CLOVEWOOD

Draft Environmental ImpactStatement

Appendix G
Water Supply Report

G-1: Water Supply Report
G-2: Water Distribution System Engineer's Report

Community Planning Consultants
CPC
P.O. Box 2020, Monroe New York 10949
Tel: (845) 774 · 8000 | cpcnynj@gmail.com

CLOVEWOOD

Draft Environmental Impact Statement

G-1
Water Supply Report

Community Planning Consultants
CPC
P.O. Box 2020, Monroe New York 10949
Tel: (845) 774 · 8000 | cpcnynj@gmail.com

WATER-SUPPLY REPORT
CLOVEWOOD WATER SYSTEM
BLAGGS CLOVE
VILLAGE OF SOUTH BLOOMING GROVE
ORANGE COUNTY, NEW YORK

PROJECT NO.: 770113.LAKANN.00
DATE: APRIL 2018 (REVISED JANUARY 2019)

LBG HYDROGEOLOGIC & ENGINEERING SERVICES, P.C.
MEMBER OF WSP
4 RESEARCH DRIVE, SUITE 204
SHELTON, CT 06484

TEL.: +1 (203) 929-8555
WSP.COM

SIGNATURES

PREPARED BY:

Stacy Stieber, CPG, PG(NY)
Lead Hydrogeologist

REVIEWED BY:

Thomas P. Cusack, CPG, PG(NY)
Senior Supervising Hydrogeologist

TABLE OF CONTENTS

Page

TABLES

PAGE

FIGURE (AT END OF REPORT)

APPENDICES (AT END OF REPORT)

1.0 GENERAL DESCRIPTION AND HISTORY OF PROPOSED PROJECT; PROJECT AUTHORIZATION

The Clovewood property is located on Clove Road in the Village of South Blooming Grove, New York (figure 1) between the cross streets of Route 208 to the south and Round Hill Road to the north. The site was formerly occupied by the Lake Anne Golf Course which closed in the 1990s and the Lake Anne Country Club cottage residences, both of which are no longer in use and will be razed as part of the proposed development. A single-family residential home located to the south of the former bungalow colony is currently occupied by the property caretaker. The balance of the site is undeveloped and vacant at this time.

Four wells are present on the project site that are associated with former uses on the property. Wells C-Well 1, C-Well 2, and C-Well 3 were the supply wells for the Lake Anne property and Well C-13 was an irrigation well for the former golf course. Wells C-4 through C-7 were drilled on the project site during a groundwater exploration program completed in 2007 for a prior project.

Wells C-7A, 7B, 8 through 12, and 14 through 23 were drilled as part of the current groundwater exploration program for the Clovewood project after well drilling permits were obtained from the Village of South Blooming Grove. The goal of the groundwater exploration program was to develop sufficient water to supply the proposed 600, 4-bedroom residential units on the project site.

The groundwater exploration program drilling was conducted in stages. Preliminary yield testing on the initial wells drilled demonstrated that several of the wells in the valley setting paralleling Clove Road were high-yielding, but had the potential to cause individual and/or cumulative environmental impacts. Therefore, those wells were removed from consideration as potential supply wells for the project and additional well locations were drilled farther into the project site in the upland setting.

2.0 GENERAL MAPS OF PROJECT

A topographic map showing the Clovewood property boundary and the location of proposed water-supply Wells C-6, C-12, C-14, C-16, C-21 and C-23 are shown on figure 1. The local watershed delineation is also depicted on figure 1. The planned service area for the Clovewood water system corresponds with the project site boundary shown on figure 1.

The wastewater treatment for the project is proposed to be constructed on the Clovewood property and the discharge of waste water will occur on the project site.

3.0 WATER SOURCE CAPACITIES AND SYSTEM DEMAND CALCULATIONS

This section of the Water-Supply Report presents a detailed description of the existing sources of water supply.

3.1 Water Sources and Capacities

A simultaneous 72-hour pumping test was conducted on proposed bedrock water-supply Wells C-6, 12, 14, 16 and 23 from July 10 through July 16, 2017. The wells were pumped concurrently and demonstrated stabilized yields of 45 gpm (gallons per minute), 40.5 gpm, 157 gpm, 50 gpm and 90 gpm, respectively, for a combined total yield of 382.5 gpm or 550,800 gpd (gallons per day). Well C-21 was tested individually as the best well between July 25 and 28, 2017. The well demonstrated a stabilized yield of 163 gpm during its pumping test. A detailed description of the 72-hour pumping test conducted on the proposed supply wells is provided in the report in the Clovewood Draft Environmental Impact Statement (DEIS) Appendix F.

Table 1 - Well Yields for the Proposed Clovewood Supply Wells

Well Number	Source Type	Tested Yield (gpm)
C-6	BW	45
C-12	BW	40.5
C-14	BW	157
C-16	BW	50
C-21	BW	163
C-23	BW	90

gpm gallons per minute
BW Bedrock Well

3.2 Wellhead Protection Radius

The layout of the planned development will provide the necessary wellhead protection radius for proposed supply Wells C-6, C-12, C-14, C-16, C-21 and C-23. The 100-foot radius of ownership and 200-foot radius of sanitary control for all wells are within the boundary of the Clovewood property. Sanitary control minimum separation distance requirements listed in the New York State Department of Health (NYSDOH) Sanitary Code Part 5, Subpart 5-1, Appendix 5-D for public water-supply wells will be followed.

3.3 Description of Groundwater Sources

See Section 3.1 above for a summary of the yield capacity of the proposed supply wells.

Copies of the well logs for Wells C-6, C-12, C-14, C-16, C-21 and C-23 and figures and a Plate depicting the well locations are included in LBGHES' pumping test report in the Clovewood DEIS Appendix F.

Well C-6 was drilled by Northern Drilling, Inc. in May 2007 as part of a prior groundwater investigation program on the project site. The well was constructed with 8-inch diameter casing set to a depth of 61 feet, and the well was drilled to a total depth of 600 feet.

Well C-12 was drilled by Northern Drilling, Inc. in June 2014 as part of the groundwater investigation program conducted for the Clovewood project. The well was constructed with 8-inch diameter casing set to 70 feet, and the well was drilled to a total depth of 580 feet.

Well C-14 was drilled by Northern Drilling, Inc. in July 2015 as part of the groundwater investigation program conducted for the Clovewood project. The well was constructed with 8-inch diameter casing set to 50 feet, and the well was drilled to a total depth of 750 feet.

Well C-16 was drilled by Northern Drilling, Inc. in October 2015 as part of the groundwater investigation program conducted for the Clovewood project. The well was constructed with 8-inch diameter casing set to 50 feet, and the well was drilled to a total depth of 670 feet.

Well C-21 was drilled by Frey Well Drilling in April 2016 as part of the groundwater investigation program conducted for the Clovewood project. The well was constructed with 8-inch diameter casing set to 101 feet, and the well was drilled to a total depth of 1,010 feet.

Well C-23 was drilled by Frey Well Drilling in August 2016 as part of the groundwater investigation program conducted for the Clovewood project. The well was constructed with 8-inch diameter casing set to 101 feet, and the well was drilled to a total depth of 1,000 feet.

A 72-hour pumping test event was completed on the proposed supply wells in July 2017. The test demonstrated a combined yield from Wells C-6, C-12, C-14, C-16 and C-23 of 382.5 gpm or 550,800 gpd. Well C-21 was tested separately from the other wells at a rate of 163 gpm or 234,720 gpd to demonstrate it as the system's best well.

3.4 Water Demands and Withdrawal Rate Calculations

3.4.1 Proposed Instantaneous and Maximum Daily Rates of Withdrawal

The proposed instantaneous withdrawal rate and the calculated maximum daily withdrawal rate for each well and for the combined system are provided in the table below. The instantaneous withdrawal rates for the wells are the respective tested rates demonstrated during the 72-hour pumping tests. The maximum daily withdrawal rates were calculated based on the wells pumping at the instantaneous withdrawal rate continuously throughout one day.

