PERRY CITY COUNCIL MEETING AGENDA
Thursday, August 14, 2025

City Council Chambers, 1950 South Highway 89 (south entrance)
To view Zoom live meeting visit:
http://www.perrycityut.gov/whats-new.htm.htm

This is an "Electronic Meeting" Web/Teleconferencing may be used by officials to participate.

Agenda items may vary depending on length of discussion, cancellation of scheduled items, or agenda alteration. Numbers and/or times are estimates of when agenda items will be discussed. Action on public hearings will always be later in the same meeting or at a subsequent meeting. Every agenda item shall be a discussion and/or action item, unless otherwise indicated.

Approx. 7:00 PM – Regular City Council Meeting

1. **Call to Order**

2. **Procedural Issues**
   - **A.** Conflicts of Interest Declaration(s), If Any

3. **Public Hearings**
   Rules: (1) Please Speak Only Once (Maximum of 3 Minutes) per Agenda Item; **(2)** Please Speak in a Courteous and Professional Manner; **(3)** Do Not Speak to Specific Member(s) of the City Council, Staff, or Public (Please Speak to the Mayor or to the Council as a Group); **(4**) Please Present Possible Solutions for All Problems Identified; and **(5)** No Decision May Be Made During this Meeting if the Item Is Not Specifically on the Agenda (with Action on Public Hearings, if any, later in the Meeting)
   - **A.** Ordinance 25-L Impact Fee Enactment
   - **B.** Resolution 2025-14 Water Conservation Plan

4. **Action Items**
   - **A.** Resolution 2025-14 Water Conservation Plan
   - **B.** Resolution 2025-17 Interlocal Agreement for Inspection Services
   - **C.** Ordinance 25-L Amending PMC 13.05 Impact Fee Enactment

5. **Minutes & Council/Mayor Reports (Including Council Assignments)**
   No Council Action May be Taken if an Item is not specifically on the Agenda
   - **A.** Approval of Consent Items
     - July 10, 2025 City Council Meeting Minutes
   - **B.** Mayor's Report
   - **C.** Council Reports
   - **D.** Staff Comments
   - **E.** Planning Commission Report

6. **Closed Session (if needed)**
   - **A.** Discussion of the purchase, exchange, lease, or sale of real property, when public discussion would disclose the value of the property or prevent the authority from completing the transaction on the best possible terms.
   - **B.** Strategy session to discuss the character, professional competence, or physical or mental health of an individual.
   - **C.** Strategy session to discuss collective bargaining.
   - **D.** Strategy session regarding pending, or reasonably imminent litigation.
   - **E.** Strategy session to discuss the deployment of security personnel, devices, or systems.
   - **F.** Discussion of investigative proceedings regarding allegations of criminal misconduct.

7. **Approx. 8:30 PM - Adjournment**

Certificate of Posting

The undersigned duly appointed official hereby certifies that a copy of the foregoing agenda was sent to each member of the City Council and was posted in three locations: Perry City Hall; Centennial Park, Perry City Park; and was emailed to the Ogden Standard-Examiner, Box Elder News Journal; and posted on the State Public Meeting Notice Website on this 8th day of August, 2025. Any individual requiring auxiliary services should contact the City Offices at least 3 days in advance (435-723-6461).

_____

Shanna S. Johnson, City Recorder

PERRY CITY
ORDINANCE NO. 25-L

IMPACT FEE ENACTMENT

AN ORDINANCE OF PERRY CITY, UTAH, AMENDING CHAPTER 13.05 OF THE PERRY CITY MUNICIPAL CODE AS THE "IMPACT FEE ENACTMENT" AS PROVIDED HEREIN; ADOPTING THE IFFP, CFP AND IFA PREPARED BY THIRD PARTIES; PROVIDE FOR THE CALCULATION AND COLLECTION OF CULINARY WATER IMPACT FEES; AND PROVIDE FOR APPEAL, ACCOUNTING, AND SEVERABILITY.

WHEREAS, Perry City (hereinafter "City") is a municipal corporation duly organized and existing under the laws of the State of Utah;

WHEREAS, Title 11, Chapter 36a of the *Utah Code Annotated* authorizes municipalities in the State of Utah to adopt an impact fee enactment;

WHEREAS, in accordance state law, the appropriate notices have been given;

WHEREAS, the City retained a qualified engineer to prepare or update the required Impact Fee Facilities Plan and retained an independent consultant to prepare or update the required Impact Fee Analysis on the impact fees imposed;

WHEREAS, the City desires to impose its impact fees in compliance with state law;

WHEREAS, the City Council held its public hearing on August 14, 2025, on this Impact Fee Enactment;

WHEREAS, the Council deems it to be in the best interest of the health, safety, and welfare of the community to enact impact fees;

NOW, THEREFORE, be it Ordained by City Council of Perry City, Utah, as follows:

Section 1: Amendment. Chapter 13.05 is hereby adopted to read as follows:

Chapter 15.05
IMPACT FEE ENACTMENT

13.05.010. Findings, authority, and purpose.

The City Council finds that growth and development activity in Perry City will create additional demand and need for public infrastructure facilities in the City, and City Council finds that persons responsible for growth and development activity should pay a proportionate share of the cost of such planned facilities needed to serve the growth and development activity. The City Council further finds that impact fees are necessary to achieve an equitable allocation to the costs borne in the past and to be borne in the future, in comparison to the benefits already received and yet to be received. Therefore, in accordance with Title 11, Chapter 36a, of the *Utah Code Annotated*, the City Council adopts this Chapter and enacts the impact fees as provided herein, except those impact fees already adopted shall remain in full force and effect and are continued to be administered under this Chapter. The provisions of this Chapter shall be liberally construed in order to carry out the purposes of the impact fee program.

13.05.020. Definitions.

In addition to the definition provided in *Utah Code Annotated* §11-36a-102, 1953, as amended, the following definitions apply to this chapter:

1. "Administrator" means the City Administrator of Perry City, Utah, or his designee.
2. "Building permit" means any permit required for new construction and additions pursuant to state law and the municipal code.
3. "City" means the municipality of Perry City, Utah.
4. "Unit of measure" means that basic gauging unit which can be quantified for measuring impact of development on the public facilities in question, and provides a fair and equitable method of assessing the demands for expanded public facilities, or the inflow/outflow of people, products, or waste, depending on the particular type of public facility; and may include, but shall not be limited to, the following measuring methods: Plumbing fixture units, gallons per day, size of water meter or pipeline, or number of Equivalent Residential Units (ERUs).

13.05.030. Pre-existing impact fees unaffected.

Any impact fee imposed that predates this enactment is not repealed and shall continue in full force and effect and shall be applied by the City Administrator accordingly under this Chapter.

13.05.040. Adoption of Impact Fee Facilities Plan.

Any prior IFFP not superseded by the IFFP adopted in this Section shall continue.

~~1.~~ Parks. The Parks Impact Fee Facilities Plan (IFFP) prepared by Lewis Robertson Birmingham dated April 2023~~, and the Water IFFP prepared by Lewis Robertson Birmingham dated February 2024, are~~ is hereby adopted and incorporated herein by this reference. ~~Any prior IFFP not superceded by the IFFP adopted in this section shall continue.~~

2. Culinary Water. The Culinary Water Capital Facilities Plan (CFP) prepared by Jones & Associated Consulting Engineers dated June, 2025, is hereby adopted and incorporated herein by this reference. Also, the Culinary Water Impact Fee Facilities Plan (IFFP) prepared by LRB Public Finance Advisors dated July 2025, is hereby adopted and incorporated herein by this reference.

13.05.050. Adoption of Impact Fee Analysis.

Any prior IFA not superseded by the IFA adopted in this Section shall continue. The following Impact Fees Analysis (IFA) ~~also constitute the "reasonable plan"~~ required by state law and are hereby adopted and incorporated by reference with the impact fee rates as specified in each IFA:

1. Parks. The Parks IFA prepared by Lewis Robertson Birmingham dated April 2023~~, and the Water IFA prepared by Lewis Robertson Birmingham dated February 2024 are~~ is hereby adopted and incorporated herein by this reference.
2. Culinary Water. The Culinary Water Impact Fee Analysis (IFA) prepared by LRB Public Finance Advisors dated July 2025, is hereby adopted and incorporated herein by this reference.

~~3. Any prior IFA not superceded by the IFA adopted in this section shall continue.~~

13.05.060. Impact fee enactment and calculations.

The City Administrator shall implement this Chapter. The impact fees adopted herein are hereby enacted as a condition of the issuance of a building permit by the City or for any development activity which creates additional demand and need for public facilities. This Chapter serves as the impact fee enactment required by *Utah Code Annotated* §11-36a-401, 1953, as amended. In accordance with *Utah Code Annotated* §11-36a-401(1)(b), 1953, as amended, impact fees enacted by this Chapter are hereby specified in the City's Fee Schedule and may not exceed the highest fee justified by the IFA.

13.05.070. Service area.

In accordance with *Utah Code Annotated* §11-36a-402, 1953, as amended, the service area for all impact fees provided in this Chapter constitutes the city limits of Perry City, Utah, and also includes any applicable overlay designated in the City's General Plan, and includes any area outside of the city limits serviced in any way by the City for the impact fee being imposed.

13.05.080. Adjustment of impact fee.

The City Administrator may adjust impact fees enacted by this Chapter as allowed by *Utah Code Annotated* §11-36a-402, 1953, as amended, as provided by statute or fairness. If an applicant is not satisfied with the decision under this section, an appeal may be made as set forth in this Chapter. Adjustments may be granted to adjust the calculation of the amount of the fee based upon:

1. Studies and Data. Studies and data submitted by an applicant as approved by the City Administrator in order to ensure that the impact fee represents the proportionate share of the costs of providing such public facilities which are reasonably related to and necessary in order to provide the services in question to anticipated future growth and development activities.
2. Credits. Credits against impact fees for dedication of land for, improvements to or new construction of, any system improvements provided by that developer that relate to the reasonable plan and required as a condition of development. No credits shall be given for project improvements that service only the development.
3. Information. The City Administrator shall have the authority to make such adjustments based upon creditable information submitted by an applicant, recommendation from the City Engineer, or as provided by law.

13.05.090. Administrative challenges and appeals.

4. Challenges. Any challenge to this Chapter shall be in accordance with *Utah Code Annotated* §11-36a-701, 1953, as amended.
5. Time limitations. The time limitations for challenging any impact fee is set forth in *Utah Code Annotated* §11-36a-702, 1953 as amended.
6. Administrative Appeal Procedure. In accordance with *Utah Code Annotated* § 11-36-703, 1953, as amended, the appeal procedure for challenging an impact fees is as follows:
    a. Any person subject to an impact fee may challenge the impact fee imposed by filing a written request for information as provided in this section.
    b. After receiving a copy of the written analysis if such person still believes an impact fee does not meet the requirements of the law, the person ~~they~~ may file a written notice of challenge. A notice of challenge shall state:
        i. The name and contact information of appellant.
        ii. The legal basis for appellant's challenge of the impact fee.

c. All appeals shall be conducted according to the general administrative appeal procedures in the municipal code.
d. The City may adjust the impact fee in the course of the appeal proceeding to either:
   i. Respond to unusual circumstances.
   ii. Ensure that impact fees are fairly imposed.
e. Within thirty (30) calendar days ~~time~~ of the filing of the notice of challenge provided in this part, a decision shall be rendered by the City.

13.05.100. Accounting, expenditure, and refund.

7. Accounting. All impact fees collected by the municipality shall be accounted in accordance with *Utah Code Annotated* §11-36a-601, 1953, as amended.
8. Expenditure. All impact fees expended by the municipality shall be in accordance with *Utah Code Annotated* §11-36a-602, 1953, as amended.
9. Refund. Any refund of impact fees by the municipality shall proceed according to *Utah Code Annotated* §11-36a-603, 1953, as amended.

13.05.110. Severability.

If any section, paragraph, sentence, clause or phrase of this chapter is declared invalid by a court of competent jurisdiction, the remainder shall not be affected thereby and shall remain in full force and effect.

Section 2: Effective Date. This Ordinance is effective ninety (90) days from the date of posting.

PASSED AND ADOPTED by the City Council on this ____ day of _____, 2025.

_____
Mayor

ATTEST:

_____
City Recorder

RECORDED this ___ day of _____, 2025.
PUBLISHED OR POSTED this ___ day of _____, 2025.

CERTIFICATE OF PASSAGE AND PUBLICATION OR POSTING

In accordance with Utah Code Annotated §10-3-713, 1953 as amended, I, the City Recorder, hereby certify that foregoing Ordinance was duly passed and published or posted as provided in State Law.

_____ DATE:_____
City Recorder

LRB PUBLIC FINANCE ADVISORS

PERRY CITY, UTAH

JULY 2025

IMPACT FEE FACILITIES PLAN (IFFP) & IMPACT FEE ANALYSIS (IFA)

CULINARY WATER **AMENDMENT**

PREPARED BY:

LRB PUBLIC FINANCE ADVISORS

FORMERLY LEWIS YOUNG ROBERTSON & BURNINGHAM INC.

TABLE OF CONTENTS

IMPACT FEE CERTIFICATION

IFFP AMENDMENT CERTIFICATION

LRB Public Finance Advisors (formerly Lewis Young Robertson & Burningham, Inc.) and Perry City jointly certify that the Impact Fee Facilities Plan (IFFP) amendment prepared for culinary water:

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;
    c. an expense for overhead, unless the expense is calculated pursuant to a methodology that is consistent with generally accepted cost accounting practices and the methodological standards set forth by the federal Office of Management and Budget for federal grant reimbursement; and
3. complies in every relevant respect with the Impact Fees Act.

LRB PUBLIC FINANCE ADVISORS & WEST VALLEY CITY

IFA AMENDMENT CERTIFICATION

LRB Public Finance Advisors certifies that the Impact Fee Analysis (IFA) amendment prepared for culinary water:

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;
    c. an expense for overhead, unless the expense is calculated pursuant to a methodology that is consistent with generally accepted cost accounting practices and the methodological standards set forth by the federal Office of Management and Budget for federal grant reimbursement;
    d. offsets costs with grants or other alternate sources of payment; and
3. complies in every relevant respect with the Impact Fees Act.

LRB Public Finance Advisors makes this certification with the following caveats:

1. All the recommendations for implementation of the IFFP made in the IFFP documents or in the IFA documents are followed by City Staff and elected officials.
2. If all or a portion of the IFFP or IFA is modified or amended, this certification is no longer valid.
3. All information provided to LRB is assumed to be correct, complete, and accurate. This includes information provided by the City as well as outside sources.

LRB PUBLIC FINANCE ADVISORS

SECTION 1: CULINARY WATER AMENDMENT

SUMMARY

The Perry City culinary water Impact Fee Facilities Plan (IFFP) and Impact Fee Analysis (IFA), dated February 2024, is being amended to account for changes to capital improvements and estimated future facility costs, based on updated capital plans and revised cost estimates.

EXPLANATION

The City reviewed the capital cost assumptions included in the 2024 IFFP and IFA. This plan reevaluated future facility costs, prioritization, and timing based on current market conditions. As a result, IFFP and IFA **Table 5.4** is amended to reflect these changes.

AMENDED TABLE 5.4: FUTURE DISTRIBUTION FACILITIES

#	YEAR	PROJECT DESCRIPTION	TOTAL COST	CONST. YEAR COST	IMPACT FEE ELIGIBLE	TOTAL IMPACT FEE COST	% TO IFFP DEMAND	COST TO IFA
1	2024	Replace 2" Crossing Pipe with 6" PRV	$201,292	$211,357	75%	$158,517	70%	$110,962
2	2024	Replace 2" Crossing Pipe with 6" PRV	$198,156	$208,064	75%	$156,047	80%	$124,837
2a1	2026	Southern Water Reservoir Overflow Drainage Basin	$186,358	$195,675	100%	$215,732	100%	$195,675
2b1	2026	Replace 2" Waterline with 8" – 1700 South	$595,446	$625,218	100%	$689,303	100%	$625,218
2c1	2026	8" Waterline – 1200 South to 1425 South (Mace Street)	$486,980	$511,329	100%	$563,740	100%	$511,329
3	2026	10" Water Main on 3000 South	$447,374	$517,891	50%	$258,946	100%	$258,946
5	2030	8" Water Main on 2700 S	$389,903	$548,632	0%	$0	100%	$0
7	2026	16" Water Main on 3200 S	$351,130	$406,477	100%	$406,477	60%	$243,886
9	2027	12" Water Main	$852,878	$1,036,679	100%	$1,036,679	80%	$829,343
10	2028	8" Water Main on 2700 South	$705,315	$900,181	0%	$0	100%	$0
11	2030	10" Water Main HWY	$1,069,250	$1,504,542	50%	$752,271	60%	$451,363
12	2033	10" Water Main HWY 89	$1,021,898	$1,664,563	50%	$832,284	70%	$582,599
13	2033	10" Water Main on West Side HWY 89	$1,039,350	$1,692,992	36%	$609,484	60%	$365,690
TOTALS			**$7,545,328**	**$10,023,599**	**55%**	**$5,542,926**	**78%**	**$4,299,848**

Source: 2025 Perry City Culinary Water CFP, Table 6.2.2, Appendix D
The Construction Year Costs for the original project list is based on 2023 base year cost. The Construction Year Cost for the amended projects is based on 2025 base year cost.

The City amended its capital facilities plan (CFP) in June 2025. This CFP identifies the projects included in this analysis using demand modeling, planning analysis, and other engineering data. The accuracy and correctness of the IFFP and IFA is contingent upon the accuracy of the CFP data and assumptions. Any deviations or changes in the assumptions due to changes in the economy or other relevant information used by the City for this study may cause this plan to be inaccurate and may require further modifications.

AMENDED CULINARY WATER IMPACT FEE SCHEDULE

The amended culinary water impact fees proposed in this amendment will be assessed in a manner described in the 2024 IFFP and IFA. Perry City's culinary water system is not used for irrigation, as irrigation needs are presently met by Pineview Irrigation Company's secondary water system. The City's impact fee schedule includes two scenarios:

1. **Scenario 1 (Indoor Use Only):** All consumption is assumed to be indoor use only as no irrigation is provided within the City's culinary system.
2. **Scenario 2 (Indoor and Outdoor Use):** Assumes new development will have access to irrigation which will be provided within the City's culinary system.

The culinary water impact fees will be assessed within the Service Area. The tables below illustrate the amended impact fee to maintain the existing level of service, based on the assumptions within this amendment and the 2024 IFFP and IFA. The fee below represents the maximum allowable impact fee assignable to new development. The amended total fee per ERC is **$12,338** under Scenario 1 and **$23,352** under Scenario 2.

AMENDED TABLE 6.1: SCENARIO 1 — BASE IMPACT FEE PER ERC

	ORIGINAL VALUE	% TO GROWTH	COST TO GROWTH	ERCS SERVED	FEE PER ERC
BUY-IN					
Source Excess Capacity	$483,841	4%	$21,175	866	$24
Storage Excess Capacity	$1,261,352	24%	$301,333	866	$348
Distribution Excess Capacity	$3,105,231	9%	$290,090	866	$335
FUTURE FACILITIES					
Source Future Improvements	$9,597,650	60%	$5,765,255	866	$6,657
Storage Future Improvements	$3,265,660	0%	$0	866	$0
Distribution Future Improvements	$5,542,926	78%	$4,299,848	866	$4,965
OTHER					
Professional Expense	$7,500	100%	$7,500	866	$9
TOTAL IMPACT FEE	**$23,264,160**		**$10,685,200**		**$12,338**

AMENDED TABLE 6.2: SCENARIO 2 — BASE IMPACT FEE PER ERC

	ORIGINAL VALUE	% TO GROWTH	COST TO GROWTH	ERCS SERVED	FEE PER ERC
BUY-IN					
Source Excess Capacity	$483,841	4%	$21,175	866	$24
Storage Excess Capacity	$1,261,352	52%	$655,903	866	$757
Distribution Excess Capacity	$3,105,231	9%	$290,090	866	$335
FUTURE FACILITIES					
Source Future Improvements	$16,880,269	82%	$13,851,081	866	$15,994
Storage Future Improvements	$3,265,660	34%	$1,098,416	866	$1,268
Distribution Future Improvements	$5,542,926	78%	$4,299,848	866	$4,965
OTHER					
Professional Expense	$7,500	100%	$7,500	866	$9
TOTAL IMPACT FEE	**$30,546,779**		**$20,224,013**		**$23,352**

NON-STANDARD CULINARY WATER IMPACT FEES

The City reserves the right under the Impact Fees Act to assess an adjusted fee that more closely matches the true impact that the land-use will have upon water facilities.[1] This adjustment could result in a higher fee if the City determines that a particular user may create a greater impact than is standard for its land use. The City may also decrease the impact fee if the developer can provide documentation, evidence, or other credible analysis that the proposed impact will be lower than what is proposed in this analysis. The formula for determining a non-standard impact fee is found below.

AMENDED FORMULA FOR NON-STANDARD WATER IMPACT FEES:
ERCs x Impact Fee per ERC ($12,338) = Indoor Only Impact Fee
ERCs x Impact Fee per ERC ($23,352) = Indoor+Outdoor Impact Fee

[1] UC 11-36a-402(1)(c)

Culinary Water
Capital Facilities Plan

June 2025

Prepared By:

JONES & ASSOCIATES
CONSULTING ENGINEERS

6080 Fashion Point Drive
South Ogden, UT 84403
801.476.9767

TABLE OF CONTENTS

TABLES

EXHIBITS

APPENDICES

ACRONYMS

ac-ft	acre-feet
AF	acre-feet
CFP	Capital Facilities Plan
cfs	cubic feet per second
DDW	Division of Drinking Water
ERC	Equivalent Residential Connection
gal	gallon
gpd	gallons per day
gpm	gallons per minute
IFA	Impact Fee Analysis
IFFP	Impact Fee Facilities Plan
LOS	Level of Service
MG	million gallons
MGD	million gallons per day
PDD	peak day demand
PID	peak instantaneous demand
psi	pounds per square inch
UAC	Utah Administrative Code
UDEQ	Utah Department of Environmental Quality
WBWCD	Weber Basin Water Conservancy District

EXECUTIVE SUMMARY

Perry City's potable water system was analyzed for source capacity, storage capacity, and distribution system adequacy. The existing system's supply and storage was found to be compliant with the Utah Administrative Code; however, the existing system's ability to meet fire flow was deficient in some areas, mostly along the East Bench foothills. The projected build-out of the City will require additional source capacity and distribution system upgrades. Storage capacity buildout is dependent on the size and type of buildings constructed. The system's elements and their current and future compliance with State Code are summarized in Table ES.1.

Table ES.1. Summary of Compliance

		Compliant with State Code	
Element	**Demand Requirement**	**Current**	**Projected Build-Out**
Source Flow Rate	Peak Day Demand	Y	Y
Source Annual Volume	Average Yearly Demand	Y	Y
Storage Capacity		Y	Depends
Distribution System		N	Y

Current compliance does not eliminate the immediate need for projects, as other factors contribute to the relevancy of the projects, such as problematic conditions (leaks, accessibility, etc.) and emergency preparedness. Advanced planning for the replacement of ageing infrastructure approaching its life expectancy is also recommended.

A full list of recommended projects is provided in Section 6 of this Plan. These projects are a summary of deficiencies and potential problems in the existing system and future deficiencies based on projected growth.

1. INTRODUCTION

1.1 Background

According to Utah History Encyclopedia (Lois, 1994), Perry was settled by American Pioneers in 1851. Most of the settlements were used for agricultural purposes, until suffering water shortages. The lack of water in the area caused many settlers to migrate out of the City, leaving much of the land abandoned. In 1902, irrigation water became readily available when the Three Mile Creek Irrigation Company began piping water from the mouth of the canyon, causing a growth in population. Soon after, the Pineview canal was completed, bringing irrigation water from Ogden to Perry, resulting in another growth in population.

Perry was officially incorporated in 1911, and the construction of the City 's culinary water system was completed to every single home soon after incorporation. Culinary water came from mountain springs and then later from wells. Today, Perry continues to maintain its own water system, while also preparing for future growth.

The City of Perry is in Box Elder County and is generally surrounded by Brigham City to the North and Willard to the South. US 89 highway and Interstate 15 are the two major transportation corridors that pass through the City. The 2020 census determined a population of 5,555 people.

This report independently analyzes and reviews the culinary water system for consumption and irrigation uses (in some areas). It identifies projects necessary to bring the current system into full compliance with regulations; update and/or repair infrastructure based on known needs and age; and plan for future growth. It also evaluates projects based on the infrastructure's condition and its importance to the overall system.

Section 7 contains the Impact Fee Facility Plan (IFFP) and identifies projects that are needed in the next five (5) to seven (7) years. The costs of these projects are then used by the City's financial consultant in preparation of the Impact Fee Analysis, which determines the impact fees.

Information for this Plan was gathered from previous reports and plans, Perry City personnel, and other sources. The most recent Culinary Water Capital Facilities Plan was adopted in 2015. Several of the projects identified in the 2015 plan have been completed or are under design and/or construction, many are still needed, and additional projects have since been identified.

1.2 Study Area

Perry City currently serves all areas within the City boundaries with culinary water. The current City boundary encompasses approximately 7.7 square miles. Land use is primarily residential with agricultural and commercial/industrial uses. The City's vision for future land use remains primarily residential; however, the City would like to increase the percentage of commercial development in the future. For the purposes of this Plan, future needs have been estimated based on Perry City's 2019 General Plan. It is understood that the service boundary and/or the proposed land use may change depending on development. These factors may require periodic adjustments to this Plan and the

recommended projects. Exhibit 2.1 Future Land use, shows the proposed future land uses from the General Plan.

1.3 Water System Overview

Currently, the City owns and maintains all the culinary water storage and distribution facilities needed to serve its customers. Perry City's water infrastructure includes pump lines, transmission lines, and distribution lines, and three (3) storage reservoirs. The City also owns and operates three (3) potable water wells and one (1) natural spring. The City's current water system is illustrated in Exhibit 2.2 Existing Water System.

In recent years, the wells & spring have provided 100% of the drinking water needed to meet current demands. The City intends to continue using and maintaining the wells and spring in the future. It is anticipated that the current demand can be met by the existing water sources. Future water demand will need to be appropriated to the City as needed.

Perry's current culinary water system is not used for irrigation. Most of the City's irrigation needs are met by the Pineview Irrigation Company's secondary water system. However, due to the request of the City , this report will investigate the impacts of irrigation use and demand on the existing and future culinary water systems by modeling future outdoor use and indoor use demands in comparison to indoor use only demands. This report will elaborate further on the feasibility and possible costs of upgrading the current system to meet irrigation demand for new development areas and maintain a high level of service for the rest of Perry City 's residential indoor use.

This Plan evaluates a worst-case scenario in which all future water users will necessitate irrigation as a demand on the water system for the projected build out of the City. As a comparison, an indoor use only scenario is also evaluated as a comparison scenario in which no irrigation demand is imposed upon the projected build out of the City. These two scenarios provide a minimum impact and maximum impact to the City 's current and future water system's infrastructure.

2. MINIMUM SIZING REQUIREMENTS, ERCs, GROWTH ESTIMATES

2.1 Minimum Sizing Requirements and the Division of Drinking Water (DDW)

In 2018, the Utah Legislature passed a bill that requires "the [DDW] director shall establish system-specific source and storage minimum sizing requirements for a community water system serving a population of more than 3,300 based on at least the most recent three years of a community water system's actual water use data submitted."[1] Submittal of data was required by March 1, 2019.

Due to the lack of data at the time it was required by the DDW, Perry City opted to enter into a Corrective Action Agreement allowing them to submit an engineering study which would be submitted in lieu of the data. The engineering study for sizing requirements is being conducted concurrently with this Capital Facilities Plan. This Plan reflects the sizing requirement recommendations that will also be submitted within the engineering study provided to the DDW. If any of the values change during the approval process of the engineering study then the recommendations provided by the DDW will then be used, and this report will be updated.

Data for monthly residential and commercial indoor use and annual source production was provided by Perry City, for the years 2019 through 2022. From the data, an average and peak monthly use per residential connection was established. Since Perry City does not currently collect daily water use data, peaking factors were researched, tested, and established to produce values for the Peak Day Demand (PDD) and Peak Hour Demand (PHD).

A summary of system component requirements and their determined demand values for Peak Day Demand (PPD), Average Day Demand (ADD), Peak Hour Demand (PHD) are provided in Table 2.1.

Table 2.1. Component Sizing Requirements (Indoor Use Only)

Component	Measurement	Requirement
Sources	• Flowrate • Volume	• 550 gpd/ERC for Peak Day Demand • 87,600 gallons/ERC (0.269 ac-ft/ERC) for Average Yearly Demand (at 240 gpd/ERC)
Storage Facilities	• Volume	• 87,600 gallons/ERC
Distribution System	• Pressure	• 20 psi during conditions of fire flow and fire demand experienced during peak day demand. • 30 psi during peak hour demand • 40 psi during peak day demand

[1] From Utah Code 19-4-114

Additionally, due to the rising demand of irrigation connection requests by proposed developments, Perry City has also opted to evaluate additional system requirements needed to allow for future irrigation connections within the City. An irrigation demand per residential connection was established by taking a sample of an existing developed quarter acre lot subdivision and determining area quantities for landscape. These quantities were then multiplied by a predetermined amount of 3.1 acre-ft per acre volume over a six-month period to produce an outdoor use flow rate and volume per residential connection. Only future users were considered for the tabulation of source and storage required as existing connections will not have a separate irrigation connection. Table 2.1.2 illustrates the values used during this study period to consider source/storage requirements.

*Table 2.1.2. Component Sizing Requirements (Indoor/Outdoor Use) **

Component	Measurement	Requirement
Sources	• Flowrate • Volume	• 1415 gpd/ERC for Peak Day Demand • 403,325 gallons /ERC (1.26 ac-ft/ERC) for Average Yearly Demand
Storage Facilities	• Volume	• 403,325 gallons / Future ERC • Not including current residents
Distribution System	• Pressure	• 20 psi during conditions of fire flow and fire demand experienced during peak day demand. • 30 psi during peak hour demand • 40 psi during peak day demand

**Note: 3.1 acre-ft per acre over a 6-month period is the value determined by local irrigation companies as the average use per acre flow rate among their users.*

In summary, this Capital Facilities Plan will evaluate the current and future needs of the culinary water system in two scenarios. The first scenario, in which all consumption will be indoor use only, and the second, where consumption will comprise of indoor use all year long and outdoor use for 6 months out of the year. The values in table 3.1 and table 3.1.2 will be used to compare the two scenarios. The goal of this comparison is to differentiate the individual infrastructure needs of each scenario and determine what infrastructural needs would need to be constructed in either.

2.2 Equivalent Residential Connections (ERCs)

Water use varies from connection to connection throughout a water system. To avoid the complexity of analyzing each connection, a simple basic unit of water use can be defined for the purposes of comparison. This basic unit is called an Equivalent Residential Connection or ERC. An ERC quantifies the typical daily water needed for one single family residential connection within the system, the most common type of connection in the City, and is then applied to non-residential users based on water usage. This unit is needed to compare non-residential users and evaluate the system with one single equalizing unit of measure.

"Equivalent Residential Connection (ERC) is a term used to evaluate service connections to consumers other than the typical residential domicile. Public water system management is expected to review annual metered drinking water volumes delivered to non-residential connections and estimate the equivalent number of residential connections that these represent based upon the average of annual metered drinking water volumes delivered to true single family residential connections. This information is utilized in [the] evaluation of the system's source and storage capacities (refer to R309-510)." Utah Administrative Code R309-110-4

2.3 Sizing Demand Requirements

The system-specific minimum sizing requirements for indoor use is an average flow rate of 240 gpd per ERC, which quantifies one ERC to be equal 240 gpd. Since irrigation use data is currently not available, an estimate of 3.1 acre-ft per irrigated acre for six-months was used on a sample City block from quarter acre lots in Perry (See Exhibit 2.3 – Landscape Area). The landscape area from this sample was then tabulated and multiplied by this flow rate. Next, the total block flow rate was divided by the number of quarter acre lots, the flow/ERC was determined to be approximately 865 gpd. The outdoor use system-specific minimum sizing requirement is the sum of the average day indoor and average day outdoor use for six months of the year, which is 865 gpd (outdoor) plus 240 gpd (indoor use), for a total of 1105 gpd, the other six months of the year maintain a flow rate of 240 gpd.

However, due to Utah's climate, outdoor use is most prevalent in the spring/summer season ranging from April to September and should be evaluated during this timeframe. Indoor use follows a similar peak pattern to outdoor use in summer months. An evaluation of the sum of the peak day demand for indoor use and the average day demand outdoor use is more reflective of a high-water use day than the average day scenario (flow = 1425 gpd).

This study considers the sum of the peak day indoor use and the average day outdoor use as a factor for the system's source requirements sizing. Storage requirements are based upon the average day scenario of 1105 gpd since this number more accurately reflects the amount of water needed in both peak and non-peak scenarios annually.

2.4 Summary of Perry City ERC (2023)

As part of this Capital Facilities Plan, an evaluation of Perry City's annual culinary use for the entire city was evaluated to determine total ERC for the years of 2019 through 2022. The average values for monthly and annual use were calculated and a tally of the total number of physical single family residential connections was recorded. The single-family average was then used as the dividing factor for the non-residential ERC connections conversion for each year. Non-single-family ERC was found by dividing each non-single-family connection usage by the single-family average use value for each respective year. The amount of ERC for single family residences and non-single-family residences is shown in Table 2.4.

Table 2.4. Annual Average ERCs

Year	Single Family Residences	ERCs for Non-Single-Family Residences	Total ERCs
2019	1,132	92	1,224
2020	1,276	153	1,429
2021	1,364	171	1,535
2022	1,432	308	1,740

As a result of this evaluation, it was determined that, even though there were only 1,464 physical connections (residential and non-residential) to the system in 2022, the City provided water in a quantity equivalent to 1,740 single family dwellings.

2.5 Consumption vs. Production

Various factors within a water system drive the water production to be higher than consumption. In Perry, production includes water pumped from the wells and springs. Consumption, or metered water delivered to the consumer, can be significantly less than what is produced. Factors that cause this difference include non-metered connections or uses, inaccurate or old customer meters, water main breaks, leaks, reservoir overflows, firefighting activities, and water line flushing. These items are typically referred to as system losses.

$$Production = Consumption + Losses$$

Table 2.5 below compares consumption per ERC versus production per ERC.

Table 2.5. Consumption versus Production per ERC

Year	Production Per ERC (gpd)	Consumption Per ERC (gpd)	Losses Per ERC (gpd)
2019	523	443	80
2020	448	337	111
2021	417	277	139
2022	361	223	139
Average	**438**	**320**	**118**

2.6 Growth Estimates

2.6.1 Population Projections

Historical population data was gathered from official US Census Bureau data. The last 70 years of census data and the average yearly growth rate are shown in Table 2.6.1a.

Table 2.6.1a. Historic Population Data and Growth Rate

Year	Census	Average Growth Rate per Year
1960	587	30.7%
1970	909	54.9%
1980	1,084	19.3%
1990	1,211	11.7%
2000	2,383	96.8%
2010	4,512	89.3%
2020	5,555	23.1%

One way to project the population is by plotting the historic population and mathematically estimating a curve to best fit the data. The following figure displays the findings:

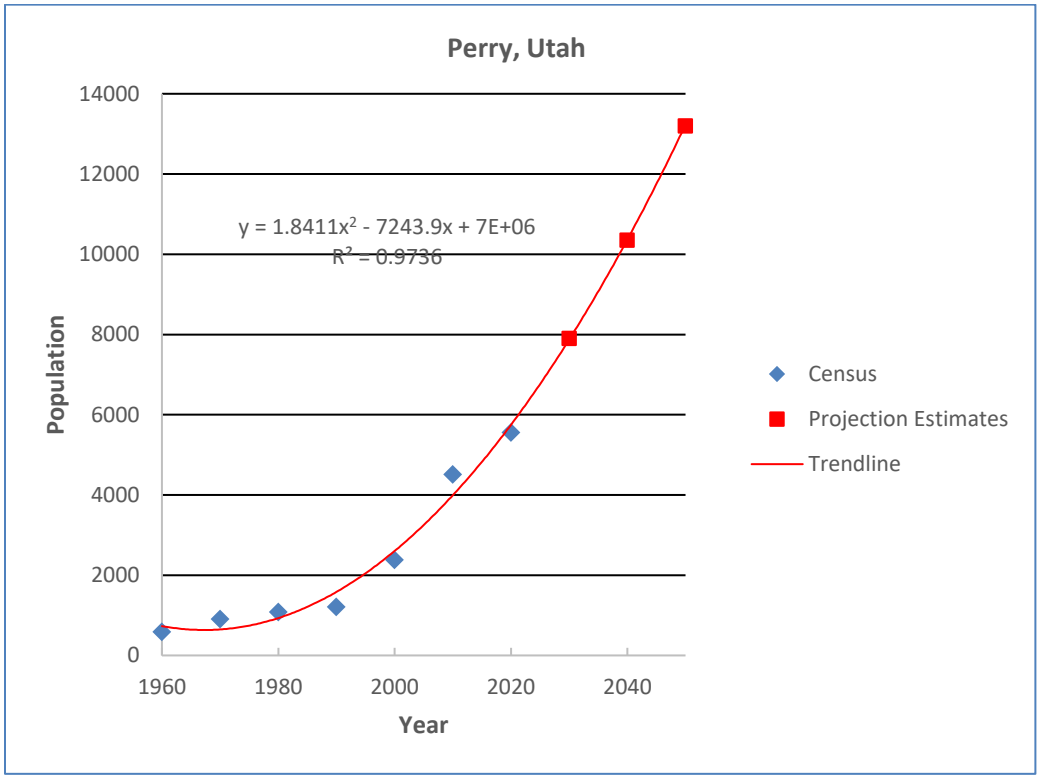


Figure 1. Historic and Projected Population

The regression equation for the growth trendline is shown in the figure. The R^2 value, shown below the equation, represents how well the trendline fits the data, with an R^2 value of 1.0 being a perfect fit. The trendline was found to be extremely accurate with an R^2 value of 0.974. Using the regression equation, the following projected populations were calculated. The projected growth rate is also shown in Table 2.6.1b.

Table 2.6.1b. Population Projections

Year	Projected Population	Growth Rate
2030	7,900	42.2%
2040	10,350	31.0%
2050	13,200	27.5%

2.6.2 ERC Projections and Build-Out

Starting with population and ERCs from 2020 and applying the population growth described above, projected residential and non-residential ERCs, and the projected total ERCs can be estimated.

Perry City served 1,740 residential ERCs in 2022. Based on the projected growth, the City will add approximately 7,500 residential ERCs by 2093.

$$Residential\ Build\text{-}out = 1740\ existing\ ERCs + 7500\ future\ ERCs = 9270\ total\ residential\ ERCs$$

Non-residential water varies greatly and can be difficult to estimate; therefore, assumptions were made to estimate the ERC values in these areas. Using the Projected Land Use Map, projected ERCs have been assigned to the developable land in the City. All the expected future ERCs are shown in Exhibit 3.1 Projected ERC.

