/9/21		

Overall Condition Rating (Circle rating for individual components in sections below)

1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Pumps

	Pump ID	Age (years)	Pump ID (Checklist):	Condition Rating:
	1			1 (2) 3 4 5
	2			1 2 3 4 5
	3			1 2 3 4 5
	4			1 2 3 4 5
	5			1 2 3 4 5
	6			1 2 3 4 5

	Condition Checklist (Mark pumps w/ issues at right)	1	(2)	3	4	5	6	Comments:
	Pump surface - corrosion							
	Pump surface - chipped coating							
	Pump seals leaking							
	Worn nuts/lugs on bolted connections							
	Loose connections							
	Cracked or damaged foundation supports							
	Unusual vibrations or noise							
	Impeller - pitting or heavy wear							
	Pump performance significantly below rating							
	Past usefule life -> replace							

Motors

	Motor ID	Age (years)	Motor ID (Checklist):	Condition Rating:
	1			1 (2) 3 4 5
	2			1 2 3 4 5
	3			1 2 3 4 5
	4			1 2 3 4 5
	5			1 2 3 4 5
	6			1 2 3 4 5

	Condition Checklist (Mark motors w/ issues at right)	1	(2)	3	4	5	6	Comments:
	Dirty inspection ports							
	Oil reservoir low							
	Discoloration (potential overheating)							
	Unusual vibrations or noise							
	Past useful life -> replace							

Pump and Mechanical Assessment
Pump Station

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Piping	Condition Rating: 1 (2) 3 4 5
[X] Needs minor touch-up paint	Comments:
[ ] Needs complete repaint	
[ ] Needs replacement	

Isolation Valves	Condition Rating: 1 (2) 3 4 5
[ ] Leaking	Comments:
[ ] Recoating needed	
[ ] Needs replacement	

HVAC System	Condition Rating: 1 2 3 4 5
[ ] System Age: _____	Comments: N/A
[ ] Type	
[X] Ventilation Only	
[ ] Air conditioning	
[ ] Upgrade required (comment)	

Tank Farm BPS & Tank

Site Assessment

Storage Tank Assessment
Steel Tanks

Storage Tank ID:	ST001 Tankfarm 2mil	**Address:**	4408 South 4800 West
Inspected By:		**Image Ref:**	
Date:		**Tank Age:**	45

Overall Condition Rating (Circle rating below)

1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Landscape & Enclosure	**Rating:** 1 2 3 4 5
☐ Landscape dead or dying (needs rehab/replant)	**Comments:** N/A
☐ Landscape needs complete replacement	
☐ Fencing/enclosure requires repair	
☒ Not applicable (No landscaping)	

Asphalt/Concrete (Parking, Walkways, Access)	**Rating:** (1) 2 3 4 5
☐ Alligator cracking/aggregate visible/spalling	**Comments:**
☐ Large cracks and/or uplifts	
☐ Potholes or noticable settlement	
☐ Drainage issues (standing water, depressions, etc	

Exterior (if exposed)	**Rating:** (1) 2 3 4 5
▨ Cracking	**Comments:**
☐ Single	
☐ Multiple	
☐ Broken/Collapsing Section	
▨ Surface	
☐ Surface spalling	
☐ Aggregate visible/projecting	
☐ Reinforcement visible/corroded	

Interior	**Rating:** 1 (2) 3 4 5
▨ Sealants/Joins	**Comments:**
☐ Daylight visible	
☐ Need replacement	
▨ Cracking	
☐ Single	
☐ Multiple	
☐ Broken/Collapsing Section	
▨ Surface	
☐ Surface spalling	
☐ Aggregate visible/projecting	
☐ Reinforcement visible/corroded	

Appurtenances	**Rating:** 1 (2) 3 4 5
▨ Ladders/Piping/Miscellaneous Metals	**Comments:**
☐ Evidence of Corrosion	
☐ Replacements needed (comment required)	
▨ Hatches	
☐ Not Secure	
☐ Evidence of corrosion	
☐ Vents - screening improvements needed	
☐ Drains - screening improvements needed	
☐ Overflow - screening improvements needed	
☐ Foundation & Anchors - repairs needed	

Storage Tank Assessment
Steel Tanks

Storage Tank ID:	ST001 Tank Farm 2 Mil	**Address:**	4408 South 4800 West
Inspected By:		**Image Ref:**	
Date:		**Tank Age:**	45

Overall Condition Rating (Circle rating below)

1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

	Landscape & Enclosure	**Rating:** 1 2 3 4 5
	Landscape dead or dying (needs rehab/replant)	**Comments:** N/A
	Landscape needs complete replacement	
	Fencing/enclosure requires repair	
X	Not applicable (No landscaping)	

	Asphalt/Concrete (Parking, Walkways, Access)	**Rating:** (1) 2 3 4 5
	Alligator cracking/aggregate visible/spalling	**Comments:**
	Large cracks and/or uplifts	
	Potholes or noticable settlement	
	Drainage issues (standing water, depressions, etc	

	Structural Steel	**Rating:** 1 2 (3) 4 5
	Age: _____	**Comments:** Minor cracking in cement around 2 mil tank
	Foundation & Anchors	
X	Foundation - Concrete cracking/damage	
	Anchors - Evidence of Corrosion	
	Other repairs needed (comment)	

	Exterior Coating	**Rating:** 1 (2) 3 4 5
	Age: _____	**Comments:**
	Signs of corrosion evident	

	Interior Coating	**Rating:** 1 (2) 3 4 5
	Age: _____	**Comments:**
	Signs of corrosion evident	
	Anodes present	
	If anodes present, anode replacement needed?	

	Appurtenances	**Rating:** 1 (2) 3 4 5
	Ladders/Piping/Miscellaneous Metals	**Comments:**
	Evidence of Corrosion	
	Needs repaint/replacement	
	Hatches	
	Wrong type (not shoe box)	
	Not Secure	
	Evidence of corrosion	
	Vents - screening improvements needed	
	Drains - screening improvements needed	
	Overflow - screening improvements needed	

Storage Tank Assessment
Steel Tanks

Storage Tank ID:	ST002 Tankfarm / mil	**Address:**	4408 South 4800 West
Inspected By:		**Image Ref:**	
Date:		**Tank Age:**	45

Overall Condition Rating (Circle rating below)

1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Landscape & Enclosure	**Rating:** 1 2 3 4 5
☐ Landscape dead or dying (needs rehab/replant)	**Comments:** N/A
☐ Landscape needs complete replacement	
☐ Fencing/enclosure requires repair	
☒ Not applicable (No landscaping)	

Asphalt/Concrete (Parking, Walkways, Access)	**Rating:** (1) 2 3 4 5
☐ Alligator cracking/aggregate visible/spalling	**Comments:**
☐ Large cracks and/or uplifts	
☐ Potholes or noticable settlement	
☐ Drainage issues (standing water, depressions, et	

Exterior (if exposed)	**Rating:** (1) 2 3 4 5
▨ Cracking	**Comments:**
☐ Single	
☐ Multiple	
☐ Broken/Collapsing Section	
▨ Surface	
☐ Surface spalling	
☐ Aggregate visible/projecting	
☐ Reinforcement visible/corroded	

Interior	**Rating:** 1 (2) 3 4 5
▨ Sealants/Joins	**Comments:**
☐ Daylight visible	
☐ Need replacement	
▨ Cracking	
☐ Single	
☐ Multiple	
☐ Broken/Collapsing Section	
▨ Surface	
☐ Surface spalling	
☐ Aggregate visible/projecting	
☐ Reinforcement visible/corroded	

Appurtenances	**Rating:** 1 (2) 3 4 5
▨ Ladders/Piping/Miscellaneous Metals	**Comments:**
☐ Evidence of Corrosion	
☐ Replacements needed (comment required)	
▨ Hatches	
☐ Not Secure	
☐ Evidence of corrosion	
☐ Vents - screening improvements needed	
☐ Drains - screening improvements needed	
☐ Overflow - screening improvements needed	
☐ Foundation & Anchors - repairs needed	

Storage Tank Assessment
Steel Tanks

Storage Tank ID:	ST002 Tank Farm 1 Mil	**Address:**	4408 South 4800 West
Inspected By:		**Image Ref:**	
Date:		**Tank Age:**	45

Overall Condition Rating (Circle rating below)

1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

	Landscape & Enclosure	**Rating:** 1 2 3 4 5
	Landscape dead or dying (needs rehab/replant)	**Comments:** N/A
	Landscape needs complete replacement	
	Fencing/enclosure requires repair	
X	Not applicable (No landscaping)	

	Asphalt/Concrete (Parking, Walkways, Access)	**Rating:** (1) 2 3 4 5
	Alligator cracking/aggregate visible/spalling	**Comments:**
	Large cracks and/or uplifts	
	Potholes or noticable settlement	
	Drainage issues (standing water, depressions, etc	

	Structural Steel	**Rating:** 1 2 (3) 4 5
	Age: _____	**Comments:** Minor Cracking in Cement around 1 mil. Tank
	Foundation & Anchors	
X	Foundation - Concrete cracking/damage	
	Anchors - Evidence of Corrosion	
	Other repairs needed (comment)	

	Exterior Coating	**Rating:** 1 (2) 3 4 5
	Age: _____	**Comments:**
	Signs of corrosion evident	

	Interior Coating	**Rating:** 1 (2) 3 4 5
	Age: _____	**Comments:**
	Signs of corrosion evident	
	Anodes present	
	If anodes present, anode replacement needed?	

	Appurtenances	**Rating:** 1 (2) 3 4 5
	Ladders/Piping/Miscellaneous Metals	**Comments:**
	Evidence of Corrosion	
	Needs repaint/replacement	
	Hatches	
	Wrong type (not shoe box)	
	Not Secure	
	Evidence of corrosion	
	Vents - screening improvements needed	
	Drains - screening improvements needed	
	Overflow - screening improvements needed	

Building and Site Assessment
Pump Station

Pump Station ID:	Tankfarm	**Address:**	
Inspected By:	Dee Smalka	**Image Ref:**	
Date:	8/10/21		

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

General	**Rating:** 1 (2) 3 4 5
▒ Building age: _____	**Comments:** N/A

Building/Vault Exterior	**Rating:** 1 (2) 3 4 5
☐ Roofing improvement needed	**Comments:** Future upgrades
☐ Aesthetic improvement needed	
☐ Minor component improvement needed	
☐ Not applicable (No building)	

Building/Vault Interior	**Rating:** 1 (2) 3 4 5
☐ Needs cleaning	**Comments:** N/A
☐ Aesthetic improvement needed	
☐ Updates needed to meet code	Future upgrades
▒ Structural improvements needed (check below)	
☐ Seismic upgrades	
☐ Repair	
☐ Complete replacement	

Landscape & Enclosure	**Rating:** 1 (2) 3 4 5
☐ Landscape dead or dying (needs rehab/replant)	**Comments:**
☐ Landscape needs complete replacement	
☐ Fencing/enclosure requires repair	
☐ Not applicable (No landscaping)	

Asphalt/Concrete (Parking, Walkways, Access)	**Rating:** 1 (2) 3 4 5
☐ Alligator cracking/aggregate visible/spalling	**Comments:**
☐ Large cracks and/or uplifts	
☐ Potholes or noticable settlement	
☐ Drainage issues (standing water, depressions, etc.)	

Pump and Mechanical Assessment
Pump Station

Pump Station ID:	Tank Farm	**Address:**	
Inspected By:	Dee Smolka	**Image Ref:**	
Date:	8/10/21		

Overall Condition Rating (Circle rating for individual components in sections below)

1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Pumps

	Pump ID	Age (years)	Pump ID (Checklist):	Condition Rating:
	1			1 (2) 3 4 5
	2			1 (2) 3 4 5
	3			1 (2) 3 4 5
	4			1 (2) 3 4 5
	5			1 2 3 4 5
	6			1 2 3 4 5

	Condition Checklist (Mark pumps w/ issues at right)	1	2	3	4	5	6	Comments:
X	Pump surface - corrosion							
	Pump surface - chipped coating	X		X	X			Future upgrades
X	Pump seals leaking			X				
	Worn nuts/lugs on bolted connections							
	Loose connections							
	Cracked or damaged foundation supports							
	Unusual vibrations or noise							
	Impeller - pitting or heavy wear							
	Pump performance significantly below rating							
	Past usefule life -> replace							

Motors

	Motor ID	Age (years)	Motor ID (Checklist):	Condition Rating:
	1	Rebuilt 2014		1 (2) 3 4 5
	2	" 2015		1 (2) 3 4 5
	3	" 2016		1 (2) 3 4 5
	4	" 2015		1 (2) 3 4 5
	5			1 2 3 4 5
	6			1 2 3 4 5

	Condition Checklist (Mark motors w/ issues at right)	1	2	3	4	5	6	Comments:
	Dirty inspection ports							
	Oil reservoir low							
	Discoloration (potential overheating)							
	Unusual vibrations or noise							
	Past useful life -> replace							

Pump and Mechanical Assessment
Pump Station

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Piping		Condition Rating:	1	2	(3)	4	5
X	Needs minor touch-up paint	Comments:					
	Needs complete repaint						
	Needs replacement						

Isolation Valves		Condition Rating:	1	2	(3)	4	5
	Leaking	Comments:					
	Recoating needed						
	Needs replacement						

HVAC System		Condition Rating:	1	(2)	3	4	5
	System Age:	Comments:					
	Type Lennox LCA240SN1G						
✓	Ventilation Only						
X	Air conditioning						
	Upgrade required (comment)						

Well 1

Site Assessment

Building and Site Assessment - Well

Well ID:	Well 1	**Address:**	
Inspected By:	S. Rugh	**Image Ref:**	
Date:	7/28		

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

General	**Rating:** 1 2 3 4 5
▒ Building age: _____	**Comments:**

Building Exterior	**Rating:** 1 2 3 4 5
☐ Roofing improvement needed	**Comments:**
☒ Aesthetic improvement needed	grout/caulk
☐ Minor component improvement eeded	fill holes
☐ Not applicable (No building)	

Building/Vault Interior	**Rating:** 1 2 3 4 5
☐ Needs cleaning	**Comments:**
☑ Aesthetic improvement needed	anchorage
☐ Updates needed to meet code	tanks
▒ Structural improvements needed (check below)	heater
☒ Seismic upgrades	ductwork
☐ Repair	
☐ Complete replacement	

Landscape & Enclosure	**Rating:** 1 2 3 4 5
☐ Landscape dead or dying (needs rehab/replant)	**Comments:**
☐ Landscape needs complete replacement	
☐ Fencing/enclosure requires repair	
☐ Not applicable (No landscaping)	

Asphalt/Concrete (Parking, Walkways, Access)	**Rating:** 1 2 3 4 5
☐ Alligator cracking/aggregate visible/spalling	**Comments:**
☐ Large cracks and/or uplifts	
☐ Potholes or noticable settlement	
☐ Drainage issues (standing water, depressions, etc.)	

Pumps and Mechanical Assessment - Well

Well ID:	Well 1	**Address:**	
Inspected By:	B. Mayer	**Image Ref:**	
Date: 7/28/21	7/28/21		

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Pump	**Rating:** (1) 2 3 4 5
Age: 2015	**Comments:** Was oil lube, water lube
Pump surface - corrosion	
Pump surface - chipped coating	
Pump seals leaking	
Worn nuts/lugs on bolted connections	
Loose connections	
Cracked or damaged foundation supports	
Unusual vibrations or noise	
Impeller - pitting or heavy wear	
Pump performance significantly below rating	
Past useful life -> replace	

Motor	**Rating:** (1) 2 3 4 5
Age: ~~2015~~ 2009	**Comments:**
Dirty inspection ports	
Oil reservoir low	
Discoloration (potential overheating)	
Unusual vibrations or noise	
Past useful life -> replace	

Exposed Piping	**Rating:** (1) 2 3 4 5
Needs minor touch-up paint	**Comments:**
Needs complete repaint	
Needs replacement	

Isolation Valves	**Rating:** (1) 2 3 4 5
Leaking	**Comments:**
Recoating needed	
Needs replacement	

Well Casing (if recent video available)	**Rating:** 1 2 3 4 5
Corrosion	**Comments:**
Holes present	
Needs replacement	

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Well Screens (if recent video available)		Rating: 1 2 3 4 5
	Needs cleaning	Comments:
	Corrosion/chemical buildup	
	Pitting/large holes	
	Excessive sand production	
	Clogged	

Secondary Disinfection (If Applicable)		Rating: 1 (2) 3 4 5
	System Age:	Comments:
	Chlorine odor present?	
✓	Cleaning required (comment)	
	Repairs required (comment)	
	Replacement required (comment)	

Fluoridation System (If Applicable)		Rating: 1 (2) 3 4 5
	System Age:	Comments:
✓	Cleaning required (comment)	
	Repairs required (comment)	
	Replacement required (comment)	

HVAC System		Rating: 1 (2) 3 4 5
	System Age: _____	Comments:
	Type	
	Ventilation Only	
✓	Air conditioning	
	Upgrade required (comment)	

Electrical Assessment - Well

Well ID:	Well 1	**Address:**	
Inspected By:	D. Ovard / N. Davis	**Image Ref:**	
Date:	7/28		

Condition Rating (Circle rating for individual components in sections below)

1	Excellent; no wear or equipment issues; all hardware present
2	Adequate: minor wear, no equipment issues; all hardware present
3	Fair; worn, no major equipment issues; missing non-critical hardware
4	Poor; old and worn; missing important hardware; replacement recommended
5	Bad; hardware gone or failed; replacement required to continue operation

Overall Electrical

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 (3) 4 5		

Generator and Transfer Switch

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		(1) (2) 3 4 5		2015 ~~Unsure on year.~~

