

### **Executive Summary**

Zone 50 is a service area of the Sacramento County Water Agency (SCWA) being developed as Metro Air Park (MAP), an industrial and commercial community adjacent to the Sacramento International Airport (SIA). The Zone 50 Water Supply Master Plan (WSMP) is a plan for the development of new transmission and distribution mains, pumping, and storage facilities needed to serve the Zone 50 project area.

The Zone 50 WSMP defines the Zone 50 fee program, discusses SCWA Zone 41 Operation and Maintenance, identifies phased and buildout water demands and identifies the water facilities required for buildout and for the phasing of the development.

Supply for Zone 50 will be purchased from the City of Sacramento (City), and transmitted to the project area via a pipeline that will serve SIA and Zone 50.

The MAP developers, MAP LLC, will provide funding for all water infrastructure projects in Zone 50 (unless otherwise explicitly stated in the following WSMP), and for the first one (1) MGD increment of capacity from the City for the initial phase of development, calculated to be \$1,595,902 in 2004 dollars. SCWA will fund all future water increments through the Zone 50 development fee program. To purchase sufficient City water for Zone 50 buildout, the development fee fund must ultimately reach an estimated \$13,214,069 in 2004 dollars.

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# 1 Introduction

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## 1.1 INTRODUCTION

The purpose of the Zone 50 Water Supply Master Plan (WSMP) is to provide a clear plan for the development of new transmission/distribution, supply, pumping, and storage facilities needed to serve the Zone 50 project area. The water supply and facility recommendations contained in this study will be the basis of design for the Zone 50 water system improvements. The WSMP is consistent with the requirements of Ordinance No. 18 of the Sacramento County Water Agency (SCWA).

This WSMP also has as its foundation the Water Forum Agreement (Water Forum, January 2000) and its two coequal objectives: (1) to provide a reliable and safe water supply for the region's economic health and planned development through the year 2030, and (2) to preserve the fishery, wildlife, recreational, and aesthetic values of the lower American River.

This WSMP provides supporting hydraulic modeling assumptions, scenarios, and results for the updated water distribution system analysis in *Hydraulic Model Simulations - Appendix I*, March 16, 2004 (*Appendix A*).

## 1.2 OBJECTIVES OF THE WSMP

The primary objectives of this WSMP are highlighted as follows:

- ▣ Document buildout and phased water demand projections
- ▣ Identify the required water facilities in the Buildout Water System Plan
- ▣ Provide Facility Phasing and Implementation Plans to identify how the system improvements will be implemented and phased with growth.
- ▣ Creation and implementation of the Zone 50 fee program
- ▣ Discuss Zone 41 operation and maintenance services

## 1.3 STUDY AREA

SCWA Zone 50 is located in Sacramento County (County), bounded on the west by the SIA, on the south by Interstate 5, on the east by Lone Tree Road, and on the north by an extension of Elverta Road. MAP is a 1,391-acre planned industrial and

# ZONE 50 WATER SUPPLY MASTER PLAN

## INTRODUCTION

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commercial community within the unincorporated area of the County, refer to the Zone 50 Project Area - Vicinity Map, **Figure 1-1**.

The study area is relatively flat land that has historically been used for growing crops. Ground elevations range from 10 feet in the southwest region to 25 feet above mean sea level in the northwest region of the site.

### 1.4 HYDRAULIC MODELING APPROACH

A network water distribution model was used to analyze the proposed water system and to model the preferred supply alternative. MAP network simulations were also run to evaluate various phasing assumptions.

Detailed discussions on modeling, modeling assumptions, and simulation results are contained in Appendix I. The simulations run in this study include buildout and phased model scenarios, fire flow scenarios, special on-site system options, and reservoir fill scenarios. All simulations reflect the water system layout and main sizes outlined in this report.

# ZONE 50 WATER SUPPLY MASTER PLAN

## INTRODUCTION

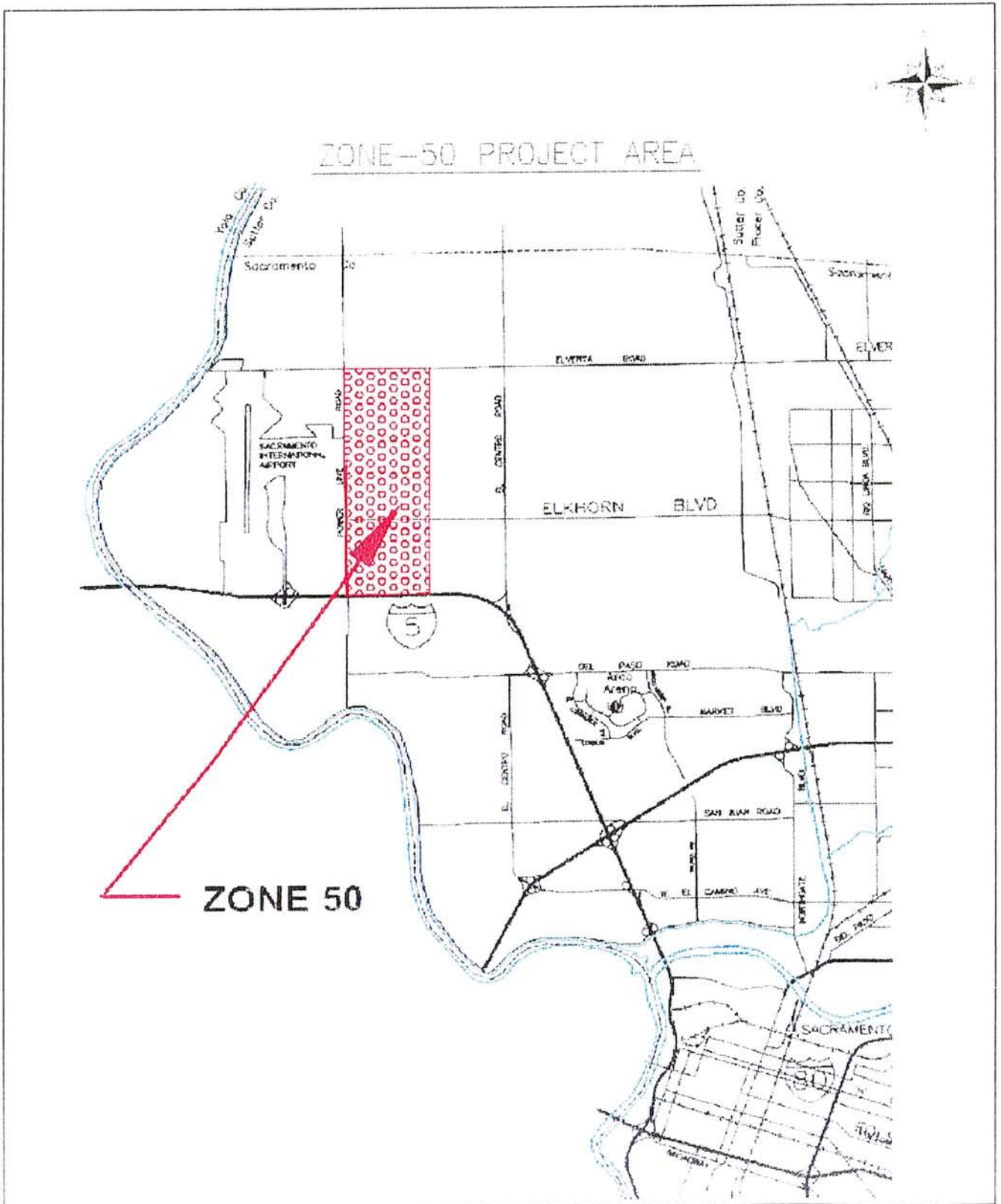


Figure 1-1 ZONE 50 PROJECT AREA - VICINITY MAP

## 2 Background

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### 2.1 SCWA AND ZONE 50

SCWA was formed in 1952 by a special legislative act of the State of California (the Sacramento County Water Agency Act [Agency Act]). SCWA's purposes include but are not limited to the following:

- Making water available for any beneficial use of lands and inhabitants
- Producing, storing, transmitting, and distributing groundwater

SCWA is governed by a Board of Directors (ex officio, the County of Sacramento Board of Supervisors [Board]). Under the Agency Act, the Board may contract with the federal government under reclamation laws with the same powers as irrigation districts, and with the State of California and federal government with respect to the purchase, sale, and acquisition of water. SCWA may also own, construct, and operate any required capital facilities.

SCWA Ordinance No. 18, adopted in 1986, authorized establishment of fees, charges, credits, and regulations for the wholesale supply of water to zones within SCWA. A water supply master plan is required by this Ordinance.

On August 25, 1993, the Sacramento County Board of Supervisors adopted Ordinance No. SZC93-0045, revising Title V, Chapter 5, Article 3, of the Metropolitan Airport Vicinity Special Planning Area, granting development entitlements to the MAP project. Condition #15 of the ordinance stipulates that no development shall occur within the MAP project area until a zone of the SCWA encompassing the project site is formed.

Zone 50 was created by SCWA Resolution WA-2542 on June 1, 2004. Zone 50 was formed to fund water projects within the Zone. Zone 50 will provide the mechanism to fund future improvements and/or upgrades to the water system, which are not specifically mentioned in the *Draft MAP Public Facilities Master Plan (PFMP)*, March 2005 or the WSMP.

### 2.2 WATER FORUM AGREEMENT

The Water Forum (WFA) process brought together a diverse group of stakeholders that included water managers, business and agricultural leaders, environmentalists, citizen groups, and local governments to evaluate available water resources and the future water needs of the Sacramento metropolitan region. The coequal objectives of

the WFA are to: 1) provide a reliable and safe water supply for the region's economic health and planned development through the year 2030; and 2) preserve the fishery, wildlife, recreational, and aesthetic values of the lower American River. The first objective will be met by additional diversions of surface water, increased conjunctive use of surface water and groundwater, expanded water demand management programs, and recycled water. The second objective will be met by modifications to American River flow patterns in order to improve in-stream fish habitat.

Development of a WFA to meet the coequal objectives involved substantial scientific study, environmental analysis, and consensus-building with various stakeholders. The WFA is a comprehensive package of linked actions that, when implemented, are intended to successfully achieve the coequal objectives. These linked actions require the support of each stakeholder in the public policy decision-making process and through implementation in order to successfully achieve the coequal objectives.

These actions include adherence to an agreed upon long-term average annual limit (defined as "sustainable yield") for each of the three geographic sub-areas of the groundwater basin underlying the County: 131,000 acre-feet (AF) for the North Area (north of the American River); 273,000 AF for the Central Area (between the American and Cosumnes rivers); and 115,000 AF for the Galt or South Area (south of the Cosumnes River). Any proposed water supply project must satisfy the groundwater conditions specified in the WFA for the 2030 project level of development.

## 2.3 OTHER WATER PURVEYORS

Two water purveyors provide service in the general vicinity of the MAP project. The following provides a brief description of these purveyors.

### 2.3.1 NATOMAS CENTRAL MUTUAL WATER COMPANY (NCMWC)

Natomas Central Mutual Water Company (NCMWC) (See **Figure 2-1**) diverts surface water from the Sacramento River to meet the irrigation needs of its stakeholders (every land owner inside the NCMWC service area is a shareholder in the NCMWC). NCMWC's points of diversion are located at the Elkhorn and Prichard pumping stations. Water is then conveyed through a system of open ditches.

In 1964, NCMWC entered into an agreement with the United States Bureau of Reclamation (USBR) regarding operation of the Central Valley Project (CVP) and its water entitlements. NCMWC's agreement restricts use of its water entitlements to



**ZONE 50 WATER SUPPLY MASTER PLAN**  
**BACKGROUND**

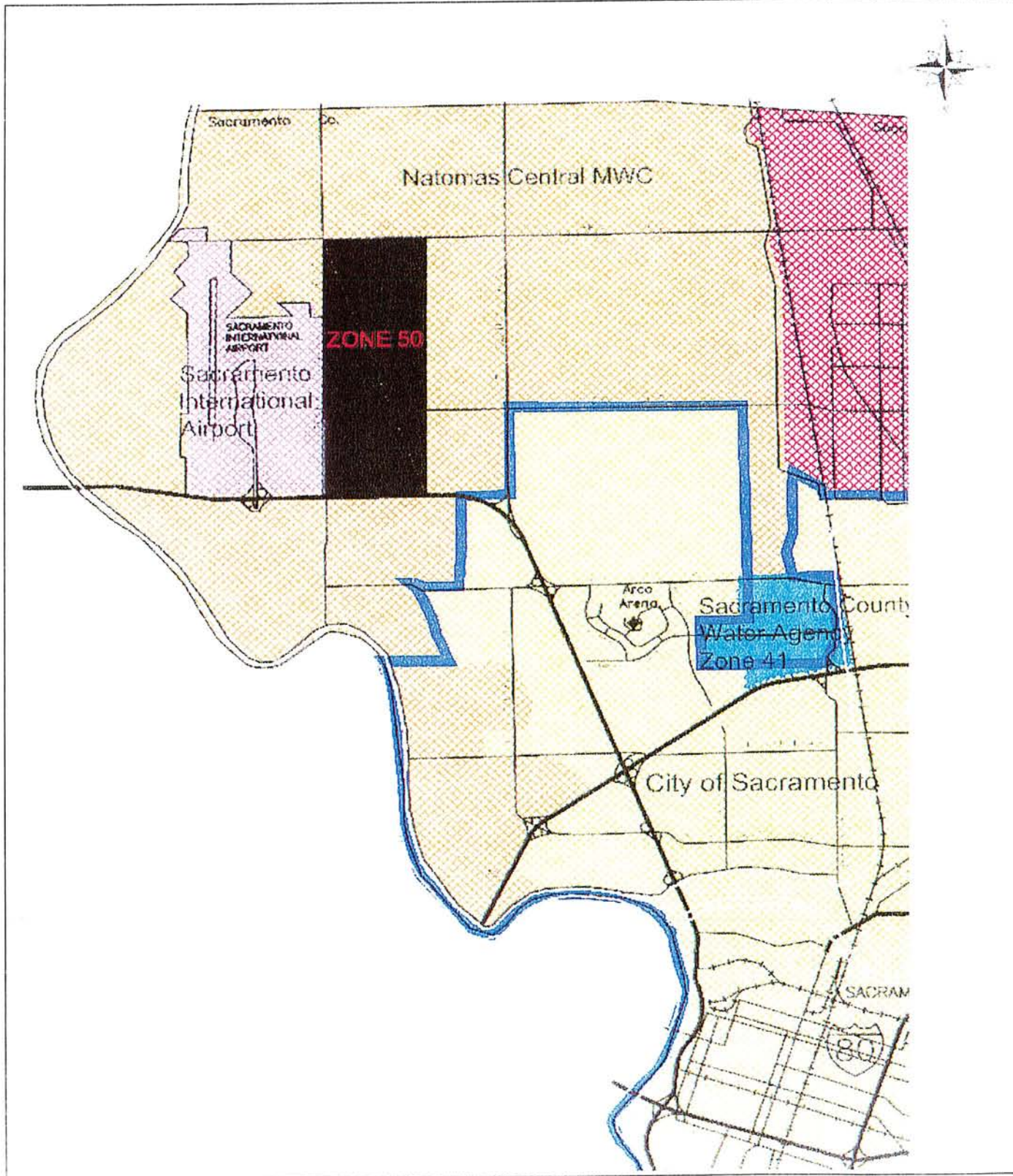


Figure 2-1 ZONE 50 AREA WATER PURVEYORS

# ZONE 50 WATER SUPPLY MASTER PLAN

## BACKGROUND

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to its service area. The agreement also stipulates that NCMWC is subject to a reduction in both “base” and “project” supplies of 25 percent during critically dry years. NCMWC is also subject to reductions in water diversions by the State of California as stated in its licenses. Under certain conditions, the State Water Resources Control Board can reduce diversions to meet water quality and fish life objectives for the Sacramento River.

NCMWC possesses a combination of surface water entitlements, including five (5) water licenses and one (1) water permit. Per Application 25727, approved by the Division of Water Rights on July 12, 1990, all of their entitlements allow the water to be used for M&I purposes within their service area. Total licensed water entitlements equal 120,200 acre feet, which can be diverted between April and October. Permit 019400 is the only entitlement, which allows deliveries from November 1 through March 15, and has a maximum diversion limit of 10,000 ac-ft during that period.

### 2.3.2 CITY OF SACRAMENTO

The City of Sacramento (City) provides potable water to its customers in the Natomas area. Recently completed North Natomas upgrades includes, 18-inch through 36-inch water mains constructed to serve several new communities located north of Interstate 80, and the construction of two (2) three (3) million gallon storage tanks and booster station facilities (including the El Centro Reservoir).

## 2.4 WATER SUPPLY SOURCES

Condition 16 of the rezone (County Ordinance No. SZC93-0045) required that the MAP water delivery system include the use of surface water, either wholly or in part. Options included the implementation of a conjunctive use of surface water and groundwater, or 100 percent surface water. Simultaneous with the discussions to determine the most reliable and cost-effective source of water for the MAP project the City and SIA were discussing delivery of city water to the airport to solve water quality issues associated with the SIA’S groundwater supply. Partnering in the project was deemed to be a cost-effective way to deliver water to the Zone 50 area. On October 12, 2004, the City, County, and SCWA, approved the *Agreement Between the City of Sacramento, the County of Sacramento, and the Sacramento County Water Agency for Wholesale and/or Wheeling Water Service for Sacramento International Airport and Metro Air Park (Agreement)*. Included as appendix B. The *Agreement* calls for the wholesaling of City supplied water to the County for use at SIA and to SCWA for Zone 50. The *Agreement* defines the terms for water deliveries to SIA and Zone 50 including costs for providing wholesale water service. This agreement addresses the long-term water supply needs of the project and minimizes impacts to the local groundwater basin.



### 3 Land Use, Phasing Scenarios, and Demand Projections

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#### 3.1 INTRODUCTION

Land use, phasing scenarios, and demand projections are described in this section.

#### 3.2 LAND USE

**Figure 3-1**, entitled *Land Use Plan* identifies proposed land use and zoning for MAP along with arterial and other major roadways as approved by the Sacramento County Board of Supervisors in August 1993.

#### 3.3 PROJECT PHASING

Phasing of development has been defined as the following percentages of adsorption:

Table 3-1	
Phasing by Development Adsorption	
Phasing	Development absorption (%)
1A	INITIAL DEVELOPMENT
1B	10%-14%
1C	15%-19%
2	20%-29%
3	30%-39%
4	40%-59%
5	60%-79%
6	80%--Buildout

The goal of the initial phase of water infrastructure development is to provide a reasonable opportunity for property owners to have access to basic water facilities.

## **ZONE 50 WATER SUPPLY MASTER PLAN**

### **LAND USE, PHASING SCENARIOS, AND DEMAND PROJECTIONS**

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although additional extensions of water facilities will be required to serve all of the parcels in the plan.

# ZONE 50 WATER SUPPLY MASTER PLAN

## LAND USE, PHASING SCENARIOS, AND DEMAND PROJECTIONS

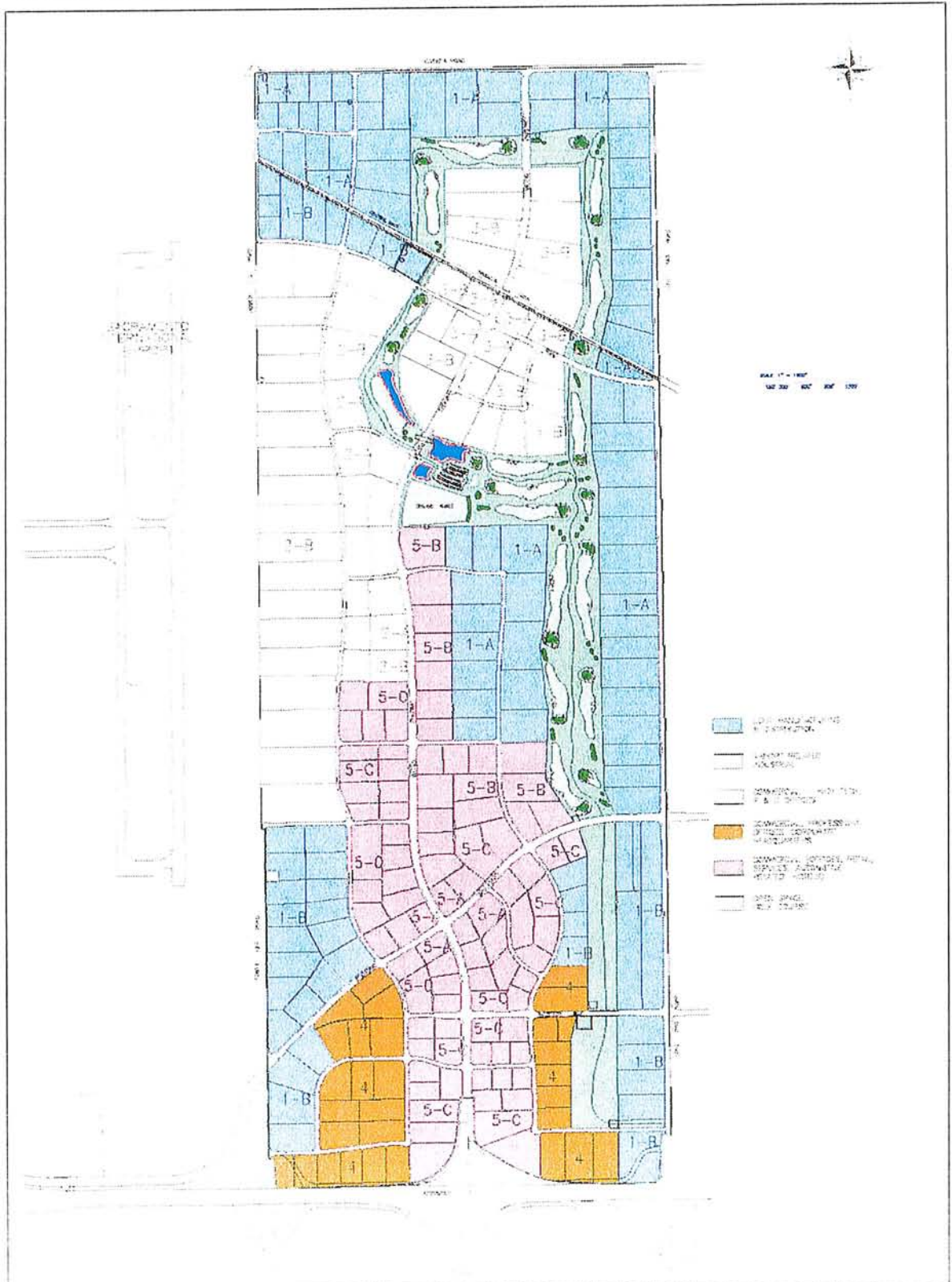


Figure 3-1 LAND USE PLAN

## ZONE 50 WATER SUPPLY MASTER PLAN

### LAND USE, PHASING SCENARIOS, AND DEMAND PROJECTIONS

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Major improvements will be staged to meet demands at each level of growth, please refer to **Section 7** for specifics. Elements of the distribution system that have not been assigned a phase, such as distribution mains, will be constructed along with individual developments, by the landowners.

### 3.4 WATER DEMAND PROJECTION

Water demand projections for Zone 50 are based on approved land uses, **Figure 3-1** and unit demands based on average water use rates for typical commercial, industrial and research, and other similar types of development within the County tailored to reflect airport related usage. The total project build-out water demand is estimated by extending unit demands by land use acreages.

Average unit water demands for commercial and industrial land use categories may vary from county-wide or other zone demand averages due to disparities in the nature of development, type of manufacturing, number of employees per acre, and varying ratios of high to low water users. Should a large number of high water use or employee intensive manufacturing facilities be constructed, or a greater percentage of multiple-story buildings be constructed, actual unit water use may exceed that projected in this WSMP. If a significant amount of industrial warehouse or storage facilities are constructed with low occupancy rates, actual demands will be significantly lower than the estimates provided herein.

As a signatory to the WFA, SCWA is committed to implement 16 Water Conservation Best Management Practices (BMP) as defined in the County of Sacramento Water Forum Water Conservation Plan, pages 119-128 of Appendix J of the WFA (included in this document as Appendix C).

The unit water demand factors used in this study are listed in **Table 3-2**. Average annual demand projections determine the required entitlements and supplies to meet future demands (Average Day Demand (ADD) is the average annual demand divided by 365 days). Maximum Day Demand (MDD, = 2 x ADD) projections are used for sizing source production facilities and large conveyance pipelines. Peak Hour Demand (PHD, =2 x MDD) projections are used for sizing local water pipelines, storage reservoirs, and pump stations.

# ZONE 50 WATER SUPPLY MASTER PLAN

## LAND USE, PHASING SCENARIOS, AND DEMAND PROJECTIONS

**Table 3-2**  
**Water Demand Factors**

Item	Land Use	Projected Unit Water Demand Factors		
		Avg. Day Demand Factors <sup>1</sup> (AF/ac/yr)	Avg. Day Demand Factors (gpd/ac)	Max. Day Demand Factors (gpd/ac)
1	Light Manufacturing and Distribution	3.81	3,400	6,800
2	Airport Related Industrial	3.24	2,895	5,790
3	Commercial-High-tech R&D Offices	3.24	2,895	5,790
4	Commercial-Professional Offices-Corporate Headquarters	3	2,680	5,360
5	Commercial-Offices Retail/Services, Automotive & Related Hotels	3	2,680	5,360
6	Open Space	0	0	0
7	Major Roadways <sup>2</sup>	0.19	166	332

1. Unit water demand factor includes a 7.5% increase for unaccounted losses in the system.

2. Includes landscaped regions along major roadway corridors.

An ADD to MDD peaking factor of 2.0 and an MDD to PHD peaking factor of 2.0 were used in this study. Thus, the projected increase from ADD to PHD is 4 fold.

The projected water demands at buildout are based on the current proposed land uses identified in the Land Use Map, 1999 and *Metro Air Park Developable and Total Acreage by Zoning District*, Table 2, Spink are listed in Table 3-3. *Metro Air Park Developable and Total Acreage by Zoning District*, Table 2 supersedes Table A-1 in the *Metro Air Park Public Facilities Master Plan*, Spink, September 1998.

Golf course irrigation demands are not part of this WSMP. Due to the availability and reduced processing cost of agricultural water the golf course is assumed to be irrigated with non-potable water, which may be supplied by either groundwater or by surface water delivered by NCMWC.



## ZONE 50 WATER SUPPLY MASTER PLAN

### LAND USE, PHASING SCENARIOS, AND DEMAND PROJECTIONS

**Table 3-2**

#### Water Demand Projection

Item	Land Use	Projected Water Demand				
		Average Demand Factors (gpd/ac)	Acres	Avg. Day Demand (gpm)	Max. Day Demand (gpm)	Peak Hour Demand (gpm)
1	Light Manufacturing and Distribution (LMD) <sup>1</sup>	3,400	612.30	1,445.73	2,891.46	5,782.92
2	Airport Related Industrial (A1)	2,895	279.60	562.11	1,124.22	2,248.44
3	Commercial-High-Tech R&D Offices (CHT)	2,895	168.13	338.01	676.02	1,352.04
4	Commercial-Professional Offices-Corporate Headquarters (CPC)	2,680	95.50	177.74	355.48	710.96
5	Commercial-Offices Retail/Services, Hotels, Automotive & Related (C) <sup>4</sup>	2,680	358.74	667.66	1,335.32	2,670.64
6	Major Roadways <sup>2</sup>	166	81.49	9.40	18.80	37.60
7	Golf Course Club House <sup>3</sup>	2680	5.00	9.31	18.62	37.24
8	Freeway Interchange	166	11.40	1.31	2.62	5.24
9	Light Rail	2,680	5.80	10.79	21.58	43.16
<b>Totals</b>			<b>1617.96</b>	<b>3,222.06</b>	<b>6,444.12</b>	<b>12,888.24</b>
<b>Use Totals</b>				<b>3,222</b>	<b>6,444</b>	<b>12,888</b>

1. Average demand factors include a 7.5% increase for unaccounted for losses in the system.

2. Includes landscaped regions along major roadway corridors only.

3. Golf course demands are not included as part of these demand calculations since irrigation water for the golf course will be provided by groundwater supplied by the course owners, surface water delivered by NCMWC, or from other sources.

4. Includes acreages for water facilities and a fire station.

Using the unit demand values listed above and the land uses listed in **Table 3-2** and **Table 3-3**, the MDD for build-out is projected to reach 6,444 gallons per minute (gpm) or 9.279 million gallons per day (MGD), and PHD is projected to reach 12,888 gpm or 18.56 MGD. The total ultimate annual potable demand is projected to reach 5,198 acre-feet per year.

### 3.5 PHASED WATER DEMAND PROJECTIONS

Growth projections provided by the project proponent are based on average overall absorption within the project. Phased demand projections, based on absorption, are shown in **Table 3-4**.

## ZONE 50 WATER SUPPLY MASTER PLAN

### LAND USE, PHASING SCENARIOS, AND DEMAND PROJECTIONS

Table 3-3 Phased Water Demand Projections				
Development Phase	Maximum Absorption <sup>1</sup> (%)	ADD (gpm)	MDD (gpm)	PHD (gpm)
Phase 1A	Initial	322.20	644.40	1,288.80
Phase 1B	Initial - 10	322.20	644.40	1,288.80
Phase 1C	11 - 15	483.30	966.60	1,933.20
Phase 2	16 - 29	934.38	1,868.76	3,737.52
Phase 3	30 - 39	1,256.58	2,513.16	5,026.32
Phase 4	40 - 59	1,900.98	3,801.96	7,603.92
Phase 5	60 - 79	2,545.38	5,090.76	10,181.52
Phase 6 <sup>2</sup>	80 - Buildout	3,222.00	6,444.00	12,888.00

1. Listed absorption is based on maximum projected absorption for the phase.
2. Buildout demand is equivalent to the Use Totals listed in Table 3-3.

## 4 Water Supply

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### 4.1 INTRODUCTION

This section describes current water regulations, water quality, feasible supply sources, and the recommended water supply plan for the study area.

### 4.2 DRINKING WATER REGULATIONS

The Safe Drinking Water Act (SDWA) was enacted by Congress (1974) to set the maximum allowable levels of contaminants in drinking water for primary and secondary contaminants. As a primacy state, the State of California is responsible for implementing the SDWA within the State. Under primacy rules the State must enforce regulations that are at least as stringent as those promulgated under the SDWA and may also promulgate and enforce additional regulations not mandated by the SDWA. Title 22 of the California Code of Regulations (CCR) lists all regulated contaminants for drinking water in the State.

### 4.3 GROUNDWATER QUALITY

Groundwater conditions in Zone 50 were reviewed in a report entitled *Hydrogeologic Review and Water Supply Well Installation Recommendations for the Metro Air Park (MAP) (Hydrogeologic Review)*, Stantec Consulting Inc., dated July 10, 2003. This study evaluated water quality and geophysical data from four exploratory borings, which were drilled on the site to depths between 600 and 1,200 feet.

Arsenic levels in the wells in the northern portion of the site were found to be in excess of 60 ppb, along with manganese levels that exceed secondary drinking water standards. Therefore, any groundwater pumped for potable uses in Zone 50 would have to undergo treatment to reduce concentrations of both arsenic and manganese to acceptable levels prior to delivery to the distribution system.

### 4.4 WATER SUPPLY SOURCES

At a regular hearing in July 1995, the NCMWC Board of Directors decided not to provide retail service to the MAP project. In the future, NCMWC may wholesale surface water for municipal and industrial (M&I) use within the project area, if agreed to by the City/County. This water would need to be treated at a City surface water treatment plant and wheeled through the City's system for use in the service area(s). Water entitlements must stay within the MAP boundary and not transferred to the County or any other purveyors.



### WATER SUPPLY

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Water treated by the City's Sacramento River Water Treatment Plant (Sacramento River WTP) meets or exceeds all current EPA and CCR Title 22 requirements for safe drinking water and is operated and maintained as a highly reliable facility.

#### 4.5 RECOMMENDED WATER SUPPLY PLAN

The recommended water supply plan for the Zone 50 service area is to serve all project phases with City supplied water and to participate in cost sharing of the SIA pipeline project. Water supplied by the City's system would be a conjunctive mix of surface and groundwater supplies.

In order to obtain the firm supply, the required water delivery infrastructure will need to be constructed and the City/County/SCWA will need to comply with the terms as listed in the *Agreement*. Additionally, it will be important to provide the City with adequate notification of the intent to draw water and for staged deliveries above those specified for the initial project phases. The City will implement the necessary water supply, transmission, and storage projects needed to maintain this supply for all future development phases.

Adequate water supplies shall be provided to meet the Project's Maximum Day Demand requirements. Peak Hour Demand shall be provided by the MAP Reservoir and Pumping Facility.

## 5 Service Requirements

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### 5.1 INTRODUCTION

The water system service requirements and facility sizing criteria that was used in the planning of the Zone 50 water system and for modeling as addressed in *Appendix I* are described in this section.

### 5.2 SYSTEM CRITERIA

#### 5.2.1. System Operating Criteria

SCWA has developed minimum operating criteria to be used in the planning of new water systems. These operating criteria were used for the sizing of pipelines and other regional facilities in this WSMP and are presented as follows:

- ▣ Minimum distribution system pressures during MDD conditions are to be equal to or greater than 40 pound per square inch (psi).
- ▣ The required fire flow is to be provided under MDD conditions at a minimum residual pressure of 20 psi at the most remote hydrant in the system.
- ▣ Maximum operating pressure at the pumps is 150 psi. (for purposes of analyzing water main sizes). Actual pump design operating points may be higher.
- ▣ The maximum distribution system pressure shall be limited to 90 psi.
- ▣ Velocities in transmission mains shall not exceed seven feet per second at Peak Hour Demand.
- ▣ Total head loss per 1,000 linear foot (lf) of pipeline shall not exceed 5.0 feet, except during fire flow events.

#### 5.2.2. Fire Flow Requirement Criteria

Transmission and distribution systems within Zone 50 are sized to provide adequate fire flows to all regions of the project at minimum residual pressures. Available fire flows shall meet or exceed the flows specified by the ISO and local fire department. The City provides fire protection service to Zone 50, and the City's Fire Department requires the following fire flows and durations based on land use:

SERVICE REQUIREMENTS

**Table 5-1**

**Fire Flow Requirements**

Land Use	Fire Flow <sup>2</sup> (gpm)	Duration (Hours)	Residual Pressure <sup>1</sup> (psi.)
Industrial and Manufacturing	4,000	4.0	20.0
Commercial – Office/Professional	3,500	4.0	20.0
Commercial – R&D	3,500	4.0	20.0

- 1 Residual pressures are assumed to be available during the highest fire flow at the most remote regions of the distribution system.
- 2 Fire flows higher than 4,000 gpm may be required based on construction materials, exposure type, and occupancy factor. Provisions for flows higher than 4,000 gpm are assumed to be provided by the individual developer through either an on-site fire suppression system or by storing additional water on-site at the individual development.

The City requires minimum fire flows of up to 4,000 gpm for four (4) hours for industrial and commercial type projects. If higher flows are required by the City, an on-site suppression system may be required to make up the difference. The cost for any system to provide fire flows in excess of 4,000 gpm or any other measures that need to be taken, including specialized construction, will be the responsibility of each individual property owner(s), not the responsibility of SCWA.

### 5.2.3. Reservoir Sizing Criteria

Water stored in reservoirs shall be used to meet PHD on a daily basis and to supply adequate flows for fire suppression, brief supply outages, or for other emergency needs. Ground level reservoir facilities shall be equipped with a high service booster pump station as described in further detail in Section 7.

The storage reservoir sizing criteria applicable to Zone 50 have been developed relative to service for commercial and airport related industrial type developments and are listed as follows:

- Operational - 25 percent of the MDD to meet fluctuations in demand
- Emergency - 33 percent of the ADD for emergency requirements
- Fire - Provide 4,000 gpm for a maximum duration of four (4) hours

For the operational component, the storage tanks are sized to meet the difference between the peak hour and maximum day flows in order to accommodate intra-day

## ZONE 50 WATER SUPPLY MASTER PLAN

### SERVICE REQUIREMENTS

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fluctuations in system demands, thus source and supply conveyance facilities will be sized to meet the project's MDD.

A total of 33 percent of the ADD is allocated to emergency storage and is consistent with other systems within SCWA. It is assumed that any additional emergency storage would be provided by the City in its system, since the reliability of the supply would be the responsibility of the City up to the City/SCWA flow metering facility.

Storage volume requirements for this project are calculated in **Section 6**.

## 6 Water Supply and Storage Calculations

### 6.1 INTRODUCTION

This section provides calculations for the off-site water supply system and on-site storage requirements for the project.

### 6.2 WATER PRODUCTION REQUIREMENTS

An adequate and dependable supply of water is needed to meet the demands of each growth phase of the project. Demands above supply rates will be met with water stored in storage reservoirs.

**Table 6-1** identifies the required production rates for supply facilities to meet Zone 50 build-out demands. Zone 50 will be supplied by a conjunctive use water program, with the City providing 100 percent surface water during “Normal” years. Groundwater is assumed to meet the demands not supplied by surface water and to allow for reductions in supply during “dry” and/or “critically” dry years (per USBR contract requirements). Assuming that City supplied groundwater may be used to supply from 0 to 25 percent of the project’s demands during the “dry” years, the goal of the conjunctive use program will be met.

Table 6-1			
Build-out Water Production Requirements			
Normal Years			
Surface Water Supplied (MGD)	City Groundwater Supplied (MGD)	Total Production Supplied (MGD)	Production Required to Meet Demands (MGD)
9.28 (100%) <sup>1</sup>	0.00 (0.0%)	9.28 (100%)	9.28
Dry or Critically Dry Years			
Surface Water Supplied (MGD)	City Groundwater Supplied (MGD)	Total Production Supplied (MGD)	Production Required to Meet Demands (MGD)
6.96 (75%) <sup>1</sup>	2.32 (25%)	9.28 (100.0%)	9.28

<sup>1</sup> Percentage is a ratio of supply to required production

### 6.3 OFF-SITE SUPPLY SYSTEM HYDRAULICS

According to the *Agreement*, the City will endeavor to maintain pressures above a minimum of 30 psi and below 80 psi at the POC under normal operating conditions. This will provide adequate pressures for sustained deliveries to the Zone 50 service area.

For the off-site facilities shown on **Figure 2-2** (under build-out conditions - 6,444 gpm), velocities in the 24- and 30-inch supply mains will be within the County of Sacramento's Improvement Standards specifications, with 4.57 fps and 3.66 fps respectively, and the head loss per 1,000 feet will be in the 1.54 to 2.75 feet per 1,000 feet of line range. Based on a starting pressure of 30 psi at the City's POC, hydraulic calculations reveal that pressures at the terminus of the 24-inch supply main will be adequate to fill the two reservoirs, based on a reservoir height of 30 feet and maximum flow rate of 6,444 gpm. Limited head will be available to accommodate losses through on-site control valves and piping assemblies.

### 6.4 STORAGE CALCULATIONS

Total water storage requirements for build-out are based on the sum of the required operational, emergency, and fire components. A fire storage component of 0.96 MG is needed to meet the fire flow requirements listed in **Section 5**. Build-out storage volume calculations are listed in **Table 6-2**. The minimum storage volume needed for build-out is 4.81 MG. Therefore, a total of 5.0 MG of storage shall be provided with the project, which will consist of two 2.5 MG storage tanks at the Reservoir and Pumping Facility site.

**Table 6-2**

**Buildout Water Storage Requirements**

Max. Day Demand	Operational Component	Emergency Component	Fire Component	Minimum Required Storage
(MGD)	(MG)	(MG)	(MG)	(MG)
9.279	2.32	1.53	0.96	4.81



## 6.5 PHASED STORAGE CALCULATIONS

Phased storage needs are based on the operational, emergency, and fire storage components required for each phase. The 0.96 MG fire storage component will be provided in the initial phase and maintained through buildout. Operational and emergency components will vary based on the total projected demand in each phase as shown in Table 6-3. This plan proposes a single 2.5 MG reservoir to be constructed in the initial phase, which will provide adequate storage for the project through the end of Phase 3. A second 2.5 MG reservoir is proposed to be constructed prior to Phase 4 to meet the storage needs of MAP through buildout.

**Table 6-3**

### **Phased Water Storage Requirements**

<b>Development Phase and Absorption</b>	<b>Max. Day Demands</b>	<b>Operational Component</b>	<b>Emergency Component</b>	<b>Fire Component</b>	<b>Required Storage by Phase</b>
	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)
Phase 1A - Initial	0.928	0.232	0.153	0.96	1.345
Phase 1B - 10%	0.928	0.232	0.153	0.96	1.345
Phase 1C - 15%	1.392	0.348	0.230	0.96	1.538
Phase 2 - 29%	2.691	0.673	0.444	0.96	2.077
Phase 3 - 39%	3.619	0.905	0.597	0.96	2.462
Phase 4 - 59%	5.475	1.369	0.903	0.96	3.232
Phase 5 - 79%	7.331	1.833	1.210	0.96	4.003
Phase 6 - Buildout	9.279	2.320	1.531	0.96	4.811

## 7 Water Supply Facilities

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### 7.1 INTRODUCTION

This section provides an overview of the off-site and on-site water facilities needed to serve Zone 50 for each development phase.

### 7.2 ZONE 50 OFF-SITE FACILITIES OVERVIEW/CONTROL

Water will be delivered to Zone 50 by a 30-inch transmission main connected to the City's system. This transmission main then bifurcates with a 24-inch pipeline supplying Zone 50 and a 16-inch pipeline supplying SIA. By limiting flows at each of these facilities, adequate pressures can be maintained in the City's system while meeting the flow requirements of the *Agreement*. A hydraulic schematic of the Zone 50/City system is shown on **Figure 7-1**.

Flows into the system will be regulated by combination altitude/flow control/pressure sustaining valves, which will limit flows into each of the 2.5 MG tanks at build-out in conjunction with flow control logic, which will regulate flows in the reservoir bypass line. Flows from the tank(s) will be pumped into the system by high service booster pumps. Flows in the reservoir bypass line will be pumped into the system by low head boosters.

### 7.3 BUILD-OUT AND PHASED FACILITY PLANS

The water supply, treatment, storage, and transmission and distribution facilities required to serve Zone 50 at build-out are all identified on the Phase 6 – Build-out Potable Water Facilities Plan (refer to **Figure 7-8**). Phased water facility improvements are shown on the Water Facilities Phasing Plans (see **Figures 7-3 through 7-7**). Below is a detailed description of the major components of the Water Facility Plan.



# **ZONE 50 WATER SUPPLY MASTER PLAN** **WATER SUPPLY FACILITIES**

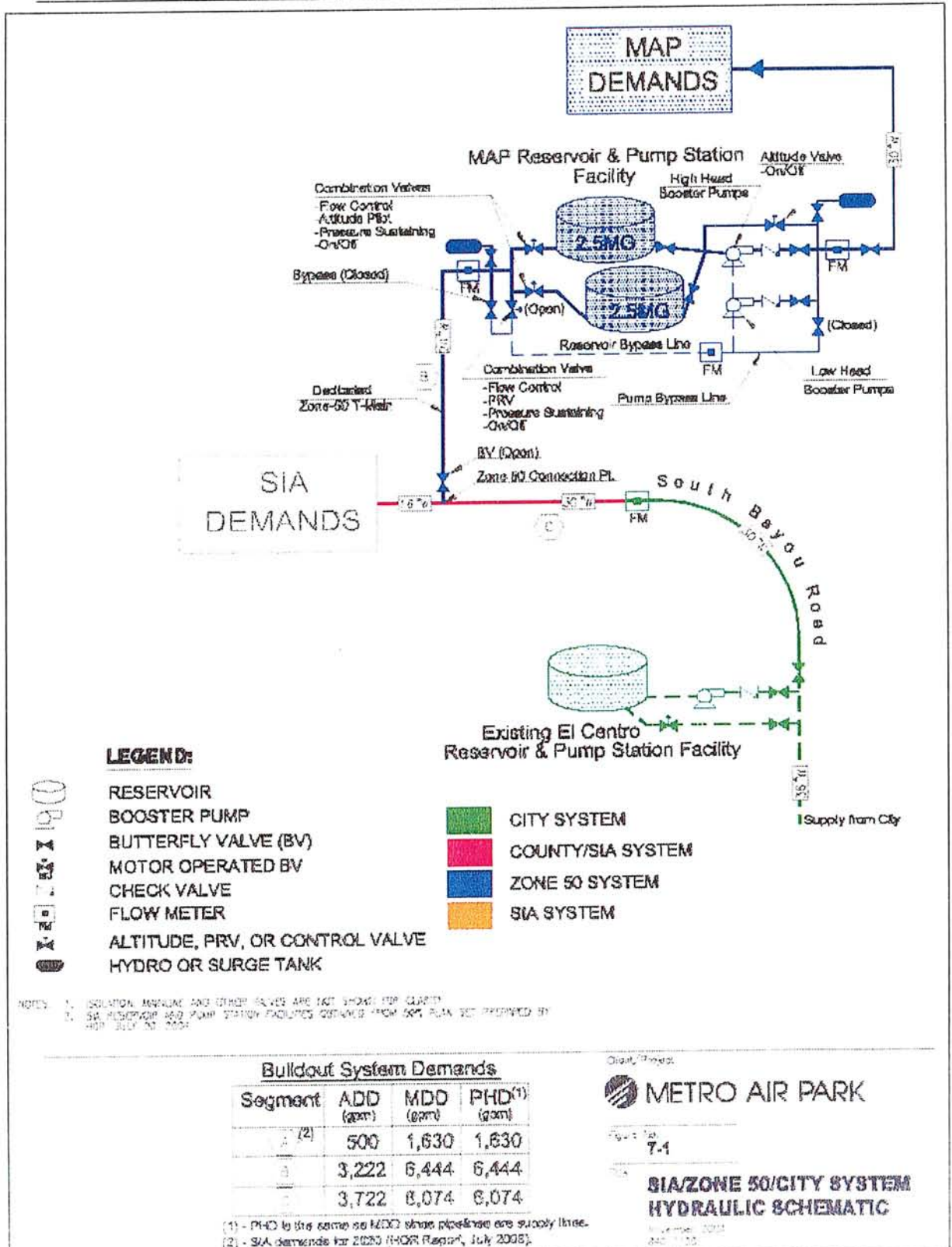


Figure 7-1 SIA/ZONE 50/CITY SYSTEM – HYDRAULIC SCHEMATIC

# ZONE 50 WATER SUPPLY MASTER PLAN

## WATER SUPPLY FACILITIES

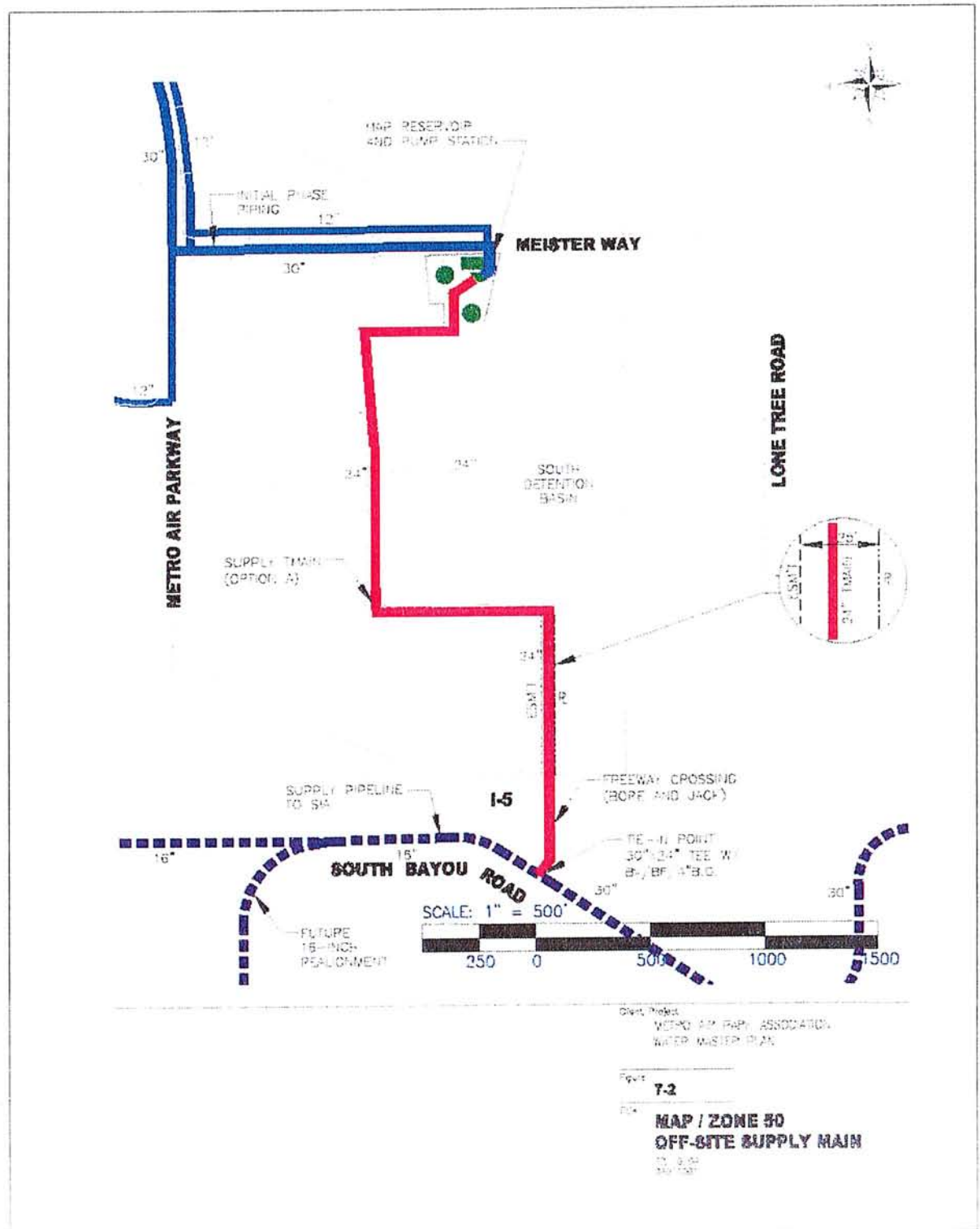


Figure 7-2 MAP/ZONE 50 OFF-SITE SUPPLY MAIN

# **ZONE 50 WATER SUPPLY MASTER PLAN** **WATER SUPPLY FACILITIES**

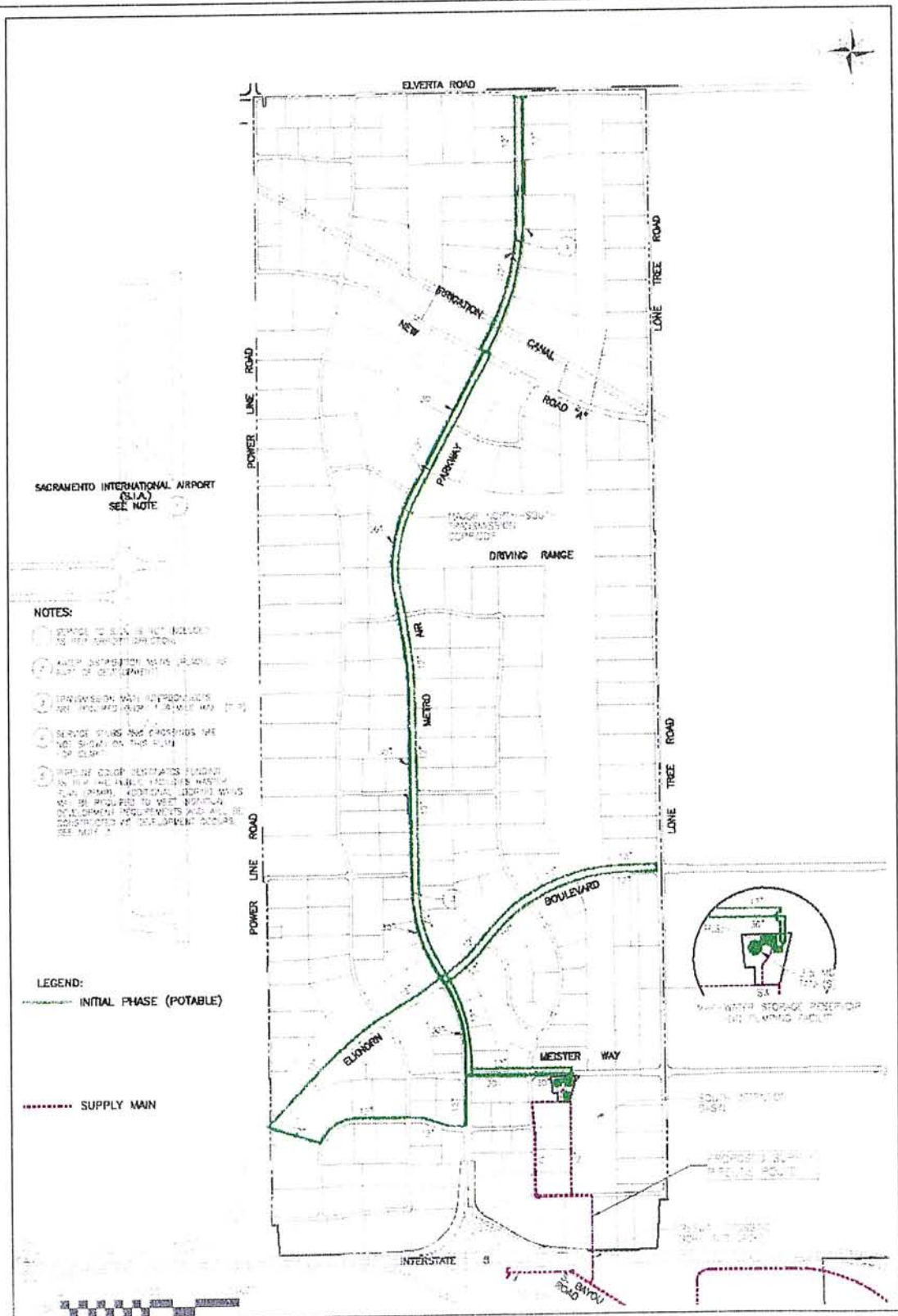


Figure 7-3 PHASE 1A – WATER FACILITIES PHASING PLAN

# ZONE 50 WATER SUPPLY MASTER PLAN

## WATER SUPPLY FACILITIES

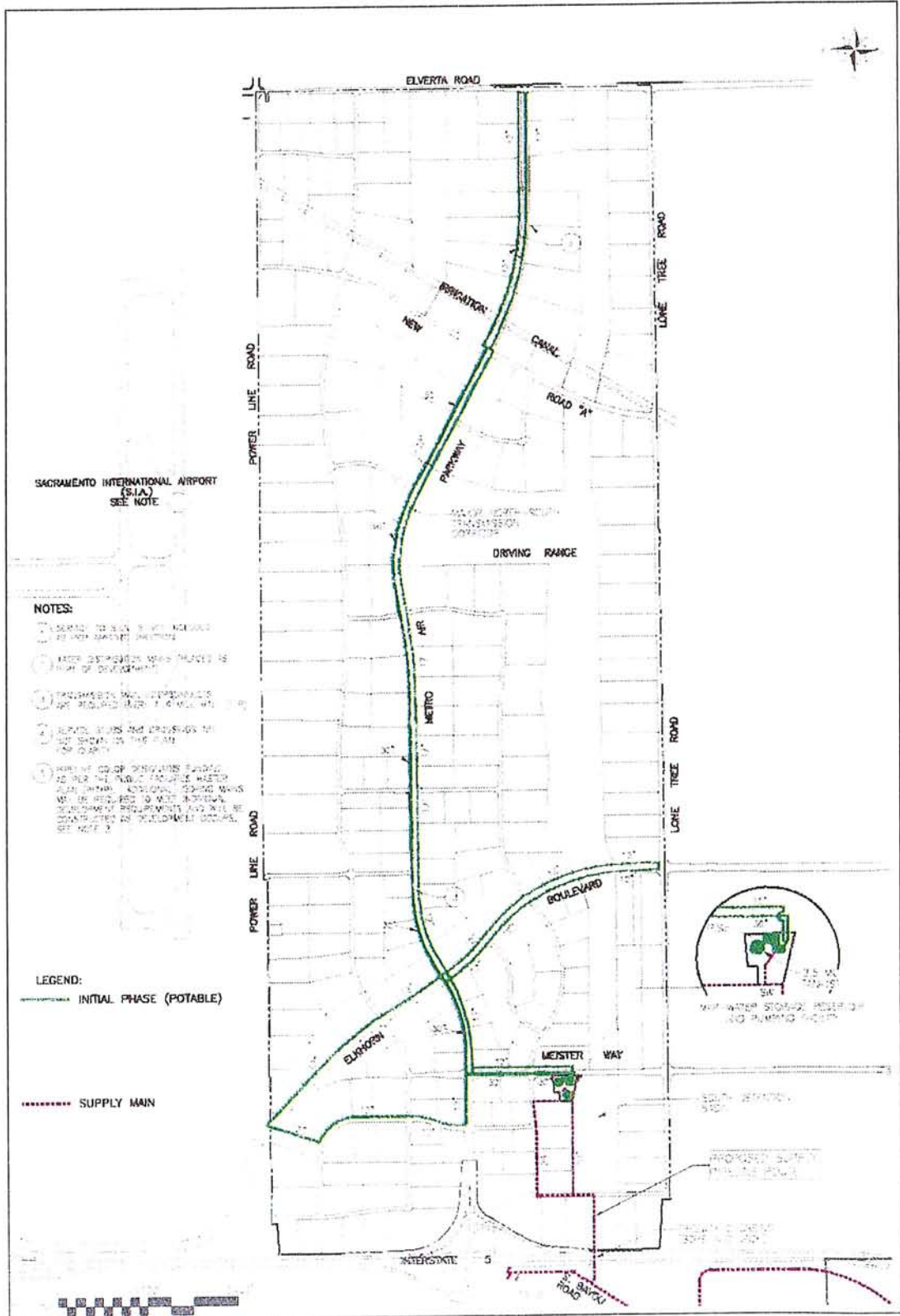


Figure 7-4 PHASE 2 – WATER FACILITIES PHASING PLAN



## ZONE 50 WATER SUPPLY MASTER PLAN

### WATER SUPPLY FACILITIES

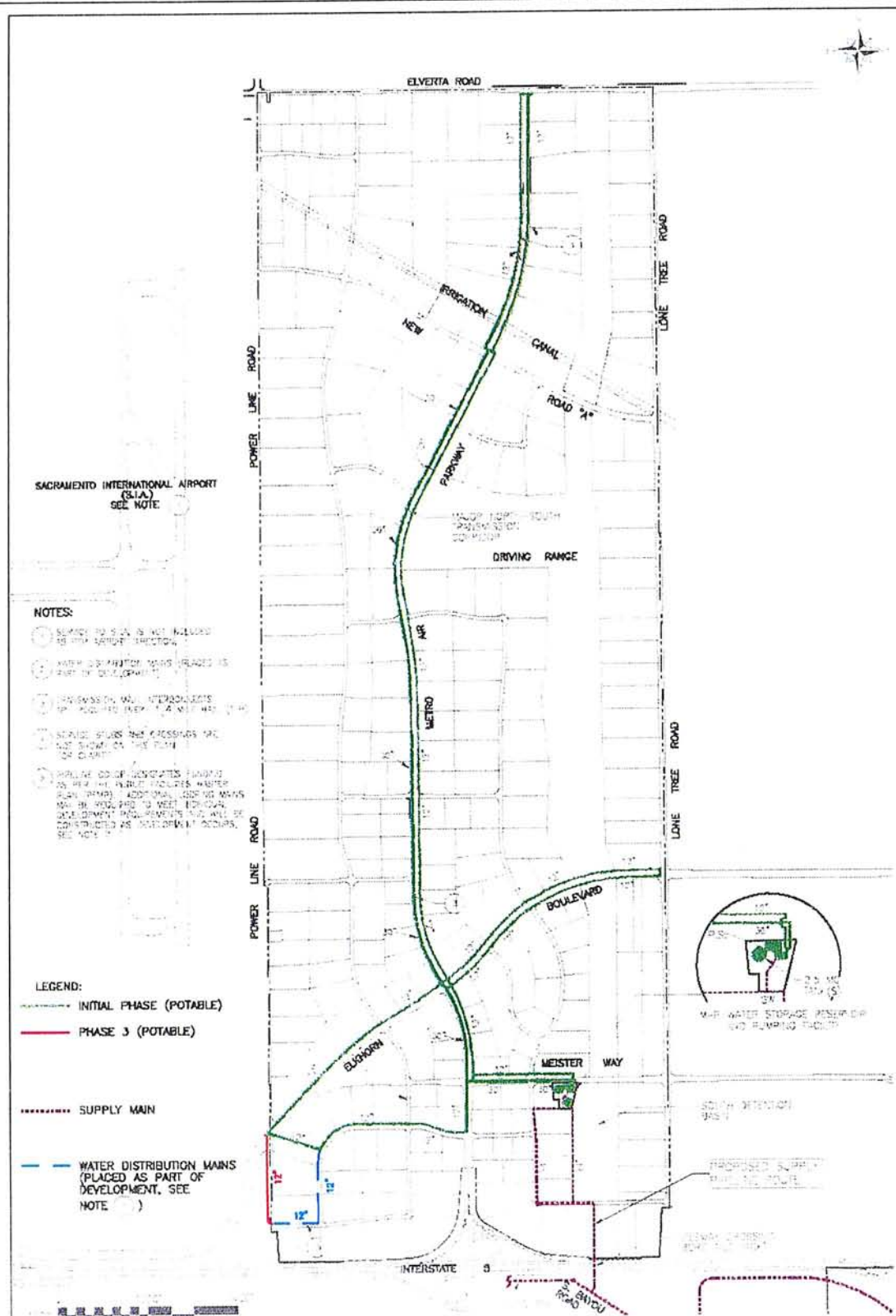
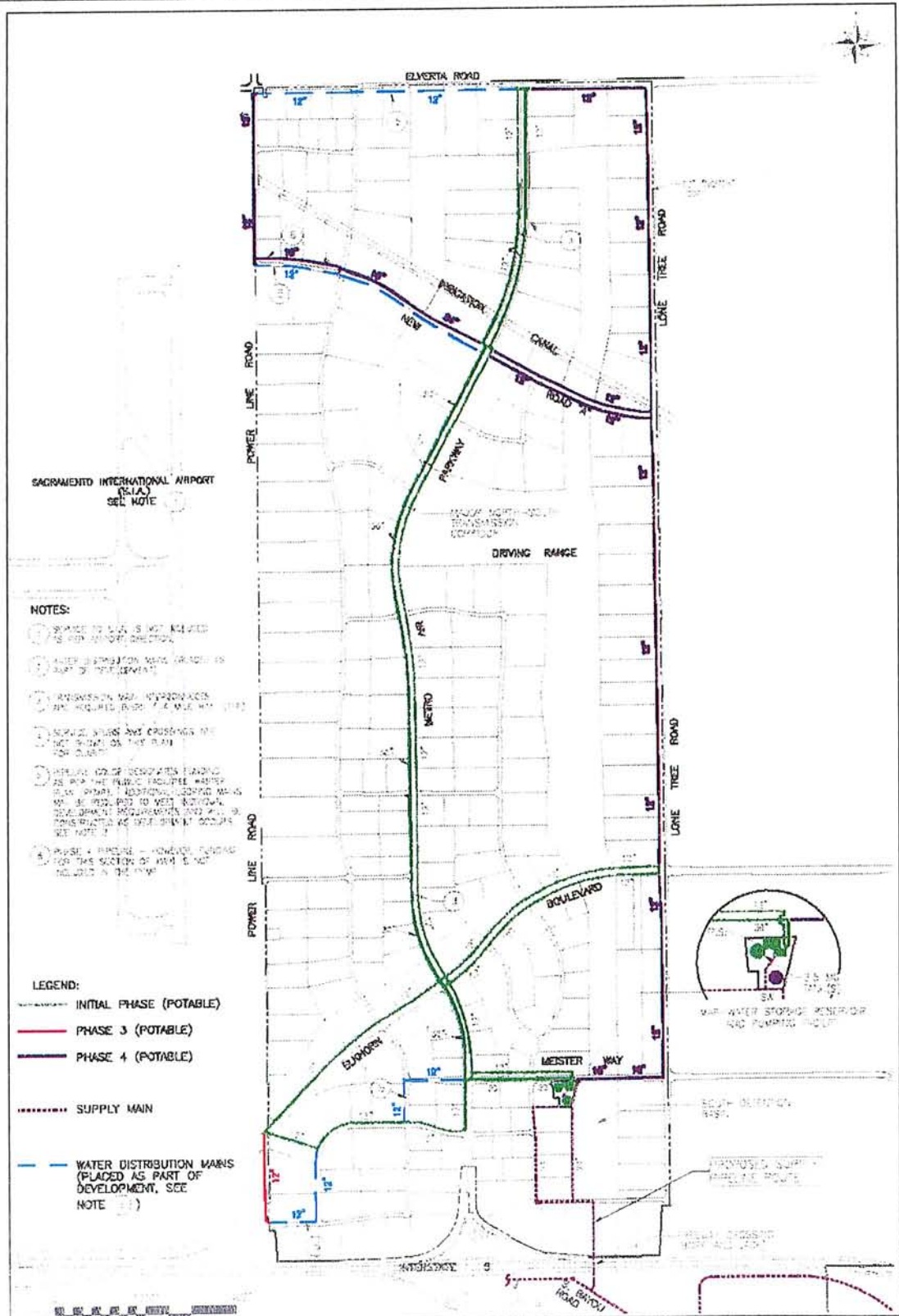
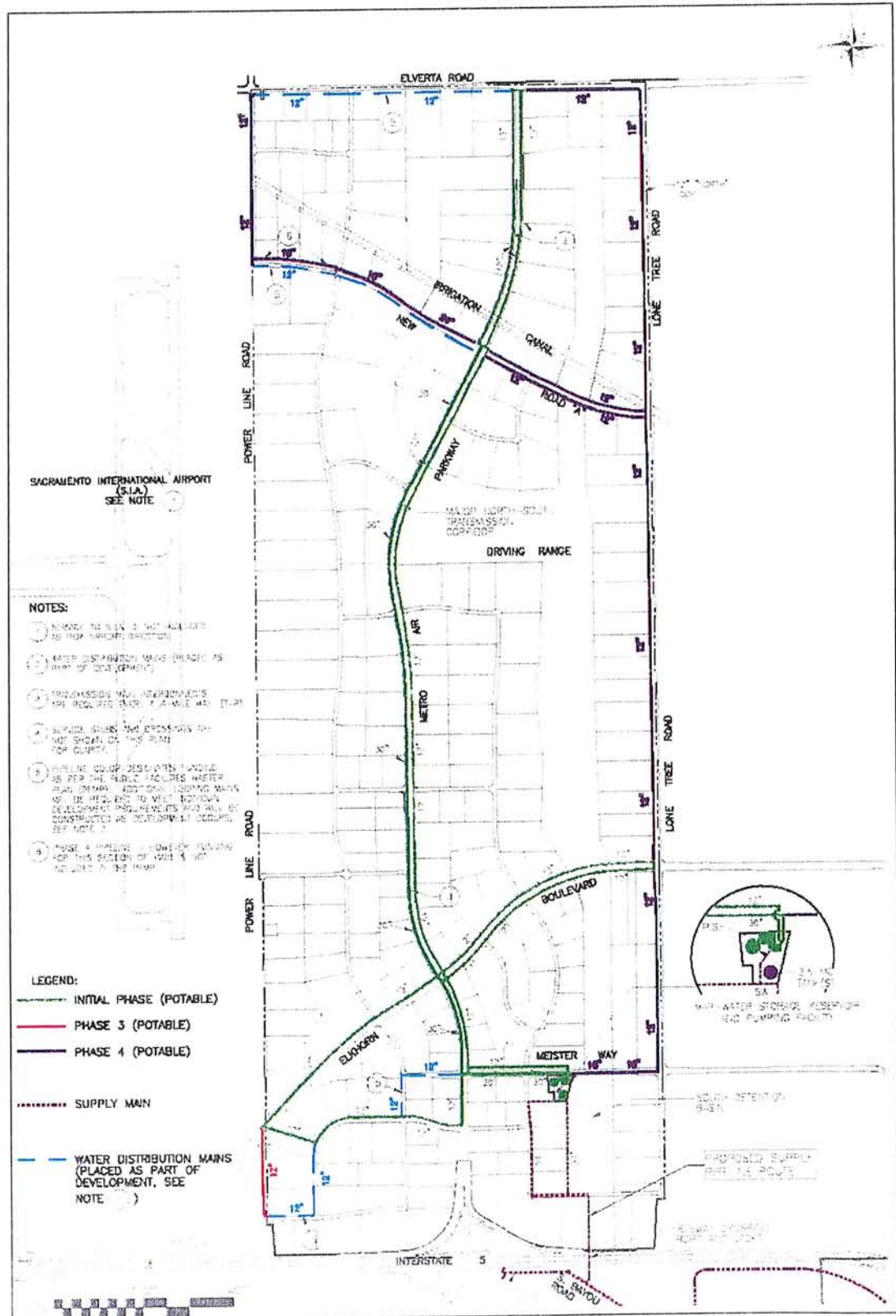


Figure 7-5 PHASE 3 – WATER FACILITIES PHASING PLAN

# **ZONE 50 WATER SUPPLY MASTER PLAN** **WATER SUPPLY FACILITIES**



# ZONE 50 WATER SUPPLY MASTER PLAN WATER SUPPLY FACILITIES





# **ZONE 50 WATER SUPPLY MASTER PLAN** **WATER SUPPLY FACILITIES**

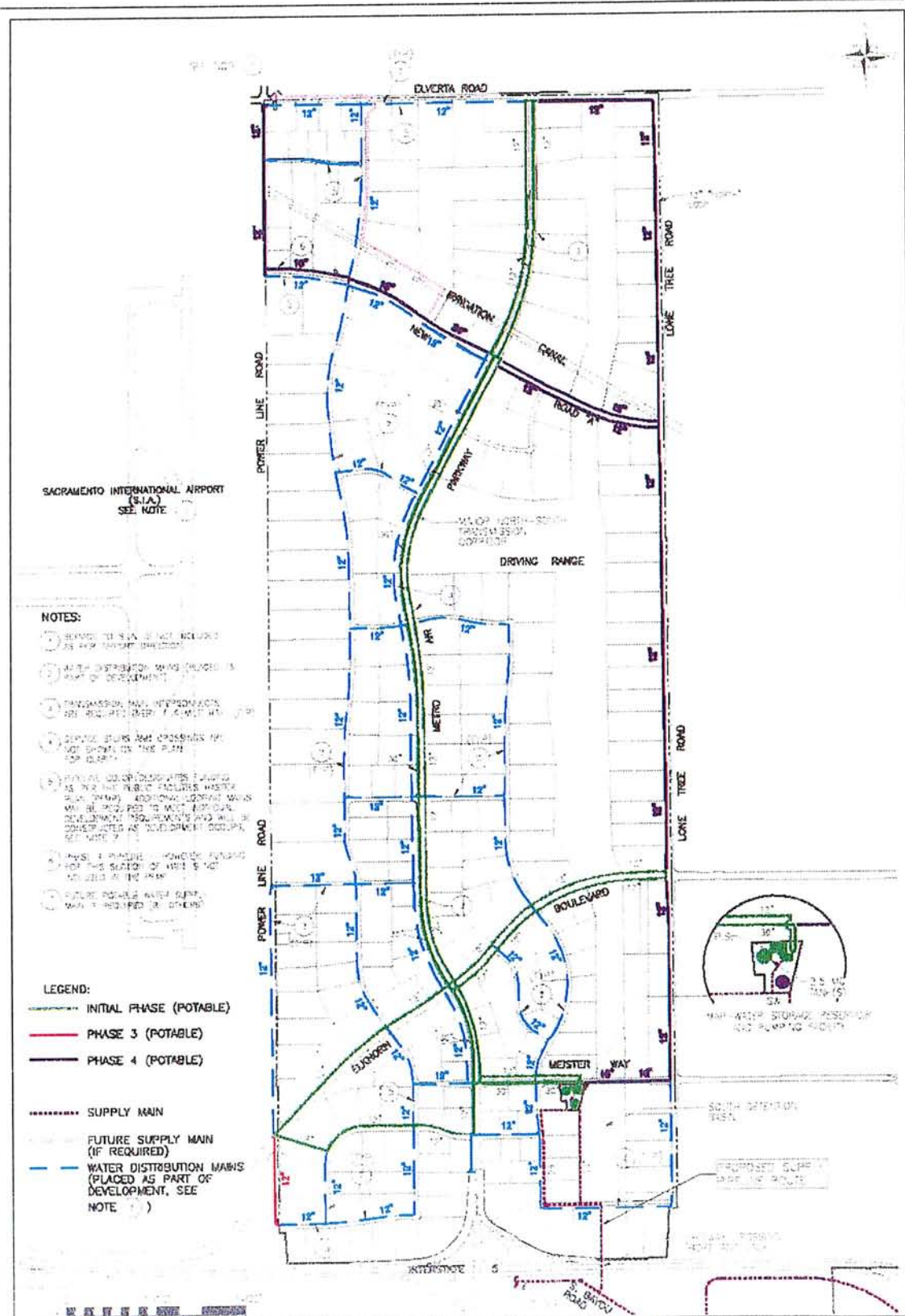


Figure 7-3 PHASE 6 - BUILDOUT WATER FACILITIES PLAN



## ZONE 50 WATER SUPPLY MASTER PLAN

### WATER SUPPLY FACILITIES

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#### 7.3.1 SIA PIPELINE/PUMP STATION PROJECT

The SIA water supply project consists of an off-site supply main, flow meter assembly, a dual reservoir and pumping facility, and a dedicated service line to connect to the SIA distribution system. The off-site T-main will extend as a 30-inch line from the City's El Centro Reservoir to the Zone 50 connection point and extend to the SIA reservoir and pump station as a 16-inch main, as shown on **Figure 7-1**

The City will operate and maintain the 30-inch pipe segment within City limits, between the El Centro Reservoir and the flow meter assembly. Zone 41 will operate the SIA system and the supply line west of the City's flow meter. Most of the pipeline is located within existing City/County rights of way in South Bayou Road with limited segments on private properties. The dedicated SIA pipeline and pumping facilities will be located on airport property, west of Power Inn Road.

#### 7.3.2 SUPPLY MAIN FROM SIA PROJECT TO THE ZONE 50 RESERVOIR AND PUMPING FACILITY PROJECT

This 24-inch supply line will connect to the 30-inch SIA pipeline in South Bayou Road east of the proposed MAP interchange, cross Interstate 5 via bore and jack, and extend to the Zone 50 Reservoir and Pumping Facility along Meister Way. This line is planned as a dedicated service line with no taps or connections.

A Caltrans Encroachment Permit will be needed to complete the bore and jack crossing of Interstate 5, and the SIA plans show the connection point with a tee, butterfly valve, and blind-flange near the Interstate 5 crossing location. Easements on MAP property will be dedicated for pipeline alignments on private properties, refer to **Exhibit 7-2** for alignment routing options.

#### 7.3.3 ZONE 50 RESERVOIR AND PUMPING FACILITY

The Zone 50 Reservoir and Pumping Facility is planned as a dual reservoir (5 MG total) and pumping facility with a high service pumping capacity of 12,900 gpm. The facility will provide on-line storage for water supplied by the City to meet the demands of the Zone 50 service area. The facility site will be located along the south side of Meister Way, between Metro Parkway and Lone Tree Road (refer to **Figure 7-2**). The minimum improvements will include two 2.5 MG reservoir(s), high and low service booster pumps, electrical, control system, and SCADA systems, on-site water, drainage, and sewer systems, a control building, hydropneumatic/surge relief vessels, backup generator, and site improvements.

## ZONE 50 WATER SUPPLY MASTER PLAN

### WATER SUPPLY FACILITIES

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High head booster pumps (12,900 gpm capacity) will pump flows into the distribution system and will be augmented by low head boosters pumping from the bypass line when the reservoirs are nearly full and adequate pressures are available in the City's system. Reservoir fill rates will be limited by combination/altitude valve(s), and flows in the bypass line may be controlled by variable speed pumps and control valves.

The initial phase facility will consist of a 2.5 MG steel reservoir, 6,600 gpm capacity high service booster pumps, and low head boosters. The second phase of Water Storage improvements (prior to Phase 4) will include the second 2.5 MG steel reservoir and expansion of the high head booster pumps to the ultimate capacity of 12,900 gpm.

Facility control will be fully automated by a programmable logic controller (PLC), and pump/valve setting points will be remotely adjustable to optimize facility performance for tank filling, pumping, and regulation of supply flows. The system will communicate with SCWA's operation center through a supervisory control and data acquisition system (SCADA). The facility control logic will need to monitor data provided by the SIA reservoir/pumping facility as well as the City flow meter assembly.

The dual tank and pump station facility will be situated on a 2.166 acre parcel, to be owned by the SCWA, upon execution of the grant deed by MAP LLC.

#### 7.3.4 TRANSMISSION AND DISTRIBUTION SYSTEM

The potable transmission system consists of 16- through 30-inch transmission mains and 12-inch distribution mains, refer to **Figure 7-8**. A 30-inch transmission main is proposed in Metro Air Parkway, and along with a 24-inch main in Road "A", which will interconnect the Zone 50 Reservoir and Pumping Facility to the distribution network. A grid of 12-inch mains will form a reliable multi-looped system. 12-inch distribution mains are to be interconnected with transmission mains at 1/4-mile intervals, minimum.

The line sizes shown on the water system plan (refer to **Figure 7-8**) will provide adequate domestic water service to future customers at suitable pressures, above the minimum criteria specified in **Section 5.0**. The system is capable of providing the minimum fire flows at or above the required residual pressures.

System phasing is shown on the Potable Water Facilities Phasing Plans, refer to **Figures 7-3 through 7-7**. The Initial Phase System (refer to **Figure 7-3**) will be capable of serving growth through Phase 2, and the system may be expanded to connect to future systems. The 12-inch loops in Lone Tree and Elverta Roads are

## ZONE 50 WATER SUPPLY MASTER PLAN

### WATER SUPPLY FACILITIES

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shown to be completed in Phase 4. Color-coding shows pipeline sequencing on **Figures 7-3 through 7-8**.

A 30-inch transmission main in Metro Air Parkway is proposed for Phase 1A and will provide a reliable backbone link between the storage facility and the distribution grid.

Twelve (12) inch distribution mains will be constructed along with individual developments to meet project requirements. It is recommended that individual on-site water systems be modeled to verify the capabilities of each system and the extent of looping needed provide adequate service to each project.

On-site water mains are proposed predominantly within roadway corridors. Easements across private properties will be dedicated for the main extensions on MAP lots as shown on **Figure 7-3 through 7-8**.

#### 7.3.5 GOLF COURSE IRRIGATION SYSTEM

The MAP golf course is assumed to be supplied by untreated surface water from NCMWC or groundwater as provided. The irrigation system serving the golf course is not part in this study; however, irrigation pipeline crossings at roadways will be included in the major roadway improvement plans.

Raw water pipeline crossings within right-of-ways will be included on the Public Facility Improvement Plans.

### 7.4 IMPLEMENTATION PLAN

As stated in the *PFMP* and shown below in **Table 7-1**, major infrastructure facilities for the project have been designed to accommodate initial phase development as well as development at the following percentages: 10, 15, 20-29, 30-39, 40-59, 60-79, and 80-buildout levels. The goal of initial phase infrastructure development is to allow a reasonable opportunity for property owners to have access to water, although additional extensions of the system may be needed to serve all of the parcels in the project area.

The initial phase of construction, Phase 1A, is comprised of projects MP-1.1, EB-1.1, WTR-4, WTR-5.2, and the off-site 24-inch transmission main project. These projects include the construction of the 30-inch transmission mains in Metro Parkway and Meister Way, 12-inch distribution mains in Metro Parkway, Elkhorn Blvd, and Road "I", the initial phase of construction for the reservoir and pumping facility, and the 24-inch transmission main connection between the Zone 50 Reservoir/Pumping Facility and the SIA supply main in South Bayou Road (see **Figure 7-2**). These facilities will

## ZONE 50 WATER SUPPLY MASTER PLAN

### WATER SUPPLY FACILITIES

serve as the backbone infrastructure for all the development that will occur within MAP.

The remainder of the backbone infrastructure, which includes additional transmission and distribution mains through out the project area, as well as a second phase to the tank and pumping facility, will be constructed based on **Table 7-1** below. In addition to *PFMP* projects listed below, additional distribution mains through the MAP project area will be developer constructed and will depend on the area and time that development occurs.

**Table 7-1**

#### **Water Development by Phase**

Phase	Development	PFMP Project	Exhibit
1A	INITIAL	MP-1.1, EB-1.1, WTR-1, WTR-4,	7-4
1B	INITIAL—10%	WTR-5.1, WTR-5.2	7-4
1C	10%—15%	---	7-4
2	16%—29%	---	7-5
3	30%—39%	PLR-1	7-6
4	40%—59%	WTR-2, WTR-3, WTR-5.1, MW-1, WTR-7, WTR-9, LTR-1, PLR-2	7-7
5	60%—79%	---	----
6	80%—Buildout	---	7-8

## 8 FINANCIAL ANALYSIS

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### 8.1 INTRODUCTION

This section provides a financial analysis of required capital costs and describes the financial program for Zone 50.

### 8.2 ZONE 50 CAPITAL COSTS

Zone 50 capital costs are broken down into two categories: Facility Capital Costs and City Water Connection Costs. Facility Capital Costs are capital costs for the on-site project infrastructure and the incremental cost of the pipeline that connects the Zone 50 water system to the City's water system. City Water Connection Costs are capital costs for the purchase of firm water capacity in the City's water treatment and conveyance system to wheel or wholesale water to Zone 50.

All Facility Capital Costs will be paid by the MAP LLC as well as the first increment of City Water Connection Costs. SCWA capital costs for Zone 50 only include City Water Connection Costs beyond the first increment of capacity.

#### 8.2.1 FACILITY CAPITAL COSTS

Facility Capital Costs encompass all costs for the Zone 50 water infrastructure within the project area and the incremental cost of the pipeline that connects the water system to the City. These costs will be paid by MAP LLC as the phases of development progress over time. MAP LLC will also pay for the first increment of City Water Connection Costs. The first one (1) MGD increment of City capacity is needed to meet demands of the first phase of development. This cost is calculated to be \$1,595,902 (see Appendix B, Exhibit F) in 2004 dollars. In 2016 this cost was updated by the City to be \$2,553,408. According to the *PFMP*, the total Facility Capital Costs (i.e. on-site facilities) in 2004 dollars for the water system is \$18,825,075 (this does not include MAP LLC's obligation to pay the incremental cost of the pipeline that connects Zone 50 to the City's water system). On-site water projects not included in the *PFMP* will be funded and installed by the individual property owners that the facilities serve (e.g., distribution mains, hydrants, and other water appurtenances required as part of the frontage improvements and on-site development of a property).

#### 8.2.2 CITY WATER CONNECTION COSTS

City Water Connection Costs consist of all costs related to the purchase of water from the City after the purchase of the initial increment of capacity by MAP LLC. SCWA Zone 50 will pay for subsequent increments of the City Water Connection Costs through the collection of development fees, credit agreements, and payment of monthly user charges. Credit agreements require that the developer provide Zone 50 with sufficient funds to pay for the needed increment of City capacity in exchange for credits against all or part of the Zone 50 development fee. The amount of any potential credit agreement is minimized in this fee

program. User charges are monthly charges that are in addition to the monthly quantity charge. The user charge is needed to pay long term capital costs that may go beyond build-out of the development. This may occur if the City authorizes a long term payment provision for the City Water Connection Costs.

Table 8-1 below contains the difference in City Water Connection Costs or connection fee by phase, based on a cost of \$1,595,902 per MGD (2004 dollars) and actual cost of \$2,553,408 per MGD (2016 dollars) . Connection fees shall be paid in one (1) MGD increments, or pro-rata portions thereof, up to the maximum capacity specified in the Agreement, and the connection fee shall become due on the date that Zone 50 first requests wholesale water service from the City for any one (1) MGD increment, or portion thereof. The connection fee shall be paid in accordance with the Agreement. The total City Water Connection Costs paid through implementation of the Zone 50 development fee program in 2004 dollars was \$14,809,971. Updating the cost component based upon 2016 dollars provides a total cost liability of \$23,721,160.

**Table 8-1 Estimated City Water Connection Cost difference calculation by Phase<sup>1</sup>**

Development Phase	Maximum Absorption	Incremental Absorption	Total Supply Require (MGD)	Incremental Capacity Purchase from City (MGD)	Unit Cost Per MGD Based Year 2004 <sup>2</sup>	Unit Cost Per MGD Based Year 2016 <sup>3</sup>
<b>Phase 1A</b>	Initial	4%	0.93	1.00	\$1,595,902	\$2,553,408
<b>Phase 1B</b>	10%	6%	0.93		\$0	\$0
<b>Phase 1C</b>	15%	5%	1.39	0.39	\$622,402	\$995,829
<b>Phase 2</b>	29%	14%	2.69	1.30	\$2,074,673	\$3,319,430
<b>Phase 3</b>	39%	10%	3.62	0.93	\$1,484,189	\$2,374,669
<b>Phase 4</b>	59%	20%	5.47	1.86	\$2,968,378	\$4,749,339
<b>Phase 5</b>	79%	20%	7.33	1.86	\$2,968,378	\$4,749,339
<b>Phase 6</b>	100%	21%	9.28	1.95	\$3,112,009	\$4,979,146
<b>Total</b>		<b>100%</b>		<b>9.28</b>	<b>\$14,825,930</b>	<b>\$23,721,160</b>

## 8.3 ZONE 50 FINANCIAL PROGRAM

Both MAP LLC and SCWA have prepared comprehensive financial programs that will cover their respective costs of the Zone 50 water infrastructure. Each plan is summarized below.

<sup>1</sup> Listed absorption is based on maximum projected absorption for the phase.

<sup>2</sup> Cost as calculated in Exhibit F of October 12th 2004 Agreement

<sup>3</sup> Data from Bret Ewart with City of Sacramento, email May 25, 2016

### **8.3.1 MAP LLC FINANCING OF DEVELOPMENT COSTS**

To cover infrastructure costs, MAP LLC has or will secure financing through at least three Mello-Roos District bonds issued through the County of Sacramento with the assistance of the County's Infrastructure and Finance Section. Repayment of the bonds will be accomplished by incorporating the bond expense into a special assessment against the properties within the Mello-Roos District. This cost can be passed on to future lease holders and property owners. The first bond was issued in Fall 2004 and the second bond was issued in December 2007. Subsequent releases have yet to be scheduled, but will be used to finance future phases of MAP. For further information concerning MAP bonds, please refer to the most current MAP *PFMP*.

### **8.3.2 FINANCING OF ZONE 50 DEVELOPMENT FEES**

Zone 50's revenue source to pay for future increments of the City Water Connection Cost is through a development fee containing an acreage component and an equivalent dwelling unit (EDU) component. The development fee is a one-time charge levied against new development, authorized through SCWA Code Title 4 – Schedule A, Appendix No. 1 – Water Development Fees.

Any development fee has to provide a clear nexus of benefit to the property paying the fee. In this case, the development fee purchases dedicated water supply capacity for Zone 50 within the City's water system. The benefit of this capacity goes to all property owners in the project to meet both their maximum day water demands and fire flow requirements. In this case, the fee is not paying for on-site facilities to deliver an instantaneous flow rate to each property, but rather, a set amount of water to be delivered to a storage reservoir that infrastructure paid through the MAP LLC will deliver to the project developments. Spreading the total cost of this capacity to each of the property owners should be done equitably.

The fire protection component is spread equally among all property owners through an acreage assessment. The first one (1) MGD increment of City Connection Costs is funded through a Mello-Roos District and as such is spread over the entire project and can be assumed to be a component of the fire protection requirement that is needed for all properties in MAP. The water demand component is where the property's proposed development is assessed an EDU component to account for the differing water demands between various land uses. EDU development fees are calculated from the size of each customer's water meter using SCWA Code Title 4 – Schedule A, Appendix No. 1 – Water Development Fees as a reference.

### **8.3.3 DETERMINATION OF ZONE 50 DEVELOPMENT FEE**

With an acreage component, an EDU component and a user charge, a development fee has to be structured so that it provides equity among all property owners. To accomplish this, a financial model was developed in accordance with the Connection Fee section of the Agreement to evaluate the range of fees necessary to maintain a "pay-as-you-go" system where monies collected from a previous development pays for the next increment of City Water Connections Costs. It is important to note that while one phase may be paying for the next



properties, all properties share in the cost of the first increment of capacity and that all properties eventually pay their fair share of the total cost to serve the project at build-out.

Per SCWA Code Title 4 – Schedule A, Appendix No. 1 – Water Development Fees. The development fee can also be increased in response to new programs or design standards that increase the total capital cost of system facilities and through needed adjustments in the fee program as a result of changed conditions in the assumptions used to set up the program. The user charge can also be inflated if deemed necessary to pay for increments of the City Water Connection Costs.

Development fees are based on EDU's and acreage of developed land area. All developers pay a portion of the development fee when improvement plans are submitted to pay for review and administrative processing costs. The remaining portion of the fee is paid at the time a water connection and building permit are issued.

As described above, the Zone 50 fee program funds a Capital Improvement Program (CIP) that only includes the purchase of water and treatment plant capacity from the City to serve the project through build-out. The development fee will be incorporated into SCWA's Code Title 4 – Schedule A, Appendix No. 1 – Water Development Fees. The supporting calculation for the fee includes the following assumptions:

1. Fire flow water is assumed to be the rate of inflow of City water needed to fill the on-site storage reservoirs at build-out levels of water demand. This implies that a percentage of the water received through City facilities will go toward maintaining tank levels sufficient to provide required fire flow volumes. The calculation of fire storage is 4 hours of flow at 4500 gpm or approximately equivalent to 1 million gallons of storage capacity. The amount of water that can be delivered at build-out in a 4 hour period based on 9.28 MGD is approximately 3 MG.
2. Administration cost is held at 5%.
3. Fee structure to be updated every year based upon the City Water Connection Cost for that year. The City Water Connection Cost to be provided by the City as part of the October 12, 2004 agreement between City of Sacramento, County of Sacramento and Sacramento County Water Agency.
4. Incremental capacity to be purchased as funds become available and not necessarily in increments of 1MGD.
5. These alternatives assume capacity is purchased as fees are collected so there is no inflation, interest payment, or earned interest. The incremental capacity is purchased as soon as development pays the Commercial Service Fee to minimize issues with City Water Connection Cost fluctuations.
6. The alternatives have the user fee as part of the calculation. Table 8-3 calculates that the user fee will collect \$9.5M. This method of calculation is used because the user fee

collection is tied to the amount of water being used by the development. It is anticipated that most development will be commercial in nature and will be billed on 33% of metered use.

7. It is anticipated that within the 15 year buildout, SCWA will be updating the Zone 50 Master Plan at least 3 times at a cost of \$300,000 per iteration. This cost will be funded by the Zone 50 developments and collected as part of the development fee.
8. A one (1) EDU equivalent is assigned to each acre of land for purposes of irrigation. Typically a property will have two meters, one for indoor uses and the other for outdoor irrigation uses.

### 8.3.4 EDU EQUIVALENTS AND ACREAGE

Acreage and EDU equivalents were assumed for each land use category as follows:

**Table 8-2 - EDU Equivalents and Acreage for Each Land Use Category**

Item	Land Use	Average Demand Factors (gpd/ac)	Equivalent Dwelling Units (EDUs/acre)	Acres
1	Light Manufacturing and Distribution (LMD)	3,400	9	612
2	Airport Related Industrial (A1)	2,895	4	280
3	Commercial-High-Tech R&D Offices (CHT)	2,895	9	168
4	Commercial-Professional Offices-Corporate Headquarters (CPC)	2,680	9	96
5	Commercial-Offices Retail/Services, Hotels, Automotive & Related( C)	2,680	9	359
6	Major Roadways	166	1	81
7	Golf Course Club House	2,680	2	5
8	Freeway Interchange	166	2	11
9	Light Rail	2,680	1	6
	<b>Totals</b>			<b>1,618</b>

### 8.3.5 SPECIAL CAPITAL DEVELOPMENT FEE (USER FEE)

A special Capital Development Fee (User fee) is required by Section 3.50.130 of SCWA Code Title 3, which collects “33% of the General Metered Service for commercial/industrial monthly rate, but not less than \$28.80”. The Zone 50 Master Plan states that the user fee initially charged to finance City Connection Costs will likely be converted to an O&M component for replacement and rehabilitation costs over time.

The user fee collection is indefinite in nature and places some of the burden for capital investment in the water supply system on the end users rather than all of the investment being placed on the

initial developer. This fee provides SCWA the ability to purchase incremental capacity independent of development fee collection.

Results from the 2005 Zone 50 Master Plan Financial Model (Table 4.1 - Cash Flow Results of Financial Model Zone 50 MP) indicate that a total of 36% of the Capital Cost is to be paid through user fee revenue generation throughout the buildout (15 years).

Metro Air Park is an industrial/commercial development. These projects pose uncertainty about their water demand as the water use characteristics of future projects is un-known. Table 8-3 is used to quantify the user fee/acre based upon the total capacity required for Zone 50 using demand information from the Zone 50 Master Plan as follows:

**Table 8-3 User Fee Calculations**

User Fee Calculation	
Metro Air Park MDD - MGD <sup>4</sup>	9.28
Metro Air Park Acreage - Acres <sup>5</sup> (a)	1,618
Amount of water use - in gallons per month <sup>6</sup>	282,266,667
Amount of water used - in CCF <sup>7</sup> (b)	377,362
Rate per CCF <sup>8</sup> (c )	\$1.03659
Total Water use Bill (d = b*c)	\$391,170
33% User Fee <sup>9</sup> (e = 33% of d)	\$129,086
User Fee/acre (e/a)	\$79.78

Zone 50 Master Plan anticipates a complete buildout of Metro Air Park in 15 years implying that all the incremental capacity would be required to be purchased within this time frame. Our projections begin in the year 2017 as this is the year the first development will come on line. It is anticipated that the user fee is initially used for procurement of incremental capacity and will later be converted to an O&M component for replacement and rehabilitation costs over time per the Zone 50 Master Plan. Table 8.4 calculated that approximately \$9.5M will be collected as user fee in 15 years following the Zone 50 Master Plan adopted phasing and buildout criteria.

Calculated this way, the user fee share is approximately 44% of the total City Water Connection Cost based on today's incremental cost from the City. This is a higher percentage than was originally envisioned in the Zone 50 Master Plan.

<sup>4</sup> Zone 50 Master Plan - Table 8-1

<sup>5</sup> Zone 50 Master Plan - Table 8-2

<sup>6</sup> Calculated from 9.28MGD demand

<sup>7</sup> Calculated from row above

<sup>8</sup> 2016 SCWA water charge

<sup>9</sup> SCWA Fee & Credit Revision Effective March 1, 2016

**Table 8.4 Projected User Fee Revenue Collections Each Phase**

Development Phase <sup>10</sup>	Acreage <sup>11</sup>	Cumulative Acreage (f)	User fee/Acre <sup>12</sup> (g)	Billing Period (h)	User Fee (f*g*h)
Phase 1A	68	68	\$79.78	6	\$32,679
Phase 1B	46	114	\$79.78	12	\$109,359
Phase 1B	46	160	\$79.78	12	\$153,359
Phase 1C	40	201	\$79.78	12	\$192,085
Phase 1C	40	241	\$79.78	12	\$230,810
Phase 2	113	354	\$79.78	12	\$339,241
Phase 2	113	468	\$79.78	12	\$447,671
Phase 3	80	548	\$79.78	12	\$524,346
Phase 3	80	628	\$79.78	12	\$601,021
Phase 4	163	790	\$79.78	12	\$756,697
Phase 4	163	953	\$79.78	12	\$912,374
Phase 5	163	1,116	\$79.78	12	\$1,068,050
Phase 5	163	1,278	\$79.78	12	\$1,223,726
Phase 6	170	1,448	\$79.78	12	\$1,386,372
Phase 6	170	1,618	\$79.78	12	\$1,549,018
	<b>1,618</b>		(Rounded to )		<b>\$9,526,000</b>

### 8.3.6 COMBINED ACREAGE/FLOW BASED FEE STRUCTURE

This fee structure combines the Acreage fee, EDU fee, and User fee to pay for the incremental City connection cost through buildout. This alternative provides a foreseeable fee collection assessment based on acreage and also allows for lower fees for low water use developments based on EDUs calculated on water connection size for each development. So, developments will pay for capacity used for the entirety of Zone 50 area and for the incremental portion based upon their meter sizing.

This fee calculation relies on the user fee component of \$9.5M, which is anticipated to fund 44% of the remaining 8.34MGD capacity required, providing 3.73MGD in incremental capacity. The acreage fee and EDU fee will pay for the remainder of the required capacity at 44% and 22% respectively as initially projected in the 2005 Zone 50 Master Plan Financial Model.

The first increment of water supply was purchased by SCWA through the monies paid by MAP developers and it was planned to be credited to all the future developments equitably. This

<sup>10</sup> 2005 Zone 50 Master Plan – Table 8-4

<sup>11</sup> Incremental absorption calculated from Zone 50 Master Plan – Table 8-1

<sup>12</sup> From Table 1.3

alternative is proposing that the fee should be calculated after deducting the first incremental capacity cost, which effectively credits all the development equitably. There is also a deduction from the capacity to be purchased (based on development fees that have been collected) at the current City Water Connection Cost. This deduction is called “additional capacity purchased.” SCWA purchased this capacity in late 2016.

Total Capacity = 9.28MGD

First Incremental Capacity = 0.84MGD

Additional capacity purchased =  $\$2,553,408 / \$262,704 = 0.10\text{MGD}$

Balance capacity required =  $9.28\text{MGD} - 0.84\text{MGD} - 0.10\text{MGD} = 8.34\text{MGD}$

User Fee -  $\$9,526,000 / \$2,553,408 \text{ per MGD} = 3.73\text{MGD}$

Capacity to be purchased through acreage and EDU fee =  $8.34 - 3.73 = 4.61\text{MGD}$

MGD/Acre =  $4.61 * 61\% = 2.81\text{MGD} / 1,550 \text{ acres} = 0.00181\text{MGD/acre}$

MGD/EDU =  $4.61 * 39\% = 1.80\text{MGD} / 13,934\text{EDU} = 0.00013\text{MGD/EDU}$

Zone 50 Master Plan update expense =  $\$300,000 * 3 = \$900,000$

Zone 50 Master Plan update/Acre =  $\$900,000 * 61\% = \$549,000 / 1,550 = \$354/\text{acre}$

Zone 50 Master Plan update/EDU =  $\$900,000 * 39\% = \$351,000 / 13,934 = \$25/\text{EDU}$

Acreage fee = City Fee (\$/MGD) \*  $0.00181\text{MGD/acre} + \$354/\text{acre}$

EDU fee = City Fee (\$/MGD) \*  $0.00013\text{MGD/EDU} + \$25/\text{EDU}$

The annual updated rate of City incremental capacity cost will be used to update the acreage fee and EDU fee as suggested above.

This implies that the total money collected through the fee program pays for the facilities and administration to run the program, and that no additional funds are collected beyond those necessary to fund program costs. Inherent in any financial program are assumptions that may change as development progresses. The Zone 50 Financial Model should be evaluated every year to verify that the assumptions are still valid and, if not, to make any corrections in the fee structure. .

### **8.3.7 MAP OPERATIONS & MAINTENANCE (O&M) COSTS**

O&M performed for the Zone 50 storage, booster pump, water distribution system, and related appurtenances will be the responsibility of SCWA Zone 41 and financed partially through the

Services Special Tax Requirement that is expected to terminate in approximately five years after the formation of CFD No. 2000-1 (for further information on the Special Tax Requirement, please refer to the latest *PFMP*). This tax will be assessed along with a monthly service charge based on the amount of water used by each property based on metered water quantity usage amounts. The user fee initially charged to finance City Connection Costs will likely be converted to an O&M component for replacement and rehabilitation costs over time.

## APPENDIX A

### HYDRAULIC MODEL SIMULATIONS - APPENDIX I

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**Stantec**

## **METRO AIR PARK - WATER SYSTEM**

### **APPENDIX I - HYDRAULIC MODEL SIMULATIONS**

### **FINAL REPORT**

Prepared for:

Metro Air Park Association

Prepared by:

Stantec Consulting Inc.  
2590 Venture Oaks Way  
Sacramento, CA 95833  
(916) 569-2500



March 16, 2004  
84071001

**METRO AIR PARK – WATER SYSTEM  
APPENDIX I - HYDRAULIC MODEL SIMULATIONS**

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APPENDIX C	PHASED SYSTEM MODEL RESULTS System Maps and Printouts
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## 1.0 BACKGROUND

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### Purpose

The purpose of this study is to perform comprehensive hydraulic modeling of the proposed Metro Air Park (MAP) water system and model updated surface water and groundwater supply alternatives. This study also evaluated the impacts of interchanging the locations of the proposed MAP groundwater treatment plant and the storage and booster pump station on the proposed water transmission and distribution system.

### Background

The MAP water system is intended to be a stand-alone system and will provide high quality and reliable service to future MAP customers. The system is also designed to be expandable as the neighboring region develops.

The *Metro Air Park (MAP) Water Facilities Study (Water Facilities Study)*, Spink, August 30, 1999, contained a comprehensive plan for the development of new potable and raw water systems to serve the MAP, which included water supply, treatment, storage, pumping, and distribution facilities. This report modifies the proposed water system facilities as identified in earlier reports and provides the supporting hydraulic model assumptions, scenarios, and results for the updated water distribution system analysis.

Due to the more favorable water quality and yield conditions in the northern region, the MAP groundwater treatment plant is planned to be located on the north side of the project along Road “A”. In order to support this change, a new well field has been identified in the northern region of the site, and hydraulic modeling has been performed to evaluate the hydraulic impacts on the system.

Groundwater conditions on the site were reviewed in a report entitled *Hydrogeologic Review and Water Supply Well Installation Recommendations for the Metro Air Park (MAP) (Hydrogeologic Review)*, Stantec Consulting Inc., dated July 10, 2003. This study evaluated data from four exploratory borings, which were drilled on the site to depths between 600 and 1,200 feet. Based on the review of geologic data from the test wells, it was determined that well yields in the northern region could be significantly higher than in the southern region of the site.

## METRO AIR PARK – WATER SYSTEM

### APPENDIX I - HYDRAULIC MODEL SIMULATIONS

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Based on water quality testing of source water from the test wells, levels of Arsenic are also lower in the northern region of the site. With the recently promulgated Arsenic Rule, which goes into effect in 2006, the Federal Maximum Contaminant level (MCL) for Arsenic will be reduced from 50 to 10 ug/l with a potential California Action Level in the 5 to 8 ug/l range.

If the MAP tank and pump station is located in the southern region of the site, it will allow for some flexibility concerning the implementation of a future surface water supply alternative. Treated surface water could be stored at the site and/or a booster pump component could be added to the facility design for boosting treated surface water into the system.

Therefore, due to the benefits of the revised system configuration and the potential for higher well yields and enhanced water quality, interchanging the MAP groundwater treatment plant and well field with the storage reservoir and pumping facility is warranted.

The MAP potable water distribution system consists of transmission and distribution mains and facilities. The transmission mains (Tmains) interconnect the groundwater treatment plant with the storage reservoir and booster station and provide for the conveyance of a future surface water component. Twelve (12)-inch distribution mains are proposed parallel to the transmission mains and in a grid layout to serve individual developments and to equalize pressure fluctuations in the system. Due to the central Tmain concept, interchanging the locations of the treatment plant and the storage reservoir and booster station is possible with minor modifications to the original plan.

The MAP system is envisioned to be constructed in phases, and the phased potable and raw water systems are shown on the enclosed Figures W1A through W6. Each phase is envisioned to provide customers with reliable service through the looping of mains. Looping mains will provide system redundancy by accommodating a short term shut-down of a transmission or distribution main.

The MAP water supply plan, land uses, phasing scenarios, and demand projections have not been modified in this study and will remain as described in previous MAP studies. The proposed modifications to the MAP water system are specifically addressed in this document.

## 2.0 Assumptions and Model Development

---

### Assumptions and Criteria

The water supply assumptions and facility sizing criteria that were used in this study generally are listed below:

- ❑ Minimum system pressures during maximum daily demand conditions are to be equal or greater than 40 psi.
- ❑ The required fire flow is to be provided under the maximum day demand scenario at a minimum residual pressure of 20 psi at the most remote hydrant in the system.
- ❑ Starting pressure at the pumps is limited to 50 psi.
- ❑ The maximum system pressure shall be limited to 90 psi.
- ❑ Velocities in transmission mains shall not exceed the limitations as established by the Sacramento County Water Agency (SCWA) for new growth areas.
- ❑ Total head loss per 1,000 lf of pipeline shall not exceed 5.0 feet, except during fire flow events.
- ❑ To maintain system redundancy, water main extensions shall be looped.

### Model Development

The MAP network water distribution model was updated in this study to conform to minor shifts in roadway and lot layouts. All MAP network simulations were re-run to evaluate the updated system. The modifications to the MAP models are listed below:

- ❑ The Software and MAP network model was upgrade from *WaterCAD, Version 3.0* to *Version 6.0*.
- ❑ Water mains were adjusted to reflect the latest roadway alignments and pipe lengths were recomputed.
- ❑ Hazen Williams “C” values were modified to 125 to reflect the latest County Improvement Standards, 1999 Edition.
- ❑ Ground elevations were updated to reflect the *Metro Air Park Grading Study*, Morton & Pitalo, November, 2001.
- ❑ Interim system demands were re-allocated as per the node demand distribution spreadsheets included in Appendix A.
- ❑ The locations of the groundwater treatment plant and storage and pumping facility were interchanged as described in this report.

### 3.0 Supply Assumptions, Demand Projections, and Fire Flow Requirements

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#### Supply Assumptions

The MAP water system is designed for a combination of groundwater and/or groundwater and surface water supply alternatives. It is assumed that groundwater will be used to serve initial development phases until a conjunctive use plan can be implemented. The MAP water system is also sized for short-term emergency service in the event of a short-term shut down of a facility or main.

The water supply alternatives assumed in the approved *Metro Air Park Public Facilities Master Plan (PFMP), Final Report*, Stantec Consulting, adopted by the County of Sacramento Board of Supervisors, September 26, 2000, indicates that the network shall be sized for 100% groundwater supply or the conjunctive supply of 50% groundwater and 50% surface water, when treated surface water becomes available.

The water supply assumptions in this study are similar to those in the *PFMP*, except that the transmission mains were upsized to accommodate the potential 100% surface water supply from the south alternative. This assumption will provide a flexible transmission system, which can accommodate any of the water supply alternatives listed below:

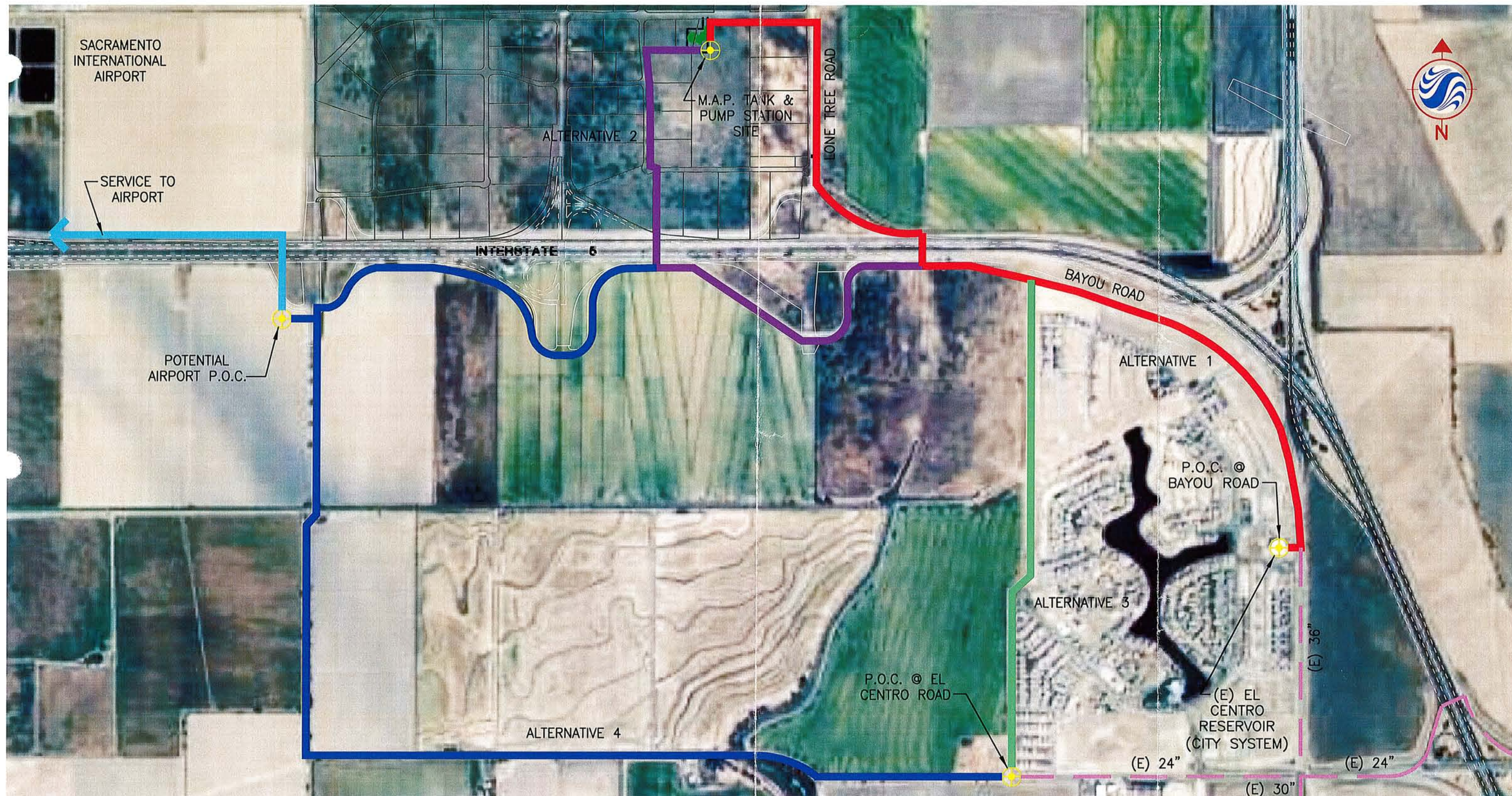
1. 100% surface water supply from the south
2. 50% surface water supply from the south / 50% surface water supply from the north
3. Conjunctive supply of 50% surface water supply from the south / 50% groundwater supply
4. 100% groundwater supply

It is anticipated that the preferred conjunctive supply plan for the MAP would be part of a regional solution, whereby the project would pay its “fair share” cost component for a region-wide surface water treatment plant.

#### Surface Water Supply Alternative Modeling

An alternative to supply the project with surface water from the south was identified in the *1999 Water Facilities Study*. This alternative consists of using Natomas Central Mutual Water District's (NCMWD) water rights and entitlements for diversions from





- Legend**
- Alternative 1
  - Alternative 2
  - Alternative 3
  - Alternative 4
  - Service to Airport

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**Offsite Surface Water Supply Alternatives (S)**  
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the Sacramento River. The water would then be pumped to and treated at the City's Sacramento River water treatment plant and wheeled through the City's transmission system to the South Natomas region.

Since 2000, the City has made significant progress in the construction of large water transmission mains to serve the South Natomas region. Two large diameter mains extend service to the El Centro Reservoir and Pump Station, which include a 30-inch main running north-south in Bayou Road and a 24-inch main in El Centro Road, crossing Interstate 5 to the east.

Several logical routes may be considered for the extension of a supply main to serve the project, which include the extension of a main from the El Centro Reservoir to the north in Bayou Road, a freeway crossing, and then an extension to the site along Lone Tree Road or adjacent to the proposed interchange, as shown as Alignment Nos. 1 and 2 on Exhibit WA. Other potential alignments for the surface water main are also shown on this exhibit. The pipeline would also include capacity to serve the Sacramento International Airport (SIA) if they would share in the cost of the improvements.

Only Alternative 1 was modeled in this study to identify the impacts on the proposed system if 100% of the maximum daily demand is supplied by this waterline. The results of this modeling effort are discussed in Section 5 – Model Results. The 50% Surface Water (N) option was not modeled in this study, since it is similar to the 50% groundwater supply alternative.

### **Land Use and Demand Projections**

Water demand projections for the MAP are based on approved land uses. Corresponding unit demand rates are assigned based on average demand rates for typical commercial, industrial, and research and development uses within the County of Sacramento, tailored to reflect airport related usage.

Changes in land use are not proposed in this study, and the buildout water demand projections used for the modeling in this study are presented below in Table 3.1. Demands are allocated as per the Buildout of Service Area Node Demand Distribution Spread Sheet in Appendix A.

**METRO AIR PARK – WATER SYSTEM**  
**APPENDIX I - HYDRAULIC MODEL SIMULATIONS**

**Table 3.1 – Potable Water Demand Projection for MAP (Buildout)**

Item	Land Use	Average Demand Factor (gpd/ac.)	Acres	Avg. Day Demand (gpm)	Max. Day Demand (gpm)	Peak Hour Demand (gpm)
1	Light Manufacturing and Distribution (LMD)	3,400	612.30	1,445.73	2,891.46	5,782.92
2	Airport Related Industrial (A1)	2,895	279.60	562.11	1,124.22	2,248.44
3	Commercial High Tech. R&D Offices (CHT)	2,895	168.13	338.01	676.02	1,352.04
4	Commercial-Professional Offices-Corporate Headquarters (CPC)	2,680	95.50	177.74	355.48	710.96
5	Commercial-Offices Retail/Services, Hotels, Automotive & Related ©	2,680	358.74	667.66	1,335.32	2,670.64
6	Major Roadways	166	81.49	9.40	18.80	37.60
7	Golf Course and Open Space	0	273.36	0.00	0.00	0.00
8	Golf Course Club House	2,680	5.00	9.31	18.62	37.24
9	Freeway Interchange	166	11.40	1.31	2.62	5.24
10	Light Rail	2,680	5.80	10.79	21.58	43.16
	<b>Totals</b>		1,891.32	3,222.06	6,444.12	12,888.24

The buildout demands presume an average day to maximum day factor of 2.0 and a maximum day to peak hour factor of 2.0. The maximum daily demand factor is mainly used to determine water supply and treatment requirements, and peak hour demands are mainly used for sizing pipelines and booster pumps. The total water systems demands used in this analysis are listed below in Table 3.2.

**Table 3.2 – Buildout System Demands**

Scenario	Demand (gpm)
Average day demands (ADD)	3,222
Maximum day demands (MDD)	6,444
Peak hour demands (PHD)	12,888

Phased simulations were run to evaluate the ability of the system to serve interim growth phases. Phases 2 through 6 (Buildout) were evaluated in this study. Since the interim system is sized to serve Phases 2-5, Interim Phases 1A, 1B, and 1C were not evaluated. The interim system demands used in this analysis were obtained from *Table 4-3 of the Water Facilities Study* and are listed below in *Table 3.3*.

**Table 3.3 – Phased Demand Projections**

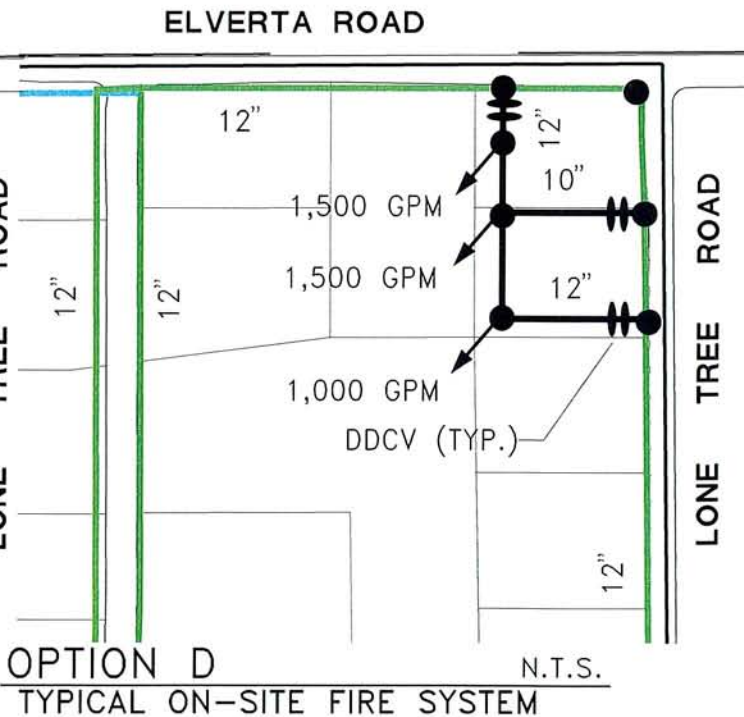
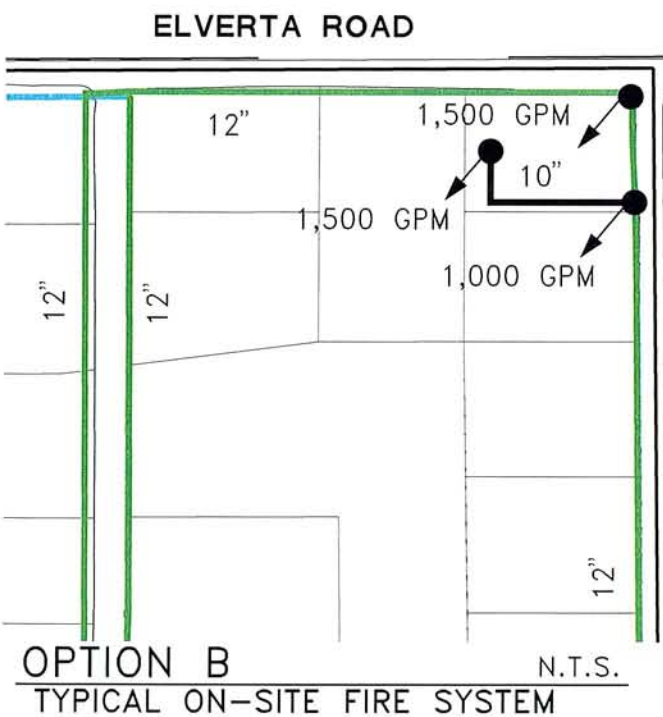
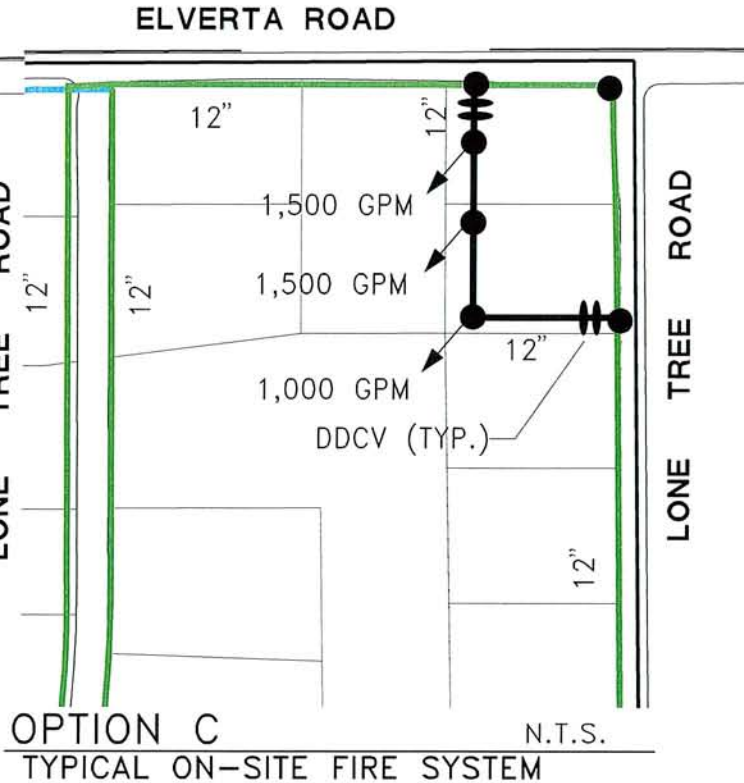
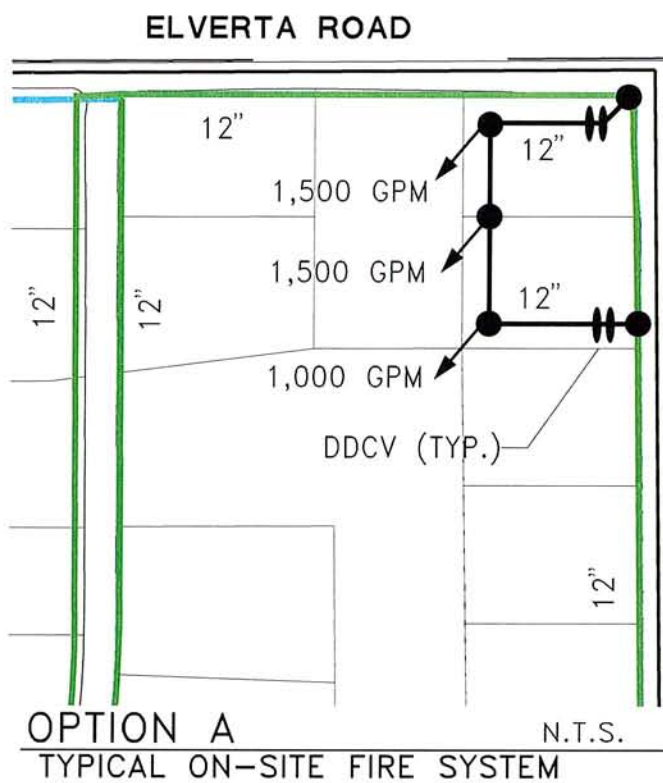
Development Phase	Absorption (%)	ADD (gpm)	MDD (gpm)	PHD (gpm)
Phase 2 <sup>1</sup>	29	934.38	1,868.76	3,737.52
Phase 3	39	1,256.58	2,513.16	5,026.32
Phase 4	59	1,900.98	3,801.96	7,603.92
Phase 5	79	2,545.38	5,090.76	10,181.52
Phase 6 (Buildout)	100	3,222.00	6,444.00	12,888.00

1. Interim Phases 1A-1C were not evaluated in this analysis, since the Phase 2 piping system is identical to Phase 1A.

### **Fire Flow Requirements**

The potable system is sized to provide the required fire flows at the minimum residual pressure to meet the requirements of the City of Sacramento Fire Department and the Uniform Fire Code (UFC). Fire flow requirements will vary for each development within the MAP depending upon the building size, construction, exposure, and type.

For industrial areas, a maximum fire flow of 4,000 gpm was assumed for duration of 4.0 hours for both interim and ultimate growth scenarios.



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**ON-SITE WATER  
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## 4.0 Model Scenarios

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### Buildout and Phased Model Scenarios

Phased and buildout model scenarios include maximum day demand, peak hour demand, reservoir fill, and fire flow scenarios. Hierarchy listings of the simulations are contained in this section, and print-outs are included in Appendix B for buildout simulations and in Appendix C for phased simulations.

### Metro Parkway Tmain

The controlling simulations in this study were run with a 30-inch Tmain in Metro Parkway between Elkhorn Blvd. and Road “A”. Buildout simulations included a parallel 12-inch distribution main along with the Metro Parkway Tmain.

### Fire Flow Scenarios

Fire flows were modeled using the WaterCAD fire flow analysis routine to evaluate fire flows at key nodes. Fire flow scenarios were run under maximum daily demand conditions for both groundwater and surface water supply alternatives with the tank and booster facility operating as a fixed grade reservoir, set to 50 psi.

Elevations for on-site nodes were set to future lot grades as per the *MAP Grading Study*, Morton & Pitalo, Inc., and the starting grade for hydraulic grade lines at the reservoirs were also established from proposed earth grades. Actual finish elevations could vary depending upon the design of the site improvements.

In order to provide the required fire flows with a minimum residual pressure of 20 psi at the most remote hydrant, on-site losses were assumed to be limited to the 5-8 psi. range depending on location. The onsite water systems will need to allow for losses in on-site piping, double detector check backflow preventors, hydrants, and etc. On-site fire systems may be looped or consist of single or multiple mains to feed hydrants located at the rear of the site(s). It is recommended that each on-site water system be modeled to verify that the system, as designed, will meet the service requirements of this study.

## METRO AIR PARK – WATER SYSTEM

### APPENDIX I - HYDRAULIC MODEL SIMULATIONS

the initial Phase 1A backbone system is capable of serving projects located in the northeast area of the site, the on-site fire flows analysis also included the extension of a 12-inch loop in Road "A" and Lone Tree and Elverta Roads to serve the onsite system. The results of fire flow analysis are contained in Appendices B, C, and D.

#### On-site System Options

Four (4) on-site water system options were developed to verify that adequate fire flows can be delivered to the most restrictive sites, as shown on Figure W0. These systems consist of single feed and looped systems. The 4,000 gpm fire flow was distributed to three (3) nodes as shown on the exhibit to limit the maximum flow from each hydrant to 1,500 gpm as required in Section 8-15, County Improvement Standards.

The most restrictive case for on-site fire flow modeling was found to be the 100%SW(S) supply scenario, and the on-site systems were modeled for both buildout and phased conditions. The results for the onsite fire analysis for Option A are contained in Appendices B and C for buildout and phased systems. The results for the fire analysis for onsite Options B, C, and D are contained in Appendix D.

#### Reservoir Fill Scenarios

The capability of the proposed system to fill the MAP storage reservoir during off-peak hours while maintaining adequate pressures in all regions of the system was evaluated by reservoir fill scenarios. These scenarios presume that filling would occur at the rates as listed below under maximum day demand conditions. The operational component is assumed to be replaced within an eight (8) hour period for each phase. For these runs, the groundwater treatment plant was modeled as a fixed grade reservoir with a pressure set at 50 psi. Operational volumes were obtained from *Table 6-4* of the *Water Facilities Study*, and the corresponding fill rates are listed below in *Table 4.1*.