Table 2 – Instantaneous and Maximum Daily Withdrawal Rate

Well Number	Instantaneous Withdrawal Rate (gpm)	Maximum Daily Withdrawal Rate (gpd)
C-6	45	64,800
C-12	40.5	58,320
C-14	157	226,080
C-16	50	72,000
C-21	163	234,720
C-23	90	129,600
Clovewood Water System Combined Yield	382.5	550,800

gpm gallons per minute
gpd gallons per day

The 72-hour pumping test program conducted on the wells in July 2017 demonstrated that the wells can meet the instantaneous and maximum daily rates.

3.4.2 Average and Daily Maximum Demand

An average daily water demand for the Clovewood project has been calculated based on the March 2014 New York State Design Standards for Intermediate Sized Wastewater Treatment Systems water usage rate of 110 gpd/bedroom. For the planned 600, 4-bedroom residential units the average daily demand is 264,000 gpd or 183.3 gpm. The maximum daily demand has been calculated based on the NYSDOH requirement that a new water system demonstrate twice the average water demand. Therefore, the system's calculated maximum daily demand is 528,000 gpd or 366.7 gpm.

The applicant may also consider the inclusion of swimming pools/bath houses in the proposed development. The water usage rate for a swimming pool/bath house has been calculated based on 10 gpd per swimmer with an allowed 20% reduction for the use of water saving fixtures. Assuming 2 swimmers per residential unit, the additional water demand for the swimming pool/bath house would be 9,600 gpd or 6.7 gpm. Adding the pool demand to the water demand for the proposed 600 units results in a combined average water demand of 273,600 gpd or 190 gpm and a maximum daily demand of 547,200 gpd or 380 gpm.

4.0 EVALUATION OF ALTERNATIVES AND PROJECT JUSTIFICATION

4.1 Evaluated Alternatives

Alternate water sources that were considered to supply the planned Clovewood development were connection to the existing Village of South Blooming Grove public water supply or connection to the existing Village of Kiryas Joel public water supply. An evaluation of these alternatives indicated that neither existing system had sufficient surplus capacity to supply the Clovewood project.

4.2 Water Conservation and Efficiency Measurements

Water saving fixtures will be utilized in all residential units for efficiency and to reduce water usage. In addition, the planned layout for the project is a cluster development with limited outdoor space for each residential property. A planned 80% of the property is to remain open space. This planned layout will conserve water by reducing the outdoor water usage within the development and reduces impervious surface area compared to a conventional subdivision layout thereby allowing for increased groundwater recharge.

4.3 Water Withdrawal Quantity is Reasonable for the Proposed Use

The requested permitted rates for Wells C-6, C-12, C-14, C-16, C-21 and C-23 of 45 gpm, 40.5 gpm, 157 gpm, 50 gpm, 163 gpm, and 90 gpm, as well as the combined permitted withdrawal from the wells of 550,800 gpd is reasonable to meet the Clovewood project's calculated maximum daily demand per the NYSDOH requirement of developing a water system that can produce twice the average water demand of a new development with the best well out of service.

As described above, the calculated maximum daily demand of the 600, 4-bedroom residential units is 528,000 gpd. Should the addition of swimming pools/bath houses occur, the calculated maximum daily demand would be 547,200 gpd. The requested permitted rates will provide sufficient water to meet these demand requirements.

4.4 Proposed Conservation Measures are Environmentally Sound and Economically Feasible

The cluster type residential development, which promotes conservation by limiting the need for outdoor water use, is more economically feasible than the conventional residential development that have large lot sizes. The planned stormwater management and green infrastructure that will be included as part of the cluster development are also environmentally sound and economically feasible

4.5 Proposed Water Supply is Adequate

The 72-hour pumping test program completed on the wells in July 2017 demonstrated a combined yield from Wells C-6, C-12, C-14, C-16 and C-23 of 382.5 gpm or 550,800 gpd. Well C-21 was tested separately from the other wells at a rate of 163 gpm or 234,720 gpd to demonstrate it as the system's best well in accordance with NYSDOH requirements. The tested yields demonstrated that the wells are adequate to meet the proposed average and maximum day water demand requirements of the Clovewood project.

4.6 Project is Just and Equitable to Other Municipalities

The proposed bedrock water-supply wells for the Clovewood project are all located within the Clovewood site property boundaries.

During the July 2017 72-hour pumping test event, an offsite well monitoring program was conducted to assess potential pumping-related effects to nearby wells, including individual residential wells and municipal public

water-supply wells. The locations of the 16 offsite wells measured during the pumping test program are provide on figures in the pumping test report included in the Clovewood DEIS Appendix F.

No discernible pumping-related impacts were measured in any of the offsite wells monitored that were attributed to pumping wells C-6, C-12, C-14, C-16, C-21 or C-23 during the pumping test. This data indicates that pumping the proposed Clovewood wells should have no discernible effect on other nearby municipalities.

4.7 Individual or Cumulative Adverse Environmental Impacts

An extensive water-level data collection program was conducted to assess potential pumping-related drawdown in the bedrock aquifer and surface-water features during the July 2017 pumping test event. Water-level data was collected from 24 onsite bedrock wells, 16 offsite wells, 1 offsite spring, and 7 onsite piezometer locations. In addition to the water-level data, stream flow measurements were collected from nine gaging locations during the test period.

The water-level data collected from the onsite and offsite wells demonstrated that all pumping-related water-level drawdown effects that were attributed to pumping of Wells C-6, C-12, C-14, C-16, C-21 and C-23 were limited to the onsite bedrock monitoring wells on the Clovewood property. No discernible water-level drawdown that was attributed to the pumping of wells C-6, C-12, C-14, C-16, C-21 and C-23 was measured in the offsite wells monitored.

Water-level data was collected from eight piezometer locations that were set in surface-water features near the onsite wells where groundwater withdrawals occurred. The locations for the onsite piezometers are shown on the Plate in the pumping test report in the Clovewood DEIS Appendix F. The water-level data collected from seven of the piezometers (PZ-1, PZ-5, PZ-6, PZ-9, PZ-16, PZ-Pond and PZ-22) showed no discernible pumping-related water-level drawdown in the groundwater and/or surface water during the pumping test event. There was no discernible effect on the surface-water level at the last piezometer location, PZ-8. However, a change in the groundwater level was observed during the pumping test which was unclear whether the change was related to the pumping event or a naturally occurring condition.

Stream-flow measurements were also collected from nine gaging locations during the pumping test period. The stream-flow data showed variation as a result of precipitation received during the background, testing and recovery periods, but no discernible change in flow was measured that was attributed to pumping in the onsite wells.

Groundwater recharge to the bedrock aquifer for the study property was calculated using a recharge rate for metasedimentary bedrock of 625 gpd/acre and a local recharge area to the bedrock aquifer of about 1,177 acres. The recharge contribution area is provided on a figure in the pumping test report in the Clovewood DEIS Appendix F. Using these values, the recharge to bedrock under normal precipitation conditions was calculated to be approximately 735,600 gpd. Under one-year-in-30 drought conditions, the estimated average recharge rate would decrease approximately 31% to approximately 507,600 gpd or 352.5 gpm. Both the normal and drought recharge rates exceed the average water demand of the proposed 600, four-bedroom units of 264,000 gpd. The recharge rates also exceed the average water demand of 273,600 gpd with the potential inclusion of swimming pools/bath houses within the development.

Based on the above information, no individual or cumulative adverse environmental impacts are anticipated from the use of the proposed Clovewood water-supply wells.

5.0 WATER CONSERVATION

The completed and signed Water Conservation Form the was included in the New York State Department of Environmental Conservation (NYSDEC) Water Withdrawal Permit application for the Clovewood project is included in Appendix I.

The Clovewood project plans to meter all sources of supply to document the water system's groundwater withdrawal quantities. All customer connections will also be metered to track water consumption within the system. In accordance with NYSDEC guidelines, annual water audits will be conducted to track potential water loss in the system and leak detection will be implemented to address water losses should they occur.

The development will be new construction; therefore, water-saving fixtures are planned for use in the onsite construction.

6.0 WATER SYSTEM APPROVALS

6.1 Water Analysis Results and Project Plans

Water analysis results and engineering plans for treatment and water-supply system design for the proposed supply wells and water system will be submitted to the Orange County Department of Health (OCDH) for approval.