Switchboard

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 (2) 3 4 5		2003

Transformer

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 (3) 4 5		2003

Motor Control Center (MCC)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		n/a

Panelboard

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 (2) 3 4 5		Panel 2003 - 2003 (Might be updated)

VFD (If applicable)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 (3) 4 5		2003 - Old - no parts

Motor Starter (If applicable)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		n/a

PLC Panel/RTU

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 (2) 3 4 5		2015

HMI

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 (2) 3 4 5		2015

Security System (if applicable; if not present, leave comment)

Equipment No.	Age (yrs)	Condition (circle)	Status (Circle)	Comments:
		1 2 3 (4) 5	New Outdated	Door alarms

Design 1,200 gpm @ 85%
Actual 705 gpm @ 85%

Well 5

Site Assessment

Electrical Assessment
Pump Station

Pump Station ID:	WELL 5 (RIDGELAND)	**Address:**	2386 SOUTH 3600 WEST
Inspected By:	DAVID MOEAKIOLA	**Image Ref:**	
Date:	08/05/21		

Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; no wear or equipment issues; all hardware present
2	Adequate: minor wear, no equipment issues; all hardware present
3	Fair; worn, no major equipment issues; missing non-critical hardware
4	Poor; old and worn; missing important hardware; replacement recommended
5	Bad; hardware gone or failed; replacement required to continue operation

Overall Electrical

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 (4) 5		OLD & OLDER

Generators & Transfer Switches

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 (3) 4 5		

Switchboard

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 (5)		ORIGINAL WITH WELL

Transformer

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		

Motor Control Center (MCC)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 (4) 5		ORIGINAL

Panelboards

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 (5)		NO DATE BUT OLD

VFD Control Panels (If applicable; one per pump motor)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
1		1 2 (3) 4 5		2011
2		1 2 (3) 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		

Electrical Assessment
Pump Station

Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; no wear or equipment issues; all hardware present
2	Adequate: minor wear, no equipment issues; all hardware present
3	Fair; worn, no major equipment issues; missing non-critical hardware
4	Poor; old and worn; missing important hardware; replacement recommended
5	Bad; hardware gone or failed; replacement required to continue operation

Motor Starter(s) (If applicable; one per pump motor)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
NORTH BOOSTER		1 (2) 3 4 5		2011
SOUTH BOOSTER		1 (2) 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		

PLC Panel/RTU

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 (3) 4 5		2011

HMI

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 (3) 4 5		2011

Security System (if applicable; if not present, leave comment)

Equipment No.	Age (yrs)	Condition (circle)	Status (Circle)	Comments: DOOR SWITCHES
		1 2 (3) 4 5	New Outdated	

Well 8

Site Assessment

WU-W-3

Electrical Assessment - Well

Water Utility Assets
Wells

Well ID:	WELL 8 (WOODBURY)	**Address:**	3735 SOUTH 000 WEST
Inspected By:	DAVID MOEAKIOLA	**Image Ref:**	
Date:	08/05/21		

Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; no wear or equipment issues; all hardware present
2	Adequate: minor wear, no equipment issues; all hardware present
3	Fair; worn, no major equipment issues; missing non-critical hardware
4	Poor; old and worn; missing important hardware; replacement recommended
5	Bad; hardware gone or failed; replacement required to continue operation

Overall Electrical

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 (2) 3 4 5		2003

Generator and Transfer Switch

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		(1) 2 3 4 5		

Switchboard

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 (2) 3 4 5		2003

Transformer

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 (2) 3 4 5		2003

Motor Control Center (MCC)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 (3) 4 5		2003

Panelboard

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 (3) 4 5		2003

VFD (If applicable)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments: NEWER SWEIDER DRIVE
		(1) 2 3 4 5		

Motor Starter (If applicable)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 (3) 4 5		2003

PLC Panel/RTU

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 (3) 4 5		2003

HMI

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 (2) 3 4 5		

Security System (if applicable; if not present, leave comment)

Equipment No.	Age (yrs)	Condition (circle)	Status (Circle)	Comments: DOOR SWITCHES 2003
		1 2 (3) 4 5	New Outdated	

Building and Site Assessment - Well

Well ID:	Well 8	**Address:**	
Inspected By:	Dee Smolka	**Image Ref:**	
Date:	8/9/21		

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

General	**Rating:** 1 (2) 3 4 5
▒ Building age: _____	**Comments:**

Building Exterior	**Rating:** 1 (2) 3 4 5
☐ Roofing improvement needed	**Comments:**
☐ Aesthetic improvement needed	
☐ Minor component improvement eeded	
☐ Not applicable (No building)	

Building/Vault Interior	**Rating:** 1 (2) 3 4 5
☐ Needs cleaning	**Comments:**
☐ Aesthetic improvement needed	
☐ Updates needed to meet code	
▒ Structural improvements needed (check below)	
☐ Seismic upgrades	
☐ Repair	
☐ Complete replacement	

Landscape & Enclosure	**Rating:** (1) 2 3 4 5
☐ Landscape dead or dying (needs rehab/replant)	**Comments:**
☐ Landscape needs complete replacement	
☐ Fencing/enclosure requires repair	
☐ Not applicable (No landscaping)	

Asphalt/Concrete (Parking, Walkways, Access)	**Rating:** (1) 2 3 4 5
☐ Alligator cracking/aggregate visible/spalling	**Comments:**
☐ Large cracks and/or uplifts	
☐ Potholes or noticable settlement	
☐ Drainage issues (standing water, depressions, etc.)	

Pumps and Mechanical Assessment - Well

Well ID:	Well 8	**Address:**	
Inspected By:	Dee Smolka	**Image Ref:**	
Date:	8/9/21		

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Pump	**Rating:** 1 (2) 3 4 5
Age:	**Comments:** Rebuilt 2015 C.W. Silver
Pump surface - corrosion	
Pump surface - chipped coating	
Pump seals leaking	
Worn nuts/lugs on bolted connections	
Loose connections	
Cracked or damaged foundation supports	
Unusual vibrations or noise	
Impeller - pitting or heavy wear	
Pump performance significantly below rating	
Past useful life -> replace	

Motor	**Rating:** (1) 2 3 4 5
Age:	**Comments:** Rebuilt 2015 C.W. Silver
Dirty inspection ports	
Oil reservoir low	
Discoloration (potential overheating)	
Unusual vibrations or noise	
Past useful life -> replace	

Exposed Piping	**Rating:** (1) 2 3 4 5
Needs minor touch-up paint	**Comments:**
Needs complete repaint	
Needs replacement	

Isolation Valves	**Rating:** (1) 2 3 4 5
Leaking	**Comments:**
Recoating needed	
Needs replacement	

Well Casing (if recent video available)	**Rating:** 1 (2) 3 4 5
Corrosion	**Comments:**
Holes present	
Needs replacement	

Pumps and Mechanical Assessment - Well

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Well Screens (if recent video available)		Rating: (1) 2 3 4 5
	Needs cleaning	Comments:
	Corrosion/chemical buildup	
	Pitting/large holes	
	Excessive sand production	
	Clogged	

Secondary Disinfection (If Applicable)		Rating: (1) 2 3 4 5
	System Age:	Comments: PSI New system
	Chlorine odor present?	
	Cleaning required (comment)	
	Repairs required (comment)	
	Replacement required (comment)	

Fluoridation System (If Applicable)		Rating: 1 (2) 3 4 5
	System Age:	Comments:
	Cleaning required (comment)	
	Repairs required (comment)	
	Replacement required (comment)	

HVAC System		Rating: 1 (2) 3 4 5
	System Age: _____	Comments:
	Type Carrier 48TMD014-A-601	
	Ventilation Only	
X	Air conditioning	
	Upgrade required (comment)	

Sodium Hypo A/C (2)

Carrier 50HJ-004-631

Well 14

Site Assessment

Electrical Assessment - Well

Well ID:	WELL 14 (WRIGHT)	**Address:**	4000 SOUTH 2200 WEST
Inspected By:	DAVID MOEAKIOLA	**Image Ref:**	
Date:	08/05/21		

Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; no wear or equipment issues; all hardware present
2	Adequate: minor wear, no equipment issues; all hardware present
3	Fair; worn, no major equipment issues; missing non-critical hardware
4	Poor; old and worn; missing important hardware; replacement recommended
5	Bad; hardware gone or failed; replacement required to continue operation

Overall Electrical

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		

Generator and Transfer Switch

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		

Switchboard

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		

Transformer

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		

Motor Control Center (MCC)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		

Panelboard

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		

VFD (If applicable)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		

Motor Starter (If applicable)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		

PLC Panel/RTU

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		

HMI

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		

Security System (if applicable; if not present, leave comment)

Equipment No.	Age (yrs)	Condition (circle)	Status (Circle)	Comments:
		1 2 3 4 5	New Outdated	

Building and Site Assessment - Well

Well ID:	Well 14	**Address:**	
Inspected By:	Dee Smolka	**Image Ref:**	
Date:	8/9/21		

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

General	**Rating:** 1 (2) 3 4 5
▨ Building age: _____	**Comments:**

Building Exterior	**Rating:** 1 2 (3) 4 5
☐ Roofing improvement needed	**Comments:** Anti Graffiti Coating
☐ Aesthetic improvement needed	Cracking/peeling
☐ Minor component improvement eeded	
☐ Not applicable (No building)	

Building/Vault Interior	**Rating:** 1 (2) 3 4 5
☐ Needs cleaning	**Comments:**
☐ Aesthetic improvement needed	
☐ Updates needed to meet code	
▨ Structural improvements needed (check below)	
☐ Seismic upgrades	
☐ Repair	
☐ Complete replacement	

Landscape & Enclosure	**Rating:** 1 (2) 3 4 5
☐ Landscape dead or dying (needs rehab/replant)	**Comments:**
☐ Landscape needs complete replacement	
☐ Fencing/enclosure requires repair	
☐ Not applicable (No landscaping)	

Asphalt/Concrete (Parking, Walkways, Access)	**Rating:** 1 (2) 3 4 5
☐ Alligator cracking/aggregate visible/spalling	**Comments:**
☐ Large cracks and/or uplifts	
☐ Potholes or noticable settlement	
☐ Drainage issues (standing water, depressions, etc.)	

Pumps and Mechanical Assessment - Well

Well ID:	Well 14	**Address:**	
Inspected By:	Dee Sinolka	**Image Ref:**	
Date:	8/9/21		

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Pump	**Rating:** 1 2 (3) 4 5
▒ Age: _____	**Comments:** Needs to be painted
☐ Pump surface - corrosion	
☒ Pump surface - chipped coating	
☐ Pump seals leaking	
☐ Worn nuts/lugs on bolted connections	
☐ Loose connections	
☐ Cracked or damaged foundation supports	
☐ Unusual vibrations or noise	
☐ Impeller - pitting or heavy wear	
☐ Pump performance significantly below rating	
☐ Past useful life -> replace	

Motor	**Rating:** (1) 2 3 4 5
▒ Age: _____	**Comments:** Brand New
☐ Dirty inspection ports	
☐ Oil reservoir low	
☐ Discoloration (potential overheating)	
☐ Unusual vibrations or noise	
☐ Past useful life -> replace	

Exposed Piping	**Rating:** 1 2 (3) 4 5
☐ Needs minor touch-up paint	**Comments:**
☒ Needs complete repaint	
☐ Needs replacement	

Isolation Valves	**Rating:** 1 (2) 3 4 5
☐ Leaking	**Comments:**
☐ Recoating needed	
☐ Needs replacement	

Well Casing (if recent video available)	**Rating:** 1 (2) 3 4 5
☐ Corrosion	**Comments:**
☐ Holes present	
☐ Needs replacement	

Pumps and Mechanical Assessment - Well

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Well Screens (if recent video available)		Rating: 1 (2) 3 4 5
	Needs cleaning	Comments:
	Corrosion/chemical buildup	
	Pitting/large holes	
	Excessive sand production	
	Clogged	

Secondary Disinfection (If Applicable)		Rating: 1 2 (3) 4 5
	System Age:	Comments:
	Chlorine odor present?	
	Cleaning required (comment)	
	Repairs required (comment)	
	Replacement required (comment)	

Fluoridation System (If Applicable)		Rating: 1 2 (3) 4 5
	System Age:	Comments:
	Cleaning required (comment)	
	Repairs required (comment)	
	Replacement required (comment)	

HVAC System		Rating: 1 (2) 3 4 5
	System Age: _____	Comments:
	Type Lennox LGA 156HJ1G	
	Ventilation Only	
X	Air conditioning	
	Upgrade required (comment)	

Well 15

Site Assessment

Electrical Assessment - Well

Well ID:	WELL 15 (EVANS)	**Address:**	2355 SOUTH 2300 WEST
Inspected By:	DAVID MOFAKIOLA	**Image Ref:**	
Date:	08/05/21		

Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; no wear or equipment issues; all hardware present
2	Adequate: minor wear, no equipment issues; all hardware present
3	Fair; worn, no major equipment issues; missing non-critical hardware
4	Poor; old and worn; missing important hardware; replacement recommended
5	Bad; hardware gone or failed; replacement required to continue operation

Overall Electrical

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 (4) 5		2002

Generator and Transfer Switch

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 (2) 3 4 5		GENERATOR & TRANSFER SWITCH FAIRLY NEW

Switchboard

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 (4) 5		2002

Transformer

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 (4) 5		2002

Motor Control Center (MCC)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 (4) 5		2002

Panelboard

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 (4) 5		2002

VFD (If applicable)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 (3) 4 5		?

Motor Starter (If applicable)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 (4) 5		2002

PLC Panel/RTU

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 (4) 5		OLD AND NEW 2002 — PRESENT

HMI

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 (3) 4 5		

Security System (if applicable; if not present, leave comment)

Equipment No.	Age (yrs)	Condition (circle)	Status (Circle)	Comments:
		1 2 3 (4) 5	New Outdated	DOOR SWITCHES BUT SEEM TO FAIL IN XTREME HEAT

Building and Site Assessment - Well

Well ID:	Well 15	**Address:**	
Inspected By:	Dee Smolka	**Image Ref:**	
Date:	8/9/21		

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

General	**Rating:** 1 2 3 4 5
Building age: 67	**Comments:**

Building Exterior	**Rating:** 1 (2) 3 4 5
☐ Roofing improvement needed	**Comments:** Anti Graffiti Coating cracking/peeling
☐ Aesthetic improvement needed	
☐ Minor component improvement eeded	
☐ Not applicable (No building)	

Building/Vault Interior	**Rating:** 1 (2) 3 4 5
☐ Needs cleaning	**Comments:**
☐ Aesthetic improvement needed	
☐ Updates needed to meet code	
☒ Structural improvements needed (check below)	
☐ Seismic upgrades	
☐ Repair	
☐ Complete replacement	

Landscape & Enclosure	**Rating:** (1) 2 3 4 5
☐ Landscape dead or dying (needs rehab/replant)	**Comments:**
☐ Landscape needs complete replacement	
☐ Fencing/enclosure requires repair	
☐ Not applicable (No landscaping)	

Asphalt/Concrete (Parking, Walkways, Access)	**Rating:** 1 2 (3) 4 5
☒ Alligator cracking/aggregate visible/spalling	**Comments:**
☐ Large cracks and/or uplifts	
☐ Potholes or noticable settlement	
☐ Drainage issues (standing water, depressions, etc.)	

Pumps and Mechanical Assessment - Well

Well ID:	Well 15	**Address:**	
Inspected By:	Dee Smolka	**Image Ref:**	
Date:	8/9/21		

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Pump	**Rating:** 1 (2) 3 4 5
Age:	**Comments:**
Pump surface - corrosion	
Pump surface - chipped coating	
Pump seals leaking	
Worn nuts/lugs on bolted connections	
Loose connections	
Cracked or damaged foundation supports	
Unusual vibrations or noise	
Impeller - pitting or heavy wear	
Pump performance significantly below rating	
Past useful life -> replace	

Motor	**Rating:** (1) 2 3 4 5
Age: Rebuilt 11/3/2017	**Comments:**
Dirty inspection ports	
Oil reservoir low	
Discoloration (potential overheating)	
Unusual vibrations or noise	
Past useful life -> replace	

Exposed Piping	**Rating:** 1 (2) 3 4 5
Needs minor touch-up paint	**Comments:** wipe down/remove hard water scale.
Needs complete repaint	
Needs replacement	

Isolation Valves	**Rating:** (1) 2 3 4 5
Leaking	**Comments:**
Recoating needed	
Needs replacement	

Well Casing (if recent video available)	**Rating:** 1 (2) 3 4 5
Corrosion	**Comments:**
Holes present	
Needs replacement	

Pumps and Mechanical Assessment - Well

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Well Screens (if recent video available)		Rating: 1 (2) 3 4 5
	Needs cleaning	Comments:
	Corrosion/chemical buildup	
	Pitting/large holes	
	Excessive sand production	
	Clogged	

Secondary Disinfection (If Applicable)		Rating: 1 2 (3) 4 5
	System Age: 16+	Comments:
	Chlorine odor present?	
	Cleaning required (comment)	
	Repairs required (comment)	
	Replacement required (comment)	

Fluoridation System (If Applicable)		Rating: 1 (2) 3 4 5
	System Age: 16+	Comments:
	Cleaning required (comment)	
	Repairs required (comment)	
	Replacement required (comment)	

HVAC System		Rating: (1) 2 3 4 5
	System Age: ~~Lennox V9151~~ 2010	Comments:
	Type Lennox V9151	
	Ventilation Only	
X	Air conditioning	
	Upgrade required (comment)	

Well 16

Site Assessment

Electrical Assessment - Well

Well ID:	WELL 16 (TAGGART)	**Address:**	1621 WEST 2320 SOUTH
Inspected By:	DAVID MOEAKIOLA	**Image Ref:**	
Date:	08/05/21		

Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; no wear or equipment issues; all hardware present
2	Adequate: minor wear, no equipment issues; all hardware present
3	Fair; worn, no major equipment issues; missing non-critical hardware
4	Poor; old and worn; missing important hardware; replacement recommended
5	Bad; hardware gone or failed; replacement required to continue operation

Overall Electrical

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 (3) ~~4~~ 5		2003

Generator and Transfer Switch

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		

Switchboard

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 (4) 5		2003

Transformer

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 (3) 4 5		2003

Motor Control Center (MCC)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 (3) 4 5		2003

Panelboard

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 (3) 4 5		2003

VFD (If applicable)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		(1) 2 3 4 5		VFD INSTALLED 2021

Motor Starter (If applicable)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 (3) 4 5		2003?