**Table 4.1 – Reservoir Fill Rates**

Development Phase	Absorption	Operational Component (MG)	Fill Period (Hrs)	Fill Rate (gpm)
Phase 2	29%	0.673	8	1,402.1
Phase 3	39%	0.905	8	1,885.4
Phase 4	59%	1.369	8	2,852.1
Phase 5	79%	1.833	8	3,818.8
Phase 6 (Buildout)	100%	2.320	8	4,833.3



## Scenario Hierarchy Report

Base Hierarchy	
Label	Notes
Base	
Run 1-MDD-100%GW Hierarchy	
Label	Notes
Run 1-MDD-100%GW	Created: 08/13/03 05:04:36 PM
Run 2-MDD-50%GW-50%SW(S) Hierarchy	
Label	Notes
Run 2-MDD-50%GW-50%SW(S)	Created: 08/13/03 05:05:07 PM
Run 3-MDD-100%SW(S)	Created: 03/13/04 10:30:56 PM
Run 4-PHD-100%GW Hierarchy	
Label	Notes
Run 4-PHD-100%GW	Created: 08/13/03 05:06:21 PM
Run 5-PHD-50%GW-50%SW(S) Hierarchy	
Label	Notes
Run 5-PHD-50%GW-50%SW(S)	Created: 08/13/03 05:07:20 PM
Run 6-PHD-100%SW(S)	Created: 03/13/04 11:07:12 PM
Run 7-MDD 100%GW RESE FILL 4,833 GPM (8 HR FILL) Hierarchy	
Label	Notes
Run 7-MDD 100%GW RESE FILL 4,833 GPM (8 HR FI	Created: 08/13/03 05:24:28 PM
Run 8-MDD 50%GW-50%SW(S) RESE FILL 4,833 GPM (8 HR FILL) Hierarchy	
Label	Notes
Run 8-MDD 50%GW-50%SW(S) RESE FILL 4,833 GPI	Created: 08/13/03 05:39:24 PM
Run 9A-MDD-100%GW+FF Base - 6444 Inflow @J3 Hierarchy	
Label	Notes
Run 9A-MDD-100%GW+FF Base - 6444 Inflow @J3	Created: 09/09/03 03:34:05 PM
Run 9B-MDD-100%GW+ FF @ J6, 7, & 8	Created: 09/09/03 03:36:09 PM
Run 9C-MDD-100%GW+6444 Inflow @J3 Multi-F	Created: 09/09/03 04:16:00 PM
Run 10A-MDD-50%GW-50%SW(S)+FF Base Hierarchy	
Label	Notes
Run 10A-MDD-50%GW-50%SW(S)+FF Base	Created: 09/09/03 03:37:07 PM
Run 10B-MDD-50%GW-50%SW(S)+ FF @ J6, 7,	Created: 09/09/03 03:38:23 PM
Run 10C-MDD-50%GW-50%SW(S)+Multi-FF Rui	Created: 09/09/03 04:17:33 PM
Run 11A-MDD-100%SW(S)+FF Base	Created: 03/13/04 11:11:00 PM
Run 11B-MDD-100%SW(S) + FF@J6, 7, &	Created: 03/13/04 11:11:45 PM
Run 11C-MDD-100%SW(S) - Multi FF Run	Created: 03/13/04 11:12:27 PM

## Scenario Hierarchy Report

### Phase 1A\_2 Run 1 MDD-100%GW Hierarchy

Label	Notes
Phase 1A & 2 Run 1 MDD-100%GW	Created: 01/22/04 04:26:22 PM
Phase 1A & 2 Run 2 MDD-100%SW(S)	Created: 01/25/04 07:58:47 PM
Phase 1A & 2 Run 3 PHD-100%GW	Created: 01/25/04 07:59:24 PM
Phase 1A & 2 Run 4 PHD-100%SW(S)	Created: 01/25/04 08:00:14 PM
Phase 1A & 2 Run 5 MDD 100%GW Multi Fire Fl	Created: 01/25/04 08:01:01 PM
Phase 1A & 2 Run 6 MDD 100%SW(S) Multi FF	Created: 01/25/04 08:06:47 PM
Phase 1A & 2 Run 7 MDD 100%SW(S) Onsite FF	Created: 01/25/04 08:27:55 PM
Phase 1A & 2 Run 8 MDD 100%GW-Reservoir Fi	Created: 01/25/04 08:31:20 PM

### Phase 3 Run 1 MDD-100%GW Hierarchy

Label	Notes
Phase 3 Run 1 MDD-100%GW	Created: 01/22/04 04:27:19 PM
Phase 3 Run 2 PHD-100%GW	Created: 01/25/04 08:36:30 PM
Phase 3 Run 3 PHD-100%SW(S)	Created: 01/25/04 08:38:06 PM
Phase 3 Run 4 MDD 100%SW(S) Multi FF	Created: 01/25/04 08:39:11 PM
Phase 3 Run 5 MDD 100%SW(S) Onsite FF @ J	Created: 01/25/04 08:42:42 PM
Phase 3 Run 6 MDD-100%GW Reservoir Fill	Created: 01/25/04 08:45:27 PM

### Phase 4 Run 1 MDD-100%GW Hierarchy

Label	Notes
Phase 4 Run 1 MDD-100%GW	Created: 01/22/04 04:27:53 PM
Phase 4 Run 2 PHD-100%GW	Created: 01/25/04 08:51:33 PM
Phase 4 Run 3 PHD-100%SW(S)	Created: 01/25/04 08:52:24 PM
Phase 4 Run 4 MDD 100%SW(S) Multi FF	Created: 01/25/04 08:54:51 PM
Phase 4 Run 5 MDD 100%SW(S) Onsite FF @ J	Created: 01/25/04 09:00:36 PM
Phase 4 Run 6 MDD-100%GW Reservoir Fill	Created: 01/25/04 09:01:30 PM

### Phase 5 Run 1 MDD-100%GW Hierarchy

Label	Notes
Phase 5 Run 1 MDD-100%GW	Created: 01/25/04 02:46:02 PM
Phase 5 Run 2 PHD-100%GW	Created: 01/25/04 09:04:54 PM
Phase 5 Run 3 PHD-100%SW(S)	Created: 01/25/04 09:05:35 PM
Phase 5 Run 4 MDD 100%SW(S) Multi FF	Created: 01/25/04 09:07:59 PM
Phase 5 Run 5 MDD 100%SW(S) Onsite FF @ J	Created: 01/25/04 09:09:55 PM
Phase 5 Run 6 MDD 100%GW-Rese Fill	Created: 01/25/04 09:10:38 PM

### Surface Water Supply (S) Alternative Modeling

Modeling of the surface water supply alternative was limited to Alternative 1 (Bayou Road) to evaluate potential impacts on the MAP on-site system if the 100% surface water supply (S) alternative is implemented. Based on early discussions with City staff, it was determined that a booster pump station may be needed to boost pressures to the MAP system, since the City may not be able to maintain pressures high enough to serve the MAP under all flow conditions. Therefore, 100% surface water supply (S) options were modeled with a booster station at the MAP reservoir and pump station facility.

The surface water supply main serving the MAP was modeled as a transmission main also providing service to the SIA. The City's El Centro Reservoir and Pump Station was modeled as a fixed grade reservoir, with an assumed starting pressure of 50 psi, until more refined assumptions can be provided by City staff. The off-site supply line was isolated from the on-site system by a closed pipeline, assuming that a pressure boosting station and control valve assembly would be used to either pump surface water into the MAP system or to make deliveries to the MAP storage reservoir during off-peak periods.

Water demand projections for the Sacramento International Airport were obtained from the draft *Alternative Analysis Update for the Sacramento International Airport* study as prepared by HDR, July 2003. The demand assumptions used for modeling of the off-site water main are listed below in Table 4.2.

**Table 4.2 – Off-site Water Main Demands**

Development Phase	MAP Absorption	SIA Max.-day Demands (gpm)	MAP Max.-day Demands (gpm)	Combined Max.-day Demand (gpm)
Phase 2	29%	2,205.0	1,869.0	4,074.0
Phase 3	39%	2,285.0	2,513.0	4,798.0
Phase 4	59%	2,285.0	3,802.0	6,087.0
Phase 5	79%	1,630.0	5,091.0	6,721.0
Phase 6 (Buildout)	100%	1,630.0	6,444.0	8,074.0

## **5.0 Model Results**

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### **Buildout System Analysis**

Under buildout conditions, the model shows that pressures are maintained above 40 psi for maximum daily demand (MDD) 100% groundwater supply (GW), 50%GW-50% surface water (SW), and 100%SW(S) supply scenarios with a 30-inch Tmain in Metro Parkway (Runs 1, 2, and 3). For peak hour demand conditions (PHD), pressures are maintained above 35 psi (Runs 4, 5, and 6) under all supply scenarios.

Reservoir fill Runs 7 and 8 reveal that the MAP storage reservoir may be filled during off-peak periods while maintaining pressures greater than 40 psi in the system with a 30-inch Tmain in Metro Parkway. Reservoir filling is enhanced with the reservoir located at a lower elevation than the treatment plant, and for the above simulations, significantly higher fill rates could be achieved.

### **Phased System Analysis**

Phased model simulations show that pressures are maintained above 40 psi for MDD and above 35 psi for PHD scenarios for both 100%GW and 100%SW(S) supply options.

Reservoir fill runs for Phases 2–5 reveal that the MAP reservoir may be filled during off-peak periods while maintaining pressures greater than 40 psi in the system. Reservoir filling is enhanced with the reservoir located at a lower elevation than the treatment plant.

The fire flow analysis for the combined 30-inch Tmain and 12-inch main in Metro Parkway reveals that a 4,000 gpm fire flow may be delivered in all regions of the system with pressures greater than the minimum requirement under the 100%GW, 50%GW-50%SW, and 100%SW(S) supply scenarios. Multi-fire flow simulation results indicate that residual pressures are maintained above 20 psi during fire flow events.

### **On-site Fire System Analysis**

For the most restrictive onsite Option A, buildout simulations reveal that residual pressures of 25.67, 24.39, and 21.94 psi can be maintained at the onsite Node J6 during a fire event under the 100%GW, 50%GW-50%SW, and 100%SW(S) supply scenarios respectively (Runs 9B, 10B, and 11B in Appendix B). Onsite Options B, C, and D would provide higher pressures at the hydrants under similar conditions.

For onsite system Option A, phased fire flow simulations reveal that residual pressures of 22.22 and 21.67 psi. can be maintained at J6 for Phases 1A and 3 respectively (Runs P-1A-7 and P-3-5). This analysis also presumes that the 12-inch loops would be provided in Lone Tree and Elverta Roads and in Road A to serve the region shown on Figure W0. Once Phase 4 pipelines are extended to Elkhorn Road, the residual pressures in the onsite system (J6) increase to 23.00 and 21.82 psi for Runs P4-5 and P5-5 respectively.

The analysis of onsite Options B, C, and D reveals that each of these systems will provide higher residual pressures during a fire flow. For the most restrictive case in Phase 3 with 100%SW(S), residual pressures of 24.29, 23.75, and 24.29 psi can be achieved with the more innovative onsite systems (refer to Figures OB, OC, and OD in Appendix C). Therefore, the backbone water transmission system is adequately sized to provide service to the onsite systems during the worst case fire events.

### **Surface Water Supply (S) Alternative Analysis**

The surface water supply (S) alternative analysis of the Lone Tree alignment reveals that 6,444 gpm can be carried through a 24-inch main to the MAP tank and pump station with an ending pressure of 33 psi and velocity of 5.73 fps. This presumes that a starting pressure of 50 psi can be maintained at the City's El Centro reservoir and pump station and that the maximum daily demand at buildout of the SIA is limited to 1,630 gpm as stated in the *HDR Alternative Analysis Update for the SIA Study*.

## 6.0 Facility Requirements

### Proposed Buildout Potable Water Facilities Plan

Based on the modeling performed in this study, the MAP Potable Water Facilities Plan has been modified and is enclosed as Figure W1. This figure shows the proposed MAP water transmission, distribution, treatment, storage, and pump station facilities that are needed to serve the project, and the facilities are color coded by phase. The proposed changes to the plan are summarized below in Table 6.1.

**Table 6.1 – Proposed Buildout System Plan Modifications**

No.	Item	Proposed Modification
1	Groundwater treatment plant	Shift to the former storage and booster pump station site along Road “A”, west of Metro Parkway
2	Storage and booster pump station	Shift to Meister Way, east of Metro Parkway
3	30-inch Main in Road “A” (WTP to Metro Pkwy)	Modify to a 24-inch main with a future parallel 12-inch main
4	16-inch Main in Road “A” (Metro Parkway to Lone Tree Rd.)	Modify to parallel 12-inch distribution mains
5	12-inch Main in Road “A”	Modify to a 16-inch main and 12-inch distribution main
6	24-inch Main in Metro Pkwy. (Meister Way to Elkhorn Blvd.)	Modify to a 30-inch main with future parallel 12-inch distribution mains
7	24-inch main in Metro Pkwy (Elkhorn Blvd. To Road “A”)	Modify to a 30-inch main with future parallel 12-inch distribution mains
8	12-inch main in Elkhorn Blvd. (Metro Pkwy. to Lone Tree Rd.)	Modify single 12-inch main to dual 12-inch mains
9	20-inch main in Meister Way	Modify to a 16-inch main

The MAP buildout water system consists of a groundwater treatment plant, a storage reservoir and pumping facility, interconnecting 30- and 24-inch Tmains, 12-inch distribution mains parallel to the Tmains, an extensive 12-inch distribution grid, and dual 12-inch mains in Metro Parkway, north of Road A and in Elkhorn Boulevard and in Road A east of Metro Parkway. Overall, the system will meet SCWA's requirements for new water systems and will be highly reliable and expandable.

### **Proposed Initial Phase Potable Water Facilities Plan**

The MAP Initial Phase Water Facilities Plan (Phase 1A) has been modified to show the facilities needed to serve the initial development, refer to Figure W1A. This plan includes the proposed MAP potable water transmission, distribution, treatment, storage, and pump station facilities, which are to be constructed in the initial development phase. The phased water system plans for Phases 2 through 5 are shown on Figures W2 through W5 respectively.

The initial phase system consists of the groundwater treatment plant, a storage and booster pumping facility, an interconnecting 24/30-inch Tmain, dual 12-inch mains in Elkhorn Blvd. and in Metro Parkway north of Road "A", and a limited 12-inch distribution grid. The system will provide adequate service for Phases 2-5, and 12-inch distribution mains will be added as individual developments are constructed.

The proposed changes to the Initial Phase Potable Water Facilities Plan (*Figure 7-3 of the Water Facilities Study*) are summarized below in Table 6.2.



**METRO AIR PARK – WATER SYSTEM  
APPENDIX I - HYDRAULIC MODEL SIMULATIONS**

**Table 6.2 – Proposed Initial System Plan Modifications**

<b>No.</b>	<b>Item</b>	<b>Proposed Modification</b>
1	Groundwater treatment plant	Shift to the former storage and booster pump station site along Road "A", west of Metro Parkway
2	Storage and booster pump station	Shift to Meister Way, east of Metro Parkway
3	30-inch main in Road "A" (WTP to Metro Pkwy)	Modify to a 24-inch main
4	16-inch main in Road "A" (Metro Parkway to Lone Tree Rd.)	Delete from the initial phase plan
5	12-inch main in Lone Tree Road and Elverta Road	Delete from the initial phase plan
6	12-inch main in Metro Parkway (Road A to Elverta Road)	Modify to dual 12-inch mains
7	12-inch main in Metro Parkway (Elkhorn Blvd. to Road A)	Modify to a 30-inch main and parallel 12-inch distribution main
8	12-inch main in Metro Parkway (Meister Way to Elkhorn Blvd.)	Modify to a 30-inch main and parallel 12-inch distribution main
9	12-inch main in Elkhorn Blvd. (Metro Pkwy. To Lone Tree Rd.)	Modify single 12-inch to dual 12-inch mains

### Proposed Groundwater Supply and Collection System Plan

The proposed MAP Groundwater Supply and Raw Water Collection System Plan consists of five to six groundwater wells and a raw water collection system, based on a 100%GW supply. If a surface water supply source is implemented, the total number of required wells may be reduced. Tentative well sites were selected to be accessible, compatible with the overall development plan, and based on an assumed minimum spacing of approximately 2,000 feet.

Well Site W1 was identified at the groundwater treatment plant to reduce initial facility costs and enhance reliability. Well Sites W2-W4 were selected on the fringe of the golf course, and raw water mains may be constructed along with the roadways. Well Sites W5 and W6 are situated west of groundwater treatment plant and are planned for later development stages.

The construction of MAP Wells 1 and 2 includes a stepped well development program to evaluate aquifer characteristics and to confirm the recommended spacing for MAP production wells. Once this has been completed, it is anticipated that Figure W-R will be reviewed and updated accordingly if a well spacing of greater than 2,000 feet is needed to minimize the interference between drawdown cones.

The proposed MAP groundwater supply and collection system is shown on Figure W-R, which supersedes *Figure 7-5* in the *Water Facilities Study*, and the facilities are color coded by development phase.

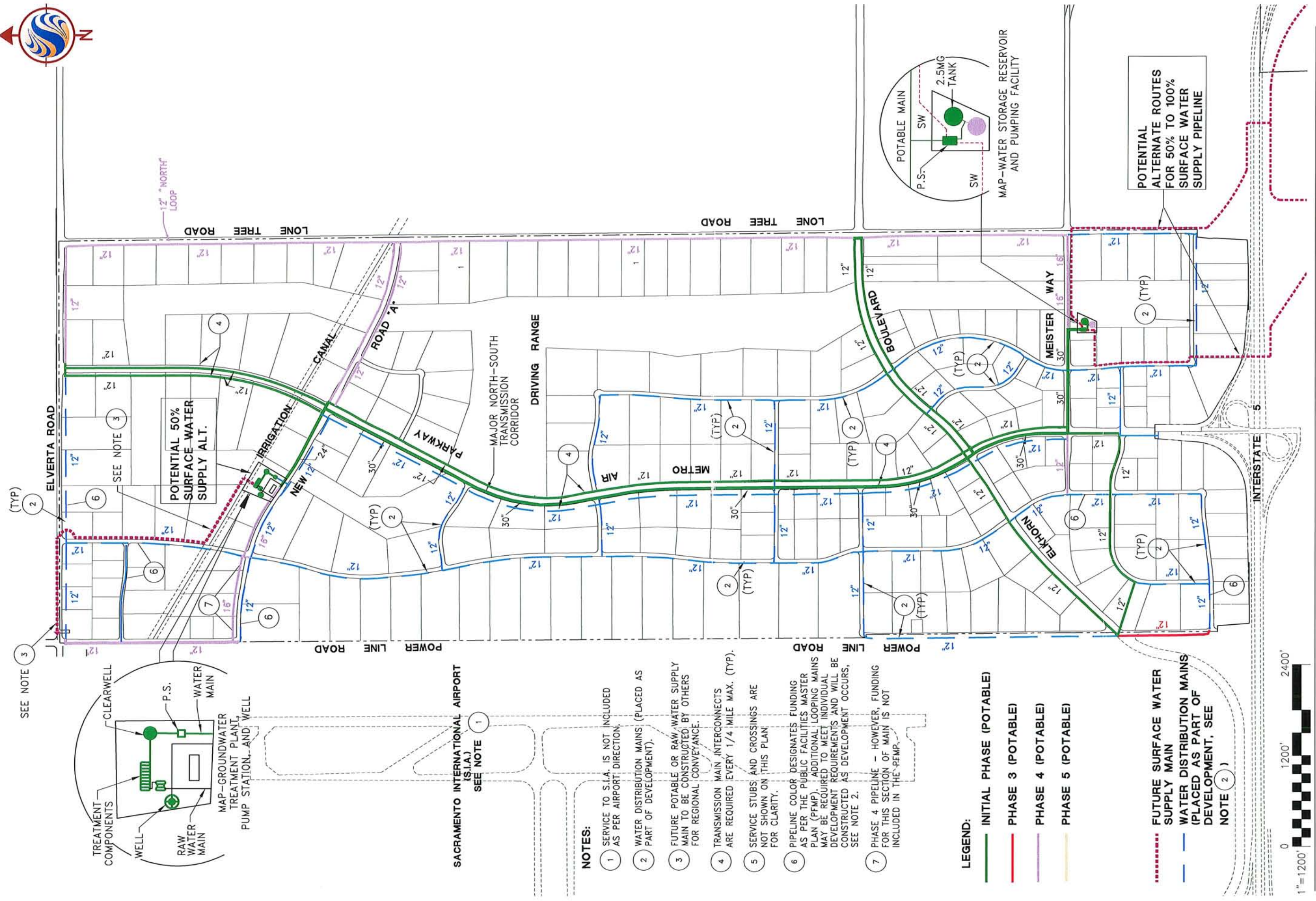
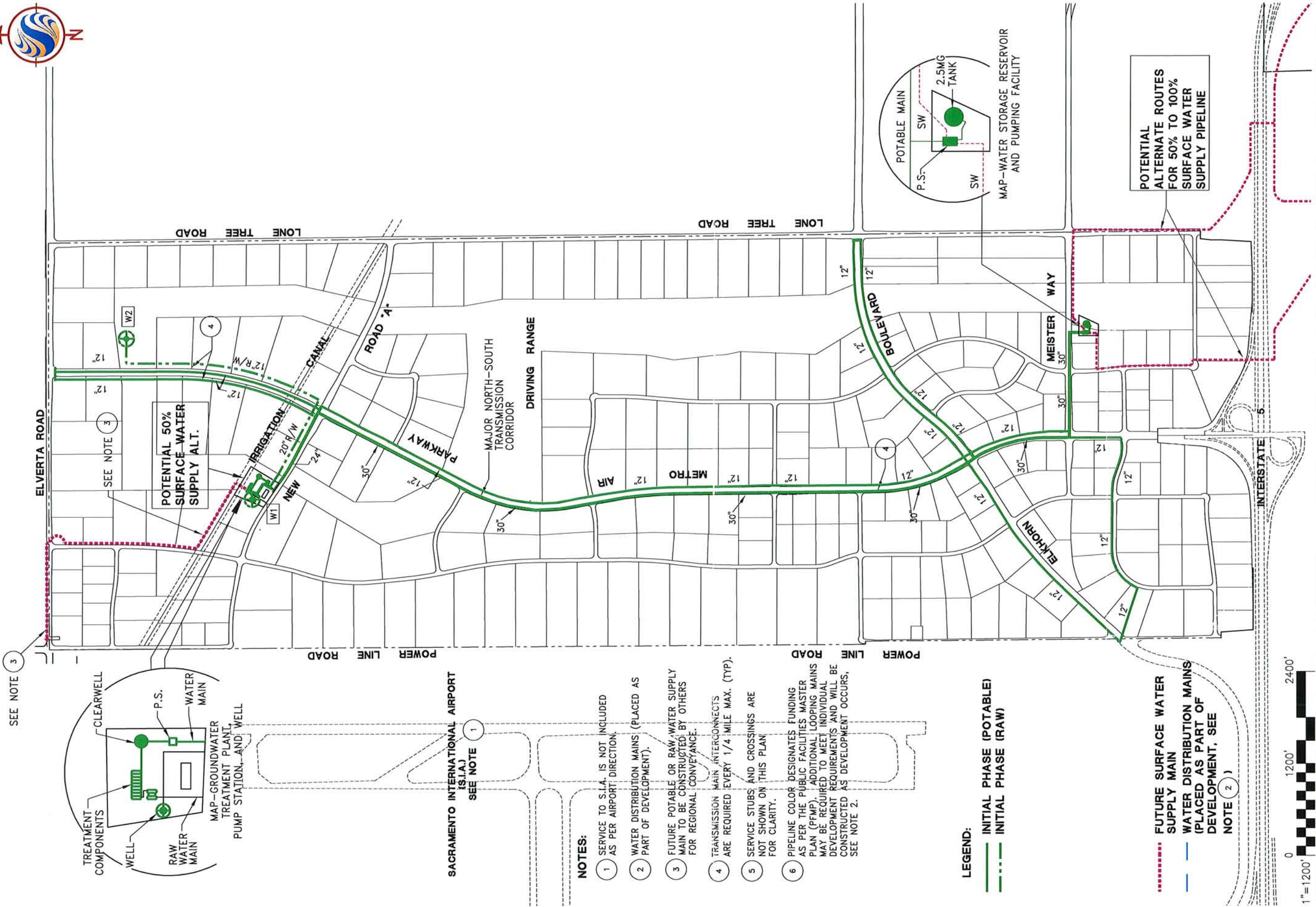
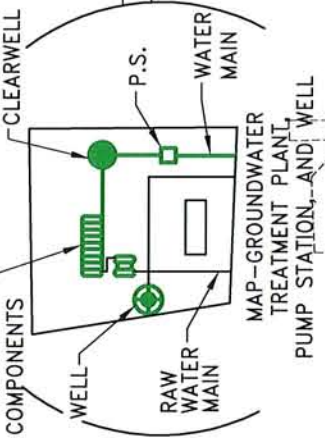


Figure No.	Title
<b>W1 - BUILDOUT</b>	<b>POTABLE WATER FACILITIES PLAN</b>





SEE NOTE 3



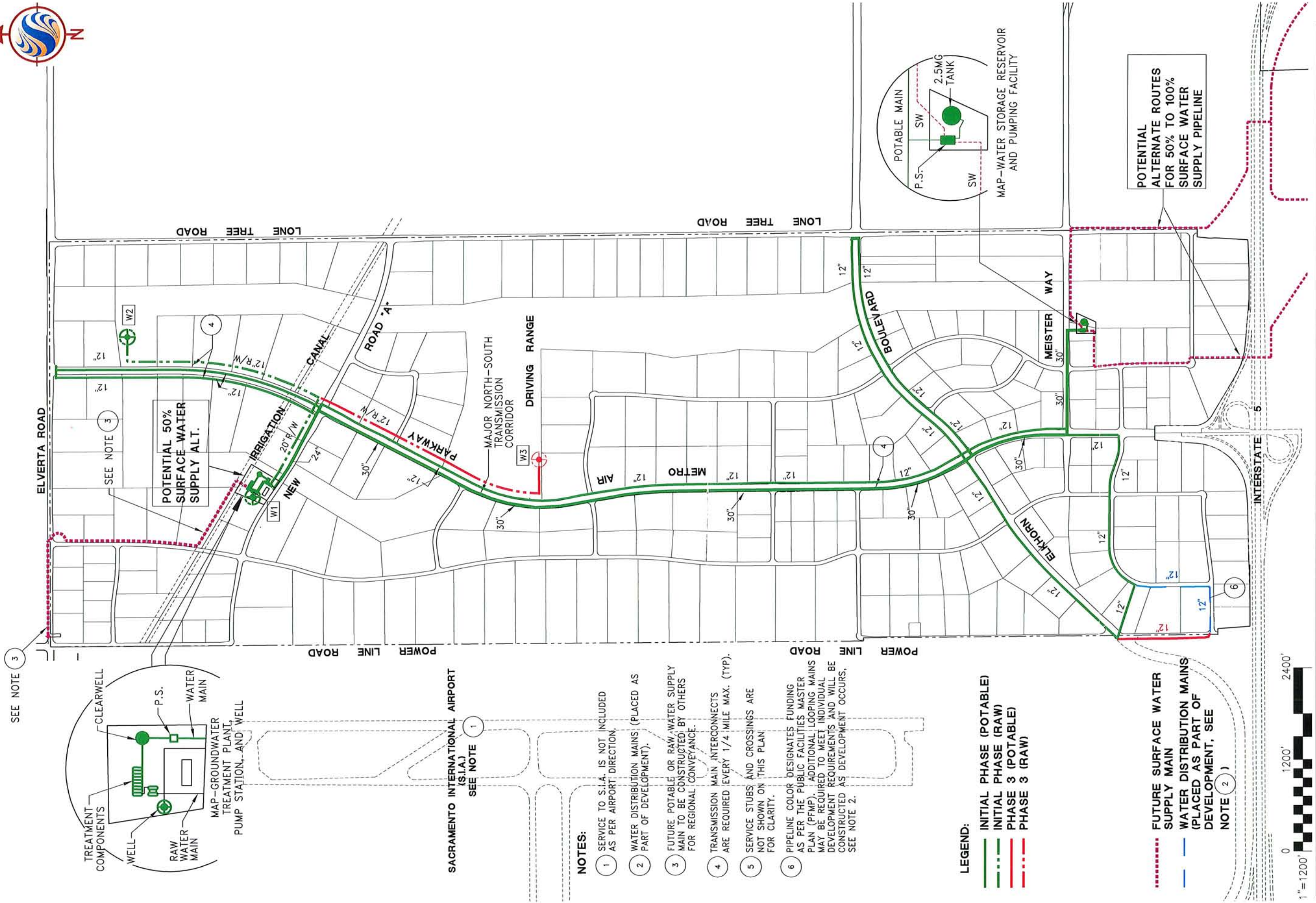
SACRAMENTO INTERNATIONAL AIRPORT (S.I.A.)  
SEE NOTE 1

- NOTES:**
- 1 SERVICE TO S.I.A. IS NOT INCLUDED AS PER AIRPORT DIRECTION.
  - 2 WATER DISTRIBUTION MAINS (PLACED AS PART OF DEVELOPMENT).
  - 3 FUTURE POTABLE OR RAW-WATER SUPPLY MAIN TO BE CONSTRUCTED BY OTHERS FOR REGIONAL CONVEYANCE.
  - 4 TRANSMISSION MAIN INTERCONNECTS ARE REQUIRED EVERY 1/4 MILE MAX. (TYP).
  - 5 SERVICE STUBS AND CROSSINGS ARE NOT SHOWN ON THIS PLAN FOR CLARITY.
  - 6 PIPELINE COLOR DESIGNATES FUNDING AS PER THE PUBLIC FACILITIES MASTER PLAN (PFMP). ADDITIONAL LOOPING MAINS MAY BE REQUIRED TO MEET INDIVIDUAL DEVELOPMENT REQUIREMENTS AND WILL BE CONSTRUCTED AS DEVELOPMENT OCCURS, SEE NOTE 2.

- LEGEND:**
- FUTURE SURFACE WATER SUPPLY MAIN
  - WATER DISTRIBUTION MAINS (PLACED AS PART OF DEVELOPMENT, SEE NOTE 2)
  - INITIAL PHASE (POTABLE)
  - INITIAL PHASE (RAW)

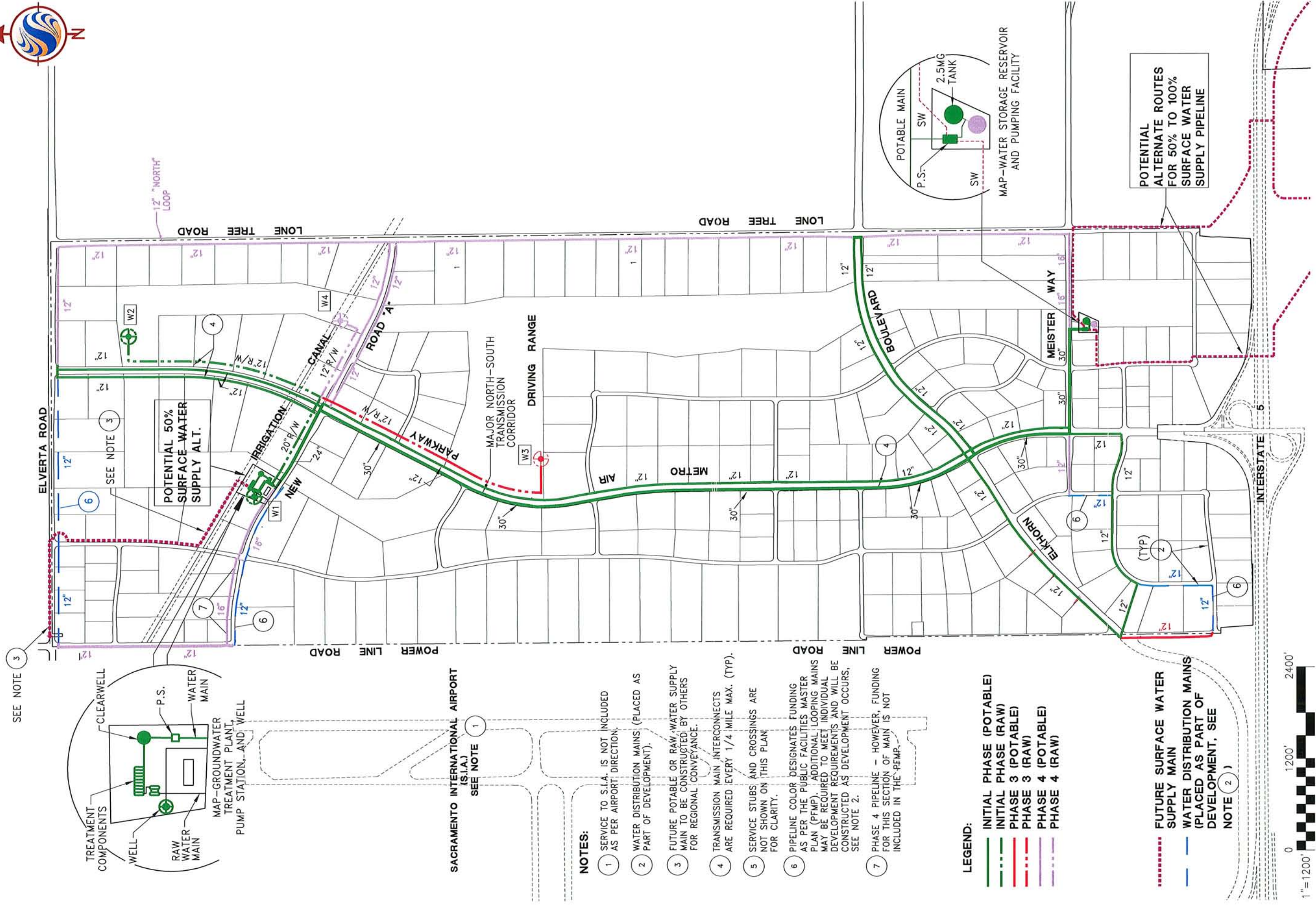






METRO AIR PARK





Client/Project

## METRO AIR PARK

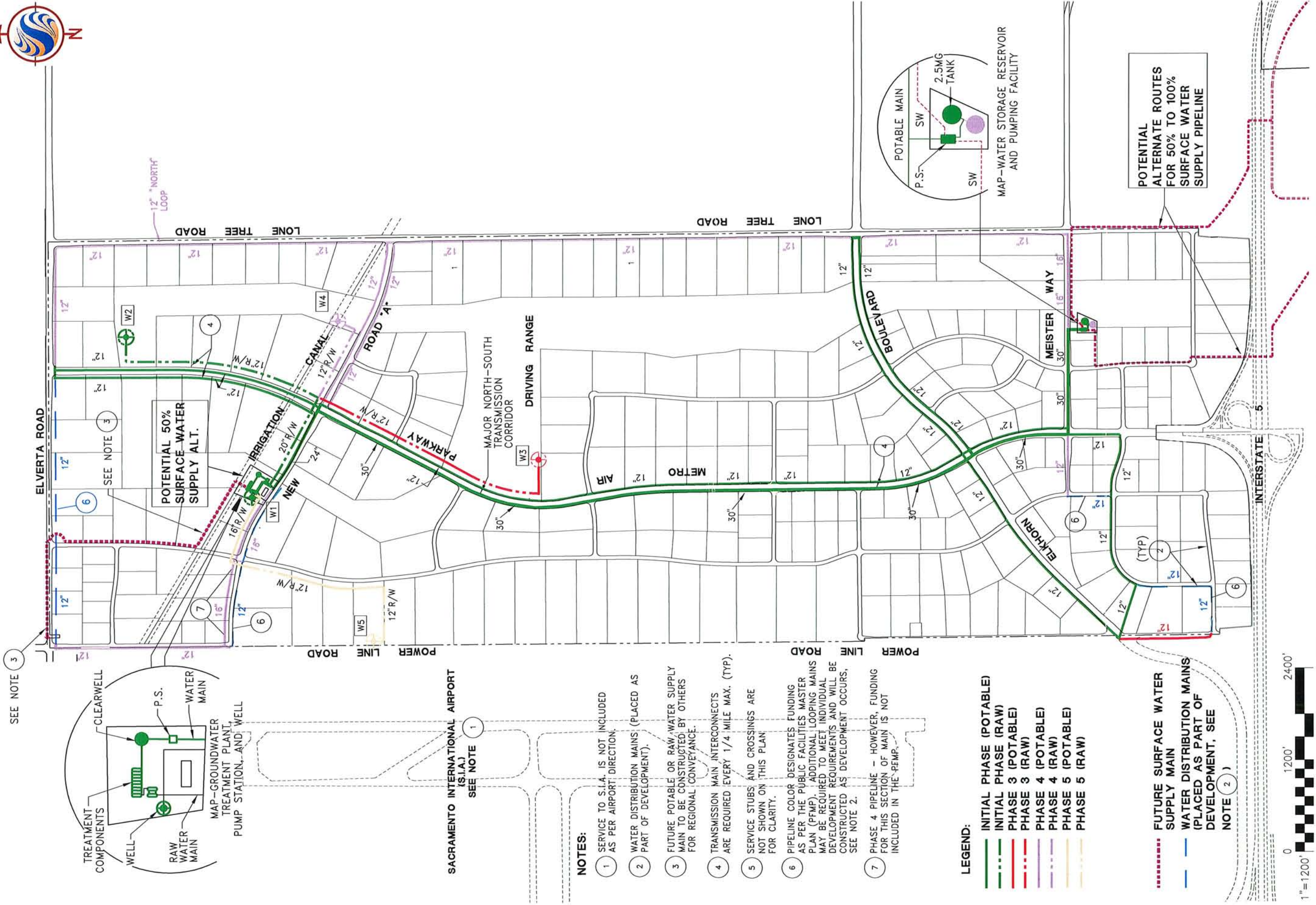
Figure No. **W4 - PHASE 4**

## POTABLE & RAW WATER FACILITIES PHASING PLAN

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Client/Project

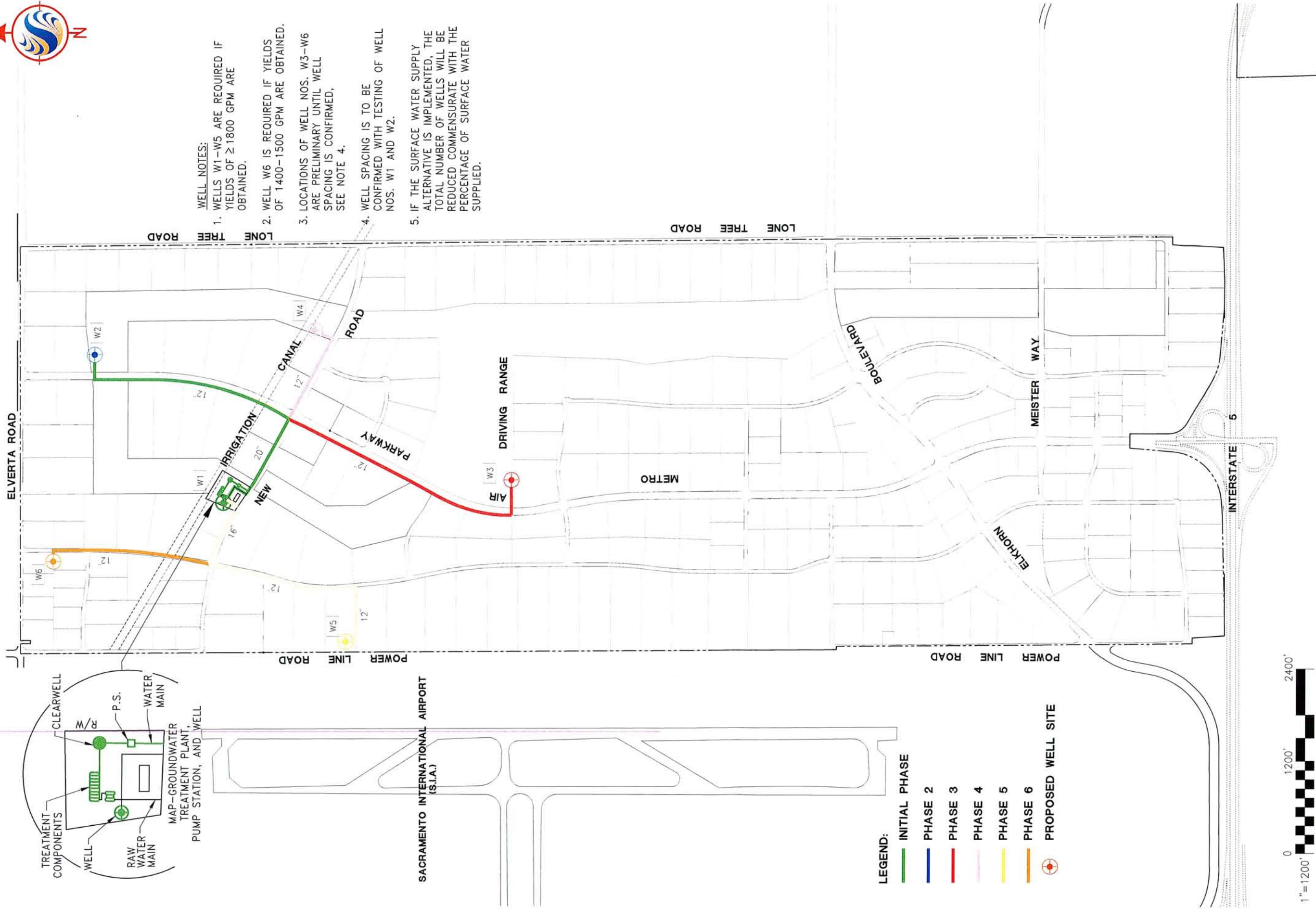


## METRO AIR PARK

Figure No. **W5 - PHASE 5**

Title  
**POTABLE & RAW WATER  
FACILITIES PHASING PLAN**  
MARCH, 2004  
840 71001





Client/Project

METRO AIR PARK

Figure No.

W-R

Title

**GROUND WATER AND RAW WATER  
COLLECTION SYSTEM PLAN**

MARCH 2004  
840 71001

## 7.0 Findings and Recommendations

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The major findings and recommendations of this study include the following:

- ❑ Interchanging the locations of the MAP groundwater treatment plant and the storage reservoir and pumping facility is practical. The buildout and phased systems exhibit good performance and meet the requirements of the SCWA.
- ❑ Shifting the MAP wells, collection system, and groundwater treatment plant to the north (refer to Figure W-R) will take advantage of potentially higher well yields and better water quality in this region of the site and will strategically locate the MAP storage tank and booster facility in the southern region of the site to better accommodate the potential surface water supply (south) option.
- ❑ The line sizes as shown on the revised water system plan (refer to Figure W1) will provide adequate domestic water service to future MAP customers at suitable pressures. The system is capable of providing the minimum fire flows at or above the required residual pressures.
- ❑ A 30-inch Tmain in Metro Parkway (Elkhorn Blvd. to Road A) will meet the study criteria as listed in Section 2 for both phased and buildout conditions.
- ❑ The revised system is sized to permit a 100% surface water supply to be introduced into the system at the MAP tank and pump station or a 50% surface water supply component to be introduced at the groundwater treatment plant on the north, as shown on Figure W1.
- ❑ Looped mains are to be provided with each phase for system redundancy. The looped system shall be designed to accommodate a short term shut-down of a transmission or distribution main.
- ❑ The MAP supply and storage facilities will meet the needs of interim and buildout growth phases and are expandable in logical increments as shown on Figures W1A and W2 – W5.

## METRO AIR PARK – WATER SYSTEM

### APPENDIX I - HYDRAULIC MODEL SIMULATIONS

- ❑ The Initial System (refer to Figure W1A) is capable of serving growth through Phase 2, and the system may be easily expanded. The 12-inch loops in Lone Tree and Elverta Roads are shown to be completed in Phase 4. Color-coding shows pipeline sequencing on Figures W1, W1A, and W2 – W5.
- ❑ It is recommended that individual onsite water systems be modeled to verify that each system is capable of providing adequate domestic and fire flows and to determine which looping mains (shown as blue mains on Figure W1) should be constructed to meet individual project requirements.
- ❑ The capability of the City's system to supply the stated surface water supply flows at the indicated pressures was not evaluated in this study and will require further analysis to implement this alternative.

**Buildout Of Service Area  
Node Demand Distribution Spread Sheet**

**Assumptions**      gpd/ac  
 Light Manufacturing =      3400  
 Airport Industrial =      2895  
 Commercial R&D=      2895  
 Commerical Professic      2680  
 Commercial Retail/Of      2680  
 Net to Gross Acre Far      1.050315 x

1.050315

Updated

2/20/2004

Node	Light Manufacturing (Acres)	Airport Industrial (Acres)	Commercial R&D (Acres)	Commercial Professional (Acres)	Commercial Retail/Office (Acres)	No Demand Area (Acres)	Total ADD Net (gpd)	Total ADD Gross (gpd)	Total ADD (gpm)	Total MDD gpm
J 1						13	35360	37139.14	25.79	51.58
J 5	10.4						39780	41781.53	29.01	58.03
J 80	11.7						20740	21783.53	15.13	30.25
J 90	6.1						18700	19640.89	13.64	27.28
J 100	5.5						45560	47852.35	33.23	66.46
J 110	13.4						58140	61065.31	42.41	84.81
J 120	17.1						66276	69610.68	48.34	96.68
J 130	12	8.8					140024.5	147069.83	102.13	204.26
J 140	13	33.1					66640	69992.99	48.61	97.21
J 150	19.6						31236	32807.64	22.78	45.57
J 160	5.1	4.8					45741	48042.46	33.36	66.73
J 170			15.8				74823	78587.72	54.57	109.15
J 190	12.3		11.4				33292.5	34967.61	24.28	48.57
J 200			11.5				82450	86598.47	60.14	120.28
J 210	24.25						65280	68564.56	47.61	95.23
J 220	19.2						36040	37853.35	26.29	52.57
J 230	10.6						29580	31068.32	21.58	43.15
J 240	8.7						75140	78920.67	54.81	109.61
J 250	22.1						52020	54637.39	37.94	75.89
J 260	15.3						84678.75	88939.36	61.76	123.53
J 300			29.25				214519.5	225313.05	156.47	312.93
J 310		74.1					130020.75	136562.74	94.84	189.67
J 320		23.25			23.4		183600	192837.83	133.92	267.83
J 330	54						84822	89089.82	61.87	123.74
J 350					31.65		157354	165271.27	114.77	229.54
J 360	28.9				22.05		53244	55922.97	38.84	77.67
J 370	10.3				6.8		88050	92480.24	64.22	128.44
J 380	12.3			3.5	13.75		66330	69667.39	48.38	96.76
J 400					24.75		77720	81630.48	56.69	113.38
J 410					29		90950	95526.15	66.34	132.68
J 420	26.75						85680	89990.99	62.49	124.99
J 430	25.2						96900	101775.52	70.68	141.35
J 440	28.5						82960	87134.13	60.51	121.02
J 450	24.4						37580	39470.84	27.41	54.82
J 470	7.9			4			13382	14055.32	9.76	19.52
J 490	1.65			2.9			56200	59027.70	40.99	81.98
J 500	5.1			14.5			62444	65585.87	45.55	91.09
J 510				15.9	7.4		82276	86415.72	60.01	120.02
J 520				16.1	14.6		24120	25333.60	17.59	35.19
J 530				4.1	4.9		18760	19703.91	13.68	27.37
J 540					7		38324	40252.27	27.95	55.91
J 550					14.3		41540	43630.09	30.30	60.60
J 560				8.5	7		31356	32933.68	22.87	45.74
J 570				6.6	5.1		58188	61115.73	42.44	84.88
J 580	12.7				5.6		97016	101897.36	70.76	141.52
J 590				21.1	15.1		70040	73564.06	51.09	102.17
J 600	20.6						97070	101954.08	70.80	141.60
J 610	28.55						18190	19105.23	13.27	26.54
J 620	5.35						153191	160898.81	111.74	223.47
J 650		39.4			14.6		70203.75	73736.05	51.21	102.41
J 670			24.25				20910	21962.09	15.25	30.50
J 680	6.15						85290	89581.37	62.21	124.42
J 690	14.05				14		107115	112504.49	78.13	156.26
J 700		37					123327	129532.20	89.95	179.91
J 720		42.6					23883.75	25085.46	17.42	34.84
J 730		8.25					109595.5	115109.80	79.94	159.87
J 740	13.5	13.3			9.4		69530	73028.40	50.71	101.43
J 750	20.45						23852	25052.11	17.40	34.79
J 760					8.9		61640	64741.42	44.96	89.92
J 770					23					

J 780			6.7	10.2		45292	47570.87	33.04	66.07
J 800		8.6				24897	26149.69	18.16	36.32
J 810		19.8				57321	60205.11	41.81	83.62
J 820		37.7				109141.5	114632.95	79.61	159.21
J 830				26.9		72092	75719.31	52.58	105.17
Totals	572.7	284.6	158.3	117.9	325.4	13.0		3222.00	6444.00

**Metro Air Park**  
**Interim Node Distribution Spread**  
**Phase 1A and 2**

Modified for parallel mains in Metro Parkway

1/23/2004

		Interim Q= 1868.76 gpm			
	Node	Acres		MDD	PHD
J	1	60	0.0407636	76.17746	152.3549
J	170	103.95	0.070623	131.9774	263.9549
J	190	12.3	0.0083565	15.61638	31.23276
J	200	0	0	0	0
J	210	0	0	0	0
J	220	0	0	0	0
J	230	0	0	0	0
J	240	0	0	0	0
J	260	102.8	0.0698417	130.5174	261.0348
J	300	47.05	0.0319655	59.73582	119.4716
J	320	151.75	0.103098	192.6655	385.331
J	350	157.9	0.1072763	200.4737	400.9474
J	380	44.85	0.0304708	56.94265	113.8853
J	400	24.75	0.016815	31.4232	62.8464
J	410	52.5	0.0356682	66.65528	133.3106
J	420	0	0	0	0
J	430	0	0	0	0
J	440	0	0	0	0
J	450	78.1	0.0530607	99.15766	198.3153
J	470	11.9	0.0080848	15.10853	30.21706
J	510	58.3	0.0396087	74.0191	148.0382
J	540	15.9	0.0108024	20.18703	40.37405
J	550	14.3	0.0097153	18.15563	36.31125
J	570	79.9	0.0542836	101.443	202.886
J	680	26.6	0.0180719	33.77201	67.54401
J	690	52.4	0.0356002	66.52831	133.0566
J	730	79.05	0.0537061	100.3638	200.7276
J	770	25.3	0.0171887	32.12149	64.24299
J	800	131.9	0.0896121	167.4634	334.9269
J	810	19.8	0.013452	25.13856	50.27712
J	820	49.1	0.0333582	62.33855	124.6771
J	830	71.5	0.0485767	90.77814	181.5563
Totals		1471.9	1.0000000	1868.76	3737.52



**Metro Air Park**  
**Interim Node Distribution Spread**  
**Phase 3**

Modified for parallel mains in Metro Parkway

1/23/2004

		Interim Q= 2513.16 gpm			
	Node	Acres		MDD	PHD
J	1	60	0.0407636	102.4455	204.8911
J	170	103.95	0.070623	177.4869	354.9738
J	190	12.3	0.0083565	21.00134	42.00267
J	200	0	0	0	0
J	210	0	0	0	0
J	220	0	0	0	0
J	230	0	0	0	0
J	240	0	0	0	0
J	260	102.8	0.0698417	175.5234	351.0467
J	300	47.05	0.0319655	80.33438	160.6688
J	320	151.75	0.103098	259.1019	518.2037
J	350	157.9	0.1072763	269.6025	539.2051
J	380	44.85	0.0304708	76.57805	153.1561
J	400	24.75	0.016815	42.25879	84.51758
J	410	52.5	0.0356682	89.63985	179.2797
J	420	0	0	0	0
J	430	0	0	0	0
J	440	0	0	0	0
J	450	78.1	0.0530607	133.35	266.6999
J	470	11.9	0.0080848	20.31837	40.63673
J	490	17.47	0.011869	29.82873	59.65746
J	500	17.46	0.0118622	29.81165	59.62331
J	510	58.3	0.0396087	99.54292	199.0858
J	540	15.9	0.0108024	27.14807	54.29614
J	550	14.3	0.0097153	24.41619	48.83238
J	570	79.9	0.0542836	136.4233	272.8466
J	680	26.6	0.0180719	45.41753	90.83505
J	690	17.47	0.011869	29.82873	59.65746
J	730	79.05	0.0537061	134.972	269.944
J	770	25.3	0.0171887	43.19787	86.39574
J	800	131.9	0.0896121	225.2095	450.4189
J	810	19.8	0.013452	33.80703	67.61406
J	820	49.1	0.0333582	83.83461	167.6692
J	830	71.5	0.0485767	122.0809	244.1619
Totals		1471.9	1.0000000	2513.16	5026.32

**Metro Air Park**  
**Interim Node Distribution Spread**  
**Phase 4**

Modified for parallel mains in Metro Parkway

2/20/2004

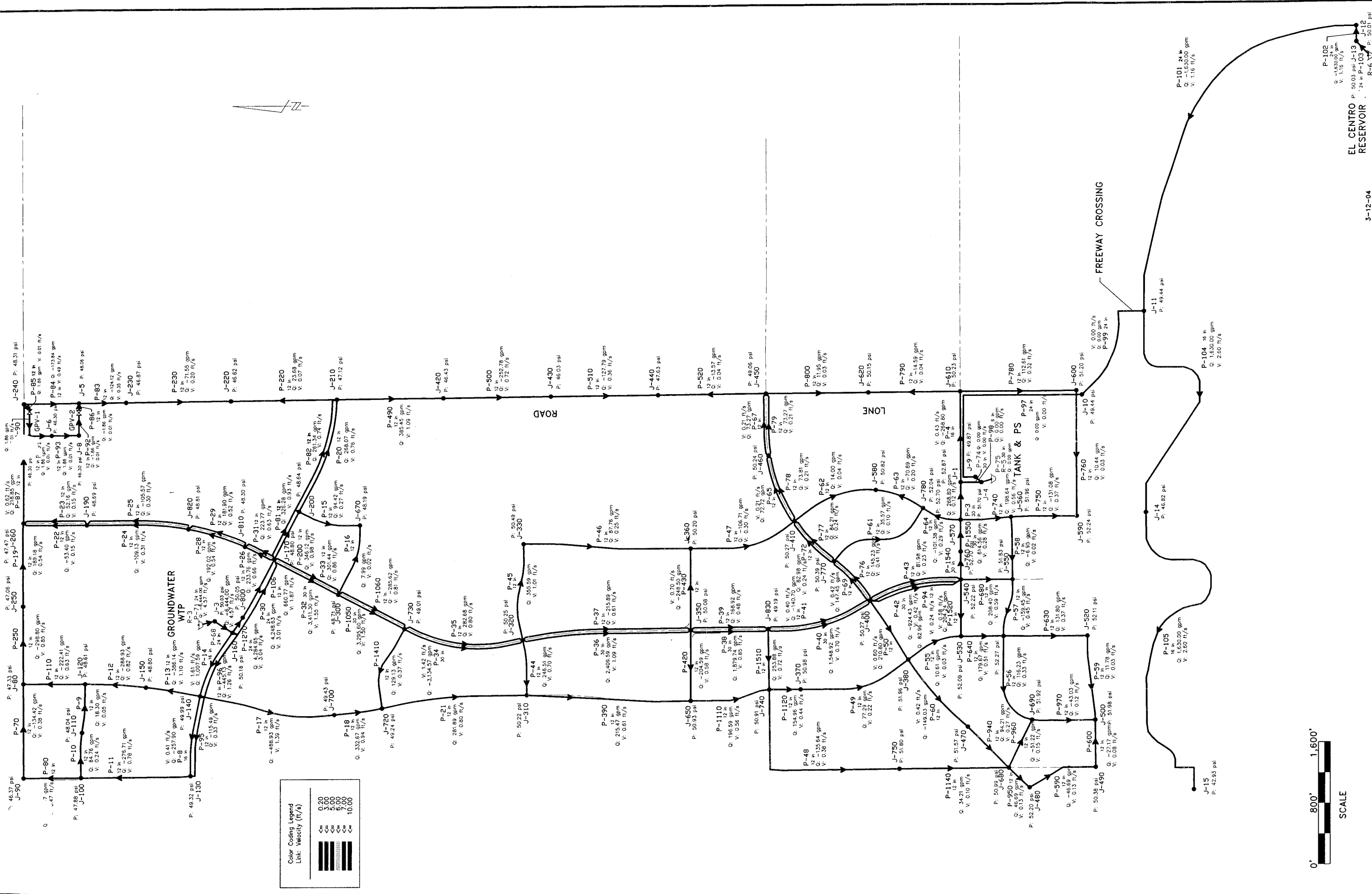
		Interim Q= 3801.96 gpm			
	Node	Acres		MDD	PHD
J	1	0	0	0	0
J	80	26	0.017664	67.15875	134.3175
J	90	12.9	0.008764	33.32107	66.64214
J	100	19	0.012908	49.07755	98.15509
J	130	49.85	0.033868	128.764	257.528
J	140	18.7	0.012705	48.30264	96.60527
J	160	32.35	0.021978	83.56098	167.122
J	170	15.8	0.010734	40.81185	81.62371
J	190	12.3	0.008357	31.77125	63.54251
J	200	17.95	0.012195	46.36537	92.73073
J	210	26.4	0.017936	68.19196	136.3839
J	220	17.05	0.011584	44.04064	88.08128
J	230	15.9	0.010802	41.07016	82.14031
J	240	13.8	0.009376	35.6458	71.29159
J	250	18.9	0.012841	48.81924	97.63849
J	260	15.3	0.010395	39.52034	79.04068
J	300	47.05	0.031965	121.5315	243.063
J	320	151.75	0.103098	391.9746	783.9492
J	350	157.9	0.107276	407.8602	815.7205
J	380	44.85	0.030471	115.8488	231.6977
J	400	24.75	0.016815	63.92996	127.8599
J	410	52.5	0.035668	135.609	271.218
J	420	26.75	0.018174	69.09602	138.192
J	430	27.8	0.018887	71.8082	143.6164
J	440	25.9	0.017596	66.90044	133.8009
J	450	24.4	0.016577	63.0259	126.0518
J	470	11.9	0.008085	30.73804	61.47608
J	490	17.47	0.011869	45.12551	90.25102
J	500	17.46	0.011862	45.09968	90.19936
J	510	58.3	0.039609	150.5906	301.1812
J	540	15.9	0.010802	41.07016	82.14031
J	550	14.3	0.009715	36.93731	73.87462
J	570	79.9	0.054284	206.384	412.768
J	610	49.3	0.033494	127.3433	254.6866
J	620	10.7	0.00727	27.63841	55.27682
J	680	26.6	0.018072	68.70856	137.4171
J	690	17.47	0.011869	45.12551	90.25102
J	730	79.05	0.053706	204.1884	408.3768
J	770	25.3	0.017189	65.35063	130.7013
J	800	12	0.008153	30.99634	61.99269
J	810	19.8	0.013452	51.14397	102.2879
J	820	49.1	0.033358	126.8267	253.6534
J	830	71.5	0.048577	184.6866	369.3731
Totals		1471.9	1.000000	3801.96	7603.92

**Metro Air Park**  
**Interim Node Distribution Spread**  
**Phase 5**

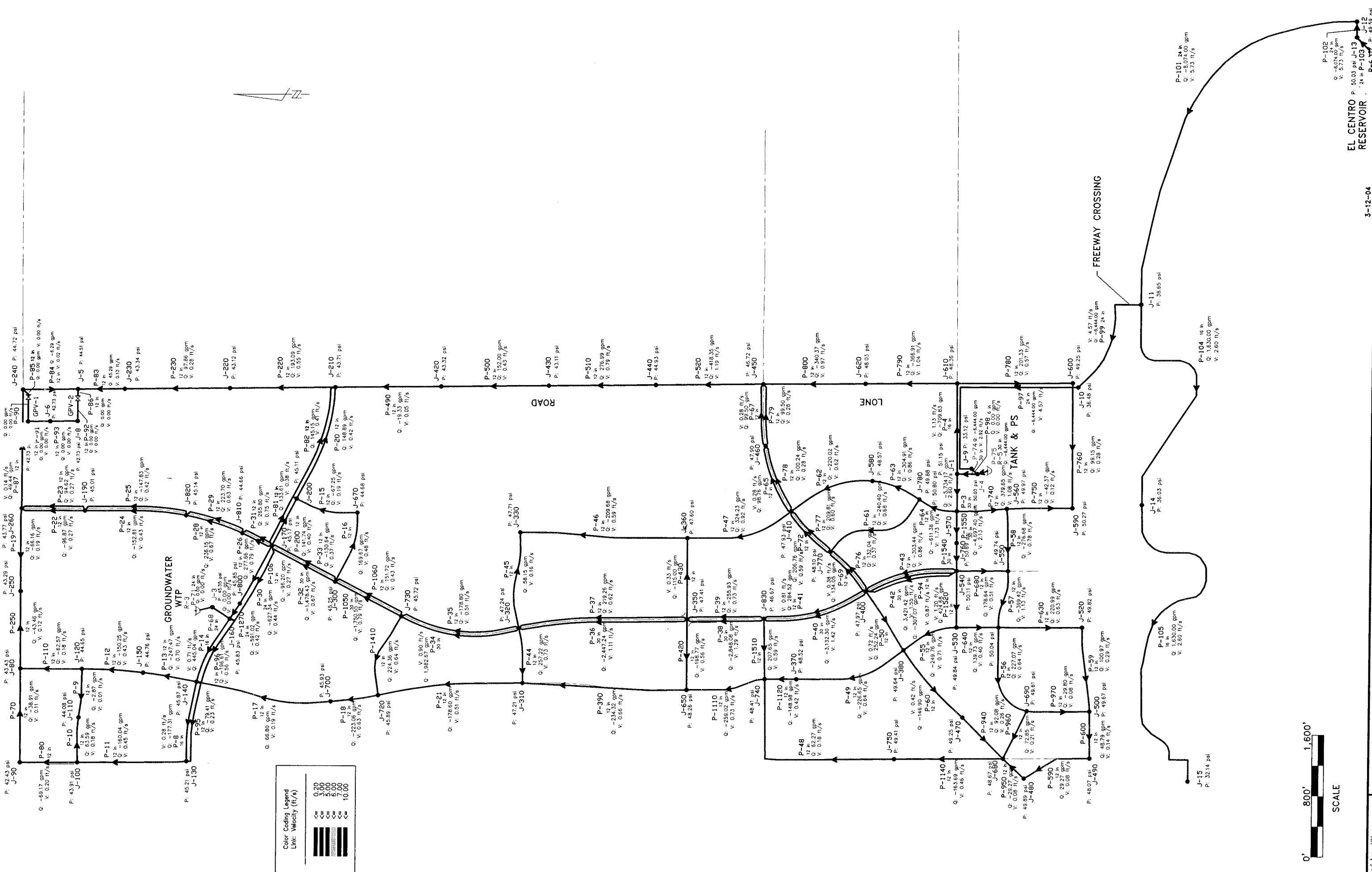
Modified for parallel mains in Metro Parkway

2/20/2004

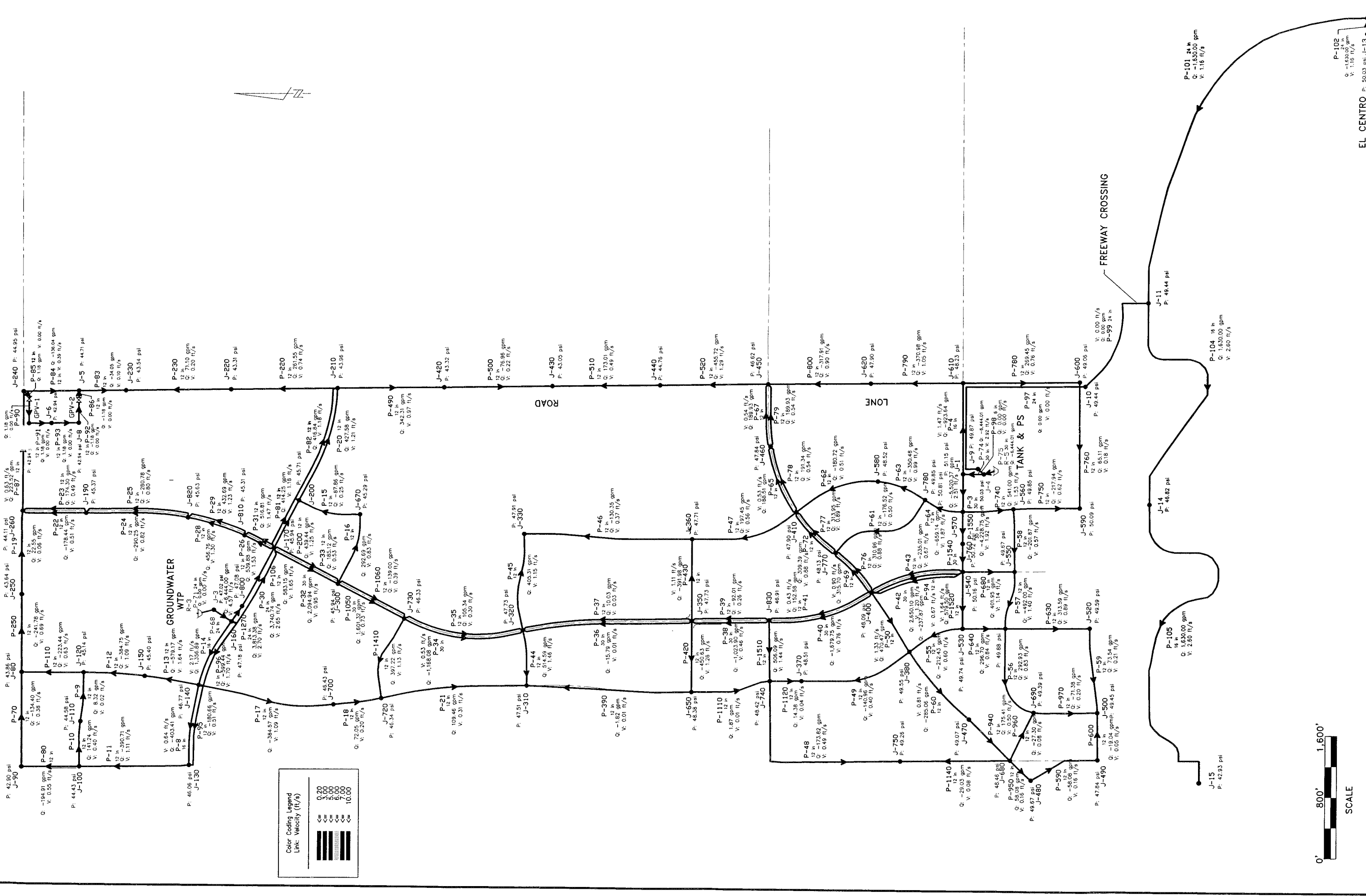
		Interim Q= 5090.76 gpm			
	Node	Acres		MDD	PHD
J	1	0	0	0	0
J	80	26	0.017664	89.92442	179.8488
J	90	12.9	0.008764	44.61635	89.2327
J	100	19	0.012908	65.714	131.428
J	130	49.85	0.033868	172.4128	344.8256
J	140	18.7	0.012705	64.67641	129.3528
J	160	32.35	0.021978	111.8867	223.7735
J	170	15.8	0.010734	54.64638	109.2928
J	190	12.3	0.008357	42.54117	85.08234
J	200	17.95	0.012195	62.08244	124.1649
J	210	26.4	0.017936	91.30788	182.6158
J	220	17.05	0.011584	58.96967	117.9393
J	230	15.9	0.010802	54.99224	109.9845
J	240	13.8	0.009376	47.72912	95.45823
J	250	18.9	0.012841	65.36814	130.7363
J	260	15.3	0.010395	52.91707	105.8341
J	300	47.05	0.031965	162.7286	325.4572
J	320	151.75	0.103098	524.8474	1049.695
J	350	157.9	0.107276	546.1179	1092.236
J	380	44.85	0.030471	155.1196	310.2393
J	400	24.75	0.016815	85.60113	171.2023
J	410	52.5	0.035668	181.5782	363.1563
J	420	26.75	0.018174	92.5184	185.0368
J	430	27.8	0.018887	96.14996	192.2999
J	440	25.9	0.017596	89.57856	179.1571
J	450	24.4	0.016577	84.39061	168.7812
J	470	11.9	0.008085	41.15772	82.31543
J	490	17.47	0.011869	60.4223	120.8446
J	500	17.46	0.011862	60.38771	120.7754
J	510	58.3	0.039609	201.6382	403.2765
J	540	15.9	0.010802	54.99224	109.9845
J	550	14.3	0.009715	49.45843	98.91687
J	570	79.9	0.054284	276.3447	552.6893
J	610	49.3	0.033494	170.5105	341.0211
J	620	10.7	0.00727	37.00736	74.01472
J	680	26.6	0.018072	91.9996	183.9992
J	690	17.47	0.011869	60.4223	120.8446
J	730	79.05	0.053706	273.4048	546.8097
J	770	25.3	0.017189	87.50338	175.0068
J	800	12	0.008153	41.50358	83.00716
J	810	19.8	0.013452	68.48091	136.9618
J	820	49.1	0.033358	169.8188	339.6376
J	830	71.5	0.048577	247.2922	494.5843
Totals		1471.9	1.0000000	5090.76	10181.52

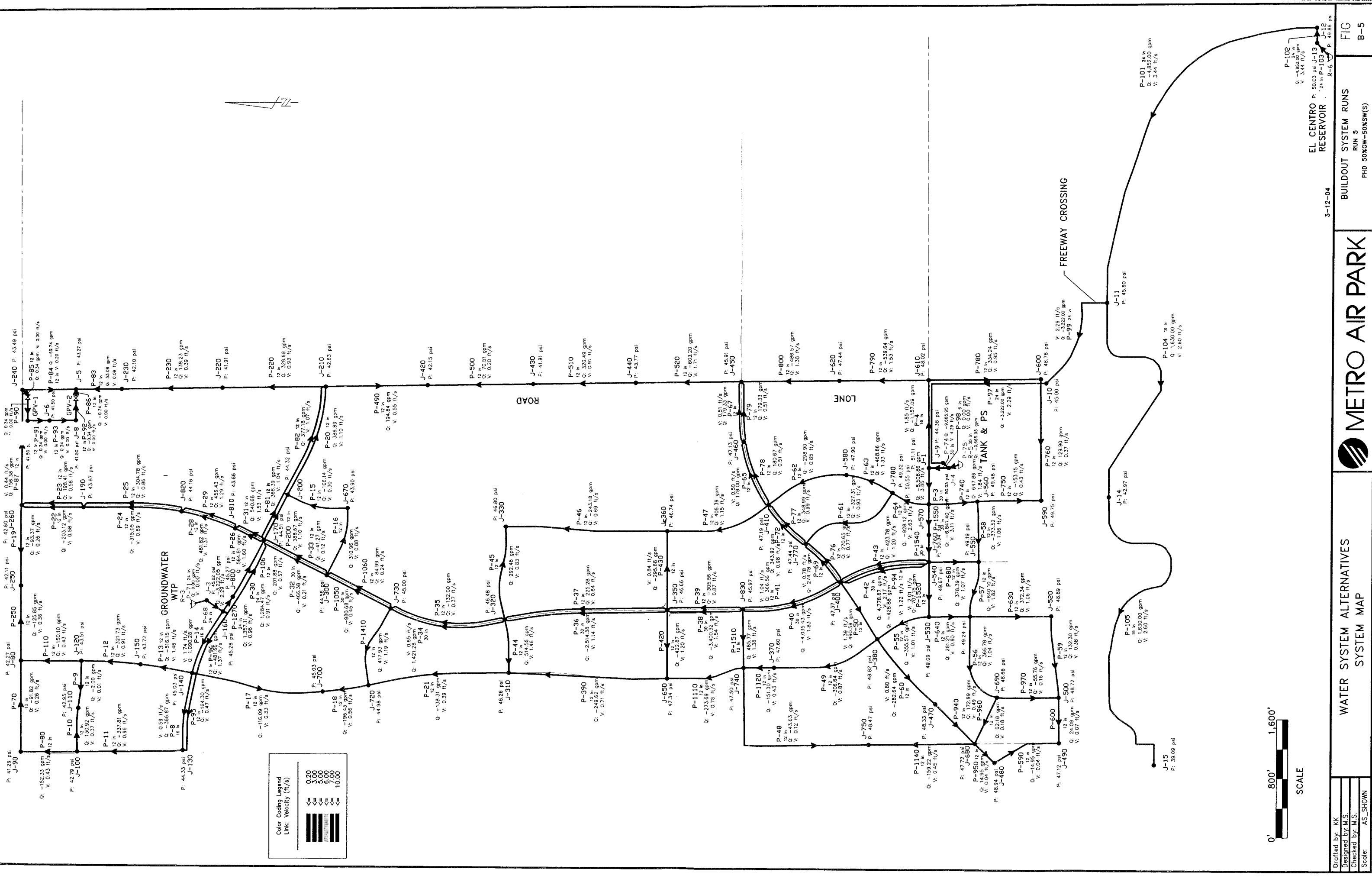


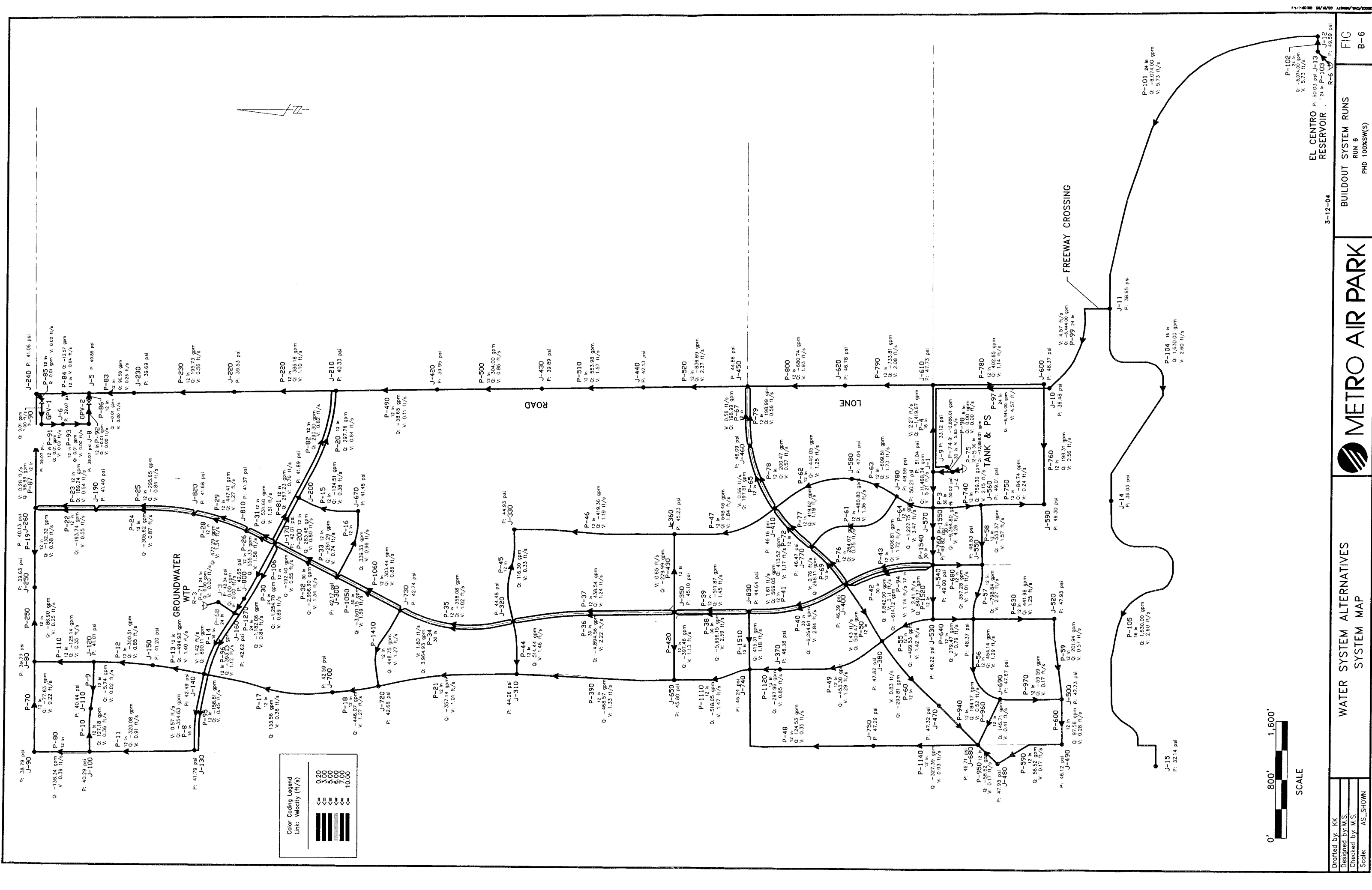










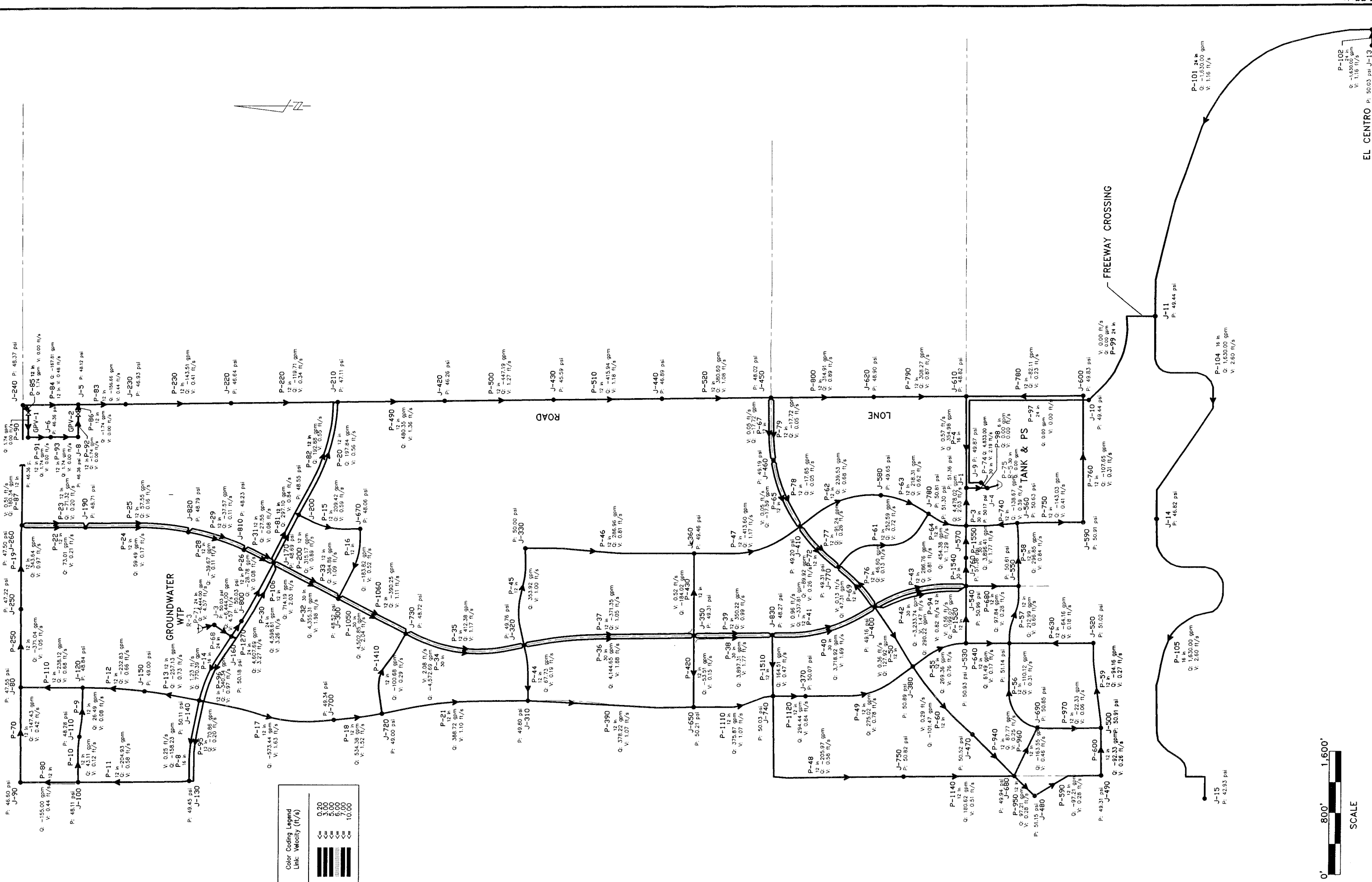


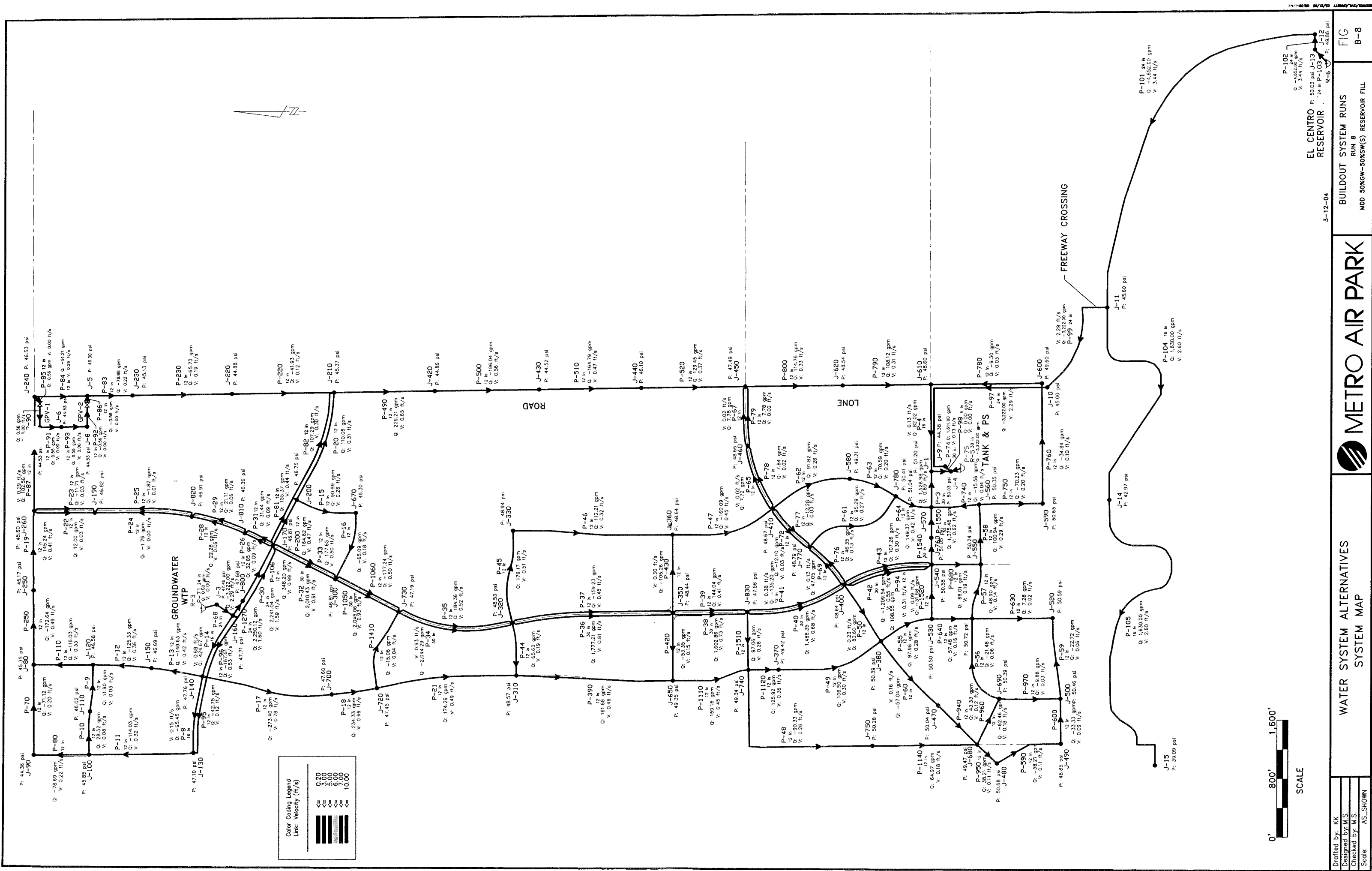
Drafted by: KK  
Designed by: M.S.  
Checked by: M.S.  
Scale: AS SHOWN

WATER SYSTEM ALTERNATIVES  
SYSTEM MAP



BUILDOUT SYSTEM RUNS  
RUN 6  
PHD 100XSW(S)



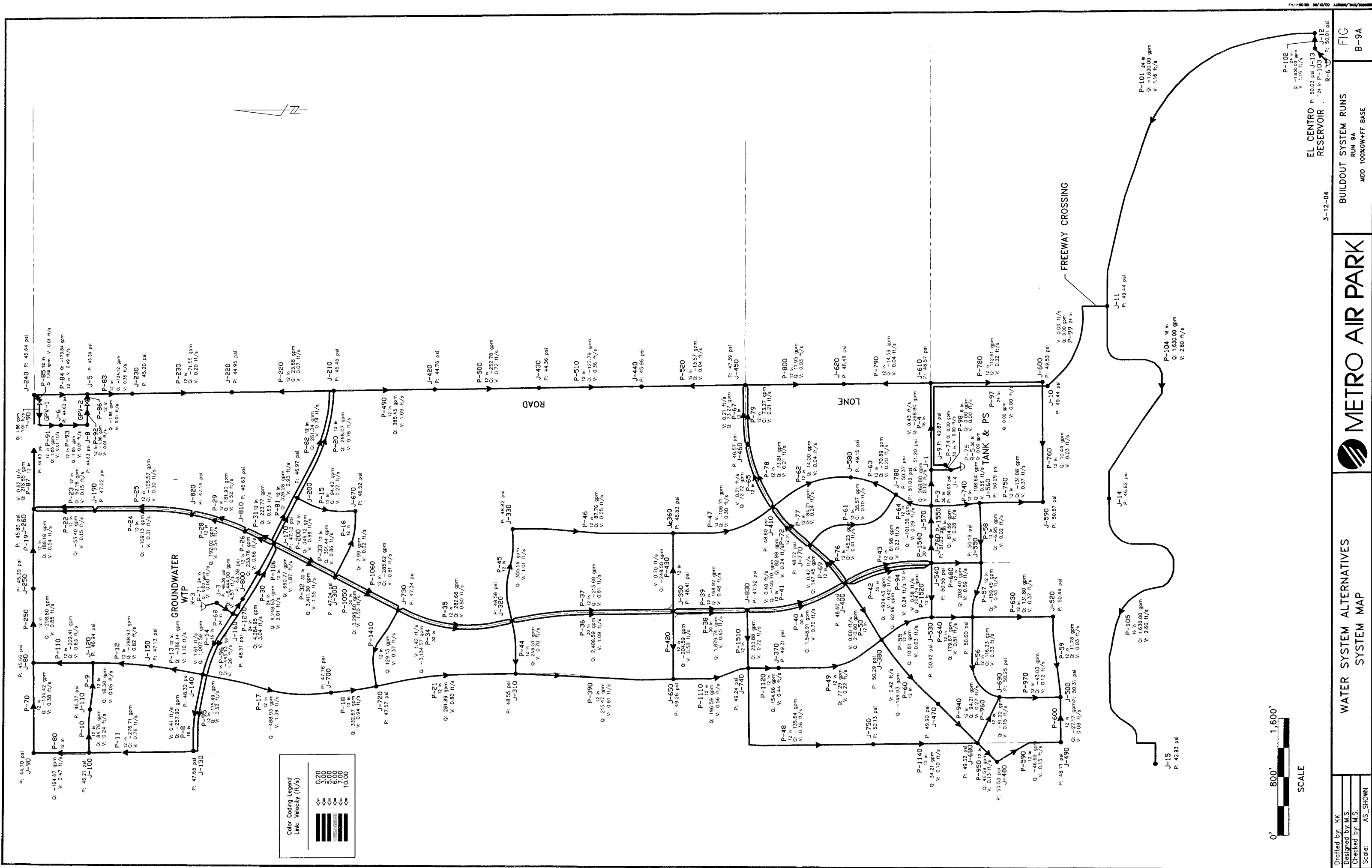


Drafted by: KK  
Designed by: M.S.  
Checked by: M.S.  
Scale: AS SHOWN

WATER SYSTEM ALTERNATIVES  
SYSTEM MAP



BUILDOUT SYSTEM RUNS  
RUN 8  
MOD 50XGW-50XSW(S) RESERVOIR FILL



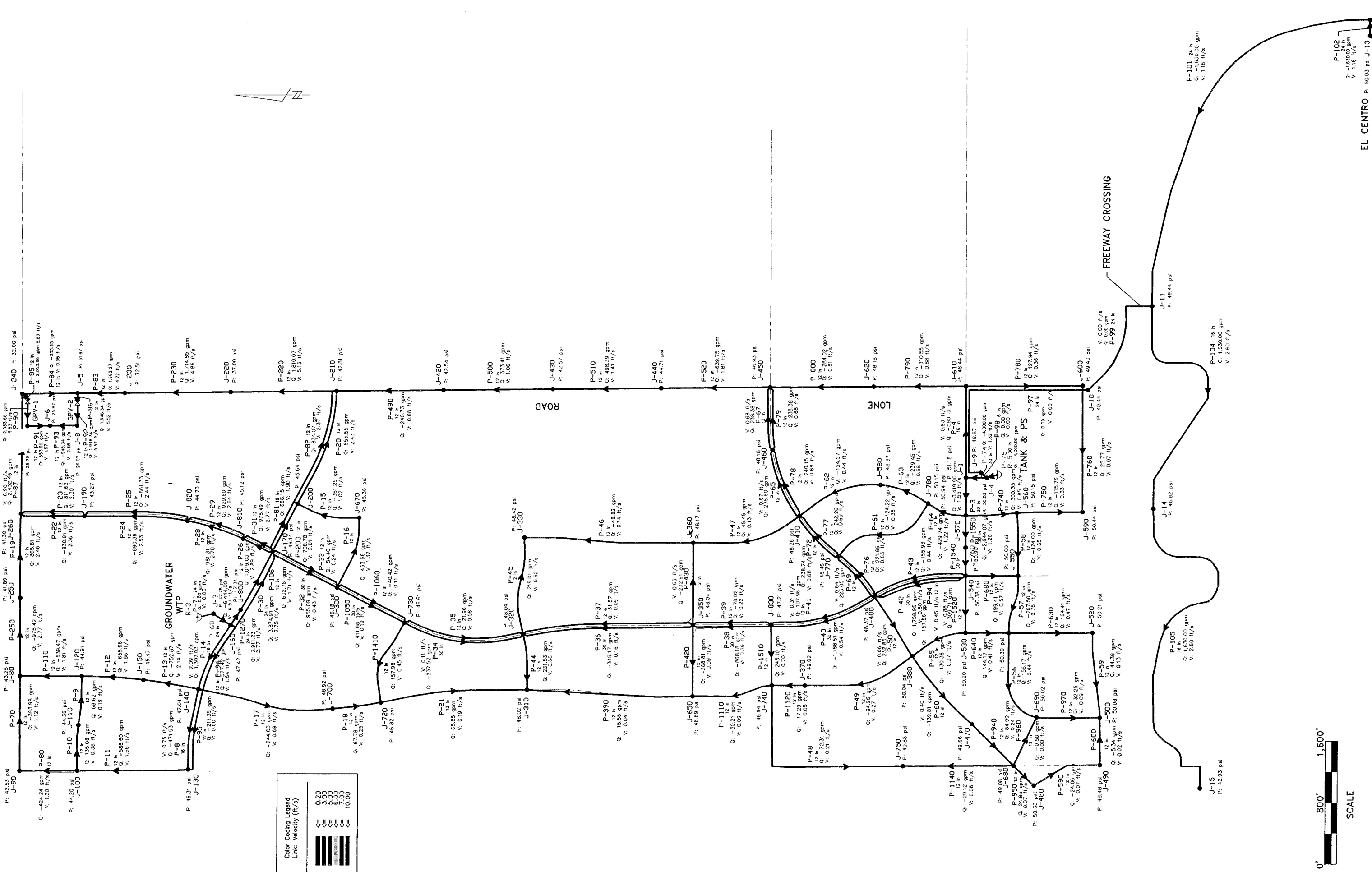
Drafted by: KK  
Designed by: M.S.  
Checked by: M.S.  
Scale: AS SHOWN

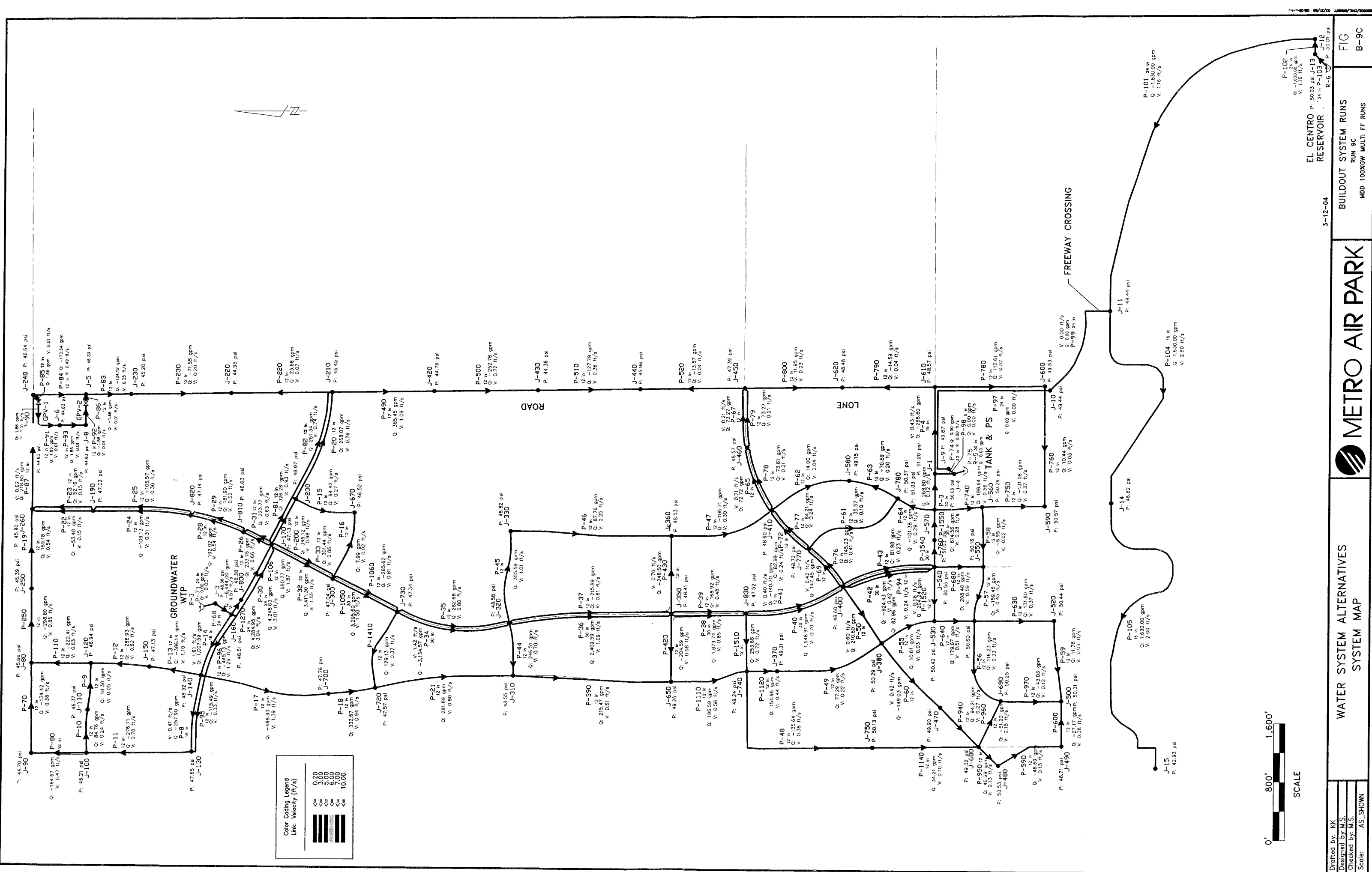
WATER SYSTEM ALTERNATIVES  
SYSTEM MAP



BUILDOUT SYSTEM RUNS  
RUN 9A  
MOD 100%GW+FF BASE







Drafted by: KK  
Designed by: M.S.  
Checked by: M.S.  
Scale: AS SHOWN

WATER SYSTEM ALTERNATIVES  
SYSTEM MAP

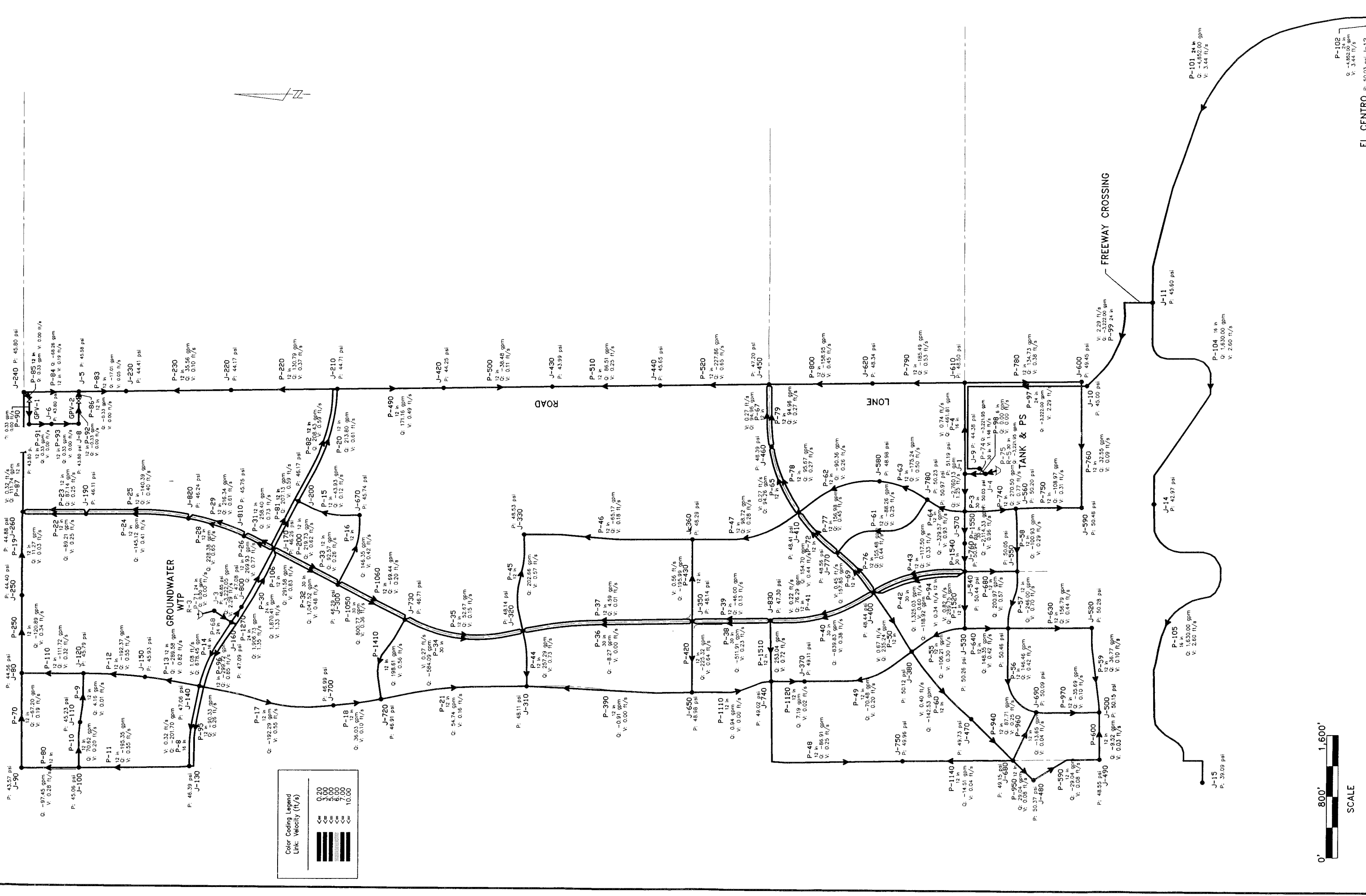


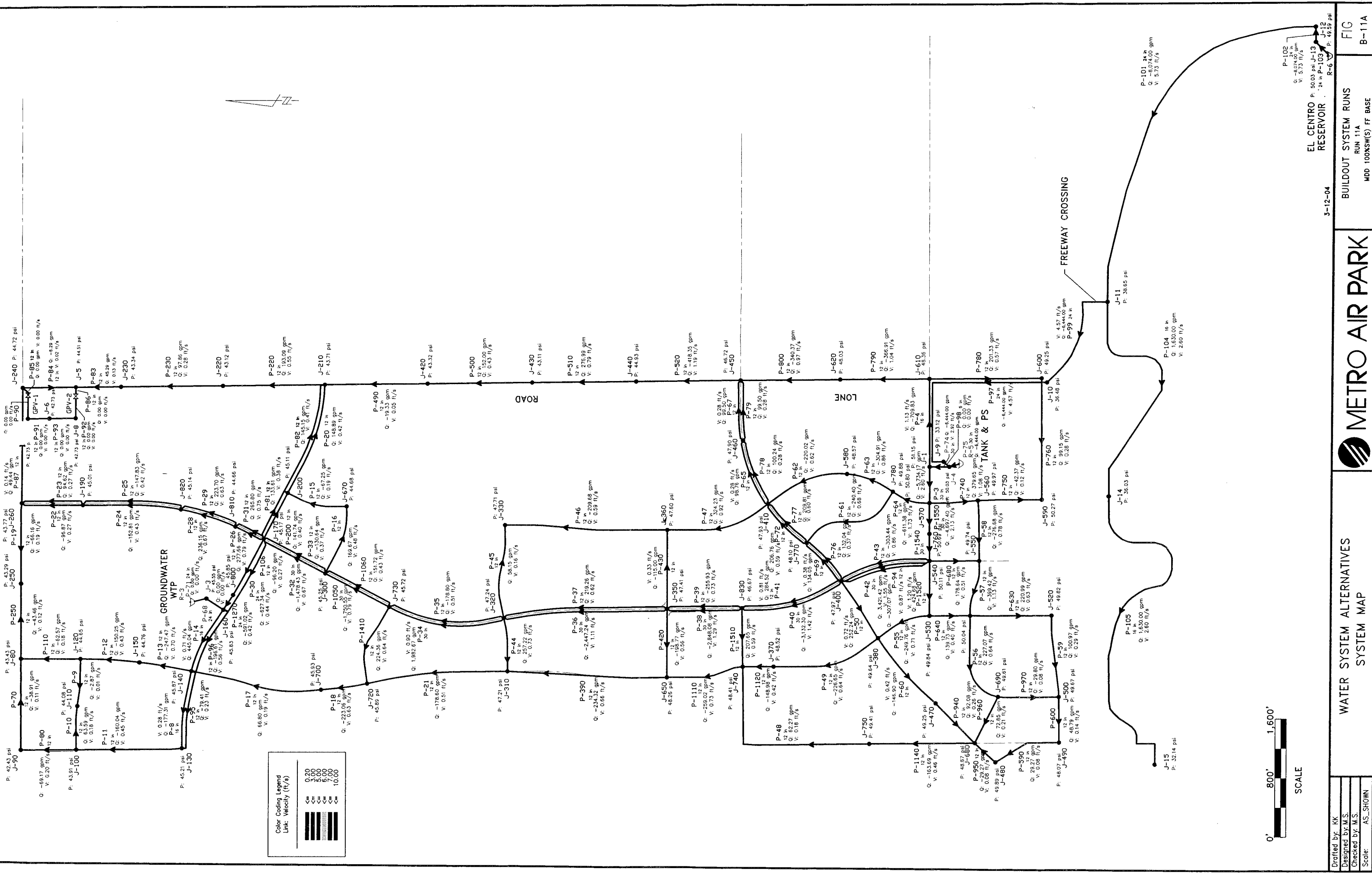
BUILDOUT SYSTEM RUNS  
RUN 9C  
MDD 100XGW MULTI FF RUNS

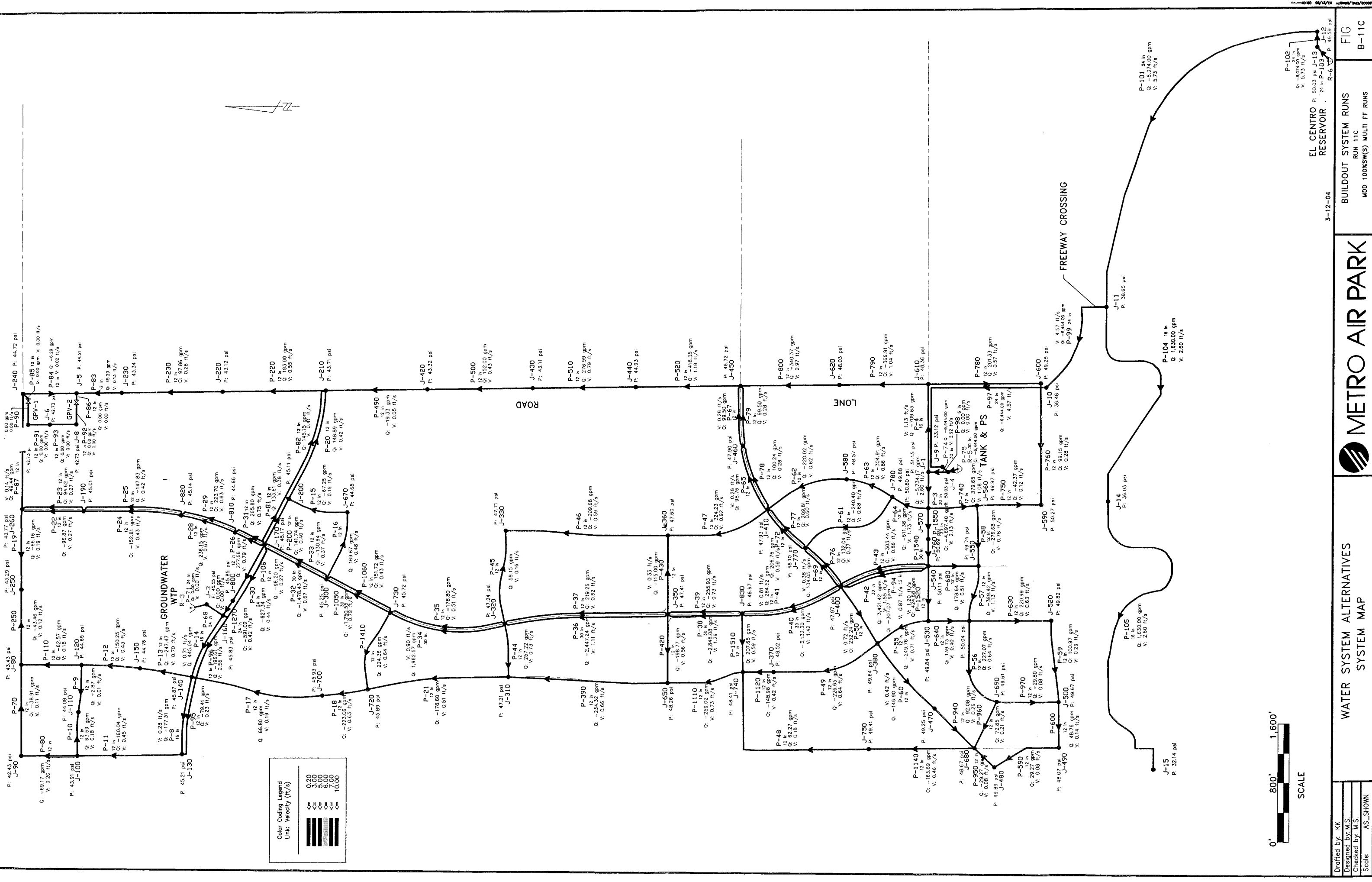
FIG  
B-9C



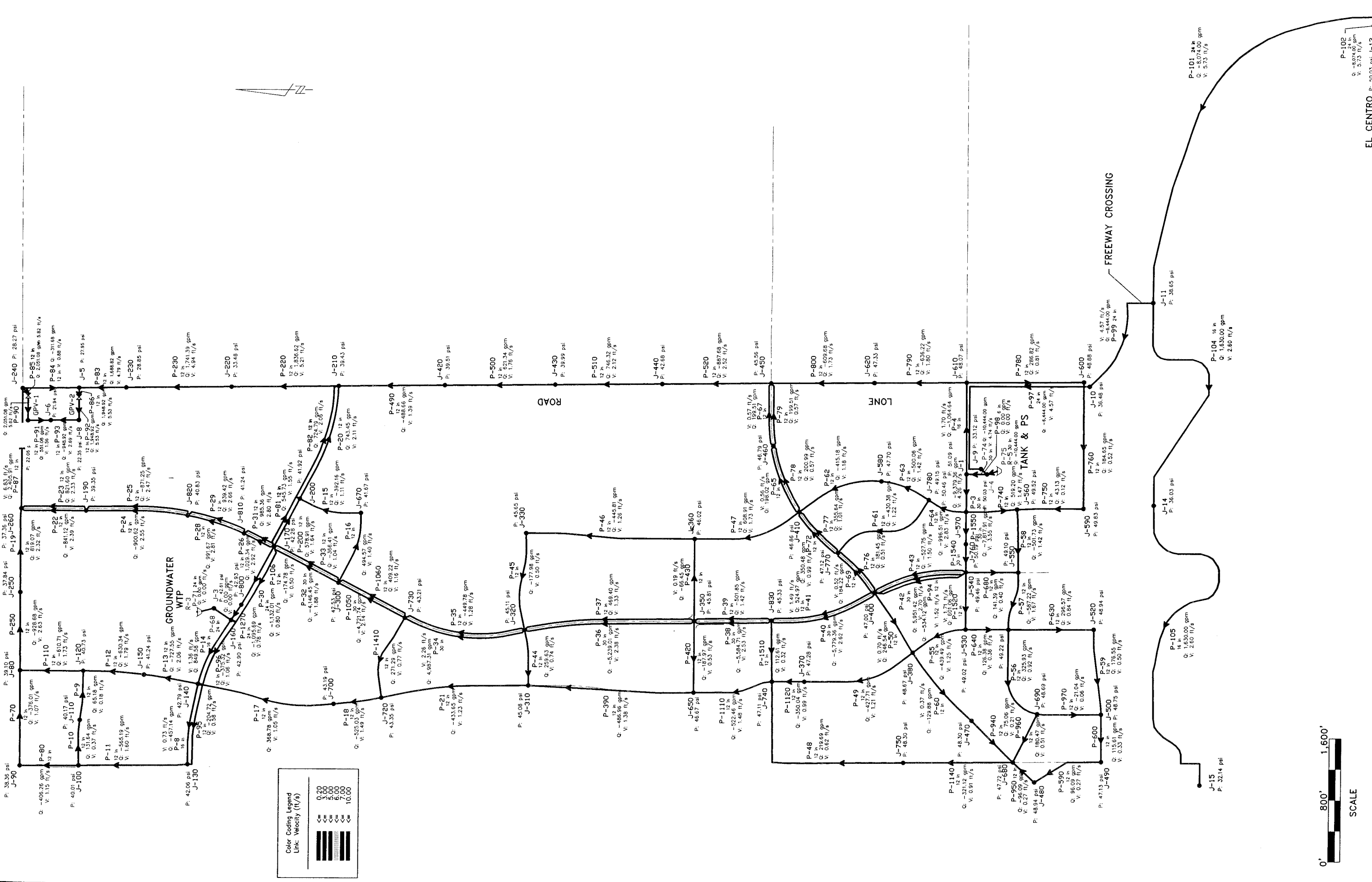












# Scenario: Run 1-MDD-100%GW

## Steady State Analysis

### Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-1	9.30	1	Demand	0.00	Fixed	0.00	131.25	52.87
J-3	19.50	Zone-1	Demand	0.00	Fixed	0.00	134.90	50.03
J-4	12.00	Zone-1	Demand	0.00	Fixed	0.00	131.25	51.70
J-5	21.50	Zone-1	Demand	51.58	Fixed	51.58	132.36	48.06
J-6	21.00	Zone-1	Demand	0.00	Fixed	0.00	127.80	46.30
J-7	21.00	Zone-1	Demand	0.00	Fixed	0.00	127.80	46.30
J-8	21.00	Zone-1	Demand	0.00	Fixed	0.00	127.80	46.30
J-9	12.00	Zone-1	Demand	0.00	Fixed	0.00	127.04	49.87
J-10	13.00	Zone-1	Demand	0.00	Fixed	0.00	127.04	49.44
J-11	13.00	Zone-1	Demand	0.00	Fixed	0.00	127.04	49.44
J-12	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.35	50.01
J-13	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.40	50.03
J-14	13.00	Zone-1	Demand	0.00	Fixed	0.00	121.00	46.82
J-15	13.00	Zone-1	Demand	1,630.00	Fixed	1,630.00	112.04	42.93
J-80	24.00	1	Demand	58.03	Pattern - 1	58.03	133.18	47.33
J-90	26.30	1	Demand	30.25	Pattern - 1	30.25	133.27	46.37
J-100	22.90	1	Demand	27.28	Pattern - 1	27.28	133.34	47.88
J-110	22.50	1	Demand	66.46	Pattern - 1	66.46	133.33	48.04
J-120	21.20	1	Demand	84.81	Pattern - 1	84.81	133.32	48.61
J-130	20.10	1	Demand	96.68	Pattern - 1	96.68	133.86	49.32
J-140	18.60	1	Demand	204.26	Pattern - 1	204.26	133.92	49.99
J-150	21.00	1	Demand	97.21	Pattern - 1	97.21	133.56	48.80
J-160	18.85	1	Demand	45.57	Pattern - 1	45.57	134.60	50.18
J-170	20.42	1	Demand	66.73	Pattern - 1	66.73	132.98	48.80
J-190	20.40	1	Demand	109.15	Pattern - 1	109.15	132.72	48.69
J-200	20.50	1	Demand	48.57	Pattern - 1	48.57	132.69	48.64
J-210	23.60	1	Demand	120.28	Pattern - 1	120.28	132.29	47.12
J-220	24.75	1	Demand	95.23	Pattern - 1	95.23	132.29	46.62
J-230	24.20	1	Demand	52.57	Pattern - 1	52.57	132.32	46.87
J-240	21.00	1	Demand	43.15	Pattern - 1	43.15	132.44	48.31
J-250	24.30	1	Demand	109.61	Pattern - 1	109.61	132.86	47.06
J-260	23.21	1	Demand	75.89	Pattern - 1	75.89	132.71	47.47
J-300	20.30	1	Demand	123.53	Pattern - 1	123.53	132.66	48.71
J-310	15.90	1	Demand	312.93	Pattern - 1	312.93	131.75	50.22
J-320	16.00	1	Demand	189.67	Pattern - 1	189.67	131.91	50.25
J-330	14.90	1	Demand	267.83	Pattern - 1	267.83	131.36	50.49
J-350	16.00	1	Demand	123.74	Pattern - 1	123.74	131.52	50.08
J-360	15.50	1	Demand	229.54	Pattern - 1	229.54	131.29	50.20
J-370	13.60	1	Demand	77.67	Pattern - 1	77.67	131.19	50.98
J-380	11.30	1	Demand	128.44	Pattern - 1	128.44	131.15	51.96
J-400	15.35	1	Demand	96.76	Pattern - 1	96.76	131.30	50.27
J-410	15.27	1	Demand	113.38	Pattern - 1	113.38	131.22	50.27
J-420	24.50	1	Demand	132.68	Pattern - 1	132.68	131.59	46.43
J-430	25.10	1	Demand	124.99	Pattern - 1	124.99	131.27	46.03
J-440	21.30	1	Demand	141.35	Pattern - 1	141.35	131.18	47.63
J-450	18.00	1	Demand	121.02	Pattern - 1	121.02	131.18	49.06
J-460	15.30	1	Demand	0.00	Pattern - 1	0.00	131.20	50.24
J-470	12.09	1	Demand	54.82	Pattern - 1	54.82	131.05	51.57
J-480	10.60	1	Demand	0.00	Pattern - 1	0.00	131.02	52.20
J-490	14.80	1	Demand	19.52	Pattern - 1	19.52	131.01	50.38
J-500	11.10	1	Demand	81.98	Pattern - 1	81.98	131.01	51.98
J-510	10.50	1	Demand	91.09	Pattern - 1	91.09	131.08	52.27

**Scenario: Run 1-MDD-100%GW**  
**Steady State Analysis**  
**Junction Report**

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-520	10.80	1	Demand	120.02	Pattern - 1	120.02	131.01	52.11
J-530	11.00	1	Demand	35.19	Pattern - 1	35.19	131.15	52.09
J-540	10.82	1	Demand	27.37	Pattern - 1	27.37	131.26	52.22
J-550	11.60	1	Demand	55.91	Pattern - 1	55.91	131.16	51.83
J-560	11.30	1	Demand	60.60	Pattern - 1	60.60	131.16	51.96
J-570	9.70	1	Demand	45.74	Pattern - 1	45.74	131.25	52.70
J-580	14.00	1	Demand	84.88	Pattern - 1	84.88	131.22	50.82
J-590	10.60	1	Demand	141.52	Pattern - 1	141.52	131.10	52.24
J-600	13.00	1	Demand	102.17	Pattern - 1	102.17	131.10	51.20
J-610	15.30	1	Demand	141.60	Pattern - 1	141.60	131.18	50.23
J-620	15.50	1	Demand	26.54	Pattern - 1	26.53	131.18	50.15
J-650	13.90	1	Demand	223.47	Pattern - 1	223.47	131.38	50.93
J-670	21.50	1	Demand	102.41	Pattern - 1	102.41	132.66	48.19
J-680	13.40	1	Demand	30.50	Pattern - 1	30.50	131.02	50.99
J-690	11.25	1	Demand	124.42	Pattern - 1	124.42	131.01	51.92
J-700	18.50	1	Demand	156.26	Pattern - 1	156.26	132.53	49.43
J-720	18.70	1	Demand	179.91	Pattern - 1	179.91	132.29	49.24
J-730	19.31	1	Demand	34.84	Pattern - 1	34.84	132.36	49.01
J-740	13.80	1	Demand	159.87	Pattern - 1	159.87	131.23	50.91
J-750	11.55	1	Demand	101.43	Pattern - 1	101.43	131.03	51.80
J-760	9.70	1	Demand	34.79	Pattern - 1	34.79	131.26	52.70
J-770	15.00	1	Demand	89.92	Pattern - 1	89.92	131.24	50.39
J-780	11.20	1	Demand	66.07	Pattern - 1	66.07	131.23	52.04
J-800	18.80	1	Demand	36.32	Pattern - 1	36.32	134.25	50.05
J-810	21.47	1	Demand	83.62	Pattern - 1	83.62	132.89	48.30
J-820	20.20	1	Demand	159.21	Pattern - 1	159.21	132.79	48.81
J-830	17.95	1	Demand	105.17	Pattern - 1	105.17	131.41	49.19

# Scenario: Run 1-MDD-100%GW

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-1510	851.00	12	125.0	0.00	Open	253.88	0.18	0.22	false	0.72
P-1520	800.00	12	125.0	0.00	Open	204.24	0.12	0.14	false	0.58
P-1550	449.00	30	125.0	0.00	Open	614.56	0.01	0.01	false	0.28
P-1540	395.00	30	125.0	0.00	Open	649.36	0.01	0.01	false	0.29
P-1410	1,217.00	12	125.0	0.00	Open	129.13	0.07	0.06	false	0.37
P-1270	257.00	24	125.0	0.00	Open	4,284.95	0.35	1.38	false	3.04
P-1120	447.00	12	125.0	0.00	Open	154.96	0.04	0.09	false	0.44
P-1110	1,139.00	12	125.0	0.00	Open	196.59	0.15	0.13	false	0.56
P-1140	1,540.00	12	125.0	0.00	Open	34.21	0.01	0.01	false	0.10
P-1060	1,125.00	12	125.0	0.00	Open	-285.62	0.30	0.27	false	0.81
P-1050	1,053.00	30	125.0	0.00	Open	3,295.60	0.30	0.29	false	1.50
P-960	746.00	12	125.0	0.00	Open	-51.22	0.01	0.01	false	0.15
P-970	897.00	12	125.0	0.00	Open	-43.03	0.01	0.01	false	0.12
P-950	402.00	12	125.0	0.00	Open	46.69	0.00	0.01	false	0.13
P-940	817.00	12	125.0	0.00	Open	94.21	0.03	0.03	false	0.27
P-590	1,013.00	12	125.0	0.00	Open	-46.69	0.01	0.01	false	0.13
P-600	659.00	12	125.0	0.00	Open	-27.17	0.00	0.00	false	0.08
P-630	1,187.00	12	125.0	0.00	Open	131.80	0.08	0.06	false	0.37
P-750	931.00	12	125.0	0.00	Open	-131.08	0.06	0.06	false	0.37
P-760	1,759.00	12	125.0	0.00	Open	10.44	0.00	0.00	false	0.03
P-780	1,638.00	12	125.0	0.00	Open	112.61	0.08	0.05	false	0.32
P-790	1,293.00	12	125.0	0.00	Open	-14.59	0.00	0.00	false	0.04
P-800	1,439.00	12	125.0	0.00	Open	11.95	0.00	0.00	false	0.03
P-740	709.00	12	125.0	0.00	Open	198.64	0.10	0.14	false	0.56
P-640	597.00	12	125.0	0.00	Open	179.67	0.07	0.11	false	0.51
P-680	726.00	12	125.0	0.00	Open	208.40	0.11	0.15	false	0.59
P-420	996.00	12	125.0	0.00	Open	-204.59	0.14	0.14	false	0.58
P-390	2,320.00	12	125.0	0.00	Open	215.47	0.37	0.16	false	0.61
P-510	1,511.00	12	125.0	0.00	Open	-127.79	0.09	0.06	false	0.36
P-520	1,532.00	12	125.0	0.00	Open	-13.57	0.00	0.00	false	0.04
P-430	1,150.00	12	125.0	0.00	Open	-248.50	0.24	0.21	false	0.70
P-230	1,475.00	12	125.0	0.00	Open	-71.55	0.03	0.02	false	0.20
P-220	1,496.00	12	125.0	0.00	Open	23.68	0.00	0.00	false	0.07
P-200	753.00	12	125.0	0.00	Open	346.12	0.29	0.38	false	0.98
P-87	1,673.00	12	125.0	0.00	Open	218.85	0.27	0.16	false	0.62
P-70	1,321.00	12	125.0	0.00	Open	-134.42	0.09	0.07	false	0.38
P-110	870.00	12	125.0	0.00	Open	-222.41	0.15	0.17	false	0.63
P-80	808.00	12	125.0	0.00	Open	-164.67	0.08	0.10	false	0.47
P-250	1,092.00	12	125.0	0.00	Open	-298.80	0.32	0.29	false	0.85
P-3	527.00	30	125.0	0.00	Open	268.80	0.00	0.00	false	0.12
P-4	1,274.00	16	125.0	0.00	Open	-268.80	0.08	0.06	false	0.43
P-8	1,129.00	16	125.0	0.00	Open	-257.90	0.06	0.05	false	0.41
P-9	685.00	12	125.0	0.00	Open	18.30	0.00	0.00	false	0.05
P-10	634.00	12	125.0	0.00	Open	84.76	0.02	0.03	false	0.24
P-11	2,034.00	12	125.0	0.00	Open	-276.71	0.51	0.25	false	0.78
P-12	860.00	12	125.0	0.00	Open	-288.93	0.24	0.27	false	0.82
P-13	767.00	12	125.0	0.00	Open	-386.14	0.36	0.47	false	1.10
P-14	1,007.00	16	125.0	0.00	Open	1,007.59	0.69	0.68	false	1.61
P-15	898.00	12	125.0	0.00	Open	94.42	0.03	0.03	false	0.27
P-16	1,041.00	12	125.0	0.00	Open	7.99	0.00	0.00	false	0.02
P-17	1,922.00	12	125.0	0.00	Open	-488.93	1.39	0.72	false	1.39

# Scenario: Run 1-MDD-100%GW

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen-Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-18	676.00	12	125.0	0.00	Open	332.67	0.24	0.35	false	0.94
P-19	1,174.00	12	125.0	0.00	Open	189.18	0.15	0.12	false	0.54
P-20	1,680.00	12	125.0	0.00	Open	268.07	0.40	0.24	false	0.76
P-490	1,505.00	12	125.0	0.00	Open	385.45	0.70	0.47	false	1.09
P-500	1,520.00	12	125.0	0.00	Open	-252.78	0.32	0.21	false	0.72
P-21	2,057.00	12	125.0	0.00	Open	281.89	0.54	0.26	false	0.80
P-22	900.00	12	125.0	0.00	Open	-53.40	0.01	0.01	false	0.15
P-23	940.00	12	125.0	0.00	Open	52.16	0.01	0.01	false	0.15
P-24	1,437.00	12	125.0	0.00	Open	-109.13	0.06	0.05	false	0.31
P-25	1,528.00	12	125.0	0.00	Open	-105.57	0.06	0.04	false	0.30
P-26	463.00	12	125.0	0.00	Open	233.76	0.09	0.18	false	0.66
P-28	825.00	12	125.0	0.00	Open	192.02	0.11	0.13	false	0.54
P-29	912.00	12	125.0	0.00	Open	181.90	0.11	0.12	false	0.52
P-30	935.00	24	125.0	0.00	Open	4,248.63	1.27	1.36	false	3.01
P-31	502.00	12	125.0	0.00	Open	223.77	0.09	0.17	false	0.63
P-32	1,044.00	30	125.0	0.00	Open	3,411.30	0.32	0.30	false	1.55
P-33	1,076.00	12	125.0	0.00	Open	301.44	0.32	0.30	false	0.86
P-34	1,740.00	30	125.0	0.00	Open	-3,134.57	0.45	0.26	false	1.42
P-35	1,727.00	12	125.0	0.00	Open	282.68	0.45	0.26	false	0.80
P-36	2,395.00	30	125.0	0.00	Open	2,409.59	0.38	0.16	false	1.09
P-37	2,406.00	12	125.0	0.00	Open	-215.89	0.38	0.16	false	0.61
P-38	1,120.00	30	125.0	0.00	Open	1,879.74	0.11	0.10	false	0.85
P-39	1,119.00	12	125.0	0.00	Open	168.92	0.11	0.10	false	0.48
P-40	1,551.00	30	125.0	0.00	Open	1,548.92	0.11	0.07	false	0.70
P-41	1,519.00	12	125.0	0.00	Open	-140.70	0.11	0.07	false	0.40
P-42	1,335.00	30	125.0	0.00	Open	-924.43	0.04	0.03	false	0.42
P-43	1,367.00	12	125.0	0.00	Open	81.98	0.04	0.03	false	0.23
P-44	779.00	12	125.0	0.00	Open	246.51	0.16	0.20	false	0.70
P-45	1,370.00	12	125.0	0.00	Open	355.59	0.55	0.40	false	1.01
P-46	2,363.00	12	125.0	0.00	Open	87.76	0.07	0.03	false	0.25
P-47	1,575.00	12	125.0	0.00	Open	-106.71	0.07	0.04	false	0.30
P-48	2,947.00	12	125.0	0.00	Open	-135.64	0.20	0.07	false	0.38
P-49	1,627.00	12	125.0	0.00	Open	77.29	0.04	0.02	false	0.22
P-50	989.00	12	125.0	0.00	Open	210.80	0.15	0.15	false	0.60
P-55	829.00	12	125.0	0.00	Open	10.61	0.00	0.00	false	0.03
P-56	1,373.00	12	125.0	0.00	Open	116.23	0.07	0.05	false	0.33
P-57	818.00	12	125.0	0.00	Open	-159.45	0.07	0.09	false	0.45
P-58	881.00	12	125.0	0.00	Open	-6.95	0.00	0.00	false	0.02
P-59	1,189.00	12	125.0	0.00	Open	11.78	0.00	0.00	false	0.03
P-60	1,264.00	12	125.0	0.00	Open	-149.03	0.10	0.08	false	0.42
P-61	1,571.00	12	125.0	0.00	Open	35.57	0.01	0.01	false	0.10
P-62	1,256.00	12	125.0	0.00	Open	14.00	0.00	0.00	false	0.04
P-63	726.00	12	125.0	0.00	Open	-70.89	0.01	0.02	false	0.20
P-64	563.00	12	125.0	0.00	Open	-101.38	0.02	0.04	false	0.29
P-65	1,029.00	12	125.0	0.00	Open	72.72	0.02	0.02	false	0.21
P-67	900.00	12	125.0	0.00	Open	73.27	0.02	0.02	false	0.21
P-69	773.00	12	125.0	0.00	Open	147.45	0.06	0.08	false	0.42
P-72	823.00	12	125.0	0.00	Open	82.98	0.02	0.03	false	0.24
P-68	100.00	24	125.0	0.00	Open	-6,444.00	0.29	2.94	true	4.57
P-71	1.00	24	125.0	0.00	Open	-6,444.00	0.00	2.93	true	4.57
P-74	100.00	30	125.0	0.00	Open	0.00	0.00	0.00	true	0.00