6.2 Groundwater Withdrawal

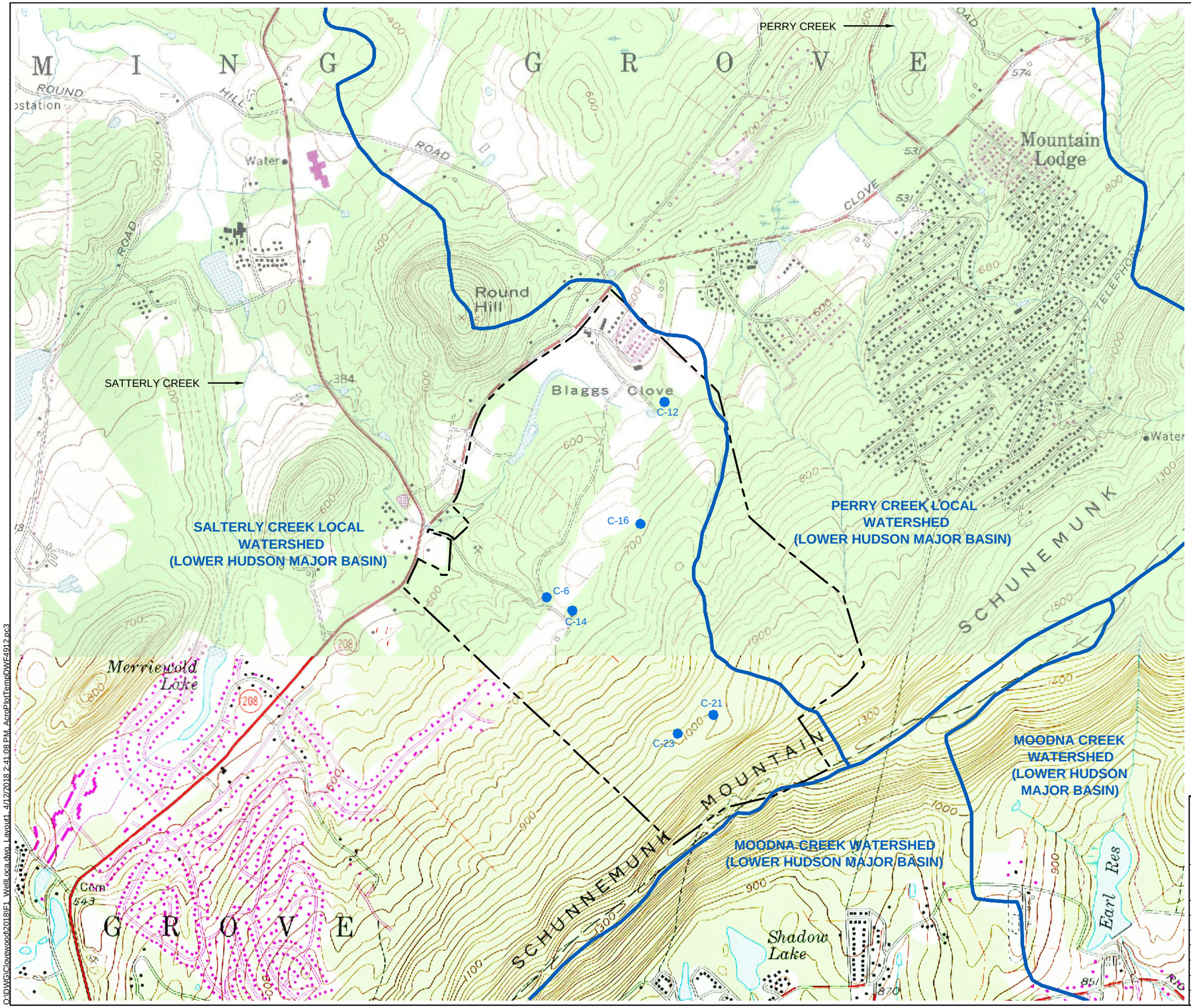
A Water Withdrawal Permit application has been submitted to the NYSDEC requesting approval for withdrawal of a combined 550,800 gpd from wells C-6, C-12, C-14, C-16, C-21 and C-23 at pumping rates of 45 gpm, 40.5 gpm, 157 gpm, 50 gpm, 163 gpm and 90 gpm, respectively.

6.3 Transportation Corporation

A proposed Certificate of Incorporation for the Clovewood Transportation Corporation, pursuant to Section 3 and Article 10 of the Transportation Corporation Law of the State of New York, was submitted to the Village of South Blooming Grove on April 17, 2018. A copy of the submission is included in Appendix II.

cmm
January 30, 2019
H:\Lake Anne\Clovewood\2019\Water-Supply Rpt\Report for DEIS_revised Jan 2019.docx

FIGURE



LEGEND

- PROPERTY BOUNDARY/FUTURE SERVICE AREA
- PROPOSED WATER-SUPPLY WELL LOCATION
- LOCAL WATERSHED BOUNDARY

SOURCE:
USGS TOPOGRAPHIC QUADRANGLES MAYBROOK (1957) AND MONROE (PHOTOREVISED 1984) NEW YORK.

0 1500
SCALE IN FEET

CLOVEWOOD PROPERTY
VILLAGE OF SOUTH BLOOMING GROVE
BLAGGS CLOVE, NEW YORK

SITE LOCATION AND WATERSHED MAP

DATE	REVISED

PREPARED BY
LBG HYDROGEOLOGIC & ENGINEERING SERVICES, P.C.
Professional Geologists & Environmental Engineers
Member of WSP
4 Research Drive
Suite 204
Shelton, Connecticut 06484
(203) 929-8555

DRAWN:	RAC	CHECKED:	SS	DATE:	04/12/18	FIGURE:	1

O:\DWG\Clovewood\2018\F1_WellLoca.dwg, Layout1, 4/12/2018 2:41:08 PM, AcroPlotTempDWF4912.pc3

APPENDIX I

DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Clear Form

WATER CONSERVATION PROGRAM FORM

For Public Water Supplies

Print Form

TO BE COMPLETED AND SUBMITTED AS PART OF A NYSDEC WATER WITHDRAWAL PERMIT APPLICATION
- SEE PAGE 6 FOR FURTHER INTRODUCTION AND INSTRUCTION REGARDING THIS FORM -

If your water system already has its own written water conservation program, please feel free to submit it as a supplement to this WCPF.If your system is new, please indicate the water conservation measures that will be taken when the system is completed (e.g., all sources of supply and customers will be 100% metered.

I. GENERAL SYSTEM INFORMATION

Name of Applicant: Keen Equities, LLC		DEC No. Dept Use Only
Street Address: 505 Clove Road		WWA No. Dept Use Only
Post Office: South Blooming Grove	**County:** Orange	**State & ZIP:** NY 10914
Name & Title of Contact: Yehoshua (YC) Rubin, Managing Member		
Street Address: 4922 11th Avenue		
Post Office: Brooklyn	**State & ZIP:** NY 11219	
Applicant Telephone: (949) 769-9478	**Contact Telephone:** (949) 769-9478	

II. SOURCES OF WATER SUPPLY

Please give amounts in gallons per minute (**gpm**), per day (**gpd**) or million gallons per day (**mgd**).

Source Type: **S** = Surface supply, **G** = Ground supply, **P** = Purchased supply
Source Status: **R** = Regular use, **S** = Standby use, **E** = Emergency use

Name of Source	Source Type	Source Status	Tested Capacity	Actual Current Withdrawal	Start-up Year
C-6	G	R	45 gpm	N/A	TBD
C-12	G	R	40.5 gpm	N/A	TBD
C-14	G	R	157 gpm	N/A	TBD
C-16	G	R	50 gpm	N/A	TBD
C-21	G	R	163 gpm	N/A	TBD
C-23	G	R	90 gpm	N/A	TBD

Name of Applicant: Keen Equities, LLC	WWA No. For Dept Use

III. WATER USAGE AND METERING

The water production data requested in this section should be available from the monthly "Water System Operation Reports" required by the State or Local Department of Health.

For unmetered systems, please provide your best estimates for water production and/or consumption.

Are all sources of supply (including major interconnections) equipped with master meters?			
What percentage of your system is metered? %		How often are they read?	
Number of service connections?		Total population served?	
How many meters are recalibrated and/or replaced each year?			
Water Production for calendar year		**Water Consumption for calendar year**	
Total metered water production :	System not yet in service.	Total metered water consumption:	
Average day production (total/365):		Average day consumption (total/365):	
Peak day production (largest single day):		Per capita usage per day (avg. day/pop. served):	(gpcd)

What are your future goals and schedule for water system metering? All sources of supply and customers will be 100% metered and meters will be read regularly.