PLC Panel/RTU

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 (4) 5		2003?

HMI

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 (3) 4 5		

Security System (if applicable; if not present, leave comment)

Equipment No.	Age (yrs)	Condition (circle)	Status (Circle)	Comments:
		1 2 (3) 4 5	New Outdated	DOOR SWITCHES

Building and Site Assessment - Well

Well ID:	Well 16	**Address:**	
Inspected By:	Dee Smolka	**Image Ref:**	
Date:	8/9/21		

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

General	**Rating:** (1) 2 3 4 5
▒ Building age: 16+	**Comments:**

Building Exterior	**Rating:** 1 (2) 3 4 5
☐ Roofing improvement needed	**Comments:** Anti Graffiti coating Cracking/peeling
☐ Aesthetic improvement needed	
☐ Minor component improvement eeded	
☐ Not applicable (No building)	

Building/Vault Interior	**Rating:** 1 (2) 3 4 5
☐ Needs cleaning	**Comments:**
☐ Aesthetic improvement needed	
☐ Updates needed to meet code	
▒ Structural improvements needed (check below)	
☐ Seismic upgrades	
☐ Repair	
☐ Complete replacement	

Landscape & Enclosure	**Rating:** (1) 2 3 4 5
☐ Landscape dead or dying (needs rehab/replant)	**Comments:**
☐ Landscape needs complete replacement	
☐ Fencing/enclosure requires repair	
☐ Not applicable (No landscaping)	

Asphalt/Concrete (Parking, Walkways, Access)	**Rating:** (1) 2 3 4 5
☐ Alligator cracking/aggregate visible/spalling	**Comments:**
☐ Large cracks and/or uplifts	
☐ Potholes or noticable settlement	
☐ Drainage issues (standing water, depressions, etc.)	

Pumps and Mechanical Assessment - Well

Well ID:	Well 16	**Address:**	
Inspected By:	Dee Smolka	**Image Ref:**	
Date:	8/9/21		

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Pump	**Rating:** 1 (2) 3 4 5
	Age: _____
	Pump surface - corrosion
	Pump surface - chipped coating
	Pump seals leaking
	Worn nuts/lugs on bolted connections
	Loose connections
	Cracked or damaged foundation supports
	Unusual vibrations or noise
	Impeller - pitting or heavy wear
	Pump performance significantly below rating
	Past useful life -> replace
Comments:	

Motor	**Rating:** (1) 2 3 4 5
	Age: _____
	Dirty inspection ports
	Oil reservoir low
	Discoloration (potential overheating)
	Unusual vibrations or noise
	Past useful life -> replace
Comments:	

Exposed Piping	**Rating:** (1) 2 3 4 5
	Needs minor touch-up paint
	Needs complete repaint
	Needs replacement
Comments:	

Isolation Valves	**Rating:** (1) 2 3 4 5
	Leaking
	Recoating needed
	Needs replacement
Comments:	

Well Casing (if recent video available)	**Rating:** 1 (2) 3 4 5
	Corrosion
	Holes present
	Needs replacement
Comments:	

Pumps and Mechanical Assessment - Well

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Well Screens (if recent video available)		Rating: 1 (2) 3 4 5
	Needs cleaning	Comments:
	Corrosion/chemical buildup	
	Pitting/large holes	
	Excessive sand production	
	Clogged	

Secondary Disinfection (If Applicable)		Rating: 1 2 (3) 4 5
	System Age: 16+	Comments: Run Hrs 30989
	Chlorine odor present?	
	Cleaning required (comment)	
	Repairs required (comment)	
	Replacement required (comment)	

Fluoridation System (If Applicable)		Rating: 1 (2) 3 4 5
	System Age: 16+	Comments:
	Cleaning required (comment)	
	Repairs required (comment)	
	Replacement required (comment)	

HVAC System		Rating: (1) 2 3 4 5
	System Age: ~~York~~ 2019	Comments:
	Type ~~York~~ YC090C00A4AAA5	
	Ventilation Only	
X	Air conditioning	
	Upgrade required (comment)	

Sodium Room A/C 16+ (3)

Trane

Well 17

Site Assessment

Building and Site Assessment - Well

Well ID:	Well 17	**Address:**	
Inspected By:	S. Pugh	**Image Ref:**	
Date:	7/28/21		

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

General	**Rating:** 1 2 3 4 5
☐ Building age: _____	**Comments:**

Building Exterior	**Rating:** 1 2 3 4 5
☐ Roofing improvement needed	**Comments:**
☐ Aesthetic improvement needed	
☐ Minor component improvement eeded	
☐ Not applicable (No building)	

Building/Vault Interior	**Rating:** 1 2 3 4 5
☐ Needs cleaning	**Comments:**
☐ Aesthetic improvement needed	
☐ Updates needed to meet code	
☐ Structural improvements needed (check below)	
☐ Seismic upgrades	
☐ Repair	
☐ Complete replacement	

Landscape & Enclosure	**Rating:** 1 2 3 4 5
☐ Landscape dead or dying (needs rehab/replant)	**Comments:**
☐ Landscape needs complete replacement	
☐ Fencing/enclosure requires repair	
☐ Not applicable (No landscaping)	

Asphalt/Concrete (Parking, Walkways, Access)	**Rating:** 1 2 3 4 5
☐ Alligator cracking/aggregate visible/spalling	**Comments:**
☐ Large cracks and/or uplifts	
☐ Potholes or noticable settlement	
☐ Drainage issues (standing water, depressions, etc.)	

Pumps and Mechanical Assessment - Well

Well ID: 17	17	**Address:**	
Inspected By:	B. Mayer	**Image Ref:**	
Date: 07/28/21	7/28/21		

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Pump		**Rating:** (1) 2 3 4 5
▒	Age: NEW (<5 yrs)	**Comments:**
	Pump surface - corrosion	
	Pump surface - chipped coating	
	Pump seals leaking	
	Worn nuts/lugs on bolted connections	
	Loose connections	
	Cracked or damaged foundation supports	
	Unusual vibrations or noise	
	Impeller - pitting or heavy wear	
	Pump performance significantly below rating	
	Past useful life -> replace	

Motor		**Rating:** (1) 2 3 4 5
▒	Age:	**Comments:**
	Dirty inspection ports	
	Oil reservoir low	
	Discoloration (potential overheating)	
	Unusual vibrations or noise	
	Past useful life -> replace	

Exposed Piping		**Rating:** (1) 2 3 4 5
	Needs minor touch-up paint	**Comments:**
	Needs complete repaint	
	Needs replacement	

Isolation Valves		**Rating:** (1) 2 3 4 5
	Leaking	**Comments:**
	Recoating needed	
	Needs replacement	

Well Casing (if recent video available)		**Rating:** 1 2 3 4 5
	Corrosion	**Comments:**
	Holes present	
	Needs replacement	

Pumps and Mechanical Assessment - Well

Well 17

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Well Screens (if recent video available)		Rating: 1 2 3 4 5
	Needs cleaning	Comments:
	Corrosion/chemical buildup	
	Pitting/large holes	
	Excessive sand production	
	Clogged	

Secondary Disinfection (If Applicable)		Rating: (1) 2 3 4 5
	System Age:	Comments:
	Chlorine odor present?	
	Cleaning required (comment)	
	Repairs required (comment)	
	Replacement required (comment)	

Fluoridation System (If Applicable)		Rating: (1) 2 3 4 5
	System Age:	Comments:
	Cleaning required (comment)	
	Repairs required (comment)	
	Replacement required (comment)	

HVAC System		Rating: (1) 2 3 4 5
	System Age: _____	Comments:
	Type	
	Ventilation Only	
	Air conditioning	
	Upgrade required (comment)	

Electrical Assessment - Well

Well ID:	17	**Address:**	
Inspected By:	D. Ovard / N. Davis	**Image Ref:**	
Date:	7/28		

Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; no wear or equipment issues; all hardware present
2	Adequate: minor wear, no equipment issues; all hardware present
3	Fair; worn, no major equipment issues; missing non-critical hardware
4	Poor; old and worn; missing important hardware; replacement recommended
5	Bad; hardware gone or failed; replacement required to continue operation

Overall Electrical

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		(1) 2 3 4 5		2017

Generator and Transfer Switch

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		(1) 2 3 4 5		

Switchboard

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		(1) 2 3 4 5		

Transformer

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		(1) 2 3 4 5		

Motor Control Center (MCC)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		(1) 2 3 4 5		

Panelboard

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		(1) 2 3 4 5		

VFD (If applicable)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		(1) 2 3 4 5		2 - 1 for redundancy

Motor Starter (If applicable)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		n/a

PLC Panel/RTU

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		(1) 2 3 4 5		

HMI

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		(1) 2 3 4 5		

Security System (if applicable; if not present, leave comment)

Equipment No.	Age (yrs)	Condition (circle)	Status (Circle)	Comments:
		(1) 2 3 4 5	New Outdated	Door contacts

Running @ 1,900 SPM

Chlorine is hard to maintain. Old tech. Would replace if available

U651 PSI Microchlor ~$200,000 - supply + install. 1/year

Winder Tank

Site Assessment

Storage Tank Assessment
Concrete Tanks

Storage Tank ID:	ST010 Winder	**Address:**	4381 South Nugget Drive
Inspected By:	Dee Smolka	**Image Ref:**	
Date:	8/10/21	**Tank Age:**	8

Overall Condition Rating (Circle rating below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Landscape & Enclosure		**Rating:**	(1) 2 3 4 5
☐	Landscape dead or dying (needs rehab/replant)	**Comments:**	
☐	Landscape needs complete replacement		
☐	Fencing/enclosure requires repair		
☐	Not applicable (No landscaping)		
Asphalt/Concrete (Parking, Walkways, Access)		**Rating:**	(1) 2 3 4 5
☐	Alligator cracking/aggregate visible/spalling	**Comments:**	
☐	Large cracks and/or uplifts		
☐	Potholes or noticable settlement		
☐	Drainage issues (standing water, depressions, et		
Structural Steel		**Rating:**	(1) 2 3 4 5
▒	Age: _____	**Comments:**	
☐	Foundation & Anchors		
☐	Foundation - Concrete cracking/damage		
☐	Anchors - Evidence of Corrosion		
☐	Other repairs needed (comment)		
Exterior Coating		**Rating:**	(1) 2 3 4 5
▒	Age: _____	**Comments:**	
☐	Signs of corrosion evident		
Interior Coating		**Rating:**	(1) 2 3 4 5
▒	Age: _____	**Comments:**	
☐	Signs of corrosion evident		
☐	Anodes present		
☐	If anodes present, anode replacement needed?		
Appurtenances		**Rating:**	(1) 2 3 4 5
▒	Ladders/Piping/Miscellaneous Metals	**Comments:**	
☐	Evidence of Corrosion		
☐	Needs repaint/replacement		
▒	Hatches		
☐	Wrong type (not shoe box)		
☐	Not Secure		
☐	Evidence of corrosion		
☐	Vents - screening improvements needed		
☐	Drains - screening improvements needed		
☐	Overflow - screening improvements needed		

Zone 5 Tank

Site Assessment

Storage Tank Assessment
Concrete Tanks

Storage Tank ID:	ST008 Zone 5	**Address:**	5216 South upper ridge road
Inspected By:	Dee Smolka	**Image Ref:**	
Date:	8/10/21	**Tank Age:**	15

Overall Condition Rating (Circle rating below)

1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Landscape & Enclosure	**Rating:**	1 2 3 4 5
☐ Landscape dead or dying (needs rehab/replant)	**Comments:**	N/A
☐ Landscape needs complete replacement		
☐ Fencing/enclosure requires repair		
☒ Not applicable (No landscaping)		
Asphalt/Concrete (Parking, Walkways, Access)	**Rating:**	1 (2) 3 4 5
☐ Alligator cracking/aggregate visible/spalling	**Comments:**	
☐ Large cracks and/or uplifts		
☐ Potholes or noticable settlement		
☐ Drainage issues (standing water, depressions, et		
Structural Steel	**Rating:**	(1) 2 3 4 5
☐ Age: _____	**Comments:**	
☐ Foundation & Anchors		
☐ Foundation - Concrete cracking/damage		
☐ Anchors - Evidence of Corrosion		
☐ Other repairs needed (comment)		
Exterior Coating	**Rating:**	(1) 2 3 4 5
☐ Age: _____	**Comments:**	
☐ Signs of corrosion evident		
Interior Coating	**Rating:**	(1) 2 3 4 5
☐ Age: _____	**Comments:**	
☐ Signs of corrosion evident		
☐ Anodes present		
☐ If anodes present, anode replacement needed?		
Appurtenances	**Rating:**	(1) 2 3 4 5
☐ Ladders/Piping/Miscellaneous Metals	**Comments:**	
☐ Evidence of Corrosion		
☐ Needs repaint/replacement		
☐ Hatches		
☐ Wrong type (not shoe box)		
☐ Not Secure		
☐ Evidence of corrosion		
☐ Vents - screening improvements needed		
☐ Drains - screening improvements needed		
☐ Overflow - screening improvements needed		

APPENDIX F

WATER ASSESSMENT FORMS

APPENDIX F

WATER ASSESSMENT FORMS

GRANGER HUNTER IMPROVEMENT DISTRICT ASSET MANAGEMENT PLAN
CONDITION ASSESSMENT FORMS AND EXPECTED ASSET LIFE

Water Utility Assets				
Asset Name (Code)	**Form code**	**Asset Component (Evaluation Methods)**	**Condition Assessment Criteria**	**Expected Lifespan (yrs)**
Distribution System (WU-DS)	-	**Pipes (Fracta)**	-	80
	-	**Valves (Fracta)**	-	40
	-	**Hydrants (Age)**	-	50
	WU-DS-1A & WU-DS-1B	**Storage Tanks (Inspection)**	Landscape & Enclosure	50
			Asphalt/Concrete	25
			Steel - Structural	75
			Steel - Exterior Coating	25
			Steel - Interior Coating	25
			Concrete - Exterior	80
			Concrete - Interior	80
			Appurtenances	50
Pump Stations (WU-PS)	**WU-PS-1**	**Building & Site (Inspection)**	Building Interior & Exterior	60
			Landscape & Enclosure	60
			Asphalt/Concrete	25
	WU-PS-2	**Pumps (Inspection)**	Pump	20 Rebuild @ 10
			Motor	20
			Piping	50
			Isolation Valves	40
	WU-PS-3	**Electrical (Inspection)**	Generator & Transfer Switch	20
			Switchboard	25
			Transformer	25
			MCC	25
			Panelboard	20
			VFD/Motor Starters	15
			PLC/RTU	10
			HMI	10
PRVs (WU-PRV)	-	**Vault (Age)**	-	80
		Valves (Age)	-	40
Wells (WU-W)	**WU-W-1**	**Building & Site (Inspection)**	Building Interior & Exterior	60
			Landscape & Enclosure	60
			Asphalt/Concrete	25
	WU-W-2	**Pump & Mechanical (Inspection)**	Pump	20 Rebuild @ 10
			Motor	15
			Piping	20
			Isolation Valves	15
			Casing	50
			Screens	50
			Secondary Disinfection	20
	WU-W-3	**Electrical (Inspection)**	Generator & Transfer Switch	20
			Switchboard	25
			Transformer	25
			MCC	20
			Panelboard	20
			VFD/Motor Starters	15
			PLC/RTU	10
			HMI	10

Storage Tank Assessment
Steel Tanks

Storage Tank ID:		**Address:**	
Inspected By:		**Image Ref:**	
Date:		**Tank Age:**	

Overall Condition Rating (Circle rating below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

	Landscape & Enclosure	**Rating:** 1 2 3 4 5
	Landscape dead or dying (needs rehab/replant)	**Comments:**
	Landscape needs complete replacement	
	Fencing/enclosure requires repair	
	Not applicable (No landscaping)	

	Asphalt/Concrete (Parking, Walkways, Access)	**Rating:** 1 2 3 4 5
	Alligator cracking/aggregate visible/spalling	**Comments:**
	Large cracks and/or uplifts	
	Potholes or noticable settlement	
	Drainage issues (standing water, depressions, etc	

	Exterior (if exposed)	**Rating:** 1 2 3 4 5
	Cracking	**Comments:**
	Single	
	Multiple	
	Broken/Collapsing Section	
	Surface	
	Surface spalling	
	Aggregate visible/projecting	
	Reinforcement visible/corroded	

	Interior	**Rating:** 1 2 3 4 5
	Sealants/Joins	**Comments:**
	Daylight visible	
	Need replacement	
	Cracking	
	Single	
	Multiple	
	Broken/Collapsing Section	
	Surface	
	Surface spalling	
	Aggregate visible/projecting	
	Reinforcement visible/corroded	

	Appurtenances	**Rating:** 1 2 3 4 5
	Ladders/Piping/Miscellaneous Metals	**Comments:**
	Evidence of Corrosion	
	Replacements needed (comment required)	
	Hatches	
	Not Secure	
	Evidence of corrosion	
	Vents - screening improvements needed	
	Drains - screening improvements needed	
	Overflow - screening improvements needed	
	Foundation & Anchors - repairs needed	

Storage Tank Assessment
Concrete Tanks

Storage Tank ID:		**Address:**	
Inspected By:		**Image Ref:**	
Date:		**Tank Age:**	

Overall Condition Rating (Circle rating below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Landscape & Enclosure		**Rating:** 1 2 3 4 5
	Landscape dead or dying (needs rehab/replant)	**Comments:**
	Landscape needs complete replacement	
	Fencing/enclosure requires repair	
	Not applicable (No landscaping)	

Asphalt/Concrete (Parking, Walkways, Access)		**Rating:** 1 2 3 4 5
	Alligator cracking/aggregate visible/spalling	**Comments:**
	Large cracks and/or uplifts	
	Potholes or noticable settlement	
	Drainage issues (standing water, depressions, etc	

Structural Steel		**Rating:** 1 2 3 4 5
	Age: _____	**Comments:**
	Foundation & Anchors	
	Foundation - Concrete cracking/damage	
	Anchors - Evidence of Corrosion	
	Other repairs needed (comment)	

Exterior Coating		**Rating:** 1 2 3 4 5
	Age: _____	**Comments:**
	Signs of corrosion evident	

Interior Coating		**Rating:** 1 2 3 4 5
	Age: _____	**Comments:**
	Signs of corrosion evident	
	Anodes present	
	If anodes present, anode replacement needed?	