# Scenario: Run 1-MDD-100%GW

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-75	3.00	30	125.0	0.00	Closed	0.00	0.00	0.00	true	0.00
P-76	795.00	12	125.0	0.00	Open	145.23	0.06	0.08	false	0.41
P-77	801.00	12	125.0	0.00	Open	84.21	0.02	0.03	false	0.24
P-78	1,001.00	12	125.0	0.00	Open	73.81	0.02	0.02	false	0.21
P-79	900.00	12	125.0	0.00	Open	73.27	0.02	0.02	false	0.21
P-81	840.00	12	125.0	0.00	Open	326.28	0.29	0.34	false	0.93
P-82	1,761.00	12	125.0	0.00	Open	261.34	0.40	0.23	false	0.74
P-83	665.00	12	125.0	0.00	Open	-124.12	0.04	0.06	false	0.35
P-84	775.00	12	125.0	0.00	Open	-173.84	0.08	0.11	false	0.49
P-85	139.00	12	125.0	0.00	Open	1.86	0.00	0.00	false	0.01
P-86	130.00	12	125.0	0.00	Open	-1.86	0.00	0.00	false	0.01
P-90	345.00	12	125.0	0.00	Open	1.86	0.00	0.00	false	0.01
P-91	318.00	12	125.0	0.00	Open	1.86	0.00	0.00	false	0.01
P-92	320.00	12	125.0	0.00	Open	-1.86	0.00	0.00	false	0.01
P-93	382.00	12	125.0	0.00	Open	1.86	0.00	0.00	false	0.01
P-94	1,337.00	12	125.0	0.00	Open	82.96	0.04	0.03	false	0.24
P-95	1,231.00	12	125.0	0.00	Open	-115.49	0.06	0.05	false	0.33
P-96	1,126.00	12	125.0	0.00	Open	-445.13	0.69	0.61	false	1.26
P-97	2,986.00	24	125.0	0.00	Open	0.00	0.00	0.00	false	0.00
P-98	113.00	6	130.0	0.00	Closed	0.00	0.00	0.00	false	0.00
P-99	1,701.00	24	125.0	0.00	Open	0.00	0.00	0.00	false	0.00
P-101	5,665.00	24	125.0	0.00	Open	-1,630.00	1.30	0.23	false	1.16
P-102	224.00	24	125.0	0.00	Open	-1,630.00	0.05	0.23	false	1.16
P-103	1.00	24	125.0	0.00	Open	-1,630.00	0.00	0.23	true	1.16
P-104	3,645.00	16	125.0	0.00	Open	1,630.00	6.05	1.66	false	2.60
P-105	5,402.00	16	125.0	0.00	Open	1,630.00	8.96	1.66	false	2.60
P-106	1,283.00	12	125.0	0.00	Open	660.77	1.62	1.27	false	1.87

# Scenario: Run 2-MDD-50%GW-50%SW(S)

## Steady State Analysis

### Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-1	9.30	1	Demand	0.00	Fixed	0.00	127.37	51.19
J-3	19.50	Zone-1	Inflow	3,222.05	Fixed	-3,222.05	127.56	46.85
J-4	12.00	Zone-1	Demand	0.00	Fixed	0.00	127.40	50.03
J-5	21.50	Zone-1	Demand	51.58	Fixed	51.58	126.63	45.58
J-6	21.00	Zone-1	Demand	0.00	Fixed	0.00	122.04	43.80
J-7	21.00	Zone-1	Demand	0.00	Fixed	0.00	122.04	43.80
J-8	21.00	Zone-1	Demand	0.00	Fixed	0.00	122.04	43.80
J-9	12.00	Zone-1	Demand	3,222.00	Fixed	3,222.00	114.37	44.38
J-10	13.00	Zone-1	Demand	0.00	Fixed	0.00	116.79	45.00
J-11	13.00	Zone-1	Demand	0.00	Fixed	0.00	118.18	45.60
J-12	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.01	49.86
J-13	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.40	50.03
J-14	13.00	Zone-1	Demand	0.00	Fixed	0.00	112.13	42.97
J-15	13.00	Zone-1	Demand	1,630.00	Fixed	1,630.00	103.17	39.09
J-80	24.00	1	Demand	58.03	Pattern - 1	58.03	126.79	44.56
J-90	26.30	1	Demand	30.25	Pattern - 1	30.25	126.81	43.57
J-100	22.90	1	Demand	27.28	Pattern - 1	27.28	126.84	45.06
J-110	22.50	1	Demand	66.46	Pattern - 1	66.46	126.83	45.23
J-120	21.20	1	Demand	84.81	Pattern - 1	84.81	126.83	45.79
J-130	20.10	1	Demand	96.68	Pattern - 1	96.68	127.11	46.39
J-140	18.60	1	Demand	204.26	Pattern - 1	204.26	127.15	47.06
J-150	21.00	1	Demand	97.21	Pattern - 1	97.21	126.94	45.93
J-160	18.85	1	Demand	45.57	Pattern - 1	45.57	127.48	47.09
J-170	20.42	1	Demand	66.73	Pattern - 1	66.73	127.12	46.26
J-190	20.40	1	Demand	109.15	Pattern - 1	109.15	126.75	46.11
J-200	20.50	1	Demand	48.57	Pattern - 1	48.57	127.00	46.17
J-210	23.60	1	Demand	120.28	Pattern - 1	120.28	126.73	44.71
J-220	24.75	1	Demand	95.23	Pattern - 1	95.23	126.64	44.17
J-230	24.20	1	Demand	52.57	Pattern - 1	52.57	126.63	44.41
J-240	21.00	1	Demand	43.15	Pattern - 1	43.15	126.65	45.80
J-250	24.30	1	Demand	109.61	Pattern - 1	109.61	126.73	44.40
J-260	23.21	1	Demand	75.89	Pattern - 1	75.89	126.73	44.88
J-300	20.30	1	Demand	123.53	Pattern - 1	123.53	127.08	46.29
J-310	15.90	1	Demand	312.93	Pattern - 1	312.93	126.87	48.11
J-320	16.00	1	Demand	189.67	Pattern - 1	189.67	127.04	48.14
J-330	14.90	1	Demand	267.83	Pattern - 1	267.83	126.85	48.53
J-350	16.00	1	Demand	123.74	Pattern - 1	123.74	127.04	48.14
J-360	15.50	1	Demand	229.54	Pattern - 1	229.54	126.89	48.29
J-370	13.60	1	Demand	77.67	Pattern - 1	77.67	126.87	49.11
J-380	11.30	1	Demand	128.44	Pattern - 1	128.44	126.90	50.12
J-400	15.35	1	Demand	96.76	Pattern - 1	96.76	127.09	48.44
J-410	15.27	1	Demand	113.38	Pattern - 1	113.38	126.95	48.41
J-420	24.50	1	Demand	132.68	Pattern - 1	132.68	126.58	44.25
J-430	25.10	1	Demand	124.99	Pattern - 1	124.99	126.57	43.99
J-440	21.30	1	Demand	141.35	Pattern - 1	141.35	126.61	45.65
J-450	18.00	1	Demand	121.02	Pattern - 1	121.02	126.88	47.20
J-460	15.30	1	Demand	0.00	Pattern - 1	0.00	126.91	48.39
J-470	12.09	1	Demand	54.82	Pattern - 1	54.82	126.81	49.73
J-480	10.60	1	Demand	0.00	Pattern - 1	0.00	126.78	50.37
J-490	14.80	1	Demand	19.52	Pattern - 1	19.52	126.78	48.55
J-500	11.10	1	Demand	81.98	Pattern - 1	81.98	126.78	50.15
J-510	10.50	1	Demand	91.09	Pattern - 1	91.09	126.89	50.46



# Scenario: Run 2-MDD-50%GW-50%SW(S)

## Steady State Analysis

### Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-520	10.80	1	Demand	120.02	Pattern - 1	120.02	126.79	50.28
J-530	11.00	1	Demand	35.19	Pattern - 1	35.19	126.94	50.26
J-540	10.82	1	Demand	27.37	Pattern - 1	27.37	127.16	50.44
J-550	11.60	1	Demand	55.91	Pattern - 1	55.91	127.06	50.05
J-560	11.30	1	Demand	60.60	Pattern - 1	60.60	127.09	50.20
J-570	9.70	1	Demand	45.74	Pattern - 1	45.74	127.26	50.97
J-580	14.00	1	Demand	84.88	Pattern - 1	84.88	126.99	48.98
J-590	10.60	1	Demand	141.52	Pattern - 1	141.52	127.05	50.48
J-600	13.00	1	Demand	102.17	Pattern - 1	102.17	127.06	49.45
J-610	15.30	1	Demand	141.60	Pattern - 1	141.60	127.17	48.50
J-620	15.50	1	Demand	26.54	Pattern - 1	26.53	127.01	48.34
J-650	13.90	1	Demand	223.47	Pattern - 1	223.47	126.87	48.98
J-670	21.50	1	Demand	102.41	Pattern - 1	102.41	127.00	45.74
J-680	13.40	1	Demand	30.50	Pattern - 1	30.50	126.79	49.15
J-690	11.25	1	Demand	124.42	Pattern - 1	124.42	126.78	50.09
J-700	18.50	1	Demand	156.26	Pattern - 1	156.26	126.90	46.99
J-720	18.70	1	Demand	179.91	Pattern - 1	179.91	126.90	46.91
J-730	19.31	1	Demand	34.84	Pattern - 1	34.84	127.06	46.71
J-740	13.80	1	Demand	159.87	Pattern - 1	159.87	126.87	49.02
J-750	11.55	1	Demand	101.43	Pattern - 1	101.43	126.78	49.96
J-760	9.70	1	Demand	34.79	Pattern - 1	34.79	127.21	50.94
J-770	15.00	1	Demand	89.92	Pattern - 1	89.92	127.02	48.56
J-780	11.20	1	Demand	66.07	Pattern - 1	66.07	127.07	50.23
J-800	18.80	1	Demand	36.32	Pattern - 1	36.32	127.40	47.08
J-810	21.47	1	Demand	83.62	Pattern - 1	83.62	127.01	45.75
J-820	20.20	1	Demand	159.21	Pattern - 1	159.21	126.86	46.24
J-830	17.95	1	Demand	105.17	Pattern - 1	105.17	127.05	47.30

# Scenario: Run 2-MDD-50%GW-50%SW(S)

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen-Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-1510	851.00	12	125.0	0.00	Open	253.04	0.18	0.21	false	0.72
P-1520	800.00	12	125.0	0.00	Open	289.75	0.22	0.27	false	0.82
P-1550	449.00	30	125.0	0.00	Open	-2,114.33	0.06	0.13	false	0.96
P-1540	395.00	30	125.0	0.00	Open	-2,079.54	0.05	0.12	false	0.94
P-1410	1,217.00	12	125.0	0.00	Open	198.61	0.17	0.14	false	0.56
P-1270	257.00	24	125.0	0.00	Open	1,906.73	0.08	0.31	false	1.35
P-1120	447.00	12	125.0	0.00	Open	7.19	0.00	0.00	false	0.02
P-1110	1,139.00	12	125.0	0.00	Open	0.94	0.00	0.00	false	0.00
P-1140	1,540.00	12	125.0	0.00	Open	-14.51	0.00	0.00	false	0.04
P-1060	1,125.00	12	125.0	0.00	Open	-69.44	0.02	0.02	false	0.20
P-1050	1,053.00	30	125.0	0.00	Open	800.76	0.02	0.02	false	0.36
P-960	746.00	12	125.0	0.00	Open	-13.65	0.00	0.00	false	0.04
P-970	897.00	12	125.0	0.00	Open	-35.69	0.01	0.01	false	0.10
P-950	402.00	12	125.0	0.00	Open	29.04	0.00	0.00	false	0.08
P-940	817.00	12	125.0	0.00	Open	87.71	0.02	0.03	false	0.25
P-590	1,013.00	12	125.0	0.00	Open	-29.04	0.00	0.00	false	0.08
P-600	659.00	12	125.0	0.00	Open	-9.52	0.00	0.00	false	0.03
P-630	1,187.00	12	125.0	0.00	Open	156.79	0.10	0.09	false	0.44
P-750	931.00	12	125.0	0.00	Open	-108.97	0.04	0.04	false	0.31
P-760	1,759.00	12	125.0	0.00	Open	32.55	0.01	0.00	false	0.09
P-780	1,638.00	12	125.0	0.00	Open	134.73	0.11	0.07	false	0.38
P-790	1,293.00	12	125.0	0.00	Open	-185.49	0.16	0.12	false	0.53
P-800	1,439.00	12	125.0	0.00	Open	-158.95	0.13	0.09	false	0.45
P-740	709.00	12	125.0	0.00	Open	270.50	0.17	0.24	false	0.77
P-640	597.00	12	125.0	0.00	Open	148.35	0.05	0.08	false	0.42
P-680	726.00	12	125.0	0.00	Open	200.97	0.10	0.14	false	0.57
P-420	996.00	12	125.0	0.00	Open	-225.32	0.17	0.17	false	0.64
P-390	2,320.00	12	125.0	0.00	Open	-0.91	0.00	0.00	false	0.00
P-510	1,511.00	12	125.0	0.00	Open	86.51	0.04	0.03	false	0.25
P-520	1,532.00	12	125.0	0.00	Open	-227.86	0.27	0.18	false	0.65
P-430	1,150.00	12	125.0	0.00	Open	-195.99	0.15	0.13	false	0.56
P-230	1,475.00	12	125.0	0.00	Open	35.56	0.01	0.01	false	0.10
P-220	1,496.00	12	125.0	0.00	Open	130.79	0.09	0.06	false	0.37
P-200	753.00	12	125.0	0.00	Open	219.73	0.12	0.16	false	0.62
P-87	1,673.00	12	125.0	0.00	Open	111.74	0.08	0.05	false	0.32
P-70	1,321.00	12	125.0	0.00	Open	-67.20	0.02	0.02	false	0.19
P-110	870.00	12	125.0	0.00	Open	-111.72	0.04	0.05	false	0.32
P-80	808.00	12	125.0	0.00	Open	-97.45	0.03	0.04	false	0.28
P-250	1,092.00	12	125.0	0.00	Open	-120.89	0.06	0.05	false	0.34
P-3	527.00	30	125.0	0.00	Open	-2,760.14	0.11	0.21	false	1.25
P-4	1,274.00	16	125.0	0.00	Open	-461.82	0.20	0.16	false	0.74
P-8	1,129.00	16	125.0	0.00	Open	-201.70	0.04	0.03	false	0.32
P-9	685.00	12	125.0	0.00	Open	4.16	0.00	0.00	false	0.01
P-10	634.00	12	125.0	0.00	Open	70.62	0.01	0.02	false	0.20
P-11	2,034.00	12	125.0	0.00	Open	-195.35	0.27	0.13	false	0.55
P-12	860.00	12	125.0	0.00	Open	-192.37	0.11	0.13	false	0.55
P-13	767.00	12	125.0	0.00	Open	-289.58	0.21	0.27	false	0.82
P-14	1,007.00	16	125.0	0.00	Open	678.45	0.33	0.33	false	1.08
P-15	898.00	12	125.0	0.00	Open	-43.93	0.01	0.01	false	0.12
P-16	1,041.00	12	125.0	0.00	Open	146.35	0.08	0.08	false	0.42
P-17	1,922.00	12	125.0	0.00	Open	-192.29	0.25	0.13	false	0.55

# Scenario: Run 2-MDD-50%GW-50%SW(S)

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-18	676.00	12	125.0	0.00	Open	36.03	0.00	0.01	false	0.10
P-19	1,174.00	12	125.0	0.00	Open	11.27	0.00	0.00	false	0.03
P-20	1,680.00	12	125.0	0.00	Open	213.80	0.26	0.16	false	0.61
P-490	1,505.00	12	125.0	0.00	Open	171.16	0.16	0.10	false	0.49
P-500	1,520.00	12	125.0	0.00	Open	-38.48	0.01	0.01	false	0.11
P-21	2,057.00	12	125.0	0.00	Open	54.74	0.03	0.01	false	0.16
P-22	900.00	12	125.0	0.00	Open	-89.21	0.03	0.03	false	0.25
P-23	940.00	12	125.0	0.00	Open	87.14	0.03	0.03	false	0.25
P-24	1,437.00	12	125.0	0.00	Open	-145.12	0.11	0.08	false	0.41
P-25	1,528.00	12	125.0	0.00	Open	-140.39	0.11	0.07	false	0.40
P-26	463.00	12	125.0	0.00	Open	269.93	0.11	0.24	false	0.77
P-28	825.00	12	125.0	0.00	Open	228.38	0.15	0.18	false	0.65
P-29	912.00	12	125.0	0.00	Open	216.34	0.15	0.16	false	0.61
P-30	935.00	24	125.0	0.00	Open	1,870.41	0.28	0.30	false	1.33
P-31	502.00	12	125.0	0.00	Open	258.40	0.11	0.22	false	0.73
P-32	1,044.00	30	125.0	0.00	Open	1,047.51	0.04	0.03	false	0.48
P-33	1,076.00	12	125.0	0.00	Open	92.56	0.04	0.03	false	0.26
P-34	1,740.00	30	125.0	0.00	Open	-584.08	0.02	0.01	false	0.27
P-35	1,727.00	12	125.0	0.00	Open	52.67	0.02	0.01	false	0.15
P-36	2,395.00	30	125.0	0.00	Open	-8.27	0.00	0.00	false	0.00
P-37	2,406.00	12	125.0	0.00	Open	4.59	0.00	0.00	false	0.01
P-38	1,120.00	30	125.0	0.00	Open	-511.91	0.01	0.01	false	0.23
P-39	1,119.00	12	125.0	0.00	Open	-46.00	0.01	0.01	false	0.13
P-40	1,551.00	30	125.0	0.00	Open	-839.83	0.04	0.02	false	0.38
P-41	1,519.00	12	125.0	0.00	Open	76.29	0.04	0.02	false	0.22
P-42	1,335.00	30	125.0	0.00	Open	1,325.03	0.07	0.05	false	0.60
P-43	1,367.00	12	125.0	0.00	Open	-117.50	0.07	0.05	false	0.33
P-44	779.00	12	125.0	0.00	Open	257.29	0.17	0.22	false	0.73
P-45	1,370.00	12	125.0	0.00	Open	202.66	0.19	0.14	false	0.57
P-46	2,363.00	12	125.0	0.00	Open	-65.17	0.04	0.02	false	0.18
P-47	1,575.00	12	125.0	0.00	Open	98.72	0.06	0.04	false	0.28
P-48	2,947.00	12	125.0	0.00	Open	-86.91	0.09	0.03	false	0.25
P-49	1,627.00	12	125.0	0.00	Open	-70.48	0.03	0.02	false	0.20
P-50	989.00	12	125.0	0.00	Open	235.24	0.18	0.19	false	0.67
P-55	829.00	12	125.0	0.00	Open	-106.21	0.04	0.04	false	0.30
P-56	1,373.00	12	125.0	0.00	Open	146.46	0.11	0.08	false	0.42
P-57	818.00	12	125.0	0.00	Open	-246.00	0.17	0.20	false	0.70
P-58	881.00	12	125.0	0.00	Open	-100.93	0.03	0.04	false	0.29
P-59	1,189.00	12	125.0	0.00	Open	36.77	0.01	0.01	false	0.10
P-60	1,264.00	12	125.0	0.00	Open	-142.53	0.09	0.07	false	0.40
P-61	1,571.00	12	125.0	0.00	Open	-88.26	0.05	0.03	false	0.25
P-62	1,256.00	12	125.0	0.00	Open	-90.36	0.04	0.03	false	0.26
P-63	726.00	12	125.0	0.00	Open	-175.24	0.08	0.11	false	0.50
P-64	563.00	12	125.0	0.00	Open	-329.57	0.20	0.35	false	0.93
P-65	1,029.00	12	125.0	0.00	Open	94.26	0.04	0.03	false	0.27
P-67	900.00	12	125.0	0.00	Open	94.96	0.03	0.03	false	0.27
P-69	773.00	12	125.0	0.00	Open	157.85	0.07	0.09	false	0.45
P-72	823.00	12	125.0	0.00	Open	154.70	0.07	0.09	false	0.44
P-68	100.00	24	125.0	0.00	Open	-3,222.05	0.08	0.81	true	2.29
P-71	1.00	24	125.0	0.00	Closed	0.00	0.00	0.00	true	0.00
P-74	100.00	30	125.0	0.00	Open	-3,221.95	0.03	0.27	true	1.46

# Scenario: Run 2-MDD-50%GW-50%SW(S)

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-75	3.00	30	125.0	0.00	Open	-3,221.95	0.00	0.27	true	1.46
P-76	795.00	12	125.0	0.00	Open	155.48	0.07	0.09	false	0.44
P-77	801.00	12	125.0	0.00	Open	156.98	0.07	0.09	false	0.45
P-78	1,001.00	12	125.0	0.00	Open	95.67	0.04	0.04	false	0.27
P-79	900.00	12	125.0	0.00	Open	94.96	0.03	0.03	false	0.27
P-81	840.00	12	125.0	0.00	Open	207.13	0.12	0.15	false	0.59
P-82	1,761.00	12	125.0	0.00	Open	208.43	0.26	0.15	false	0.59
P-83	665.00	12	125.0	0.00	Open	-17.01	0.00	0.00	false	0.05
P-84	775.00	12	125.0	0.00	Open	-68.26	0.01	0.02	false	0.19
P-85	139.00	12	125.0	0.00	Open	0.33	0.00	0.00	false	0.00
P-86	130.00	12	125.0	0.00	Open	-0.33	0.00	0.00	false	0.00
P-90	345.00	12	125.0	0.00	Open	0.33	0.00	0.00	false	0.00
P-91	318.00	12	125.0	0.00	Open	0.33	0.00	0.00	false	0.00
P-92	320.00	12	125.0	0.00	Open	-0.33	0.00	0.00	false	0.00
P-93	382.00	12	125.0	0.00	Open	0.33	0.00	0.00	false	0.00
P-94	1,337.00	12	125.0	0.00	Open	-118.92	0.07	0.05	false	0.34
P-95	1,231.00	12	125.0	0.00	Open	-90.33	0.04	0.03	false	0.26
P-96	1,126.00	12	125.0	0.00	Open	-299.72	0.33	0.29	false	0.85
P-97	2,986.00	24	125.0	0.00	Open	-3,222.00	2.43	0.81	false	2.29
P-98	113.00	6	130.0	0.00	Closed	0.00	0.00	0.00	false	0.00
P-99	1,701.00	24	125.0	0.00	Open	-3,222.00	1.38	0.81	false	2.29
P-101	5,665.00	24	125.0	0.00	Open	-4,852.00	9.83	1.74	false	3.44
P-102	224.00	24	125.0	0.00	Open	-4,852.00	0.39	1.74	false	3.44
P-103	1.00	24	125.0	0.00	Open	-4,852.00	0.00	1.74	true	3.44
P-104	3,645.00	16	125.0	0.00	Open	1,630.00	6.05	1.66	false	2.60
P-105	5,402.00	16	125.0	0.00	Open	1,630.00	8.96	1.66	false	2.60
P-106	1,283.00	12	125.0	0.00	Open	291.58	0.36	0.28	false	0.83

# Scenario: Run 3-MDD-100%SW(S)

## Steady State Analysis

### Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-1	9.30	1	Demand	0.00	Fixed	0.00	127.30	51.15
J-3	19.50	Zone-1	Demand	0.00	Fixed	0.00	124.56	45.55
J-4	12.00	Zone-1	Demand	0.00	Fixed	0.00	127.40	50.03
J-5	21.50	Zone-1	Demand	51.58	Fixed	51.58	124.16	44.51
J-6	21.00	Zone-1	Demand	0.00	Fixed	0.00	119.56	42.73
J-7	21.00	Zone-1	Demand	0.00	Fixed	0.00	119.56	42.73
J-8	21.00	Zone-1	Demand	0.00	Fixed	0.00	119.56	42.73
J-9	12.00	Zone-1	Demand	6,444.00	Fixed	6,444.00	88.39	33.12
J-10	13.00	Zone-1	Demand	0.00	Fixed	0.00	97.15	36.48
J-11	13.00	Zone-1	Demand	0.00	Fixed	0.00	102.15	38.65
J-12	13.00	Zone-1	Demand	0.00	Fixed	0.00	127.40	49.59
J-13	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.40	50.03
J-14	13.00	Zone-1	Demand	0.00	Fixed	0.00	96.10	36.03
J-15	13.00	Zone-1	Demand	1,630.00	Fixed	1,630.00	87.14	32.14
J-80	24.00	1	Demand	58.03	Pattern - 1	58.03	124.17	43.43
J-90	26.30	1	Demand	30.25	Pattern - 1	30.25	124.18	42.43
J-100	22.90	1	Demand	27.28	Pattern - 1	27.28	124.19	43.91
J-110	22.50	1	Demand	66.46	Pattern - 1	66.46	124.18	44.08
J-120	21.20	1	Demand	84.81	Pattern - 1	84.81	124.18	44.65
J-130	20.10	1	Demand	96.68	Pattern - 1	96.68	124.38	45.21
J-140	18.60	1	Demand	204.26	Pattern - 1	204.26	124.41	45.87
J-150	21.00	1	Demand	97.21	Pattern - 1	97.21	124.25	44.76
J-160	18.85	1	Demand	45.57	Pattern - 1	45.57	124.56	45.83
J-170	20.42	1	Demand	66.73	Pattern - 1	66.73	124.61	45.17
J-190	20.40	1	Demand	109.15	Pattern - 1	109.15	124.21	45.01
J-200	20.50	1	Demand	48.57	Pattern - 1	48.57	124.55	45.11
J-210	23.60	1	Demand	120.28	Pattern - 1	120.28	124.42	43.71
J-220	24.75	1	Demand	95.23	Pattern - 1	95.23	124.22	43.12
J-230	24.20	1	Demand	52.57	Pattern - 1	52.57	124.17	43.34
J-240	21.00	1	Demand	43.15	Pattern - 1	43.15	124.16	44.72
J-250	24.30	1	Demand	109.61	Pattern - 1	109.61	124.16	43.29
J-260	23.21	1	Demand	75.89	Pattern - 1	75.89	124.18	43.77
J-300	20.30	1	Demand	123.53	Pattern - 1	123.53	124.68	45.25
J-310	15.90	1	Demand	312.93	Pattern - 1	312.93	124.79	47.21
J-320	16.00	1	Demand	189.67	Pattern - 1	189.67	124.96	47.24
J-330	14.90	1	Demand	267.83	Pattern - 1	267.83	124.94	47.71
J-350	16.00	1	Demand	123.74	Pattern - 1	123.74	125.36	47.41
J-360	15.50	1	Demand	229.54	Pattern - 1	229.54	125.30	47.60
J-370	13.60	1	Demand	77.67	Pattern - 1	77.67	125.51	48.52
J-380	11.30	1	Demand	128.44	Pattern - 1	128.44	125.80	49.64
J-400	15.35	1	Demand	96.76	Pattern - 1	96.76	126.01	47.97
J-410	15.27	1	Demand	113.38	Pattern - 1	113.38	125.83	47.93
J-420	24.50	1	Demand	132.68	Pattern - 1	132.68	124.42	43.32
J-430	25.10	1	Demand	124.99	Pattern - 1	124.99	124.55	43.11
J-440	21.30	1	Demand	141.35	Pattern - 1	141.35	124.93	44.93
J-450	18.00	1	Demand	121.02	Pattern - 1	121.02	125.76	46.72
J-460	15.30	1	Demand	0.00	Pattern - 1	0.00	125.80	47.90
J-470	12.09	1	Demand	54.82	Pattern - 1	54.82	125.70	49.25
J-480	10.60	1	Demand	0.00	Pattern - 1	0.00	125.67	49.89
J-490	14.80	1	Demand	19.52	Pattern - 1	19.52	125.68	48.07
J-500	11.10	1	Demand	81.98	Pattern - 1	81.98	125.68	49.67
J-510	10.50	1	Demand	91.09	Pattern - 1	91.09	125.93	50.04

# Scenario: Run 3-MDD-100%SW(S)

## Steady State Analysis

### Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-520	10.80	1	Demand	120.02	Pattern - 1	120.02	125.73	49.82
J-530	11.00	1	Demand	35.19	Pattern - 1	35.19	125.97	49.84
J-540	10.82	1	Demand	27.37	Pattern - 1	27.37	126.42	50.11
J-550	11.60	1	Demand	55.91	Pattern - 1	55.91	126.33	49.74
J-560	11.30	1	Demand	60.60	Pattern - 1	60.60	126.56	49.97
J-570	9.70	1	Demand	45.74	Pattern - 1	45.74	126.88	50.80
J-580	14.00	1	Demand	84.88	Pattern - 1	84.88	126.04	48.57
J-590	10.60	1	Demand	141.52	Pattern - 1	141.52	126.55	50.27
J-600	13.00	1	Demand	102.17	Pattern - 1	102.17	126.62	49.25
J-610	15.30	1	Demand	141.60	Pattern - 1	141.60	126.84	48.36
J-620	15.50	1	Demand	26.54	Pattern - 1	26.53	126.29	48.03
J-650	13.90	1	Demand	223.47	Pattern - 1	223.47	125.22	48.26
J-670	21.50	1	Demand	102.41	Pattern - 1	102.41	124.57	44.68
J-680	13.40	1	Demand	30.50	Pattern - 1	30.50	125.67	48.67
J-690	11.25	1	Demand	124.42	Pattern - 1	124.42	125.69	49.61
J-700	18.50	1	Demand	156.26	Pattern - 1	156.26	124.45	45.93
J-720	18.70	1	Demand	179.91	Pattern - 1	179.91	124.56	45.89
J-730	19.31	1	Demand	34.84	Pattern - 1	34.84	124.77	45.72
J-740	13.80	1	Demand	159.87	Pattern - 1	159.87	125.48	48.41
J-750	11.55	1	Demand	101.43	Pattern - 1	101.43	125.52	49.41
J-760	9.70	1	Demand	34.79	Pattern - 1	34.79	126.63	50.69
J-770	15.00	1	Demand	89.92	Pattern - 1	89.92	125.96	48.10
J-780	11.20	1	Demand	66.07	Pattern - 1	66.07	126.26	49.88
J-800	18.80	1	Demand	36.32	Pattern - 1	36.32	124.57	45.85
J-810	21.47	1	Demand	83.62	Pattern - 1	83.62	124.49	44.66
J-820	20.20	1	Demand	159.21	Pattern - 1	159.21	124.34	45.14
J-830	17.95	1	Demand	105.17	Pattern - 1	105.17	125.60	46.67



# Scenario: Run 3-MDD-100%SW(S)

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen-Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-1510	851.00	12	125.0	0.00	Open	207.65	0.13	0.15	false	0.59
P-1520	800.00	12	125.0	0.00	Open	424.68	0.45	0.56	false	1.20
P-1550	449.00	30	125.0	0.00	Open	-4,697.40	0.25	0.55	false	2.13
P-1540	395.00	30	125.0	0.00	Open	-4,662.60	0.21	0.54	false	2.12
P-1410	1,217.00	12	125.0	0.00	Open	224.36	0.21	0.17	false	0.64
P-1270	257.00	24	125.0	0.00	Open	-591.02	0.01	0.04	false	0.42
P-1120	447.00	12	125.0	0.00	Open	-148.98	0.04	0.08	false	0.42
P-1110	1,139.00	12	125.0	0.00	Open	-259.02	0.25	0.22	false	0.73
P-1140	1,540.00	12	125.0	0.00	Open	-163.69	0.15	0.10	false	0.46
P-1060	1,125.00	12	125.0	0.00	Open	151.72	0.09	0.08	false	0.43
P-1050	1,053.00	30	125.0	0.00	Open	-1,750.55	0.09	0.09	false	0.79
P-960	746.00	12	125.0	0.00	Open	72.85	0.02	0.02	false	0.21
P-970	897.00	12	125.0	0.00	Open	-29.80	0.00	0.00	false	0.08
P-950	402.00	12	125.0	0.00	Open	-29.27	0.00	0.00	false	0.08
P-940	817.00	12	125.0	0.00	Open	92.08	0.03	0.03	false	0.26
P-590	1,013.00	12	125.0	0.00	Open	29.27	0.00	0.00	false	0.08
P-600	659.00	12	125.0	0.00	Open	48.79	0.01	0.01	false	0.14
P-630	1,187.00	12	125.0	0.00	Open	220.99	0.20	0.17	false	0.63
P-750	931.00	12	125.0	0.00	Open	-42.37	0.01	0.01	false	0.12
P-760	1,759.00	12	125.0	0.00	Open	99.15	0.07	0.04	false	0.28
P-780	1,638.00	12	125.0	0.00	Open	201.33	0.23	0.14	false	0.57
P-790	1,293.00	12	125.0	0.00	Open	-366.91	0.55	0.43	false	1.04
P-800	1,439.00	12	125.0	0.00	Open	-340.37	0.53	0.37	false	0.97
P-740	709.00	12	125.0	0.00	Open	379.65	0.32	0.45	false	1.08
P-640	597.00	12	125.0	0.00	Open	139.73	0.04	0.07	false	0.40
P-680	726.00	12	125.0	0.00	Open	178.64	0.08	0.11	false	0.51
P-420	996.00	12	125.0	0.00	Open	-198.77	0.14	0.14	false	0.56
P-390	2,320.00	12	125.0	0.00	Open	-234.32	0.43	0.19	false	0.66
P-510	1,511.00	12	125.0	0.00	Open	276.99	0.38	0.25	false	0.79
P-520	1,532.00	12	125.0	0.00	Open	-418.35	0.83	0.54	false	1.19
P-430	1,150.00	12	125.0	0.00	Open	-115.00	0.06	0.05	false	0.33
P-230	1,475.00	12	125.0	0.00	Open	97.86	0.05	0.04	false	0.28
P-220	1,496.00	12	125.0	0.00	Open	193.09	0.19	0.13	false	0.55
P-200	753.00	12	125.0	0.00	Open	141.74	0.06	0.07	false	0.40
P-87	1,673.00	12	125.0	0.00	Open	49.44	0.02	0.01	false	0.14
P-70	1,321.00	12	125.0	0.00	Open	-38.91	0.01	0.01	false	0.11
P-110	870.00	12	125.0	0.00	Open	-62.57	0.01	0.02	false	0.18
P-80	808.00	12	125.0	0.00	Open	-69.17	0.02	0.02	false	0.20
P-250	1,092.00	12	125.0	0.00	Open	-43.46	0.01	0.01	false	0.12
P-3	527.00	30	125.0	0.00	Open	-5,734.17	0.42	0.80	false	2.60
P-4	1,274.00	16	125.0	0.00	Open	-709.83	0.45	0.36	false	1.13
P-8	1,129.00	16	125.0	0.00	Open	-177.31	0.03	0.03	false	0.28
P-9	685.00	12	125.0	0.00	Open	-2.87	0.00	0.00	false	0.01
P-10	634.00	12	125.0	0.00	Open	63.59	0.01	0.02	false	0.18
P-11	2,034.00	12	125.0	0.00	Open	-160.04	0.19	0.09	false	0.45
P-12	860.00	12	125.0	0.00	Open	-150.25	0.07	0.08	false	0.43
P-13	767.00	12	125.0	0.00	Open	-247.47	0.16	0.21	false	0.70
P-14	1,007.00	16	125.0	0.00	Open	445.04	0.15	0.15	false	0.71
P-15	898.00	12	125.0	0.00	Open	-67.25	0.02	0.02	false	0.19
P-16	1,041.00	12	125.0	0.00	Open	169.67	0.11	0.10	false	0.48
P-17	1,922.00	12	125.0	0.00	Open	66.80	0.03	0.02	false	0.19

# Scenario: Run 3-MDD-100%SW(S)

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-18	676.00	12	125.0	0.00	Open	-223.06	0.11	0.17	false	0.63
P-19	1,174.00	12	125.0	0.00	Open	-66.16	0.02	0.02	false	0.19
P-20	1,680.00	12	125.0	0.00	Open	148.89	0.13	0.08	false	0.42
P-490	1,505.00	12	125.0	0.00	Open	-19.33	0.00	0.00	false	0.05
P-500	1,520.00	12	125.0	0.00	Open	152.00	0.13	0.08	false	0.43
P-21	2,057.00	12	125.0	0.00	Open	-178.60	0.23	0.11	false	0.51
P-22	900.00	12	125.0	0.00	Open	-96.87	0.03	0.04	false	0.27
P-23	940.00	12	125.0	0.00	Open	94.62	0.03	0.03	false	0.27
P-24	1,437.00	12	125.0	0.00	Open	-152.81	0.12	0.08	false	0.43
P-25	1,528.00	12	125.0	0.00	Open	-147.83	0.12	0.08	false	0.42
P-26	463.00	12	125.0	0.00	Open	277.66	0.12	0.25	false	0.79
P-28	825.00	12	125.0	0.00	Open	236.15	0.16	0.19	false	0.67
P-29	912.00	12	125.0	0.00	Open	223.70	0.16	0.17	false	0.63
P-30	935.00	24	125.0	0.00	Open	-627.34	0.04	0.04	false	0.44
P-31	502.00	12	125.0	0.00	Open	265.80	0.12	0.23	false	0.75
P-32	1,044.00	30	125.0	0.00	Open	-1,478.43	0.07	0.06	false	0.67
P-33	1,076.00	12	125.0	0.00	Open	-130.64	0.07	0.06	false	0.37
P-34	1,740.00	30	125.0	0.00	Open	1,982.67	0.19	0.11	false	0.90
P-35	1,727.00	12	125.0	0.00	Open	-178.80	0.19	0.11	false	0.51
P-36	2,395.00	30	125.0	0.00	Open	-2,447.24	0.39	0.16	false	1.11
P-37	2,406.00	12	125.0	0.00	Open	219.26	0.39	0.16	false	0.62
P-38	1,120.00	30	125.0	0.00	Open	-2,848.08	0.24	0.22	false	1.29
P-39	1,119.00	12	125.0	0.00	Open	-255.93	0.24	0.22	false	0.73
P-40	1,551.00	30	125.0	0.00	Open	-3,132.30	0.40	0.26	false	1.42
P-41	1,519.00	12	125.0	0.00	Open	284.52	0.40	0.27	false	0.81
P-42	1,335.00	30	125.0	0.00	Open	3,421.42	0.41	0.31	false	1.55
P-43	1,367.00	12	125.0	0.00	Open	-303.44	0.41	0.30	false	0.86
P-44	779.00	12	125.0	0.00	Open	257.22	0.17	0.22	false	0.73
P-45	1,370.00	12	125.0	0.00	Open	58.15	0.02	0.01	false	0.16
P-46	2,363.00	12	125.0	0.00	Open	-209.68	0.36	0.15	false	0.59
P-47	1,575.00	12	125.0	0.00	Open	324.23	0.53	0.34	false	0.92
P-48	2,947.00	12	125.0	0.00	Open	62.27	0.05	0.02	false	0.18
P-49	1,627.00	12	125.0	0.00	Open	-226.65	0.28	0.17	false	0.64
P-50	989.00	12	125.0	0.00	Open	252.24	0.21	0.21	false	0.72
P-55	829.00	12	125.0	0.00	Open	-249.76	0.17	0.21	false	0.71
P-56	1,373.00	12	125.0	0.00	Open	227.07	0.24	0.18	false	0.64
P-57	818.00	12	125.0	0.00	Open	-399.42	0.41	0.50	false	1.13
P-58	881.00	12	125.0	0.00	Open	-276.68	0.22	0.25	false	0.78
P-59	1,189.00	12	125.0	0.00	Open	100.97	0.05	0.04	false	0.29
P-60	1,264.00	12	125.0	0.00	Open	-146.90	0.10	0.08	false	0.42
P-61	1,571.00	12	125.0	0.00	Open	-240.40	0.31	0.19	false	0.68
P-62	1,256.00	12	125.0	0.00	Open	-220.02	0.21	0.17	false	0.62
P-63	726.00	12	125.0	0.00	Open	-304.91	0.22	0.30	false	0.86
P-64	563.00	12	125.0	0.00	Open	-611.38	0.62	1.10	false	1.73
P-65	1,029.00	12	125.0	0.00	Open	98.76	0.04	0.04	false	0.28
P-67	900.00	12	125.0	0.00	Open	99.50	0.03	0.04	false	0.28
P-69	773.00	12	125.0	0.00	Open	134.05	0.05	0.07	false	0.38
P-72	823.00	12	125.0	0.00	Open	206.76	0.12	0.15	false	0.59
P-68	100.00	24	125.0	0.00	Open	0.00	0.00	0.00	true	0.00
P-71	1.00	24	125.0	0.00	Closed	0.00	0.00	0.00	true	0.00
P-74	100.00	30	125.0	0.00	Open	-6,444.00	0.10	0.99	true	2.92

# Scenario: Run 3-MDD-100%SW(S)

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-75	3.00	30	125.0	0.00	Open	-6,444.00	0.00	0.99	true	2.92
P-76	795.00	12	125.0	0.00	Open	132.04	0.05	0.06	false	0.37
P-77	801.00	12	125.0	0.00	Open	209.81	0.12	0.15	false	0.60
P-78	1,001.00	12	125.0	0.00	Open	100.24	0.04	0.04	false	0.28
P-79	900.00	12	125.0	0.00	Open	99.50	0.03	0.04	false	0.28
P-81	840.00	12	125.0	0.00	Open	133.61	0.06	0.07	false	0.38
P-82	1,761.00	12	125.0	0.00	Open	145.15	0.13	0.08	false	0.41
P-83	665.00	12	125.0	0.00	Open	45.29	0.01	0.01	false	0.13
P-84	775.00	12	125.0	0.00	Open	-6.29	0.00	0.00	false	0.02
P-85	139.00	12	125.0	0.00	Open	0.00	0.00	0.00	false	0.00
P-86	130.00	12	125.0	0.00	Open	-0.00	0.00	0.00	false	0.00
P-90	345.00	12	125.0	0.00	Open	0.00	0.00	0.00	false	0.00
P-91	318.00	12	125.0	0.00	Open	0.00	0.00	0.00	false	0.00
P-92	320.00	12	125.0	0.00	Open	-0.00	0.00	0.00	false	0.00
P-93	382.00	12	125.0	0.00	Open	0.00	0.00	0.00	false	0.00
P-94	1,337.00	12	125.0	0.00	Open	-307.07	0.41	0.31	false	0.87
P-95	1,231.00	12	125.0	0.00	Open	-79.41	0.03	0.03	false	0.23
P-96	1,126.00	12	125.0	0.00	Open	-196.61	0.15	0.13	false	0.56
P-97	2,986.00	24	125.0	0.00	Open	-6,444.00	8.77	2.94	false	4.57
P-98	113.00	6	130.0	0.00	Closed	0.00	0.00	0.00	false	0.00
P-99	1,701.00	24	125.0	0.00	Open	-6,444.00	4.99	2.94	false	4.57
P-101	5,665.00	24	125.0	0.00	Open	-8,074.00	25.25	4.46	false	5.73
P-102	224.00	24	125.0	0.00	Open	-8,074.00	1.00	4.46	false	5.73
P-103	1.00	24	125.0	0.00	Open	-8,074.00	0.00	4.46	true	5.73
P-104	3,645.00	16	125.0	0.00	Open	1,630.00	6.05	1.66	false	2.60
P-105	5,402.00	16	125.0	0.00	Open	1,630.00	8.96	1.66	false	2.60
P-106	1,283.00	12	125.0	0.00	Open	-96.20	0.05	0.04	false	0.27

# Scenario: Run 4-PHD-100%GW

## Steady State Analysis

### Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-1	9.30	1	Demand	0.00	Fixed	0.00	127.30	51.15
J-3	19.50	Zone-1	Inflow	6,444.00	Fixed	-6,444.00	127.97	47.02
J-4	12.00	Zone-1	Demand	0.00	Fixed	0.00	127.40	50.03
J-5	21.50	Zone-1	Demand	103.16	Fixed	103.16	124.63	44.71
J-6	21.00	Zone-1	Demand	0.00	Fixed	0.00	120.05	42.94
J-7	21.00	Zone-1	Demand	0.00	Fixed	0.00	120.05	42.94
J-8	21.00	Zone-1	Demand	0.00	Fixed	0.00	120.05	42.94
J-9	12.00	Zone-1	Demand	0.00	Fixed	0.00	127.04	49.87
J-10	13.00	Zone-1	Demand	0.00	Fixed	0.00	127.04	49.44
J-11	13.00	Zone-1	Demand	0.00	Fixed	0.00	127.04	49.44
J-12	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.35	50.01
J-13	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.40	50.03
J-14	13.00	Zone-1	Demand	0.00	Fixed	0.00	121.00	46.82
J-15	13.00	Zone-1	Demand	1,630.00	Fixed	1,630.00	112.04	42.93
J-80	24.00	1	Demand	116.06	Pattern - 1	116.06	125.18	43.86
J-90	26.30	1	Demand	60.51	Pattern - 1	60.51	125.27	42.90
J-100	22.90	1	Demand	54.56	Pattern - 1	54.56	125.38	44.43
J-110	22.50	1	Demand	132.92	Pattern - 1	132.92	125.33	44.58
J-120	21.20	1	Demand	169.63	Pattern - 1	169.63	125.33	45.14
J-130	20.10	1	Demand	193.36	Pattern - 1	193.36	126.35	46.06
J-140	18.60	1	Demand	408.53	Pattern - 1	408.53	126.49	46.77
J-150	21.00	1	Demand	194.43	Pattern - 1	194.43	125.73	45.40
J-160	18.85	1	Demand	91.13	Pattern - 1	91.13	127.68	47.18
J-170	20.42	1	Demand	133.45	Pattern - 1	133.45	126.39	45.94
J-190	20.40	1	Demand	218.30	Pattern - 1	218.30	125.06	45.37
J-200	20.50	1	Demand	97.13	Pattern - 1	97.13	125.94	45.71
J-210	23.60	1	Demand	240.55	Pattern - 1	240.55	124.99	43.96
J-220	24.75	1	Demand	190.46	Pattern - 1	190.46	124.65	43.31
J-230	24.20	1	Demand	105.15	Pattern - 1	105.15	124.62	43.54
J-240	21.00	1	Demand	86.30	Pattern - 1	86.30	124.68	44.95
J-250	24.30	1	Demand	219.22	Pattern - 1	219.22	124.97	43.64
J-260	23.21	1	Demand	151.77	Pattern - 1	151.77	124.96	44.11
J-300	20.30	1	Demand	247.05	Pattern - 1	247.05	126.26	45.94
J-310	15.90	1	Demand	625.87	Pattern - 1	625.87	125.49	47.51
J-320	16.00	1	Demand	379.34	Pattern - 1	379.34	126.11	47.73
J-330	14.90	1	Demand	535.66	Pattern - 1	535.66	125.41	47.91
J-350	16.00	1	Demand	247.47	Pattern - 1	247.47	126.11	47.73
J-360	15.50	1	Demand	459.09	Pattern - 1	459.09	125.56	47.71
J-370	13.60	1	Demand	155.34	Pattern - 1	155.34	125.49	48.51
J-380	11.30	1	Demand	256.89	Pattern - 1	256.89	125.61	49.55
J-400	15.35	1	Demand	193.52	Pattern - 1	193.52	126.27	48.09
J-410	15.27	1	Demand	226.75	Pattern - 1	226.75	125.77	47.90
J-420	24.50	1	Demand	265.35	Pattern - 1	265.35	124.43	43.32
J-430	25.10	1	Demand	249.98	Pattern - 1	249.98	124.39	43.05
J-440	21.30	1	Demand	282.71	Pattern - 1	282.71	124.55	44.76
J-450	18.00	1	Demand	242.04	Pattern - 1	242.04	125.53	46.62
J-460	15.30	1	Demand	0.00	Pattern - 1	0.00	125.64	47.84
J-470	12.09	1	Demand	109.64	Pattern - 1	109.64	125.27	49.07
J-480	10.60	1	Demand	0.00	Pattern - 1	0.00	125.18	49.67
J-490	14.80	1	Demand	39.04	Pattern - 1	39.04	125.16	47.84
J-500	11.10	1	Demand	163.97	Pattern - 1	163.97	125.16	49.45
J-510	10.50	1	Demand	182.18	Pattern - 1	182.18	125.56	49.88

**Scenario: Run 4-PHD-100%GW**  
**Steady State Analysis**  
**Junction Report**

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-520	10.80	1	Demand	240.04	Pattern - 1	240.04	125.19	49.59
J-530	11.00	1	Demand	70.37	Pattern - 1	70.37	125.73	49.74
J-540	10.82	1	Demand	54.73	Pattern - 1	54.73	126.53	50.16
J-550	11.60	1	Demand	111.81	Pattern - 1	111.81	126.16	49.67
J-560	11.30	1	Demand	121.19	Pattern - 1	121.19	126.29	49.85
J-570	9.70	1	Demand	91.48	Pattern - 1	91.48	126.91	50.81
J-580	14.00	1	Demand	169.77	Pattern - 1	169.77	125.91	48.52
J-590	10.60	1	Demand	283.05	Pattern - 1	283.05	126.14	50.09
J-600	13.00	1	Demand	204.34	Pattern - 1	204.34	126.17	49.06
J-610	15.30	1	Demand	283.21	Pattern - 1	283.21	126.56	48.23
J-620	15.50	1	Demand	53.07	Pattern - 1	53.07	126.00	47.90
J-650	13.90	1	Demand	446.94	Pattern - 1	446.94	125.49	48.38
J-670	21.50	1	Demand	204.82	Pattern - 1	204.82	125.97	45.29
J-680	13.40	1	Demand	61.01	Pattern - 1	61.01	125.18	48.46
J-690	11.25	1	Demand	248.84	Pattern - 1	248.84	125.18	49.39
J-700	18.50	1	Demand	312.51	Pattern - 1	312.51	125.60	46.43
J-720	18.70	1	Demand	359.81	Pattern - 1	359.81	125.58	46.34
J-730	19.31	1	Demand	69.68	Pattern - 1	69.68	126.18	46.33
J-740	13.80	1	Demand	319.75	Pattern - 1	319.75	125.49	48.42
J-750	11.55	1	Demand	202.86	Pattern - 1	202.86	125.17	49.26
J-760	9.70	1	Demand	69.59	Pattern - 1	69.59	126.70	50.72
J-770	15.00	1	Demand	179.84	Pattern - 1	179.84	126.02	48.13
J-780	11.20	1	Demand	132.14	Pattern - 1	132.14	126.20	49.85
J-800	18.80	1	Demand	72.64	Pattern - 1	72.64	127.39	47.08
J-810	21.47	1	Demand	167.24	Pattern - 1	167.24	125.99	45.31
J-820	20.20	1	Demand	318.42	Pattern - 1	318.42	125.46	45.63
J-830	17.95	1	Demand	210.33	Pattern - 1	210.33	126.15	46.91

# Scenario: Run 4-PHD-100%GW

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-1510	851.00	12	125.0	0.00	Open	506.09	0.66	0.77	false	1.44
P-1520	800.00	12	125.0	0.00	Open	579.50	0.79	0.99	false	1.64
P-1550	449.00	30	125.0	0.00	Open	-4,228.75	0.20	0.45	false	1.92
P-1540	395.00	30	125.0	0.00	Open	-4,159.16	0.17	0.44	false	1.89
P-1410	1,217.00	12	125.0	0.00	Open	397.22	0.60	0.49	false	1.13
P-1270	257.00	24	125.0	0.00	Open	3,813.38	0.29	1.11	false	2.70
P-1120	447.00	12	125.0	0.00	Open	14.38	0.00	0.00	false	0.04
P-1110	1,139.00	12	125.0	0.00	Open	1.87	0.00	0.00	false	0.01
P-1140	1,540.00	12	125.0	0.00	Open	-29.03	0.01	0.00	false	0.08
P-1060	1,125.00	12	125.0	0.00	Open	-139.00	0.08	0.07	false	0.39
P-1050	1,053.00	30	125.0	0.00	Open	1,601.32	0.08	0.08	false	0.73
P-960	746.00	12	125.0	0.00	Open	-27.30	0.00	0.00	false	0.08
P-970	897.00	12	125.0	0.00	Open	-71.38	0.02	0.02	false	0.20
P-950	402.00	12	125.0	0.00	Open	58.08	0.01	0.01	false	0.16
P-940	817.00	12	125.0	0.00	Open	175.41	0.09	0.11	false	0.50
P-590	1,013.00	12	125.0	0.00	Open	-58.08	0.01	0.01	false	0.16
P-600	659.00	12	125.0	0.00	Open	-19.04	0.00	0.00	false	0.05
P-630	1,187.00	12	125.0	0.00	Open	313.59	0.38	0.32	false	0.89
P-750	931.00	12	125.0	0.00	Open	-217.94	0.15	0.16	false	0.62
P-760	1,759.00	12	125.0	0.00	Open	65.11	0.03	0.02	false	0.18
P-780	1,638.00	12	125.0	0.00	Open	269.45	0.39	0.24	false	0.76
P-790	1,293.00	12	125.0	0.00	Open	-370.98	0.56	0.43	false	1.05
P-800	1,439.00	12	125.0	0.00	Open	-317.91	0.47	0.33	false	0.90
P-740	709.00	12	125.0	0.00	Open	541.00	0.62	0.87	false	1.53
P-640	597.00	12	125.0	0.00	Open	296.70	0.17	0.29	false	0.84
P-680	726.00	12	125.0	0.00	Open	401.95	0.37	0.50	false	1.14
P-420	996.00	12	125.0	0.00	Open	-450.63	0.62	0.62	false	1.28
P-390	2,320.00	12	125.0	0.00	Open	-1.82	0.00	0.00	false	0.01
P-510	1,511.00	12	125.0	0.00	Open	173.01	0.16	0.11	false	0.49
P-520	1,532.00	12	125.0	0.00	Open	-455.72	0.97	0.64	false	1.29
P-430	1,150.00	12	125.0	0.00	Open	-391.98	0.55	0.48	false	1.11
P-230	1,475.00	12	125.0	0.00	Open	71.10	0.03	0.02	false	0.20
P-220	1,496.00	12	125.0	0.00	Open	261.55	0.34	0.23	false	0.74
P-200	753.00	12	125.0	0.00	Open	439.44	0.45	0.59	false	1.25
P-87	1,673.00	12	125.0	0.00	Open	223.52	0.28	0.17	false	0.63
P-70	1,321.00	12	125.0	0.00	Open	-134.40	0.09	0.07	false	0.38
P-110	870.00	12	125.0	0.00	Open	-223.44	0.15	0.17	false	0.63
P-80	808.00	12	125.0	0.00	Open	-194.91	0.11	0.13	false	0.55
P-250	1,092.00	12	125.0	0.00	Open	-241.78	0.21	0.20	false	0.69
P-3	527.00	30	125.0	0.00	Open	-5,520.37	0.39	0.74	false	2.51
P-4	1,274.00	16	125.0	0.00	Open	-923.64	0.74	0.58	false	1.47
P-8	1,129.00	16	125.0	0.00	Open	-403.41	0.14	0.12	false	0.64
P-9	685.00	12	125.0	0.00	Open	8.32	0.00	0.00	false	0.02
P-10	634.00	12	125.0	0.00	Open	141.24	0.05	0.07	false	0.40
P-11	2,034.00	12	125.0	0.00	Open	-390.71	0.97	0.48	false	1.11
P-12	860.00	12	125.0	0.00	Open	-384.75	0.40	0.46	false	1.09
P-13	767.00	12	125.0	0.00	Open	-579.17	0.76	0.99	false	1.64
P-14	1,007.00	16	125.0	0.00	Open	1,356.89	1.19	1.18	false	2.17
P-15	898.00	12	125.0	0.00	Open	-87.86	0.03	0.03	false	0.25
P-16	1,041.00	12	125.0	0.00	Open	292.69	0.29	0.28	false	0.83
P-17	1,922.00	12	125.0	0.00	Open	-384.57	0.89	0.46	false	1.09



# Scenario: Run 4-PHD-100%GW

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-18	676.00	12	125.0	0.00	Open	72.05	0.01	0.02	false	0.20
P-19	1,174.00	12	125.0	0.00	Open	22.55	0.00	0.00	false	0.06
P-20	1,680.00	12	125.0	0.00	Open	427.58	0.95	0.57	false	1.21
P-490	1,505.00	12	125.0	0.00	Open	342.31	0.56	0.37	false	0.97
P-500	1,520.00	12	125.0	0.00	Open	-76.96	0.04	0.02	false	0.22
P-21	2,057.00	12	125.0	0.00	Open	109.46	0.09	0.05	false	0.31
P-22	900.00	12	125.0	0.00	Open	-178.44	0.10	0.11	false	0.51
P-23	940.00	12	125.0	0.00	Open	174.30	0.10	0.11	false	0.49
P-24	1,437.00	12	125.0	0.00	Open	-290.25	0.40	0.28	false	0.82
P-25	1,528.00	12	125.0	0.00	Open	-280.78	0.40	0.26	false	0.80
P-26	463.00	12	125.0	0.00	Open	539.88	0.40	0.87	false	1.53
P-28	825.00	12	125.0	0.00	Open	456.76	0.53	0.64	false	1.30
P-29	912.00	12	125.0	0.00	Open	432.69	0.53	0.58	false	1.23
P-30	935.00	24	125.0	0.00	Open	3,740.74	1.00	1.07	false	2.65
P-31	502.00	12	125.0	0.00	Open	516.81	0.40	0.80	false	1.47
P-32	1,044.00	30	125.0	0.00	Open	2,094.94	0.13	0.12	false	0.95
P-33	1,076.00	12	125.0	0.00	Open	185.12	0.13	0.12	false	0.53
P-34	1,740.00	30	125.0	0.00	Open	-1,168.08	0.07	0.04	false	0.53
P-35	1,727.00	12	125.0	0.00	Open	105.34	0.07	0.04	false	0.30
P-36	2,395.00	30	125.0	0.00	Open	-15.79	0.00	0.00	false	0.01
P-37	2,406.00	12	125.0	0.00	Open	10.03	0.00	0.00	false	0.03
P-38	1,120.00	30	125.0	0.00	Open	-1,023.90	0.04	0.03	false	0.46
P-39	1,119.00	12	125.0	0.00	Open	-92.01	0.04	0.03	false	0.26
P-40	1,551.00	30	125.0	0.00	Open	-1,679.75	0.13	0.08	false	0.76
P-41	1,519.00	12	125.0	0.00	Open	152.58	0.13	0.08	false	0.43
P-42	1,335.00	30	125.0	0.00	Open	2,650.10	0.25	0.19	false	1.20
P-43	1,367.00	12	125.0	0.00	Open	-235.01	0.25	0.19	false	0.67
P-44	779.00	12	125.0	0.00	Open	514.59	0.62	0.80	false	1.46
P-45	1,370.00	12	125.0	0.00	Open	405.31	0.70	0.51	false	1.15
P-46	2,363.00	12	125.0	0.00	Open	-130.35	0.15	0.06	false	0.37
P-47	1,575.00	12	125.0	0.00	Open	197.45	0.21	0.14	false	0.56
P-48	2,947.00	12	125.0	0.00	Open	-173.82	0.31	0.11	false	0.49
P-49	1,627.00	12	125.0	0.00	Open	-140.96	0.12	0.07	false	0.40
P-50	989.00	12	125.0	0.00	Open	470.47	0.67	0.67	false	1.33
P-55	829.00	12	125.0	0.00	Open	-212.43	0.13	0.15	false	0.60
P-56	1,373.00	12	125.0	0.00	Open	292.93	0.39	0.28	false	0.83
P-57	818.00	12	125.0	0.00	Open	-492.00	0.60	0.73	false	1.40
P-58	881.00	12	125.0	0.00	Open	-201.87	0.12	0.14	false	0.57
P-59	1,189.00	12	125.0	0.00	Open	73.54	0.03	0.02	false	0.21
P-60	1,264.00	12	125.0	0.00	Open	-285.06	0.34	0.27	false	0.81
P-61	1,571.00	12	125.0	0.00	Open	-176.52	0.17	0.11	false	0.50
P-62	1,256.00	12	125.0	0.00	Open	-180.72	0.14	0.11	false	0.51
P-63	726.00	12	125.0	0.00	Open	-350.48	0.28	0.39	false	0.99
P-64	563.00	12	125.0	0.00	Open	-659.14	0.71	1.26	false	1.87
P-65	1,029.00	12	125.0	0.00	Open	188.51	0.13	0.12	false	0.53
P-67	900.00	12	125.0	0.00	Open	189.93	0.11	0.13	false	0.54
P-69	773.00	12	125.0	0.00	Open	315.70	0.25	0.32	false	0.90
P-72	823.00	12	125.0	0.00	Open	309.39	0.26	0.31	false	0.88
P-68	100.00	24	125.0	0.00	Open	-6,444.00	0.29	2.94	true	4.57
P-71	1.00	24	125.0	0.00	Closed	0.00	0.00	0.00	true	0.00
P-74	100.00	30	125.0	0.00	Open	-6,444.01	0.10	0.99	true	2.92

# Scenario: Run 4-PHD-100%GW

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-75	3.00	30	125.0	0.00	Open	-6,444.01	0.00	0.99	true	2.92
P-76	795.00	12	125.0	0.00	Open	310.96	0.25	0.31	false	0.88
P-77	801.00	12	125.0	0.00	Open	313.95	0.26	0.32	false	0.89
P-78	1,001.00	12	125.0	0.00	Open	191.34	0.13	0.13	false	0.54
P-79	900.00	12	125.0	0.00	Open	189.93	0.11	0.13	false	0.54
P-81	840.00	12	125.0	0.00	Open	414.25	0.45	0.53	false	1.18
P-82	1,761.00	12	125.0	0.00	Open	416.84	0.95	0.54	false	1.18
P-83	665.00	12	125.0	0.00	Open	-34.05	0.00	0.01	false	0.10
P-84	775.00	12	125.0	0.00	Open	-136.04	0.05	0.07	false	0.39
P-85	139.00	12	125.0	0.00	Open	1.18	0.00	0.00	false	0.00
P-86	130.00	12	125.0	0.00	Open	-1.18	0.00	0.00	false	0.00
P-90	345.00	12	125.0	0.00	Open	1.18	0.00	0.00	false	0.00
P-91	318.00	12	125.0	0.00	Open	1.18	0.00	0.00	false	0.00
P-92	320.00	12	125.0	0.00	Open	-1.18	0.00	0.00	false	0.00
P-93	382.00	12	125.0	0.00	Open	1.18	0.00	0.00	false	0.00
P-94	1,337.00	12	125.0	0.00	Open	-237.87	0.25	0.19	false	0.67
P-95	1,231.00	12	125.0	0.00	Open	-180.66	0.14	0.11	false	0.51
P-96	1,126.00	12	125.0	0.00	Open	-599.44	1.19	1.06	false	1.70
P-97	2,986.00	24	125.0	0.00	Open	0.00	0.00	0.00	false	0.00
P-98	113.00	6	130.0	0.00	Closed	0.00	0.00	0.00	false	0.00
P-99	1,701.00	24	125.0	0.00	Open	0.00	0.00	0.00	false	0.00
P-101	5,665.00	24	125.0	0.00	Open	-1,630.00	1.30	0.23	false	1.16
P-102	224.00	24	125.0	0.00	Open	-1,630.00	0.05	0.23	false	1.16
P-103	1.00	24	125.0	0.00	Open	-1,630.00	0.00	0.23	true	1.16
P-104	3,645.00	16	125.0	0.00	Open	1,630.00	6.05	1.66	false	2.60
P-105	5,402.00	16	125.0	0.00	Open	1,630.00	8.96	1.66	false	2.60
P-106	1,283.00	12	125.0	0.00	Open	583.15	1.29	1.00	false	1.65

# Scenario: Run 5-PHD-50%GW-50%SW(S)

## Steady State Analysis

### Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-1	9.30	1	Demand	0.00	Fixed	0.00	127.18	51.11
J-3	19.50	Zone-1	Inflow	3,222.06	Fixed	-3,222.05	123.34	45.02
J-4	12.00	Zone-1	Demand	0.00	Fixed	0.00	127.39	50.03
J-5	21.50	Zone-1	Demand	103.16	Fixed	103.16	121.31	43.27
J-6	21.00	Zone-1	Demand	0.00	Fixed	0.00	116.72	41.50
J-7	21.00	Zone-1	Demand	0.00	Fixed	0.00	116.72	41.50
J-8	21.00	Zone-1	Demand	0.00	Fixed	0.00	116.72	41.50
J-9	12.00	Zone-1	Demand	3,222.00	Fixed	3,222.00	114.37	44.38
J-10	13.00	Zone-1	Demand	0.00	Fixed	0.00	116.79	45.00
J-11	13.00	Zone-1	Demand	0.00	Fixed	0.00	118.18	45.60
J-12	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.01	49.86
J-13	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.40	50.03
J-14	13.00	Zone-1	Demand	0.00	Fixed	0.00	112.13	42.97
J-15	13.00	Zone-1	Demand	1,630.00	Fixed	1,630.00	103.17	39.09
J-80	24.00	1	Demand	116.06	Pattern - 1	116.06	121.50	42.27
J-90	26.30	1	Demand	60.51	Pattern - 1	60.51	121.54	41.29
J-100	22.90	1	Demand	54.56	Pattern - 1	54.56	121.61	42.79
J-110	22.50	1	Demand	132.92	Pattern - 1	132.92	121.57	42.95
J-120	21.20	1	Demand	169.63	Pattern - 1	169.63	121.57	43.51
J-130	20.10	1	Demand	193.36	Pattern - 1	193.36	122.35	44.33
J-140	18.60	1	Demand	408.53	Pattern - 1	408.53	122.47	45.03
J-150	21.00	1	Demand	194.43	Pattern - 1	194.43	121.85	43.72
J-160	18.85	1	Demand	91.13	Pattern - 1	91.13	123.26	45.26
J-170	20.42	1	Demand	133.45	Pattern - 1	133.45	123.08	44.51
J-190	20.40	1	Demand	218.30	Pattern - 1	218.30	121.60	43.87
J-200	20.50	1	Demand	97.13	Pattern - 1	97.13	122.72	44.32
J-210	23.60	1	Demand	240.55	Pattern - 1	240.55	121.94	42.63
J-220	24.75	1	Demand	190.46	Pattern - 1	190.46	121.42	41.91
J-230	24.20	1	Demand	105.15	Pattern - 1	105.15	121.31	42.10
J-240	21.00	1	Demand	86.30	Pattern - 1	86.30	121.33	43.49
J-250	24.30	1	Demand	219.22	Pattern - 1	219.22	121.43	42.11
J-260	23.21	1	Demand	151.77	Pattern - 1	151.77	121.47	42.60
J-300	20.30	1	Demand	247.05	Pattern - 1	247.05	123.09	44.56
J-310	15.90	1	Demand	625.87	Pattern - 1	625.87	122.61	46.26
J-320	16.00	1	Demand	379.34	Pattern - 1	379.34	123.23	46.48
J-330	14.90	1	Demand	535.66	Pattern - 1	535.66	122.84	46.80
J-350	16.00	1	Demand	247.47	Pattern - 1	247.47	123.64	46.66
J-360	15.50	1	Demand	459.09	Pattern - 1	459.09	123.31	46.74
J-370	13.60	1	Demand	155.34	Pattern - 1	155.34	123.41	47.60
J-380	11.30	1	Demand	256.89	Pattern - 1	256.89	123.90	48.82
J-400	15.35	1	Demand	193.52	Pattern - 1	193.52	124.63	47.37
J-410	15.27	1	Demand	226.75	Pattern - 1	226.75	124.12	47.19
J-420	24.50	1	Demand	265.35	Pattern - 1	265.35	121.74	42.15
J-430	25.10	1	Demand	249.98	Pattern - 1	249.98	121.77	41.91
J-440	21.30	1	Demand	282.71	Pattern - 1	282.71	122.27	43.77
J-450	18.00	1	Demand	242.04	Pattern - 1	242.04	123.91	45.91
J-460	15.30	1	Demand	0.00	Pattern - 1	0.00	124.01	47.13
J-470	12.09	1	Demand	109.64	Pattern - 1	109.64	123.57	48.33
J-480	10.60	1	Demand	0.00	Pattern - 1	0.00	123.49	48.94
J-490	14.80	1	Demand	39.04	Pattern - 1	39.04	123.49	47.12
J-500	11.10	1	Demand	163.97	Pattern - 1	163.97	123.49	48.72
J-510	10.50	1	Demand	182.18	Pattern - 1	182.18	124.08	49.24

# Scenario: Run 5-PHD-50%GW-50%SW(S)

## Steady State Analysis

### Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-520	10.80	1	Demand	240.04	Pattern - 1	240.04	123.56	48.89
J-530	11.00	1	Demand	70.37	Pattern - 1	70.37	124.24	49.09
J-540	10.82	1	Demand	54.73	Pattern - 1	54.73	125.39	49.67
J-550	11.60	1	Demand	111.81	Pattern - 1	111.81	125.06	49.19
J-560	11.30	1	Demand	121.19	Pattern - 1	121.19	125.45	49.48
J-570	9.70	1	Demand	91.48	Pattern - 1	91.48	126.31	50.55
J-580	14.00	1	Demand	169.77	Pattern - 1	169.77	124.49	47.90
J-590	10.60	1	Demand	283.05	Pattern - 1	283.05	125.37	49.75
J-600	13.00	1	Demand	204.34	Pattern - 1	204.34	125.48	48.76
J-610	15.30	1	Demand	283.21	Pattern - 1	283.21	126.06	48.02
J-620	15.50	1	Demand	53.07	Pattern - 1	53.07	124.94	47.44
J-650	13.90	1	Demand	446.94	Pattern - 1	446.94	123.09	47.34
J-670	21.50	1	Demand	204.82	Pattern - 1	204.82	122.76	43.90
J-680	13.40	1	Demand	61.01	Pattern - 1	61.01	123.49	47.72
J-690	11.25	1	Demand	248.84	Pattern - 1	248.84	123.50	48.66
J-700	18.50	1	Demand	312.51	Pattern - 1	312.51	122.37	45.03
J-720	18.70	1	Demand	359.81	Pattern - 1	359.81	122.46	44.98
J-730	19.31	1	Demand	69.68	Pattern - 1	69.68	123.12	45.00
J-740	13.80	1	Demand	319.75	Pattern - 1	319.75	123.37	47.50
J-750	11.55	1	Demand	202.86	Pattern - 1	202.86	123.35	48.47
J-760	9.70	1	Demand	69.59	Pattern - 1	69.59	125.81	50.34
J-770	15.00	1	Demand	179.84	Pattern - 1	179.84	124.43	47.44
J-780	11.20	1	Demand	132.14	Pattern - 1	132.14	124.97	49.32
J-800	18.80	1	Demand	72.64	Pattern - 1	72.64	123.22	45.27
J-810	21.47	1	Demand	167.24	Pattern - 1	167.24	122.64	43.86
J-820	20.20	1	Demand	318.42	Pattern - 1	318.42	122.06	44.16
J-830	17.95	1	Demand	210.33	Pattern - 1	210.33	123.98	45.97

# Scenario: Run 5-PHD-50%GW-50%SW(S)

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-1510	851.00	12	125.0	0.00	Open	485.77	0.61	0.72	false	1.38
P-1520	800.00	12	125.0	0.00	Open	707.15	1.15	1.43	false	2.01
P-1550	449.00	30	125.0	0.00	Open	-6,841.40	0.50	1.11	false	3.11
P-1540	395.00	30	125.0	0.00	Open	-6,771.81	0.43	1.09	false	3.07
P-1410	1,217.00	12	125.0	0.00	Open	417.93	0.66	0.54	false	1.19
P-1270	257.00	24	125.0	0.00	Open	1,357.11	0.04	0.16	false	0.96
P-1120	447.00	12	125.0	0.00	Open	-151.30	0.04	0.08	false	0.43
P-1110	1,139.00	12	125.0	0.00	Open	-273.69	0.28	0.25	false	0.78
P-1140	1,540.00	12	125.0	0.00	Open	-159.22	0.14	0.09	false	0.45
P-1060	1,125.00	12	125.0	0.00	Open	84.99	0.03	0.03	false	0.24
P-1050	1,053.00	30	125.0	0.00	Open	-980.68	0.03	0.03	false	0.45
P-960	746.00	12	125.0	0.00	Open	62.18	0.01	0.02	false	0.18
P-970	897.00	12	125.0	0.00	Open	-55.76	0.01	0.01	false	0.16
P-950	402.00	12	125.0	0.00	Open	14.95	0.00	0.00	false	0.04
P-940	817.00	12	125.0	0.00	Open	172.99	0.09	0.11	false	0.49
P-590	1,013.00	12	125.0	0.00	Open	-14.95	0.00	0.00	false	0.04
P-600	659.00	12	125.0	0.00	Open	24.09	0.00	0.00	false	0.07
P-630	1,187.00	12	125.0	0.00	Open	372.34	0.52	0.44	false	1.06
P-750	931.00	12	125.0	0.00	Open	-153.15	0.08	0.08	false	0.43
P-760	1,759.00	12	125.0	0.00	Open	129.90	0.11	0.06	false	0.37
P-780	1,638.00	12	125.0	0.00	Open	334.24	0.59	0.36	false	0.95
P-790	1,293.00	12	125.0	0.00	Open	-539.64	1.12	0.87	false	1.53
P-800	1,439.00	12	125.0	0.00	Open	-486.57	1.03	0.72	false	1.38
P-740	709.00	12	125.0	0.00	Open	647.86	0.86	1.22	false	1.84
P-640	597.00	12	125.0	0.00	Open	281.21	0.16	0.26	false	0.80
P-680	726.00	12	125.0	0.00	Open	378.39	0.33	0.45	false	1.07
P-420	996.00	12	125.0	0.00	Open	-422.87	0.55	0.55	false	1.20
P-390	2,320.00	12	125.0	0.00	Open	-249.62	0.48	0.21	false	0.71
P-510	1,511.00	12	125.0	0.00	Open	320.49	0.50	0.33	false	0.91
P-520	1,532.00	12	125.0	0.00	Open	-603.20	1.64	1.07	false	1.71
P-430	1,150.00	12	125.0	0.00	Open	-295.88	0.33	0.29	false	0.84
P-230	1,475.00	12	125.0	0.00	Open	138.23	0.10	0.07	false	0.39
P-220	1,496.00	12	125.0	0.00	Open	328.69	0.52	0.35	false	0.93
P-200	753.00	12	125.0	0.00	Open	388.67	0.36	0.47	false	1.10
P-87	1,673.00	12	125.0	0.00	Open	156.38	0.15	0.09	false	0.44
P-70	1,321.00	12	125.0	0.00	Open	-91.82	0.04	0.03	false	0.26
P-110	870.00	12	125.0	0.00	Open	-150.10	0.07	0.08	false	0.43
P-80	808.00	12	125.0	0.00	Open	-152.33	0.07	0.08	false	0.43
P-250	1,092.00	12	125.0	0.00	Open	-125.85	0.06	0.06	false	0.36
P-3	527.00	30	125.0	0.00	Open	-8,508.86	0.87	1.66	false	3.86
P-4	1,274.00	16	125.0	0.00	Open	-1,157.09	1.12	0.88	false	1.85
P-8	1,129.00	16	125.0	0.00	Open	-366.87	0.12	0.10	false	0.59
P-9	685.00	12	125.0	0.00	Open	-2.00	0.00	0.00	false	0.01
P-10	634.00	12	125.0	0.00	Open	130.92	0.04	0.06	false	0.37
P-11	2,034.00	12	125.0	0.00	Open	-337.81	0.74	0.37	false	0.96
P-12	860.00	12	125.0	0.00	Open	-321.73	0.29	0.33	false	0.91
P-13	767.00	12	125.0	0.00	Open	-516.15	0.61	0.80	false	1.46
P-14	1,007.00	16	125.0	0.00	Open	1,090.28	0.79	0.79	false	1.74
P-15	898.00	12	125.0	0.00	Open	-106.14	0.04	0.04	false	0.30
P-16	1,041.00	12	125.0	0.00	Open	310.96	0.33	0.31	false	0.88
P-17	1,922.00	12	125.0	0.00	Open	-116.09	0.10	0.05	false	0.33

# Scenario: Run 5-PHD-50%GW-50%SW(S)

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-18	676.00	12	125.0	0.00	Open	-196.43	0.09	0.13	false	0.56
P-19	1,174.00	12	125.0	0.00	Open	-93.37	0.04	0.03	false	0.26
P-20	1,680.00	12	125.0	0.00	Open	386.89	0.79	0.47	false	1.10
P-490	1,505.00	12	125.0	0.00	Open	194.84	0.20	0.13	false	0.55
P-500	1,520.00	12	125.0	0.00	Open	70.51	0.03	0.02	false	0.20
P-21	2,057.00	12	125.0	0.00	Open	-138.31	0.14	0.07	false	0.39
P-22	900.00	12	125.0	0.00	Open	-203.12	0.13	0.14	false	0.58
P-23	940.00	12	125.0	0.00	Open	198.41	0.13	0.14	false	0.56
P-24	1,437.00	12	125.0	0.00	Open	-315.05	0.46	0.32	false	0.89
P-25	1,528.00	12	125.0	0.00	Open	-304.78	0.46	0.30	false	0.86
P-26	463.00	12	125.0	0.00	Open	564.81	0.44	0.95	false	1.60
P-28	825.00	12	125.0	0.00	Open	481.82	0.58	0.70	false	1.37
P-29	912.00	12	125.0	0.00	Open	456.43	0.58	0.64	false	1.29
P-30	935.00	24	125.0	0.00	Open	1,284.47	0.14	0.15	false	0.91
P-31	502.00	12	125.0	0.00	Open	540.68	0.44	0.87	false	1.53
P-32	1,044.00	30	125.0	0.00	Open	-466.38	0.01	0.01	false	0.21
P-33	1,076.00	12	125.0	0.00	Open	-41.27	0.01	0.01	false	0.12
P-34	1,740.00	30	125.0	0.00	Open	1,421.28	0.10	0.06	false	0.65
P-35	1,727.00	12	125.0	0.00	Open	-132.00	0.10	0.06	false	0.37
P-36	2,395.00	30	125.0	0.00	Open	-2,514.38	0.41	0.17	false	1.14
P-37	2,406.00	12	125.0	0.00	Open	225.28	0.41	0.17	false	0.64
P-38	1,120.00	30	125.0	0.00	Open	-3,400.32	0.34	0.30	false	1.54
P-39	1,119.00	12	125.0	0.00	Open	-305.56	0.34	0.30	false	0.87
P-40	1,551.00	30	125.0	0.00	Open	-4,035.43	0.65	0.42	false	1.83
P-41	1,519.00	12	125.0	0.00	Open	366.56	0.65	0.42	false	1.04
P-42	1,335.00	30	125.0	0.00	Open	4,778.87	0.76	0.57	false	2.17
P-43	1,367.00	12	125.0	0.00	Open	-423.78	0.76	0.56	false	1.20
P-44	779.00	12	125.0	0.00	Open	514.56	0.62	0.80	false	1.46
P-45	1,370.00	12	125.0	0.00	Open	292.48	0.38	0.28	false	0.83
P-46	2,363.00	12	125.0	0.00	Open	-243.18	0.47	0.20	false	0.69
P-47	1,575.00	12	125.0	0.00	Open	406.39	0.81	0.51	false	1.15
P-48	2,947.00	12	125.0	0.00	Open	-43.63	0.02	0.01	false	0.12
P-49	1,627.00	12	125.0	0.00	Open	-306.64	0.50	0.31	false	0.87
P-50	989.00	12	125.0	0.00	Open	490.59	0.72	0.73	false	1.39
P-55	829.00	12	125.0	0.00	Open	-355.57	0.33	0.40	false	1.01
P-56	1,373.00	12	125.0	0.00	Open	366.78	0.58	0.43	false	1.04
P-57	818.00	12	125.0	0.00	Open	-640.10	0.98	1.19	false	1.82
P-58	881.00	12	125.0	0.00	Open	-373.52	0.39	0.44	false	1.06
P-59	1,189.00	12	125.0	0.00	Open	132.30	0.08	0.06	false	0.38
P-60	1,264.00	12	125.0	0.00	Open	-282.64	0.33	0.26	false	0.80
P-61	1,571.00	12	125.0	0.00	Open	-327.31	0.54	0.34	false	0.93
P-62	1,256.00	12	125.0	0.00	Open	-298.90	0.37	0.29	false	0.85
P-63	726.00	12	125.0	0.00	Open	-468.66	0.49	0.67	false	1.33
P-64	563.00	12	125.0	0.00	Open	-928.12	1.34	2.37	false	2.63
P-65	1,029.00	12	125.0	0.00	Open	178.00	0.11	0.11	false	0.50
P-67	900.00	12	125.0	0.00	Open	179.33	0.10	0.11	false	0.51
P-69	773.00	12	125.0	0.00	Open	274.78	0.19	0.25	false	0.78
P-72	823.00	12	125.0	0.00	Open	343.92	0.31	0.38	false	0.98
P-68	100.00	24	125.0	0.00	Open	-3,222.05	0.08	0.81	true	2.29
P-71	1.00	24	125.0	0.00	Closed	0.00	0.00	0.00	true	0.00
P-74	100.00	30	125.0	0.00	Open	-9,665.95	0.21	2.10	true	4.39



# Scenario: Run 5-PHD-50%GW-50%SW(S)

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-75	3.00	30	125.0	0.00	Open	-9,665.95	0.01	2.10	true	4.39
P-76	795.00	12	125.0	0.00	Open	270.65	0.19	0.24	false	0.77
P-77	801.00	12	125.0	0.00	Open	348.99	0.31	0.39	false	0.99
P-78	1,001.00	12	125.0	0.00	Open	180.67	0.11	0.11	false	0.51
P-79	900.00	12	125.0	0.00	Open	179.33	0.10	0.11	false	0.51
P-81	840.00	12	125.0	0.00	Open	366.39	0.36	0.42	false	1.04
P-82	1,761.00	12	125.0	0.00	Open	377.18	0.79	0.45	false	1.07
P-83	665.00	12	125.0	0.00	Open	33.08	0.00	0.00	false	0.09
P-84	775.00	12	125.0	0.00	Open	-69.74	0.02	0.02	false	0.20
P-85	139.00	12	125.0	0.00	Open	0.34	0.00	0.00	false	0.00
P-86	130.00	12	125.0	0.00	Open	-0.34	0.00	0.00	false	0.00
P-90	345.00	12	125.0	0.00	Open	0.34	0.00	0.00	false	0.00
P-91	318.00	12	125.0	0.00	Open	0.34	0.00	0.00	false	0.00
P-92	320.00	12	125.0	0.00	Open	-0.34	0.00	0.00	false	0.00
P-93	382.00	12	125.0	0.00	Open	0.34	0.00	0.00	false	0.00
P-94	1,337.00	12	125.0	0.00	Open	-428.88	0.76	0.57	false	1.22
P-95	1,231.00	12	125.0	0.00	Open	-164.30	0.12	0.10	false	0.47
P-96	1,126.00	12	125.0	0.00	Open	-481.66	0.79	0.70	false	1.37
P-97	2,986.00	24	125.0	0.00	Open	-3,222.00	2.43	0.81	false	2.29
P-98	113.00	6	130.0	0.00	Closed	0.00	0.00	0.00	false	0.00
P-99	1,701.00	24	125.0	0.00	Open	-3,222.00	1.38	0.81	false	2.29
P-101	5,665.00	24	125.0	0.00	Open	-4,852.00	9.83	1.74	false	3.44
P-102	224.00	24	125.0	0.00	Open	-4,852.00	0.39	1.74	false	3.44
P-103	1.00	24	125.0	0.00	Open	-4,852.00	0.00	1.74	true	3.44
P-104	3,645.00	16	125.0	0.00	Open	1,630.00	6.05	1.66	false	2.60
P-105	5,402.00	16	125.0	0.00	Open	1,630.00	8.96	1.66	false	2.60
P-106	1,283.00	12	125.0	0.00	Open	201.88	0.18	0.14	false	0.57

# Scenario: Run 6-PHD-100%SW(S)

## Steady State Analysis

### Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-1	9.30	1	Demand	0.00	Fixed	0.00	127.03	51.04
J-3	19.50	Zone-1	Demand	0.00	Fixed	0.00	117.16	42.34
J-4	12.00	Zone-1	Demand	0.00	Fixed	0.00	127.39	50.02
J-5	21.50	Zone-1	Demand	103.16	Fixed	103.16	115.72	40.85
J-6	21.00	Zone-1	Demand	0.00	Fixed	0.00	111.12	39.07
J-7	21.00	Zone-1	Demand	0.00	Fixed	0.00	111.12	39.07
J-8	21.00	Zone-1	Demand	0.00	Fixed	0.00	111.12	39.07
J-9	12.00	Zone-1	Demand	6,444.00	Fixed	6,444.00	88.39	33.12
J-10	13.00	Zone-1	Demand	0.00	Fixed	0.00	97.15	36.48
J-11	13.00	Zone-1	Demand	0.00	Fixed	0.00	102.15	38.65
J-12	13.00	Zone-1	Demand	0.00	Fixed	0.00	127.40	49.59
J-13	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.40	50.03
J-14	13.00	Zone-1	Demand	0.00	Fixed	0.00	96.10	36.03
J-15	13.00	Zone-1	Demand	1,630.00	Fixed	1,630.00	87.14	32.14
J-80	24.00	1	Demand	116.06	Pattern - 1	116.06	115.74	39.77
J-90	26.30	1	Demand	60.51	Pattern - 1	60.51	115.77	38.79
J-100	22.90	1	Demand	54.56	Pattern - 1	54.56	115.83	40.29
J-110	22.50	1	Demand	132.92	Pattern - 1	132.92	115.79	40.44
J-120	21.20	1	Demand	169.63	Pattern - 1	169.63	115.79	41.01
J-130	20.10	1	Demand	193.36	Pattern - 1	193.36	116.50	41.79
J-140	18.60	1	Demand	408.53	Pattern - 1	408.53	116.61	42.49
J-150	21.00	1	Demand	194.43	Pattern - 1	194.43	116.04	41.20
J-160	18.85	1	Demand	91.13	Pattern - 1	91.13	117.16	42.62
J-170	20.42	1	Demand	133.45	Pattern - 1	133.45	117.32	42.01
J-190	20.40	1	Demand	218.30	Pattern - 1	218.30	115.90	41.40
J-200	20.50	1	Demand	97.13	Pattern - 1	97.13	117.12	41.89
J-210	23.60	1	Demand	240.55	Pattern - 1	240.55	116.64	40.33
J-220	24.75	1	Demand	190.46	Pattern - 1	190.46	115.94	39.53
J-230	24.20	1	Demand	105.15	Pattern - 1	105.15	115.74	39.69
J-240	21.00	1	Demand	86.30	Pattern - 1	86.30	115.72	41.06
J-250	24.30	1	Demand	219.22	Pattern - 1	219.22	115.71	39.63
J-260	23.21	1	Demand	151.77	Pattern - 1	151.77	115.78	40.13
J-300	20.30	1	Demand	247.05	Pattern - 1	247.05	117.57	42.17
J-310	15.90	1	Demand	625.87	Pattern - 1	625.87	117.98	44.26
J-320	16.00	1	Demand	379.34	Pattern - 1	379.34	118.60	44.48
J-330	14.90	1	Demand	535.66	Pattern - 1	535.66	118.53	44.93
J-350	16.00	1	Demand	247.47	Pattern - 1	247.47	120.03	45.10
J-360	15.50	1	Demand	459.09	Pattern - 1	459.09	119.82	45.23
J-370	13.60	1	Demand	155.34	Pattern - 1	155.34	120.58	46.38
J-380	11.30	1	Demand	256.89	Pattern - 1	256.89	121.61	47.82
J-400	15.35	1	Demand	193.52	Pattern - 1	193.52	122.37	46.39
J-410	15.27	1	Demand	226.75	Pattern - 1	226.75	121.75	46.16
J-420	24.50	1	Demand	265.35	Pattern - 1	265.35	116.65	39.95
J-430	25.10	1	Demand	249.98	Pattern - 1	249.98	117.10	39.89
J-440	21.30	1	Demand	282.71	Pattern - 1	282.71	118.48	42.13
J-450	18.00	1	Demand	242.04	Pattern - 1	242.04	121.48	44.86
J-460	15.30	1	Demand	0.00	Pattern - 1	0.00	121.61	46.09
J-470	12.09	1	Demand	109.64	Pattern - 1	109.64	121.25	47.32
J-480	10.60	1	Demand	0.00	Pattern - 1	0.00	121.16	47.93
J-490	14.80	1	Demand	39.04	Pattern - 1	39.04	121.18	46.12
J-500	11.10	1	Demand	163.97	Pattern - 1	163.97	121.20	47.73
J-510	10.50	1	Demand	182.18	Pattern - 1	182.18	122.08	48.37

# Scenario: Run 6-PHD-100%SW(S)

## Steady State Analysis

### Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-520	10.80	1	Demand	240.04	Pattern - 1	240.04	121.37	47.93
J-530	11.00	1	Demand	70.37	Pattern - 1	70.37	122.23	48.22
J-540	10.82	1	Demand	54.73	Pattern - 1	54.73	123.85	49.00
J-550	11.60	1	Demand	111.81	Pattern - 1	111.81	123.55	48.53
J-560	11.30	1	Demand	121.19	Pattern - 1	121.19	124.35	49.01
J-570	9.70	1	Demand	91.48	Pattern - 1	91.48	125.51	50.21
J-580	14.00	1	Demand	169.77	Pattern - 1	169.77	122.50	47.04
J-590	10.60	1	Demand	283.05	Pattern - 1	283.05	124.33	49.30
J-600	13.00	1	Demand	204.34	Pattern - 1	204.34	124.57	48.37
J-610	15.30	1	Demand	283.21	Pattern - 1	283.21	125.40	47.73
J-620	15.50	1	Demand	53.07	Pattern - 1	53.07	123.41	46.78
J-650	13.90	1	Demand	446.94	Pattern - 1	446.94	119.54	45.80
J-670	21.50	1	Demand	204.82	Pattern - 1	204.82	117.18	41.48
J-680	13.40	1	Demand	61.01	Pattern - 1	61.01	121.16	46.71
J-690	11.25	1	Demand	248.84	Pattern - 1	248.84	121.21	47.67
J-700	18.50	1	Demand	312.51	Pattern - 1	312.51	116.74	42.59
J-720	18.70	1	Demand	359.81	Pattern - 1	359.81	117.15	42.68
J-730	19.31	1	Demand	69.68	Pattern - 1	69.68	117.90	42.74
J-740	13.80	1	Demand	319.75	Pattern - 1	319.75	120.46	46.24
J-750	11.55	1	Demand	202.86	Pattern - 1	202.86	120.63	47.29
J-760	9.70	1	Demand	69.59	Pattern - 1	69.59	124.62	49.82
J-770	15.00	1	Demand	179.84	Pattern - 1	179.84	122.18	46.47
J-780	11.20	1	Demand	132.14	Pattern - 1	132.14	123.29	48.59
J-800	18.80	1	Demand	72.64	Pattern - 1	72.64	117.19	42.65
J-810	21.47	1	Demand	167.24	Pattern - 1	167.24	116.90	41.37
J-820	20.20	1	Demand	318.42	Pattern - 1	318.42	116.34	41.68
J-830	17.95	1	Demand	210.33	Pattern - 1	210.33	120.91	44.64

# Scenario: Run 6-PHD-100%SW(S)

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-151C	851.00	12	125.0	0.00	Open	415.31	0.46	0.54	false	1.18
P-152C	800.00	12	125.0	0.00	Open	849.37	1.61	2.01	false	2.41
P-155C	449.00	30	125.0	0.00	Open	-9,394.80	0.89	1.99	false	4.26
P-154C	395.00	30	125.0	0.00	Open	-9,325.21	0.78	1.96	false	4.23
P-141C	1,217.00	12	125.0	0.00	Open	448.75	0.75	0.62	false	1.27
P-127C	257.00	24	125.0	0.00	Open	-1,182.06	0.03	0.13	false	0.84
P-112C	447.00	12	125.0	0.00	Open	-297.96	0.13	0.29	false	0.85
P-111C	1,139.00	12	125.0	0.00	Open	-518.05	0.92	0.81	false	1.47
P-114C	1,540.00	12	125.0	0.00	Open	-327.39	0.53	0.34	false	0.93
P-106C	1,125.00	12	125.0	0.00	Open	303.44	0.34	0.30	false	0.86
P-105C	1,053.00	30	125.0	0.00	Open	-3,501.15	0.34	0.32	false	1.59
P-960	746.00	12	125.0	0.00	Open	145.71	0.06	0.08	false	0.41
P-970	897.00	12	125.0	0.00	Open	-59.59	0.01	0.01	false	0.17
P-950	402.00	12	125.0	0.00	Open	-58.52	0.01	0.01	false	0.17
P-940	817.00	12	125.0	0.00	Open	184.17	0.10	0.12	false	0.52
P-590	1,013.00	12	125.0	0.00	Open	58.52	0.01	0.01	false	0.17
P-600	659.00	12	125.0	0.00	Open	97.56	0.02	0.04	false	0.28
P-630	1,187.00	12	125.0	0.00	Open	441.98	0.71	0.60	false	1.25
P-750	931.00	12	125.0	0.00	Open	-84.74	0.03	0.03	false	0.24
P-760	1,759.00	12	125.0	0.00	Open	198.31	0.24	0.14	false	0.56
P-780	1,638.00	12	125.0	0.00	Open	402.65	0.83	0.51	false	1.14
P-790	1,293.00	12	125.0	0.00	Open	-733.81	1.99	1.54	false	2.08
P-800	1,439.00	12	125.0	0.00	Open	-680.74	1.92	1.34	false	1.93
P-740	709.00	12	125.0	0.00	Open	759.30	1.16	1.64	false	2.15
P-640	597.00	12	125.0	0.00	Open	279.47	0.15	0.26	false	0.79
P-680	726.00	12	125.0	0.00	Open	357.28	0.29	0.41	false	1.01
P-420	996.00	12	125.0	0.00	Open	-397.46	0.49	0.49	false	1.13
P-390	2,320.00	12	125.0	0.00	Open	-468.57	1.55	0.67	false	1.33
P-510	1,511.00	12	125.0	0.00	Open	553.98	1.38	0.91	false	1.57
P-520	1,532.00	12	125.0	0.00	Open	-836.69	3.00	1.96	false	2.37
P-430	1,150.00	12	125.0	0.00	Open	-229.99	0.21	0.18	false	0.65
P-230	1,475.00	12	125.0	0.00	Open	195.73	0.20	0.13	false	0.56
P-220	1,496.00	12	125.0	0.00	Open	386.18	0.70	0.47	false	1.10
P-200	753.00	12	125.0	0.00	Open	283.48	0.20	0.26	false	0.80
P-87	1,673.00	12	125.0	0.00	Open	98.89	0.06	0.04	false	0.28
P-70	1,321.00	12	125.0	0.00	Open	-77.83	0.03	0.02	false	0.22
P-110	870.00	12	125.0	0.00	Open	-125.14	0.05	0.06	false	0.35
P-80	808.00	12	125.0	0.00	Open	-138.34	0.06	0.07	false	0.39
P-250	1,092.00	12	125.0	0.00	Open	-86.90	0.03	0.03	false	0.25
P-3	527.00	30	125.0	0.00	Open	-11,468.34	1.52	2.88	false	5.21
P-4	1,274.00	16	125.0	0.00	Open	-1,419.67	1.64	1.28	false	2.27
P-8	1,129.00	16	125.0	0.00	Open	-354.63	0.11	0.10	false	0.57
P-9	685.00	12	125.0	0.00	Open	-5.74	0.00	0.00	false	0.02
P-10	634.00	12	125.0	0.00	Open	127.18	0.04	0.06	false	0.36
P-11	2,034.00	12	125.0	0.00	Open	-320.08	0.67	0.33	false	0.91
P-12	860.00	12	125.0	0.00	Open	-300.51	0.25	0.29	false	0.85
P-13	767.00	12	125.0	0.00	Open	-494.93	0.57	0.74	false	1.40
P-14	1,007.00	16	125.0	0.00	Open	890.11	0.54	0.54	false	1.42
P-15	898.00	12	125.0	0.00	Open	-134.51	0.06	0.07	false	0.38
P-16	1,041.00	12	125.0	0.00	Open	339.33	0.38	0.37	false	0.96
P-17	1,922.00	12	125.0	0.00	Open	133.56	0.13	0.07	false	0.38

# Scenario: Run 6-PHD-100%SW(S)

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-18	676.00	12	125.0	0.00	Open	-446.07	0.41	0.61	false	1.27
P-19	1,174.00	12	125.0	0.00	Open	-132.32	0.08	0.06	false	0.38
P-20	1,680.00	12	125.0	0.00	Open	297.78	0.49	0.29	false	0.84
P-490	1,505.00	12	125.0	0.00	Open	-38.65	0.01	0.01	false	0.11
P-500	1,520.00	12	125.0	0.00	Open	304.00	0.46	0.30	false	0.86
P-21	2,057.00	12	125.0	0.00	Open	-357.14	0.83	0.40	false	1.01
P-22	900.00	12	125.0	0.00	Open	-193.74	0.12	0.13	false	0.55
P-23	940.00	12	125.0	0.00	Open	189.24	0.12	0.12	false	0.54
P-24	1,437.00	12	125.0	0.00	Open	-305.62	0.44	0.30	false	0.87
P-25	1,528.00	12	125.0	0.00	Open	-295.65	0.44	0.29	false	0.84
P-26	463.00	12	125.0	0.00	Open	555.33	0.42	0.92	false	1.58
P-28	825.00	12	125.0	0.00	Open	472.29	0.56	0.68	false	1.34
P-29	912.00	12	125.0	0.00	Open	447.41	0.56	0.61	false	1.27
P-30	935.00	24	125.0	0.00	Open	-1,254.70	0.13	0.14	false	0.89
P-31	502.00	12	125.0	0.00	Open	531.60	0.42	0.85	false	1.51
P-32	1,044.00	30	125.0	0.00	Open	-2,956.90	0.24	0.23	false	1.34
P-33	1,076.00	12	125.0	0.00	Open	-261.29	0.24	0.23	false	0.74
P-34	1,740.00	30	125.0	0.00	Open	3,964.93	0.70	0.40	false	1.80
P-35	1,727.00	12	125.0	0.00	Open	-358.08	0.70	0.41	false	1.02
P-36	2,395.00	30	125.0	0.00	Open	-4,894.56	1.42	0.59	false	2.22
P-37	2,406.00	12	125.0	0.00	Open	438.54	1.42	0.59	false	1.24
P-38	1,120.00	30	125.0	0.00	Open	-5,696.15	0.88	0.79	false	2.59
P-39	1,119.00	12	125.0	0.00	Open	-511.87	0.88	0.79	false	1.45
P-40	1,551.00	30	125.0	0.00	Open	-6,264.61	1.46	0.94	false	2.84
P-41	1,519.00	12	125.0	0.00	Open	569.05	1.46	0.96	false	1.61
P-42	1,335.00	30	125.0	0.00	Open	6,842.90	1.48	1.11	false	3.11
P-43	1,367.00	12	125.0	0.00	Open	-606.81	1.48	1.08	false	1.72
P-44	779.00	12	125.0	0.00	Open	514.44	0.62	0.80	false	1.46
P-45	1,370.00	12	125.0	0.00	Open	116.30	0.07	0.05	false	0.33
P-46	2,363.00	12	125.0	0.00	Open	-419.36	1.29	0.55	false	1.19
P-47	1,575.00	12	125.0	0.00	Open	648.46	1.92	1.22	false	1.84
P-48	2,947.00	12	125.0	0.00	Open	124.53	0.17	0.06	false	0.35
P-49	1,627.00	12	125.0	0.00	Open	-453.30	1.02	0.63	false	1.29
P-50	989.00	12	125.0	0.00	Open	504.47	0.76	0.77	false	1.43
P-55	829.00	12	125.0	0.00	Open	-499.53	0.62	0.75	false	1.42
P-56	1,373.00	12	125.0	0.00	Open	454.14	0.87	0.63	false	1.29
P-57	818.00	12	125.0	0.00	Open	-798.84	1.47	1.80	false	2.27
P-58	881.00	12	125.0	0.00	Open	-553.37	0.80	0.91	false	1.57
P-59	1,189.00	12	125.0	0.00	Open	201.94	0.17	0.14	false	0.57
P-60	1,264.00	12	125.0	0.00	Open	-293.81	0.36	0.28	false	0.83
P-61	1,571.00	12	125.0	0.00	Open	-480.80	1.10	0.70	false	1.36
P-62	1,256.00	12	125.0	0.00	Open	-440.05	0.75	0.60	false	1.25
P-63	726.00	12	125.0	0.00	Open	-609.81	0.79	1.09	false	1.73
P-64	563.00	12	125.0	0.00	Open	-1,222.75	2.23	3.96	false	3.47
P-65	1,029.00	12	125.0	0.00	Open	197.51	0.14	0.14	false	0.56
P-67	900.00	12	125.0	0.00	Open	198.99	0.12	0.14	false	0.56
P-69	773.00	12	125.0	0.00	Open	268.11	0.18	0.24	false	0.76
P-72	823.00	12	125.0	0.00	Open	413.52	0.44	0.53	false	1.17
P-68	100.00	24	125.0	0.00	Open	0.00	0.00	0.00	true	0.00
P-71	1.00	24	125.0	0.00	Closed	0.00	0.00	0.00	true	0.00
P-74	100.00	30	125.0	0.00	Open	-12,888.01	0.36	3.57	true	5.85

# Scenario: Run 6-PHD-100%SW(S)

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-75	3.00	30	125.0	0.00	Open	-12,888.01	0.01	3.57	true	5.85
P-76	795.00	12	125.0	0.00	Open	264.07	0.18	0.23	false	0.75
P-77	801.00	12	125.0	0.00	Open	419.62	0.44	0.55	false	1.19
P-78	1,001.00	12	125.0	0.00	Open	200.47	0.14	0.14	false	0.57
P-79	900.00	12	125.0	0.00	Open	198.99	0.12	0.14	false	0.56
P-81	840.00	12	125.0	0.00	Open	267.23	0.20	0.24	false	0.76
P-82	1,761.00	12	125.0	0.00	Open	290.30	0.49	0.28	false	0.82
P-83	665.00	12	125.0	0.00	Open	90.58	0.02	0.03	false	0.26
P-84	775.00	12	125.0	0.00	Open	-12.57	0.00	0.00	false	0.04
P-85	139.00	12	125.0	0.00	Open	0.01	0.00	0.00	false	0.00
P-86	130.00	12	125.0	0.00	Open	-0.01	0.00	0.00	false	0.00
P-90	345.00	12	125.0	0.00	Open	0.01	0.00	0.00	false	0.00
P-91	318.00	12	125.0	0.00	Open	0.01	0.00	0.00	false	0.00
P-92	320.00	12	125.0	0.00	Open	-0.01	0.00	0.00	false	0.00
P-93	382.00	12	125.0	0.00	Open	0.01	0.00	0.00	false	0.00
P-94	1,337.00	12	125.0	0.00	Open	-614.12	1.48	1.10	false	1.74
P-95	1,231.00	12	125.0	0.00	Open	-158.81	0.11	0.09	false	0.45
P-96	1,126.00	12	125.0	0.00	Open	-393.23	0.54	0.48	false	1.12
P-97	2,986.00	24	125.0	0.00	Open	-6,444.00	8.77	2.94	false	4.57
P-98	113.00	6	130.0	0.00	Closed	0.00	0.00	0.00	false	0.00
P-99	1,701.00	24	125.0	0.00	Open	-6,444.00	4.99	2.94	false	4.57
P-101	5,665.00	24	125.0	0.00	Open	-8,074.00	25.25	4.46	false	5.73
P-102	224.00	24	125.0	0.00	Open	-8,074.00	1.00	4.46	false	5.73
P-103	1.00	24	125.0	0.00	Open	-8,074.00	0.00	4.46	true	5.73
P-104	3,645.00	16	125.0	0.00	Open	1,630.00	6.05	1.66	false	2.60
P-105	5,402.00	16	125.0	0.00	Open	1,630.00	8.96	1.66	false	2.60
P-106	1,283.00	12	125.0	0.00	Open	-192.40	0.17	0.13	false	0.55



# Scenario: Run 7-MDD 100%GW RESE FILL 4,833 GPM (8 HR FILL)

## Steady State Analysis

### Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-1	9.30	1	Demand	0.00	Fixed	0.00	127.78	51.36
J-3	19.50	Zone-1	Demand	0.00	Fixed	0.00	134.90	50.03
J-4	12.00	Zone-1	Demand	4,833.00	Fixed	4,833.00	127.72	50.17
J-5	21.50	Zone-1	Demand	12.90	Fixed	12.90	132.51	48.12
J-6	21.00	Zone-1	Demand	0.00	Fixed	0.00	127.95	46.36
J-7	21.00	Zone-1	Demand	0.00	Fixed	0.00	127.95	46.36
J-8	21.00	Zone-1	Demand	0.00	Fixed	0.00	127.95	46.36
J-9	12.00	Zone-1	Demand	0.00	Fixed	0.00	127.04	49.87
J-10	13.00	Zone-1	Demand	0.00	Fixed	0.00	127.04	49.44
J-11	13.00	Zone-1	Demand	0.00	Fixed	0.00	127.04	49.44
J-12	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.35	50.01
J-13	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.40	50.03
J-14	13.00	Zone-1	Demand	0.00	Fixed	0.00	121.00	46.82
J-15	13.00	Zone-1	Demand	1,630.00	Fixed	1,630.00	112.04	42.93
J-80	24.00	1	Demand	14.51	Pattern - 1	14.51	133.69	47.55
J-90	26.30	1	Demand	7.56	Pattern - 1	7.56	133.80	46.60
J-100	22.90	1	Demand	6.82	Pattern - 1	6.82	133.87	48.11
J-110	22.50	1	Demand	16.62	Pattern - 1	16.62	133.86	48.28
J-120	21.20	1	Demand	21.20	Pattern - 1	21.20	133.86	48.84
J-130	20.10	1	Demand	24.17	Pattern - 1	24.17	134.16	49.45
J-140	18.60	1	Demand	51.07	Pattern - 1	51.07	134.19	50.11
J-150	21.00	1	Demand	24.30	Pattern - 1	24.30	134.02	49.00
J-160	18.85	1	Demand	11.39	Pattern - 1	11.39	134.60	50.18
J-170	20.42	1	Demand	16.68	Pattern - 1	16.68	132.73	48.69
J-190	20.40	1	Demand	27.29	Pattern - 1	27.29	132.76	48.71
J-200	20.50	1	Demand	12.14	Pattern - 1	12.14	132.49	48.55
J-210	23.60	1	Demand	30.07	Pattern - 1	30.07	132.26	47.11
J-220	24.75	1	Demand	23.81	Pattern - 1	23.81	132.34	46.64
J-230	24.20	1	Demand	13.14	Pattern - 1	13.14	132.45	46.93
J-240	21.00	1	Demand	10.79	Pattern - 1	10.79	132.59	48.37
J-250	24.30	1	Demand	27.40	Pattern - 1	27.40	133.22	47.22
J-260	23.21	1	Demand	18.97	Pattern - 1	18.97	132.78	47.50
J-300	20.30	1	Demand	30.88	Pattern - 1	30.88	132.23	48.52
J-310	15.90	1	Demand	78.23	Pattern - 1	78.23	130.76	49.80
J-320	16.00	1	Demand	47.42	Pattern - 1	47.42	130.78	49.76
J-330	14.90	1	Demand	66.96	Pattern - 1	66.96	130.23	50.00
J-350	16.00	1	Demand	30.93	Pattern - 1	30.93	129.73	49.31
J-360	15.50	1	Demand	57.39	Pattern - 1	57.39	129.60	49.46
J-370	13.60	1	Demand	19.42	Pattern - 1	19.42	129.09	50.07
J-380	11.30	1	Demand	32.11	Pattern - 1	32.11	128.68	50.89
J-400	15.35	1	Demand	24.19	Pattern - 1	24.19	128.74	49.16
J-410	15.27	1	Demand	28.34	Pattern - 1	28.34	128.76	49.20
J-420	24.50	1	Demand	33.17	Pattern - 1	33.17	131.20	46.26
J-430	25.10	1	Demand	31.25	Pattern - 1	31.25	130.27	45.59
J-440	21.30	1	Demand	35.34	Pattern - 1	35.34	129.46	46.89
J-450	18.00	1	Demand	30.25	Pattern - 1	30.25	128.76	48.02
J-460	15.30	1	Demand	0.00	Pattern - 1	0.00	128.76	49.19
J-470	12.09	1	Demand	13.71	Pattern - 1	13.71	128.63	50.52
J-480	10.60	1	Demand	0.00	Pattern - 1	0.00	128.59	51.15
J-490	14.80	1	Demand	4.88	Pattern - 1	4.88	128.55	49.31
J-500	11.10	1	Demand	20.50	Pattern - 1	20.50	128.53	50.91
J-510	10.50	1	Demand	22.77	Pattern - 1	22.77	128.47	51.14

Project Engineer: Mark Smith

WaterCAD v6.5 [6.5120]

# Scenario: Run 7-MDD 100%GW RESE FILL 4,833 GPM (8 HR FILL)

## Steady State Analysis

### Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-520	10.80	1	Demand	30.01	Pattern - 1	30.01	128.49	51.02
J-530	11.00	1	Demand	8.80	Pattern - 1	8.80	128.48	50.93
J-540	10.82	1	Demand	6.84	Pattern - 1	6.84	128.37	50.96
J-550	11.60	1	Demand	13.98	Pattern - 1	13.98	128.35	50.61
J-560	11.30	1	Demand	15.15	Pattern - 1	15.15	128.09	50.63
J-570	9.70	1	Demand	11.44	Pattern - 1	11.44	128.04	51.30
J-580	14.00	1	Demand	21.22	Pattern - 1	21.22	128.52	49.65
J-590	10.60	1	Demand	35.38	Pattern - 1	35.38	128.02	50.91
J-600	13.00	1	Demand	25.54	Pattern - 1	25.54	127.95	49.83
J-610	15.30	1	Demand	35.40	Pattern - 1	35.40	127.90	48.82
J-620	15.50	1	Demand	6.63	Pattern - 1	6.63	128.30	48.90
J-650	13.90	1	Demand	55.87	Pattern - 1	55.87	129.72	50.21
J-670	21.50	1	Demand	25.60	Pattern - 1	25.60	132.35	48.06
J-680	13.40	1	Demand	7.63	Pattern - 1	7.63	128.61	49.94
J-690	11.25	1	Demand	31.10	Pattern - 1	31.10	128.54	50.85
J-700	18.50	1	Demand	39.06	Pattern - 1	39.06	132.32	49.34
J-720	18.70	1	Demand	44.98	Pattern - 1	44.98	131.74	49.00
J-730	19.31	1	Demand	8.71	Pattern - 1	8.71	131.69	48.72
J-740	13.80	1	Demand	39.97	Pattern - 1	39.97	129.21	50.03
J-750	11.55	1	Demand	25.36	Pattern - 1	25.36	128.78	50.82
J-760	9.70	1	Demand	8.70	Pattern - 1	8.70	128.22	51.38
J-770	15.00	1	Demand	22.48	Pattern - 1	22.48	128.73	49.31
J-780	11.20	1	Demand	16.52	Pattern - 1	16.52	128.40	50.81
J-800	18.80	1	Demand	9.08	Pattern - 1	9.08	134.20	50.03
J-810	21.47	1	Demand	20.90	Pattern - 1	20.90	132.73	48.23
J-820	20.20	1	Demand	39.80	Pattern - 1	39.80	132.74	48.79
J-830	17.95	1	Demand	26.29	Pattern - 1	26.29	129.30	48.27

# Scenario: Run 7-MDD 100%GW RESE FILL 4,833 GPM (8 HR FILL)

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen-Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-1510	851.00	12	125.0	0.00	Open	164.51	0.08	0.10	false	0.47
P-1520	800.00	12	125.0	0.00	Open	-199.07	0.11	0.14	false	0.56
P-1550	449.00	30	125.0	0.00	Open	3,896.41	0.18	0.39	false	1.77
P-1540	395.00	30	125.0	0.00	Open	3,905.11	0.15	0.39	false	1.77
P-1410	1,217.00	12	125.0	0.00	Open	-100.68	0.05	0.04	false	0.29
P-1270	257.00	24	125.0	0.00	Open	4,607.69	0.41	1.58	false	3.27
P-1120	447.00	12	125.0	0.00	Open	294.44	0.13	0.28	false	0.84
P-1110	1,139.00	12	125.0	0.00	Open	375.87	0.51	0.45	false	1.07
P-1140	1,540.00	12	125.0	0.00	Open	180.62	0.18	0.11	false	0.51
P-1060	1,125.00	12	125.0	0.00	Open	-390.25	0.54	0.48	false	1.11
P-1050	1,053.00	30	125.0	0.00	Open	4,502.85	0.54	0.51	false	2.04
P-960	746.00	12	125.0	0.00	Open	-163.55	0.07	0.10	false	0.46
P-970	897.00	12	125.0	0.00	Open	-22.33	0.00	0.00	false	0.06
P-950	402.00	12	125.0	0.00	Open	97.21	0.01	0.04	false	0.28
P-940	817.00	12	125.0	0.00	Open	87.77	0.02	0.03	false	0.25
P-590	1,013.00	12	125.0	0.00	Open	-97.21	0.04	0.04	false	0.28
P-600	659.00	12	125.0	0.00	Open	-92.33	0.02	0.03	false	0.26
P-630	1,187.00	12	125.0	0.00	Open	-64.16	0.02	0.02	false	0.18
P-750	931.00	12	125.0	0.00	Open	-143.03	0.07	0.07	false	0.41
P-760	1,759.00	12	125.0	0.00	Open	-107.65	0.08	0.04	false	0.31
P-780	1,638.00	12	125.0	0.00	Open	-82.11	0.04	0.03	false	0.23
P-790	1,293.00	12	125.0	0.00	Open	308.27	0.40	0.31	false	0.87
P-800	1,439.00	12	125.0	0.00	Open	314.91	0.46	0.32	false	0.89
P-740	709.00	12	125.0	0.00	Open	-138.67	0.05	0.07	false	0.39
P-640	597.00	12	125.0	0.00	Open	61.49	0.01	0.02	false	0.17
P-680	726.00	12	125.0	0.00	Open	97.84	0.03	0.04	false	0.28
P-420	996.00	12	125.0	0.00	Open	-53.51	0.01	0.01	false	0.15
P-390	2,320.00	12	125.0	0.00	Open	378.22	1.04	0.45	false	1.07
P-510	1,511.00	12	125.0	0.00	Open	-415.94	0.81	0.54	false	1.18
P-520	1,532.00	12	125.0	0.00	Open	380.60	0.70	0.46	false	1.08
P-430	1,150.00	12	125.0	0.00	Open	-184.02	0.14	0.12	false	0.52
P-230	1,475.00	12	125.0	0.00	Open	-143.51	0.11	0.07	false	0.41
P-220	1,496.00	12	125.0	0.00	Open	-119.71	0.08	0.05	false	0.34
P-200	753.00	12	125.0	0.00	Open	315.17	0.24	0.32	false	0.89
P-87	1,673.00	12	125.0	0.00	Open	180.34	0.19	0.11	false	0.51
P-70	1,321.00	12	125.0	0.00	Open	-147.43	0.10	0.08	false	0.42
P-110	870.00	12	125.0	0.00	Open	-238.12	0.17	0.19	false	0.68
P-80	808.00	12	125.0	0.00	Open	-155.00	0.07	0.09	false	0.44
P-250	1,092.00	12	125.0	0.00	Open	-371.04	0.47	0.43	false	1.05
P-3	527.00	30	125.0	0.00	Open	4,478.02	0.27	0.50	false	2.03
P-4	1,274.00	16	125.0	0.00	Open	354.98	0.13	0.10	false	0.57
P-8	1,129.00	16	125.0	0.00	Open	-158.23	0.02	0.02	false	0.25
P-9	685.00	12	125.0	0.00	Open	26.49	0.00	0.00	false	0.08
P-10	634.00	12	125.0	0.00	Open	43.11	0.01	0.01	false	0.12
P-11	2,034.00	12	125.0	0.00	Open	-204.93	0.29	0.14	false	0.58
P-12	860.00	12	125.0	0.00	Open	-232.83	0.16	0.18	false	0.66
P-13	767.00	12	125.0	0.00	Open	-257.13	0.17	0.22	false	0.73
P-14	1,007.00	16	125.0	0.00	Open	770.39	0.42	0.41	false	1.23
P-15	898.00	12	125.0	0.00	Open	209.42	0.14	0.15	false	0.59
P-16	1,041.00	12	125.0	0.00	Open	-183.82	0.12	0.12	false	0.52
P-17	1,922.00	12	125.0	0.00	Open	-573.44	1.87	0.97	false	1.63

# Scenario: Run 7-MDD 100%GW RESE FILL 4,833 GPM (8 HR FILL)

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-18	676.00	12	125.0	0.00	Open	534.38	0.58	0.85	false	1.52
P-19	1,174.00	12	125.0	0.00	Open	343.64	0.44	0.38	false	0.97
P-20	1,680.00	12	125.0	0.00	Open	197.84	0.23	0.14	false	0.56
P-490	1,505.00	12	125.0	0.00	Open	480.35	1.05	0.70	false	1.36
P-500	1,520.00	12	125.0	0.00	Open	-447.19	0.93	0.61	false	1.27
P-21	2,057.00	12	125.0	0.00	Open	388.72	0.97	0.47	false	1.10
P-22	900.00	12	125.0	0.00	Open	73.01	0.02	0.02	false	0.21
P-23	940.00	12	125.0	0.00	Open	-71.32	0.02	0.02	false	0.20
P-24	1,437.00	12	125.0	0.00	Open	59.49	0.02	0.01	false	0.17
P-25	1,528.00	12	125.0	0.00	Open	57.55	0.02	0.01	false	0.16
P-26	463.00	12	125.0	0.00	Open	-28.78	0.00	0.00	false	0.08
P-28	825.00	12	125.0	0.00	Open	-39.67	0.01	0.01	false	0.11
P-29	912.00	12	125.0	0.00	Open	-37.57	0.01	0.01	false	0.11
P-30	935.00	24	125.0	0.00	Open	4,598.61	1.47	1.57	false	3.26
P-31	502.00	12	125.0	0.00	Open	-27.55	0.00	0.00	false	0.08
P-32	1,044.00	30	125.0	0.00	Open	4,355.31	0.50	0.48	false	1.98
P-33	1,076.00	12	125.0	0.00	Open	384.86	0.50	0.46	false	1.09
P-34	1,740.00	30	125.0	0.00	Open	-4,572.69	0.91	0.52	false	2.08
P-35	1,727.00	12	125.0	0.00	Open	412.38	0.91	0.53	false	1.17
P-36	2,395.00	30	125.0	0.00	Open	4,144.65	1.05	0.44	false	1.88
P-37	2,406.00	12	125.0	0.00	Open	-371.35	1.05	0.44	false	1.05
P-38	1,120.00	30	125.0	0.00	Open	3,897.31	0.44	0.39	false	1.77
P-39	1,119.00	12	125.0	0.00	Open	350.22	0.44	0.39	false	0.99
P-40	1,551.00	30	125.0	0.00	Open	3,718.92	0.55	0.36	false	1.69
P-41	1,519.00	12	125.0	0.00	Open	-337.81	0.55	0.37	false	0.96
P-42	1,335.00	30	125.0	0.00	Open	-3,233.74	0.37	0.28	false	1.47
P-43	1,367.00	12	125.0	0.00	Open	286.76	0.37	0.27	false	0.81
P-44	779.00	12	125.0	0.00	Open	67.73	0.01	0.02	false	0.19
P-45	1,370.00	12	125.0	0.00	Open	353.92	0.55	0.40	false	1.00
P-46	2,363.00	12	125.0	0.00	Open	286.96	0.64	0.27	false	0.81
P-47	1,575.00	12	125.0	0.00	Open	-413.60	0.84	0.53	false	1.17
P-48	2,947.00	12	125.0	0.00	Open	-205.97	0.43	0.15	false	0.58
P-49	1,627.00	12	125.0	0.00	Open	275.02	0.41	0.25	false	0.78
P-50	989.00	12	125.0	0.00	Open	127.92	0.06	0.06	false	0.36
P-55	829.00	12	125.0	0.00	Open	269.36	0.20	0.24	false	0.76
P-56	1,373.00	12	125.0	0.00	Open	-110.12	0.06	0.05	false	0.31
P-57	818.00	12	125.0	0.00	Open	212.99	0.13	0.16	false	0.60
P-58	881.00	12	125.0	0.00	Open	296.85	0.25	0.29	false	0.84
P-59	1,189.00	12	125.0	0.00	Open	-94.16	0.04	0.03	false	0.27
P-60	1,264.00	12	125.0	0.00	Open	-101.47	0.05	0.04	false	0.29
P-61	1,571.00	12	125.0	0.00	Open	252.59	0.33	0.21	false	0.72
P-62	1,256.00	12	125.0	0.00	Open	239.53	0.24	0.19	false	0.68
P-63	726.00	12	125.0	0.00	Open	218.31	0.12	0.16	false	0.62
P-64	563.00	12	125.0	0.00	Open	454.38	0.36	0.63	false	1.29
P-65	1,029.00	12	125.0	0.00	Open	-17.59	0.00	0.00	false	0.05
P-67	900.00	12	125.0	0.00	Open	-17.72	0.00	0.00	false	0.05
P-69	773.00	12	125.0	0.00	Open	47.31	0.01	0.01	false	0.13
P-72	823.00	12	125.0	0.00	Open	-89.92	0.03	0.03	false	0.26
P-68	100.00	24	125.0	0.00	Open	-6,444.00	0.29	2.94	true	4.57
P-71	1.00	24	125.0	0.00	Open	-6,444.00	0.00	2.93	true	4.57
P-74	100.00	30	125.0	0.00	Open	4,833.00	0.06	0.58	true	2.19

# Scenario: Run 7-MDD 100%GW RESE FILL 4,833 GPM (8 HR FILL)

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-75	3.00	30	125.0	0.00	Closed	0.00	0.00	0.00	true	0.00
P-76	795.00	12	125.0	0.00	Open	46.60	0.01	0.01	false	0.13
P-77	801.00	12	125.0	0.00	Open	-91.24	0.03	0.03	false	0.26
P-78	1,001.00	12	125.0	0.00	Open	-17.85	0.00	0.00	false	0.05
P-79	900.00	12	125.0	0.00	Open	-17.72	0.00	0.00	false	0.05
P-81	840.00	12	125.0	0.00	Open	297.10	0.24	0.29	false	0.84
P-82	1,761.00	12	125.0	0.00	Open	192.88	0.23	0.13	false	0.55
P-83	665.00	12	125.0	0.00	Open	-156.66	0.06	0.09	false	0.44
P-84	775.00	12	125.0	0.00	Open	-167.81	0.08	0.10	false	0.48
P-85	139.00	12	125.0	0.00	Open	1.74	0.00	0.00	false	0.00
P-86	130.00	12	125.0	0.00	Open	-1.74	0.00	0.00	false	0.00
P-90	345.00	12	125.0	0.00	Open	1.74	0.00	0.00	false	0.00
P-91	318.00	12	125.0	0.00	Open	1.74	0.00	0.00	false	0.00
P-92	320.00	12	125.0	0.00	Open	-1.74	0.00	0.00	false	0.00
P-93	382.00	12	125.0	0.00	Open	1.74	0.00	0.00	false	0.00
P-94	1,337.00	12	125.0	0.00	Open	290.22	0.37	0.28	false	0.82
P-95	1,231.00	12	125.0	0.00	Open	-70.86	0.02	0.02	false	0.20
P-96	1,126.00	12	125.0	0.00	Open	-340.34	0.42	0.37	false	0.97
P-97	2,986.00	24	125.0	0.00	Open	0.00	0.00	0.00	false	0.00
P-98	113.00	6	130.0	0.00	Closed	0.00	0.00	0.00	false	0.00
P-99	1,701.00	24	125.0	0.00	Open	0.00	0.00	0.00	false	0.00
P-101	5,665.00	24	125.0	0.00	Open	-1,630.00	1.30	0.23	false	1.16
P-102	224.00	24	125.0	0.00	Open	-1,630.00	0.05	0.23	false	1.16
P-103	1.00	24	125.0	0.00	Open	-1,630.00	0.00	0.23	true	1.16
P-104	3,645.00	16	125.0	0.00	Open	1,630.00	6.05	1.66	false	2.60
P-105	5,402.00	16	125.0	0.00	Open	1,630.00	8.96	1.66	false	2.60
P-106	1,283.00	12	125.0	0.00	Open	714.19	1.87	1.46	false	2.03