Recommendations:

* 100% metering of all water system connections, including public buildings.

* Master meters should be tested and calibrated annually.

* Customer meters should be recalibrated or replaced at least once every 15 years or in accordance with an optimum meter replacement schedule developed using the American Water Works Association (AWWA) Manual M6.

* Quarterly meter reading and prompt billing with rates that reflect amount of water used.

Name of Applicant: Keen Equities, LLC	WWA No. For Dept Use

IV. WATER SUPPLY AUDIT

Do you conduct a system water audit at least once each year? N/A.
If yes, please submit a copy of your latest audit in addition to completing the following section.

** Water Supply Audit for Calendar Year System not in operation.

Total metered water production (from previous section)		Total		% of Total
Total metered water consumed (from previous section)		subtract		
Authorized unmetered usage		subtract		
e.g. Unmetered public bldgs. Firefighting & training Main flushing Street cleaning		subtract		
		subtract		
		subtract		
Water lost to leaks that have since been repaired		subtract		
TOTAL UNACCOUNTED-FOR WATER		Sub-total		
Unaccounted-for water breakdown	Meter under-registration	subtract		
	Unrepaired leakage	subtract		
	Other:	subtract		
** Water measurement and accounting techniques are available in NYSDEC's January 1989, (re-printed February 1998) Water Conservation Manual.			0	

What are your future goals for water system auditing? Future goals for water system auditing are to conduct annual water audits and keep accurate water records.

Recommendations:

* At least once each year, a system water audit should be conducted using metered water production and consumption data to determine unaccounted-for water.

* Quantify all authorized water uses by consumption categories (e.g. residential, industrial, municipal etc.).

* Keep accurate estimates of authorized unmetered water use (e.g. firefighting, main flushing, etc.).

Name of Applicant: . Keen Equities, LLC	WWA No. For Dept Use

V. LEAK DETECTION AND REPAIR

Not in service, not constructed to date.

Do you regularly survey your system for leaks with listening equipment? ☐

Total miles of distribution pipe	Percent of system surveyed each year	Miles of pipe surveyed each year	Listening equipment used	Year of last survey	Number of leaks found	Number of leaks repaired

Do you have a regular water system rehabilitation program? _____.
If yes, give details: _____

What are your future goals for water system leak detection and repair? The water system will be checked for leaks. Leaks will be repaired as soon as possible.

Recommendations:

* Check at least one third of your water distribution system for leaks each year.

* Fix every detectable leak as soon as possible.

* Have an on-going system rehabilitation program.

Name of Applicant: Keen Equities, LLC	WWA No. For Dept Use

VI. WATER USE REDUCTION

Have you distributed information to residential customers on household water saving devices and ways to reduce water use? N/A - system not yet in operation. Water saving devices will be incorporated in planned residential construction.

Have you distributed water conservation information to industrial and commercial customers that promotes recycling and reuse? N/A - system not yet in operation. No planned industrial or commercial uses.

Do you have a program to retrofit public buildings with water savings fixtures and encourage the private sector to do the same? N/A - system not yet in operation. No buildings in need of retrofitting.

Do you have lawn sprinkling time restrictions during the summer or periods of peak demand?____.
If yes, please describe: Lawn sprinkling time restrictions during summer or periods of peak demand will be considered as a means of water conservation once the system is placed into service.

Do you have a plan that takes progressive steps to further reduce outdoor water use during drought conditions with a procedure to assure compliance? ____. If yes, please describe:
The planned development is a cluster subdivision with a large portion of the site remaining as open space. Outdoor water use will likely be low.

What are your future goals for reducing water usage? Conservation through education and awareness programs.

Recommendations:

* Carry out a public information program that promotes water conservation practices by all categories of water users (e.g. residential, commercial, industrial, etc.).

* Retrofit public buildings with water saving fixtures and encourage the private sector to do the same.

* Use lawn sprinkling time restrictions (e.g. Odd/even days, morning and evening hours) during the summer and outdoor water use bans during times of drought.

* Adopt a procedure to be followed in times of drought that calls for a progression of restrictions on water use specifying: who will reduce, how, and by how much, along with actions to be taken to assure compliance.

Name of Applicant Keen Equities, LLC	WWA No. For Dept Use

VII. CERTIFICATION OF WATER CONSERVATION PROGRAM:

To be signed by the owner or official of the municipality or corporation operating this water system.

I hereby affirm that the information provided on this form is true to the best of my knowledge and belief. False statements made herein are punishable as a Class A misdemeanor pursuant to Section 210.45 of the Penal Law.

Date: 4/17/18 Signature: [signature] Title: Managing Member

DISCUSSION:

Effective January 1, 1989, New York State Environmental Conservation Law (ECL 15-1501) has required that all new applications for a NYSDEC Public Water Supply Permit include a water conservation program. This Water Conservation Program Form (WCPF) is intended to be a guide in completing this requirement.

The WCPF has been set up to cover the following basic elements of a water conservation program: Source Water Inventory, Water Usage and Metering, Water Supply Auditing, Leak Detection/Repair and Water Use Reduction. The recommended actions listed at the bottom of each page represent DEC water conservation policy objectives and should be factored into your program development. Additional water conservation measures such as increasing block water rate structuring, non-residential water use reduction or water efficient landscaping may also play an important role in your system's program and should certainly be considered when applicable.

Water supply permit applicants can consult the NYSDEC publication entitled, "Water Conservation Manual For Development of a Water Conservation Plan", January, 1989 (Re-printed February 1998) for details regarding the development of these water conservation practices. A PDF version of this manual is available on our website at: http://www.dec.ny.gov/docs/permits_ejoperations_pdf/program.pdf Copies can also be obtained through your DEC Regional Offices.

The American Water Works Associat ion (AWWA) is also an excellent source of information regarding water conservation and public water supply systems in general. Information ranging from technical manuals to public education bill stuffers are available from AWWA at reasonable cost by calling 1-800-926-7337.

As a final note, the former "Bureau of Water Resources" has been incorporated into the "Bureau of Water Resource Management" and can now be contacted at (518) 402-8099.

APPENDIX II

CERTIFICATE OF INCORPORATION
OF
KEEN TRANSPORTATION CORPORATION

A WATER-WORKS CORPORATION

PURSUANT TO ARTICLE 1, SECTION 3 AND
ARTICLE 4 OF THE TRANSPORTATION
CORPORATIONS LAW OF THE STATE OF NEW YORK

I, the undersigned, for the purpose of forming a water- works corporation pursuant to Article 1, Section 3 and Article 4 of the Transportation Corporations Law of the State of New York, hereby certify:

FIRST: The name of the proposed corporation is:

KEEN TRANSPORTATION CORPORATION

SECOND: The purposes for which the within water-works corporation is formed are to provide for the water supply and/or distribution system and appurtenances thereto associated with the Clovewood residential development of 600 lots, located on property within the Village of South Blooming Grove, Town of Blooming Grove, County of Orange and State of New York, and in connection with said development to lay, maintain, repair and operate such facilities in any street, highway or public place of any city, town, village or other municipal area, in which it has obtained the consent required by Article 4, Section 41 of the Transportation Corporations Law and to perform all other permitted activities under Article 1, Section 3 and Article 4 of the Transportation Corporations Law.

THIRD: The aggregate number of shares which the Corporation shall have the authority to issue is 200 shares of no par value stock.

FOURTH: The office of the Corporation is to be located in Orange County.

FIFTH: The Secretary of State is designated as agent of the Corporation upon whom process against it may be served. The post office address to which the Secretary of State shall mail a copy of any process against the Corporation served upon him is: Keen Equities LLC, % Yehousha Rubin 4922 11th Avenue, Brooklyn, NY 11219.

SIXTH: The undersigned incorporator is of the age of twenty-one years or over:

YEHOUSHA RUBIN

SEVENTH: This Corporation shall be empowered to engage in any similar lawful business or enterprise which is or might be incidental to, and in any manner connected with its primary purposes.