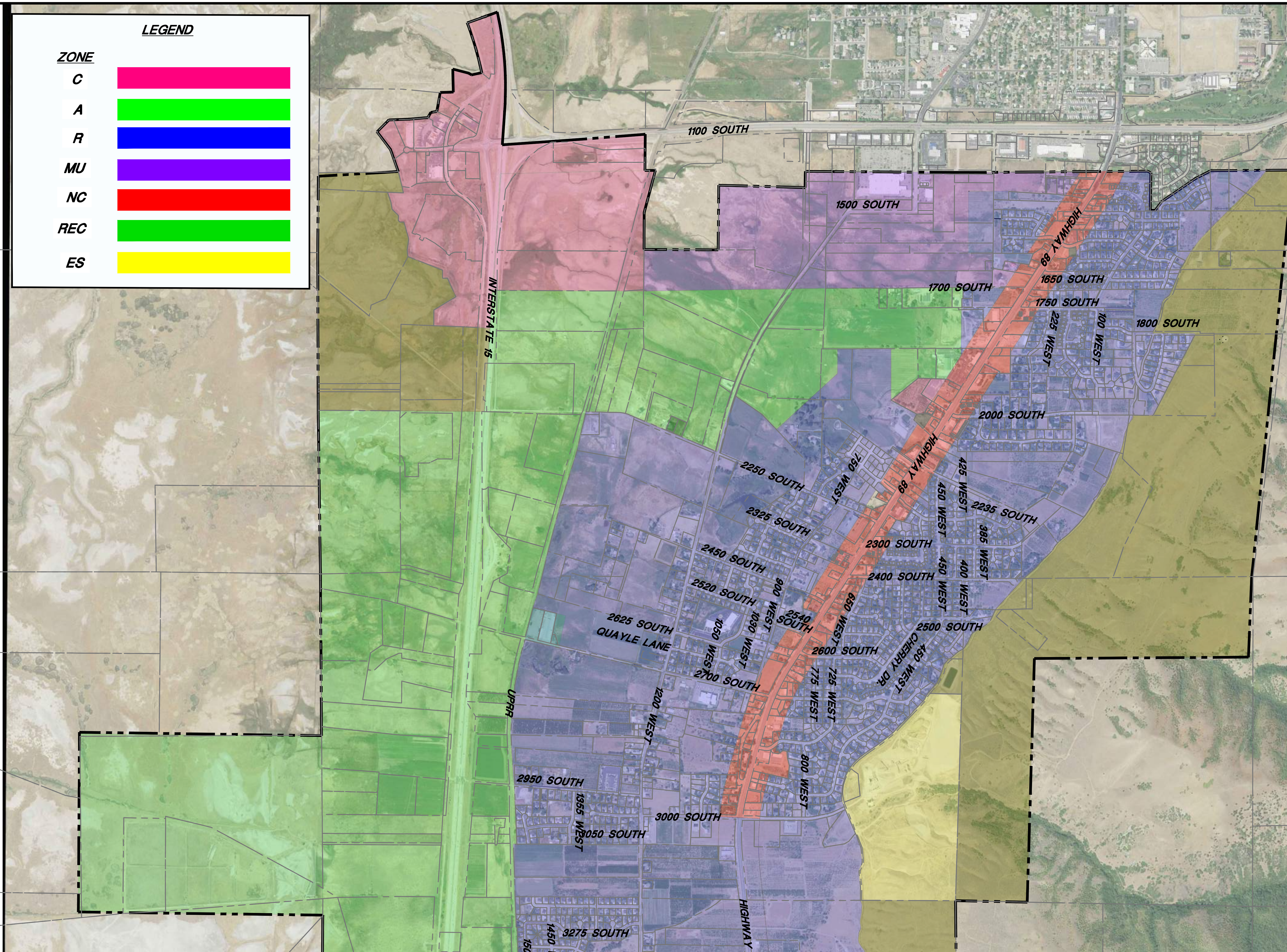
A summary of these projections is shown in Table 2.6.2.

Table 2.6.2. Population and ERC Projections

Year	Population Projection	Annual Growth Rate	Projected Total ERCs
2020*	5,555*	-	1,740*
2030	7,900	42.2%	2,469
2040	10,350	31.0%	3,234
2050	13,200	27.5%	4,125
2060	16,400	24.2%	5,125
2070	20,100	22.6%	6,281
2080	24,150	20.1%	7,547
2093 (Build Out)	**29,680**	**22.9%**	**9,275**

**Actual data*

Based on the projections, the City will reach its "build-out" condition around 2093, meaning that no more land is available for development. (This does not take into consideration higher density redevelopment.) **Total build-out of 9,270 ERCs is estimated in 2093**, as commercial growth can be quite slow. Due to changes in the economy, land use, and growth rate, it is recommended that this Plan be reviewed and updated every five (5) to seven (7) years.



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PERRY CITY CORPORATION
2023 CULINARY WATER CFP

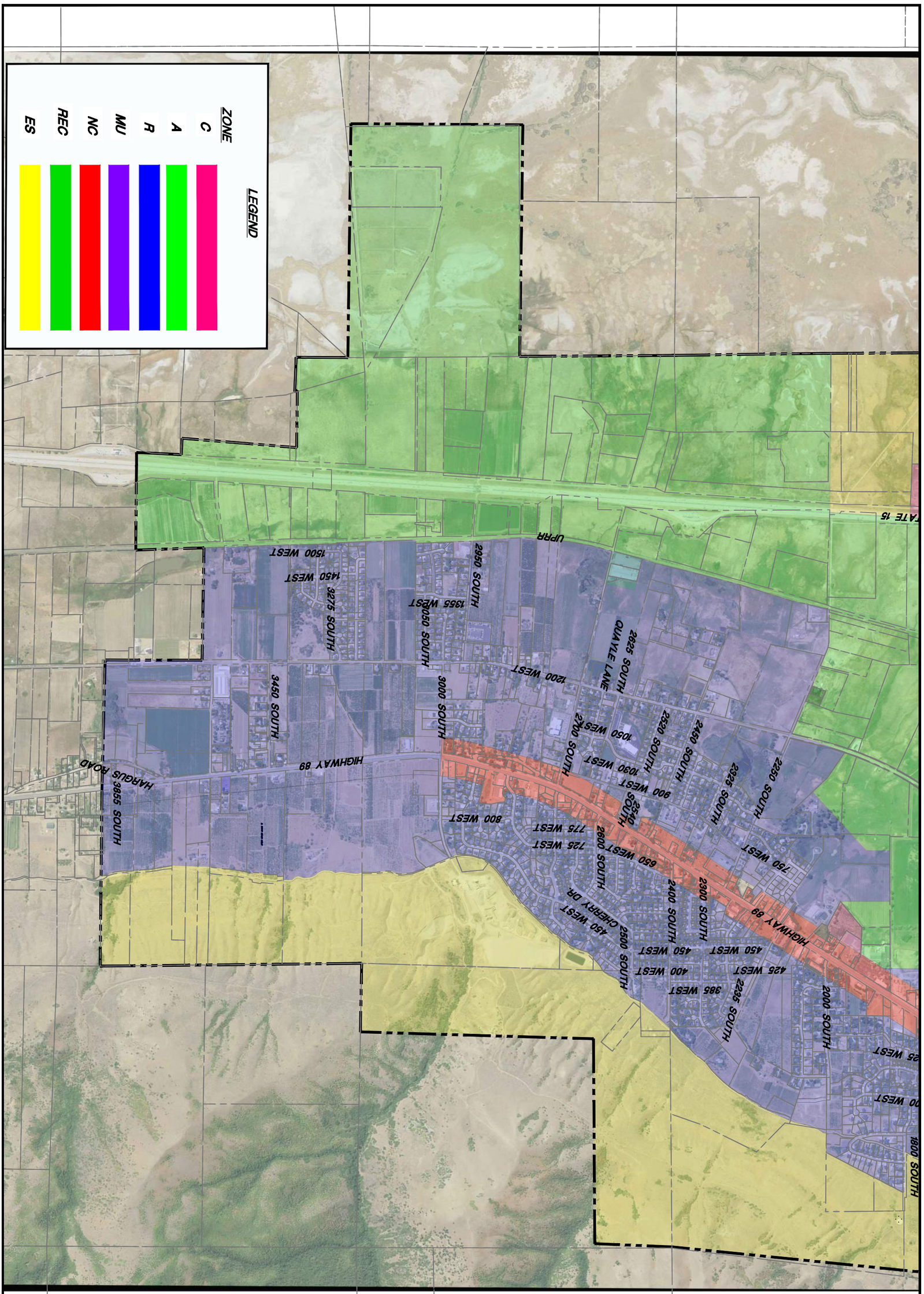
EXHIBIT 2.1
FUTURE LAND USE

REV.	DATE	APPR.

AMO DESIGNED
AMO DRAWN
BKJ CHECKED

SCALE: 22"x34" H:1"=50'
11"x17" H:1"=100

SHEET: 2.1
OF 1 SHEETS



SHEET: 2.1 OF 1 SHEETS	SCALE: 22"x34" H:1"=50' 11"x17" H:1"=100	AMO DESIGNED				PERRY CITY CORPORATION	JONES & ASSOCIATES CONSULTING ENGINEERS
		AMO DRAWN				2023 CULINARY WATER CFP	6080 Fashion Point Drive South Ogden, Utah 84403
		BKJ CHECKED				EXHIBIT 2.1 FUTURE LAND USE	(801) 476-9767 www.jonescivil.com
			REV.	DATE	APPR.		

LEGEND

- 4 INCH
- 6 INCH
- 8 INCH
- 10 INCH+
- SOURCE (WELL/SPRING)
- RESERVOIR
- PRESSURE RELEASE VALVE
- PRESSURE ZONE 3
- PRESSURE ZONE 2
- PRESSURE ZONE 1

NORTH WATER RESERVOIR

WELL #4

WELL # 1

STOKES SPRINGS

TWO SOUTHERN RESIVOIRS

WELL # 2

WELL # 3

1100 SOUTH
1500 SOUTH
1650 SOUTH
1750 SOUTH
1900 SOUTH
2000 SOUTH
2295 SOUTH
2400 SOUTH
2500 SOUTH
2540 SOUTH
2600 SOUTH
2625 SOUTH
2700 SOUTH
2850 SOUTH
2925 SOUTH
2950 SOUTH
3000 SOUTH
3050 SOUTH
3275 SOUTH
3450 SOUTH
QUAYLE LANE
INTERSTATE 15
HIGHWAY 89
HIGHWAY 89A
UPRR
200 WEST
225 WEST
300 WEST
350 WEST
400 WEST
450 WEST
500 WEST
600 WEST
700 WEST
725 WEST
750 WEST
800 WEST
900 WEST
950 WEST
1000 WEST
1440 WEST
CHERRY DR.

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PERRY CITY CORPORATION

2023 CULINARY WATER CFP

EXISTING WATER SYSTEM
EXHIBIT 2.2

REV.	DATE	APPR.

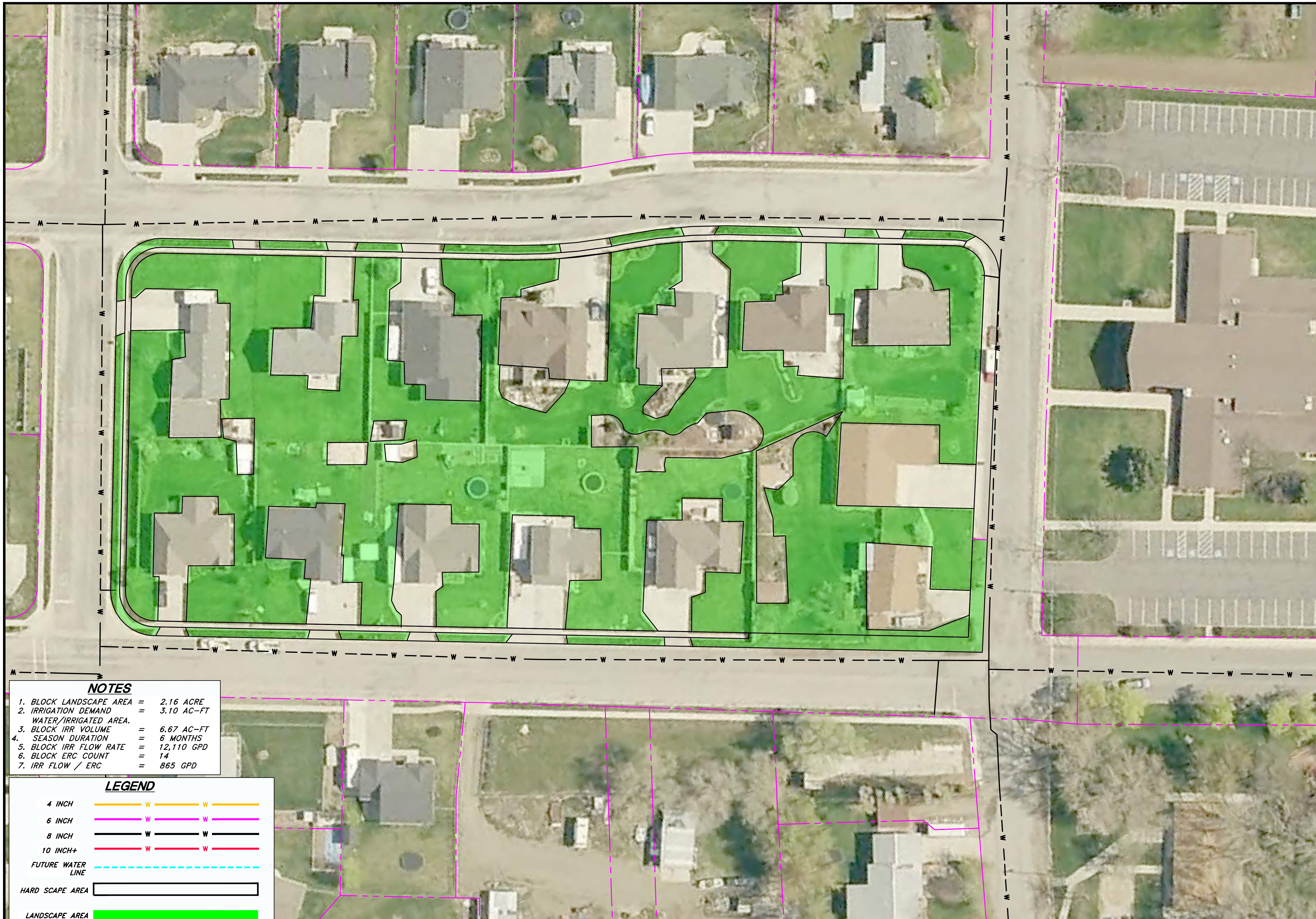
AMO DESIGNED | AMO DRAWN | BKJ CHECKED

SCALE: 22"x34" H:1"=50' | 11"x17" H:1"=100

SHEET: 2.2 OF 1 SHEETS

IRRIGATION DEMAND ANALYSIS
EXHIBIT 2.3

PERRY CITY CORPORATION
2023 CULINARY WATER CFP



NOTES

1.	BLOCK LANDSCAPE AREA	=	2.16 ACRE
2.	IRRIGATION DEMAND WATER/IRRIGATED AREA.	=	3.10 AC-FT
3.	BLOCK IRR VOLUME	=	6.67 AC-FT
4.	SEASON DURATION	=	6 MONTHS
5.	BLOCK IRR FLOW RATE	=	12,110 GPD
6.	BLOCK ERC COUNT	=	14
7.	IRR FLOW / ERC	=	865 GPD

LEGEND

- 4 INCH — W — W —
- 6 INCH — W — W —
- 8 INCH — W — W —
- 10 INCH+ — W — W —
- FUTURE WATER LINE
- HARD SCAPE AREA
- LANDSCAPE AREA

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REV.	DATE	APPR.

AMO DESIGNED
AMO DRAWN
BMJ CHECKED

SCALE:
22"x34"
H:1"=60'
V:1"=2'
11"x17"
H:1"=30'
V:1"=4'

SHEET:
2.3
OF SHEETS

3. WATER SOURCES

3.1 Water Source Requirements

In this section, Perry's water sources will be evaluated per the average day, peak day, and irrigation values mentioned in the Tables 3.2 and 3.2.5. Values will be used concurrently with the *Utah Administrative Code R309-510-7 which states that sources shall legally and physically meet water demands under two conditions:*

(a) The water system's source capacity shall be able to meet the anticipated water demand on the day of highest water consumption, which is the peak day demand (550 gpd/ERC).
(b) The water system's source capacity shall also be able to provide one year's supply of water, which is the average yearly demand (87,600 gal/ERC).

The values shown are the sizing requirements used for determining the adequacy of water sources.

3.2 Emergency Water Source

In recent years, Perry City has become familiar with the need for source emergency preparation due to unexpected source contamination, source reliability, and pump failure interruptions of service. Due to these experiences, it is in good judgement that emergency source procedures also be considered in this Capital Facilities Plan. Due to the vastly different system conditions from city to city, the State allows for each city to determine an emergency plan for their system. Perry City's approach to ensure system reliability in the event of an emergency is to consider system requirements in the event in which the highest producing source is not able to contribute to the system capacity and physically meet water demands under two conditions:

(a) The water system's source capacity shall be able to meet the anticipated water demand on the day of highest water consumption, which is the peak day demand (550 gpd/ERC).
(b) The water system's source capacity shall also be able to provide one year's supply of water, which is the average yearly demand (87,600 gal/ERC)

Well #3 is Perry City's highest contributing water source. To account for the emergency scenario, Well #3 will be removed as a contributor for the analysis of both peak day demand and average day demand. Table 3.2 shows the capacity information of Well #3, all other tables in this report will reflect Well #3 as a non-contributing source of physical water. The well's water right quantity is still reflected as a contributor since the city can still rely on the approved quantity when replacing a malfunctioning well.

Table 3.2a - Well #3 Excluded System Capacity

Name of Source	Priority Date	Water Right Use	Water Right No.	Certificate No.	Flow (cfs)	Approved Quantity (ac-ft/yr)	Actual Production (ac-ft/yr)
Well #3	7-8-1950	Municipal	29-1017	-	0.96	695	726

Table 3.2b Well #3 Excluded System Capacity

Source	Maximum Source Production Rate		Allowable Source Production Rate	
	GPM[2]	MGD[1]	GPM	MGD
Well #3	**900**	**0.65**	**430**	**0.62**

3.3 Existing Water Source Available Capacity

Perry obtains its water from five (5) sources: four (4) potable water wells and one (1) spring. Table 3.2 shows a breakdown of the current culinary water sources as of July 2023 and their respective state recorded water right quantity. The water right quantity is only a reflection of a source's legal permissible water amount determined by the Division of Drinking Water. Table 3.2b shows a breakdown of the maximum production of each source based on recently recorded data. Maximum production is an accurate reflection of the City's system capacity of water physically available for consumption.

The following subsections provide a more in-depth description of each source and their contribution potential to Perry City's culinary water system.

Distribution of water in the city is done by pipe, and excess water is stored in three (3) storage tanks located along the East Bench foothills. Due to variations of elevation throughout the system it is divided into three (3) pressure zones separated by seven (7) PRVs' providing a minimum level of service as described in section 5.

Table 3.3a. Existing Water Source Capacity

Name of Source	Priority Date	Water Right Use	Water Right No.	Certificate No.	Flow (cfs)	Approved Quantity (ac-ft/yr)	Maximum Production (ac-ft/yr)
Well #1	1929	Municipal	29-162	251564	0.55	398	0
Well #2	3/7/1936	Municipal	29-1192	251563	0.89	644	363
Well #3	7/8/1950	Municipal	29-1017	-	0.96	695	**0
Well #4	6/30/1996	Municipal	29-3728	-	2.00	*500	726
Stokes Springs	1897	Municipal	29-2869	-	0.29	210	32
					TOTAL	**2,447**	**1121**

[1] *As of 2023*

[2] **Limited Water Right Quantity*

[3] ***Emergency condition applied (see section 3.2)*

Table 3.3. Existing Water Source Production

Source	** Maximum Source Production Rate		*Allowable Source Production Rate	
	GPM[2]	MGD[1,3]	GPM	MGD
Well #1	0	0	247	0.36
Well #2	450	0.32	400	0.58
Well #3	***0	***0	430	0.62
Well #4	900	0.65	310	0.45
Stokes Spring	40	0.03	130	0.19
Totals	**1390**	**1.00**	**1,517**	**2.18**

[1] **Water Right Capacity.*
[2] ***Production Capacity.*
[3] *Runtime of Pump Estimation = 12-hr/day*
[4.] ****Emergency condition applied (See section 3.2).*

3.3.1 Well # 1

Well #1 is located at the intersection of 380 West and 2400 South and pumps directly into Zone 1 of the distribution system. Ownership of the water rights of this well was provided in 1935 and the well was in operation until 2022. The well was originally rated to pump at a maximum flow rate of approximately 373 gpm. The annual production for the well is limited by the water right, which allows an annual withdrawal from the well of 398-acre feet (0.355 MG/year or 247 gpm if pumped continuously). Historically, the city has only been using about 161 ac-ft from the well annually. Currently Well #1 has a source contamination and Perry is in the planning stage of relocating the well.

3.3.2 Well #2

Well #2 is located at the intersection of Cherry Drive and 2400 south and pumps directly into Zone 1 of the distribution system. Water rights were appropriated to Perry in 1956, for a pump rate of 700 gpm. The allowable annual flow rate for the well is approximately 644-acre ft (0.575 MG/year or 400 gpm). In recent years, Perry has been using about 363 acre-ft (0.324 MG/year or 225 gpm.)

3.3.3 Well #3

Well #3 is the highest producing well in the city. It is located at the intersection of 725 West and 2700 South. The well was originally appropriated in 1950 for a pump rate of approximately 3 acre-ft per acre irrigated, originally intended for agricultural use. Today the City maintains water rights for the well for 695 acre-ft (0.575 MG/year or 430 gallons/minute). On average, Perry City pumped 726 ac-ft/year of physical water to meet current demands. The overall allowable withdrawal flow rate allowed by the well's water right is exceeded by the production use of the well but is balanced using other municipal water rights associated with other city owned well not exceeding their water right allowable flow.

3.3.4 Well #4

Well #4 is the second highest production well in the City. Well #4 is located at 100 West and 1800 South. Originally appropriated in the year 1996 for a total allowable volume of 500 acre-ft. On average, Perry pumps to 726-ac-ft/year, exceeding the water right's allowable use but is balanced using other municipal water rights associated with other city owned wells not exceeding their water right allowable flow.

3.3.5 Stokes Spring

Stokes Spring is located on the Eash Bench foothill of Perry. The spring is a small contributor to the overall water production in Perry. The water right for the Spring was appropriated in 1897 for an overall value of 0.29 cubic foot per second which equates to approximately 210 acre-ft/year. On average, the spring contributes a quantity of 32 acre-ft/year to the city culinary system (0.0288 MGD or 20 gpm.)

3.4 Peak Day Demand

3.4.1 Existing Conditions

As described in Section 3.1 and 3.2, the water system's source capacity must be able to meet the anticipated water demand on the day of highest water consumption, which is the peak day demand (550 gpd/ERC) with the consideration of an emergency condition, in which, the highest producing source is not available at the time of the peak day period. With this consideration Well #3 has been reflected as a non-contributing water source of physical water to the water system.

The city is currently compliant in providing enough source for current connections to meet peak day demand, See Table 3.4.1.

Table 3.4.1. Existing Peak Day Demand and Supply

Year	Existing ERCs	Source Requirement (GPD/ERC)	Peak Day Demand[2] (MGD)	Maximum Source Production Rate[1] (MGD)
2022	1,740	550	0.956	1.00*

[1]As of December 2023
[2]ERCs x 550 gpd/ERC ÷ 1,000,000 gal/MG
[3]Emergency Source Condition applied (see section 3.2)

3.4.2 Future Indoor Only Scenario

When Perry progresses to build-out, the system will require approximately 5.10 MGD of source capacity to meet the peak day demand, as shown in Table 3.4.2. The current maximum source production rate is 1.00 MGD. The future need will require an additional 4.10 MGD to meet the build-out peak day demand in 2093. The City's growth will require the construction of at least six (6) additional wells (500 gpm minimum with a runtime time of 24 hours) to meet build-out peak day demands. In the next ten years, if population growth trends continue, the peak day demand will require an additional well. The city is currently taking steps toward securing an additional well to meet the growing demand.

Table 3.4.2. Projected Peak Day Demand and Supply

Year	Projected ERCs	Projected Peak Day Demand[1] (MGD)	Maximum Source Production Rate[2] (MGD)
2030	2,469	1.36	1.72
2040	3,234	1.78	2.44
2050	4,125	2.27	*2.44*
2060	5,125	2.82	*3.16*
2070	6,281	3.45	*3.88*
2080	7,547	4.15	*4.60*
2093 (Build Out)	**9,275**	**5.10**	***5.32***

[1]*ERCs x 550 gpd/ERC ÷ 1,000,000 gal/MG*
[2]*Includes 3 Existing Sources & 6 Future Wells @ 500 GPM*

3.4.3 Future Outdoor/Indoor Use Scenario

Perry City currently limits irrigation off the culinary water system to a few of their users. Due to this condition, this study only considers irrigation demand for future development. This study evaluated the number of single-family ERC and the non-single family ERC equivalents connected to the water system. The analysis determined that the city provides indoor use water supply to approximately 1,740 ERCs as of the year 2022.

Thus, if all the additional connections to the culinary water system to build out included irrigation on the peak day, then total system peak day demand at build out would be 11.8 MGD. At this demand, the construction of at least fifteen (15) additional wells with a minimum production capacity of 500 gpm at a runtime of 24 hours would be required to sustain the peak daily demand. Table 3.4.3 provides a breakdown of the peak day demand as population grows and how much source production the city will need to provide to meet the peak day demand use.

It is anticipated that not all developers and home builders opt to use culinary water as a source for irrigation use. However, for the purpose of this analysis it is conservatively assumed that all future connections will include outdoor use.

Table 3.4.3. Projected Peak Day Demand and Supply

Year	Current ERC No Irrigation	Projected ERCs	Peak Day Demand No Irrigation	Peak Day Demand w/ Irrigation (MGD)	Projected Peak Day Demand[1] (MGD)	Maximum Source Production Rate[2] (MGD)
2030	1,740	729	1.0	1.0	2.0	2.4
2040	1,740	1,494	1.0	2.1	3.1	3.2
2050	1,740	2,385	1.0	3.4	4.4	4.6
2060	1,740	3,385	1.0	4.8	5.8	6.0
2070	1,740	4,451	1.0	6.4	7.4	7.5
2080	1,740	5,807	1.0	8.2	9.2	9.6
2093 (Build Out)	**1,740**	**7,535**	**1.0**	**10.6**	**11.6**	**11.8**

[1]*ERCs x 1425 gpd/ERC ÷ 1,000,000 gal/MG*
[2]*Includes 3 Existing Sources & 15 Future Wells @ 500 GPM*

3.5 Average Yearly Demand

3.5.1 Existing Conditions

Another system requirement for compliance is that the water source maximum capacity must be able to provide for the average yearly demand of the City. The system's sources were evaluated by determining if the maximum source production capacity meets the existing water demand. Table 3.5.1 below shows the tabulation of average yearly demand based on the criteria in section 1, which shows a demand rate of 87,600 gal/ERC/yr (0.269 ac-ft/ERC) multiplied by the total number of existing ERC's. Based on the evaluation, it was determined that the City has approximately 1,980 ac-ft of excess capacity in its annual source. Thus, the City is currently compliant in meeting the average day demand.

Table 3.5.1. Existing Water Source Required Capacity

Year	[1] Existing ERCs	Average Day Requirement (ac-ft/ERC/yr)	Required Source Capacity (ac-ft/yr)	Maximum Source Capacity (ac-ft/yr)
2022	1,740	0.269	468	1121

[1] *As of December 2022*

3.5.2 Future Indoor Use Only Scenario

As the City grows, the current source capacity for indoor average yearly demand must be evaluated for projected ERC. The system was evaluated by multiplying the average yearly demand of 0.269 ac-

ft/ERC/YR to the projected ERCs as estimated. This calculation shows that the system build-out demand is approximately 2494 ac-ft/yr.

The City's current water right allowable capacity is 2447 acre-ft. The projected build out system demand requires an additional 53 acre-ft of water right to be attainted by the City prior to the year 2093.

To estimate the total water right acquirement schedule for build out, an evaluation of the proposed future wells system capacity contribution was completed. The analysis evaluates the proposed wells required to sustain the peak day demand. Each future well added to the system has an anticipated maximum capacity for instantaneous flow of 500 gpm see section 3.4. However, for the average day demand, the required daily pump runtime for each additional well is 6.8 hours a day. Table 3.5.2 reflects the contribution of each well to the overall system average day capacity through the years they are proposed and scheduled in section 3.4.

Table 3.5.2. Projected Average Yearly Demand and Supply

Year	Projected ERC	Source Req (ac/ft/yr)	Projected Source (ac-ft/yr)						
			Well #1	Well #2	Well #3	Well #4	Stokes Spring	Future Wells	Total
2030	2,469	664	0	363	0*	726	32	230	1,351
2040	3,234	869	0	363	0*	726	32	230	1,351
2050	4,125	1,109	0	363	0*	726	32	460	1,581
2060	5,125	1,378	0	363	0*	726	32	690	1,811
2070	6,281	1,689	0	363	0*	726	32	920	2,040
2080	7,547	2,029	0	363	0*	726	32	920	2,040
2093 (Build Out)	**9,270**	**2,494**	**0**	**363**	**0***	**726**	**32**	**1,380**	**2,500**

3.5.3 Future Indoor/Outdoor Use Scenario

System evaluation of an indoor/outdoor use for projected ERC demand considered that outdoor use would be limited to a six-month season from April to September. Indoor use would be consistent all year long. Therefore, demand for the months of April to September

Demand was tabulated by summing the demand needed for twelve months of indoor use (0.269 ac-ft /ERC/yr) and six months of outdoor use (1.24 ac-ft/ERC/yr.). Only future ERC irrigation demand was placed upon the system. The results of this analysis for the years 2030 to 2093 (build out) are provided in Table 3.5.3.

The scenario to build out results in an overall irrigation demand requirement of an additional 5,059-acre ft.

This evaluation provides a comparison of "paper water"/water rights and future water needs and does not speak to the true capacity of the wells' system. If the wells are unable to provide the water yield needed to meet system compliance, then new water source will need to be acquired.

Table 3.5.3. Projected Average Yearly Demand and Supply

Year	Current ERCs'	Project ERC	Projected Demand (ac-ft/year)	Projected Source (ac-ft/yr)						
				Well #1	Well #2	Well #3	Well #4	Stokes Spring	Future Wells[1]	Total
2030	1,740	729	1,566	0	363	*0	726	32	807	1,928
2040	1,740	1,494	2,719	0	363	*0	726	32	2,420	3,541
2050	1,740	2,385	4,061	0	363	*0	726	32	3,226	4,347
2060	1,740	3,385	5,568	0	363	*0	726	32	4,839	5,960
2070	1,740	4,541	7,309	0	363	*0	726	32	6,452	7,573
2080	1,740	5,807	9,217	0	363	*0	726	32	8,065	9,186
2093 (Build Out)	1,740	7,535	11,820	**0**	**363**	*0	**726**	**32**	**12,098**	**13,219**

1.Water Rights Required for Future Growth

3.6 Other Water Source Needs

As described in Section 2.1, the State has mandated that water systems determine their own minimum sizing requirements either by submitting data to the State or by performing an engineering study. The city entered into a Corrective Action Agreement (CAA) with the Division of Drinking Water. The CAA specifies a March 2024 deadline to submit an engineering study for their review and approval. Additional water source needs will be identified in the engineering study.

3.7 Future Water Sources

From the analysis provided in this section it is evident that Perry City's population growth will require additional water rights and water capacity to meet the City's needs. If the system provides water for indoor use only, future build out will require an additional six (6) wells / pump stations with an instantaneous flow rate of 0.72 MGD for the peak day required demand. Also, the City will need an additional 53 acre-ft to maintain their yearly average source capacity. Table 3.6.1 shows a breakdown of the required wells and water rights needed as the City grows.

Table 3.6.1. Indoor Use Only Additional Water Right and Capacity

Future Well #	Instantaneous Capacity (MGD)	Additional Water Rights Required (AC-FT / YR)	Total Water Rights Cumulative (AC-FT/YR)	Year Required
5	0.72	0	2447	2030
6	0.72	0	2447	2040
7	0.72	0	2447	2060
8	0.72	0	2447	2070
9	0.72	0	2447	2080
10	0.72	53	2500	2093
Total	**4.32**	**53**		

The addition of irrigation to indoor use creates a significant increase in water need. Fifteen (15) additional wells/pump stations are required to meet the future peak day demand. An additional 2,612 acre-ft of water rights are also required. Table 3.6.2 1 shows a breakdown of the required wells and water rights needed as the City grows.

Table 3.6.2. Indoor/Outdoor Use Additional Water Right and Capacity

Future Well #	Instantaneous Capacity (MGD)	Additional Water Rights Required (AC-FT / YR)	Total Water Rights Cumulative (AC-FT/YR)	Year Required
5	0.72	0	2,447	2030
6	0.72	770	3,217	2030
7	0.72	770	3,987	2040
8	0.72	770	4,757	2050
9	0.72	770	5,527	2050
10	0.72	770	6,297	2060
11	0.72	770	7,067	2060
12	0.72	770	7,837	2070
13	0.72	770	8,607	2070
14	0.72	770	9,377	2080
15	0.72	770	10,147	2080

16	0.72	770	10,917	2080
17	0.72	770	11,687	2093
18	0.72	770	12,457	2093
19	0.72	762	13,219	2093
Total	**10.8**	**10,772**		

3.8 Projects

A summary of the projects needed for water source compliance is provided in this Section, Section 4, and Section 6.

3.8.1 Indoor Use Only

The following projects are the recommended projects for source capacity to build out in the indoor use only scenario and are in order of recommend priority:

Project #	Project	Description/Purpose	Year Required
1	Nielson Well Rehabilitation (Well # 5)	Rehabilitate well and connect back to the system.	2030
2	Anderson Well Relocation Well # 1 (Well #6)	Rehabilitate well and connect back to the system, or seek another well location to replace this well.	2040
3	South Bench Well #7 & Pump station	New well and pump station for future ERC use. (500 GPM instantaneous Demand Req for PDD)	2060
4	Future Well # 8 & Pump Station	New well and pump station for future ERC use. (500 GPM instantaneous Demand Req for PDD)	2070
5	Future Well # 9 & Pump Station	New well and pump station for future ERC use. (500 GPM instantaneous Demand Req for PDD)	2080
6	Future Well #10 & Pump Station	New well and pump station for future ERC use. (500 GPM instantaneous Demand Req for PDD)	2093

Outdoor/Indoor Use

The following projects are the recommended projects for source capacity to build out in the Indoor/Outdoor use scenario. Projects 1 through 4 are the same projects as found in Section 3.7.1 as each contributes to the source capacity deficiency.

Projects are in order of recommend priority:

Project #	Project	Description/Purpose	Year Required
1	Nielson Well Rehabilitation Well # 5	Rehabilitate well and connect back to the system.	2030
2	Anderson Well Relocation Well # 1 (Well #6)	Rehabilitate well and connect back to the system, or seek another well location to replace this well.	2030
3	South Bench Well #7 & Pump station	New well and pump station for future ERC use. (500 GPM instantaneous Demand Req for PDD)	2040
4	Future Well # 8 & Pump Station	New well and pump station for future ERC use. (500 GPM instantaneous Demand Req for PDD)	2050
5	Future Well #9 & Pump Station	New well and pump station for future ERC use. (500 GPM instantaneous Demand Req for PDD)	2050
6	Future Well #10 & Pump Station	New well and pump station for future ERC use. (500 GPM instantaneous Demand Req for PDD)	2060
7	Future Well #11 & Pump Station	New well and pump station for future ERC use. (500 GPM instantaneous Demand Req for PDD)	2060
8	Future Well #12 & Pump Station	New well and pump station for future ERC use. (500 GPM instantaneous Demand Req for PDD)	2070
9	Future Well #13 & Pump Station	New well and pump station for future ERC use. (500 GPM instantaneous Demand Req for PDD)	2070
10	Future Well #14 & Pump Station	New well and pump station for future ERC use. (550 GPM instantaneous Demand Req for PDD)	2080
11	Future Well # 15 & Pump Station	New well and pump station for future ERC use. (500 GPM instantaneous Demand Req for PDD)	2080
12	Future Well # 16 & Pump Station	New well and pump station for future ERC use. (500 GPM instantaneous Demand Req for PDD)	2080

13	Future Well # 17 & Pump Station	New well and pump station for future ERC use. (500 GPM instantaneous Demand Req for PDD)	2093
14	Future Well # 18 & Pump Station	New well and pump station for future ERC use. (500 GPM instantaneous Demand Req for PDD)	2093
15	Future Well # 19 & Pump Station	New well and pump station for future ERC use. (500 GPM instantaneous Demand Req for PDD)	2093

4. WATER STORAGE

4.1 Water Storage Requirements

This Capital Facilities plan evaluates the City's storage requirements in correlation with the associated flow rates, and storage requirements, water data from 2018 through 2019 and Utah Administrative Code R309-510-8:

> *Each public water system, or storage facility serving 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.*

Based on Table 510-4 of the aforementioned rule, 240 gpd/ERC is the required indoor equalization storage flow rate for indoor use only water demand. The indoor/outdoor use scenario has an equalization storage flow rate of1105 gpd/ERC for outdoor use and 240 gpd/ERC for indoor use.

Fire flow storage is equal to the largest fire flow demand as determined by the local fire authority. The largest fire flow need is at the Walmart facility (1200 South Commerce Way) with a requirement of 4,000 gpm for 60 minutes, which equates to 240,000 gallons. The rest of this Section evaluates the ability of current and future infrastructure to meet or exceed current and future needs.

4.2 Emergency Water Storage

Emergency water storage for a city is imperative due to the inherent unpredictability of natural and man-made disasters that can disrupt regular water supply systems. In Perry, being able to prevent water shortages is an essential part of the level of service the City aims to provide. Due to the unique challenges that City water systems face throughout the state, the State allows each city to determine the adequate emergency storage amount for their city. Perry City finds the most likely and worst-case scenario to be a major fire on a peak water use day. Due to this concern, this report will reflect the storage requirements of holding the peak day volume and maintaining the required fire flow storage as mentioned in section 4.1. Table 4.2 shows the current full amount of the Peak Day Storage plus fire flow. Emergency storage will be the difference between the full peak day and the required equalization storage as shown in sections 4.4 to 4.6.

Table 4.2. Existing Emergency Water Storage Analysis

Year	Existing ERCs	Peak Day Storage Volume (MG)	Required Storage - Equalization - (MG)	Required Storage - Fire Flow - (MG)	Total Emergency Storage (MG)
2022	1,740	0.96	0.425	0.24	**0.54**

Table 4.2.1. Projected Emergency Storage Analysis (Indoor Use Only)

Year	Projected ERCs	Peak Day Storage Volume (MG)	Required Storage - Equalization - (MG)	Required Storage - Fire Flow - (MG)	Total Emergency Storage (MG)
2030	2,469	1.36	0.59	0.24	0.77
2040	3,234	1.78	0.78	0.24	1.00
2050	4,125	2.27	0.99	0.24	1.28
2060	5,125	2.82	1.23	0.24	1.59
2070	6,181	3.45	1.51	0.24	1.95
2080	7,547	4.15	1.81	0.24	2.34
2093 (Build Out)	**9,270**	**5.10**	**2.23**	**0.24**	**2.88**

Table 4.2.2. Projected Required Storage Capacity (Outdoor/Indoor)

Year	Current ERC (Non-Irr)	Projected ERCs (W/ IRR)	Peak Day Storage Volume (MG)	Required Storage - Equalization - (MG)	Required Storage - Fire Flow - (MG)	Total Emergency Storage (MG)
2030	1,740	729	2.0	1.2	0.24	0.77
2040	1,740	1,494	3.1	2.1	0.24	1.00
2050	1,740	2,385	4.3	3.1	0.24	1.28
2060	1,740	3,385	5.8	1.2	0.24	1.59
2070	1,740	4,541	7.4	5.4	0.24	1.95
2080	1,740	5,807	9.2	6.8	0.24	2.34
2093 (Build Out)	**1,740**	**7,535**	**11.6**	**8.7**	**0.24**	**2.88**

4.3 Existing Water Storage

The water system operates three (3) pressure zones. Zones are provided so that pressure can be more evenly distributed. All of the tanks are located along the east bench foothills in Zone 1. The distribution

system is constructed in a way that tanks can provide pressure to Zone 2 and Zone 3 from the tanks along the bench in Zone 1. Reductions of pressure are made possible by pressure reducing valves (PRVs) strategically placed to maintain pressure zones.

Exhibit 2.2 Existing Water System, illustrates the locations of the City's water storage reservoirs. Table 4.2 below lists the reservoirs' capacities.

Table 4.2. Existing Water Storage

Name	Location	Capacity (gal)
East Bench Reservoir I (North)	Near 1800 South	1,000,000
East Bench Reservoir II (South)	Near Allen Street	300,000
East Bench Reservoir III (South)	Near Allen Street	350,000
	Total	**1,650,000**

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4.4 Existing Requirements

The water system must contain capacity for both equalization storage and fire storage. Currently, equalization storage is defined at 240 gpd/ERC. The fire demand is 4,000 gpm for 60 minutes, resulting in a fire storage volume of 240,000 gal. Table 4.3 below summarizes the total required storage of 0.54 MG. The City has 1.65 MG of storage capacity and is currently compliant in providing equalization and fire storage.