# Scenario: Run 8-MDD 50%GW-50%SW(S) RESE FILL 4,833 GPM (8 HR FILL)

## Steady State Analysis

### Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-1	9.30	1	Demand	0.00	Fixed	0.00	127.41	51.20
J-3	19.50	Zone-1	Inflow	3,222.00	Fixed	-3,222.00	128.98	47.46
J-4	12.00	Zone-1	Demand	4,833.00	Fixed	4,833.00	127.40	50.03
J-5	21.50	Zone-1	Demand	12.90	Fixed	12.90	128.31	46.30
J-6	21.00	Zone-1	Demand	0.00	Fixed	0.00	123.72	44.53
J-7	21.00	Zone-1	Demand	0.00	Fixed	0.00	123.72	44.53
J-8	21.00	Zone-1	Demand	0.00	Fixed	0.00	123.72	44.53
J-9	12.00	Zone-1	Demand	3,222.00	Fixed	3,222.00	114.37	44.38
J-10	13.00	Zone-1	Demand	0.00	Fixed	0.00	116.79	45.00
J-11	13.00	Zone-1	Demand	0.00	Fixed	0.00	118.18	45.60
J-12	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.01	49.86
J-13	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.40	50.03
J-14	13.00	Zone-1	Demand	0.00	Fixed	0.00	112.13	42.97
J-15	13.00	Zone-1	Demand	1,630.00	Fixed	1,630.00	103.17	39.09
J-80	24.00	1	Demand	14.51	Pattern - 1	14.51	128.61	45.35
J-90	26.30	1	Demand	7.56	Pattern - 1	7.56	128.63	44.36
J-100	22.90	1	Demand	6.82	Pattern - 1	6.82	128.65	45.85
J-110	22.50	1	Demand	16.62	Pattern - 1	16.62	128.65	46.02
J-120	21.20	1	Demand	21.20	Pattern - 1	21.20	128.65	46.58
J-130	20.10	1	Demand	24.17	Pattern - 1	24.17	128.75	47.10
J-140	18.60	1	Demand	51.07	Pattern - 1	51.07	128.76	47.76
J-150	21.00	1	Demand	24.30	Pattern - 1	24.30	128.70	46.69
J-160	18.85	1	Demand	11.39	Pattern - 1	11.39	128.90	47.71
J-170	20.42	1	Demand	16.68	Pattern - 1	16.68	128.40	46.81
J-190	20.40	1	Demand	27.29	Pattern - 1	27.29	128.40	46.82
J-200	20.50	1	Demand	12.14	Pattern - 1	12.14	128.33	46.75
J-210	23.60	1	Demand	30.07	Pattern - 1	30.07	128.25	45.37
J-220	24.75	1	Demand	23.81	Pattern - 1	23.81	128.27	44.88
J-230	24.20	1	Demand	13.14	Pattern - 1	13.14	128.29	45.13
J-240	21.00	1	Demand	10.79	Pattern - 1	10.79	128.33	46.53
J-250	24.30	1	Demand	27.40	Pattern - 1	27.40	128.49	45.17
J-260	23.21	1	Demand	18.97	Pattern - 1	18.97	128.40	45.60
J-300	20.30	1	Demand	30.88	Pattern - 1	30.88	128.29	46.81
J-310	15.90	1	Demand	78.23	Pattern - 1	78.23	127.94	48.57
J-320	16.00	1	Demand	47.42	Pattern - 1	47.42	127.96	48.53
J-330	14.90	1	Demand	66.96	Pattern - 1	66.96	127.80	48.94
J-350	16.00	1	Demand	30.93	Pattern - 1	30.93	127.74	48.44
J-360	15.50	1	Demand	57.39	Pattern - 1	57.39	127.69	48.64
J-370	13.60	1	Demand	19.42	Pattern - 1	19.42	127.60	49.42
J-380	11.30	1	Demand	32.11	Pattern - 1	32.11	127.53	50.39
J-400	15.35	1	Demand	24.19	Pattern - 1	24.19	127.55	48.64
J-410	15.27	1	Demand	28.34	Pattern - 1	28.34	127.54	48.67
J-420	24.50	1	Demand	33.17	Pattern - 1	33.17	127.99	44.86
J-430	25.10	1	Demand	31.25	Pattern - 1	31.25	127.78	44.52
J-440	21.30	1	Demand	35.34	Pattern - 1	35.34	127.64	46.10
J-450	18.00	1	Demand	30.25	Pattern - 1	30.25	127.54	47.49
J-460	15.30	1	Demand	0.00	Pattern - 1	0.00	127.54	48.66
J-470	12.09	1	Demand	13.71	Pattern - 1	13.71	127.51	50.04
J-480	10.60	1	Demand	0.00	Pattern - 1	0.00	127.50	50.68
J-490	14.80	1	Demand	4.88	Pattern - 1	4.88	127.49	48.85
J-500	11.10	1	Demand	20.50	Pattern - 1	20.50	127.49	50.46
J-510	10.50	1	Demand	22.77	Pattern - 1	22.77	127.49	50.72



# Scenario: Run 8-MDD 50%GW-50%SW(S) RESE FILL 4,833 GPM (8 HR FILL)

## Steady State Analysis

### Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-520	10.80	1	Demand	30.01	Pattern - 1	30.01	127.49	50.59
J-530	11.00	1	Demand	8.80	Pattern - 1	8.80	127.49	50.50
J-540	10.82	1	Demand	6.84	Pattern - 1	6.84	127.49	50.58
J-550	11.60	1	Demand	13.98	Pattern - 1	13.98	127.48	50.24
J-560	11.30	1	Demand	15.15	Pattern - 1	15.15	127.44	50.35
J-570	9.70	1	Demand	11.44	Pattern - 1	11.44	127.44	51.04
J-580	14.00	1	Demand	21.22	Pattern - 1	21.22	127.50	49.21
J-590	10.60	1	Demand	35.38	Pattern - 1	35.38	127.43	50.65
J-600	13.00	1	Demand	25.54	Pattern - 1	25.54	127.42	49.60
J-610	15.30	1	Demand	35.40	Pattern - 1	35.40	127.42	48.60
J-620	15.50	1	Demand	6.63	Pattern - 1	6.63	127.47	48.54
J-650	13.90	1	Demand	55.87	Pattern - 1	55.87	127.72	49.35
J-670	21.50	1	Demand	25.60	Pattern - 1	25.60	128.30	46.30
J-680	13.40	1	Demand	7.63	Pattern - 1	7.63	127.50	49.47
J-690	11.25	1	Demand	31.10	Pattern - 1	31.10	127.49	50.39
J-700	18.50	1	Demand	39.06	Pattern - 1	39.06	128.29	47.60
J-720	18.70	1	Demand	44.98	Pattern - 1	44.98	128.16	47.45
J-730	19.31	1	Demand	8.71	Pattern - 1	8.71	128.16	47.19
J-740	13.80	1	Demand	39.97	Pattern - 1	39.97	127.62	49.34
J-750	11.55	1	Demand	25.36	Pattern - 1	25.36	127.53	50.28
J-760	9.70	1	Demand	8.70	Pattern - 1	8.70	127.47	51.05
J-770	15.00	1	Demand	22.48	Pattern - 1	22.48	127.54	48.79
J-780	11.20	1	Demand	16.52	Pattern - 1	16.52	127.49	50.41
J-800	18.80	1	Demand	9.08	Pattern - 1	9.08	128.79	47.68
J-810	21.47	1	Demand	20.90	Pattern - 1	20.90	128.40	46.36
J-820	20.20	1	Demand	39.80	Pattern - 1	39.80	128.40	46.91
J-830	17.95	1	Demand	26.29	Pattern - 1	26.29	127.65	47.56

# Scenario: Run 8-MDD 50%GW-50%SW(S) RESE FILL 4,833 GPM (8 HR FILL)

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen-Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-1510	851.00	12	125.0	0.00	Open	97.06	0.03	0.04	false	0.28
P-1520	800.00	12	125.0	0.00	Open	-31.68	0.00	0.00	false	0.09
P-1550	449.00	30	125.0	0.00	Open	1,375.48	0.03	0.06	false	0.62
P-1540	395.00	30	125.0	0.00	Open	1,384.18	0.02	0.06	false	0.63
P-1410	1,217.00	12	125.0	0.00	Open	-15.06	0.00	0.00	false	0.04
P-1270	257.00	24	125.0	0.00	Open	2,250.12	0.11	0.42	false	1.60
P-1120	447.00	12	125.0	0.00	Open	125.92	0.03	0.06	false	0.36
P-1110	1,139.00	12	125.0	0.00	Open	159.16	0.10	0.09	false	0.45
P-1140	1,540.00	12	125.0	0.00	Open	64.97	0.03	0.02	false	0.18
P-1060	1,125.00	12	125.0	0.00	Open	-177.24	0.12	0.11	false	0.50
P-1050	1,053.00	30	125.0	0.00	Open	2,045.06	0.12	0.12	false	0.93
P-960	746.00	12	125.0	0.00	Open	-62.46	0.01	0.02	false	0.18
P-970	897.00	12	125.0	0.00	Open	-9.88	0.00	0.00	false	0.03
P-950	402.00	12	125.0	0.00	Open	38.21	0.00	0.01	false	0.11
P-940	817.00	12	125.0	0.00	Open	43.33	0.01	0.01	false	0.12
P-590	1,013.00	12	125.0	0.00	Open	-38.21	0.01	0.01	false	0.11
P-600	659.00	12	125.0	0.00	Open	-33.33	0.00	0.01	false	0.09
P-630	1,187.00	12	125.0	0.00	Open	7.28	0.00	0.00	false	0.02
P-750	931.00	12	125.0	0.00	Open	-70.23	0.02	0.02	false	0.20
P-760	1,759.00	12	125.0	0.00	Open	-34.84	0.01	0.01	false	0.10
P-780	1,638.00	12	125.0	0.00	Open	-9.30	0.00	0.00	false	0.03
P-790	1,293.00	12	125.0	0.00	Open	108.12	0.06	0.04	false	0.31
P-800	1,439.00	12	125.0	0.00	Open	114.76	0.07	0.05	false	0.33
P-740	709.00	12	125.0	0.00	Open	-15.56	0.00	0.00	false	0.04
P-640	597.00	12	125.0	0.00	Open	57.48	0.01	0.01	false	0.16
P-680	726.00	12	125.0	0.00	Open	66.01	0.01	0.02	false	0.19
P-420	996.00	12	125.0	0.00	Open	-53.35	0.01	0.01	false	0.15
P-390	2,320.00	12	125.0	0.00	Open	161.68	0.22	0.09	false	0.46
P-510	1,511.00	12	125.0	0.00	Open	-164.79	0.15	0.10	false	0.47
P-520	1,532.00	12	125.0	0.00	Open	129.45	0.09	0.06	false	0.37
P-430	1,150.00	12	125.0	0.00	Open	-105.26	0.05	0.04	false	0.30
P-230	1,475.00	12	125.0	0.00	Open	-65.73	0.03	0.02	false	0.19
P-220	1,496.00	12	125.0	0.00	Open	-41.93	0.01	0.01	false	0.12
P-200	753.00	12	125.0	0.00	Open	164.82	0.07	0.10	false	0.47
P-87	1,673.00	12	125.0	0.00	Open	102.56	0.07	0.04	false	0.29
P-70	1,321.00	12	125.0	0.00	Open	-71.12	0.03	0.02	false	0.20
P-110	870.00	12	125.0	0.00	Open	-116.03	0.04	0.05	false	0.33
P-80	808.00	12	125.0	0.00	Open	-78.69	0.02	0.02	false	0.22
P-250	1,092.00	12	125.0	0.00	Open	-172.64	0.12	0.11	false	0.49
P-3	527.00	30	125.0	0.00	Open	1,528.98	0.04	0.07	false	0.69
P-4	1,274.00	16	125.0	0.00	Open	82.02	0.01	0.01	false	0.13
P-8	1,129.00	16	125.0	0.00	Open	-95.45	0.01	0.01	false	0.15
P-9	685.00	12	125.0	0.00	Open	11.90	0.00	0.00	false	0.03
P-10	634.00	12	125.0	0.00	Open	28.52	0.00	0.00	false	0.08
P-11	2,034.00	12	125.0	0.00	Open	-114.03	0.10	0.05	false	0.32
P-12	860.00	12	125.0	0.00	Open	-125.33	0.05	0.06	false	0.36
P-13	767.00	12	125.0	0.00	Open	-149.63	0.06	0.08	false	0.42
P-14	1,007.00	16	125.0	0.00	Open	424.67	0.14	0.14	false	0.68
P-15	898.00	12	125.0	0.00	Open	90.69	0.03	0.03	false	0.26
P-16	1,041.00	12	125.0	0.00	Open	-65.09	0.02	0.02	false	0.18
P-17	1,922.00	12	125.0	0.00	Open	-273.40	0.47	0.25	false	0.78

# Scenario: Run 8-MDD 50%GW-50%SW(S) RESE FILL 4,833 GPM (8 HR FILL)

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen-Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-18	676.00	12	125.0	0.00	Open	234.33	0.13	0.19	false	0.66
P-19	1,174.00	12	125.0	0.00	Open	145.24	0.09	0.08	false	0.41
P-20	1,680.00	12	125.0	0.00	Open	110.06	0.08	0.05	false	0.31
P-490	1,505.00	12	125.0	0.00	Open	229.21	0.27	0.18	false	0.65
P-500	1,520.00	12	125.0	0.00	Open	-196.04	0.20	0.13	false	0.56
P-21	2,057.00	12	125.0	0.00	Open	174.29	0.22	0.11	false	0.49
P-22	900.00	12	125.0	0.00	Open	12.00	0.00	0.00	false	0.03
P-23	940.00	12	125.0	0.00	Open	-11.71	0.00	0.00	false	0.03
P-24	1,437.00	12	125.0	0.00	Open	-1.76	0.00	0.00	false	0.00
P-25	1,528.00	12	125.0	0.00	Open	-1.82	0.00	0.00	false	0.01
P-26	463.00	12	125.0	0.00	Open	32.85	0.00	0.00	false	0.09
P-28	825.00	12	125.0	0.00	Open	22.28	0.00	0.00	false	0.06
P-29	912.00	12	125.0	0.00	Open	21.11	0.00	0.00	false	0.06
P-30	935.00	24	125.0	0.00	Open	2,241.04	0.39	0.42	false	1.59
P-31	502.00	12	125.0	0.00	Open	31.44	0.00	0.00	false	0.09
P-32	1,044.00	30	125.0	0.00	Open	2,010.43	0.12	0.11	false	0.91
P-33	1,076.00	12	125.0	0.00	Open	177.65	0.12	0.11	false	0.50
P-34	1,740.00	30	125.0	0.00	Open	-2,044.29	0.21	0.12	false	0.93
P-35	1,727.00	12	125.0	0.00	Open	184.36	0.21	0.12	false	0.52
P-36	2,395.00	30	125.0	0.00	Open	1,777.21	0.22	0.09	false	0.81
P-37	2,406.00	12	125.0	0.00	Open	-159.23	0.22	0.09	false	0.45
P-38	1,120.00	30	125.0	0.00	Open	1,602.86	0.08	0.08	false	0.73
P-39	1,119.00	12	125.0	0.00	Open	144.04	0.08	0.08	false	0.41
P-40	1,551.00	30	125.0	0.00	Open	1,488.35	0.10	0.07	false	0.68
P-41	1,519.00	12	125.0	0.00	Open	-135.20	0.10	0.07	false	0.38
P-42	1,335.00	30	125.0	0.00	Open	-1,209.54	0.06	0.04	false	0.55
P-43	1,367.00	12	125.0	0.00	Open	107.26	0.06	0.04	false	0.30
P-44	779.00	12	125.0	0.00	Open	65.63	0.01	0.02	false	0.19
P-45	1,370.00	12	125.0	0.00	Open	179.17	0.15	0.11	false	0.51
P-46	2,363.00	12	125.0	0.00	Open	112.21	0.11	0.05	false	0.32
P-47	1,575.00	12	125.0	0.00	Open	-160.09	0.14	0.09	false	0.45
P-48	2,947.00	12	125.0	0.00	Open	-90.33	0.09	0.03	false	0.26
P-49	1,627.00	12	125.0	0.00	Open	106.50	0.07	0.04	false	0.30
P-50	989.00	12	125.0	0.00	Open	80.60	0.03	0.03	false	0.23
P-55	829.00	12	125.0	0.00	Open	97.96	0.03	0.04	false	0.28
P-56	1,373.00	12	125.0	0.00	Open	-21.48	0.00	0.00	false	0.06
P-57	818.00	12	125.0	0.00	Open	48.90	0.01	0.01	false	0.14
P-58	881.00	12	125.0	0.00	Open	100.94	0.03	0.04	false	0.29
P-59	1,189.00	12	125.0	0.00	Open	-22.72	0.00	0.00	false	0.06
P-60	1,264.00	12	125.0	0.00	Open	-57.04	0.02	0.01	false	0.16
P-61	1,571.00	12	125.0	0.00	Open	95.29	0.06	0.04	false	0.27
P-62	1,256.00	12	125.0	0.00	Open	91.82	0.04	0.03	false	0.26
P-63	726.00	12	125.0	0.00	Open	70.59	0.01	0.02	false	0.20
P-64	563.00	12	125.0	0.00	Open	149.37	0.05	0.08	false	0.42
P-65	1,029.00	12	125.0	0.00	Open	7.72	0.00	0.00	false	0.02
P-67	900.00	12	125.0	0.00	Open	7.78	0.00	0.00	false	0.02
P-69	773.00	12	125.0	0.00	Open	47.05	0.01	0.01	false	0.13
P-72	823.00	12	125.0	0.00	Open	-12.10	0.00	0.00	false	0.03
P-68	100.00	24	125.0	0.00	Open	-3,222.00	0.08	0.81	true	2.29
P-71	1.00	24	125.0	0.00	Closed	0.00	0.00	0.00	true	0.00
P-74	100.00	30	125.0	0.00	Open	1,611.00	0.01	0.08	true	0.73

# Scenario: Run 8-MDD 50%GW-50%SW(S) RESE FILL 4,833 GPM (8 HR FILL)

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-75	3.00	30	125.0	0.00	Open	-3,222.00	0.00	0.27	true	1.46
P-76	795.00	12	125.0	0.00	Open	46.35	0.01	0.01	false	0.13
P-77	801.00	12	125.0	0.00	Open	-12.28	0.00	0.00	false	0.03
P-78	1,001.00	12	125.0	0.00	Open	7.84	0.00	0.00	false	0.02
P-79	900.00	12	125.0	0.00	Open	7.78	0.00	0.00	false	0.02
P-81	840.00	12	125.0	0.00	Open	155.37	0.07	0.09	false	0.44
P-82	1,761.00	12	125.0	0.00	Open	107.29	0.08	0.04	false	0.30
P-83	665.00	12	125.0	0.00	Open	-78.88	0.02	0.02	false	0.22
P-84	775.00	12	125.0	0.00	Open	-91.21	0.03	0.03	false	0.26
P-85	139.00	12	125.0	0.00	Open	0.56	0.00	0.00	false	0.00
P-86	130.00	12	125.0	0.00	Open	-0.56	0.00	0.00	false	0.00
P-90	345.00	12	125.0	0.00	Open	0.56	0.00	0.00	false	0.00
P-91	318.00	12	125.0	0.00	Open	0.56	0.00	0.00	false	0.00
P-92	320.00	12	125.0	0.00	Open	-0.56	0.00	0.00	false	0.00
P-93	382.00	12	125.0	0.00	Open	0.56	0.00	0.00	false	0.00
P-94	1,337.00	12	125.0	0.00	Open	108.55	0.06	0.04	false	0.31
P-95	1,231.00	12	125.0	0.00	Open	-42.75	0.01	0.01	false	0.12
P-96	1,126.00	12	125.0	0.00	Open	-187.61	0.14	0.12	false	0.53
P-97	2,986.00	24	125.0	0.00	Open	-3,222.00	2.43	0.81	false	2.29
P-98	113.00	6	130.0	0.00	Closed	0.00	0.00	0.00	false	0.00
P-99	1,701.00	24	125.0	0.00	Open	-3,222.00	1.38	0.81	false	2.29
P-101	5,665.00	24	125.0	0.00	Open	-4,852.00	9.83	1.74	false	3.44
P-102	224.00	24	125.0	0.00	Open	-4,852.00	0.39	1.74	false	3.44
P-103	1.00	24	125.0	0.00	Open	-4,852.00	0.00	1.74	true	3.44
P-104	3,645.00	16	125.0	0.00	Open	1,630.00	6.05	1.66	false	2.60
P-105	5,402.00	16	125.0	0.00	Open	1,630.00	8.96	1.66	false	2.60
P-106	1,283.00	12	125.0	0.00	Open	348.20	0.50	0.39	false	0.99

# Scenario: Run 9A-MDD-100%GW+FF Base - 6444 Inflow @J3

## Steady State Analysis

### Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-1	9.30	1	Demand	0.00	Fixed	0.00	127.40	51.20
J-3	19.50	Zone-1	Inflow	6,444.00	Fixed	-6,444.00	131.04	48.36
J-4	12.00	Zone-1	Demand	0.00	Fixed	0.00	127.40	50.03
J-5	21.50	Zone-1	Demand	51.58	Fixed	51.58	128.51	46.39
J-6	21.00	Zone-1	Demand	0.00	Fixed	0.00	123.95	44.63
J-7	21.00	Zone-1	Demand	0.00	Fixed	0.00	123.95	44.63
J-8	21.00	Zone-1	Demand	0.00	Fixed	0.00	123.95	44.63
J-9	12.00	Zone-1	Demand	0.00	Fixed	0.00	127.04	49.87
J-10	13.00	Zone-1	Demand	0.00	Fixed	0.00	127.04	49.44
J-11	13.00	Zone-1	Demand	0.00	Fixed	0.00	127.04	49.44
J-12	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.35	50.01
J-13	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.40	50.03
J-14	13.00	Zone-1	Demand	0.00	Fixed	0.00	121.00	46.82
J-15	13.00	Zone-1	Demand	1,630.00	Fixed	1,630.00	112.04	42.93
J-80	24.00	1	Demand	58.03	Pattern - 1	58.03	129.33	45.66
J-90	26.30	1	Demand	30.25	Pattern - 1	30.25	129.41	44.70
J-100	22.90	1	Demand	27.28	Pattern - 1	27.28	129.49	46.21
J-110	22.50	1	Demand	66.46	Pattern - 1	66.46	129.47	46.37
J-120	21.20	1	Demand	84.81	Pattern - 1	84.81	129.47	46.94
J-130	20.10	1	Demand	96.68	Pattern - 1	96.68	130.00	47.65
J-140	18.60	1	Demand	204.26	Pattern - 1	204.26	130.07	48.32
J-150	21.00	1	Demand	97.21	Pattern - 1	97.21	129.71	47.13
J-160	18.85	1	Demand	45.57	Pattern - 1	45.57	130.75	48.51
J-170	20.42	1	Demand	66.73	Pattern - 1	66.73	129.13	47.13
J-190	20.40	1	Demand	109.15	Pattern - 1	109.15	128.87	47.02
J-200	20.50	1	Demand	48.57	Pattern - 1	48.57	128.84	46.97
J-210	23.60	1	Demand	120.28	Pattern - 1	120.28	128.44	45.45
J-220	24.75	1	Demand	95.23	Pattern - 1	95.23	128.44	44.95
J-230	24.20	1	Demand	52.57	Pattern - 1	52.57	128.47	45.20
J-240	21.00	1	Demand	43.15	Pattern - 1	43.15	128.59	46.64
J-250	24.30	1	Demand	109.61	Pattern - 1	109.61	129.01	45.39
J-260	23.21	1	Demand	75.89	Pattern - 1	75.89	128.86	45.80
J-300	20.30	1	Demand	123.53	Pattern - 1	123.53	128.81	47.04
J-310	15.90	1	Demand	312.93	Pattern - 1	312.93	127.90	48.55
J-320	16.00	1	Demand	189.67	Pattern - 1	189.67	128.06	48.58
J-330	14.90	1	Demand	267.83	Pattern - 1	267.83	127.51	48.82
J-350	16.00	1	Demand	123.74	Pattern - 1	123.74	127.67	48.41
J-360	15.50	1	Demand	229.54	Pattern - 1	229.54	127.43	48.53
J-370	13.60	1	Demand	77.67	Pattern - 1	77.67	127.34	49.31
J-380	11.30	1	Demand	128.44	Pattern - 1	128.44	127.30	50.29
J-400	15.35	1	Demand	96.76	Pattern - 1	96.76	127.45	48.60
J-410	15.27	1	Demand	113.38	Pattern - 1	113.38	127.37	48.60
J-420	24.50	1	Demand	132.68	Pattern - 1	132.68	127.74	44.76
J-430	25.10	1	Demand	124.99	Pattern - 1	124.99	127.41	44.36
J-440	21.30	1	Demand	141.35	Pattern - 1	141.35	127.32	45.96
J-450	18.00	1	Demand	121.02	Pattern - 1	121.02	127.32	47.39
J-460	15.30	1	Demand	0.00	Pattern - 1	0.00	127.34	48.57
J-470	12.09	1	Demand	54.82	Pattern - 1	54.82	127.20	49.90
J-480	10.60	1	Demand	0.00	Pattern - 1	0.00	127.16	50.53
J-490	14.80	1	Demand	19.52	Pattern - 1	19.52	127.16	48.71
J-500	11.10	1	Demand	81.98	Pattern - 1	81.98	127.15	50.31
J-510	10.50	1	Demand	91.09	Pattern - 1	91.09	127.23	50.60

Project Engineer: Mark Smith

WaterCAD v6.5 [6.5120]

# Scenario: Run 9A-MDD-100%GW+FF Base - 6444 Inflow @J3

## Steady State Analysis

### Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand Calculated (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-520	10.80	1	Demand	120.02	Pattern - 1	120.02	127.15	50.44
J-530	11.00	1	Demand	35.19	Pattern - 1	35.19	127.30	50.42
J-540	10.82	1	Demand	27.37	Pattern - 1	27.37	127.41	50.55
J-550	11.60	1	Demand	55.91	Pattern - 1	55.91	127.30	50.16
J-560	11.30	1	Demand	60.60	Pattern - 1	60.60	127.30	50.29
J-570	9.70	1	Demand	45.74	Pattern - 1	45.74	127.40	51.03
J-580	14.00	1	Demand	84.88	Pattern - 1	84.88	127.36	49.15
J-590	10.60	1	Demand	141.52	Pattern - 1	141.52	127.25	50.57
J-600	13.00	1	Demand	102.17	Pattern - 1	102.17	127.25	49.53
J-610	15.30	1	Demand	141.60	Pattern - 1	141.60	127.32	48.57
J-620	15.50	1	Demand	26.54	Pattern - 1	26.53	127.32	48.48
J-650	13.90	1	Demand	223.47	Pattern - 1	223.47	127.53	49.26
J-670	21.50	1	Demand	102.41	Pattern - 1	102.41	128.81	46.52
J-680	13.40	1	Demand	30.50	Pattern - 1	30.50	127.17	49.32
J-690	11.25	1	Demand	124.42	Pattern - 1	124.42	127.16	50.25
J-700	18.50	1	Demand	156.26	Pattern - 1	156.26	128.67	47.76
J-720	18.70	1	Demand	179.91	Pattern - 1	179.91	128.43	47.57
J-730	19.31	1	Demand	34.84	Pattern - 1	34.84	128.51	47.34
J-740	13.80	1	Demand	159.87	Pattern - 1	159.87	127.38	49.24
J-750	11.55	1	Demand	101.43	Pattern - 1	101.43	127.18	50.13
J-760	9.70	1	Demand	34.79	Pattern - 1	34.79	127.41	51.03
J-770	15.00	1	Demand	89.92	Pattern - 1	89.92	127.39	48.72
J-780	11.20	1	Demand	66.07	Pattern - 1	66.07	127.38	50.37
J-800	18.80	1	Demand	36.32	Pattern - 1	36.32	130.40	48.38
J-810	21.47	1	Demand	83.62	Pattern - 1	83.62	129.04	46.63
J-820	20.20	1	Demand	159.21	Pattern - 1	159.21	128.94	47.14
J-830	17.95	1	Demand	105.17	Pattern - 1	105.17	127.56	47.52



# Scenario: Run 9A-MDD-100%GW+FF Base - 6444 Inflow @J3

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-1510	851.00	12	125.0	0.00	Open	253.88	0.18	0.22	false	0.72
P-1520	800.00	12	125.0	0.00	Open	204.24	0.12	0.14	false	0.58
P-1550	449.00	30	125.0	0.00	Open	614.56	0.01	0.01	false	0.28
P-1540	395.00	30	125.0	0.00	Open	649.35	0.01	0.01	false	0.29
P-1410	1,217.00	12	125.0	0.00	Open	129.13	0.07	0.06	false	0.37
P-1270	257.00	24	125.0	0.00	Open	4,284.95	0.35	1.38	false	3.04
P-1120	447.00	12	125.0	0.00	Open	154.96	0.04	0.09	false	0.44
P-1110	1,139.00	12	125.0	0.00	Open	196.59	0.15	0.13	false	0.56
P-1140	1,540.00	12	125.0	0.00	Open	34.21	0.01	0.01	false	0.10
P-1060	1,125.00	12	125.0	0.00	Open	-285.62	0.30	0.27	false	0.81
P-1050	1,053.00	30	125.0	0.00	Open	3,295.60	0.30	0.29	false	1.50
P-960	746.00	12	125.0	0.00	Open	-51.22	0.01	0.01	false	0.15
P-970	897.00	12	125.0	0.00	Open	-43.03	0.01	0.01	false	0.12
P-950	402.00	12	125.0	0.00	Open	46.69	0.00	0.01	false	0.13
P-940	817.00	12	125.0	0.00	Open	94.21	0.03	0.03	false	0.27
P-590	1,013.00	12	125.0	0.00	Open	-46.69	0.01	0.01	false	0.13
P-600	659.00	12	125.0	0.00	Open	-27.17	0.00	0.00	false	0.08
P-630	1,187.00	12	125.0	0.00	Open	131.80	0.08	0.06	false	0.37
P-750	931.00	12	125.0	0.00	Open	-131.08	0.06	0.06	false	0.37
P-760	1,759.00	12	125.0	0.00	Open	10.44	0.00	0.00	false	0.03
P-780	1,638.00	12	125.0	0.00	Open	112.61	0.08	0.05	false	0.32
P-790	1,293.00	12	125.0	0.00	Open	-14.59	0.00	0.00	false	0.04
P-800	1,439.00	12	125.0	0.00	Open	11.95	0.00	0.00	false	0.03
P-740	709.00	12	125.0	0.00	Open	198.64	0.10	0.14	false	0.56
P-640	597.00	12	125.0	0.00	Open	179.67	0.07	0.11	false	0.51
P-680	726.00	12	125.0	0.00	Open	208.40	0.11	0.15	false	0.59
P-420	996.00	12	125.0	0.00	Open	-204.59	0.14	0.14	false	0.58
P-390	2,320.00	12	125.0	0.00	Open	215.47	0.37	0.16	false	0.61
P-510	1,511.00	12	125.0	0.00	Open	-127.79	0.09	0.06	false	0.36
P-520	1,532.00	12	125.0	0.00	Open	-13.57	0.00	0.00	false	0.04
P-430	1,150.00	12	125.0	0.00	Open	-248.50	0.24	0.21	false	0.70
P-230	1,475.00	12	125.0	0.00	Open	-71.55	0.03	0.02	false	0.20
P-220	1,496.00	12	125.0	0.00	Open	23.68	0.00	0.00	false	0.07
P-200	753.00	12	125.0	0.00	Open	346.12	0.29	0.38	false	0.98
P-87	1,673.00	12	125.0	0.00	Open	218.85	0.27	0.16	false	0.62
P-70	1,321.00	12	125.0	0.00	Open	-134.42	0.09	0.07	false	0.38
P-110	870.00	12	125.0	0.00	Open	-222.41	0.15	0.17	false	0.63
P-80	808.00	12	125.0	0.00	Open	-164.67	0.08	0.10	false	0.47
P-250	1,092.00	12	125.0	0.00	Open	-298.80	0.32	0.29	false	0.85
P-3	527.00	30	125.0	0.00	Open	268.80	0.00	0.00	false	0.12
P-4	1,274.00	16	125.0	0.00	Open	-268.80	0.08	0.06	false	0.43
P-8	1,129.00	16	125.0	0.00	Open	-257.90	0.06	0.05	false	0.41
P-9	685.00	12	125.0	0.00	Open	18.30	0.00	0.00	false	0.05
P-10	634.00	12	125.0	0.00	Open	84.76	0.02	0.03	false	0.24
P-11	2,034.00	12	125.0	0.00	Open	-276.71	0.51	0.25	false	0.78
P-12	860.00	12	125.0	0.00	Open	-288.93	0.24	0.27	false	0.82
P-13	767.00	12	125.0	0.00	Open	-386.14	0.36	0.47	false	1.10
P-14	1,007.00	16	125.0	0.00	Open	1,007.59	0.69	0.68	false	1.61
P-15	898.00	12	125.0	0.00	Open	94.42	0.03	0.03	false	0.27
P-16	1,041.00	12	125.0	0.00	Open	7.99	0.00	0.00	false	0.02
P-17	1,922.00	12	125.0	0.00	Open	-488.93	1.39	0.72	false	1.39

# Scenario: Run 9A-MDD-100%GW+FF Base - 6444 Inflow @J3

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen-Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-18	676.00	12	125.0	0.00	Open	332.67	0.24	0.35	false	0.94
P-19	1,174.00	12	125.0	0.00	Open	189.18	0.15	0.12	false	0.54
P-20	1,680.00	12	125.0	0.00	Open	268.07	0.40	0.24	false	0.76
P-490	1,505.00	12	125.0	0.00	Open	385.45	0.70	0.47	false	1.09
P-500	1,520.00	12	125.0	0.00	Open	-252.78	0.32	0.21	false	0.72
P-21	2,057.00	12	125.0	0.00	Open	281.89	0.54	0.26	false	0.80
P-22	900.00	12	125.0	0.00	Open	-53.40	0.01	0.01	false	0.15
P-23	940.00	12	125.0	0.00	Open	52.16	0.01	0.01	false	0.15
P-24	1,437.00	12	125.0	0.00	Open	-109.13	0.06	0.05	false	0.31
P-25	1,528.00	12	125.0	0.00	Open	-105.57	0.06	0.04	false	0.30
P-26	463.00	12	125.0	0.00	Open	233.76	0.09	0.18	false	0.66
P-28	825.00	12	125.0	0.00	Open	192.02	0.11	0.13	false	0.54
P-29	912.00	12	125.0	0.00	Open	181.90	0.11	0.12	false	0.52
P-30	935.00	24	125.0	0.00	Open	4,248.63	1.27	1.36	false	3.01
P-31	502.00	12	125.0	0.00	Open	223.77	0.09	0.17	false	0.63
P-32	1,044.00	30	125.0	0.00	Open	3,411.30	0.32	0.30	false	1.55
P-33	1,076.00	12	125.0	0.00	Open	301.44	0.32	0.30	false	0.86
P-34	1,740.00	30	125.0	0.00	Open	-3,134.57	0.45	0.26	false	1.42
P-35	1,727.00	12	125.0	0.00	Open	282.68	0.45	0.26	false	0.80
P-36	2,395.00	30	125.0	0.00	Open	2,409.59	0.38	0.16	false	1.09
P-37	2,406.00	12	125.0	0.00	Open	-215.89	0.38	0.16	false	0.61
P-38	1,120.00	30	125.0	0.00	Open	1,879.74	0.11	0.10	false	0.85
P-39	1,119.00	12	125.0	0.00	Open	168.92	0.11	0.10	false	0.48
P-40	1,551.00	30	125.0	0.00	Open	1,548.91	0.11	0.07	false	0.70
P-41	1,519.00	12	125.0	0.00	Open	-140.70	0.11	0.07	false	0.40
P-42	1,335.00	30	125.0	0.00	Open	-924.43	0.04	0.03	false	0.42
P-43	1,367.00	12	125.0	0.00	Open	81.98	0.04	0.03	false	0.23
P-44	779.00	12	125.0	0.00	Open	246.51	0.16	0.20	false	0.70
P-45	1,370.00	12	125.0	0.00	Open	355.59	0.55	0.40	false	1.01
P-46	2,363.00	12	125.0	0.00	Open	87.76	0.07	0.03	false	0.25
P-47	1,575.00	12	125.0	0.00	Open	-106.71	0.07	0.04	false	0.30
P-48	2,947.00	12	125.0	0.00	Open	-135.64	0.20	0.07	false	0.38
P-49	1,627.00	12	125.0	0.00	Open	77.29	0.04	0.02	false	0.22
P-50	989.00	12	125.0	0.00	Open	210.80	0.15	0.15	false	0.60
P-55	829.00	12	125.0	0.00	Open	10.61	0.00	0.00	false	0.03
P-56	1,373.00	12	125.0	0.00	Open	116.23	0.07	0.05	false	0.33
P-57	818.00	12	125.0	0.00	Open	-159.45	0.07	0.09	false	0.45
P-58	881.00	12	125.0	0.00	Open	-6.95	0.00	0.00	false	0.02
P-59	1,189.00	12	125.0	0.00	Open	11.78	0.00	0.00	false	0.03
P-60	1,264.00	12	125.0	0.00	Open	-149.03	0.10	0.08	false	0.42
P-61	1,571.00	12	125.0	0.00	Open	35.57	0.01	0.01	false	0.10
P-62	1,256.00	12	125.0	0.00	Open	14.00	0.00	0.00	false	0.04
P-63	726.00	12	125.0	0.00	Open	-70.89	0.01	0.02	false	0.20
P-64	563.00	12	125.0	0.00	Open	-101.38	0.02	0.04	false	0.29
P-65	1,029.00	12	125.0	0.00	Open	72.72	0.02	0.02	false	0.21
P-67	900.00	12	125.0	0.00	Open	73.27	0.02	0.02	false	0.21
P-69	773.00	12	125.0	0.00	Open	147.45	0.06	0.08	false	0.42
P-72	823.00	12	125.0	0.00	Open	82.99	0.02	0.03	false	0.24
P-68	100.00	24	125.0	0.00	Open	-6,444.00	0.29	2.94	true	4.57
P-71	1.00	24	125.0	0.00	Closed	0.00	0.00	0.00	true	0.00
P-74	100.00	30	125.0	0.00	Open	-0.00	0.00	0.00	true	0.00

Project Engineer: Mark Smith

WaterCAD v6.5 [6.5120]

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# Scenario: Run 9A-MDD-100%GW+FF Base - 6444 Inflow @J3

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-75	3.00	30	125.0	0.00	Open	-0.00	0.00	0.00	true	0.00
P-76	795.00	12	125.0	0.00	Open	145.23	0.06	0.08	false	0.41
P-77	801.00	12	125.0	0.00	Open	84.21	0.02	0.03	false	0.24
P-78	1,001.00	12	125.0	0.00	Open	73.81	0.02	0.02	false	0.21
P-79	900.00	12	125.0	0.00	Open	73.27	0.02	0.02	false	0.21
P-81	840.00	12	125.0	0.00	Open	326.28	0.29	0.34	false	0.93
P-82	1,761.00	12	125.0	0.00	Open	261.34	0.40	0.23	false	0.74
P-83	665.00	12	125.0	0.00	Open	-124.12	0.04	0.06	false	0.35
P-84	775.00	12	125.0	0.00	Open	-173.84	0.08	0.11	false	0.49
P-85	139.00	12	125.0	0.00	Open	1.86	0.00	0.00	false	0.01
P-86	130.00	12	125.0	0.00	Open	-1.86	0.00	0.00	false	0.01
P-90	345.00	12	125.0	0.00	Open	1.86	0.00	0.00	false	0.01
P-91	318.00	12	125.0	0.00	Open	1.86	0.00	0.00	false	0.01
P-92	320.00	12	125.0	0.00	Open	-1.86	0.00	0.00	false	0.01
P-93	382.00	12	125.0	0.00	Open	1.86	0.00	0.00	false	0.01
P-94	1,337.00	12	125.0	0.00	Open	82.96	0.04	0.03	false	0.24
P-95	1,231.00	12	125.0	0.00	Open	-115.49	0.06	0.05	false	0.33
P-96	1,126.00	12	125.0	0.00	Open	-445.13	0.69	0.61	false	1.26
P-97	2,986.00	24	125.0	0.00	Open	0.00	0.00	0.00	false	0.00
P-98	113.00	6	130.0	0.00	Closed	0.00	0.00	0.00	false	0.00
P-99	1,701.00	24	125.0	0.00	Open	0.00	0.00	0.00	false	0.00
P-101	5,665.00	24	125.0	0.00	Open	-1,630.00	1.30	0.23	false	1.16
P-102	224.00	24	125.0	0.00	Open	-1,630.00	0.05	0.23	false	1.16
P-103	1.00	24	125.0	0.00	Open	-1,630.00	0.00	0.23	true	1.16
P-104	3,645.00	16	125.0	0.00	Open	1,630.00	6.05	1.66	false	2.60
P-105	5,402.00	16	125.0	0.00	Open	1,630.00	8.96	1.66	false	2.60
P-106	1,283.00	12	125.0	0.00	Open	660.77	1.62	1.27	false	1.87

# Scenario: Run 9B-MDD-100%GW+ FF @ J6, 7, & 8

## Steady State Analysis

### Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-1	9.30	1	Demand	0.00	Fixed	0.00	127.36	51.18
J-3	19.50	Zone-1	Inflow	6,444.00	Fixed	-6,444.00	128.52	47.26
J-4	12.00	Zone-1	Demand	0.00	Fixed	0.00	127.40	50.03
J-5	21.50	Zone-1	Demand	51.58	Fixed	51.58	94.54	31.67
J-6	21.00	Zone-1	Demand	1,500.00	Fixed	1,500.00	80.20	25.67
J-7	21.00	Zone-1	Demand	1,500.00	Fixed	1,500.00	80.49	25.79
J-8	21.00	Zone-1	Demand	1,000.00	Fixed	1,000.00	81.14	26.07
J-9	12.00	Zone-1	Demand	0.00	Fixed	0.00	127.04	49.87
J-10	13.00	Zone-1	Demand	0.00	Fixed	0.00	127.04	49.44
J-11	13.00	Zone-1	Demand	0.00	Fixed	0.00	127.04	49.44
J-12	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.35	50.01
J-13	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.40	50.03
J-14	13.00	Zone-1	Demand	0.00	Fixed	0.00	121.00	46.82
J-15	13.00	Zone-1	Demand	1,630.00	Fixed	1,630.00	112.04	42.93
J-80	24.00	1	Demand	58.03	Pattern - 1	58.03	123.77	43.25
J-90	26.30	1	Demand	30.25	Pattern - 1	30.25	124.41	42.53
J-100	22.90	1	Demand	27.28	Pattern - 1	27.28	124.86	44.20
J-110	22.50	1	Demand	66.46	Pattern - 1	66.46	124.82	44.36
J-120	21.20	1	Demand	84.81	Pattern - 1	84.81	124.80	44.91
J-130	20.10	1	Demand	96.68	Pattern - 1	96.68	126.92	46.31
J-140	18.60	1	Demand	204.26	Pattern - 1	204.26	127.11	47.04
J-150	21.00	1	Demand	97.21	Pattern - 1	97.21	125.88	45.47
J-160	18.85	1	Demand	45.57	Pattern - 1	45.57	128.22	47.42
J-170	20.42	1	Demand	66.73	Pattern - 1	66.73	126.85	46.14
J-190	20.40	1	Demand	109.15	Pattern - 1	109.15	120.22	43.27
J-200	20.50	1	Demand	48.57	Pattern - 1	48.57	125.77	45.64
J-210	23.60	1	Demand	120.28	Pattern - 1	120.28	122.34	42.81
J-220	24.75	1	Demand	95.23	Pattern - 1	95.23	110.10	37.00
J-230	24.20	1	Demand	52.57	Pattern - 1	52.57	99.19	32.51
J-240	21.00	1	Demand	43.15	Pattern - 1	43.15	94.82	32.00
J-250	24.30	1	Demand	109.61	Pattern - 1	109.61	120.93	41.89
J-260	23.21	1	Demand	75.89	Pattern - 1	75.89	118.48	41.30
J-300	20.30	1	Demand	123.53	Pattern - 1	123.53	126.82	46.18
J-310	15.90	1	Demand	312.93	Pattern - 1	312.93	126.67	48.02
J-320	16.00	1	Demand	189.67	Pattern - 1	189.67	126.81	48.04
J-330	14.90	1	Demand	267.83	Pattern - 1	267.83	126.59	48.42
J-350	16.00	1	Demand	123.74	Pattern - 1	123.74	126.82	48.04
J-360	15.50	1	Demand	229.54	Pattern - 1	229.54	126.61	48.17
J-370	13.60	1	Demand	77.67	Pattern - 1	77.67	126.68	49.02
J-380	11.30	1	Demand	128.44	Pattern - 1	128.44	126.74	50.04
J-400	15.35	1	Demand	96.76	Pattern - 1	96.76	126.92	48.37
J-410	15.27	1	Demand	113.38	Pattern - 1	113.38	126.63	48.28
J-420	24.50	1	Demand	132.68	Pattern - 1	132.68	122.63	42.54
J-430	25.10	1	Demand	124.99	Pattern - 1	124.99	123.30	42.57
J-440	21.30	1	Demand	141.35	Pattern - 1	141.35	124.43	44.71
J-450	18.00	1	Demand	121.02	Pattern - 1	121.02	126.26	46.93
J-460	15.30	1	Demand	0.00	Pattern - 1	0.00	126.43	48.18
J-470	12.09	1	Demand	54.82	Pattern - 1	54.82	126.65	49.66
J-480	10.60	1	Demand	0.00	Pattern - 1	0.00	126.62	50.30
J-490	14.80	1	Demand	19.52	Pattern - 1	19.52	126.62	48.48
J-500	11.10	1	Demand	81.98	Pattern - 1	81.98	126.62	50.08
J-510	10.50	1	Demand	91.09	Pattern - 1	91.09	126.74	50.39

Project Engineer: Mark Smith

WaterCAD v6.5 [6.5120]

# Scenario: Run 9B-MDD-100%GW+ FF @ J6, 7, & 8

## Steady State Analysis

### Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-520	10.80	1	Demand	120.02	Pattern - 1	120.02	126.63	50.21
J-530	11.00	1	Demand	35.19	Pattern - 1	35.19	126.79	50.20
J-540	10.82	1	Demand	27.37	Pattern - 1	27.37	127.04	50.38
J-550	11.60	1	Demand	55.91	Pattern - 1	55.91	126.94	50.00
J-560	11.30	1	Demand	60.60	Pattern - 1	60.60	126.99	50.15
J-570	9.70	1	Demand	45.74	Pattern - 1	45.74	127.20	50.94
J-580	14.00	1	Demand	84.88	Pattern - 1	84.88	126.74	48.87
J-590	10.60	1	Demand	141.52	Pattern - 1	141.52	126.94	50.44
J-600	13.00	1	Demand	102.17	Pattern - 1	102.17	126.95	49.40
J-610	15.30	1	Demand	141.60	Pattern - 1	141.60	127.05	48.44
J-620	15.50	1	Demand	26.54	Pattern - 1	26.53	126.64	48.18
J-650	13.90	1	Demand	223.47	Pattern - 1	223.47	126.68	48.89
J-670	21.50	1	Demand	102.41	Pattern - 1	102.41	126.14	45.36
J-680	13.40	1	Demand	30.50	Pattern - 1	30.50	126.62	49.08
J-690	11.25	1	Demand	124.42	Pattern - 1	124.42	126.62	50.02
J-700	18.50	1	Demand	156.26	Pattern - 1	156.26	126.73	46.92
J-720	18.70	1	Demand	179.91	Pattern - 1	179.91	126.71	46.82
J-730	19.31	1	Demand	34.84	Pattern - 1	34.84	126.82	46.61
J-740	13.80	1	Demand	159.87	Pattern - 1	159.87	126.68	48.94
J-750	11.55	1	Demand	101.43	Pattern - 1	101.43	126.62	49.88
J-760	9.70	1	Demand	34.79	Pattern - 1	34.79	127.11	50.90
J-770	15.00	1	Demand	89.92	Pattern - 1	89.92	126.79	48.46
J-780	11.20	1	Demand	66.07	Pattern - 1	66.07	126.88	50.15
J-800	18.80	1	Demand	36.32	Pattern - 1	36.32	127.92	47.31
J-810	21.47	1	Demand	83.62	Pattern - 1	83.62	125.55	45.12
J-820	20.20	1	Demand	159.21	Pattern - 1	159.21	123.38	44.73
J-830	17.95	1	Demand	105.17	Pattern - 1	105.17	126.85	47.21

# Scenario: Run 9B-MDD-100%GW+ FF @ J6, 7, & 8

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-1510	851.00	12	125.0	0.00	Open	245.10	0.17	0.20	false	0.70
P-1520	800.00	12	125.0	0.00	Open	309.71	0.25	0.31	false	0.88
P-1550	449.00	30	125.0	0.00	Open	-2,644.07	0.09	0.19	false	1.20
P-1540	395.00	30	125.0	0.00	Open	-2,609.28	0.07	0.19	false	1.18
P-1410	1,217.00	12	125.0	0.00	Open	157.98	0.11	0.09	false	0.45
P-1270	257.00	24	125.0	0.00	Open	3,911.23	0.30	1.16	false	2.77
P-1120	447.00	12	125.0	0.00	Open	-17.29	0.00	0.00	false	0.05
P-1110	1,139.00	12	125.0	0.00	Open	-30.21	0.00	0.00	false	0.09
P-1140	1,540.00	12	125.0	0.00	Open	-29.12	0.01	0.00	false	0.08
P-1060	1,125.00	12	125.0	0.00	Open	-40.42	0.01	0.01	false	0.11
P-1050	1,053.00	30	125.0	0.00	Open	411.88	0.01	0.01	false	0.19
P-960	746.00	12	125.0	0.00	Open	-0.50	0.00	0.00	false	0.00
P-970	897.00	12	125.0	0.00	Open	-32.25	0.00	0.00	false	0.09
P-950	402.00	12	125.0	0.00	Open	24.86	0.00	0.00	false	0.07
P-940	817.00	12	125.0	0.00	Open	84.99	0.02	0.03	false	0.24
P-590	1,013.00	12	125.0	0.00	Open	-24.86	0.00	0.00	false	0.07
P-600	659.00	12	125.0	0.00	Open	-5.34	0.00	0.00	false	0.02
P-630	1,187.00	12	125.0	0.00	Open	164.41	0.11	0.10	false	0.47
P-750	931.00	12	125.0	0.00	Open	-115.76	0.05	0.05	false	0.33
P-760	1,759.00	12	125.0	0.00	Open	25.77	0.01	0.00	false	0.07
P-780	1,638.00	12	125.0	0.00	Open	127.94	0.10	0.06	false	0.36
P-790	1,293.00	12	125.0	0.00	Open	-310.55	0.40	0.31	false	0.88
P-800	1,439.00	12	125.0	0.00	Open	-284.02	0.38	0.26	false	0.81
P-740	709.00	12	125.0	0.00	Open	300.35	0.21	0.29	false	0.85
P-640	597.00	12	125.0	0.00	Open	144.17	0.05	0.08	false	0.41
P-680	726.00	12	125.0	0.00	Open	199.41	0.10	0.14	false	0.57
P-420	996.00	12	125.0	0.00	Open	-208.81	0.15	0.15	false	0.59
P-390	2,320.00	12	125.0	0.00	Open	-15.55	0.00	0.00	false	0.04
P-510	1,511.00	12	125.0	0.00	Open	498.39	1.13	0.75	false	1.41
P-520	1,532.00	12	125.0	0.00	Open	-639.75	1.83	1.19	false	1.81
P-430	1,150.00	12	125.0	0.00	Open	-232.91	0.21	0.18	false	0.66
P-230	1,475.00	12	125.0	0.00	Open	1,714.85	10.92	7.40	false	4.86
P-220	1,496.00	12	125.0	0.00	Open	1,810.07	12.24	8.18	false	5.13
P-200	753.00	12	125.0	0.00	Open	708.78	1.08	1.44	false	2.01
P-87	1,673.00	12	125.0	0.00	Open	2,432.46	23.65	14.14	false	6.90
P-70	1,321.00	12	125.0	0.00	Open	-393.98	0.64	0.49	false	1.12
P-110	870.00	12	125.0	0.00	Open	-639.47	1.04	1.19	false	1.81
P-80	808.00	12	125.0	0.00	Open	-424.24	0.45	0.56	false	1.20
P-250	1,092.00	12	125.0	0.00	Open	-975.42	2.84	2.60	false	2.77
P-3	527.00	30	125.0	0.00	Open	-3,419.90	0.16	0.31	false	1.55
P-4	1,274.00	16	125.0	0.00	Open	-580.10	0.31	0.24	false	0.93
P-8	1,129.00	16	125.0	0.00	Open	-471.93	0.19	0.17	false	0.75
P-9	685.00	12	125.0	0.00	Open	68.62	0.01	0.02	false	0.19
P-10	634.00	12	125.0	0.00	Open	135.08	0.04	0.07	false	0.38
P-11	2,034.00	12	125.0	0.00	Open	-586.60	2.06	1.01	false	1.66
P-12	860.00	12	125.0	0.00	Open	-655.66	1.07	1.25	false	1.86
P-13	767.00	12	125.0	0.00	Open	-752.87	1.24	1.61	false	2.14
P-14	1,007.00	16	125.0	0.00	Open	1,307.03	1.11	1.10	false	2.09
P-15	898.00	12	125.0	0.00	Open	-361.25	0.37	0.41	false	1.02
P-16	1,041.00	12	125.0	0.00	Open	463.66	0.68	0.66	false	1.32
P-17	1,922.00	12	125.0	0.00	Open	-244.03	0.38	0.20	false	0.69

Project Engineer: Mark Smith

WaterCAD v6.5 [6.5120]

# Scenario: Run 9B-MDD-100%GW+ FF @ J6, 7, & 8

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-18	676.00	12	125.0	0.00	Open	87.78	0.02	0.03	false	0.25
P-19	1,174.00	12	125.0	0.00	Open	865.81	2.45	2.09	false	2.46
P-20	1,680.00	12	125.0	0.00	Open	855.55	3.43	2.04	false	2.43
P-490	1,505.00	12	125.0	0.00	Open	-240.73	0.29	0.20	false	0.68
P-500	1,520.00	12	125.0	0.00	Open	373.41	0.67	0.44	false	1.06
P-21	2,057.00	12	125.0	0.00	Open	65.85	0.04	0.02	false	0.19
P-22	900.00	12	125.0	0.00	Open	-830.91	1.74	1.93	false	2.36
P-23	940.00	12	125.0	0.00	Open	811.63	1.74	1.85	false	2.30
P-24	1,437.00	12	125.0	0.00	Open	-890.36	3.16	2.20	false	2.53
P-25	1,528.00	12	125.0	0.00	Open	-861.33	3.16	2.07	false	2.44
P-26	463.00	12	125.0	0.00	Open	1,019.03	1.31	2.82	false	2.89
P-28	825.00	12	125.0	0.00	Open	981.31	2.17	2.63	false	2.78
P-29	912.00	12	125.0	0.00	Open	929.60	2.17	2.38	false	2.64
P-30	935.00	24	125.0	0.00	Open	3,874.91	1.07	1.14	false	2.75
P-31	502.00	12	125.0	0.00	Open	975.49	1.31	2.60	false	2.77
P-32	1,044.00	30	125.0	0.00	Open	955.09	0.03	0.03	false	0.43
P-33	1,076.00	12	125.0	0.00	Open	84.40	0.03	0.03	false	0.24
P-34	1,740.00	30	125.0	0.00	Open	-237.52	0.00	0.00	false	0.11
P-35	1,727.00	12	125.0	0.00	Open	21.96	0.00	0.00	false	0.06
P-36	2,395.00	30	125.0	0.00	Open	-349.17	0.01	0.00	false	0.16
P-37	2,406.00	12	125.0	0.00	Open	31.57	0.01	0.00	false	0.09
P-38	1,120.00	30	125.0	0.00	Open	-868.18	0.03	0.02	false	0.39
P-39	1,119.00	12	125.0	0.00	Open	-78.02	0.03	0.02	false	0.22
P-40	1,551.00	30	125.0	0.00	Open	-1,188.51	0.07	0.04	false	0.54
P-41	1,519.00	12	125.0	0.00	Open	107.96	0.07	0.04	false	0.31
P-42	1,335.00	30	125.0	0.00	Open	1,758.95	0.12	0.09	false	0.80
P-43	1,367.00	12	125.0	0.00	Open	-155.98	0.12	0.09	false	0.44
P-44	779.00	12	125.0	0.00	Open	231.53	0.14	0.18	false	0.66
P-45	1,370.00	12	125.0	0.00	Open	219.01	0.22	0.16	false	0.62
P-46	2,363.00	12	125.0	0.00	Open	-48.82	0.02	0.01	false	0.14
P-47	1,575.00	12	125.0	0.00	Open	45.45	0.01	0.01	false	0.13
P-48	2,947.00	12	125.0	0.00	Open	-72.31	0.06	0.02	false	0.21
P-49	1,627.00	12	125.0	0.00	Open	-94.96	0.06	0.03	false	0.27
P-50	989.00	12	125.0	0.00	Open	232.85	0.18	0.18	false	0.66
P-55	829.00	12	125.0	0.00	Open	-130.36	0.05	0.06	false	0.37
P-56	1,373.00	12	125.0	0.00	Open	156.17	0.12	0.09	false	0.44
P-57	818.00	12	125.0	0.00	Open	-267.50	0.19	0.24	false	0.76
P-58	881.00	12	125.0	0.00	Open	-124.00	0.05	0.06	false	0.35
P-59	1,189.00	12	125.0	0.00	Open	44.39	0.01	0.01	false	0.13
P-60	1,264.00	12	125.0	0.00	Open	-139.81	0.09	0.07	false	0.40
P-61	1,571.00	12	125.0	0.00	Open	-124.22	0.09	0.06	false	0.35
P-62	1,256.00	12	125.0	0.00	Open	-154.57	0.11	0.09	false	0.44
P-63	726.00	12	125.0	0.00	Open	-239.45	0.14	0.19	false	0.68
P-64	563.00	12	125.0	0.00	Open	-429.74	0.32	0.57	false	1.22
P-65	1,029.00	12	125.0	0.00	Open	236.60	0.19	0.19	false	0.67
P-67	900.00	12	125.0	0.00	Open	238.38	0.17	0.19	false	0.68
P-69	773.00	12	125.0	0.00	Open	225.05	0.13	0.17	false	0.64
P-72	823.00	12	125.0	0.00	Open	238.74	0.16	0.19	false	0.68
P-68	100.00	24	125.0	0.00	Open	-6,444.00	0.29	2.94	true	4.57
P-71	1.00	24	125.0	0.00	Closed	0.00	0.00	0.00	true	0.00
P-74	100.00	30	125.0	0.00	Open	-4,000.00	0.04	0.41	true	1.82

Project Engineer: Mark Smith

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# Scenario: Run 9B-MDD-100%GW+ FF @ J6, 7, & 8

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-75	3.00	30	125.0	0.00	Open	-4,000.00	0.00	0.41	true	1.82
P-76	795.00	12	125.0	0.00	Open	221.66	0.13	0.17	false	0.63
P-77	801.00	12	125.0	0.00	Open	242.26	0.16	0.20	false	0.69
P-78	1,001.00	12	125.0	0.00	Open	240.15	0.19	0.19	false	0.68
P-79	900.00	12	125.0	0.00	Open	238.38	0.17	0.19	false	0.68
P-81	840.00	12	125.0	0.00	Open	668.15	1.08	1.29	false	1.90
P-82	1,761.00	12	125.0	0.00	Open	834.07	3.43	1.95	false	2.37
P-83	665.00	12	125.0	0.00	Open	1,662.27	4.65	6.99	false	4.72
P-84	775.00	12	125.0	0.00	Open	-335.65	0.28	0.36	false	0.95
P-85	139.00	12	125.0	0.00	Open	2,053.66	1.44	10.33	false	5.83
P-86	130.00	12	125.0	0.00	Open	1,946.34	1.22	9.36	false	5.52
P-90	345.00	12	125.0	0.00	Open	2,053.66	3.57	10.33	false	5.83
P-91	318.00	12	125.0	0.00	Open	553.66	0.29	0.91	false	1.57
P-92	320.00	12	125.0	0.00	Open	1,946.34	2.99	9.36	false	5.52
P-93	382.00	12	125.0	0.00	Open	-946.34	0.94	2.46	false	2.68
P-94	1,337.00	12	125.0	0.00	Open	-157.86	0.12	0.09	false	0.45
P-95	1,231.00	12	125.0	0.00	Open	-211.35	0.19	0.15	false	0.60
P-96	1,126.00	12	125.0	0.00	Open	-577.42	1.11	0.99	false	1.64
P-97	2,986.00	24	125.0	0.00	Open	0.00	0.00	0.00	false	0.00
P-98	113.00	6	130.0	0.00	Closed	0.00	0.00	0.00	false	0.00
P-99	1,701.00	24	125.0	0.00	Open	0.00	0.00	0.00	false	0.00
P-101	5,665.00	24	125.0	0.00	Open	-1,630.00	1.30	0.23	false	1.16
P-102	224.00	24	125.0	0.00	Open	-1,630.00	0.05	0.23	false	1.16
P-103	1.00	24	125.0	0.00	Open	-1,630.00	0.00	0.23	true	1.16
P-104	3,645.00	16	125.0	0.00	Open	1,630.00	6.05	1.66	false	2.60
P-105	5,402.00	16	125.0	0.00	Open	1,630.00	8.96	1.66	false	2.60
P-106	1,283.00	12	125.0	0.00	Open	602.76	1.37	1.07	false	1.71

Project Engineer: Mark Smith

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# Scenario: Run 9C-MDD-100%GW+6444 Inflow @J3 Multi-FF Runs

## Fire Flow Analysis

### Fire Flow Report

Label	Fire Flow Balanced?	Satisfies Fire Flow Constraints?	Needed Fire Flow (gpm)	Available Fire Flow (gpm)	Total Flow Needed (gpm)	Total Flow Available (gpm)	Calculated Residual Pressure (psi)	Calculated Minimum System Pressure (psi)	Minimum System Junction
J-1	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-3	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-4	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-5	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-6	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-7	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-8	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-9	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-10	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-11	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-12	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-13	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-14	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-15	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-80	true	true	4,000.00	4,000.00	4,058.03	4,058.03	36.82	37.43	J-90
J-90	true	true	4,000.00	4,000.00	4,030.26	4,030.26	32.94	38.60	J-100
J-100	true	false	4,000.00	4,000.00	4,027.28	4,027.28	37.20	36.72	J-90
J-110	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-120	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-130	true	true	4,000.00	4,000.00	4,096.68	4,096.68	43.20	41.62	J-90
J-140	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-150	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-160	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-170	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-190	true	false	4,000.00	4,000.00	4,109.15	4,109.15	40.58	40.06	J-260
J-200	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-210	true	true	4,000.00	4,000.00	4,120.28	4,120.28	39.58	39.85	J-420
J-220	true	true	4,000.00	4,000.00	4,095.23	4,095.23	30.31	34.15	J-230
J-230	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-240	true	true	4,000.00	4,000.00	4,043.15	4,043.15	31.19	30.08	GPV-1
J-250	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-260	true	false	4,000.00	4,000.00	4,075.89	4,075.89	38.93	39.24	GPV-1
J-300	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-310	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-320	true	false	4,000.00	4,000.00	4,189.67	4,189.67	47.98	42.93	J-15
J-330	true	false	4,000.00	4,000.00	4,267.83	4,267.83	39.36	42.93	J-15
J-350	true	false	4,000.00	4,000.00	4,123.74	4,123.74	47.99	42.93	J-15
J-360	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-370	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-380	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-400	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-410	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-420	true	true	4,000.00	4,000.00	4,132.68	4,132.68	30.17	33.57	J-430
J-430	true	false	4,000.00	4,000.00	4,124.99	4,124.99	27.44	34.53	J-420
J-440	true	true	4,000.00	4,000.00	4,141.36	4,141.36	31.77	33.72	J-430
J-450	true	false	4,000.00	4,000.00	4,121.02	4,121.02	42.88	41.24	J-430
J-460	true	true	4,000.00	4,000.00	4,000.00	4,000.00	44.92	42.05	J-430
J-470	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-480	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-490	true	false	4,000.00	4,000.00	4,019.52	4,019.52	39.14	42.93	J-15

Project Engineer: Mark Smith

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# Scenario: Run 9C-MDD-100%GW+6444 Inflow @J3 Multi-FF Runs

## Fire Flow Analysis

### Fire Flow Report

Label	Fire Flow Balanced?	Satisfies Fire Flow Constraints?	Needed Fire Flow (gpm)	Available Fire Flow (gpm)	Total Flow Needed (gpm)	Total Flow Available (gpm)	Calculated Residual Pressure (psi)	Calculated Minimum System Pressure (psi)	Minimum System Junction
J-500	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-510	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-520	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-530	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-540	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-550	true	false	4,000.00	4,000.00	4,055.91	4,055.91	47.72	42.93	J-15
J-560	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-570	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-580	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-590	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-600	true	true	4,000.00	4,000.00	4,102.17	4,102.17	38.91	42.93	J-15
J-610	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-620	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-650	true	false	4,000.00	4,000.00	4,223.47	4,223.47	45.53	42.93	J-15
J-670	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-680	true	false	4,000.00	4,000.00	4,030.50	4,030.50	43.71	42.93	J-15
J-690	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-700	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-720	true	true	4,000.00	4,000.00	4,179.91	4,179.91	42.42	42.93	J-15
J-730	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-740	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-750	true	true	4,000.00	4,000.00	4,101.43	4,101.43	38.15	42.93	J-15
J-760	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-770	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-780	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-800	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-810	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-820	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-830	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A

Project Engineer: Mark Smith

WaterCAD v6.5 [6.5120]

# Scenario: Run 10A-MDD-50%GW-50%SW(S)+FF Base

## Steady State Analysis

### Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-1	9.30	1	Demand	0.00	Fixed	0.00	127.37	51.19
J-3	19.50	Zone-1	Inflow	3,222.06	Fixed	-3,222.05	127.56	46.85
J-4	12.00	Zone-1	Demand	0.00	Fixed	0.00	127.40	50.03
J-5	21.50	Zone-1	Demand	51.58	Fixed	51.58	126.63	45.58
J-6	21.00	Zone-1	Demand	0.00	Fixed	0.00	122.04	43.80
J-7	21.00	Zone-1	Demand	0.00	Fixed	0.00	122.04	43.80
J-8	21.00	Zone-1	Demand	0.00	Fixed	0.00	122.04	43.80
J-9	12.00	Zone-1	Demand	3,222.00	Fixed	3,222.00	114.37	44.38
J-10	13.00	Zone-1	Demand	0.00	Fixed	0.00	116.79	45.00
J-11	13.00	Zone-1	Demand	0.00	Fixed	0.00	118.18	45.60
J-12	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.01	49.86
J-13	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.40	50.03
J-14	13.00	Zone-1	Demand	0.00	Fixed	0.00	112.13	42.97
J-15	13.00	Zone-1	Demand	1,630.00	Fixed	1,630.00	103.17	39.09
J-80	24.00	1	Demand	58.03	Pattern - 1	58.03	126.79	44.56
J-90	26.30	1	Demand	30.25	Pattern - 1	30.25	126.81	43.57
J-100	22.90	1	Demand	27.28	Pattern - 1	27.28	126.84	45.06
J-110	22.50	1	Demand	66.46	Pattern - 1	66.46	126.83	45.23
J-120	21.20	1	Demand	84.81	Pattern - 1	84.81	126.83	45.79
J-130	20.10	1	Demand	96.68	Pattern - 1	96.68	127.11	46.39
J-140	18.60	1	Demand	204.26	Pattern - 1	204.26	127.15	47.06
J-150	21.00	1	Demand	97.21	Pattern - 1	97.21	126.94	45.93
J-160	18.85	1	Demand	45.57	Pattern - 1	45.57	127.48	47.09
J-170	20.42	1	Demand	66.73	Pattern - 1	66.73	127.12	46.26
J-190	20.40	1	Demand	109.15	Pattern - 1	109.15	126.75	46.11
J-200	20.50	1	Demand	48.57	Pattern - 1	48.57	127.00	46.17
J-210	23.60	1	Demand	120.28	Pattern - 1	120.28	126.73	44.71
J-220	24.75	1	Demand	95.23	Pattern - 1	95.23	126.64	44.17
J-230	24.20	1	Demand	52.57	Pattern - 1	52.57	126.63	44.41
J-240	21.00	1	Demand	43.15	Pattern - 1	43.15	126.65	45.80
J-250	24.30	1	Demand	109.61	Pattern - 1	109.61	126.73	44.40
J-260	23.21	1	Demand	75.89	Pattern - 1	75.89	126.73	44.88
J-300	20.30	1	Demand	123.53	Pattern - 1	123.53	127.08	46.29
J-310	15.90	1	Demand	312.93	Pattern - 1	312.93	126.87	48.11
J-320	16.00	1	Demand	189.67	Pattern - 1	189.67	127.04	48.14
J-330	14.90	1	Demand	267.83	Pattern - 1	267.83	126.85	48.53
J-350	16.00	1	Demand	123.74	Pattern - 1	123.74	127.04	48.14
J-360	15.50	1	Demand	229.54	Pattern - 1	229.54	126.89	48.29
J-370	13.60	1	Demand	77.67	Pattern - 1	77.67	126.87	49.11
J-380	11.30	1	Demand	128.44	Pattern - 1	128.44	126.90	50.12
J-400	15.35	1	Demand	96.76	Pattern - 1	96.76	127.09	48.44
J-410	15.27	1	Demand	113.38	Pattern - 1	113.38	126.95	48.41
J-420	24.50	1	Demand	132.68	Pattern - 1	132.68	126.58	44.25
J-430	25.10	1	Demand	124.99	Pattern - 1	124.99	126.57	43.99
J-440	21.30	1	Demand	141.35	Pattern - 1	141.35	126.61	45.65
J-450	18.00	1	Demand	121.02	Pattern - 1	121.02	126.88	47.20
J-460	15.30	1	Demand	0.00	Pattern - 1	0.00	126.91	48.39
J-470	12.09	1	Demand	54.82	Pattern - 1	54.82	126.81	49.73
J-480	10.60	1	Demand	0.00	Pattern - 1	0.00	126.78	50.37
J-490	14.80	1	Demand	19.52	Pattern - 1	19.52	126.78	48.55
J-500	11.10	1	Demand	81.98	Pattern - 1	81.98	126.78	50.15
J-510	10.50	1	Demand	91.09	Pattern - 1	91.09	126.89	50.46

Project Engineer: Mark Smith

WaterCAD v6.5 [6.5120]

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# Scenario: Run 10A-MDD-50%GW-50%SW(S)+FF Base

## Steady State Analysis

### Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-520	10.80	1	Demand	120.02	Pattern - 1	120.02	126.79	50.28
J-530	11.00	1	Demand	35.19	Pattern - 1	35.19	126.94	50.26
J-540	10.82	1	Demand	27.37	Pattern - 1	27.37	127.16	50.44
J-550	11.60	1	Demand	55.91	Pattern - 1	55.91	127.06	50.05
J-560	11.30	1	Demand	60.60	Pattern - 1	60.60	127.09	50.20
J-570	9.70	1	Demand	45.74	Pattern - 1	45.74	127.26	50.97
J-580	14.00	1	Demand	84.88	Pattern - 1	84.88	126.99	48.98
J-590	10.60	1	Demand	141.52	Pattern - 1	141.52	127.05	50.48
J-600	13.00	1	Demand	102.17	Pattern - 1	102.17	127.06	49.45
J-610	15.30	1	Demand	141.60	Pattern - 1	141.60	127.17	48.50
J-620	15.50	1	Demand	26.54	Pattern - 1	26.53	127.01	48.34
J-650	13.90	1	Demand	223.47	Pattern - 1	223.47	126.87	48.98
J-670	21.50	1	Demand	102.41	Pattern - 1	102.41	127.00	45.74
J-680	13.40	1	Demand	30.50	Pattern - 1	30.50	126.79	49.15
J-690	11.25	1	Demand	124.42	Pattern - 1	124.42	126.78	50.09
J-700	18.50	1	Demand	156.26	Pattern - 1	156.26	126.90	46.99
J-720	18.70	1	Demand	179.91	Pattern - 1	179.91	126.90	46.91
J-730	19.31	1	Demand	34.84	Pattern - 1	34.84	127.06	46.71
J-740	13.80	1	Demand	159.87	Pattern - 1	159.87	126.87	49.02
J-750	11.55	1	Demand	101.43	Pattern - 1	101.43	126.78	49.96
J-760	9.70	1	Demand	34.79	Pattern - 1	34.79	127.21	50.94
J-770	15.00	1	Demand	89.92	Pattern - 1	89.92	127.02	48.56
J-780	11.20	1	Demand	66.07	Pattern - 1	66.07	127.07	50.23
J-800	18.80	1	Demand	36.32	Pattern - 1	36.32	127.40	47.08
J-810	21.47	1	Demand	83.62	Pattern - 1	83.62	127.01	45.75
J-820	20.20	1	Demand	159.21	Pattern - 1	159.21	126.86	46.24
J-830	17.95	1	Demand	105.17	Pattern - 1	105.17	127.05	47.30

# Scenario: Run 10A-MDD-50%GW-50%SW(S)+FF Base

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen-Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-1510	851.00	12	125.0	0.00	Open	253.04	0.18	0.21	false	0.72
P-1520	800.00	12	125.0	0.00	Open	289.75	0.22	0.27	false	0.82
P-1550	449.00	30	125.0	0.00	Open	-2,114.33	0.06	0.13	false	0.96
P-1540	395.00	30	125.0	0.00	Open	-2,079.53	0.05	0.12	false	0.94
P-1410	1,217.00	12	125.0	0.00	Open	198.61	0.17	0.14	false	0.56
P-1270	257.00	24	125.0	0.00	Open	1,906.73	0.08	0.31	false	1.35
P-1120	447.00	12	125.0	0.00	Open	7.19	0.00	0.00	false	0.02
P-1110	1,139.00	12	125.0	0.00	Open	0.94	0.00	0.00	false	0.00
P-1140	1,540.00	12	125.0	0.00	Open	-14.51	0.00	0.00	false	0.04
P-1060	1,125.00	12	125.0	0.00	Open	-69.44	0.02	0.02	false	0.20
P-1050	1,053.00	30	125.0	0.00	Open	800.77	0.02	0.02	false	0.36
P-960	746.00	12	125.0	0.00	Open	-13.65	0.00	0.00	false	0.04
P-970	897.00	12	125.0	0.00	Open	-35.69	0.01	0.01	false	0.10
P-950	402.00	12	125.0	0.00	Open	29.04	0.00	0.00	false	0.08
P-940	817.00	12	125.0	0.00	Open	87.71	0.02	0.03	false	0.25
P-590	1,013.00	12	125.0	0.00	Open	-29.04	0.00	0.00	false	0.08
P-600	659.00	12	125.0	0.00	Open	-9.52	0.00	0.00	false	0.03
P-630	1,187.00	12	125.0	0.00	Open	156.79	0.10	0.09	false	0.44
P-750	931.00	12	125.0	0.00	Open	-108.97	0.04	0.04	false	0.31
P-760	1,759.00	12	125.0	0.00	Open	32.55	0.01	0.00	false	0.09
P-780	1,638.00	12	125.0	0.00	Open	134.73	0.11	0.07	false	0.38
P-790	1,293.00	12	125.0	0.00	Open	-185.49	0.16	0.12	false	0.53
P-800	1,439.00	12	125.0	0.00	Open	-158.95	0.13	0.09	false	0.45
P-740	709.00	12	125.0	0.00	Open	270.50	0.17	0.24	false	0.77
P-640	597.00	12	125.0	0.00	Open	148.35	0.05	0.08	false	0.42
P-680	726.00	12	125.0	0.00	Open	200.97	0.10	0.14	false	0.57
P-420	996.00	12	125.0	0.00	Open	-225.32	0.17	0.17	false	0.64
P-390	2,320.00	12	125.0	0.00	Open	-0.91	0.00	0.00	false	0.00
P-510	1,511.00	12	125.0	0.00	Open	86.51	0.04	0.03	false	0.25
P-520	1,532.00	12	125.0	0.00	Open	-227.86	0.27	0.18	false	0.65
P-430	1,150.00	12	125.0	0.00	Open	-195.99	0.15	0.13	false	0.56
P-230	1,475.00	12	125.0	0.00	Open	35.56	0.01	0.01	false	0.10
P-220	1,496.00	12	125.0	0.00	Open	130.79	0.09	0.06	false	0.37
P-200	753.00	12	125.0	0.00	Open	219.73	0.12	0.16	false	0.62
P-87	1,673.00	12	125.0	0.00	Open	111.74	0.08	0.05	false	0.32
P-70	1,321.00	12	125.0	0.00	Open	-67.20	0.02	0.02	false	0.19
P-110	870.00	12	125.0	0.00	Open	-111.72	0.04	0.05	false	0.32
P-80	808.00	12	125.0	0.00	Open	-97.45	0.03	0.04	false	0.28
P-250	1,092.00	12	125.0	0.00	Open	-120.89	0.06	0.05	false	0.34
P-3	527.00	30	125.0	0.00	Open	-2,760.13	0.11	0.21	false	1.25
P-4	1,274.00	16	125.0	0.00	Open	-461.81	0.20	0.16	false	0.74
P-8	1,129.00	16	125.0	0.00	Open	-201.70	0.04	0.03	false	0.32
P-9	685.00	12	125.0	0.00	Open	4.16	0.00	0.00	false	0.01
P-10	634.00	12	125.0	0.00	Open	70.62	0.01	0.02	false	0.20
P-11	2,034.00	12	125.0	0.00	Open	-195.35	0.27	0.13	false	0.55
P-12	860.00	12	125.0	0.00	Open	-192.37	0.11	0.13	false	0.55
P-13	767.00	12	125.0	0.00	Open	-289.58	0.21	0.27	false	0.82
P-14	1,007.00	16	125.0	0.00	Open	678.45	0.33	0.33	false	1.08
P-15	898.00	12	125.0	0.00	Open	-43.93	0.01	0.01	false	0.12
P-16	1,041.00	12	125.0	0.00	Open	146.35	0.08	0.08	false	0.42
P-17	1,922.00	12	125.0	0.00	Open	-192.29	0.25	0.13	false	0.55

Project Engineer: Mark Smith  
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# Scenario: Run 10A-MDD-50%GW-50%SW(S)+FF Base

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-18	676.00	12	125.0	0.00	Open	36.03	0.00	0.01	false	0.10
P-19	1,174.00	12	125.0	0.00	Open	11.27	0.00	0.00	false	0.03
P-20	1,680.00	12	125.0	0.00	Open	213.80	0.26	0.16	false	0.61
P-490	1,505.00	12	125.0	0.00	Open	171.16	0.16	0.10	false	0.49
P-500	1,520.00	12	125.0	0.00	Open	-38.48	0.01	0.01	false	0.11
P-21	2,057.00	12	125.0	0.00	Open	54.74	0.03	0.01	false	0.16
P-22	900.00	12	125.0	0.00	Open	-89.21	0.03	0.03	false	0.25
P-23	940.00	12	125.0	0.00	Open	87.14	0.03	0.03	false	0.25
P-24	1,437.00	12	125.0	0.00	Open	-145.12	0.11	0.08	false	0.41
P-25	1,528.00	12	125.0	0.00	Open	-140.39	0.11	0.07	false	0.40
P-26	463.00	12	125.0	0.00	Open	269.93	0.11	0.24	false	0.77
P-28	825.00	12	125.0	0.00	Open	228.38	0.15	0.18	false	0.65
P-29	912.00	12	125.0	0.00	Open	216.34	0.15	0.16	false	0.61
P-30	935.00	24	125.0	0.00	Open	1,870.41	0.28	0.30	false	1.33
P-31	502.00	12	125.0	0.00	Open	258.40	0.11	0.22	false	0.73
P-32	1,044.00	30	125.0	0.00	Open	1,047.52	0.04	0.03	false	0.48
P-33	1,076.00	12	125.0	0.00	Open	92.57	0.04	0.03	false	0.26
P-34	1,740.00	30	125.0	0.00	Open	-584.09	0.02	0.01	false	0.27
P-35	1,727.00	12	125.0	0.00	Open	52.67	0.02	0.01	false	0.15
P-36	2,395.00	30	125.0	0.00	Open	-8.27	0.00	0.00	false	0.00
P-37	2,406.00	12	125.0	0.00	Open	4.59	0.00	0.00	false	0.01
P-38	1,120.00	30	125.0	0.00	Open	-511.91	0.01	0.01	false	0.23
P-39	1,119.00	12	125.0	0.00	Open	-46.00	0.01	0.01	false	0.13
P-40	1,551.00	30	125.0	0.00	Open	-839.83	0.04	0.02	false	0.38
P-41	1,519.00	12	125.0	0.00	Open	76.29	0.04	0.02	false	0.22
P-42	1,335.00	30	125.0	0.00	Open	1,325.03	0.07	0.05	false	0.60
P-43	1,367.00	12	125.0	0.00	Open	-117.50	0.07	0.05	false	0.33
P-44	779.00	12	125.0	0.00	Open	257.29	0.17	0.22	false	0.73
P-45	1,370.00	12	125.0	0.00	Open	202.66	0.19	0.14	false	0.57
P-46	2,363.00	12	125.0	0.00	Open	-65.17	0.04	0.02	false	0.18
P-47	1,575.00	12	125.0	0.00	Open	98.72	0.06	0.04	false	0.28
P-48	2,947.00	12	125.0	0.00	Open	-86.91	0.09	0.03	false	0.25
P-49	1,627.00	12	125.0	0.00	Open	-70.48	0.03	0.02	false	0.20
P-50	989.00	12	125.0	0.00	Open	235.24	0.18	0.19	false	0.67
P-55	829.00	12	125.0	0.00	Open	-106.21	0.04	0.04	false	0.30
P-56	1,373.00	12	125.0	0.00	Open	146.46	0.11	0.08	false	0.42
P-57	818.00	12	125.0	0.00	Open	-246.00	0.17	0.20	false	0.70
P-58	881.00	12	125.0	0.00	Open	-100.93	0.03	0.04	false	0.29
P-59	1,189.00	12	125.0	0.00	Open	36.77	0.01	0.01	false	0.10
P-60	1,264.00	12	125.0	0.00	Open	-142.53	0.09	0.07	false	0.40
P-61	1,571.00	12	125.0	0.00	Open	-88.26	0.05	0.03	false	0.25
P-62	1,256.00	12	125.0	0.00	Open	-90.36	0.04	0.03	false	0.26
P-63	726.00	12	125.0	0.00	Open	-175.24	0.08	0.11	false	0.50
P-64	563.00	12	125.0	0.00	Open	-329.57	0.20	0.35	false	0.93
P-65	1,029.00	12	125.0	0.00	Open	94.26	0.04	0.03	false	0.27
P-67	900.00	12	125.0	0.00	Open	94.96	0.03	0.03	false	0.27
P-69	773.00	12	125.0	0.00	Open	157.85	0.07	0.09	false	0.45
P-72	823.00	12	125.0	0.00	Open	154.70	0.07	0.09	false	0.44
P-68	100.00	24	125.0	0.00	Open	-3,222.05	0.08	0.81	true	2.29
P-71	1.00	24	125.0	0.00	Closed	0.00	0.00	0.00	true	0.00
P-74	100.00	30	125.0	0.00	Open	-3,221.95	0.03	0.27	true	1.46

Project Engineer: Mark Smith

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# Scenario: Run 10A-MDD-50%GW-50%SW(S)+FF Base

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-75	3.00	30	125.0	0.00	Open	-3,221.95	0.00	0.27	true	1.46
P-76	795.00	12	125.0	0.00	Open	155.48	0.07	0.09	false	0.44
P-77	801.00	12	125.0	0.00	Open	156.98	0.07	0.09	false	0.45
P-78	1,001.00	12	125.0	0.00	Open	95.67	0.04	0.04	false	0.27
P-79	900.00	12	125.0	0.00	Open	94.96	0.03	0.03	false	0.27
P-81	840.00	12	125.0	0.00	Open	207.13	0.12	0.15	false	0.59
P-82	1,761.00	12	125.0	0.00	Open	208.43	0.26	0.15	false	0.59
P-83	665.00	12	125.0	0.00	Open	-17.01	0.00	0.00	false	0.05
P-84	775.00	12	125.0	0.00	Open	-68.26	0.01	0.02	false	0.19
P-85	139.00	12	125.0	0.00	Open	0.33	0.00	0.00	false	0.00
P-86	130.00	12	125.0	0.00	Open	-0.33	0.00	0.00	false	0.00
P-90	345.00	12	125.0	0.00	Open	0.33	0.00	0.00	false	0.00
P-91	318.00	12	125.0	0.00	Open	0.33	0.00	0.00	false	0.00
P-92	320.00	12	125.0	0.00	Open	-0.33	0.00	0.00	false	0.00
P-93	382.00	12	125.0	0.00	Open	0.33	0.00	0.00	false	0.00
P-94	1,337.00	12	125.0	0.00	Open	-118.92	0.07	0.05	false	0.34
P-95	1,231.00	12	125.0	0.00	Open	-90.33	0.04	0.03	false	0.26
P-96	1,126.00	12	125.0	0.00	Open	-299.72	0.33	0.29	false	0.85
P-97	2,986.00	24	125.0	0.00	Open	-3,222.00	2.43	0.81	false	2.29
P-98	113.00	6	130.0	0.00	Closed	0.00	0.00	0.00	false	0.00
P-99	1,701.00	24	125.0	0.00	Open	-3,222.00	1.38	0.81	false	2.29
P-101	5,665.00	24	125.0	0.00	Open	-4,852.00	9.83	1.74	false	3.44
P-102	224.00	24	125.0	0.00	Open	-4,852.00	0.39	1.74	false	3.44
P-103	1.00	24	125.0	0.00	Open	-4,852.00	0.00	1.74	true	3.44
P-104	3,645.00	16	125.0	0.00	Open	1,630.00	6.05	1.66	false	2.60
P-105	5,402.00	16	125.0	0.00	Open	1,630.00	8.96	1.66	false	2.60
P-106	1,283.00	12	125.0	0.00	Open	291.58	0.36	0.28	false	0.83

**Scenario: Run 10B-MDD-50%GW-50%SW(S)+ FF @ J6, 7, & 8**

**Steady State Analysis**

**Junction Report**

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-1	9.30	1	Demand	0.00	Fixed	0.00	127.27	51.14
J-3	19.50	Zone-1	Inflow	3,222.06	Fixed	-3,222.05	124.18	45.38
J-4	12.00	Zone-1	Demand	0.00	Fixed	0.00	127.40	50.03
J-5	21.50	Zone-1	Demand	51.58	Fixed	51.58	91.60	30.39
J-6	21.00	Zone-1	Demand	1,500.00	Fixed	1,500.00	77.25	24.39
J-7	21.00	Zone-1	Demand	1,500.00	Fixed	1,500.00	77.54	24.51
J-8	21.00	Zone-1	Demand	1,000.00	Fixed	1,000.00	78.19	24.79
J-9	12.00	Zone-1	Demand	3,222.00	Fixed	3,222.00	114.37	44.38
J-10	13.00	Zone-1	Demand	0.00	Fixed	0.00	116.79	45.00
J-11	13.00	Zone-1	Demand	0.00	Fixed	0.00	118.18	45.60
J-12	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.01	49.86
J-13	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.40	50.03
J-14	13.00	Zone-1	Demand	0.00	Fixed	0.00	112.13	42.97
J-15	13.00	Zone-1	Demand	1,630.00	Fixed	1,630.00	103.17	39.09
J-80	24.00	1	Demand	58.03	Pattern - 1	58.03	120.24	41.72
J-90	26.30	1	Demand	30.25	Pattern - 1	30.25	120.85	40.99
J-100	22.90	1	Demand	27.28	Pattern - 1	27.28	121.27	42.65
J-110	22.50	1	Demand	66.46	Pattern - 1	66.46	121.23	42.80
J-120	21.20	1	Demand	84.81	Pattern - 1	84.81	121.22	43.36
J-130	20.10	1	Demand	96.68	Pattern - 1	96.68	123.24	44.71
J-140	18.60	1	Demand	204.26	Pattern - 1	204.26	123.42	45.44
J-150	21.00	1	Demand	97.21	Pattern - 1	97.21	122.24	43.89
J-160	18.85	1	Demand	45.57	Pattern - 1	45.57	124.10	45.63
J-170	20.42	1	Demand	66.73	Pattern - 1	66.73	123.87	44.85
J-190	20.40	1	Demand	109.15	Pattern - 1	109.15	117.09	41.92
J-200	20.50	1	Demand	48.57	Pattern - 1	48.57	122.89	44.39
J-210	23.60	1	Demand	120.28	Pattern - 1	120.28	119.74	41.68
J-220	24.75	1	Demand	95.23	Pattern - 1	95.23	107.35	35.81
J-230	24.20	1	Demand	52.57	Pattern - 1	52.57	96.30	31.26
J-240	21.00	1	Demand	43.15	Pattern - 1	43.15	91.86	30.72
J-250	24.30	1	Demand	109.61	Pattern - 1	109.61	117.58	40.44
J-260	23.21	1	Demand	75.89	Pattern - 1	75.89	115.30	39.92
J-300	20.30	1	Demand	123.53	Pattern - 1	123.53	123.95	44.93
J-310	15.90	1	Demand	312.93	Pattern - 1	312.93	124.16	46.93
J-320	16.00	1	Demand	189.67	Pattern - 1	189.67	124.35	46.97
J-330	14.90	1	Demand	267.83	Pattern - 1	267.83	124.34	47.45
J-350	16.00	1	Demand	123.74	Pattern - 1	123.74	124.86	47.19
J-360	15.50	1	Demand	229.54	Pattern - 1	229.54	124.79	47.38
J-370	13.60	1	Demand	77.67	Pattern - 1	77.67	125.11	48.34
J-380	11.30	1	Demand	128.44	Pattern - 1	128.44	125.47	49.49
J-400	15.35	1	Demand	96.76	Pattern - 1	96.76	125.67	47.83
J-410	15.27	1	Demand	113.38	Pattern - 1	113.38	125.34	47.72
J-420	24.50	1	Demand	132.68	Pattern - 1	132.68	120.25	41.51
J-430	25.10	1	Demand	124.99	Pattern - 1	124.99	121.23	41.67
J-440	21.30	1	Demand	141.35	Pattern - 1	141.35	122.75	43.98
J-450	18.00	1	Demand	121.02	Pattern - 1	121.02	125.05	46.41
J-460	15.30	1	Demand	0.00	Pattern - 1	0.00	125.19	47.64
J-470	12.09	1	Demand	54.82	Pattern - 1	54.82	125.37	49.11
J-480	10.60	1	Demand	0.00	Pattern - 1	0.00	125.35	49.75
J-490	14.80	1	Demand	19.52	Pattern - 1	19.52	125.36	47.93
J-500	11.10	1	Demand	81.98	Pattern - 1	81.98	125.37	49.54
J-510	10.50	1	Demand	91.09	Pattern - 1	91.09	125.64	49.92

Project Engineer: Mark Smith

WaterCAD v6.5 [6.5120]

# Scenario: Run 10B-MDD-50%GW-50%SW(S)+ FF @ J6, 7, & 8

## Steady State Analysis

### Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand Calculated (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-520	10.80	1	Demand	120.02	Pattern - 1	120.02	125.42	49.69
J-530	11.00	1	Demand	35.19	Pattern - 1	35.19	125.68	49.72
J-540	10.82	1	Demand	27.37	Pattern - 1	27.37	126.19	50.01
J-550	11.60	1	Demand	55.91	Pattern - 1	55.91	126.11	49.64
J-560	11.30	1	Demand	60.60	Pattern - 1	60.60	126.39	49.89
J-570	9.70	1	Demand	45.74	Pattern - 1	45.74	126.76	50.75
J-580	14.00	1	Demand	84.88	Pattern - 1	84.88	125.66	48.40
J-590	10.60	1	Demand	141.52	Pattern - 1	141.52	126.38	50.19
J-600	13.00	1	Demand	102.17	Pattern - 1	102.17	126.46	49.19
J-610	15.30	1	Demand	141.60	Pattern - 1	141.60	126.70	48.29
J-620	15.50	1	Demand	26.54	Pattern - 1	26.53	125.88	47.85
J-650	13.90	1	Demand	223.47	Pattern - 1	223.47	124.73	48.05
J-670	21.50	1	Demand	102.41	Pattern - 1	102.41	123.27	44.12
J-680	13.40	1	Demand	30.50	Pattern - 1	30.50	125.35	48.53
J-690	11.25	1	Demand	124.42	Pattern - 1	124.42	125.37	49.47
J-700	18.50	1	Demand	156.26	Pattern - 1	156.26	123.58	45.56
J-720	18.70	1	Demand	179.91	Pattern - 1	179.91	123.80	45.56
J-730	19.31	1	Demand	34.84	Pattern - 1	34.84	124.08	45.42
J-740	13.80	1	Demand	159.87	Pattern - 1	159.87	125.06	48.23
J-750	11.55	1	Demand	101.43	Pattern - 1	101.43	125.15	49.25
J-760	9.70	1	Demand	34.79	Pattern - 1	34.79	126.45	50.61
J-770	15.00	1	Demand	89.92	Pattern - 1	89.92	125.56	47.93
J-780	11.20	1	Demand	66.07	Pattern - 1	66.07	125.96	49.75
J-800	18.80	1	Demand	36.32	Pattern - 1	36.32	124.05	45.63
J-810	21.47	1	Demand	83.62	Pattern - 1	83.62	122.54	43.82
J-820	20.20	1	Demand	159.21	Pattern - 1	159.21	120.32	43.40
J-830	17.95	1	Demand	105.17	Pattern - 1	105.17	125.17	46.48

# Scenario: Run 10B-MDD-50%GW-50%SW(S)+ FF @ J6, 7, & 8

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen-Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-1510	851.00	12	125.0	0.00	Open	192.95	0.11	0.13	false	0.55
P-1520	800.00	12	125.0	0.00	Open	453.39	0.50	0.63	false	1.29
P-1550	449.00	30	125.0	0.00	Open	-5,257.84	0.30	0.68	false	2.39
P-1540	395.00	30	125.0	0.00	Open	-5,223.05	0.27	0.67	false	2.37
P-1410	1,217.00	12	125.0	0.00	Open	263.78	0.28	0.23	false	0.75
P-1270	257.00	24	125.0	0.00	Open	1,497.82	0.05	0.20	false	1.06
P-1120	447.00	12	125.0	0.00	Open	-178.03	0.05	0.11	false	0.51
P-1110	1,139.00	12	125.0	0.00	Open	-299.41	0.33	0.29	false	0.85
P-1140	1,540.00	12	125.0	0.00	Open	-189.74	0.19	0.13	false	0.54
P-1060	1,125.00	12	125.0	0.00	Open	182.17	0.13	0.12	false	0.52
P-1050	1,053.00	30	125.0	0.00	Open	-2,101.93	0.13	0.12	false	0.95
P-960	746.00	12	125.0	0.00	Open	89.84	0.02	0.03	false	0.25
P-970	897.00	12	125.0	0.00	Open	-28.76	0.00	0.00	false	0.08
P-950	402.00	12	125.0	0.00	Open	-40.56	0.00	0.01	false	0.12
P-940	817.00	12	125.0	0.00	Open	89.85	0.03	0.03	false	0.25
P-590	1,013.00	12	125.0	0.00	Open	40.56	0.01	0.01	false	0.12
P-600	659.00	12	125.0	0.00	Open	60.08	0.01	0.01	false	0.17
P-630	1,187.00	12	125.0	0.00	Open	233.33	0.22	0.18	false	0.66
P-750	931.00	12	125.0	0.00	Open	-35.84	0.01	0.01	false	0.10
P-760	1,759.00	12	125.0	0.00	Open	105.68	0.07	0.04	false	0.30
P-780	1,638.00	12	125.0	0.00	Open	207.85	0.24	0.15	false	0.59
P-790	1,293.00	12	125.0	0.00	Open	-456.63	0.83	0.64	false	1.30
P-800	1,439.00	12	125.0	0.00	Open	-430.10	0.82	0.57	false	1.22
P-740	709.00	12	125.0	0.00	Open	408.92	0.37	0.52	false	1.16
P-640	597.00	12	125.0	0.00	Open	137.17	0.04	0.07	false	0.39
P-680	726.00	12	125.0	0.00	Open	173.69	0.08	0.11	false	0.49
P-420	996.00	12	125.0	0.00	Open	-196.15	0.13	0.13	false	0.56
P-390	2,320.00	12	125.0	0.00	Open	-272.10	0.57	0.24	false	0.77
P-510	1,511.00	12	125.0	0.00	Open	583.82	1.52	1.01	false	1.66
P-520	1,532.00	12	125.0	0.00	Open	-725.18	2.30	1.50	false	2.06
P-430	1,150.00	12	125.0	0.00	Open	-134.91	0.08	0.07	false	0.38
P-230	1,475.00	12	125.0	0.00	Open	1,726.48	11.05	7.49	false	4.90
P-220	1,496.00	12	125.0	0.00	Open	1,821.71	12.38	8.28	false	5.17
P-200	753.00	12	125.0	0.00	Open	670.84	0.98	1.30	false	1.90
P-87	1,673.00	12	125.0	0.00	Open	2,420.83	23.44	14.01	false	6.87
P-70	1,321.00	12	125.0	0.00	Open	-381.00	0.60	0.46	false	1.08
P-110	870.00	12	125.0	0.00	Open	-618.69	0.97	1.12	false	1.76
P-80	808.00	12	125.0	0.00	Open	-411.25	0.42	0.53	false	1.17
P-250	1,092.00	12	125.0	0.00	Open	-941.65	2.66	2.44	false	2.67
P-3	527.00	30	125.0	0.00	Open	-6,415.86	0.52	0.98	false	2.91
P-4	1,274.00	16	125.0	0.00	Open	-806.09	0.57	0.45	false	1.29
P-8	1,129.00	16	125.0	0.00	Open	-461.25	0.18	0.16	false	0.74
P-9	685.00	12	125.0	0.00	Open	66.14	0.01	0.02	false	0.19
P-10	634.00	12	125.0	0.00	Open	132.60	0.04	0.06	false	0.38
P-11	2,034.00	12	125.0	0.00	Open	-571.13	1.96	0.97	false	1.62
P-12	860.00	12	125.0	0.00	Open	-637.37	1.02	1.18	false	1.81
P-13	767.00	12	125.0	0.00	Open	-734.58	1.18	1.54	false	2.08
P-14	1,007.00	16	125.0	0.00	Open	1,006.09	0.68	0.68	false	1.61
P-15	898.00	12	125.0	0.00	Open	-361.17	0.37	0.41	false	1.02
P-16	1,041.00	12	125.0	0.00	Open	463.58	0.68	0.66	false	1.32
P-17	1,922.00	12	125.0	0.00	Open	156.09	0.17	0.09	false	0.44

Project Engineer: Mark Smith

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## Steady State Analysis

## Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-18	676.00	12	125.0	0.00	Open	-312.35	0.21	0.32	false	0.89
P-19	1,174.00	12	125.0	0.00	Open	832.04	2.28	1.94	false	2.36
P-20	1,680.00	12	125.0	0.00	Open	818.18	3.16	1.88	false	2.32
P-490	1,505.00	12	125.0	0.00	Open	-326.16	0.52	0.34	false	0.93
P-500	1,520.00	12	125.0	0.00	Open	458.83	0.98	0.64	false	1.30
P-21	2,057.00	12	125.0	0.00	Open	-228.47	0.36	0.18	false	0.65
P-22	900.00	12	125.0	0.00	Open	-842.11	1.78	1.98	false	2.39
P-23	940.00	12	125.0	0.00	Open	822.56	1.78	1.90	false	2.33
P-24	1,437.00	12	125.0	0.00	Open	-901.61	3.23	2.25	false	2.56
P-25	1,528.00	12	125.0	0.00	Open	-872.21	3.23	2.12	false	2.47
P-26	463.00	12	125.0	0.00	Open	1,030.34	1.33	2.88	false	2.92
P-28	825.00	12	125.0	0.00	Open	992.67	2.22	2.69	false	2.82
P-29	912.00	12	125.0	0.00	Open	940.36	2.22	2.43	false	2.67
P-30	935.00	24	125.0	0.00	Open	1,461.50	0.18	0.19	false	1.04
P-31	502.00	12	125.0	0.00	Open	986.31	1.33	2.66	false	2.80
P-32	1,044.00	30	125.0	0.00	Open	-1,558.75	0.07	0.07	false	0.71
P-33	1,076.00	12	125.0	0.00	Open	-138.24	0.07	0.07	false	0.39
P-34	1,740.00	30	125.0	0.00	Open	2,369.07	0.27	0.16	false	1.08
P-35	1,727.00	12	125.0	0.00	Open	-213.65	0.27	0.16	false	0.61
P-36	2,395.00	30	125.0	0.00	Open	-2,821.05	0.51	0.21	false	1.28
P-37	2,406.00	12	125.0	0.00	Open	252.76	0.51	0.21	false	0.72
P-38	1,120.00	30	125.0	0.00	Open	-3,237.67	0.31	0.28	false	1.47
P-39	1,119.00	12	125.0	0.00	Open	-290.94	0.31	0.28	false	0.83
P-40	1,551.00	30	125.0	0.00	Open	-3,508.07	0.50	0.32	false	1.59
P-41	1,519.00	12	125.0	0.00	Open	318.66	0.50	0.33	false	0.90
P-42	1,335.00	30	125.0	0.00	Open	3,876.87	0.52	0.39	false	1.76
P-43	1,367.00	12	125.0	0.00	Open	-343.79	0.52	0.38	false	0.98
P-44	779.00	12	125.0	0.00	Open	269.31	0.19	0.24	false	0.76
P-45	1,370.00	12	125.0	0.00	Open	32.11	0.01	0.00	false	0.09
P-46	2,363.00	12	125.0	0.00	Open	-235.72	0.44	0.19	false	0.67
P-47	1,575.00	12	125.0	0.00	Open	330.35	0.55	0.35	false	0.94
P-48	2,947.00	12	125.0	0.00	Open	88.31	0.09	0.03	false	0.25
P-49	1,627.00	12	125.0	0.00	Open	-255.70	0.35	0.22	false	0.73
P-50	989.00	12	125.0	0.00	Open	247.78	0.20	0.21	false	0.70
P-55	829.00	12	125.0	0.00	Open	-281.03	0.22	0.26	false	0.80
P-56	1,373.00	12	125.0	0.00	Open	243.01	0.27	0.20	false	0.69
P-57	818.00	12	125.0	0.00	Open	-430.26	0.47	0.57	false	1.22
P-58	881.00	12	125.0	0.00	Open	-312.48	0.28	0.32	false	0.89
P-59	1,189.00	12	125.0	0.00	Open	113.30	0.06	0.05	false	0.32
P-60	1,264.00	12	125.0	0.00	Open	-144.67	0.10	0.08	false	0.41
P-61	1,571.00	12	125.0	0.00	Open	-275.44	0.39	0.25	false	0.78
P-62	1,256.00	12	125.0	0.00	Open	-276.97	0.32	0.25	false	0.79
P-63	726.00	12	125.0	0.00	Open	-361.85	0.30	0.41	false	1.03
P-64	563.00	12	125.0	0.00	Open	-703.36	0.80	1.42	false	2.00
P-65	1,029.00	12	125.0	0.00	Open	206.50	0.15	0.15	false	0.59
P-67	900.00	12	125.0	0.00	Open	208.05	0.13	0.15	false	0.59
P-69	773.00	12	125.0	0.00	Open	200.17	0.11	0.14	false	0.57
P-72	823.00	12	125.0	0.00	Open	289.30	0.23	0.27	false	0.82
P-68	100.00	24	125.0	0.00	Open	-3,222.05	0.08	0.81	true	2.29
P-71	1.00	24	125.0	0.00	Closed	0.00	0.00	0.00	true	0.00
P-74	100.00	30	125.0	0.00	Open	-7,221.95	0.12	1.22	true	3.28

## Steady State Analysis

## Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-75	3.00	30	125.0	0.00	Open	-7,221.95	0.00	1.22	true	3.28
P-76	795.00	12	125.0	0.00	Open	197.16	0.11	0.13	false	0.56
P-77	801.00	12	125.0	0.00	Open	293.56	0.23	0.28	false	0.83
P-78	1,001.00	12	125.0	0.00	Open	209.60	0.15	0.15	false	0.59
P-79	900.00	12	125.0	0.00	Open	208.05	0.13	0.15	false	0.59
P-81	840.00	12	125.0	0.00	Open	632.38	0.98	1.17	false	1.79
P-82	1,761.00	12	125.0	0.00	Open	797.64	3.16	1.79	false	2.26
P-83	665.00	12	125.0	0.00	Open	1,673.91	4.71	7.08	false	4.75
P-84	775.00	12	125.0	0.00	Open	-325.16	0.26	0.34	false	0.92
P-85	139.00	12	125.0	0.00	Open	2,052.51	1.43	10.32	false	5.82
P-86	130.00	12	125.0	0.00	Open	1,947.49	1.22	9.37	false	5.52
P-90	345.00	12	125.0	0.00	Open	2,052.51	3.56	10.32	false	5.82
P-91	318.00	12	125.0	0.00	Open	552.51	0.29	0.91	false	1.57
P-92	320.00	12	125.0	0.00	Open	1,947.49	3.00	9.37	false	5.52
P-93	382.00	12	125.0	0.00	Open	-947.49	0.94	2.47	false	2.69
P-94	1,337.00	12	125.0	0.00	Open	-347.93	0.52	0.39	false	0.99
P-95	1,231.00	12	125.0	0.00	Open	-206.56	0.18	0.15	false	0.59
P-96	1,126.00	12	125.0	0.00	Open	-444.47	0.68	0.61	false	1.26
P-97	2,986.00	24	125.0	0.00	Open	-3,222.00	2.43	0.81	false	2.29
P-98	113.00	6	130.0	0.00	Closed	0.00	0.00	0.00	false	0.00
P-99	1,701.00	24	125.0	0.00	Open	-3,222.00	1.38	0.81	false	2.29
P-101	5,665.00	24	125.0	0.00	Open	-4,852.00	9.83	1.74	false	3.44
P-102	224.00	24	125.0	0.00	Open	-4,852.00	0.39	1.74	false	3.44
P-103	1.00	24	125.0	0.00	Open	-4,852.00	0.00	1.74	true	3.44
P-104	3,645.00	16	125.0	0.00	Open	1,630.00	6.05	1.66	false	2.60
P-105	5,402.00	16	125.0	0.00	Open	1,630.00	8.96	1.66	false	2.60
P-106	1,283.00	12	125.0	0.00	Open	228.11	0.23	0.18	false	0.65

# Scenario: Run 10C-MDD-50%GW-50%SW(S)+Multi-FF Runs

## Fire Flow Analysis

### Fire Flow Report

Label	Fire Flow Balanced?	Satisfies Fire Flow Constraints?	Needed Fire Flow (gpm)	Available Fire Flow (gpm)	Total Flow Needed (gpm)	Total Flow Available (gpm)	Calculated Residual Pressure (psi)	Calculated Minimum System Pressure (psi)	Minimum System Junction
J-1	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-3	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-4	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-5	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-6	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-7	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-8	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-9	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-10	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-11	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-12	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-13	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-14	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-15	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-80	true	true	4,000.00	4,000.00	4,058.03	4,058.03	35.33	35.91	J-90
J-90	true	true	4,000.00	4,000.00	4,030.26	4,030.26	31.44	37.09	J-100
J-100	true	false	4,000.00	4,000.00	4,027.28	4,027.28	35.71	35.23	J-90
J-110	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-120	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-130	true	true	4,000.00	4,000.00	4,096.68	4,096.68	41.72	39.09	J-15
J-140	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-150	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-160	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-170	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-190	true	false	4,000.00	4,000.00	4,109.15	4,109.15	39.20	38.67	J-260
J-200	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-210	true	true	4,000.00	4,000.00	4,120.28	4,120.28	38.48	38.72	J-220
J-220	true	true	4,000.00	4,000.00	4,095.23	4,095.23	29.13	32.91	J-230
J-230	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-240	true	true	4,000.00	4,000.00	4,043.15	4,043.15	29.90	28.80	GPV-1
J-250	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-260	true	false	4,000.00	4,000.00	4,075.89	4,075.89	37.55	37.92	GPV-1
J-300	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-310	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-320	true	false	4,000.00	4,000.00	4,189.67	4,189.67	46.88	39.09	J-15
J-330	true	false	4,000.00	4,000.00	4,267.83	4,267.83	38.51	39.09	J-15
J-350	true	false	4,000.00	4,000.00	4,123.74	4,123.74	47.13	39.09	J-15
J-360	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-370	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-380	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-400	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-410	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-420	true	true	4,000.00	4,000.00	4,132.68	4,132.68	29.31	32.83	J-430
J-430	true	false	4,000.00	4,000.00	4,124.99	4,124.99	26.71	33.66	J-420
J-440	true	true	4,000.00	4,000.00	4,141.36	4,141.36	31.14	32.98	J-430
J-450	true	false	4,000.00	4,000.00	4,121.02	4,121.02	42.41	39.09	J-15
J-460	true	true	4,000.00	4,000.00	4,000.00	4,000.00	44.45	39.09	J-15
J-470	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-480	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-490	true	false	4,000.00	4,000.00	4,019.52	4,019.52	38.71	39.09	J-15

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# Scenario: Run 10C-MDD-50%GW-50%SW(S)+Multi-FF Runs

## Fire Flow Analysis

### Fire Flow Report

Label	Fire Flow Balanced?	Satisfies Fire Flow Constraints?	Needed Fire Flow (gpm)	Available Fire Flow (gpm)	Total Flow Needed (gpm)	Total Flow Available (gpm)	Calculated Residual Pressure (psi)	Calculated Minimum System Pressure (psi)	Minimum System Junction
J-500	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-510	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-520	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-530	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-540	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-550	true	false	4,000.00	4,000.00	4,055.91	4,055.91	47.39	39.09	J-15
J-560	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-570	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-580	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-590	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-600	true	true	4,000.00	4,000.00	4,102.17	4,102.17	38.73	39.09	J-15
J-610	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-620	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-650	true	false	4,000.00	4,000.00	4,223.47	4,223.47	44.74	39.09	J-15
J-670	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-680	true	false	4,000.00	4,000.00	4,030.50	4,030.50	43.26	39.09	J-15
J-690	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-700	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-720	true	true	4,000.00	4,000.00	4,179.91	4,179.91	41.15	39.09	J-15
J-730	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-740	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-750	true	true	4,000.00	4,000.00	4,101.43	4,101.43	37.67	39.09	J-15
J-760	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-770	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-780	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-800	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-810	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-820	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-830	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A

**Scenario: Run 11A-MDD-100%SW(S)+FF Base**  
**Steady State Analysis**  
**Junction Report**

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-1	9.30	1	Demand	0.00	Fixed	0.00	127.30	51.15
J-3	19.50	Zone-1	Demand	0.00	Fixed	0.00	124.56	45.55
J-4	12.00	Zone-1	Demand	0.00	Fixed	0.00	127.40	50.03
J-5	21.50	Zone-1	Demand	51.58	Fixed	51.58	124.16	44.51
J-6	21.00	Zone-1	Demand	0.00	Fixed	0.00	119.56	42.73
J-7	21.00	Zone-1	Demand	0.00	Fixed	0.00	119.56	42.73
J-8	21.00	Zone-1	Demand	0.00	Fixed	0.00	119.56	42.73
J-9	12.00	Zone-1	Demand	6,444.00	Fixed	6,444.00	88.39	33.12
J-10	13.00	Zone-1	Demand	0.00	Fixed	0.00	97.15	36.48
J-11	13.00	Zone-1	Demand	0.00	Fixed	0.00	102.15	38.65
J-12	13.00	Zone-1	Demand	0.00	Fixed	0.00	127.40	49.59
J-13	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.40	50.03
J-14	13.00	Zone-1	Demand	0.00	Fixed	0.00	96.10	36.03
J-15	13.00	Zone-1	Demand	1,630.00	Fixed	1,630.00	87.14	32.14
J-80	24.00	1	Demand	58.03	Pattern - 1	58.03	124.17	43.43
J-90	26.30	1	Demand	30.25	Pattern - 1	30.25	124.18	42.43
J-100	22.90	1	Demand	27.28	Pattern - 1	27.28	124.19	43.91
J-110	22.50	1	Demand	66.46	Pattern - 1	66.46	124.18	44.08
J-120	21.20	1	Demand	84.81	Pattern - 1	84.81	124.18	44.65
J-130	20.10	1	Demand	96.68	Pattern - 1	96.68	124.38	45.21
J-140	18.60	1	Demand	204.26	Pattern - 1	204.26	124.41	45.87
J-150	21.00	1	Demand	97.21	Pattern - 1	97.21	124.25	44.76
J-160	18.85	1	Demand	45.57	Pattern - 1	45.57	124.56	45.83
J-170	20.42	1	Demand	66.73	Pattern - 1	66.73	124.61	45.17
J-190	20.40	1	Demand	109.15	Pattern - 1	109.15	124.21	45.01
J-200	20.50	1	Demand	48.57	Pattern - 1	48.57	124.55	45.11
J-210	23.60	1	Demand	120.28	Pattern - 1	120.28	124.42	43.71
J-220	24.75	1	Demand	95.23	Pattern - 1	95.23	124.22	43.12
J-230	24.20	1	Demand	52.57	Pattern - 1	52.57	124.17	43.34
J-240	21.00	1	Demand	43.15	Pattern - 1	43.15	124.16	44.72
J-250	24.30	1	Demand	109.61	Pattern - 1	109.61	124.16	43.29
J-260	23.21	1	Demand	75.89	Pattern - 1	75.89	124.18	43.77
J-300	20.30	1	Demand	123.53	Pattern - 1	123.53	124.68	45.25
J-310	15.90	1	Demand	312.93	Pattern - 1	312.93	124.79	47.21
J-320	16.00	1	Demand	189.67	Pattern - 1	189.67	124.96	47.24
J-330	14.90	1	Demand	267.83	Pattern - 1	267.83	124.94	47.71
J-350	16.00	1	Demand	123.74	Pattern - 1	123.74	125.36	47.41
J-360	15.50	1	Demand	229.54	Pattern - 1	229.54	125.30	47.60
J-370	13.60	1	Demand	77.67	Pattern - 1	77.67	125.51	48.52
J-380	11.30	1	Demand	128.44	Pattern - 1	128.44	125.80	49.64
J-400	15.35	1	Demand	96.76	Pattern - 1	96.76	126.01	47.97
J-410	15.27	1	Demand	113.38	Pattern - 1	113.38	125.83	47.93
J-420	24.50	1	Demand	132.68	Pattern - 1	132.68	124.42	43.32
J-430	25.10	1	Demand	124.99	Pattern - 1	124.99	124.55	43.11
J-440	21.30	1	Demand	141.35	Pattern - 1	141.35	124.93	44.93
J-450	18.00	1	Demand	121.02	Pattern - 1	121.02	125.76	46.72
J-460	15.30	1	Demand	0.00	Pattern - 1	0.00	125.80	47.90
J-470	12.09	1	Demand	54.82	Pattern - 1	54.82	125.70	49.25
J-480	10.60	1	Demand	0.00	Pattern - 1	0.00	125.67	49.89
J-490	14.80	1	Demand	19.52	Pattern - 1	19.52	125.68	48.07
J-500	11.10	1	Demand	81.98	Pattern - 1	81.98	125.68	49.67
J-510	10.50	1	Demand	91.09	Pattern - 1	91.09	125.93	50.04



# Scenario: Run 11A-MDD-100%SW(S)+FF Base

## Steady State Analysis

### Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand Calculated (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-520	10.80	1	Demand	120.02	Pattern - 1	120.02	125.73	49.82
J-530	11.00	1	Demand	35.19	Pattern - 1	35.19	125.97	49.84
J-540	10.82	1	Demand	27.37	Pattern - 1	27.37	126.42	50.11
J-550	11.60	1	Demand	55.91	Pattern - 1	55.91	126.33	49.74
J-560	11.30	1	Demand	60.60	Pattern - 1	60.60	126.56	49.97
J-570	9.70	1	Demand	45.74	Pattern - 1	45.74	126.88	50.80
J-580	14.00	1	Demand	84.88	Pattern - 1	84.88	126.04	48.57
J-590	10.60	1	Demand	141.52	Pattern - 1	141.52	126.55	50.27
J-600	13.00	1	Demand	102.17	Pattern - 1	102.17	126.62	49.25
J-610	15.30	1	Demand	141.60	Pattern - 1	141.60	126.84	48.36
J-620	15.50	1	Demand	26.54	Pattern - 1	26.53	126.29	48.03
J-650	13.90	1	Demand	223.47	Pattern - 1	223.47	125.22	48.26
J-670	21.50	1	Demand	102.41	Pattern - 1	102.41	124.57	44.68
J-680	13.40	1	Demand	30.50	Pattern - 1	30.50	125.67	48.67
J-690	11.25	1	Demand	124.42	Pattern - 1	124.42	125.69	49.61
J-700	18.50	1	Demand	156.26	Pattern - 1	156.26	124.45	45.93
J-720	18.70	1	Demand	179.91	Pattern - 1	179.91	124.56	45.89
J-730	19.31	1	Demand	34.84	Pattern - 1	34.84	124.77	45.72
J-740	13.80	1	Demand	159.87	Pattern - 1	159.87	125.48	48.41
J-750	11.55	1	Demand	101.43	Pattern - 1	101.43	125.52	49.41
J-760	9.70	1	Demand	34.79	Pattern - 1	34.79	126.63	50.69
J-770	15.00	1	Demand	89.92	Pattern - 1	89.92	125.96	48.10
J-780	11.20	1	Demand	66.07	Pattern - 1	66.07	126.26	49.88
J-800	18.80	1	Demand	36.32	Pattern - 1	36.32	124.57	45.85
J-810	21.47	1	Demand	83.62	Pattern - 1	83.62	124.49	44.66
J-820	20.20	1	Demand	159.21	Pattern - 1	159.21	124.34	45.14
J-830	17.95	1	Demand	105.17	Pattern - 1	105.17	125.60	46.67

# Scenario: Run 11A-MDD-100%SW(S)+FF Base

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-1510	851.00	12	125.0	0.00	Open	207.65	0.13	0.15	false	0.59
P-1520	800.00	12	125.0	0.00	Open	424.68	0.45	0.56	false	1.20
P-1550	449.00	30	125.0	0.00	Open	-4,697.40	0.25	0.55	false	2.13
P-1540	395.00	30	125.0	0.00	Open	-4,662.60	0.21	0.54	false	2.12
P-1410	1,217.00	12	125.0	0.00	Open	224.36	0.21	0.17	false	0.64
P-1270	257.00	24	125.0	0.00	Open	-591.02	0.01	0.04	false	0.42
P-1120	447.00	12	125.0	0.00	Open	-148.98	0.04	0.08	false	0.42
P-1110	1,139.00	12	125.0	0.00	Open	-259.02	0.25	0.22	false	0.73
P-1140	1,540.00	12	125.0	0.00	Open	-163.69	0.15	0.10	false	0.46
P-1060	1,125.00	12	125.0	0.00	Open	151.72	0.09	0.08	false	0.43
P-1050	1,053.00	30	125.0	0.00	Open	-1,750.55	0.09	0.09	false	0.79
P-960	746.00	12	125.0	0.00	Open	72.85	0.02	0.02	false	0.21
P-970	897.00	12	125.0	0.00	Open	-29.80	0.00	0.00	false	0.08
P-950	402.00	12	125.0	0.00	Open	-29.27	0.00	0.00	false	0.08
P-940	817.00	12	125.0	0.00	Open	92.08	0.03	0.03	false	0.26
P-590	1,013.00	12	125.0	0.00	Open	29.27	0.00	0.00	false	0.08
P-600	659.00	12	125.0	0.00	Open	48.79	0.01	0.01	false	0.14
P-630	1,187.00	12	125.0	0.00	Open	220.99	0.20	0.17	false	0.63
P-750	931.00	12	125.0	0.00	Open	-42.37	0.01	0.01	false	0.12
P-760	1,759.00	12	125.0	0.00	Open	99.15	0.07	0.04	false	0.28
P-780	1,638.00	12	125.0	0.00	Open	201.33	0.23	0.14	false	0.57
P-790	1,293.00	12	125.0	0.00	Open	-366.91	0.55	0.43	false	1.04
P-800	1,439.00	12	125.0	0.00	Open	-340.37	0.53	0.37	false	0.97
P-740	709.00	12	125.0	0.00	Open	379.65	0.32	0.45	false	1.08
P-640	597.00	12	125.0	0.00	Open	139.73	0.04	0.07	false	0.40
P-680	726.00	12	125.0	0.00	Open	178.64	0.08	0.11	false	0.51
P-420	996.00	12	125.0	0.00	Open	-198.77	0.14	0.14	false	0.56
P-390	2,320.00	12	125.0	0.00	Open	-234.32	0.43	0.19	false	0.66
P-510	1,511.00	12	125.0	0.00	Open	276.99	0.38	0.25	false	0.79
P-520	1,532.00	12	125.0	0.00	Open	-418.35	0.83	0.54	false	1.19
P-430	1,150.00	12	125.0	0.00	Open	-115.00	0.06	0.05	false	0.33
P-230	1,475.00	12	125.0	0.00	Open	97.86	0.05	0.04	false	0.28
P-220	1,496.00	12	125.0	0.00	Open	193.09	0.19	0.13	false	0.55
P-200	753.00	12	125.0	0.00	Open	141.74	0.06	0.07	false	0.40
P-87	1,673.00	12	125.0	0.00	Open	49.44	0.02	0.01	false	0.14
P-70	1,321.00	12	125.0	0.00	Open	-38.91	0.01	0.01	false	0.11
P-110	870.00	12	125.0	0.00	Open	-62.57	0.01	0.02	false	0.18
P-80	808.00	12	125.0	0.00	Open	-69.17	0.02	0.02	false	0.20
P-250	1,092.00	12	125.0	0.00	Open	-43.46	0.01	0.01	false	0.12
P-3	527.00	30	125.0	0.00	Open	-5,734.17	0.42	0.80	false	2.60
P-4	1,274.00	16	125.0	0.00	Open	-709.83	0.45	0.36	false	1.13
P-8	1,129.00	16	125.0	0.00	Open	-177.31	0.03	0.03	false	0.28
P-9	685.00	12	125.0	0.00	Open	-2.87	0.00	0.00	false	0.01
P-10	634.00	12	125.0	0.00	Open	63.59	0.01	0.02	false	0.18
P-11	2,034.00	12	125.0	0.00	Open	-160.04	0.19	0.09	false	0.45
P-12	860.00	12	125.0	0.00	Open	-150.25	0.07	0.08	false	0.43
P-13	767.00	12	125.0	0.00	Open	-247.47	0.16	0.21	false	0.70
P-14	1,007.00	16	125.0	0.00	Open	445.04	0.15	0.15	false	0.71
P-15	898.00	12	125.0	0.00	Open	-67.25	0.02	0.02	false	0.19
P-16	1,041.00	12	125.0	0.00	Open	169.67	0.11	0.10	false	0.48
P-17	1,922.00	12	125.0	0.00	Open	66.80	0.03	0.02	false	0.19

Project Engineer: Mark Smith

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# Scenario: Run 11A-MDD-100%SW(S)+FF Base

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-18	676.00	12	125.0	0.00	Open	-223.06	0.11	0.17	false	0.63
P-19	1,174.00	12	125.0	0.00	Open	-66.16	0.02	0.02	false	0.19
P-20	1,680.00	12	125.0	0.00	Open	148.89	0.13	0.08	false	0.42
P-490	1,505.00	12	125.0	0.00	Open	-19.33	0.00	0.00	false	0.05
P-500	1,520.00	12	125.0	0.00	Open	152.00	0.13	0.08	false	0.43
P-21	2,057.00	12	125.0	0.00	Open	-178.60	0.23	0.11	false	0.51
P-22	900.00	12	125.0	0.00	Open	-96.87	0.03	0.04	false	0.27
P-23	940.00	12	125.0	0.00	Open	94.62	0.03	0.03	false	0.27
P-24	1,437.00	12	125.0	0.00	Open	-152.81	0.12	0.08	false	0.43
P-25	1,528.00	12	125.0	0.00	Open	-147.83	0.12	0.08	false	0.42
P-26	463.00	12	125.0	0.00	Open	277.66	0.12	0.25	false	0.79
P-28	825.00	12	125.0	0.00	Open	236.15	0.16	0.19	false	0.67
P-29	912.00	12	125.0	0.00	Open	223.70	0.16	0.17	false	0.63
P-30	935.00	24	125.0	0.00	Open	-627.34	0.04	0.04	false	0.44
P-31	502.00	12	125.0	0.00	Open	265.80	0.12	0.23	false	0.75
P-32	1,044.00	30	125.0	0.00	Open	-1,478.43	0.07	0.06	false	0.67
P-33	1,076.00	12	125.0	0.00	Open	-130.64	0.07	0.06	false	0.37
P-34	1,740.00	30	125.0	0.00	Open	1,982.67	0.19	0.11	false	0.90
P-35	1,727.00	12	125.0	0.00	Open	-178.80	0.19	0.11	false	0.51
P-36	2,395.00	30	125.0	0.00	Open	-2,447.24	0.39	0.16	false	1.11
P-37	2,406.00	12	125.0	0.00	Open	219.26	0.39	0.16	false	0.62
P-38	1,120.00	30	125.0	0.00	Open	-2,848.08	0.24	0.22	false	1.29
P-39	1,119.00	12	125.0	0.00	Open	-255.93	0.24	0.22	false	0.73
P-40	1,551.00	30	125.0	0.00	Open	-3,132.30	0.40	0.26	false	1.42
P-41	1,519.00	12	125.0	0.00	Open	284.52	0.40	0.27	false	0.81
P-42	1,335.00	30	125.0	0.00	Open	3,421.42	0.41	0.31	false	1.55
P-43	1,367.00	12	125.0	0.00	Open	-303.44	0.41	0.30	false	0.86
P-44	779.00	12	125.0	0.00	Open	257.22	0.17	0.22	false	0.73
P-45	1,370.00	12	125.0	0.00	Open	58.15	0.02	0.01	false	0.16
P-46	2,363.00	12	125.0	0.00	Open	-209.68	0.36	0.15	false	0.59
P-47	1,575.00	12	125.0	0.00	Open	324.23	0.53	0.34	false	0.92
P-48	2,947.00	12	125.0	0.00	Open	62.27	0.05	0.02	false	0.18
P-49	1,627.00	12	125.0	0.00	Open	-226.65	0.28	0.17	false	0.64
P-50	989.00	12	125.0	0.00	Open	252.24	0.21	0.21	false	0.72
P-55	829.00	12	125.0	0.00	Open	-249.76	0.17	0.21	false	0.71
P-56	1,373.00	12	125.0	0.00	Open	227.07	0.24	0.18	false	0.64
P-57	818.00	12	125.0	0.00	Open	-399.42	0.41	0.50	false	1.13
P-58	881.00	12	125.0	0.00	Open	-276.68	0.22	0.25	false	0.78
P-59	1,189.00	12	125.0	0.00	Open	100.97	0.05	0.04	false	0.29
P-60	1,264.00	12	125.0	0.00	Open	-146.90	0.10	0.08	false	0.42
P-61	1,571.00	12	125.0	0.00	Open	-240.40	0.31	0.19	false	0.68
P-62	1,256.00	12	125.0	0.00	Open	-220.02	0.21	0.17	false	0.62
P-63	726.00	12	125.0	0.00	Open	-304.91	0.22	0.30	false	0.86
P-64	563.00	12	125.0	0.00	Open	-611.38	0.62	1.10	false	1.73
P-65	1,029.00	12	125.0	0.00	Open	98.76	0.04	0.04	false	0.28
P-67	900.00	12	125.0	0.00	Open	99.50	0.03	0.04	false	0.28
P-69	773.00	12	125.0	0.00	Open	134.05	0.05	0.07	false	0.38
P-72	823.00	12	125.0	0.00	Open	206.76	0.12	0.15	false	0.59
P-68	100.00	24	125.0	0.00	Open	0.00	0.00	0.00	true	0.00
P-71	1.00	24	125.0	0.00	Closed	0.00	0.00	0.00	true	0.00
P-74	100.00	30	125.0	0.00	Open	-6,444.00	0.10	0.99	true	2.92