Appurtenances		**Rating:** 1 2 3 4 5
	Ladders/Piping/Miscellaneous Metals	**Comments:**
	Evidence of Corrosion	
	Needs repaint/replacement	
	Hatches	
	Wrong type (not shoe box)	
	Not Secure	
	Evidence of corrosion	
	Vents - screening improvements needed	
	Drains - screening improvements needed	
	Overflow - screening improvements needed	

Building and Site Assessment
Pump Station

Pump Station ID:		**Address:**	
Inspected By:		**Image Ref:**	
Date:			

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

General		**Rating:** 1 2 3 4 5
	Building age: _____	**Comments:**

Building/Vault Exterior		**Rating:** 1 2 3 4 5
	Roofing improvement needed	**Comments:**
	Aesthetic improvement needed	
	Minor component improvement needed	
	Not applicable (No building)	

Building/Vault Interior		**Rating:** 1 2 3 4 5
	Needs cleaning	**Comments:**
	Aesthetic improvement needed	
	Updates needed to meet code	
	Structural improvements needed (check below)	
	Seismic upgrades	
	Repair	
	Complete replacement	

Landscape & Enclosure		**Rating:** 1 2 3 4 5
	Landscape dead or dying (needs rehab/replant)	**Comments:**
	Landscape needs complete replacement	
	Fencing/enclosure requires repair	
	Not applicable (No landscaping)	

Asphalt/Concrete (Parking, Walkways, Access)		**Rating:** 1 2 3 4 5
	Alligator cracking/aggregate visible/spalling	**Comments:**
	Large cracks and/or uplifts	
	Potholes or noticable settlement	
	Drainage issues (standing water, depressions, etc.)	

Pump and Mechanical Assessment
Pump Station

Pump Station ID:		**Address:**	
Inspected By:		**Image Ref:**	
Date:			

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Pumps

	Pump ID	Age (years)	**Pump ID (Checklist):**	**Condition Rating:**
	1	_____		**1 2 3 4 5**
	2	_____		**1 2 3 4 5**
	3	_____		**1 2 3 4 5**
	4	_____		**1 2 3 4 5**
	5	_____		**1 2 3 4 5**
	6	_____		**1 2 3 4 5**

	Condition Checklist (Mark pumps w/ issues at right)	**1**	**2**	**3**	**4**	**5**	**6**	**Comments:**
	Pump surface - corrosion							
	Pump surface - chipped coating							
	Pump seals leaking							
	Worn nuts/lugs on bolted connections							
	Loose connections							
	Cracked or damaged foundation supports							
	Unusual vibrations or noise							
	Impeller - pitting or heavy wear							
	Pump performance significantly below rating							
	Past usefule life -> replace							

Motors

	Motor ID	Age (years)	**Motor ID (Checklist):**	**Condition Rating:**
	1	_____		**1 2 3 4 5**
	2	_____		**1 2 3 4 5**
	3	_____		**1 2 3 4 5**
	4	_____		**1 2 3 4 5**
	5	_____		**1 2 3 4 5**
	6	_____		**1 2 3 4 5**

	Condition Checklist (Mark motors w/ issues at right)	**1**	**2**	**3**	**4**	**5**	**6**	**Comments:**
	Dirty inspection ports							
	Oil reservoir low							
	Discoloration (potential overheating)							
	Unusual vibrations or noise							
	Past useful life -> replace							

Pump and Mechanical Assessment
Pump Station

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

	Piping	Condition Rating:	1	2	3	4	5
	Needs minor touch-up paint	Comments:					
	Needs complete repaint						
	Needs replacement						

	Isolation Valves	Condition Rating:	1	2	3	4	5
	Leaking	Comments:					
	Recoating needed						
	Needs replacement						

	HVAC System	Condition Rating:	1	2	3	4	5
	System Age: _____	Comments:					
	Type						
	Ventilation Only						
	Air conditioning						
	Upgrade required (comment)						

Electrical Assessment
Pump Station

Pump Station ID:		**Address:**	
Inspected By:		**Image Ref:**	
Date:			

Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; no wear or equipment issues; all hardware present
2	Adequate: minor wear, no equipment issues; all hardware present
3	Fair; worn, no major equipment issues; missing non-critical hardware
4	Poor; old and worn; missing important hardware; replacement recommended
5	Bad; hardware gone or failed; replacement required to continue operation

Overall Electrical

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		

Generators & Transfer Switches

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		

Switchboard

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		

Transformer

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		

Motor Control Center (MCC)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		

Panelboards

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		

VFD Control Panels (If applicable; one per pump motor)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		

Electrical Assessment
Pump Station

Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; no wear or equipment issues; all hardware present
2	Adequate: minor wear, no equipment issues; all hardware present
3	Fair; worn, no major equipment issues; missing non-critical hardware
4	Poor; old and worn; missing important hardware; replacement recommended
5	Bad; hardware gone or failed; replacement required to continue operation

Motor Starter(s) (If applicable; one per pump motor)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		

PLC Panel/RTU

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		

HMI

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		

Security System (if applicable; if not present, leave comment)

Equipment No.	Age (yrs)	Condition (circle)	Status (Circle)	Comments:
		1 2 3 4 5	New Outdated	

Building and Site Assessment - Well

Well ID:		**Address:**	
Inspected By:		**Image Ref:**	
Date:			

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

General		**Rating:**	1	2	3	4	5
	Building age: _____	**Comments:**					

Building Exterior		**Rating:**	1	2	3	4	5
	Roofing improvement needed	**Comments:**					
	Aesthetic improvement needed						
	Minor component improvement eeded						
	Not applicable (No building)						

Building/Vault Interior		**Rating:**	1	2	3	4	5
	Needs cleaning	**Comments:**					
	Aesthetic improvement needed						
	Updates needed to meet code						
	Structural improvements needed (check below)						
	Seismic upgrades						
	Repair						
	Complete replacement						

Landscape & Enclosure		**Rating:**	1	2	3	4	5
	Landscape dead or dying (needs rehab/replant)	**Comments:**					
	Landscape needs complete replacement						
	Fencing/enclosure requires repair						
	Not applicable (No landscaping)						

Asphalt/Concrete (Parking, Walkways, Access)		**Rating:**	1	2	3	4	5
	Alligator cracking/aggregate visible/spalling	**Comments:**					
	Large cracks and/or uplifts						
	Potholes or noticable settlement						
	Drainage issues (standing water, depressions, etc.)						

Pumps and Mechanical Assessment - Well

Well ID:		**Address:**	
Inspected By:		**Image Ref:**	
Date:			

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Pump		**Rating:** 1 2 3 4 5
	Age: _____	**Comments:**
	Pump surface - corrosion	
	Pump surface - chipped coating	
	Pump seals leaking	
	Worn nuts/lugs on bolted connections	
	Loose connections	
	Cracked or damaged foundation supports	
	Unusual vibrations or noise	
	Impeller - pitting or heavy wear	
	Pump performance significantly below rating	
	Past useful life -> replace	

Motor		**Rating:** 1 2 3 4 5
	Age: _____	**Comments:**
	Dirty inspection ports	
	Oil reservoir low	
	Discoloration (potential overheating)	
	Unusual vibrations or noise	
	Past useful life -> replace	

Exposed Piping		**Rating:** 1 2 3 4 5
	Needs minor touch-up paint	**Comments:**
	Needs complete repaint	
	Needs replacement	

Isolation Valves		**Rating:** 1 2 3 4 5
	Leaking	**Comments:**
	Recoating needed	
	Needs replacement	

Well Casing (if recent video available)		**Rating:** 1 2 3 4 5
	Corrosion	**Comments:**
	Holes present	
	Needs replacement	

Pumps and Mechanical Assessment - Well

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Well Screens (if recent video available)		Rating: 1 2 3 4 5
	Needs cleaning	Comments:
	Corrosion/chemical buildup	
	Pitting/large holes	
	Excessive sand production	
	Clogged	

Secondary Disinfection (If Applicable)		Rating: 1 2 3 4 5
	System Age:	Comments:
	Chlorine odor present?	
	Cleaning required (comment)	
	Repairs required (comment)	
	Replacement required (comment)	

Fluoridation System (If Applicable)		Rating: 1 2 3 4 5
	System Age:	Comments:
	Cleaning required (comment)	
	Repairs required (comment)	
	Replacement required (comment)	

HVAC System		Rating: 1 2 3 4 5
	System Age: _____	Comments:
	Type	
	Ventilation Only	
	Air conditioning	
	Upgrade required (comment)	

Electrical Assessment - Well

Well ID:		**Address:**	
Inspected By:		**Image Ref:**	
Date:			

Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; no wear or equipment issues; all hardware present
2	Adequate: minor wear, no equipment issues; all hardware present
3	Fair; worn, no major equipment issues; missing non-critical hardware
4	Poor; old and worn; missing important hardware; replacement recommended
5	Bad; hardware gone or failed; replacement required to continue operation

Overall Electrical

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		

Generator and Transfer Switch

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		

Switchboard

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		

Transformer

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		

Motor Control Center (MCC)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		

Panelboard

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		

VFD (If applicable)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		

Motor Starter (If applicable)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		

PLC Panel/RTU

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		

HMI

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		

Security System (if applicable; if not present, leave comment)

Equipment No.	Age (yrs)	Condition (circle)	Status (Circle)	Comments:
		1 2 3 4 5	New Outdated	

GRANGER HUNTER IMPROVEMENT DISTRICT ASSET MANAGEMENT PLAN
CONDITION ASSESSMENT FORMS AND EXPECTED ASSET LIFE

Sewer Utility Assets				
Asset Name (Code)	**Form Code**	**Asset Component (Evaluation Method)**	**Assessment Items**	**Expected Lifespan (yrs)**
Collection System (SS-CS)	**-**	**Manholes (Inspection)**	GHID Scoring System	100
	-	**Pipes (Inspection)**	PACP Structural Assessment	100
Sewer Lift Stations (SS-LS)	**SS-LS-1**	**Building & Site (Inspection)**	Building Interior & Exterior	60
			Landscape & Enclosure	-
			Asphalt/Concrete	25
	SS-LS-2	**Pump & Mechanical (Inspection)**	Pump	20 Rebuild @ 10
			Motor	20
			Piping	50
			Isolation Valves	40
	SS-LS-3	**Wet Well (Inspection)**	Wet Well Structure	50
	SS-LS-4	**Grinders (Inspection)**	Grinder Assembly	5
			Bypass Structure	50
	SS-LS-5	**Electrical (Inspection)**	Generator & Transfer Switch	20
			Switchboard	25
			Transformer	25
			MCC	20
			Panelboard	20
			VFD/Motor Starters	15
			PLC/RTU	10
			HMI	10

Building and Site Assessment
Lift Station

Lift Station ID:		**Address:**	
Inspected By:		**Image Ref:**	
Date:			

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

General	**Rating:** 1 2 3 4 5
☐ Building age: _____	**Comments:**

Building Exterior	**Rating:** 1 2 3 4 5
☐ Roofing improvement needed	**Comments:**
☐ Aesthetic improvement needed	
☐ Minor component improvement eeded	
☐ Not applicable (No building)	

Building/Vault Interior	**Rating:** 1 2 3 4 5
☐ Needs cleaning	**Comments:**
☐ Aesthetic improvement needed	
☐ Updates needed to meet code	
☐ Structural improvements needed (check below)	
☐ Seismic upgrades	
☐ Repair	
☐ Complete replacement	

Landscape & Enclosure	**Rating:** 1 2 3 4 5
☐ Landscape dead or dying (needs rehab/replant)	**Comments:**
☐ Landscape needs complete replacement	
☐ Fencing/enclosure requires repair	
☐ Not applicable (No landscaping)	

Asphalt/Concrete (Parking, Walkways, Access)	**Rating:** 1 2 3 4 5
☐ Alligator cracking/aggregate visible/spalling	**Comments:**
☐ Large cracks and/or uplifts	
☐ Potholes or noticable settlement	
☐ Drainage issues (standing water, depressions, etc.)	

Pumps and Mechanical Assessment
Lift Station

Pump Station ID:		**Address:**	
Inspected By:		**Image Ref:**	
Date:			

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Pumps

	Pump ID Age (years)	Pump ID (Checklist):	Condition Rating:
	1		1 2 3 4 5
	2		1 2 3 4 5
	3		1 2 3 4 5
	4		1 2 3 4 5
	5		1 2 3 4 5
	6		1 2 3 4 5

	Condition Checklist (Mark pumps w/ issues at right)	1	2	3	4	5	6	Comments:
	Check if Submersible (no feasible visual inspection)							
	Pump surface - corrosion							
	Pump surface - chipped coating							
	Pump seals leaking							
	Worn nuts/lugs on bolted connections							
	Loose connections							
	Cracked or damaged foundation supports							
	Unusual vibrations or noise							
	Impeller - pitting or heavy wear							
	Pump performance significantly below rating							
	Past usefule life -> replace							

Motors

	Motor ID Age (years)	Motor ID (Checklist):	Condition Rating:
	1		1 2 3 4 5
	2		1 2 3 4 5
	3		1 2 3 4 5
	4		1 2 3 4 5
	5		1 2 3 4 5
	6		1 2 3 4 5

	Condition Checklist (Mark motors w/ issues at right)	1	2	3	4	5	6	Comments:
	Check if Submersible (no feasible visual inspection)							
	Dirty inspection ports							
	Oil reservoir low							
	Discoloration (potential overheating)							
	Unusual vibrations or noise							
	Past useful life -> replace							

Pumps and Mechanical Assessment
Lift Station

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

Piping		Condition Rating:	1	2	3	4	5
	Needs minor touch-up paint	Comments:					
	Needs complete repaint						
	Needs replacement						

Isolation Valves		Condition Rating:	1	2	3	4	5
	Leaking	Comments:					
	Recoating needed						
	Needs replacement						

HVAC System		Condition Rating:	1	2	3	4	5
	System Age:	Comments:					
	Type						
	Ventilation Only						
	Air conditioning						
	Upgrade required (comment)						

Wet Well Assessment Form

Lift Station ID:		**Address:**	
Inspected By:		**Image Ref:**	
Date:			

Overall Condition Rating (Circle rating below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

	Structure	**Rating:** 1 2 3 4 5
	Cracks	**Comments:**
	Single	
	Multiple	
	Broken/Collapsing Section	
	Infiltration/Inflow	
	None	
	Stain	
	Seeping	
	Dripping	
	Running	
	Surface Condition	
	Surface Spalling	
	Aggregate Visible	
	Aggregate Projecting	
	Reinforcement Visible	
	Reinforcement Corroded	
	Holes Visible	
	Lid/Hatches need replacement	
	Vent function impaired	

Grinder Assessment
Lift Station

Lift Station ID:		**Address:**	
Inspected By:		**Image Ref:**	
Date:		**Grinder ID:**	

Overall Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; like-new conditions, no issues noted; routine maintenance adequate
2	Adequate: minor wear, no equipment issues; schedule routine maintenance soon
3	Fair; worn, but no pressing equipment issues; Mid term replacement/rehabilitation recommended
4	Poor; equipment damaged/impacting operation; short term replacement/rehabilitation required
5	Bad; equipment severely damaged/halting operation; Immediate replacement/maintenance required

	Grinder condition	**Rating:** 1 2 3 4 5
	Grinder age: _____	**Comments:**
	Cutter stack age: _____	
	Grinder improperly seated	
	Plastric strips (front/back) not flush with drum	
	Interference between screens/cutter stacks	
	Damage to drum/screen material	
	Leaks present (inline grinders)	
	Rotation issues (bump grinders)	
	Cutter stack insufficiently torqued	
	Leaks to power pack and/or torque motor	
	Tank Oil Level _____	
	Clear	
	Milky	
	Bubbles	

	Bypass Structure (if applicable)	**Rating:** 1 2 3 4 5
	Not Applicable	**Comments:**
	Control Gates need replacement	
	Cracks	
	Single	
	Multiple	
	Broken/Collapsing Section	
	Structure Surface Conditions	
	Surface Spalling	
	Aggregate Visible	
	Aggregate Projecting	
	Reinforcement Visible	
	Reinforcement Corroded	