Table 4.3. Existing Water Storage Required Capacity

Year	Existing ERCs	Required Storage --Equalization -- (MG)	Required Storage -- Fire Flow -- (MG)	Emergency Storage (MG)	Total Required Storage (MG)
2022	1,740	0.425	0.24	**0.54**	**1.20**

4.5 Future Requirements

4.5.1 Indoor Use Only Scenario

As the City grows, the storage capacity must be able to accommodate the equalization, fire, and emergency storage water demands for all residents for one day. Fire storage is anticipated to remain constant throughout the years unless future attractions cause greater fire storage need, see section 4.1. The equalization demand for indoor use is the average day demand of 240 gpd/ERC for one day.

Emergency storage has been sized for the difference between the Peak Day demand (550 gpd /ERC) and average day demand for one day.

Table 4.4.1 shows the storage amount for equalization, fire, and emergency storage through the years as population is anticipated to increase. The summation of these storage demands is the total storage requirement for the City to provide its ideal level of service. Currently the city provides 1.65 MG of total storage. At Build out the the City will need to increase storage capacity from 1.65 MG to 5.34 MG.

Table 4.4.1. Projected Required Storage Capacity (Indoor Use Only)

Year	Projected ERCs	Required Storage - Equalization - (MG)	Required Storage - Fire Flow - (MG)	Emergency Storage (MG)	Total Required Storage (MG)
2030	2,469	0.59	0.24	0.77	1.60
2040	3,234	0.78	0.24	1.00	2.02
2050	4,125	0.99	0.24	1.28	2.51
2060	5,125	1.23	0.24	1.59	3.06
2070	6,181	1.51	0.24	1.95	3.69
2080	7,547	1.81	0.24	2.34	4.39
2093 (Build Out)	**9,270**	**2.23**	**0.24**	**2.88**	**5.34**

4.5.2 Outdoor/Indoor Use Scenario

As a comparison scenario, the evaluation of indoor/outdoor use requires storage capacity of City tanks to meet the State's requirements for equalization, fire, and emergency storage. Introducing outdoor use as a scenario increases the total storage requirement. The equalization demand for indoor/outdoor use is an average day demand of 1105 gpd/ERC.

The current residences of Perry are not considered for outdoor use since they are currently receiving irrigation water from the Pineview Water System. The total ERC count for non-outdoor use consideration is 1740 ERC, as of July 2023. The total storage amount needed to satisfy the demand at build out in this scenario is 11.84 MG of storage. The City currently has 1.65 MG of storage and needs **10.2 MG additional storage at the time of build out.**

Table 4.4.2. Projected Required Storage Capacity (Outdoor/Indoor)

Year	Current ERC	Projected ERCs	Required Storage - Equalization - (MG)	Required Storage - Fire Flow - (MG)	Emergency Storage (MG)	Total Required Storage (MG)
2030	1,740	729	1.2	0.24	0.8	2.24
2040	1,740	1,494	2.0	0.24	1.0	3.24
2050	1,740	2,385	3.0	0.24	1.3	4.54
2060	1,740	3,385	4.2	0.24	1.6	6.04
2070	1,740	4,541	5.4	0.24	2.0	7.64
2080	1,740	5,807	6.8	0.24	2.3	9.44
2093 (Build Out)	1,740	**7,535**	**8.7**	**0.24**	**2.9**	**11.84**

4.6 Projects

4.6.1 Indoor Use Only

The following projects are the recommended projects for storage capacity to build out in the indoor use only scenario and are in order of recommended priority:

Project #	Project	Description/Purpose
1	3200 S South Bench Tank (1.25 MG tank)	This tank will provide additional storage to meet build-out demand. Additionally, it can be built at a higher elevation to help with pressures of homes along the East Bench foothills.
2	1750 South Tank II (1.25 MG tank)	Additional tank located in the northeastern foothills of the City to provide pressure for build-out demand.
3	New Tank Project (1.25 MG tank)	Additional tank located in the City to provide pressure for build-out demand.

4.6.2 Outdoor Use / Indoor Use

The following projects are the recommended projects for storage capacity to build out in the Indoor/Outdoor use scenario. Project 1 and project 2 are the same projects as found in Section 4.5.1, however, the quantity of volume provided differs from those shown in the table below.

Projects are in order of recommend priority:

Project #	Project	Description/Purpose
1	3200 S South Bench Tank (0.85 MG tank)	This tank will provide additional storage to meet build-out demand. Additionally, it can be built at a higher elevation to help with pressures of homes along the East Bench foothills.
2	1750 South - Tank (1 MG)	Additional tank further Northeastern foothills of the City the needed storage for build-out demands and can provide pressure for home on the northeast foothills.
3	Southeast Bench Tank 1.5 MG)	New tank for future additional future storage.
4	New Tank Project (1.0 MG tank)	Additional tank located in the city to provide pressure for build-out demand.
5	New Tank Project (2 MG tank)	Additional tank located in the City to provide pressure for build-out demand.
6	New Tank Project (1.5 MG tank)	Additional tank located in the City to provide pressure for build-out demand.
7	New Tank Project (2.5 MG tank)	Additional tank located in the City to provide pressure for build-out demand.

5. WATER DISTRIBUTION SYSTEM REQUIREMENTS

5.1 Pressure Zones

Pressure zones play a vital role in maintaining the water distribution system, providing water quality, fire protection, system efficiency, and customer satisfaction. Perry City maintains three (3) pressure zones, with three (3) water tanks, and seven (7) pressure release valves (PRV). All three of the City's water tanks are in Zone 1 along the East Bench Foothills. Water is distributed from Zone 1 to Zones 2 and 3 respectively and circulated with water lines looping throughout the City. In this report, service pressure will be evaluated for scenarios of high demand like peak day, peak hour, and peak day plus a fire scenario. Each scenario will require a minimum pressure service for all residents within each demand requirement.

5.2 Minimum Sizing

Utah Administrative Code sections R309-105 and R309-510-9 describe the minimum requirements that a public water distribution system must meet.

Specifically, R309-105-9 discusses minimum water pressures under specific conditions:

> *(1) Unless otherwise specifically approved by the Director, no water supplier shall allow any connection to the water system where the dynamic water pressure at the point of connection will fall below 20 psi during the normal operation of the water system. Water systems approved prior to January 1, 2007, are required to maintain the above minimum dynamic water pressure at all locations within their distribution system. Existing public drinking water systems, approved prior to January 1, 2007, which expand their service into new areas or supply new subdivisions shall meet the minimum dynamic water pressure requirements in R309-105-9(2) at any point of connection in the new service areas or new subdivisions.*
>
> *(2) Unless otherwise specifically approved by the Director, new public drinking water systems constructed after January 1, 2007 shall be designed and shall meet the following minimum water pressures at points of connection:*
>
> *(a) 20 psi during conditions of fire flow and fire demand experienced during peak day demand.*
>
> *(b) 30 psi during peak instantaneous demand; and*
>
> *(c) 40 psi during peak day demand.*
>
> *(3) Individual home booster pumps are not allowed as indicated in R309-540-5(4)(c).*

R309-510-9 references the above and goes on to discuss the peak instantaneous demand for indoor and irrigation use and fire flow.

5.3 Fire Flow Requirements

As of the date of this study, Perry City has adopted the 2018 International Fire Code. The Fire Code states:

SECTION B105 FIRE-FLOW REQUIREMENTS FOR BUILDINGS

B105.1 One- and two-family dwellings.

The minimum fire-flow requirements for one- and two-family dwellings having a fire-flow calculation area which does not exceed 3,600 square feet (344.5 m^2) shall be 1,000 gallons per minute (3785.4 L/min). Fire-flow and flow duration for dwellings having a fire-flow calculation area in excess of 3,600 square feet (344.5 m^2) shall not be less than that specified in Table B105.1.[2]

Generally, residences are under 3,600 square feet and require a fire flow of 1,500 gpm to provide two hours of firefighting capability. Residences larger than 3,600 square feet shall be evaluated by the Fire Marshall and the flow established on a case-by-case basis.

5.4 Existing Water Distribution System

Using EPANet, the existing water system model was updated based on recent development and projects and new usage data for some of the non-residential users. The analysis section provides an explanation of the modeling requirements and procedures that were used to determine system deficiencies as they are today. This analysis was then used in comparison with the future water distribution system's analysis in Section 5.4, to determine which projects, if any, might be completed by future development.

5.4.1 Analysis

The model was run for average day demand (240 gpd/ERC = 0.27 gpm/ERC). The results showed that the pressure does not fall below 60 psi anywhere in the distribution system, except for model demand nodes located on the east bench foothills.

Next, the model analysis was run for each of the following scenarios as listed in R309-105-9(2):

1. **Fire flow (1,500 gpm) in conjunction with peak day demand (550 gpd = 0.3819 gpm).** The result of the model showed several areas unable to meet the required fire flow at the minimum pressure (20 psi). The table below provides deficiency information for these areas.

2. **Peak instantaneous demand was applied using a factor of 2 times peak monthly demand (2 x 360 gpd = 720 gpd = 0.500 gpm).** The only nodes that do not meet the minimum 30 psi pressure requirements were model nodes on the East Bench foothills in Perry, mainly nodes on 400 West.

3. **Peak day demand was then applied to the model.** Like peak instantaneous demand, the nodes in the water model that reflect a pressure lower than the minimum value were found on the east bench foothills. Additionally, a few homes on Chateau Drive and Valley View Dr. were also unable to meet the 40-psi minimum required.

[2] ** Table B105.1 of the International Fire Code shows that for a typical wooden frame construction type home that is 0 – 3600 square feet, a fire flow of 1,500 gpm for 2 hours is required. Table B105.1 is included in Appendix B.*

5.4.2 Results

The results of the model showed that the worst-case scenario is fire flow plus peak day demand. This is because when the model is run, water demand nodes are set for peak day use (550 gpd) and applied to all applicable ERCs in conjunction with a 1,500-gpm fire flow. This scenario is modeled, in effect, to find where the system may fail below the minimum required pressure of 20 psi during a fire event. For Perry's model, distribution lines larger than 8" in diameter, that are looped, don't have any issues with providing the required amount of fire flow required by code. However, there are some areas of the City that do not sufficiently provide fire flow due to smaller diameter pipe sizes, dead ends, or low-pressure areas that reach the 20-psi minimum soon after flows start to increase limiting high flow amounts.

Appendix C contains a schematic of the water model as well as the output of the results of the peak day demand combined with a 1,500-gpm fire flow. The table below describes the areas which failed to meet the minimum pressure or fire flow:

Table 5.3.2. Existing Distribution System Deficiencies

Project #	Location	Failing Node(s)	Reason
1	*2500 S (Cul-de-sac)*	*n495*	*FF = 640 gpm. Dead End 6" Line*
3	*2600 S*	*n97*	*FF = 1270 gpm. Update 6" Line.*
4	2700 S (East Side Bench)	n32, n33, n92, n93, n94, n96, n212, n357	950<FF<1150 gpm. Homes in this location have substantially low pressure. They tend to reach 20 psi minimum before fire flow can be provided, this is due to their elevation in relation with the HGL of existing water tanks.
5	*2700 S (West Side of 1200 West)*	*n212, n357*	*300<FF<310 gpm. Dead End 4" line.*
6	2875 South Cul-de sac	n36, n73	FF = 1150 gpm. Dead end 8" line.
7	*2950 S (West side of 1200 West)*	*n205, j24*	*600<FF<1200 gpm. Dead End 4" Line.*
8	*3000 S (East Side of 1200 West)*	*n430, n494, n516,*	*910<FF<1240 gpm. 6" Distribution line & PRV install needed across HWY 89.*
9	*3600S (Between HWY 89 & 1200 West)*	*n429*	*FF = 910 gpm. 6" Distribution loop and PRV install needed across HWY 89.*
10	3600 S (East Side of HWY 89)	n449	FF = 870 gpm. 6" line and PRV install needed across HWY 89.

11	400 WEST (East Bench – Cul de Sac)	n26, n336	580<FF<640 gpm. Dead End 8" Line.
12	450 West (East Bench homes)	n30, n31, n46, n47, n48, n332, n333, n334, 1,2,3	330>FF>1200 gpm. Homes in this location have substantially low pressure. They tend to reach 20 psi minimum before fire flow can be provided, this is due to their elevation in relation with the HGL of existing water tanks.
13	725 West (East Bench Homes)	n88, n100, n192, n193	1150<FF<1270 gpm. 6" line loop. However, the greater issue is likely the low-pressure nodes in the area.
14	800 West (Cul de Sac)	n42, n44	FF = 1010 6" Dead end line and existing low pressure.
15	800 West (East Bench Homes)	n41, n42, n43, n44, n493	980<FF<1010 gpm. 8" Line Loop. However greater issue is likely the low-pressure nodes in the area.
16	*HWY 89 East Side (3450 South to Southern City Limit)*	*n77, n78, j27,j43,j90*	*550<FF<830 gpm. Dead End 6" Line*
17	*HWY 89 West Side (3000 S to Southern City Limit)*	n36, n37, n91, n339,89, n95	880<FF<1270 gpm. Dead end 6" Line
19	*3600 South*	*j28, j27*	*FF = 880 gpm. 6" main line & PRV install*
20	Valley View Dr.	n235, n447	1010 <FF<1070 gpm. Dead End 8" line.

5.4.3 Water Main Pipe Size Minimum

Almost one third of the existing distribution system is 6-inch piping. State Code R309-550-5 – Water Main Design, (4) Minimum Water Main Size states: "…Minimum water main size, serving a fire hydrant lateral, shall be 8-inches in diameter unless a hydraulic analysis indicates that required flow and pressures can be maintained by 6-inch lines." The italicized items listed above do not meet this criterion.

Development may correct a few of these deficiencies by way of looping system lines, thus improving water flow. For example, should development occur on the easternmost end of north end of Valley View Drive, the deficiency listed as item 16 may be eliminated.

> *The State DDW's Hydraulic Modeling Rule (R309-511) requires that the existing water model is updated and re-run as development occurs in order to re-evaluate the system for compliance with minimum requirements and identify any deficiencies that would result due to the proposed*

development. Any system improvements or upsizing necessary in order to be compliant must be done as part of the development in order to receive approval.

Several other projects have been identified based on maintenance issues, providing needed reliability and redundancy in the system, and emergency preparedness. These projects are considered existing deficiencies. They are as follows:

1. New Pressure Zones for East Bench foothill homes with accompanying infrastructure. (Deficiencies #4, #8, #11, #12, #13, #14, & #15.)

2. Replace existing 2" distribution pipes across HWY 89 with 6" PRV on 3000 South & 3450 South. (Deficiencies # 8, #9, & #10)

3. Replace 6" dead end lines with 10" diameter pipe or as specified by the City engineer in Highway 89 (Deficiencies #1, #10, #16, & #17)

4. Replace 6" mainline for 10" diameter pipe or as specified by the City engineer for HWY 89. (Deficiency #18)

5. Replace 6" main dead-end lines in cul-de-sacs with 8" pipes that have fire hydrants attached. (Deficiency #2)

6. Replace 6" mainline with 8" pipe for 2600 South from 725 West to HWY 89.

7. Replace 4" main dead-end lines with 8" pipe for FH on 2700 South. (Deficiency #5)

8. Replace 4" main dead-end lines with 8" pipe for FH on 2950 South (Deficiency #7)

9. Replace 8" main dead-end line with 12" Main for FH on 2875 South. (Deficiency #6)

10. Replace 6" line with 8" line for two FH on 3600 South (Deficiency #19)

Since impact fees cannot be used to correct existing deficiencies, the water model was updated to "correct" all deficiencies and substandard lines prior to proceeding with the future development model. By doing this, the future model clearly shows where growth results in failure to meet the minimum requirements.

5.5 Future Water Distribution System Needs

5.5.1 Analysis

To analyze the future system, the distribution model needed to reflect a probable future layout of Perry. The 2019 Perry City General Plan and the Future Roads Plan were used to determine future zoning boundaries of residential, commercial, and mixed-use areas. ERCs for the commercial, residential, and mixed-use areas were estimated based on the size of each parcel, as shown in Exhibit 3.1. Residential ERCs were tabulated by taking the area within the residential zone that are not yet developed (removing area of future roads based on general plan) and multiplying that area by 4 ERC/acre[3]. ERCs for mixed use and commercial were similarly tabulated by taking parcel areas within their respective zone and multiplying their areas by 10 ERC/acre, since these areas are anticipated for higher density. Agricultural land was counted as 1 ERC for culinary use only since irrigation is not provided for agricultural uses. The projected ERCs were then added to the existing "corrected" water model to check the capacity of the lines and the water pressures for both the indoor use only model and the indoor/outdoor use model.

5.5.2 Results

The water model was then run to identify what infrastructure changes are still needed for build out. This was done as a comparison to determine what deficiencies of the current model could not be solved by developer-installed water lines looping the current system (all lines assumed to be 8" dia or larger per City code).

From the analysis it was determined that the following changes to the system are required.

1. A new pressure zone was created with one of the tanks that will be required for build out. Tank to be installed at a higher elevation than the current tanks for increased pressures along the bench. PRVs to be installed on the bottom of the new pressure zone. The new pressure zone will provide a higher pressure threshold for homes along the bench and allow more time for the system to increase fire flows before hitting the 20-psi minimum.

2. 4" main lines need to be replaced as they continue to create deficiencies for fire flow requirements and are not in compliance with the fire code for minimum sizing. (2700 South & 2950 South)

3. Replaced 2" main line crossing HWY 89 with 6" PRVs.

4. 8" dead end lines need to be replaced with 12" mains.

5. 6" dead end lines with FF on the system need to be replaced with minimum 8" lines.

[3] *This was done by request of the city manager in anticipation of a ¼ acre lot build out.*

Appendix D contains the approximate future water model schematic with the appropriately sized water lines.

5.6 Projects

The following is a summarized list of the water distribution system projects listed by type: maintenance, existing system deficiency, or future system deficiency. Section 6 groups and prioritizes these individual pipe segments into projects. It is anticipated that outdoor use demands will not pose additional need for distribution projects since distribution lines are generally sized for high fire flow (1500 gpm) which surpasses the outdoor/indoor use peak day flow rate of 1190 gpm. These projects are graphically represented on Exhibit 7.1 Projects Map.

5.6.1 Existing Water System Maintenance Projects

Project #	Project	Description/Purpose
1	PRV Repair Replacements	Replace broken PRVs and adjust settings on PRV to match model pressure zone settings.
2	Fire Hydrant Upgrades.	Repair existing fire hydrants that are leaking or in need of repair.

5.6.2 Existing Water System Deficiencies

Project #	Location	Project	Description/Purpose
1	3200 South	New Storage Tank	A new tank installed at higher elevation creating pressure zone for east bench homes will allow for higher flow to service most locations that are currently deficient before 20 psi minimum is achieved.
2	3000 S & 3450 South	Replace 2” Water lines with 6” PRVs	Pipes are connected across pressure boundary. New PRV’s will ensure pressure is distributed correctly.
3	2700 S (West Side) From 1200 West to Frontage Rd.)	Update 4” Pipe to 8” Pipe	Improve fire flow of fire hydrant on the current line until the time of looping can occur.
4	2875 S Cul-de-sac	Update 8” Pipe with 10” Pipe	Improve fire flow of fire hydrant on the current line.
5	2950 S (West Side) From 1450 W to Frontage Rd.	Update 4” Pipe to 12” Pipe.	Improve fire flow until looping can occur. (Note: No Fire Hydrants are installed on this line.)
6	3600 South (East Side From 400 West to HWY 89	Update 6” Pipe to 8” Pipe	Project #1 would likely increase the likelihood of higher flows here before reaching 20 psi

			minimum. However, an 8” pipe would help in the interim.
7	HWY 89 (East Side) 3400 South to Southern City Limit	Update 6” pipe to 10” pipe.	Since there is no future plan to completely loop the end of HWY 89, increasing the flow in this area is crucial to fire flow. However, secondary to projects 1 and 2, increasing diameter raises fire flow in the area to 1400 min.
8	HWY 89 (West Side) from 3000 S to Southern City Limit	Update 6” Pipe to 10” Pipe	Future looping would solve this deficiency but in the interim a 10” line would provide 1350 gpm minimum of FF.
9	Valley View Dr. Finish 12” Loop	12” pipe	Fire flow is deficient currently but finalizing the loop solves the issue.

5.6.3 Future Deficiencies of Existing Infrastructure

These projects may be impact fee eligible.

Project #	Project	Description/Purpose
1	3200 South Future Tank	Since the City will be required to build an additional tank for water storage, this tank could be strategic in providing higher pressures for residents on the East bench. If this issue is left unresolved pressures will likely be too low.
2	16” Water Main from New 3200 S Future Tank to Existing System	Pipe will connect the new tank to the existing system.
3	10” Water Main from Future South Bench Well # 6	When Well #6 is constructed, a pipeline from the pumpstation will need to loop into the existing system.
4	12” Water Main from Future 1750 Water	When the 1750 South Tank is constructed, water will need to be conveyed from tank to existing system.
5[1]	Southern Water Reservoir Overflow Drainage Basin	With additional sources pumping into the water system on a peak day, these small tanks have a risk of overflowing. Without a catchment basin, there is a high risk of flooding nearby properties.
6[1]	8” Waterline Realignment – 1200 South to 1425 South (Mace Street)	The general plan requires that this road be realigned for new development to occur. The existing waterline is located in an unacceptable location for future development.
7[1]	Replace 2” Waterline with 8” – 1700 S	For future development to occur and achieve adequate fire flow, this waterline needs to be upsized.

[1]Project added with 2025 amendment

6. ASSET MANAGEMENT, PROJECTS, AND COST ESTIMATES

6.1 Asset Management System

Perry City does not have a formal asset management system, but rather, relies on the knowledge of its Public Works employees. An asset management system would track the age of existing infrastructure as well as identify problem areas in a GIS database. This would then become the basis for making decisions on repair and replacement-type projects. Due to the inevitable change in personnel and, therefore, the loss of their institutional knowledge of the system, it is recommended that the City implement an asset management program to ensure that the system's data is maintained in a central location and accessible by those who need the information, both now and in the future.

6.2 Projects and Cost Estimates

As detailed in the previous sections, the existing and future water systems have been analyzed to determine needed system improvements. These improvements have been grouped, mainly by geography and type, and prioritized based on criticality to meet/service the public and condition. The projects and their associated ratings are shown in Table 6.2.

While some of these projects will be driven by development, others are necessary to provide better efficiency and reliability of the system. Consequently, these projects may be constructed and/or funded in part or entirely by either developers or by the City. Therefore, the project costs were evaluated and categorized to reflect these conditions.

- A summarized list of the projects and their associated costs is shown in Table 6.2.
- An itemized cost estimate for each project is included in Appendix E.
- A map of the City showing a conceptual layout of each project and its location is included as Exhibit 7.1 Projects Map.

LEGEND

- 4 INCH
- 6 INCH
- 8 INCH
- 10 INCH+
- FUTURE WATER LINE

PROJECT 14) 1750 S WATER TANK
INDOOR ONLY = 0.7 MG
IRR & INDOOR = 2 MG

PROJECT 15) 12" WATER MAIN FROM 1750 S WATER TANK TO EXISTING SYSTEM.

PROJECT 2C) 8" WATERMAIN REALIGNMENT

PROJECT 9) NEW 6" PRESSURE REDUCER VALVES

PROJECT 2B) REPLACE 2" WATERLINE WITH 8" WATER MAIN

PROJECT 13) 10" WATER MAIN
L= 4310'

PROJECT 5) 8" WATER MAIN
L= 1760 '

PROJECT 10) 8" WATER MAIN
L= 4000'

PROJECT 19) 12" WATER MAIN
L= 671'

PROJECT 16) 10" WATER MAIN TO GUN RANGE
L= 5530'

PROJECT 1) 6" PRESSURE REDUCING VALVE ACROSS HWY 89

PROJECT 12) 10" WATER MAIN REPLACEMENT ON EAST SIDE OF HWY 89 3000 S TO 3600 S
L = 6250'

PROJECT 9)
12" WATER MAIN LOOP AND NEW DISTRIBUTION CREATED WITH 4 PRV. RELOCATE EX. PRV BEYOND MAPLE HILLS SUBDIVISION.
L = 1060'

PROJECT 2A) SOUTHERN WATER RESERVOIR OVERFLOW DRAINAGE BASIN

PROJECT 4) WELL #1
RE-DRILLING.

PROJECT 3) 10" WATER MAIN FROM WELL 5 TO DISTRIBUTION SYSTEM.

PROJECT 8) NIELSON WELL REHABILITATION (WELL #5) Q= 550 GPM MINIMUM.

PROJECT 6) 200 SOUTH WATER TANK
INDOOR ONLY = 0.3 MG (MIN)
IRR & INDOOR = 2 MG (MIN)

1100 SOUTH
1500 SOUTH
1700 SOUTH
1650 SOUTH
1750 SOUTH
1800 SOUTH
2000 SOUTH
2250 SOUTH
2325 SOUTH
2300 SOUTH
2235 SOUTH
2450 SOUTH
2520 SOUTH
2400 SOUTH
2500 SOUTH
2540 SOUTH
2600 SOUTH
2625 SOUTH
2700 SOUTH
2950 SOUTH
3000 SOUTH
3050 SOUTH
3275 SOUTH

INTERSTATE 15
HIGHWAY 89
QUAYLE LANE
CHERRY DR
UPRR
N NIELSEN WAY 14

CONSULTING ENGINEERS
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South Ogden, Utah 84403
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PERRY CITY CORPORATION
2023 CULINARY WATER CFP

NORTH WATER PROJECTS EXHIBITS 7.1

REV.	DATE	APPR.

AMO DESIGNED
AMO DRAWN
BKJ CHECKED

SCALE:
22"x34" H:1"=50'
11"x17" H:1"=100

SHEET:
7.1
OF 1 SHEETS

PROJECT 13) 10" WATER MAIN
L= 4310'

PROJECT 5) 8" WATER MAIN
L= 1760 '

PROJECT 10) 8" WATER MAIN
L= 4000'

PROJECT 19) 12" WATER MAIN
L= 671'

PROJECT 16) 10" WATER MAIN
TO GUN RANGE
L= 5530'

PROJECT 1) 6" PRESSURE
REDUCING VALVE ACROSS HWY 89

PROJECT 12) 10" WATER MAIN
REPLACEMENT ON EAST SIDE OF
HWY 89 3000 S TO 3600 S
L = 6250'

PROJECT 20) 10" WATER MAIN
L= 1650'

PROJECT 11) 10" WATER MAIN
L= 6100'

PROJECT 9)
12" WATER MAIN LOOP AND NEW
DISTRIBUTION CREATED WITH 4 PRV.
RELOCATE EX. PRV BEYOND MAPLE
HILLS SUBDIVISION.
L = 1060'

PROJECT 2A) SOUTHERN WATER
RESERVOIR OVERFLOW DRAINAGE BASIN

PROJECT 4) WELL #1
RE-DRILLING.

PROJECT 3) 10" WATER MAIN FROM
WELL 5 TO DISTRIBUTION SYSTEM.

PROJECT 8) NIELSON WELL
REHABILITATION (WELL #5) Q= 550
GPM MINIMUM.

PROJECT 6) 200 SOUTH WATER TANK
INDOOR ONLY = 0.3 MG (MIN)
IRR & INDOOR = 2 MG (MIN)

PROJECT 7) 6" PVC PIPE FROM
3200 SOUTH WATER TANK.
L = 1150 LF

PROJECT 18) 8" WATER MAIN ON 800
WEST LOOP WITH HWY 89.

FROM SOUTH BENCH WELLS TO 3200
S WATER TANK AND TO EXISTING
SYSTEM.

PROJECT 17) SOUTH BENCH WELLS
(WELL #6) Q = 550 GPM MIN.

LEGEND

4 INCH	W W
6 INCH	W W
8 INCH	W W
10 INCH+	W W
FUTURE WATER LINE	

CONSULTING ENGINEERS
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PERRY CITY CORPORATION
2023 CULINARY WATER CFP

SOUTH WATER PROJECTS EXHIBITS 7.1

REV.	DATE	APPR.

AMO DESIGNED
AMO DRAWN
ZJB CHECKED

SCALE:
22"x34" H:1"=50'
11"x17" H:1"=100

SHEET:
7.1
OF 1 SHEETS

Table 6.2. Project Ratings-Indoor Use Only

Project #	Project Description	Rated 1-5 with 5 being highest priority and 0 being only with development			Total Rating
		Criticality	Condition	When Needed	
1	Replace 2" Crossing Pipe with 6" PRV. Across HWY 89 @ 3600 South	5	5	5	**5**
2	Replace 2" Crossing Pipe with 6" PRV. Across HWY 89 @ 3000 South	5	5	5	**5**
2a[1]	Southern Water Reservoir Overflow Drainage Basin	4	5	5	**4.6**
2b[1]	Replace 2" Waterline with 8" – 1700 South	3	3	5	**3.6**
2c[1]	8" Waterline Realignment – 1200 South to 1425 South (Mace Street)	3	3	5	**3.6**
3	10" Water Main on 3000 South (from 400 West to HWY 89)	4	3	4	**3.6**
4	Well # 1 – Redrilling	4	5	2	**3.6**
5	8" Water Main on 2700 S (900 W to 1200 West)	3	5	3	**3.6**
6	New Water Tank – Future 3200 South	5	0	5	**3.3**
7	16" Water Main on 3200 S	5	0	5	**3.3**
8	Nielson Well Rehab – Well #5	5	0	5	**3.3**
9	12" Water Main – Finish Loop Valley View	5	0	5	**3.3**
10	8" Water Main on 2700 South (1200 West to I-15)	2	5	2	**3**
11	10" Water Main HWY 89 -West Side (3000 S to 3600 S)	2	5	2	**3**
12	10" Water Main HWY 89 -East Side) (3000 S to 3600 S)	2	5	2	**3**
13	10" Water Main on West Side HWY 89 (1950 S to Larsen Ave)	2	5	2	**3**
14	New Water Tank – 1750 S	3	0	3	**2**
15	12" Water Main on 1750 S	3	0	3	**2**
16	10" Water Main to Gun Range	2	0	2	**1.3**
17	South Bench Well	1	0	2	**1**
18	10" Main on 800 West	1	0	2	**1**
19	12" Water Main on 2950 S (1400 West to I – 15)	1	0	1	**0.6**
20	10" Water Main on 3550 South	1	0	1	**0.6**

[1]Project added with 2025 amendment

Table 6.2.1 Additional Indoor/Outdoor Use Projects

Project #	Project Description	Rated 1-5, with 5 being highest priority and 0 being only with development			Total Rating
		Criticality	Condition	When Needed	
21	Future Well # 7 W/ Pump Station	0	0	1	**0.3**
22	Future Well #8 W/ Pump Station	0	0	1	**0.3**
23	Future Well # 9 W/ Pump Station	0	0	1	**0.3**
24	Future Well # 10 W/ Pump Station	0	0	1	**0.3**
25	Future Well #11 W/Pump Station	0	0	1	**0.3**
26	Future Well #12 W/Pump Station	0	0	1	**0.3**
27	Future Well #13 W/Pump Station	0	0	1	**0.3**
28	Future Well #14 W/Pump Station	0	0	1	0.3
29	Future Well #15 W/Pump Station	0	0	1	**0.3**
30	Future Well #16 W/Pump Station	0	0	1	**0.3**
31	Future Well #17 W/Pump Station	0	0	1	**0.3**
32	Future Well #18 W/Pump Station	0	0	1	**0.3**
33	Future Well #19 W/Pump Station	0	0	1	**0.3**
34	1.25 MG additional Storage for 3200 Southern East Bench Tank.	0	0	1	**0.3**
35	1.25 MG additional Storage for 1750 South Tank	0	0	1	**0.3**
36	New Water Tank (1.25 MG)	0	0	1	**0.3**

Table 6.2.2. Projects Cost Summary

Project No.	Project Description	Total Estimated Cost	Cost Breakdown			
			Replacement/ Deficiency/ Expansion	Impact Fee Eligible	Developer Cost	Proposed Budget Year
1	Replace 2" Crossing Pipe with 6" PRV. Across HWY 89 @ 3600 South	$201,292.00	Deficiency	75%	$150,969.00	2024
2	Replace 2" Crossing Pipe with 6" PRV. Across HWY 89 @ 3000 South	$198,155.75	Deficiency	75%	$148,616.00	2024
2a[1]	Southern Water Reservoir Overflow Drainage Basin	$186,357.60	Expansion	100%	$186,357.60	2026
2b[1]	Replace 2" Waterline with 8" – 1700 South	$595,445.50	Expansion	100%	$595,445.50	2026
2c[1]	8" Waterline – 1200 South to 1425 South (Mace Street)	$486,980.00	Expansion	100%	$486,980.00	2026
3	10" Water Main on 3000 South (from 400 West to HWY 89)	$447,374.00	Replacement	50%	223,687.00	2026
4	Well # 1 – Redrilling	$3,666,000.00	Replacement	50%	$1,833,000	2033
5	8" Water Main on 2700 S (900 W to 1200 West)	$389,902.50	Replacement	0%	$0	2030
6	New Water Tank – Future 3200 South	$2,821,000.00	Expansion	100%	$2,821,000.00	2026
7	16" Water Main on 3200 S	$351,130.00	Expansion	100%	$351,130.00	2026
8	Nielson Well Rehab – Well #5	$3,289,000.00	Expansion	100%	$3,289,000.00	2025
9	12" Water Main – Finish Loop Valley View	$852,878.00	Expansion	100%	$852,878.00	2027
10	8" Water Main on 2700 South (1200 West to I-15)	$705,315.00	Replacement	0%	$0	2028
11	10" Water Main HWY 89 -West Side (3000 S to 3600 S)	$1,069,250.00	Replacement/ Expansion	50%	$534,625.00	2030

12	10” Water Main HWY 89 -East Side) (3000 S to 3600 S)	$1,021,897.50	Replacement/ Expansion	50%	$510,950.00	2033
13	10” Water Main on West Side HWY 89 (1950 S to Larsen Ave)	$1,039,350.00	Replacement	36%	$374.170.00	2033
14	New Water Tank - 1750 S	$2,703,556.82	Expansion	100%	$2,703,556.82	20XX
15	12” Water Main on 1750 S	$381,972.50	Expansion	100%	$381,927.50	20XX
16	10” Water Main to Gun Range Area	$1,191,775.00	Expansion	100%	$1,191,775.00	20XX
17	3600 West Well #6	$3,666,000.00	Expansion	100%	$3,666,000.00	20XX
18	10” Main on 800 West	$955,726.80	Expansion	100%	$955,726.80	20XX
19	12” Water Main on 2950 S (1400 West to I – 15)	$153,647.00	Expansion/ Replacement	75%	$115,235	20XX
20	10” Water Main on 3550 South	$291,330.00	Expansion	100%	$104,878.80	20XX
21	*Future Well #7 W/ Pump Station	$2.5M	Expansion	100%	$2.5M	2080
22	*Future Well #8 W/ Pump Station & 47 acre-ft of Water Rights	2.65M	Expansion	100%	$2.65M	2090

** Future Well Projects are for indoor use only scenario*

[1]Project added with 2025 amendment

Table 6.2.3. Additional Indoor/Outdoor Projects Cost Summary

Project No.	Project Description	Total Estimated Cost	Cost Breakdown			
			Replacement/ Deficiency/Expansion	Impact Fee Eligible	Developer Cost	Proposed Budget Year
21	**Well #5 Nielson Well Rehab W/ Pump Station	$3.3 M	Expansion	100%	$3.3M	2030
22	**Well #6 3200 South W/ Pump Station	$3.3M	Expansion	100%	$3.3M	2030
23	Future Well #7 W/ Pump Station & 230 ac-ft Water Right	3.3 M	Expansion	100%	$3.3M	2040
24	Future Well # 8 W/ Pump Station & 230 ac-ft Water Right	$3.3M	Expansion	100%	$3.3M	2050
25	Future Well # 9 W/ Pump Station & 230 ac-ft Water Right	$3.3M	Expansion	100%	$3.3M	2050
26	Future Well # 10 W/ Pump Station & 230 ac-ft Water Right	$3.3M	Expansion	100%	$3.3M	2060
27	Future Well #11 W/ Pump Station & 230 ac-ft Water Right	$3.3M	Expansion	100%	$3.3M	2060
28	Future Well #12 W/ Pump Station & 230 ac-ft Water Right	$3.3M	Expansion	100%	$3.3M	2070
29	Future Well #13 W/ Pump Station & 230 ac-ft Water Right	$3.3M	Expansion	100%	$3.3M	2070
30	Future Well # 14 W/ Pump Station & 230 ac-ft Water Right	$3.3M	Expansion	100%	$3.3M	2080
31	Future Well # 15 W/ Pump Station & 230 ac-ft Water Right	$3.3M	Expansion	100%	$3.3M	2080
32	Future Well # 16 W/ Pump Station & 230 ac-ft Water Right	$3.3M	Expansion	100%	$3.3M	2080
33	Future Well # 17 W/ Pump Station & 230 ac-ft Water Right	$3.3M	Expansion	100%	$3.3M	2093

34	Future Well # 18 W/ Pump Station & 230 ac-ft Water Right	$3.3M	Expansion	100%	$3.3M	2093
35	Future Well # 19 W/ Pump Station & 230 ac-ft Water Right	$3.3M	Expansion	100%	$3.3M	2093
36	0.85 MG additional Storage for 3200 Southern East Bench Tank.	$1.7 M	Expansion	100%	$1.7 M	2030
37	1 MG additional Storage for 1750 South Tank (MG)	$2.0 M	Expansion	100%	$2.0 M	2040
38	New Water Tank – (1.5 MG)	$3.0 M	Expansion	100%	$3.0 M	2050
39	New Water Tank – (1 MG)	$2.0 M	Expansion	100%	$2.0 M	2060
40	New Water Tank – (2 MG)	$4.0 M	Expansion	100%	$4.0 M	2070
41	New Water Tank – (1.5 MG)	$3.0 M	Expansion	100%	$3.0 M	2080
42	New Water Tank – (2.5 MG)	$5.0 M	Expansion	100%	$5.0 M	2093

APPENDICES

APPENDIX A

INTERNATIONAL FIRE CODE
TABLE B105.1

TABLE B105.1(1)
REQUIRED FIRE FLOW FOR ONE- AND TWO-FAMILY DWELLINGS, GROUP R-3 AND R-4 BUILDINGS AND TOWNHOUSES

FIRE-FLOW CALCULATION AREA (square feet)	AUTOMATIC SPRINKLER SYSTEM (Design Standard)	MINIMUM FIRE FLOW (gallons per minute)	FLOW DURATION (hours)
0–3,600	No automatic sprinkler system	1,000	1
3,601 and greater	No automatic sprinkler system	Value in Table B105.1(2)	Duration in Table B105.1(2) at the required fire-flow rate
0–3,600	Section 903.3.1.3 of the *International Fire Code* or Section P2904 of the *International Residential Code*	500	$^1/_2$
3,601 and greater	Section 903.3.1.3 of the *International Fire Code* or Section P2904 of the *International Residential Code*	$^1/_2$ value in Table B105.1(2)	1

For SI: 1 square foot = 0.0929 m^2, 1 gallon per minute = 3.785 L/m.