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# Scenario: Run 11A-MDD-100%SW(S)+FF Base

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-75	3.00	30	125.0	0.00	Open	-6,444.00	0.00	0.99	true	2.92
P-76	795.00	12	125.0	0.00	Open	132.04	0.05	0.06	false	0.37
P-77	801.00	12	125.0	0.00	Open	209.81	0.12	0.15	false	0.60
P-78	1,001.00	12	125.0	0.00	Open	100.24	0.04	0.04	false	0.28
P-79	900.00	12	125.0	0.00	Open	99.50	0.03	0.04	false	0.28
P-81	840.00	12	125.0	0.00	Open	133.61	0.06	0.07	false	0.38
P-82	1,761.00	12	125.0	0.00	Open	145.15	0.13	0.08	false	0.41
P-83	665.00	12	125.0	0.00	Open	45.29	0.01	0.01	false	0.13
P-84	775.00	12	125.0	0.00	Open	-6.29	0.00	0.00	false	0.02
P-85	139.00	12	125.0	0.00	Open	0.00	0.00	0.00	false	0.00
P-86	130.00	12	125.0	0.00	Open	-0.00	0.00	0.00	false	0.00
P-90	345.00	12	125.0	0.00	Open	0.00	0.00	0.00	false	0.00
P-91	318.00	12	125.0	0.00	Open	0.00	0.00	0.00	false	0.00
P-92	320.00	12	125.0	0.00	Open	-0.00	0.00	0.00	false	0.00
P-93	382.00	12	125.0	0.00	Open	0.00	0.00	0.00	false	0.00
P-94	1,337.00	12	125.0	0.00	Open	-307.07	0.41	0.31	false	0.87
P-95	1,231.00	12	125.0	0.00	Open	-79.41	0.03	0.03	false	0.23
P-96	1,126.00	12	125.0	0.00	Open	-196.61	0.15	0.13	false	0.56
P-97	2,986.00	24	125.0	0.00	Open	-6,444.00	8.77	2.94	false	4.57
P-98	113.00	6	130.0	0.00	Closed	0.00	0.00	0.00	false	0.00
P-99	1,701.00	24	125.0	0.00	Open	-6,444.00	4.99	2.94	false	4.57
P-101	5,665.00	24	125.0	0.00	Open	-8,074.00	25.25	4.46	false	5.73
P-102	224.00	24	125.0	0.00	Open	-8,074.00	1.00	4.46	false	5.73
P-103	1.00	24	125.0	0.00	Open	-8,074.00	0.00	4.46	true	5.73
P-104	3,645.00	16	125.0	0.00	Open	1,630.00	6.05	1.66	false	2.60
P-105	5,402.00	16	125.0	0.00	Open	1,630.00	8.96	1.66	false	2.60
P-106	1,283.00	12	125.0	0.00	Open	-96.20	0.05	0.04	false	0.27

# Scenario: Run 11B-MDD-100%SW(S) + FF@J6, 7, & 8

## Steady State Analysis

### Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-1	9.30	1	Demand	0.00	Fixed	0.00	127.15	51.09
J-3	19.50	Zone-1	Demand	0.00	Fixed	0.00	117.80	42.61
J-4	12.00	Zone-1	Demand	0.00	Fixed	0.00	127.39	50.03
J-5	21.50	Zone-1	Demand	51.58	Fixed	51.58	85.96	27.95
J-6	21.00	Zone-1	Demand	1,500.00	Fixed	1,500.00	71.61	21.94
J-7	21.00	Zone-1	Demand	1,500.00	Fixed	1,500.00	71.90	22.06
J-8	21.00	Zone-1	Demand	1,000.00	Fixed	1,000.00	72.55	22.35
J-9	12.00	Zone-1	Demand	6,444.00	Fixed	6,444.00	88.39	33.12
J-10	13.00	Zone-1	Demand	0.00	Fixed	0.00	97.15	36.48
J-11	13.00	Zone-1	Demand	0.00	Fixed	0.00	102.15	38.65
J-12	13.00	Zone-1	Demand	0.00	Fixed	0.00	127.40	49.59
J-13	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.40	50.03
J-14	13.00	Zone-1	Demand	0.00	Fixed	0.00	96.10	36.03
J-15	13.00	Zone-1	Demand	1,630.00	Fixed	1,630.00	87.14	32.14
J-80	24.00	1	Demand	58.03	Pattern - 1	58.03	114.19	39.10
J-90	26.30	1	Demand	30.25	Pattern - 1	30.25	114.78	38.36
J-100	22.90	1	Demand	27.28	Pattern - 1	27.28	115.19	40.01
J-110	22.50	1	Demand	66.46	Pattern - 1	66.46	115.15	40.17
J-120	21.20	1	Demand	84.81	Pattern - 1	84.81	115.14	40.73
J-130	20.10	1	Demand	96.68	Pattern - 1	96.68	117.12	42.06
J-140	18.60	1	Demand	204.26	Pattern - 1	204.26	117.30	42.79
J-150	21.00	1	Demand	97.21	Pattern - 1	97.21	116.14	41.24
J-160	18.85	1	Demand	45.57	Pattern - 1	45.57	117.80	42.90
J-170	20.42	1	Demand	66.73	Pattern - 1	66.73	117.94	42.28
J-190	20.40	1	Demand	109.15	Pattern - 1	109.15	111.17	39.35
J-200	20.50	1	Demand	48.57	Pattern - 1	48.57	117.19	41.92
J-210	23.60	1	Demand	120.28	Pattern - 1	120.28	114.55	39.43
J-220	24.75	1	Demand	95.23	Pattern - 1	95.23	101.98	33.48
J-230	24.20	1	Demand	52.57	Pattern - 1	52.57	90.75	28.85
J-240	21.00	1	Demand	43.15	Pattern - 1	43.15	86.21	28.27
J-250	24.30	1	Demand	109.61	Pattern - 1	109.61	111.60	37.84
J-260	23.21	1	Demand	75.89	Pattern - 1	75.89	109.39	37.36
J-300	20.30	1	Demand	123.53	Pattern - 1	123.53	118.39	42.53
J-310	15.90	1	Demand	312.93	Pattern - 1	312.93	119.88	45.08
J-320	16.00	1	Demand	189.67	Pattern - 1	189.67	120.05	45.11
J-330	14.90	1	Demand	267.83	Pattern - 1	267.83	120.20	45.65
J-350	16.00	1	Demand	123.74	Pattern - 1	123.74	121.67	45.81
J-360	15.50	1	Demand	229.54	Pattern - 1	229.54	121.65	46.02
J-370	13.60	1	Demand	77.67	Pattern - 1	77.67	122.65	47.28
J-380	11.30	1	Demand	128.44	Pattern - 1	128.44	123.57	48.67
J-400	15.35	1	Demand	96.76	Pattern - 1	96.76	123.77	47.00
J-410	15.27	1	Demand	113.38	Pattern - 1	113.38	123.36	46.86
J-420	24.50	1	Demand	132.68	Pattern - 1	132.68	115.64	39.51
J-430	25.10	1	Demand	124.99	Pattern - 1	124.99	117.35	39.99
J-440	21.30	1	Demand	141.35	Pattern - 1	141.35	119.75	42.68
J-450	18.00	1	Demand	121.02	Pattern - 1	121.02	123.10	45.56
J-460	15.30	1	Demand	0.00	Pattern - 1	0.00	123.22	46.79
J-470	12.09	1	Demand	54.82	Pattern - 1	54.82	123.49	48.30
J-480	10.60	1	Demand	0.00	Pattern - 1	0.00	123.49	48.94
J-490	14.80	1	Demand	19.52	Pattern - 1	19.52	123.53	47.13
J-500	11.10	1	Demand	81.98	Pattern - 1	81.98	123.56	48.75
J-510	10.50	1	Demand	91.09	Pattern - 1	91.09	124.03	49.22

Project Engineer: Mark Smith

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# Scenario: Run 11B-MDD-100%SW(S) + FF@J6, 7, & 8

## Steady State Analysis

### Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-520	10.80	1	Demand	120.02	Pattern - 1	120.02	123.69	48.94
J-530	11.00	1	Demand	35.19	Pattern - 1	35.19	124.07	49.02
J-540	10.82	1	Demand	27.37	Pattern - 1	27.37	124.91	49.46
J-550	11.60	1	Demand	55.91	Pattern - 1	55.91	124.86	49.10
J-560	11.30	1	Demand	60.60	Pattern - 1	60.60	125.53	49.52
J-570	9.70	1	Demand	45.74	Pattern - 1	45.74	126.11	50.46
J-580	14.00	1	Demand	84.88	Pattern - 1	84.88	124.03	47.70
J-590	10.60	1	Demand	141.52	Pattern - 1	141.52	125.54	49.83
J-600	13.00	1	Demand	102.17	Pattern - 1	102.17	125.75	48.88
J-610	15.30	1	Demand	141.60	Pattern - 1	141.60	126.19	48.07
J-620	15.50	1	Demand	26.54	Pattern - 1	26.53	124.67	47.33
J-650	13.90	1	Demand	223.47	Pattern - 1	223.47	121.55	46.67
J-670	21.50	1	Demand	102.41	Pattern - 1	102.41	117.62	41.67
J-680	13.40	1	Demand	30.50	Pattern - 1	30.50	123.48	47.72
J-690	11.25	1	Demand	124.42	Pattern - 1	124.42	123.56	48.69
J-700	18.50	1	Demand	156.26	Pattern - 1	156.26	118.13	43.19
J-720	18.70	1	Demand	179.91	Pattern - 1	179.91	118.68	43.35
J-730	19.31	1	Demand	34.84	Pattern - 1	34.84	118.98	43.21
J-740	13.80	1	Demand	159.87	Pattern - 1	159.87	122.48	47.11
J-750	11.55	1	Demand	101.43	Pattern - 1	101.43	122.96	48.30
J-760	9.70	1	Demand	34.79	Pattern - 1	34.79	125.47	50.19
J-770	15.00	1	Demand	89.92	Pattern - 1	89.92	123.68	47.12
J-780	11.20	1	Demand	66.07	Pattern - 1	66.07	124.58	49.15
J-800	18.80	1	Demand	36.32	Pattern - 1	36.32	117.83	42.93
J-810	21.47	1	Demand	83.62	Pattern - 1	83.62	116.61	41.24
J-820	20.20	1	Demand	159.21	Pattern - 1	159.21	114.39	40.83
J-830	17.95	1	Demand	105.17	Pattern - 1	105.17	122.52	45.33

## Steady State Analysis

## Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-1510	851.00	12	125.0	0.00	Open	112.61	0.04	0.05	false	0.32
P-1520	800.00	12	125.0	0.00	Open	601.06	0.85	1.06	false	1.71
P-1550	449.00	30	125.0	0.00	Open	-7,817.91	0.64	1.42	false	3.55
P-1540	395.00	30	125.0	0.00	Open	-7,783.11	0.55	1.40	false	3.53
P-1410	1,217.00	12	125.0	0.00	Open	271.29	0.30	0.24	false	0.77
P-1270	257.00	24	125.0	0.00	Open	-1,095.69	0.03	0.11	false	0.78
P-1120	447.00	12	125.0	0.00	Open	-350.04	0.17	0.39	false	0.99
P-1110	1,139.00	12	125.0	0.00	Open	-522.46	0.93	0.82	false	1.48
P-1140	1,540.00	12	125.0	0.00	Open	-321.12	0.51	0.33	false	0.91
P-1060	1,125.00	12	125.0	0.00	Open	409.22	0.59	0.52	false	1.16
P-1050	1,053.00	30	125.0	0.00	Open	-4,721.74	0.59	0.56	false	2.14
P-960	746.00	12	125.0	0.00	Open	180.47	0.09	0.11	false	0.51
P-970	897.00	12	125.0	0.00	Open	-21.04	0.00	0.00	false	0.06
P-950	402.00	12	125.0	0.00	Open	-96.09	0.01	0.04	false	0.27
P-940	817.00	12	125.0	0.00	Open	75.06	0.02	0.02	false	0.21
P-590	1,013.00	12	125.0	0.00	Open	96.09	0.04	0.04	false	0.27
P-600	659.00	12	125.0	0.00	Open	115.61	0.03	0.05	false	0.33
P-630	1,187.00	12	125.0	0.00	Open	296.57	0.34	0.29	false	0.84
P-750	931.00	12	125.0	0.00	Open	43.13	0.01	0.01	false	0.12
P-760	1,759.00	12	125.0	0.00	Open	184.65	0.21	0.12	false	0.52
P-780	1,638.00	12	125.0	0.00	Open	286.82	0.44	0.27	false	0.81
P-790	1,293.00	12	125.0	0.00	Open	-636.22	1.53	1.18	false	1.80
P-800	1,439.00	12	125.0	0.00	Open	-609.68	1.57	1.09	false	1.73
P-740	709.00	12	125.0	0.00	Open	519.20	0.57	0.81	false	1.47
P-640	597.00	12	125.0	0.00	Open	126.38	0.04	0.06	false	0.36
P-680	726.00	12	125.0	0.00	Open	141.39	0.05	0.07	false	0.40
P-420	996.00	12	125.0	0.00	Open	-187.97	0.12	0.12	false	0.53
P-390	2,320.00	12	125.0	0.00	Open	-486.96	1.67	0.72	false	1.38
P-510	1,511.00	12	125.0	0.00	Open	746.32	2.40	1.59	false	2.12
P-520	1,532.00	12	125.0	0.00	Open	-887.68	3.35	2.19	false	2.52
P-430	1,150.00	12	125.0	0.00	Open	-66.45	0.02	0.02	false	0.19
P-230	1,475.00	12	125.0	0.00	Open	1,741.39	11.23	7.61	false	4.94
P-220	1,496.00	12	125.0	0.00	Open	1,836.62	12.57	8.40	false	5.21
P-200	753.00	12	125.0	0.00	Open	578.91	0.75	0.99	false	1.64
P-87	1,673.00	12	125.0	0.00	Open	2,405.91	23.18	13.85	false	6.83
P-70	1,321.00	12	125.0	0.00	Open	-376.01	0.59	0.45	false	1.07
P-110	870.00	12	125.0	0.00	Open	-610.71	0.95	1.09	false	1.73
P-80	808.00	12	125.0	0.00	Open	-406.26	0.42	0.51	false	1.15
P-250	1,092.00	12	125.0	0.00	Open	-928.68	2.60	2.38	false	2.63
P-3	527.00	30	125.0	0.00	Open	-9,379.36	1.05	1.98	false	4.26
P-4	1,274.00	16	125.0	0.00	Open	-1,064.64	0.96	0.75	false	1.70
P-8	1,129.00	16	125.0	0.00	Open	-457.14	0.18	0.16	false	0.73
P-9	685.00	12	125.0	0.00	Open	65.18	0.01	0.02	false	0.18
P-10	634.00	12	125.0	0.00	Open	131.64	0.04	0.06	false	0.37
P-11	2,034.00	12	125.0	0.00	Open	-565.19	1.93	0.95	false	1.60
P-12	860.00	12	125.0	0.00	Open	-630.34	1.00	1.16	false	1.79
P-13	767.00	12	125.0	0.00	Open	-727.55	1.16	1.51	false	2.06
P-14	1,007.00	16	125.0	0.00	Open	849.58	0.50	0.50	false	1.36
P-15	898.00	12	125.0	0.00	Open	-392.16	0.43	0.48	false	1.11
P-16	1,041.00	12	125.0	0.00	Open	494.57	0.77	0.74	false	1.40
P-17	1,922.00	12	125.0	0.00	Open	368.78	0.83	0.43	false	1.05

## Steady State Analysis

## Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-18	676.00	12	125.0	0.00	Open	-525.03	0.56	0.83	false	1.49
P-19	1,174.00	12	125.0	0.00	Open	819.07	2.21	1.88	false	2.32
P-20	1,680.00	12	125.0	0.00	Open	743.45	2.64	1.57	false	2.11
P-490	1,505.00	12	125.0	0.00	Open	-488.66	1.09	0.72	false	1.39
P-500	1,520.00	12	125.0	0.00	Open	621.34	1.72	1.13	false	1.76
P-21	2,057.00	12	125.0	0.00	Open	-433.65	1.19	0.58	false	1.23
P-22	900.00	12	125.0	0.00	Open	-841.12	1.78	1.98	false	2.39
P-23	940.00	12	125.0	0.00	Open	821.60	1.78	1.89	false	2.33
P-24	1,437.00	12	125.0	0.00	Open	-900.62	3.23	2.25	false	2.55
P-25	1,528.00	12	125.0	0.00	Open	-871.25	3.23	2.11	false	2.47
P-26	463.00	12	125.0	0.00	Open	1,029.34	1.33	2.88	false	2.92
P-28	825.00	12	125.0	0.00	Open	991.67	2.21	2.68	false	2.81
P-29	912.00	12	125.0	0.00	Open	939.42	2.21	2.43	false	2.66
P-30	935.00	24	125.0	0.00	Open	-1,132.01	0.11	0.12	false	0.80
P-31	502.00	12	125.0	0.00	Open	985.36	1.33	2.65	false	2.80
P-32	1,044.00	30	125.0	0.00	Open	-4,146.45	0.46	0.44	false	1.88
P-33	1,076.00	12	125.0	0.00	Open	-366.41	0.46	0.42	false	1.04
P-34	1,740.00	30	125.0	0.00	Open	4,987.31	1.07	0.62	false	2.26
P-35	1,727.00	12	125.0	0.00	Open	-449.78	1.07	0.62	false	1.28
P-36	2,395.00	30	125.0	0.00	Open	-5,239.01	1.62	0.67	false	2.38
P-37	2,406.00	12	125.0	0.00	Open	469.40	1.62	0.67	false	1.33
P-38	1,120.00	30	125.0	0.00	Open	-5,584.71	0.85	0.76	false	2.53
P-39	1,119.00	12	125.0	0.00	Open	-501.85	0.85	0.76	false	1.42
P-40	1,551.00	30	125.0	0.00	Open	-5,779.36	1.26	0.81	false	2.62
P-41	1,519.00	12	125.0	0.00	Open	524.97	1.26	0.83	false	1.49
P-42	1,335.00	30	125.0	0.00	Open	5,951.42	1.14	0.85	false	2.70
P-43	1,367.00	12	125.0	0.00	Open	-527.75	1.14	0.83	false	1.50
P-44	779.00	12	125.0	0.00	Open	259.63	0.17	0.22	false	0.74
P-45	1,370.00	12	125.0	0.00	Open	-177.98	0.15	0.11	false	0.50
P-46	2,363.00	12	125.0	0.00	Open	-445.81	1.44	0.61	false	1.26
P-47	1,575.00	12	125.0	0.00	Open	608.91	1.71	1.09	false	1.73
P-48	2,947.00	12	125.0	0.00	Open	219.69	0.49	0.16	false	0.62
P-49	1,627.00	12	125.0	0.00	Open	-427.71	0.92	0.57	false	1.21
P-50	989.00	12	125.0	0.00	Open	246.54	0.20	0.20	false	0.70
P-55	829.00	12	125.0	0.00	Open	-439.49	0.49	0.59	false	1.25
P-56	1,373.00	12	125.0	0.00	Open	325.93	0.47	0.34	false	0.92
P-57	818.00	12	125.0	0.00	Open	-587.22	0.83	1.02	false	1.67
P-58	881.00	12	125.0	0.00	Open	-501.73	0.67	0.76	false	1.42
P-59	1,189.00	12	125.0	0.00	Open	176.55	0.13	0.11	false	0.50
P-60	1,264.00	12	125.0	0.00	Open	-129.88	0.08	0.06	false	0.37
P-61	1,571.00	12	125.0	0.00	Open	-430.38	0.90	0.57	false	1.22
P-62	1,256.00	12	125.0	0.00	Open	-415.18	0.67	0.54	false	1.18
P-63	726.00	12	125.0	0.00	Open	-500.06	0.55	0.76	false	1.42
P-64	563.00	12	125.0	0.00	Open	-996.51	1.52	2.71	false	2.83
P-65	1,029.00	12	125.0	0.00	Open	198.02	0.14	0.14	false	0.56
P-67	900.00	12	125.0	0.00	Open	199.51	0.12	0.14	false	0.57
P-69	773.00	12	125.0	0.00	Open	184.22	0.09	0.12	false	0.52
P-72	823.00	12	125.0	0.00	Open	350.48	0.32	0.39	false	0.99
P-68	100.00	24	125.0	0.00	Open	0.00	0.00	0.00	true	0.00
P-71	1.00	24	125.0	0.00	Closed	0.00	0.00	0.00	true	0.00
P-74	100.00	30	125.0	0.00	Open	-10,444.00	0.24	2.42	true	4.74

## Steady State Analysis

## Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-75	3.00	30	125.0	0.00	Open	-10,444.00	0.01	2.42	true	4.74
P-76	795.00	12	125.0	0.00	Open	181.45	0.09	0.12	false	0.51
P-77	801.00	12	125.0	0.00	Open	355.64	0.32	0.40	false	1.01
P-78	1,001.00	12	125.0	0.00	Open	200.99	0.14	0.14	false	0.57
P-79	900.00	12	125.0	0.00	Open	199.51	0.12	0.14	false	0.57
P-81	840.00	12	125.0	0.00	Open	545.73	0.75	0.89	false	1.55
P-82	1,761.00	12	125.0	0.00	Open	724.79	2.64	1.50	false	2.06
P-83	665.00	12	125.0	0.00	Open	1,688.82	4.78	7.19	false	4.79
P-84	775.00	12	125.0	0.00	Open	-311.68	0.24	0.31	false	0.88
P-85	139.00	12	125.0	0.00	Open	2,051.08	1.43	10.31	false	5.82
P-86	130.00	12	125.0	0.00	Open	1,948.92	1.22	9.38	false	5.53
P-90	345.00	12	125.0	0.00	Open	2,051.08	3.56	10.31	false	5.82
P-91	318.00	12	125.0	0.00	Open	551.08	0.29	0.90	false	1.56
P-92	320.00	12	125.0	0.00	Open	1,948.92	3.00	9.38	false	5.53
P-93	382.00	12	125.0	0.00	Open	-948.92	0.94	2.47	false	2.69
P-94	1,337.00	12	125.0	0.00	Open	-534.12	1.14	0.85	false	1.52
P-95	1,231.00	12	125.0	0.00	Open	-204.72	0.18	0.14	false	0.58
P-96	1,126.00	12	125.0	0.00	Open	-375.32	0.50	0.44	false	1.06
P-97	2,986.00	24	125.0	0.00	Open	-6,444.00	8.77	2.94	false	4.57
P-98	113.00	6	130.0	0.00	Closed	0.00	0.00	0.00	false	0.00
P-99	1,701.00	24	125.0	0.00	Open	-6,444.00	4.99	2.94	false	4.57
P-101	5,665.00	24	125.0	0.00	Open	-8,074.00	25.25	4.46	false	5.73
P-102	224.00	24	125.0	0.00	Open	-8,074.00	1.00	4.46	false	5.73
P-103	1.00	24	125.0	0.00	Open	-8,074.00	0.00	4.46	true	5.73
P-104	3,645.00	16	125.0	0.00	Open	1,630.00	6.05	1.66	false	2.60
P-105	5,402.00	16	125.0	0.00	Open	1,630.00	8.96	1.66	false	2.60
P-106	1,283.00	12	125.0	0.00	Open	-174.78	0.14	0.11	false	0.50

**Scenario: Run 11C-MDD-100%SW(S) - Multi FF Runs**

**Fire Flow Analysis**

**Fire Flow Report**

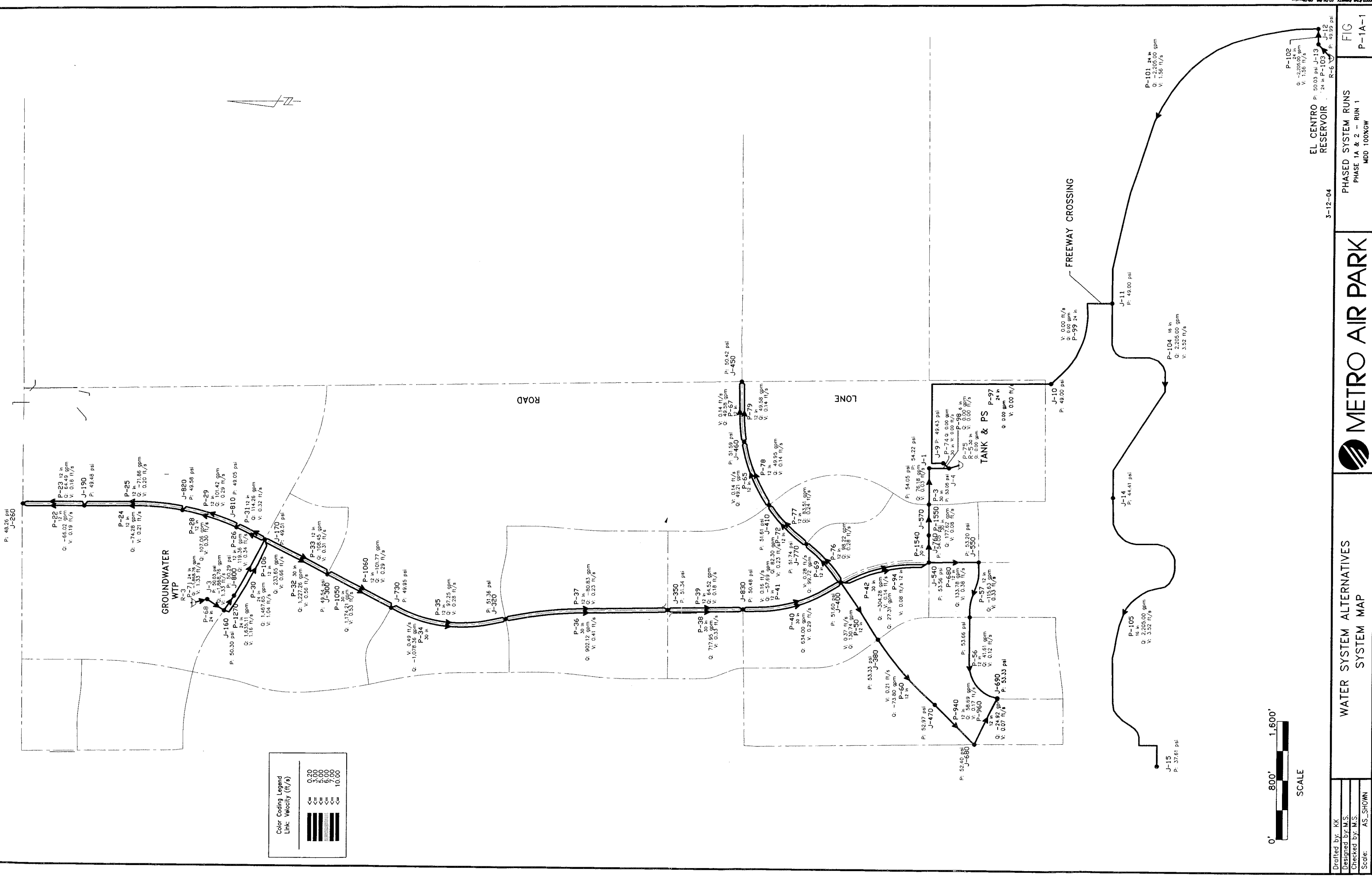
Label	Fire Flow Balanced?	Satisfies Fire Flow Constraints?	Needed Fire Flow (gpm)	Available Fire Flow (gpm)	Total Flow Needed (gpm)	Total Flow Available (gpm)	Calculated Residual Pressure (psi)	Calculated Minimum System Pressure (psi)	Minimum System Junction
J-1	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-3	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-4	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-5	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-6	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-7	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-8	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-9	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-10	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-11	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-12	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-13	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-14	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-15	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-80	true	true	4,000.00	4,000.00	4,058.03	4,058.03	32.69	32.14	J-15
J-90	true	true	4,000.00	4,000.00	4,030.26	4,030.26	28.77	32.14	J-15
J-100	true	false	4,000.00	4,000.00	4,027.28	4,027.28	33.02	32.14	J-15
J-110	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-120	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-130	true	true	4,000.00	4,000.00	4,096.68	4,096.68	38.95	32.14	J-15
J-140	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-150	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-160	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-170	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-190	true	false	4,000.00	4,000.00	4,109.15	4,109.15	36.63	32.14	J-15
J-200	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-210	true	true	4,000.00	4,000.00	4,120.28	4,120.28	36.29	32.14	J-15
J-220	true	true	4,000.00	4,000.00	4,095.23	4,095.23	26.81	30.52	J-230
J-230	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-240	true	true	4,000.00	4,000.00	4,043.15	4,043.15	27.44	26.36	GPV-1
J-250	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-260	true	false	4,000.00	4,000.00	4,075.89	4,075.89	34.99	32.14	J-15
J-300	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-310	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-320	true	false	4,000.00	4,000.00	4,189.67	4,189.67	44.99	32.14	J-15
J-330	true	false	4,000.00	4,000.00	4,267.83	4,267.83	36.98	32.14	J-15
J-350	true	false	4,000.00	4,000.00	4,123.74	4,123.74	45.72	32.14	J-15
J-360	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-370	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-380	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-400	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-410	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-420	true	true	4,000.00	4,000.00	4,132.68	4,132.68	27.60	31.40	J-430
J-430	true	false	4,000.00	4,000.00	4,124.99	4,124.99	25.26	31.92	J-420
J-440	true	true	4,000.00	4,000.00	4,141.36	4,141.36	29.93	31.55	J-430
J-450	true	false	4,000.00	4,000.00	4,121.02	4,121.02	41.55	32.14	J-15
J-460	true	true	4,000.00	4,000.00	4,000.00	4,000.00	43.60	32.14	J-15
J-470	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-480	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-490	true	false	4,000.00	4,000.00	4,019.52	4,019.52	37.96	32.14	J-15

# Scenario: Run 11C-MDD-100%SW(S) - Multi FF Runs

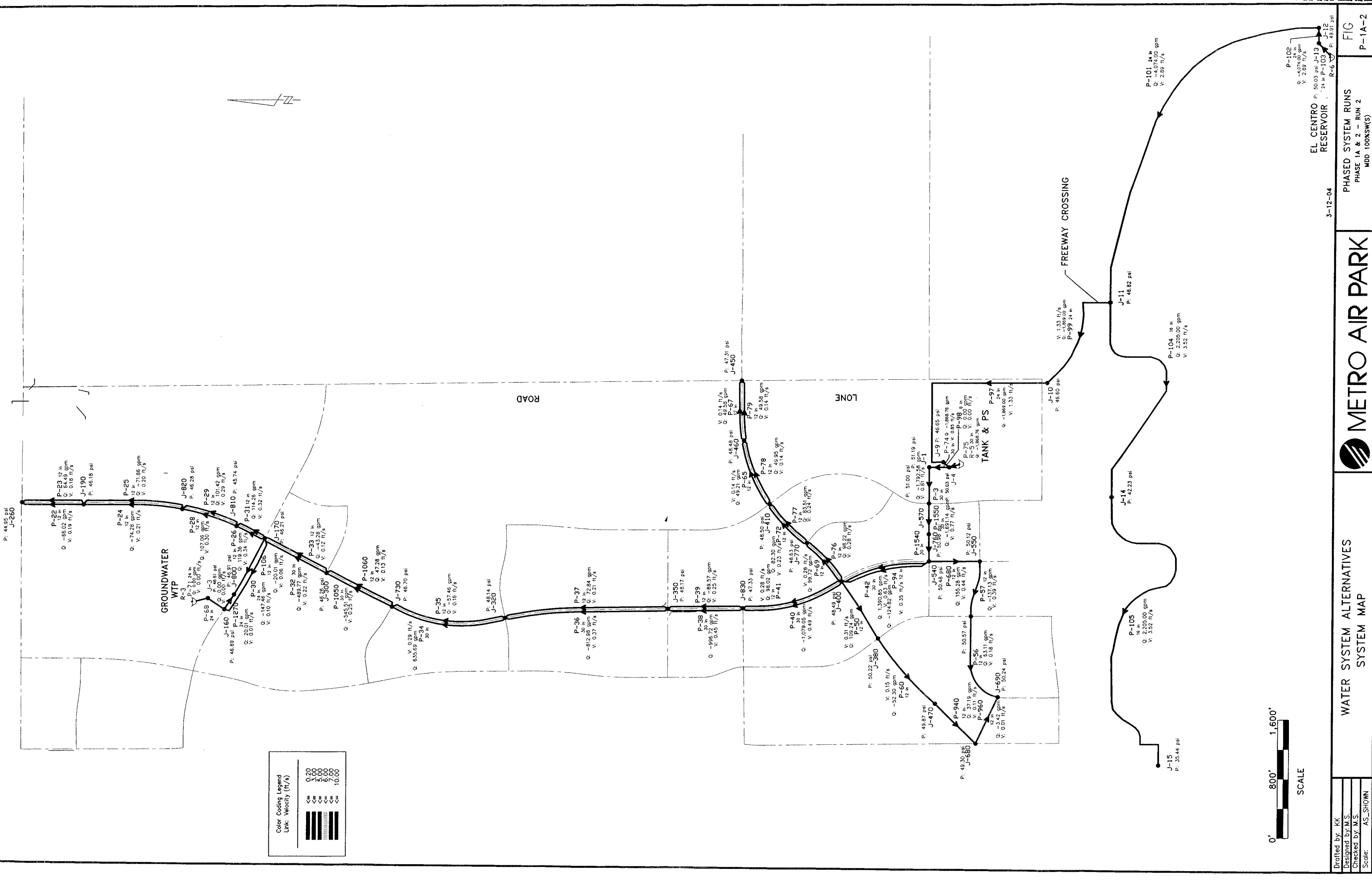
## Fire Flow Analysis

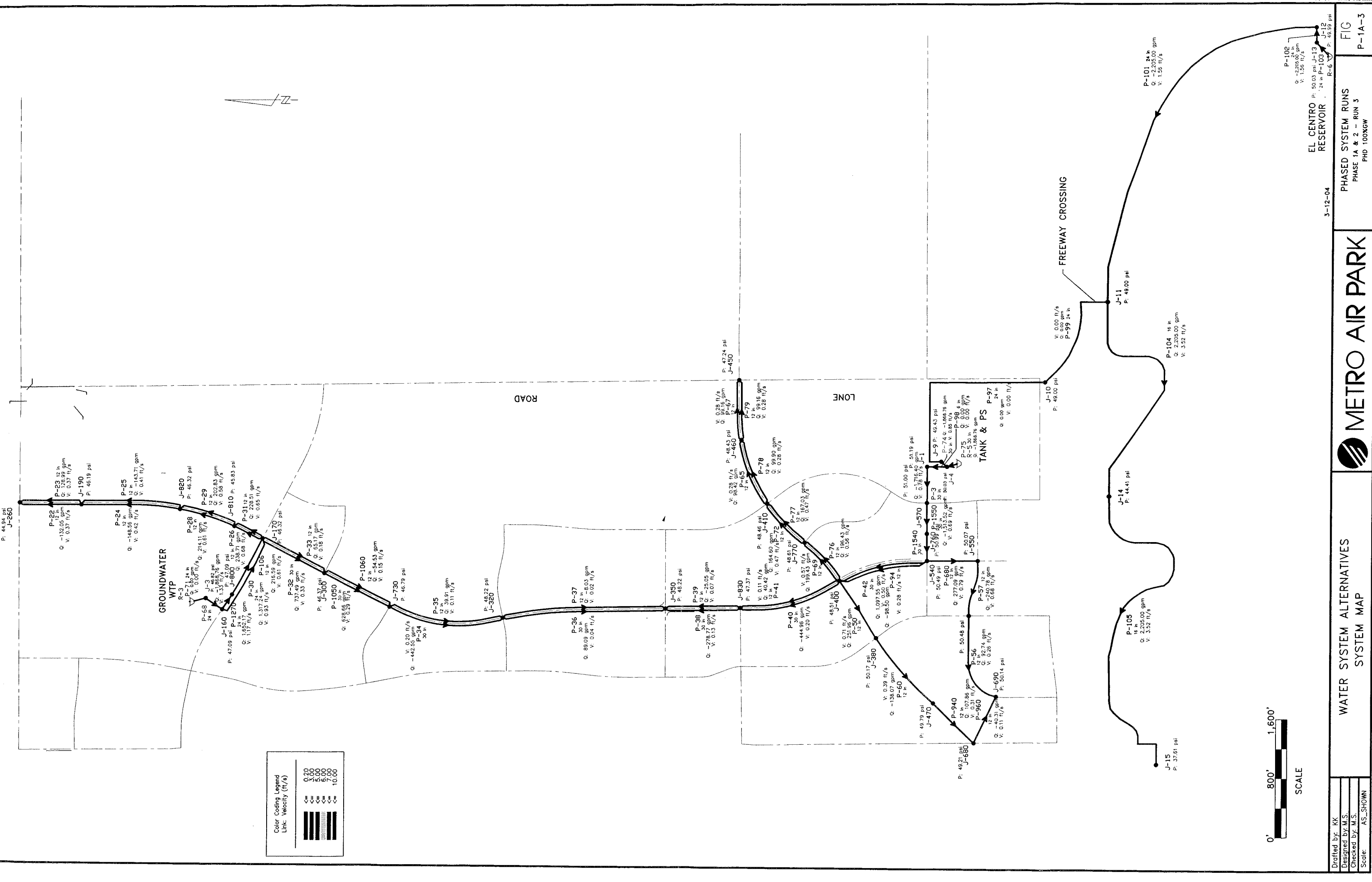
### Fire Flow Report

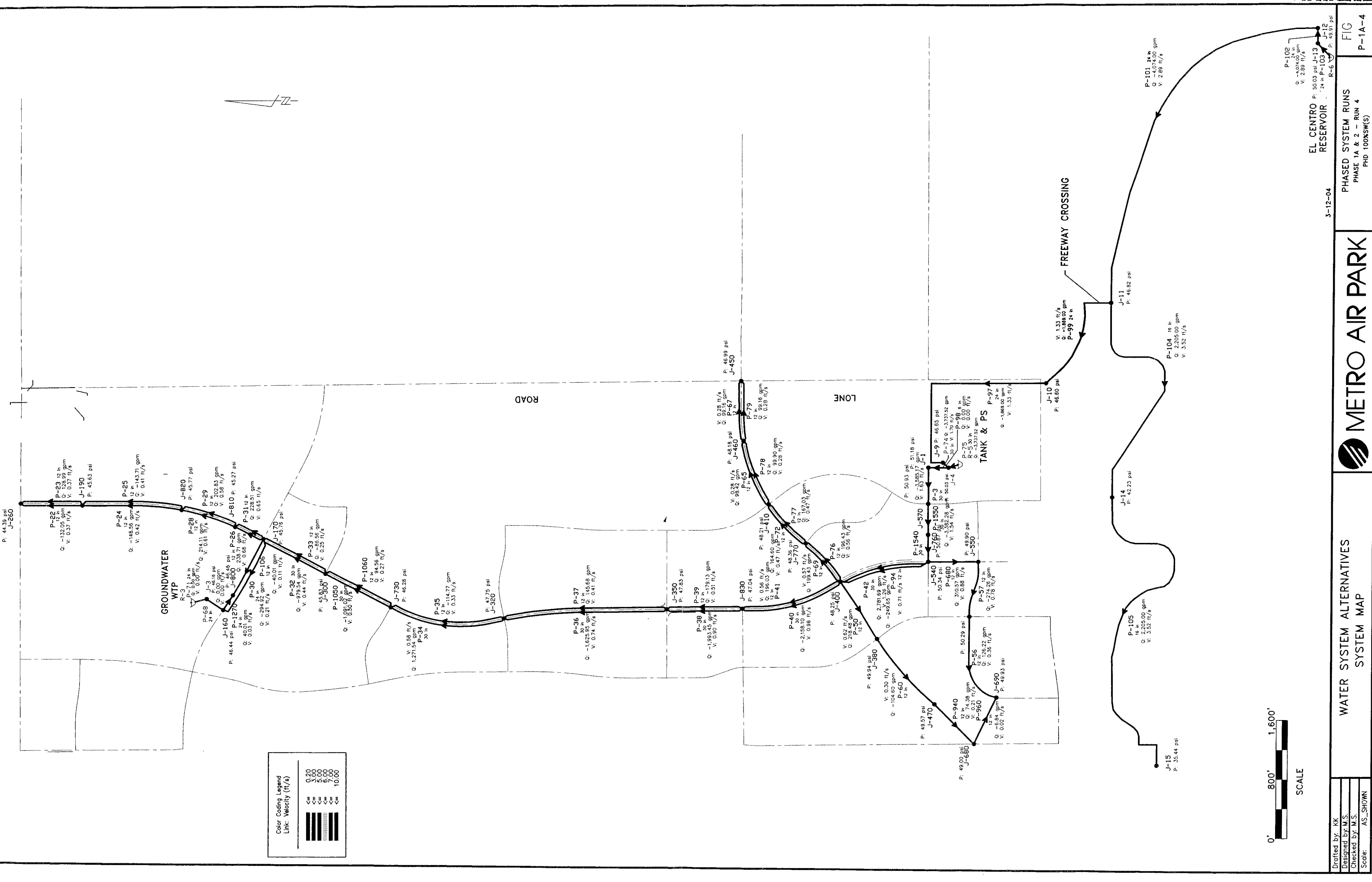
Label	Fire Flow Balanced?	Satisfies Fire Flow Constraints?	Needed Fire Flow (gpm)	Available Fire Flow (gpm)	Total Flow Needed (gpm)	Total Flow Available (gpm)	Calculated Residual Pressure (psi)	Calculated Minimum System Pressure (psi)	Minimum System Junction
J-500	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-510	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-520	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-530	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-540	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-550	true	false	4,000.00	4,000.00	4,055.91	4,055.91	46.84	32.14	J-15
J-560	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-570	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-580	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-590	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-600	true	true	4,000.00	4,000.00	4,102.17	4,102.17	38.37	32.14	J-15
J-610	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-620	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-650	true	false	4,000.00	4,000.00	4,223.47	4,223.47	43.41	32.14	J-15
J-670	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-680	true	false	4,000.00	4,000.00	4,030.50	4,030.50	42.49	32.14	J-15
J-690	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-700	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-720	true	true	4,000.00	4,000.00	4,179.91	4,179.91	39.04	32.14	J-15
J-730	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-740	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-750	true	true	4,000.00	4,000.00	4,101.43	4,101.43	36.83	32.14	J-15
J-760	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-770	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-780	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-800	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-810	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-820	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-830	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A

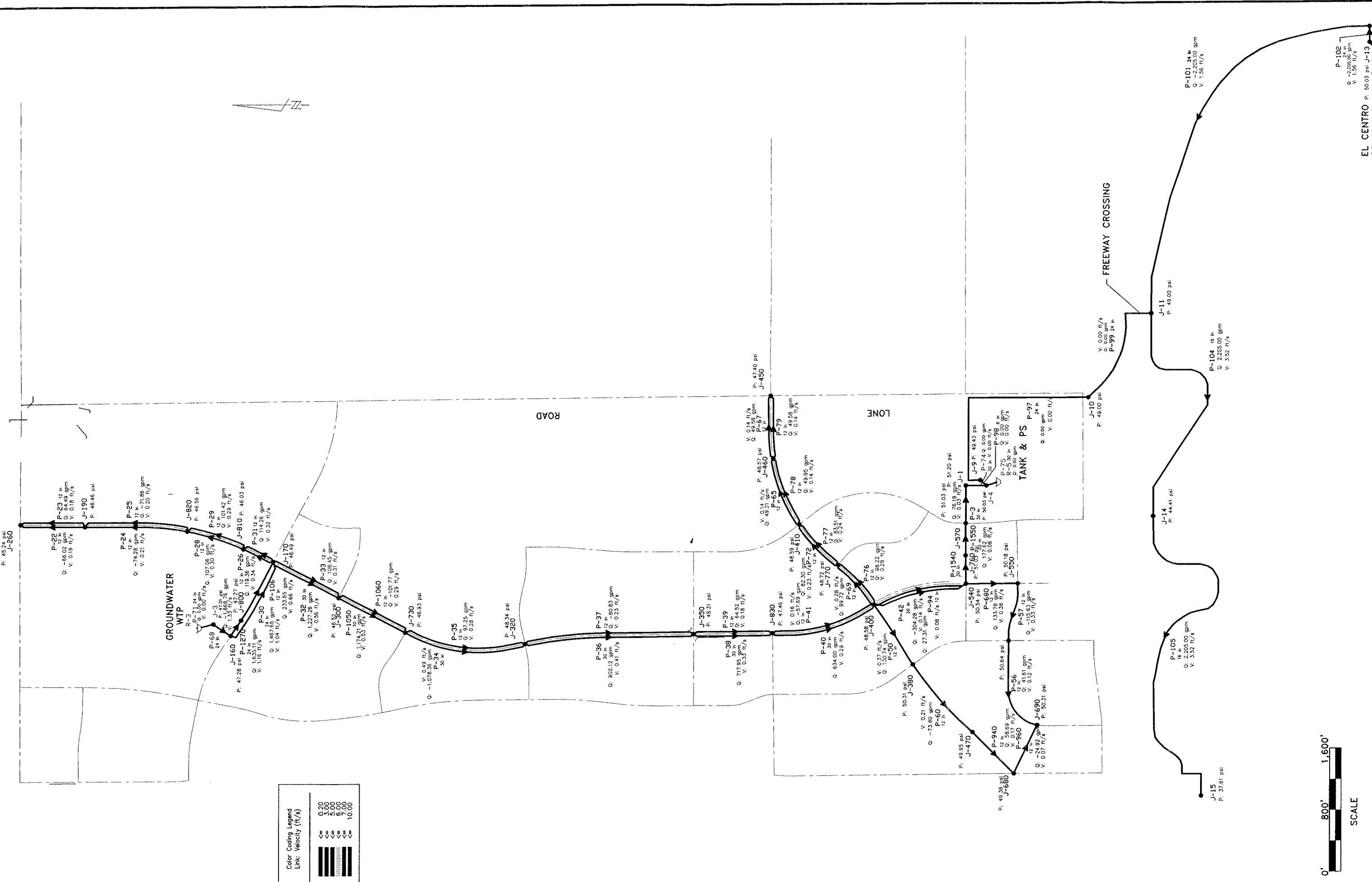


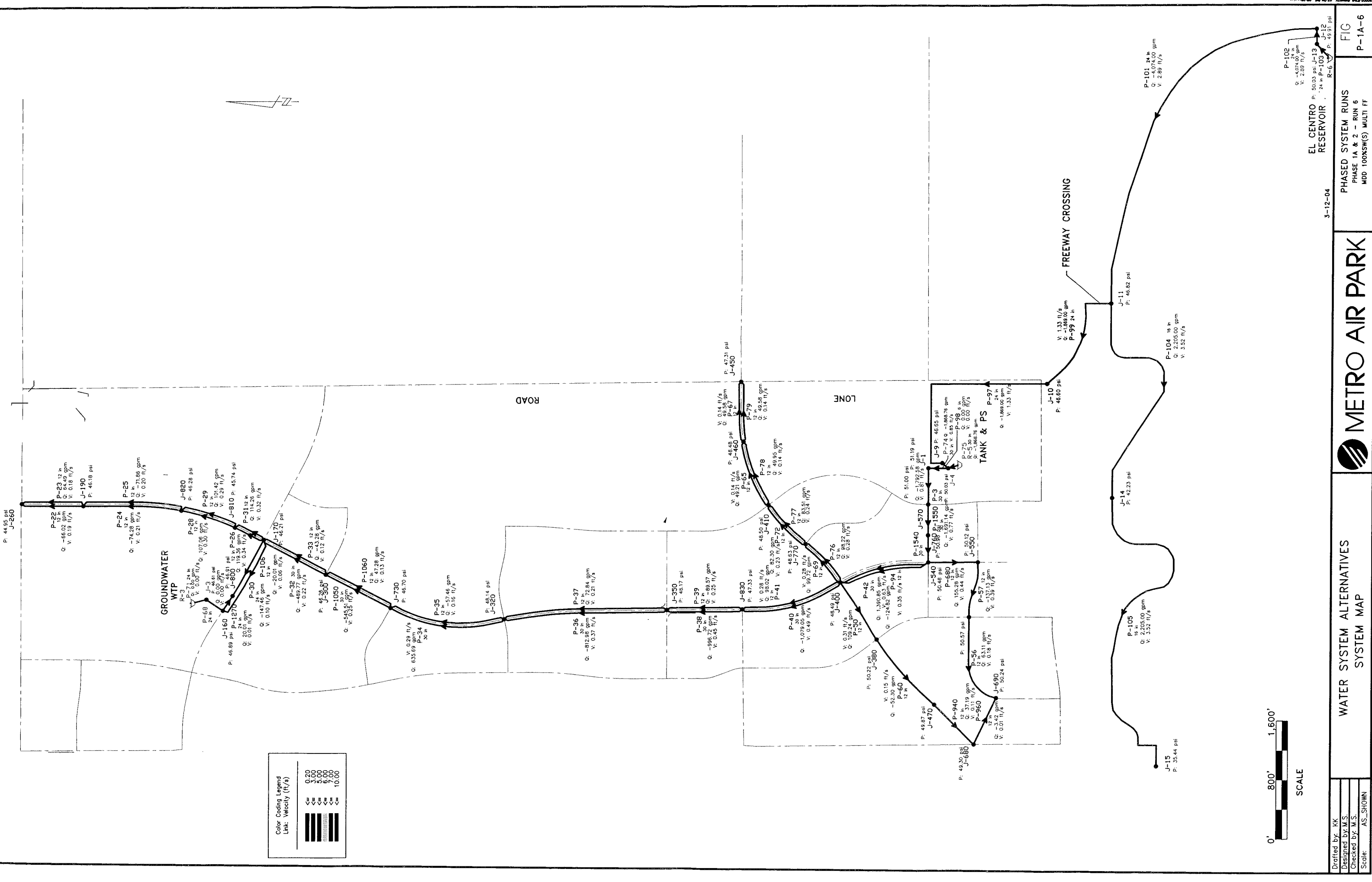


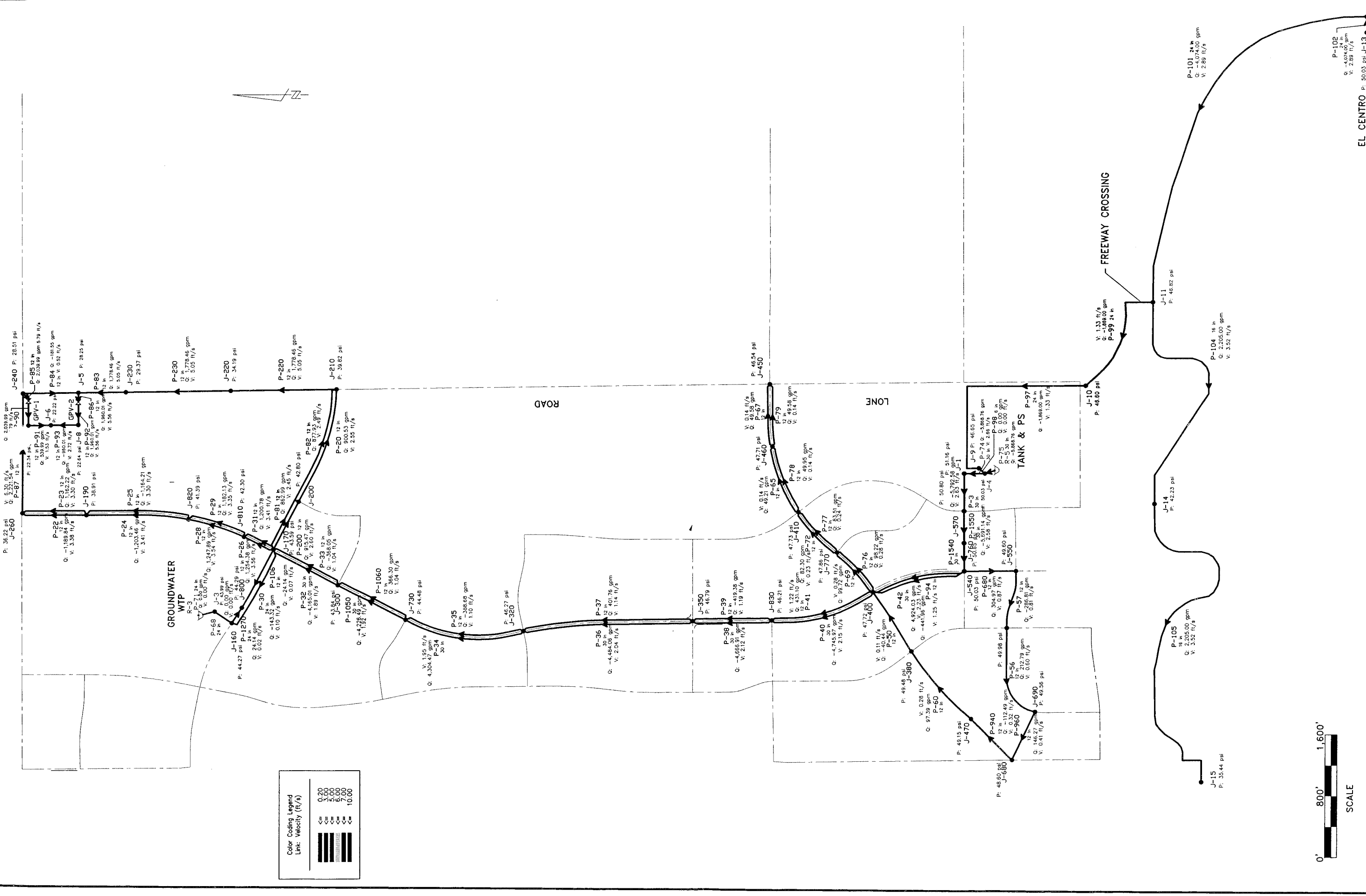


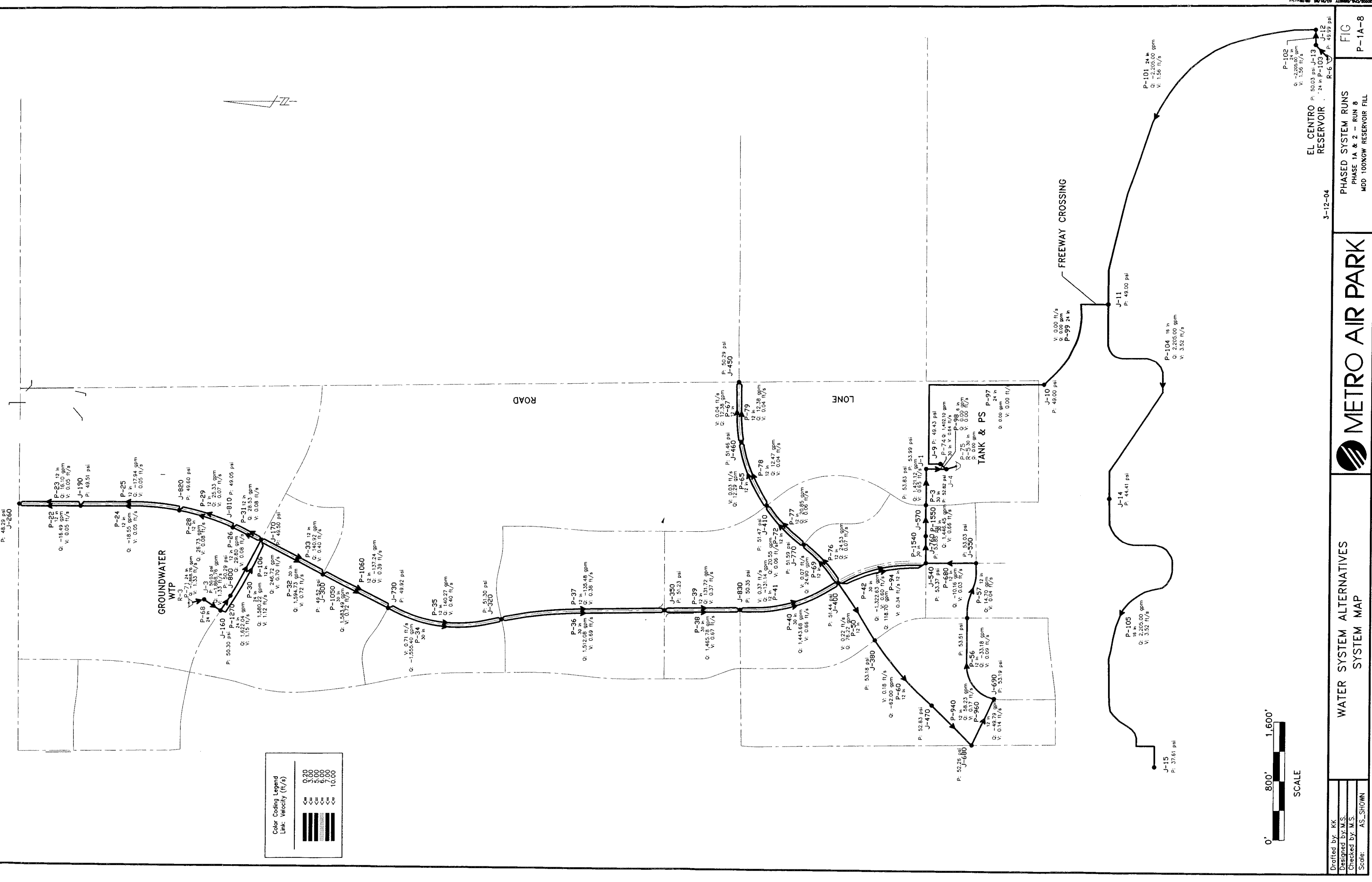












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Checked by: M.S.  
Scale: AS SHOWN

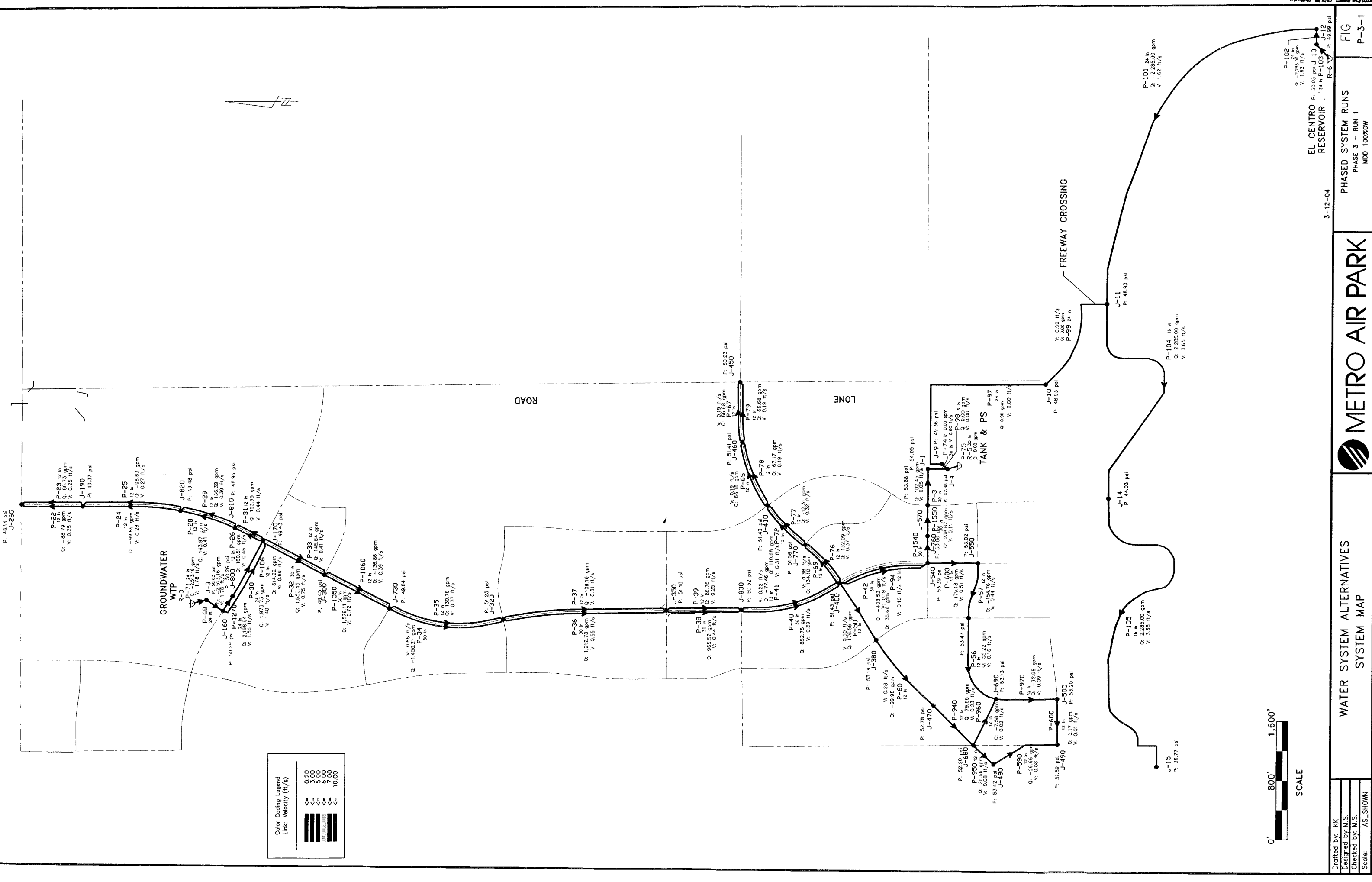
WATER SYSTEM ALTERNATIVES  
SYSTEM MAP

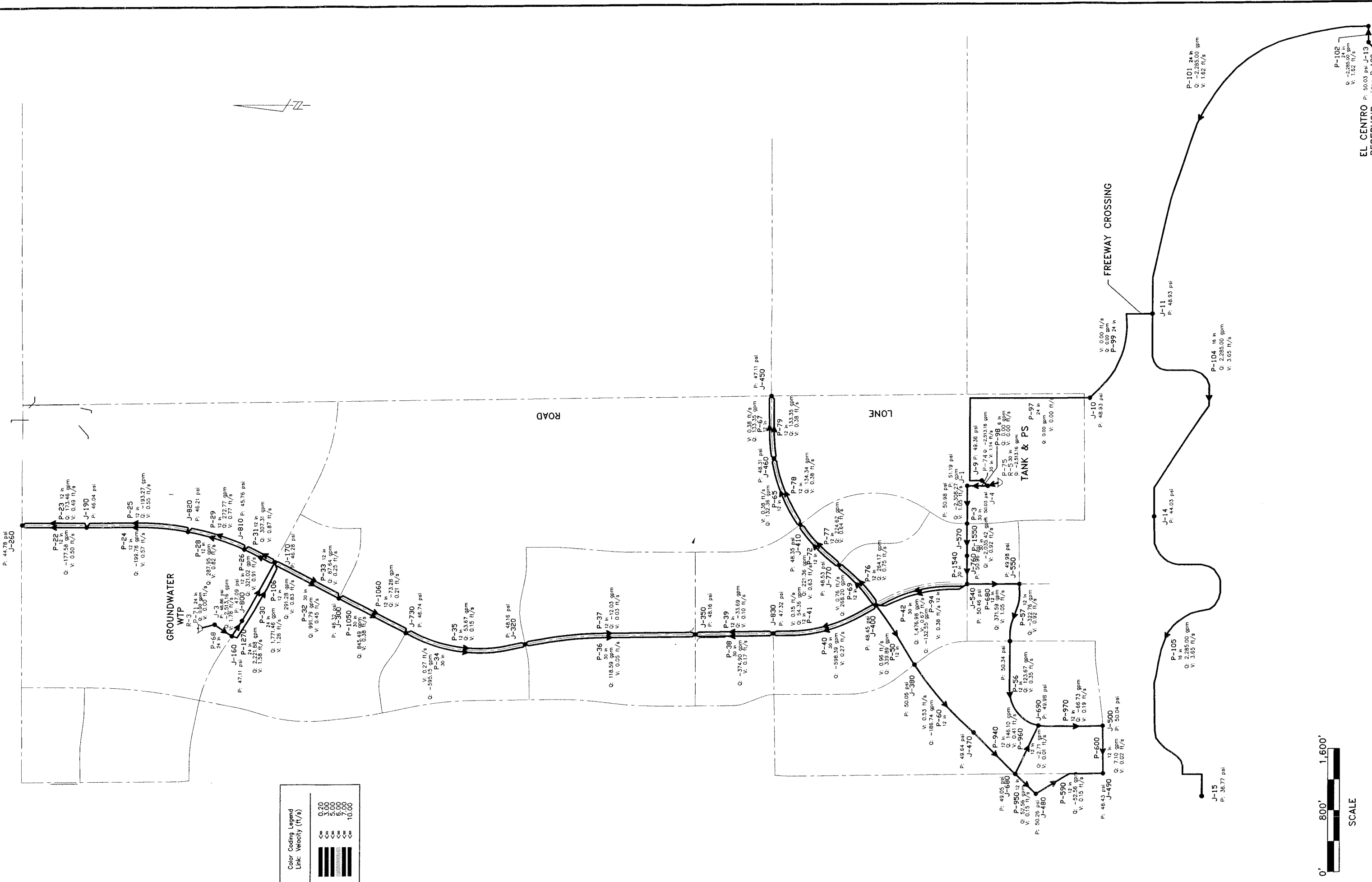


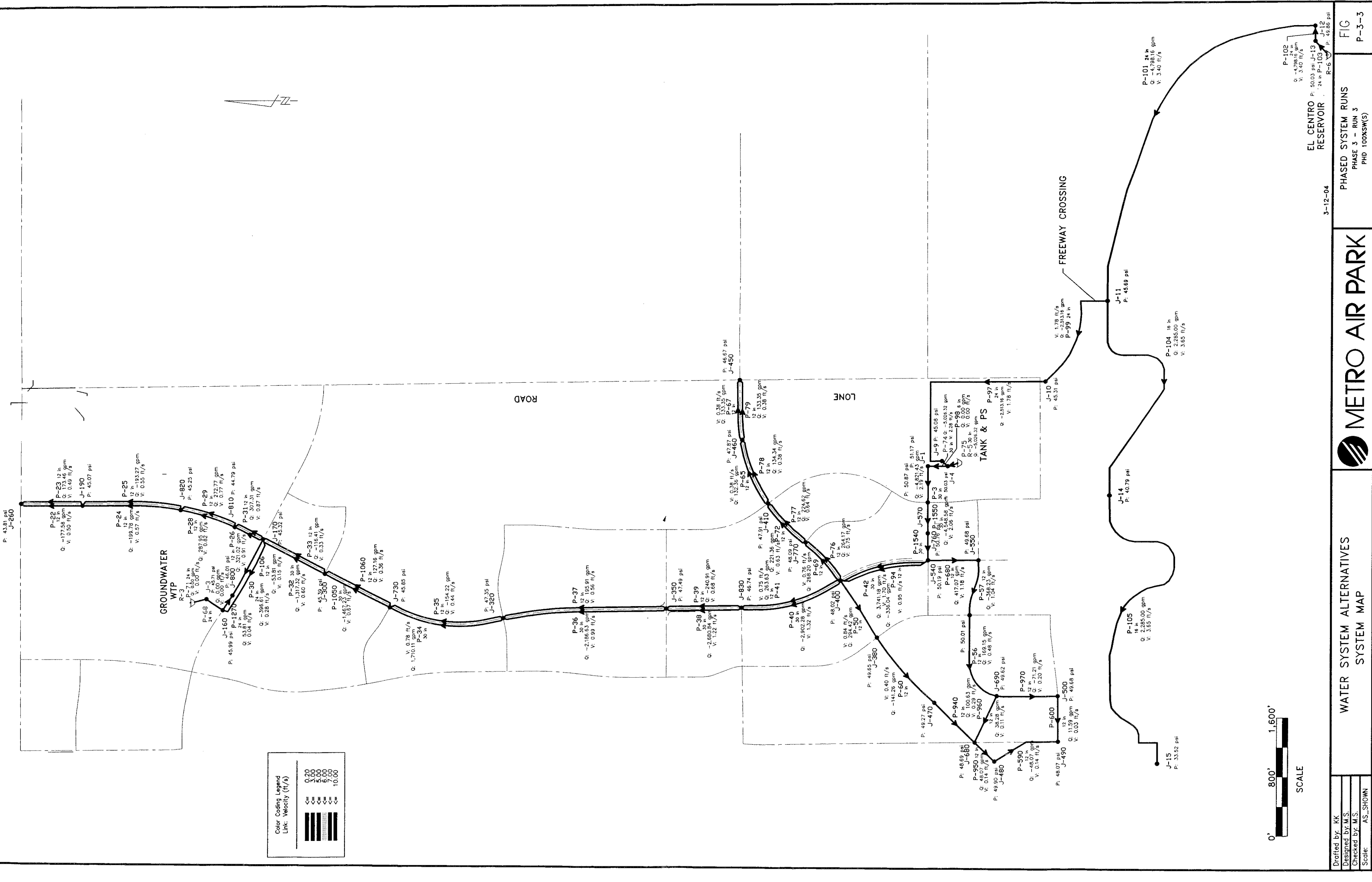
PHASED SYSTEM RUNS  
PHASE 1A & 2 - RUN 8  
MOD 100%W RESERVOIR FILL

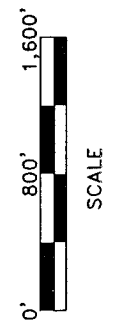
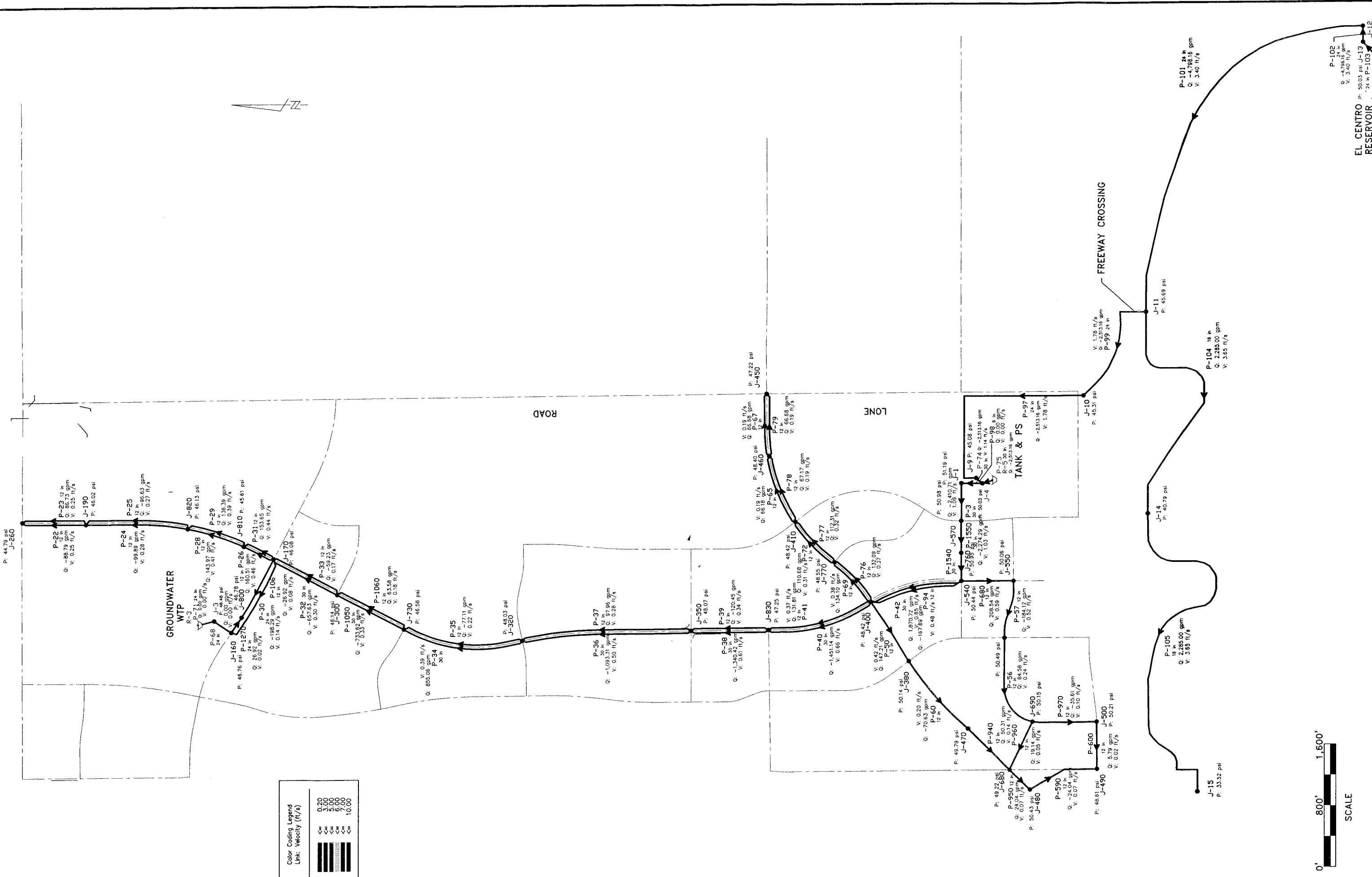
FIG  
P-1A-8

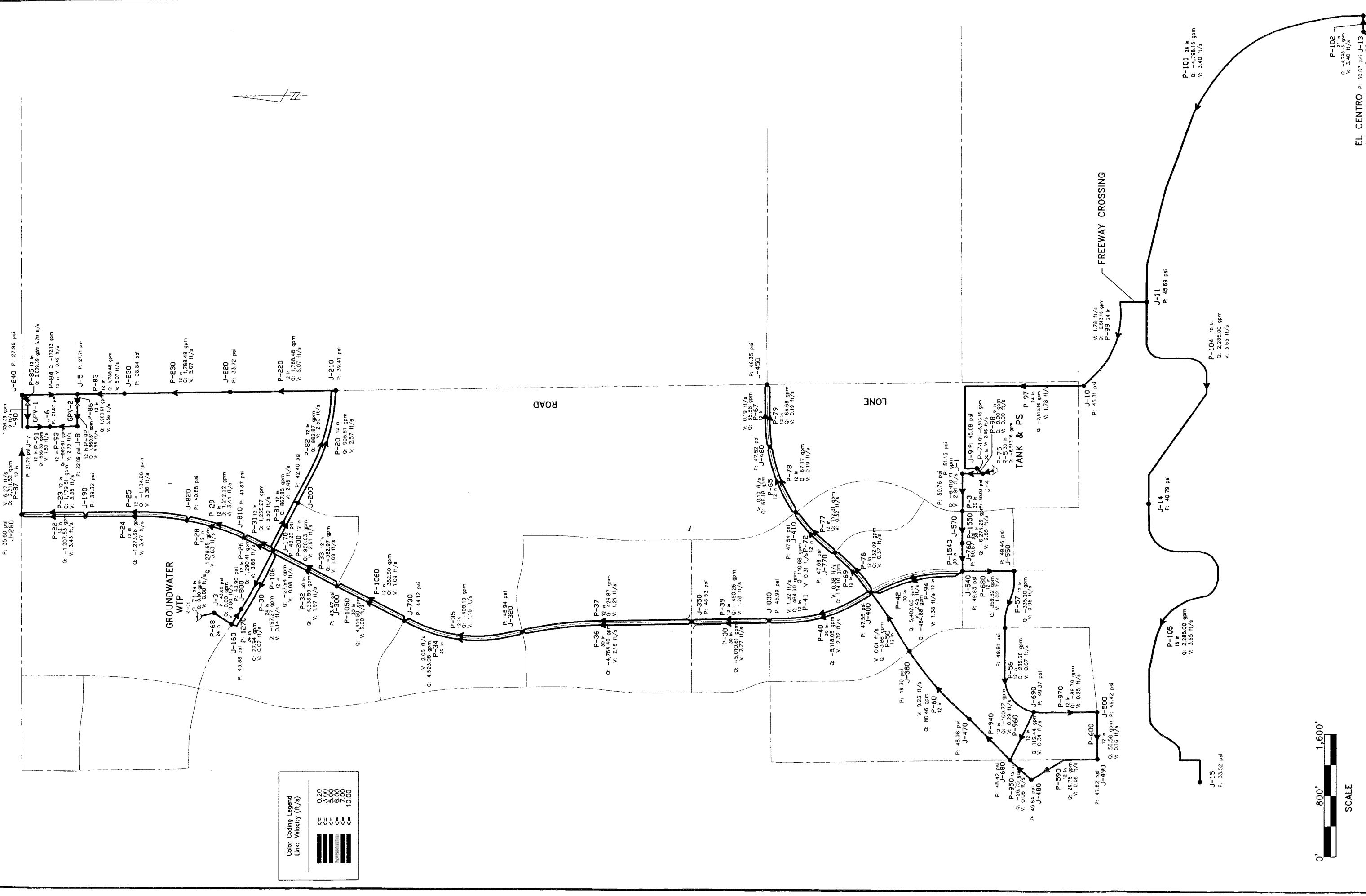


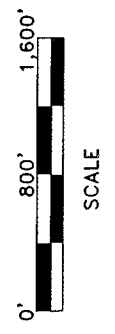
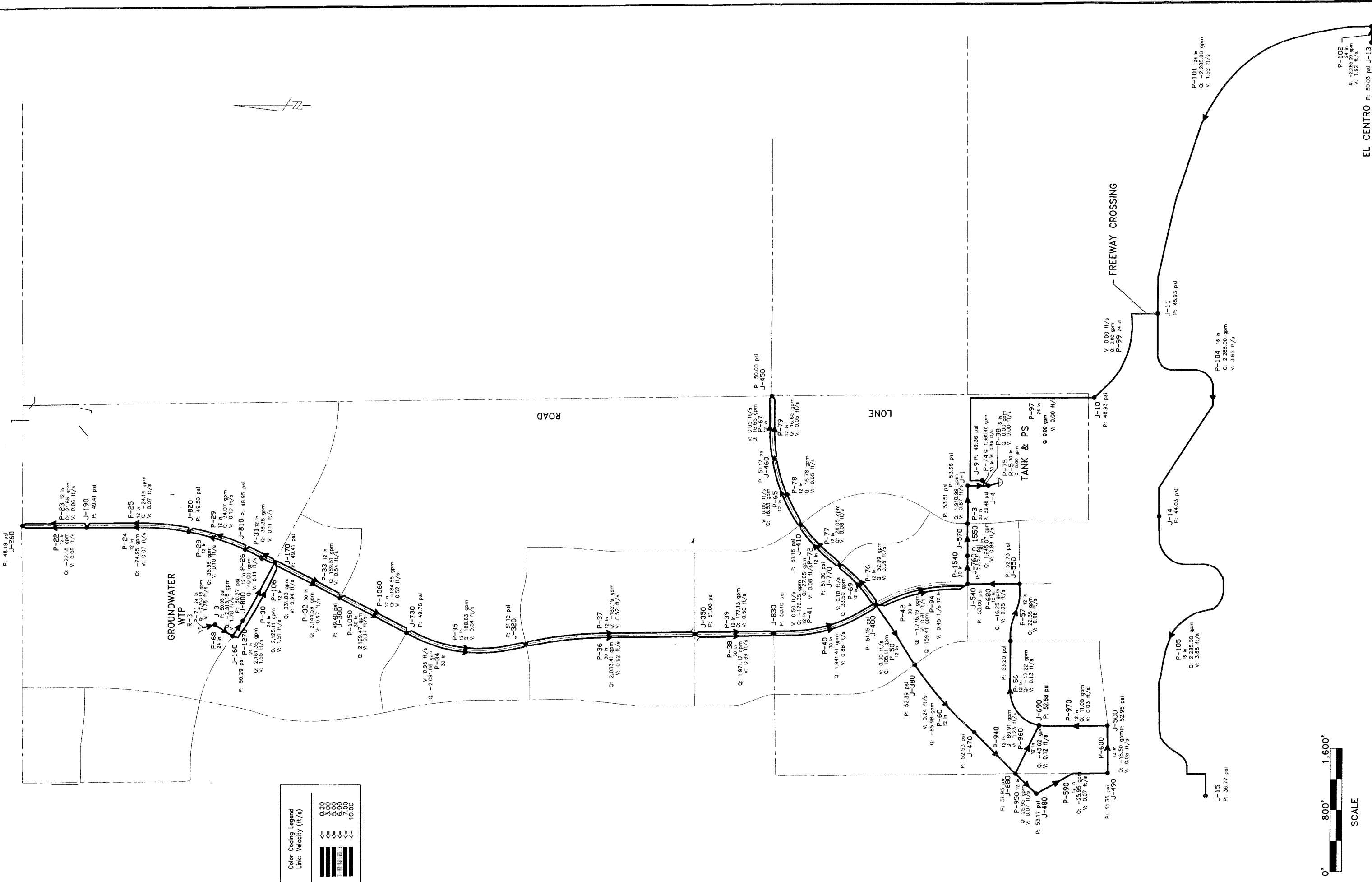






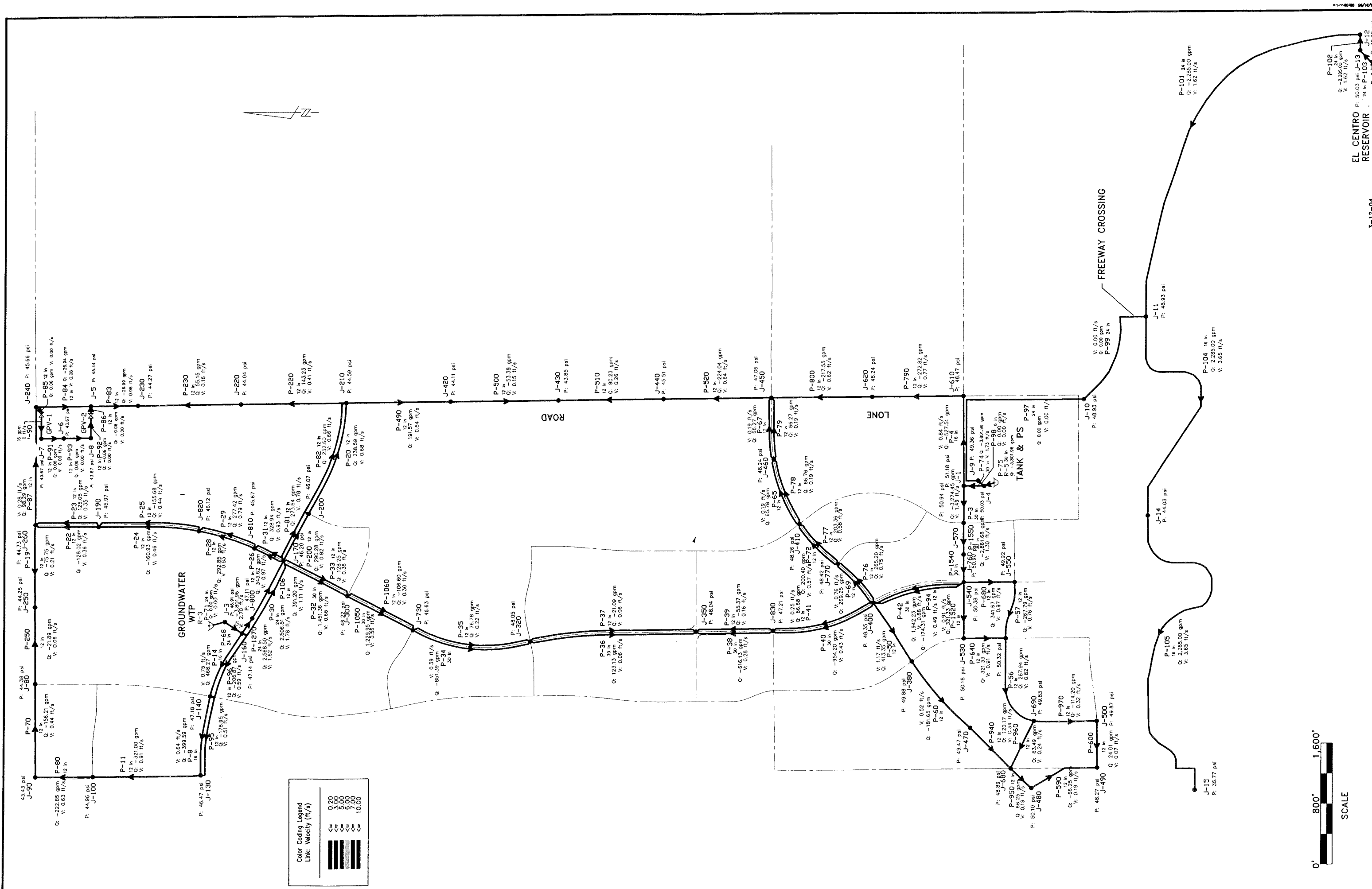












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Designed by: M.S
Checked by: M.S
Scale: AS

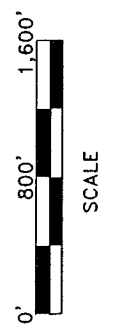
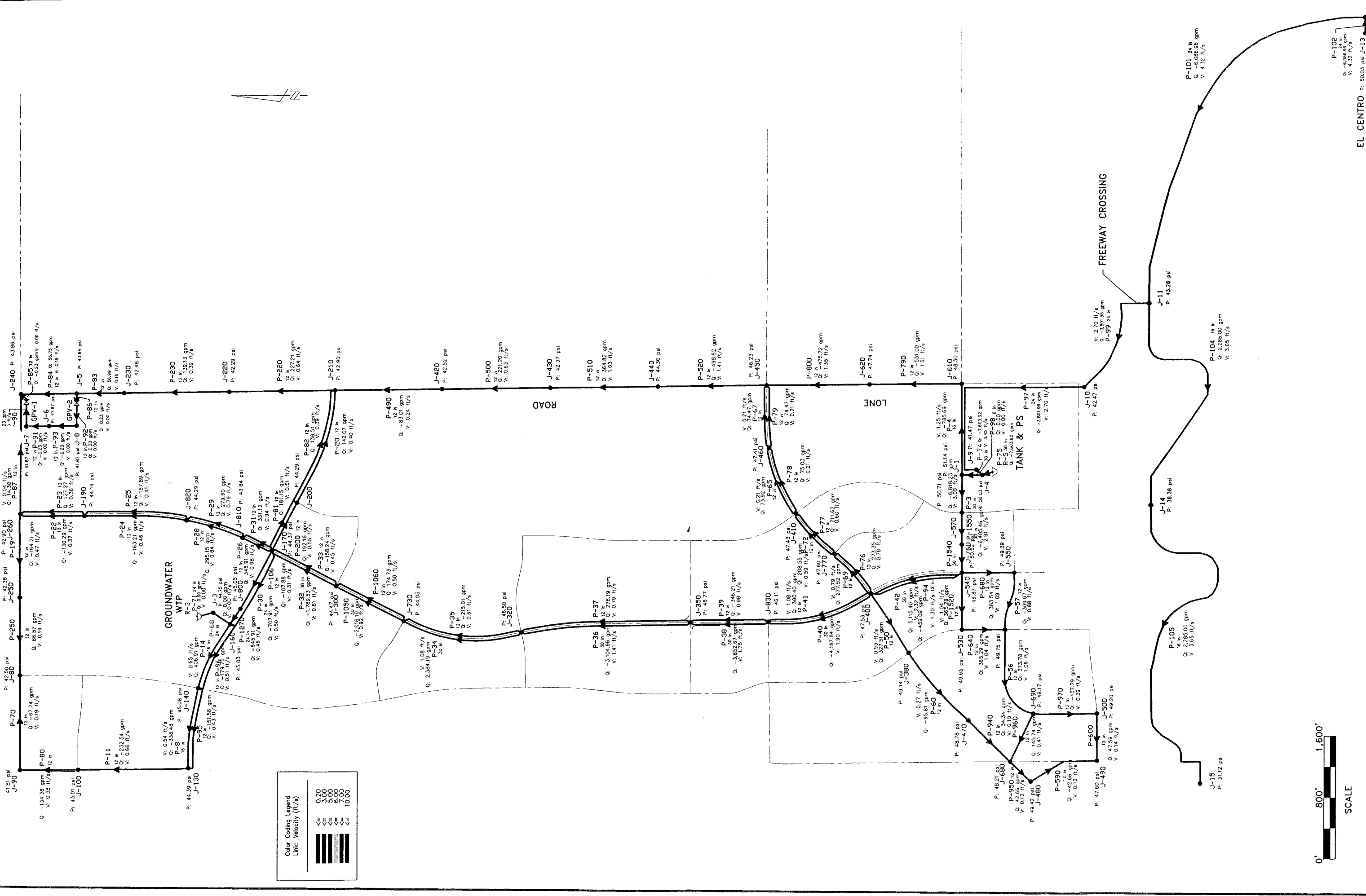
# WATER SYSTEM ALTERNATIVES SYSTEM MAP



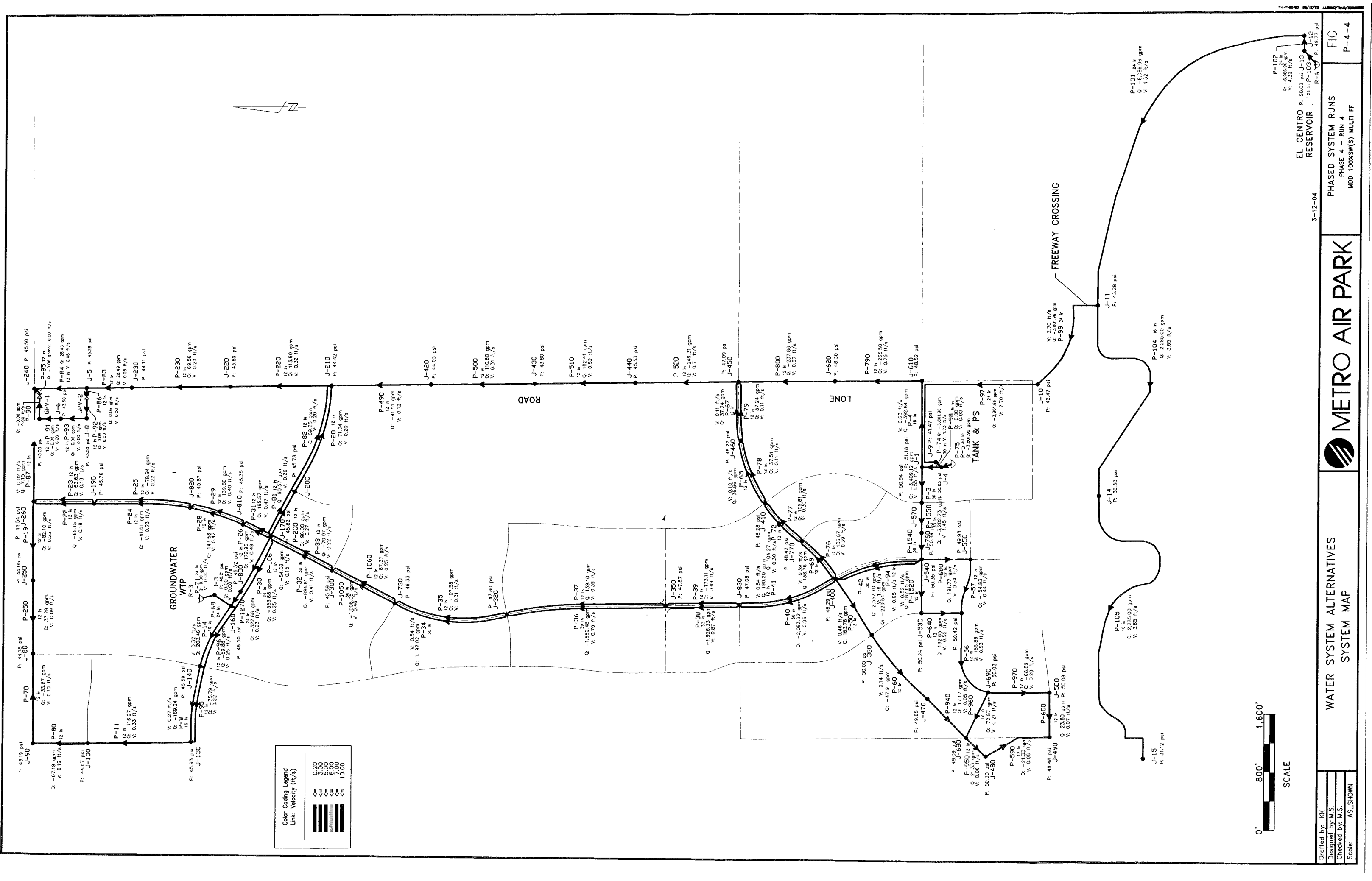
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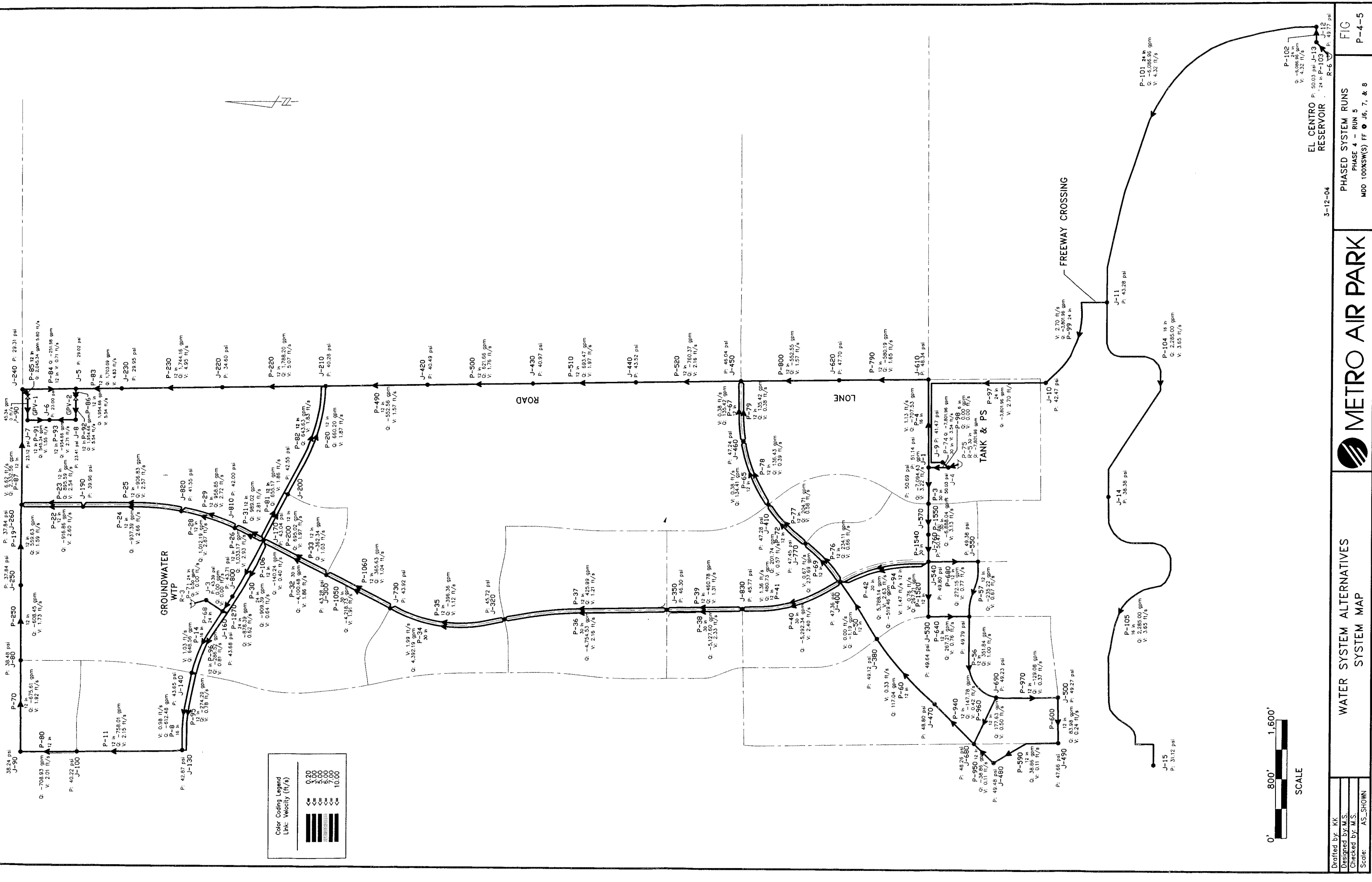
PHASED SYSTEM RUNS  
PHASE 4 - RUN 2  
PHD 100%GW

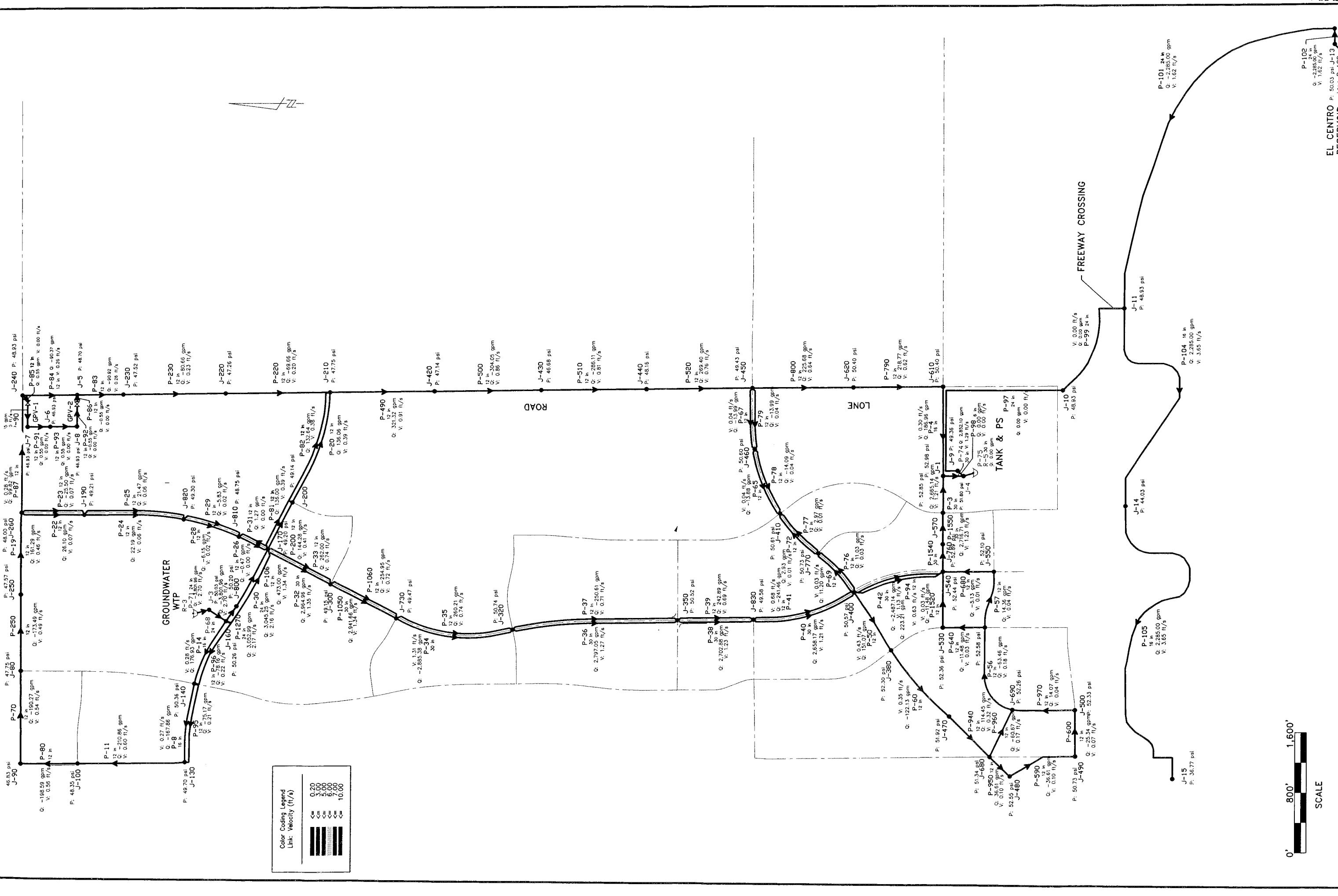
FIG  
P-4-2

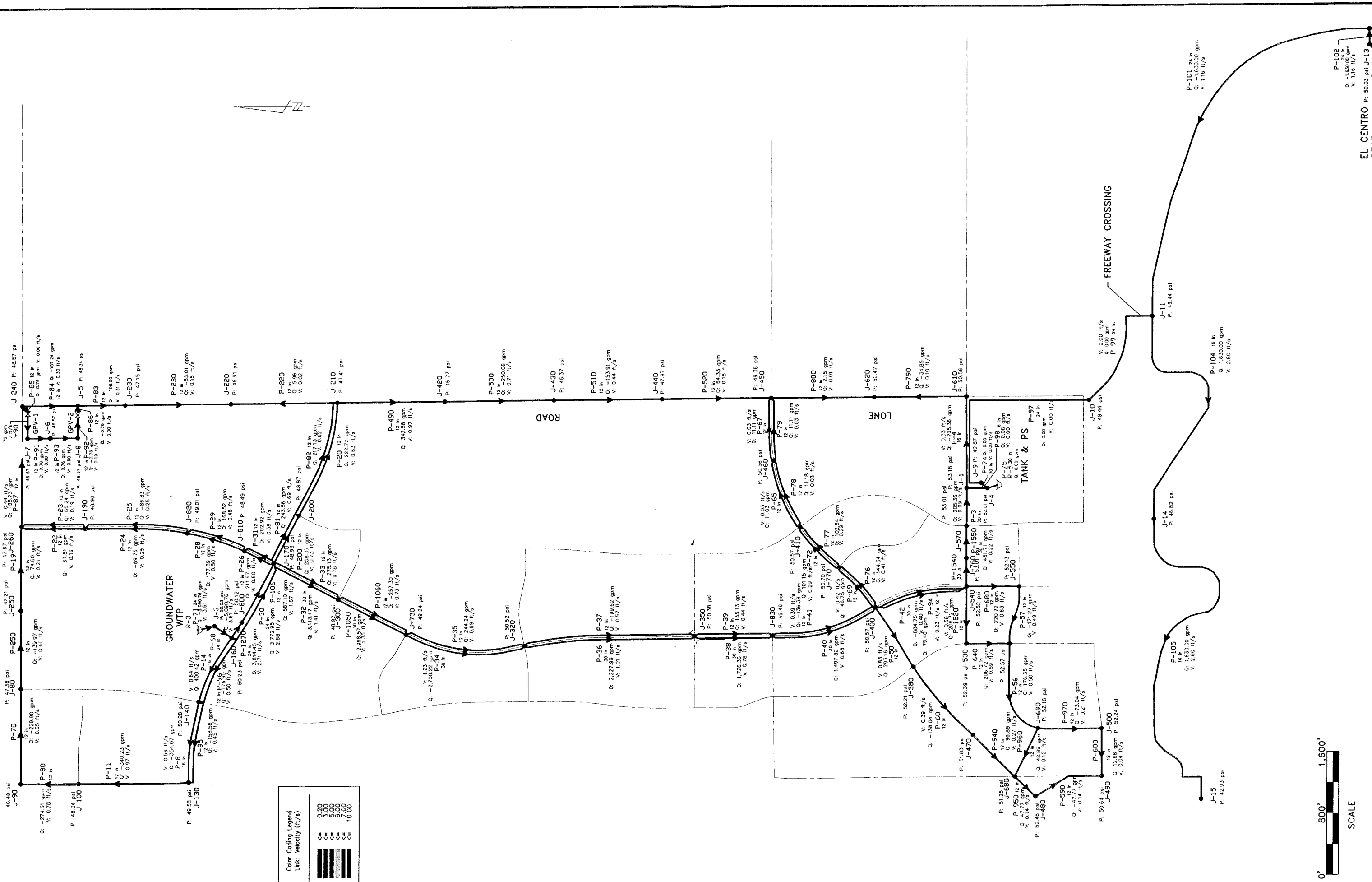


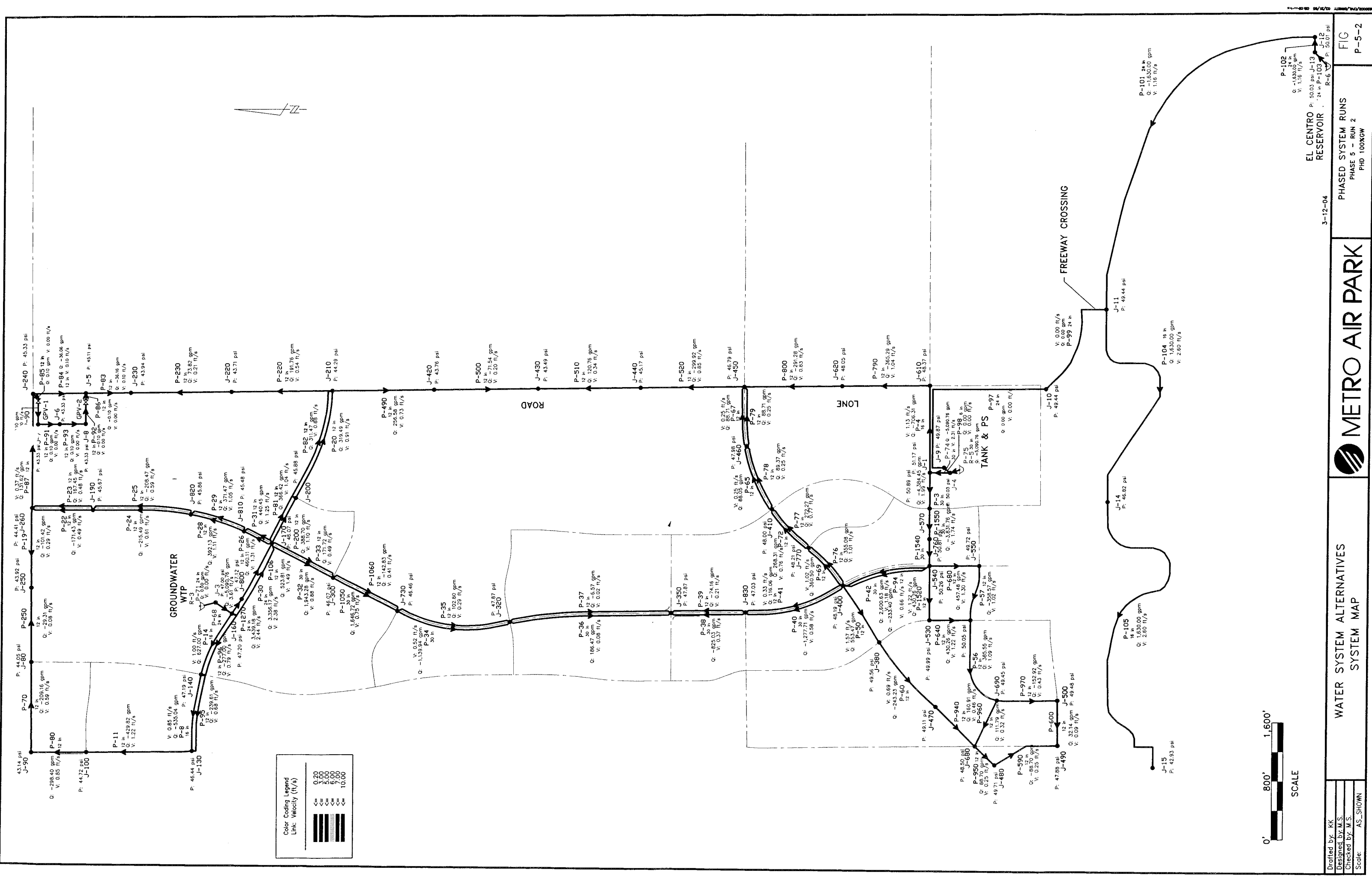
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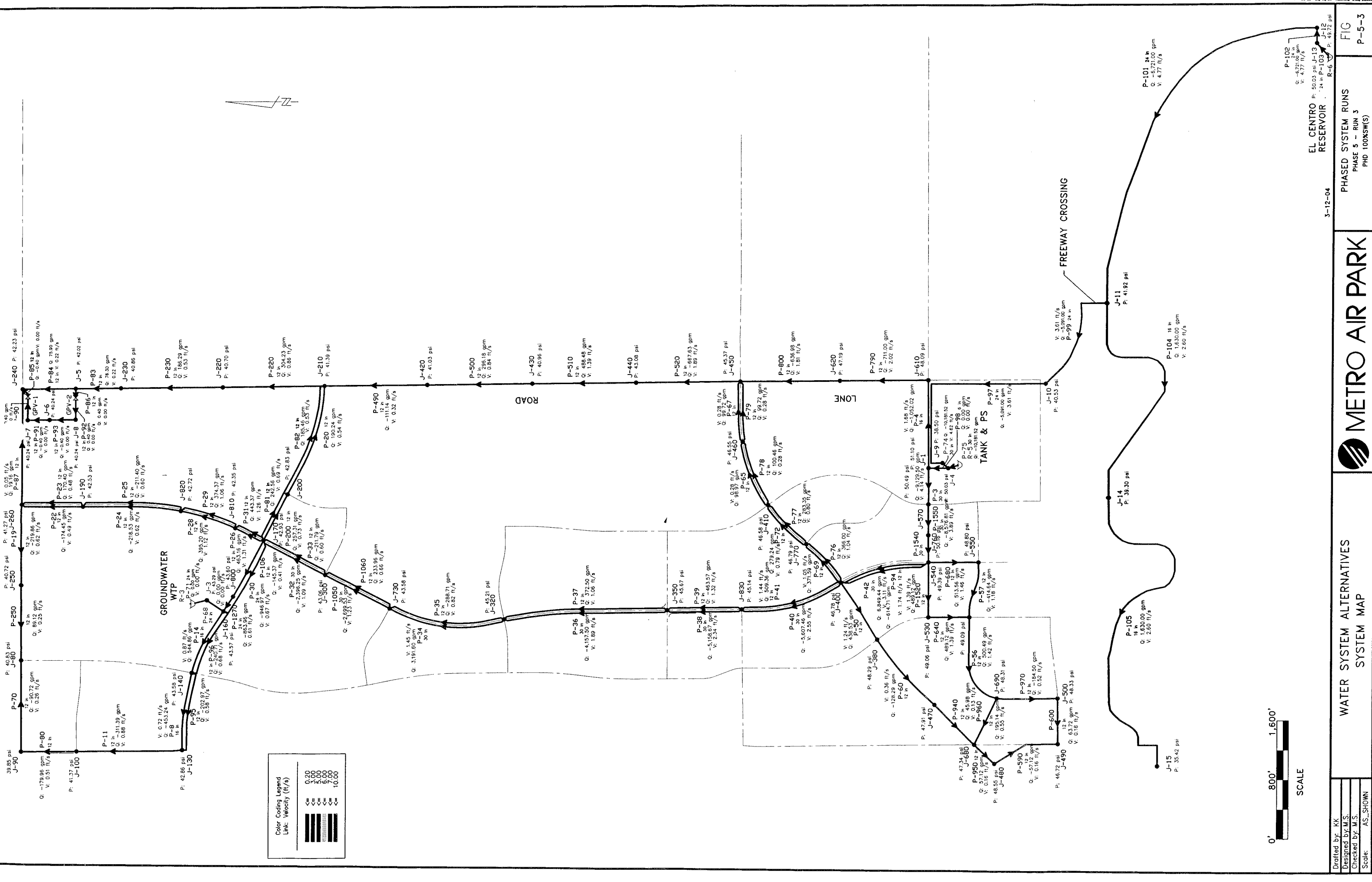




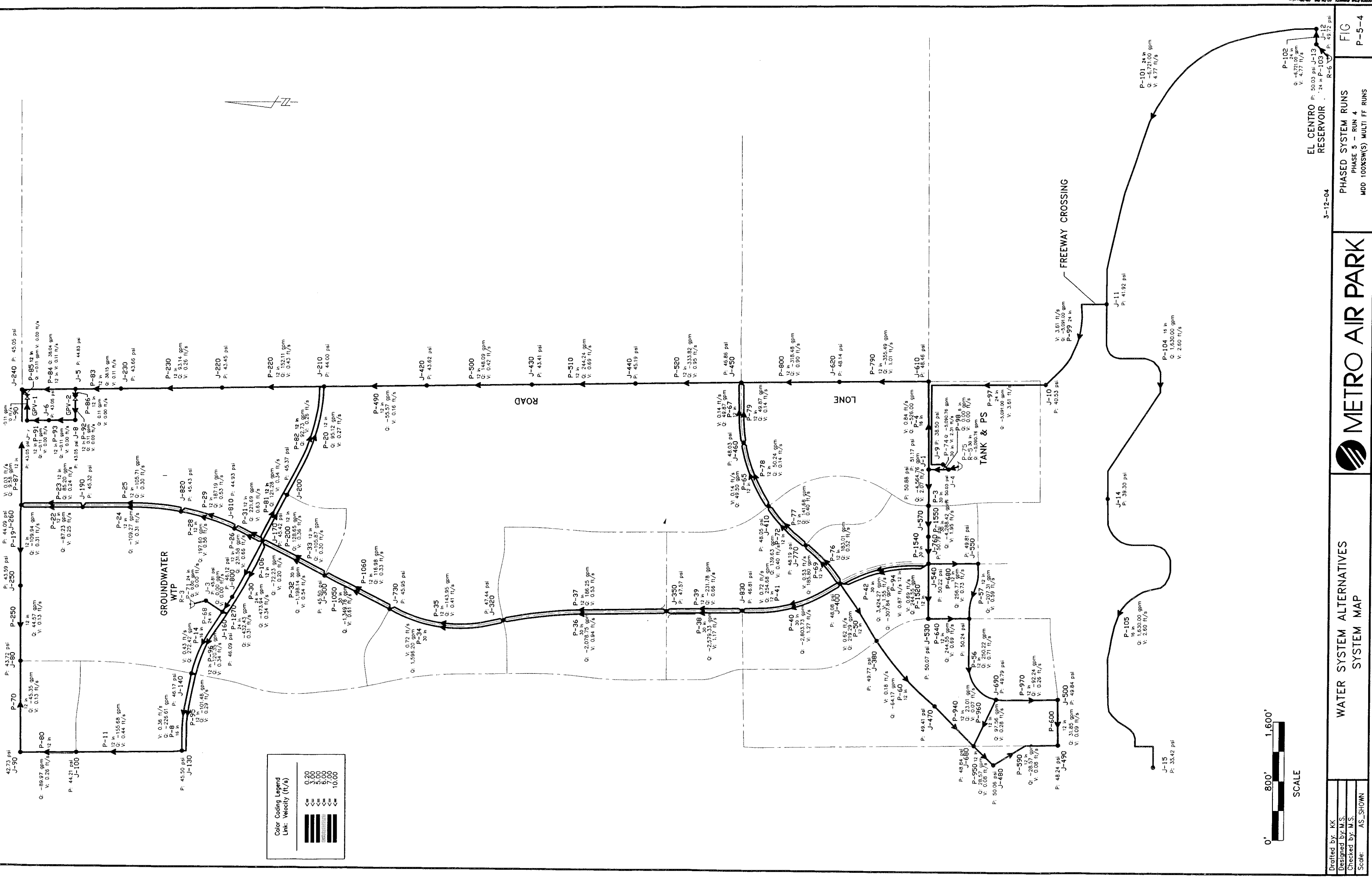


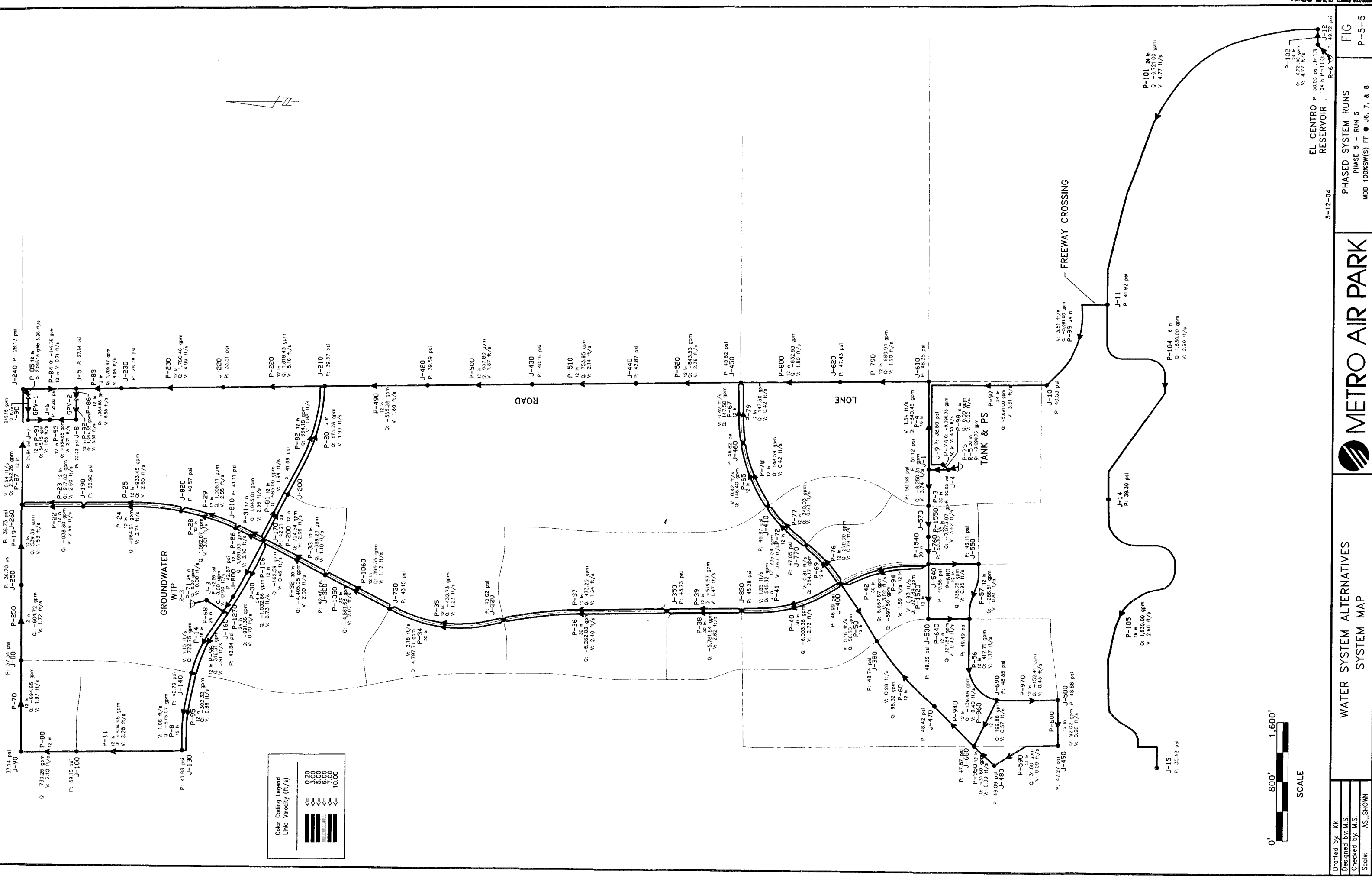












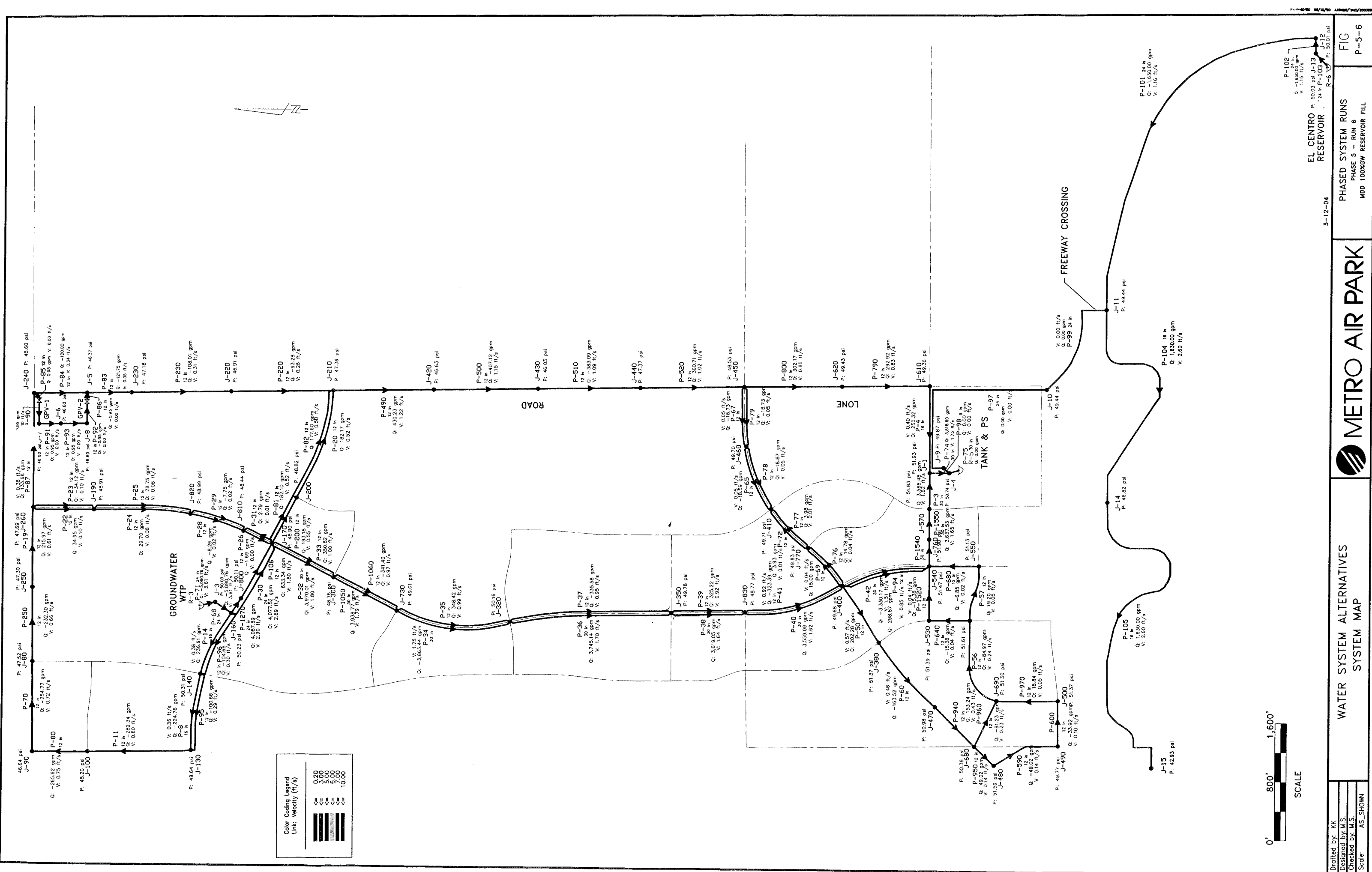
Drafted by: KK  
Designed by: M.S.  
Checked by: M.S.  
Scale: AS SHOWN

WATER SYSTEM ALTERNATIVES  
SYSTEM MAP

**METRO AIR PARK**

3-12-04

EL CENTRO  
RESERVOIR



# Scenario: Phase 1A & 2 Run 1 MDD-100%GW

## Steady State Analysis

### Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-1	9.30	1	Demand	76.18	Fixed	76.18	134.37	54.22
J-3	19.50	Zone-1	Demand	0.00	Fixed	0.00	134.90	50.03
J-4	12.00	Zone-1	Demand	0.00	Fixed	0.00	134.37	53.05
J-9	12.00	Zone-1	Demand	0.00	Fixed	0.00	126.03	49.43
J-10	13.00	Zone-1	Demand	0.00	Fixed	0.00	126.03	49.00
J-11	13.00	Zone-1	Demand	0.00	Fixed	0.00	126.03	49.00
J-12	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.31	49.99
J-13	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.40	50.03
J-14	13.00	Zone-1	Demand	0.00	Fixed	0.00	115.45	44.41
J-15	13.00	Zone-1	Demand	2,205.00	Fixed	2,205.00	99.76	37.61
J-160	18.85	1	Demand	0.00	Fixed	0.00	134.87	50.30
J-170	20.42	1	Demand	131.98	Fixed	131.98	134.63	49.51
J-190	20.40	1	Demand	15.62	Fixed	15.62	134.54	49.48
J-260	23.21	1	Demand	130.52	Fixed	130.52	134.53	48.26
J-300	20.30	1	Demand	59.74	Fixed	59.74	134.59	49.54
J-320	16.00	1	Demand	192.67	Fixed	192.67	134.48	51.36
J-350	16.00	1	Demand	200.47	Fixed	200.47	134.42	51.34
J-380	11.30	1	Demand	56.94	Fixed	56.94	134.31	53.33
J-400	15.35	1	Demand	31.42	Fixed	31.42	134.38	51.60
J-410	15.27	1	Demand	66.66	Fixed	66.66	134.32	51.61
J-450	18.00	1	Demand	99.16	Fixed	99.16	134.30	50.42
J-460	15.30	1	Demand	0.00	Fixed	0.00	134.31	51.59
J-470	12.09	1	Demand	15.11	Fixed	15.11	134.29	52.97
J-510	10.50	1	Demand	74.02	Fixed	74.02	134.28	53.66
J-540	10.82	1	Demand	20.19	Fixed	20.19	134.37	53.56
J-550	11.60	1	Demand	18.16	Fixed	18.16	134.32	53.20
J-570	9.70	1	Demand	101.44	Fixed	101.44	134.37	54.05
J-680	13.40	1	Demand	33.77	Fixed	33.77	134.27	52.40
J-690	11.25	1	Demand	66.53	Fixed	66.53	134.27	53.33
J-730	19.31	1	Demand	100.36	Fixed	100.36	134.54	49.95
J-760	9.70	1	Demand	0.00	Fixed	0.00	134.37	54.05
J-770	15.00	1	Demand	32.12	Fixed	32.12	134.35	51.74
J-800	18.80	1	Demand	167.46	Fixed	167.46	134.81	50.29
J-810	21.47	1	Demand	25.14	Fixed	25.14	134.61	49.05
J-820	20.20	1	Demand	62.34	Fixed	62.34	134.57	49.58
J-830	17.95	1	Demand	90.78	Fixed	90.78	134.40	50.48