Electrical Assessment
Lift Station

Lift Station ID:		**Address:**	
Inspected By:		**Image Ref:**	
Date:			

Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; no wear or equipment issues; all hardware present
2	Adequate: minor wear, no equipment issues; all hardware present
3	Fair; worn, no major equipment issues; missing non-critical hardware
4	Poor; old and worn; missing important hardware; replacement recommended
5	Bad; hardware gone or failed; replacement required to continue operation

Overall Electrical

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		

Generators & Transfer Switches

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		

Switchboard

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		

Transformer

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		

Motor Control Center (MCC)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		

Panelboards

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		

VFD (If applicable; one per pump motor)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		

Electrical Assessment
Lift Station

Condition Rating (Circle rating for individual components in sections below)	
1	Excellent; no wear or equipment issues; all hardware present
2	Adequate: minor wear, no equipment issues; all hardware present
3	Fair; worn, no major equipment issues; missing non-critical hardware
4	Poor; old and worn; missing important hardware; replacement recommended
5	Bad; hardware gone or failed; replacement required to continue operation

Motor Starter(s) (If applicable; one per pump motor)

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		
		1 2 3 4 5		

PLC Panel/RTU

Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		

HMI

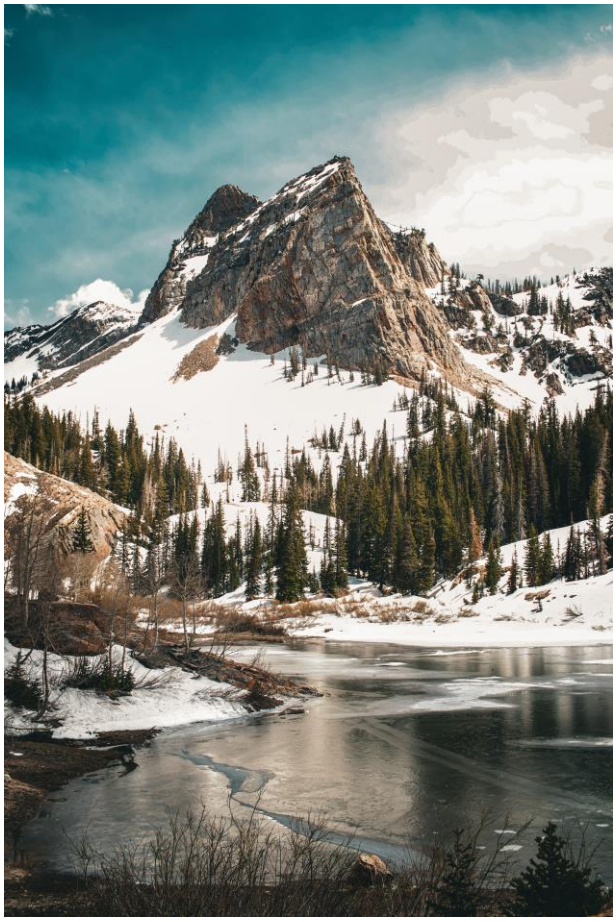
Equipment No.	Age (yrs)	Condition (circle)	% Usage Time	Comments:
		1 2 3 4 5		

Security System (if applicable; if not present, leave comment)

Equipment No.	Age (yrs)	Condition (circle)	Status (Circle)	Comments:
		1 2 3 4 5	New Outdated	

APPENDIX G

DROUGHT CONTINGENCY PLAN



GRANGER-HUNTER
IMPROVEMENT DISTRICT

DROUGHT CONTINGENCY PLAN

Improving Quality of Life Today, Creating a Better Tomorrow

June 2022

Prepared by J-U-B Engineers, Inc.

Contents

EXECUTIVE SUMMARY

This Drought Contingency Plan prepared for Granger-Hunter Improvement District (District) will assist in recognizing the early stages of drought, understanding drought impacts and developing plans to hedge against reduced water supplies. The District has developed this plan to foster long-term resilience to drought by analyzing potential water supply reductions, better understanding customer reactions to drought levels, and to plan for and develop projects to protect against long-term drought.

The District provides water and wastewater service to 130,000 residents of West Valley City, Utah. The District currently utilizes a water wholesaler, Jordan Valley Water Conservancy District (JVWCD), for approximately 75 percent of its water supply. The remaining 25 percent comes from its own wells in the Salt Lake Valley aquifer. During times of drought, JVWCD may request reductions or reduce the contract by up to 30 percent or more depending on the severity of the drought. In 2022, JVWCD declared a Level 1 Drought.

Drought Level	Targeted % Reduction in JVWCD Contract	Targeted Annual Volume from JVWCD (Acre-ft)	Max Delivered % of JVWCD Contract	Max Delivered Annual Volume from JVWCD (Acre-ft)
0	0%	18,500	-	-
1	5%	17,575	120%	22,200
2	10%	16,650	110%	20,350
3	20%	14,800	100%	18,500
4	30%	12,950	>100%	>18,500

Notes:
1 – At Level 4, JVWCD will determine the water supply availability as a ratio to wholesale contract amounts (i.e., 90 percent, 85 percent, etc.) at the time that this level of water supply availability is established.
2 – Reduction targets and max delivered volumes are taken from Table 6-1 of the JVWCD Drought Contingency Plan.

Fig.1: JVWCD Contract Reductions during Drought

Due to the potential for supply reductions, the District has determined a strategy for reducing demand and increasing its drought-resilient supply by accessing additional groundwater resources. The District owns additional groundwater rights that can be utilized to make up for a supply shortage, though the groundwater contains higher levels of iron, manganese and ammonia that need to be removed to reduce water quality complaints and concerns.

During a drought, the District will implement one of 5 Drought Levels:

Level 0: Education and Public Awareness of water use within the District's boundaries, and a focus on water loss reduction. This is the default level unless additional restrictions are warranted.
Level 1: Voluntary water conservation, including suggestions for outdoor irrigation and additional public outreach.
Level 2: Voluntary time of day, watering frequency and/or other voluntary water restrictions, in addition to public outreach.
Level 3: Mandatory time of day, watering frequency and/or other voluntary water restrictions, in addition to public outreach. Temporary increases to Tier III and IV water rates.
Level 4: Emergency water use restrictions, including bans on certain types of outdoor irrigation and a reduction to the size of Tier III.

Based on these Drought Levels, it is anticipated that water use reductions will occur in the range of 5 to 30 percent. In 2021, the District saw a demand reduction from 10 to 15 percent without declaring a drought level, just based on outreach from the State of Utah and the media. For planning purposes, the District should not count on long-term demand reductions if summers become hotter and drier due to climate change. Snow levels are also expected to reduce long-term, leading to less surface water available for the Wasatch Front. Based on potential cutbacks and marginal groundwater quality, the District should pursue the construction of an additional well and an additional groundwater treatment plant to reduce reliance on surface water supplies from JVWCD and increase drought resiliency.

1. INTRODUCTION

Granger-Hunter Improvement District (District) provides potable water distribution and wastewater collection services to approximately 130,000 residents in a 24.5 square mile area in West Valley City, Utah. The District's mission is: "Stewards of Water: delivered clean and safe for daily use and collected responsibly to protect public health and the environment." The District has approximately 375 miles of potable water piping, ranging in size from 4-inch to 30-inch, along with nine storage reservoirs and eight deep wells. The wastewater system consists of 12 lift stations along with 300 miles of collection piping. The District is governed by a 3-member Board of Trustees, with 75 staff handling the day-to-day operations. The District's eight deep wells provide approximately 25 percent of its potable water, with the remainder coming from Jordan Valley Water Conservancy District (JVWCD). The District's wastewater is treated by Central Valley Water Reclamation Facility (CVWRF).

The District purchases approximately 75 percent of its potable water from Jordan Valley Water Conservancy District (JVWCD) through a wholesale "take-or-pay contract." JVWCD's water sources include the Central Utah Project, the Provo Reservoir Water Users Company, the Central Water Project (groundwater from Utah County), the Utah Lake System (storage in Strawberry Reservoir), groundwater, and other smaller sources. JVWCD generally allows for a yearly overage of 20% of the contract, though generally the District remains close to utilizing 18,500 Acre-feet per year (AFY). In addition, JVWCD's yearly increases include a factor for 'peaking', which encourages the District to utilize JVWCD water at a similar amount throughout the year and peak on its own supplies.

The remaining 25 percent of potable water is self-supplied through seven deep wells, as shown below. For planning purposes, Well No. 4 is not currently utilized due to water quality issues.

Well Name	Pumping Capacity[1] (gpm)	Annual Yield 6-Month Operation (Acre-Ft/Year)	Annual Yield Year-Round[2] (Acre-Ft/Year)
Well No. 1	1,000	807	1,613
Well No. 4	0	0	0
Well No. 8	1,700	1,371	2,742
Well No. 12	2,300	1,855	3,710
Well No. 14	650	524	1,048
Well No. 15	2,600	2,097	4,194
Well No. 16	2,500	2,016	4,033
Well No. 17	3,300	2,661	5,323
Total Capacity	**14,050**	**11,331**	**22,663**

Table 1-1: District Well Supply

The entire 22,663 AFY shown in Table 1-1 is not currently able to be utilized, due to limitations on pumping capacity in the summer and that water demand in the non-irrigation season is significantly less than the pumping capacity. In addition, many of the District's wells have higher levels of ammonia, manganese, and iron. These constituents impact water quality in the District by creating taste, odor and aesthetic complaints. Iron and Manganese are currently secondary standards, and as such there are only guidelines for aesthetic considerations. It is possible that Manganese becomes a primary drinking water standard in the future, therefore the District is planning on treating its wells with the highest amounts, starting with Wells No. 1, 12 and 17 with a treatment plant that is already under construction.

The District's wholesale supply is contingent on JVWCD supplying the full contract amount (18,500 acre-feet). JVWCD has indicated, in times of drought, that they may set water demand targets as follows:

Water Supply Availability Level	Water Shortage Description	Water Demand Reduction Target
 Level 0	Normal	None
 Level 1	Moderate	5% reduction in typical use for wholesale Member Agencies and JVWCD retail customers, but in any event, JVWCD will not supply more than 120% of wholesale contract amounts
 Level 2	Severe	10% reduction in typical use for wholesale Member Agencies and JVWCD retail customers, but in any event, JVWCD will not supply more than 110% of wholesale contract amounts
 Level 3	Extreme	20% reduction in typical use for wholesale Member Agencies and JVWCD retail customers, but in any event, JVWCD will not supply more than wholesale contract amounts
 Level 4	Critical/Exceptional	30% reduction in typical use for wholesale Member Agencies and JVWCD retail customers. JVWCD will determine the water supply availability as a ratio to wholesale contract amounts (i.e. 90%, 85%, etc.) at the time that this water supply availability is established

Table 1-2: JVWCD Drought Water Demand Reduction Targets

In addition, JVWCD has indicated they may temporarily increase the wholesale dollar rate of water during times of drought, specifically water taken above the reduced contract amount. Due to the possible curtailment of the contract amount, appropriate actions need to be taken to ensure an adequate water supply is available.

2. DROUGHT HISTORY

Utah has experienced periods of water shortages since the pioneers first settled in the Salt Lake Valley. The lengthy droughts of the 1930s and 1950s caused significant economic problems for the state. While the drought of 1976-77 was not as long, the consequences were still intense and costly. In 2016, after several years of drought conditions that started in 2012, Utah Lake dropped to levels causing the Utah State Engineer to prohibit diversions of more than 100,000 acre-feet (AF) of secondary storage rights (junior water rights holders) in Utah Lake. The low water levels also intensified a widespread algal bloom in Utah Lake, prompting public health advisories. Declining water levels and algal blooms caused by drought conditions are chronic issues.

The recently completed Weber River and Bear River tree-ring stream flow reconstructive studies and JVWCD's *Preparing for Climate Change—A Management Plan* forecast the likelihood of much more severe and longer-term droughts in the future. Per “Rapid Intensification of the emerging southwestern North American megadrought in 2020-2021”, Nature Climate Change, Mar. 2022, Williams, Park A. et. Al., “the drought will very likely persist through 2022, matching the duration of the late-1500s megadrought,” which lasted for 22 years, and modeling shows the current drought may last for another 2-8 years. Figure 2-1 shows the history of soil moisture from 800 CE onward, with a clear reduction since 2000.

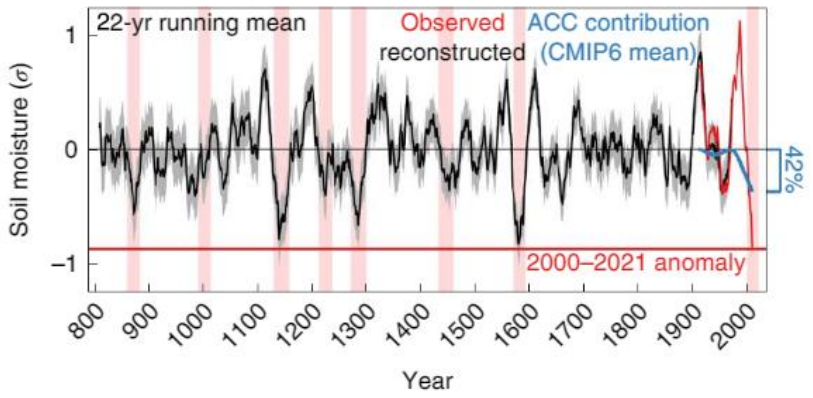


Fig. 2-1: Soil Moisture History from 800 CE, "Rapid Intensification of the emerging southwestern North American megadrought in 2020-2021", Nature Climate Change, Mar. 2022, Williams, Park A. et. Al.

In April of 2022, the Utah Department of Natural Resources indicated that 99.39 percent of the state was in severe drought or worse, with 43.46 percent of Utah in extreme drought with the snowpack at only 75 percent of normal. Of Utah's largest 45 reservoirs, 19 were below 55 percent of available capacity, and overall statewide storage was only at 59 percent of capacity. Of the 94 measured streams, 59 were flowing below normal despite spring runoff, and two streams were flowing at record low conditions. On April 21, 2022, Governor Spencer J. Cox declared a state of emergency due to the dire drought conditions affecting the entire state.

3. PURPOSE OF DROUGHT PLANNING

The 2012 drought contributed to public-health issues threatening state economic growth, agricultural users and recreational activities restrictions, and damage to the vibrant ecosystems surrounding the shrinking Great Salt Lake and Utah Lake. In May 2017, JVWCD completed a study called *Preparing for Climate Change—A Management Plan* (revised March 2018), which indicates that the drought mitigation projects of the 20th century are likely inadequate to compensate for the impacts of climate change and to mitigate the area's longest droughts. JVWCD stakeholders, including the District, agreed that planning to mitigate the risks associated with a severe drought could no longer be delayed. JVWCD assembled stakeholders from the municipal, industrial, agricultural, recreational, and environmental communities and developed its 2021 Drought Contingency Plan, which includes projects, actions, and partnerships to prepare for and reduce water shortages and provide better drought resilience for the area's diverse water users.

In 2021 after participating in the drought planning with JVWCD, the District implemented drought water rates to address when and if, in times of drought, JVWCD may curtail a percentage of the water contract dependent on the severity of the drought. In addition, JVWCD has indicated they may temporarily increase the wholesale rate of water during times of drought, specifically water taken above the reduced contract amount. DISTRICT felt that due to the possible curtailment of the contract amount, appropriate actions must be taken to ensure an adequate water supply is available to District customers.

In 2022, the District decided to create its own Drought Contingency Plan (DCP) to evaluate its system vulnerabilities and impacts further and identify the most effective and efficient mitigation actions that will reduce the effects of drought in the future. The DCP has been added as an appendix to the District's Water Master Plan.

The DCP provides a practical and systematic means for the District to manage emergency supply conditions within its own service area. This plan is intended to serve as a guiding document for managing water supply and delivery in the event of severe or prolonged drought and will be monitored and adjusted as more information becomes available.

4. DISTRICT WATER CONSERVATION AND SUPPLY

During preparation of the District's Water Master Plan in 2022, the District analyzed its gallons per capita/day (gpcd) rate. This was compared to the State of Utah's Regional Water Conservation Goals for the Salt Lake Region. Table 4-1 shows the compiled information. Based on the analysis, the District is already well ahead of the regional goals but has committed to reducing gpcd use by another 6% by 2030 and 10% by 2040.

Year	State of Utah (gpcd)	State of Utah (%)	GHID (gpcd)	GHID (%)
2015	210			
2020	-		187	
2030	187	11%	176	6%
2040	178	15%	169	10%
2065	169	19%	161	14%

Table 4-1: District Conservation Goals

During the preparation of the 2022 District Water Master Plan, the hydraulic model was used to determine if the current water system could support the full summertime demand given the potential for reductions in JVWCD supply. The most likely source loss for the District is a reduction of the supply due to the JVWCD Drought Contingency Plan. At the different drought levels, JVWCD could implement voluntary or mandatory reductions in supplied water between 5 and 30% of typical use. Between 2014 and 2021, the District's typical use of JVWCD wholesale water was 18,900 AFY. The targeted volume and max deliveries from JVWCD are different because many member agencies routinely exceed their contract amounts by large percentages. Because the District routinely uses close to its contract amount, less significant reductions are mandatory, but are still targeted and suggested.

The District currently has 27 million gallons (MG) of storage with plans to purchase and/or construct an additional 8 MG. Due to the long-term nature of the drought, storage is not a critical element for drought mitigation, and as such is not included in the plan.

As shown below, a Drought Level 3 would reduce supply by up to 3,700 AFY, requiring additional use of DISTRICT wells.