TABLE B105.1(2)
REFERENCE TABLE FOR TABLES B105.1(1) AND B105.2

FIRE-FLOW CALCULATION AREA (square feet)					FIRE FLOW (gallons per minute)[b]	FLOW DURATION (hours)
Type IA and IB[a]	Type IIA and IIIA[a]	Type IV and V-A[a]	Type IIB and IIIB[a]	Type V-B[a]		
0-22,700	0-12,700	0-8,200	0-5,900	0-3,600	1,500	2
22,701-30,200	12,701-17,000	8,201-10,900	5,901-7,900	3,601-4,800	1,750	
30,201-38,700	17,001-21,800	10,901-12,900	7,901-9,800	4,801-6,200	2,000	
38,701-48,300	21,801-24,200	12,901-17,400	9,801-12,600	6,201-7,700	2,250	
48,301-59,000	24,201-33,200	17,401-21,300	12,601-15,400	7,701-9,400	2,500	
59,001-70,900	33,201-39,700	21,301-25,500	15,401-18,400	9,401-11,300	2,750	
70,901-83,700	39,701-47,100	25,501-30,100	18,401-21,800	11,301-13,400	3,000	3
83,701-97,700	47,101-54,900	30,101-35,200	21,801-25,900	13,401-15,600	3,250	
97,701-112,700	54,901-63,400	35,201-40,600	25,901-29,300	15,601-18,000	3,500	
112,701-128,700	63,401-72,400	40,601-46,400	29,301-33,500	18,001-20,600	3,750	
128,701-145,900	72,401-82,100	46,401-52,500	33,501-37,900	20,601-23,300	4,000	4
145,901-164,200	82,101-92,400	52,501-59,100	37,901-42,700	23,301-26,300	4,250	
164,201-183,400	92,401-103,100	59,101-66,000	42,701-47,700	26,301-29,300	4,500	
183,401-203,700	103,101-114,600	66,001-73,300	47,701-53,000	29,301-32,600	4,750	
203,701-225,200	114,601-126,700	73,301-81,100	53,001-58,600	32,601-36,000	5,000	
225,201-247,700	126,701-139,400	81,101-89,200	58,601-65,400	36,001-39,600	5,250	
247,701-271,200	139,401-152,600	89,201-97,700	65,401-70,600	39,601-43,400	5,500	
271,201-295,900	152,601-166,500	97,701-106,500	70,601-77,000	43,401-47,400	5,750	
295,901-Greater	166,501-Greater	106,501-115,800	77,001-83,700	47,401-51,500	6,000	
—	—	115,801-125,500	83,701-90,600	51,501-55,700	6,250	
—	—	125,501-135,500	90,601-97,900	55,701-60,200	6,500	
—	—	135,501-145,800	97,901-106,800	60,201-64,800	6,750	
—	—	145,801-156,700	106,801-113,200	64,801-69,600	7,000	
—	—	156,701-167,900	113,201-121,300	69,601-74,600	7,250	
—	—	167,901-179,400	121,301-129,600	74,601-79,800	7,500	
—	—	179,401-191,400	129,601-138,300	79,801-85,100	7,750	
—	—	191,401-Greater	138,301-Greater	85,101-Greater	8,000	

For SI: 1 square foot = 0.0929 m^2, 1 gallon per minute = 3.785 L/m, 1 pound per square inch = 6.895 kPa.

a. Types of construction are based on the *International Building Code*.

b. Measured at 20 psi residual pressure.

APPENDIX B

EXISTING WATER SYSTEM MODEL AND OUTPUT

[TITLE]
Perry City Water System Model
The elevations for each node are at surface elevation from 2013 AGRC lidar data.
Residential demands are approximately 0.38 gpm per residence.
Nodes without an "n" desigation at the beginning are additions since the original model.
NEW LINE SIZES TO SW QUADRANT OF CITY:
- New 12" on west side of US-89 (2700 S to 3000 S)
- New 8" on 3000 S (US-89 to 1200 W)
- New 8" on 1200 W (2950 S to Pheasant Hollow)
- New 12" on 1200 W (Cherry Ridge to 3600 S)
- New 8" on 2450 S (1200 W to 1350 W)
- 1500 gpm fire flow at 1200 W south end

[JUNCTIONS]

;ID	Elev	Demand	Pattern	
n4	4387	9.00	1	;
n5	4383	7.00	1	;
n7	4373	13.00	1	;
n9	4375	7.00	1	;
n10	4358	10.00	1	;
n13	4400	12.00	1	;
n14	4425	6.00	1	;
n16	4420	6.00	1	;
n19	4407	1.00	1	;
n20	4417	9.00	1	
;Stokes Spring (35 gpm)				
n21	4365	7.00	1	;
n24	4542	0.00		;
n26	4517	8.00	1	;
n28	4446	1.00	1	;
n29	4448	13.00	1	;
n30	4456	9.00	1	;
n31	4482	10.00	1	;
n32	4510	9.00	1	;
n33	4466	12.00	1	;
n35	4397	0.00		;
n36	4392	8.00	1	;
n37	4386	6.00	1	;
n39	4409	5.00	1	;
n41	4458	4.00	1	;
n42	4462	3.00	1	;
n43	4463	5.00	1	;
n44	4470	4.00	1	;
n45	4522	13.00	1	;
n46	4528	2.00	1	;
n47	4511	5.00	1	;
n48	4525	2.00	1	;
n49	4370	10.00	1	;
n50	4363	6.00	1	;

```
n51                 4316            21.00           1                   ;
n52                 4307            9.00            1                   ;
n53                 4322            11.00           1                   ;
n54                 4333            21.00           1                   ;
n56                 4557            0.00                                ;
n58                 4503            9.00            1                   ;
n60                 4473            4.00            1                   ;
n61                 4471            6.00            1                   ;
n62                 4512            2.00            1                   ;
n63                 4444            13.00           1                   ;
n65                 4454            5.00            1                   ;
n68                 4289            4.00            1                   ;
n69                 4296            7.00            1                   ;
n70                 4324            6.00            1                   ;
n73                 4416            7.00            1                   ;
n75                 4331            10              1                   ;
n77                 4354            28.00           1                   ;
n78                 4349            3.95            1                   ;
n79                 4372            7.00            1                   ;
n80                 4369            4.00            1                   ;
n83                 4370            8.00            1                   ;
n84                 4354            6.00            1                   ;
n88                 4422            10.00           1                   ;
n91                 4375            5.00            1                   ;
n92                 4406            5.00            1                   ;
n93                 4412            3.00            1                   ;
n94                 4467            5.00            1                   ;
n96                 4474            3.00            1                   ;
n97                 4384            4.00            1                   ;
n99                 4415            15.00           1                   ;
n100                4401            11.00           1                   ;
n101                4421            15.00           1                   ;
n102                4418            7.00            1                   ;
n105                4400            8.00            1                   ;
n106                4393            4.00            1                   ;
n108                4376            8.00            1                   ;
n109                4378            5.00            1                   ;
n110                4382            4.00            1                   ;
n111                4388            6.00            1                   ;
n113                4371            6.00            1                   ;
n114                4367            7.00            1                   ;
n116                4374            6.00            1                   ;
n118                4381            8.00            1                   ;
n121                4325            5.00            1                   ;
n122                4309            8.00            1                   ;
n123                4288            8.00            1                   ;
n124                4270            13.00           1                   ;
n126                4261            15.00           1                   ;
n127                4274            10.00           1                   ;
n130                4282            7.00            1                   ;
```

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n131                    4322            10.00           1                       ;
n137                    4319            2.00            1                       ;
n140                    4287            15.00           1                       ;
n142                    4302            5.00            1                       ;
n143                    4313            9.00            1                       ;
n146                    4304            12.00           1                       ;
n147                    4295            12.00           1                       ;
n148                    4296            14.00           1                       ;
n150                    4274            4.00            1                       ;
n151                    4273            1.00            1                       ;
n152                    4330            11.00           1                       ;
n155                    4346            2.00            1                       ;
n156                    4362            1.00            1                       ;
n157                    4366            2.00            1                       ;
n158                    4375            8.00            1                       ;
n159                    4348            6.00            1                       ;
n160                    4359            4.00            1                       ;
n165                    4276            0.00                                    ;
n168                    4306            5.00            1                       ;
n169                    4298            8.00            1                       ;
n170                    4578            0.00                                    ;
n171                    4446            16.00           1                       ;
n174                    4367            4.00            1                       ;
n177                    4388            17.00           1                       ;
n179                    4366            2.00            1                       ;
n181                    4332            4.00            1                       ;
n182                    4331            2.00            1                       ;
n183                    4331            7.00            1                       ;
n184                    4303            6.00            1                       ;
n187                    4295            26.00           1                       ;
n188                    4291            0.00                                    ;
n192                    4451            15.00           1                       ;
n193                    4415            10.00           1                       ;
n194                    4379            9.00            1                       ;
n195                    4330            1.00            1                       ;
n197                    4374            4.00            1                       ;
n199                    4391            6.00            1                       ;
n201                    4397            2.00            1                       ;
n202                    4377            10.00           1                       ;
n203                    4397            9.00            1                       ;
n205                    4265            11.00           1                       ;
n212                    4258            2.00            1                       ;
n232                    4459            7.00            1                       ;
n235                    4486            2.00            1                       ;
n241                    4449            12.00           1                       ;
n242                    4450            2.00            1                       ;
n246                    4455            10.00           1                       ;
n249                    4326            33.00           1                       ;
n251                    4373            12.00           1                       ;
n253                    4337            14.00           1                       ;
```

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 n256                    4449            9.00            1                       ;
 n257                    4445            2.00            1                       ;
 n261                    4552            1               1                       ;27
 n266                    4373            10.00           1                       ;
 n267                    4356            9.00            1                       ;
 n272                    4370            5.00            1                       ;
 n274                    4377            4.00            1                       ;
 n277                    4300            11.00           1                       ;
 n287                    4279            2.00            1                       ;
 n290                    4273            6.00            1                       ;
 n291                    4272            2.00            1                       ;
 n300                    4317            11.00           1                       ;
 n305                    4513            1.00            1                       ;
 n308                    4512            1.00            1                       ;
 n314                    4384            6.00            1                       ;
 n315                    4379            9.00            1                       ;
 n316                    4412            5.00            1                       ;
 n320                    4377            14.00           1                       ;
 n323                    4416            5.00            1                       ;
 n324                    4384            10.00           1                       ;
 n325                    4398            7.00            1                       ;
 n332                    4520            3.00            1                       ;
 n333                    4521            3.00            1                       ;
 n334                    4508            4.00            1                       ;
 n335                    4428            3.00            1                       ;
 n336                    4492            5.00            1                       ;
 n337                    4361            5.00            1                       ;
 n338                    4358            2.00            1                       ;
 n339                    4354            4.00            1                       ;
 n343                    4419            5.00            1                       ;
 n345                    4404            0.00                                    ;
 n352                    4268            0.00                                    ;
 n357                    4242            75.00           1
;Elevation is a guess
 n358                    4394            3.00            1                       ;
 n361                    4440            8.00            1                       ;
 n362                    4390            7.00            1                       ;
 n367                    4325            5.00            1                       ;
 n369                    4302            9.00            1                       ;
 n374                    4314            1               1                       ;T
 n376                    4319            1.00            1                       ;
 n385                    4349            19.00           1                       ;
 n387                    4357            13.00           1                       ;
 n389                    4326            4.00            1                       ;No
demand on Maddox (have there own well)
 n390                    4351            40.00           1                       ;
 n391                    4368            5.00            1                       ;
 n395                    4298            0.00                                    ;
 n397                    4220            63.00           1
;Elevation is a guess
```

```
n398                    4301            12.00           1                       ;
n399                    4327            9.00            1                       ;
n400                    4290            5.00            1                       ;
n406                    4323            5.00            1                       ;
n407                    4358            10.00           1                       ;
n408                    4360            1.00            1                       ;
n409                    4361            4.00            1                       ;
n410                    4364            7.00            1                       ;
n416                    4379            2.00            1                       ;
n418                    4398            8.00            1                       ;
n420                    4330            17.00           1                       ;
n421                    4332            7.00            1                       ;
n423                    4310            3.00            1                       ;
n424                    4289            3.00            1                       ;
n429                    4310            8.00            1                       ;
n430                    4398            1.00            1                       ;
n436                    4365            11.00           1                       ;
n437                    4373            9.00            1                       ;
n438                    4388            10.00           1                       ;
n440                    4386            1.00            1                       ;
n443                    4302            8.00            1                       ;
n444                    4291            9.00            1                       ;
n445                    4313            4.00            1                       ;
n446                    4314            3.00            1                       ;
n447                    4467            9.00            1                       ;
n448                    4448            2.00            1                       ;
n449                    4329            5.00            1                       ;
n450                    4445            0.00                                    ;
n451                    4441            3.00            1                       ;
n453                    4509            2.00            1                       ;
n457                    4361            8.00            1                       ;
n458                    4377            12.00           1                       ;
n459                    4374            6.00            1                       ;
n460                    4370            12.00           1                       ;
n467                    4452            5.00            1                       ;
n468                    4433            5.00            1                       ;
n472                    4373            11.00           1                       ;
n473                    4371            0.00                                    ;
n475                    4352            9.00            1                       ;
n477                    4415            4.00            1                       ;
n478                    04428           5.00            1                       ;
n479                    4420            3.00            1                       ;
n480                    4429            4.00            1                       ;
n481                    4411            8.00            1                       ;
n493                    4446            6.00            1                       ;
n494                    4457            3.00            1                       ;
n495                    4503            4.00            1                       ;
n496                    4277            1.00            1                       ;
n500                    4338            5.00            1                       ;
n511                    4316            6.00            1                       ;
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 n512                    4448            4.00            1                       ;
 n516                    4397            3.00            1                       ;
 n518                    4511            62.00           1                       ;
 n527                    4284            12.00           1                       ;
 1                       4467            13.00           1                       ;
 2                       4496            4.00            1                       ;
 3                       4392            6.00            1                       ;
 4                       4308            7.00            1                       ;
 5                       4482            2.00            1                       ;
 6                       4502            4.00            1                       ;
 7                       4306.5          1.00            1                       ;
 16                      4497            0.00                                    ;
 17                      4312            2.00            1                       ;
 18                      4281            22.00           1                       ;
 8                       4274            8               1                       ;
 9                       4435            2.00            1                       ;
 12                      4450            4.00            1
;Elevation from Design Drawings
 13                      4452            5.00            1
;Elevation from Design Drawings
 14                      4452            1.00            1
;Elevation from Design Drawings
 15                      4521            1.00            1
;Elevation from Design Drawings
 19                      4520            11.00           1
;Elevation from Design Drawings
 20                      4266            8.00            1
;Elevation from Design Drawings
 21                      4268            2.00            1
;Elevation from Design Drawings
 22                      4267            3.00            1
;Elevation from Design Drawings
 23                      4288            8.00            1                       ;
 24                      4240            4.00            1
;Elevation is a guess
 25                      4277            65.00           1                       ;
 26                      4283            3.00            1                       ;
 30                      4424            5.00            1                       ;
 31                      4412            3.00            1                       ;
 32                      4458            6.00            1                       ;
 33                      4464            3.00            1                       ;
 34                      4492            5.00            1                       ;
 35                      4470            4.00            1                       ;
 27                      4328            18.00           1                       ;
 28                      4297            8.00            1                       ;
 29                      4329            11.00           1                       ;
 36                      4299            14.00           1                       ;
 37                      4298            6.00            1                       ;
 38                      4270            11.00           1                       ;
 39                      4269            4.00            1                       ;
```

```
 40                    4392          9                                  ;
 41                    4391          0                                  ;
 42                    4264          2.63          1                    ;
 43                    4350          1.05          1                    ;
 44                    4330          0                                  ;
 45                    4276          0                                  ;
 46                    4278          0                                  ;
 47                    4263          21            1                    ;
 48                    4265          18            1                    ;
 49                    4263          1             1                    ;
 50                    4276          21            1                    ;
 51                    4278          18            1                    ;
 52                    4262          8                                  ;
 53                    4326          0                                  ;
 54                    4326          0                                  ;
 55                    4352          1                                  ;
 56                    4333          7             1                    ;
 57                    4310.5        7             1                    ;
 58                    4293.25       6             1                    ;
 59                    4308.75       6             1                    ;
 66                    4222.75       30                                 ;
 67                    4222          30                                 ;
 68                    4220.5        30                                 ;
 69                    4221          0                                  ;
 70                    4222.5        30                                 ;
 71                    4283          0                                  ;
 60                    4259          8             1                    ;
 61                    4256          7             1                    ;
 62                    4350.5        4                                  ;
 63                    4347          7
;elevation from plan
 64                    4349.5        7
;elevation from plan
 65                    4332.5        4                                  ;
 72                    4377          8                                  ;
 73                    4373.5        8                                  ;
 74                    4305.5        8                                  ;
 75                    4305          0                                  ;
 76                    4400          9                                  ;
 77                    4379          11                                 ;
 78                    4375          0                                  ;
 79                    4374.5        11                                 ;
 80                    4380.25       4                                  ;
 81                    4384          4                                  ;
 82                    4330.75       8                                  ;
 83                    4337.5        8                                  ;
 84                    4329.25       4             1                    ;
 85                    4293          0             1                    ;
 86                    4310          0             1                    ;
 87                    4257.75       6                                  ;
```

```
 88                     4262.5          6                                       ;
 89                     4550            27              1                       ;

[RESERVOIRS]
;ID                    Head            Pattern
 1004                   4500
;East_Bench_Well_House_(Well_#4)
 1001                   4440
;Allen_St_Well_House_(Well_#1)
 1002                   4386                                    ;500 pgm (10-16
hours per day)
 1003                   4448
;Anderson_Well_House_(Well_#3)
 1005                   4511                                    ;Well_House_#5

[TANKS]
;ID                    Elevation       InitLevel       MinLevel        MaxLevel
Diameter        MinVol          VolCurve                Overflow
 2001                   4674            12              0               16
105             0                                       ;East_Bench_Reservoir=1MG
 10                     4581            12              0               16
60              0                                       ;Res300,000gal
 11                     4579            14              0               18
54              0                                       ;Res350,000gal

[PIPES]
;ID                    Node1                   Node2                   Length
Diameter        Roughness       MinorLoss       Status
 p23                    n41                     n42                     178.79
6               110             0               Open    ;
 p24                    n43                     n44                     181.23
6               110             0               Open    ;
 p25                    n45                     n46                     132.82
4               110             0               Open    ;
 p26                    n47                     n48                     199.27
4               110             0               Open    ;
 p29                    n53                     n54                     386.42
8               110             0               Open    ;
 p42                    n79                     n80                     221.53
8               110             0               Open    ;
 p44                    n83                     n84                     503.92
8               110             0               Open    ;
 p50                    n92                     n93                     170.50
6               110             0               Open    ;
 p55                    n101                    n102                    521.91
6               110             0               Open    ;
 p59                    n109                    n110                    123.82
6               110             0               Open    ;
 p61                    n113                    n114                    296.17
6               110             0               Open    ;
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 p81                n147               n148               509.90
8               110             0               Open    ;
 p83                n150               n151               481.09
8               110             0               Open    ;
 p84                n146               n152               640.42
8               110             0               Open    ;
 p87                n157               n158               853.95
8               110             0               Open    ;
 p89                n159               n160               555.12
8               110             0               Open    ;
 p95                n170               n24                346.04
12              110             0               Open    ;
 p109               n193               n194               671.83
8               110             0               Open    ;
 p139               n241               n242               118.24
8               110             0               Open    ;
 p149               n256               n257               250.17
8               110             0               Open    ;
 p170               n290               n291               186.96
8               110             0               Open    ;
 p191               n324               n101               949.11
6               110             0               Open    ;
 p198               n335               n336               656.69
6               110             0               Open    ;
 p199               n325               n29                633.85
6               110             0               Open    ;
 p200               n337               n338               421.64
10              110             0               Open    ;
 p206               n345               n19                477.29
10              110             0               Open    ;
 p207               n28                n345               379.37
10              110             0               Open    ;
 p218               n212               n357               875.78
3               110             0               Open    ;
 p223               n361               n203               521.72
6               110             0               Open    ;
 p224               n316               n362               528.96
6               110             0               Open    ;
 p230               n300               n369               430.11
8               110             0               Open    ;
 p245               n84                n385               627.43
6               110             0               Open    ;
 p249               n338               n390               415.23
8               110             0               Open    ;
 p251               n391               n179               1182.02
8               110             0               Open    ;
 p265               n407               n387               657.04
6               110             0               Open    ;
 p266               n408               n407               359.00
6               110             0               Open    ;
```

```
 p267                n408                n409                520.56
6               110             0       Open    ;
 p270                n409                n156                595.81
6               110             0       Open    ;
 p271                n156                n157                285.28
8               110             0       Open    ;
 p275                n418                n416                280.13
8               110             0       Open    ;
 p281                n75                 n421                746.54
10              110             0       Open    ;
 p292                n418                n430                484.97
6               110             0       Open    ;
 p300                n437                n113                327.23
6               110             0       Open    ;
 p301                n320                n438                499.80
6               110             0       Open    ;
 p306                n430                n77                 2507.73
6               110             0       Closed  ;
 p309                n445                n446                162.16
8               110             0       Open    ;
 p311                n448                n256                312.06
8               110             0       Open    ;
 p314                n195                n450                242.89
10              110             0       Open    ;
 p315                n451                n28                 266.21
6               110             0       Open    ;
 p322                n457                n410                691.60
6               110             0       Open    ;
 p323                n458                n459                274.04
6               110             0       Open    ;
 p324                n460                n458                544.12
6               110             0       Open    ;
 p326                n457                n84                 852.18
6               110             0       Open    ;
 p336                n472                n473                452.82
6               110             0       Open    ;
 p337                n174                n472                617.33
6               110             0       Open    ;
 p342                n477                n478                202.84
8               110             0       Open    ;
 p343                n479                n480                163.42
8               110             0       Open    ;
 p354                n336                n495                151.46
6               110             0       Open    ;
 p365                n94                 n512                312.44
8               110             0       Open    ;
 4                   n65                 n232                188
8               110             0       Open    ;
 7                   n30                 1                   414.09
6               110             0       Open    ;
```

```
 13                 1                  2                  228.19
6          110             0          Open    ;
 14                 n108               n109               259.85
6          110             0          Open    ;
 16                 n105               3                  395.54
6          110             0          Open    ;
 17                 3                  n106               105.77
6          110             0          Open    ;
 18                 n97                n111               154.42
6          110             0          Open    ;
 21                 n99                n102               176.01
6          110             0          Open    ;
 22                 n97                n194               308.08
6          110             0          Open    ;
 23                 n194               n436               243.07
6          110             0          Open    ;
 24                 n97                n100               282.51
6          110             0          Open    ;
 25                 n100               n88                370.19
6          110             0          Open    ;
 28                 n512               n88                278.15
10         110             0          Open    ;
 30                 n159               n155               591.73
8          110             0          Open    ;
 31                 n155               n152               615.00
8          110             0          Open    ;
 32                 n152               n399               299.27
8          110             0          Open    ;
 33                 n399               n70                471.45
8          110             0          Open    ;
 34                 n70                n367               125.72
8          110             0          Open    ;
 35                 n367               n406               685.84
8          110             0          Open    ;
 36                 n52                n53                822.71
8          110             0          Open    ;
 37                 n51                n53                240.66
8          110             0          Open    ;
 38                 n527               n147               639.78
8          110             0          Open    ;
 39                 n147               n146               289.19
8          110             0          Open    ;
 40                 n398               n146               323.36
8          110             0          Open    ;
 41                 n399               n398               614.30
8          110             0          Open    ;
 43                 n69                n443               146.64
8          110             0          Open    ;
 44                 n443               n445               247.70
8          110             0          Open    ;
```

```
 45                 n445                n70                 265.32
8          110             0          Open    ;
 46                 n142                n52                 291.98
8          110             0          Open    ;
 47                 n52                 n511                356.49
8          110             0          Open    ;
 48                 n527                n140                538.67
8          110             0          Open    ;
 49                 n140                n142                780.55
8          110             0          Open    ;
 51                 n511                n54                 812.51
6          110             0          Open    ;
 54                 n511                n131                541.18
8          110             0          Open    ;
 56                 n367                n407                783.49
6          110             0          Open    ;
 58                 n406                n387                688.74
8          110             0          Open    ;
 63                 n181                4                   467.40
8          110             0          Open    ;
 68                 5                   n232                238
8          110             0          Open    ;
 74                 n305                n62                 115.98
8          110             0          Open    ;
 75                 n62                 n308                138.18
8          110             0          Open    ;
 86                 n251                n343                696.57
8          110             0          Open    ;
 89                 n199                n201                227.45
8          110             0          Open    ;
 90                 n199                n358                129.27
6          110             0          Open    ;
 93                 n197                n274                146.35
4          110             0          Open    ;
 94                 n197                n272                273.26
8          110             0          Open    ;
 96                 n315                n314                241.10
6          110             0          Open    ;
 97                 n315                n362                280.67
6          110             0          Open    ;
 98                 n362                n203                308.03
6          110             0          Open    ;
 99                 n203                n323                285.89
6          110             0          Open    ;
 100                n323                n451                281.85
6          110             0          Open    ;
 103                n459                n83                 473.94
8          110             0          Open    ;
 104                n83                 n266                263.20
8          110             0          Open    ;
```

```
 106                    n459                    n315                    267.32
6               110             0               Open    ;
 107                    n266                    n315                    383.41
8               110             0               Open    ;
 109                    n21                     n79                     338.66
6               110             0               Open    ;
 110                    n79                     n459                    273.37
6               110             0               Open    ;
 112                    n114                    n320                    590.60
8               110             0               Open    ;
 113                    n320                    n324                    318.79
8               110             0               Open    ;
 114                    n324                    n440                    79.76
8               110             0               Open    ;
 117                    n440                    n325                    254.16
8               110             0               Open    ;
 118                    n325                    n316                    177.79
8               110             0               Open    ;
 119                    n316                    n335                    148.88
8               110             0               Open    ;
 120                    n335                    n195                    62.52
6               110             0               Open    ;
 1                      n453                    n24                     378.67
10              110             0               Open    ;
 102                    n113                    n116                    283.68
6               110             0               Open    ;
 121                    n30                     n31                     398.59
8               110             0               Open    ;
 126                    n47                     n45                     326.24
8               110             0               Open    ;
 130                    n92                     n193                    322.16
8               110             0               Open    ;
 131                    n193                    n88                     282.10
8               110             0               Open    ;
 140                    n77                     n339                    79.43
2               110             0               Closed  ;Normally Closed
 142                    n385                    n267                    363.66
8               110             0               Open    ;
 145                    n142                    n51                     757.91
8               110             0               Open    ;
 146                    n152                    n409                    714.58
8               110             0               Open    ;
 147                    n457                    n21                     226.76
6               110             0               Open    ;
 155                    n424                    n123                    134.05
8               110             0               Open    ;
 165                    n369                    n277                    340.22
8               110             0               Open    ;
 166                    n277                    n188                    343.45
8               110             0               Open    ;
```

```
 168                n416               n49                287.31
8          110          0          Open    ;
 171                n148               n143               452.41
8          110          0          Open    ;
 172                n143               n137               101.90
8          110          0          Open    ;
 173                n150               n527               1203.06
8          110          0          Open    ;
 174                n212               n511               2291.14
4          110          0          Open    ;
 175                n4                 n481               333.21
10         110          0          Open    ;
 176                n481               n448               434.61
10         110          0          Open    ;
 5                  n493               n41                272.55
8          110          0          Open    ;
 6                  n41                n43                268.02
8          110          0          Open    ;
 8                  n43                n33                290.54
8          110          0          Open    ;
 10                 n33                n494               384.17
8          110          0          Open    ;
 11                 n450               n24                613.32
12         110          0          Open    ;
 26                 n195               n361               97.85
6          110          0          Open    ;
 53                 n406               n168               354.89
8          110          0          Open    ;
 180                n168               n444               272.49
8          110          0          Open    ;
 181                n444               n496               1489.03
8          110          0          Open    ;
 183                n453               n28                646.56
10         110          0          Open    ;
 190                n35                n339               2661.52
6          110          0          Open    ;
 192                n91                n436               862.24
6          110          0          Open    ;
 193                n436               n410               1418.38
6          110          0          Open    ;
 195                n21                n460               242.87
6          110          0          Open    ;
 203                n339               n449               972.80
6          110          0          Open    ;
 211                n429               n121               1231.34
6          110          0          Open    ;
 212                n398               n69                539.44
8          110          0          Open    ;
 213                n69                n68                205.80
8          110          0          Open    ;
```

```
 2                  n475                n10                 707.21
6               110             0       Open    ;
 3                  n10                 n174                536.49
6               110             0       Open    ;
 60                 n481                n479                210.09
10              110             0       Open    ;
 62                 n251                n253                816.16
8               110             0       Open    ;
 69                 n184                n183                648.57
8               110             0       Open    ;
 70                 n183                n182                226.78
8               110             0       Open    ;
 77                 n183                n181                259.20
8               110             0       Open    ;
 108                n165                n352                4477.79
12              110             0       Open    ;
 111                n438                n101                430.93
6               110             0       Open    ;
 141                n20                 n343                502.56
10              110             0       Open    ;
 148                n421                n420                325.40
10              110             0       Open    ;
 157                n188                7                   155.88
8               110             0       Open    ;
 158                n300                n277                762.43
8               110             0       Open    ;
 160                n300                n421                332.30
8               110             0       Open    ;
 161                n187                n205                950.06
6               110             0       Open    ;
 163                n187                n420                1042.88
6               110             0       Open    ;
 66                 n261                n56                 771.20
10              110             0       Open    ;
 78                 n10                 n171                1045.68
8               110             0       Open    ;
 81                 n177                n241                921.09
8               110             0       Open    ;
 83                 n177                n246                905.00
8               110             0       Open    ;
 84                 n246                n241                324.66
8               110             0       Open    ;
 88                 n61                 n60                 331.79
8               110             0       Open    ;
 164                n61                 n62                 432.52
8               110             0       Open    ;
 170                n246                n63                 497.03
8               110             0       Open    ;
 178                n472                n63                 1049.69
8               110             0       Open    ;
```

```
 182                n63                n232               289
8          110             0          Open    ;
 188                n14                n16                242.65
6          110             0          Open    ;
 189                n13                n14                409.98
6          110             0          Open    ;
 199                n473               n13                305.18
6          110             0          Open    ;
 201                n65                n447               741
8          110             0          Open    ;
 204                n447               n235               186
8          110             0          Open    ;
 206                n251               n9                 974.47
6          110             0          Open    ;
 207                n253               n7                 1054.59
8          110             0          Open    ;
 208                n7                 n20                857.45
8          110             0          Open    ;
 209                n267               n266               702.04
8          110             0          Open    ;
 222                n266               n197               276.27
8          110             0          Open    ;
 223                n467               n451               145.20
6          110             0          Open    ;
 224                n337               n179               436.79
8          110             0          Open    ;
 226                n479               n477               328.51
10         110             0          Open    ;
 227                n475               n4                 481.79
10         110             0          Open    ;
 228                n5                 n4                 650.77
6          110             0          Open    ;
 229                n389               n390               1967.85
8          110             0          Open    ;
 231                n26                n336               610.95
8          110             0          Open    ;
 232                n197               n202               323.62
8          110             0          Open    ;
 233                n202               n203               441.85
8          110             0          Open    ;
 234                1                  n29                783.22
6          110             0          Open    ;
 235                n361               n453               796.77
6          110             0          Open    ;
 236                n323               n468               209.49
6          110             0          Open    ;
 237                n202               n199               393.93
8          110             0          Open    ;
 238                n168               n169               703.84
8          110             0          Open    ;
```

```
 239                n443               n444               766.33
8          110             0          Open    ;
 240                n398               n400               342.34
8          110             0          Open    ;
 241                n146               n143               596.77
8          110             0          Open    ;
 242                n51                n143               813.68
8          110             0          Open    ;
 243                n158               n160               260.44
6          110             0          Open    ;
 244                n54                n160               663.81
6          110             0          Open    ;
 245                n53                n500               368.82
8          110             0          Open    ;
 246                n88                n192               695.68
8          110             0          Open    ;
 247                n192               n193               671.38
8          110             0          Open    ;
 248                n94                n96                264.38
6          110             0          Open    ;
 249                n31                n32                580.69
8          110             0          Open    ;
 250                6                  n332               180.01
6          110             0          Open    ;
 252                n31                6                  261.97
8          110             0          Open    ;
 253                n493               n192               313.33
8          110             0          Open    ;
 254                n45                n33                1127.90
8          110             0          Open    ;
 255                n334               n47                335.46
8          110             0          Open    ;
 256                n333               n334               162.66
6          110             0          Open    ;
 257                n334               6                  268.10
8          110             0          Open    ;
 258                n92                n91                343.11
8          110             0          Open    ;
 259                n100               n99                934.28
8          110             0          Open    ;
 260                n108               n111               370.74
6          110             0          Open    ;
 262                n111               n105               454.76
6          110             0          Open    ;
 263                n109               3                  401.42
6          110             0          Open    ;
 264                n108               n437               359.90
6          110             0          Open    ;
 265                n437               n118               467.52
6          110             0          Open    ;
```

```
 266                n156               n155               512.59
8          110          0          Open    ;
 267                n105               n99                268.43
6          110          0          Open    ;
 268                n39                n493               378.14
8          110          0          Open    ;
 269                n37                n39                414.59
8          110          0          Open    ;
 270                n91                n37                876.66
6          110          0          Open    ;
 271                n36                n73                540.22
8          110          0          Open    ;
 272                n37                n36                529.66
6          110          0          Open    ;
 275                n516               n494               970.70
6          110          0          Open    ;
 276                n494               n518               697.61
6          110          0          Open    ;
 277                n516               n35                303.16
6          110          0          Open    ;
 278                n421               n49                992.39
8          110          0          Open    ;
 279                n49                n50                694.10
8          110          0          Open    ;
 280                n121               n122               478.63
8          110          0          Open    ;
 282                n123               n124               548.93
8          110          0          Open    ;
 283                n124               n126               763.63
8          110          0          Open    ;
 284                n126               n127               405.62
8          110          0          Open    ;
 285                n127               n290               250.13
8          110          0          Open    ;
 286                n290               n130               523.01
8          110          0          Open    ;
 287                n130               n287               147.47
8          110          0          Open    ;
 288                n130               n123               298.54
8          110          0          Open    ;
 289                n130               n127               386.50
8          110          0          Open    ;
 290                n127               n124               401.89
8          110          0          Open    ;
 291                n122               n423               116.40
8          110          0          Open    ;
 292                n429               n77                1795.21
8          110          0          Open    ;
 294                n420               n131               1507.47
8          110          0          Open    ;
```

```
 295                n410                n114                287.25
8               110             0       Open    ;
 299                n20                 n19                 944.32
10              110             0       Open    ;
 300                n267                n202                1043.14
8               110             0       Open    ;
 301                n148                n140                598.67
8               110             0       Open    ;
 12                 n31                 n94                 431.60
8               110             0       Open    ;
 29                 16                  n448                585.47
10              110             0       Open    ;
 73                 n391                17                  857.50
8               110             0       Open    ;
 57                 n352                18                  1075.25
12              110             0       Open    ;
 61                 n395                18                  1191.25
8               110             0       Open    ;
 50                 n165                n496                97.54
12              110             0       Open    ;
 52                 10                  n170                117.61
12              110             0       Open    ;
 55                 11                  n170                72.98
12              110             0       Open    ;
 15                 n14                 9                   187.34
6               110             0       Open    ;
 20                 n63                 9                   216.45
8               110             0       Open    ;
 27                 n5                  n9                  226.88
8               110             0       Open    ;
 91                 n242                13                  183.16
8               110             0       Open    ;
 92                 13                  14                  169.51
8               110             0       Open    ;
 95                 13                  19                  931.12
12              110             0       Open    ;
 101                19                  n305                182.91
12              110             0       Open    ;
 105                19                  15                  149.74
12              110             0       Open    ;
 115                13                  n171                76.63
12              110             0       Open    ;
 116                23                  20                  719.41
8               110             0       Open    ;
 122                20                  21                  246.67
8               110             0       Open    ;
 123                20                  22                  217.93
8               110             0       Open    ;
 124                n187                23                  595.37
8               110             0       Open    ;
```

```
 125                    23                     n188                    144.19
8               110             0              Open    ;
 127                    24                     n205                    638.33
2               110             0              Open    ;
 85                     n56                    2001                    276.85
10              110             0              Open    ;
 64                     18                     25                      585.78
8               110             0              Open    ;
 129                    25                     26                      1289.62
8               110             0              Open    ;
 132                    n448                   14                      347.23
8               120             0              Open    ;Future Loop
 167                    n246                   n61                     295.56
8               120             0              Open    ;
 87                     12                     n257                    385.66
8               110             0              Open    ;
 220                    n343                   31                      922.95
10              110             0              Open    ;
 133                    31                     30                      190.86
10              110             0              Open    ;
 134                    30                     n477                    289.69
10              110             0              Open    ;
 135                    30                     32                      542.66
10              110             0              Open    ;
 136                    35                     33                      224.72
8               110             0              Open    ;
 137                    33                     34                      245.70
8               110             0              Open    ;
 138                    33                     32                      157.40
8               110             0              Open    ;
 139                    32                     12                      163.33
8               110             0              Open    ;
 143                    n429                   28                      975.80
6               110             0              Open    ;
 144                    27                     28                      1896.12
6               110             0              Open    ;
 149                    n77                    27                      1008.76
6               110             0              Open    ;
 154                    29                     n121                    246.73
6               110             0              Open    ;
 281                    n122                   37                      263.64
8               110             0              Open    ;
 156                    37                     n123                    258.03
8               110             0              Open    ;
 159                    29                     36                      708.38
8               110             0              Open    ;
 169                    36                     37                      420.64
8               110             0              Open    ;
 177                    36                     38                      781.84
8               110             0              Open    ;
```

```
 179                 38                  n124                282.03
8               110             0       Open    ;
 184                 38                  39                  257.23
8               110             0       Open    ;
 152                 n36                 40                  386.70
6               110             0       Open    ;
 153                 40                  n516                262.18
6               110             0       Open    ;
 185                 40                  41                  80.36
2               110             0       Open    ;
 187                 41                  n418                536.89
12              110             0       Open    ;
 191                 28                  42                  1774.68
8               120             0       Open    ;
 194                 27                  43                  1842.44
6               120             0       Open    ;
 196                 n78                 43                  248.40
6               120             0       Open    ;
 151                 n75                 44                  417.54
10              120             0       Open    ;
 162                 44                  29                  329.54
6               120             0       Open    ;
 197                 n496                45                  414.71
10              120             0       Open    ;
 198                 45                  46                  308.98
10              120             0       Open    ;
 200                 46                  n527                940.05
10              120             0       Open    ;
 210                 48                  47                  317.44
8               120             0       Open    ;
 215                 47                  49                  315.93
8               120             0       Open    ;
 216                 47                  50                  1244.39
8               120             0       Open    ;
 217                 48                  51                  1284.01
8               120             0       Open    ;
 218                 n397                52                  6842.44
12              120             0       Open    ;
 219                 52                  8                   1040.67
12              120             0       Open    ;
 225                 49                  52                  128.68
8               120             0       Open    ;
 19                  n389                n376                1000
8               120             0       Open    ;
 67                  n385                53                  934.06
6               110             0       Open    ;
 150                 54                  n249                30.23
6               110             0       Open    ;
 214                 n253                n249                475.11
8               120             0       Open    ;
```

```
 251                n387               55                 550.28
6          120             0          Open     ;
 261                55                 n389               1592.93
6          120             0          Open     ;
 273                55                 56                 376.90
8          120             0          Open     ;
 274                56                 57                 348.73
8          120             0          Open     ;
 293                57                 58                 521.50
8          120             0          Open     ;
 296                57                 59                 273.60
8          120             0          Open     ;
 302                67                 66                 239.73
8          100             0          Open     ;
 303                68                 69                 515.18
12         100             0          Open     ;
 304                69                 n397               564.91
12         100             0          Open     ;
 305                67                 70                 126.38
8          100             0          Open     ;
 306                n397               70                 441.02
8          100             0          Open     ;
 307                68                 67                 600.86
8          100             0          Open     ;
 308                66                 70                 344.41
8          100             0          Open     ;
 310                n395               71                 383.76
8          100             0          Open     ;
 311                71                 n374               1044.87
8          100             0          Open     ;
 312                71                 26                 286.65
8          100             0          Open     ;
 313                26                 n374               924.93
8          100             0          Open     ;
 65                 61                 60                 316.15
8          100             0          Open     ;
 72                 n179               60                 95.82
12         100             0          Open     ;
 80                 60                 n181               291.71
12         100             0          Open     ;
 221                65                 64                 322.89
8          100             0          Open     ;
 297                62                 64                 66.52
8          100             0          Open     ;
 298                64                 63                 321.65
8          100             0          Open     ;
 309                n475               65                 1054.71
6          100             0          Open     ;
 314                n249               65                 994.40
6          100             0          Open     ;
```

```
 315                 73                  72                  214.64
8               100             0       Open    ;
 316                 n177                72                  189.86
8               100             0       Open    ;
 317                 72                  n174                110.74
8               100             0       Open    ;
 318                 n75                 74                  1150.07
8               100             0       Open    ;
 319                 7                   74                  258.54
8               100             0       Open    ;
 320                 74                  75                  280.24
8               100             0       Open    ;
 321                 76                  40                  225.84
8               100             0       Open    ;
 322                 n158                80                  407.33
12              100             0       Open    ;
 323                 80                  81                  480.42
12              100             0       Open    ;
 324                 41                  81                  911.62
12              100             0       Open    ;
 325                 80                  79                  77.50
8               100             0       Open    ;
 326                 81                  77                  78.19
8               100             0       Open    ;
 327                 77                  78                  104.66
8               100             0       Open    ;
 328                 77                  79                  481.62
8               100             0       Open    ;
 329                 56                  83                  434.90
12              100             0       Open    ;
 330                 83                  82                  204.94
12              100             0       Open    ;
 331                 57                  82                  586.61
12              100             0       Open    ;
 186                 59                  84                  238.89
12              100             0       Open    ;
 205                 59                  58                  265.56
12              100             0       Open    ;
 230                 85                  58                  130.21
12              100             0       Open    ;
 332                 86                  59                  119.63
12              100             0       Open    ;
 333                 35                  87                  230.43
8               100             0       Open    ;
 334                 n343                87                  398.24
8               100             0       Open    ;
 335                 87                  88                  549.18
8               100             0       Open    ;
 337                 n58                 89                  1966.60
8               100             0       Open    ;
```

```
 339                    16                     n58                    405.53
10              100             0              Closed  ;
 340                    89                     n261                   106.02
8               100             0              Open    ;
 341                    n261                   n58                    499.89
8               100             0              Open    ;

[PUMPS]
;ID                    Node1                  Node2                  Parameters
 4002                   1002                   n440                   HEAD 2
;Well_#2
 4001                   1001                   n361                   HEAD 1
;Allen_St_Well_(Well_#1)
 4003                   1003                   n512                   HEAD 3
;Anderson_Well_(Well_#3)
 4005                   1005                   n518                   HEAD 5
;Well_#5
 4004                   1004                   2001                   HEAD 4
;East_Bench_Well_(Well_#4)

[VALVES]
;ID                    Node1                  Node2                  Diameter
Type    Setting         MinorLoss
 71                     17                     n374                   6
PRV     74              0               ;PRV north line
 76                     n475                   n390                   8
PRV     80              0               ;
 79                     n410                   n408                   8
PRV     76              0               ;
 82                     n91                    n158                   6
PRV     69.75           0               ;
 42                     n496                   8                      8
PRV     70              0               ;Pointe Perry PRV
 202                    53                     54                     6
PRV     100             0               ;
 336                    n58                    n256                   6
PRV     68              0               ;

[TAGS]
 NODE   1002                    Well_House_#2

[DEMANDS]
;Junction              Demand          Pattern                 Category

[STATUS]
;ID                    Status/Setting
 4001                   Closed
 4005                   Closed
 79                     Closed
```

```
[PATTERNS]
;ID                      Multipliers
;
 1                       0.38

[CURVES]
;ID                      X-Value         Y-Value
;PUMP: PUMP: Well House #1 Pump Curve
 1                       180             172
;PUMP: PUMP: Well House #2 Pump Curve
 2                       500             240
;PUMP: PUMP: Well House #3 Pump Curve
 3                       400             165
;PUMP: PUMP: Well House #4 Pump Curve
 4                       900             205
;PUMP: PUMP: Well House #5 Pump Curve
 5                       800             100

[CONTROLS]


[RULES]


[ENERGY]
 Global Efficiency      75
 Global Price           0
 Demand Charge          0

[EMITTERS]
;Junction               Coefficient

[QUALITY]
;Node                   InitQual

[SOURCES]
;Node                   Type            Quality         Pattern

[REACTIONS]
;Type           Pipe/Tank               Coefficient


[REACTIONS]
 Order Bulk             1
 Order Tank             1
 Order Wall             1
 Global Bulk            0
 Global Wall            0
 Limiting Potential     0
 Roughness Correlation  0
```

```
[MIXING]
;Tank                    Model

[TIMES]
 Duration                0:00
 Hydraulic Timestep      1:00
 Quality Timestep        0:05
 Pattern Timestep        1:00
 Pattern Start           0:00
 Report Timestep         1:00
 Report Start            0:00
 Start ClockTime         12 am
 Statistic               None

[REPORT]
 Status                  No
 Summary                 No
 Page                    0

[OPTIONS]
 Units                   GPM
 Headloss                H-W
 Specific Gravity        1
 Viscosity               1
 Trials                  40
 Accuracy                0.001
 CHECKFREQ               2
 MAXCHECK                10
 DAMPLIMIT               0
 Unbalanced              Continue 10
 Pattern                 1
 Demand Multiplier       1
 Emitter Exponent        0.5
 Quality                 None mg/L
 Diffusivity             1
 Tolerance               0.01

[COORDINATES]
;Node                    X-Coord                 Y-Coord
n4                       1497841.749             3698471.225
n5                       1497684.473             3697841.409
n7                       1497375.333             3696274.206
n9                       1497512.329             3697705.481
n10                      1497746.344             3699077.929
n13                      1498918.757             3700387.789
n14                      1499289.376             3700265.051
n16                      1499371.083             3700481.726
n19                      1497833.624             3695439.548
n20                      1498231.906             3696286.868
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n21	1495136.692	3694594.759
n24	1497138.022	3693729.204
n26	1496188.792	3692872.314
n28	1497415.679	3694613.468
n29	1496098.285	3693415.936
n30	1495296.329	3692226.464
n31	1495227.118	3692054.041
n32	1495710.828	3692226.254
n33	1493830.989	3690478.966
n35	1492789.372	3689825.022
n36	1492932.345	3690763.412
n37	1493069.961	3691265.134
n39	1493445.445	3691362.769
n41	1493849.447	3691061.625
n42	1494032.491	3691059.008
n43	1493842.872	3690785.586
n44	1494059.108	3690782.734
n45	1494449.286	3691183.897
n46	1494555.944	3691142.675
n47	1494651.153	3691433.412
n48	1494810.668	3691316.395
n49	1492153.115	3690153.311
n50	1492253.226	3690825.354
n51	1492485.819	3692950.653
n52	1491632.199	3692886.209
n53	1492435.192	3692707.293
n54	1492334.592	3692342.557
n56	1500491.916	3698076.730
n58	1499221.174	3698052.510
n60	1499629.471	3699577.717
n61	1499430.261	3699292.742
n62	1499849.231	3699205.648
n63	1499381.749	3699900.838
n65	1499671.339	3700090.500
n68	1493038.416	3695012.563
n69	1493249.650	3694915.435
n70	1493839.411	3694624.615
n73	1493515.927	3690630.206
n75	1491141.796	3689419.545
n77	1492955.384	3687175.337
n78	1493293.027	3684092.616
n79	1495475.356	3694595.466
n80	1495458.039	3694813.161
n83	1495765.715	3695053.480
n84	1495374.987	3695368.985
n88	1494301.230	3692050.199
n91	1493340.407	3692098.271
n92	1493682.148	3692067.624
n93	1493643.128	3691903.888
n94	1494812.933	3692006.960

n96	1494762.816	3691762.858
n97	1494325.914	3692759.334
n99	1495147.049	3692583.076
n100	1494313.669	3692460.772
n101	1495577.385	3693144.934
n102	1495260.856	3692717.344
n105	1494922.876	3692730.728
n106	1495205.788	3693170.359
n108	1494481.711	3693123.412
n109	1494740.094	3693118.204
n110	1494739.873	3692992.213
n111	1494472.348	3692759.001
n113	1494744.415	3693773.187
n114	1494818.895	3694057.652
n116	1495022.345	3693730.355
n118	1495045.046	3693405.892
n121	1491143.880	3688403.976
n122	1490693.810	3688274.787
n123	1490160.935	3688265.320
n124	1489656.402	3688407.824
n126	1489293.237	3688020.694
n127	1489692.758	3688012.150
n130	1490107.014	3687977.008
n131	1491375.123	3691954.075
n137	1493009.002	3693552.926
n140	1491894.135	3693937.491
n142	1491703.672	3693171.850
n143	1492920.057	3693582.718
n146	1492942.827	3694128.270
n147	1492666.411	3694234.732
n148	1492493.758	3693726.287
n150	1490900.667	3694888.902
n151	1490755.796	3694415.057
n152	1493512.111	3693927.394
n155	1493324.060	3693289.998
n156	1493851.640	3693138.748
n157	1493610.795	3692756.842
n158	1493258.376	3692131.222
n159	1493161.485	3692757.531
n160	1492997.931	3692190.622
n165	1492433.913	3696187.259
n168	1494052.312	3695379.352
n169	1494279.531	3695886.715
n170	1497456.955	3693711.495
n171	1498774.808	3698975.026
n174	1498034.548	3699530.430
n177	1498319.358	3699520.901
n179	1497977.457	3699579.105
n181	1497599.205	3699616.846
n182	1497786.407	3700053.055

n183	1497685.383	3699852.652
n184	1497053.085	3699937.080
n187	1490076.885	3690568.952
n188	1489993.589	3689839.303
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n193	1493997.680	3692059.676
n194	1494009.764	3692766.853
n195	1496529.190	3694014.001
n197	1496310.929	3695018.737
n199	1496994.433	3694942.316
n201	1497197.710	3694951.547
n202	1496630.265	3695063.434
n203	1496630.043	3694560.425
n205	1489085.279	3690649.000
n212	1489166.953	3693083.353
n232	1499671.079	3699902.829
n235	1500357.663	3700257.415
n241	1498976.621	3699202.883
n242	1498894.437	3699060.051
n246	1499180.678	3699467.330
n249	1496260.425	3696749.332
n251	1497540.522	3696733.240
n253	1496724.649	3696711.678
n256	1498603.470	3698149.816
n257	1498569.138	3697902.009
n261	1499720.742	3698070.458
n266	1496021.992	3695018.470
n267	1496030.542	3695708.110
n272	1496310.280	3695273.745
n274	1496310.859	3694856.950
n277	1490335.004	3689836.636
n287	1490183.070	3687933.723
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n291	1489687.005	3687619.018
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n308	1499921.605	3699342.032
n314	1496026.453	3694320.686
n315	1496023.895	3694579.697
n316	1496313.724	3694021.833
n320	1495458.010	3694044.861
n323	1496932.385	3694548.903
n324	1495786.851	3694031.359
n325	1496116.654	3694021.771
n332	1495307.466	3691711.246
n333	1495055.643	3691496.702
n334	1494940.034	3691610.417
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n337	1497736.253	3699214.949

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n339	1493034.811	3687175.389
n343	1498235.307	3696775.182
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n352	1494589.306	3700047.565
n357	1488504.538	3693240.425
n358	1496946.078	3694830.747
n361	1496625.935	3694013.664
n362	1496318.923	3694571.761
n367	1493912.611	3694722.491
n369	1490344.919	3690196.161
n374	1497771.846	3700594.415
n376	1495965.108	3696905.832
n385	1495718.135	3695894.263
n387	1495015.661	3694964.326
n389	1496171.325	3696769.247
n390	1497262.761	3698507.757
n391	1498620.345	3700571.004
n395	1496931.127	3700022.321
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n399	1493624.932	3694208.224
n400	1492767.866	3694579.439
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n407	1494650.896	3694390.337
n408	1494447.443	3694062.360
n409	1494166.760	3693644.112
n410	1494552.517	3694062.542
n416	1492440.383	3690148.580
n418	1492720.414	3690156.179
n420	1491162.466	3690470.625
n421	1491160.802	3690165.845
n423	1490689.328	3688402.082
n424	1490152.487	3688391.041
n429	1491160.179	3687172.743
n430	1492712.422	3689671.273
n436	1493781.286	3692838.742
n437	1494588.492	3693465.262
n438	1495441.814	3693296.633
n440	1495855.177	3694029.228
n443	1493377.065	3694860.836
n444	1493776.262	3695497.987
n445	1493611.314	3694755.834
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n447	1500279.019	3700425.529
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n449	1493142.725	3686162.764
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n459	1495753.339	3694588.956
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n467	1497249.858	3694438.845
n468	1496931.161	3694333.884
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n473	1498617.154	3700410.366
n475	1497361.976	3698477.122
n477	1498097.700	3697921.664
n478	1498305.231	3697918.830
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n493	1493820.683	3691327.355
n494	1493825.201	3690122.128
n495	1496537.638	3693402.220
n496	1492411.036	3696092.439
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n511	1491542.751	3692532.751
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n516	1492815.762	3690127.032
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2	1495876.202	3692628.148
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5	1499908.696	3699905.008
6	1495131.960	3691789.190
7	1489994.413	3689683.423
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17	1497772.194	3700642.830
18	1495656.272	3700040.261
8	1492260.022	3696157.099
9	1499385.374	3700109.192
12	1498560.217	3697523.655
13	1498840.623	3698964.487
14	1498740.700	3698782.981
15	1499711.397	3698796.239
19	1499768.062	3698950.131
20	1489284.788	3689938.346
21	1489315.796	3689693.636
22	1489241.513	3690151.938
23	1490000.542	3689983.328
24	1488416.492	3690706.178
25	1495654.265	3700700.361
26	1496943.861	3700692.616
30	1498145.224	3697647.825
31	1497992.907	3697532.821

32	1498566.258	3697360.989
33	1498633.777	3697220.649
34	1498879.462	3697218.396
35	1498632.782	3696995.928
27	1493057.814	3686171.793
28	1491161.864	3686196.941
29	1491146.153	3688672.567
36	1490437.815	3688680.702
37	1490422.236	3688260.348
38	1489656.024	3688689.849
39	1489400.373	3688718.304
40	1492838.758	3690388.206
41	1492759.897	3690403.679
42	1491201.318	3684394.616
43	1493264.917	3684341.031
44	1491138.760	3689002.020
45	1492310.569	3695690.085
46	1492236.168	3695390.193
47	1491128.445	3696151.096
48	1491007.651	3695857.538
49	1491250.635	3696442.438
50	1492284.397	3695696.858
51	1492203.935	3695397.248
52	1491300.887	3696560.895
53	1496224.239	3696679.333
54	1496246.543	3696722.478
55	1495309.901	3695429.333
56	1495034.175	3695682.019
57	1494765.212	3695901.696
58	1494705.133	3696293.541
59	1494914.913	3696130.706
66	1487441.684	3700240.184
67	1487441.891	3700479.914
68	1487441.762	3701080.772
69	1487956.801	3701092.793
70	1487568.271	3700479.684
71	1496938.292	3700406.017
60	1497890.344	3699617.362
61	1498038.184	3699893.886
62	1497082.389	3697407.466
63	1497093.941	3697795.467
64	1497084.343	3697473.957
65	1496789.526	3697591.282
72	1498135.318	3699484.502
73	1498035.612	3699294.422
74	1489991.741	3689424.901
75	1489989.513	3689144.669
76	1493062.967	3690375.258
77	1492917.376	3691304.631
78	1492816.140	3691331.168

79	1493043.184	3691769.531
80	1493117.883	3691748.890
81	1492993.058	3691284.973
82	1494620.779	3695436.213
83	1494790.714	3695321.657
84	1495099.775	3695979.404
85	1494776.721	3696390.947
86	1494980.386	3696230.825
87	1498633.434	3696765.498
88	1498663.676	3696219.492
89	1499720.742	3697964.440
1004	1499327.218	3697987.340
1001	1496671.164	3693958.330
1002	1495836.431	3694116.008
1003	1494513.386	3692003.386
1005	1494522.614	3690043.906
2001	1500721.000	3697981.685
10	1497553.820	3693778.206
11	1497555.415	3693721.167

[VERTICES]

;Link	X-Coord	Y-Coord
p26	1494689.530	3691392.381
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p50	1493673.206	3691971.994
p61	1494813.908	3693976.510
p95	1497280.046	3693654.883
p191	1495761.115	3693385.312
p323	1495750.062	3694366.741
p324	1495434.030	3694347.076
p365	1494741.363	3691993.226
p365	1494656.737	3692004.862
p365	1494571.758	3692034.347
16	1494960.217	3692830.845
16	1494982.849	3692879.879
23	1493902.831	3692781.810
23	1493858.826	3692794.383
33	1493710.314	3694432.566
35	1494125.518	3694970.253
36	1491999.884	3692807.732
37	1492465.513	3692924.193
45	1493784.362	3694673.750
86	1497842.065	3696738.122
89	1497091.556	3694903.702
89	1497150.649	3694908.731
103	1495756.307	3694788.031
103	1495731.161	3694891.129
103	1495738.705	3694996.742

104	1495802.027	3695030.744
104	1495940.070	3695020.808
1	1497343.140	3693909.937
102	1494855.147	3693737.540
126	1494615.482	3691409.306
126	1494519.220	3691310.928
126	1494473.734	3691241.112
146	1493857.812	3693792.103
146	1493987.924	3693742.385
147	1495027.699	3694597.036
173	1491469.576	3694685.955
173	1492018.322	3694492.998
5	1493820.166	3691240.115
5	1493847.827	3691187.309
11	1497002.781	3693758.592
190	1492811.498	3689372.023
190	1492921.076	3688245.765
190	1492958.988	3687888.973
192	1493593.316	3692549.847
195	1495133.449	3694389.214
212	1493145.435	3694666.345
69	1497586.572	3699910.331
70	1497761.642	3699968.641
77	1497602.644	3699717.621
108	1492667.666	3697055.765
108	1492853.954	3697559.247
108	1493252.836	3698288.577
108	1494462.465	3699962.986
141	1498252.505	3696310.037
141	1498251.522	3696518.406
141	1498236.779	3696532.166
158	1490799.991	3689903.630
158	1490764.767	3689845.762
78	1497797.930	3699059.287
78	1498083.661	3699048.704
78	1498276.264	3698974.626
81	1498330.163	3699260.585
81	1498848.958	3699264.471
83	1498513.092	3699587.902
83	1498981.446	3699578.134
83	1499079.727	3699546.544
164	1499555.530	3699255.571
164	1499615.902	3699248.551
164	1499708.566	3699249.955
164	1499787.191	3699233.809
170	1499378.750	3699744.525
178	1498426.315	3700023.906
178	1499048.573	3700021.789
178	1499101.486	3700000.624
178	1499167.098	3699930.779

178	1499230.594	3699907.497
188	1499357.138	3700348.336
188	1499371.954	3700405.482
189	1499076.278	3700389.787
189	1499140.485	3700377.156
189	1499188.263	3700347.734
189	1499239.060	3700311.753
199	1498681.967	3700388.550
201	1499686.563	3700146.767
201	1499722.852	3700179.497
201	1499772.659	3700202.266
201	1499920.658	3700200.131
201	1500013.868	3700222.900
201	1500072.925	3700254.919
201	1500110.637	3700286.938
201	1500188.194	3700371.611
206	1497549.766	3697381.926
207	1496730.123	3696564.957
207	1496697.558	3696474.662
207	1496687.936	3696396.950
207	1496700.518	3696356.984
207	1496754.547	3696318.498
207	1496803.394	3696298.515
207	1497103.882	3696286.673
208	1497619.641	3696294.417
209	1496000.309	3695637.278
209	1496001.082	3695050.497
228	1497801.969	3698233.836
228	1497841.298	3698438.906
231	1496426.225	3693179.116
232	1496402.872	3695019.108
234	1496000.001	3693153.970
234	1496049.036	3693225.636
234	1496079.211	3693302.331
237	1496716.882	3695069.665
237	1496794.834	3695049.548
238	1494154.679	3695578.111
238	1494274.213	3695676.489
238	1494400.095	3695763.230
239	1493524.673	3695147.968
239	1493562.755	3695197.686
239	1493669.596	3695269.618
240	1492800.584	3694514.018
241	1492918.463	3694044.923
241	1492904.711	3693927.505
241	1492978.759	3693879.902
241	1492962.891	3693744.501
242	1492532.994	3693001.353
242	1492670.733	3693066.520
242	1492738.862	3693109.471

242	1492796.623	3693185.005
245	1492627.752	3692644.295
246	1494288.614	3691619.813
246	1494257.937	3691563.749
246	1494154.270	3691463.255
247	1493977.225	3691600.218
248	1494834.452	3691923.409
248	1494818.585	3691853.593
249	1495350.961	3692007.809
249	1495514.501	3692020.389
253	1493927.036	3691334.413
253	1494025.105	3691370.874
254	1494308.105	3690611.365
254	1494276.210	3690527.987
254	1494214.409	3690484.445
254	1494145.584	3690471.804
256	1494955.044	3691589.136
257	1495040.728	3691669.531
257	1495096.793	3691729.827
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259	1494674.756	3692421.474
259	1494747.062	3692383.565
259	1494815.157	3692366.717
259	1494869.211	3692366.015
259	1494926.073	3692380.757
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262	1494829.459	3692759.179
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275	1493016.297	3690112.230
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279	1492175.688	3690472.144
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279	1492248.652	3690693.552
280	1490977.542	3688391.223
280	1490810.321	3688293.154
282	1489977.723	3688263.762
282	1489890.247	3688284.402

282	1489774.268	3688389.570
283	1489299.539	3688404.313
283	1489258.258	3688355.169
283	1489267.563	3688058.168
286	1489946.503	3687757.674
288	1490156.471	3688092.115
289	1490021.940	3688005.361
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300	1496335.774	3695576.089
300	1496643.378	3695435.630
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12	1495060.827	3692083.141
73	1498574.472	3700599.600
73	1498173.333	3700621.215
73	1497774.697	3700648.581
15	1499352.894	3700199.900
95	1498902.755	3698942.878
116	1489697.983	3689986.658
116	1489499.220	3689976.594
124	1490051.212	3690121.260
85	1500661.630	3698070.740
132	1498642.423	3698593.652
132	1498682.637	3698682.546
220	1498154.387	3697335.553
220	1497979.328	3697352.765
220	1497985.249	3697489.686
134	1498120.435	3697672.071
134	1498102.663	3697700.211
134	1498096.738	3697763.897
135	1498298.163	3697485.457
135	1498357.405	3697401.037
135	1498437.382	3697365.491
138	1498615.530	3697259.942
138	1498577.198	3697316.949
138	1498568.502	3697351.945
139	1498560.489	3697385.750
216	1492066.098	3695750.810
217	1491928.506	3695471.413
217	1492021.872	3695440.525
218	1488073.993	3700409.511
218	1488179.724	3700331.472
218	1488232.589	3700292.452
218	1488285.455	3700253.432
218	1488486.847	3700067.144
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218	1488602.648	3699619.046
218	1488548.739	3698769.190
218	1488837.866	3698755.422

218	1488798.009	3697772.148
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218	1490883.679	3696736.992
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274	1494982.300	3695709.098
293	1494564.967	3696093.853
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306	1487926.991	3700500.307
306	1487666.305	3700500.658
306	1487621.044	3700481.010
308	1487531.862	3700239.878
308	1487567.664	3700277.085
311	1497764.823	3700376.704
313	1497758.339	3700688.140
313	1497756.233	3700593.369
65	1497907.044	3699683.669
72	1497933.567	3699604.591
80	1497839.263	3699624.238
221	1496895.604	3697526.342
221	1496955.035	3697495.890
221	1497019.377	3697478.699
316	1498202.116	3699483.520
321	1492868.958	3690378.205
331	1494523.438	3695537.934
331	1494576.513	3695493.705
331	1494610.914	3695477.979
230	1494705.087	3696288.413
335	1498636.140	3696646.298
335	1498663.676	3696526.320
335	1498661.709	3696380.773
337	1499228.728	3697482.374
337	1499281.031	3697267.511
337	1499354.536	3697157.253
337	1499391.289	3697124.740
337	1499463.381	3697112.018
337	1499507.202	3697127.567
337	1499545.369	3697168.561
337	1499652.800	3697509.232
337	1499671.176	3697606.769
337	1499700.862	3697762.261
337	1499712.170	3697900.792
4004	1499407.792	3698045.296
4004	1500648.908	3698048.123
336	1499133.858	3698053.184
336	1498974.125	3698140.826

[LABELS]