# Scenario: Phase 1A & 2 Run 1 MDD-100%GW

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-155C	449.00	30	125.0	0.00	Open	177.62	0.00	0.00	false	0.08
P-154C	395.00	30	125.0	0.00	Open	177.62	0.00	0.00	false	0.08
P-127C	257.00	24	125.0	0.00	Open	1,635.11	0.06	0.23	false	1.16
P-106C	1,125.00	12	125.0	0.00	Open	-101.77	0.04	0.04	false	0.29
P-105C	1,053.00	30	125.0	0.00	Open	1,174.21	0.04	0.04	false	0.53
P-960	746.00	12	125.0	0.00	Open	-24.92	0.00	0.00	false	0.07
P-940	817.00	12	125.0	0.00	Open	58.69	0.01	0.01	false	0.17
P-680	726.00	12	125.0	0.00	Open	133.78	0.05	0.07	false	0.38
P-3	527.00	30	125.0	0.00	Open	76.18	0.00	0.00	false	0.03
P-22	900.00	12	125.0	0.00	Open	-66.02	0.02	0.02	false	0.19
P-23	940.00	12	125.0	0.00	Open	64.49	0.02	0.02	false	0.18
P-24	1,437.00	12	125.0	0.00	Open	-74.28	0.03	0.02	false	0.21
P-25	1,528.00	12	125.0	0.00	Open	-71.86	0.03	0.02	false	0.20
P-26	463.00	12	125.0	0.00	Open	119.36	0.02	0.05	false	0.34
P-28	825.00	12	125.0	0.00	Open	107.06	0.04	0.04	false	0.30
P-29	912.00	12	125.0	0.00	Open	101.42	0.04	0.04	false	0.29
P-30	935.00	24	125.0	0.00	Open	1,467.65	0.18	0.19	false	1.04
P-31	502.00	12	125.0	0.00	Open	114.26	0.02	0.05	false	0.32
P-32	1,044.00	30	125.0	0.00	Open	1,227.26	0.05	0.05	false	0.56
P-33	1,076.00	12	125.0	0.00	Open	108.45	0.05	0.04	false	0.31
P-34	1,740.00	30	125.0	0.00	Open	-1,078.36	0.06	0.04	false	0.49
P-35	1,727.00	12	125.0	0.00	Open	97.25	0.06	0.04	false	0.28
P-36	2,395.00	30	125.0	0.00	Open	902.12	0.06	0.03	false	0.41
P-37	2,406.00	12	125.0	0.00	Open	-80.83	0.06	0.03	false	0.23
P-38	1,120.00	30	125.0	0.00	Open	717.95	0.02	0.02	false	0.33
P-39	1,119.00	12	125.0	0.00	Open	64.52	0.02	0.02	false	0.18
P-40	1,551.00	30	125.0	0.00	Open	634.00	0.02	0.01	false	0.29
P-41	1,519.00	12	125.0	0.00	Open	-57.69	0.02	0.01	false	0.16
P-42	1,335.00	30	125.0	0.00	Open	-304.28	0.00	0.00	false	0.14
P-50	989.00	12	125.0	0.00	Open	130.74	0.06	0.06	false	0.37
P-56	1,373.00	12	125.0	0.00	Open	41.61	0.01	0.01	false	0.12
P-57	818.00	12	125.0	0.00	Open	-115.63	0.04	0.05	false	0.33
P-60	1,264.00	12	125.0	0.00	Open	-73.80	0.03	0.02	false	0.21
P-65	1,029.00	12	125.0	0.00	Open	49.21	0.01	0.01	false	0.14
P-67	900.00	12	125.0	0.00	Open	49.58	0.01	0.01	false	0.14
P-69	773.00	12	125.0	0.00	Open	99.72	0.03	0.04	false	0.28
P-72	823.00	12	125.0	0.00	Open	82.30	0.02	0.03	false	0.23
P-68	100.00	24	125.0	0.00	Open	-1,868.76	0.03	0.30	true	1.33
P-71	1.00	24	125.0	0.00	Open	-1,868.76	0.00	0.29	true	1.33
P-74	100.00	30	125.0	0.00	Open	0.00	0.00	0.00	true	0.00
P-75	3.00	30	125.0	0.00	Closed	0.00	0.00	0.00	true	0.00
P-76	795.00	12	125.0	0.00	Open	98.22	0.03	0.04	false	0.28
P-77	801.00	12	125.0	0.00	Open	83.51	0.02	0.03	false	0.24
P-78	1,001.00	12	125.0	0.00	Open	49.95	0.01	0.01	false	0.14
P-79	900.00	12	125.0	0.00	Open	49.58	0.01	0.01	false	0.14
P-94	1,337.00	12	125.0	0.00	Open	27.31	0.00	0.00	false	0.08
P-97	2,986.00	24	125.0	0.00	Open	0.00	0.00	0.00	false	0.00
P-98	113.00	6	130.0	0.00	Closed	0.00	0.00	0.00	false	0.00
P-99	1,701.00	24	125.0	0.00	Open	0.00	0.00	0.00	false	0.00
P-101	5,665.00	24	125.0	0.00	Open	-2,205.00	2.28	0.40	false	1.56
P-102	224.00	24	125.0	0.00	Open	-2,205.00	0.09	0.40	false	1.56

# Scenario: Phase 1A & 2 Run 1 MDD-100%GW

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-103	1.00	24	125.0	0.00	Open	-2,205.00	0.00	0.40	true	1.56
P-104	3,645.00	16	125.0	0.00	Open	2,205.00	10.58	2.90	false	3.52
P-105	5,402.00	16	125.0	0.00	Open	2,205.00	15.68	2.90	false	3.52
P-106	1,283.00	12	125.0	0.00	Open	233.65	0.24	0.18	false	0.66

# Scenario: Phase 1A & 2 Run 2 MDD=100%SW(S)

## Steady State Analysis

### Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-1	9.30	1	Demand	76.18	Fixed	76.18	127.39	51.19
J-3	19.50	Zone-1	Demand	0.00	Fixed	0.00	127.01	46.61
J-4	12.00	Zone-1	Demand	0.00	Fixed	0.00	127.40	50.03
J-9	12.00	Zone-1	Demand	1,869.00	Fixed	1,869.00	119.61	46.65
J-10	13.00	Zone-1	Demand	0.00	Fixed	0.00	120.50	46.60
J-11	13.00	Zone-1	Demand	0.00	Fixed	0.00	121.00	46.82
J-12	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.12	49.91
J-13	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.40	50.03
J-14	13.00	Zone-1	Demand	0.00	Fixed	0.00	110.42	42.23
J-15	13.00	Zone-1	Demand	2,205.00	Fixed	2,205.00	94.74	35.44
J-160	18.85	1	Demand	0.00	Fixed	0.00	127.01	46.89
J-170	20.42	1	Demand	131.98	Fixed	131.98	127.01	46.21
J-190	20.40	1	Demand	15.62	Fixed	15.62	126.92	46.18
J-260	23.21	1	Demand	130.52	Fixed	130.52	126.90	44.95
J-300	20.30	1	Demand	59.74	Fixed	59.74	127.02	46.26
J-320	16.00	1	Demand	192.67	Fixed	192.67	127.05	48.14
J-350	16.00	1	Demand	200.47	Fixed	200.47	127.10	48.17
J-380	11.30	1	Demand	56.94	Fixed	56.94	127.15	50.22
J-400	15.35	1	Demand	31.42	Fixed	31.42	127.19	48.49
J-410	15.27	1	Demand	66.66	Fixed	66.66	127.14	48.50
J-450	18.00	1	Demand	99.16	Fixed	99.16	127.12	47.31
J-460	15.30	1	Demand	0.00	Fixed	0.00	127.13	48.48
J-470	12.09	1	Demand	15.11	Fixed	15.11	127.13	49.87
J-510	10.50	1	Demand	74.02	Fixed	74.02	127.15	50.57
J-540	10.82	1	Demand	20.19	Fixed	20.19	127.27	50.48
J-550	11.60	1	Demand	18.16	Fixed	18.16	127.21	50.12
J-570	9.70	1	Demand	101.44	Fixed	101.44	127.34	51.00
J-680	13.40	1	Demand	33.77	Fixed	33.77	127.13	49.30
J-690	11.25	1	Demand	66.53	Fixed	66.53	127.13	50.24
J-730	19.31	1	Demand	100.36	Fixed	100.36	127.03	46.70
J-760	9.70	1	Demand	0.00	Fixed	0.00	127.30	50.98
J-770	15.00	1	Demand	32.12	Fixed	32.12	127.16	48.63
J-800	18.80	1	Demand	167.46	Fixed	167.46	127.01	46.91
J-810	21.47	1	Demand	25.14	Fixed	25.14	126.98	45.74
J-820	20.20	1	Demand	62.34	Fixed	62.34	126.95	46.28
J-830	17.95	1	Demand	90.78	Fixed	90.78	127.14	47.33

Project Engineer: Mark Smith

# Scenario: Phase 1A & 2 Run 2 MDD-100%SW(S)

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen-Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-155C	449.00	30	125.0	0.00	Open	-1,691.14	0.04	0.08	false	0.77
P-154C	395.00	30	125.0	0.00	Open	-1,691.14	0.03	0.08	false	0.77
P-127C	257.00	24	125.0	0.00	Open	20.01	0.00	0.00	false	0.01
P-106C	1,125.00	12	125.0	0.00	Open	47.28	0.01	0.01	false	0.13
P-105C	1,053.00	30	125.0	0.00	Open	-545.51	0.01	0.01	false	0.25
P-960	746.00	12	125.0	0.00	Open	-3.42	0.00	0.00	false	0.01
P-940	817.00	12	125.0	0.00	Open	37.19	0.01	0.01	false	0.11
P-680	726.00	12	125.0	0.00	Open	155.28	0.06	0.09	false	0.44
P-3	527.00	30	125.0	0.00	Open	-1,792.58	0.05	0.09	false	0.81
P-22	900.00	12	125.0	0.00	Open	-66.02	0.02	0.02	false	0.19
P-23	940.00	12	125.0	0.00	Open	64.49	0.02	0.02	false	0.18
P-24	1,437.00	12	125.0	0.00	Open	-74.28	0.03	0.02	false	0.21
P-25	1,528.00	12	125.0	0.00	Open	-71.86	0.03	0.02	false	0.20
P-26	463.00	12	125.0	0.00	Open	119.36	0.02	0.05	false	0.34
P-28	825.00	12	125.0	0.00	Open	107.06	0.04	0.04	false	0.30
P-29	912.00	12	125.0	0.00	Open	101.42	0.04	0.04	false	0.29
P-30	935.00	24	125.0	0.00	Open	-147.46	0.00	0.00	false	0.10
P-31	502.00	12	125.0	0.00	Open	114.26	0.02	0.05	false	0.32
P-32	1,044.00	30	125.0	0.00	Open	-489.77	0.01	0.01	false	0.22
P-33	1,076.00	12	125.0	0.00	Open	-43.28	0.01	0.01	false	0.12
P-34	1,740.00	30	125.0	0.00	Open	635.69	0.02	0.01	false	0.29
P-35	1,727.00	12	125.0	0.00	Open	-57.46	0.02	0.01	false	0.16
P-36	2,395.00	30	125.0	0.00	Open	-812.98	0.05	0.02	false	0.37
P-37	2,406.00	12	125.0	0.00	Open	72.84	0.05	0.02	false	0.21
P-38	1,120.00	30	125.0	0.00	Open	-996.72	0.03	0.03	false	0.45
P-39	1,119.00	12	125.0	0.00	Open	-89.57	0.03	0.03	false	0.25
P-40	1,551.00	30	125.0	0.00	Open	-1,079.05	0.06	0.04	false	0.49
P-41	1,519.00	12	125.0	0.00	Open	98.02	0.06	0.04	false	0.28
P-42	1,335.00	30	125.0	0.00	Open	1,390.85	0.08	0.06	false	0.63
P-50	989.00	12	125.0	0.00	Open	109.24	0.04	0.05	false	0.31
P-56	1,373.00	12	125.0	0.00	Open	63.11	0.02	0.02	false	0.18
P-57	818.00	12	125.0	0.00	Open	-137.13	0.06	0.07	false	0.39
P-60	1,264.00	12	125.0	0.00	Open	-52.30	0.01	0.01	false	0.15
P-65	1,029.00	12	125.0	0.00	Open	49.21	0.01	0.01	false	0.14
P-67	900.00	12	125.0	0.00	Open	49.58	0.01	0.01	false	0.14
P-69	773.00	12	125.0	0.00	Open	99.72	0.03	0.04	false	0.28
P-72	823.00	12	125.0	0.00	Open	82.30	0.02	0.03	false	0.23
P-68	100.00	24	125.0	0.00	Open	0.00	0.00	0.00	true	0.00
P-71	1.00	24	125.0	0.00	Closed	0.00	0.00	0.00	true	0.00
P-74	100.00	30	125.0	0.00	Open	-1,868.76	0.01	0.10	true	0.85
P-75	3.00	30	125.0	0.00	Open	-1,868.76	0.00	0.10	true	0.85
P-76	795.00	12	125.0	0.00	Open	98.22	0.03	0.04	false	0.28
P-77	801.00	12	125.0	0.00	Open	83.51	0.02	0.03	false	0.24
P-78	1,001.00	12	125.0	0.00	Open	49.95	0.01	0.01	false	0.14
P-79	900.00	12	125.0	0.00	Open	49.58	0.01	0.01	false	0.14
P-94	1,337.00	12	125.0	0.00	Open	-124.82	0.08	0.06	false	0.35
P-97	2,986.00	24	125.0	0.00	Open	-1,869.00	0.89	0.30	false	1.33
P-98	113.00	6	130.0	0.00	Closed	0.00	0.00	0.00	false	0.00
P-99	1,701.00	24	125.0	0.00	Open	-1,869.00	0.50	0.30	false	1.33
P-101	5,665.00	24	125.0	0.00	Open	-4,074.00	7.11	1.26	false	2.89
P-102	224.00	24	125.0	0.00	Open	-4,074.00	0.28	1.26	false	2.89

Project Engineer: Mark Smith

WaterCAD v6.5 [6.5120]

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Page 1 of 2



# Scenario: Phase 1A & 2 Run 2 MDD-100%SW(S)

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-103	1.00	24	125.0	0.00	Open	-4,074.00	0.00	1.25	true	2.89
P-104	3,645.00	16	125.0	0.00	Open	2,205.00	10.58	2.90	false	3.52
P-105	5,402.00	16	125.0	0.00	Open	2,205.00	15.68	2.90	false	3.52
P-106	1,283.00	12	125.0	0.00	Open	-20.01	0.00	0.00	false	0.06

**Scenario: Phase 1A & 2 Run 3 PHD-100%GW**  
**Steady State Analysis**  
**Junction Report**

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-1	9.30	1	Demand	152.35	Fixed	152.35	127.39	51.19
J-3	19.50	Zone-1	Inflow	1,868.76	Fixed	-1,868.76	127.50	46.82
J-4	12.00	Zone-1	Demand	0.00	Fixed	0.00	127.40	50.03
J-9	12.00	Zone-1	Demand	0.00	Fixed	0.00	126.03	49.43
J-10	13.00	Zone-1	Demand	0.00	Fixed	0.00	126.03	49.00
J-11	13.00	Zone-1	Demand	0.00	Fixed	0.00	126.03	49.00
J-12	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.31	49.99
J-13	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.40	50.03
J-14	13.00	Zone-1	Demand	0.00	Fixed	0.00	115.45	44.41
J-15	13.00	Zone-1	Demand	2,205.00	Fixed	2,205.00	99.76	37.61
J-160	18.85	1	Demand	0.00	Fixed	0.00	127.47	47.09
J-170	20.42	1	Demand	263.95	Fixed	263.95	127.27	46.32
J-190	20.40	1	Demand	31.23	Fixed	31.23	126.94	46.19
J-260	23.21	1	Demand	261.03	Fixed	261.03	126.88	44.94
J-300	20.30	1	Demand	119.47	Fixed	119.47	127.25	46.37
J-320	16.00	1	Demand	385.33	Fixed	385.33	127.22	48.22
J-350	16.00	1	Demand	400.95	Fixed	400.95	127.22	48.22
J-380	11.30	1	Demand	113.89	Fixed	113.89	127.03	50.17
J-400	15.35	1	Demand	62.85	Fixed	62.85	127.24	48.51
J-410	15.27	1	Demand	133.31	Fixed	133.31	127.05	48.46
J-450	18.00	1	Demand	198.32	Fixed	198.32	126.98	47.24
J-460	15.30	1	Demand	0.00	Fixed	0.00	127.01	48.43
J-470	12.09	1	Demand	30.22	Fixed	30.22	126.94	49.79
J-510	10.50	1	Demand	148.04	Fixed	148.04	126.94	50.48
J-540	10.82	1	Demand	40.37	Fixed	40.37	127.29	50.49
J-550	11.60	1	Demand	36.31	Fixed	36.31	127.10	50.07
J-570	9.70	1	Demand	202.89	Fixed	202.89	127.34	51.00
J-680	13.40	1	Demand	67.54	Fixed	67.54	126.90	49.21
J-690	11.25	1	Demand	133.06	Fixed	133.06	126.90	50.14
J-730	19.31	1	Demand	200.73	Fixed	200.73	127.24	46.79
J-760	9.70	1	Demand	0.00	Fixed	0.00	127.31	50.99
J-770	15.00	1	Demand	64.24	Fixed	64.24	127.13	48.61
J-800	18.80	1	Demand	334.93	Fixed	334.93	127.41	47.09
J-810	21.47	1	Demand	50.28	Fixed	50.28	127.18	45.83
J-820	20.20	1	Demand	124.68	Fixed	124.68	127.05	46.32
J-830	17.95	1	Demand	181.56	Fixed	181.56	127.23	47.37

# Scenario: Phase 1A & 2 Run 3 PHD-100%GW

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-1550	449.00	30	125.0	0.00	Open	-1,513.52	0.03	0.07	false	0.69
P-1540	395.00	30	125.0	0.00	Open	-1,513.52	0.03	0.07	false	0.69
P-1270	257.00	24	125.0	0.00	Open	1,652.17	0.06	0.24	false	1.17
P-1060	1,125.00	12	125.0	0.00	Open	-54.53	0.01	0.01	false	0.15
P-1050	1,053.00	30	125.0	0.00	Open	628.66	0.01	0.01	false	0.29
P-960	746.00	12	125.0	0.00	Open	-40.31	0.01	0.01	false	0.11
P-940	817.00	12	125.0	0.00	Open	107.86	0.04	0.04	false	0.31
P-680	726.00	12	125.0	0.00	Open	277.09	0.18	0.25	false	0.79
P-3	527.00	30	125.0	0.00	Open	-1,716.40	0.05	0.09	false	0.78
P-22	900.00	12	125.0	0.00	Open	-132.05	0.06	0.06	false	0.37
P-23	940.00	12	125.0	0.00	Open	128.99	0.06	0.06	false	0.37
P-24	1,437.00	12	125.0	0.00	Open	-148.56	0.11	0.08	false	0.42
P-25	1,528.00	12	125.0	0.00	Open	-143.71	0.11	0.08	false	0.41
P-26	463.00	12	125.0	0.00	Open	238.71	0.09	0.19	false	0.68
P-28	825.00	12	125.0	0.00	Open	214.11	0.13	0.16	false	0.61
P-29	912.00	12	125.0	0.00	Open	202.83	0.13	0.14	false	0.58
P-30	935.00	24	125.0	0.00	Open	1,317.24	0.15	0.16	false	0.93
P-31	502.00	12	125.0	0.00	Open	228.51	0.09	0.18	false	0.65
P-32	1,044.00	30	125.0	0.00	Open	737.49	0.02	0.02	false	0.33
P-33	1,076.00	12	125.0	0.00	Open	65.17	0.02	0.02	false	0.18
P-34	1,740.00	30	125.0	0.00	Open	-442.55	0.01	0.01	false	0.20
P-35	1,727.00	12	125.0	0.00	Open	39.91	0.01	0.01	false	0.11
P-36	2,395.00	30	125.0	0.00	Open	89.09	0.00	0.00	false	0.04
P-37	2,406.00	12	125.0	0.00	Open	-8.03	0.00	0.00	false	0.02
P-38	1,120.00	30	125.0	0.00	Open	-278.77	0.00	0.00	false	0.13
P-39	1,119.00	12	125.0	0.00	Open	-25.05	0.00	0.00	false	0.07
P-40	1,551.00	30	125.0	0.00	Open	-444.96	0.01	0.01	false	0.20
P-41	1,519.00	12	125.0	0.00	Open	40.42	0.01	0.01	false	0.11
P-42	1,335.00	30	125.0	0.00	Open	1,097.55	0.05	0.04	false	0.50
P-50	989.00	12	125.0	0.00	Open	251.96	0.21	0.21	false	0.71
P-56	1,373.00	12	125.0	0.00	Open	92.74	0.05	0.03	false	0.26
P-57	818.00	12	125.0	0.00	Open	-240.78	0.16	0.20	false	0.68
P-60	1,264.00	12	125.0	0.00	Open	-138.07	0.09	0.07	false	0.39
P-65	1,029.00	12	125.0	0.00	Open	98.42	0.04	0.04	false	0.28
P-67	900.00	12	125.0	0.00	Open	99.16	0.03	0.04	false	0.28
P-69	773.00	12	125.0	0.00	Open	199.43	0.11	0.14	false	0.57
P-72	823.00	12	125.0	0.00	Open	164.60	0.08	0.10	false	0.47
P-68	100.00	24	125.0	0.00	Open	-1,868.76	0.03	0.30	true	1.33
P-71	1.00	24	125.0	0.00	Closed	0.00	0.00	0.00	true	0.00
P-74	100.00	30	125.0	0.00	Open	-1,868.76	0.01	0.10	true	0.85
P-75	3.00	30	125.0	0.00	Open	-1,868.76	0.00	0.10	true	0.85
P-76	795.00	12	125.0	0.00	Open	196.43	0.11	0.13	false	0.56
P-77	801.00	12	125.0	0.00	Open	167.03	0.08	0.10	false	0.47
P-78	1,001.00	12	125.0	0.00	Open	99.90	0.04	0.04	false	0.28
P-79	900.00	12	125.0	0.00	Open	99.16	0.03	0.04	false	0.28
P-94	1,337.00	12	125.0	0.00	Open	-98.50	0.05	0.04	false	0.28
P-97	2,986.00	24	125.0	0.00	Open	0.00	0.00	0.00	false	0.00
P-98	113.00	6	130.0	0.00	Closed	0.00	0.00	0.00	false	0.00
P-99	1,701.00	24	125.0	0.00	Open	0.00	0.00	0.00	false	0.00
P-101	5,665.00	24	125.0	0.00	Open	-2,205.00	2.28	0.40	false	1.56
P-102	224.00	24	125.0	0.00	Open	-2,205.00	0.09	0.40	false	1.56

Project Engineer: Mark Smith

WaterCAD v6.5 [6.5120]

**Scenario: Phase 1A & 2 Run 3 PHD-100%GW**  
**Steady State Analysis**  
**Pipe Report**

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-103	1.00	24	125.0	0.00	Open	-2,205.00	0.00	0.40	true	1.56
P-104	3,645.00	16	125.0	0.00	Open	2,205.00	10.58	2.90	false	3.52
P-105	5,402.00	16	125.0	0.00	Open	2,205.00	15.68	2.90	false	3.52
P-106	1,283.00	12	125.0	0.00	Open	216.59	0.21	0.16	false	0.61

# Scenario: Phase 1A & 2 Run 4 PHD-100%SW(S)

## Steady State Analysis

### Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-1	9.30	1	Demand	152.35	Fixed	152.35	127.36	51.18
J-3	19.50	Zone-1	Demand	0.00	Fixed	0.00	125.98	46.16
J-4	12.00	Zone-1	Demand	0.00	Fixed	0.00	127.40	50.03
J-9	12.00	Zone-1	Demand	1,869.00	Fixed	1,869.00	119.61	46.65
J-10	13.00	Zone-1	Demand	0.00	Fixed	0.00	120.50	46.60
J-11	13.00	Zone-1	Demand	0.00	Fixed	0.00	121.00	46.82
J-12	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.12	49.91
J-13	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.40	50.03
J-14	13.00	Zone-1	Demand	0.00	Fixed	0.00	110.42	42.23
J-15	13.00	Zone-1	Demand	2,205.00	Fixed	2,205.00	94.74	35.44
J-160	18.85	1	Demand	0.00	Fixed	0.00	125.98	46.44
J-170	20.42	1	Demand	263.95	Fixed	263.95	125.99	45.76
J-190	20.40	1	Demand	31.23	Fixed	31.23	125.65	45.63
J-260	23.21	1	Demand	261.03	Fixed	261.03	125.59	44.39
J-300	20.30	1	Demand	119.47	Fixed	119.47	126.02	45.83
J-320	16.00	1	Demand	385.33	Fixed	385.33	126.14	47.75
J-350	16.00	1	Demand	400.95	Fixed	400.95	126.33	47.83
J-380	11.30	1	Demand	113.89	Fixed	113.89	126.49	49.94
J-400	15.35	1	Demand	62.85	Fixed	62.85	126.65	48.25
J-410	15.27	1	Demand	133.31	Fixed	133.31	126.47	48.21
J-450	18.00	1	Demand	198.32	Fixed	198.32	126.40	46.99
J-460	15.30	1	Demand	0.00	Fixed	0.00	126.43	48.18
J-470	12.09	1	Demand	30.22	Fixed	30.22	126.44	49.57
J-510	10.50	1	Demand	148.04	Fixed	148.04	126.50	50.29
J-540	10.82	1	Demand	40.37	Fixed	40.37	126.93	50.34
J-550	11.60	1	Demand	36.31	Fixed	36.31	126.71	49.90
J-570	9.70	1	Demand	202.89	Fixed	202.89	127.19	50.93
J-680	13.40	1	Demand	67.54	Fixed	67.54	126.42	49.00
J-690	11.25	1	Demand	133.06	Fixed	133.06	126.42	49.93
J-730	19.31	1	Demand	200.73	Fixed	200.73	126.06	46.28
J-760	9.70	1	Demand	0.00	Fixed	0.00	127.05	50.87
J-770	15.00	1	Demand	64.24	Fixed	64.24	126.55	48.36
J-800	18.80	1	Demand	334.93	Fixed	334.93	125.98	46.46
J-810	21.47	1	Demand	50.28	Fixed	50.28	125.90	45.27
J-820	20.20	1	Demand	124.68	Fixed	124.68	125.77	45.77
J-830	17.95	1	Demand	181.56	Fixed	181.56	126.45	47.04

# Scenario: Phase 1A & 2 Run 4 PHD-100%SW(S)

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen-Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-1550	449.00	30	125.0	0.00	Open	-3,382.28	0.13	0.30	false	1.54
P-1540	395.00	30	125.0	0.00	Open	-3,382.28	0.12	0.30	false	1.54
P-1270	257.00	24	125.0	0.00	Open	40.01	0.00	0.00	false	0.03
P-1060	1,125.00	12	125.0	0.00	Open	94.56	0.04	0.03	false	0.27
P-1050	1,053.00	30	125.0	0.00	Open	-1,091.02	0.04	0.04	false	0.50
P-960	746.00	12	125.0	0.00	Open	-6.84	0.00	0.00	false	0.02
P-940	817.00	12	125.0	0.00	Open	74.38	0.02	0.02	false	0.21
P-680	726.00	12	125.0	0.00	Open	310.57	0.23	0.31	false	0.88
P-3	527.00	30	125.0	0.00	Open	-3,585.17	0.18	0.33	false	1.63
P-22	900.00	12	125.0	0.00	Open	-132.05	0.06	0.06	false	0.37
P-23	940.00	12	125.0	0.00	Open	128.99	0.06	0.06	false	0.37
P-24	1,437.00	12	125.0	0.00	Open	-148.56	0.11	0.08	false	0.42
P-25	1,528.00	12	125.0	0.00	Open	-143.71	0.11	0.08	false	0.41
P-26	463.00	12	125.0	0.00	Open	238.71	0.09	0.19	false	0.68
P-28	825.00	12	125.0	0.00	Open	214.11	0.13	0.16	false	0.61
P-29	912.00	12	125.0	0.00	Open	202.83	0.13	0.14	false	0.58
P-30	935.00	24	125.0	0.00	Open	-294.92	0.01	0.01	false	0.21
P-31	502.00	12	125.0	0.00	Open	228.51	0.09	0.18	false	0.65
P-32	1,044.00	30	125.0	0.00	Open	-979.54	0.03	0.03	false	0.44
P-33	1,076.00	12	125.0	0.00	Open	-86.56	0.03	0.03	false	0.25
P-34	1,740.00	30	125.0	0.00	Open	1,271.54	0.09	0.05	false	0.58
P-35	1,727.00	12	125.0	0.00	Open	-114.77	0.09	0.05	false	0.33
P-36	2,395.00	30	125.0	0.00	Open	-1,625.95	0.19	0.08	false	0.74
P-37	2,406.00	12	125.0	0.00	Open	145.68	0.19	0.08	false	0.41
P-38	1,120.00	30	125.0	0.00	Open	-1,993.45	0.13	0.11	false	0.90
P-39	1,119.00	12	125.0	0.00	Open	-179.13	0.13	0.11	false	0.51
P-40	1,551.00	30	125.0	0.00	Open	-2,158.10	0.20	0.13	false	0.98
P-41	1,519.00	12	125.0	0.00	Open	196.03	0.20	0.13	false	0.56
P-42	1,335.00	30	125.0	0.00	Open	2,781.69	0.28	0.21	false	1.26
P-50	989.00	12	125.0	0.00	Open	218.48	0.16	0.16	false	0.62
P-56	1,373.00	12	125.0	0.00	Open	126.22	0.08	0.06	false	0.36
P-57	818.00	12	125.0	0.00	Open	-274.26	0.20	0.25	false	0.78
P-60	1,264.00	12	125.0	0.00	Open	-104.60	0.05	0.04	false	0.30
P-65	1,029.00	12	125.0	0.00	Open	98.42	0.04	0.04	false	0.28
P-67	900.00	12	125.0	0.00	Open	99.16	0.03	0.04	false	0.28
P-69	773.00	12	125.0	0.00	Open	199.43	0.11	0.14	false	0.57
P-72	823.00	12	125.0	0.00	Open	164.60	0.08	0.10	false	0.47
P-68	100.00	24	125.0	0.00	Open	0.00	0.00	0.00	true	0.00
P-71	1.00	24	125.0	0.00	Closed	0.00	0.00	0.00	true	0.00
P-74	100.00	30	125.0	0.00	Open	-3,737.52	0.04	0.36	true	1.70
P-75	3.00	30	125.0	0.00	Open	-3,737.52	0.00	0.36	true	1.70
P-76	795.00	12	125.0	0.00	Open	196.43	0.11	0.13	false	0.56
P-77	801.00	12	125.0	0.00	Open	167.03	0.08	0.10	false	0.47
P-78	1,001.00	12	125.0	0.00	Open	99.90	0.04	0.04	false	0.28
P-79	900.00	12	125.0	0.00	Open	99.16	0.03	0.04	false	0.28
P-94	1,337.00	12	125.0	0.00	Open	-249.65	0.28	0.21	false	0.71
P-97	2,986.00	24	125.0	0.00	Open	-1,869.00	0.89	0.30	false	1.33
P-98	113.00	6	130.0	0.00	Closed	0.00	0.00	0.00	false	0.00
P-99	1,701.00	24	125.0	0.00	Open	-1,869.00	0.50	0.30	false	1.33
P-101	5,665.00	24	125.0	0.00	Open	-4,074.00	7.11	1.26	false	2.89
P-102	224.00	24	125.0	0.00	Open	-4,074.00	0.28	1.26	false	2.89

# Scenario: Phase 1A & 2 Run 4 PHD-100%SW(S)

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-103	1.00	24	125.0	0.00	Open	-4,074.00	0.00	1.25	true	2.89
P-104	3,645.00	16	125.0	0.00	Open	2,205.00	10.58	2.90	false	3.52
P-105	5,402.00	16	125.0	0.00	Open	2,205.00	15.68	2.90	false	3.52
P-106	1,283.00	12	125.0	0.00	Open	-40.01	0.01	0.01	false	0.11

# Scenario: Phase 1A & 2 Run 5 MDD 100%GW Multi Fire Flows

## Fire Flow Analysis

### Fire Flow Report

Label	Fire Flow Balanced?	Satisfies Fire Flow Constraints?	Needed Fire Flow (gpm)	Available Fire Flow (gpm)	Total Flow Needed (gpm)	Total Flow Available (gpm)	Calculated Residual Pressure (psi)	Calculated Minimum System Pressure (psi)	Minimum System Junction
J-1	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-3	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-4	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-9	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-10	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-11	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-12	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-13	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-14	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-15	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-160	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-170	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-190	true	true	4,000.00	4,000.00	4,015.62	4,015.62	32.09	30.87	J-260
J-260	true	true	4,000.00	4,000.00	4,130.52	4,130.52	26.71	32.09	J-190
J-300	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-320	true	false	4,000.00	4,000.00	4,192.67	4,192.67	47.39	37.61	J-15
J-350	true	false	4,000.00	4,000.00	4,200.47	4,200.47	47.61	37.61	J-15
J-380	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-400	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-410	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-450	true	true	4,000.00	4,000.00	4,099.16	4,099.16	31.08	36.27	J-460
J-460	true	true	4,000.00	4,000.00	4,000.00	4,000.00	36.27	35.09	J-450
J-470	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-510	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-540	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-550	true	true	4,000.00	4,000.00	4,018.16	4,018.16	42.76	37.61	J-15
J-570	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-680	true	false	4,000.00	4,000.00	4,033.77	4,033.77	33.86	37.61	J-15
J-690	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-730	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-760	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-770	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-800	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-810	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-820	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-830	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A



# Scenario: Phase 1A & 2 Run 6 MDD 100%SW(S) Multi FF

## Fire Flow Analysis

### Fire Flow Report

Label	Fire Flow Balanced?	Satisfies Fire Flow Constraints?	Needed Fire Flow (gpm)	Available Fire Flow (gpm)	Total Flow Needed (gpm)	Total Flow Available (gpm)	Calculated Residual Pressure (psi)	Calculated Minimum System Pressure (psi)	Minimum System Junction
J-1	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-3	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-4	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-9	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-10	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-11	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-12	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-13	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-14	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-15	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-160	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-170	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-190	true	true	4,000.00	4,000.00	4,015.62	4,015.62	30.50	29.28	J-260
J-260	true	true	4,000.00	4,000.00	4,130.52	4,130.52	25.12	30.50	J-190
J-300	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-320	true	false	4,000.00	4,000.00	4,192.67	4,192.67	46.27	35.44	J-15
J-350	true	false	4,000.00	4,000.00	4,200.47	4,200.47	46.79	35.44	J-15
J-380	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-400	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-410	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-450	true	true	4,000.00	4,000.00	4,099.16	4,099.16	30.63	35.44	J-15
J-460	true	true	4,000.00	4,000.00	4,000.00	4,000.00	35.82	34.64	J-450
J-470	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-510	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-540	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-550	true	true	4,000.00	4,000.00	4,018.16	4,018.16	42.48	35.44	J-15
J-570	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-680	true	false	4,000.00	4,000.00	4,033.77	4,033.77	33.53	35.44	J-15
J-690	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-730	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-760	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-770	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-800	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-810	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-820	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-830	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A

# Scenario: Phase 1A & 2 Run 7 MDD 100%SW(S) Onsite FF @ J6, 7, & 8

## Steady State Analysis

### Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-1	9.30	1	Demand	76.18	Fixed	76.18	127.31	51.16
J-3	19.50	Zone-1	Demand	0.00	Fixed	0.00	120.97	43.99
J-4	12.00	Zone-1	Demand	0.00	Fixed	0.00	127.40	50.03
J-5	21.50	Zone-1	Demand	0.00	Fixed	0.00	86.67	28.25
J-6	21.00	Zone-1	Demand	1,500.00	Fixed	1,500.00	72.25	22.22
J-7	21.00	Zone-1	Demand	1,500.00	Fixed	1,500.00	72.53	22.34
J-8	21.00	Zone-1	Demand	1,000.00	Fixed	1,000.00	73.22	22.64
J-9	12.00	Zone-1	Demand	1,869.00	Fixed	1,869.00	119.61	46.65
J-10	13.00	Zone-1	Demand	0.00	Fixed	0.00	120.50	46.60
J-11	13.00	Zone-1	Demand	0.00	Fixed	0.00	121.00	46.82
J-12	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.12	49.91
J-13	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.40	50.03
J-14	13.00	Zone-1	Demand	0.00	Fixed	0.00	110.42	42.23
J-15	13.00	Zone-1	Demand	2,205.00	Fixed	2,205.00	94.74	35.44
J-160	18.85	1	Demand	0.00	Fixed	0.00	120.97	44.27
J-170	20.42	1	Demand	131.98	Fixed	131.98	120.97	43.59
J-190	20.40	1	Demand	15.62	Fixed	15.62	110.14	38.91
J-200	20.50	1	Demand	0.00	Fixed	0.00	119.23	42.80
J-210	23.60	1	Demand	0.00	Fixed	0.00	115.46	39.82
J-220	24.75	1	Demand	0.00	Fixed	0.00	103.62	34.19
J-230	24.20	1	Demand	0.00	Fixed	0.00	91.94	29.37
J-240	21.00	1	Demand	0.00	Fixed	0.00	86.76	28.51
J-260	23.21	1	Demand	130.52	Fixed	130.52	106.76	36.22
J-300	20.30	1	Demand	59.74	Fixed	59.74	121.43	43.84
J-320	16.00	1	Demand	192.67	Fixed	192.67	122.73	46.27
J-350	16.00	1	Demand	200.47	Fixed	200.47	123.94	46.79
J-380	11.30	1	Demand	56.94	Fixed	56.94	125.43	49.48
J-400	15.35	1	Demand	31.42	Fixed	31.42	125.42	47.72
J-410	15.27	1	Demand	66.66	Fixed	66.66	125.37	47.73
J-450	18.00	1	Demand	99.16	Fixed	99.16	125.35	46.54
J-460	15.30	1	Demand	0.00	Fixed	0.00	125.36	47.71
J-470	12.09	1	Demand	15.11	Fixed	15.11	125.47	49.15
J-510	10.50	1	Demand	74.02	Fixed	74.02	125.78	49.98
J-540	10.82	1	Demand	20.19	Fixed	20.19	126.22	50.03
J-550	11.60	1	Demand	18.16	Fixed	18.16	126.00	49.60
J-570	9.70	1	Demand	101.44	Fixed	101.44	126.89	50.80
J-680	13.40	1	Demand	33.77	Fixed	33.77	125.51	48.60
J-690	11.25	1	Demand	66.53	Fixed	66.53	125.57	49.56
J-730	19.31	1	Demand	100.36	Fixed	100.36	121.91	44.48
J-760	9.70	1	Demand	0.00	Fixed	0.00	126.53	50.65
J-770	15.00	1	Demand	32.12	Fixed	32.12	125.39	47.86
J-800	18.80	1	Demand	167.46	Fixed	167.46	120.97	44.29
J-810	21.47	1	Demand	25.14	Fixed	25.14	119.05	42.30
J-820	20.20	1	Demand	62.34	Fixed	62.34	115.66	41.39
J-830	17.95	1	Demand	90.78	Fixed	90.78	124.55	46.21

# Scenario: Phase 1A & 2 Run 7 MDD 100%SW(S) Onsite FF @ J6, 7, & 8

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen-Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-155C	449.00	30	125.0	0.00	Open	-5,691.14	0.35	0.79	false	2.58
P-154C	395.00	30	125.0	0.00	Open	-5,691.14	0.31	0.79	false	2.58
P-127C	257.00	24	125.0	0.00	Open	24.14	0.00	0.00	false	0.02
P-106C	1,125.00	12	125.0	0.00	Open	366.30	0.48	0.42	false	1.04
P-105C	1,053.00	30	125.0	0.00	Open	-4,226.49	0.48	0.45	false	1.92
P-960	746.00	12	125.0	0.00	Open	146.27	0.06	0.08	false	0.41
P-940	817.00	12	125.0	0.00	Open	-112.49	0.04	0.05	false	0.32
P-680	726.00	12	125.0	0.00	Open	304.97	0.22	0.30	false	0.87
P-230	1,475.00	12	125.0	0.00	Open	1,778.46	11.68	7.92	false	5.05
P-220	1,496.00	12	125.0	0.00	Open	1,778.46	11.84	7.92	false	5.05
P-200	753.00	12	125.0	0.00	Open	915.47	1.74	2.31	false	2.60
P-87	1,673.00	12	125.0	0.00	Open	2,221.54	20.00	11.95	false	6.30
P-3	527.00	30	125.0	0.00	Open	-5,792.58	0.43	0.81	false	2.63
P-20	1,680.00	12	125.0	0.00	Open	900.53	3.77	2.24	false	2.55
P-22	900.00	12	125.0	0.00	Open	-1,189.84	3.38	3.76	false	3.38
P-23	940.00	12	125.0	0.00	Open	1,162.22	3.38	3.60	false	3.30
P-24	1,437.00	12	125.0	0.00	Open	-1,203.46	5.52	3.84	false	3.41
P-25	1,528.00	12	125.0	0.00	Open	-1,164.21	5.52	3.61	false	3.30
P-26	463.00	12	125.0	0.00	Open	1,254.38	1.92	4.15	false	3.56
P-28	825.00	12	125.0	0.00	Open	1,247.89	3.39	4.11	false	3.54
P-29	912.00	12	125.0	0.00	Open	1,182.13	3.39	3.72	false	3.35
P-30	935.00	24	125.0	0.00	Open	-143.32	0.00	0.00	false	0.10
P-31	502.00	12	125.0	0.00	Open	1,200.78	1.92	3.82	false	3.41
P-32	1,044.00	30	125.0	0.00	Open	-4,165.01	0.46	0.44	false	1.89
P-33	1,076.00	12	125.0	0.00	Open	-368.05	0.46	0.43	false	1.04
P-34	1,740.00	30	125.0	0.00	Open	4,304.47	0.82	0.47	false	1.95
P-35	1,727.00	12	125.0	0.00	Open	-388.68	0.82	0.47	false	1.10
P-36	2,395.00	30	125.0	0.00	Open	-4,484.06	1.21	0.51	false	2.04
P-37	2,406.00	12	125.0	0.00	Open	401.76	1.21	0.50	false	1.14
P-38	1,120.00	30	125.0	0.00	Open	-4,666.91	0.61	0.54	false	2.12
P-39	1,119.00	12	125.0	0.00	Open	-419.38	0.61	0.55	false	1.19
P-40	1,551.00	30	125.0	0.00	Open	-4,745.97	0.87	0.56	false	2.15
P-41	1,519.00	12	125.0	0.00	Open	431.10	0.87	0.57	false	1.22
P-42	1,335.00	30	125.0	0.00	Open	4,924.03	0.80	0.60	false	2.23
P-50	989.00	12	125.0	0.00	Open	-40.44	0.01	0.01	false	0.11
P-56	1,373.00	12	125.0	0.00	Open	212.79	0.21	0.16	false	0.60
P-57	818.00	12	125.0	0.00	Open	-286.81	0.22	0.27	false	0.81
P-60	1,264.00	12	125.0	0.00	Open	97.39	0.05	0.04	false	0.28
P-65	1,029.00	12	125.0	0.00	Open	49.21	0.01	0.01	false	0.14
P-67	900.00	12	125.0	0.00	Open	49.58	0.01	0.01	false	0.14
P-69	773.00	12	125.0	0.00	Open	99.72	0.03	0.04	false	0.28
P-72	823.00	12	125.0	0.00	Open	82.30	0.02	0.03	false	0.23
P-68	100.00	24	125.0	0.00	Open	0.00	0.00	0.00	true	0.00
P-71	1.00	24	125.0	0.00	Closed	0.00	0.00	0.00	true	0.00
P-74	100.00	30	125.0	0.00	Open	-5,868.76	0.08	0.83	true	2.66
P-75	3.00	30	125.0	0.00	Open	-5,868.76	0.00	0.83	true	2.66
P-76	795.00	12	125.0	0.00	Open	98.22	0.03	0.04	false	0.28
P-77	801.00	12	125.0	0.00	Open	83.51	0.02	0.03	false	0.24
P-78	1,001.00	12	125.0	0.00	Open	49.95	0.01	0.01	false	0.14
P-79	900.00	12	125.0	0.00	Open	49.58	0.01	0.01	false	0.14
P-81	840.00	12	125.0	0.00	Open	862.99	1.74	2.07	false	2.45

# Scenario: Phase 1A & 2 Run 7 MDD 100%SW(S) Onsite FF @ J6, 7, & 8

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-82	1,761.00	12	125.0	0.00	Open	877.93	3.77	2.14	false	2.49
P-83	665.00	12	125.0	0.00	Open	1,778.46	5.26	7.92	false	5.05
P-84	775.00	12	125.0	0.00	Open	-181.55	0.09	0.12	false	0.52
P-85	139.00	12	125.0	0.00	Open	2,039.99	1.42	10.21	false	5.79
P-86	130.00	12	125.0	0.00	Open	1,960.01	1.23	9.48	false	5.56
P-90	345.00	12	125.0	0.00	Open	2,039.99	3.52	10.21	false	5.79
P-91	318.00	12	125.0	0.00	Open	539.99	0.28	0.87	false	1.53
P-92	320.00	12	125.0	0.00	Open	1,960.01	3.03	9.48	false	5.56
P-93	382.00	12	125.0	0.00	Open	-960.01	0.97	2.53	false	2.72
P-94	1,337.00	12	125.0	0.00	Open	-441.96	0.80	0.60	false	1.25
P-97	2,986.00	24	125.0	0.00	Open	-1,869.00	0.89	0.30	false	1.33
P-98	113.00	6	130.0	0.00	Closed	0.00	0.00	0.00	false	0.00
P-99	1,701.00	24	125.0	0.00	Open	-1,869.00	0.50	0.30	false	1.33
P-101	5,665.00	24	125.0	0.00	Open	-4,074.00	7.11	1.26	false	2.89
P-102	224.00	24	125.0	0.00	Open	-4,074.00	0.28	1.26	false	2.89
P-103	1.00	24	125.0	0.00	Open	-4,074.00	0.00	1.25	true	2.89
P-104	3,645.00	16	125.0	0.00	Open	2,205.00	10.58	2.90	false	3.52
P-105	5,402.00	16	125.0	0.00	Open	2,205.00	15.68	2.90	false	3.52
P-106	1,283.00	12	125.0	0.00	Open	-24.14	0.00	0.00	false	0.07

# Scenario: Phase 1A & 2 Run 8 MDD 100%GW-Reservoir Fill

## Steady State Analysis

### Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-1	9.30	1	Demand	19.02	Fixed	19.02	133.85	53.99
J-3	19.50	Zone-1	Demand	0.00	Fixed	0.00	134.90	50.03
J-4	12.00	Zone-1	Demand	1,402.10	Fixed	1,402.10	133.84	52.82
J-9	12.00	Zone-1	Demand	0.00	Fixed	0.00	126.03	49.43
J-10	13.00	Zone-1	Demand	0.00	Fixed	0.00	126.03	49.00
J-11	13.00	Zone-1	Demand	0.00	Fixed	0.00	126.03	49.00
J-12	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.31	49.99
J-13	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.40	50.03
J-14	13.00	Zone-1	Demand	0.00	Fixed	0.00	115.45	44.41
J-15	13.00	Zone-1	Demand	2,205.00	Fixed	2,205.00	99.76	37.61
J-160	18.85	1	Demand	0.00	Fixed	0.00	134.87	50.30
J-170	20.42	1	Demand	32.96	Fixed	32.96	134.61	49.50
J-190	20.40	1	Demand	3.90	Fixed	3.90	134.60	49.51
J-260	23.21	1	Demand	32.59	Fixed	32.59	134.60	48.29
J-300	20.30	1	Demand	14.92	Fixed	14.92	134.53	49.52
J-320	16.00	1	Demand	48.11	Fixed	48.11	134.33	51.30
J-350	16.00	1	Demand	50.06	Fixed	50.06	134.17	51.23
J-380	11.30	1	Demand	14.22	Fixed	14.22	133.98	53.18
J-400	15.35	1	Demand	7.85	Fixed	7.85	134.00	51.44
J-410	15.27	1	Demand	16.64	Fixed	16.64	134.00	51.47
J-450	18.00	1	Demand	24.76	Fixed	24.76	133.99	50.29
J-460	15.30	1	Demand	0.00	Fixed	0.00	133.99	51.46
J-470	12.09	1	Demand	3.77	Fixed	3.77	133.96	52.83
J-510	10.50	1	Demand	18.48	Fixed	18.48	133.93	53.51
J-540	10.82	1	Demand	5.04	Fixed	5.04	133.93	53.37
J-550	11.60	1	Demand	4.53	Fixed	4.53	133.93	53.03
J-570	9.70	1	Demand	25.33	Fixed	25.33	133.88	53.83
J-680	13.40	1	Demand	8.43	Fixed	8.43	133.95	52.26
J-690	11.25	1	Demand	16.61	Fixed	16.61	133.94	53.19
J-730	19.31	1	Demand	25.06	Fixed	25.06	134.45	49.92
J-760	9.70	1	Demand	0.00	Fixed	0.00	133.90	53.85
J-770	15.00	1	Demand	8.02	Fixed	8.02	134.00	51.59
J-800	18.80	1	Demand	41.82	Fixed	41.82	134.81	50.29
J-810	21.47	1	Demand	6.28	Fixed	6.28	134.61	49.05
J-820	20.20	1	Demand	15.57	Fixed	15.57	134.60	49.60
J-830	17.95	1	Demand	22.67	Fixed	22.67	134.10	50.35

# Scenario: Phase 1A & 2 Run 8 MDD 100%GW-Reservoir Fill

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen-Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-1550	449.00	30	125.0	0.00	Open	1,446.45	0.03	0.06	false	0.66
P-1540	395.00	30	125.0	0.00	Open	1,446.45	0.02	0.06	false	0.66
P-1270	257.00	24	125.0	0.00	Open	1,622.04	0.06	0.23	false	1.15
P-1060	1,125.00	12	125.0	0.00	Open	-137.24	0.08	0.07	false	0.39
P-1050	1,053.00	30	125.0	0.00	Open	1,583.49	0.08	0.07	false	0.72
P-960	746.00	12	125.0	0.00	Open	-49.79	0.01	0.01	false	0.14
P-940	817.00	12	125.0	0.00	Open	58.23	0.01	0.01	false	0.17
P-680	726.00	12	125.0	0.00	Open	-10.16	0.00	0.00	false	0.03
P-3	527.00	30	125.0	0.00	Open	1,421.12	0.03	0.06	false	0.65
P-22	900.00	12	125.0	0.00	Open	-16.49	0.00	0.00	false	0.05
P-23	940.00	12	125.0	0.00	Open	16.10	0.00	0.00	false	0.05
P-24	1,437.00	12	125.0	0.00	Open	-18.55	0.00	0.00	false	0.05
P-25	1,528.00	12	125.0	0.00	Open	-17.94	0.00	0.00	false	0.05
P-26	463.00	12	125.0	0.00	Open	29.80	0.00	0.00	false	0.08
P-28	825.00	12	125.0	0.00	Open	26.73	0.00	0.00	false	0.08
P-29	912.00	12	125.0	0.00	Open	25.33	0.00	0.00	false	0.07
P-30	935.00	24	125.0	0.00	Open	1,580.22	0.20	0.22	false	1.12
P-31	502.00	12	125.0	0.00	Open	28.53	0.00	0.00	false	0.08
P-32	1,044.00	30	125.0	0.00	Open	1,594.73	0.08	0.07	false	0.72
P-33	1,076.00	12	125.0	0.00	Open	140.92	0.08	0.07	false	0.40
P-34	1,740.00	30	125.0	0.00	Open	-1,555.40	0.12	0.07	false	0.71
P-35	1,727.00	12	125.0	0.00	Open	140.27	0.12	0.07	false	0.40
P-36	2,395.00	30	125.0	0.00	Open	1,512.08	0.16	0.07	false	0.69
P-37	2,406.00	12	125.0	0.00	Open	-135.48	0.16	0.07	false	0.38
P-38	1,120.00	30	125.0	0.00	Open	1,465.78	0.07	0.06	false	0.67
P-39	1,119.00	12	125.0	0.00	Open	131.72	0.07	0.06	false	0.37
P-40	1,551.00	30	125.0	0.00	Open	1,443.68	0.10	0.06	false	0.66
P-41	1,519.00	12	125.0	0.00	Open	-131.14	0.10	0.06	false	0.37
P-42	1,335.00	30	125.0	0.00	Open	-1,322.63	0.07	0.05	false	0.60
P-50	989.00	12	125.0	0.00	Open	76.22	0.02	0.02	false	0.22
P-56	1,373.00	12	125.0	0.00	Open	-33.18	0.01	0.00	false	0.09
P-57	818.00	12	125.0	0.00	Open	14.70	0.00	0.00	false	0.04
P-60	1,264.00	12	125.0	0.00	Open	-62.00	0.02	0.02	false	0.18
P-65	1,029.00	12	125.0	0.00	Open	12.29	0.00	0.00	false	0.03
P-67	900.00	12	125.0	0.00	Open	12.38	0.00	0.00	false	0.04
P-69	773.00	12	125.0	0.00	Open	24.90	0.00	0.00	false	0.07
P-72	823.00	12	125.0	0.00	Open	20.55	0.00	0.00	false	0.06
P-68	100.00	24	125.0	0.00	Open	-1,868.76	0.03	0.30	true	1.33
P-71	1.00	24	125.0	0.00	Open	-1,868.76	0.00	0.29	true	1.33
P-74	100.00	30	125.0	0.00	Open	1,402.10	0.01	0.06	true	0.64
P-75	3.00	30	125.0	0.00	Closed	0.00	0.00	0.00	true	0.00
P-76	795.00	12	125.0	0.00	Open	24.53	0.00	0.00	false	0.07
P-77	801.00	12	125.0	0.00	Open	20.85	0.00	0.00	false	0.06
P-78	1,001.00	12	125.0	0.00	Open	12.47	0.00	0.00	false	0.04
P-79	900.00	12	125.0	0.00	Open	12.38	0.00	0.00	false	0.04
P-94	1,337.00	12	125.0	0.00	Open	118.70	0.07	0.05	false	0.34
P-97	2,986.00	24	125.0	0.00	Open	0.00	0.00	0.00	false	0.00
P-98	113.00	6	130.0	0.00	Closed	0.00	0.00	0.00	false	0.00
P-99	1,701.00	24	125.0	0.00	Open	0.00	0.00	0.00	false	0.00
P-101	5,665.00	24	125.0	0.00	Open	-2,205.00	2.28	0.40	false	1.56
P-102	224.00	24	125.0	0.00	Open	-2,205.00	0.09	0.40	false	1.56

**Scenario: Phase 1A & 2 Run 8 MDD 100%GW-Reservoir Fill**  
**Steady State Analysis**  
**Pipe Report**

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-103	1.00	24	125.0	0.00	Open	-2,205.00	0.00	0.40	true	1.56
P-104	3,645.00	16	125.0	0.00	Open	2,205.00	10.58	2.90	false	3.52
P-105	5,402.00	16	125.0	0.00	Open	2,205.00	15.68	2.90	false	3.52
P-106	1,283.00	12	125.0	0.00	Open	246.72	0.26	0.20	false	0.70

# Scenario: Phase 3 Run 1 MDD-100%GW

## Steady State Analysis

### Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-1	9.30	1	Demand	102.45	Fixed	102.45	133.98	54.05
J-3	19.50	Zone-1	Demand	0.00	Fixed	0.00	134.90	50.03
J-4	12.00	Zone-1	Demand	0.00	Fixed	0.00	133.98	52.88
J-9	12.00	Zone-1	Demand	0.00	Fixed	0.00	125.87	49.36
J-10	13.00	Zone-1	Demand	0.00	Fixed	0.00	125.87	48.93
J-11	13.00	Zone-1	Demand	0.00	Fixed	0.00	125.87	48.93
J-12	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.30	49.99
J-13	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.40	50.03
J-14	13.00	Zone-1	Demand	0.00	Fixed	0.00	114.56	44.03
J-15	13.00	Zone-1	Demand	2,285.00	Fixed	2,285.00	97.81	36.77
J-160	18.85	1	Demand	0.00	Fixed	0.00	134.85	50.29
J-170	20.42	1	Demand	177.49	Fixed	177.49	134.44	49.43
J-190	20.40	1	Demand	21.00	Fixed	21.00	134.28	49.37
J-260	23.21	1	Demand	175.52	Fixed	175.52	134.25	48.14
J-300	20.30	1	Demand	80.33	Fixed	80.33	134.36	49.45
J-320	16.00	1	Demand	259.10	Fixed	259.10	134.17	51.23
J-350	16.00	1	Demand	269.60	Fixed	269.60	134.06	51.18
J-380	11.30	1	Demand	76.58	Fixed	76.58	133.88	53.14
J-400	15.35	1	Demand	42.26	Fixed	42.26	133.99	51.43
J-410	15.27	1	Demand	89.64	Fixed	89.64	133.90	51.43
J-450	18.00	1	Demand	133.35	Fixed	133.35	133.87	50.23
J-460	15.30	1	Demand	0.00	Fixed	0.00	133.89	51.41
J-470	12.09	1	Demand	20.32	Fixed	20.32	133.84	52.78
J-480	10.60	1	Demand	0.00	Fixed	0.00	133.81	53.42
J-490	14.80	1	Demand	29.83	Fixed	29.83	133.81	51.59
J-500	11.10	1	Demand	29.81	Fixed	29.81	133.81	53.20
J-510	10.50	1	Demand	99.54	Fixed	99.54	133.83	53.47
J-540	10.82	1	Demand	27.15	Fixed	27.15	133.98	53.39
J-550	11.60	1	Demand	24.42	Fixed	24.42	133.90	53.02
J-570	9.70	1	Demand	136.42	Fixed	136.42	133.98	53.88
J-680	13.40	1	Demand	45.42	Fixed	45.42	133.82	52.20
J-690	11.25	1	Demand	29.83	Fixed	29.83	133.81	53.13
J-730	19.31	1	Demand	134.97	Fixed	134.97	134.28	49.84
J-760	9.70	1	Demand	0.00	Fixed	0.00	133.98	53.88
J-770	15.00	1	Demand	43.20	Fixed	43.20	133.94	51.56
J-800	18.80	1	Demand	225.21	Fixed	225.21	134.75	50.26
J-810	21.47	1	Demand	33.81	Fixed	33.81	134.40	48.96
J-820	20.20	1	Demand	83.83	Fixed	83.83	134.33	49.48
J-830	17.95	1	Demand	122.08	Fixed	122.08	134.03	50.32



# Scenario: Phase 3 Run 1 MDD-100%GW

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen-Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-1550	449.00	30	125.0	0.00	Open	238.87	0.00	0.00	false	0.11
P-1540	395.00	30	125.0	0.00	Open	238.87	0.00	0.00	false	0.11
P-1270	257.00	24	125.0	0.00	Open	2,198.94	0.10	0.40	false	1.56
P-1060	1,125.00	12	125.0	0.00	Open	-136.86	0.08	0.07	false	0.39
P-1050	1,053.00	30	125.0	0.00	Open	1,579.11	0.08	0.07	false	0.72
P-960	746.00	12	125.0	0.00	Open	-7.58	0.00	0.00	false	0.02
P-970	897.00	12	125.0	0.00	Open	-32.98	0.00	0.00	false	0.09
P-950	402.00	12	125.0	0.00	Open	26.66	0.00	0.00	false	0.08
P-940	817.00	12	125.0	0.00	Open	79.66	0.02	0.03	false	0.23
P-590	1,013.00	12	125.0	0.00	Open	-26.66	0.00	0.00	false	0.08
P-600	659.00	12	125.0	0.00	Open	3.17	0.00	0.00	false	0.01
P-680	726.00	12	125.0	0.00	Open	179.18	0.08	0.11	false	0.51
P-3	527.00	30	125.0	0.00	Open	102.45	0.00	0.00	false	0.05
P-22	900.00	12	125.0	0.00	Open	-88.79	0.03	0.03	false	0.25
P-23	940.00	12	125.0	0.00	Open	86.73	0.03	0.03	false	0.25
P-24	1,437.00	12	125.0	0.00	Open	-99.89	0.05	0.04	false	0.28
P-25	1,528.00	12	125.0	0.00	Open	-96.63	0.05	0.04	false	0.27
P-26	463.00	12	125.0	0.00	Open	160.51	0.04	0.09	false	0.46
P-28	825.00	12	125.0	0.00	Open	143.97	0.06	0.08	false	0.41
P-29	912.00	12	125.0	0.00	Open	136.39	0.06	0.07	false	0.39
P-30	935.00	24	125.0	0.00	Open	1,973.73	0.31	0.33	false	1.40
P-31	502.00	12	125.0	0.00	Open	153.65	0.04	0.08	false	0.44
P-32	1,044.00	30	125.0	0.00	Open	1,650.45	0.08	0.08	false	0.75
P-33	1,076.00	12	125.0	0.00	Open	145.84	0.08	0.08	false	0.41
P-34	1,740.00	30	125.0	0.00	Open	-1,450.21	0.11	0.06	false	0.66
P-35	1,727.00	12	125.0	0.00	Open	130.78	0.11	0.06	false	0.37
P-36	2,395.00	30	125.0	0.00	Open	1,212.73	0.11	0.04	false	0.55
P-37	2,406.00	12	125.0	0.00	Open	-109.16	0.11	0.04	false	0.31
P-38	1,120.00	30	125.0	0.00	Open	965.52	0.03	0.03	false	0.44
P-39	1,119.00	12	125.0	0.00	Open	86.76	0.03	0.03	false	0.25
P-40	1,551.00	30	125.0	0.00	Open	852.75	0.04	0.02	false	0.39
P-41	1,519.00	12	125.0	0.00	Open	-77.46	0.04	0.02	false	0.22
P-42	1,335.00	30	125.0	0.00	Open	-408.53	0.01	0.01	false	0.19
P-50	989.00	12	125.0	0.00	Open	176.56	0.11	0.11	false	0.50
P-56	1,373.00	12	125.0	0.00	Open	55.22	0.02	0.01	false	0.16
P-57	818.00	12	125.0	0.00	Open	-154.76	0.07	0.09	false	0.44
P-60	1,264.00	12	125.0	0.00	Open	-99.98	0.05	0.04	false	0.28
P-65	1,029.00	12	125.0	0.00	Open	66.18	0.02	0.02	false	0.19
P-67	900.00	12	125.0	0.00	Open	66.68	0.02	0.02	false	0.19
P-69	773.00	12	125.0	0.00	Open	134.10	0.05	0.07	false	0.38
P-72	823.00	12	125.0	0.00	Open	110.68	0.04	0.05	false	0.31
P-68	100.00	24	125.0	0.00	Open	-2,513.16	0.05	0.51	true	1.78
P-71	1.00	24	125.0	0.00	Open	-2,513.16	0.00	0.52	true	1.78
P-74	100.00	30	125.0	0.00	Open	0.00	0.00	0.00	true	0.00
P-75	3.00	30	125.0	0.00	Closed	0.00	0.00	0.00	true	0.00
P-76	795.00	12	125.0	0.00	Open	132.09	0.05	0.06	false	0.37
P-77	801.00	12	125.0	0.00	Open	112.31	0.04	0.05	false	0.32
P-78	1,001.00	12	125.0	0.00	Open	67.17	0.02	0.02	false	0.19
P-79	900.00	12	125.0	0.00	Open	66.68	0.02	0.02	false	0.19
P-94	1,337.00	12	125.0	0.00	Open	36.66	0.01	0.01	false	0.10
P-97	2,986.00	24	125.0	0.00	Open	0.00	0.00	0.00	false	0.00

Project Engineer: Mark Smith

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# Scenario: Phase 3 Run 1 MDD-100%GW

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-98	113.00	6	130.0	0.00	Closed	0.00	0.00	0.00	false	0.00
P-99	1,701.00	24	125.0	0.00	Open	0.00	0.00	0.00	false	0.00
P-101	5,665.00	24	125.0	0.00	Open	-2,285.00	2.44	0.43	false	1.62
P-102	224.00	24	125.0	0.00	Open	-2,285.00	0.10	0.43	false	1.62
P-103	1.00	24	125.0	0.00	Open	-2,285.00	0.00	0.43	true	1.62
P-104	3,645.00	16	125.0	0.00	Open	2,285.00	11.30	3.10	false	3.65
P-105	5,402.00	16	125.0	0.00	Open	2,285.00	16.75	3.10	false	3.65
P-106	1,283.00	12	125.0	0.00	Open	314.22	0.41	0.32	false	0.89

**Scenario: Phase 3 Run 2 PHD-100%GW**  
**Steady State Analysis**  
**Junction Report**

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand Calculated (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-1	9.30	1	Demand	204.89	Fixed	204.89	127.38	51.19
J-3	19.50	Zone-1	Inflow	2,513.16	Fixed	-2,513.16	127.58	46.86
J-4	12.00	Zone-1	Demand	0.00	Fixed	0.00	127.40	50.03
J-9	12.00	Zone-1	Demand	0.00	Fixed	0.00	125.87	49.36
J-10	13.00	Zone-1	Demand	0.00	Fixed	0.00	125.87	48.93
J-11	13.00	Zone-1	Demand	0.00	Fixed	0.00	125.87	48.93
J-12	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.30	49.99
J-13	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.40	50.03
J-14	13.00	Zone-1	Demand	0.00	Fixed	0.00	114.56	44.03
J-15	13.00	Zone-1	Demand	2,285.00	Fixed	2,285.00	97.81	36.77
J-160	18.85	1	Demand	0.00	Fixed	0.00	127.53	47.11
J-170	20.42	1	Demand	354.97	Fixed	354.97	127.17	46.28
J-190	20.40	1	Demand	42.00	Fixed	42.00	126.60	46.04
J-260	23.21	1	Demand	351.05	Fixed	351.05	126.50	44.78
J-300	20.30	1	Demand	160.67	Fixed	160.67	127.14	46.32
J-320	16.00	1	Demand	518.20	Fixed	518.20	127.10	48.16
J-350	16.00	1	Demand	539.21	Fixed	539.21	127.09	48.16
J-380	11.30	1	Demand	153.16	Fixed	153.16	126.75	50.05
J-400	15.35	1	Demand	84.52	Fixed	84.52	127.12	48.45
J-410	15.27	1	Demand	179.28	Fixed	179.28	126.80	48.35
J-450	18.00	1	Demand	266.70	Fixed	266.70	126.67	47.11
J-460	15.30	1	Demand	0.00	Fixed	0.00	126.73	48.31
J-470	12.09	1	Demand	40.64	Fixed	40.64	126.60	49.64
J-480	10.60	1	Demand	0.00	Fixed	0.00	126.53	50.26
J-490	14.80	1	Demand	59.66	Fixed	59.66	126.52	48.43
J-500	11.10	1	Demand	59.62	Fixed	59.62	126.52	50.04
J-510	10.50	1	Demand	199.09	Fixed	199.09	126.61	50.34
J-540	10.82	1	Demand	54.30	Fixed	54.30	127.21	50.46
J-550	11.60	1	Demand	48.83	Fixed	48.83	126.89	49.98
J-570	9.70	1	Demand	272.85	Fixed	272.85	127.30	50.98
J-680	13.40	1	Demand	90.84	Fixed	90.84	126.54	49.05
J-690	11.25	1	Demand	59.66	Fixed	59.66	126.54	49.98
J-730	19.31	1	Demand	269.94	Fixed	269.94	127.12	46.74
J-760	9.70	1	Demand	0.00	Fixed	0.00	127.25	50.96
J-770	15.00	1	Demand	86.40	Fixed	86.40	126.93	48.53
J-800	18.80	1	Demand	450.42	Fixed	450.42	127.42	47.09
J-810	21.47	1	Demand	67.61	Fixed	67.61	127.02	45.76
J-820	20.20	1	Demand	167.67	Fixed	167.67	126.80	46.21
J-830	17.95	1	Demand	244.16	Fixed	244.16	127.10	47.32

# Scenario: Phase 3 Run 2 PHD-100%GW

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen-Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-1550	449.00	30	125.0	0.00	Open	-2,035.42	0.05	0.12	false	0.92
P-1540	395.00	30	125.0	0.00	Open	-2,035.42	0.05	0.12	false	0.92
P-1270	257.00	24	125.0	0.00	Open	2,221.88	0.10	0.41	false	1.58
P-1060	1,125.00	12	125.0	0.00	Open	-73.28	0.02	0.02	false	0.21
P-1050	1,053.00	30	125.0	0.00	Open	845.49	0.02	0.02	false	0.38
P-960	746.00	12	125.0	0.00	Open	-2.71	0.00	0.00	false	0.01
P-970	897.00	12	125.0	0.00	Open	-66.73	0.02	0.02	false	0.19
P-950	402.00	12	125.0	0.00	Open	52.56	0.00	0.01	false	0.15
P-940	817.00	12	125.0	0.00	Open	146.10	0.06	0.08	false	0.41
P-590	1,013.00	12	125.0	0.00	Open	-52.56	0.01	0.01	false	0.15
P-600	659.00	12	125.0	0.00	Open	7.10	0.00	0.00	false	0.02
P-680	726.00	12	125.0	0.00	Open	371.59	0.32	0.44	false	1.05
P-3	527.00	30	125.0	0.00	Open	-2,308.27	0.08	0.15	false	1.05
P-22	900.00	12	125.0	0.00	Open	-177.58	0.10	0.11	false	0.50
P-23	940.00	12	125.0	0.00	Open	173.46	0.10	0.11	false	0.49
P-24	1,437.00	12	125.0	0.00	Open	-199.78	0.20	0.14	false	0.57
P-25	1,528.00	12	125.0	0.00	Open	-193.27	0.20	0.13	false	0.55
P-26	463.00	12	125.0	0.00	Open	321.02	0.15	0.33	false	0.91
P-28	825.00	12	125.0	0.00	Open	287.95	0.22	0.27	false	0.82
P-29	912.00	12	125.0	0.00	Open	272.77	0.22	0.25	false	0.77
P-30	935.00	24	125.0	0.00	Open	1,771.46	0.25	0.27	false	1.26
P-31	502.00	12	125.0	0.00	Open	307.31	0.15	0.31	false	0.87
P-32	1,044.00	30	125.0	0.00	Open	991.79	0.03	0.03	false	0.45
P-33	1,076.00	12	125.0	0.00	Open	87.64	0.03	0.03	false	0.25
P-34	1,740.00	30	125.0	0.00	Open	-595.15	0.02	0.01	false	0.27
P-35	1,727.00	12	125.0	0.00	Open	53.67	0.02	0.01	false	0.15
P-36	2,395.00	30	125.0	0.00	Open	118.59	0.00	0.00	false	0.05
P-37	2,406.00	12	125.0	0.00	Open	-12.03	0.00	0.00	false	0.03
P-38	1,120.00	30	125.0	0.00	Open	-374.90	0.01	0.01	false	0.17
P-39	1,119.00	12	125.0	0.00	Open	-33.69	0.01	0.01	false	0.10
P-40	1,551.00	30	125.0	0.00	Open	-598.39	0.02	0.01	false	0.27
P-41	1,519.00	12	125.0	0.00	Open	54.36	0.02	0.01	false	0.15
P-42	1,335.00	30	125.0	0.00	Open	1,476.98	0.09	0.06	false	0.67
P-50	989.00	12	125.0	0.00	Open	339.89	0.37	0.37	false	0.96
P-56	1,373.00	12	125.0	0.00	Open	123.67	0.08	0.06	false	0.35
P-57	818.00	12	125.0	0.00	Open	-322.76	0.27	0.34	false	0.92
P-60	1,264.00	12	125.0	0.00	Open	-186.74	0.15	0.12	false	0.53
P-65	1,029.00	12	125.0	0.00	Open	132.36	0.07	0.06	false	0.38
P-67	900.00	12	125.0	0.00	Open	133.35	0.06	0.07	false	0.38
P-69	773.00	12	125.0	0.00	Open	268.20	0.18	0.24	false	0.76
P-72	823.00	12	125.0	0.00	Open	221.36	0.14	0.17	false	0.63
P-68	100.00	24	125.0	0.00	Open	-2,513.16	0.05	0.51	true	1.78
P-71	1.00	24	125.0	0.00	Closed	0.00	0.00	0.00	true	0.00
P-74	100.00	30	125.0	0.00	Open	-2,513.16	0.02	0.17	true	1.14
P-75	3.00	30	125.0	0.00	Open	-2,513.16	0.00	0.17	true	1.14
P-76	795.00	12	125.0	0.00	Open	264.17	0.18	0.23	false	0.75
P-77	801.00	12	125.0	0.00	Open	224.62	0.14	0.17	false	0.64
P-78	1,001.00	12	125.0	0.00	Open	134.34	0.07	0.07	false	0.38
P-79	900.00	12	125.0	0.00	Open	133.35	0.06	0.07	false	0.38
P-94	1,337.00	12	125.0	0.00	Open	-132.55	0.09	0.06	false	0.38
P-97	2,986.00	24	125.0	0.00	Open	0.00	0.00	0.00	false	0.00

# Scenario: Phase 3 Run 2 PHD-100%GW

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-98	113.00	6	130.0	0.00	Closed	0.00	0.00	0.00	false	0.00
P-99	1,701.00	24	125.0	0.00	Open	0.00	0.00	0.00	false	0.00
P-101	5,665.00	24	125.0	0.00	Open	-2,285.00	2.44	0.43	false	1.62
P-102	224.00	24	125.0	0.00	Open	-2,285.00	0.10	0.43	false	1.62
P-103	1.00	24	125.0	0.00	Open	-2,285.00	0.00	0.43	true	1.62
P-104	3,645.00	16	125.0	0.00	Open	2,285.00	11.30	3.10	false	3.65
P-105	5,402.00	16	125.0	0.00	Open	2,285.00	16.75	3.10	false	3.65
P-106	1,283.00	12	125.0	0.00	Open	291.28	0.36	0.28	false	0.83

# Scenario: Phase 3 Run 3 PHD=100%SW(S)

## Steady State Analysis

### Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-1	9.30	1	Demand	204.89	Fixed	204.89	127.34	51.17
J-3	19.50	Zone-1	Demand	0.00	Fixed	0.00	124.94	45.71
J-4	12.00	Zone-1	Demand	0.00	Fixed	0.00	127.40	50.03
J-9	12.00	Zone-1	Demand	2,513.16	Fixed	2,513.16	115.98	45.08
J-10	13.00	Zone-1	Demand	0.00	Fixed	0.00	117.51	45.31
J-11	13.00	Zone-1	Demand	0.00	Fixed	0.00	118.39	45.69
J-12	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.02	49.86
J-13	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.40	50.03
J-14	13.00	Zone-1	Demand	0.00	Fixed	0.00	107.08	40.79
J-15	13.00	Zone-1	Demand	2,285.00	Fixed	2,285.00	90.33	33.52
J-160	18.85	1	Demand	0.00	Fixed	0.00	124.94	45.99
J-170	20.42	1	Demand	354.97	Fixed	354.97	124.95	45.32
J-190	20.40	1	Demand	42.00	Fixed	42.00	124.37	45.07
J-260	23.21	1	Demand	351.05	Fixed	351.05	124.27	43.81
J-300	20.30	1	Demand	160.67	Fixed	160.67	125.01	45.39
J-320	16.00	1	Demand	518.20	Fixed	518.20	125.22	47.35
J-350	16.00	1	Demand	539.21	Fixed	539.21	125.54	47.49
J-380	11.30	1	Demand	153.16	Fixed	153.16	125.83	49.65
J-400	15.35	1	Demand	84.52	Fixed	84.52	126.11	48.02
J-410	15.27	1	Demand	179.28	Fixed	179.28	125.79	47.91
J-450	18.00	1	Demand	266.70	Fixed	266.70	125.66	46.67
J-460	15.30	1	Demand	0.00	Fixed	0.00	125.72	47.87
J-470	12.09	1	Demand	40.64	Fixed	40.64	125.74	49.27
J-480	10.60	1	Demand	0.00	Fixed	0.00	125.70	49.90
J-490	14.80	1	Demand	59.66	Fixed	59.66	125.69	48.07
J-500	11.10	1	Demand	59.62	Fixed	59.62	125.69	49.68
J-510	10.50	1	Demand	199.09	Fixed	199.09	125.85	50.01
J-540	10.82	1	Demand	54.30	Fixed	54.30	126.59	50.19
J-550	11.60	1	Demand	48.83	Fixed	48.83	126.20	49.68
J-570	9.70	1	Demand	272.85	Fixed	272.85	127.03	50.87
J-680	13.40	1	Demand	90.84	Fixed	90.84	125.71	48.69
J-690	11.25	1	Demand	59.66	Fixed	59.66	125.71	49.62
J-730	19.31	1	Demand	269.94	Fixed	269.94	125.07	45.85
J-760	9.70	1	Demand	0.00	Fixed	0.00	126.80	50.76
J-770	15.00	1	Demand	86.40	Fixed	86.40	125.93	48.09
J-800	18.80	1	Demand	450.42	Fixed	450.42	124.93	46.01
J-810	21.47	1	Demand	67.61	Fixed	67.61	124.80	44.79
J-820	20.20	1	Demand	167.67	Fixed	167.67	124.57	45.25
J-830	17.95	1	Demand	244.16	Fixed	244.16	125.76	46.74

# Scenario: Phase 3 Run 3 PHD-100%SW(S)

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen-Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-1550	449.00	30	125.0	0.00	Open	-4,548.58	0.23	0.52	false	2.06
P-1540	395.00	30	125.0	0.00	Open	-4,548.58	0.21	0.52	false	2.06
P-1270	257.00	24	125.0	0.00	Open	53.81	0.00	0.00	false	0.04
P-1060	1,125.00	12	125.0	0.00	Open	127.16	0.07	0.06	false	0.36
P-1050	1,053.00	30	125.0	0.00	Open	-1,467.23	0.07	0.06	false	0.67
P-960	746.00	12	125.0	0.00	Open	38.28	0.00	0.01	false	0.11
P-970	897.00	12	125.0	0.00	Open	-71.21	0.02	0.02	false	0.20
P-950	402.00	12	125.0	0.00	Open	48.07	0.00	0.01	false	0.14
P-940	817.00	12	125.0	0.00	Open	100.63	0.03	0.04	false	0.29
P-590	1,013.00	12	125.0	0.00	Open	-48.07	0.01	0.01	false	0.14
P-600	659.00	12	125.0	0.00	Open	11.59	0.00	0.00	false	0.03
P-680	726.00	12	125.0	0.00	Open	417.07	0.39	0.54	false	1.18
P-3	527.00	30	125.0	0.00	Open	-4,821.43	0.30	0.58	false	2.19
P-22	900.00	12	125.0	0.00	Open	-177.58	0.10	0.11	false	0.50
P-23	940.00	12	125.0	0.00	Open	173.46	0.10	0.11	false	0.49
P-24	1,437.00	12	125.0	0.00	Open	-199.78	0.20	0.14	false	0.57
P-25	1,528.00	12	125.0	0.00	Open	-193.27	0.20	0.13	false	0.55
P-26	463.00	12	125.0	0.00	Open	321.02	0.15	0.33	false	0.91
P-28	825.00	12	125.0	0.00	Open	287.95	0.22	0.27	false	0.82
P-29	912.00	12	125.0	0.00	Open	272.77	0.22	0.25	false	0.77
P-30	935.00	24	125.0	0.00	Open	-396.61	0.02	0.02	false	0.28
P-31	502.00	12	125.0	0.00	Open	307.31	0.15	0.31	false	0.87
P-32	1,044.00	30	125.0	0.00	Open	-1,317.32	0.05	0.05	false	0.60
P-33	1,076.00	12	125.0	0.00	Open	-116.41	0.05	0.05	false	0.33
P-34	1,740.00	30	125.0	0.00	Open	1,710.11	0.15	0.08	false	0.78
P-35	1,727.00	12	125.0	0.00	Open	-154.22	0.15	0.09	false	0.44
P-36	2,395.00	30	125.0	0.00	Open	-2,186.63	0.32	0.13	false	0.99
P-37	2,406.00	12	125.0	0.00	Open	195.91	0.32	0.13	false	0.56
P-38	1,120.00	30	125.0	0.00	Open	-2,680.84	0.22	0.20	false	1.22
P-39	1,119.00	12	125.0	0.00	Open	-240.91	0.22	0.20	false	0.68
P-40	1,551.00	30	125.0	0.00	Open	-2,902.28	0.35	0.23	false	1.32
P-41	1,519.00	12	125.0	0.00	Open	263.63	0.35	0.23	false	0.75
P-42	1,335.00	30	125.0	0.00	Open	3,741.18	0.48	0.36	false	1.70
P-50	989.00	12	125.0	0.00	Open	294.42	0.28	0.28	false	0.84
P-56	1,373.00	12	125.0	0.00	Open	169.15	0.14	0.10	false	0.48
P-57	818.00	12	125.0	0.00	Open	-368.23	0.35	0.43	false	1.04
P-60	1,264.00	12	125.0	0.00	Open	-141.26	0.09	0.07	false	0.40
P-65	1,029.00	12	125.0	0.00	Open	132.36	0.07	0.06	false	0.38
P-67	900.00	12	125.0	0.00	Open	133.35	0.06	0.07	false	0.38
P-69	773.00	12	125.0	0.00	Open	268.20	0.18	0.24	false	0.76
P-72	823.00	12	125.0	0.00	Open	221.36	0.14	0.17	false	0.63
P-68	100.00	24	125.0	0.00	Open	0.00	0.00	0.00	true	0.00
P-71	1.00	24	125.0	0.00	Closed	0.00	0.00	0.00	true	0.00
P-74	100.00	30	125.0	0.00	Open	-5,026.32	0.06	0.62	true	2.28
P-75	3.00	30	125.0	0.00	Open	-5,026.32	0.00	0.63	true	2.28
P-76	795.00	12	125.0	0.00	Open	264.17	0.18	0.23	false	0.75
P-77	801.00	12	125.0	0.00	Open	224.62	0.14	0.17	false	0.64
P-78	1,001.00	12	125.0	0.00	Open	134.34	0.07	0.07	false	0.38
P-79	900.00	12	125.0	0.00	Open	133.35	0.06	0.07	false	0.38
P-94	1,337.00	12	125.0	0.00	Open	-336.04	0.48	0.36	false	0.95
P-97	2,986.00	24	125.0	0.00	Open	-2,513.16	1.53	0.51	false	1.78

Project Engineer: Mark Smith

WaterCAD v6.5 [6.5120]

# Scenario: Phase 3 Run 3 PHD-100%SW(S)

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-98	113.00	6	130.0	0.00	Closed	0.00	0.00	0.00	false	0.00
P-99	1,701.00	24	125.0	0.00	Open	-2,513.16	0.87	0.51	false	1.78
P-101	5,665.00	24	125.0	0.00	Open	-4,798.16	9.63	1.70	false	3.40
P-102	224.00	24	125.0	0.00	Open	-4,798.16	0.38	1.70	false	3.40
P-103	1.00	24	125.0	0.00	Open	-4,798.16	0.00	1.69	true	3.40
P-104	3,645.00	16	125.0	0.00	Open	2,285.00	11.30	3.10	false	3.65
P-105	5,402.00	16	125.0	0.00	Open	2,285.00	16.75	3.10	false	3.65
P-106	1,283.00	12	125.0	0.00	Open	-53.81	0.02	0.01	false	0.15



# Scenario: Phase 3 Run 4 MDD 100%SW(S) Multi FF

## Fire Flow Analysis

### Fire Flow Report

Label	Fire Flow Balanced?	Satisfies Fire Flow Constraints?	Needed Fire Flow (gpm)	Available Fire Flow (gpm)	Total Flow Needed (gpm)	Total Flow Available (gpm)	Calculated Residual Pressure (psi)	Calculated Minimum System Pressure (psi)	Minimum System Junction
J-1	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-3	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-4	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-9	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-10	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-11	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-12	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-13	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-14	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-15	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-160	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-170	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-190	true	false	4,000.00	4,000.00	4,021.00	4,021.00	29.75	28.52	J-260
J-260	true	false	4,000.00	4,000.00	4,175.52	4,175.52	24.28	29.75	J-190
J-300	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-320	true	false	4,000.00	4,000.00	4,259.10	4,259.10	45.94	33.52	J-15
J-350	true	false	4,000.00	4,000.00	4,269.60	4,269.60	46.53	33.52	J-15
J-380	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-400	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-410	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-450	true	false	4,000.00	4,000.00	4,133.35	4,133.35	30.12	33.52	J-15
J-460	true	true	4,000.00	4,000.00	4,000.00	4,000.00	35.37	33.52	J-15
J-470	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-480	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-490	true	true	4,000.00	4,000.00	4,029.83	4,029.83	27.45	31.75	J-500
J-500	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-510	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-540	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-550	true	false	4,000.00	4,000.00	4,024.42	4,024.42	42.31	33.52	J-15
J-570	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-680	true	false	4,000.00	4,000.00	4,045.42	4,045.42	33.75	33.52	J-15
J-690	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-730	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-760	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-770	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-800	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-810	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-820	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-830	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A

# Scenario: Phase 3 Run 5 MDD 100%SW(S) Onsite FF @ J6, 7, & 8

## Steady State Analysis

### Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-1	9.30	1	Demand	102.45	Fixed	102.45	127.30	51.15
J-3	19.50	Zone-1	Demand	0.00	Fixed	0.00	120.06	43.60
J-4	12.00	Zone-1	Demand	0.00	Fixed	0.00	127.40	50.03
J-5	21.50	Zone-1	Demand	0.00	Fixed	0.00	85.41	27.71
J-6	21.00	Zone-1	Demand	1,500.00	Fixed	1,500.00	70.99	21.67
J-7	21.00	Zone-1	Demand	1,500.00	Fixed	1,500.00	71.26	21.79
J-8	21.00	Zone-1	Demand	1,000.00	Fixed	1,000.00	71.95	22.09
J-9	12.00	Zone-1	Demand	2,513.16	Fixed	2,513.16	115.98	45.08
J-10	13.00	Zone-1	Demand	0.00	Fixed	0.00	117.51	45.31
J-11	13.00	Zone-1	Demand	0.00	Fixed	0.00	118.39	45.69
J-12	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.02	49.86
J-13	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.40	50.03
J-14	13.00	Zone-1	Demand	0.00	Fixed	0.00	107.08	40.79
J-15	13.00	Zone-1	Demand	2,285.00	Fixed	2,285.00	90.33	33.52
J-160	18.85	1	Demand	0.00	Fixed	0.00	120.06	43.88
J-170	20.42	1	Demand	177.49	Fixed	177.49	120.07	43.20
J-190	20.40	1	Demand	21.00	Fixed	21.00	108.80	38.32
J-200	20.50	1	Demand	0.00	Fixed	0.00	118.31	42.40
J-210	23.60	1	Demand	0.00	Fixed	0.00	114.50	39.41
J-220	24.75	1	Demand	0.00	Fixed	0.00	102.53	33.72
J-230	24.20	1	Demand	0.00	Fixed	0.00	90.73	28.84
J-240	21.00	1	Demand	0.00	Fixed	0.00	85.49	27.96
J-260	23.21	1	Demand	175.52	Fixed	175.52	105.32	35.60
J-300	20.30	1	Demand	80.33	Fixed	80.33	120.56	43.47
J-320	16.00	1	Demand	259.10	Fixed	259.10	121.98	45.94
J-350	16.00	1	Demand	269.60	Fixed	269.60	123.33	46.53
J-380	11.30	1	Demand	76.58	Fixed	76.58	125.03	49.30
J-400	15.35	1	Demand	42.26	Fixed	42.26	125.03	47.55
J-410	15.27	1	Demand	89.64	Fixed	89.64	124.94	47.54
J-450	18.00	1	Demand	133.35	Fixed	133.35	124.91	46.35
J-460	15.30	1	Demand	0.00	Fixed	0.00	124.92	47.52
J-470	12.09	1	Demand	20.32	Fixed	20.32	125.06	48.98
J-480	10.60	1	Demand	0.00	Fixed	0.00	125.10	49.64
J-490	14.80	1	Demand	29.83	Fixed	29.83	125.10	47.82
J-500	11.10	1	Demand	29.81	Fixed	29.81	125.11	49.42
J-510	10.50	1	Demand	99.54	Fixed	99.54	125.39	49.81
J-540	10.82	1	Demand	27.15	Fixed	27.15	125.98	49.93
J-550	11.60	1	Demand	24.42	Fixed	24.42	125.69	49.46
J-570	9.70	1	Demand	136.42	Fixed	136.42	126.78	50.76
J-680	13.40	1	Demand	45.42	Fixed	45.42	125.09	48.42
J-690	11.25	1	Demand	29.83	Fixed	29.83	125.13	49.37
J-730	19.31	1	Demand	134.97	Fixed	134.97	121.08	44.12
J-760	9.70	1	Demand	0.00	Fixed	0.00	126.36	50.57
J-770	15.00	1	Demand	43.20	Fixed	43.20	124.98	47.68
J-800	18.80	1	Demand	225.21	Fixed	225.21	120.06	43.90
J-810	21.47	1	Demand	33.81	Fixed	33.81	118.05	41.87
J-820	20.20	1	Demand	83.83	Fixed	83.83	114.50	40.88
J-830	17.95	1	Demand	122.08	Fixed	122.08	124.03	45.99

# Scenario: Phase 3 Run 5 MDD 100%SW(S) Onsite FF @ J6, 7, & 8

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen-Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-1550	449.00	30	125.0	0.00	Open	-6,274.29	0.42	0.94	false	2.85
P-1540	395.00	30	125.0	0.00	Open	-6,274.29	0.37	0.94	false	2.85
P-1270	257.00	24	125.0	0.00	Open	27.94	0.00	0.00	false	0.02
P-1060	1,125.00	12	125.0	0.00	Open	382.60	0.52	0.46	false	1.09
P-1050	1,053.00	30	125.0	0.00	Open	-4,414.59	0.52	0.49	false	2.00
P-960	746.00	12	125.0	0.00	Open	119.44	0.04	0.05	false	0.34
P-970	897.00	12	125.0	0.00	Open	-86.39	0.03	0.03	false	0.25
P-950	402.00	12	125.0	0.00	Open	-26.75	0.00	0.00	false	0.08
P-940	817.00	12	125.0	0.00	Open	-100.77	0.03	0.04	false	0.29
P-590	1,013.00	12	125.0	0.00	Open	26.75	0.00	0.00	false	0.08
P-600	659.00	12	125.0	0.00	Open	56.58	0.01	0.01	false	0.16
P-680	726.00	12	125.0	0.00	Open	359.62	0.30	0.41	false	1.02
P-230	1,475.00	12	125.0	0.00	Open	1,788.48	11.80	8.00	false	5.07
P-220	1,496.00	12	125.0	0.00	Open	1,788.48	11.97	8.00	false	5.07
P-200	753.00	12	125.0	0.00	Open	920.63	1.76	2.34	false	2.61
P-87	1,673.00	12	125.0	0.00	Open	2,211.52	19.83	11.85	false	6.27
P-3	527.00	30	125.0	0.00	Open	-6,410.71	0.52	0.98	false	2.91
P-20	1,680.00	12	125.0	0.00	Open	905.61	3.81	2.27	false	2.57
P-22	900.00	12	125.0	0.00	Open	-1,207.53	3.48	3.86	false	3.43
P-23	940.00	12	125.0	0.00	Open	1,179.51	3.48	3.70	false	3.35
P-24	1,437.00	12	125.0	0.00	Open	-1,223.98	5.69	3.96	false	3.47
P-25	1,528.00	12	125.0	0.00	Open	-1,184.06	5.69	3.73	false	3.36
P-26	463.00	12	125.0	0.00	Open	1,290.41	2.02	4.37	false	3.66
P-28	825.00	12	125.0	0.00	Open	1,279.65	3.55	4.30	false	3.63
P-29	912.00	12	125.0	0.00	Open	1,212.22	3.55	3.89	false	3.44
P-30	935.00	24	125.0	0.00	Open	-197.27	0.00	0.00	false	0.14
P-31	502.00	12	125.0	0.00	Open	1,235.27	2.02	4.03	false	3.50
P-32	1,044.00	30	125.0	0.00	Open	-4,333.89	0.50	0.47	false	1.97
P-33	1,076.00	12	125.0	0.00	Open	-382.97	0.50	0.46	false	1.09
P-34	1,740.00	30	125.0	0.00	Open	4,523.98	0.89	0.51	false	2.05
P-35	1,727.00	12	125.0	0.00	Open	-408.19	0.89	0.52	false	1.16
P-36	2,395.00	30	125.0	0.00	Open	-4,764.40	1.36	0.57	false	2.16
P-37	2,406.00	12	125.0	0.00	Open	426.87	1.36	0.56	false	1.21
P-38	1,120.00	30	125.0	0.00	Open	-5,010.61	0.70	0.62	false	2.27
P-39	1,119.00	12	125.0	0.00	Open	-450.26	0.70	0.62	false	1.28
P-40	1,551.00	30	125.0	0.00	Open	-5,118.05	1.00	0.65	false	2.32
P-41	1,519.00	12	125.0	0.00	Open	464.90	1.00	0.66	false	1.32
P-42	1,335.00	30	125.0	0.00	Open	5,402.65	0.95	0.71	false	2.45
P-50	989.00	12	125.0	0.00	Open	-3.88	0.00	0.00	false	0.01
P-56	1,373.00	12	125.0	0.00	Open	235.66	0.26	0.19	false	0.67
P-57	818.00	12	125.0	0.00	Open	-335.20	0.29	0.36	false	0.95
P-60	1,264.00	12	125.0	0.00	Open	80.46	0.03	0.03	false	0.23
P-65	1,029.00	12	125.0	0.00	Open	66.18	0.02	0.02	false	0.19
P-67	900.00	12	125.0	0.00	Open	66.68	0.02	0.02	false	0.19
P-69	773.00	12	125.0	0.00	Open	134.10	0.05	0.07	false	0.38
P-72	823.00	12	125.0	0.00	Open	110.68	0.04	0.05	false	0.31
P-68	100.00	24	125.0	0.00	Open	0.00	0.00	0.00	true	0.00
P-71	1.00	24	125.0	0.00	Closed	0.00	0.00	0.00	true	0.00
P-74	100.00	30	125.0	0.00	Open	-6,513.16	0.10	1.01	true	2.96
P-75	3.00	30	125.0	0.00	Open	-6,513.16	0.00	1.01	true	2.96
P-76	795.00	12	125.0	0.00	Open	132.09	0.05	0.06	false	0.37

# Scenario: Phase 3 Run 5 MDD 100%SW(S) Onsite FF @ J6, 7, & 8

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-77	801.00	12	125.0	0.00	Open	112.31	0.04	0.05	false	0.32
P-78	1,001.00	12	125.0	0.00	Open	67.17	0.02	0.02	false	0.19
P-79	900.00	12	125.0	0.00	Open	66.68	0.02	0.02	false	0.19
P-81	840.00	12	125.0	0.00	Open	867.85	1.76	2.10	false	2.46
P-82	1,761.00	12	125.0	0.00	Open	882.87	3.81	2.16	false	2.50
P-83	665.00	12	125.0	0.00	Open	1,788.48	5.32	8.00	false	5.07
P-84	775.00	12	125.0	0.00	Open	-172.13	0.08	0.10	false	0.49
P-85	139.00	12	125.0	0.00	Open	2,039.39	1.42	10.20	false	5.79
P-86	130.00	12	125.0	0.00	Open	1,960.61	1.23	9.48	false	5.56
P-90	345.00	12	125.0	0.00	Open	2,039.39	3.52	10.20	false	5.79
P-91	318.00	12	125.0	0.00	Open	539.39	0.28	0.87	false	1.53
P-92	320.00	12	125.0	0.00	Open	1,960.61	3.03	9.48	false	5.56
P-93	382.00	12	125.0	0.00	Open	-960.61	0.97	2.53	false	2.73
P-94	1,337.00	12	125.0	0.00	Open	-484.88	0.95	0.71	false	1.38
P-97	2,986.00	24	125.0	0.00	Open	-2,513.16	1.53	0.51	false	1.78
P-98	113.00	6	130.0	0.00	Closed	0.00	0.00	0.00	false	0.00
P-99	1,701.00	24	125.0	0.00	Open	-2,513.16	0.87	0.51	false	1.78
P-101	5,665.00	24	125.0	0.00	Open	-4,798.16	9.63	1.70	false	3.40
P-102	224.00	24	125.0	0.00	Open	-4,798.16	0.38	1.70	false	3.40
P-103	1.00	24	125.0	0.00	Open	-4,798.16	0.00	1.69	true	3.40
P-104	3,645.00	16	125.0	0.00	Open	2,285.00	11.30	3.10	false	3.65
P-105	5,402.00	16	125.0	0.00	Open	2,285.00	16.75	3.10	false	3.65
P-106	1,283.00	12	125.0	0.00	Open	-27.94	0.00	0.00	false	0.08

**Scenario: Phase 3 Run 6 MDD-100%GW Reservoir Fill**  
**Steady State Analysis**  
**Junction Report**

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-1	9.30	1	Demand	25.59	Fixed	25.59	133.07	53.66
J-3	19.50	Zone-1	Demand	0.00	Fixed	0.00	134.90	50.03
J-4	12.00	Zone-1	Demand	1,885.40	Fixed	1,885.40	133.06	52.48
J-9	12.00	Zone-1	Demand	0.00	Fixed	0.00	125.87	49.36
J-10	13.00	Zone-1	Demand	0.00	Fixed	0.00	125.87	48.93
J-11	13.00	Zone-1	Demand	0.00	Fixed	0.00	125.87	48.93
J-12	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.30	49.99
J-13	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.40	50.03
J-14	13.00	Zone-1	Demand	0.00	Fixed	0.00	114.56	44.03
J-15	13.00	Zone-1	Demand	2,285.00	Fixed	2,285.00	97.81	36.77
J-160	18.85	1	Demand	0.00	Fixed	0.00	134.85	50.29
J-170	20.42	1	Demand	44.33	Fixed	44.33	134.39	49.41
J-190	20.40	1	Demand	5.25	Fixed	5.25	134.38	49.41
J-260	23.21	1	Demand	43.84	Fixed	43.84	134.38	48.19
J-300	20.30	1	Demand	20.07	Fixed	20.07	134.26	49.40
J-320	16.00	1	Demand	64.72	Fixed	64.72	133.91	51.12
J-350	16.00	1	Demand	67.34	Fixed	67.34	133.63	51.00
J-380	11.30	1	Demand	19.13	Fixed	19.13	133.30	52.89
J-400	15.35	1	Demand	10.56	Fixed	10.56	133.34	51.15
J-410	15.27	1	Demand	22.39	Fixed	22.39	133.33	51.18
J-450	18.00	1	Demand	33.31	Fixed	33.31	133.33	50.00
J-460	15.30	1	Demand	0.00	Fixed	0.00	133.33	51.17
J-470	12.09	1	Demand	5.08	Fixed	5.08	133.26	52.53
J-480	10.60	1	Demand	0.00	Fixed	0.00	133.24	53.17
J-490	14.80	1	Demand	7.45	Fixed	7.45	133.24	51.35
J-500	11.10	1	Demand	7.45	Fixed	7.45	133.24	52.95
J-510	10.50	1	Demand	24.86	Fixed	24.86	133.22	53.20
J-540	10.82	1	Demand	6.78	Fixed	6.78	133.22	53.06
J-550	11.60	1	Demand	6.10	Fixed	6.10	133.22	52.73
J-570	9.70	1	Demand	34.08	Fixed	34.08	133.13	53.51
J-680	13.40	1	Demand	11.34	Fixed	11.34	133.24	51.95
J-690	11.25	1	Demand	7.45	Fixed	7.45	133.24	52.88
J-730	19.31	1	Demand	33.71	Fixed	33.71	134.13	49.78
J-760	9.70	1	Demand	0.00	Fixed	0.00	133.18	53.53
J-770	15.00	1	Demand	10.79	Fixed	10.79	133.34	51.30
J-800	18.80	1	Demand	56.25	Fixed	56.25	134.75	50.27
J-810	21.47	1	Demand	8.44	Fixed	8.44	134.39	48.95
J-820	20.20	1	Demand	20.94	Fixed	20.94	134.39	49.50
J-830	17.95	1	Demand	30.49	Fixed	30.49	133.51	50.10

# Scenario: Phase 3 Run 6 MDD-100%GW Reservoir Fill

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen-Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-1550	449.00	30	125.0	0.00	Open	1,945.07	0.05	0.11	false	0.88
P-1540	395.00	30	125.0	0.00	Open	1,945.07	0.04	0.11	false	0.88
P-1270	257.00	24	125.0	0.00	Open	2,181.36	0.10	0.39	false	1.55
P-1060	1,125.00	12	125.0	0.00	Open	-184.56	0.13	0.12	false	0.52
P-1050	1,053.00	30	125.0	0.00	Open	2,129.47	0.13	0.13	false	0.97
P-960	746.00	12	125.0	0.00	Open	-43.62	0.01	0.01	false	0.12
P-970	897.00	12	125.0	0.00	Open	11.05	0.00	0.00	false	0.03
P-950	402.00	12	125.0	0.00	Open	25.95	0.00	0.00	false	0.07
P-940	817.00	12	125.0	0.00	Open	80.91	0.02	0.03	false	0.23
P-590	1,013.00	12	125.0	0.00	Open	-25.95	0.00	0.00	false	0.07
P-600	659.00	12	125.0	0.00	Open	-18.50	0.00	0.00	false	0.05
P-680	726.00	12	125.0	0.00	Open	-16.25	0.00	0.00	false	0.05
P-3	527.00	30	125.0	0.00	Open	1,910.99	0.05	0.10	false	0.87
P-22	900.00	12	125.0	0.00	Open	-22.18	0.00	0.00	false	0.06
P-23	940.00	12	125.0	0.00	Open	21.66	0.00	0.00	false	0.06
P-24	1,437.00	12	125.0	0.00	Open	-24.95	0.00	0.00	false	0.07
P-25	1,528.00	12	125.0	0.00	Open	-24.14	0.00	0.00	false	0.07
P-26	463.00	12	125.0	0.00	Open	40.09	0.00	0.01	false	0.11
P-28	825.00	12	125.0	0.00	Open	35.96	0.00	0.01	false	0.10
P-29	912.00	12	125.0	0.00	Open	34.07	0.00	0.01	false	0.10
P-30	935.00	24	125.0	0.00	Open	2,125.11	0.35	0.38	false	1.51
P-31	502.00	12	125.0	0.00	Open	38.38	0.00	0.01	false	0.11
P-32	1,044.00	30	125.0	0.00	Open	2,144.59	0.13	0.13	false	0.97
P-33	1,076.00	12	125.0	0.00	Open	189.51	0.13	0.13	false	0.54
P-34	1,740.00	30	125.0	0.00	Open	-2,091.68	0.21	0.12	false	0.95
P-35	1,727.00	12	125.0	0.00	Open	188.63	0.21	0.12	false	0.54
P-36	2,395.00	30	125.0	0.00	Open	2,033.41	0.28	0.12	false	0.92
P-37	2,406.00	12	125.0	0.00	Open	-182.19	0.28	0.12	false	0.52
P-38	1,120.00	30	125.0	0.00	Open	1,971.12	0.12	0.11	false	0.89
P-39	1,119.00	12	125.0	0.00	Open	177.13	0.12	0.11	false	0.50
P-40	1,551.00	30	125.0	0.00	Open	1,941.41	0.17	0.11	false	0.88
P-41	1,519.00	12	125.0	0.00	Open	-176.35	0.17	0.11	false	0.50
P-42	1,335.00	30	125.0	0.00	Open	-1,776.19	0.12	0.09	false	0.81
P-50	989.00	12	125.0	0.00	Open	105.11	0.04	0.04	false	0.30
P-56	1,373.00	12	125.0	0.00	Open	-47.22	0.01	0.01	false	0.13
P-57	818.00	12	125.0	0.00	Open	22.35	0.00	0.00	false	0.06
P-60	1,264.00	12	125.0	0.00	Open	-85.98	0.04	0.03	false	0.24
P-65	1,029.00	12	125.0	0.00	Open	16.53	0.00	0.00	false	0.05
P-67	900.00	12	125.0	0.00	Open	16.65	0.00	0.00	false	0.05
P-69	773.00	12	125.0	0.00	Open	33.50	0.00	0.01	false	0.10
P-72	823.00	12	125.0	0.00	Open	27.65	0.00	0.00	false	0.08
P-68	100.00	24	125.0	0.00	Open	-2,513.16	0.05	0.51	true	1.78
P-71	1.00	24	125.0	0.00	Open	-2,513.16	0.00	0.52	true	1.78
P-74	100.00	30	125.0	0.00	Open	1,885.40	0.01	0.10	true	0.86
P-75	3.00	30	125.0	0.00	Closed	0.00	0.00	0.00	true	0.00
P-76	795.00	12	125.0	0.00	Open	32.99	0.00	0.00	false	0.09
P-77	801.00	12	125.0	0.00	Open	28.05	0.00	0.00	false	0.08
P-78	1,001.00	12	125.0	0.00	Open	16.78	0.00	0.00	false	0.05
P-79	900.00	12	125.0	0.00	Open	16.65	0.00	0.00	false	0.05
P-94	1,337.00	12	125.0	0.00	Open	159.41	0.12	0.09	false	0.45
P-97	2,986.00	24	125.0	0.00	Open	0.00	0.00	0.00	false	0.00

**Scenario: Phase 3 Run 6 MDD-100%GW Reservoir Fill**  
**Steady State Analysis**  
**Pipe Report**

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-98	113.00	6	130.0	0.00	Closed	0.00	0.00	0.00	false	0.00
P-99	1,701.00	24	125.0	0.00	Open	0.00	0.00	0.00	false	0.00
P-101	5,665.00	24	125.0	0.00	Open	-2,285.00	2.44	0.43	false	1.62
P-102	224.00	24	125.0	0.00	Open	-2,285.00	0.10	0.43	false	1.62
P-103	1.00	24	125.0	0.00	Open	-2,285.00	0.00	0.43	true	1.62
P-104	3,645.00	16	125.0	0.00	Open	2,285.00	11.30	3.10	false	3.65
P-105	5,402.00	16	125.0	0.00	Open	2,285.00	16.75	3.10	false	3.65
P-106	1,283.00	12	125.0	0.00	Open	331.80	0.45	0.35	false	0.94

# Scenario: Phase 4 Run 1 MDD-100%GW

## Steady State Analysis

### Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-1	9.30	1	Demand	0.00	Fixed	0.00	133.19	53.71
J-3	19.50	Zone-1	Demand	0.00	Fixed	0.00	134.90	50.03
J-4	12.00	Zone-1	Demand	0.00	Fixed	0.00	133.19	52.54
J-5	21.50	Zone-1	Demand	0.00	Fixed	0.00	133.79	48.68
J-6	21.00	Zone-1	Demand	0.00	Fixed	0.00	129.20	46.91
J-7	21.00	Zone-1	Demand	0.00	Fixed	0.00	129.20	46.91
J-8	21.00	Zone-1	Demand	0.00	Fixed	0.00	129.20	46.91
J-9	12.00	Zone-1	Demand	0.00	Fixed	0.00	125.87	49.36
J-10	13.00	Zone-1	Demand	0.00	Fixed	0.00	125.87	48.93
J-11	13.00	Zone-1	Demand	0.00	Fixed	0.00	125.87	48.93
J-12	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.30	49.99
J-13	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.40	50.03
J-14	13.00	Zone-1	Demand	0.00	Fixed	0.00	114.56	44.03
J-15	13.00	Zone-1	Demand	2,285.00	Fixed	2,285.00	97.81	36.77
J-80	24.00	1	Demand	67.16	Fixed	67.16	133.96	47.67
J-90	26.30	1	Demand	33.32	Fixed	33.32	134.10	46.73
J-100	22.90	1	Demand	49.08	Fixed	49.08	134.21	48.26
J-130	20.10	1	Demand	128.76	Fixed	128.76	134.65	49.66
J-140	18.60	1	Demand	48.30	Fixed	48.30	134.72	50.34
J-160	18.85	1	Demand	83.56	Fixed	83.56	134.79	50.26
J-170	20.42	1	Demand	40.81	Fixed	40.81	134.03	49.25
J-190	20.40	1	Demand	31.77	Fixed	31.77	133.91	49.21
J-200	20.50	1	Demand	46.37	Fixed	46.37	133.93	49.17
J-210	23.60	1	Demand	68.19	Fixed	68.19	133.77	47.76
J-220	24.75	1	Demand	44.04	Fixed	44.04	133.77	47.26
J-230	24.20	1	Demand	41.07	Fixed	41.07	133.78	47.50
J-240	21.00	1	Demand	35.65	Fixed	35.65	133.81	48.91
J-250	24.30	1	Demand	48.82	Fixed	48.82	133.91	47.52
J-260	23.21	1	Demand	39.52	Fixed	39.52	133.90	47.99
J-300	20.30	1	Demand	121.53	Fixed	121.53	133.87	49.24
J-320	16.00	1	Demand	391.97	Fixed	391.97	133.53	50.95
J-350	16.00	1	Demand	407.86	Fixed	407.86	133.33	50.87
J-380	11.30	1	Demand	115.85	Fixed	115.85	133.06	52.78
J-400	15.35	1	Demand	63.93	Fixed	63.93	133.22	51.10
J-410	15.27	1	Demand	135.61	Fixed	135.61	133.16	51.11
J-420	24.50	1	Demand	69.10	Fixed	69.10	133.44	47.23
J-430	25.10	1	Demand	71.81	Fixed	71.81	133.25	46.89
J-440	21.30	1	Demand	66.90	Fixed	66.90	133.18	48.50
J-450	18.00	1	Demand	63.03	Fixed	63.03	133.16	49.93
J-460	15.30	1	Demand	0.00	Fixed	0.00	133.16	51.10
J-470	12.09	1	Demand	30.74	Fixed	30.74	133.00	52.42
J-480	10.60	1	Demand	0.00	Fixed	0.00	132.98	53.06
J-490	14.80	1	Demand	45.13	Fixed	45.13	132.98	51.23
J-500	11.10	1	Demand	45.10	Fixed	45.10	132.98	52.84
J-510	10.50	1	Demand	150.59	Fixed	150.59	133.08	53.14
J-530	11.00	1	Demand	0.00	Fixed	0.00	133.13	52.95
J-540	10.82	1	Demand	41.07	Fixed	41.07	133.20	53.05
J-550	11.60	1	Demand	36.94	Fixed	36.94	133.13	52.68
J-570	9.70	1	Demand	206.38	Fixed	206.38	133.19	53.54
J-610	15.30	1	Demand	127.34	Fixed	127.34	133.17	51.10
J-620	15.50	1	Demand	27.64	Fixed	27.64	133.16	51.01
J-680	13.40	1	Demand	68.71	Fixed	68.71	132.99	51.84



**Scenario: Phase 4 Run 1 MDD-100%GW****Steady State Analysis****Junction Report**

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-690	11.25	1	Demand	45.13	Fixed	45.13	132.99	52.78
J-730	19.31	1	Demand	204.19	Fixed	204.19	133.73	49.60
J-760	9.70	1	Demand	0.00	Fixed	0.00	133.20	53.54
J-770	15.00	1	Demand	65.35	Fixed	65.35	133.18	51.23
J-800	18.80	1	Demand	31.00	Fixed	31.00	134.62	50.21
J-810	21.47	1	Demand	51.14	Fixed	51.14	133.99	48.78
J-820	20.20	1	Demand	126.83	Fixed	126.83	133.93	49.31
J-830	17.95	1	Demand	184.69	Fixed	184.69	133.28	50.00

# Scenario: Phase 4 Run 1 MDD-100%GW

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-1520	800.00	12	125.0	0.00	Open	154.39	0.07	0.09	false	0.44
P-1550	449.00	30	125.0	0.00	Open	359.76	0.00	0.00	false	0.16
P-1540	395.00	30	125.0	0.00	Open	359.76	0.00	0.00	false	0.16
P-1270	257.00	24	125.0	0.00	Open	2,848.77	0.17	0.65	false	2.02
P-1060	1,125.00	12	125.0	0.00	Open	-192.15	0.14	0.13	false	0.55
P-1050	1,053.00	30	125.0	0.00	Open	2,217.04	0.14	0.14	false	1.01
P-960	746.00	12	125.0	0.00	Open	32.03	0.00	0.00	false	0.09
P-970	897.00	12	125.0	0.00	Open	-54.55	0.01	0.01	false	0.15
P-950	402.00	12	125.0	0.00	Open	35.67	0.00	0.01	false	0.10
P-940	817.00	12	125.0	0.00	Open	72.35	0.02	0.02	false	0.21
P-590	1,013.00	12	125.0	0.00	Open	-35.67	0.01	0.01	false	0.10
P-600	659.00	12	125.0	0.00	Open	9.45	0.00	0.00	false	0.03
P-790	1,293.00	12	125.0	0.00	Open	-26.03	0.00	0.00	false	0.07
P-800	1,439.00	12	125.0	0.00	Open	1.61	0.00	0.00	false	0.00
P-640	597.00	12	125.0	0.00	Open	154.39	0.05	0.09	false	0.44
P-680	726.00	12	125.0	0.00	Open	164.85	0.07	0.10	false	0.47
P-510	1,511.00	12	125.0	0.00	Open	-114.95	0.07	0.05	false	0.33
P-520	1,532.00	12	125.0	0.00	Open	48.05	0.02	0.01	false	0.14
P-230	1,475.00	12	125.0	0.00	Open	-39.58	0.01	0.01	false	0.11
P-220	1,496.00	12	125.0	0.00	Open	4.46	0.00	0.00	false	0.01
P-200	753.00	12	125.0	0.00	Open	192.97	0.10	0.13	false	0.55
P-87	1,673.00	12	125.0	0.00	Open	116.30	0.08	0.05	false	0.33
P-70	1,321.00	12	125.0	0.00	Open	-171.69	0.14	0.10	false	0.49
P-80	808.00	12	125.0	0.00	Open	-205.01	0.12	0.14	false	0.58
P-250	1,092.00	12	125.0	0.00	Open	-104.53	0.05	0.04	false	0.30
P-3	527.00	30	125.0	0.00	Open	153.37	0.00	0.00	false	0.07
P-4	1,274.00	16	125.0	0.00	Open	-153.37	0.03	0.02	false	0.24
P-8	1,129.00	16	125.0	0.00	Open	-264.43	0.06	0.06	false	0.42
P-11	2,034.00	12	125.0	0.00	Open	-254.09	0.44	0.22	false	0.72
P-14	1,007.00	16	125.0	0.00	Open	299.05	0.07	0.07	false	0.48
P-19	1,174.00	12	125.0	0.00	Open	55.72	0.02	0.01	false	0.16
P-20	1,680.00	12	125.0	0.00	Open	166.34	0.17	0.10	false	0.47
P-490	1,505.00	12	125.0	0.00	Open	255.85	0.33	0.22	false	0.73
P-500	1,520.00	12	125.0	0.00	Open	-186.76	0.19	0.12	false	0.53
P-22	900.00	12	125.0	0.00	Open	-50.64	0.01	0.01	false	0.14
P-23	940.00	12	125.0	0.00	Open	49.46	0.01	0.01	false	0.14
P-24	1,437.00	12	125.0	0.00	Open	-67.03	0.03	0.02	false	0.19
P-25	1,528.00	12	125.0	0.00	Open	-64.84	0.03	0.02	false	0.18
P-26	463.00	12	125.0	0.00	Open	158.30	0.04	0.09	false	0.45
P-28	825.00	12	125.0	0.00	Open	132.85	0.05	0.06	false	0.38
P-29	912.00	12	125.0	0.00	Open	125.85	0.05	0.06	false	0.36
P-30	935.00	24	125.0	0.00	Open	2,817.77	0.59	0.63	false	2.00
P-31	502.00	12	125.0	0.00	Open	151.54	0.04	0.08	false	0.43
P-32	1,044.00	30	125.0	0.00	Open	2,325.25	0.16	0.15	false	1.06
P-33	1,076.00	12	125.0	0.00	Open	205.47	0.16	0.15	false	0.58
P-34	1,740.00	30	125.0	0.00	Open	-2,022.60	0.20	0.12	false	0.92
P-35	1,727.00	12	125.0	0.00	Open	182.40	0.20	0.12	false	0.52
P-36	2,395.00	30	125.0	0.00	Open	1,663.94	0.19	0.08	false	0.76
P-37	2,406.00	12	125.0	0.00	Open	-149.08	0.19	0.08	false	0.42
P-38	1,120.00	30	125.0	0.00	Open	1,289.31	0.06	0.05	false	0.59
P-39	1,119.00	12	125.0	0.00	Open	115.86	0.06	0.05	false	0.33

# Scenario: Phase 4 Run 1 MDD-100%GW

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-40	1,551.00	30	125.0	0.00	Open	1,118.83	0.06	0.04	false	0.51
P-41	1,519.00	12	125.0	0.00	Open	-101.65	0.06	0.04	false	0.29
P-42	1,335.00	30	125.0	0.00	Open	-660.76	0.02	0.01	false	0.30
P-50	989.00	12	125.0	0.00	Open	218.94	0.16	0.16	false	0.62
P-56	1,373.00	12	125.0	0.00	Open	131.71	0.09	0.06	false	0.37
P-57	818.00	12	125.0	0.00	Open	-127.91	0.05	0.06	false	0.36
P-60	1,264.00	12	125.0	0.00	Open	-103.09	0.05	0.04	false	0.29
P-65	1,029.00	12	125.0	0.00	Open	8.23	0.00	0.00	false	0.02
P-67	900.00	12	125.0	0.00	Open	8.29	0.00	0.00	false	0.02
P-69	773.00	12	125.0	0.00	Open	109.60	0.04	0.05	false	0.31
P-72	823.00	12	125.0	0.00	Open	75.54	0.02	0.02	false	0.21
P-68	100.00	24	125.0	0.00	Open	-3,801.96	0.11	1.10	true	2.70
P-71	1.00	24	125.0	0.00	Open	-3,801.96	0.00	1.10	true	2.70
P-74	100.00	30	125.0	0.00	Open	0.00	0.00	0.00	true	0.00
P-75	3.00	30	125.0	0.00	Closed	0.00	0.00	0.00	true	0.00
P-76	795.00	12	125.0	0.00	Open	107.95	0.04	0.04	false	0.31
P-77	801.00	12	125.0	0.00	Open	76.65	0.02	0.02	false	0.22
P-78	1,001.00	12	125.0	0.00	Open	8.36	0.00	0.00	false	0.02
P-79	900.00	12	125.0	0.00	Open	8.29	0.00	0.00	false	0.02
P-81	840.00	12	125.0	0.00	Open	181.90	0.10	0.12	false	0.52
P-82	1,761.00	12	125.0	0.00	Open	162.16	0.17	0.09	false	0.46
P-83	665.00	12	125.0	0.00	Open	-80.65	0.02	0.03	false	0.23
P-84	775.00	12	125.0	0.00	Open	-80.21	0.02	0.03	false	0.23
P-85	139.00	12	125.0	0.00	Open	0.44	0.00	0.00	false	0.00
P-86	130.00	12	125.0	0.00	Open	-0.44	0.00	0.00	false	0.00
P-90	345.00	12	125.0	0.00	Open	0.44	0.00	0.00	false	0.00
P-91	318.00	12	125.0	0.00	Open	0.44	0.00	0.00	false	0.00
P-92	320.00	12	125.0	0.00	Open	-0.44	0.00	0.00	false	0.00
P-93	382.00	12	125.0	0.00	Open	0.44	0.00	0.00	false	0.00
P-94	1,337.00	12	125.0	0.00	Open	59.30	0.02	0.01	false	0.17
P-95	1,231.00	12	125.0	0.00	Open	-118.42	0.06	0.05	false	0.34
P-96	1,126.00	12	125.0	0.00	Open	-132.11	0.07	0.06	false	0.37
P-97	2,986.00	24	125.0	0.00	Open	0.00	0.00	0.00	false	0.00
P-98	113.00	6	130.0	0.00	Closed	0.00	0.00	0.00	false	0.00
P-99	1,701.00	24	125.0	0.00	Open	0.00	0.00	0.00	false	0.00
P-101	5,665.00	24	125.0	0.00	Open	-2,285.00	2.44	0.43	false	1.62
P-102	224.00	24	125.0	0.00	Open	-2,285.00	0.10	0.43	false	1.62
P-103	1.00	24	125.0	0.00	Open	-2,285.00	0.00	0.43	true	1.62
P-104	3,645.00	16	125.0	0.00	Open	2,285.00	11.30	3.10	false	3.65
P-105	5,402.00	16	125.0	0.00	Open	2,285.00	16.75	3.10	false	3.65
P-106	1,283.00	12	125.0	0.00	Open	438.47	0.76	0.59	false	1.24

# Scenario: Phase 4 Run 2 PHD-100%GW

## Steady State Analysis

### Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-1	9.30	1	Demand	0.00	Fixed	0.00	127.36	51.18
J-3	19.50	Zone-1	Inflow	3,801.96	Fixed	-3,801.96	127.71	46.91
J-4	12.00	Zone-1	Demand	0.00	Fixed	0.00	127.40	50.03
J-5	21.50	Zone-1	Demand	0.00	Fixed	0.00	126.32	45.44
J-6	21.00	Zone-1	Demand	0.00	Fixed	0.00	121.72	43.67
J-7	21.00	Zone-1	Demand	0.00	Fixed	0.00	121.72	43.67
J-8	21.00	Zone-1	Demand	0.00	Fixed	0.00	121.72	43.67
J-9	12.00	Zone-1	Demand	0.00	Fixed	0.00	125.87	49.36
J-10	13.00	Zone-1	Demand	0.00	Fixed	0.00	125.87	48.93
J-11	13.00	Zone-1	Demand	0.00	Fixed	0.00	125.87	48.93
J-12	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.30	49.99
J-13	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.40	50.03
J-14	13.00	Zone-1	Demand	0.00	Fixed	0.00	114.56	44.03
J-15	13.00	Zone-1	Demand	2,285.00	Fixed	2,285.00	97.81	36.77
J-80	24.00	1	Demand	134.32	Fixed	134.32	126.36	44.38
J-90	26.30	1	Demand	66.64	Fixed	66.64	126.48	43.43
J-100	22.90	1	Demand	98.16	Fixed	98.16	126.62	44.96
J-130	20.10	1	Demand	257.53	Fixed	257.53	127.29	46.47
J-140	18.60	1	Demand	96.61	Fixed	96.61	127.43	47.18
J-160	18.85	1	Demand	167.12	Fixed	167.12	127.60	47.14
J-170	20.42	1	Demand	81.62	Fixed	81.62	126.98	46.20
J-190	20.40	1	Demand	63.54	Fixed	63.54	126.44	45.97
J-200	20.50	1	Demand	92.73	Fixed	92.73	126.77	46.07
J-210	23.60	1	Demand	136.38	Fixed	136.38	126.45	44.59
J-220	24.75	1	Demand	88.08	Fixed	88.08	126.34	44.04
J-230	24.20	1	Demand	82.14	Fixed	82.14	126.32	44.27
J-240	21.00	1	Demand	71.29	Fixed	71.29	126.33	45.66
J-250	24.30	1	Demand	97.64	Fixed	97.64	126.36	44.25
J-260	23.21	1	Demand	79.04	Fixed	79.04	126.39	44.73
J-300	20.30	1	Demand	243.06	Fixed	243.06	126.92	46.22
J-320	16.00	1	Demand	783.95	Fixed	783.95	126.83	48.05
J-350	16.00	1	Demand	815.72	Fixed	815.72	126.82	48.04
J-380	11.30	1	Demand	231.70	Fixed	231.70	126.36	49.88
J-400	15.35	1	Demand	127.86	Fixed	127.86	126.88	48.35
J-410	15.27	1	Demand	271.22	Fixed	271.22	126.58	48.26
J-420	24.50	1	Demand	138.19	Fixed	138.19	126.26	44.11
J-430	25.10	1	Demand	143.62	Fixed	143.62	126.24	43.85
J-440	21.30	1	Demand	133.80	Fixed	133.80	126.29	45.51
J-450	18.00	1	Demand	126.05	Fixed	126.05	126.55	47.06
J-460	15.30	1	Demand	0.00	Fixed	0.00	126.57	48.24
J-470	12.09	1	Demand	61.48	Fixed	61.48	126.21	49.47
J-480	10.60	1	Demand	0.00	Fixed	0.00	126.16	50.10
J-490	14.80	1	Demand	90.25	Fixed	90.25	126.14	48.27
J-500	11.10	1	Demand	90.20	Fixed	90.20	126.14	49.87
J-510	10.50	1	Demand	301.18	Fixed	301.18	126.56	50.32
J-530	11.00	1	Demand	0.00	Fixed	0.00	126.76	50.18
J-540	10.82	1	Demand	82.14	Fixed	82.14	127.03	50.38
J-550	11.60	1	Demand	73.87	Fixed	73.87	126.76	49.92
J-570	9.70	1	Demand	412.77	Fixed	412.77	127.21	50.94
J-610	15.30	1	Demand	254.69	Fixed	254.69	127.10	48.47
J-620	15.50	1	Demand	55.28	Fixed	55.28	126.78	48.24
J-680	13.40	1	Demand	137.42	Fixed	137.42	126.17	48.89

**Scenario: Phase 4 Run 2 PHD-100%GW**  
**Steady State Analysis**  
**Junction Report**

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-690	11.25	1	Demand	90.25	Fixed	90.25	126.19	49.83
J-730	19.31	1	Demand	408.38	Fixed	408.38	126.87	46.63
J-760	9.70	1	Demand	0.00	Fixed	0.00	127.11	50.90
J-770	15.00	1	Demand	130.70	Fixed	130.70	126.70	48.42
J-800	18.80	1	Demand	61.99	Fixed	61.99	127.46	47.11
J-810	21.47	1	Demand	102.29	Fixed	102.29	126.81	45.67
J-820	20.20	1	Demand	253.65	Fixed	253.65	126.57	46.12
J-830	17.95	1	Demand	369.37	Fixed	369.37	126.84	47.21