EIGHTH: The area to be supplied with water by the Corporation is the Clovewood residential development, located solely in the Village of South Blooming Grove, Town of Blooming Grove, County of Orange, State of New York and the Consent of the Village Board of the Village of South Blooming Grove, as required by Section 41 of the Transportation Corporations Law, has been obtained and is annexed hereto.

NINTH: No holder of any of the shares of any class of the Corporation shall be entitled as of right to subscribe for, purchase, or otherwise acquire any shares of any class of the Corporation which the Corporation proposes to issue, or any rights or options which the Corporation proposes to grant for the purchase of shares of any class of the Corporation or for the purchase of any shares, bonds, securities, or obligations of the Corporation which are convertible into or exchangeable for, or which carry any rights to subscribe for, purchase or otherwise acquire shares of any class of the Corporation; and any and all of such shares, bonds, securities or obligations of the Corporation, whether now or hereafter authorized or created, may be issued, or may be reissued or transferred if the same have been reacquired and have treasury status, and any and all of such rights and options may be granted by the Board of Directors to such persons, firms, corporations and associations, and for such lawful consideration and on such terms, as the Board of Directors in its discretion may determine, without first offering the same, or any thereof, to any said holder. Without limiting the generality of the foregoing stated denial of any and all preemptive rights, no holder of shares of any class of the Corporation shall have any preemptive rights in respect of the matters, proceedings, or transaction specified in Article 6, Section 622, paragraph (e), subparagraphs (1) to (6) inclusive of the Business Corporation Law.

TENTH: Except as may otherwise be specifically provided in this Certificate of Incorporation, no provision of this Certificate of Incorporation is intended by the Corporation to be construed as limiting, prohibiting, denying, or abrogating any of the general or specific powers or rights conferred under the Transportation Corporations Law or, by virtue of Article 1, Section 3 and Article 4 thereof, the Business Corporation Law upon the Corporation, upon its shareholders, bondholders, and security holders, and upon its directors, officers and other corporate personnel including, in particular, the power of the Corporation to furnish indemnification to directors and officers in the capacities defined and prescribed by the Business Corporation Law, and the defined and prescribed rights of said persons to indemnification as the same are conferred by the Business Corporation Law.

ELEVENTH: Annexed hereto is a certificate, duly executed on behalf of the local governing body of the Village of South Blooming Grove, the Incorporated Village in which all of the water-works system provided by this Corporation is situated, consenting to the formation of this Corporation.

IN WITNESS WHEREOF, this Certificate has been signed this 18th day of May, 2018.

Yehoshua Rubin

State of New York, County of KINGS ss.:

On the of May 18 in the year 2018 before me, the undersigned personally appeared YEHOSHUA RUBIN, personally known to me or proved to me on the basis of satisfactory evidence to be the individual whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his capacity, and that by his signature on the instrument the individual, or the person upon whose behalf the individual acted, executed the instrument.

Notary Public

YENTY RUBIN
Notary Public State of New York
No. 01RU6080784
Qualified in Kings County
Commission Expires September, 23, 2020

CERTIFICATE OF CONSENT
TO FORMATION OF THE
KEEN TRANSPORTATION CORPORATION

I, JAMES LOFRANCO, Mayor of the Village of South Blooming Grove, pursuant to Resolution of the Village Board of Village of South Blooming Grove adopted on _____ _____,_, hereby certifies that the Village Board of the Village of South Blooming Grove has consented to the formation of the KEEN TRANSPORTATION CORPORATION, a water- works corporation under the provisions of Article 1, Section 3 and Article 4 of the Transportation Corporations Law of the State of New York for the purpose of servicing the Village of South Blooming Grove with a water system effective at such time as the New York State Department of Environmental Conservation issues the requisite permit and approves the maps and certifications of the proposed water system or issues notice of its intent to grant such approval, and consent to the filing of the annexed Certificate of Incorporation of the Keen Transportation Corporation.

James LoFranco, Mayor
Village of South Blooming Grove

State of New York, County of Orange ss.:

On the _____ of _____ in the year 2018 before me, the undersigned personally appeared JAMES LOFRANCO personally known to me or proved to me on the basis of satisfactory evidence to be the individual whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his capacity, and that by his signature on the instrument the individual, or the person upon whose behalf the individual acted, executed the instrument.

Notary Public

VILLAGE OF SOUTH BLOOMING GROVE
MAY 23 2018
RECEIVED

CLOVEWOOD

Draft Environmental Impact Statement

G-2
Water Distribution System Engineer's Report

Community Planning Consultants
CPC
P.O. Box 2020, Monroe New York 10949
Tel: (845) 774 · 8000 | cpcnynj@gmail.com

Water Distribution System

Engineer's Report

CLOVEWOOD SUBDIVISION

Village of South Blooming Grove
Orange County, NY

Prepared March 2019

Kirk Rother, PE, PLLC
5 Saint Stephens Lane
Warwick, NY 10990

Summary

This Engineer's Report is prepared to analyze the proposed water distribution system serving Clovewood. Clovewood is a proposed development comprised of 600 single family residential lots with associated accessory uses and is situated on approximately 708 acres of land within the Village of South Blooming Grove in Orange County, NY. Domestic and fire water supply will be accomplished through the development of a new central water system. Water supply will be via six on-site bedrock wells which have been drilled and tested and deemed to be capable of meeting the calculated water demand. Water from the supply wells will be distributed to the development through a system of water mains and service connections. The distribution system has been designed in accordance with the *Recommended Standards for Water Works* and NYS Department of Health. Fire suppression will be accomplished by a system of fire hydrants capable of providing the needed fire flow established by the Insurance Services Office *Guide for the Determination of Needed Fire Flow*.

Table of Contents

List of Appendices

List of Tables

Section 1 – Project Description

Clovewood is proposed residential development comprised of 600 single family dwelling units situated on approximately 708 acres of land lying on the east side of NYS Route 208 and County Route 27 (a.k.a. Clove Road) within the Village of South Blooming Grove. The property is bounded on the north by the Village of South Blooming Grove – Town of Blooming Grove municipal boundary, on the east by the ridgeline of Schunnemunk Mountain, on the south primarily by vacant land and on the west by NYS Route 208 and Clove Road. The site is identified as Tax Lot Section 208 Block 1 Lot 2 and Lot 3 on current Village of South Blooming Grove tax maps and lies entirely within the Village's RC-1 and RR Zoning Districts.

The property is currently improved by the remains of a former county club and golf course known as the Lake Ann Country Club. The remains of the county club are concentrated in the north western extremities of the site leaving the majority parcel as vacant woodland. Terrain on the site slopes from its highest elevations at the ridge of Schunnemunk Mountain on the east downward toward the lowest elevations of the site in the southwest. Topography varies from relatively flat in the central western portions the site, adjacent to Clove Road, too steeply sloping in the easternmost extremities of the site comprising the ridgeline of Schunnemunk Mountain. The highest elevations on the ridge are found to be approximately 1,370 feet above sea level with the lowest elevation of the site, lying in the southwesterly corner of the property, having an elevation of approximately 480 feet above sea level. The resultant elevation change is found to be approximately 890 feet.

Planned improvements include demolition of the remains of the Lake Ann Country Club and the construction of 600 residential structures with associated roadways and parking areas. Four community center facilities are also proposed with associated parking, playground and swimming facilities. Other planned improvements include features such as sidewalks, playground areas, park and ride facilities, water and sewer utilities, telephone, electric and gas utilities, site lighting and landscaping. Approximately 80% of the site is slated to remain as open space.

Water and sewer will be accomplished by new central facilities. Central sewer will consist of a gravity sewer collection system, a sewer pump station and new sewage treatment plant. Domestic and fire water supply will be by means of six on-site wells, a water storage tank and a system water distribution piping with associated appurtenances.

Section 2 – Water Supply

Water for the Clovewood development will be provided by on-site groundwater wells drilled into bedrock. A groundwater exploration program was conducted by drilling of multiple bedrock wells. After a preliminary analysis of the viability of the water supply, six wells were chosen for further source development. The wells are identified as C-6, C-12, C-14, C-16, C-21 and C-23. A simultaneous 72-hour pumping test was conducted by the project hydro-geologist on water-supply Wells C-6, C-12, C-14, C-16 and C-23 from July 10, 2017 through July 16, 2017. The wells were pumped concurrently and demonstrated stabilized yields of 45 gpm (gallons per minute), 40.5 gpm, 157 gpm, 50 gpm and 90 gpm, respectively, for a combined total yield of 382.5 gpm or 550,800 gpd (gallons per day).