```
;X-Coord             Y-Coord             Label & Anchor Node
1499763.454             3698014.750             "Valves closed on line here. "

[BACKDROP]
  DIMENSIONS    1482224.213             3669954.616             1524097.595
3726569.104
 UNITS                  Feet
 FILE                   G:\Clients\Perry City\Studies and Planning\Water\2023 Perry
Utah Culinary Water Capital Facilities Plan\Drawings\aeriel WATER MODEL 2021-UPDATE
enhanced.emf
 OFFSET                 -11894.68               22935.68

[END]
```

2023 MODEL FF RESULTS (CURRENT CONDITIONS)

"Check_Node","Maximal_Flow","Violating_Node","Minimal_pressure"
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"n45",810,"n46",19.92437
"n46",360,"n46",19.90694
"n47",850,"n46",19.89811
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"n63",1490,"15",19.96382
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APPENDIX C

FUTURE WATER SYSTEM MODEL AND OUTPUT

[TITLE]
Perry City Water System Model
The elevations for each node are at surface elevation from 2013 AGRC lidar data.
Residential demands are approximately 0.38 gpm per residence.
Nodes without an n desigation at the beginning are additions since the original model.

[JUNCTIONS]

;ID	Elev	Demand	Pattern	
n4	4387	9.00	1	;
n5	4383	7.00	1	;
n7	4373	67.00	1	;
n9	4375	7.00	1	;
n10	4358	10.00	1	;
n13	4400	12.00	1	;
n14	4425	6.00	1	;
n16	4420	6.00	1	;
n19	4407	1	1	
;Stokes Spring (35 GPM)				
n20	4417	9.00	1	;
n21	4365	7.00	1	;
n24	4542	0.00		;
n26	4517	8.00	1	;
n28	4446	69.00	1	;
n29	4448	13.00	1	;
n30	4456	9.00	1	;
n31	4482	10.00	1	;
n32	4510	9.00	1	;
n33	4466	12.00	1	;
n35	4397	0.00		;
n36	4392	16.00	1	;
n37	4386	6.00	1	;
n39	4409	5.00	1	;
n41	4458	4.00	1	;
n42	4462	3.00	1	;
n43	4463	5.00	1	;
n44	4470	4.00	1	;
n45	4522	13.00	1	;
n46	4528	2.00	1	;
n47	4511	5.00	1	;
n48	4525	2.00	1	;
n49	4370	10.00	1	;
n50	4363	6.00	1	;
n51	4316	21.00	1	;
n52	4307	9.00	1	;
n53	4322	11.00	1	;
n54	4333	21.00	1	;

```
n56             4557            0.00                            ;
n58             4503            15.00           1               ;
n60             4473            4.00            1               ;
n61             4471            6.00            1               ;
n62             4512            2.00            1               ;
n63             4444            13.00           1               ;
n65             4454            5.00            1               ;
n68             4289            4.00            1               ;
n69             4296            7.00            1               ;
n70             4324            6.00            1               ;
n73             4416            15.00           1               ;
n75             4331            10.00           1               ;
n77             4354            62.00           1               ;
n78             4349            4.00            1               ;
n79             4372            7.00            1               ;
n80             4369            4.00            1               ;
n83             4370            8.00            1               ;
n84             4354            6.00            1               ;
n88             4422            10.00           1               ;
n91             4375            5.00            1               ;
n92             4406            5.00            1               ;
n93             4412            3.00            1               ;
n94             4467            5.00            1               ;
n96             4474            3.00            1               ;
n97             4384            4.00            1               ;
n99             4415            15.00           1               ;
n100            4401            11.00           1               ;
n101            4421            15.00           1               ;
n102            4418            7.00            1               ;
n105            4400            8.00            1               ;
n106            4393            4.00            1               ;
n108            4376            8.00            1               ;
n109            4378            5.00            1               ;
n110            4382            4.00            1               ;
n111            4388            6.00            1               ;
n113            4371            6.00            1               ;
n114            4367            7.00            1               ;
n116            4374            6.00            1               ;
n118            4381            8.00            1               ;
n121            4325            23.00           1               ;
n122            4309            8.00            1               ;
n123            4288            8.00            1               ;
n124            4270            13.00           1               ;
n126            4261            15.00           1               ;
n127            4274            10.00           1               ;
n130            4282            7.00            1               ;
n131            4322            10.00           1               ;
n137            4319            2.00            1               ;
n140            4287            38.00           1               ;
n142            4302            37.00           1               ;
```

```
n143                4313            9.00            1                       ;
n146                4304            12.00           1                       ;
n147                4295            12.00           1                       ;
n148                4296            14.00           1                       ;
n150                4274            43.00           1                       ;
n151                4273            1.00            1                       ;
n152                4330            11.00           1                       ;
n155                4346            6.00            1                       ;
n156                4362            4.00            1                       ;
n157                4366            4.00            1                       ;
n158                4375            14.00           1                       ;
n159                4348            6.00            1                       ;
n160                4359            11.00           1                       ;
n165                4276            0.00                                    ;
n168                4306            5.00            1                       ;
n169                4298            8.00            1                       ;
n170                4578            0.00                                    ;
n171                4446            16.00           1                       ;
n174                4367            4.00            1                       ;
n177                4388            17.00           1                       ;
n179                4366            2.00            1                       ;
n181                4332            4.00            1                       ;
n182                4331            2.00            1                       ;
n183                4331            7.00            1                       ;
n184                4303            6.00            1                       ;
n187                4295            26.00           1                       ;
n188                4291            0.00                                    ;
n192                4451            15.00           1                       ;
n193                4415            10.00           1                       ;
n194                4379            9.00            1                       ;
n195                4330            1.00            1                       ;
n197                4374            4.00            1                       ;
n199                4391            6.00            1                       ;
n201                4397            2.00            1                       ;
n202                4377            10.00           1                       ;
n203                4397            9.00            1                       ;
n205                4265            40.00           1                       ;
n212                4258            31.00           1                       ;
n232                4459            7.00            1                       ;
n235                4486            2.00            1                       ;
n241                4449            12.00           1                       ;
n242                4450            2.00            1                       ;
n246                4455            10.00           1                       ;
n249                4326            33.00           1                       ;
n251                4373            12.00           1                       ;
n253                4337            14.00           1                       ;
n256                4449            9.00            1                       ;
n257                4445            2.00            1                       ;
n261                4552            27.00           1                       ;
n266                4373            10.00           1                       ;
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```
 n267                    4356            9.00            1                       ;
 n272                    4370            5.00            1                       ;
 n274                    4377            4.00            1                       ;

 n277                    4300            11.00           1                       ;
 n287                    4279            30.00           1                       ;
 n290                    4273            6.00            1                       ;
 n291                    4272            32.00           1                       ;
 n300                    4317            11.00           1                       ;
 n305                    4513            1.00            1                       ;
 n308                    4512            5.00            1                       ;
 n314                    4384            6.00            1                       ;
 n315                    4379            9.00            1                       ;
 n316                    4412            5.00            1                       ;
 n320                    4377            14.00           1                       ;
 n323                    4416            5.00            1                       ;
 n324                    4384            10.00           1                       ;
 n325                    4398            7.00            1                       ;
 n332                    4520            3.00            1                       ;
 n333                    4521            3.00            1                       ;
 n334                    4508            4.00            1                       ;
 n335                    4428            3.00            1                       ;
 n336                    4492            5.00            1                       ;
 n337                    4361            5.00            1                       ;
 n338                    4358            18.00           1                       ;
 n339                    4354            29.00           1                       ;
 n343                    4419            5.00            1                       ;
 n345                    4404            0.00                                    ;
 n352                    4268            20.00           1                       ;
 n357                    4242            81.00           1
;Elevation is a guess
 n358                    4394            3.00            1                       ;
 n361                    4440            8.00            1                       ;
 n362                    4390            7.00            1                       ;
 n367                    4325            5.00            1                       ;
 n369                    4302            9.00            1                       ;
 n374                    4314            1.00            1                       ;
 n376                    4319            1.00            1                       ;
 n385                    4349            19.00           1                       ;
 n387                    4357            24.00           1                       ;
 n389                    4326            4.00            1                       ;No
demand on Maddox
 n390                    4351            47.00           1                       ;
 n391                    4368            5.00            1                       ;
 n395                    4298            36.00           1                       ;
 n397                    4220            283.00          1
;Elevation is a guess
 n398                    4301            12.00           1                       ;
 n399                    4327            9.00            1                       ;
 n400                    4290            34.00           1                       ;
```

```
n406                4323            17.00           1                       ;
n407                4358            10.00           1                       ;
n408                4360            1.00            1                       ;
n409                4361            23.00           1                       ;
n410                4364            7.00            1                       ;
n416                4379            2.00            1                       ;
n418                4398            25.00           1                       ;
n420                4330            22.00           1                       ;
n421                4332            29.00           1                       ;
n423                4310            3.00            1                       ;
n424                4289            3.00            1                       ;
n429                4310            61.00           1                       ;
n430                4398            1.00            1                       ;
n436                4365            11.00           1                       ;
n437                4373            9.00            1                       ;
n438                4388            10.00           1                       ;
n440                4386            1.00            1                       ;
n443                4302            8.00            1                       ;
n444                4291            85.00           1                       ;
n445                4313            4.00            1                       ;
n446                4314            3.00            1                       ;
n447                4467            12.00           1                       ;
n448                4448            19.00           1                       ;
n449                4329            31.00           1                       ;
n450                4445            0.00                                    ;
n451                4441            3.00            1                       ;
n453                4509            2.00            1                       ;
n457                4361            8.00            1                       ;
n458                4377            12.00           1                       ;
n459                4374            6.00            1                       ;
n460                4370            12.00           1                       ;
n467                4452            5.00            1                       ;
n468                4433            5.00            1                       ;
n472                4373            11.00           1                       ;
n473                4371            0.00                                    ;
n475                4352            9.00            1                       ;
n477                4415            4.00            1                       ;
n478                4428            5.00            1                       ;
n479                4420            3.00            1                       ;
n480                4429            4.00            1                       ;
n481                4411            8.00            1                       ;
n493                4446            6.00            1                       ;
n494                4457            49.00           1                       ;
n495                4503            4.00            1                       ;
n496                4277            79.00           1                       ;
n500                4338            5.00            1                       ;
n511                4316            55.00           1                       ;
n512                4448            4.00            1                       ;
n516                4397            22.00           1                       ;
n518                4511            89.00           1                       ;
```

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 n527                    4284            48.00           1                       ;
 1                       4467            13.00           1                       ;
 2                       4496            4.00            1                       ;
 3                       4392            6.00            1                       ;
 4                       4308            17.00           1                       ;
 5                       4482            7.00            1                       ;
 6                       4502            4.00            1                       ;
 7                       4306.5          8.00            1                       ;
 16                      4497            0.00                                    ;
 17                      4312            12.00           1                       ;
 18                      4281            65.00           1                       ;
 8                       4274            8.00            1                       ;
 9                       4435            2.00            1
;Elevation From Design Drawings
 12                      4450            4.00            1
;Elevation From Design Drawings
 13                      4452            5.00            1
;Elevation From Design Drawings
 14                      4452            1.00            1
;Elevation From Design Drawings
 15                      4521            5.00            1
;Elevation From Design Drawings
 19                      4520            11.00           1
;Elevation From Design Drawings
 20                      4266            8.00            1
;Elevation From Design Drawings
 21                      4268            17.00           1
;Elevation From Design Drawings
 22                      4267            3.00            1                       ;
 23                      4288            8.00            1
;Elevation is a guess
 24                      4240            11.00           1                       ;
 25                      4277            65.00           1                       ;
 26                      4283            3.00            1                       ;
 30                      4424            5.00            1                       ;
 31                      4412            3.00            1                       ;
 32                      4458            6.00            1                       ;
 33                      4464            3.00            1                       ;
 34                      4492            5.00            1                       ;
 35                      4470            4.00            1                       ;
 27                      4328            58.00           1                       ;
 28                      4297            77.00           1                       ;
 29                      4329            16.00           1                       ;
 36                      4299            24.00           1                       ;
 37                      4298            6.00            1                       ;
 38                      4270            11.00           1                       ;
 39                      4269            11.00           1                       ;
 40                      4392            9.00            1                       ;
 41                      4391            0.00                                    ;
 42                      4264            29.00           1                       ;
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 43                      4350            44.00           1                       ;
 44                      4330            0.00                                    ;
 45                      4276            0.00                                    ;
 46                      4278            0.00                                    ;
 47                      4263            21.00           1                       ;
 48                      4265            47.00           1                       ;
 49                      4263            1.00            1                       ;
 50                      4276            21.00           1                       ;
 51                      4278            18.00           1                       ;
 52                      4262            11.00           1                       ;
 53                      4326            0.00                                    ;
 54                      4326            0.00                                    ;
 55                      4352            1.00            1                       ;
 56                      4333            7.00            1                       ;
 57                      4310.5          7.00            1                       ;
 58                      4293.25         6.00            1                       ;
 59                      4308.75         6.00            1                       ;
 66                      4222.75         30.00           1                       ;
 67                      4222            30.00           1                       ;
 68                      4220.5          30.00           1                       ;
 69                      4221            80.00           1                       ;
 70                      4222.5          30.00           1                       ;
 71                      4283            14.00           1                       ;
 60                      4259            8.00            1                       ;
 61                      4256            7.00            1                       ;
 62                      4350.5          4.00            1                       ;
 63                      4347            7.00            1
;Elevation from Plan
 64                      4349.5          7.00            1
;Elevation From Plan
 65                      4332.5          4.00            1                       ;
 72                      4377            8.00            1                       ;
 73                      4373.5          8.00            1                       ;
 74                      4305.5          8.00            1                       ;
 75                      4305            7.00            1                       ;
 76                      4400            9.00            1                       ;
 77                      4379            11.00           1                       ;
 78                      4375            9.00            1                       ;
 79                      4374.5          11.00           1                       ;
 80                      4380.25         4.00            1                       ;
 81                      4384            4.00            1                       ;
 82                      4330.75         8.00            1                       ;
 83                      4337.5          8.00            1                       ;
 84                      4329.25         4.00            1                       ;
 85                      4293            0.00                                    ;
 86                      4310            0.00                                    ;
 87                      4257.75         6.00            1                       ;
 88                      4262.5          57.00           1                       ;
 90                      4352            29.00           1                       ;
 91                      4341            5.00            1                       ;
```

92	4348	13.00	1	;
93	4362	12.00	1	;
94	4328	9.00	1	;
95	4324	39.00	1	;
96	4391	0.00		;
97	4359	33.00	1	;
98	4355	6.00	1	;
99	4337	9.00	1	;
100	4330	31.00	1	;
101	4395	28.00	1	;
102	4358	56.00	1	;
103	4348	42.00	1	;
104	4384	24.00	1	;
105	4329	20.00	1	;
106	4341	38.00	1	;
107	4318	36.00	1	;
108	4368	23.00	1	;
109	4307	10.00	1	;
89	4412	80.00	1	;
110	4415	66.00	1	;
111	4408	71.00	1	;
112	4440	109.00	1	;
113	4395	32.00	1	;
114	4384	23.00	1	;
115	4369	18.00	1	;
116	4408	95.00	1	;
117	4289	40.00	1	;
118	4275	47.00	1	;
119	4329	41.00	1	;
120	4306	47.00	1	;
121	4264	59.00	1	;
122	4258	64.00	1	;
123	4256	6.00	1	;
124	4233	9.00	1	;
125	4279	29.00	1	;
126	4267	110.00	1	;
127	4285	87.00	1	;
128	4300	62.00	1	;
129	4272	51.00	1	;
130	4273	34.00	1	;
131	4263	17.00	1	;
132	4261	16.00	1	;
133	4260	18.00	1	;
134	4268	36.00	1	;
135	4277	79.00	1	;
136	4276	62.00	1	;
137	4283	51.00	1	;
138	4292	26.00	1	;
139	4294	4.00	1	;
140	4310	0.00		;

141	4303	4.00	1	;
142	4347	0.00		;
143	4302	22.00	1	;
144	4292	47.00	1	;
145	4308	16.00	1	;
146	4270	66.00	1	;
147	4267	40.00	1	;
148	4282	4.00	1	;
149	4270	31.00	1	;
150	4266	113.00	1	;
151	4276	100.00	1	;
152	4285	55.00	1	;
153	4292	76.00	1	;
154	4288	132.00	1	;
155	4280	98.00	1	;
156	4272	95.00	1	;
157	4266	69.00	1	;
158	4272	22.00	1	;
159	4303	17.00	1	;
160	4292	14.00	1	;
161	4296	0.00		;
162	4367	54.00	1	;
163	4507	19.00	1	;
164	4520	5.00	1	;
165	4516	6.00	1	;
166	4479	3.00	1	;
167	4439	0.00		;
169	4415	0.00		;
170	4424	0.00		;
168	4259	48.00	1	;
171	4259	100.00	1	;
172	4258	120.00	1	;
173	4260	52.00	1	;
174	4259	35.00	1	;
175	4261	79.00	1	;
176	4248	76.00	1	;
177	4252	62.00	1	;
178	4260	0.00		;
179	4247	46.00	1	;
180	4248	6.00	1	;
181	4245	619.00	1	;
182	4253	46.00	1	;
183	4246	6.00	1	;
184	4236	0.00		;
185	4250	0.00		;
186	4239	2.00	1	;
187	4234	0.00		;
188	4242	2.00	1	;
189	4214	2.00	1	;
190	4215	0.00		;