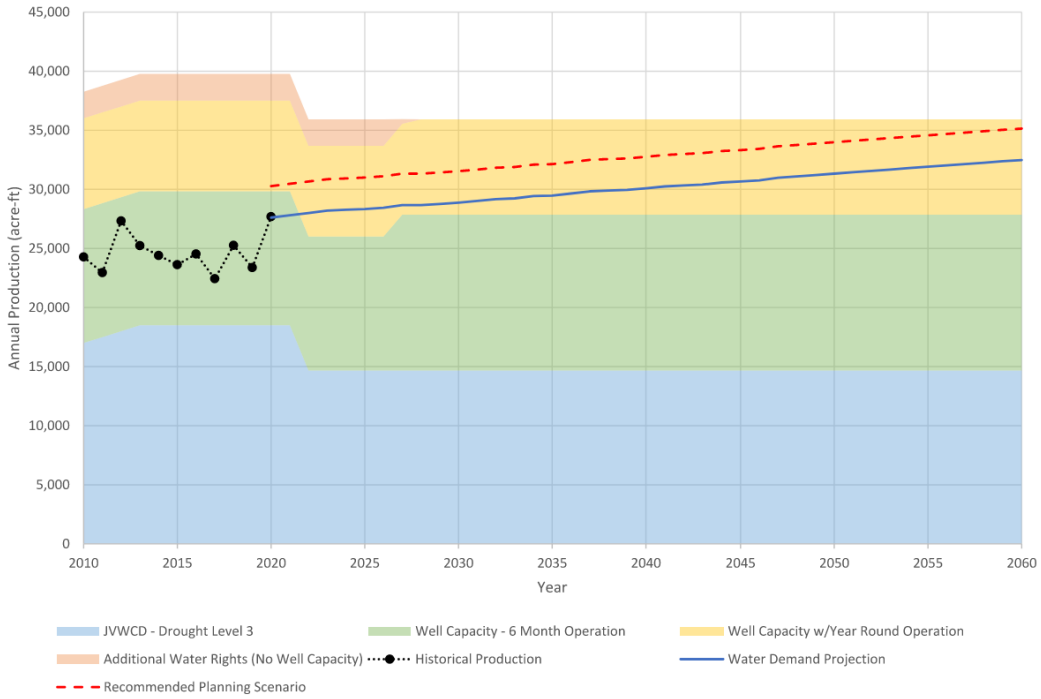


Fig. 4-1: Projected Annual Production Requirements at JVWCD Drought Level 3 in 2022

The Recommended Planning Scenario above is greater than the Water Demand Projection because it assumes that one of the District's largest wells, Well No. 17, is offline and not available all summer. This graph also assumes year-around use of the District's wells, which may not be possible given that demand during the non-irrigation season is less than be supplied by the District's wells. The District's Well No. 16 is the only well that can pump to the higher pressure zones on the south-western portion of the District, and if this well was out of service, supply to approximately 25 percent of the District's service area would be disrupted if the JVWCD max delivery had been reached. In addition, JVWCD does not declare a drought level until May, which would make it difficult to predict if year-round operation of District wells is necessary.

4.1 Water Tiered Rates

Starting in 2018, the District adopted a three-tiered water rate in order to promote conservation. While the incremental rates were small at first, in 2022 they were increased, and a fourth tier was added. The first two tiers, as shown in Table 4-2, are designed to keep rates low for indoor use (Tier I) and responsible outdoor use (Tier II). Tiers III and IV are designed to encourage responsible use of water, especially since any use above 45,000 gallons per month would be considered excessive for most single-family residential homes.

Water Tiers	Price (per 1,000 gallons)
Tier 1 (Less than 7,000 gallons)	$1.77
Tier 2 (7,001 - 15,000 gallons)	$1.90
Tier 3 (15,001 - 45,000 gallons)	$2.20
Tier 4 (45,001 gallons and above)	$3.00
Multi-Unit (apartments, condos, etc.)	$2.10

Table 4-2: District Water Rates

It is the District's intention to continue to assess rates that assign a higher cost to high outdoor water use. In addition, the District has adopted Drought Level 3 and 4 temporary water rate increases and reductions in Tier size. At Drought Level 3, Tier III increases from $2.20/1,000 gallons to $3.30, and Tier IV increases from $3.00 to $6.00. At Drought Level 4, Tier III reduces from 45,000 gallons to 35,000 gallons, and Tier IV begins at 35,001 gallons.

Drought Contingency Rates	
Level 3: As defined by Jordan Valley Water/Board of Trustee	
Tier 3 Rates	$3.30
Tier 4 Rates	$6.00
Level 4: As defined by Jordan Valley Water/Board of Trustee	
Tier 3 Rates - 15,001 - 35,000 gallons per month	$3.30
Tier 4 Rates - All > 35,000 gallons per month	$6.00

Table 4-3: Tiered Water Rates During Drought Levels

4.2 Salt Lake Valley Aquifer Safe Yield

The District's seven wells pull water from the deep Salt Lake Valley Aquifer. This aquifer has provided water to Salt Lake County residents for many years. In 2002, a coalition of stakeholders prepared a final "Salt Lake Valley Groundwater Management Plan" in which the objectives were to promote the wise use of groundwater resources, protect existing water rights, and address water quality issues and over-appropriation of groundwater in the valley. The Salt Lake Valley is closed to new appropriations. From 1986 to 2000, water-level declines in the aquifer were noted in the south portion of the valley, but none in the north-western portion where the District operates its wells. In addition, it noted that the safe use of the aquifer was 165,000 AFY and that the current use was 130,000 AFY.

The report also determined safe aquifer yields by section as part of their analysis:

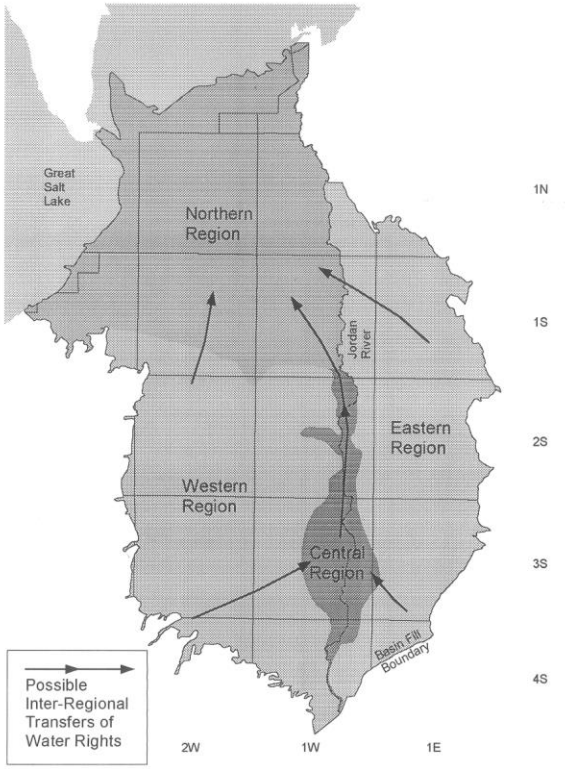


Figure 4-2: Salt Lake Valley Aquifer Regions

Region	Safe Yield (acre-feet per year)
Western	25,000
Eastern	90,000
Central	20,000
Northern	30,000

Table 4-4: Safe Aquifer Yields

The District utilizes groundwater from both the Northern and Western sections, where the total safe yield is 55,000 AFY. The AFY amounts pumped by others are currently unknown, but the maximum the District has recently pumped is 7,400 AFY.

Other agencies in the Northern and Western sections include Magna Water District, Taylorsville-Bennion Improvement District, Kearns Improvement District, West Jordan City, Riverton, Herriman and Bluffdale. While it is unknown the exact quantities other agencies are pumping, averages of annual water use data are available from waterrights.utah.gov. Based on these averages, approximately 42,000 AFY is being used in the Northern and Western areas for potable water. It is unknown how much is used for secondary irrigation systems.

AGENCY	ESTIMATED ANNUAL WITHDRAWAL
DISTRICT	8,000 AFY
TBID	8,000 AFY
KID	2,000 AFY
MAGNA	5,000 AFY
WEST JORDAN	2,000 AFY
RIVERTON	SECONDARY ONLY
HERRIMAN	5,000 AFY
BLUFFDALE	SECONDARY ONLY
JVWCD	7,000 AFY
OTHER	5,000 AFY
TOTAL	**42,000 AFY**

Table 4-5: Average Groundwater Use by Agencies in the Northern and Western Sections of the Salt Lake Aquifer

Based on this analysis, there are 13,000 AFY of safe yield remaining in the Northern and Western regions of the aquifer, which would give the District an allowance to use its entire 22,000 AFY of water rights during a drought year without impairment of the aquifer. The District, through its Supervisory Control and Data Acquisition (SCADA) system, would monitor aquifer levels to ensure no regional drawdown is occurring. If drawdown is occurring, yields would need to be reduced in order to ensure the long-term sustainability of the aquifer.

4.3 Salt Lake Valley Aquifer Water Quality

The District's seven wells are generally higher in TDS, manganese, iron and ammonia than JVWCD water quality. As shown in Figure 4-4, the total dissolved solids (TDS) of groundwater in the District's area ranges from 250 to greater than 1,000 milligrams per liter, with the TDS generally increasing since 1988.

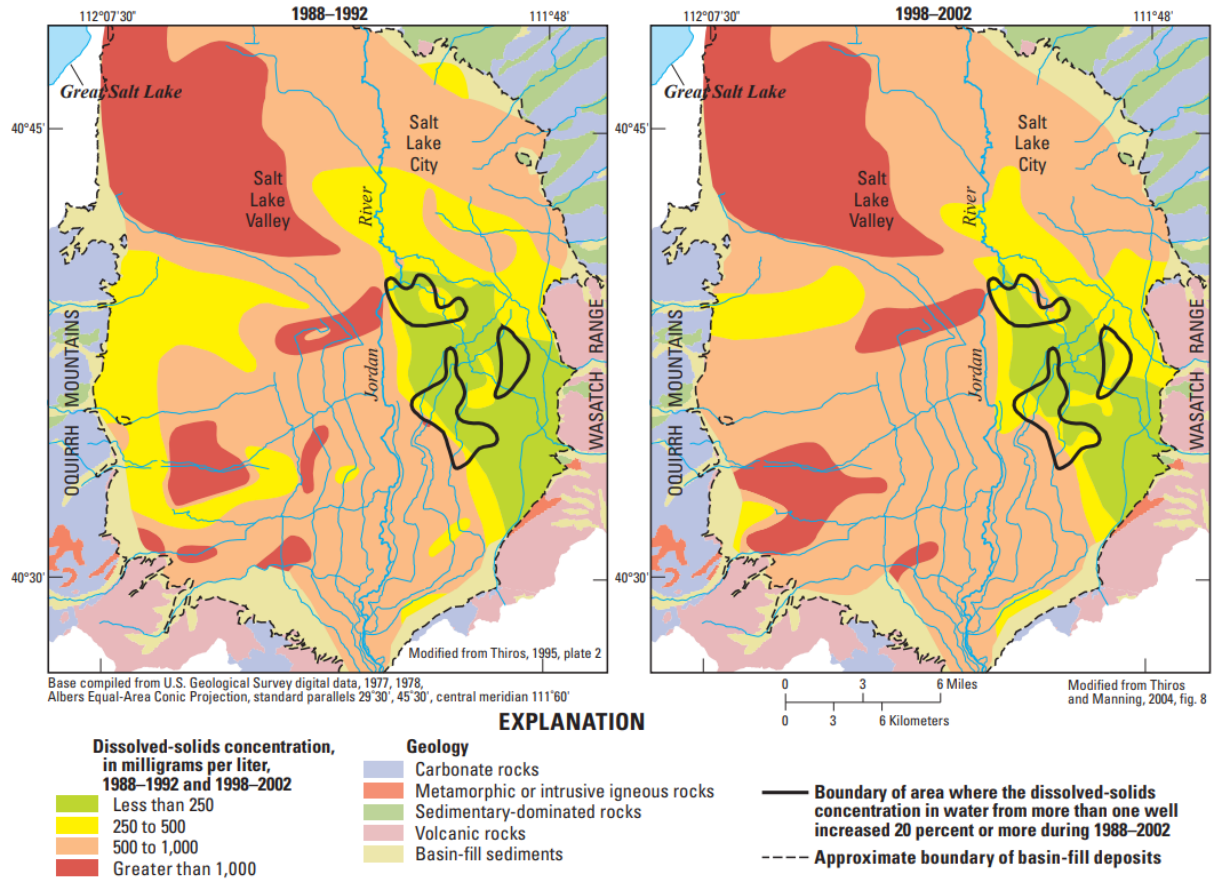


Figure 4-4: TDS Concentrations in the Salt Lake Valley Aquifer, Conceptual Understanding and Groundwater Quality of Selected Basin-Fill Aquifer in Salt Lake Valley, Utah, USGS, Paper 1781

While the TDS levels have not yet reached levels that have caused large issues, the levels of iron, manganese and ammonia in the groundwater can cause aesthetic problems and lead to excessive water quality complaints. A study conducted by the District and Confluence Engineering Group determined that the level of manganese entering the system from several wells was above 0.05 mg/L. Often, other metals (iron, lead, and arsenic) can co-accumulate, causing a potential health risk if scaling on pipe walls is released. Table 4-6 shows a summary of water quality conditions in 2018.

Parameter (units)	Well Number (and number of Data Points)							USEPA Standard	Recommended Limit*
	Well 1 (n=7)	Well 8 (n=2)	Well 12 (n=5)	Well 14 (n=0)	Well 15 (n=6)	Well 16 (n=1)	Well 17 (n=7)		
Ammonia (mg/L as N)	0.22 (0.02 - 0.34)	-- (0.38 - 0.39)	0.34 (0.30 - 0.38)	NM	0.40 (0.36 - 0.44)	0.60 (--)	0.17 (0.13 - 0.34)	NA	NA
Conductivity (µS/cm)	596 (560 - 630)	-- (473 - 474)	732 (688 - 796)	NM	636 (541 - 706)	913 (--)	902 (828 - 972)	NA	NA
Iron (mg/L)	0.06 (0.02 - 0.12)	-- (0.09 - 0.10)	0.12 (0.01 - **0.40**)	NM	0.17 (0.10 - **0.36**)	0.05 (--)	0.12 (0.08 - 0.23)	0.3 ‡	0.1
Manganese (mg/L)	0.04 (0.01 - **0.09**)	-- (**0.06 - 0.07**)	**0.10** (0.03 - **0.20**)	NM	**0.05** (0.04 - **0.07**)	**0.06** (--)	0.04 (0.01 - **0.06**)	0.05 ‡	0.02
pH (units)	7.7 (7.5 - 7.9)	-- (7.7 - 7.9)	7.7 (7.6 - 7.9)	NM	7.8 (7.0 - 8.1)	7.8 (--)	7.8 (7.6 - 7.9)	6.5 - 8.5 ‡	NA
Total Dissolved Solids (mg/L)†	371 (348 - 393)	-- (292 - 293)	458 (430 - 499)	NM	396 (336 - 441)	**573** (--)	**566** (**519 - 611**)	500 ‡	NA
Turbidity (NTU)	0.7 (0.2 - 1.2)	NM	0.9 (0.3 - 3.4)	NM	0.7 (0.2 - 1.8)	NM	0.4 (0.2 - 1.0)	5 ‡	NA

Methods: Ammonia (HACH Method 10205 ULR TNTplus 830), Iron (HACH Method 8008 FerroVer pillows), and Manganese (HACH Method 8149 PAN pillows).

Bolded, red data are above the USEPA Standard

NA = No standard / not applicable

NM = Not measured

-- Not calculated due to lack of data

† TDS calculated based on conductivity

‡ Secondary (aesthetic) standard

* Recommended limits based on industry best practices

Based on the conclusions of the study, well water treatment was recommended in order to remove iron, manganese, and ammonia, reduce water quality complaints and reduce the likelihood of non-compliance if the US EPA adopts manganese primary drinking water standards. The District has proceeded with constructing a water treatment plan for Wells No. 1, 12, and 17, but Wells No. 15 and No. 16 both have elevated levels as well and require treatment.

5. Operational and Administrative Framework

The operational and administrative framework lays out how the District will monitor and determine its drought level and who will oversee implementation of the drought response. The District's General Manager, under the direction of the District's Board of Trustees, will oversee implementation of the plan with assistance from staff.

5.1 Drought Monitoring

As most of the District's potable water is supplied from JVWCD (75 percent) on a take-or-pay contract, the District's drought monitoring process will follow that of JVWCD's, outlined in their Drought Contingency Plan. The JVWCD drought monitoring process includes five water supply conditions or drought levels that are based on three drought monitoring triggers including:

- JVWCD supply availability of CUP with storage in Jordanelle reservoir as provided by CUWCD
- JVWCD supply availability of Provo River Project as determined by PRWUA
- JVWCD supply availability of high-quality groundwater as reported by Utah DEQ.

Since the remaining 25 percent of the District's water is supplied through seven deep wells, these three drought monitoring sources were found to be sufficient to accurately identify the drought level the District will implement throughout the year. The five water supply conditions/drought levels are generally described in Table 5-1 below.