Well C-21 was tested individually as the best well between July 25 and 28, 2017. That well demonstrated a stabilized yield of 163 gpm during its pumping test. A separate Engineer's Report detailing the well development program and corresponding test results has been prepared by the project hydrogeologist for submittal to the NYSDEC as a part of the Water Withdrawal Permit Application. A copy of that report can be found in the Clovewood Environmental Impact Statement. A table summarizing the well yields as taken from the Water Withdrawal Report follows:

Table 1 – Instantaneous and Maximum Daily Well Yields

Well Number	Instantaneous Withdrawal Rate (gpm)	Maximum Daily Yield (gpd)
C-6	45	64,800
C-12	40.5	58,320
C-14	157	226,080

Well Number	Instantaneous Withdrawal Rate (gpm)	Maximum Daily Yield (gpd)
C-16	50	72,000
C-21	163*	234,720*
C-23	90	129,600
Total	**382.5***	**550,800***

* Totals calculated with best well out of service.

Section 3 – Water System Demands

Average daily water demand for the Clovewood project has been calculated based on hydraulic loading set forth in the *New York State Design Standards for Intermediate Sized Wastewater Treatment Systems, March 2014 Revision.* The sewage discharge rate, and therefore the anticipated water consumption rate, found in the in the standard is 110 gpd/bedroom. For the planned 600, 4-bedroom residential units within the Clovewood project the average daily demand is therefore computed to be 264,000 gpd, or 183.3 gpm, or 0.31 gpm per dwelling.

The maximum daily demand is calculated based on the New York State Department of Health requirement that a new water system demonstrate twice the average water demand. The maximum daily demand is therefore calculated to be 528,000 gpd or 366.7 gpm or 0.62 gpm per dwelling.

Peak hourly demand is conservatively taken to be five times the average daily demand which equates to 916.5 gpm or 3.1 gpm per dwelling.

The project also plans to include swimming pools and bath houses within the four community centers proposed within the development. The water usage for a swimming pool with bath house has been calculated based on 10 gpd per swimmer with an allowed 20% reduction for the use of water saving fixtures. Assuming 2 swimmers per residential unit, the additional water demand for the swimming pool with bath house is computed to be 9,600 gpd or an additional 6.7 gpm. Adding this additional demand to

the domestic water demand results in a combined average water demand of 273,600 gpd or 190 gpm and a maximum daily demand of 547,200 gpd or 380 gpm.

Pursuant to the Insurance Services Office *Guide to Determining Needed Fire Flow*, two story dwellings spaced between 11 feet to 30 feet apart have a minimum needed fire flow of 1,000 gallons per minute for a minimum duration of two hours.

Section 4 – Storage

Water storage is provided to accommodate peak domestic demand in morning and evening hours as well as to provide the needed fire flow. One water storage tank is proposed. In accordance with the *Recommended Standards for Water Works* the minimum storage volume should equal to the average daily demand with the maximum operating range within the storage tank not exceeding 30 feet.

Considering the tanks placement within the Village's Ridgeline Overlay District a low, wide tank was chosen for the application. A single 48-foot diameter tank operating with a range of 22 feet was chosen. The tank will provide approximately 297,780 gallons of storage. Water level within the tank will control the operation of the well pumps. Well pumps will feed directly into the distribution system and, during periods of low demand, will replenish water storage levels within the tank.

Section 5 – Distribution System

5.1 Pipe

Water main distribution piping will be PVC pipe meeting AWWA C-900 standards. The total length of water distribution piping is computed to be approximately 29,600 linear feet. Water distribution piping is proposed to be 10-inch diameter having a pressure class of 200 psi. Lateral connections to fire hydrants will be a minimum of 6-inch diameter.

5.2 Hydrants

58 fire hydrants are provided for fire suppression. Hydrants are generally located at or near all street intersections and at intervals of not greater than 600 feet. Consideration for hydrant placement is also based on the vertical alignment of the water distribution mains to allow for air relief and flushing. Hydrants are designed to provided a minimum needed fire flow of 1,000 gpm.

5.3 Valves

Valves will be placed at all tee's in the water mains and at interval spacing not to exceed 800 linear feet. Each fire hydrant will also be fitted with a valve. Curb stops will be provided for each service connection. Given the elevation differential within the site and its corresponding effect on system pressure, five pressure reducing vales will be installed. Four of the valves are generally located along Road A at the intersections with Road C, Road F, and Road I and within northerly portion of Road A itself. Due to the continued elevation drop within Road C, a second pressure reducing valve is located in westerly portion of Road C at its intersection with Road B. Modulated pressures for the five reducing vales are to be set be either 40 or 50 psi depending on the circumstances. Although the system of water mains are largely interconnected, some of the gate valves will need to remain closed during normal system operation to prevent back feeding of higher, upstream system pressure into reduced pressure zones.

Section 6 – Pressure

The water distribution network has been designed to provided the average daily demand, maximum daily demand and peak hourly demand while providing a minimum system wide pressure of 35 psi and a maximum system wide pressure of 100 psi. The system is designed to provide the needed fire flow of 1,000 gpm for a period of two hours while providing a minimum system wide pressure of 20 psi.

An analysis of the water distribution network was performed using WaterCAD computer modeling software.

The placement of the lots, roadways, water mains, hydrants and water storage tank, with corresponding elevations, was imported into WaterCAD from the subdivision design drawings. Each lot was assigned a continuous base demand of 440 gpd, or 0.31 gpm and the four community facilities with swimming pools were assigned a base demand of 2,400 gpd each, or 1.67 gpm. This demand scenario was established as the base Average Daily Demand. A Maximum Daily Demand scenario was then created by doubling the unit loads at each lot and the community centers. Lastly, a Peak Hourly Demand scenario was created by increasing the average base demand by a multiple of 5.

A storage tank was established with a ground elevation of 880 feet. The minimum operating elevation was set at 885 feet with the tank full operating level set 22 feet higher at 907 feet. The tank was assigned a diameter of 48 feet which provides approximately 0.30 million gallons storage.

Junctions were created at all watermain intersections and at certain high points and bends in the system. A water load was built in which WaterCAD assigned the aforedescribed demands from each of the respective lots and community centers to the nearest adjacent water main pipe via the assignment of water service taps.

With the system model constructed and the various demand scenarios identified, a system analysis was computed. Areas in which pressures exceeding 100 psi in the base Average Daily Demand were identified and pressure reducing valves were placed accordinaly. Multiple revisions to the system were made until satisfactory system pressures were realized in the base scenario. A check of system pressure during fire flow conditions was then performed by modeling four different fire hydrants under a 1,000 gpm demand while the whole system was also experiencing the maximum daily demand. During the fire flow scenario the water level in the tank was lowered to one foot above the minimum level, or 886 feet.

The four hydrants chosen to be flowed were chosen based on their physical properties in relation to the water system. The hydrants chosen are as follows:

- Hydrant L-4 – highest hydrant elevation, nearest storage tank

- Hydrant J-3 – highest hydrant elevation in southern portion of site
- Hydrant H-3 – highest hydrant elevation in northern area most distant from storage tank
- Hydrant C-1 – Lowest elevation

During the steady state average daily demand in the tank full condition only three nodes experienced pressure under 50 psi. Those are hydrants L-4, L-3 and junction J-76 with pressures of 34 psi, 49 psi and 35 psi respectively. It is noted that all three of these nodes are nearest the storage tank and a minimum pressure of 35 psi at junction J-76 was used as the basis of setting the tank elevation.

During the four fire flow scenarios the worst-case pressure occurs in hydrant L-4, the hydrant located nearest the storage tank at the end of cul-de-sac Road L. Pressure in the hydrant drops to 23 psi when the hydrant during the 1,000 gpm flow in the tank empty condition with the maximum daily demand occurring simultaneously.

Color coded maps of the entire system network during the steady state Average Daily Demand can be found in Appendix A attached to the report. Detailed WaterCAD reports of the Average Daily, Peak Hourly, and four Fire Flow scenarios can be found in Appendix B.