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 191                    4233            0.00                                    ;
 192                    4220            6.00            1                       ;
 193                    4220            1.00            1                       ;
 194                    4221            6.00            1                       ;
 195                    4217            3.00            1                       ;
 196                    4232            0.00                                    ;
 197                    4239            1.00            1                       ;
 198                    4228            0.00                                    ;
 202                    4227            2.00            1                       ;
 204                    4266            23.00           1                       ;
 205                    4260            0.00                                    ;
 206                    4266            0.00                                    ;
 207                    4264            0.00                                    ;
 208                    4243            571.00          1                       ;
 200                    4415            0                                       ;
 201                    4451            0                                       ;
 203                    4516            0                                       ;
 199                    4335            0                                       ;

[RESERVOIRS]
;ID                    Head            Pattern
 3004                   4500
;East_Bench_Well_House_(Well_#4)
 3001                   4440
;Allen_St_Well_House_(Well_#1)
 3002                   4386                                    ;500 pgm (10-16
hours per day)
 3003                   4448
;Anderson_Well_House_(Well_#3)
 3005                   4511                                    ;Well_House_#5
 3006                   4324                                    ;WELL6
 3007                   4322                                    ;WELL7

[TANKS]
;ID                    Elevation       InitLevel       MinLevel        MaxLevel
Diameter        MinVol          VolCurve                Overflow
 9999                   4674            12              0               16
105             0                                       ;East_Bench_Reservoir=1MG
 10                     4581            12              0               16
60              0                                       ;Res300,000gal
 11                     4579            14              0               18
54              0                                       ;Res350,000gal
 1001                   4580            9               0               13
50              0                                       ;
 1002                   4580            9               0               13
50              0                                       ;
 1003                   4580            9               0               13
50              0                                       ;
 1004                   4580            9               0               13
50              0                                       ;
```

```
[PIPES]
;ID              Node1           Node2           Length
Diameter        Roughness       MinorLoss       Status
 p23             n41             n42             178.79
6               110             0               Open    ;
 p24             n43             n44             181.23
6               110             0               Open    ;
 p25             n45             n46             114.35
4               110             0               Open    ;
 p26             n47             n48             199.27
4               110             0               Open    ;
 p29             n53             n54             386.42
8               110             0               Open    ;
 p42             n79             n80             221.53
8               110             0               Open    ;
 p44             n83             n84             503.92
8               110             0               Open    ;
 p50             n92             n93             170.50
6               110             0               Open    ;
 p55             n101            n102            521.91
6               110             0               Open    ;
 p59             n109            n110            123.82
6               110             0               Open    ;
 p61             n113            n114            296.17
6               110             0               Open    ;
 p81             n147            n148            509.90
8               110             0               Open    ;
 p83             n150            n151            481.09
8               110             0               Open    ;
 p84             n146            n152            640.42
8               110             0               Open    ;
 p87             n157            n158            718.05
8               110             0               Open    ;
 p89             n159            n160            555.12
8               110             0               Open    ;
 p95             n170            n24             346.04
12              110             0               Open    ;
 p109            n193            n194            707.28
8               110             0               Open    ;
 p139            n241            n242            118.24
8               110             0               Open    ;
 p149            n256            n257            244.74
8               110             0               Open    ;
 p170            n290            n291            186.96
8               110             0               Open    ;
 p191            n324            n101            949.11
6               110             0               Open    ;
 p198            n335            n336            656.69
6               110             0               Open    ;
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 p199                    n325                    n29                     606.11
6                110            0               Open    ;
 p200                    n337                    n338                    421.64
10               110            0               Open    ;
 p206                    n345                    n19                     477.29
10               110            0               Open    ;
 p207                    n28                     n345                    379.37
10               110            0               Open    ;
 p218                    n212                    n357                    875.78
3                110            0               Open    ;
 p223                    n361                    n203                    521.72
6                110            0               Open    ;
 p224                    n316                    n362                    528.96
6                110            0               Open    ;
 p230                    n300                    n369                    430.11
8                110            0               Open    ;
 p245                    n84                     n385                    627.43
6                110            0               Open    ;
 p249                    n338                    n390                    347.36
8                110            0               Open    ;
 p251                    n391                    n179                    1182.02
8                110            0               Open    ;
 p265                    n407                    n387                    657.04
6                110            0               Open    ;
 p266                    n408                    n407                    385.96
6                110            0               Open    ;
 p267                    n408                    n409                    503.70
6                110            0               Open    ;really 6
 p270                    n409                    n156                    595.81
6                110            0               Open    ;reall 6
 p271                    n156                    n157                    285.28
8                110            0               Open    ;
 p275                    n418                    n416                    280.13
8                110            0               Open    ;
 p281                    n75                     n421                    746.54
10               110            0               Open    ;
 p292                    n418                    n430                    484.97
6                110            0               Open    ;
 p300                    n437                    n113                    327.23
6                110            0               Open    ;
 p301                    n320                    n438                    499.80
6                110            0               Open    ;
 p309                    n445                    n446                    162.16
8                110            0               Open    ;
 p311                    n448                    n256                    289.65
8                110            0               Open    ;
 p314                    n195                    n450                    242.89
10               110            0               Open    ;
 p315                    n451                    n28                     266.21
6                110            0               Open    ;
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 p322                n457                n410                691.60
6               110             0       Open    ;
 p323                n458                n459                274.04
6               110             0       Open    ;
 p324                n460                n458                544.12
6               110             0       Open    ;
 p326                n457                n84                 852.18
6               110             0       Open    ;
 p336                n472                n473                452.82
6               110             0       Open    ;
 p337                n174                n472                617.33
6               110             0       Open    ;
 p342                n477                n478                202.84
8               110             0       Open    ;
 p343                n479                n480                163.42
8               110             0       Open    ;
 p354                n336                n495                151.46
6               110             0       Open    ;
 p365                n94                 n512                312.44
8               110             0       Open    ;
 4                   n65                 n232                187.67
8               110             0       Open    ;
 7                   n30                 1                   665.46
6               110             0       Open    ;
 13                  1                   2                   219.99
6               110             0       Open    ;
 14                  n108                n109                259.85
6               110             0       Open    ;
 16                  n105                3                   395.54
6               110             0       Open    ;
 17                  3                   n106                105.77
6               110             0       Open    ;
 18                  n97                 n111                154.42
6               110             0       Open    ;
 21                  n99                 n102                176.01
6               110             0       Open    ;
 22                  n97                 n194                316.24
6               110             0       Open    ;
 23                  n194                n436                243.07
6               110             0       Open    ;
 24                  n97                 n100                282.51
6               110             0       Open    ;
 25                  n100                n88                 370.19
6               110             0       Open    ;
 28                  n512                n88                 278.15
10              110             0       Open    ;
 30                  n159                n155                591.73
8               110             0       Open    ;
 31                  n155                n152                615.00
8               110             0       Open    ;
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 32                 n152               n399               299.27
8          110            0          Open    ;
 33                 n399               n70                471.45
8          110            0          Open    ;
 34                 n70                n367               125.72
8          110            0          Open    ;
 35                 n367               n406               685.84
8          110            0          Open    ;
 36                 n52                n53                822.71
8          110            0          Open    ;
 37                 n51                n53                240.66
8          110            0          Open    ;
 38                 n527               n147               639.78
8          110            0          Open    ;
 39                 n147               n146               289.19
8          110            0          Open    ;
 40                 n398               n146               323.36
8          110            0          Open    ;
 41                 n399               n398               614.30
8          110            0          Open    ;
 43                 n69                n443               146.64
8          110            0          Open    ;
 44                 n443               n445               247.70
8          110            0          Open    ;
 45                 n445               n70                265.32
8          110            0          Open    ;
 46                 n142               n52                291.98
8          110            0          Open    ;
 47                 n52                n511               356.49
8          110            0          Open    ;
 48                 n527               n140               538.67
8          110            0          Open    ;
 49                 n140               n142               780.55
8          110            0          Open    ;
 51                 n511               n54                812.51
6          110            0          Open    ;
 56                 n367               n407               783.49
6          110            0          Open    ;
 58                 n406               n387               688.74
8          110            0          Open    ;
 63                 n181               4                  467.40
8          110            0          Open    ;
 68                 5                  n232               237.63
8          110            0          Open    ;
 86                 n251               n343               696.57
8          110            0          Open    ;
 89                 n199               n201               227.45
8          110            0          Open    ;
 90                 n199               n358               129.27
6          110            0          Open    ;
```

```
 93                 n197                n274                146.35
4          110             0          Open    ;
 94                 n197                n272                273.26
8          110             0          Open    ;
 96                 n315                n314                241.10
6          110             0          Open    ;
 97                 n315                n362                280.67
6          110             0          Open    ;
 98                 n362                n203                308.03
6          110             0          Open    ;
 99                 n203                n323                285.89
6          110             0          Open    ;
 100                n323                n451                281.85
6          110             0          Open    ;
 103                n459                n83                 473.94
8          110             0          Open    ;
 104                n83                 n266                263.20
8          110             0          Open    ;
 106                n459                n315                267.32
6          110             0          Open    ;
 107                n266                n315                383.41
8          110             0          Open    ;
 109                n21                 n79                 338.66
6          110             0          Open    ;
 110                n79                 n459                273.37
6          110             0          Open    ;
 112                n114                n320                639.24
8          110             0          Open    ;
 113                n320                n324                318.79
8          110             0          Open    ;
 114                n324                n440                79.76
8          110             0          Open    ;
 117                n440                n325                261.58
8          110             0          Open    ;
 118                n325                n316                197.07
8          110             0          Open    ;
 119                n316                n335                148.88
8          110             0          Open    ;
 120                n335                n195                62.52
6          110             0          Open    ;
 1                  n453                n24                 389.57
10         110             0          Open    ;
 102                n113                n116                283.68
6          110             0          Open    ;
 121                n30                 n31                 185.80
8          110             0          Open    ;
 126                n47                 n45                 326.24
8          110             0          Open    ;
 130                n92                 n193                315.63
8          110             0          Open    ;
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 131                n193                n88                282.10
8               110             0       Open    ;
 142                n385                n267               363.66
8               110             0       Open    ;
 145                n142                n51                757.91
8               110             0       Open    ;
 146                n152                n409               714.58
8               110             0       Open    ;
 147                n457                n21                226.76
6               110             0       Open    ;
 155                n424                n123               134.05
8               110             0       Open    ;
 165                n369                n277               340.22
8               110             0       Open    ;
 166                n277                n188               343.45
8               110             0       Open    ;
 168                n416                n49                287.31
8               110             0       Open    ;
 171                n148                n143               452.41
8               110             0       Open    ;
 172                n143                n137               101.90
8               110             0       Open    ;
 173                n150                n527               1203.06
8               110             0       Open    ;
 175                n4                  n481               333.21
10              110             0       Open    ;
 176                n481                n448               434.61
10              110             0       Open    ;
 5                  n493                n41                272.55
8               110             0       Open    ;
 6                  n41                 n43                268.02
8               110             0       Open    ;
 11                 n450                n24                613.32
12              110             0       Open    ;
 26                 n195                n361               97.85
6               110             0       Open    ;
 53                 n406                n168               354.89
8               110             0       Open    ;
 180                n168                n444               272.49
8               110             0       Open    ;
 181                n444                n496               1489.03
8               110             0       Open    ;
 183                n453                n28                646.56
10              110             0       Open    ;
 192                n91                 n436               862.24
6               110             0       Open    ;
 193                n436                n410               1418.38
6               110             0       Open    ;
 195                n21                 n460               242.87
6               110             0       Open    ;
```

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 203                n339                n449                972.80
6               110             0       Open    ;
 212                n398                n69                 539.44
8               110             0       Open    ;
 213                n69                 n68                 205.80
8               110             0       Open    ;
 2                  n475                n10                 707.21
6               110             0       Open    ;
 3                  n10                 n174                536.49
6               110             0       Open    ;
 60                 n481                n479                210.09
10              110             0       Open    ;
 62                 n251                n253                816.16
8               110             0       Open    ;
 69                 n184                n183                648.57
8               110             0       Open    ;
 70                 n183                n182                226.78
8               110             0       Open    ;
 77                 n183                n181                259.20
8               110             0       Open    ;
 111                n438                n101                430.93
6               110             0       Open    ;
 141                n20                 n343                502.56
10              110             0       Open    ;
 148                n421                n420                325.40
10              110             0       Open    ;
 157                n188                7                   155.88
8               110             0       Open    ;
 158                n300                n277                762.43
8               110             0       Open    ;
 160                n300                n421                332.30
8               110             0       Open    ;
 59                 n58                 n261                500.45
10              110             0       Open    ;
 66                 n261                n56                 772.19
10              110             0       Open    ;
 78                 n10                 n171                1045.68
8               110             0       Open    ;
 81                 n177                n241                921.09
8               110             0       Open    ;
 83                 n177                n246                905.00
8               110             0       Open    ;
 84                 n246                n241                324.66
8               110             0       Open    ;
 88                 n61                 n60                 331.79
8               110             0       Open    ;
 170                n246                n63                 497.03
8               110             0       Open    ;
 178                n472                n63                 1049.69
8               110             0       Open    ;
```

```
 188                n14                n16                242.65
6               110             0       Open    ;
 189                n13                n14                409.98
6               110             0       Open    ;
 199                n473               n13                305.18
6               110             0       Open    ;
 201                n65                n447               741
8               110             0       Open    ;
 204                n447               n235               186
8               110             0       Open    ;
 206                n251               n9                 974.47
6               110             0       Open    ;
 207                n253               n7                 1054.59
8               110             0       Open    ;
 208                n7                 n20                857.45
8               110             0       Open    ;
 209                n267               n266               702.04
8               110             0       Open    ;
 222                n266               n197               276.27
8               110             0       Open    ;
 223                n467               n451               145.20
6               110             0       Open    ;
 224                n337               n179               436.79
8               110             0       Open    ;
 226                n479               n477               328.51
10              110             0       Open    ;
 227                n475               n4                 481.79
10              110             0       Open    ;
 228                n5                 n4                 650.77
6               110             0       Open    ;
 231                n26                n336               610.95
8               110             0       Open    ;
 232                n197               n202               323.62
8               110             0       Open    ;
 233                n202               n203               441.85
8               110             0       Open    ;
 234                1                  n29                783.22
6               110             0       Open    ;
 235                n361               n453               796.77
6               110             0       Open    ;
 236                n323               n468               209.49
6               110             0       Open    ;
 237                n202               n199               393.93
8               110             0       Open    ;
 238                n168               n169               703.84
8               110             0       Open    ;
 239                n443               n444               766.33
8               110             0       Open    ;
 240                n398               n400               342.34
8               110             0       Open    ;
```

```
 241                n146                n143                596.77
8               110             0       Open    ;
 242                n51                 n143                813.68
8               110             0       Open    ;
 243                n158                n160                267.13
6               110             0       Open    ;
 245                n53                 n500                368.82
8               110             0       Open    ;
 246                n88                 n192                695.68
8               110             0       Open    ;
 247                n192                n193                671.38
8               110             0       Open    ;
 248                n94                 n96                 264.38
6               110             0       Open    ;
 249                n31                 n32                 580.69
8               110             0       Open    ;
 250                6                   n332                192.04
6               110             0       Open    ;
 252                n31                 6                   281.43
8               110             0       Open    ;
 253                n493                n192                313.33
8               110             0       Open    ;
 254                n45                 n33                 1004.53
8               110             0       Open    ;
 255                n334                n47                 338.80
8               110             0       Open    ;
 256                n333                n334                162.66
6               110             0       Open    ;
 257                n334                6                   268.10
8               110             0       Open    ;
 258                n92                 n91                 343.11
8               110             0       Open    ;
 259                n100                n99                 934.28
8               110             0       Open    ;
 260                n108                n111                370.74
6               110             0       Open    ;
 262                n111                n105                454.76
6               110             0       Open    ;
 263                n109                3                   401.42
6               110             0       Open    ;
 264                n108                n437                359.90
6               110             0       Open    ;
 265                n437                n118                467.52
6               110             0       Open    ;
 266                n156                n155                512.59
8               110             0       Open    ;
 267                n105                n99                 268.43
6               110             0       Open    ;
 268                n39                 n493                378.14
8               110             0       Open    ;
```

```
 269                n37                n39                414.59
8               110             0       Open    ;
 270                n91                n37                876.66
6               110             0       Open    ;
 271                n36                n73                540.22
8               110             0       Open    ;
 272                n37                n36                529.66
6               110             0       Open    ;
 275                n516               n494               970.70
6               110             0       Open    ;
 276                n494               n518               697.61
6               110             0       Open    ;
 277                n516               n35                303.16
6               110             0       Open    ;
 279                n49                n50                694.10
8               110             0       Open    ;
 280                n121               n122               478.63
8               110             0       Open    ;
 282                n123               n124               548.93
8               110             0       Open    ;
 283                n124               n126               763.63
8               110             0       Open    ;
 284                n126               n127               405.62
8               110             0       Open    ;
 285                n127               n290               250.13
8               110             0       Open    ;
 286                n290               n130               523.01
8               110             0       Open    ;
 287                n130               n287               147.47
8               110             0       Open    ;
 288                n130               n123               298.54
8               110             0       Open    ;
 289                n130               n127               386.50
8               110             0       Open    ;
 290                n127               n124               401.89
8               110             0       Open    ;
 291                n122               n423               116.40
8               110             0       Open    ;
 295                n410               n114               266.42
8               110             0       Open    ;
 299                n20                n19                944.32
10              110             0       Open    ;
 301                n148               n140               598.67
8               110             0       Open    ;
 12                 n31                n94                431.60
8               110             0       Open    ;
 29                 16                 n448               694.03
10              110             0       Open    ;
 73                 n391               17                 857.50
8               110             0       Open    ;
```

```
 50                 n165                n496                97.54
12          110             0           Open    ;
 52                 10                  n170                117.61
12          110             0           Open    ;
 55                 11                  n170                98.93
12          110             0           Open    ;
 15                 n14                 9                   187.34
6           110             0           Open    ;
 20                 n63                 9                   208.39
8           110             0           Open    ;
 27                 n5                  n9                  226.88
8           110             0           Open    ;
 91                 n242                13                  183.16
8           110             0           Open    ;
 92                 13                  14                  169.51
8           110             0           Open    ;
 95                 13                  19                  931.12
12          110             0           Open    ;
 101                19                  n305                182.91
12          110             0           Open    ;
 105                19                  15                  149.74
12          110             0           Open    ;
 115                13                  n171                76.63
12          110             0           Open    ;
 116                23                  20                  719.41
8           110             0           Open    ;
 122                20                  21                  246.67
8           110             0           Open    ;
 123                20                  22                  217.93
8           110             0           Open    ;
 124                n187                23                  595.37
8           110             0           Open    ;
 125                23                  n188                144.19
8           110             0           Open    ;
 127                24                  n205                638.33
2           110             0           Open    ;
 85                 n56                 9999                105.94
10          110             0           Open    ;
 64                 18                  25                  585.78
8           110             0           Open    ;
 129                25                  26                  1289.62
8           110             0           Open    ;
 132                n448                14                  347.23
8           120             0           Open    ;Future Loop
 167                n246                n61                 295.56
8           120             0           Open    ;
 87                 12                  n257                385.66
8           110             0           Open    ;
 220                n343                31                  922.95
10          110             0           Open    ;
```

```
 133                    31                     30                     190.86
10              110             0              Open    ;
 134                    30                     n477                   289.69
10              110             0              Open    ;
 135                    30                     32                     542.66
10              110             0              Open    ;
 136                    35                     33                     224.72
8               110             0              Open    ;
 137                    33                     34                     245.70
8               110             0              Open    ;
 138                    33                     32                     157.40
8               110             0              Open    ;
 139                    32                     12                     163.33
8               110             0              Open    ;
 143                    n429                   28                     975.80
6               110             0              Open    ;
 149                    n77                    27                     1008.76
6               110             0              Open    ;
 154                    29                     n121                   246.73
6               110             0              Open    ;
 281                    n122                   37                     263.64
8               110             0              Open    ;
 156                    37                     n123                   258.03
8               110             0              Open    ;
 159                    29                     36                     708.38
8               110             0              Open    ;
 169                    36                     37                     420.64
8               110             0              Open    ;
 177                    36                     38                     781.84
8               110             0              Open    ;
 179                    38                     n124                   282.03
8               110             0              Open    ;
 184                    38                     39                     257.23
8               110             0              Open    ;
 152                    n36                    40                     386.70
6               110             0              Open    ;
 153                    40                     n516                   262.18
6               110             0              Open    ;
 187                    41                     n418                   250.63
12              110             0              Open    ;
 191                    28                     42                     1774.68
8               120             0              Open    ;
 196                    n78                    43                     248.40
6               120             0              Open    ;
 162                    44                     29                     329.54
6               120             0              Open    ;
 197                    n496                   45                     414.71
10              120             0              Open    ;
 198                    45                     46                     308.98
10              120             0              Open    ;
```

```
 200                 46                  n527                940.05
10          120             0           Open    ;
 210                 48                  47                  317.44
8           120             0           Open    ;
 215                 47                  49                  315.93
8           120             0           Open    ;
 216                 47                  50                  1244.39
8           120             0           Open    ;
 217                 48                  51                  1284.01
8           120             0           Open    ;
 219                 52                  8                   1040.67
12          120             0           Open    ;
 225                 49                  52                  128.68
8           120             0           Open    ;
 19                  n389                n376                247.35
8           120             0           Open    ;
 67                  n385                53                  934.06
6           110             0           Open    ;
 150                 54                  n249                30.23
6           110             0           Open    ;
 214                 n253                n249                475.11
8           120             0           Open    ;
 251                 n387                55                  550.28
6           120             0           Open    ;
 273                 55                  56                  376.90
8           120             0           Open    ;
 274                 56                  57                  348.73
8           120             0           Open    ;
 293                 57                  58                  521.50
8           120             0           Open    ;
 296                 57                  59                  273.60
8           120             0           Open    ;
 9                   n58                 n261                2058.84
12          110             0           Open    ;
 302                 67                  66                  239.73
8           110             0           Open    ;
 303                 68                  69                  515.18
12          110             0           Open    ;
 304                 69                  n397                564.91
12          110             0           Open    ;
 305                 67                  70                  126.38
8           110             0           Open    ;
 306                 n397                70                  441.02
8           110             0           Open    ;
 307                 68                  67                  600.86
8           110             0           Open    ;
 308                 66                  70                  344.41
8           110             0           Open    ;
 310                 n395                71                  383.76
8           110             0           Open    ;
```

```
 311                    71                     n374                   1044.87
8               110             0              Open    ;
 312                    71                     26                     286.65
8               110             0              Open    ;
 313                    26                     n374                   924.93
8               110             0              Open    ;
 65                     61                     60                     316.15
8               110             0              Open    ;
 72                     n179                   60                     95.82
12              110             0              Open    ;
 80                     60                     n181                   291.71
12              110             0              Open    ;
 221                    65                     64                     322.89
8               110             0              Open    ;
 297                    62                     64                     66.52
8               110             0              Open    ;
 298                    64                     63                     321.65
8               110             0              Open    ;
 309                    n475                   65                     1054.71
6               110             0              Open    ;
 314                    n249                   65                     994.40
6               110             0              Open    ;
 315                    73                     72                     214.64
8               110             0              Open    ;
 316                    n177                   72                     189.86
8               110             0              Open    ;
 317                    72                     n174                   110.74
8               110             0              Open    ;
 318                    n75                    74                     1150.07
8               110             0              Open    ;
 319                    7                      74                     258.54
8               110             0              Open    ;
 320                    74                     75                     280.24
8               110             0              Open    ;
 321                    76                     40                     225.84
8               110             0              Open    ;
 322                    n158                   80                     407.33
12              110             0              Open    ;
 323                    80                     81                     480.42
12              110             0              Open    ;
 325                    80                     79                     77.50
8               110             0              Open    ;
 326                    81                     77                     78.19
8               110             0              Open    ;
 327                    77                     78                     104.66
8               110             0              Open    ;
 328                    77                     79                     481.62
8               110             0              Open    ;
 329                    56                     83                     434.90
8               110             0              Open    ;
```

```
 330                 83                  82                  204.94
8               110             0       Open    ;
 331                 57                  82                  586.61
8               110             0       Open    ;
 186                 59                  84                  238.89
8               110             0       Open    ;
 205                 59                  58                  265.56
8               110             0       Open    ;
 230                 85                  58                  130.21
8               110             0       Open    ;
 332                 86                  59                  119.63
8               110             0       Open    ;
 333                 35                  87                  230.43
8               110             0       Open    ;
 334                 n343                87                  398.24
8               110             0       Open    ;
 335                 87                  88                  549.18
8               110             0       Open    ;
 336                 78                  90                  596.70
8               110             0       Open    ;
 337                 90                  91                  352.42
8               110             0       Open    ;
 338                 91                  92                  758.23
8               110             0       Open    ;
 339                 92                  93                  431.53
8               110             0       Open    ;
 340                 n420                94                  485.11
8               110             0       Open    ;
 341                 94                  95                  811.07
8               110             0       Open    ;
 342                 95                  n131                210.37
12              110             0       Open    ;
 343                 n131                n511                602.47
8               110             0       Open    ;
 344                 92                  94                  670.51
8               110             0       Open    ;
 345                 91                  95                  596.10
8               110             0       Open    ;
 346                 90                  93                  634.71
8               110             0       Open    ;
 347                 n50                 93                  34.32
8               110             0       Open    ;
 348                 81                  96                  471.85
12              110             0       Open    ;
 349                 96                  41                  439.79
12              110             0       Open    ;
 350                 96                  93                  621.14
8               110             0       Open    ;
 351                 n49                 97                  217.73
8               110             0       Open    ;
```

```
 352                    97                     98                     110.02
8               110             0              Open    ;
 353                    98                     n421                   664.70
8               110             0              Open    ;
 354                    n160                   99                     518.79
8               110             0              Open    ;
 355                    99                     n54                    161.73
8               110             0              Open    ;
 356                    90                     99                     851.32
8               110             0              Open    ;
 357                    92                     98                     684.22
8               110             0              Open    ;
 358                    97                     102                    1041.70
8               110             0              Open    ;
 359                    102                    103                    735.02
8               110             0              Open    ;
 360                    103                    106                    613.39
8               110             0              Open    ;
 362                    102                    101                    844.36
8               110             0              Open    ;
 363                    104                    103                    912.50
8               110             0              Open    ;
 364                    103                    n121                   786.71
8               110             0              Open    ;
 365                    108                    106                    944.64
8               110             0              Open    ;
 366                    106                    107                    766.96
8               110             0              Open    ;
 367                    105                    106                    591.52
8               110             0              Open    ;
 368                    n75                    100                    295.27
8               110             0              Open    ;
 369                    100                    44                     122.26
8               110             0              Open    ;
 370                    100                    109                    699.90
8               110             0              Open    ;
 371                    109                    75                     450.55
8               110             0              Open    ;
 372                    109                    36                     464.11
8               110             0              Open    ;
 373                    n121                   107                    622.99
8               110             0              Open    ;
 374                    107                    n429                   608.36
8               110             0              Open    ;
 375                    107                    n287                   997.13
8               110             0              Open    ;
 376                    n77                    105                    1035.91
8               110             0              Open    ;
 377                    105                    n429                   759.31
8               110             0              Open    ;
```

```
 378                n430                101                574.77
6               110             0       Open    ;
 379                101                 104                745.54
6               110             0       Open    ;
 380                104                 108                610.34
6               110             0       Open    ;
 381                108                 n77                584.16
6               110             0       Open    ;
 151                89                  n339               759.29
8               110             0       Open    ;
 211                115                 110                829.37
8               110             0       Open    ;
 244                89                  110                595.93
8               110             0       Open    ;
 278                110                 111                580.61
8               110             0       Open    ;
 292                111                 114                894.48
8               110             0       Open    ;
 294                111                 112                796.81
8               110             0       Open    ;
 324                112                 113                972.39
8               110             0       Open    ;
 382                n494                112                996.29
8               110             0       Open    ;
 383                n35                 113                724.60
6               110             0       Open    ;
 384                113                 114                748.16
6               110             0       Open    ;
 385                114                 115                603.62
6               110             0       Open    ;
 386                115                 n339               585.18
6               110             0       Open    ;
 387                117                 118                1015.63
8               110             0       Open    ;
 388                119                 117                1204.97
8               110             0       Open    ;
 389                120                 117                822.48
8               110             0       Open    ;
 390                27                  119                819.17
6               110             0       Open    ;
 391                43                  119                1023.33
6               110             0       Open    ;
 392                27                  120                1101.88
6               110             0       Open    ;
 393                120                 28                 794.26
6               110             0       Open    ;
 394                n429                121                1492.60
8               110             0       Open    ;
 395                121                 n291               407.48
8               110             0       Open    ;
```

```
 396                 28                  122                 1555.90
8               110             0       Open    ;
 397                 122                 124                 1558.75
8               110             0       Open    ;
 398                 123                 122                 363.54
8               110             0       Open    ;
 399                 122                 121                 798.59
8               110             0       Open    ;
 400                 125                 126                 2338.27
8               110             0       Open    ;
 401                 128                 127                 2258.15
8               110             0       Open    ;
 402                 n511                127                 1248.39
4               110             0       Open    ;
 403                 127                 126                 541.13
4               110             0       Open    ;
 404                 126                 n212                649.25
4               110             0       Open    ;
 405                 n420                128                 944.52
6               110             0       Open    ;
 407                 125                 n205                592.25
6               110             0       Open    ;
 408                 n187                125                 402.61
6               110             0       Open    ;
 409                 n187                128                 145.57
6               110             0       Open    ;
 410                 n140                130                 1234.39
8               110             0       Open    ;
 411                 n142                129                 1240.85
8               110             0       Open    ;
 412                 127                 129                 720.20
8               110             0       Open    ;
 413                 129                 130                 861.77
8               110             0       Open    ;
 414                 130                 n151                74.44
8               110             0       Open    ;
 415                 126                 131                 752.54
8               110             0       Open    ;
 417                 132                 133                 605.20
8               110             0       Open    ;
 418                 129                 131                 581.08
8               110             0       Open    ;
 419                 132                 131                 888.50
8               110             0       Open    ;
 420                 132                 130                 622.06
8               110             0       Open    ;
 421                 48                  134                 933.86
8               110             0       Open    ;
 422                 n150                134                 254.51
8               110             0       Open    ;
```

```
 423                 134                 133                 429.48
8               110             0       Open    ;
 424                 146                 135                 1438.24
8               110             0       Open    ;
 428                 85                  139                 130.63
8               110             0       Open    ;
 429                 139                 138                 585.08
8               110             0       Open    ;
 430                 140                 141                 764.70
8               110             0       Open    ;
 431                 143                 141                 431.38
8               110             0       Open    ;
 432                 141                 138                 321.08
8               110             0       Open    ;
 433                 138                 148                 420.00
8               110             0       Open    ;
 434                 148                 135                 360.37
8               110             0       Open    ;
 435                 142                 140                 705.19
8               110             0       Open    ;
 436                 140                 139                 246.51
8               110             0       Open    ;
 437                 139                 148                 724.40
8               110             0       Open    ;
 438                 135                 136                 780.34
8               110             0       Open    ;
 439                 136                 137                 770.97
8               110             0       Open    ;
 440                 138                 137                 782.63
8               110             0       Open    ;
 441                 n376                143                 340.79
8               110             0       Open    ;
 442                 143                 144                 761.97
8               110             0       Open    ;
 443                 144                 137                 692.60
8               110             0       Open    ;
 444                 144                 145                 627.20
8               110             0       Open    ;
 445                 136                 147                 1130.36
8               110             0       Open    ;
 446                 136                 149                 950.94
8               110             0       Open    ;
 447                 149                 151                 769.13
8               110             0       Open    ;
 448                 151                 137                 958.81
8               110             0       Open    ;
 449                 151                 152                 686.15
8               110             0       Open    ;
 450                 144                 152                 969.49
8               110             0       Open    ;
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 451                 145                 153                 976.93
8               110             0       Open    ;
 452                 157                 156                 707.83
8               110             0       Open    ;
 453                 156                 155                 692.70
8               110             0       Open    ;
 454                 155                 154                 630.23
8               110             0       Open    ;
 455                 151                 156                 860.24
8               110             0       Open    ;
 456                 155                 152                 853.80
8               110             0       Open    ;
 457                 153                 154                 845.54
8               110             0       Open    ;
 458                 158                 156                 379.46
8               110             0       Open    ;
 459                 155                 18                  380.38
8               110             0       Open    ;
 460                 154                 159                 649.34
8               110             0       Open    ;
 461                 159                 4                   129.77
8               110             0       Open    ;
 462                 160                 154                 323.54
8               110             0       Open    ;
 463                 n338                161                 1062.80
8               110             0       Open    ;
 464                 n390                161                 1216.67
8               110             0       Open    ;
 465                 161                 153                 132.40
8               110             0       Open    ;
 466                 153                 152                 623.70
8               110             0       Open    ;
 467                 149                 150                 526.62
8               110             0       Open    ;
 468                 n7                  162                 1185.42
8               110             0       Open    ;
 469                 88                  n28                 2082.51
8               110             0       Open    ;
 470                 n58                 163                 457.84
12              110             0       Open    ;
 471                 15                  163                 465.93
12              110             0       Open    ;
 472                 163                 16                  64.48
8               110             0       Open    ;
 473                 n308                164                 689.68
8               110             0       Open    ;
 474                 5                   164                 517.56
8               110             0       Open    ;
 475                 164                 165                 232.32
8               110             0       Open    ;
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 476                 n235                165                 324.52
8               110             0       Open    ;
 477                 165                 166                 612.42
8               110             0       Open    ;
 478                 166                 n447                538.86
8               110             0       Open    ;
 479                 169                 167                 620.90
8               110             0       Open    ;
 480                 167                 166                 637.58
8               110             0       Open    ;
 481                 167                 170                 136.11
8               110             0       Open    ;
 482                 n165                146                 1139.67
12              110             0       Open    ;
 484                 150                 157                 991.05
12              110             0       Open    ;
 485                 157                 n352                514.64
12              110             0       Open    ;
 486                 147                 146                 697.26
12              110             0       Open    ;
 487                 147                 150                 1141.82
12              110             0       Open    ;
 488                 n352                158                 373.54
12              110             0       Open    ;
 489                 158                 18                  693.45
12              110             0       Open    ;
 490                 159                 n395                372.06
8               110             0       Open    ;
 491                 n395                160                 648.06
8               110             0       Open    ;
 492                 160                 18                  631.26
8               110             0       Open    ;
 57                  140                 86                  1000
8               110             0       Open    ;
 61                  n352                168                 1000
8               110             0       Open    ;
 108                 168                 171                 699.14
8               110             0       Open    ;
 144                 171                 174                 389.95
8               110             0       Open    ;
 161                 168                 173                 406.78
8               110             0       Open    ;
 163                 157                 173                 406.85
8               110             0       Open    ;
 174                 173                 174                 720.13
8               110             0       Open    ;
 190                 150                 173                 849.34
8               110             0       Open    ;
 194                 150                 175                 631.37
8               110             0       Open    ;
```

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 406                 175                 174                 556.03
8               110             0       Open    ;
 416                 175                 172                 703.33
8               110             0       Open    ;
 425                 171                 177                 709.08
8               110             0       Open    ;
 426                 177                 172                 960.83
8               110             0       Open    ;
 427                 172                 176                 1216.31
8               110             0       Open    ;
 493                 172                 178                 898.19
8               110             0       Open    ;
 494                 147                 178                 726.15
8               110             0       Open    ;
 495                 178                 179                 1411.69
8               110             0       Open    ;
 496                 176                 179                 426.83
8               110             0       Open    ;
 497                 179                 180                 891.88
8               110             0       Open    ;
 498                 146                 180                 1973.64
8               110             0       Open    ;
 499                 52                  182                 733.75
12              110             0       Open    ;
 500                 182                 181                 681.60
12              110             0       Open    ;
 502                 180                 182                 1238.92
8               110             0       Open    ;
 503                 182                 133                 1645.69
8               110             0       Open    ;
 504                 24                  185                 67.53
12              110             0       Open    ;
 505                 185                 124                 4404.46
8               110             0       Open    ;
 506                 185                 n357                2540.34
8               110             0       Open    ;
 507                 n357                183                 1608.01
8               110             0       Open    ;
 508                 184                 183                 2265.99
8               110             0       Open    ;
 509                 183                 181                 2314.09
8               110             0       Open    ;
 510                 n357                186                 335.22
8               110             0       Open    ;
 511                 187                 186                 5221.91
8               110             0       Open    ;
 512                 186                 198                 513.50
8               110             0       Open    ;
 513                 186                 197                 955.20
8               110             0       Open    ;
```

```
 515                 194                 193                 1593.03
8               110             0       Open    ;
 516                 193                 189                 832.61
8               110             0       Open    ;
 517                 189                 190                 1210.36
8               110             0       Open    ;
 518                 190                 192                 778.25
8               110             0       Open    ;
 519                 192                 193                 1182.29
8               110             0       Open    ;
 521                 192                 195                 1607.62
8               110             0       Open    ;
 522                 195                 196                 1225.77
8               110             0       Open    ;
 523                 196                 191                 1651.05
8               110             0       Open    ;
 524                 192                 191                 1279.58
8               110             0       Open    ;
 525                 193                 188                 1303.54
8               110             0       Open    ;
 526                 188                 191                 1083.81
8               110             0       Open    ;
 527                 188                 197                 1631.52
8               110             0       Open    ;
 528                 197                 202                 479.06
8               110             0       Open    ;
 529                 202                 194                 844.73
8               110             0       Open    ;
 530                 202                 198                 1047.21
8               110             0       Open    ;
 531                 181                 184                 1152.88
12              110             0       Open    ;
 532                 184                 187                 2065.60
12              110             0       Open    ;
 533                 187                 n397                2199.12
12              110             0       Open    ;
 534                 39                  204                 423.77
8               110             0       Open    ;
 535                 75                  204                 585.90
8               110             0       Open    ;
 536                 204                 21                  604.71
8               110             0       Open    ;
 537                 168                 207                 942.81
8               110             0       Open    ;
 538                 207                 206                 397.31
8               110             0       Open    ;
 539                 207                 205                 857.47
8               110             0       Open    ;
 540                 181                 208                 4562.31
8               110             0       Open    ;
```

```
 218                102                100                784.12
8               100             0               Open    ;
 361                112                1001               1160.60
12              100             0               Open    ;
 501                15                 1002               607.96
12              100             0               Open    ;
 514                n449               116                2234.24
8               100             0               Open    ;
 520                89                 200                2335.93
8               100             0               Open    ;
 541                200                116                506.36
8               100             0               Open    ;
 542                1003               200                851.35
12              100             0               Open    ;
 543                87                 1004               967.10
8               100             0               Open    ;
 545                n494               201                384.07
12              100             0               Open    ;
 546                n43                201                462.87
12              100             0               Open    ;
 8                  n202               162                382.24
8               100             0               Open    ;
 10                 n267               162                673.63
8               100             0               Open    ;
 74                 n389               142                973.08
6               100             0               Open    ;
 261                142                55                 619.87
6               100             0               Open    ;
 300                n390               199                806.33
8               100             0               Open    ;
 483                199                n389               1246.39
8               100             0               Open    ;
 544                199                145                578.28
8               100             0               Open    ;
 547                n305               n62                107.85
12              100             0               Open    ;
 548                n62                n61                434.35
8               100             0               Open    ;
 549                n62                203                149.44
12              100             0               Open    ;

[PUMPS]
;ID                Node1              Node2              Parameters
 2002               3002               n440               HEAD 2
;Well_#2
 2001               3001               n361               HEAD 1
;Allen_St_Well_(Well_#1)
 2003               3003               n512               HEAD 3
;Anderson_Well_(Well_#3)
 2005               3005               n518               HEAD 5
```

```
;Well_#5
 2004                    3004                    9999                    HEAD 4
;East_Bench_Well_(Well_#4)
 2006                    3006                    89                      HEAD 6
;ppumpsb
 2007                    3007                    n19                     HEAD 7
;WELL7
 2008                    201                     n33                     HEAD 8
;ppumpb
 75                      203                     n308                    HEAD 9  ;