Water Supply Conditions / Drought Level	Water Shortage Description	Triggering Criteria Applied to Water Supply Availability Levels		
		CUWCD Supply Availability (Jordanelle Storage of CUP)	PRWUA Supply Allocation (in the Provo River Project)	Salt Lake Valley Groundwater Conditions
0	Normal	At least 95 percent supply availability	At least an 80 percent supply allocation	3-year average diversions less than safe yield
1	Moderate	At least 95 percent supply availability	75 – 80 percent supply allocation	JVWCD groundwater diversions to compensate for shortage exceeds 12,000 AF, or 3-year average exceeds safe yield
2	Severe	At least 90 – 95 percent supply availability	75 – 80 percent supply allocation	JVWCD groundwater diversions to compensate for shortage exceeds 16,000 AF, or 3-year average exceeds safe yield
3	Extreme	At least 90 – 95 percent supply availability	Less than 75 percent supply allocation	JVWCD groundwater diversions to compensate for shortage exceeds 20,000 AF, or 3-year average exceeds safe yield
4	Critical / Exceptional	Less than 90 percent supply availability	Less than 45 percent supply allocation	JVWCD groundwater diversions to compensate for shortage exceeds 20,000 AF, or 3-year average exceeds safe yield

Table 5-1: JVWCD Water Supply Conditions and Triggers

Each year JVWCD considers feedback and updated water supply forecast information and determines a final drought level recommendation no later than May 1. JVWCD establishes the water supply availability level by formal action of its Board of Trustees at its May Board Meeting and encourages each Member Agency to similarly establish the water supply availability level by formal action of their respective governing bodies.

The District will monitor the water supply availability level set by JVWCD in May of each calendar year and will follow a similar process for implementing the drought level and associated response actions to be followed by DISTRICT water users. At the May Board Meeting, the District's Board of Trustees will analyze JVWCD's drought level and determine the District's Drought Level. The General Manager will be responsible for recommending a drought level.

5.2 Drought Response Implementation

As laid out in Section 8, the levels of drought response set guidelines for action for District staff to implement. The General Manager will oversee the implementation of the guidelines as directed by the District's Board of Trustees. The District's Director of Administrative Services will be responsible for implementing outreach with the District's customers utilizing the Customer Service and Meter Department staff. The District Operations and I.T. staff will be responsible for monitoring overall water use and providing information to Management on current supply and demand.

6. VULNERABILITY ASSESSMENT

As part of this drought planning effort, a vulnerability assessment was conducted to evaluate the likelihood of a prolonged drought based on historical data and evaluate potential risks and impacts that a drought would present to the District's service area. The vulnerabilities to JVWCD's water supply are well documented within their

Drought Contingency Plan. It includes risk factors that contribute to reduced supply which were identified and weighted based on their likelihood of occurrence and the reliance JVWCD has on that particular supply source as a percentage of its portfolio. The risk factors that JVWCD identified are also risk factors to the District's system due to its reliance on the same sources for water supply.

The key drought vulnerabilities identified, along with the associated risks and their potential impacts by sector, are outlined in Table 6-1 below.

Key Drought Vulnerabilities	Risks	Impacts by Sector		
		Municipal	Agricultural	Environmental
Available Water Supply	• JVWCD contract curtailment • Reliance on surface flows subject to minimum flow requirements • Local mountain streams lack holdover storage • Climate Change • Groundwater Overpumping	✓	✓	✓
Source Water Quality Degradation	– Algal by-products/blooms impacting usability of JVWCD sources	✓	✓	✓
Increased Water Costs	– Tiered rate structure with JVWCD contract – JVWCD contract costs are 50% greater than groundwater production costs prior to treatment	✓	✓	
Inability to Utilize Available Supply due to Aging Infrastructure	• Aging wells • Mechanical failure of wells or treatment equipment	✓	✓	
Heavy Reliance on JVWCD	• Currently, 75 percent of water supplied from JVWCD	✓	✓	✓

Table 6-1: Key Vulnerabilities, Risks, and Impacts by Sector

6.1 Key Drought Risks and Impacts by Sector

Municipal and Industrial (M&I) - The M&I sector relies on each water source in the District's portfolio and the various assets used to store, convey, or treat the water. Any form of disruption to these sources can heavily impact this sector. Outdoor landscaping is particularly susceptible to disruption, as reductions in outdoor use may lead to the death of plants and groundcover.

Agricultural - Groups within this sector rely on quality water, and any adverse impacts to the water quality due to drought can quickly interrupt water sources in this sector. The previously mentioned 2016 algal blooms in Utah Lake that prompted secondary water systems to shut down are an example of this. Without the ability to use these secondary water systems, this sector's demand on JVWCD's system is increased.

Environmental - Lower stream and groundwater flows and altered runoff patterns impact ecosystems that rely on these water sources. During drought, water quality can also be compromised, affecting ecosystems and critical aquatic habitats such as the lower Provo River, a critical habitat for the June Sucker, an endangered species.

6.2 High Water Users

The District's service area also includes food manufacturing and bottling plants, whose entire business is reliant on water. Any disruptions to their supply could prove detrimental to their continued operations in the West Valley City area. High water users also include West Valley City (parks, government facilities) and the Granite School District (2 high schools and multiple middle and elementary schools).

It is the District's intention, during a drought, to work closely with both Industrial/Commercial and Governmental users to assist the District in meeting it's conservation goals. This would take the form of outreach to the organizations with information on their water use and methods to reduce it, while ensuring that these vital uses have enough supply to continue their viability as employers and to preserve our vital open space.

6.3 Possible Future Climate Change Scenarios

Climate change impacts are anticipated to exacerbate existing extreme weather events, including the length and intensity of drought and floods, through changes in precipitation and temperature. Although there is uncertainty in the degree of potential changes in the hydrologic cycle, projected trends according to the Intergovernmental Panel on Climate Change (IPCC) indicate a high likelihood of increases in temperature and changes in the severity and intensity of precipitation events. IPCC prepared studies at the regional and local levels using dendrochronology along the Weber and Bear Rivers. This study yielded relevant information on paleohydrology and has demonstrated significant annual and decadal climate variability, including drought periods that are much longer and drier than those experienced in recorded history.

JVWCD, within their Drought Contingency Plan, has used these studies and past palaeohydrological data to understand how past severe droughts occurred and the potential impacts if they were to recure in the future. These impacts include changes in precipitation and general hydrologic patterns, reduction of snowpack and water supply, water quality impacts, and potential increases in water demand.

The climate of the State of Utah has seen high variability across the past 1,000 years, with more significant variability in terms of extremes for both wet and dry periods experienced in the recent study Period. Utah has demonstrated an increasing trend in temperature that corresponds to trends predicted by global climate models. The impacts of this changing condition include changes in snowmelt flows and the anticipation of greater inefficiencies of these flows in the future. Early snowmelt resulting in the inefficient conversion of snowmelt runoff to reservoir inflow occurred between 2000-2004 during a drought that affected most Utah watersheds and is an example of what could be expected to continue with increasing temperatures. This early snowmelt shifts average peak streamflow periods currently relied upon by existing water supplies. Other impacts include the potential increase in evapotranspiration rate due to increased temperatures and an increase in the intensity of rainfall events.

Research from the University of Utah Department of Atmospheric Sciences summarizes and indicates potential key changes in temperature and precipitation may result in the following by the year 2100:

- Temperature increases between 1.5 to 5 degrees Celsius (°C)
- Precipitation increase between 5 to 10 percent (Wasatch), 20 percent (Uinta)
- Snowpack increase of 10 percent above 8,500 feet and decrease of 11 percent below 8,500 ft.

7. MITIGATION ACTIONS

7.1 Identification of Mitigation Actions

Key Drought Vulnerabilities	Risks	Possible Mitigation Actions
Available Water Supply	– JVWCD contract curtailment – Reliance on surface flows subject to minimum flow requirements – Local mountain streams lack holdover storage – Climate Change	– Drill additional wells and build treatment facilities to provide multiple water sources, including additional groundwater. – Improve public awareness and overall conservation through education.
Source Water Quality Degradation	– Algal by-products/blooms impacting the usability of JVWCD sources – High manganese/iron/ammonia levels in groundwater.	– Build additional water treatment facilities to remove iron and manganese in existing wells.
Increased Water Costs	– Tiered rate structure with JVWCD contract. JVWCD contract costs are approximately 50% greater than groundwater production costs	– Drill additional wells and treatment facilities to provide less reliance on JVWCD. – Educate the public about the cost of overuse of water for outdoor use. Develop guidance for how much water is required for outdoor use based on acreage.
Inability to Utilize Available Supply due to Aging Infrastructure	– Reduced production of wells and aging pumps and/or mechanical failure of wells or treatment equipment	– Improve drought reliability through system improvements that include replacing aging pipes, pumps, generators, and other equipment. Upgrade technology for monitoring, measuring, and providing security of the delivery system.
Heavy Reliance on JVWCD	– 75 percent of District's water supply is dependent on JVWCD	– Drill and equip new wells to fully utilize the District water rights to reduce dependency and provide drought resiliency.

Table 7-1: Key Vulnerabilities, Risks, Possible Mitigation Actions

8. DROUGHT RESPONSE ACTIONS AND LEVELS

Response actions have been developed within the District's Drought Mitigation Plan, which was begun in 2021. These response actions are triggered by JVWCD's associated drought levels used in times of drought, and the District has used them as a guide to their response actions and to mitigate the resulting impacts. These actions will be monitored, evaluated, and adjusted based on their effectiveness in reducing usage targets.

Level 0 – Normal Water Supply

At this level, no additional water conservation actions are required. The District has adopted a tiered water rate system that encourages conservation through water pricing, including higher pricing for outdoor use in Tiers III and IV.

The District will continue its other conservation programs, including:

- Assisting with public education and outreach, including promulgating the Utah Outdoor Weekly Watering Guide.
- Continuing to remove turf areas from District property.

- Encouraging no outdoor watering during the middle of the day, using drought-tolerant plants and grasses, and using low water-use fixtures.
- Reaching out to customers whose water use trends indicate they may have a water leak.
- Looking for and repairing leaks in the distribution system by utilizing third-party contractors.
- Purchasing leak detection equipment for District maintenance crews.

Level 0 is always in effect unless the District's Board of Trustees adopts a higher level.

Level 1 – Voluntary Water Conservation

At Level 1, the District will contact customers to request a voluntary reduction in water use. This drought action level aims to draw attention to the reduced water supply and for customers to use this resource wisely. The District's Board of Trustees shall define the means of communication with customers at the time of adoption of the drought level. These actions may include, in addition to those found in Level 0:

- E-mailing customers requesting voluntary water reductions.
- Mailing flyers requesting voluntary water reductions.
- Postings on social media and the District website requesting voluntary water reductions.

In addition, customers will be requested to follow the State of Utah Division of Water Resources lawn watering guide, which gives outdoor watering recommendations, including time of day of watering and length of watering.

JVWCD, if adopting a Level 1 restriction, expects to seek to voluntarily reduce the District's water contract by approximately 5 percent or approximately 1,000 AFY and in no case provide more than 120% of the contracted amount. The District's groundwater supply can provide the additional volume without additional cutbacks required if no savings are achieved. It is anticipated this drought level will lead to a minimum 5 to 10 percent decrease in water demand.

In 2021, the Governor of the State of Utah issued a drought emergency and the District’s customers responded by cutting their use. Figure 8-1 shows the reduction (in yellow) from the District’s customers compared to the blue line which represents the 5-year average. Taking into account the amount of rainfall and climate of 2021 versus the 5 previous years, it is likely District customers reduced their use by 10 to 15 percent. Based on these years of data, it seems probable that a 5 to 10 percent reduction in demand will be achievable at Level 1.

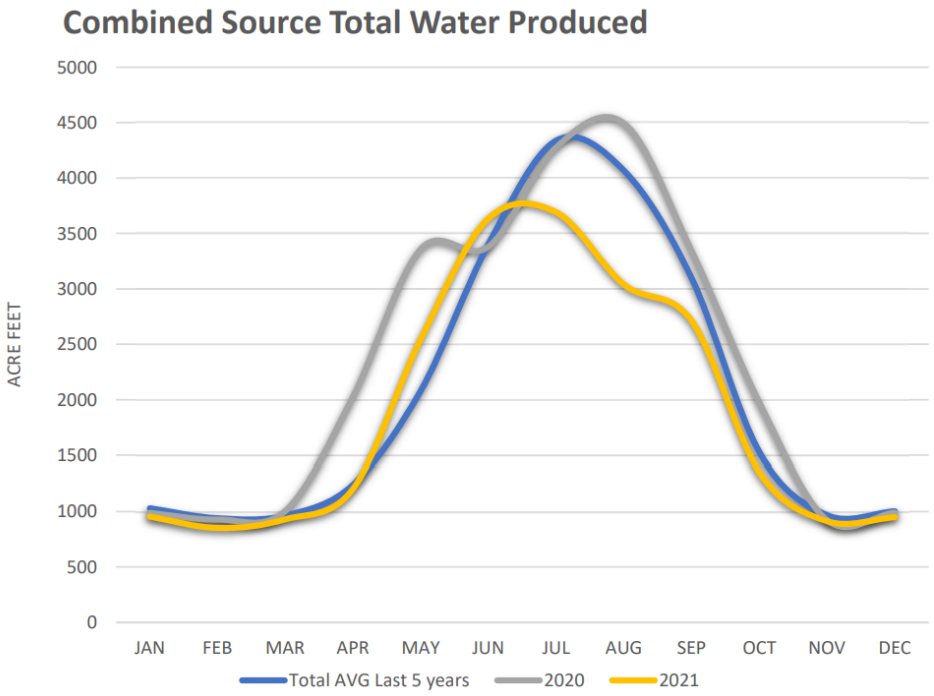


Figure 8-1: 2021 Drought Year Water Use

Level 2 – Voluntary Water Restrictions

At this level, the District will begin contacting customers to request additional voluntary reductions in water use. The purpose of this drought action level is to continue to draw attention to reduced water supplies and to attempt to reduce water use even more than Level 1. The District's Board of Trustees shall define the additional means of communication, and the actions requested to reduce water use at the time of adoption of the drought level. These actions may include, in addition to those found in Levels 0 and 1:

- Voluntary time of day, watering frequency and/or other voluntary water restrictions. This may include even/odd watering based on address or other criteria and restrictions based on the Utah Division of Water Resources lawn watering guide. Outreach for these voluntary restrictions will begin with mailers/e-mail may escalate to phone calls or home visits.
- Additional e-mails, flyers, social media, and website postings requesting further water use reductions, including voluntary restrictions as defined above.

There are no penalties associated with these voluntary water restrictions.

JVWCD, if adopting a Level 2 restriction, expects to seek to voluntarily reduce the District's water contract by approximately 10 percent or approximately 2,000 AFY and in no case provide more than 110% of the contracted amount. The District's groundwater supply can provide the additional volume without additional cutbacks required even if no savings are achieved. It is anticipated this drought level will lead to a 10 to 15 percent decrease in water demand.

Level 3 – Mandatory Water Restrictions

This level may include directives imposed by the District's Board of Trustees which may limit the manner of use of water, such as mandatory time of day and watering days per week limitations. The purpose of this drought action level is to reduce overall use by 20% throughout the year, specifically reducing outdoor water use. The District's

Board of Trustees shall define the requirements of Level 3 to reduce water use at the time of adoption of the drought level. These actions may include, in addition to the actions from Levels 0, 1, and 2:

- Mandatory time of day, watering frequency, and/or other water restrictions. This may include mandatory restrictions based on the Utah Division of Water Resources lawn watering guide or other limitations imposed by the Board of Trustees.
- Warnings and/or fines for violating the mandatory watering restrictions. Fines shall be assessed on customer water bills monthly.
    - First notice of violation – communication with customer with a reminder about restrictions.
    - Second notice of violation – communication with customer with a reminder about restrictions, and door flyer at the property.
    - Third notice of violation – communication with customer with a reminder about restrictions, door flyer at the property, site visit by customer service representative.
    - Fourth Notice and beyond – communication with customer with a reminder about restrictions, door flyer at the property, site visit by customer service representative, and/or fine.
- Temporary rate increases to the upper tier of water rates, as adopted in the 2022 water rates.
- Additional e-mails, flyers, social media, and website postings outlining the mandatory water use restrictions.

The District Board of Trustees may impose any additional limitations upon the adoption of Level 3. Notice of Level 3 Mandatory Water Restrictions shall be provided to customers by mailer, social media, and website updates.

JVWCD, if adopting a Level 3 restriction, expects to curtail the District's water contract by approximately 20 percent, or 4,000 AFY, and in any event will not supply more than the contracted amount. The District's groundwater supply can provide an additional 4,000 AFY, but it is anticipated this drought level will lead to a 15 to 20 percent reduction in water demand, so no water shortage is predicted.

Level 4 – Emergency Water Restrictions

This level may include directives imposed by the District's Board of Trustees which may limit the manner of use of water, such as mandatory time of day and watering days per week limitations, and temporary reductions in size of the top one or two water tiers. The purpose of this drought action level is to reduce overall use by 20% throughout the year, specifically targeting outdoor water use. The District's Board of Trustees shall define the requirements of Level 4 to reduce water use at the time of adoption of the drought level. These actions may include, in addition to those from Levels 0, 1, 2, and 3:

- Extreme restrictions and/or bans on outdoor watering of turf areas at private residential properties.
- Extreme restrictions on outdoor watering of turf areas at commercial, industrial and institutional properties.
- Warnings and/or fines for violating the emergency watering restrictions. Fines shall be assessed on customer water bills monthly.
    - First notice of violation – communication with customer with a reminder about restrictions.
    - Second notice of violation – communication with customer with a reminder about restrictions, and door flyer at the property.
    - Third notice of violation – communication with customer with a reminder about restrictions, door flyer at the property, site visit by customer service representative.

- Fourth Notice and beyond – communication with customer with a reminder about restrictions, door flyer at the property, site visit by customer service representative, potential fine.

- Temporary tier size reductions, as approved in the 2022 Rates and Fees. Any other changes to rates, fees or tier sizes may occur after a public hearing process.
- Additional e-mails, flyers, social media, and website postings outline the mandatory water use restrictions.