# Scenario: Phase 4 Run 2 PHD-100%GW

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-1520	800.00	12	125.0	0.00	Open	321.33	0.27	0.33	false	0.91
P-1550	449.00	30	125.0	0.00	Open	-2,861.68	0.10	0.22	false	1.30
P-1540	395.00	30	125.0	0.00	Open	-2,861.68	0.09	0.22	false	1.30
P-1270	257.00	24	125.0	0.00	Open	2,568.50	0.14	0.53	false	1.82
P-1060	1,125.00	12	125.0	0.00	Open	-106.60	0.05	0.04	false	0.30
P-1050	1,053.00	30	125.0	0.00	Open	1,229.95	0.05	0.05	false	0.56
P-960	746.00	12	125.0	0.00	Open	83.49	0.02	0.03	false	0.24
P-970	897.00	12	125.0	0.00	Open	-114.20	0.04	0.05	false	0.32
P-950	402.00	12	125.0	0.00	Open	66.25	0.01	0.02	false	0.19
P-940	817.00	12	125.0	0.00	Open	120.17	0.04	0.05	false	0.34
P-590	1,013.00	12	125.0	0.00	Open	-66.25	0.02	0.02	false	0.19
P-600	659.00	12	125.0	0.00	Open	24.01	0.00	0.00	false	0.07
P-790	1,293.00	12	125.0	0.00	Open	-272.82	0.32	0.25	false	0.77
P-800	1,439.00	12	125.0	0.00	Open	-217.55	0.23	0.16	false	0.62
P-640	597.00	12	125.0	0.00	Open	321.33	0.20	0.33	false	0.91
P-680	726.00	12	125.0	0.00	Open	341.67	0.27	0.37	false	0.97
P-510	1,511.00	12	125.0	0.00	Open	90.23	0.05	0.03	false	0.26
P-520	1,532.00	12	125.0	0.00	Open	-224.04	0.26	0.17	false	0.64
P-230	1,475.00	12	125.0	0.00	Open	55.15	0.02	0.01	false	0.16
P-220	1,496.00	12	125.0	0.00	Open	143.23	0.11	0.07	false	0.41
P-200	753.00	12	125.0	0.00	Open	290.28	0.21	0.28	false	0.82
P-87	1,673.00	12	125.0	0.00	Open	98.29	0.06	0.04	false	0.28
P-70	1,321.00	12	125.0	0.00	Open	-156.21	0.12	0.09	false	0.44
P-80	808.00	12	125.0	0.00	Open	-222.85	0.14	0.17	false	0.63
P-250	1,092.00	12	125.0	0.00	Open	-21.89	0.00	0.00	false	0.06
P-3	527.00	30	125.0	0.00	Open	-3,274.45	0.15	0.28	false	1.49
P-4	1,274.00	16	125.0	0.00	Open	-527.51	0.26	0.21	false	0.84
P-8	1,129.00	16	125.0	0.00	Open	-399.59	0.14	0.12	false	0.64
P-11	2,034.00	12	125.0	0.00	Open	-321.00	0.68	0.33	false	0.91
P-14	1,007.00	16	125.0	0.00	Open	468.27	0.17	0.16	false	0.75
P-19	1,174.00	12	125.0	0.00	Open	-75.75	0.03	0.02	false	0.21
P-20	1,680.00	12	125.0	0.00	Open	238.59	0.32	0.19	false	0.68
P-490	1,505.00	12	125.0	0.00	Open	191.57	0.19	0.13	false	0.54
P-500	1,520.00	12	125.0	0.00	Open	-53.38	0.02	0.01	false	0.15
P-22	900.00	12	125.0	0.00	Open	-128.02	0.05	0.06	false	0.36
P-23	940.00	12	125.0	0.00	Open	125.05	0.05	0.06	false	0.35
P-24	1,437.00	12	125.0	0.00	Open	-160.93	0.13	0.09	false	0.46
P-25	1,528.00	12	125.0	0.00	Open	-155.68	0.13	0.09	false	0.44
P-26	463.00	12	125.0	0.00	Open	343.62	0.17	0.38	false	0.97
P-28	825.00	12	125.0	0.00	Open	292.85	0.23	0.28	false	0.83
P-29	912.00	12	125.0	0.00	Open	277.42	0.23	0.25	false	0.79
P-30	935.00	24	125.0	0.00	Open	2,506.51	0.48	0.51	false	1.78
P-31	502.00	12	125.0	0.00	Open	328.94	0.17	0.35	false	0.93
P-32	1,044.00	30	125.0	0.00	Open	1,451.36	0.07	0.06	false	0.66
P-33	1,076.00	12	125.0	0.00	Open	128.25	0.07	0.06	false	0.36
P-34	1,740.00	30	125.0	0.00	Open	-851.39	0.04	0.02	false	0.39
P-35	1,727.00	12	125.0	0.00	Open	76.78	0.04	0.02	false	0.22
P-36	2,395.00	30	125.0	0.00	Open	123.13	0.00	0.00	false	0.06
P-37	2,406.00	12	125.0	0.00	Open	-21.09	0.00	0.00	false	0.06
P-38	1,120.00	30	125.0	0.00	Open	-616.13	0.01	0.01	false	0.28
P-39	1,119.00	12	125.0	0.00	Open	-55.37	0.01	0.01	false	0.16

Project Engineer: Mark Smith

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# Scenario: Phase 4 Run 2 PHD-100%GW

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-40	1,551.00	30	125.0	0.00	Open	-954.20	0.04	0.03	false	0.43
P-41	1,519.00	12	125.0	0.00	Open	86.68	0.04	0.03	false	0.25
P-42	1,335.00	30	125.0	0.00	Open	1,942.23	0.14	0.11	false	0.88
P-50	989.00	12	125.0	0.00	Open	413.35	0.52	0.53	false	1.17
P-56	1,373.00	12	125.0	0.00	Open	287.94	0.37	0.27	false	0.82
P-57	818.00	12	125.0	0.00	Open	-267.79	0.19	0.24	false	0.76
P-60	1,264.00	12	125.0	0.00	Open	-181.65	0.15	0.12	false	0.52
P-65	1,029.00	12	125.0	0.00	Open	65.78	0.02	0.02	false	0.19
P-67	900.00	12	125.0	0.00	Open	66.27	0.02	0.02	false	0.19
P-69	773.00	12	125.0	0.00	Open	269.25	0.19	0.24	false	0.76
P-72	823.00	12	125.0	0.00	Open	200.40	0.11	0.14	false	0.57
P-68	100.00	24	125.0	0.00	Open	-3,801.96	0.11	1.10	true	2.70
P-71	1.00	24	125.0	0.00	Closed	0.00	0.00	0.00	true	0.00
P-74	100.00	30	125.0	0.00	Open	-3,801.96	0.04	0.37	true	1.73
P-75	3.00	30	125.0	0.00	Open	-3,801.96	0.00	0.37	true	1.73
P-76	795.00	12	125.0	0.00	Open	265.20	0.19	0.23	false	0.75
P-77	801.00	12	125.0	0.00	Open	203.36	0.11	0.14	false	0.58
P-78	1,001.00	12	125.0	0.00	Open	66.76	0.02	0.02	false	0.19
P-79	900.00	12	125.0	0.00	Open	66.27	0.02	0.02	false	0.19
P-81	840.00	12	125.0	0.00	Open	273.64	0.21	0.25	false	0.78
P-82	1,761.00	12	125.0	0.00	Open	232.60	0.32	0.18	false	0.66
P-83	665.00	12	125.0	0.00	Open	-26.99	0.00	0.00	false	0.08
P-84	775.00	12	125.0	0.00	Open	-26.94	0.00	0.00	false	0.08
P-85	139.00	12	125.0	0.00	Open	0.06	0.00	0.00	false	0.00
P-86	130.00	12	125.0	0.00	Open	-0.06	0.00	0.00	false	0.00
P-90	345.00	12	125.0	0.00	Open	0.06	0.00	0.00	false	0.00
P-91	318.00	12	125.0	0.00	Open	0.06	0.00	0.00	false	0.00
P-92	320.00	12	125.0	0.00	Open	-0.06	0.00	0.00	false	0.00
P-93	382.00	12	125.0	0.00	Open	0.06	0.00	0.00	false	0.00
P-94	1,337.00	12	125.0	0.00	Open	-174.31	0.14	0.11	false	0.49
P-95	1,231.00	12	125.0	0.00	Open	-178.95	0.14	0.11	false	0.51
P-96	1,126.00	12	125.0	0.00	Open	-206.87	0.17	0.15	false	0.59
P-97	2,986.00	24	125.0	0.00	Open	0.00	0.00	0.00	false	0.00
P-98	113.00	6	130.0	0.00	Closed	0.00	0.00	0.00	false	0.00
P-99	1,701.00	24	125.0	0.00	Open	0.00	0.00	0.00	false	0.00
P-101	5,665.00	24	125.0	0.00	Open	-2,285.00	2.44	0.43	false	1.62
P-102	224.00	24	125.0	0.00	Open	-2,285.00	0.10	0.43	false	1.62
P-103	1.00	24	125.0	0.00	Open	-2,285.00	0.00	0.43	true	1.62
P-104	3,645.00	16	125.0	0.00	Open	2,285.00	11.30	3.10	false	3.65
P-105	5,402.00	16	125.0	0.00	Open	2,285.00	16.75	3.10	false	3.65
P-106	1,283.00	12	125.0	0.00	Open	391.20	0.61	0.48	false	1.11

# Scenario: Phase 4 Run 3 PHD-100%SW(S)

## Steady State Analysis

### Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-1	9.30	1	Demand	0.00	Fixed	0.00	127.26	51.14
J-3	19.50	Zone-1	Demand	0.00	Fixed	0.00	122.71	44.75
J-4	12.00	Zone-1	Demand	0.00	Fixed	0.00	127.40	50.03
J-5	21.50	Zone-1	Demand	0.00	Fixed	0.00	122.18	43.64
J-6	21.00	Zone-1	Demand	0.00	Fixed	0.00	117.57	41.87
J-7	21.00	Zone-1	Demand	0.00	Fixed	0.00	117.57	41.87
J-8	21.00	Zone-1	Demand	0.00	Fixed	0.00	117.57	41.87
J-9	12.00	Zone-1	Demand	3,801.96	Fixed	3,801.96	107.66	41.47
J-10	13.00	Zone-1	Demand	0.00	Fixed	0.00	110.96	42.47
J-11	13.00	Zone-1	Demand	0.00	Fixed	0.00	112.84	43.28
J-12	13.00	Zone-1	Demand	0.00	Fixed	0.00	127.81	49.77
J-13	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.40	50.03
J-14	13.00	Zone-1	Demand	0.00	Fixed	0.00	101.54	38.38
J-15	13.00	Zone-1	Demand	2,285.00	Fixed	2,285.00	84.79	31.12
J-80	24.00	1	Demand	134.32	Fixed	134.32	122.03	42.50
J-90	26.30	1	Demand	66.64	Fixed	66.64	122.06	41.51
J-100	22.90	1	Demand	98.16	Fixed	98.16	122.11	43.01
J-130	20.10	1	Demand	257.53	Fixed	257.53	122.48	44.39
J-140	18.60	1	Demand	96.61	Fixed	96.61	122.59	45.08
J-160	18.85	1	Demand	167.12	Fixed	167.12	122.71	45.03
J-170	20.42	1	Demand	81.62	Fixed	81.62	122.77	44.37
J-190	20.40	1	Demand	63.54	Fixed	63.54	122.22	44.14
J-200	20.50	1	Demand	92.73	Fixed	92.73	122.67	44.29
J-210	23.60	1	Demand	136.38	Fixed	136.38	122.55	42.90
J-220	24.75	1	Demand	88.08	Fixed	88.08	122.29	42.29
J-230	24.20	1	Demand	82.14	Fixed	82.14	122.18	42.48
J-240	21.00	1	Demand	71.29	Fixed	71.29	122.17	43.86
J-250	24.30	1	Demand	97.64	Fixed	97.64	122.05	42.38
J-260	23.21	1	Demand	79.04	Fixed	79.04	122.17	42.90
J-300	20.30	1	Demand	243.06	Fixed	243.06	122.87	44.47
J-320	16.00	1	Demand	783.95	Fixed	783.95	123.26	46.50
J-350	16.00	1	Demand	815.72	Fixed	815.72	123.88	46.77
J-380	11.30	1	Demand	231.70	Fixed	231.70	124.65	49.14
J-400	15.35	1	Demand	127.86	Fixed	127.86	124.99	47.53
J-410	15.27	1	Demand	271.22	Fixed	271.22	124.67	47.43
J-420	24.50	1	Demand	138.19	Fixed	138.19	122.59	42.52
J-430	25.10	1	Demand	143.62	Fixed	143.62	122.85	42.37
J-440	21.30	1	Demand	133.80	Fixed	133.80	123.48	44.30
J-450	18.00	1	Demand	126.05	Fixed	126.05	124.63	46.23
J-460	15.30	1	Demand	0.00	Fixed	0.00	124.65	47.41
J-470	12.09	1	Demand	61.48	Fixed	61.48	124.61	48.78
J-480	10.60	1	Demand	0.00	Fixed	0.00	124.60	49.42
J-490	14.80	1	Demand	90.25	Fixed	90.25	124.59	47.60
J-500	11.10	1	Demand	90.20	Fixed	90.20	124.60	49.20
J-510	10.50	1	Demand	301.18	Fixed	301.18	125.27	49.75
J-530	11.00	1	Demand	0.00	Fixed	0.00	125.52	49.65
J-540	10.82	1	Demand	82.14	Fixed	82.14	125.86	49.87
J-550	11.60	1	Demand	73.87	Fixed	73.87	125.52	49.39
J-570	9.70	1	Demand	412.77	Fixed	412.77	126.68	50.71
J-610	15.30	1	Demand	254.69	Fixed	254.69	126.71	48.30
J-620	15.50	1	Demand	55.28	Fixed	55.28	125.62	47.74
J-680	13.40	1	Demand	137.42	Fixed	137.42	124.60	48.21

Project Engineer: Mark Smith

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**Scenario: Phase 4 Run 3 PHD-100%SW(S)**  
**Steady State Analysis**  
**Junction Report**

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-690	11.25	1	Demand	90.25	Fixed	90.25	124.66	49.17
J-730	19.31	1	Demand	408.38	Fixed	408.38	122.99	44.95
J-760	9.70	1	Demand	0.00	Fixed	0.00	126.24	50.52
J-770	15.00	1	Demand	130.70	Fixed	130.70	124.80	47.60
J-800	18.80	1	Demand	61.99	Fixed	61.99	122.73	45.05
J-810	21.47	1	Demand	102.29	Fixed	102.29	122.59	43.84
J-820	20.20	1	Demand	253.65	Fixed	253.65	122.36	44.29
J-830	17.95	1	Demand	369.37	Fixed	369.37	124.30	46.11

# Scenario: Phase 4 Run 3 PHD-100%SW(S)

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-1520	800.00	12	125.0	0.00	Open	365.29	0.34	0.42	false	1.04
P-1550	449.00	30	125.0	0.00	Open	-6,405.46	0.44	0.98	false	2.91
P-1540	395.00	30	125.0	0.00	Open	-6,405.46	0.39	0.98	false	2.91
P-1270	257.00	24	125.0	0.00	Open	-645.91	0.01	0.04	false	0.46
P-1060	1,125.00	12	125.0	0.00	Open	174.73	0.12	0.11	false	0.50
P-1050	1,053.00	30	125.0	0.00	Open	-2,016.10	0.12	0.12	false	0.92
P-960	746.00	12	125.0	0.00	Open	145.74	0.06	0.08	false	0.41
P-970	897.00	12	125.0	0.00	Open	-137.79	0.06	0.07	false	0.39
P-950	402.00	12	125.0	0.00	Open	42.66	0.00	0.01	false	0.12
P-940	817.00	12	125.0	0.00	Open	34.34	0.00	0.01	false	0.10
P-590	1,013.00	12	125.0	0.00	Open	-42.66	0.01	0.01	false	0.12
P-600	659.00	12	125.0	0.00	Open	47.59	0.01	0.01	false	0.14
P-790	1,293.00	12	125.0	0.00	Open	-531.00	1.09	0.84	false	1.51
P-800	1,439.00	12	125.0	0.00	Open	-475.72	0.99	0.69	false	1.35
P-640	597.00	12	125.0	0.00	Open	365.29	0.25	0.42	false	1.04
P-680	726.00	12	125.0	0.00	Open	383.54	0.34	0.46	false	1.09
P-510	1,511.00	12	125.0	0.00	Open	364.82	0.64	0.42	false	1.03
P-520	1,532.00	12	125.0	0.00	Open	-498.62	1.15	0.75	false	1.41
P-230	1,475.00	12	125.0	0.00	Open	139.13	0.10	0.07	false	0.39
P-220	1,496.00	12	125.0	0.00	Open	227.21	0.26	0.18	false	0.64
P-200	753.00	12	125.0	0.00	Open	192.16	0.10	0.13	false	0.55
P-87	1,673.00	12	125.0	0.00	Open	14.30	0.00	0.00	false	0.04
P-70	1,321.00	12	125.0	0.00	Open	-67.74	0.02	0.02	false	0.19
P-80	808.00	12	125.0	0.00	Open	-134.38	0.05	0.07	false	0.38
P-250	1,092.00	12	125.0	0.00	Open	66.57	0.02	0.02	false	0.19
P-3	527.00	30	125.0	0.00	Open	-6,818.23	0.58	1.10	false	3.09
P-4	1,274.00	16	125.0	0.00	Open	-785.69	0.55	0.43	false	1.25
P-8	1,129.00	16	125.0	0.00	Open	-338.48	0.10	0.09	false	0.54
P-11	2,034.00	12	125.0	0.00	Open	-232.54	0.37	0.18	false	0.66
P-14	1,007.00	16	125.0	0.00	Open	406.91	0.13	0.13	false	0.65
P-19	1,174.00	12	125.0	0.00	Open	-164.21	0.11	0.10	false	0.47
P-20	1,680.00	12	125.0	0.00	Open	142.07	0.12	0.07	false	0.40
P-490	1,505.00	12	125.0	0.00	Open	-83.01	0.04	0.03	false	0.24
P-500	1,520.00	12	125.0	0.00	Open	221.20	0.25	0.17	false	0.63
P-22	900.00	12	125.0	0.00	Open	-130.29	0.06	0.06	false	0.37
P-23	940.00	12	125.0	0.00	Open	127.27	0.06	0.06	false	0.36
P-24	1,437.00	12	125.0	0.00	Open	-163.21	0.14	0.09	false	0.46
P-25	1,528.00	12	125.0	0.00	Open	-157.89	0.14	0.09	false	0.45
P-26	463.00	12	125.0	0.00	Open	345.91	0.18	0.38	false	0.98
P-28	825.00	12	125.0	0.00	Open	295.15	0.23	0.28	false	0.84
P-29	912.00	12	125.0	0.00	Open	279.60	0.23	0.26	false	0.79
P-30	935.00	24	125.0	0.00	Open	-707.91	0.05	0.05	false	0.50
P-31	502.00	12	125.0	0.00	Open	331.13	0.18	0.35	false	0.94
P-32	1,044.00	30	125.0	0.00	Open	-1,789.53	0.10	0.09	false	0.81
P-33	1,076.00	12	125.0	0.00	Open	-158.24	0.10	0.09	false	0.45
P-34	1,740.00	30	125.0	0.00	Open	2,384.19	0.27	0.16	false	1.08
P-35	1,727.00	12	125.0	0.00	Open	-215.01	0.27	0.16	false	0.61
P-36	2,395.00	30	125.0	0.00	Open	-3,104.96	0.61	0.26	false	1.41
P-37	2,406.00	12	125.0	0.00	Open	278.19	0.61	0.25	false	0.79
P-38	1,120.00	30	125.0	0.00	Open	-3,852.67	0.43	0.38	false	1.75
P-39	1,119.00	12	125.0	0.00	Open	-346.21	0.43	0.38	false	0.98

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# Scenario: Phase 4 Run 3 PHD-100%SW(S)

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-40	1,551.00	30	125.0	0.00	Open	-4,187.84	0.69	0.45	false	1.90
P-41	1,519.00	12	125.0	0.00	Open	380.40	0.69	0.46	false	1.08
P-42	1,335.00	30	125.0	0.00	Open	5,115.40	0.86	0.65	false	2.32
P-50	989.00	12	125.0	0.00	Open	327.51	0.34	0.34	false	0.93
P-56	1,373.00	12	125.0	0.00	Open	373.78	0.60	0.44	false	1.06
P-57	818.00	12	125.0	0.00	Open	-309.67	0.25	0.31	false	0.88
P-60	1,264.00	12	125.0	0.00	Open	-95.81	0.04	0.04	false	0.27
P-65	1,029.00	12	125.0	0.00	Open	73.92	0.02	0.02	false	0.21
P-67	900.00	12	125.0	0.00	Open	74.47	0.02	0.02	false	0.21
P-69	773.00	12	125.0	0.00	Open	277.52	0.20	0.25	false	0.79
P-72	823.00	12	125.0	0.00	Open	208.55	0.12	0.15	false	0.59
P-68	100.00	24	125.0	0.00	Open	0.00	0.00	0.00	true	0.00
P-71	1.00	24	125.0	0.00	Closed	0.00	0.00	0.00	true	0.00
P-74	100.00	30	125.0	0.00	Open	-7,603.92	0.13	1.35	true	3.45
P-75	3.00	30	125.0	0.00	Open	-7,603.92	0.00	1.35	true	3.45
P-76	795.00	12	125.0	0.00	Open	273.35	0.20	0.25	false	0.78
P-77	801.00	12	125.0	0.00	Open	211.62	0.12	0.15	false	0.60
P-78	1,001.00	12	125.0	0.00	Open	75.03	0.02	0.02	false	0.21
P-79	900.00	12	125.0	0.00	Open	74.47	0.02	0.02	false	0.21
P-81	840.00	12	125.0	0.00	Open	181.15	0.10	0.12	false	0.51
P-82	1,761.00	12	125.0	0.00	Open	138.51	0.12	0.07	false	0.39
P-83	665.00	12	125.0	0.00	Open	56.99	0.01	0.01	false	0.16
P-84	775.00	12	125.0	0.00	Open	56.75	0.01	0.01	false	0.16
P-85	139.00	12	125.0	0.00	Open	-0.23	0.00	0.00	false	0.00
P-86	130.00	12	125.0	0.00	Open	0.23	0.00	0.00	false	0.00
P-90	345.00	12	125.0	0.00	Open	-0.23	0.00	0.00	false	0.00
P-91	318.00	12	125.0	0.00	Open	-0.23	0.00	0.00	false	0.00
P-92	320.00	12	125.0	0.00	Open	0.23	0.00	0.00	false	0.00
P-93	382.00	12	125.0	0.00	Open	-0.23	0.00	0.00	false	0.00
P-94	1,337.00	12	125.0	0.00	Open	-459.09	0.86	0.64	false	1.30
P-95	1,231.00	12	125.0	0.00	Open	-151.58	0.10	0.08	false	0.43
P-96	1,126.00	12	125.0	0.00	Open	-179.76	0.13	0.11	false	0.51
P-97	2,986.00	24	125.0	0.00	Open	-3,801.96	3.30	1.10	false	2.70
P-98	113.00	6	130.0	0.00	Closed	0.00	0.00	0.00	false	0.00
P-99	1,701.00	24	125.0	0.00	Open	-3,801.96	1.88	1.10	false	2.70
P-101	5,665.00	24	125.0	0.00	Open	-6,086.96	14.96	2.64	false	4.32
P-102	224.00	24	125.0	0.00	Open	-6,086.96	0.59	2.64	false	4.32
P-103	1.00	24	125.0	0.00	Open	-6,086.96	0.00	2.64	true	4.32
P-104	3,645.00	16	125.0	0.00	Open	2,285.00	11.30	3.10	false	3.65
P-105	5,402.00	16	125.0	0.00	Open	2,285.00	16.75	3.10	false	3.65
P-106	1,283.00	12	125.0	0.00	Open	-107.88	0.06	0.04	false	0.31

# Scenario: Phase 4 Run 4 MDD 100%SW(S) Multi FF

## Fire Flow Analysis

### Fire Flow Report

Label	Fire Flow Balanced?	Satisfies Fire Flow Constraints?	Needed Fire Flow (gpm)	Available Fire Flow (gpm)	Total Flow Needed (gpm)	Total Flow Available (gpm)	Calculated Residual Pressure (psi)	Calculated Minimum System Pressure (psi)	Minimum System Junction
J-1	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-3	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-4	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-5	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-6	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-7	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-8	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-9	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-10	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-11	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-12	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-13	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-14	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-15	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-80	true	true	4,000.00	4,000.00	4,067.16	4,067.16	25.03	28.58	J-90
J-90	true	true	4,000.00	4,000.00	4,033.32	4,033.32	23.76	29.33	J-100
J-100	true	true	4,000.00	4,000.00	4,049.08	4,049.08	26.72	27.42	J-90
J-130	true	false	4,000.00	4,000.00	4,128.76	4,128.76	39.25	31.12	J-15
J-140	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-160	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-170	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-190	true	false	4,000.00	4,000.00	4,031.77	4,031.77	37.12	31.12	J-15
J-200	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-210	true	true	4,000.00	4,000.00	4,068.19	4,068.19	37.09	31.12	J-15
J-220	true	false	4,000.00	4,000.00	4,044.04	4,044.04	28.04	31.12	J-15
J-230	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-240	true	false	4,000.00	4,000.00	4,035.65	4,035.65	28.42	27.41	GPV-1
J-250	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-260	true	true	4,000.00	4,000.00	4,039.52	4,039.52	35.18	31.12	J-15
J-300	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-320	true	true	4,000.00	4,000.00	4,391.98	4,391.98	45.60	31.12	J-15
J-350	true	false	4,000.00	4,000.00	4,407.86	4,407.86	46.21	31.12	J-15
J-380	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-400	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-410	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-420	true	true	4,000.00	4,000.00	4,069.10	4,069.10	28.96	31.12	J-15
J-430	true	true	4,000.00	4,000.00	4,071.81	4,071.81	26.66	31.12	J-15
J-440	true	false	4,000.00	4,000.00	4,066.90	4,066.90	30.99	31.12	J-15
J-450	true	false	4,000.00	4,000.00	4,063.03	4,063.03	41.36	31.12	J-15
J-460	true	true	4,000.00	4,000.00	4,000.00	4,000.00	42.91	31.12	J-15
J-470	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-480	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-490	true	true	4,000.00	4,000.00	4,045.13	4,045.13	30.21	31.12	J-15
J-500	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-510	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-530	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-540	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-550	true	false	4,000.00	4,000.00	4,036.94	4,036.94	44.77	31.12	J-15
J-570	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-610	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A

# Scenario: Phase 4 Run 4 MDD 100%SW(S) Multi FF

## Fire Flow Analysis

### Fire Flow Report

Label	Fire Flow Balanced?	Satisfies Fire Flow Constraints?	Needed Fire Flow (gpm)	Available Fire Flow (gpm)	Total Flow Needed (gpm)	Total Flow Available (gpm)	Calculated Residual Pressure (psi)	Calculated Minimum System Pressure (psi)	Minimum System Junction
J-620	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-680	true	false	4,000.00	4,000.00	4,068.71	4,068.71	36.25	31.12	J-15
J-690	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-730	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-760	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-770	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-800	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-810	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-820	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-830	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A

# Scenario: Phase 4 Run 5 MDD 100%SW(S) Onsite FF @ J6, 7, & 8

## Steady State Analysis

### Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-1	9.30	1	Demand	0.00	Fixed	0.00	127.25	51.14
J-3	19.50	Zone-1	Demand	0.00	Fixed	0.00	119.60	43.39
J-4	12.00	Zone-1	Demand	0.00	Fixed	0.00	127.40	50.03
J-5	21.50	Zone-1	Demand	0.00	Fixed	0.00	88.44	29.02
J-6	21.00	Zone-1	Demand	1,500.00	Fixed	1,500.00	74.05	23.00
J-7	21.00	Zone-1	Demand	1,500.00	Fixed	1,500.00	74.33	23.12
J-8	21.00	Zone-1	Demand	1,000.00	Fixed	1,000.00	75.00	23.41
J-9	12.00	Zone-1	Demand	3,801.96	Fixed	3,801.96	107.66	41.47
J-10	13.00	Zone-1	Demand	0.00	Fixed	0.00	110.96	42.47
J-11	13.00	Zone-1	Demand	0.00	Fixed	0.00	112.84	43.28
J-12	13.00	Zone-1	Demand	0.00	Fixed	0.00	127.81	49.77
J-13	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.40	50.03
J-14	13.00	Zone-1	Demand	0.00	Fixed	0.00	101.54	38.38
J-15	13.00	Zone-1	Demand	2,285.00	Fixed	2,285.00	84.79	31.12
J-80	24.00	1	Demand	67.16	Fixed	67.16	112.76	38.48
J-90	26.30	1	Demand	33.32	Fixed	33.32	114.51	38.24
J-100	22.90	1	Demand	49.08	Fixed	49.08	115.67	40.22
J-130	20.10	1	Demand	128.76	Fixed	128.76	118.99	42.87
J-140	18.60	1	Demand	48.30	Fixed	48.30	119.29	43.65
J-160	18.85	1	Demand	83.56	Fixed	83.56	119.60	43.68
J-170	20.42	1	Demand	40.81	Fixed	40.81	119.69	43.04
J-190	20.40	1	Demand	31.77	Fixed	31.77	112.57	39.96
J-200	20.50	1	Demand	46.37	Fixed	46.37	118.64	42.55
J-210	23.60	1	Demand	68.19	Fixed	68.19	116.52	40.28
J-220	24.75	1	Demand	44.04	Fixed	44.04	104.56	34.60
J-230	24.20	1	Demand	41.07	Fixed	41.07	93.29	29.95
J-240	21.00	1	Demand	35.65	Fixed	35.65	88.60	29.31
J-250	24.30	1	Demand	48.82	Fixed	48.82	111.58	37.84
J-260	23.21	1	Demand	39.52	Fixed	39.52	110.49	37.84
J-300	20.30	1	Demand	121.53	Fixed	121.53	120.14	43.28
J-320	16.00	1	Demand	391.97	Fixed	391.97	121.46	45.72
J-350	16.00	1	Demand	407.86	Fixed	407.86	122.81	46.30
J-380	11.30	1	Demand	115.85	Fixed	115.85	124.60	49.12
J-400	15.35	1	Demand	63.93	Fixed	63.93	124.60	47.36
J-410	15.27	1	Demand	135.61	Fixed	135.61	124.34	47.28
J-420	24.50	1	Demand	69.10	Fixed	69.10	117.89	40.49
J-430	25.10	1	Demand	71.81	Fixed	71.81	119.61	40.97
J-440	21.30	1	Demand	66.90	Fixed	66.90	121.70	43.52
J-450	18.00	1	Demand	63.03	Fixed	63.03	124.21	46.04
J-460	15.30	1	Demand	0.00	Fixed	0.00	124.27	47.24
J-470	12.09	1	Demand	30.74	Fixed	30.74	124.67	48.80
J-480	10.60	1	Demand	0.00	Fixed	0.00	124.73	49.48
J-490	14.80	1	Demand	45.13	Fixed	45.13	124.74	47.66
J-500	11.10	1	Demand	45.10	Fixed	45.10	124.76	49.27
J-510	10.50	1	Demand	150.59	Fixed	150.59	125.36	49.79
J-530	11.00	1	Demand	0.00	Fixed	0.00	125.50	49.64
J-540	10.82	1	Demand	41.07	Fixed	41.07	125.69	49.80
J-550	11.60	1	Demand	36.94	Fixed	36.94	125.51	49.38
J-570	9.70	1	Demand	206.38	Fixed	206.38	126.63	50.69
J-610	15.30	1	Demand	127.34	Fixed	127.34	126.80	48.34
J-620	15.50	1	Demand	27.64	Fixed	27.64	125.52	47.70
J-680	13.40	1	Demand	68.71	Fixed	68.71	124.73	48.26

Project Engineer: Mark Smith

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**Scenario: Phase 4 Run 5 MDD 100%SW(S) Onsite FF @ J6, 7, & 8**  
**Steady State Analysis**  
**Junction Report**

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-690	11.25	1	Demand	45.13	Fixed	45.13	124.81	49.23
J-730	19.31	1	Demand	204.19	Fixed	204.19	120.61	43.92
J-760	9.70	1	Demand	0.00	Fixed	0.00	126.13	50.47
J-770	15.00	1	Demand	65.35	Fixed	65.35	124.46	47.45
J-800	18.80	1	Demand	31.00	Fixed	31.00	119.62	43.71
J-810	21.47	1	Demand	51.14	Fixed	51.14	118.35	42.00
J-820	20.20	1	Demand	126.83	Fixed	126.83	116.05	41.55
J-830	17.95	1	Demand	184.69	Fixed	184.69	123.54	45.77

# Scenario: Phase 4 Run 5 MDD 100%SW(S) Onsite FF @ J6, 7, & 8

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-1520	800.00	12	125.0	0.00	Open	267.21	0.19	0.24	false	0.76
P-1550	449.00	30	125.0	0.00	Open	-6,888.04	0.50	1.12	false	3.13
P-1540	395.00	30	125.0	0.00	Open	-6,888.04	0.44	1.12	false	3.13
P-1270	257.00	24	125.0	0.00	Open	-878.39	0.02	0.07	false	0.62
P-1060	1,125.00	12	125.0	0.00	Open	365.63	0.48	0.42	false	1.04
P-1050	1,053.00	30	125.0	0.00	Open	-4,218.73	0.48	0.45	false	1.91
P-960	746.00	12	125.0	0.00	Open	177.63	0.08	0.11	false	0.50
P-970	897.00	12	125.0	0.00	Open	-129.08	0.06	0.06	false	0.37
P-950	402.00	12	125.0	0.00	Open	-38.86	0.00	0.01	false	0.11
P-940	817.00	12	125.0	0.00	Open	-147.78	0.06	0.08	false	0.42
P-590	1,013.00	12	125.0	0.00	Open	38.86	0.01	0.01	false	0.11
P-600	659.00	12	125.0	0.00	Open	83.98	0.02	0.03	false	0.24
P-790	1,293.00	12	125.0	0.00	Open	-580.19	1.29	0.99	false	1.65
P-800	1,439.00	12	125.0	0.00	Open	-552.55	1.31	0.91	false	1.57
P-640	597.00	12	125.0	0.00	Open	267.21	0.14	0.24	false	0.76
P-680	726.00	12	125.0	0.00	Open	272.15	0.18	0.24	false	0.77
P-510	1,511.00	12	125.0	0.00	Open	693.47	2.09	1.38	false	1.97
P-520	1,532.00	12	125.0	0.00	Open	-760.37	2.51	1.64	false	2.16
P-230	1,475.00	12	125.0	0.00	Open	1,744.16	11.26	7.64	false	4.95
P-220	1,496.00	12	125.0	0.00	Open	1,788.20	11.96	8.00	false	5.07
P-200	753.00	12	125.0	0.00	Open	695.02	1.05	1.39	false	1.97
P-87	1,673.00	12	125.0	0.00	Open	2,332.56	21.89	13.08	false	6.62
P-70	1,321.00	12	125.0	0.00	Open	-675.61	1.74	1.32	false	1.92
P-80	808.00	12	125.0	0.00	Open	-708.93	1.16	1.44	false	2.01
P-250	1,092.00	12	125.0	0.00	Open	-608.45	1.19	1.09	false	1.73
P-3	527.00	30	125.0	0.00	Open	-7,094.43	0.62	1.18	false	3.22
P-4	1,274.00	16	125.0	0.00	Open	-707.53	0.45	0.35	false	1.13
P-8	1,129.00	16	125.0	0.00	Open	-612.48	0.31	0.27	false	0.98
P-11	2,034.00	12	125.0	0.00	Open	-758.01	3.32	1.63	false	2.15
P-14	1,007.00	16	125.0	0.00	Open	648.56	0.30	0.30	false	1.03
P-19	1,174.00	12	125.0	0.00	Open	559.63	1.09	0.93	false	1.59
P-20	1,680.00	12	125.0	0.00	Open	660.20	2.12	1.26	false	1.87
P-490	1,505.00	12	125.0	0.00	Open	-552.56	1.37	0.91	false	1.57
P-500	1,520.00	12	125.0	0.00	Open	621.66	1.72	1.13	false	1.76
P-22	900.00	12	125.0	0.00	Open	-916.86	2.09	2.32	false	2.60
P-23	940.00	12	125.0	0.00	Open	895.59	2.09	2.22	false	2.54
P-24	1,437.00	12	125.0	0.00	Open	-937.39	3.47	2.42	false	2.66
P-25	1,528.00	12	125.0	0.00	Open	-906.83	3.47	2.27	false	2.57
P-26	463.00	12	125.0	0.00	Open	1,033.17	1.34	2.90	false	2.93
P-28	825.00	12	125.0	0.00	Open	1,012.19	2.30	2.79	false	2.87
P-29	912.00	12	125.0	0.00	Open	958.85	2.30	2.52	false	2.72
P-30	935.00	24	125.0	0.00	Open	-909.39	0.07	0.08	false	0.64
P-31	502.00	12	125.0	0.00	Open	989.02	1.34	2.67	false	2.81
P-32	1,044.00	30	125.0	0.00	Open	-4,100.48	0.45	0.43	false	1.86
P-33	1,076.00	12	125.0	0.00	Open	-362.34	0.45	0.42	false	1.03
P-34	1,740.00	30	125.0	0.00	Open	4,392.19	0.85	0.49	false	1.99
P-35	1,727.00	12	125.0	0.00	Open	-396.36	0.85	0.49	false	1.12
P-36	2,395.00	30	125.0	0.00	Open	-4,754.53	1.35	0.56	false	2.16
P-37	2,406.00	12	125.0	0.00	Open	425.99	1.35	0.56	false	1.21
P-38	1,120.00	30	125.0	0.00	Open	-5,127.60	0.73	0.65	false	2.33
P-39	1,119.00	12	125.0	0.00	Open	-460.78	0.73	0.65	false	1.31

Project Engineer: Mark Smith

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# Scenario: Phase 4 Run 5 MDD 100%SW(S) Onsite FF @ J6, 7, & 8

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-40	1,551.00	30	125.0	0.00	Open	-5,292.34	1.07	0.69	false	2.40
P-41	1,519.00	12	125.0	0.00	Open	480.73	1.07	0.70	false	1.36
P-42	1,335.00	30	125.0	0.00	Open	5,788.14	1.08	0.81	false	2.63
P-50	989.00	12	125.0	0.00	Open	-1.19	0.00	0.00	false	0.00
P-56	1,373.00	12	125.0	0.00	Open	351.84	0.54	0.39	false	1.00
P-57	818.00	12	125.0	0.00	Open	-235.22	0.15	0.19	false	0.67
P-60	1,264.00	12	125.0	0.00	Open	117.04	0.06	0.05	false	0.33
P-65	1,029.00	12	125.0	0.00	Open	134.41	0.07	0.07	false	0.38
P-67	900.00	12	125.0	0.00	Open	135.42	0.06	0.07	false	0.38
P-69	773.00	12	125.0	0.00	Open	237.69	0.15	0.19	false	0.67
P-72	823.00	12	125.0	0.00	Open	201.74	0.12	0.14	false	0.57
P-68	100.00	24	125.0	0.00	Open	0.00	0.00	0.00	true	0.00
P-71	1.00	24	125.0	0.00	Closed	0.00	0.00	0.00	true	0.00
P-74	100.00	30	125.0	0.00	Open	-7,801.96	0.14	1.41	true	3.54
P-75	3.00	30	125.0	0.00	Open	-7,801.96	0.00	1.41	true	3.54
P-76	795.00	12	125.0	0.00	Open	234.11	0.15	0.19	false	0.66
P-77	801.00	12	125.0	0.00	Open	204.71	0.12	0.14	false	0.58
P-78	1,001.00	12	125.0	0.00	Open	136.43	0.07	0.07	false	0.39
P-79	900.00	12	125.0	0.00	Open	135.42	0.06	0.07	false	0.38
P-81	840.00	12	125.0	0.00	Open	655.17	1.05	1.25	false	1.86
P-82	1,761.00	12	125.0	0.00	Open	643.63	2.12	1.21	false	1.83
P-83	665.00	12	125.0	0.00	Open	1,703.09	4.86	7.31	false	4.83
P-84	775.00	12	125.0	0.00	Open	-251.58	0.16	0.21	false	0.71
P-85	139.00	12	125.0	0.00	Open	2,045.34	1.43	10.26	false	5.80
P-86	130.00	12	125.0	0.00	Open	1,954.66	1.23	9.43	false	5.54
P-90	345.00	12	125.0	0.00	Open	2,045.34	3.54	10.26	false	5.80
P-91	318.00	12	125.0	0.00	Open	545.34	0.28	0.89	false	1.55
P-92	320.00	12	125.0	0.00	Open	1,954.66	3.02	9.43	false	5.54
P-93	382.00	12	125.0	0.00	Open	-954.66	0.96	2.50	false	2.71
P-94	1,337.00	12	125.0	0.00	Open	-519.46	1.08	0.81	false	1.47
P-95	1,231.00	12	125.0	0.00	Open	-274.29	0.31	0.25	false	0.78
P-96	1,126.00	12	125.0	0.00	Open	-286.52	0.30	0.27	false	0.81
P-97	2,986.00	24	125.0	0.00	Open	-3,801.96	3.30	1.10	false	2.70
P-98	113.00	6	130.0	0.00	Closed	0.00	0.00	0.00	false	0.00
P-99	1,701.00	24	125.0	0.00	Open	-3,801.96	1.88	1.10	false	2.70
P-101	5,665.00	24	125.0	0.00	Open	-6,086.96	14.96	2.64	false	4.32
P-102	224.00	24	125.0	0.00	Open	-6,086.96	0.59	2.64	false	4.32
P-103	1.00	24	125.0	0.00	Open	-6,086.96	0.00	2.64	true	4.32
P-104	3,645.00	16	125.0	0.00	Open	2,285.00	11.30	3.10	false	3.65
P-105	5,402.00	16	125.0	0.00	Open	2,285.00	16.75	3.10	false	3.65
P-106	1,283.00	12	125.0	0.00	Open	-140.24	0.09	0.07	false	0.40

Project Engineer: Mark Smith

WaterCAD v6.5 [6.5120]

# Scenario: Phase 4 Run 6 MDD-100%GW Reservoir Fill

## Steady State Analysis

### Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-1	9.30	1	Demand	0.00	Fixed	0.00	131.51	52.98
J-3	19.50	Zone-1	Demand	0.00	Fixed	0.00	134.90	50.03
J-4	12.00	Zone-1	Demand	2,852.10	Fixed	2,852.10	131.49	51.80
J-5	21.50	Zone-1	Demand	0.00	Fixed	0.00	133.83	48.70
J-6	21.00	Zone-1	Demand	0.00	Fixed	0.00	129.24	46.93
J-7	21.00	Zone-1	Demand	0.00	Fixed	0.00	129.24	46.93
J-8	21.00	Zone-1	Demand	0.00	Fixed	0.00	129.24	46.93
J-9	12.00	Zone-1	Demand	0.00	Fixed	0.00	125.87	49.36
J-10	13.00	Zone-1	Demand	0.00	Fixed	0.00	125.87	48.93
J-11	13.00	Zone-1	Demand	0.00	Fixed	0.00	125.87	48.93
J-12	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.30	49.99
J-13	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.40	50.03
J-14	13.00	Zone-1	Demand	0.00	Fixed	0.00	114.56	44.03
J-15	13.00	Zone-1	Demand	2,285.00	Fixed	2,285.00	97.81	36.77
J-80	24.00	1	Demand	16.78	Fixed	16.78	134.15	47.75
J-90	26.30	1	Demand	8.32	Fixed	8.32	134.31	46.83
J-100	22.90	1	Demand	12.26	Fixed	12.26	134.42	48.35
J-130	20.10	1	Demand	32.17	Fixed	32.17	134.73	49.70
J-140	18.60	1	Demand	12.07	Fixed	12.07	134.76	50.36
J-160	18.85	1	Demand	20.88	Fixed	20.88	134.79	50.26
J-170	20.42	1	Demand	10.20	Fixed	10.20	133.91	49.20
J-190	20.40	1	Demand	7.94	Fixed	7.94	133.92	49.21
J-200	20.50	1	Demand	11.58	Fixed	11.58	133.86	49.14
J-210	23.60	1	Demand	17.04	Fixed	17.04	133.74	47.75
J-220	24.75	1	Demand	11.00	Fixed	11.00	133.77	47.26
J-230	24.20	1	Demand	10.26	Fixed	10.26	133.81	47.52
J-240	21.00	1	Demand	8.91	Fixed	8.91	133.86	48.93
J-250	24.30	1	Demand	12.20	Fixed	12.20	134.03	47.57
J-260	23.21	1	Demand	9.87	Fixed	9.87	133.92	48.00
J-300	20.30	1	Demand	30.36	Fixed	30.36	133.67	49.15
J-320	16.00	1	Demand	97.93	Fixed	97.93	133.04	50.74
J-350	16.00	1	Demand	101.90	Fixed	101.90	132.53	50.52
J-380	11.30	1	Demand	28.94	Fixed	28.94	131.93	52.30
J-400	15.35	1	Demand	15.97	Fixed	15.97	132.01	50.57
J-410	15.27	1	Demand	33.88	Fixed	33.88	132.01	50.61
J-420	24.50	1	Demand	17.26	Fixed	17.26	133.24	47.14
J-430	25.10	1	Demand	17.94	Fixed	17.94	132.79	46.68
J-440	21.30	1	Demand	16.71	Fixed	16.71	132.38	48.16
J-450	18.00	1	Demand	15.75	Fixed	15.75	132.01	49.43
J-460	15.30	1	Demand	0.00	Fixed	0.00	132.01	50.60
J-470	12.09	1	Demand	7.68	Fixed	7.68	131.86	51.92
J-480	10.60	1	Demand	0.00	Fixed	0.00	131.82	52.55
J-490	14.80	1	Demand	11.27	Fixed	11.27	131.81	50.73
J-500	11.10	1	Demand	11.27	Fixed	11.27	131.81	52.33
J-510	10.50	1	Demand	37.62	Fixed	37.62	131.79	52.58
J-530	11.00	1	Demand	0.00	Fixed	0.00	131.78	52.36
J-540	10.82	1	Demand	10.26	Fixed	10.26	131.78	52.44
J-550	11.60	1	Demand	9.23	Fixed	9.23	131.78	52.10
J-570	9.70	1	Demand	51.56	Fixed	51.56	131.62	52.85
J-610	15.30	1	Demand	31.81	Fixed	31.81	131.55	50.40
J-620	15.50	1	Demand	6.91	Fixed	6.91	131.76	50.40
J-680	13.40	1	Demand	17.17	Fixed	17.17	131.82	51.34

**Scenario: Phase 4 Run 6 MDD-100%GW Reservoir Fill**  
**Steady State Analysis**  
**Junction Report**

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand Calculated (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-690	11.25	1	Demand	11.27	Fixed	11.27	131.81	52.26
J-730	19.31	1	Demand	51.01	Fixed	51.01	133.42	49.47
J-760	9.70	1	Demand	0.00	Fixed	0.00	131.71	52.89
J-770	15.00	1	Demand	16.33	Fixed	16.33	132.01	50.73
J-800	18.80	1	Demand	7.74	Fixed	7.74	134.60	50.20
J-810	21.47	1	Demand	12.78	Fixed	12.78	133.91	48.75
J-820	20.20	1	Demand	31.69	Fixed	31.69	133.91	49.30
J-830	17.95	1	Demand	46.14	Fixed	46.14	132.31	49.58

# Scenario: Phase 4 Run 6 MDD-100%GW Reservoir Fill

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-1520	800.00	12	125.0	0.00	Open	-11.48	0.00	0.00	false	0.03
P-1550	449.00	30	125.0	0.00	Open	2,716.71	0.09	0.20	false	1.23
P-1540	395.00	30	125.0	0.00	Open	2,716.71	0.08	0.20	false	1.23
P-1270	257.00	24	125.0	0.00	Open	3,052.99	0.19	0.74	false	2.17
P-1060	1,125.00	12	125.0	0.00	Open	-254.95	0.24	0.22	false	0.72
P-1050	1,053.00	30	125.0	0.00	Open	2,941.66	0.24	0.23	false	1.34
P-960	746.00	12	125.0	0.00	Open	-60.67	0.01	0.02	false	0.17
P-970	897.00	12	125.0	0.00	Open	14.07	0.00	0.00	false	0.04
P-950	402.00	12	125.0	0.00	Open	36.61	0.00	0.01	false	0.10
P-940	817.00	12	125.0	0.00	Open	114.45	0.04	0.05	false	0.32
P-590	1,013.00	12	125.0	0.00	Open	-36.61	0.01	0.01	false	0.10
P-600	659.00	12	125.0	0.00	Open	-25.34	0.00	0.00	false	0.07
P-790	1,293.00	12	125.0	0.00	Open	218.77	0.21	0.16	false	0.62
P-800	1,439.00	12	125.0	0.00	Open	225.68	0.25	0.17	false	0.64
P-640	597.00	12	125.0	0.00	Open	-11.48	0.00	0.00	false	0.03
P-680	726.00	12	125.0	0.00	Open	-5.13	0.00	0.00	false	0.01
P-510	1,511.00	12	125.0	0.00	Open	-286.11	0.41	0.27	false	0.81
P-520	1,532.00	12	125.0	0.00	Open	269.40	0.37	0.24	false	0.76
P-230	1,475.00	12	125.0	0.00	Open	-80.66	0.04	0.03	false	0.23
P-220	1,496.00	12	125.0	0.00	Open	-69.66	0.03	0.02	false	0.20
P-200	753.00	12	125.0	0.00	Open	144.28	0.06	0.08	false	0.41
P-87	1,673.00	12	125.0	0.00	Open	99.82	0.06	0.04	false	0.28
P-70	1,321.00	12	125.0	0.00	Open	-190.27	0.17	0.13	false	0.54
P-80	808.00	12	125.0	0.00	Open	-198.59	0.11	0.14	false	0.56
P-250	1,092.00	12	125.0	0.00	Open	-173.49	0.12	0.11	false	0.49
P-3	527.00	30	125.0	0.00	Open	2,665.14	0.10	0.19	false	1.21
P-4	1,274.00	16	125.0	0.00	Open	186.96	0.04	0.03	false	0.30
P-8	1,129.00	16	125.0	0.00	Open	-167.86	0.03	0.02	false	0.27
P-11	2,034.00	12	125.0	0.00	Open	-210.86	0.31	0.15	false	0.60
P-14	1,007.00	16	125.0	0.00	Open	176.93	0.03	0.03	false	0.28
P-19	1,174.00	12	125.0	0.00	Open	161.29	0.11	0.09	false	0.46
P-20	1,680.00	12	125.0	0.00	Open	136.06	0.11	0.07	false	0.39
P-490	1,505.00	12	125.0	0.00	Open	321.32	0.50	0.33	false	0.91
P-500	1,520.00	12	125.0	0.00	Open	-304.05	0.46	0.30	false	0.86
P-22	900.00	12	125.0	0.00	Open	26.10	0.00	0.00	false	0.07
P-23	940.00	12	125.0	0.00	Open	-25.50	0.00	0.00	false	0.07
P-24	1,437.00	12	125.0	0.00	Open	22.19	0.00	0.00	false	0.06
P-25	1,528.00	12	125.0	0.00	Open	21.47	0.00	0.00	false	0.06
P-26	463.00	12	125.0	0.00	Open	-0.47	0.00	0.00	false	0.00
P-28	825.00	12	125.0	0.00	Open	-6.15	0.00	0.00	false	0.02
P-29	912.00	12	125.0	0.00	Open	-5.83	0.00	0.00	false	0.02
P-30	935.00	24	125.0	0.00	Open	3,045.25	0.68	0.73	false	2.16
P-31	502.00	12	125.0	0.00	Open	1.27	0.00	0.00	false	0.00
P-32	1,044.00	30	125.0	0.00	Open	2,964.96	0.25	0.24	false	1.35
P-33	1,076.00	12	125.0	0.00	Open	262.00	0.25	0.23	false	0.74
P-34	1,740.00	30	125.0	0.00	Open	-2,885.38	0.39	0.22	false	1.31
P-35	1,727.00	12	125.0	0.00	Open	260.21	0.39	0.23	false	0.74
P-36	2,395.00	30	125.0	0.00	Open	2,797.05	0.51	0.21	false	1.27
P-37	2,406.00	12	125.0	0.00	Open	-250.61	0.51	0.21	false	0.71
P-38	1,120.00	30	125.0	0.00	Open	2,702.88	0.22	0.20	false	1.23
P-39	1,119.00	12	125.0	0.00	Open	242.89	0.22	0.20	false	0.69

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# Scenario: Phase 4 Run 6 MDD-100%GW Reservoir Fill

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-40	1,551.00	30	125.0	0.00	Open	2,658.17	0.30	0.19	false	1.21
P-41	1,519.00	12	125.0	0.00	Open	-241.46	0.30	0.20	false	0.68
P-42	1,335.00	30	125.0	0.00	Open	-2,487.14	0.23	0.17	false	1.13
P-50	989.00	12	125.0	0.00	Open	151.07	0.08	0.08	false	0.43
P-56	1,373.00	12	125.0	0.00	Open	-63.46	0.02	0.02	false	0.18
P-57	818.00	12	125.0	0.00	Open	14.36	0.00	0.00	false	0.04
P-60	1,264.00	12	125.0	0.00	Open	-122.13	0.07	0.06	false	0.35
P-65	1,029.00	12	125.0	0.00	Open	-13.88	0.00	0.00	false	0.04
P-67	900.00	12	125.0	0.00	Open	-13.99	0.00	0.00	false	0.04
P-69	773.00	12	125.0	0.00	Open	11.20	0.00	0.00	false	0.03
P-72	823.00	12	125.0	0.00	Open	2.93	0.00	0.00	false	0.01
P-68	100.00	24	125.0	0.00	Open	-3,801.96	0.11	1.10	true	2.70
P-71	1.00	24	125.0	0.00	Open	-3,801.96	0.00	1.10	true	2.70
P-74	100.00	30	125.0	0.00	Open	2,852.10	0.02	0.22	true	1.29
P-75	3.00	30	125.0	0.00	Closed	0.00	0.00	0.00	true	0.00
P-76	795.00	12	125.0	0.00	Open	11.03	0.00	0.00	false	0.03
P-77	801.00	12	125.0	0.00	Open	2.97	0.00	0.00	false	0.01
P-78	1,001.00	12	125.0	0.00	Open	-14.09	0.00	0.00	false	0.04
P-79	900.00	12	125.0	0.00	Open	-13.99	0.00	0.00	false	0.04
P-81	840.00	12	125.0	0.00	Open	136.00	0.06	0.07	false	0.39
P-82	1,761.00	12	125.0	0.00	Open	132.64	0.11	0.06	false	0.38
P-83	665.00	12	125.0	0.00	Open	-90.92	0.02	0.03	false	0.26
P-84	775.00	12	125.0	0.00	Open	-90.37	0.02	0.03	false	0.26
P-85	139.00	12	125.0	0.00	Open	0.55	0.00	0.00	false	0.00
P-86	130.00	12	125.0	0.00	Open	-0.55	0.00	0.00	false	0.00
P-90	345.00	12	125.0	0.00	Open	0.55	0.00	0.00	false	0.00
P-91	318.00	12	125.0	0.00	Open	0.55	0.00	0.00	false	0.00
P-92	320.00	12	125.0	0.00	Open	-0.55	0.00	0.00	false	0.00
P-93	382.00	12	125.0	0.00	Open	0.55	0.00	0.00	false	0.00
P-94	1,337.00	12	125.0	0.00	Open	223.21	0.23	0.17	false	0.63
P-95	1,231.00	12	125.0	0.00	Open	-75.17	0.03	0.02	false	0.21
P-96	1,126.00	12	125.0	0.00	Open	-78.16	0.03	0.02	false	0.22
P-97	2,986.00	24	125.0	0.00	Open	0.00	0.00	0.00	false	0.00
P-98	113.00	6	130.0	0.00	Closed	0.00	0.00	0.00	false	0.00
P-99	1,701.00	24	125.0	0.00	Open	0.00	0.00	0.00	false	0.00
P-101	5,665.00	24	125.0	0.00	Open	-2,285.00	2.44	0.43	false	1.62
P-102	224.00	24	125.0	0.00	Open	-2,285.00	0.10	0.43	false	1.62
P-103	1.00	24	125.0	0.00	Open	-2,285.00	0.00	0.43	true	1.62
P-104	3,645.00	16	125.0	0.00	Open	2,285.00	11.30	3.10	false	3.65
P-105	5,402.00	16	125.0	0.00	Open	2,285.00	16.75	3.10	false	3.65
P-106	1,283.00	12	125.0	0.00	Open	473.00	0.87	0.68	false	1.34

# Scenario: Phase 5 Run 1 MDD-100%GW

## Steady State Analysis

### Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-1	9.30	1	Demand	0.00	Fixed	0.00	131.97	53.18
J-3	19.50	Zone-1	Demand	0.00	Fixed	0.00	134.90	50.03
J-4	12.00	Zone-1	Demand	0.00	Fixed	0.00	131.97	52.01
J-5	21.50	Zone-1	Demand	0.00	Fixed	0.00	133.00	48.34
J-6	21.00	Zone-1	Demand	0.00	Fixed	0.00	128.42	46.57
J-7	21.00	Zone-1	Demand	0.00	Fixed	0.00	128.42	46.57
J-8	21.00	Zone-1	Demand	0.00	Fixed	0.00	128.42	46.57
J-9	12.00	Zone-1	Demand	0.00	Fixed	0.00	127.04	49.87
J-10	13.00	Zone-1	Demand	0.00	Fixed	0.00	127.04	49.44
J-11	13.00	Zone-1	Demand	0.00	Fixed	0.00	127.04	49.44
J-12	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.35	50.01
J-13	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.40	50.03
J-14	13.00	Zone-1	Demand	0.00	Fixed	0.00	121.00	46.82
J-15	13.00	Zone-1	Demand	1,630.00	Fixed	1,630.00	112.04	42.93
J-80	24.00	1	Demand	89.92	Fixed	89.92	133.28	47.38
J-90	26.30	1	Demand	44.62	Fixed	44.62	133.52	46.48
J-100	22.90	1	Demand	65.71	Fixed	65.71	133.72	48.04
J-130	20.10	1	Demand	172.41	Fixed	172.41	134.47	49.58
J-140	18.60	1	Demand	64.68	Fixed	64.68	134.58	50.28
J-160	18.85	1	Demand	111.89	Fixed	111.89	134.71	50.23
J-170	20.42	1	Demand	54.65	Fixed	54.65	133.40	48.98
J-190	20.40	1	Demand	42.54	Fixed	42.54	133.20	48.90
J-200	20.50	1	Demand	62.08	Fixed	62.08	133.24	48.87
J-210	23.60	1	Demand	91.31	Fixed	91.31	132.95	47.41
J-220	24.75	1	Demand	58.97	Fixed	58.97	132.95	46.91
J-230	24.20	1	Demand	54.99	Fixed	54.99	132.97	47.15
J-240	21.00	1	Demand	47.73	Fixed	47.73	133.03	48.57
J-250	24.30	1	Demand	65.37	Fixed	65.37	133.21	47.21
J-260	23.21	1	Demand	52.92	Fixed	52.92	133.18	47.67
J-300	20.30	1	Demand	162.73	Fixed	162.73	133.14	48.92
J-320	16.00	1	Demand	524.85	Fixed	524.85	132.54	50.52
J-350	16.00	1	Demand	546.12	Fixed	546.12	132.21	50.38
J-380	11.30	1	Demand	155.12	Fixed	155.12	131.73	52.21
J-400	15.35	1	Demand	85.60	Fixed	85.60	132.01	50.57
J-410	15.27	1	Demand	181.58	Fixed	181.58	131.92	50.57
J-420	24.50	1	Demand	92.52	Fixed	92.52	132.39	46.77
J-430	25.10	1	Demand	96.15	Fixed	96.15	132.07	46.37
J-440	21.30	1	Demand	89.58	Fixed	89.58	131.94	47.97
J-450	18.00	1	Demand	84.39	Fixed	84.39	131.92	49.38
J-460	15.30	1	Demand	0.00	Fixed	0.00	131.92	50.56
J-470	12.09	1	Demand	41.16	Fixed	41.16	131.64	51.83
J-480	10.60	1	Demand	0.00	Fixed	0.00	131.61	52.46
J-490	14.80	1	Demand	60.42	Fixed	60.42	131.60	50.64
J-500	11.10	1	Demand	60.39	Fixed	60.39	131.60	52.24
J-510	10.50	1	Demand	201.64	Fixed	201.64	131.77	52.57
J-530	11.00	1	Demand	0.00	Fixed	0.00	131.86	52.39
J-540	10.82	1	Demand	54.99	Fixed	54.99	131.98	52.52
J-550	11.60	1	Demand	49.46	Fixed	49.46	131.86	52.13
J-570	9.70	1	Demand	276.34	Fixed	276.34	131.97	53.01
J-610	15.30	1	Demand	170.51	Fixed	170.51	131.92	50.56
J-620	15.50	1	Demand	37.01	Fixed	37.01	131.92	50.47
J-680	13.40	1	Demand	92.00	Fixed	92.00	131.61	51.25

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**Scenario: Phase 5 Run 1 MDD-100%GW**  
**Steady State Analysis**  
**Junction Report**

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-690	11.25	1	Demand	60.42	Fixed	60.42	131.62	52.18
J-730	19.31	1	Demand	273.40	Fixed	273.40	132.89	49.24
J-760	9.70	1	Demand	0.00	Fixed	0.00	131.97	53.01
J-770	15.00	1	Demand	87.50	Fixed	87.50	131.95	50.70
J-800	18.80	1	Demand	41.50	Fixed	41.50	134.42	50.12
J-810	21.47	1	Demand	68.48	Fixed	68.48	133.33	48.49
J-820	20.20	1	Demand	169.82	Fixed	169.82	133.24	49.01
J-830	17.95	1	Demand	247.29	Fixed	247.29	132.11	49.49

# Scenario: Phase 5 Run 1 MDD-100%GW

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-1520	800.00	12	125.0	0.00	Open	206.72	0.12	0.15	false	0.59
P-1550	449.00	30	125.0	0.00	Open	481.71	0.00	0.01	false	0.22
P-1540	395.00	30	125.0	0.00	Open	481.71	0.00	0.01	false	0.22
P-1270	257.00	24	125.0	0.00	Open	3,814.45	0.29	1.11	false	2.71
P-1060	1,125.00	12	125.0	0.00	Open	-257.30	0.25	0.22	false	0.73
P-1050	1,053.00	30	125.0	0.00	Open	2,968.57	0.25	0.24	false	1.35
P-960	746.00	12	125.0	0.00	Open	42.89	0.01	0.01	false	0.12
P-970	897.00	12	125.0	0.00	Open	-73.04	0.02	0.02	false	0.21
P-950	402.00	12	125.0	0.00	Open	47.77	0.00	0.01	false	0.14
P-940	817.00	12	125.0	0.00	Open	96.88	0.03	0.04	false	0.27
P-590	1,013.00	12	125.0	0.00	Open	-47.77	0.01	0.01	false	0.14
P-600	659.00	12	125.0	0.00	Open	12.66	0.00	0.00	false	0.04
P-790	1,293.00	12	125.0	0.00	Open	-34.85	0.01	0.01	false	0.10
P-800	1,439.00	12	125.0	0.00	Open	2.15	0.00	0.00	false	0.01
P-640	597.00	12	125.0	0.00	Open	206.72	0.09	0.15	false	0.59
P-680	726.00	12	125.0	0.00	Open	220.72	0.12	0.17	false	0.63
P-510	1,511.00	12	125.0	0.00	Open	-153.91	0.13	0.09	false	0.44
P-520	1,532.00	12	125.0	0.00	Open	64.33	0.03	0.02	false	0.18
P-230	1,475.00	12	125.0	0.00	Open	-53.01	0.02	0.01	false	0.15
P-220	1,496.00	12	125.0	0.00	Open	5.96	0.00	0.00	false	0.02
P-200	753.00	12	125.0	0.00	Open	258.37	0.17	0.22	false	0.73
P-87	1,673.00	12	125.0	0.00	Open	155.73	0.15	0.09	false	0.44
P-70	1,321.00	12	125.0	0.00	Open	-229.90	0.24	0.18	false	0.65
P-80	808.00	12	125.0	0.00	Open	-274.51	0.20	0.25	false	0.78
P-250	1,092.00	12	125.0	0.00	Open	-139.97	0.08	0.07	false	0.40
P-3	527.00	30	125.0	0.00	Open	205.36	0.00	0.00	false	0.09
P-4	1,274.00	16	125.0	0.00	Open	-205.36	0.05	0.04	false	0.33
P-8	1,129.00	16	125.0	0.00	Open	-354.07	0.11	0.10	false	0.56
P-11	2,034.00	12	125.0	0.00	Open	-340.23	0.75	0.37	false	0.97
P-14	1,007.00	16	125.0	0.00	Open	400.42	0.12	0.12	false	0.64
P-19	1,174.00	12	125.0	0.00	Open	74.60	0.03	0.02	false	0.21
P-20	1,680.00	12	125.0	0.00	Open	222.72	0.28	0.17	false	0.63
P-490	1,505.00	12	125.0	0.00	Open	342.58	0.56	0.37	false	0.97
P-500	1,520.00	12	125.0	0.00	Open	-250.06	0.32	0.21	false	0.71
P-22	900.00	12	125.0	0.00	Open	-67.81	0.02	0.02	false	0.19
P-23	940.00	12	125.0	0.00	Open	66.24	0.02	0.02	false	0.19
P-24	1,437.00	12	125.0	0.00	Open	-89.76	0.05	0.03	false	0.25
P-25	1,528.00	12	125.0	0.00	Open	-86.83	0.05	0.03	false	0.25
P-26	463.00	12	125.0	0.00	Open	211.97	0.07	0.15	false	0.60
P-28	825.00	12	125.0	0.00	Open	177.89	0.09	0.11	false	0.50
P-29	912.00	12	125.0	0.00	Open	168.52	0.09	0.10	false	0.48
P-30	935.00	24	125.0	0.00	Open	3,772.95	1.02	1.09	false	2.68
P-31	502.00	12	125.0	0.00	Open	202.92	0.07	0.14	false	0.58
P-32	1,044.00	30	125.0	0.00	Open	3,113.47	0.27	0.26	false	1.41
P-33	1,076.00	12	125.0	0.00	Open	275.13	0.27	0.25	false	0.78
P-34	1,740.00	30	125.0	0.00	Open	-2,708.22	0.35	0.20	false	1.23
P-35	1,727.00	12	125.0	0.00	Open	244.24	0.35	0.20	false	0.69
P-36	2,395.00	30	125.0	0.00	Open	2,227.99	0.33	0.14	false	1.01
P-37	2,406.00	12	125.0	0.00	Open	-199.62	0.33	0.14	false	0.57
P-38	1,120.00	30	125.0	0.00	Open	1,726.36	0.10	0.09	false	0.78
P-39	1,119.00	12	125.0	0.00	Open	155.13	0.10	0.09	false	0.44

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**Scenario: Phase 5 Run 1 MDD-100%GW**  
**Steady State Analysis**  
**Pipe Report**

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-40	1,551.00	30	125.0	0.00	Open	1,497.82	0.10	0.07	false	0.68
P-41	1,519.00	12	125.0	0.00	Open	-136.38	0.10	0.07	false	0.39
P-42	1,335.00	30	125.0	0.00	Open	-884.75	0.03	0.03	false	0.40
P-50	989.00	12	125.0	0.00	Open	293.16	0.28	0.28	false	0.83
P-56	1,373.00	12	125.0	0.00	Open	176.35	0.15	0.11	false	0.50
P-57	818.00	12	125.0	0.00	Open	-171.27	0.08	0.10	false	0.49
P-60	1,264.00	12	125.0	0.00	Open	-138.04	0.09	0.07	false	0.39
P-65	1,029.00	12	125.0	0.00	Open	11.03	0.00	0.00	false	0.03
P-67	900.00	12	125.0	0.00	Open	11.11	0.00	0.00	false	0.03
P-69	773.00	12	125.0	0.00	Open	146.75	0.06	0.08	false	0.42
P-72	823.00	12	125.0	0.00	Open	101.15	0.03	0.04	false	0.29
P-68	100.00	24	125.0	0.00	Open	-5,090.76	0.19	1.90	true	3.61
P-71	1.00	24	125.0	0.00	Open	-5,090.76	0.00	1.89	true	3.61
P-74	100.00	30	125.0	0.00	Open	0.00	0.00	0.00	true	0.00
P-75	3.00	30	125.0	0.00	Closed	0.00	0.00	0.00	true	0.00
P-76	795.00	12	125.0	0.00	Open	144.54	0.06	0.08	false	0.41
P-77	801.00	12	125.0	0.00	Open	102.64	0.03	0.04	false	0.29
P-78	1,001.00	12	125.0	0.00	Open	11.18	0.00	0.00	false	0.03
P-79	900.00	12	125.0	0.00	Open	11.11	0.00	0.00	false	0.03
P-81	840.00	12	125.0	0.00	Open	243.56	0.17	0.20	false	0.69
P-82	1,761.00	12	125.0	0.00	Open	217.13	0.28	0.16	false	0.62
P-83	665.00	12	125.0	0.00	Open	-108.00	0.03	0.04	false	0.31
P-84	775.00	12	125.0	0.00	Open	-107.24	0.03	0.04	false	0.30
P-85	139.00	12	125.0	0.00	Open	0.76	0.00	0.00	false	0.00
P-86	130.00	12	125.0	0.00	Open	-0.76	0.00	0.00	false	0.00
P-90	345.00	12	125.0	0.00	Open	0.76	0.00	0.00	false	0.00
P-91	318.00	12	125.0	0.00	Open	0.76	0.00	0.00	false	0.00
P-92	320.00	12	125.0	0.00	Open	-0.76	0.00	0.00	false	0.00
P-93	382.00	12	125.0	0.00	Open	0.76	0.00	0.00	false	0.00
P-94	1,337.00	12	125.0	0.00	Open	79.40	0.03	0.03	false	0.23
P-95	1,231.00	12	125.0	0.00	Open	-158.56	0.11	0.09	false	0.45
P-96	1,126.00	12	125.0	0.00	Open	-176.90	0.12	0.11	false	0.50
P-97	2,986.00	24	125.0	0.00	Open	0.00	0.00	0.00	false	0.00
P-98	113.00	6	130.0	0.00	Closed	0.00	0.00	0.00	false	0.00
P-99	1,701.00	24	125.0	0.00	Open	0.00	0.00	0.00	false	0.00
P-101	5,665.00	24	125.0	0.00	Open	-1,630.00	1.30	0.23	false	1.16
P-102	224.00	24	125.0	0.00	Open	-1,630.00	0.05	0.23	false	1.16
P-103	1.00	24	125.0	0.00	Open	-1,630.00	0.00	0.23	true	1.16
P-104	3,645.00	16	125.0	0.00	Open	1,630.00	6.05	1.66	false	2.60
P-105	5,402.00	16	125.0	0.00	Open	1,630.00	8.96	1.66	false	2.60
P-106	1,283.00	12	125.0	0.00	Open	587.10	1.30	1.02	false	1.67

# Scenario: Phase 5 Run 2 PHD-100%GW

## Steady State Analysis

### Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-1	9.30	1	Demand	0.00	Fixed	0.00	127.33	51.17
J-3	19.50	Zone-1	Inflow	5,090.76	Fixed	-5,090.76	127.93	47.00
J-4	12.00	Zone-1	Demand	0.00	Fixed	0.00	127.40	50.03
J-5	21.50	Zone-1	Demand	0.00	Fixed	0.00	125.55	45.11
J-6	21.00	Zone-1	Demand	0.00	Fixed	0.00	120.95	43.33
J-7	21.00	Zone-1	Demand	0.00	Fixed	0.00	120.95	43.33
J-8	21.00	Zone-1	Demand	0.00	Fixed	0.00	120.95	43.33
J-9	12.00	Zone-1	Demand	0.00	Fixed	0.00	127.04	49.87
J-10	13.00	Zone-1	Demand	0.00	Fixed	0.00	127.04	49.44
J-11	13.00	Zone-1	Demand	0.00	Fixed	0.00	127.04	49.44
J-12	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.35	50.01
J-13	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.40	50.03
J-14	13.00	Zone-1	Demand	0.00	Fixed	0.00	121.00	46.82
J-15	13.00	Zone-1	Demand	1,630.00	Fixed	1,630.00	112.04	42.93
J-80	24.00	1	Demand	179.85	Fixed	179.85	125.62	44.05
J-90	26.30	1	Demand	89.23	Fixed	89.23	125.82	43.14
J-100	22.90	1	Demand	131.43	Fixed	131.43	126.05	44.72
J-130	20.10	1	Demand	344.83	Fixed	344.83	127.21	46.44
J-140	18.60	1	Demand	129.35	Fixed	129.35	127.45	47.19
J-160	18.85	1	Demand	223.77	Fixed	223.77	127.74	47.20
J-170	20.42	1	Demand	109.29	Fixed	109.29	126.68	46.07
J-190	20.40	1	Demand	85.08	Fixed	85.08	125.76	45.67
J-200	20.50	1	Demand	124.16	Fixed	124.16	126.32	45.88
J-210	23.60	1	Demand	182.62	Fixed	182.62	125.77	44.29
J-220	24.75	1	Demand	117.94	Fixed	117.94	125.58	43.71
J-230	24.20	1	Demand	109.98	Fixed	109.98	125.55	43.94
J-240	21.00	1	Demand	95.46	Fixed	95.46	125.56	45.33
J-250	24.30	1	Demand	130.74	Fixed	130.74	125.62	43.92
J-260	23.21	1	Demand	105.83	Fixed	105.83	125.66	44.41
J-300	20.30	1	Demand	325.46	Fixed	325.46	126.57	46.07
J-320	16.00	1	Demand	1,049.69	Fixed	1,049.69	126.42	47.87
J-350	16.00	1	Demand	1,092.24	Fixed	1,092.24	126.41	47.87
J-380	11.30	1	Demand	310.24	Fixed	310.24	125.61	49.56
J-400	15.35	1	Demand	171.20	Fixed	171.20	126.51	48.19
J-410	15.27	1	Demand	363.16	Fixed	363.16	126.00	48.00
J-420	24.50	1	Demand	185.04	Fixed	185.04	125.44	43.76
J-430	25.10	1	Demand	192.30	Fixed	192.30	125.41	43.49
J-440	21.30	1	Demand	179.16	Fixed	179.16	125.49	45.17
J-450	18.00	1	Demand	168.78	Fixed	168.78	125.94	46.79
J-460	15.30	1	Demand	0.00	Fixed	0.00	125.97	47.98
J-470	12.09	1	Demand	82.32	Fixed	82.32	125.36	49.11
J-480	10.60	1	Demand	0.00	Fixed	0.00	125.27	49.71
J-490	14.80	1	Demand	120.84	Fixed	120.84	125.24	47.88
J-500	11.10	1	Demand	120.78	Fixed	120.78	125.24	49.48
J-510	10.50	1	Demand	403.28	Fixed	403.28	125.96	50.05
J-530	11.00	1	Demand	0.00	Fixed	0.00	126.30	49.99
J-540	10.82	1	Demand	109.98	Fixed	109.98	126.76	50.26
J-550	11.60	1	Demand	98.92	Fixed	98.92	126.29	49.72
J-570	9.70	1	Demand	552.69	Fixed	552.69	127.08	50.89
J-610	15.30	1	Demand	341.02	Fixed	341.02	126.88	48.37
J-620	15.50	1	Demand	74.01	Fixed	74.01	126.34	48.05
J-680	13.40	1	Demand	184.00	Fixed	184.00	125.29	48.50

Project Engineer: Mark Smith

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**Scenario: Phase 5 Run 2 PHD-100%GW**  
**Steady State Analysis**  
**Junction Report**

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-690	11.25	1	Demand	120.84	Fixed	120.84	125.32	49.45
J-730	19.31	1	Demand	546.81	Fixed	546.81	126.48	46.46
J-760	9.70	1	Demand	0.00	Fixed	0.00	126.91	50.81
J-770	15.00	1	Demand	175.01	Fixed	175.01	126.19	48.21
J-800	18.80	1	Demand	83.01	Fixed	83.01	127.50	47.12
J-810	21.47	1	Demand	136.96	Fixed	136.96	126.38	45.48
J-820	20.20	1	Demand	339.64	Fixed	339.64	125.98	45.86
J-830	17.95	1	Demand	494.58	Fixed	494.58	126.44	47.03

# Scenario: Phase 5 Run 2 PHD-100%GW

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen-Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-1520	800.00	12	125.0	0.00	Open	430.26	0.46	0.57	false	1.22
P-1550	449.00	30	125.0	0.00	Open	-3,831.76	0.17	0.38	false	1.74
P-1540	395.00	30	125.0	0.00	Open	-3,831.76	0.15	0.38	false	1.74
P-1270	257.00	24	125.0	0.00	Open	3,439.18	0.24	0.92	false	2.44
P-1060	1,125.00	12	125.0	0.00	Open	-142.83	0.08	0.07	false	0.41
P-1050	1,053.00	30	125.0	0.00	Open	1,646.72	0.08	0.08	false	0.75
P-960	746.00	12	125.0	0.00	Open	111.79	0.04	0.05	false	0.32
P-970	897.00	12	125.0	0.00	Open	-152.92	0.08	0.08	false	0.43
P-950	402.00	12	125.0	0.00	Open	88.70	0.01	0.03	false	0.25
P-940	817.00	12	125.0	0.00	Open	160.91	0.08	0.09	false	0.46
P-590	1,013.00	12	125.0	0.00	Open	-88.70	0.03	0.03	false	0.25
P-600	659.00	12	125.0	0.00	Open	32.14	0.00	0.00	false	0.09
P-790	1,293.00	12	125.0	0.00	Open	-365.29	0.55	0.42	false	1.04
P-800	1,439.00	12	125.0	0.00	Open	-291.28	0.40	0.28	false	0.83
P-640	597.00	12	125.0	0.00	Open	430.26	0.34	0.57	false	1.22
P-680	726.00	12	125.0	0.00	Open	457.48	0.46	0.64	false	1.30
P-510	1,511.00	12	125.0	0.00	Open	120.76	0.08	0.05	false	0.34
P-520	1,532.00	12	125.0	0.00	Open	-299.92	0.45	0.29	false	0.85
P-230	1,475.00	12	125.0	0.00	Open	73.82	0.03	0.02	false	0.21
P-220	1,496.00	12	125.0	0.00	Open	191.76	0.19	0.13	false	0.54
P-200	753.00	12	125.0	0.00	Open	388.70	0.36	0.47	false	1.10
P-87	1,673.00	12	125.0	0.00	Open	131.62	0.11	0.06	false	0.37
P-70	1,321.00	12	125.0	0.00	Open	-209.16	0.20	0.15	false	0.59
P-80	808.00	12	125.0	0.00	Open	-298.40	0.23	0.29	false	0.85
P-250	1,092.00	12	125.0	0.00	Open	-29.31	0.00	0.00	false	0.08
P-3	527.00	30	125.0	0.00	Open	-4,384.45	0.26	0.49	false	1.99
P-4	1,274.00	16	125.0	0.00	Open	-706.31	0.45	0.35	false	1.13
P-8	1,129.00	16	125.0	0.00	Open	-535.04	0.24	0.21	false	0.85
P-11	2,034.00	12	125.0	0.00	Open	-429.82	1.16	0.57	false	1.22
P-14	1,007.00	16	125.0	0.00	Open	627.00	0.28	0.28	false	1.00
P-19	1,174.00	12	125.0	0.00	Open	-101.42	0.05	0.04	false	0.29
P-20	1,680.00	12	125.0	0.00	Open	319.49	0.55	0.33	false	0.91
P-490	1,505.00	12	125.0	0.00	Open	256.58	0.33	0.22	false	0.73
P-500	1,520.00	12	125.0	0.00	Open	-71.54	0.03	0.02	false	0.20
P-22	900.00	12	125.0	0.00	Open	-171.43	0.09	0.10	false	0.49
P-23	940.00	12	125.0	0.00	Open	167.45	0.09	0.10	false	0.48
P-24	1,437.00	12	125.0	0.00	Open	-215.49	0.23	0.16	false	0.61
P-25	1,528.00	12	125.0	0.00	Open	-208.47	0.23	0.15	false	0.59
P-26	463.00	12	125.0	0.00	Open	460.11	0.30	0.65	false	1.31
P-28	825.00	12	125.0	0.00	Open	392.13	0.40	0.48	false	1.11
P-29	912.00	12	125.0	0.00	Open	371.47	0.40	0.44	false	1.05
P-30	935.00	24	125.0	0.00	Open	3,356.17	0.82	0.88	false	2.38
P-31	502.00	12	125.0	0.00	Open	440.45	0.30	0.60	false	1.25
P-32	1,044.00	30	125.0	0.00	Open	1,943.28	0.11	0.11	false	0.88
P-33	1,076.00	12	125.0	0.00	Open	171.72	0.11	0.10	false	0.49
P-34	1,740.00	30	125.0	0.00	Open	-1,139.94	0.07	0.04	false	0.52
P-35	1,727.00	12	125.0	0.00	Open	102.80	0.07	0.04	false	0.29
P-36	2,395.00	30	125.0	0.00	Open	186.47	0.00	0.00	false	0.08
P-37	2,406.00	12	125.0	0.00	Open	-6.57	0.00	0.00	false	0.02
P-38	1,120.00	30	125.0	0.00	Open	-825.03	0.02	0.02	false	0.37
P-39	1,119.00	12	125.0	0.00	Open	-74.16	0.02	0.02	false	0.21

Project Engineer: Mark Smith

WaterCAD v6.5 [6.5120]

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# Scenario: Phase 5 Run 2 PHD-100%GW

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-40	1,551.00	30	125.0	0.00	Open	-1,277.71	0.08	0.05	false	0.58
P-41	1,519.00	12	125.0	0.00	Open	116.06	0.08	0.05	false	0.33
P-42	1,335.00	30	125.0	0.00	Open	2,600.63	0.25	0.18	false	1.18
P-50	989.00	12	125.0	0.00	Open	553.47	0.90	0.91	false	1.57
P-56	1,373.00	12	125.0	0.00	Open	385.55	0.64	0.47	false	1.09
P-57	818.00	12	125.0	0.00	Open	-358.57	0.33	0.41	false	1.02
P-60	1,264.00	12	125.0	0.00	Open	-243.23	0.25	0.20	false	0.69
P-65	1,029.00	12	125.0	0.00	Open	88.05	0.03	0.03	false	0.25
P-67	900.00	12	125.0	0.00	Open	88.71	0.03	0.03	false	0.25
P-69	773.00	12	125.0	0.00	Open	360.50	0.32	0.41	false	1.02
P-72	823.00	12	125.0	0.00	Open	268.31	0.20	0.24	false	0.76
P-68	100.00	24	125.0	0.00	Open	-5,090.76	0.19	1.90	true	3.61
P-71	1.00	24	125.0	0.00	Closed	0.00	0.00	0.00	true	0.00
P-74	100.00	30	125.0	0.00	Open	-5,090.76	0.06	0.64	true	2.31
P-75	3.00	30	125.0	0.00	Open	-5,090.76	0.00	0.64	true	2.31
P-76	795.00	12	125.0	0.00	Open	355.08	0.32	0.40	false	1.01
P-77	801.00	12	125.0	0.00	Open	272.27	0.20	0.24	false	0.77
P-78	1,001.00	12	125.0	0.00	Open	89.37	0.03	0.03	false	0.25
P-79	900.00	12	125.0	0.00	Open	88.71	0.03	0.03	false	0.25
P-81	840.00	12	125.0	0.00	Open	366.42	0.36	0.42	false	1.04
P-82	1,761.00	12	125.0	0.00	Open	311.47	0.55	0.31	false	0.88
P-83	665.00	12	125.0	0.00	Open	-36.16	0.00	0.01	false	0.10
P-84	775.00	12	125.0	0.00	Open	-36.06	0.00	0.01	false	0.10
P-85	139.00	12	125.0	0.00	Open	0.10	0.00	0.00	false	0.00
P-86	130.00	12	125.0	0.00	Open	-0.10	0.00	0.00	false	0.00
P-90	345.00	12	125.0	0.00	Open	0.10	0.00	0.00	false	0.00
P-91	318.00	12	125.0	0.00	Open	0.10	0.00	0.00	false	0.00
P-92	320.00	12	125.0	0.00	Open	-0.10	0.00	0.00	false	0.00
P-93	382.00	12	125.0	0.00	Open	0.10	0.00	0.00	false	0.00
P-94	1,337.00	12	125.0	0.00	Open	-233.40	0.25	0.18	false	0.66
P-95	1,231.00	12	125.0	0.00	Open	-239.61	0.24	0.19	false	0.68
P-96	1,126.00	12	125.0	0.00	Open	-277.00	0.28	0.25	false	0.79
P-97	2,986.00	24	125.0	0.00	Open	0.00	0.00	0.00	false	0.00
P-98	113.00	6	130.0	0.00	Closed	0.00	0.00	0.00	false	0.00
P-99	1,701.00	24	125.0	0.00	Open	0.00	0.00	0.00	false	0.00
P-101	5,665.00	24	125.0	0.00	Open	-1,630.00	1.30	0.23	false	1.16
P-102	224.00	24	125.0	0.00	Open	-1,630.00	0.05	0.23	false	1.16
P-103	1.00	24	125.0	0.00	Open	-1,630.00	0.00	0.23	true	1.16
P-104	3,645.00	16	125.0	0.00	Open	1,630.00	6.05	1.66	false	2.60
P-105	5,402.00	16	125.0	0.00	Open	1,630.00	8.96	1.66	false	2.60
P-106	1,283.00	12	125.0	0.00	Open	523.81	1.06	0.82	false	1.49

# Scenario: Phase 5 Run 3 PHD-100%SW(S)

## Steady State Analysis

### Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand Calculated (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-1	9.30	1	Demand	0.00	Fixed	0.00	127.16	51.10
J-3	19.50	Zone-1	Demand	0.00	Fixed	0.00	119.36	43.29
J-4	12.00	Zone-1	Demand	0.00	Fixed	0.00	127.39	50.03
J-5	21.50	Zone-1	Demand	0.00	Fixed	0.00	118.43	42.02
J-6	21.00	Zone-1	Demand	0.00	Fixed	0.00	113.82	40.24
J-7	21.00	Zone-1	Demand	0.00	Fixed	0.00	113.82	40.24
J-8	21.00	Zone-1	Demand	0.00	Fixed	0.00	113.82	40.24
J-9	12.00	Zone-1	Demand	5,091.00	Fixed	5,091.00	100.82	38.50
J-10	13.00	Zone-1	Demand	0.00	Fixed	0.00	106.48	40.53
J-11	13.00	Zone-1	Demand	0.00	Fixed	0.00	109.71	41.92
J-12	13.00	Zone-1	Demand	0.00	Fixed	0.00	127.69	49.72
J-13	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.40	50.03
J-14	13.00	Zone-1	Demand	0.00	Fixed	0.00	103.66	39.30
J-15	13.00	Zone-1	Demand	1,630.00	Fixed	1,630.00	94.70	35.42
J-80	24.00	1	Demand	179.85	Fixed	179.85	118.19	40.83
J-90	26.30	1	Demand	89.23	Fixed	89.23	118.23	39.85
J-100	22.90	1	Demand	131.43	Fixed	131.43	118.32	41.37
J-130	20.10	1	Demand	344.83	Fixed	344.83	118.96	42.86
J-140	18.60	1	Demand	129.35	Fixed	129.35	119.14	43.58
J-160	18.85	1	Demand	223.77	Fixed	223.77	119.36	43.57
J-170	20.42	1	Demand	109.29	Fixed	109.29	119.45	42.93
J-190	20.40	1	Demand	85.08	Fixed	85.08	118.51	42.53
J-200	20.50	1	Demand	124.16	Fixed	124.16	119.29	42.83
J-210	23.60	1	Demand	182.62	Fixed	182.62	119.07	41.39
J-220	24.75	1	Demand	117.94	Fixed	117.94	118.62	40.70
J-230	24.20	1	Demand	109.98	Fixed	109.98	118.45	40.86
J-240	21.00	1	Demand	95.46	Fixed	95.46	118.41	42.23
J-250	24.30	1	Demand	130.74	Fixed	130.74	118.22	40.72
J-260	23.21	1	Demand	105.83	Fixed	105.83	118.41	41.27
J-300	20.30	1	Demand	325.46	Fixed	325.46	119.62	43.06
J-320	16.00	1	Demand	1,049.69	Fixed	1,049.69	120.29	45.21
J-350	16.00	1	Demand	1,092.24	Fixed	1,092.24	121.35	45.67
J-380	11.30	1	Demand	310.24	Fixed	310.24	122.68	48.29
J-400	15.35	1	Demand	171.20	Fixed	171.20	123.27	46.78
J-410	15.27	1	Demand	363.16	Fixed	363.16	122.72	46.58
J-420	24.50	1	Demand	185.04	Fixed	185.04	119.14	41.03
J-430	25.10	1	Demand	192.30	Fixed	192.30	119.58	40.96
J-440	21.30	1	Demand	179.16	Fixed	179.16	120.67	43.08
J-450	18.00	1	Demand	168.78	Fixed	168.78	122.65	45.37
J-460	15.30	1	Demand	0.00	Fixed	0.00	122.68	46.55
J-470	12.09	1	Demand	82.32	Fixed	82.32	122.61	47.91
J-480	10.60	1	Demand	0.00	Fixed	0.00	122.59	48.55
J-490	14.80	1	Demand	120.84	Fixed	120.84	122.58	46.72
J-500	11.10	1	Demand	120.78	Fixed	120.78	122.59	48.33
J-510	10.50	1	Demand	403.28	Fixed	403.28	123.74	49.09
J-530	11.00	1	Demand	0.00	Fixed	0.00	124.17	49.06
J-540	10.82	1	Demand	109.98	Fixed	109.98	124.75	49.39
J-550	11.60	1	Demand	98.92	Fixed	98.92	124.17	48.80
J-570	9.70	1	Demand	552.69	Fixed	552.69	126.17	50.49
J-610	15.30	1	Demand	341.02	Fixed	341.02	126.22	48.09
J-620	15.50	1	Demand	74.01	Fixed	74.01	124.35	47.19
J-680	13.40	1	Demand	184.00	Fixed	184.00	122.60	47.34

Project Engineer: Mark Smith

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**Scenario: Phase 5 Run 3 PHD-100%SW(S)****Steady State Analysis****Junction Report**

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-690	11.25	1	Demand	120.84	Fixed	120.84	122.70	48.31
J-730	19.31	1	Demand	546.81	Fixed	546.81	119.83	43.58
J-760	9.70	1	Demand	0.00	Fixed	0.00	125.41	50.16
J-770	15.00	1	Demand	175.01	Fixed	175.01	122.93	46.79
J-800	18.80	1	Demand	83.01	Fixed	83.01	119.37	43.60
J-810	21.47	1	Demand	136.96	Fixed	136.96	119.15	42.35
J-820	20.20	1	Demand	339.64	Fixed	339.64	118.75	42.72
J-830	17.95	1	Demand	494.58	Fixed	494.58	122.08	45.14

# Scenario: Phase 5 Run 3 PHD-100%SW(S)

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-1520	800.00	12	125.0	0.00	Open	489.12	0.58	0.72	false	1.39
P-1550	449.00	30	125.0	0.00	Open	-8,576.81	0.75	1.68	false	3.89
P-1540	395.00	30	125.0	0.00	Open	-8,576.81	0.66	1.68	false	3.89
P-1270	257.00	24	125.0	0.00	Open	-863.96	0.02	0.07	false	0.61
P-1060	1,125.00	12	125.0	0.00	Open	233.96	0.21	0.18	false	0.66
P-1050	1,053.00	30	125.0	0.00	Open	-2,699.53	0.21	0.20	false	1.23
P-960	746.00	12	125.0	0.00	Open	195.14	0.10	0.13	false	0.55
P-970	897.00	12	125.0	0.00	Open	-184.50	0.11	0.12	false	0.52
P-950	402.00	12	125.0	0.00	Open	57.12	0.01	0.01	false	0.16
P-940	817.00	12	125.0	0.00	Open	45.98	0.01	0.01	false	0.13
P-590	1,013.00	12	125.0	0.00	Open	-57.12	0.01	0.01	false	0.16
P-600	659.00	12	125.0	0.00	Open	63.72	0.01	0.02	false	0.18
P-790	1,293.00	12	125.0	0.00	Open	-711.00	1.87	1.45	false	2.02
P-800	1,439.00	12	125.0	0.00	Open	-636.98	1.70	1.18	false	1.81
P-640	597.00	12	125.0	0.00	Open	489.12	0.43	0.72	false	1.39
P-680	726.00	12	125.0	0.00	Open	513.56	0.58	0.79	false	1.46
P-510	1,511.00	12	125.0	0.00	Open	488.48	1.09	0.72	false	1.39
P-520	1,532.00	12	125.0	0.00	Open	-667.63	1.98	1.29	false	1.89
P-230	1,475.00	12	125.0	0.00	Open	186.29	0.18	0.12	false	0.53
P-220	1,496.00	12	125.0	0.00	Open	304.23	0.45	0.30	false	0.86
P-200	753.00	12	125.0	0.00	Open	257.31	0.17	0.22	false	0.73
P-87	1,673.00	12	125.0	0.00	Open	19.16	0.00	0.00	false	0.05
P-70	1,321.00	12	125.0	0.00	Open	-90.72	0.04	0.03	false	0.26
P-80	808.00	12	125.0	0.00	Open	-179.96	0.09	0.11	false	0.51
P-250	1,092.00	12	125.0	0.00	Open	89.12	0.03	0.03	false	0.25
P-3	527.00	30	125.0	0.00	Open	-9,129.50	0.99	1.89	false	4.14
P-4	1,274.00	16	125.0	0.00	Open	-1,052.02	0.94	0.74	false	1.68
P-8	1,129.00	16	125.0	0.00	Open	-453.24	0.18	0.16	false	0.72
P-11	2,034.00	12	125.0	0.00	Open	-311.39	0.64	0.31	false	0.88
P-14	1,007.00	16	125.0	0.00	Open	544.86	0.22	0.22	false	0.87
P-19	1,174.00	12	125.0	0.00	Open	-219.86	0.19	0.16	false	0.62
P-20	1,680.00	12	125.0	0.00	Open	190.24	0.21	0.13	false	0.54
P-490	1,505.00	12	125.0	0.00	Open	-111.14	0.07	0.05	false	0.32
P-500	1,520.00	12	125.0	0.00	Open	296.18	0.44	0.29	false	0.84
P-22	900.00	12	125.0	0.00	Open	-174.45	0.10	0.11	false	0.49
P-23	940.00	12	125.0	0.00	Open	170.40	0.10	0.10	false	0.48
P-24	1,437.00	12	125.0	0.00	Open	-218.53	0.23	0.16	false	0.62
P-25	1,528.00	12	125.0	0.00	Open	-211.40	0.23	0.15	false	0.60
P-26	463.00	12	125.0	0.00	Open	463.16	0.30	0.66	false	1.31
P-28	825.00	12	125.0	0.00	Open	395.20	0.40	0.49	false	1.12
P-29	912.00	12	125.0	0.00	Open	374.37	0.40	0.44	false	1.06
P-30	935.00	24	125.0	0.00	Open	-946.97	0.08	0.08	false	0.67
P-31	502.00	12	125.0	0.00	Open	443.37	0.30	0.60	false	1.26
P-32	1,044.00	30	125.0	0.00	Open	-2,396.25	0.17	0.16	false	1.09
P-33	1,076.00	12	125.0	0.00	Open	-211.79	0.17	0.15	false	0.60
P-34	1,740.00	30	125.0	0.00	Open	3,191.60	0.47	0.27	false	1.45
P-35	1,727.00	12	125.0	0.00	Open	-288.71	0.47	0.27	false	0.82
P-36	2,395.00	30	125.0	0.00	Open	-4,157.50	1.05	0.44	false	1.89
P-37	2,406.00	12	125.0	0.00	Open	372.50	1.05	0.44	false	1.06
P-38	1,120.00	30	125.0	0.00	Open	-5,158.67	0.73	0.66	false	2.34
P-39	1,119.00	12	125.0	0.00	Open	-463.57	0.73	0.66	false	1.32

Project Engineer: Mark Smith

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# Scenario: Phase 5 Run 3 PHD-100%SW(S)

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen-Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-40	1,551.00	30	125.0	0.00	Open	-5,607.46	1.19	0.77	false	2.55
P-41	1,519.00	12	125.0	0.00	Open	509.36	1.19	0.78	false	1.44
P-42	1,335.00	30	125.0	0.00	Open	6,849.44	1.48	1.11	false	3.11
P-50	989.00	12	125.0	0.00	Open	438.53	0.59	0.59	false	1.24
P-56	1,373.00	12	125.0	0.00	Open	500.49	1.04	0.76	false	1.42
P-57	818.00	12	125.0	0.00	Open	-414.64	0.44	0.53	false	1.18
P-60	1,264.00	12	125.0	0.00	Open	-128.29	0.08	0.06	false	0.36
P-65	1,029.00	12	125.0	0.00	Open	98.97	0.04	0.04	false	0.28
P-67	900.00	12	125.0	0.00	Open	99.72	0.03	0.04	false	0.28
P-69	773.00	12	125.0	0.00	Open	371.59	0.34	0.44	false	1.05
P-72	823.00	12	125.0	0.00	Open	279.24	0.21	0.26	false	0.79
P-68	100.00	24	125.0	0.00	Open	0.00	0.00	0.00	true	0.00
P-71	1.00	24	125.0	0.00	Closed	0.00	0.00	0.00	true	0.00
P-74	100.00	30	125.0	0.00	Open	-10,181.52	0.23	2.31	true	4.62
P-75	3.00	30	125.0	0.00	Open	-10,181.52	0.01	2.31	true	4.62
P-76	795.00	12	125.0	0.00	Open	366.00	0.34	0.42	false	1.04
P-77	801.00	12	125.0	0.00	Open	283.35	0.21	0.26	false	0.80
P-78	1,001.00	12	125.0	0.00	Open	100.46	0.04	0.04	false	0.28
P-79	900.00	12	125.0	0.00	Open	99.72	0.03	0.04	false	0.28
P-81	840.00	12	125.0	0.00	Open	242.56	0.17	0.20	false	0.69
P-82	1,761.00	12	125.0	0.00	Open	185.46	0.21	0.12	false	0.53
P-83	665.00	12	125.0	0.00	Open	76.30	0.02	0.02	false	0.22
P-84	775.00	12	125.0	0.00	Open	75.90	0.02	0.02	false	0.22
P-85	139.00	12	125.0	0.00	Open	-0.40	0.00	0.00	false	0.00
P-86	130.00	12	125.0	0.00	Open	0.40	0.00	0.00	false	0.00
P-90	345.00	12	125.0	0.00	Open	-0.40	0.00	0.00	false	0.00
P-91	318.00	12	125.0	0.00	Open	-0.40	0.00	0.00	false	0.00
P-92	320.00	12	125.0	0.00	Open	0.40	0.00	0.00	false	0.00
P-93	382.00	12	125.0	0.00	Open	-0.40	0.00	0.00	false	0.00
P-94	1,337.00	12	125.0	0.00	Open	-614.71	1.48	1.11	false	1.74
P-95	1,231.00	12	125.0	0.00	Open	-202.97	0.18	0.14	false	0.58
P-96	1,126.00	12	125.0	0.00	Open	-240.71	0.22	0.19	false	0.68
P-97	2,986.00	24	125.0	0.00	Open	-5,091.00	5.67	1.90	false	3.61
P-98	113.00	6	130.0	0.00	Closed	0.00	0.00	0.00	false	0.00
P-99	1,701.00	24	125.0	0.00	Open	-5,091.00	3.23	1.90	false	3.61
P-101	5,665.00	24	125.0	0.00	Open	-6,721.00	17.98	3.17	false	4.77
P-102	224.00	24	125.0	0.00	Open	-6,721.00	0.71	3.17	false	4.77
P-103	1.00	24	125.0	0.00	Open	-6,721.00	0.00	3.17	true	4.77
P-104	3,645.00	16	125.0	0.00	Open	1,630.00	6.05	1.66	false	2.60
P-105	5,402.00	16	125.0	0.00	Open	1,630.00	8.96	1.66	false	2.60
P-106	1,283.00	12	125.0	0.00	Open	-145.37	0.10	0.08	false	0.41

Project Engineer: Mark Smith

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# Scenario: Phase 5 Run 4 MDD 100%SW(S) Multi FF

## Fire Flow Analysis

### Fire Flow Report

Label	Fire Flow Balanced?	Satisfies Fire Flow Constraints?	Needed Fire Flow (gpm)	Available Fire Flow (gpm)	Total Flow Needed (gpm)	Total Flow Available (gpm)	Calculated Residual Pressure (psi)	Calculated Minimum System Pressure (psi)	Minimum System Junction
J-1	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-3	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-4	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-5	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-6	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-7	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-8	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-9	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-10	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-11	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-12	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-13	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-14	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-15	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-80	true	true	4,000.00	4,000.00	4,089.92	4,089.92	23.71	27.30	J-90
J-90	true	false	4,000.00	4,000.00	4,044.62	4,044.62	22.46	28.09	J-100
J-100	true	false	4,000.00	4,000.00	4,065.71	4,065.71	25.47	26.14	J-90
J-130	true	false	4,000.00	4,000.00	4,172.41	4,172.41	38.25	35.42	J-15
J-140	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-160	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-170	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-190	true	false	4,000.00	4,000.00	4,042.54	4,042.54	36.02	35.34	J-260
J-200	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-210	true	true	4,000.00	4,000.00	4,091.31	4,091.31	36.12	35.42	J-15
J-220	true	false	4,000.00	4,000.00	4,058.97	4,058.97	26.92	30.61	J-230
J-230	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-240	true	true	4,000.00	4,000.00	4,047.73	4,047.73	27.24	26.23	GPV-1
J-250	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-260	true	true	4,000.00	4,000.00	4,052.92	4,052.92	34.04	34.39	J-250
J-300	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-320	true	true	4,000.00	4,000.00	4,524.85	4,524.85	44.88	35.42	J-15
J-350	true	true	4,000.00	4,000.00	4,546.12	4,546.12	45.62	35.42	J-15
J-380	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-400	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-410	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-420	true	true	4,000.00	4,000.00	4,092.52	4,092.52	27.94	31.79	J-430
J-430	true	false	4,000.00	4,000.00	4,096.15	4,096.15	25.66	32.29	J-420
J-440	true	true	4,000.00	4,000.00	4,089.58	4,089.58	30.14	31.90	J-430
J-450	true	false	4,000.00	4,000.00	4,084.39	4,084.39	40.80	35.42	J-15
J-460	true	true	4,000.00	4,000.00	4,000.00	4,000.00	42.37	35.42	J-15
J-470	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-480	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-490	true	true	4,000.00	4,000.00	4,060.42	4,060.42	29.35	33.70	J-500
J-500	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-510	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-530	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-540	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-550	true	true	4,000.00	4,000.00	4,049.46	4,049.46	44.37	35.42	J-15
J-570	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-610	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A

# Scenario: Phase 5 Run 4 MDD 100%SW(S) Multi FF

## Fire Flow Analysis

### Fire Flow Report

Label	Fire Flow Balanced?	Satisfies Fire Flow Constraints?	Needed Fire Flow (gpm)	Available Fire Flow (gpm)	Total Flow Needed (gpm)	Total Flow Available (gpm)	Calculated Residual Pressure (psi)	Calculated Minimum System Pressure (psi)	Minimum System Junction
J-620	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-680	true	true	4,000.00	4,000.00	4,092.00	4,092.00	35.44	35.42	J-15
J-690	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-730	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-760	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-770	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-800	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-810	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-820	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A
J-830	false	false	4,000.00	N/A	N/A	N/A	N/A	N/A	N/A

# Scenario: Phase 5 Run 5 MDD 100%SW(S) Onsite FF @ J6, 7, & 8

## Steady State Analysis

### Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-1	9.30	1	Demand	0.00	Fixed	0.00	127.21	51.12
J-3	19.50	Zone-1	Demand	0.00	Fixed	0.00	117.67	42.56
J-4	12.00	Zone-1	Demand	0.00	Fixed	0.00	127.39	50.03
J-5	21.50	Zone-1	Demand	0.00	Fixed	0.00	85.72	27.84
J-6	21.00	Zone-1	Demand	1,500.00	Fixed	1,500.00	71.33	21.82
J-7	21.00	Zone-1	Demand	1,500.00	Fixed	1,500.00	71.61	21.94
J-8	21.00	Zone-1	Demand	1,000.00	Fixed	1,000.00	72.29	22.23
J-9	12.00	Zone-1	Demand	5,091.00	Fixed	5,091.00	100.82	38.50
J-10	13.00	Zone-1	Demand	0.00	Fixed	0.00	106.48	40.53
J-11	13.00	Zone-1	Demand	0.00	Fixed	0.00	109.71	41.92
J-12	13.00	Zone-1	Demand	0.00	Fixed	0.00	127.69	49.72
J-13	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.40	50.03
J-14	13.00	Zone-1	Demand	0.00	Fixed	0.00	103.66	39.30
J-15	13.00	Zone-1	Demand	1,630.00	Fixed	1,630.00	94.70	35.42
J-80	24.00	1	Demand	89.92	Fixed	89.92	110.13	37.34
J-90	26.30	1	Demand	44.62	Fixed	44.62	111.97	37.14
J-100	22.90	1	Demand	65.71	Fixed	65.71	113.22	39.16
J-130	20.10	1	Demand	172.41	Fixed	172.41	116.93	41.98
J-140	18.60	1	Demand	64.68	Fixed	64.68	117.30	42.79
J-160	18.85	1	Demand	111.89	Fixed	111.89	117.67	42.84
J-170	20.42	1	Demand	54.65	Fixed	54.65	117.79	42.21
J-190	20.40	1	Demand	42.54	Fixed	42.54	110.12	38.90
J-200	20.50	1	Demand	62.08	Fixed	62.08	116.66	41.69
J-210	23.60	1	Demand	91.31	Fixed	91.31	114.41	39.37
J-220	24.75	1	Demand	58.97	Fixed	58.97	102.05	33.51
J-230	24.20	1	Demand	54.99	Fixed	54.99	90.59	28.78
J-240	21.00	1	Demand	47.73	Fixed	47.73	85.88	28.13
J-250	24.30	1	Demand	65.37	Fixed	65.37	108.96	36.70
J-260	23.21	1	Demand	52.92	Fixed	52.92	107.94	36.73
J-300	20.30	1	Demand	162.73	Fixed	162.73	118.30	42.48
J-320	16.00	1	Demand	524.85	Fixed	524.85	119.84	45.02
J-350	16.00	1	Demand	546.12	Fixed	546.12	121.49	45.73
J-380	11.30	1	Demand	155.12	Fixed	155.12	123.73	48.74
J-400	15.35	1	Demand	85.60	Fixed	85.60	123.74	46.99
J-410	15.27	1	Demand	181.58	Fixed	181.58	123.38	46.87
J-420	24.50	1	Demand	92.52	Fixed	92.52	115.83	39.59
J-430	25.10	1	Demand	96.15	Fixed	96.15	117.74	40.16
J-440	21.30	1	Demand	89.58	Fixed	89.58	120.18	42.87
J-450	18.00	1	Demand	84.39	Fixed	84.39	123.23	45.62
J-460	15.30	1	Demand	0.00	Fixed	0.00	123.30	46.82
J-470	12.09	1	Demand	41.16	Fixed	41.16	123.77	48.42
J-480	10.60	1	Demand	0.00	Fixed	0.00	123.83	49.09
J-490	14.80	1	Demand	60.42	Fixed	60.42	123.84	47.27
J-500	11.10	1	Demand	60.39	Fixed	60.39	123.86	48.88
J-510	10.50	1	Demand	201.64	Fixed	201.64	124.66	49.49
J-530	11.00	1	Demand	0.00	Fixed	0.00	124.87	49.36
J-540	10.82	1	Demand	54.99	Fixed	54.99	125.14	49.56
J-550	11.60	1	Demand	49.46	Fixed	49.46	124.88	49.11
J-570	9.70	1	Demand	276.34	Fixed	276.34	126.38	50.58
J-610	15.30	1	Demand	170.51	Fixed	170.51	126.59	48.25
J-620	15.50	1	Demand	37.01	Fixed	37.01	124.91	47.43
J-680	13.40	1	Demand	92.00	Fixed	92.00	123.83	47.87

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**Scenario: Phase 5 Run 5 MDD 100%SW(S) Onsite FF @ J6, 7, & 8**  
**Steady State Analysis**  
**Junction Report**

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-690	11.25	1	Demand	60.42	Fixed	60.42	123.93	48.85
J-730	19.31	1	Demand	273.40	Fixed	273.40	118.85	43.15
J-760	9.70	1	Demand	0.00	Fixed	0.00	125.72	50.30
J-770	15.00	1	Demand	87.50	Fixed	87.50	123.53	47.05
J-800	18.80	1	Demand	41.50	Fixed	41.50	117.69	42.87
J-810	21.47	1	Demand	68.48	Fixed	68.48	116.30	41.11
J-820	20.20	1	Demand	169.82	Fixed	169.82	113.79	40.57
J-830	17.95	1	Demand	247.29	Fixed	247.29	122.39	45.28

**Scenario: Phase 5 Run 5 MDD 100%SW(S) Onsite FF @ J6, 7, & 8**

**Steady State Analysis**

**Pipe Report**

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-1520	800.00	12	125.0	0.00	Open	327.84	0.28	0.35	false	0.93
P-1550	449.00	30	125.0	0.00	Open	-7,973.97	0.66	1.47	false	3.62
P-1540	395.00	30	125.0	0.00	Open	-7,973.97	0.58	1.47	false	3.62
P-1270	257.00	24	125.0	0.00	Open	-991.36	0.02	0.09	false	0.70
P-1060	1,125.00	12	125.0	0.00	Open	395.35	0.55	0.49	false	1.12
P-1050	1,053.00	30	125.0	0.00	Open	-4,561.68	0.55	0.52	false	2.07
P-960	746.00	12	125.0	0.00	Open	199.88	0.10	0.14	false	0.57
P-970	897.00	12	125.0	0.00	Open	-152.41	0.08	0.08	false	0.43
P-950	402.00	12	125.0	0.00	Open	-31.60	0.00	0.00	false	0.09
P-940	817.00	12	125.0	0.00	Open	-139.48	0.06	0.07	false	0.40
P-590	1,013.00	12	125.0	0.00	Open	31.60	0.00	0.00	false	0.09
P-600	659.00	12	125.0	0.00	Open	92.02	0.02	0.03	false	0.26
P-790	1,293.00	12	125.0	0.00	Open	-669.94	1.68	1.30	false	1.90
P-800	1,439.00	12	125.0	0.00	Open	-632.93	1.68	1.17	false	1.80
P-640	597.00	12	125.0	0.00	Open	327.84	0.21	0.35	false	0.93
P-680	726.00	12	125.0	0.00	Open	335.96	0.26	0.36	false	0.95
P-510	1,511.00	12	125.0	0.00	Open	753.95	2.44	1.62	false	2.14
P-520	1,532.00	12	125.0	0.00	Open	-843.53	3.05	1.99	false	2.39
P-230	1,475.00	12	125.0	0.00	Open	1,760.46	11.46	7.77	false	4.99
P-220	1,496.00	12	125.0	0.00	Open	1,819.43	12.35	8.26	false	5.16
P-200	753.00	12	125.0	0.00	Open	724.54	1.13	1.50	false	2.06
P-87	1,673.00	12	125.0	0.00	Open	2,342.26	22.06	13.18	false	6.64
P-70	1,321.00	12	125.0	0.00	Open	-694.65	1.83	1.39	false	1.97
P-80	808.00	12	125.0	0.00	Open	-739.26	1.26	1.56	false	2.10
P-250	1,092.00	12	125.0	0.00	Open	-604.72	1.17	1.07	false	1.72
P-3	527.00	30	125.0	0.00	Open	-8,250.31	0.82	1.56	false	3.74
P-4	1,274.00	16	125.0	0.00	Open	-840.45	0.62	0.49	false	1.34
P-8	1,129.00	16	125.0	0.00	Open	-675.07	0.37	0.32	false	1.08
P-11	2,034.00	12	125.0	0.00	Open	-804.98	3.71	1.82	false	2.28
P-14	1,007.00	16	125.0	0.00	Open	722.75	0.37	0.37	false	1.15
P-19	1,174.00	12	125.0	0.00	Open	539.36	1.02	0.87	false	1.53
P-20	1,680.00	12	125.0	0.00	Open	681.28	2.25	1.34	false	1.93
P-490	1,505.00	12	125.0	0.00	Open	-565.28	1.43	0.95	false	1.60
P-500	1,520.00	12	125.0	0.00	Open	657.80	1.91	1.25	false	1.87
P-22	900.00	12	125.0	0.00	Open	-938.80	2.18	2.42	false	2.66
P-23	940.00	12	125.0	0.00	Open	917.02	2.18	2.32	false	2.60
P-24	1,437.00	12	125.0	0.00	Open	-964.91	3.67	2.55	false	2.74
P-25	1,528.00	12	125.0	0.00	Open	-933.45	3.67	2.40	false	2.65
P-26	463.00	12	125.0	0.00	Open	1,091.65	1.48	3.21	false	3.10
P-28	825.00	12	125.0	0.00	Open	1,062.07	2.51	3.05	false	3.01
P-29	912.00	12	125.0	0.00	Open	1,006.11	2.51	2.76	false	2.85
P-30	935.00	24	125.0	0.00	Open	-1,032.86	0.09	0.10	false	0.73
P-31	502.00	12	125.0	0.00	Open	1,045.01	1.48	2.96	false	2.96
P-32	1,044.00	30	125.0	0.00	Open	-4,405.05	0.51	0.49	false	2.00
P-33	1,076.00	12	125.0	0.00	Open	-389.26	0.51	0.47	false	1.10
P-34	1,740.00	30	125.0	0.00	Open	4,797.71	1.00	0.57	false	2.18
P-35	1,727.00	12	125.0	0.00	Open	-432.73	1.00	0.58	false	1.23
P-36	2,395.00	30	125.0	0.00	Open	-5,282.03	1.64	0.69	false	2.40
P-37	2,406.00	12	125.0	0.00	Open	473.25	1.64	0.68	false	1.34
P-38	1,120.00	30	125.0	0.00	Open	-5,781.84	0.91	0.81	false	2.62
P-39	1,119.00	12	125.0	0.00	Open	-519.57	0.91	0.81	false	1.47

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# Scenario: Phase 5 Run 5 MDD 100%SW(S) Onsite FF @ J6, 7, & 8

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-40	1,551.00	30	125.0	0.00	Open	-6,003.38	1.35	0.87	false	2.72
P-41	1,519.00	12	125.0	0.00	Open	545.32	1.35	0.89	false	1.55
P-42	1,335.00	30	125.0	0.00	Open	6,657.67	1.40	1.05	false	3.02
P-50	989.00	12	125.0	0.00	Open	56.80	0.01	0.01	false	0.16
P-56	1,373.00	12	125.0	0.00	Open	412.71	0.73	0.53	false	1.17
P-57	818.00	12	125.0	0.00	Open	-286.51	0.22	0.27	false	0.81
P-60	1,264.00	12	125.0	0.00	Open	98.32	0.05	0.04	false	0.28
P-65	1,029.00	12	125.0	0.00	Open	146.40	0.08	0.08	false	0.42
P-67	900.00	12	125.0	0.00	Open	147.50	0.07	0.08	false	0.42
P-69	773.00	12	125.0	0.00	Open	284.17	0.20	0.27	false	0.81
P-72	823.00	12	125.0	0.00	Open	236.54	0.16	0.19	false	0.67
P-68	100.00	24	125.0	0.00	Open	0.00	0.00	0.00	true	0.00
P-71	1.00	24	125.0	0.00	Closed	0.00	0.00	0.00	true	0.00
P-74	100.00	30	125.0	0.00	Open	-9,090.76	0.19	1.87	true	4.13
P-75	3.00	30	125.0	0.00	Open	-9,090.76	0.01	1.87	true	4.13
P-76	795.00	12	125.0	0.00	Open	279.90	0.20	0.26	false	0.79
P-77	801.00	12	125.0	0.00	Open	240.03	0.16	0.19	false	0.68
P-78	1,001.00	12	125.0	0.00	Open	148.59	0.08	0.08	false	0.42
P-79	900.00	12	125.0	0.00	Open	147.50	0.07	0.08	false	0.42
P-81	840.00	12	125.0	0.00	Open	683.00	1.13	1.35	false	1.94
P-82	1,761.00	12	125.0	0.00	Open	664.18	2.25	1.28	false	1.88
P-83	665.00	12	125.0	0.00	Open	1,705.47	4.87	7.33	false	4.84
P-84	775.00	12	125.0	0.00	Open	-249.38	0.16	0.21	false	0.71
P-85	139.00	12	125.0	0.00	Open	2,045.15	1.43	10.25	false	5.80
P-86	130.00	12	125.0	0.00	Open	1,954.85	1.23	9.43	false	5.55
P-90	345.00	12	125.0	0.00	Open	2,045.15	3.54	10.25	false	5.80
P-91	318.00	12	125.0	0.00	Open	545.15	0.28	0.89	false	1.55
P-92	320.00	12	125.0	0.00	Open	1,954.85	3.02	9.43	false	5.55
P-93	382.00	12	125.0	0.00	Open	-954.85	0.96	2.50	false	2.71
P-94	1,337.00	12	125.0	0.00	Open	-597.50	1.40	1.05	false	1.69
P-95	1,231.00	12	125.0	0.00	Open	-302.32	0.37	0.30	false	0.86
P-96	1,126.00	12	125.0	0.00	Open	-319.31	0.37	0.33	false	0.91
P-97	2,986.00	24	125.0	0.00	Open	-5,091.00	5.67	1.90	false	3.61
P-98	113.00	6	130.0	0.00	Closed	0.00	0.00	0.00	false	0.00
P-99	1,701.00	24	125.0	0.00	Open	-5,091.00	3.23	1.90	false	3.61
P-101	5,665.00	24	125.0	0.00	Open	-6,721.00	17.98	3.17	false	4.77
P-102	224.00	24	125.0	0.00	Open	-6,721.00	0.71	3.17	false	4.77
P-103	1.00	24	125.0	0.00	Open	-6,721.00	0.00	3.17	true	4.77
P-104	3,645.00	16	125.0	0.00	Open	1,630.00	6.05	1.66	false	2.60
P-105	5,402.00	16	125.0	0.00	Open	1,630.00	8.96	1.66	false	2.60
P-106	1,283.00	12	125.0	0.00	Open	-162.59	0.12	0.09	false	0.46

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# Scenario: Phase 5 Run 6 MDD 100%GW-Rese Fill

## Steady State Analysis

### Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-1	9.30	1	Demand	0.00	Fixed	0.00	129.09	51.93
J-3	19.50	Zone-1	Demand	0.00	Fixed	0.00	134.90	50.03
J-4	12.00	Zone-1	Demand	3,818.80	Fixed	3,818.80	129.05	50.74
J-5	21.50	Zone-1	Demand	0.00	Fixed	0.00	133.07	48.37
J-6	21.00	Zone-1	Demand	0.00	Fixed	0.00	128.49	46.60
J-7	21.00	Zone-1	Demand	0.00	Fixed	0.00	128.49	46.60
J-8	21.00	Zone-1	Demand	0.00	Fixed	0.00	128.49	46.60
J-9	12.00	Zone-1	Demand	0.00	Fixed	0.00	127.04	49.87
J-10	13.00	Zone-1	Demand	0.00	Fixed	0.00	127.04	49.44
J-11	13.00	Zone-1	Demand	0.00	Fixed	0.00	127.04	49.44
J-12	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.35	50.01
J-13	13.00	Zone-1	Demand	0.00	Fixed	0.00	128.40	50.03
J-14	13.00	Zone-1	Demand	0.00	Fixed	0.00	121.00	46.82
J-15	13.00	Zone-1	Demand	1,630.00	Fixed	1,630.00	112.04	42.93
J-80	24.00	1	Demand	22.47	Fixed	22.47	133.61	47.52
J-90	26.30	1	Demand	11.15	Fixed	11.15	133.89	46.64
J-100	22.90	1	Demand	16.42	Fixed	16.42	134.08	48.20
J-130	20.10	1	Demand	43.08	Fixed	43.08	134.61	49.64
J-140	18.60	1	Demand	16.16	Fixed	16.16	134.66	50.31
J-160	18.85	1	Demand	27.96	Fixed	27.96	134.71	50.23
J-170	20.42	1	Demand	13.65	Fixed	13.65	133.21	48.90
J-190	20.40	1	Demand	10.63	Fixed	10.63	133.21	48.91
J-200	20.50	1	Demand	15.51	Fixed	15.51	133.11	48.82
J-210	23.60	1	Demand	22.81	Fixed	22.81	132.91	47.39
J-220	24.75	1	Demand	14.73	Fixed	14.73	132.96	46.91
J-230	24.20	1	Demand	13.74	Fixed	13.74	133.03	47.18
J-240	21.00	1	Demand	11.93	Fixed	11.93	133.11	48.60
J-250	24.30	1	Demand	16.33	Fixed	16.33	133.41	47.30
J-260	23.21	1	Demand	13.22	Fixed	13.22	133.22	47.69
J-300	20.30	1	Demand	40.66	Fixed	40.66	132.79	48.76
J-320	16.00	1	Demand	131.14	Fixed	131.14	131.70	50.16
J-350	16.00	1	Demand	136.45	Fixed	136.45	130.83	49.78
J-380	11.30	1	Demand	38.76	Fixed	38.76	129.80	51.37
J-400	15.35	1	Demand	21.39	Fixed	21.39	129.94	49.68
J-410	15.27	1	Demand	45.37	Fixed	45.37	129.94	49.71
J-420	24.50	1	Demand	23.12	Fixed	23.12	132.05	46.63
J-430	25.10	1	Demand	24.02	Fixed	24.02	131.27	46.03
J-440	21.30	1	Demand	22.38	Fixed	22.38	130.57	47.37
J-450	18.00	1	Demand	21.09	Fixed	21.09	129.94	48.53
J-460	15.30	1	Demand	0.00	Fixed	0.00	129.94	49.70
J-470	12.09	1	Demand	10.28	Fixed	10.28	129.68	50.98
J-480	10.60	1	Demand	0.00	Fixed	0.00	129.61	51.59
J-490	14.80	1	Demand	15.10	Fixed	15.10	129.60	49.77
J-500	11.10	1	Demand	15.09	Fixed	15.09	129.59	51.37
J-510	10.50	1	Demand	50.38	Fixed	50.38	129.55	51.61
J-530	11.00	1	Demand	0.00	Fixed	0.00	129.55	51.39
J-540	10.82	1	Demand	13.74	Fixed	13.74	129.55	51.47
J-550	11.60	1	Demand	12.36	Fixed	12.36	129.55	51.13
J-570	9.70	1	Demand	69.05	Fixed	69.05	129.26	51.83
J-610	15.30	1	Demand	42.60	Fixed	42.60	129.15	49.36
J-620	15.50	1	Demand	9.25	Fixed	9.25	129.51	49.43
J-680	13.40	1	Demand	22.99	Fixed	22.99	129.61	50.38

Project Engineer: Mark Smith

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**Scenario: Phase 5 Run 6 MDD 100%GW-Rese Fill**  
**Steady State Analysis**  
**Junction Report**

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-690	11.25	1	Demand	15.10	Fixed	15.10	129.59	51.30
J-730	19.31	1	Demand	68.31	Fixed	68.31	132.37	49.01
J-760	9.70	1	Demand	0.00	Fixed	0.00	129.41	51.90
J-770	15.00	1	Demand	21.86	Fixed	21.86	129.94	49.83
J-800	18.80	1	Demand	10.37	Fixed	10.37	134.38	50.11
J-810	21.47	1	Demand	17.11	Fixed	17.11	133.21	48.44
J-820	20.20	1	Demand	42.43	Fixed	42.43	133.21	48.99
J-830	17.95	1	Demand	61.79	Fixed	61.79	130.45	48.77

# Scenario: Phase 5 Run 6 MDD 100%GW-Rese Fill

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-1520	800.00	12	125.0	0.00	Open	-15.38	0.00	0.00	false	0.04
P-1550	449.00	30	125.0	0.00	Open	3,637.53	0.15	0.34	false	1.65
P-1540	395.00	30	125.0	0.00	Open	3,637.53	0.14	0.34	false	1.65
P-1270	257.00	24	125.0	0.00	Open	4,087.89	0.32	1.26	false	2.90
P-1060	1,125.00	12	125.0	0.00	Open	-341.40	0.42	0.37	false	0.97
P-1050	1,053.00	30	125.0	0.00	Open	3,938.77	0.42	0.40	false	1.79
P-960	746.00	12	125.0	0.00	Open	-81.23	0.02	0.03	false	0.23
P-970	897.00	12	125.0	0.00	Open	18.84	0.00	0.00	false	0.05
P-950	402.00	12	125.0	0.00	Open	49.02	0.00	0.01	false	0.14
P-940	817.00	12	125.0	0.00	Open	153.24	0.07	0.08	false	0.43
P-590	1,013.00	12	125.0	0.00	Open	-49.02	0.01	0.01	false	0.14
P-600	659.00	12	125.0	0.00	Open	-33.92	0.00	0.01	false	0.10
P-790	1,293.00	12	125.0	0.00	Open	292.92	0.36	0.28	false	0.83
P-800	1,439.00	12	125.0	0.00	Open	302.17	0.43	0.30	false	0.86
P-640	597.00	12	125.0	0.00	Open	-15.38	0.00	0.00	false	0.04
P-680	726.00	12	125.0	0.00	Open	-6.85	0.00	0.00	false	0.02
P-510	1,511.00	12	125.0	0.00	Open	-383.09	0.70	0.46	false	1.09
P-520	1,532.00	12	125.0	0.00	Open	360.71	0.63	0.41	false	1.02
P-230	1,475.00	12	125.0	0.00	Open	-108.01	0.07	0.04	false	0.31
P-220	1,496.00	12	125.0	0.00	Open	-93.28	0.05	0.03	false	0.26
P-200	753.00	12	125.0	0.00	Open	193.18	0.10	0.13	false	0.55
P-87	1,673.00	12	125.0	0.00	Open	133.68	0.11	0.07	false	0.38
P-70	1,321.00	12	125.0	0.00	Open	-254.77	0.29	0.22	false	0.72
P-80	808.00	12	125.0	0.00	Open	-265.92	0.19	0.23	false	0.75
P-250	1,092.00	12	125.0	0.00	Open	-232.30	0.20	0.18	false	0.66
P-3	527.00	30	125.0	0.00	Open	3,568.48	0.17	0.33	false	1.62
P-4	1,274.00	16	125.0	0.00	Open	250.32	0.07	0.05	false	0.40
P-8	1,129.00	16	125.0	0.00	Open	-224.76	0.05	0.04	false	0.36
P-11	2,034.00	12	125.0	0.00	Open	-282.34	0.53	0.26	false	0.80
P-14	1,007.00	16	125.0	0.00	Open	236.91	0.05	0.05	false	0.38
P-19	1,174.00	12	125.0	0.00	Open	215.97	0.19	0.16	false	0.61
P-20	1,680.00	12	125.0	0.00	Open	182.17	0.20	0.12	false	0.52
P-490	1,505.00	12	125.0	0.00	Open	430.23	0.86	0.57	false	1.22
P-500	1,520.00	12	125.0	0.00	Open	-407.12	0.78	0.52	false	1.15
P-22	900.00	12	125.0	0.00	Open	34.95	0.00	0.01	false	0.10
P-23	940.00	12	125.0	0.00	Open	-34.12	0.00	0.01	false	0.10
P-24	1,437.00	12	125.0	0.00	Open	29.70	0.01	0.00	false	0.08
P-25	1,528.00	12	125.0	0.00	Open	28.75	0.01	0.00	false	0.08
P-26	463.00	12	125.0	0.00	Open	-1.69	0.00	0.00	false	0.00
P-28	825.00	12	125.0	0.00	Open	-8.26	0.00	0.00	false	0.02
P-29	912.00	12	125.0	0.00	Open	-7.75	0.00	0.00	false	0.02
P-30	935.00	24	125.0	0.00	Open	4,077.52	1.18	1.26	false	2.89
P-31	502.00	12	125.0	0.00	Open	2.79	0.00	0.00	false	0.01
P-32	1,044.00	30	125.0	0.00	Open	3,970.01	0.42	0.40	false	1.80
P-33	1,076.00	12	125.0	0.00	Open	350.82	0.42	0.39	false	1.00
P-34	1,740.00	30	125.0	0.00	Open	-3,863.44	0.67	0.38	false	1.75
P-35	1,727.00	12	125.0	0.00	Open	348.42	0.67	0.39	false	0.99
P-36	2,395.00	30	125.0	0.00	Open	3,745.14	0.87	0.36	false	1.70
P-37	2,406.00	12	125.0	0.00	Open	-335.58	0.87	0.36	false	0.95
P-38	1,120.00	30	125.0	0.00	Open	3,619.05	0.38	0.34	false	1.64
P-39	1,119.00	12	125.0	0.00	Open	325.22	0.38	0.34	false	0.92

Project Engineer: Mark Smith

WaterCAD v6.5 [6.5120]

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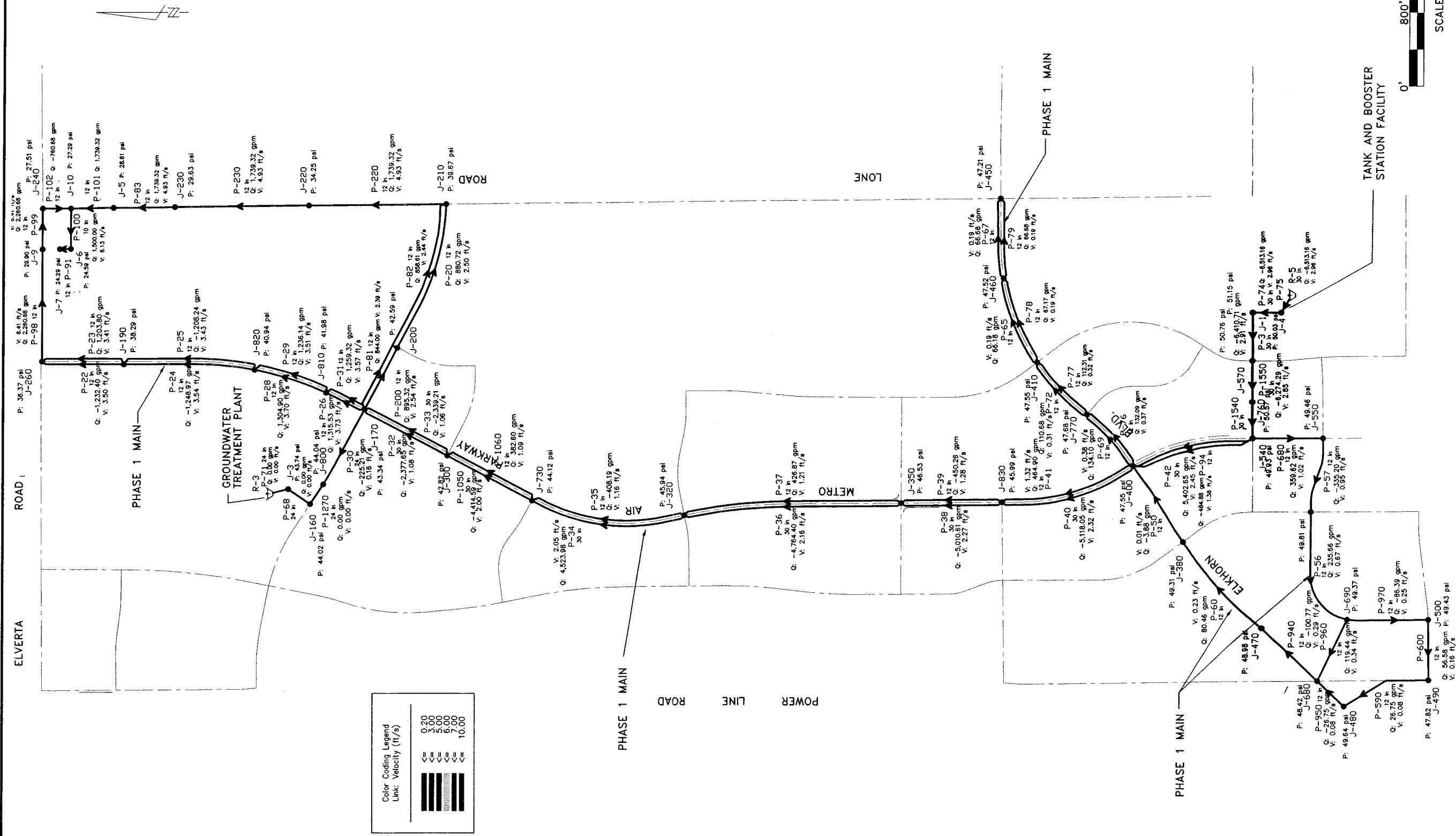
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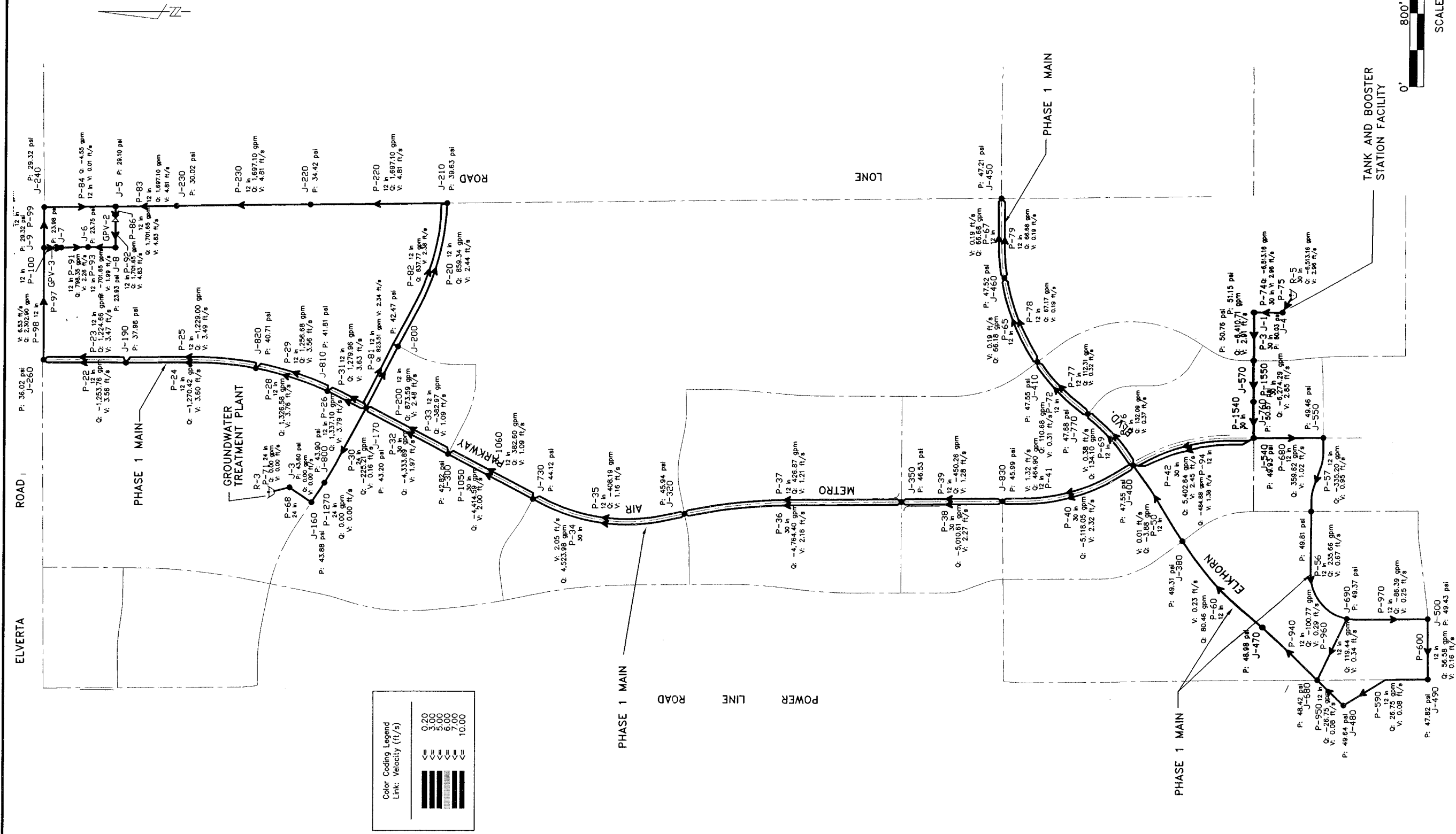
# Scenario: Phase 5 Run 6 MDD 100%GW-Rese Fill

## Steady State Analysis

### Pipe Report

Label	Length (ft)	Diameter (in)	Hazen- Williams C	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	User Defined Length?	Velocity (ft/s)
P-40	1,551.00	30	125.0	0.00	Open	3,559.09	0.51	0.33	false	1.62
P-41	1,519.00	12	125.0	0.00	Open	-323.39	0.51	0.34	false	0.92
P-42	1,335.00	30	125.0	0.00	Open	-3,330.17	0.39	0.29	false	1.51
P-50	989.00	12	125.0	0.00	Open	202.28	0.14	0.14	false	0.57
P-56	1,373.00	12	125.0	0.00	Open	-84.97	0.04	0.03	false	0.24
P-57	818.00	12	125.0	0.00	Open	19.20	0.00	0.00	false	0.05
P-60	1,264.00	12	125.0	0.00	Open	-163.52	0.12	0.10	false	0.46
P-65	1,029.00	12	125.0	0.00	Open	-18.59	0.00	0.00	false	0.05
P-67	900.00	12	125.0	0.00	Open	-18.73	0.00	0.00	false	0.05
P-69	773.00	12	125.0	0.00	Open	15.00	0.00	0.00	false	0.04
P-72	823.00	12	125.0	0.00	Open	3.93	0.00	0.00	false	0.01
P-68	100.00	24	125.0	0.00	Open	-5,090.76	0.19	1.90	true	3.61
P-71	1.00	24	125.0	0.00	Open	-5,090.76	0.00	1.89	true	3.61
P-74	100.00	30	125.0	0.00	Open	3,818.80	0.04	0.38	true	1.73
P-75	3.00	30	125.0	0.00	Closed	0.00	0.00	0.00	true	0.00
P-76	795.00	12	125.0	0.00	Open	14.78	0.00	0.00	false	0.04
P-77	801.00	12	125.0	0.00	Open	3.98	0.00	0.00	false	0.01
P-78	1,001.00	12	125.0	0.00	Open	-18.87	0.00	0.00	false	0.05
P-79	900.00	12	125.0	0.00	Open	-18.73	0.00	0.00	false	0.05
P-81	840.00	12	125.0	0.00	Open	182.10	0.10	0.12	false	0.52
P-82	1,761.00	12	125.0	0.00	Open	177.60	0.20	0.11	false	0.50
P-83	665.00	12	125.0	0.00	Open	-121.75	0.04	0.06	false	0.35
P-84	775.00	12	125.0	0.00	Open	-120.80	0.04	0.05	false	0.34
P-85	139.00	12	125.0	0.00	Open	0.95	0.00	0.00	false	0.00
P-86	130.00	12	125.0	0.00	Open	-0.95	0.00	0.00	false	0.00
P-90	345.00	12	125.0	0.00	Open	0.95	0.00	0.00	false	0.00
P-91	318.00	12	125.0	0.00	Open	0.95	0.00	0.00	false	0.00
P-92	320.00	12	125.0	0.00	Open	-0.95	0.00	0.00	false	0.00
P-93	382.00	12	125.0	0.00	Open	0.95	0.00	0.00	false	0.00
P-94	1,337.00	12	125.0	0.00	Open	298.87	0.39	0.29	false	0.85
P-95	1,231.00	12	125.0	0.00	Open	-100.66	0.05	0.04	false	0.29
P-96	1,126.00	12	125.0	0.00	Open	-104.66	0.05	0.04	false	0.30
P-97	2,986.00	24	125.0	0.00	Open	0.00	0.00	0.00	false	0.00
P-98	113.00	6	130.0	0.00	Closed	0.00	0.00	0.00	false	0.00
P-99	1,701.00	24	125.0	0.00	Open	0.00	0.00	0.00	false	0.00
P-101	5,665.00	24	125.0	0.00	Open	-1,630.00	1.30	0.23	false	1.16
P-102	224.00	24	125.0	0.00	Open	-1,630.00	0.05	0.23	false	1.16
P-103	1.00	24	125.0	0.00	Open	-1,630.00	0.00	0.23	true	1.16
P-104	3,645.00	16	125.0	0.00	Open	1,630.00	6.05	1.66	false	2.60
P-105	5,402.00	16	125.0	0.00	Open	1,630.00	8.96	1.66	false	2.60
P-106	1,283.00	12	125.0	0.00	Open	633.34	1.50	1.17	false	1.80







**AGREEMENT BETWEEN THE CITY OF SACRAMENTO,  
THE COUNTY OF SACRAMENTO AND THE  
SACRAMENTO COUNTY WATER AGENCY  
FOR WHOLESALE AND/OR WHEELING WATER SERVICE  
FOR SACRAMENTO INTERNATIONAL AIRPORT AND METRO AIR PARK**

**THIS AGREEMENT** is made and entered into this 12th day of October, 2004, by and between the CITY OF SACRAMENTO, a charter municipal corporation (hereafter referred to as "City"), and the COUNTY OF SACRAMENTO (hereafter referred to as "Sacramento County") and the SACRAMENTO COUNTY WATER AGENCY, (hereafter referred to as "Agency") (County and Agency are hereafter collectively referred to as "County").