[VALVES]
;ID                      Node1                   Node2                   Diameter
Type    Setting         MinorLoss
 71                      17                      n374                    6
PRV     74              0               ;PRV north line
 76                      n475                    n390                    8
PRV     80              0               ;
 79                      n410                    n408                    8
PRV     76              0               ;
 82                      n91                     n158                    6
PRV     69.75           0               ;
 42                      n496                    8                       8
PRV     70              0               ;Pointe Perry PRV
 128                     n58                     n256                    10
PRV     61              0               ;PRV at north tank
 202                     53                      54                      6
PRV     100             0               ;
 54                      40                      41                      6
PRV     62.75           0               ;
 140                     n339                    n77                     6
PRV     79              0               ;
 164                     n232                    n63                     8
PRV     66              0               ;

[TAGS]
 NODE   3002                    Well_House_#2

[DEMANDS]
;Junction               Demand          Pattern                 Category

[STATUS]
;ID                      Status/Setting

[PATTERNS]
;ID                      Multipliers
;
 1                       0.38

[CURVES]
```

```
;ID                      X-Value         Y-Value
;PUMP: PUMP: PUMP: PUMP: PUMP: PUMP: Well House #1 Pump Curve
 1                       500             172
;PUMP: PUMP: PUMP: PUMP: PUMP: PUMP: Well House #2 Pump Curve
 2                       450             240
;PUMP: PUMP: PUMP: PUMP: PUMP: PUMP: Well House #3 Pump Curve
 3                       900             165
;PUMP: PUMP: PUMP: PUMP: PUMP: PUMP: Well House #4 Pump Curve
 4                       900             205
;PUMP: PUMP: PUMP: PUMP: PUMP: PUMP: Well House #5 Pump Curve
 5                       500             102
;PUMP:
 6                       500             288
;PUMP:
 7                       500             271
;PUMP:
 8                       500             131
;PUMP:
 9                       1500            50

[CONTROLS]




[RULES]




[ENERGY]
 Global Efficiency      75
 Global Price           0
 Demand Charge          0

[EMITTERS]
;Junction               Coefficient

[QUALITY]
;Node                   InitQual

[SOURCES]
;Node                   Type            Quality         Pattern

[REACTIONS]
;Type           Pipe/Tank               Coefficient
```

```
[REACTIONS]
 Order Bulk            1
 Order Tank            1
 Order Wall            1
 Global Bulk           0
 Global Wall           0
 Limiting Potential    0
 Roughness Correlation 0

[MIXING]
;Tank                  Model

[TIMES]
 Duration              0:00
 Hydraulic Timestep    1:00
 Quality Timestep      0:05
 Pattern Timestep      1:00
 Pattern Start         0:00
 Report Timestep       1:00
 Report Start          0:00
 Start ClockTime       12 am
 Statistic             NONE

[REPORT]
 Status                No
 Summary               No
 Page                  0

[OPTIONS]
 Units                 GPM
 Headloss              H-W
 Specific Gravity      1
 Viscosity             1
 Trials                40
 Accuracy              0.001
 CHECKFREQ             2
 MAXCHECK              10
 DAMPLIMIT             0
 Unbalanced            Continue 10
 Pattern               1
 Demand Multiplier     1
 Emitter Exponent      0.5
 Quality               None mg/L
 Diffusivity           1
 Tolerance             0.01

[COORDINATES]
;Node                  X-Coord                 Y-Coord
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n4	1497841.749	3698471.225
n5	1497684.473	3697841.409
n7	1497375.333	3696274.206
n9	1497512.329	3697705.481
n10	1497746.344	3699077.929
n13	1498918.757	3700387.789
n14	1499289.376	3700265.051
n16	1499371.083	3700481.726
n19	1497833.624	3695439.548
n20	1498231.906	3696286.868
n21	1495136.692	3694594.759
n24	1497138.022	3693729.204
n26	1496188.792	3692872.314
n28	1497415.679	3694613.468
n29	1496098.285	3693415.936
n30	1495296.329	3692226.464
n31	1495227.118	3692054.041
n32	1495710.828	3692226.254
n33	1493965.974	3690483.713
n35	1492789.372	3689825.022
n36	1492932.345	3690763.412
n37	1493069.961	3691265.134
n39	1493445.445	3691362.769
n41	1493849.447	3691061.625
n42	1494032.491	3691059.008
n43	1493842.872	3690785.586
n44	1494059.108	3690782.734
n45	1494449.286	3691183.897
n46	1494555.944	3691142.675
n47	1494651.153	3691433.412
n48	1494810.668	3691316.395
n49	1492153.115	3690153.311
n50	1492253.226	3690825.354
n51	1492485.819	3692950.653
n52	1491632.199	3692886.209
n53	1492435.192	3692707.293
n54	1492334.592	3692342.557
n56	1500491.916	3698076.730
n58	1499219.558	3698052.924
n60	1499629.471	3699577.717
n61	1499430.261	3699292.742
n62	1499849.231	3699205.648
n63	1499381.749	3699900.838
n65	1499671.339	3700090.500
n68	1493038.416	3695012.563
n69	1493249.650	3694915.435
n70	1493839.411	3694624.615
n73	1493515.927	3690630.206
n75	1491141.796	3689419.545
n77	1492955.384	3687175.337

n78	1493293.027	3684092.616
n79	1495475.356	3694595.466
n80	1495458.039	3694813.161
n83	1495765.715	3695053.480
n84	1495374.987	3695368.985
n88	1494301.230	3692050.199
n91	1493340.407	3692098.271
n92	1493682.148	3692067.624
n93	1493643.128	3691903.888
n94	1494812.933	3692006.960
n96	1494762.816	3691762.858
n97	1494325.914	3692759.334
n99	1495147.049	3692583.076
n100	1494313.669	3692460.772
n101	1495577.385	3693144.934
n102	1495260.856	3692717.344
n105	1494922.876	3692730.728
n106	1495205.788	3693170.359
n108	1494481.711	3693123.412
n109	1494740.094	3693118.204
n110	1494739.873	3692992.213
n111	1494472.348	3692759.001
n113	1494744.415	3693773.187
n114	1494818.895	3694057.652
n116	1495022.345	3693730.355
n118	1495045.046	3693405.892
n121	1491143.880	3688403.976
n122	1490693.810	3688274.787
n123	1490160.935	3688265.320
n124	1489656.402	3688407.824
n126	1489293.237	3688020.694
n127	1489692.758	3688012.150
n130	1490107.014	3687977.008
n131	1491375.123	3691954.075
n137	1493009.002	3693552.926
n140	1491894.135	3693937.491
n142	1491703.672	3693171.850
n143	1492920.057	3693582.718
n146	1492942.827	3694128.270
n147	1492666.411	3694234.732
n148	1492493.758	3693726.287
n150	1490900.667	3694888.902
n151	1490755.796	3694415.057
n152	1493512.111	3693927.394
n155	1493324.060	3693289.998
n156	1493851.640	3693138.748
n157	1493610.795	3692756.842
n158	1493258.376	3692131.222
n159	1493161.485	3692757.531
n160	1492997.931	3692190.622

n165	1492433.913	3696187.259
n168	1494052.312	3695379.352
n169	1494279.531	3695886.715
n170	1497456.955	3693711.495
n171	1498774.808	3698975.026
n174	1498034.548	3699530.430
n177	1498319.358	3699520.901
n179	1497977.457	3699579.105
n181	1497599.205	3699616.846
n182	1497786.407	3700053.055
n183	1497685.383	3699852.652
n184	1497053.085	3699937.080
n187	1490076.885	3690568.952
n188	1489993.589	3689839.303
n192	1494106.341	3691432.741
n193	1493997.680	3692059.676
n194	1494009.764	3692766.853
n195	1496529.190	3694014.001
n197	1496310.929	3695018.737
n199	1496994.433	3694942.316
n201	1497197.710	3694951.547
n202	1496630.265	3695063.434
n203	1496630.043	3694560.425
n205	1489085.279	3690649.000
n212	1489166.953	3693083.353
n232	1499671.079	3699902.829
n235	1500357.663	3700257.415
n241	1498976.621	3699202.883
n242	1498894.437	3699060.051
n246	1499180.678	3699467.330
n249	1496260.425	3696749.332
n251	1497540.522	3696733.240
n253	1496724.649	3696711.678
n256	1498603.470	3698149.816
n257	1498569.138	3697902.009
n261	1499719.989	3698056.745
n266	1496021.992	3695018.470
n267	1496030.542	3695708.110
n272	1496310.280	3695273.745
n274	1496310.859	3694856.950
n277	1490335.004	3689836.636
n287	1490183.070	3687933.723
n290	1489695.295	3687755.579
n291	1489687.005	3687619.018
n300	1490802.210	3690168.447
n305	1499802.900	3699108.254
n308	1499921.605	3699342.032
n314	1496026.453	3694320.686
n315	1496023.895	3694579.697
n316	1496313.724	3694021.833

n320	1495458.010	3694044.861
n323	1496932.385	3694548.903
n324	1495786.851	3694031.359
n325	1496116.654	3694021.771
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n333	1495055.643	3691496.702
n334	1494940.034	3691610.417
n335	1496437.584	3694011.084
n336	1496433.494	3693401.998
n337	1497736.253	3699214.949
n338	1497455.502	3698796.736
n339	1493034.811	3687175.389
n343	1498235.307	3696775.182
n345	1497389.689	3695136.789
n352	1494589.306	3700047.565
n357	1488504.538	3693240.425
n358	1496946.078	3694830.747
n361	1496625.935	3694013.664
n362	1496318.923	3694571.761
n367	1493912.611	3694722.491
n369	1490344.919	3690196.161
n374	1497771.846	3700594.415
n376	1495965.108	3696905.832
n385	1495718.135	3695894.263
n387	1495015.661	3694964.326
n389	1496171.325	3696769.247
n390	1497262.761	3698507.757
n391	1498620.345	3700571.004
n395	1496931.127	3700022.321
n397	1487998.938	3700530.959
n398	1493050.572	3694414.173
n399	1493624.932	3694208.224
n400	1492767.866	3694579.439
n406	1494353.856	3695247.497
n407	1494650.896	3694390.337
n408	1494439.752	3694051.238
n409	1494166.760	3693644.112
n410	1494552.517	3694062.542
n416	1492440.383	3690148.580
n418	1492720.414	3690156.179
n420	1491162.466	3690470.625
n421	1491160.802	3690165.845
n423	1490689.328	3688402.082
n424	1490152.487	3688391.041
n429	1491160.179	3687172.743
n430	1492712.422	3689671.273
n436	1493781.286	3692838.742
n437	1494588.492	3693465.262
n438	1495441.814	3693296.633
n440	1495855.177	3694029.228

n443	1493377.065	3694860.836
n444	1493776.262	3695497.987
n445	1493611.314	3694755.834
n446	1493706.529	3694883.078
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n448	1498636.413	3698460.131
n449	1493142.725	3686162.764
n450	1496528.392	3693781.114
n451	1497235.766	3694546.821
n453	1497414.725	3694001.451
n457	1494921.356	3694647.574
n458	1495704.684	3694341.749
n459	1495753.339	3694588.956
n460	1495161.161	3694364.254
n467	1497249.858	3694438.845
n468	1496931.161	3694333.884
n472	1498374.959	3700045.416
n473	1498617.154	3700410.366
n475	1497361.976	3698477.122
n477	1498097.700	3697921.664
n478	1498305.231	3697918.830
n479	1498169.444	3698238.656
n480	1498343.749	3698231.458
n481	1498182.161	3698468.058
n493	1493820.683	3691327.355
n494	1493825.201	3690122.128
n495	1496537.638	3693402.220
n496	1492411.036	3696092.439
n500	1492746.113	3692533.085
n511	1491542.751	3692532.751
n512	1494511.109	3692055.369
n516	1492815.762	3690127.032
n518	1494496.102	3690285.769
n527	1492018.701	3694475.648
1	1495697.940	3692757.068
2	1495876.202	3692628.148
3	1495128.290	3693064.058
4	1497058.399	3699628.988
5	1499908.696	3699905.008
6	1495131.960	3691789.190
7	1489994.413	3689683.423
16	1499330.393	3698451.838
17	1497772.194	3700642.830
18	1495656.272	3700040.261
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[LABELS]
;X-Coord             Y-Coord             Label & Anchor Node

[BACKDROP]
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3723176.300
 UNITS                  Feet
 FILE                   G:\Clients\Perry City\Studies and Planning\Water\2023 Perry
Utah Culinary Water Capital Facilities Plan\Water Model\Scenarios\Perry Utah
2023\3-FF & Peak Day ( 20 psi minimum) - ( Q = 0.38 gpm + 1500 gpm min ff
)\projects\model.emf
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[END]
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2023 MODEL FF RESULTS (FUTURE CONDITIONS)

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APPENDIX D

COST ESTIMATES

New Water Main W/ PRV

Replaced Existing 2" Water Main w/ 8" Pipe and PRV

Date: 7/12/2023

Concept Cost Estimate

Location:
US 89 & 3000 S

Item	Description	Qty	Unit	Unit Price	Total	* Impact FeeEligible
1	Asphalt Saw Cut	180	lf	$2.50	$450.00	$337.50
2	Asphalt Removal	60	sy	$9.00	$540.00	$405.00
3	Cut, cap, and abandon in place 2" Existing Main	1	ls	$3,000.00	$3,000.00	$2,250.00
4	New 6" PRV Station	1	ea	$120,000.00	$120,000.00	$90,000.00
5	Connect to Existing 8" Main	2	ea	$5,000.00	$10,000.00	$7,500.00
6	New 8" C900 PVC Pipe	90	lf	$90.00	$8,100.00	$6,075.00
7	New HMA (6" thickness)	10	ton	$100.00	$1,000.00	$750.00
8	New UTBC (6" thickness)	25	ton	$25.00	$625.00	$468.75
9	New Granular Borrow (12" thickness)	55	ton	$25.00	$1,375.00	$1,031.25
10	New Trench Backfill (Strucutral Backfill)	190	ton	$25.00	$4,750.00	$3,562.50
11	Testing	1	ls	$5,000.00	$5,000.00	$3,750.00
				SUBTOTAL =	**$154,840.00**	**$116,130.00**
				30%± Contingency & Engineering =	**$46,452.00**	**$34,839.00**
				TOTAL =	**$201,292.00**	**$150,969.00**

New Water Main W/ PRV

Replaced Existing 2" Water Main w/ 8" Pipe and PRV

Date: 7/12/2023

Concept Cost Estimate

Location:
US 89 & 3600 S

Item	Description	Qty	Unit	Unit Price	Total	* Impact FeeEligible
1	Asphalt Saw Cut	125	lf	$2.50	$312.50	$234.38
2	Asphalt Removal	335	sy	$9.00	$3,015.00	$2,261.25
3	Cut, cap, and abandon in place 2" Existing Main	1	ls	$3,000.00	$3,000.00	$2,250.00
4	New 6" PRV Station	1	ea	$120,000.00	$120,000.00	$90,000.00
5	Connect to Existing 8" Main	1	ea	$5,000.00	$5,000.00	$3,750.00
6	New 8" C900 PVC Pipe	90	lf	$90.00	$8,100.00	$6,075.00
7	New HMA (6" thickness)	10	ton	$100.00	$1,000.00	$750.00
8	New UTBC (6" thickness)	25	ton	$25.00	$625.00	$468.75
9	New Granular Borrow (12" thickness)	55	ton	$25.00	$1,375.00	$1,031.25
10	New Trench Backfill (Strucutral Backfill)	200	ton	$25.00	$5,000.00	$3,750.00
11	Testing	1	ls	$5,000.00	$5,000.00	$3,750.00
				SUBTOTAL =	**$152,427.50**	**$114,320.63**
				30%± Contingency & Engineering =	**$45,728.25**	**$34,296.19**
				TOTAL =	**$198,155.75**	**$148,616.81**

New Water Main

Replace 6" Water Main w/ 10" Pipe

Date: 7/12/2023

Concept Cost Estimate

Location:
3000 S (From 200 W to HWY 89)

Item	Description	Qty	Unit	Unit Price	Total	* Impact FeeEligible
1	Asphalt saw-cut	3,506	lf	$2.50	$8,765.00	$4,382.50
2	Asphalt removal	1,166	sy	$9.00	$10,494.00	$5,247.00
3	Stub and Cap end of 10" Water Main	1	ea	$3,500.00	$3,500.00	$1,750.00
4	Connect to Existing 6" main	1	ea	$7,000.00	$7,000.00	$3,500.00
5	New 10" C900 PVC Pipe	1,750	lf	$105.00	$183,750.00	$91,875.00
6	New 10" Valve With Concrete Collar	4	ea	$7,000.00	$28,000.00	$14,000.00
7	New Asphalt (3" Thick)	205	ton	$100.00	$20,500.00	$10,250.00
8	New UTBC (8" Thick)	505	ton	$25.00	$12,625.00	$6,312.50
9	New Fire Hydrant Assembly (Every 500 ft)	2	ea	$10,000.00	$20,000.00	$10,000.00
10	Trench Backfill (Strucutral fill)	1,980	ton	$25.00	$49,500.00	$24,750.00
				SUBTOTAL =	**$344,134.00**	**$172,067.00**
				30%± Contingency & Engineering =	**$103,240.20**	**$51,620.10**
				TOTAL =	**$447,374.20**	**$223,687.10**

New Culinary Water Well

Replace Well #1

Date: 7/12/2023

Concept Cost Estimate

Location:
Needs to be located

Item	Description	Qty	Unit	Unit Price	Total	* Impact FeeEligible
1	Locate and drill New Well	1	ls	$1,000,000.00	$1,000,000.00	$500,000.00
2	New Well Pump Station	1	ls	$1,500,000.00	$1,500,000.00	$750,000.00
3	Property Acquisition	1	acre	$50,000.00	$50,000.00	$25,000.00
4	Water Right Cost (550 gpm min = 890 acre-ft)	1	ls	$250,000.00	$250,000.00	$125,000.00
5	Source Protection Plan	1	ls	$20,000.00	$20,000.00	$10,000.00
				SUBTOTAL =	**$2,820,000.00**	**$1,410,000.00**
				30%± Contingency & Engineering =	**$846,000.00**	**$423,000.00**
				TOTAL =	**$3,666,000.00**	**$1,833,000.00**

New Water Main

Replace 6" Water Main with 8" Pipe

Date: 7/12/2023

Concept Cost Estimate

Location:
2700 S (From 900 W to 1200 W)

Item	Description	Qty	Unit	Unit Price	Total	* Impact FeeEligible
1	Asphalt saw-cut	3,600	lf	$2.50	$9,000.00	$0.00
2	Asphalt removal	1,200	sy	$9.00	$10,800.00	$0.00
3	Connect to Existing 8" main	1	ea	$5,000.00	$5,000.00	$0.00
4	Connect to Existing 6" main	1	ea	$5,000.00	$5,000.00	$0.00
5	New 8" C900 PVC Pipe	1,800	lf	$90.00	$162,000.00	$0.00
6	New 8" Valve With Concrete Collar	1	ea	$5,000.00	$5,000.00	$0.00
7	New Asphalt (3" Thick)	205	tons	$100.00	$20,500.00	$0.00
8	New UTBC (8" Thick)	505	tons	$25.00	$12,625.00	$0.00
9	New Fire Hydrant Assembly (Every 500 ft)	2	ea	$10,000.00	$20,000.00	$0.00
10	Trench Backfill (Strucutral fill)	2,000	tons	$25.00	$50,000.00	$0.00
				SUBTOTAL =	**$299,925.00**	**$0.00**
				30%± Contingency & Engineering =	**$89,977.50**	**$0.00**
				TOTAL =	**$389,902.50**	**$0.00**

New Water Tank

New Culinary Water Tank

Date: 7/12/2023

Concept Cost Estimate
Location:
Future 3200 S
Along East Bench

Item	Description	Qty	Unit	Unit Price	Total	* Impact FeeEligible
1	Construct New (1 MG) Culinary Water Tank	1	ls	$2,000,000.00	$2,000,000.00	$2,000,000.00
2	Property Acquisition	3	acre	$50,000.00	$170,000.00	$170,000.00
				SUBTOTAL =	**$2,170,000.00**	**$2,170,000.00**
				30%± Contingency & Engineering =	**$651,000.00**	**$651,000.00**
				TOTAL =	**$2,821,000.00**	**$2,821,000.00**

New Water Main

New 12" Water Main to New Water tank

Date: 7/12/2023

Concept Cost Estimate

Location:
3200 S (8000 W to 100 W)

Item	Description	Qty	Unit	Unit Price	Total	* Impact FeeEligible
1	Connect To New Water Tank	1	ea	$4,000.00	$4,000.00	$4,000.00
2	Connect to 8" Water Main on 800 West	1	ea	$3,000.00	$3,000.00	$3,000.00
3	Bore New Water line under canal	1	ls	$50,000.00	$50,000.00	$50,000.00
4	New 12" C900 PVC Pipe	1,150	lf	$140.00	$161,000.00	$161,000.00
5	New 12" valve with Concrete Collar	1	ea	$9,000.00	$9,000.00	$9,000.00
6	Trench Backfill (Structural Fill)	1,724	ton	$25.00	$43,100.00	$43,100.00
				SUBTOTAL =	**$270,100.00**	**$270,100.00**
				30%± Contingency & Engineering =	**$81,030.00**	**$81,030.00**
				TOTAL =	**$351,130.00**	**$351,130.00**

New Culinary Water Well

Well #5 Rehabilitation

Date: 7/12/2023

Concept Cost Estimate

Location:
3000 S & 400 W

Item	Description	Qty	Unit	Unit Price	Total	* Impact FeeEligible
1	Drill Well to required depth for (550 gpm min)	1	ls	$1,000,000.00	$1,000,000.00	$1,000,000.00
2	New Well Pump Station	1	ls	$1,500,000.00	$1,500,000.00	$1,500,000.00
3	Source Protection Plan	1	ls	$30,000.00	$30,000.00	$30,000.00
				SUBTOTAL =	**$2,530,000.00**	**$2,530,000.00**
				30%± Contingency & Engineering =	**$759,000.00**	**$759,000.00**
				TOTAL =	**$3,289,000.00**	**$3,289,000.00**

New Water Main & PRV's

New 10" Water Main & connection to high pressure system & PRV install

Date: 7/12/2023

Concept Cost Estimate

Location:
Valley View Drive

Item	Description	Qty	Unit	Unit Price	Total	* Impact FeeEligible
1	New 10" C900 PVC Pipe	1,060	lf	$105.00	$111,300.00	$111,300.00
2	Connection to Existing 10" Main	3	ea	$6,000.00	$18,000.00	$18,000.00
3	New 10" Valve With Collar	4	ea	$7,000.00	$28,000.00	$28,000.00
4	New Fire Hydrant Assembly	1	ea	$10,000.00	$10,000.00	$10,000.00
5	New Apshalt (3" Thick)	2	ton	$100.00	$200.00	$200.00
6	New UTBC (8" Thick)	3	ton	$20.00	$60.00	$60.00
7	Trench Import Backfill	425	ton	$20.00	$8,500.00	$8,500.00
8	New 6" PRV assembly w/concrete vault	4	ea	$120,000.00	$480,000.00	$480,000.00
				SUBTOTAL =	**$656,060.00**	**$656,060.00**
				30%± Contingency & Engineering =	**$196,818.00**	**$196,818.00**
				TOTAL =	**$852,878.00**	**$852,878.00**

New Water Main

Replace 4" Water Main with 8" pipe

Date: 7/12/2023

Concept Cost Estimate

Location:
2700 S (1200 W to I-15)

Item	Description	Qty	Unit	Unit Price	Total	* Impact FeeEligible
1	Asphalt saw cut	3,650	lf	$2.50	$9,125.00	$0.00
2	Asphalt Removal	2,100	sy	$9.00	$18,900.00	$0.00
3	Stub and Cap 8" C900 PVC Pipe	1	ea	$4,000.00	$4,000.00	$0.00
4	Connect Existing 6" Main	1	ea	$5,000.00	$5,000.00	$0.00
5	New 8" C900 PVC Pipe	3,150	lf	$90.00	$283,500.00	$0.00
6	New Apshalt (3" Thick)	470	ton	$100.00	$47,000.00	$0.00
7	New UTBC (8" Thick)	1,150	ton	$20.00	$23,000.00	$0.00
8	New 8" Valve With Concrete Collar	6	ea	$5,000.00	$30,000.00	$0.00
9	New Fire Hydrant Assembly (Every 500 ft)	6	ea	$10,000.00	$60,000.00	$0.00
10	Trench Backfill (UTBC)	2,481	ton	$25.00	$62,025.00	$0.00
				SUBTOTAL =	**$542,550.00**	**$0.00**
				30%± Contingency & Engineering =	**$162,765.00**	**$0.00**
				TOTAL =	**$705,315.00**	**$0.00**

New Water Main

Replace 6" Water Main with 10" Pipe

Date: 7/12/2023

Concept Cost Estimate

Location:
HWY 89: 3000 S to 3600 S
(West Side)

Item	Description	Qty	Unit	Unit Price	Total	* Impact FeeEligible
1	Connect to Existing 10" Main	1	ea	$7,000.00	$7,000.00	$3,500.00
2	Connect to Existing 6" Main	1	ea	$7,000.00	$7,000.00	$3,500.00
3	New 10" C900 PVC Pipe	4,350	lf	$105.00	$456,750.00	$228,375.00
4	New 10" Valve With Concrete Collar	10	ea	$6,000.00	$60,000.00	$30,000.00
5	Replace Fire Hydrant Assembly (Every 500 ft)	4	ea	$10,000.00	$40,000.00	$20,000.00
6	Trench Backfill (Import Structural Fill)	10,070	ton	$25.00	$251,750.00	$125,875.00
				SUBTOTAL =	**$822,500.00**	**$411,250.00**
				30%± Contingency & Engineering =	**$246,750.00**	**$123,375.00**
				TOTAL =	**$1,069,250.00**	**$534,625.00**

New Water Main

Replace 6" Water Main with 10" Pipe

Date: 7/12/2023

Concept Cost Estimate

Location:
HWY 89: 3000 S to 3600 S
(East Side)

Item	Description	Qty	Unit	Unit Price	Total	* Impact FeeEligible
1	Stub and Cap New 10" main	1	ea	$5,000.00	$5,000.00	$2,500.00
2	Connect to Existing 6" man	1	ea	$7,000.00	$7,000.00	$3,500.00
3	New 10" C900 PVC Pipe	4200	lf	$105.00	$441,000.00	$220,500.00
4	New 10" Valve With Concrete Collar	10	ea	$7,000.00	$70,000.00	$35,000.00
5	New Fire Hydrant Assembly (Every 500 ft)	3	ea	$10,000.00	$30,000.00	$15,000.00
6	Trench Backfill (Structural Fill)	9323	ton	$25.00	$233,075.00	$116,537.50
				SUBTOTAL =	**$786,075.00**	**$393,037.50**
				30%± Contingency & Engineering =	**$235,822.50**	**$117,911.25**
				TOTAL =	**$1,021,897.50**	**$510,948.75**

New Water Main

Replace 6" Water Main with 10" Pipe

Date: 7/12/2023

Concept Cost Estimate

Location:
HWY 89 (1950 S to Larsen Ave)

Item	Description	Qty	Unit	Unit Price	Total	* Impact FeeEligible
1	Connect to Existing 6" Main	2	ea	$7,000.00	$14,000.00	$5,040.00
2	New 10" C900 PVC Pipe	4350	lf	$105.00	$456,750.00	$164,430.00
3	New 10" Valve With Concrete Collar	11	ea	$7,000.00	$77,000.00	$27,720.00
4	Trench Backfill (Structural fill)	10070	ton	$25.00	$251,750.00	$90,630.00
				SUBTOTAL =	**$799,500.00**	**$287,820.00**
				30%± Contingency & Engineering =	**$239,850.00**	**$86,346.00**
				TOTAL =	**$1,039,350.00**	**$374,166.00**

New Water Tank

New Culinary Water Tank

Date: 7/12/2023

Concept Cost Estimate
Location:
1750 North on
East Bench Foothills

Item	Description	Qty	Unit	Unit Price	Total	* Impact FeeEligible
1	Construct New Reservoir (1 M GALLON)	1	ls	$2,000,000.00	$2,000,000.00	$2,000,000.00
2	Property Acquisition	2	acre	$50,000.00	$79,659.09	$79,659.09
				SUBTOTAL =	**$2,079,659.09**	**$2,079,659.09**
				30%± Contingency & Engineering =	**$623,897.73**	**$623,897.73**
				TOTAL =	**$2,703,556.82**	**$2,703,556.82**

New Water Main

New 12" Pipe to New Water Tank

Date: 7/12/2023

Concept Cost Estimate

Location:
1750 S (Valley View Dr.)

Item	Description	Qty	Unit	Unit Price	Total	* Impact FeeEligible
1	Connect to New Reservoir	1	ea	$7,000.00	$7,000.00	$7,000.00
2	Connect to Existing 8" main	1	ea	$7,000.00	$7,000.00	$7,000.00
3	Bore New Line Under Canal	1	ls	$35,000.00	$35,000.00	$35,000.00
4	New 12" C900 PVC pipe	1,340	lf	$140.00	$187,600.00	$187,600.00
7	New 12" Valve With Concrete Collar	1	ea	$7,000.00	$7,000.00	$7,000.00
8	Trench Backfill (UTBC)	2,009	ton	$25.00	$50,225.00	$50,225.00
				SUBTOTAL =	**$293,825.00**	**$293,825.00**
				30%± Contingency & Engineering =	**$88,147.50**	**$88,147.50**
				TOTAL =	**$381,972.50**	**$381,972.50**

New Water Main

New 10" Water Main

Date: 7/12/2023

Concept Cost Estimate

Location:
2700 S
(Frontage Rd to Gun Range)

Item	Description	Qty	Unit	Unit Price	Total	* Impact FeeEligible
1	Stub and Cap 10" Water Main	1	ea	$4,000.00	$4,000.00	$4,000.00
2	Connect to Existing 4" main	1	ea	$3,000.00	$3,000.00	$3,000.00
3	New 10" C900 PVC Pipe	5,900	lf	$100.00	$590,000.00	$590,000.00
4	New 10" Valve With Concrete Collar	6	ea	$4,500.00	$27,000.00	$27,000.00
5	New Fire Hydrant Assembly (Every 500 ft)	13	ea	$5,500.00	$71,500.00	$71,500.00
6	Trench Backfill (Strucutral fill)	8,850	tons	$25.00	$221,250.00	$221,250.00
				SUBTOTAL =	**$916,750.00**	**$916,750.00**
				30%± Contingency & Engineering =	**$275,025.00**	**$275,025.00**
				TOTAL =	**$1,191,775.00**	**$1,191,775.00**

New Culinary Water Well

Well # 6 (Future Well)

Date: 7/12/2023

Concept Cost Estimate

Location:
TBD

Item	Description	Qty	Unit	Unit Price	Total	* Impact FeeEligible
1	Drill New Wells	1	ls	$1,000,000.00	$1,000,000.00	$1,000,000.00
2	New Well Pump Stations	1	ls	$1,500,000.00	$1,500,000.00	$1,500,000.00
3	Property Acquisition	1	acre	$50,000.00	$50,000.00	$50,000.00
4	Water Right Cost (550 gpm min = 890 acre-ft)	1	ls	$250,000.00	$250,000.00	$250,000.00
5	Source Protection Plan	1	ls	$20,000.00	$20,000.00	$20,000.00
				SUBTOTAL =	**$2,820,000.00**	**$2,820,000.00**
				30%± Contingency & Engineering =	**$846,000.00**	**$846,000.00**
				TOTAL =	**$3,666,000.00**	**$3,666,000.00**

New 8" Water Main

New 8" Water Main on 800 W

Date: 7/12/2023

Concept Cost Estimate

Location:
800 W (Future) : 3000 S to 3450 S

Item	Description	Qty	Unit	Unit Price	Total	* Impact FeeEligible
1	Connec to existing 8" Main	1	ea	$4,000.00	$4,000.00	$4,000.00
2	Connect to Pump Station	1	ea	$4,000.00	$4,000.00	$4,000.00
3	New Water Meter w/ Vault	1	ea	$6,000.00	$6,000.00	$6,000.00
4	New 8" C900 PVC Pipe	3,750	lf	$75.00	$281,250.00	$281,250.00
5	New 8" Valve With Concrete Collar	12	ea	$4,000.00	$48,000.00	$48,000.00
6	New Fire Hydrant Assembly	8	ea	$3,500.00	$28,000.00	$28,000.00
7	Trench Backfill (UTBC)	5,283	ton	$20.00	$105,660.00	$105,660.00
8	Property Acquisition	5	acre	$50,000.00	$258,264.46	$258,264.46
				SUBTOTAL =	**$735,174.46**	**$735,174.46**
				30%± Contingency & Engineering =	**$220,552.34**	**$220,552.34**
				TOTAL =	**$955,726.80**	**$955,726.80**

New Water Main

Replace Existing 4" Water Main w/ 8" Pipe

Date: 7/12/2023

Concept Cost Estimate

Location:
2950 S: 1500 W to 1-15

Item	Description	Qty	Unit	Unit Price	Total	* Impact FeeEligible
1	Asphalt saw-cut	1,420	lf	$2.50	$3,550.00	$2,662.50
2	Asphalt Removal	467	sy	$9.00	$4,200.00	$3,150.00
3	Stub and Cap 12" C900 PVC Pipe	1	ea	$4,000.00	$4,000.00	$3,000.00
4	Connect to Existing 6" main	1	ea	$4,000.00	$4,000.00	$3,000.00
5	New 12" C900 PVC Pipe	700	lf	$100.00	$70,000.00	$52,500.00
6	New Apshalt (3" Thick)	81	ton	$100.00	$8,100.00	$6,075.00
7	New UTBC (8" Thick)	201	ton	$20.00	$4,020.00	$3,015.00
8	New 12" Valve With Concrete Collar	1	ea	$4,500.00	$4,500.00	$3,375.00
9	Trench Backfill (UTBC)	791	tons	$20.00	$15,820.00	$11,865.00
				SUBTOTAL =	**$118,190.00**	**$88,642.50**
				30%± Contingency & Engineering =	**$35,457.00**	**$26,592.75**
				TOTAL =	**$153,647.00**	**$115,235.25**

New Water Main

Replaced Existing 6" Water Main w/ 10" Pipe

Date: 7/12/2023

Concept Cost Estimate

Location:
3550 S (1200 W to 1450 W)

Item	Description	Qty	Unit	Unit Price	Total	* Impact FeeEligible
1	Stub and Cap 10" Water Main	1	ea	$4,000.00	$4,000.00	$1,440.00
2	Connect to Existing 6" Main	1	ea	$3,000.00	$3,000.00	$1,080.00
3	New 10" C900 PVC Pipe	1,650	lf	$75.00	$123,750.00	$44,550.00
4	New 10" Valve With Concrete Collar	2	ea	$4,500.00	$9,000.00	$3,240.00
5	New Fire Hydrant Assembly (Every 500 ft)	3	ea	$7,500.00	$22,500.00	$8,100.00
6	Trench Backfill (Strucutral fill)	2,474	tons	$25.00	$61,850.00	$22,266.00
				SUBTOTAL =	**$224,100.00**	**$80,676.00**
				30%± Contingency & Engineering =	**$67,230.00**	**$24,202.80**
				TOTAL =	**$291,330.00**	**$104,878.80**

Mountain View Park Tank Overflow Drainage

Detention Basin for Tank Overflow Drainage

Date: 5/29/2025

Concept Cost Estimate

Location:
Mountiain View Park (2400 S)

Item	Description	Qty	Unit	Unit Price	Total	* Impact FeeEligible
1	12" Dual Wall HDPE w/ (7) Anchor Straps	66	lf	$120.00	$7,920.00	$7,920.00
2	15" Dual Wall HDPE	334	lf	$85.00	$28,390.00	$28,390.00
3	15" RCP	5	lf	$150.00	$750.00	$750.00
4	18" RCP	25	lf	$150.00	$3,750.00	$3,750.00
5	3'x3' Inlet Box	2	ea	$8,000.00	$16,000.00	$16,000.00
6	4'x4' Inlet Box	1	ea	$12,000.00	$12,000.00	$12,000.00
7	Install Air Gap Structure w/ Wing Wall	1	ea	$14,000.00	$14,000.00	$14,000.00
8	15" Flared End Section	1	ea	$2,500.00	$2,500.00	$2,500.00
9	New Sump Catch Basin	1	ea	$9,000.00	$9,000.00	$9,000.00
10	Connect to Existing Flared End with Cast-in-place Inlet Box	1	ea	$14,000.00	$14,000.00	$14,000.00
11	Rip-rap 12" Minus	54	sf	$3.00	$162.00	$162.00
12	Rip-rap 18" Minus	96	sf	$5.00	$480.00	$480.00
13	Excavation	1,200	cy	$18.00	$21,600.00	$21,600.00
14	Import Fill Material	40	ton	$20.00	$800.00	$800.00
15	Site Grading	1	ea	$12,000.00	$12,000.00	$12,000.00
				SUBTOTAL =	**$143,352.00**	**$143,352.00**
				30%± Contingency & Engineering =	**$43,005.60**	**$43,005.60**
				TOTAL =	**$186,357.60**	**$186,357.60**

New Water Main

New 8" Water Main on 1700 South

Date: 5/29/2025

Concept Cost Estimate

Location:
1700 South and HWY 89

Item	Description	Qty	Unit	Unit Price	Total	* Impact FeeEligible
1	Saw Cut Asphalt	634	lf	$2.50	$1,585.00	$1,585.00
2	Remove Asphalt	5,815	sf	$9.00	$52,335.00	$52,335.00
3	Untreated Base Course (8" UTBC)	282	ton	$20.00	$5,640.00	$5,640.00
4	Asphalt Pavement (3" HMA)	113	ton	$100.00	$11,300.00	$11,300.00
5	New 8" C900 PVC Pipe	2,045	lf	$90.00	$184,050.00	$184,050.00
6	Remove Existing 2" Water Line	2,045	lf	$5.00	$10,225.00	$10,225.00
7	Connection to Existing 2" Line (Cut-in)	1	ea	$2,500.00	$2,500.00	$2,500.00
8	Connection to Existing 8" Main (Cut-in)	1	ea	$3,500.00	$3,500.00	$3,500.00
9	Connection to Existing 8" Main (Hot Tap)	1	ea	$7,000.00	$7,000.00	$7,000.00
10	Reconnect Water Service Laterals	7	ea	$2,400.00	$16,800.00	$16,800.00
11	New 8" Valve w/ Collar	8	ea	$5,000.00	$40,000.00	$40,000.00
12	New 2" Valve w/ Collar	1	ea	$2,000.00	$2,000.00	$2,000.00
13	New Fire Hydrant w/ Auxiliary valve	3	ea	$10,000.00	$30,000.00	$30,000.00
14	Raise Valve Box to Grade w/ Concrete Collar	3	ea	$700.00	$2,100.00	$2,100.00
15	Import Trench Backfill	3,560	ton	$25.00	$89,000.00	$89,000.00
				SUBTOTAL =	**$458,035.00**	**$458,035.00**
				30%± Contingency & Engineering =	**$137,410.50**	**$137,410.50**
				TOTAL =	**$595,445.50**	**$595,445.50**

New Water Main

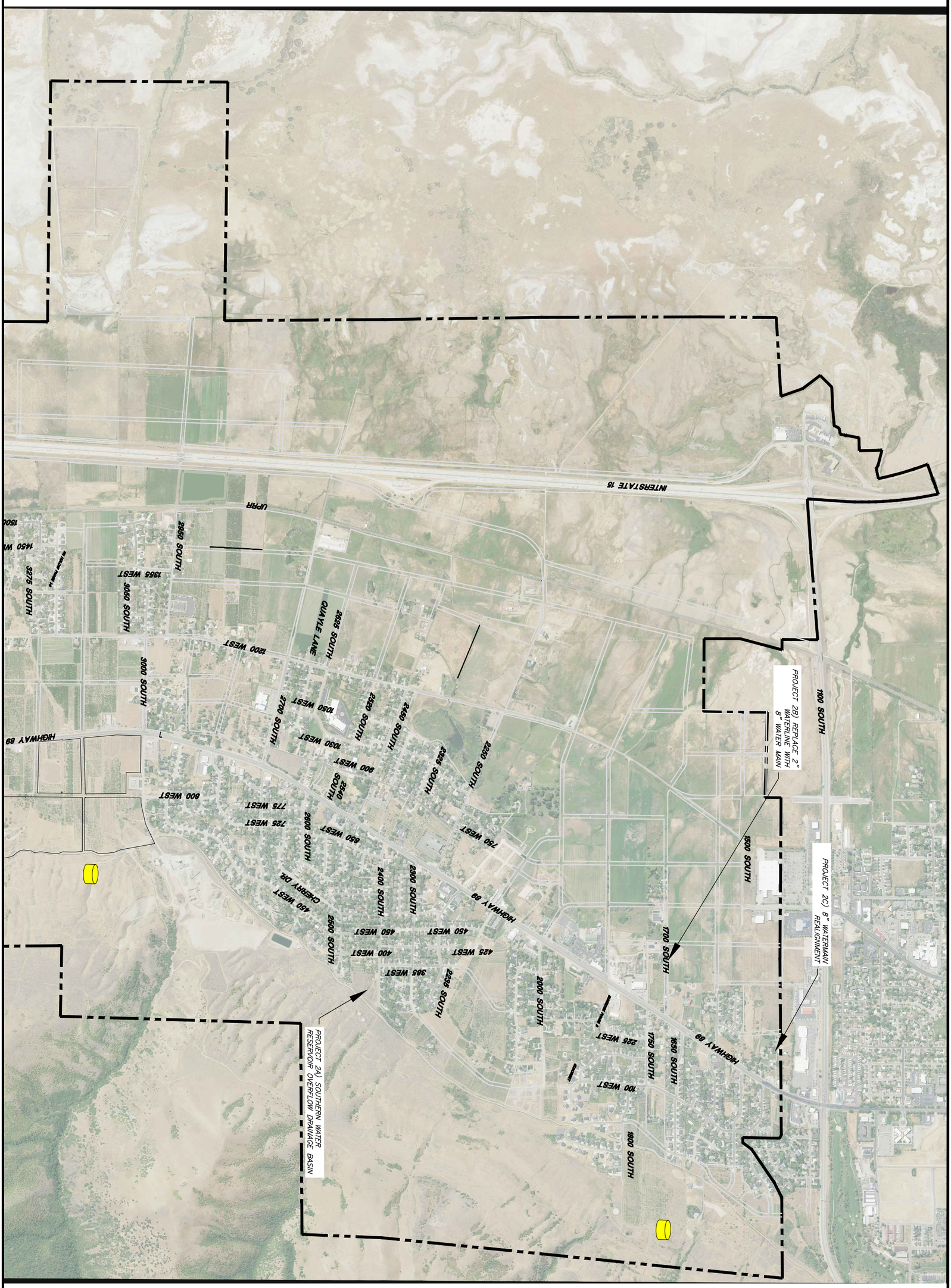
8" Water Main In New Road

Date:5/29/2025

Concept Cost Estimate

Location:
1200 South to 1425 South

Item	Description	Qty	Unit	Unit Price	Total	* Impact FeeEligible
1	Plug and Abandon Existing Culinary Water Main	2	ea	$3,500.00	$7,000.00	$7,000.00
2	New 8" C900 PVC Pipe	1,300	lf	$90.00	$117,000.00	$117,000.00
3	New 8" Valve With Collar	1	ea	$5,000.00	$5,000.00	$5,000.00
4	New Fire Hydrant Assembly	1	ea	$10,000.00	$10,000.00	$10,000.00
5	New Air / Vac Station	1	ea	$17,000.00	$17,000.00	$17,000.00
6	New 6" PRV Assembly w/ Concrete Vault	1	ea	$120,000.00	$120,000.00	$120,000.00
7	Reconnect Water Service Laterals	4	ea	$2,400.00	$9,600.00	$9,600.00
8	Connection to Existing 8" Main	3	ea	$5,000.00	$15,000.00	$15,000.00
9	Remove and Dispose of Existing Resident Structure	1	ea	$30,000.00	$30,000.00	$30,000.00
10	Trench Backfill (Structural Fill)	1,760	ton	$25.00	$44,000.00	$44,000.00
				SUBTOTAL =	**$374,600.00**	**$374,600.00**
				30%± Contingency & Engineering =	**$112,380.00**	**$112,380.00**
				TOTAL =	**$486,980.00**	**$486,980.00**



SHEET: 1 OF 1 SHEETS

SCALE:
22"x34" H:1"=50'
11"x17" H:1"=100

DESIGNED
JDC
DRAWN
CHECKED

REV.	DATE	APPR.