Based on the forgoing, the system is found to operate within the parameters set forth by the 10 State Standards for water systems. Almost the entirety of the system operates within the 50 to 80 psi range during domestic flow conditions. Some locations at the lowest extremities of the site experience pressure approaching 100 psi under the steady state domestic flow. Fire supply is provided at the minimum needed fire flow of 1,000 gpm at a minimum pressure of 20 psi in all hydrants with 56 of the 58 hydrants maintaining continuous pressures above 40 psi.

References

Great Lakes-Upper Mississippi River Board [GLUMRB]. (2014). *Recommended Standards for Wastewater Facilities.*

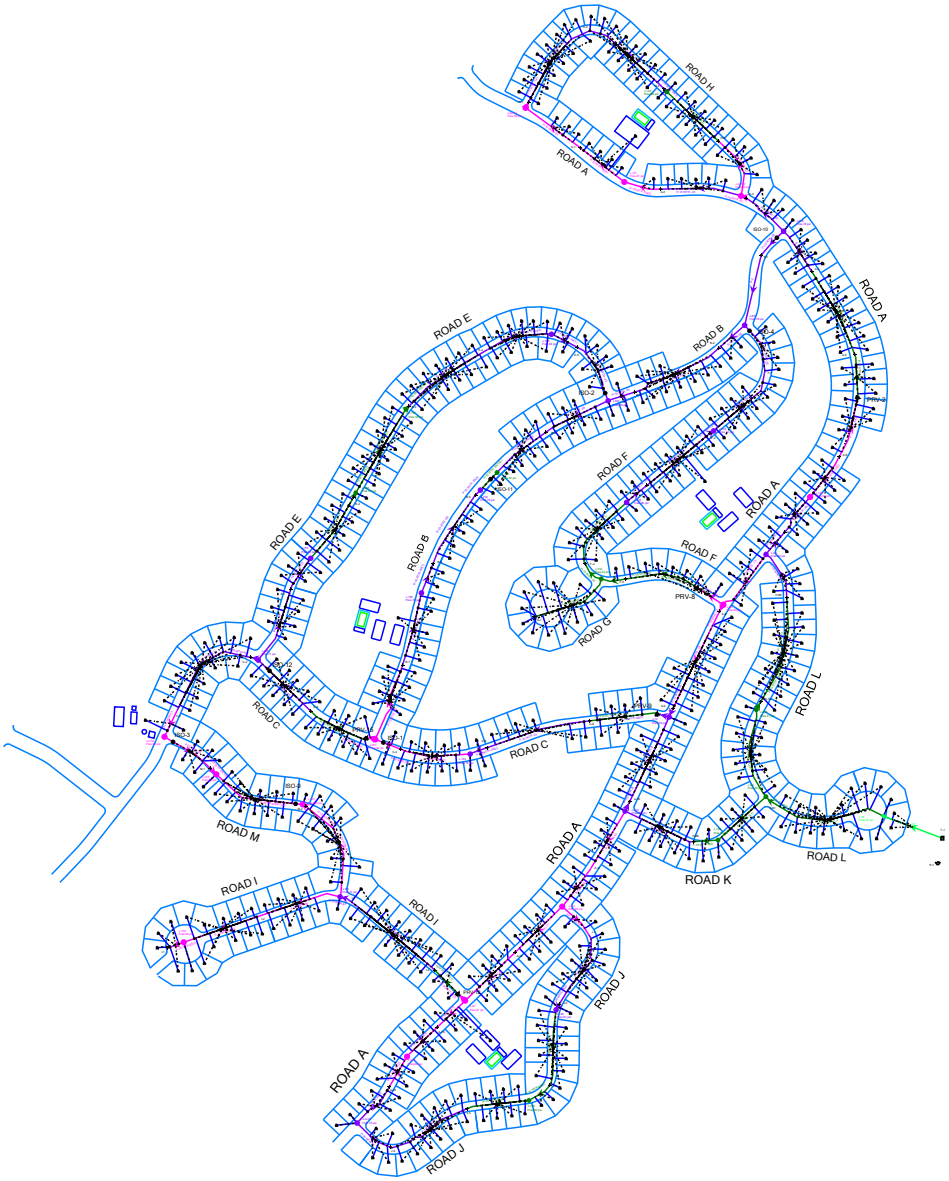
Great Lakes-Upper Mississippi River Board [GLUMRB]. (2012). *Recommended Standards for Water Works.*

Insurance Services Office [ISO]. (2008). *Guide for the Determination of Needed Fire Flow.*

Appendix A

WaterCAD Network Maps

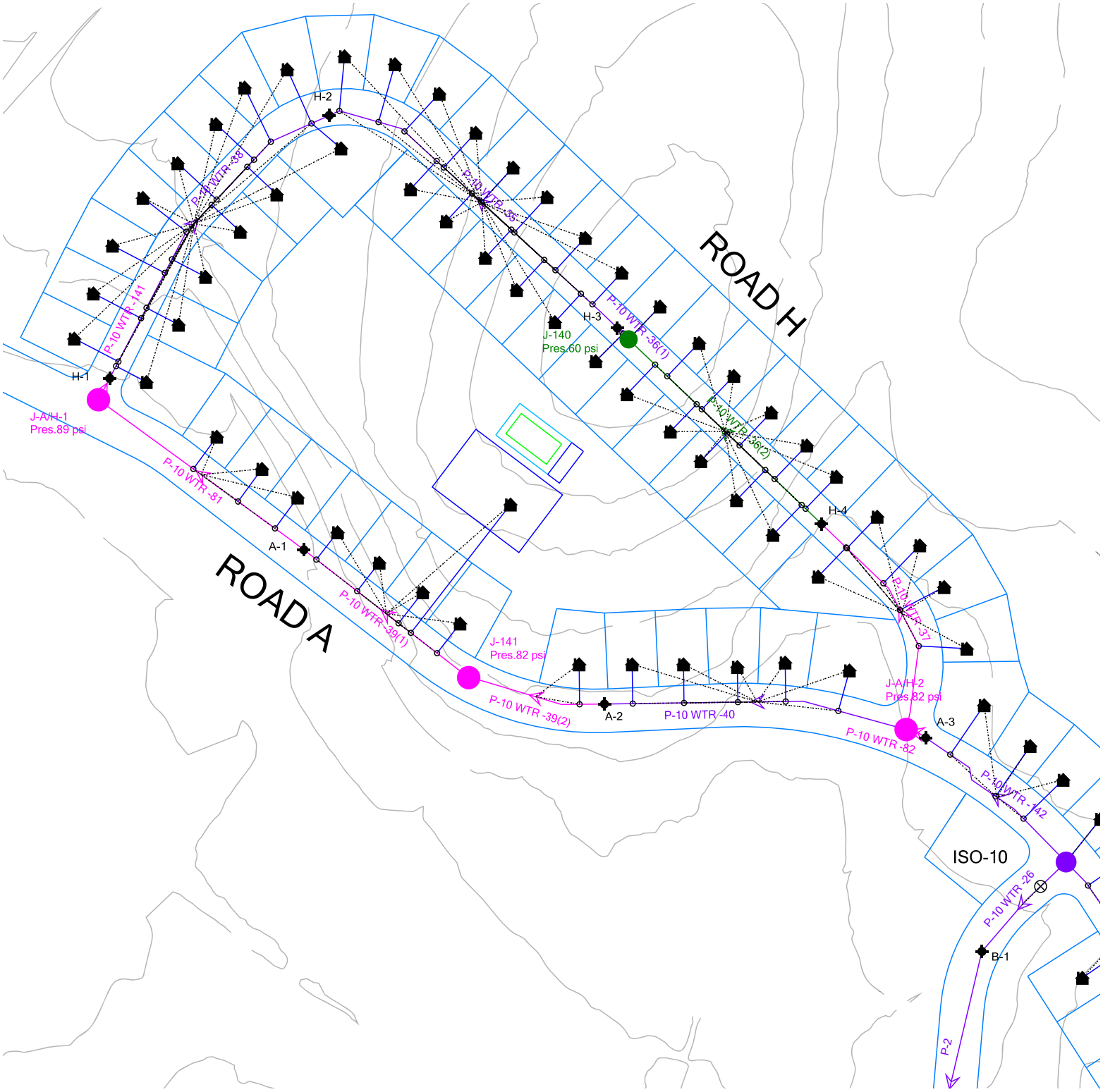
Clovewood Water System - Overall Network Map