**RECITALS**

- A. Agency owns and operates public water systems and provides municipal and industrial ("M&I") water service to its service area customers in Sacramento County, California.
- B. Sacramento County owns and operates the Sacramento International Airport (hereafter referred to as the "Airport") as part of the Sacramento County Airport System.
- C. City owns and operates public water systems and provides M&I water service to its customers in and adjacent to the City.
- D. Potable water for the Airport is provided from an on-site groundwater supply system owned and operated by the Sacramento County Airport System. Water from said groundwater supply system contains concentrations of arsenic that exceed revised state and federal drinking water standards that take effect on January 23, 2006.
- E. Groundwater treatment facilities needed to meet the revised regulatory standards for arsenic would significantly increase capital and operating costs for the Sacramento County Airport System.
- G. The City can provide potable water to the County to fully replace County's current on-site groundwater supply for the Airport at significantly less cost than would be incurred by the Sacramento County Airport System to upgrade its current groundwater system in order to comply with pending regulatory requirements.
- H. The County also desires to obtain a long-term potable water supply to meet the build-out water demand for the lands adjacent to the Airport that currently are being developed as the *Metro Air Park* (hereafter referred to as the

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CITY  
AGREEMENT NO. 2004-0159

CITY  
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"MAP").

- I. City is willing to provide potable water to County to meet the long-term build-out water demand of the Airport and MAP either through Wholesale Water Service or through Wheeling Water Service, as defined hereafter, in accordance with the terms and conditions set forth below.
- J.. In order to guarantee a reliable supply of potable water to the County pursuant to this Agreement and in recognition of the critical nature of this water supply, the City will use City facilities to provide potable water to the County under this Agreement in the same manner as these facilities are used to serve the City's retail water customers.
- K. On October 20, 2003, Sacramento County certified the Final Environmental Impact Report for the MAP development project.
- L. The land use entitlements for MAP recognize the Agency as the retail M&I water purveyor for MAP.
- M. The Agency has annexed the area within the boundaries of MAP to Zone 41, which will provide M&I retail water service.
- N. The Agency has formed Zone 50 that includes the area within the boundaries of MAP and which will provide the mechanism for establishing and collecting appropriate development fees to fund the construction of certain water supply infrastructure for the development of MAP.

NOW, THEREFORE, in consideration of the foregoing and of the mutual covenants herein contained, the parties hereto agree as follows:

1. **Recitals Incorporated:**

The foregoing recitals are incorporated by reference.

2. **Purpose:**

The purpose of this Agreement is to establish the conditions under which the City will provide Wholesale Water Service and/or Wheeling Water Service to the County to meet the build-out water demands of the Airport and MAP.

3. **Definitions:**

The following terms, when used in this Agreement, shall have the definitions given in this Section 3.



- a. *Airport Service Area:* Those lands within the Airport where the County Airport System will provide potable water that is delivered by the City using Wholesale Water Service and/or Wheeling Water Service under this Agreement, as shown on **Exhibit A** to this Agreement.
- b. *Capital Costs:* Costs incurred by the City to design and construct pumping, diversion, treatment, storage and transmission facilities used to provide potable water to the County under this Agreement and that exist or for which debt financing has been issued at the time the County's obligation to pay a Connection Fee for such Capital Costs commences in accordance with Section 10.b.2., below, including reasonable administrative costs.
- c. *City Diversion Facilities:* Facilities that are or will be owned and operated by the City that will be used to divert surface water from the Sacramento River to provide water to County under this Agreement, including the Sacramento River Water Treatment Plant diversion intake, as they exist today and as they may be constructed, modified or expanded in the future.
- d. *City surface water rights and entitlements:* The City's pre-1914 rights to divert from the Sacramento River, five water right permits issued by the State Water Resources Control Board, and a 1957 water rights settlement contract with the United States Bureau of Reclamation (hereafter referred to as the "USBR").
- e. *City Transmission Facilities:* Facilities, including transmission mains, storage facilities and all appurtenances that are or will be owned and operated by the City to deliver potable water to the County under this Agreement, as they exist today and as they may be constructed, modified or expanded in the future.
- f. *City Treatment Facilities:* Facilities that are or will be owned and operated by the City to provide potable water that meets the requirements established for drinking water by the California Department of Health Services and the United States Environmental Protection Agency, including groundwater facilities, and the Sacramento River Water Treatment Plant, as they exist today and as they may be constructed, modified or expanded in the future.
- g. *City Water:* Potable water that the City conveys to its retail and wholesale customers from the City's municipal water supply, including groundwater pumped by the City from municipal wells and surface water diverted by City pursuant to any of the City's surface water rights and entitlements.
- h. *Connection Fee:* The fee(s) paid by the County for its share of the Capital Costs associated with the Firm Capacity that will be available to provide Wholesale Water Service and/or Wheeling Water Service to the County

under this Agreement, as provided in Section 10.b., below.

- i. *County Water:* Surface water made available to the City pursuant to any of the County's surface water contracts and/or entitlements that is not City Water in order to provide Wheeling Water Service to the Airport and MAP Service Areas.
- j. *County Water Facilities:* All facilities, including transmission mains, storage facilities and all appurtenances as they exist today and as they may be modified and expanded in the future, which are or will be owned and operated by the County to supply water to its customers that is delivered under this Agreement to the Airport and MAP Service Areas.
- k. *County Water Requirements:* The maximum-day volume of potable water that the City will deliver to the County as specified in Section 5.a., below, utilizing Firm Capacity in accordance with the provisions of this Agreement.
- l. *Delivery Criteria:* The operating guidelines and criteria governing the delivery of potable water under this Agreement, as set forth in Section 4 of this Agreement.
- m. *Firm Capacity:* Capacity in the City Treatment and Transmission Facilities that is available to supply water to the County with an equal priority to the use of such capacity to meet the demands of the City's other water supply customers, except as may be provided otherwise in this Agreement.
- n. *MAP Service Area:* Those lands within the Metro Air Park development where the County will retail potable water that is delivered by the City using Wholesale Water Service and/or Wheeling Water Service under this Agreement, as shown on Exhibit A to this Agreement.
- o. *Potable water:* Potable water is water that meets the drinking water standards established by the California Department of Health Services and the United States Environmental Protection Agency.
- p. *Service Charge:* A monthly fee for City's fixed administrative costs billed to the County as part of the Wholesale Water Charge and Wheeling Water Charge, as provided in Section 10.a., below.
- q. *Service Connection:* The point of connection for delivery of potable water from the City Transmission Facilities to the County Water Facilities pursuant to this Agreement, as shown on **Exhibit B** to this Agreement, and any other connection point the parties may agree upon in the future.
- r. *Transmission Improvements:* Planned improvements to the City

Transmission Facilities and County Water Facilities that will enable City to provide Wholesale Water Service and/or Wheeling Water Service to the Airport and MAP Service Areas under this Agreement, as shown on **Exhibit B** to this Agreement.

- s. *Wheeling Unit Rate*: The cost per unit quantity of potable water delivered by City to County using Wheeling Water Service as provided in Section 10.a., below.
- t. *Wheeling Use Charge*: The cost billed by the City to the County at the Wheeling Unit Rate for a measured volume of water delivered to County using Wheeling Water Service as provided in Section 10.a., below.
- t. *Wheeling Water Charge*: The sum of the Wheeling Use Charge and Service Charge, billed by the City to the County, as provided in Section 10.a., below.
- u. *Wheeling Water Service*: The City's delivery of potable County Water in accordance with the provisions of this Agreement.
- v. *Wholesale Unit Rate*: The cost per unit quantity of potable water delivered by City to County using Wholesale Water Service as provided in Section 10.a., below.
- w. *Wholesale Use Charge*: The cost billed by the City to the County at the Wholesale Unit Rate for a measured volume of water delivered to County using Wholesale Water Service as provided in Section 10.a., below.
- x. *Wholesale Water Charge*: The sum of the Wholesale Use Charge and Service Charge, billed by the City to the County, as provided in Section 10.a., below.
- y. *Wholesale Water Service*: The City's delivery of potable City Water in accordance with the provisions of this Agreement.

4. **Delivery Criteria:**

The delivery of potable water under this Agreement will be governed by the operating guidelines and criteria set forth in the Delivery Criteria attached hereto as **Exhibit C**. The Delivery Criteria may be modified from time to time by the mutual written agreement of the City's Director of Utilities and the County's Director of Water Resources, provided that such modifications are consistent with the provisions of this Agreement.

5. **Maximum Treated Water Diversions and Deliveries:**

- a. The amount of potable water that the City delivers to County under this

Agreement, whether provided using Wholesale Water Service and/or Wheeling Water Service, shall not exceed a cumulative maximum rate of 11.7 million gallons per day (mgd); provided, further, that such cumulative maximum rate shall not exceed 5 mgd unless and until the County provides written notice to the City of the date when the County anticipates demand under this Agreement will exceed 5 mgd, which notice shall be provided not less than eighteen (18) months prior to such date.

- b. The City shall pump, divert, treat and deliver water to the County in accordance with the terms of this Agreement, except when the occurrence of an emergency condition requires shutting down any City facility(ies) necessary to do so, provided that such shutdown also prevents the use of such facilities for the City's retail water customers served by such facilities and the City does not have facilities remaining in operation during the shutdown with capacity available to supply potable water to County under this Agreement.
- c. Potable water delivered to the County under this Agreement shall be used by the County to provide M&I water service within the Airport and MAP Service Areas, and will not be used by the County for any other purpose.

**6. Services Performed by the City:**

The City will utilize Firm Capacity to deliver potable water to the County in accordance with the terms of this Agreement. The City will provide Wholesale Water Service or Wheeling Water Service, depending on whether City Water or County Water is being provided. Wholesale Water Service will be provided in accordance with the provisions of Section 7, below. Wheeling Water Service will be provided in accordance with the provisions of Section 8, below. Potable water delivered to the County under this Agreement will be provided from the City Transmission Facilities to the County Water Facilities at the Service Connection shown on **Exhibit B**. The City will provide County with the City's water quality testing data on an annual basis or on such other schedule as may be agreed to by the parties or required by regulatory agencies.

**7. Wholesale Water Service:**

- a. Condition Precedent: County shall design and construct the Transmission Improvements as specified in Section 11, below. County's performance of this obligation is a condition precedent to the City's obligation to provide wholesale water as specified in this Agreement.
- b. Wholesale Water Procedure:
  - (1) County shall notify City annually by March 01 of each year, or at such other time as may be mutually agreed to by City and County staff, and in such form as may be specified by City, that County desires City to

wholesale City Water pursuant to this Agreement. Such notification shall include the County's desired monthly delivery schedule and estimated amounts of water to be wholesaled during the succeeding 12 month period commencing on July 1.

- (2) Subject to satisfaction of the County's obligations under this Agreement, including the condition precedent set forth in subsection a, above, City Water shall be wholesaled to the County in accordance with the terms of this Agreement and the *Delivery Criteria*.
- (3) All City Water delivered to the Service Connection shall meet the drinking water standards established by DHS and the USEPA. County shall have sole responsibility for the quality and delivery of City Water wholesaled pursuant to this Agreement after the water is delivered to the Service Connection.

c. Water Wholesaling Requirements:

- (1) County shall be solely responsible for:
  - (i) obtaining all permits or other approvals required for the use of the City Water in the Airport and MAP Service Areas, including compliance with all applicable laws and regulations such as the Porter-Cologne Water Quality Control Act and the Federal Clean Water Act; and
  - (ii) compliance with any conditions which apply to the use of such water, including any measures which are imposed to mitigate potential impacts to the environment through CEQA, Federal Reclamation Laws, NEPA and the Federal and State Endangered Species Acts. The City shall not be responsible for any costs associated with obtaining such permits or other approvals and complying with any conditions required for the use of such water in the Airport and MAP Service Area.
- (2) Any City Water wholesaled pursuant to this Agreement shall be used only within the Airport and MAP Service Areas.
- (3) Wholesale Water Service shall be provided in accordance with all operating, engineering and water supply requirements set forth in this Agreement and the *Delivery Criteria*. If the City determines in the exercise of reasonable discretion that a suspension of Wholesale Water Service is necessary due to a condition that poses an immediate threat to public health or safety, such service may be suspended by City without notice for the duration of such condition.

The City shall notify County as soon as is practicable of any suspension of service, the reason for such suspension, and an estimate of when such service will be restored.

- (4) County shall be solely responsible for any and all costs incurred by City in order to comply with:
  - (i) any law or regulation to the extent applicable to the use of any City Water in the Airport and MAP Service Areas;
  - (ii) any mitigation measures to the extent applicable to the use of any City Water in the Airport and MAP Service Areas; and
  - (iii) any requirements that are imposed on the City specifically for the use of any City Water in the Airport and MAP Service Areas by any federal, state or local agency, including but not limited to the USBR, DWR, the State Water Resources Control Board, the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, the California Department of Fish and Game or the DHS.

8. **Wheeling Water Service:**

a. **Conditions Precedent:**

- (1) Approval by the Agency's Board of Directors of the environmental documentation required under the California Environmental Quality Act, if any, for the Agency's acquisition and use of the County Water to be wheeled under this Agreement.
- (2) As between the City and County, County shall be responsible for obtaining any and all state and federal regulatory approvals or authorizations that may be required for the City's diversion of any County Water at any City Diversion Facilities, and for the ultimate use of this water in the Airport and MAP Service Areas, including but not limited to any required approvals or authorizations by the State Water Resources Control Board or the USBR.
- (3) County shall make available for diversion by City at the City Diversion Facilities the quantity of County Water that is to be delivered to County using Wheeling Water Service, up to the maximum annual quantity and maximum rate specified in Section 5.a., above, so that City can wheel such water to the County pursuant to the terms of this Agreement and the *Delivery Criteria*.
- (4) County shall design and construct the Transmission Improvements,

as specified in Section 11, below.

- (5) County's performance of obligations listed in this subsection is a condition precedent to the City's obligation to wheel water as specified in this Agreement.

b. Water Wheeling Procedure:

- (1) County shall notify City annually by March 01 of each year, or at such other time as may be mutually agreed to by City and County staff and in such form as may be specified by City, that County desires City to wheel County Water pursuant to this Agreement. Such notification shall include the County's desired monthly delivery schedule and estimated amounts of water to be wheeled during the succeeding 12 month period commencing on July 1.
- (2) Subject to satisfaction of the County's obligations under this Agreement, including the Conditions Precedent set forth in subsection a., above, County Water made available for diversion at the City Diversion Facilities shall be wheeled to the County in accordance with the terms of this Agreement and the *Delivery Criteria*.
- (3) All County Water delivered to the Service Connection shall meet the drinking water standards established by DHS and the USEPA. County shall assume sole responsibility for the quality and delivery of County Water wheeled pursuant to this Agreement after the water is delivered to the Service Connection.

c. Water Wheeling Requirements:

- (1) As between the City and County, County shall be solely responsible for:
  - (i) obtaining all permits or other approvals required for the use of the County Water within the Airport and MAP Service Areas, including compliance with all applicable laws and regulations such as the Porter-Cologne Water Quality Control Act and the Federal Clean Water Act; and
  - (ii) compliance with any conditions which apply to the diversion or use of such water, including any measures which are imposed to mitigate potential impacts to the environment through CEQA, Federal Reclamation Laws, NEPA and the Federal and State Endangered Species Acts, including, but not limited to, diversion limitations, if any, included in any Biological Opinion or Incidental Take Permit. The City

shall not be responsible for any costs associated with (a) delivering the County Water to the City Diversion Facilities, or (b) obtaining all permits or other approvals and complying with any conditions required for the diversion or use of such water.

- (2) Any County Water wheeled pursuant to this Agreement shall be used only within the Airport and MAP Service Areas.
- (3) City shall not be required pursuant to this Agreement to wheel any quantity of water that exceeds the total aggregate amount of any County Water made available by County for diversion at the City Diversion Facilities.
- (4) The wheeling of any County Water shall be conducted in accordance with all operating, engineering and water supply requirements set forth in this Agreement and the *Delivery Criteria*, and with any other conditions applicable to wheeling of the County Water. If the City determines in the exercise of reasonable discretion that a suspension of wheeling is necessary due to a condition that poses an immediate threat to public health or safety, wheeling may be suspended by City without notice for the duration of such condition. The City shall notify County as soon as is practicable of any suspension of service, the reason for such suspension, and an estimate of when such service will be restored.
- (5) County shall be solely responsible for any and all costs incurred by City in order to comply with:
  - (i) any law or regulation that applies to the wheeling or use of any County Water;
  - (ii) any mitigation measures applicable to the wheeling or use of any County Water; and
  - (iii) any requirements that are imposed on the City in connection with the wheeling or use of any County Water by any federal, state or local agency, including but not limited to the USBR, DWR, the State Water Resources Control Board, the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, the California Department of Fish and Game or the DHS.
- (6) The County acknowledges that the City will not have any responsibility for reporting the annual quantity of County Water wheeled under this Agreement in its annual reports of water use to the State Water Resources Control Board.



**9. Obligations of the County:**

- a. The County will take delivery of the potable water made available by the City pursuant to the Delivery Criteria.
- b. The County will pay any and all costs associated with providing potable water to the County pursuant to this Agreement, as set forth in Sections 10 and 11 of this Agreement. In addition, the County will be responsible for its pro rata share (comparing the quantities of water that the City delivers to the County and to other City retail, wholesale and wheeling customers) of any and all costs reasonably incurred by the City in order to comply with all laws and regulations that may apply to the pumping, diversion, treatment and/or delivery of water to the County hereunder, including but not limited to, the California Environmental Quality Act (CEQA), the National Environmental Policy Act (NEPA), the Federal and State Endangered Species Acts, the Federal Reclamation Laws, the Clean Water Act and the Porter-Cologne Water Quality Control Act. Further, the County will be responsible for its pro rata share (comparing the quantities of water that the City delivers to the County and to other City retail, wholesale and wheeling customers) of any and all costs associated with any other requirements and/or conditions that are or may be imposed on the pumping, diversion, treatment and/or delivery of water to the County by any federal, state or local agency, including but not limited to the U.S. Bureau of Reclamation, the California Department of Water Resources, the State Water Resources Control Board, the U.S. Fish and Wildlife Service, the National Marine Fisheries Service or the California Department of Fish and Game.
- c. Any deliveries of City Water to the County will be subject to any and all applicable requirements and/or conditions contained in or in the future imposed on any of the City Water Rights and Entitlements.
- d. Notwithstanding any provisions in this Agreement to the contrary, County shall have no liability or obligation to pay for any costs incurred by the City in, or otherwise associated with, retrofitting City retail customers with water meters.
- e. County shall be the lead agency for purposes of any CEQA, NEPA or Endangered Species Act (federal and state) compliance required in connection with the wheeling of any County Water and/or the ultimate use of any water delivered under this Agreement.

**10. Cost Allocation and Payment:**

The cost allocations and payment for any water delivered pursuant to this Agreement will be governed by the following paragraphs.

a. Wholesale and Wheeling Water Charges

- (1) The County will be charged a Wholesale Water Charge for City Water delivered by the City using Wholesale Water Service. The Wholesale Water Charge shall consist of a Wholesale Use Charge calculated on the Wholesale Unit Rate basis (the cost-per-unit quantity) for water actually delivered, plus a monthly Service Charge for fixed administrative costs incurred irrespective of the quantity of water delivered. The Wholesale Water Charge will be determined by the City in an equitable manner such that the County neither subsidizes nor is subsidized by any other City customer or contractor. The Wholesale Unit Rate shall include the City's annual operating, maintenance, repair and applicable capital improvement costs (excluding Capital Costs included in the Connection Fees described in Section 10.b., below) and an equitable proration of appropriate overhead distribution, but in no event will the Wholesale Unit Rate exceed such costs for water pumping, diversion, treatment and conveyance divided by the number of gallons produced. Operating, maintenance, repair and capital improvement costs included in the Wholesale Unit Rate will also include any costs attributable to any applicable limitation, requirement, modification or other condition that applies, or that may in the future be applied, to any of the City Water Rights and Entitlements, but will exclude those costs that have no relationship to wholesaling City Water to the County, such as unrelated distribution system expenses or unrelated capital improvement costs. The estimated Wholesale Unit Rate and the monthly Service Charge for the Fiscal Year (FY) 2004-2005 is shown on **Exhibit D** to this Agreement.
- (2) The County will be charged a Wheeling Water Charge for County Water delivered by the City using Wheeling Water Service. The Wheeling Water Charge shall consist of a Wheeling Use Charge calculated on the Wheeling Unit Rate basis (the cost-per-unit quantity) for water actually delivered, plus a monthly Service Charge for fixed administrative costs incurred irrespective of the quantity of water delivered. The Wheeling Water Charge will be determined by the City in an equitable manner such that the County neither subsidizes nor is subsidized by any other City customer or contractor. The Wheeling Unit Rate shall include the City's annual operating, maintenance, repair and applicable capital improvement costs (excluding Capital Costs included in the Connection Fees described in Section 10.b., below) and an equitable proration of appropriate overhead distribution, but in no event will the Wheeling Unit Rate exceed such costs for water diversion, treatment and conveyance divided by the

number of gallons produced. Operating, maintenance, repair and capital improvement costs included in the Wheeling Unit Rate will exclude those costs that have no relationship to wheeling County Water to the County, such as unrelated distribution system expenses or unrelated capital improvement costs. The estimated Wheeling Unit Rate and the monthly Service Charge for the FY 2004-2005 is shown on **Exhibit E** to this Agreement.

- (3) The City will adjust the Service Charge, Wholesale Unit Rate and/or Wheeling Unit Rate in January of each year to reflect actual or anticipated cost increases or decreases.
- (4) The quantity of water actually delivered pursuant to this Agreement shall be measured by the City at the Service Connection meter located as shown on Exhibit B to this Agreement. Billing procedures and payment for water will be in accordance with the City's standard practice. The Wholesale Water Charge and the Wheeling Water Charge will be in addition to the Connection Fees described in subsection b., below.

b. **Connection Fees**

- (1) The County will pay Connection Fees for its share of Capital Costs for Firm Capacity in the City's pumping, diversion, treatment, storage and transmission facilities that will be used to provide Wholesale Water Service and/or Wheeling Water Service under this Agreement, which fees will include reasonable administrative costs. The Connection Fees shall be paid in increments of one (1) mgd, or pro-rata portions thereof, up to the maximum rate specified in Section 5.a., above. The Connection Fee for each one (1) mgd increment and/or portion thereof of Firm Capacity shall become due on the date (hereafter the "Due Date") that the County first requests Wholesale Water Service and/or Wheeling Water Service for such 1 mgd increment or portion thereof, and shall be paid in accordance with the provisions of subsection b.(2), below. The City will adjust the Connection Fee annually prior to the commencement of each Fiscal Year based on the Capital Costs for that Fiscal Year, and such adjusted Connection Fee shall apply to any one (1) mgd increment and/or portion thereof of Firm Capacity for which Connection Fee(s) become due during that Fiscal Year. The estimated Connection Fee for FY 2004-2005 for the use of one (1) mgd of Firm Capacity is shown on **Exhibit F** to this Agreement.
- (2) The County shall have the option of paying the Connection Fee for each one (1) mgd increment and/or portion thereof of Firm Capacity

either:

- (i) In one payment not later than thirty (30) days after the Due Date for such increment and/or portion thereof; or
- (ii) In annual payments over a financing period of thirty (30) years, commencing on the Due Date for such increment and/or portion thereof. If the County elects to pay such Connection Fee over time in accordance with this subsection (2)(ii), the County also shall pay a fixed annual interest rate equal to the rate the City receives on its Pool A funds on the Due Date for such increment and/or portion thereof, and the County's first annual payment shall be due not later than thirty (30) days after such Due Date.

**11. Transmission Improvements:**

- a. The County will be wholly responsible for designing, bidding and constructing the Transmission Improvements, as well as preparing all environmental documents and obtaining all permits, property rights or other approvals required for construction of the Transmission Improvements. Subject to the City's reimbursement obligation specified in subsection b., below, such activities will be paid for by the County, and will be subject to the following requirements:
  - (1) Prior to the public bidding for construction of the Transmission Improvements by the County, both the preliminary design and the final design must be approved in writing by the City Director of Utilities, which approval will not be unreasonably withheld. The design plans shall:
    - (i) distinguish between the facilities included in the Transmission Improvements that will be constructed and located within the City (hereafter the "City Portion"), the facilities included in the Transmission Improvements that will be constructed and located within the unincorporated area of Sacramento County (hereafter the "County Portion"), and the Service Connection that will connect the City Portion to the County Portion;
    - (ii) for the City Portion, comply with all standard City specifications and requirements for the design of City water lines; and
    - (iii) comply with such other requirements as may reasonably be specified by the City Director of Utilities. If either or both the preliminary design or final design is not approved by the City Director of Utilities, the City will notify the County in writing of the reason or

reasons why such design is not acceptable, and the County will perform such revisions as may be necessary to obtain the approval of the City. Preliminary cost estimates for the various portions of the Transmission Improvements are attached hereto as **Exhibit G**.

- (2) After the final design is approved by the City, the County shall competitively bid construction of the Transmission Improvements in accordance with the County's standard procedures and requirements for public works construction. The County's bid specifications shall require that the amount bid for construction of the City Portion be separately specified in the bid. With respect to construction of the City Portion and Service Connection, the County's construction contract shall require compliance with the standard City specifications and requirements for the construction of City water lines, in addition to any additional requirements reasonably specified by the City, and shall require the County's contractor to:
  - (i) indemnify, hold harmless and defend City, its officers and employees against any and all liabilities, damages, claims or costs (including reasonable attorney fees) arising from any action or failure to act by the contractor or any subcontractor in connection with construction of the City Portion and Service Connection; and
  - (ii) provide the City, its officers and employees with the same insurance coverage provided to the County, by naming the City as an additional insured on the contractor's general liability and automobile liability insurance policies.
- (3) After bids are opened, copies of the bids and the County's proposed award shall be provided to the City's Director of Utilities for review. A City representative will attend the bid opening. The County shall not take any action to award the contract until the Director of Utilities or his/her authorized representative provides written approval of the proposed award and the portion of the successful bid for construction of the City Portion, which approval shall not be unreasonably withheld.
- (4) All work on the City Portion and Service Connection shall be performed in accordance with the plans and specifications approved by the City, and any City-approved changes thereto, and in full compliance with the City's standard specifications and requirements for water main construction, unless exceptions are approved by the City. Such plans and specifications, upon approval by the City Utilities Director or his or her designee, shall be deemed incorporated herein and made a part of this Agreement. Any increase in the amount of the construction contract for work performed or any cost incurred on

the City Portion shall require written approval by the City, which approval shall not be unreasonably withheld.

- (5) City shall be allowed to enter the construction site to perform construction inspection whenever deemed necessary by City. Upon completion and testing of the Transmission Improvements, City shall inspect the City Portion and the Service Connection and either (i) accept the work as complete, or (ii) identify any deficiencies to be corrected before the City will accept the work as complete. The City Portion and the Service Connection shall become the sole and exclusive property of the City upon completion of construction, final inspection and testing, and final acceptance by City, after the correction by County of any deficiencies identified by City. As a precondition to final acceptance by City: (i) County shall take any and all actions necessary to insure that the work is free and clear of all liens, stop notices and encumbrances of any kind, and that the City is in possession of all rights and approvals necessary to operate, maintain and repair the City Portion and the Service Connection upon final acceptance by City; and (ii) County shall provide City a set of as-built plans.
- (6) The County guarantees and agrees, at no cost to the City, to remedy any defects in the City Portion or the Service Connection arising from faulty or defective construction occurring at any time within one (1) year after final acceptance thereof by the City. In the event that County fails to remedy any and all such defects within ten (10) days after being notified of the defects in writing by City, or such longer period as may be reasonably necessary to remedy such defects so long as County is acting in good-faith to diligently remedy the defects, City shall have the right, but shall not be obligated, to repair or cause to be repaired such defects, and County shall pay to City on demand all costs and expenses reasonably incurred by City to repair or cause to be repaired such defects. Notwithstanding anything herein to the contrary, if any defects in the improvements result in a condition that, in the City's sole and exclusive judgment, constitutes an imminent hazard to public health or safety, or to any person or property, City shall have the right to immediately repair or cause to be repaired such defects, with or without prior notice to County, and County shall pay to City on demand all costs and expenses reasonably incurred by City to repair or cause to be repaired such defects. Any costs incurred by the City under this subsection (6), but not paid by County, may be deducted from any reimbursement otherwise due Owner pursuant to the provisions of subsection b, below.

- b. The City shall reimburse County for costs associated with design and

construction of the City Portion as follows:

- (1) Not later than sixty (60) days after the City's final acceptance of the City Portion and the Service Connection as specified above, the City shall reimburse the County for:
    - (i) The portion of the County's payment to its design engineer attributable to services performed to design the City Portion of the Transmission Improvements, as mutually agreed by the City's Director of Utilities and the County's Director of Water Resources; and
    - (ii) The portion of the County's payment to its contractor for work performed to construct the City Portion of the Transmission Improvements, provided that such reimbursement shall not exceed the amount bid for such work or any City-approved changes thereto.
  - (2) The City shall have no responsibility for any reimbursement of costs incurred by the County to design and construct the Service Connection and the County Portion of the Transmission Improvements.
- c. The City will own, operate, maintain and repair all facilities associated with the Service Connection, including flowmeter, flow transmitter, pressure transmitter, valve, S.C.A.D.A. and electrical pedestal. As part of such operation, maintenance and repair, the City will calibrate instrumentation at reasonable scheduled intervals, at least annually, and will report such calibration as requested by the County. All operation, maintenance and repair costs incurred by the City will be reimbursed by the County by including such costs in the Wholesale and Wheeling Unit Rates paid by the County under Section 10, above. For metering errors in excess of 2 percent, Wholesale and Wheeling Water Charges may be adjusted upward or downward, as appropriate.
  - d. The County will own, operate and maintain all facilities downstream of the Service Connection, including surge control facilities to mitigate the effects of flow stoppage. The County will submit plans for surge control facilities for review and approval of the City prior to construction, which approval will not be unreasonably withheld.
  - e. Unless required by the City's Director of Utilities or otherwise required by law or regulation, backflow prevention devices will not be required at the Service Connection provided that (i) the County has a backflow prevention program meeting State regulations, and (ii) all facilities within the County Service Area

meet the standards of the California Department of Health Services and U.S. EPA.

- f. Although delivery pressure cannot be guaranteed under all circumstances, delivery pressure at the Service Connection will be maintained above a minimum of 30 pounds per square inch ("psi"), and below a maximum of 80 psi under normal operating conditions. The City will not be obligated to supply water to any or all Service Connection points at an aggregate rate exceeding the maximums set forth in Section 5.a., above.

**12. Term of Agreement:**

This Agreement will become effective as of the date it is signed by the last signatory and is approved by the Board of Supervisors of Sacramento County, the Board of Directors of the Agency and the City Council, and will continue in full force and effect unless terminated by mutual written agreement of the parties hereto or by operation of law.

**13. Failure to Deliver Water:**

It is understood and agreed that, while the City will make every reasonable effort to deliver potable water pursuant to the terms of this Agreement, the City is not warranting or guaranteeing that it will be able to pump, divert, treat, store and/or deliver water when prevented from doing so due to an emergency or other circumstances beyond the City's direct control, nor will the City be liable for any failure to deliver water to the County hereunder, provided such failure is caused in whole or in part by an emergency condition or other factors beyond the direct control of the City.

**14. The City Water Rights and Entitlements:**

This Agreement will not affect or limit in any way the City Water Rights and Entitlements. Notwithstanding anything herein to the contrary, it is understood and agreed that the County's rights hereunder will at all times be subject to, and exercised in accordance with, any applicable limitation, requirement, modification or other condition that applies, or that may in the future be applied, to any of the City Water Rights and Entitlements.

**15. Fluoridation:**

The County acknowledges that potable water delivered to the County will contain fluoride, and agrees that the County will be solely responsible for: (1) any public notification to all or any portion of the Airport/MAP Service Area that the water provided hereunder has been treated with fluoride; and (2) for all costs associated with or resulting from the introduction of fluoridated water into the County Water Facilities, including monitoring and testing costs. The County will comply, at no cost to the City, with any



requirements pertaining to such fluoridation imposed by any governmental agencies with jurisdiction, including without limitation, the Department of Health Services. If the County receives notice of any such requirements applicable to the use of water delivered hereunder and subsequently fails to comply with such requirements within a reasonable period of time, the City will be relieved of any responsibility to deliver water pursuant to this Agreement until such requirements are fulfilled.

**16. Notices:**

Unless indicated otherwise herein, all notices, invoices, payments, statements or other writing authorized or required by this Agreement may be delivered personally, or sent in the United States mail, postage prepaid, or sent by electronic mail if the recipient confirms receipt, and addressed to the respective parties as follows:

To City:

Director, Department of Utilities  
City of Sacramento  
1395 35<sup>th</sup> Avenue  
Sacramento, CA 95822  
Electronic mail: [greents@cityofsacramento.org](mailto:greents@cityofsacramento.org)

To Agency and Sacramento County:

Director, Department of Water Resources  
County of Sacramento  
827 7th Street, Room 301  
Sacramento, CA 95814

All notices, invoices, payments or other writings will be deemed served on the day that they are personally served, deposited, postage prepaid, in the United States mail, or if served electronically, on the day that the recipient acknowledges receipt. A party may change the above designations by providing notice thereof to the other party.

**17. Indemnification and Defense:**

- a. By The County: The County will fully indemnify, hold harmless and defend the City, its officers and employees, from any claims, actions or liability for any damages, any injury to persons or property, or any violation of any law or regulation, occurring by reason of anything done or omitted to be done by the County, its officers, employees, contractors or agents under this Agreement. Except as specified in subsection b., below, the County will fully indemnify, hold harmless and defend the City, its officers and employees from any claims, actions or liability for any damages, any injury to persons or property, or any violation of any law or regulation, occurring by reason of any action taken by the City, its officers or employees, if such action is required or authorized under this Agreement, unless such damages, injury, or violation

result solely from the willful or intentional acts of the City.

- b. By The City: Notwithstanding anything to the contrary herein, the City will fully indemnify, hold harmless and defend the County, its officers and employees, from any claims, actions or liability for any damages, any injury to persons or property, or any violation of any law or regulation, occurring by reason of anything done or omitted to be done by the City, its officers, employees, contractors or agents in connection with the processing, treating or conveyance of water by the City Treatment and Transmission Facilities. Such duty to indemnify, hold harmless and defend will include all claims, actions or liability occurring by reason of anything done or omitted to be done by the City in connection with any delivery by the City of water that fails to comply with the definition of potable water contained herein.

**18. Dispute Resolution:**

- a. Disputes: If a dispute arises concerning any controversy or claim arising out of or relating to this Agreement or the breach thereof, or relating to its application or interpretation, the aggrieved party will notify the other party(ies) of the dispute in writing within twenty days after such dispute arises. If the parties fail to resolve the dispute within thirty days after delivery of such notice, each party will promptly nominate a senior officer of its organization to meet at any mutually-agreed time and location to resolve the dispute. The parties agree to use their best efforts to reach a just and equitable solution satisfactory to all parties. Should the parties be unable to resolve the dispute to their mutual satisfaction within thirty days thereafter, the dispute will be subject to arbitration, pursuant to subsection b., below. The time periods set forth in this section are subject to extension as agreed to by the parties.
- b. Arbitration: A dispute that is not resolved in accordance with subsection a., above, will be subject to arbitration by an arbitrator in Sacramento, California, provided, however, that each party reserves the right to file with a court of competent jurisdiction an application for temporary or preliminary injunctive relief on the grounds that the arbitration award to which the applicant may be entitled may be rendered ineffectual in the absence of such relief. Except as otherwise provided herein, the arbitration will be conducted under and will be subject to the provisions of the California Arbitration Act (Code of Civil Procedure sections 1280 through 1294.2). The parties in the arbitration will select a single, qualified, neutral arbitrator. If they cannot agree on an arbitrator, or an alternative selection process, the parties will request that the Presiding Judge of the Sacramento County Superior Court select an arbitrator in accordance with the provisions of section 1281.6 of the Code of Civil Procedure.

A hearing on the matter to be arbitrated will take place before the arbitrator in

the County of Sacramento at a time and place selected by the arbitrator. However, the hearing will take place not later than sixty days after selection of the arbitrator. The arbitrator will select the time and place for the hearing, and will give the parties written notice of the time and place at least twenty days before the date of the hearing. At the hearing, any relevant evidence may be presented by the parties, and the formal rules of evidence applicable to judicial proceedings will not apply. The arbitrator will hear and determine the matter. The arbitration award may include an award of damages and/or an award or decree of specific performance or declaratory or injunctive relief, will be in writing and will specify the factual and legal bases for the award. An award rendered pursuant hereto may be confirmed, corrected or vacated by a court of competent jurisdiction in accordance with the provisions of the California Arbitration Act. The arbitrator will have no authority, power or right to award punitive or other damages not measured by the prevailing party=s actual damages, and will not make any ruling, finding or award that is inconsistent with or which alters, changes, amend, modifies, waives, adds to or deletes from any of the provisions of this Agreement.

The ongoing cost of the arbitration, including the arbitrator=s fees, will be borne equally by the parties. Each party will also pay the costs of its own counsel, experts, witnesses and preparation and presentation of proofs. Additional incidental costs of arbitration may be allocated by the arbitration award.

- c. Defense to Suit: The parties agree that the failure to comply with the provisions of this Section will be a complete defense to any suit, action or proceeding instituted in any federal or state court, or before any administrative body, with respect to any dispute that is subject to arbitration hereunder, provided, however, that this subsection c. will not apply to any application for temporary or preliminary injunctive relief authorized under this Section.

#### **19. Records Inspection:**

Each party will be entitled to inspect and photocopy the records of the other party(ies) that pertain to this Agreement, upon providing reasonable notice to such other party(ies) of its intent to do so. Each party may also appoint an auditor or auditors to examine the financial records of the other party(ies) to determine the adequacy of cost accumulation and billing information maintained by each party. After reasonable notice, each party will make available to the other party's(ies') auditor or auditors all requested records, and will assist and cooperate with such auditors. Each party will keep its accounting and financial records in accordance with generally-accepted accounting principles and any applicable laws or regulations.

#### **20. Amendments:**

No amendment or modification to this Agreement will be valid unless executed in writing and approved by the governing bodies of the parties, provided, however, that the Delivery Criteria may be modified by mutual written agreement of the City's Director of Utilities and the County's Director of Water Resources without obtaining approvals from the governing bodies of the parties hereto, as specified in Section 4, above.

**21. No Third-Party Beneficiary:**

This Agreement is not intended to, and will not be interpreted as conferring, any benefit or right whatsoever upon any person or entity that is not a party hereto.

**22. Exhibits Incorporated:**

All Exhibits referred to herein and attached hereto are fully incorporated into this Agreement as if such Exhibits were set forth in their entirety at this place.

**23. General Provisions:**

- a. This Agreement will be construed in accordance with, and governed by, the laws of the State of California. The place where this Agreement is to be performed and its situs or forum will at all times be in the County of Sacramento.
- b. The headings of the sections and paragraphs in this Agreement are inserted for convenience only. They do not constitute part of this Agreement and will not be used in its construction.
- c. This Agreement is the result of the joint efforts and negotiations of the parties, and the parties agree that this Agreement will be interpreted as though each of the parties participated equally in the drafting and composition of this Agreement and each and every part hereof.
- d. This Agreement may not be assigned by any party without the written consent of the non-assigning parties, and any purported assignment without such consent will be void.
- e. The provisions of this Agreement shall bind the parties= successor entities and authorized assigns.
- f. Neither City nor County, nor their respective agents, consultants or contractors, are or shall be considered to be agents of the other party in connection with the performance of this Agreement. Nothing in this Agreement shall be construed to create a joint venture, partnership or other relationship between the City and County, other than the City acting in its

municipal capacity with respect to the provision of wholesale and wheeling water service to the County.

- g. The waiver by a party to this Agreement of a breach of any provision of this Agreement shall not be deemed a continuing waiver or a waiver of any subsequent breach of that or any other provision of the Agreement.

Date: \_\_\_\_\_, 2004

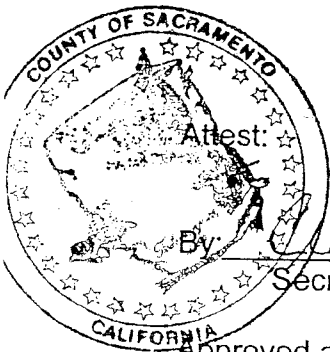
Attest:

By: *Drum R. Beekunzel*  
City Clerk

Approved as to Form:

By: *Joe M*  
City Attorney

Date: 10-21, 2004



Approved as to Form:

By: *John F. Whit*

Date: 10/14, 2004

**CITY OF SACRAMENTO**

By: *Ken Nishimoto*

Ken Nishimoto, Deputy City Manager  
For: Robert P. Thomas, City Manager

**SACRAMENTO COUNTY**

By: *Muriel L. Johnson*

**SACRAMENTO COUNTY WATER  
AGENCY**

CITY  
AGREEMENT NO. 2004-0159



By: Muriel Johnson

By: Cathy H. Harper  
Secretary

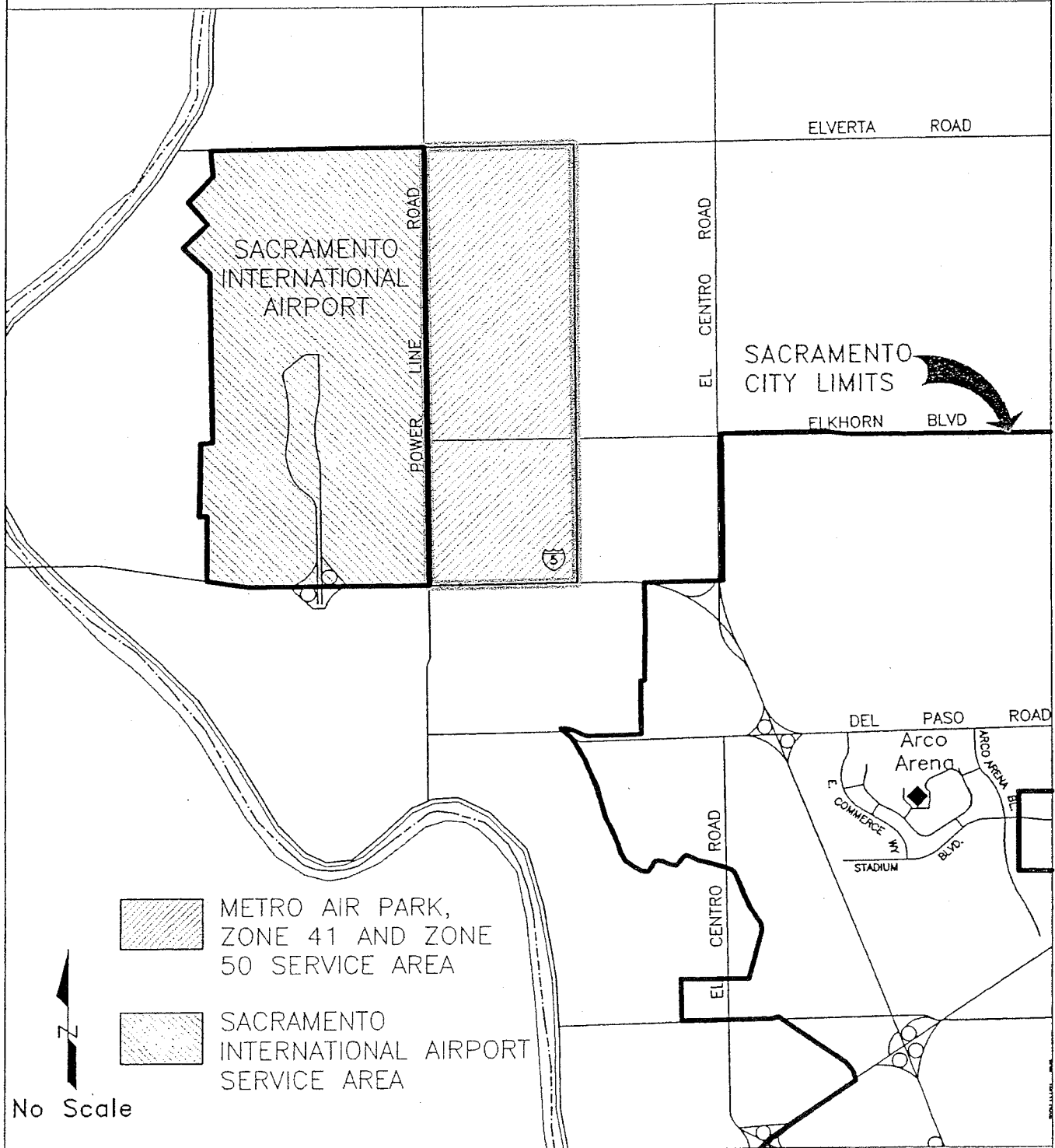
Approved as to Form:

By: John F. Whit  
Assistant County Counsel

**List of Exhibits:**

- Exhibit A: Map showing Airport/MAP Service Area
- Exhibit B: Map showing Transmission Improvements, with detail of Service Connection
- Exhibit C: Delivery Criteria
- Exhibit D: Estimated Fiscal Year 2004-05 Wholesale Unit Rate and Service Charge
- Exhibit E: Estimated FY 2004-05 Wheeling Unit Rate and Service Charge
- Exhibit F: Estimated FY 2004-05 Connection Fee (per mgd)

# EXHIBIT "A"

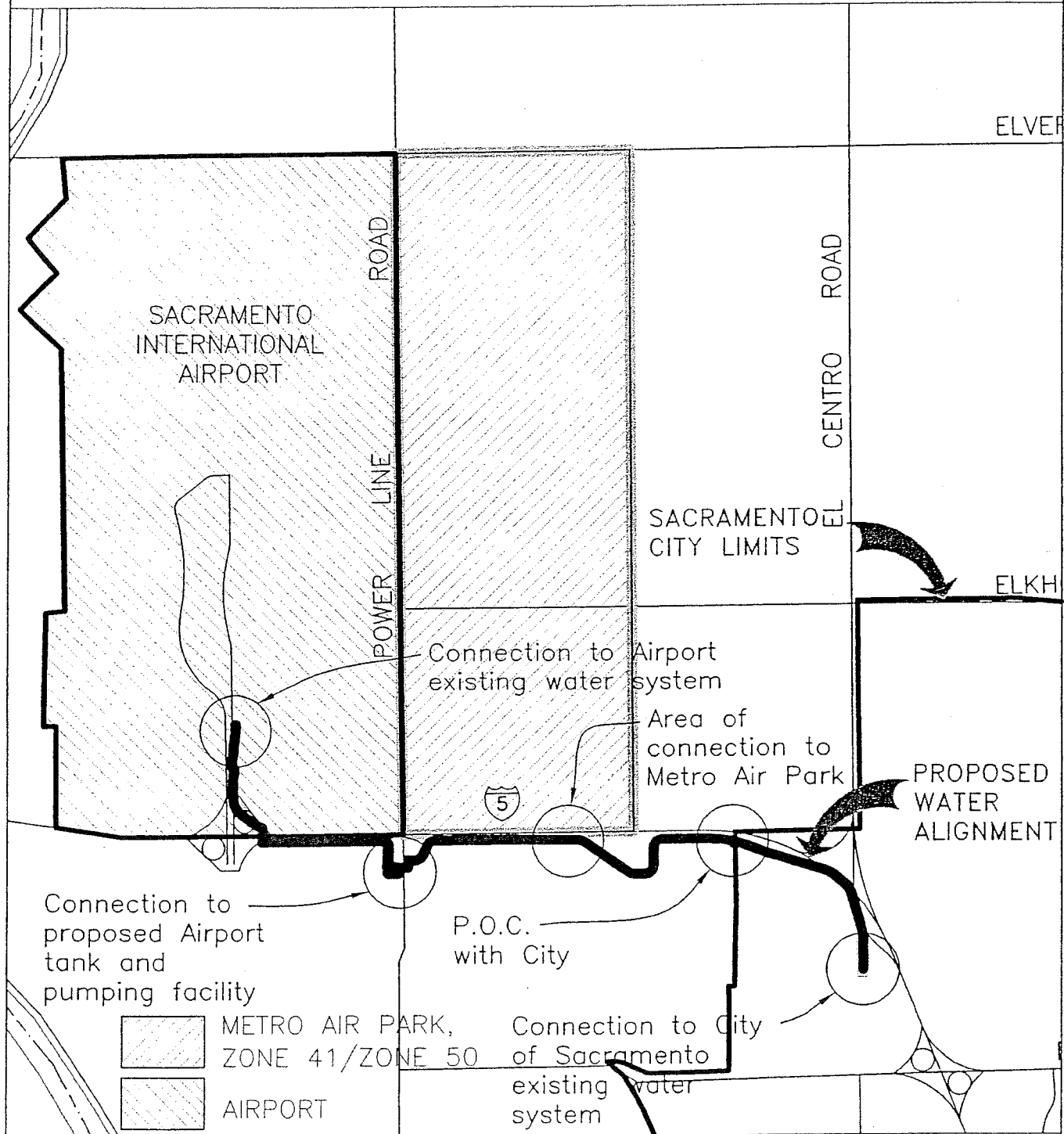


## SERVICE AREA OF SACRAMENTO INTERNATIONAL AIRPORT AND METRO AIR PARK (SCWA ZONE 41 & ZONE 50)

AUGUST, 2004  
Drawn by: BB



# EXHIBIT "B"



Map showing Transmission Improvements

No Scale

AUGUST, 2004  
Drawn by: BB

## EXHIBIT C

### CITY OF SACRAMENTO / SACRAMENTO COUNTY WATER AGENCY ZONE 50 SERVICE CONNECTION

#### DELIVERY CRITERIA

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This document outlines the general delivery guidelines and criteria for the operation of service connections between the City of Sacramento (City) and the Sacramento County Water Agency (County). The initial wholesale water service connection is located on Bayou Road, at the City Limit.

#### LIST OF CONTACTS:

The following listing of City and County contact names and phone numbers is provided in order of contact priority.

County:	WORK
Water Dispatch/After hours: County Dispatch	875-7246
Tom Pasterski, Mechanical Manager	876-6430; 591-0468
Mike Adams, Mechanical Supervisor	875-6882; 261-1767
Dave Underwood, Senior Engineer	875-6947
Keith Hall, Associate Engineer	875-6869
City of Sacramento:	WORK
E.A. Fairbairn WTP Control Room	808-3106
E.A. Fairbairn WTP Hotline	808-1516
Mary Krizanowski, Plant Operator Supervisor	808-3111
Steve Willey, Plant Operator Supervisor	808-7407
Mike Yee, Plant Services Division Manager	808-5583
Kathy Mullen, Water Superintendent	808-3105
Roland Pang, Water Superintendent	808-3119

#### OPERATIONAL PROCEDURES AND PARAMETERS:

1. For initial start-up, and for subsequently significant shut-down periods, County will call the E.A. Fairbairn Water Treatment Plant (FWTP) Control Room to communicate delivery status.

2. The City shall be responsible for reading and recording the time and flow quantities.
3. The County can take an initial maximum instantaneous flow rate of up to 5.0 mgd (3,472 gpm) as measured by the City maintained service connection flow meter. Maximum daily volume of 5.0 mgd, with 10% tolerance due to operational variations.
4. The County can incrementally increase the maximum instantaneous flow rate of up to 11.7 mgd (8,124 gpm) as measured by the City maintained service connection flow meter subject to the requirements of the wholesale and/or wheeling agreement

The minimum pressure at the service connection between the City and the County will be 30 psig. The County will strive to use the station control logic to maintain service connection pressures at or above 30 psig.

When County first starts the take of water, they will coordinate with the City so as to not cause a major pressure drop or surge in the City or County systems.

The City's and County's Operations staff will work cooperatively to assist each other to assure the pressure at the City/County point of connection does not fall below a pressure of 30 psig.

5. Changes in aforementioned delivery criteria can be modified if mutually agreed to in writing by the Director of Utilities of the City of Sacramento and the Director of Sacramento County Water resources.

**End of Exhibit C**

## EXHIBIT D

## Initial Wholesale Water Rate

**WHOLESALE WATER - UNIT COST CALCULATION**  
**FISCAL YEAR 2004-2005**

1	FY 2005 Operating/CIP Budget: (a)	\$60,949,963	FY 2004 Water Production (AF): (b)	148,784
		<b>BUDGET</b>	<b>UNIT COST ELEMENTS</b>	
	<b>OPERATING</b>			
	<b>LABOR</b>			
2	Employee Services	16,188,928	\$112.59	
3	Cost Reimb-Credit	(1,835,954)	(\$12.77)	
4	Cost Reimb-Charge	1,930,132	\$13.42	
5	CIP Reimbursement	(257,500)	(\$1.79)	
6		<u>\$16,025,606</u>	<u>\$111.46</u>	
	<b>OPERATIONS</b>			
7	Utilities	2,797,513	\$19.46	
8	Operations Equipment	1,274,525	\$8.86	
9	Direct Operations Supplies	3,070,320	\$21.35	
10	Chem & Gases	790,717	\$5.50	
11		<u>\$7,933,075</u>	<u>\$55.17</u>	
	<b>ADMINISTRATION/OVERHEAD</b>			
12	Office/Admin	1,565,247	\$10.89	
13	Interdepartmental Allocation/Taxes	7,068,647	\$49.16	
14	Comp Liability Exp	774,964	\$5.39	
15	Water Rights/Supply	359,500	\$2.50	
16	Professional Services	483,818	\$3.36	
17		<u>\$10,252,176</u>	<u>\$71.30</u>	
18	<b>TOTAL OPERATING</b>	<b>\$34,210,857</b>	<b>\$237.93</b>	
	<b>CAPITAL IMPROVEMENT PROGRAM</b>			
19	CIP	\$13,600,000	\$94.59	
20	Debt Service	<u>\$13,139,106</u>	<u>\$91.38</u>	
21	<b>TOTAL CIP</b>	<b>\$26,739,106</b>	<b>\$185.97</b>	
22	<b>TOTAL OPERATING/CIP COSTS</b>	<b>\$60,949,963</b>	<b>\$423.90</b>	
	<b>EXCLUDED COSTS (\$SWD only)</b>			
23	Unrelated Energy Costs	\$0	\$0.00	
24	Unrelated Distribution Costs	(\$7,658,986)	(\$53.27)	
25	Unrelated Dist Overhead	(\$3,282,369)	(\$22.83)	
26	Unrelated Water Rights Costs	\$0	\$0.00	
27	Unrelated CIPs	(\$5,435,000)	(\$37.80)	
28	Unrelated Debt Svc	(\$13,139,106)	(\$91.38)	
29	Non-operating Revenues	<u>(\$3,905,000)</u>	<u>(\$27.16)</u>	
30	<b>TOTAL EXCLUDED COSTS</b>	<b>(\$33,420,461)</b>	<b>(\$232.44)</b>	
31	<b>TOTAL COST</b>	<b>\$27,529,502</b>	<b>UNIT RATE</b>	<b>\$191.46 per AF</b>
32b				<b>\$0.4395 per CCF</b>
33b			<b>SERVICE CHARGE</b>	<b>\$150.00 per month</b>

Note: Unit Rate is adjusted annually to reflect current costs.  
Unit Cost may not match exactly due to rounding.

## EXHIBIT E

## Initial Wheeling Water Rate

**WHEELING WATER - UNIT COST CALCULATION**  
**FISCAL YEAR 2004-2005**

1	FY 2005 Operating/CIP Budget: (a)	\$60,949,963	FY 2004 Water Production (AF): (b)	143,784
		<b>BUDGET</b>	<b>UNIT COST ELEMENTS</b>	
	<b>OPERATING</b>			
	<b>LABOR</b>			
2	Employee Services	16,188,928		\$112.59
3	Cost Reimb-Credit	(1,835,954)		(\$12.77)
4	Cost Reimb-Charge	1,930,132		\$13.42
5	CIP Reimbursement	(257,500)		(\$1.79)
6		<u>\$16,025,606</u>		<u>\$111.46</u>
	<b>OPERATIONS</b>			
7	Utilities	2,797,513		\$19.46
8	Operations Equipment	1,274,525		\$8.86
9	Direct Operations Supplies	3,070,320		\$21.35
10	Chem & Gases	790,717		<u>\$5.50</u>
11		<u>\$7,933,075</u>		<u>\$55.17</u>
	<b>ADMINISTRATION/OVERHEAD</b>			
12	Office/Admin	1,565,247		\$10.89
13	Interdepartmental Allocation/Taxes	7,068,647		\$49.16
14	Comp Liability Exp	774,964		\$5.39
15	Water Rights/Supply	359,500		\$2.50
16	Professional Services	483,818		<u>\$3.36</u>
17		<u>\$10,252,176</u>		<u>\$71.30</u>
18	<b>TOTAL OPERATING</b>	<b>\$34,210,857</b>		<b>\$237.93</b>
	<b>CAPITAL IMPROVEMENT PROGRAM</b>			
19	CIP	\$13,600,000		\$94.59
20	Debt Service	<u>\$13,139,106</u>		<u>\$91.38</u>
21	<b>TOTAL CIP</b>	<b>\$26,739,106</b>		<b>\$185.97</b>
22	<b>TOTAL OPERATING/CIP COSTS</b>	<b>\$60,949,963</b>		<b>\$423.90</b>
	<b>EXCLUDED COSTS (SSWD only)</b>			
23	Unrelated Energy Costs	\$0		\$0.00
24	Unrelated Distribution Costs	(\$7,658,986)		(\$53.27)
25	Unrelated Dist Overhead	(\$3,282,369)		(\$22.83)
26	Unrelated Water Rights Costs	(\$359,500)		(\$2.50)
27	Unrelated CIPs	(\$5,435,000)		(\$37.80)
28	Unrelated Debt Svc	(\$13,139,106)		(\$91.38)
29	Non-operating Revenues	<u>(\$3,905,000)</u>		<u>(\$27.16)</u>
30	<b>TOTAL EXCLUDED COSTS</b>	<b>(\$33,779,961)</b>		<b>(\$234.94)</b>
31	<b>TOTAL COST</b>	<b>\$27,170,002</b>	<b>UNIT RATE</b>	<b>\$188.96 per AF</b>
32b				<b>\$0.4338 per CCF</b>
33b			<b>SERVICE CHARGE</b>	<b>\$150.00 per month</b>

Note: Unit Rate is adjusted annually to reflect current costs.  
Unit Cost may not match exactly due to rounding.

**EXHIBIT F**

**SACRAMENTO COUNTY WATER AGENCY (MAP AND AIRPORT)  
WHOLESALE / WHEELING CONNECTION FEE  
ESTIMATE  
FISCAL YEAR 2004-2005**

DESCRIPTION	NET REPL COST 6/30/2005	CAPACITY mgd	UNIT COST PER MGD FY/ 04/05
Distribution	27,623,164	360	n/a
Transmission	115,901,104	360	321,948
Hydrants	978,581	360	n/a
Storage	26,095,497	360	n/a
Wells	6,989,071	25	279,563
Treatment	282,961,030	360	786,003
Intakes	60,043,151	360	166,787
General	14,976,788	360	41,602
<b>TOTAL</b>	<b>535,568,386</b>		<b>1,595,902</b>

NOTE: Connection Fee Unit Cost based on assumption that water is taken in FY05.

# EXHIBIT G

Job No. 07019-9898-141				Calc. No.		
<b>Computation</b>				<b>HDR</b>		
<b>Project:</b> Sacramento County Airport Systems				<b>Computed:</b> MB		
<b>Subject:</b> Domestic Water Supply and Distribution System				<b>Date:</b> 6/21/2004		
<b>Task:</b> 65% Opinion of Probable Construction Costs (Alt-1, 30" DIP)				<b>Reviewed:</b> RDA & RCW		
<b>File Name:</b> P:\07019\9898\Estimates\WIP\65% Opinion_Construction_Cost.xls\65% OPCC				<b>Date:</b> 7/7/2004		
DESCRIPTION	QUANTITY	UNITS	UNIT COST	TOTAL COST	CITY COST %	CITY COST
<b>DIVISION 1 - GENERAL REQUIREMENTS</b>						
1 Mobilization	1	LS	2.50%	\$224,250	9.34%	\$20,945
2 Demobilization	1	LS	0.50%	\$43,948	9.34%	\$4,105
3 Bonds, Insurance, etc	1	LS	2.50%	\$224,250	9.34%	\$20,945
4 CPM Schedule and Updates (assume 12 mo. Const.)	1	LS	\$20,000	\$20,000	9.34%	\$1,868
5 Temporary Facilities/Fencing/Offices	1	LS	\$19,000	\$19,000	9.34%	\$1,775
6 As-Built Documents	1	LS	\$20,000	\$20,000	9.34%	\$1,868
7 Facilities Start-up & Testing	1	LS	\$30,000	\$30,000	9.34%	\$2,802
8 Permitting (incl SWPPP)	1	LS	\$15,000	\$15,000	9.34%	\$1,401
<b>SUBTOTAL</b>				<b>\$596,448</b>		<b>\$55,708</b>
<b>DIVISION 2 - SITE WORK</b>						
<b>Pipeline - General</b>						
9 Tie-in to Existing Systems	1	LS	\$50,000	\$50,000	9.34%	\$4,670
10 Pot-Holing	1	LS	\$7,500	\$7,500	9.34%	\$701
11 Hydrostatic testing	19,234	LF	\$2.00	\$38,468	9.34%	\$3,593
12 Dewatering	1	LS	\$75,000	\$75,000	9.34%	\$7,005
13 Traffic Control	1	LS	\$25,000	\$25,000	9.34%	\$2,335
<b>Alignment "L1"</b>						
14 30" DIP	12,385	LF	\$108	\$1,337,580	38.35%	\$513,000
15 AC Removal (6-in Depth)	7,110	SY	\$7.00	\$49,770	38.35%	\$19,089
16 AC Replacement (6-in Depth) L1	63,990	SF	\$2.00	\$127,980	38.35%	\$49,084
17 3/4" AB Replacement (18-in Depth) L1	2,638	CY	\$35	\$92,316	38.37%	\$35,420
18 Backfill (Sand, 18-in Depth) L1	3,316	CY	\$23	\$76,266	38.36%	\$29,256
19 Bedding (AB, 6-in Depth) L1	879	CY	\$35	\$30,771	38.44%	\$11,830
20 Trench Excavation L1	12,298	CY	\$8.00	\$98,383	38.36%	\$37,736
21 30" 45 degree Fitting	4	EA	\$4,500	\$18,000	50.00%	\$9,000
22 30" Tee	2	EA	\$6,000	\$12,000	50.00%	\$6,000
23 30" x 12" Reducer	1	EA	\$2,700	\$2,700	100.00%	\$2,700
24 12" Gate Valve	1	EA	\$1,600	\$1,600	100.00%	\$1,600
26 30" FCA	1	EA	\$1,000	\$1,000	100.00%	\$1,000
27 30" Butterfly Valve	1	EA	\$10,000	\$10,000	100.00%	\$10,000
<b>Alignment "L2"</b>						
28 24" DIP	6,524	LF	\$84	\$548,016	0.00%	\$0
29 AC Removal (6-in Depth)	1,706	SY	\$7.00	\$11,942	0.00%	\$0
30 AC Replacement (6-in Depth) L2	15,354	SF	\$2.00	\$30,708	0.00%	\$0
31 3/4" AB Replacement (18-in Depth) L2	1,059	CY	\$35	\$37,057	0.00%	\$0
32 Backfill (Sand, 18-in Depth) L2	1,389	CY	\$23	\$31,940	0.00%	\$0
33 Bedding (AB, 6-in Depth) L2	403	CY	\$35	\$14,096	0.00%	\$0
34 Trench Excavation L2	5,304	CY	\$8.00	\$42,436	0.00%	\$0
35 24" 45 degree Fitting	4	EA	\$3,250	\$13,000	0.00%	\$0
36 24" Tee	1	EA	\$4,850	\$4,850	0.00%	\$0
37 24" 15 degree Fitting	6	EA	\$3,250	\$19,500	0.00%	\$0
38 24" 90 degree Fitting	1	EA	\$3,800	\$3,800	0.00%	\$0
39 12" Gate Valve	2	EA	\$1,600	\$3,200	0.00%	\$0
40 24" x 12" Reducer	3	EA	\$2,200	\$6,600	0.00%	\$0
41 12" Restrained Mechanical Coupling	2	EA	\$310	\$620	0.00%	\$0
42 12" Butterfly Valve	1	EA	\$1,975	\$1,975	0.00%	\$0
<b>Alignment "L1" - Airport Pipeline</b>						
43 16" DIP	325	LF	\$70	\$22,750	0.00%	\$0
44 AC Removal (6-in Depth)	244	SY	\$7.00	\$1,711	0.00%	\$0
45 AC Replacement (6-in Depth)	2200	SF	\$2.00	\$4,400	0.00%	\$0
46 3/4" AB Replacement (18-in Depth)	93	CY	\$35	\$3,241	0.00%	\$0
47 Backfill (Sand, 18-in Depth)	85	CY	\$23	\$1,959	0.00%	\$0
48 Bedding (AB, 6-in Depth)	30	CY	\$35	\$1,037	0.00%	\$0
49 Trench Excavation	474	CY	\$8.00	\$3,793	0.00%	\$0
50 16" 90 degree fitting	1	EA	\$1,150	\$1,150	0.00%	\$0
51 16" Gate Valve	1	EA	\$2,775	\$2,775	0.00%	\$0
52 30" x 16" Reducer	1	EA	\$2,200	\$2,200	0.00%	\$0

# EXHIBIT G

Job No. 07019-9898-141				Calc. No.		
<b>Computation</b>				<b>HDR</b>		
Project: Sacramento County Airport Systems				Computed: MB		
Subject: Domestic Water Supply and Distribution System				Date: 6/21/2004		
Task: 65% Opinion of Probable Construction Costs (Alt-1, 30" DIP)				Reviewed: RDA & RCW		
File Name: P:\07019\9898\Estimates\WIP\65% Opinion_Construction_Cost.xls\65% OPCC				Date: 7/7/2004		
DESCRIPTION	QUANTITY	UNITS	UNIT COST	TOTAL COST	CITY COST %	CITY COST
<b>Blow-offs</b>						
53 6" 90 degree Fitting	30	EA	\$320	\$9,600	38.35%	\$3,682
54 8" x 6" Tee	30	EA	\$300	\$9,000	38.35%	\$3,452
55 6" Gate Valve	30	EA	\$1,425	\$42,750	38.35%	\$16,395
56 8" DIP	210	LF	\$35	\$7,350	38.35%	\$2,819
57 6" DIP	600	LF	\$30	\$18,000	38.35%	\$6,903
58 4" DIP	210	LF	\$25	\$5,250	38.35%	\$2,013
<b>CAVs</b>						
59 2" Combination Air and Vacuum Valve	15	EA	\$530	\$7,950	38.35%	\$3,049
60 4" 90 degree Fitting	30	EA	\$58	\$1,740	38.35%	\$667
61 4" Tee	15	EA	\$90	\$1,350	38.35%	\$518
62 4" Gate Valve	15	EA	\$860	\$12,900	38.35%	\$4,947
63 4" DIP	600	LF	\$25	\$15,000	38.35%	\$5,753
<b>City/County Metering Vault</b>						
64 Vault Excavation	40	CY	\$8	\$320	0.00%	\$0
65 8"x7"x14" Precast Concrete Meter Vault	1	EA	\$6,700	\$6,700	0.00%	\$0
66 3/4" AB	6	CY	\$35	\$207	0.00%	\$0
66 24" Magnetic Flow Meter	1	EA	\$25,000	\$25,000	0.00%	\$0
67 Meter Vault Access Hatch	2	EA	\$1,200	\$2,400	0.00%	\$0
68 Modulating BFW	1	EA	\$12,000	\$12,000	0.00%	\$0
69 24" Plain End Coupling	2	EA	\$800	\$1,600	0.00%	\$0
70 24" FCA	1	EA	\$1,000	\$1,000	0.00%	\$0
71 Link Seals	2	EA	\$1,000	\$2,000	0.00%	\$0
72 Ladder w/ Retractable Safety Post	1	EA	\$1,000	\$1,000	0.00%	\$0
73 Pipe Supports	2	EA	\$500	\$1,000	0.00%	\$0
74 Sump Pump	1	EA	\$500	\$500	0.00%	\$0
75 Triple Biased Door Position Switch	1	EA	\$1,000	\$1,000	0.00%	\$0
<b>Telemetry Conduit</b>						
76 Conduit Excavation	579	CY	\$8.00	\$4,634	0.00%	\$0
77 Conduit Concrete Encasing	140	CY	\$150	\$21,039	0.00%	\$0
78 Fiber Optic Cable Excavation	836	CY	\$8.00	\$6,688	0.00%	\$0
79 Fiber Optic Cable Concrete Encasing	251	CY	\$150	\$37,628	0.00%	\$0
<b>Storage Tanks Site</b>						
80 Excavation	2308	CY	\$7	\$16,157	0.00%	\$0
81 Grading over entire site (incl. pump sta.)	7,330	SY	\$0.83	\$6,084	0.00%	\$0
82 Site Clearing and Grubbing (incl. pump sta.)	66,000	SF	\$0.12	\$7,920	0.00%	\$0
83 Class II AB (11-in Depth)	2,240	CY	\$35	\$78,400	0.00%	\$0
84 Site fencing	1,000	LF	\$37	\$37,000	0.00%	\$0
85 Rolling Gate	20	LF	\$200	\$4,000	0.00%	\$0
86 AC overlay over entire site (2.5-in AC, incl pump sta.)	7,330	SY	\$6.40	\$46,912	0.00%	\$0
87 AC paved access roads (with Subbase)	630	SY	\$20	\$12,600	0.00%	\$0
<b>SUBTOTAL</b>				<b>\$3,333,770</b>		<b>\$794,215</b>
<b>DIVISION 3 - CONCRETE</b>						
<b>Storage Tanks Site</b>						
88 4'x7'x6" Precast Concrete Meter Vault	2	EA	\$4,000	\$8,000	0.00%	\$0
89 6'x13'x6" Precast Concrete Altitude Valve Vault	2	EA	\$6,000	\$12,000	0.00%	\$0
90 12'x10'x8" Precast Concrete Vault	1	EA	\$7,000	\$7,000	0.00%	\$0
<b>Pump Station Building</b>						
91 Pump Station Building Pad	90	CY	\$400	\$36,000	0.00%	\$0
<b>SUBTOTAL</b>				<b>\$63,000</b>		<b>\$0</b>
<b>DIVISION 4 - MASONRY</b>						
<b>Pump Station Building</b>						
92 Masonry Walls (bldg)	1	LS	\$166,200	\$166,200	0.00%	\$0
<b>SUBTOTAL</b>				<b>\$166,200</b>		<b>\$0</b>
<b>DIVISION 5 - MISCELLANEOUS METALS</b>						
<b>Pumping Station</b>						
93 Aluminum Grating	180	SF	\$50	\$9,000	0.00%	\$0
94 Traffic Rated Lid	400	SF	\$50.00	\$20,000	0.00%	\$0
<b>SUBTOTAL</b>				<b>\$29,000</b>		<b>\$0</b>
<b>DIVISION 7 - THERMAL AND MOISTURE PROTECTION</b>						
95 Roofing	1	LS	\$15,300	\$15,300	0.00%	\$0
96 Building Insulation	1	LS	\$6,000	\$6,000	0.00%	\$0
<b>SUBTOTAL</b>				<b>\$21,300</b>		<b>\$0</b>
<b>DIVISION 8 - DOORS AND WINDOWS</b>						
<b>Storage Tanks Site</b>						



# EXHIBIT G

Job No. 07019-9898-141				Calc. No.		
<b>Computation</b>				<b>HDR</b>		
<b>Project:</b> Sacramento County Airport Systems				<b>Computed:</b> MB		
<b>Subject:</b> Domestic Water Supply and Distribution System				<b>Date:</b> 6/21/2004		
<b>Task:</b> 65% Opinion of Probable Construction Costs (Alt-1, 30" DIP)				<b>Reviewed:</b> RDA & RCW		
<b>File Name:</b> P:\07019\9898\Estimates\WIP\65% Opinion_Construction_Cost.xls\65% OPCC				<b>Date:</b> 7/7/2004		
DESCRIPTION	QUANTITY	UNITS	UNIT COST	TOTAL COST	CITY COST %	CITY COST
97 Meter Vault Access Hatch	9	EA	\$1,200	\$10,800	0.00%	\$0
<b>Pumping Station</b>						
98 Single Steel Door	2	EA	\$900	\$1,800	0.00%	\$0
99 Double Steel Door	2	EA	\$900	\$1,800	0.00%	\$0
100 Vent	2	EA	\$500	\$1,000	0.00%	\$0
101 Pump Access Hatch	6	EA	\$800	\$4,800	0.00%	\$0
<b>SUBTOTAL</b>				\$20,200		\$0
<b>DIVISION 9- FINISHES</b>						
102 Painting and Protective Coatings (piping and equipment)	1	LS	\$10,000	\$10,000	9.34%	\$934
<b>SUBTOTAL</b>				\$10,000		\$934
<b>DIVISION 10- SPECIALTIES</b>						
103 Identification, Stenciling, and Tagging System	1	LS	\$2,000	\$2,000	9.34%	\$187
<b>SUBTOTAL</b>				\$2,000		\$187
<b>DIVISION 11- EQUIPMENT</b>						
<b>Pumping Station</b>						
104 Vertical Turbine Pumps (30 hp)	3	EA	\$17,500	\$52,500	0.00%	\$0
105 Vertical Turbine Pumps (100 hp)	3	EA	\$25,750	\$77,250	0.00%	\$0
106 VFD (for 30 hp pumps)	2	EA	\$5,700	\$11,400	0.00%	\$0
107 VFD (for 100 hp pumps)	2	EA	\$15,300	\$30,600	0.00%	\$0
108 350 KW Standby Generator	1	LS	\$110,000	\$110,000	0.00%	\$0
109 Sodium Hypochlorite Pump	4	EA	\$1,955	\$7,820	0.00%	\$0
110 Sodium Hypochlorite Storage Tank	1	EA	\$1,500	\$1,500	0.00%	\$0
<b>SUBTOTAL</b>				\$291,070		\$0
<b>DIVISION 13- SPECIAL CONSTRUCTION</b>						
<b>Pipeline</b>						
111 Jacking Pit	3	EA	\$15,000	\$45,000	0.00%	\$0
112 Receiving Pit	3	EA	\$10,000	\$30,000	0.00%	\$0
113 Bore and Jack Casing - 36"	550	LF	\$450	\$247,500	0.00%	\$0
<b>Storage Tanks</b>						
114 Steel Piles	20,000	VLF	\$15.00	\$300,000	0.00%	\$0
115 1.4 MG Prestressed Conc Tank (Dia 110 ft)	2	EA	\$1,500,000	\$3,000,000	0.00%	\$0
<b>SUBTOTAL</b>				\$3,622,500		\$0
<b>DIVISION 15- MECHANICAL</b>						
<b>Storage Tanks Site</b>						
116 Hydropneumatic Tank (20,000 gal)	1	EA	\$75,000	\$75,000	0.00%	\$0
117 30" DIP	5	LF	\$190	\$950	0.00%	\$0
118 30" 90 degree Fitting	1	EA	\$5,000	\$5,000	0.00%	\$0
119 24" x 30" Expansion	1	EA	\$2,200	\$2,200	0.00%	\$0
120 24" DIP	115	LF	\$118	\$13,570	0.00%	\$0
121 24" FCA	1	EA	\$700	\$700	0.00%	\$0
122 24" Butterfly Valve	1	EA	\$7,000	\$7,000	0.00%	\$0
123 24" Gate Valve	1	EA	\$5,475	\$5,475	0.00%	\$0
124 24" Tee	1	EA	\$4,850	\$4,850	0.00%	\$0
125 24" Wye	1	EA	\$4,850	\$4,850	0.00%	\$0
126 18" DIP	155	LF	\$80	\$12,400	0.00%	\$0
127 18" x 24" Expansion	2	EA	\$1,800	\$3,600	0.00%	\$0
128 18" Gate Valve	2	EA	\$3,475	\$6,950	0.00%	\$0
129 18" 45 degree Fitting	2	EA	\$1,600	\$3,200	0.00%	\$0
130 16" DIP	560	LF	\$70	\$39,200	0.00%	\$0
131 16" x 24" Expansion	1	EA	\$2,200	\$2,200	0.00%	\$0
132 16" Gate Valve	6	EA	\$2,775	\$16,650	0.00%	\$0
133 16" Fitting	2	EA	\$865	\$1,730	0.00%	\$0
134 16" 45 degree Fitting	5	EA	\$865	\$4,325	0.00%	\$0
135 16" 90 degree Fitting	4	EA	\$1,150	\$4,600	0.00%	\$0
136 16" Tee	2	EA	\$1,925	\$3,850	0.00%	\$0
137 16" Wye, lateral	1	EA	\$1,925	\$1,925	0.00%	\$0
138 16" FCA	4	EA	\$500	\$2,000	0.00%	\$0
139 Air Valve	2	EA	\$20,000	\$40,000	0.00%	\$0
140 12" DIP	90	LF	\$49	\$4,410	0.00%	\$0
141 12" 45 Degree Fitting	2	EA	\$635	\$1,270	0.00%	\$0
142 6" DIP	250	LF	\$30	\$7,500	0.00%	\$0
143 6" 90 degree Fitting	3	EA	\$320	\$960	0.00%	\$0
144 6" 45 degree Fitting	4	EA	\$297	\$1,188	0.00%	\$0
<b>Pumping Station</b>						
145 24" DIP	105	LF	\$118	\$12,390	0.00%	\$0
146 24" Tee	1	EA	\$4,850	\$4,850	0.00%	\$0
147 24" Pressure Relief Valve	1	EA	\$20,000	\$20,000	0.00%	\$0

# EXHIBIT G

Job No. 07019-9898-141			Calc. No.		
<b>Computation</b>			<b>HDR</b>		
Project: Sacramento County Airport Systems			Computed: MB		
Subject: Domestic Water Supply and Distribution System			Date: 6/21/2004		
Task: 65% Opinion of Probable Construction Costs (Alt-1, 30" DIP)			Reviewed: RDA & RCW		
File Name: P:\07019\9898\Estimates\WIP\65% Opinion_Construction_Cost.xls\65% OPCC			Date: 7/7/2004		
DESCRIPTION	QUANTITY	UNITS	UNIT COST	TOTAL COST	CITY COST
148 24" 90 degree fitting	2	EA	\$2,050	\$4,100	0.00%
149 24" Gate Valve	1	EA	\$5,475	\$5,475	0.00%
150 24" FCA	1	EA	\$700	\$700	0.00%
151 16" DIP	40	LF	\$70	\$2,800	0.00%
152 16" Gate Valve	3	EA	\$2,775	\$8,325	0.00%
153 16" FCA	3	EA	\$500	\$1,500	0.00%
154 10" DIP	20	LF	\$42.50	\$850	0.00%
155 10" Expansion Joint	3	EA	\$700	\$2,100	0.00%
156 10" FCA	3	EA	\$240	\$720	0.00%
157 10" Check Valve	3	EA	\$3,475	\$10,425	0.00%
158 10" Gate Valve	3	EA	\$1,250	\$3,750	0.00%
159 10" 90 degree Fitting	3	EA	\$745	\$2,235	0.00%
160 8" DIP	60	LF	\$35	\$2,070	0.00%
161 8" Gate Valve	6	EA	\$925	\$5,550	0.00%
162 8" FCA	6	EA	\$191	\$1,146	0.00%
163 8" 90 degree Fitting	3	EA	\$430	\$1,290	0.00%
164 8" Expansion Joint	3	EA	\$650	\$1,950	0.00%
165 8" Check Valve	3	EA	\$2,275	\$6,825	0.00%
<b>SUBTOTAL</b>				<b>\$376,559</b>	<b>\$0</b>
<b>DIVISION 16 - ELECTRICAL</b>					
166 Primary Elements and Transmitters	1	LS	\$10,000	\$10,000	0.00%
167 Electric Service (at tank site)	1	LS	\$25,000	\$25,000	0.00%
168 Site Lighting	1	LS	\$5,000	\$5,000	0.00%
169 Cathodic Protection	1	LS	\$210,000	\$210,000	9.34%
170 Electrical Wiring	1	LS	\$20,000	\$20,000	9.34%
171 3" Conduit (x2)	9,750	LF	\$30	\$292,500	0.00%
172 4" Fiber Optic Cable	65	CLF	\$300	\$19,350	0.00%
173 2" Fiber Optic Cable (x2)	129	CLF	\$200	\$25,800	0.00%
174 Microwave Motion Detector	1	EA	\$15,000	\$15,000	0.00%
175 Infrared Illuminator Lighting	1	LS	\$4,000	\$4,000	0.00%
176 Color Video Camera with PTZ	5	EA	\$4,600	\$23,000	0.00%
177 Digital Video Recorder	5	EA	\$3,500	\$17,500	0.00%
178 Video Switcher/Controller	1	EA	\$6,000	\$6,000	0.00%
179 18" Color LCD Monitor	5	EA	\$800	\$4,000	0.00%
180 Access Control Workstation	1	EA	\$5,000	\$5,000	0.00%
181 Remote Access Control Panel	1	EA	\$2,500	\$2,500	0.00%
<b>SUBTOTAL</b>				<b>\$684,650</b>	<b>\$21,482</b>
<b>DIVISION 17 - INSTRUMENTATION</b>					
<b>Storage Tanks</b>					
182 24" Magnetic Flow Meter	1	EA	\$25,000	\$25,000	0.00%
183 16" Flow Meter	1	EA	\$4,000	\$4,000	0.00%
184 Triple Biased Door Position Switch	1	EA	\$1,000	\$1,000	0.00%
<b>Pumping Station</b>					
185 Triple Biased Door Position Switch	1	EA	\$1,000	\$1,000	0.00%
<b>Miscellaneous</b>					
186 P.S. Instrumentation	1	LS	\$7,500	\$7,500	0.00%
187 Storage Instrumentation	1	LS	\$7,000	\$7,000	0.00%
188 RTU and Operator Interface	1	LS	\$20,000	\$20,000	0.00%
189 PLC and Programming	1	LS	\$50,000	\$50,000	0.00%
190 Misc. Control Panels	1	LS	\$10,000	\$10,000	0.00%
<b>SUBTOTAL</b>				<b>\$125,500</b>	<b>\$0</b>
ON SITE CONSTRUCTION (LESS DIV 1) SUBTOTAL			\$8,745,749		\$816,818
(ADDITIVE FOR) DIVISION 1 (ABOVE)			\$596,448		\$55,708
CONTINGENCY (20%)			\$1,869,000		\$175,000
TOTAL			\$11,211,198		\$1,047,526
TOTAL (ROUNDED)			\$11,220,000		\$1,050,000

- Notes:
1. This cost opinion does not include any City connection fees, environmental remediation, and etc.
  2. This cost opinion does not include costs for engineering, administration, and/or construction management
  3. Bid Contingency - Under certain conditions Bids come in higher than expected due to market variables such as busy contractors, higher field or material costs, etc.

the foregoing is a correct copy of a Resolution adopted by the Board of Supervisors, Sacramento County, California  
OCT 12 2004  
OCT 20 2004  
Clerk of said Board of Supervisors  
Deputy

RESOLUTION NO. WA-2565  
SACRAMENTO COUNTY WATER AGENCY

**RESOLUTION AUTHORIZING THE EXECUTION OF AN AGREEMENT WITH THE CITY OF SACRAMENTO FOR WHOLESALING AND/OR WHEELING WATER SERVICE FOR SACRAMENTO INTERNATIONAL AIRPORT AND METRO AIR PARK**

**WHEREAS**, Section 1.1 of the Sacramento County Water Agency Act (hereinafter referred to as the "Agency Act") authorizes the Board of Directors (hereinafter referred to as the "Board") of the Sacramento County Water Agency (hereinafter referred to as "Agency") to establish zones and to institute projects for the specific benefit of such zones; and

**WHEREAS**, on June 1, 2004, the Board adopted Resolution WA-2542 forming Zone 50; and

**WHEREAS**, the purpose of Zone 50 is to provide a water system to Metro Air Park Special Planning Area (hereinafter referred to as MAP) including but not limited to the fees necessary to fund such a system; and

**WHEREAS**, on June 1, 2004, the Board adopted Resolution WA-2537 annexing MAP to Zone 41; and

**WHEREAS**, Zone 41 was established to operate, maintain, repair, or otherwise improve any and all water supply facilities; and

**WHEREAS**, the Agency desires to obtain a long-term potable water supply to meet the build-out demands of MAP; and

**WHEREAS**, the City of Sacramento can provide potable water to meet MAP build-out demands; and

**WHEREAS**, the Sacramento International Airport desires to obtain a long-term replacement water supply for their on-site groundwater supply system; and

**WHEREAS**, the City of Sacramento is willing to provide potable water to meet the long-term build-out water demands of MAP and the Airport either through wholesale water service or through wheeling water service;

**NOW, THEREFORE**, the Board of Directors of the Sacramento County Water Agency resolves and determines as follows:

Section 1. The foregoing recitals are true and correct and this Board so finds and determines.

Section 2. Authorize the Chair of the Board of Directors to execute an agreement with the City of Sacramento in the form hereto attached entitled AGREEMENT BETWEEN THE CITY OF SACRAMENTO, THE COUNTY OF SACRAMENTO AND THE SACRAMENTO COUNTY WATER AGENCY FOR WHOLESALE AND/OR WHEELING WATER SERVICE FOR SACRAMENTO INTERNATIONAL AIRPORT AND METRO AIR PARK and to do and perform everything necessary to carry out the purposes of this Resolution on behalf of the Sacramento County Water Agency, a political subdivision of the State of California.

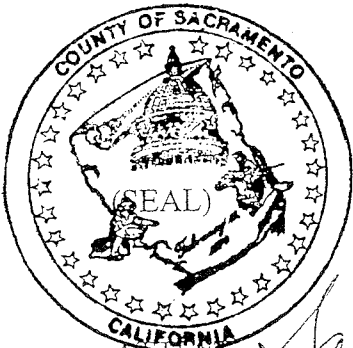
On a motion by Director Dickinson, and seconded by Director Niello, the foregoing resolution was passed and adopted by the Board of Directors of the Sacramento County Water Agency, State of California, this 12th day of October, 2004, by the following vote, to wit:

AYES: Directors, Dickinson, Niello, Johnson

NOES: Directors, None

ABSENT: Directors, Collin, Nottoli

ABSTAIN: Directors, None



Deputy

ATTEST: Sandra Leahy  
Clerk of the Board of Supervisors of Sacramento County, California, and ex officio Secretary of the Board of Directors of Sacramento County Water Agency

Muriel P. Johnson

Chair of the Board of Directors of the Sacramento County Water Agency, a district organized under the laws of the State of California

In accordance with Section 25103 of the Government Code of the State of California a copy of the document has been delivered to the Chairman on OCT 12 2004

Janeen L. Johnson  
Deputy Clerk, Board of Directors

FILED

OCT 12 2004

BOARD OF DIRECTORS  
Cindy A. Turner  
Clerk of the Board

the foregoing is a correct copy of a resolution adopted by the Board of Supervisors, Sacramento County, California  
OCT 1 2 2004  
on  
OCT 2 0 2004  
Clerk of said Board of Supervisors  
Dennis

RESOLUTION NO. 2004-1270

COUNTY OF SACRAMENTO

RESOLUTION AUTHORIZING THE EXECUTION OF AN AGREEMENT WITH THE CITY OF SACRAMENTO FOR WHOLESALING AND/OR WHEELING WATER SERVICE FOR SACRAMENTO INTERNATIONAL AIRPORT AND METRO AIR PARK

WHEREAS, Sacramento County owns and operates the Sacramento International Airport (hereinafter referred to as "Airport") as part of the Sacramento County Airport System; and

WHEREAS, potable water for the Airport is provided from an on-site groundwater supply system owned and operated by the Sacramento County Airport System. Water from said groundwater supply system contains concentrations of arsenic that exceed revised state and federal drinking water standards that take effect on January 23, 2006; and

WHEREAS, groundwater treatment facilities needed to meet the revised regulatory standards for arsenic would significantly increase capital and operating costs for the Sacramento County Airport System; and

WHEREAS, the City of Sacramento (hereinafter referred to as "City") can provide potable water to fully replace the Airport's current on-site groundwater supply at significantly less cost than upgrading the current system; and

WHEREAS, the Sacramento County Water Agency desires to obtain a long-term potable water supply to meet the build-out demands of the lands adjacent to the Airport that are currently being developed as the Metro Air Park; and

WHEREAS, the City is willing to provide potable water to meet the long-term build-out water demands of the Airport and Metro Air Park either through wholesale water service or through wheeling water service;

NOW, THEREFORE, the Board of Supervisors of the County of Sacramento resolves and determines as follows:

Section 1. The foregoing recitals are true and correct and this Board so finds and determines.

Section 2. Authorize the Chair of the Board of Supervisors to execute an agreement with the City of Sacramento in the form hereto attached entitled AGREEMENT BETWEEN THE CITY OF SACRAMENTO, THE COUNTY OF SACRAMENTO AND THE SACRAMENTO

COUNTY WATER AGENCY FOR WHOLESALE AND/OR WHEELING WATER SERVICE FOR SACRAMENTO INTERNATIONAL AIRPORT AND METRO AIR PARK and to do and perform everything necessary to carry out the purposes of this Resolution on behalf of the County of Sacramento, a political subdivision of the State of California.

On a motion by Supervisor Dickinson, and seconded by Supervisor Niello, the foregoing resolution was passed and adopted by the Board of Supervisors of the County of Sacramento, State of California, this 12th day of October, 2004, by the following vote, to wit:

AYES: Supervisors, Dickinson, Niello, Johnson

NOES: Supervisors, None

ABSENT: Supervisors, Collin, Nottoli

ABSTAIN: Supervisors, None



ATTEST: Sandra Leahy  
Clerk, Board of Supervisors

Muriel P. Johnson  
Chair of the Board of Supervisors  
of Sacramento County, California

In accordance with Section 25103 of the Government Code of the State of California a copy of the document has been delivered to the Chairman of the Board of Supervisors, County of Sacramento on **OCT 12 2004**

By Janeen Lawson  
Deputy Clerk, Board of Supervisors

**FILED**

OCT 12 2004

BOARD OF SUPERVISORS  
BY Cindy H. [Signature]  
CLERK OF THE BOARD

# RESOLUTION NO. 2004-809

ADOPTED BY THE SACRAMENTO CITY COUNCIL

ON DATE OF OCT 19 2004

CERTIFIED AS TRUE COPY  
OF Resolution 2004-809  
November 2, 2004  
DATE CERTIFIED  
Dawn P. Buckland  
CITY CLERK, CITY OF SACRAMENTO

## A RESOLUTION AUTHORIZING EXECUTION OF AN AGREEMENT FOR WHOLESALE AND/OR WHEELING WATER SERVICE WITH SACRAMENTO COUNTY AND THE SACRAMENTO COUNTY WATER AGENCY

### BE IT RESOLVED BY THE SACRAMENTO CITY COUNCIL THAT:

1. The City Council has reviewed and considered the information contained in the Mitigated Negative Declaration prepared and adopted by Sacramento County and the Sacramento County Water Agency for the project titled "Sacramento International Airport Domestic Water System," which will construct water supply facilities to deliver treated water from the City of Sacramento for the Sacramento International Airport and Metro Air Park, in accordance with the provisions of the Agreement identified in item 2, below.
2. The City Manager is hereby authorized to execute the "Agreement Between the City of Sacramento, the County of Sacramento and the Sacramento County Water Agency for Wholesale and/or Wheeling Water Service for Sacramento International Airport and Metro Air Park," in the form attached hereto.

HEATHER FARGO

MAYOR

ATTEST:

SHIRLEY CONCOLINO

CITY CLERK

FOR CITY CLERK USE ONLY

RESOLUTION NO.: 2004-809  
DATE ADOPTED: OCT 19 2004

NOTICE OF DETERMINATION

ENDORSED

To: Office of Planning and Research  
1400 10th Street, Room 222  
Sacramento, CA 95814

From: City of Sacramento  
Development Services Dept.  
1231 I Street, Room 300  
Sacramento CA 95814

OCT 22 2004

MARK NORRIS, CLERK-RECORDER  
DEPUTY

X County Clerk  
County of Sacramento

Subject: Filing of Notice of Determination in compliance with Section 21152 of the Public Resources Code and Section 15096(i) of the CEQA Guidelines.

Project Title: Agreement Between the City of Sacramento, the County of Sacramento and the Sacramento County Water Agency for Wholesale and/or Wheeling Water Service for Sacramento International Airport and Metro Air Park

Sac. County Control #	Responsible Agency	Contact Person	Telephone
03-DAE-0573	City of Sacramento	Dan Sherry	916-808-1400

Project Location (include county): Sacramento County, California (locations described below)

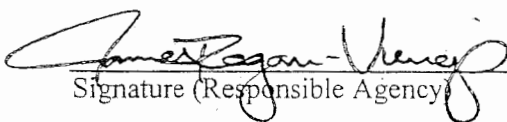
Project Description: The Agreement establishes the terms and conditions for the City to provide treated water to the Sacramento County Water Agency (SCWA), which will convey this water to serve the Sacramento International Airport and the Metro Air Park (MAP) development adjacent to the Airport. The Agreement allows SCWA to purchase treated water from the City on a wholesale (City water) or wheeling (non-City water) basis, to meet the ultimate total water demand for the Airport and MAP of 11.7 million gallons per day. The Sacramento County Airport System will construct the new pipeline and related facilities needed to convey water from the City's water distribution system pursuant to the Agreement. On October 12, 2004, Sacramento County, acting as the Lead Agency, adopted a Mitigated Negative Declaration for the project that consists of approving the Agreement and construction of the new facilities needed to supply water under the Agreement. The City of Sacramento is a Responsible Agency under CEQA with respect to this project and Agreement, and has considered the Mitigated Negative Declaration prepared and adopted by the Lead Agency.

This is to advise that the City of Sacramento, Department of ☐/Zoning Administrator☐/Planning Commission ☐/ City Council ☒ has approved the above described project on October 19, 2004, and has made the following determination regarding the above described project:

1. The project will ☐/ will not ☒ have a significant effect on the environment.
2. ☐ An Environmental Impact Report was prepared for this project pursuant to the provisions of CEQA.  
☒ A Negative Declaration was prepared for this project pursuant to the provisions of CEQA.
3. Mitigation Measures were ☒/were not ☐ made a condition of the approval of the project.
4. ☐ A statement of Overriding Considerations was adopted for this project.
5. ☐ Findings were made pursuant to the provisions of CEQA

This is to certify that the Mitigated Negative Declaration and the record of City project approval is available to the General Public at:

City of Sacramento, City Clerk's Office  
730 I Street, Sacramento CA 95814

  
Signature (Responsible Agency)

Senior Planner  
Title

10/20/04  
Date

Date received for filing at Clerk



# **COUNTY OF SACRAMENTO WATER FORUM WATER CONSERVATION PLAN**

## **BMP 1 INTERIOR AND EXTERIOR WATER AUDITS AND INCENTIVE PROGRAMS FOR SINGLE FAMILY RESIDENTIAL, MULTI-FAMILY RESIDENTIAL, AND INSTITUTIONAL CUSTOMERS**

- A. Within three years of agreement signing, the County of Sacramento will have:
  - 1. Trained water auditors on staff or available through cooperative agreements with other purveyors.
  - 2. Prepared and made available, as needed, multi-lingual interior and exterior water audit materials for customers.
  - 3. Prepared and made available to customers seasonal climate-appropriate irrigation information.
  - 4. Investigated opportunities for community based organizations (CBOs) to receive the training and financial incentives necessary for them to implement this BMP for their constituents.
- B. The County of Sacramento will annually:
  - 1. Actively market an interior and exterior, including landscape, water audit program which targets customers when they are most likely to be receptive to participation and which continues to target the top 20% water users.
    - a. During conversion to complete service area meter reading, offer water use reviews to all SF, MF and Institutional customers which receive a meter and continue to offer these reviews to customers whose meter readings indicate they are in the top 20% of water users.
    - b. After complete service area meter reading, continue to actively market the water audit program to the top 20% of water users.
  - 2. Offer, through bill inserts or other means, water-use reviews to all customers.
  - 3. Survey past program participants to determine if audit recommendations were implemented.
- C. The water-use review program will:
  - 1. Provide audits conducted by trained auditors.
  - 2. Provide audits that may include device installation by the County of Sacramento or customer (showerheads, faucet aerators, etc.), identification of water-use problems, recommend repairs, instruction in landscape principles (hydrozones, ET, etc.), irrigation timer use and, when appropriate, meter reading.
  - 3. Provide program participants with seasonal irrigation schedules by hydrozone and/or station.
- D. The County of Sacramento will be fully implementing the program described above no later than the beginning of the fourth year after agreement signing.

## **BMP 2 PLUMBING RETROFIT OF EXISTING RESIDENTIAL ACCOUNTS**

- A. Within three years of agreement signing, the County of Sacramento will:
  - 1. Have SAWWA offer to all customers with home built between 1987 and 1992 retrofit kits that include high quality low-flow showerheads, faucet aerators and toilet leak detection tablets.
  - 2. Offer toilet leak test kits to all change of account customers who visit the signatory's office.
  - 3. Work with the local "Welcome Wagon" or equivalent organization to provide water conservation materials to new residents.
  - 4. Work with local hardware/home stores to offer free water conservation information and toilet leak test kits at the check-out counters.
  - 5. Investigate partnership programs with local energy utilities to provide water conservation audits, materials and devices.
- B. The County of Sacramento will be fully implementing the program described above no later than the beginning of the fourth year after agreement signing.

## **BMP 3 DISTRIBUTION SYSTEM WATER AUDITS, LEAK DETECTION AND REPAIR**

- A. Within three years of agreement signing, the County of Sacramento will complete and maintain, in the unmetered areas:
  - 1. An annually updated "system map" of type, size and age of pipes; pressures; and leak history.
  - 2. Installation of devices (such as pressure recorders) or use of other methods designed to identify area with greater than 10% losses.
  - 3. An ongoing meter calibration and replacement program for all production and distribution meters.
  - 4. An ongoing leak detection and repair program (as defined in the manual) focused on high probability leak areas identified by the system map.
  - 5. A complete system-wide leak detection program repeated no less often than every ten years; unless there are special circumstances, such as age of system or planned main replacement.
- B. Within three years of agreement signing, the County of Sacramento will complete and maintain, in the metered areas:
  - 1. An annual system water audit, determining the difference between production and sales.
  - 2. An annually updated "system map" of: type, size and age of pipes; pressures; record of leaks, etc.; with historic data.
  - 3. An ongoing meter calibration and replacement program.
  - 4. An ongoing leak detection/repair program focused on high probability leak areas identified by map.
  - 5. A complete system wide leak detection program, repeated: when the system water audit determines losses to be greater than 10%; when the losses are less than 10% if the program is determined to be cost effective.

- C. The County of Sacramento will be fully implementing the program described above no later than the beginning of the fourth year after agreement signing.

#### **BMP 4 NON-RESIDENTIAL METER RETROFIT**

- A. Within three years of agreement signing, the County of Sacramento will:
1. Identify all non-residential unmetered customers.
  2. Provisionally identify any non-residential unmetered customer accounts that may be very difficult and expensive to retrofit.
  3. Meter unmetered non-residential accounts so that within two years all are metered.
  4. Begin installation of meters at non-residential unmetered customer locations, with consideration of separate landscape meters.
- B. Within ten years of meter installation, the County of Sacramento will provide newly metered non-residential customers with:
1. Information on how to read their meter and a consumption-based water bill.
  2. Information on the County-provided water conservation programs and services.
- C. The County of Sacramento will be fully implementing the program described above no later than the beginning of the fourth year after agreement signing.

#### **BMP4 RESIDENTIAL METER RETROFIT**

- A. The agreement related to the implementation of a residential meter retrofit program is described in the Water Forum Agreement, Section Three, V., 3., C., 1. b, page XXX.

#### **BMP 5 LARGE LANDSCAPE WATER AUDITS AND INCENTIVES FOR COMMERCIAL, INDUSTRIAL, INSTITUTIONAL (CII), AND IRRIGATION ACCOUNTS**

- A. Within three years of agreement signing, the County of Sacramento will:
1. Identify all Irrigation accounts and CII accounts with landscapes of one acre and larger and record that information in the customer database.
  2. Have certified and/or trained landscape water auditors on staff or available through agreements.
  3. Prepare and distribute multi-lingual (as appropriate) irrigation system materials, seasonal climate-appropriate information on irrigation scheduling and offer training for customers/landscape workers.
  4. Develop seasonal climate-appropriate information to determine irrigation schedules, for the three basic hydrozones identified in the DWR Landscape Water Management Handbook, and provided that information to the customers with one acre or larger landscapes.
  5. Begin installation of climate appropriate water efficient landscaping at landscaped the County of Sacramento facilities, phased in over the five years following agreement signing.

- B. The County of Sacramento will annually:
  - 1. Directly contact all Irrigation accounts and CII accounts with one acre and larger landscapes, not previously audited, and offer them landscape water-use reviews (audits).
  - 2. Offer, through bill inserts or other means, landscape water-use reviews to all customers.
  - 3. Survey past program participants to determine if audit recommendations were implemented.
  - 4. Offer program participants with separate irrigation meters information showing the relationship between actual consumption and their ET-based water demand.
- C. The County of Sacramento's landscape water-use review program will:
  - 1. Provide audits conducted by certified landscape water auditors.
  - 2. Provide audits that consist of a system review, to identify necessary irrigation system repairs, and, once repairs have been completed, a water-use review including measurement of landscaped area.
  - 3. Provide program participants with seasonal irrigation schedules by hydrozone and/or station.
  - 4. Provide program participants with regular reminders to adjust irrigation timer settings.
  - 5. Provide incentives to achieve at least 12% annual participation of targeted customers.
- D. The County of Sacramento will be fully implementing the program described above no later than the beginning of the fourth year after agreement signing.

**BMP 6 LANDSCAPE WATER CONSERVATION REQUIREMENTS FOR NEW AND EXISTING COMMERCIAL, INDUSTRIAL, INSTITUTIONAL AND MULTI-FAMILY DEVELOPMENTS**

- A. The County of Sacramento will enact and implement a landscape water efficiency ordinance pursuant to the "Water Conservation in Landscaping Act" (California Code of Regulations, Chapter 2.7), that is at least as effective as the Model Water Efficient Landscape Ordinance described in Chapter 2.7, Sections 490-495. The County of Sacramento will:
  - 1. Participate in and support a regional landscape task force established by the Forum Successor Effort. The Taskforce will include other local governments and water purveyors, the building and green industries and environmental / public interest groups. It will review the existing local ordinances to determine if it is at least as effective as the Model Water Efficient Landscape Ordinance. The Taskforce may suggest revisions to the existing landscape ordinances.
  - 2. As part of the Taskforce, participate in a review of the implementation of the local ordinances, including builder compliance, landscape plan review, final inspection/certification process and actual water use to determine their effectiveness.
  - 3. As part of the Taskforce, determine if program effectiveness is diminished by city/county staff time constraints, budget or lack of landscape knowledge/expertise, and, if so, recommend and support corrective action.
- B. The County of Sacramento will be fully implementing the program described above no later than the beginning of the fourth year after agreement signing.

## **BMP 7 PUBLIC INFORMATION**

A. Within three years of agreement signing, the County of Sacramento program will include:

A combination of a County specific program in conjunction with full participation by the County in the Sacramento Area Water Works Association (SAWWA) Conservation Committee's Public Outreach Program or other equivalent regional program. This program includes programs such as: media advertising campaigns, commercial consumer outreach, promotional materials, community events and fairs, evapotranspiration data availability, a Web site, and allied organizations outreach.

B. Elements implemented directly by the County of Sacramento will include:

1. Using utility bill inserts or messages on payment notices.
2. Providing information on residential metered customers' bills showing use in gallons per day for the last billing period compared to the same period the year before.

## **BMP 8 SCHOOL EDUCATION**

A. Within three years of agreement signing, the County of Sacramento program will include:

A combination of a County specific program in conjunction with full participation by the County in the Sacramento Area Water Works Association (SAWWA) Conservation Committee's Public Outreach Program or other equivalent regional program. This program includes programs such as: school outreach, promotional materials, community events and fairs, and a Web site.

B. Elements implemented directly by the County of Sacramento include:

1. Offering tours of County facilities to elementary schools in the County's service area.
2. Working with schools served by the County to promote school audits, reduced water bills, and innovative funding for equipment upgrades.

## **BMP 9 COMMERCIAL AND INDUSTRIAL (CI) WATER CONSERVATION**

A. Within three years of agreement signing, the County of Sacramento will have:

1. Trained commercial/industrial water auditors on staff or available through cooperative agreements.
2. The DWR Commercial / Industrial (CI) water-use materials available for CI customers.
3. Established, if possible, cooperative CI audit programs with other utilities.
4. A list of available CI water-use consultants.

B. The County of Sacramento or their representative will annually:

1. Identify the top 10% of commercial water users and top 10% of industrial water users, not previously audited, and directly contact them or the appropriate customer's representative and offer them water-use reviews (audits). Provide these customers with data on their current water-related costs (supply, wastewater, energy, on-site treatment, etc.).

- a. (For metered customers) annually determine the top 10% of commercial customers and of industrial customers based on water use, and when appropriate, special water-use factors (high water use, high wastewater flows, poor quality wastewater, high-energy use, etc.).
    - b. (For unmetered customers) annually determine the top 10% of commercial customers and of industrial customers based on special water-use factors such as wastewater flows, poor quality wastewater, or high-energy use, etc.
  2. Offer, through bill inserts or other means, CI water-use reviews to all CI customers.
  3. Survey past program participants to determine if audit recommendations were implemented.
- C. The County of Sacramento's water-use review program will:
1. Provide audits conducted by trained commercial/industrial water auditors.
  2. Provide incentives to achieve at least 20% annual participation of the targeted 10% of customers.
  3. Contact past program participants for a follow-up audit at least every fifth year.
- D. The County of Sacramento will establish policies requiring water intensive commercial and industrial building permit applicants (new, modified or change-of-water-use) to conduct a water-use efficiency review and submit the findings in required environmental documentation for the commercial or industrial project.
- E. Within three years of agreement signing, the County of Sacramento will:
1. Promote the use of efficient water-use technologies by commercial and industrial customers by offering incentives related to the benefits gained by the water and sewer service providers.
  2. Consider separate landscape water meter(s) when combined service would require a 1½" meter.
  3. Require efficient cooling systems, recirculating pumps for fountains and ponds, and water recycling systems for vehicle washing as a condition of service.
- F. The County of Sacramento will be fully implementing the program described above no later than the beginning of the fourth year after agreement signing.

## **BMP 11 CONSERVATION PRICING FOR METERED ACCOUNTS**

- A. Within three years of agreement signing, the County of Sacramento will:
  - 1. Identify all metered customers by account type (single family, multi-residential, commercial, industrial, institutional, landscape irrigation, reclaimed, wholesale).
  - 2. Establish quantity-based rates for each account type.
  - 3. Begin educating all customers about the quantity-based rate structure.
  - 4. Provide metered customers with monthly or bi-monthly information which shows current flat-rate charges, actual water use in gallons, and what charges would have been if based on actual use.
- B. The County of Sacramento will, within ten years of agreement signing, bill all metered customers utilizing rates designed to recover the cost of providing service as well as on quantity of water used.

## **BMP 12 LANDSCAPE WATER CONSERVATION FOR NEW/EXISTING SINGLE FAMILY HOMES**

- A. The County of Sacramento will implement a program that includes:
  - 1. Information on climate-appropriate landscape design, plants and efficient irrigation equipment/management provided to change-of-customer accounts and, in cooperation with the Building Industry Association of Superior California, to new customers. The availability of this information will be publicized to all existing Single Family Homes in the County of Sacramento's service area on an annual basis.
  - 2. Landscape audit program offered to all SF and MF accounts that receive a meter or interior audit. and
  - 3. Annual pre-irrigation season notification to Single Family Homes served by the County of Sacramento of the County of Sacramento-provided landscape assistance.
- B. The County of Sacramento's ongoing program, in cooperation with the California Landscape Contractors Association, Sacramento Area Water Works Association, other purveyors, etc., will include:
  - 1. Participation in the development/maintenance of a local demonstration garden within five years following agreement signing (does not have to be located within the County of Sacramento's service area but should be convenient to the County of Sacramento's customers).
  - 2. Annual participation at local and regional landscape fairs and garden shows.
  - 3. Annual cooperative education and marketing campaigns with local nurseries.
  - 4. Annual irrigation season landscape media campaign.
  - 5. Annual post-irrigation season notification, to all customers, of the importance of timer resets/ sprinkler shut-offs.
- C. The County of Sacramento will:
  - 1. Participate in and support a regional landscape task force established by the Forum Successor Effort. The Taskforce will include other local governments and water purveyors, the building and green industries and environmental / public interest groups.

It will review the existing local ordinances to determine if it is at least as effective as the Model Water Efficient Landscape Ordinance. The Taskforce may suggest revisions to the existing landscape ordinances.

2. As part of the Taskforce, participate in a review of the implementation of the local ordinances, including builder compliance, landscape plan review, final inspection/certification process and actual water use to determine their effectiveness.
3. As part of the Taskforce, determine if program effectiveness is diminished by city/county staff time constraints, budget or lack of landscape knowledge/expertise, and, if so, recommend and support corrective action.

D. The County of Sacramento will be fully implementing the program described above no later than the beginning of the fourth year after agreement signing.

### **BMP 13 WATER WASTE PROHIBITION**

Within three years of agreement signing, the County of Sacramento will enact a water waste prohibition ordinance that includes measures and enforcement mechanisms.

- A. The water waste prohibition measures will include:
1. Irrigation water shall not be allowed to run off to adjoining property or to a roadside ditch or gutter.
  2. Leaking pipes, fixtures, or sprinklers shall be repaired promptly.
  3. Open hoses not permitted - automatic shut-off nozzles are required. and
  4. Swimming pools, ponds and fountains shall be equipped with recirculating pumps. Pool draining and refilling only for health, maintenance or structural reasons - requires agency approval.
- B. Other measures, such as the following, may be permanent, seasonal or related to water shortage:
1. Restricting irrigation hours or days.
  2. Use of a hose to clean sidewalks, driveways, patios, streets and commercial parking lots is not permitted, except for health and safety.
  3. Restaurants serving water only on request.
  4. Restricting the use of potable water for compaction, dust control or other construction purposes when non-potable water is available. and
  5. Limiting the flushing of sewers or fire hydrants, except for health and safety (may be permanent, seasonal or related to water shortage).
- C. The waste prohibitions will include as enforcement mechanisms a graduated series of responses to water wasting customers. Enforcement typically includes: personal notification and an offer of a water-use review / repair service, monetary fees, service termination and, in some unmetered service areas, and mandatory water meter installation / reading.



- D. Within three years of agreement signing the County of Sacramento will:
1. Notify all customers at least annually of the waste prohibitions (by newspaper, public notice, mailings, utility billings or a combination of such) prior to the irrigation season.
  2. Have staff will respond to reports of water waste in a timely manner.
  3. Will have water waste patrols at least during water shortages.
  4. Will cooperate with the city or county in their program enforcement efforts.

#### **BMP 14 WATER CONSERVATION COORDINATOR**

The County of Sacramento's water conservation coordinator is XXXXXXXX and she/he is responsible for preparing, implementing and monitoring the Plan.

Within three years of agreement signing, at least one staff member at the County of Sacramento will be an AWWA Certified Water Conservation Practitioner (Level II) or pass equivalent training.

#### **BMP 16 ULTRA-LOW FLUSH TOILET REPLACEMENT PROGRAM FOR NON-RESIDENTIAL CUSTOMERS**

- A. Within three years of agreement signing, the County of Sacramento will:
1. Identify all non-residential customers, estimate the approximate number of non-ULF toilets at each account, and rank them by high, medium or low use (e.g., restaurant toilets are high use, warehouse toilets are low use).
  2. If possible, established a cooperative district / sanitation district ULF rebate program.
- B. The County of Sacramento will annually:
1. Offer, through direct mail or other direct communication, ULF rebates to all non-residential accounts, which do not yet have ULF toilets, with special focus on those with the highest number of high-use non ULF-toilets.
- C. The retrofit program will:
1. Offer the necessary incentive (which may include rebates, no interest loans, vouchers, billing surcharges/rebates, etc.) to insure that at least 10% of non-residential non-ULF toilets are replaced with ULF toilets each year, with a final installation target of 90% of all non-residential toilets being ULFs within ten years.
  2. Consider larger rebates for the more expensive high-use flushometer-type ULF installations.
  3. Investigate opportunities for community based organizations (CBOs) to receive the training and financial incentives necessary for them to implement this BMP for their constituents. and
  4. Consider monitoring the change in water use at metered-accounts that install ULF toilets.
- D. The County of Sacramento will be fully implementing the program described above no later than the beginning of the fourth year after agreement signing.

## **CITIZEN INVOLVEMENT PROGRAM**

County will invite the existing Community Planning Advisory Committees to designate a representative(s) to provide input to the proposed residential metering implementation plan. It is intended that this informal group will serve to provide valuable citizens' input on the overall approach to implementation of residential metering.

## Appendix D