PERRY CITY CORPORATION

2023 CULINARY WATER CFP

NORTH WATER PROJECTS 2025 AMENDMENT

JONES & ASSOCIATES
CONSULTING ENGINEERS
6080 Fashion Point Drive
South Ogden, Utah 84403
(801) 476-9767 www.jonescivil.com

RESOLUTION 2025-14
Water Conservation Plan
2025

BE IT HEREBY RESOLVED, by the City Council of Perry City Corporation, State of Utah, as follows:

WHEREAS, Perry City Corporation has a Water Conservation Plan (in accordance with U.C.A. 73-10-32) that establishes conservation planning efforts identifying water supply inventory for both present and future water requirements and establishes implementation procedures;

WHEREAS, the City Engineer has reviewed and updated the Water Conservation Plan,

WHEREAS, the City Council has reviewed the City Engineer's recommendations,

WHEREAS, a public hearing was held on August 14, 2025

NOW THEREFORE BE IT RESOLVED, Perry City hereby adopts the **2025 Water Conservation Plan**, for the geographic City boundary. The plan was updated by Brett M. Jones, City Engineer.

PASSED AND ADOPTED by the City Council of Perry City Corporation, on _____.

_____
MAYOR: Kevin G. Jeppsen

ATTEST:

_____
Shanna Johnson, City Recorder

Water Conservation Plan

2025

Prepared By:

JONES & ASSOCIATES
CONSULTING ENGINEERS

Table of Contents

SECTION 1 - SYSTEM PROFILE

SERVICE AREA

Perry City serves all areas within the City boundaries, approximately 8 square miles (See Map 1). The City currently provides culinary water to approximately 6,051 people through 1,792 connections. This water is intended for indoor, sanitary, and commercial uses. Water for outdoor and landscaping needs is provided and managed by Pineview Water Systems, Three Mile Creek Irrigation Company, and the Perry Irrigation Company.

Table 1.1 below lists each type of connection and the total number of each for 2024.

Table 1.1 - Number of Connections

Connection Type	Total
Residential / Domestic	1,736
Commercial	43
Institutional	10
Industrial	3
Unmetered	0
	1,792

SUPPLY

Perry City obtains its water from four wells and one spring. The City does not contract with any outside agency for supplemental water. The City is currently finalizing the construction of a fifth well to aid in ensuring enough supply through 2060.

City ordinances do not allow culinary water to be used for irrigation unless irrigation service is unavailable. Secondary or irrigation water is supplied and managed by Pineview Water Systems, Three Mile Creek Irrigation Company, and the Perry Irrigation Company and is not included as part of this Plan.

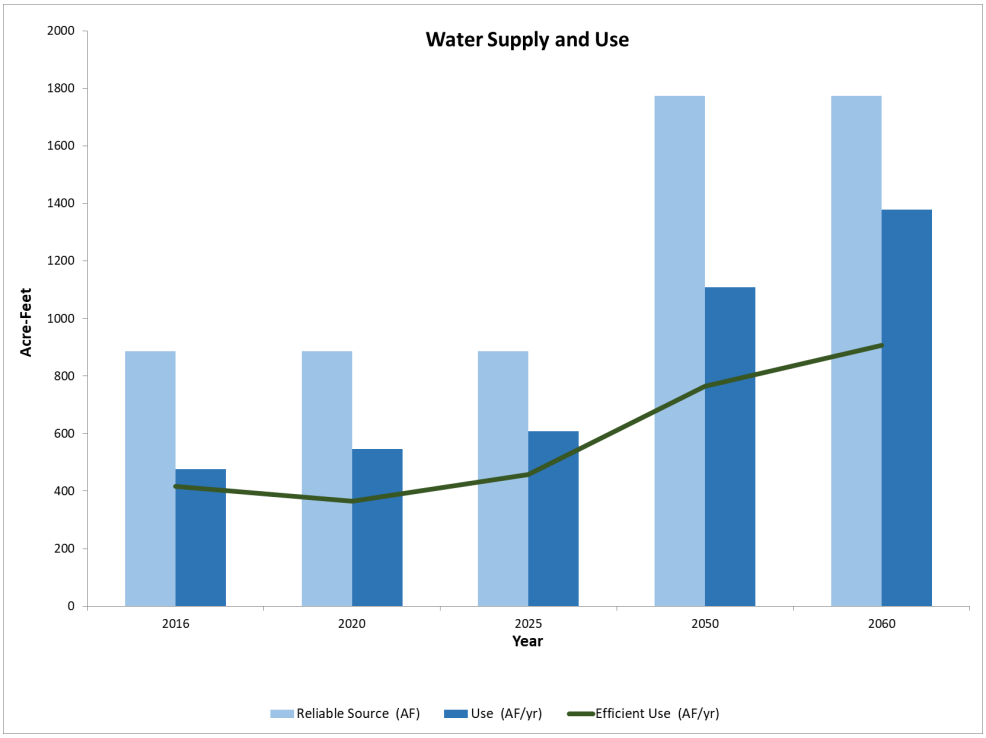
Table 1.2 below shows a breakdown of the 2024 production diverted at each source type.

Table 1.2 - Existing Water Sources Used

Source Used	Volume (Acre-Feet)	Total (Acre-Feet)
Wells	640.60	640.60
Springs	78.33	78.33
Sold	0	0
		718.93

As illustrated in graph 1.1 below, the City's water supply verses projected use provides a sufficient amount of water through the year 2060.

Graph 1.1 - Water Supply and Use



FUTURE WATER SOURCES & COST PROJECTION

The Perry City Capital Facilities and Impact Fee Analysis, completed in 2024, indicates that the City has enough capacity for water supply. Based on the residential, commercial, and institutional growth projections the build-out population will be 29,680 or 9,275 Equivalent Residential Units (ERUs). Additional water will be required to maintain the current level of service beyond 2060. This is mainly due to summer peaking requirements and Perry's specific well management needs. The reliable source reflected in the foregoing table assumes that some of the City's wells drop in production during summer months and recharge during winter months. The best usage estimate currently shows a demand of about 1,378 acre-feet per year in 2060. With the addition of the fifth well; which has been drilled and tested; it is anticipated that the City has adequate sources to provide water until that time. The City is also continuing to update and repair the infrastructure throughout the system to minimize system losses.

As noted previously, the City has sufficient water rights and sources to support anticipated growth through 2060. Conservation of these resources will help the supply to last over a longer period of time and/or allow additional water supply for additional users. By delaying or eliminating the need for additional water, the City can save a significant amount of money, as well.

WATER MEASUREMENT & BILLING

Meters: All of the connections to the water system are metered and read using the automated system. This is a fixed-base system that can be read at any time, but in general, meters are read monthly as part of utility billing. Table 1.3 below shows the percentage of the City's metered connections as of December 2024.

Table 1.3 – Metered Connections

Connection Type	Percentage of System	Reading Frequency	Calibration Schedule	Replacement Schedule
Residential	97%	Daily	Per Manufacturer	As Needed
Commercial	>1%	Daily	Per Manufacturer	As Needed
Industrial	>1%	Daily	Per Manufacturer	As Needed
Institutional	>1%	Daily	Per Manufacturer	As Needed

SYSTEM WATER LOSS CONTROL

Table 1.4 below shows the population, annual use, and percentage loss in relation to used source.

Table 1.4 – Annual Information*

Year	Population	Annual Use (AF)	Return	Percentage Loss
2009	4,500	575.03	No Return In System	36.48%
2010	4,500	570.81		66.74%
2011	1,500	0.00		100%
2012	0	0.00		0%
2013	5,100	567.74		23.24%
2014	0	80.05		100%
2015	4,566	0.59		100%
2016	4,630	479.90		0.75%
2017	4,717	560.07		17.16%
2018	4,828	698.17		9.10%
2019	4,971	673.20		6.13%
2020	5,250	546.15		32.43%
2021	5,555	477.60		37.13%
2022	5,900	442.24		40.88%
2023	6,060	477.76		35.73%
2024	6,051	490.69		31.75%

**There are errors in data reporting in various years between 2011 and 2016. Data used in the above table is taken directly from what was reported to the State of Utah. The City has worked since 2016 to remedy and prevent additional reporting errors.*

The City monitors the amount of water taken at each of its sources. The amount of water produced from year to year from the wells and springs will vary depending on groundwater and snowpack conditions. The largest discrepancy in the available source verse the source used can be contributed to leaks, tank overflows/spills, meter reading errors and software reporting problems.

Water loss is controlled by:

SCADA System: Each storage reservoir is connected to the City's SCADA system that provides continual monitoring of water storage. In the event there are issues with the pressure or levels of water, the City's designated employees are immediately alerted and able to quickly resolve the issue.

Independent Audit: In addition to this, the City conducts an annual audit of the amount of water billed verse the amount of water used. This ensures the water being used is being paid for and usage is accurately being tracked. This audit is in addition to the City's annual fiscal budget audit.

New Development: All new developments are required to follow Title 14, Subdivisions, of the City Code and follow the adopted Public Works Standards for Development, Design, and Construction. As part of the approval process, the City Engineer checks the available water sources and distribution system to ensure adequacy and responsible use of Perry's water resource. If a proposed development meets the requirements of the water distribution model and planned water source use, then the development is allowed to proceed through the approval process. During construction of the development, City staff oversees and inspects the water system to ensure the installation meets City Standards.

INCREASING RATE STRUCTURE

The following table outlines the current water rate schedule associated with the City's various connections adopted by Resolution on July 1, 2025. To continue to encourage conservation, these rates have been significantly increased. Beginning in Fiscal Year 2022, there has been an automatic three percent (3%) base rate increase implemented annually.

Table 1.5 - Water Rate Schedule (As of 2025)

Connection	$ Base Rate / Month	Allotment (Gal)	Additional Fee / 1,000 Gal
Resident With Secondary Water	$26.74	0-10,000	Included in Base
		10,001 – 20,000	$0.95
		20,001 +	$2.00
Resident Without Secondary Water	$26.74	0-15,000	Included in Base
		15,001 – 30,000	$0.95
		30,001 +	$2.00

WATER USE

Potable Water: Table 1.6 below shows the water inflow verses the water outflow for each type of use between 2005 and 2024.

Table 1.6 –Water Use

Year	INFLOW	OUTFLOW								
	Total (AF)	Res	Com	Ind	Inst.	Whole -sale	Other Uses	Un-meter ed	Total (AF)	% Diff.
2005	612.25	409.57	70.62	5.13	3.22	0	0	0	488.54	20.21%
2006	Not Reported									
2007	694.13	0	0	0	0	0	0	0	0	100%
2008	661.99	460.33	108.63	3.36	2.71	0	0	0	575.03	13.14%
2009	905.23	460.33	108.63	3.36	2.71	0	0	0	575.03	36.48%
2010	1716.15	406.37	55.24	0	9.21	0	0	0	570.81	66.74%
2011	923.52	0	0	0	0	0	0	0	0	100%
2012	0	0	0	0	0	0	0	0	0	0%
2013	739.63	469.54	89	0	9.21	0	0	0	567.74	23.24%
2014	2073**	42.71	7.98	2.29	27.10	0	0	0	80.05	96.14%
2015	7.12**	0.48	0.12	0	0	0	0	0	0.59	91.71%
2016	480.50	414.30	61.38	0	1.23	0	0	0	476.90	0.75%
2017	676.11	420.44	138.10	0	1.53	0	0	0	560.07	17.16%
2018	768.08	543.19	153.44	0	1.53	0	0	0	698.17	9.10%
2019	717.14	564.86	41.65	54.73	11.96	0	0	0	673.20	6.13%
2020	808.27	499.22	16	13.98	16.95	0	0	0	546.15	32.43%
2021	759.70	425.57	21.98	28.25	1.81	0	0	0	477.60	37.13%
2022	747.99	353.53	32.39	52.67	3.65	0	0	0	442.24	40.88%
2023	743.31	345.77	85	38.76	8.23	0	0	0	477.76	35.73%
2024	718.93	383.12	49.22	17.55	40.80	0	0	0	490.69	31.75%

*Information obtained from Utah Division of Water Rights Water Records/Use Information
**Amount reported in gallons (assumed), converted to AF.

The data reflected above, as reported to the Division of Water Rights, obviously shows discrepancies and large swings in inflow and outflow data. This analysis shows an average loss (deficiency) of 37.94% per year in the distribution system between 2005 and 2024. However, when the four years' worth of reporting that contained errors (2006, 2007, 2011, 2012) are removed, the average percentage loss improves slightly to 37.2% per year.

In the 2020 Conservation Plan, one of the goals was to reconcile reporting issues. The City has audited all the existing connections' billing classifications to ensure correct reporting of usage. They have also created a Standard Operating Procedure for ensuring correct reporting for the annual Water Survey. This progress is evidenced by the more accurate inflow/outflow reported between 2020 and 2024, with an average loss in this time period being 35.58% annually.

The goal of the City is to continue to improve the amount of loss as additional improvements are made to the water infrastructure. Some of the improvement over time can be attributed to improvements in the infrastructure as well as improved efficiency. Water unaccounted for generally comes from system leaks, fire hydrant use, and meter errors.

Non-potable Water: The City does not provide or monitor non-potable water (secondary) as this is provided through and monitored by the Pineview Water Systems, Three Mile Creek Irrigation Company, and the Perry Irrigation Company.

USE - GALLONS PER CAPITA PER DAY

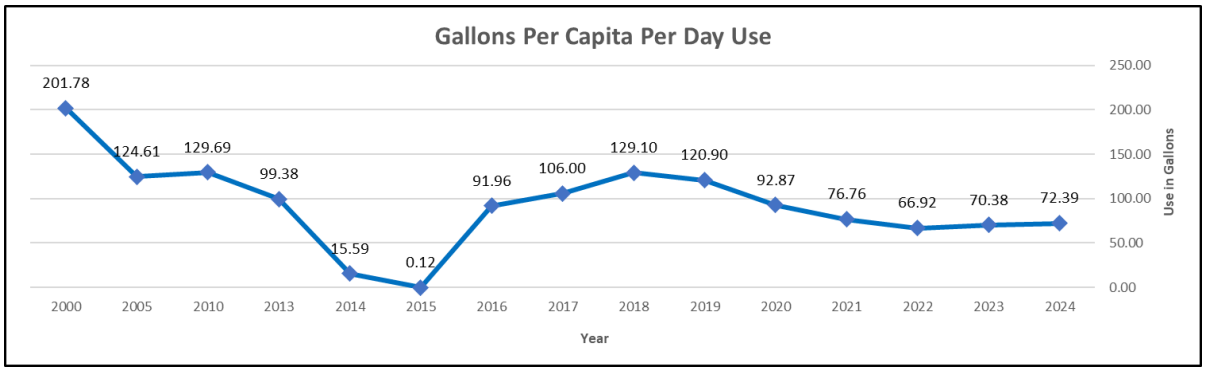
Table 1.7 below outlines the gallons per capita per day in 2024.

Table 1.7 –Water Use

	2024 Total GPCD
Residential	56.52
Commercial	7.26
Institutional	6.02
Industrial	2.59
Total	**72.39**

Graph 1.2 below illustrates the Gallons per Capita Per Day Use trend, indicating an overall decrease in water use and increase in conservation. It is evident, due to reporting changes, that data in 2014 and 2015, was not accurately reported. 2011 and 2012 were deleted from the graph as no data was reported for these years.

Graph 1.2 – Gallons Per Capita Per Day Use



SECTION 2 – CONSERVATION PRACTICES

CURRENT CONSERVATION

Perry City places a high value on the conservation of water and is already practicing the following:

- The City has SCADA system on three reservoirs and four wells to monitor and control components of the water system.

- Perry City utilizes radio-read meters. This allows the City to obtain meter readings as needed (typically read once a month) and detect possible leaks on each service as well as obtain accurate data for the water budget.

- The City has automated the watering of all their parks and park strips. This helps the City to avoid overwatering these areas. This also allows the City to water these areas at night when watering is most effective.

- The City provides water conservation education and public outreach through:
    - Providing conservation tips on City's Website.
    - Information in City's Newsletter.
    - Providing a copy of the Annual Consumer Confidence Report with a utility bill.

- The City maintains memberships in supporting organizations such as American Water Works Association, Water Environment Federation and The Rural Water Association that educate their personnel and keep up to date on source protection, public education and current regulations.

- The City requires the use of secondary water for all outdoor uses, where available.

- The current water pricing and billing system was updated and adopted by resolution on July 1, 2022. The new pricing and billing are adequate to cover expenses in the water enterprise account and is tiered so as to discourage excessive water use. The rate also includes an automatic annual three percent (3%) increase to ensure the fund can accommodate future needs.

- The City continues to complete infrastructure projects identified in the Capital Improvement Plan.

CONTACT

Mayor, Kevin Jeppsen & All Members of the City Council
1950 South HWY 89
Perry, UT 84302
kjeppsen@perrycityut.gov

Public Works Director, Zach Allen
1950 South HWY 89
Perry, UT 84302
zallen@perrycityut.gov

EVALUATION OF EXISTING CONSERVATION EFFORTS

In the 2020 Water Conservation Plan, the City established four goals based upon the issues identified. The goals and status of each are provided below:

Goal 1 – Increase Reporting Accuracy: Over the past five years, the City has had substantial data entry issues and staff turnover. Based on the reports submitted to the Division of Water Rights, it is apparent that use may not have been reported accurately, and data entry used to obtain usage has not been consistent. It is believed that the overall amount of water used is correct in recent years, but in the past years may not be. Over the next five years, the City will work to create a standard for labeling users with the appropriate category and entering user data consistently. This will provide more accurate reporting of where water is being used.

Status: The City has audited all the existing connections' billing classifications to ensure correct reporting of usage. They have also created a Standard Operating Procedure for ensuring correct classification and reporting for the annual Water Survey. This progress is evidenced by the more accurate inflow/outflow reported between 2020 and 2024.

Goal 2 – Water Rate Update. Over the next five years, the City will implement a water rate increase that is consistent with State requirements and the needs of the City's overall water system.

Status: In 2020, the City conducted an extensive water rate study to determine the financial needs of the system. This Study included reviewing current and projected future needs of operation costs; completing identified capital improvements to address existing deficiencies; and system replacement and facilities maintenance between 2020 and 2026. Because the required rate increase up front was significant, the City elected to (1) adopt a lower initial rate increase, (2) change the tiered structure of gallons allowed to one that is more conservation focused, and (3) include an automatic annual rate increase of three percent (3%) to ensure the fund can continue to grow. The rate increase will help the City be able to budget and plan for needed system improvements.

Goal 3 - Reduce the City's Per Capita Water Use Rate By 5% by 2024: The water use rate is currently 122 gallons per capita per day (gcpd). The goal is to bring this down approximately 5% to 116 gcpd. The savings will be measured in acre-feet and will be analyzed every five years by using the data that is submitted to the Division of Water Rights.

Overall Status: In 2024, the City's Per Capita Water Use was 72.39 gcpd. This is a 40% decrease in total water use per capita per day. This can largely be attributed to increased accuracy in data reporting and user classification.

This goal will be implemented by:

1. Implementation of Goals established in this report.

Status: The City is actively working to implement each goal established.

2. Read and collect data on City-owned property water use (meters read monthly).

Status: All City-owned facilities have had meters added and each meter is read monthly.

3. Completing a yearly auditing of 1% of all meters to ensure properly functioning.

Status: The City has increased the annual budget for meter replacements. On a monthly basis, the Public Works Department audits a section of meters to ensure proper functioning. Meters are replaced as needed. To ensure the continued proper functioning of all City meters, this will is a continuous goal for the City.

4. Run "zero consumption" report every other month and investigate and resolve found issues.

Status: The City runs a "zero consumption" report every other month and investigates and resolves issues found.

Goal 4 – Increase Public Awareness & Education Efforts: Currently, the City only utilizes the City's website to provide information about water conservation. Over the next five years, the City plans to provide bi-annual flyers/information with the monthly utility bill utilizing existing messages from Slow the Flow, DWRs's Conserve Utah, and WaterSense. In addition to this, the City plans to promote the use of weather based smart timers and provide information for how to obtain these tools.

Status: This goal has not been fully implemented by the City. Some messaging has been distributed, but not to the extent outlined in the goal. The City will incorporate this goal into the new best management practices and implementation plan.

NEW BEST MANAGEMENT PRACTICES & IMPLEMENTATION PLAN

Goal 1 – Reduce the City's Per Capita Water Use Rate by 5% over the next five years. The water use rate is currently 72.39 gallons per capita per day (gcpd) and will be reduced to 68.77 gcpd by 2030. The savings will be measured in acre-feet and will be analyzed annually by using the data that is submitted to the Division of Water Rights. The goal will be implemented as the City continues to implement system improvement projects, rate structures, and public education and outreach.

> *Note: The City's gallons per capita per day is 72.39 which is 30% under the established Box Elder County Regional Water Conservation Goal of 249 gcpd and 35% under the Statewide Goal of 202 by 2030. The City also considered the overall percentage decrease of 18% proposed by the State; however, this does not seem realistic for the five-year timeframe for which this goal has been established.*

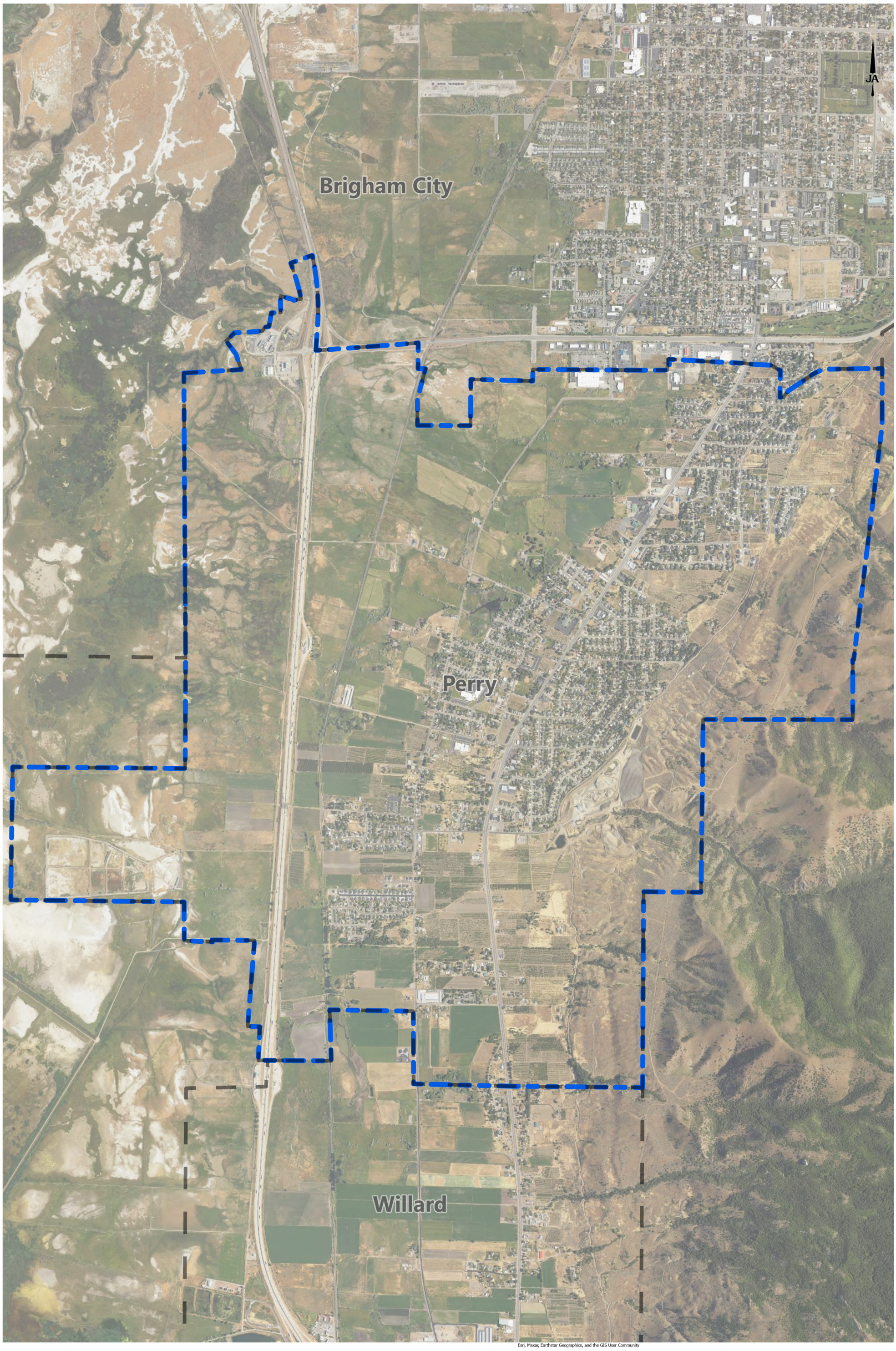
PUBLIC INFORMATION, EDUCATION, & PROGRAMS

The City currently provides regular information to residents and educates them on wise watering practices through the City's website and social media platforms.

CITY ORDINANCES & STANDARDS IN PLACE

The following ordinances and standards have been adopted and are currently in place:

- Water Management Plan, 2014
- Public Work Standards for Development, Design, & Construction were updated and adopted in April 2025
    - Incorporates the Manual of Standard Plans, published by Utah LTAP Center, Utah State University (commonly known as APWA)
    - Includes information for Low Impact Developments (using rainwater, collecting rain water, etc.)
- City Code, Title 14 Subdivision Regulations



PERRY CITY	DESIGNED JTS DRAWN JTS CHECKED BMJ	SCALE: 1" = 2,000' DATE: 6/3/2025	JONES & ASSOCIATES CONSULTING ENGINEERS 6080 Fashion Point Dr, South Ogden, UT 84403 (801) 476-9767	PERRY CITY CORPORATION WATER CONSERVATION PLAN **SERVICE AREA MAP**	SHEET: 1 OF 0 SHEETS 0

PERRY CITY
RESOLUTION 2025-17

INTERLOCAL AGREEMENT FOR INSPECTION SERVICES

A RESOLUTION OF PERRY CITY, UTAH, ADOPTING THE INTERLOCAL AGREEMENT FOR INSPECTION SERVICES WITH BRIGHAM CITY; AND EFFECTIVE DATE.

WHEREAS, Perry City (hereafter "City") is a municipal corporation duly organized and existing under the laws of the state of Utah;

WHEREAS, Brigham City provides certain building code and inspection services that the City requires;

WHEREAS, the Utah Interlocal Cooperation Act set forth in Title 11, Chapter 3 of the *Utah Code Annotated* permits governmental bodies to enter into agreements with one another for the purpose of exercising on a joint and cooperative basis powers and privileges that will benefit their citizens and make the most efficient use of their resources;

WHEREAS, City is desirous of entering the attached Interlocal Agreement in Exhibit "A" incorporated herein by this reference for the services as outlined and in order to comply with State Law;

WHEREAS, City and Brigham City have negotiated this Interlocal Agreement for the purposes contained therein;

WHEREAS, City and Brigham City find mutual benefit in this Interlocal Agreement;

NOW, THEREFORE, BE IT RESOLVED by the City Council of Perry City, Utah, that the Interlocal Agreement for Inspection Services ("Agreement") attached hereto as Exhibit "A" and incorporated herein by this reference is approved and adopted for the purposes contained therein. The City Council hereby authorizes and directs the Mayor to execute said Interlocal Agreement along with any subsequent documents relating thereto for and on behalf of the City.

PASSED AND APPROVED by the Perry City Council this ____ day of _____, 2025.

_____
Mayor

ATTEST:

_____
City Recorder

INTERLOCAL AGREEMENT
FOR
INSPECTION SERVICES

This Interlocal Agreement for Inspection Services ("Agreement") is made and entered into by and between Brigham City Corporation, a municipal corporation organized pursuant to the laws of the State of Utah, ("Brigham City"), and Perry City, a municipal corporation organized pursuant to the laws of the State of Utah, ("Perry City") and collectively referred to as the "Parties" to this Agreement.

RECITALS

WHEREAS, the Utah Interlocal Cooperation Act, Title 11, Chapter 13, Utah Code Annotated 1953, as amended, permits public agencies to enter into agreements with one another for the purpose of exercising, on a joint and cooperative basis, powers and privileges that will benefit their citizens and make the most efficient use of their resources; and

WHEREAS, all of the Parties hereto are public agencies as defined by the Interlocal Cooperation Act; and

WHEREAS, Brigham City has a Building Official and Building Inspector and staff who provide inspection services for Brigham City; and

WHEREAS, Perry City desires to use Brigham City's Inspection staff for their building inspection and building official needs on an "as needed" basis to provide certain inspection services; and

WHEREAS, the Parties agree that it is in their respective and collective best interest to collaborate to provide these services;

NOW, THEREFORE, based upon the above recitals and other consideration, the Parties enter into this Agreement and agree to the following:

1. **OPERATION** When requested by Perry City, Brigham City agrees to provide qualified, competent and licensed Brigham City staff to assist Perry City with performing and scheduling inspections, fielding questions from public/applicants, coordinating with Perry City planning, engineers, and public works staff regarding development and building activities, etc.

2. **CODE ADOPTION** Perry City is responsible to adopt the applicable Codes in order for Brigham City to carry out this Agreement.

3. **COMPENSATION** Perry City shall compensate Brigham City at 45% of the fully burdened rate of the inspector which upon execution of this agreement is $134,000.00, per year. This amount is subject to change in July of each year based upon the Brigham City budget. Payment will be made either monthly or annually as determined by the Parties.

4. **TERM** The term of this Agreement shall be for a period of one (1) year commencing September 2, 2025, and shall automatically renew annually unless terminated as set forth herein.

5. **TERMINATION**. Either Party may terminate this Agreement for any reason by giving a written six month notice to the other Party.

6. **ADMNISTRATION** This Agreement shall be administered and managed by Brigham City Administrator or their designee and the Perry City Administrator, or their designee. Accordingly, at the conclusion of each term of this Agreement, the terms and provisions of this Agreement shall be reviewed and evaluated, with recommendations being made to Brigham City and Perry City by their respective representative.

7. **LIABILITY AND INDEMNIFICATION** The parties agree and promise to indemnify and hold harmless the other City, its officers, agents, officials and employees, and volunteers harmless and release them for and from any liability, costs or expenses arising from any action, causes of action, claims for relief, demands, damages, expenses, costs, fees or compensation, whether or not said actions, causes of action, claims for relief, demands, damages, costs, fees, expenses, and/or compensation are known or unknown, are in law or equity, and without limitation, all claims of relief which can be set forth through a complaint or otherwise that may arise out of the acts or omissions, or otherwise, except negligence, of Brigham City's officers, agents, officials, members, employees or volunteers in the performance of this Agreement.

9. **REPRESENTATIONS** As an inducement to the Parties to enter into this Agreement, the Parties hereby represent and warrant as follows:

Representations and Warranties of Brigham City. Brigham hereby represents and warrants as follows as of the Effective Date that Brigham has full power and authority to enter into this Agreement, to carry out its obligations hereunder and to consummate the transactions contemplated hereby. The execution and delivery by Brigham City of this Agreement, the performance by Bigham City of its obligations hereunder and the consummation by Brigham of the transactions contemplated hereby have been duly authorized by all requisite legal action. This Agreement has been, and upon its execution will have been, duly executed and delivered by Brigham City; and, assuming due execution and delivery by both Parties hereto, this Agreement constitutes, and upon its execution will constitute, a legal, valid and binding obligation of Brigham City enforceable against Brigham City in accordance with its terms.

Representations and Warranties of Perry City. Perry City hereby represents and warrants as follows as of the Effective Date Perry City has full power and authority to enter into this Agreement, to carry out its obligations hereunder and to consummate the transactions contemplated hereby. The execution and delivery by Perry City of this Agreement, the performance by Perry City of its obligations hereunder and the consummation by Perry City of the transactions contemplated hereby have been duly authorized by all requisite legal action. This Agreement has been, and upon its execution will have been, duly executed and delivered by Perry City; and, assuming due execution and delivery by both Parties hereto, this Agreement constitutes, and upon its execution will constitute, a legal, valid and binding obligation of Perry City enforceable against Perry City in accordance with its terms.

10. MISCELLANEOUS PROVISIONS

No Assignment. Neither Party may assign its interest in this Agreement without the written consent of the other Party.

No Third-Party Beneficiaries. This Agreement shall not confer any rights or remedies upon any person or entity other than the Parties and their respective successors-in-interest.

Inducement. The making and execution of this Agreement has not been induced by any representation, statement, warranty or agreement other than those herein expressed.

No Recourse. This Agreement shall not create or be deemed to create or permit any personal liability or obligation on the part of any direct or indirect officer, employee, or representative of the Parties.

Binding Effect. This Agreement shall be binding upon and inure to the benefit of the Parties hereto and their respective successors and assigns.

Business Relationship. This Agreement does not acknowledge the existence of or establish a partnership, joint venture, or any other form of business relationship between the Parties other than as expressly set forth herein, and this Agreement is limited solely to the purposes and interests expressed herein.

Severability. If any term or provision of this Agreement shall, to any extent, be determined by a court of competent jurisdiction to be void, voidable, or unenforceable, such void, voidable or unenforceable term or provision shall not affect the enforceability of any other term or provision of this Agreement; and the Parties agree to attempt in good faith to reform such void or unenforceable provision to the extent necessary to render such provision enforceable and to carry out its original intent.

Entire Agreement. This Agreement contains the entire agreement between the Parties with respect to the subject matter, and no statements, promises, or inducements made by any Party or agents of any Party that are not contained in this Agreement shall be binding or valid.

Notice. Any notice required or desired to be given pursuant to this Agreement or otherwise relating to this Agreement shall be in writing, addressed to the Party at the address listed below, and shall be deemed effective: (i) upon personal delivery, or (ii) three business days following deposit in the United States Mail, postage prepaid, certified mail, return receipt requested.

To: **Brigham City Corporation**
20 North Main
Brigham City, Utah 84302
Attn: City Administrator

To: **Perry City**
1950 South Hwy 89

Perry, Utah 84302
Attn: City Administrator

Either Party hereto may change its address for the purpose of receiving notices as herein provided by serving written notice given in the manner aforesaid.

Applicable Law. This Agreement shall be governed by and interpreted in accordance with the laws of the State of Utah.

11. INTERLOCAL COOPERATION ACT REQUIREMENTS

In satisfaction of the requirements of the *Utah Interlocal Cooperation Act*, the Parties agree as follows:

a. This Agreement shall be conditioned upon the approval and execution of this Agreement by the Parties pursuant to and in accordance with the provisions of the *Utah Interlocal Cooperation Act*, as set forth in Utah Code Title 11, Chapter 13, including the adoption of resolutions of approval, but only if such resolutions of the legislative bodies of the Parties are required by the *Utah Interlocal Cooperation Act*.
b. In accordance with the provisions of Utah Code §11-13-202.5(3), this Agreement shall be submitted to the attorney authorized to represent each Party for review as to proper form and compliance with applicable law before this Agreement may take effect.
c. A duly executed copy of this Agreement shall be filed with the keeper of records of each Party, pursuant to §11-13-209 of the *Utah Interlocal Cooperation Act.*
d. No separate legal entity is created by the terms of this Agreement. To the extent that this Agreement requires administration other than as set forth herein, it shall be administered by the chief executive officer of each Party.

IN WITNESS WHEREOF, the Parties have caused this Agreement to be executed on the dates indicated by the signatures of the respective Parties.

THE REMAINDER OF THIS PAGE IS INTENTIONALLY BLANK

SIGNATURE PAGE TO FOLLOW

BRIGHAM CITY CORPORATION

_____
Mayor Dennis J. Bott
Date: _____

ATTEST:

_____
Brigham City Recorder

APPROVED AS TO FORM AND AS COMPATIBLE WITH STATE LAW:

_____
Brigham City Attorney

PERRY CITY CORPORATION

_____
Mayor Kevin Jeppsen
Date: _____

ATTEST:

_____
City Recorder

APPROVED AS TO FORM AND AS COMPATIBLE WITH STATE LAW:

_____
Perry City Attorney