JVWCD, if adopting a Level 4 restriction, expects to curtail the District's water contract by approximately 30%, or 6,000 acre-feet. Because the Drought Level determination from JVWCD does not arrive until May, it is possible the District's groundwater supply may not be able to provide adequate supply if one or more of the wells are offline, and if little to no conservation is achieved. If conservation of 20 to 30 percent is achieved, there may be adequate supply to meet demands.

In the following planning scenario, JVWCD declares a Drought Level 4 in May and requests a cutback of 30 percent of the contract. The District activates all its wells in May, but Well No. 17 is down for pump repairs and no parts are available until the fall. Based on flow rate limitations, the District would need approximately 13,700 AFY from JVWCD but would only be provided 12,900 AFY, given a total demand of 24,300 AFY (5-year average). A shortfall of almost 1,000 AFY would occur, necessitating mandatory water use restrictions as outlined above. In order to increase emergency supply and reduce risk due to lack of redundancy, mitigating actions were determined as outlined in Section 9.

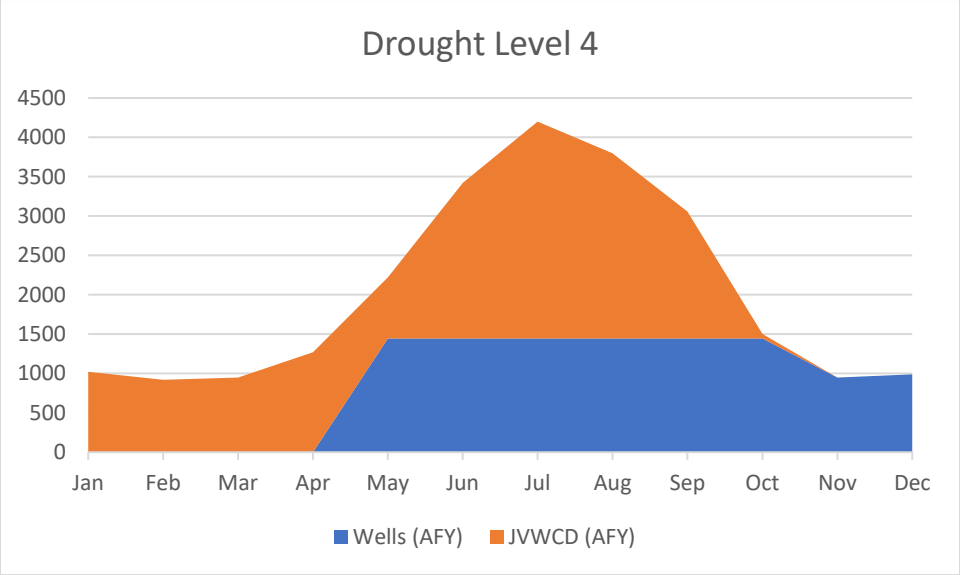


Figure 8-2: Drought Level 4 Water Supply

9. PRIORITY PROJECTS FOR DROUGHT RESILIENCY

Potential mitigation actions were evaluated based on what would best address the identified vulnerabilities. The estimated costs to complete actions were not part of the evaluation.

Prioritized Drought Mitigation Actions			
	Project Specifics	**Vulnerabilities Addressed**	**Opinion of Probable Cost**
1	**Anderson Water Treatment Plant Well No. 16 and Well No. 18:** Remove iron and manganese from an existing 3,000 GPM well No. 16 and treat New Well No. 18.	– Available Water Supply – Source Water Quality Degradation – Increased Water Costs – Heavy Reliance on JVWCD	$9,229,000.00
2	**Well No. 18:** Drill and equip a new well to utilize District water rights fully and for drought resiliency.	– Available Water Supply – Increased Water Costs – Heavy Reliance on JVWCD	$4,071,000.00
3	**Construction of new 4 MG buried concrete reservoir:** Help to meet existing and future water and fire suppression requirements.	– Available Water Supply – Increased Water Costs – Heavy Reliance on JVWCD	$6,000,000.00
4	**Well No. 15 Water Treatment Plant:** Remove iron and manganese from an existing 2,500 GPM well.	– Available Water Supply – Source Water Quality Degradation	$3,500,000.00
5	**Annual Distribution Pipeline Replacements:** Multiple-year cast iron pipe replacements, anticipating approximately $5 million yearly for ten years.	– Inability to Utilize Available Supply due to Aging Infrastructure	$5,000,000 per year
6	**Well No. 1 Replacement:** Redrill and re-equip the existing 1,000 GPM well to increase capacity to 3,000 GPM.	– Available Water Supply – Increased Water Costs – Heavy Reliance on JVWCD	$2,500,000.00

OGDEN, UTAH OFFICE
2036 LINCOLN AVENUE
SUITE 104
OGDEN, UTAH 84401
PHONE: 801.495.2224

DRAPER, UTAH OFFICE
154 E 14075 S
DRAPER, UTAH 84020
PHONE: 801.495.2224

BOISE, IDAHO OFFICE
776 E RIVERSIDE DRIVE
SUITE 250
EAGLE, IDAHO 83616
PHONE: 208.939.9561

ST. GEORGE, UTAH OFFICE
20 NORTH MAIN
SUITE 107
ST.GEORGE, UTAH 84770
PHONE: 435.656.3299

BOWEN COLLINS & ASSOCIATES

WWW.BOWENCOLLINS.COM

RESOLUTION 6-21-22.4

GRANGER-HUNTER IMPROVEMENT DISTRICT

RESOLUTION NO. 6-21-22.4

A RESOLUTION COMMITTING GRANGER-HUNTER IMPROVEMENT DISTRICT TO THE FINANCIAL AND LEGAL OBLIGATIONS ASSOCIATED WITH RECEIPT OF A FINANCIAL ASSISTANCE AWARD IN CONNECTION WITH ITS WATERSMART GRANT APPLICATION

WHEREAS, the United States Department of Interior, Bureau of Reclamation (USBR), under its WaterSMART Program, has made available to qualifying applicants grant funding for drought resiliency projects; and

WHEREAS, Granger-Hunter Improvement District (the "District"), has prepared and submitted an application for the USBR WaterSMART Drought Resiliency Projects grant program; and

WHEREAS, the District has budgeted for and intends to complete new groundwater development and treatment projects which address mitigation measures in its duly adopted Drought Contingency Plan;

NOW, THEREFORE, BE IT RESOLVED by the Board of Trustees of the District (the "Board"), as follows:

1. The District's General Manager has been delegated the legal authority to negotiate and execute, on behalf of the District, a WaterSMART Grant cooperative agreement with USBR.

2. The District's Board has reviewed and fully supports the District WaterSMART grant application submitted to USBR.

3. The District is capable of providing the amount of any funding and/or in-kind contributions specified in the District's funding plan and grant proposal.

4. The District acknowledges its obligation to work with USBR in meeting all established deadlines for entering into a grant or cooperative agreement, and agrees to work cooperatively with USBR in accomplishing said deadlines.

PASSED, ADOPTED and APPROVED this _____ day of June, 2022.

_____
Debra Armstrong, Chair, Board of Trustees

_____
District Clerk

CAPITAL PROJECT APPROVAL

20D: Kent Booster Pump Station Replacement and Tank Purchase

Capital Project: Tank Farm Booster Replacement/Tank Purchase/Energy Improvements Project
2022 Budget: $8,575,000.00

	Original Contract	Current Contract	% Contract Change	Amount Paid	% Complete
Consultant: Hansen, Allen & Luce	$334,146.23	$407,132.21	22%	$401,113.04	99%
Contractor: TBD	$0.00	$0.00	0%	$0.00	0%

Project Description: Replacement of the existing Kent Booster Pump Station at Tank Farm (4404 South 4800 West), site piping replacements, and purchase of one existing 5 MG Jordan Valley Water tank.

Project Update: The District posted an Invitation to Bid on the State of Utah's U3P website. A public bid opening was held on June 13, 2022 and two out of the seven prequalified general contractors submitted bids as follows:

Bidder	Bid Amount
Vancon, Inc.	**$17,174,996.00**
COP Construction LLC	$22,081,500.00

The low bidder, Vancon Inc., is well qualified to complete a project of this capacity. Prior to bidding, the consultant prepared a final engineer's opinion of probable construction cost which showed a construction cost estimate of $14,810,000. Vancon's bid is 16% higher than the engineer's cost estimate. Consultations with several engineering firms and contractors suggest that due to inflation, labor shortages, influx of projects, volatility of material prices, supply chain issues, fuel prices, etc., contractors have to assume a lot of risks so bids have been coming in higher than normal. It is difficult to ascertain when this trend will end. With the Infrastructure and Investment Jobs Act promising funding for transportation and utility projects, there will be billions of dollars for towns, cities, muncipalities, districts, etc. to spend on projects. If contractors get busy as a result of increased funding for projects, this could increase the occurence of non-competitive bid prices. Therefore, it is uncertain whether rebidding this project in the future will yield lower bids.

Approval Requested: Consider approval of a Construction Contract to Vancon, Inc. for the 20D: Kent Booster Pump Station Project in the amount of $17,174,996.00.

HANSEN ALLEN & LUCE inc
ENGINEERS

SALT LAKE AREA OFFICE
859 W South Jordan Pkwy, Ste 200
South Jordan, Utah 84095
Phone: (801) 566-5599
www.HALengineers.com

June 15, 2022

Mr. Victor Narteh, PE
Director of Engineering
Granger-Hunter Improvement District
2888 S 3600 W
West Valley City, UT 84119

Subject: 20D: Kent Booster Pump Station Replacement and Tank Purchase Project

Dear Victor:

On June 13, 2022, construction bids were received and opened regarding the above referenced project. Bids were received from VanCon, Inc. and COP Construction, LLC. We have completed our review of the contractors' bids. A copy of the Bid Tabulation is attached.

Due to current market conditions caused by factors such as supply chain issues, inflation, labor shortages, and fuel prices, etc. it is uncertain if prices will decrease much, if at all, in the future. These conditions also make it difficult to provide accurate Engineer's Opinions of Probable Construction Costs (OPCC) for construction projects. Prior to bidding the prepared Engineer's OPCC showed the construction cost to be $14,810,000 with a range due to uncertainty from $14,070,000 to $20,740,000.

Based on our review and depending on available funding, we recommend award of the contract to VanCon, Inc. in the amount of $17,174,996.00.

We have completed a quick Value Engineering (VE) evaluation of some options to potentially delay some items such as the chlorination system and piping in 4800 West. These VE options could potentially reduce the cost by a little under $4,000,000, but would require some re-engineering and revised pricing by VanCon, Inc.

A copy of the Notice of Award is enclosed for execution by GHID. We will also provide copies of the Agreement, Performance Bond, and Payment Bond for execution by GHID and VanCon, Inc.

Please contact me if you have any questions or need additional information.

Sincerely,

Hansen, Allen & Luce, Inc.

Michael M. Chambers, PE
Principal

ENGINEERING EXCELLENCE SINCE 1974

GHID 20D: KENT BOOSTER PUMP STATION
BID SUMMARY

BID OPENING DATE: 13-Jun-22
BID OPENING TIME: 2:00 P.M.

BASE BID SCHEDULE

Item No.	Bid Item	Unit	Estimated Quantity	COP		VANCON	
				Unit Price	Total	Unit Price	Total
1	Mobilization/Demobilization	LS	1	$ 1,873,004.00	$ 1,873,004.00	$ 1,010,000.00	$ 1,010,000.00
2	Construction Surveying	LS	1	$ 23,000.00	$ 23,000.00	$ 130,000.00	$ 130,000.00
3	Testing Agency Services	LS	1	$ 32,000.00	$ 32,000.00	$ 120,000.00	$ 120,000.00
4	Implementation of Storm Water Pollution Prevention Plan	LS	1	$ 42,000.00	$ 42,000.00	$ 22,000.00	$ 22,000.00
5	Existing Utility Investigations	LS	1	$ 145,000.00	$ 145,000.00	$ 50,000.00	$ 50,000.00
6	Pump Station Structure	LS	1	$ 3,588,800.00	$ 3,588,800.00	$ 1,720,000.00	$ 1,720,000.00
7	Pumps and Motors Complete	LS	1	$ 977,000.00	$ 977,000.00	$ 930,000.00	$ 930,000.00
8	Pump Station Piping Systems Complete	LS	1	$ 1,471,800.00	$ 1,471,800.00	$ 1,250,000.00	$ 1,250,000.00
9	HVAC Systems Complete	LS	1	$ 174,000.00	$ 174,000.00	$ 200,000.00	$ 200,000.00
10	Electrical Systems Complete	LS	1	$ 2,213,000.00	$ 2,213,000.00	$ 1,570,000.00	$ 1,570,000.00
11	Pump Station Control Panels	LS	1	$ 205,516.00	$ 205,516.00	$ 205,516.00	$ 205,516.00
12	250 kW Generator and Existing Generator Relocation	LS	1	$ 252,000.00	$ 252,000.00	$ 180,000.00	$ 180,000.00
13	Chlorination System Complete	LS	1	$ 531,000.00	$ 531,000.00	$ 530,000.00	$ 530,000.00
14	Chlorination Injection & Mixer Vault Complete	LS	1	$ 577,000.00	$ 577,000.00	$ 550,000.00	$ 550,000.00
15	Pressure Sustaining / Flow Meter Vault Complete	LS	1	$ 1,190,000.00	$ 1,190,000.00	$ 910,000.00	$ 910,000.00
16	JVWCD Check Valve Vault and Tank Interconnection Pipeline	LS	1	$ 434,000.00	$ 434,000.00	$ 410,000.00	$ 410,000.00
17	Surge Tank Vault Complete	EA	2	$ 496,000.00	$ 992,000.00	$ 430,000.00	$ 860,000.00
18	36-inch Isolation Valve Vault Complete	LS	1	$ 420,000.00	$ 420,000.00	$ 560,000.00	$ 560,000.00
19	5MG Tank Inlet/Outlet Vault Rebuild	LS	1	$269,000.00	$ 269,000.00	$ 250,000.00	$ 250,000.00
20	5MG Tank Drain/Overflow Vault Rebuild	LS	1	$59,000.00	$ 59,000.00	$ 40,000.00	$ 40,000.00
21	Canal Crossing & Restorations	LS	1	$541,000.00	$ 541,000.00	$400,000.00	$ 400,000.00
22	Tank Outlet and Zone 4 Transmission Main	LF	1203	$1,900.00	$ 2,285,700.00	$1,600.00	$ 1,924,800.00
23	Tank Fill Pipeline	LF	278	$1,200.00	$ 333,600.00	$1,100.00	$ 305,800.00
24	16-inch Zone 2 Suction Pipeline	LF	226	$1,000.00	$ 226,000.00	$ 840.00	$ 189,840.00
25	16-inch Zone 3 Discharge Pipeline	LF	368	$810.00	$ 298,080.00	$ 540.00	$ 198,720.00
26	16-inch Zone 3 Pipeline	LF	667	$870.00	$ 580,290.00	$ 760.00	$ 506,920.00
27	36-inch JVWCD Inlet Pipe	LF	373	$1,300.00	$ 484,900.00	$1,500.00	$ 559,500.00
28	16-inch Zone 2 Discharge Pipeline	LF	710	$830.00	$ 589,300.00	$650.00	$ 461,500.00
29	1MG and 2MG Tank Outlet Pipes	LF	146	$2,100.00	$ 306,600.00	$2,150.00	$ 313,900.00
30	Sanitary Sewer Pipeline	LF	704	$230.00	$ 161,920.00	$250.00	$ 176,000.00
31	2-inch Gas Dominion Allowance	LS	1	$22,000.00	$ 22,000.00	$22,000.00	$ 22,000.00
32	2-inch Gas Excavations and Restorations	LS	1	$43,000.00	$ 43,000.00	$13,000.00	$ 13,000.00
33	Tree Removals	EA	6	$2,100.00	$ 12,600.00	$1,000.00	$ 6,000.00
34	Existing Pump Station Demolition	LS	1	$44,000.00	$ 44,000.00	$40,000.00	$ 40,000.00
35	Existing Meter Vault Demolition	LS	1	$13,000.00	$ 13,000.00	$14,000.00	$ 14,000.00
36	Existing Pipeline Removals	LF	3800	$36.00	$ 136,800.00	$30.00	$ 114,000.00
37	Existing Pipeline Abandonment	CF	1600	$28.00	$ 44,800.00	$20.00	$ 32,000.00
38	Stone Mulch Removal and Placement	LS	1	$16,000.00	$ 16,000.00	$20,000.00	$ 20,000.00
39	Site Asphalt Removal	SY	2090	$11.00	$ 22,990.00	$7.00	$ 14,630.00
40	Site Asphalt Pavement and Drainage System	SY	2930	$54.00	$ 158,220.00	$50.00	$ 146,500.00
41	Site Access Asphalt Removal and Repaving	SY	620	$49.00	$ 30,380.00	$76.00	$ 47,120.00
42	4800 West Asphalt Restoration	SY	835	$120.00	$ 100,200.00	$150.00	$ 125,250.00
43	Building Permit Fee Allowance	LS	1	$15,000.00	$ 15,000.00	$15,000.00	$ 15,000.00
44	Right-of-Way Permit Fee Allowance	LS	1	$21,000.00	$ 21,000.00	$21,000.00	$ 21,000.00
45	Landscaping	LS	1	$125,000.00	$ 125,000.00	$10,000.00	$ 10,000.00
TOTAL BASE BID				**Total**	**$22,081,500.00**	**Total**	**$17,174,996.00**

CLOSED SESSION

- STRATEGY SESSION TO DISCUSS THE PURCHASE OF REAL PROPERTY