Not to Scale

Clovewood.wtg

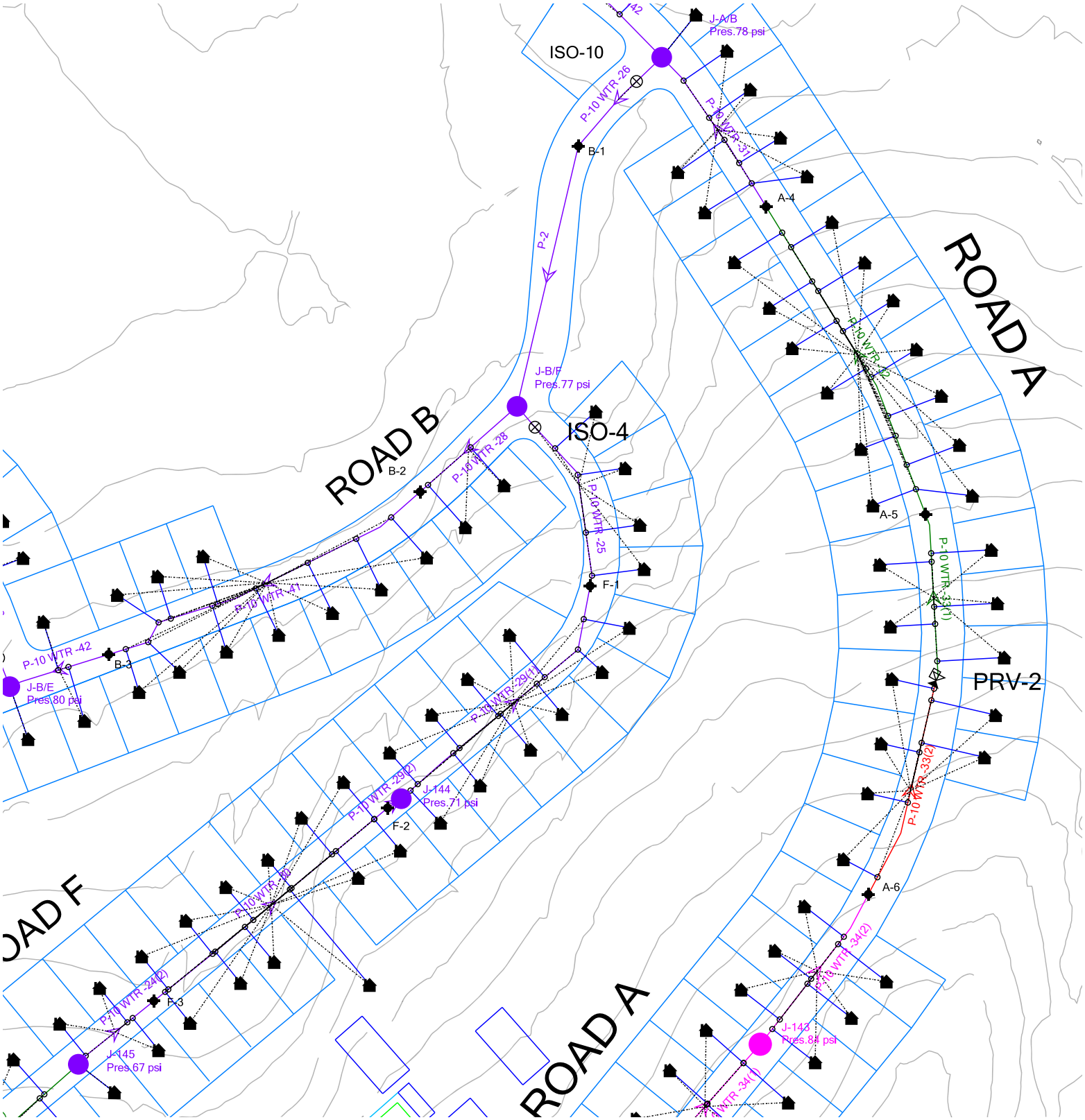
Scenario: Clovewood - Average Day **- Map 1 of 15**



Not to scale

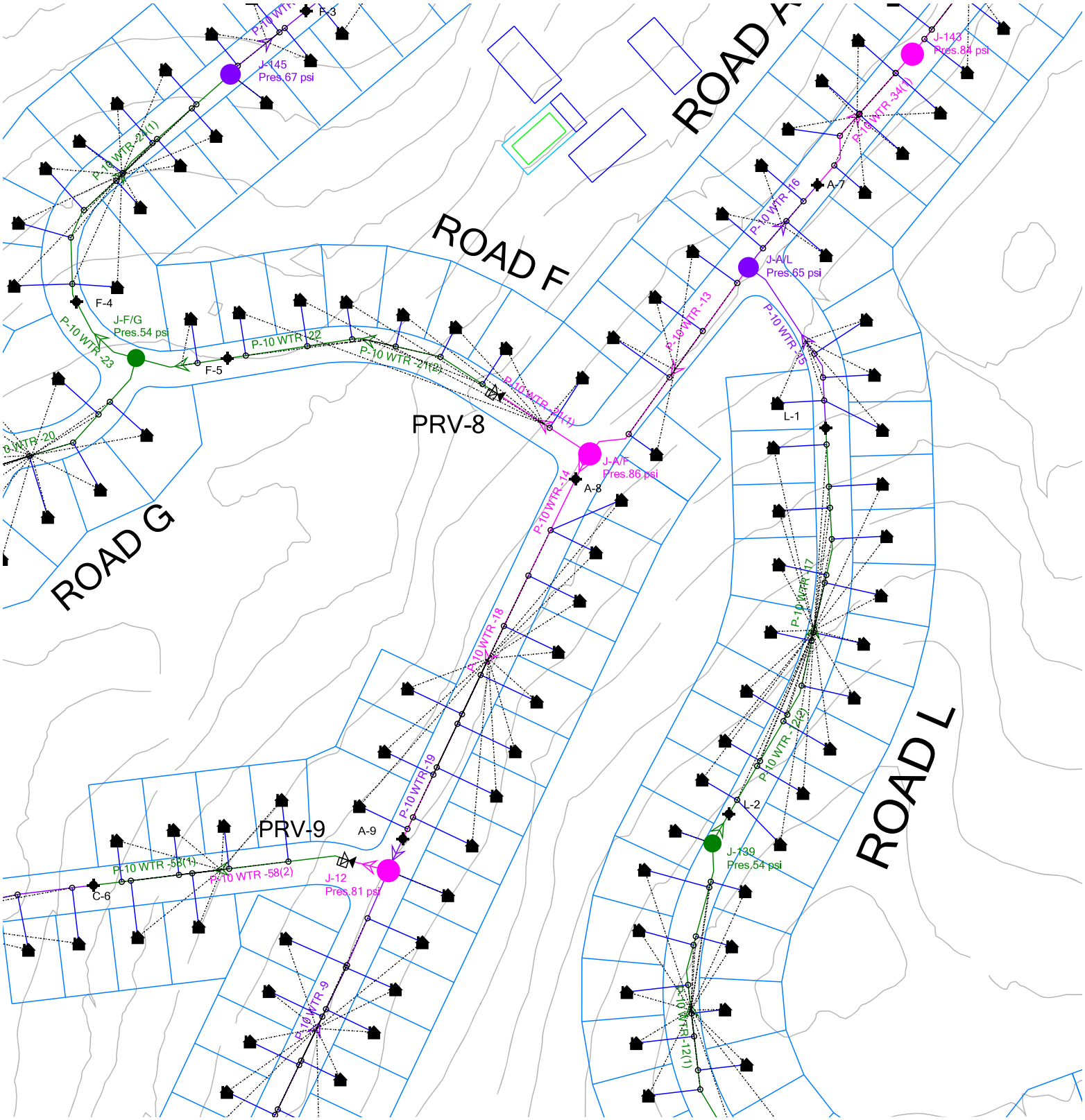
Clovewood.wtg

Scenario: Clovewood - Average Day **- Map 2 of 15**



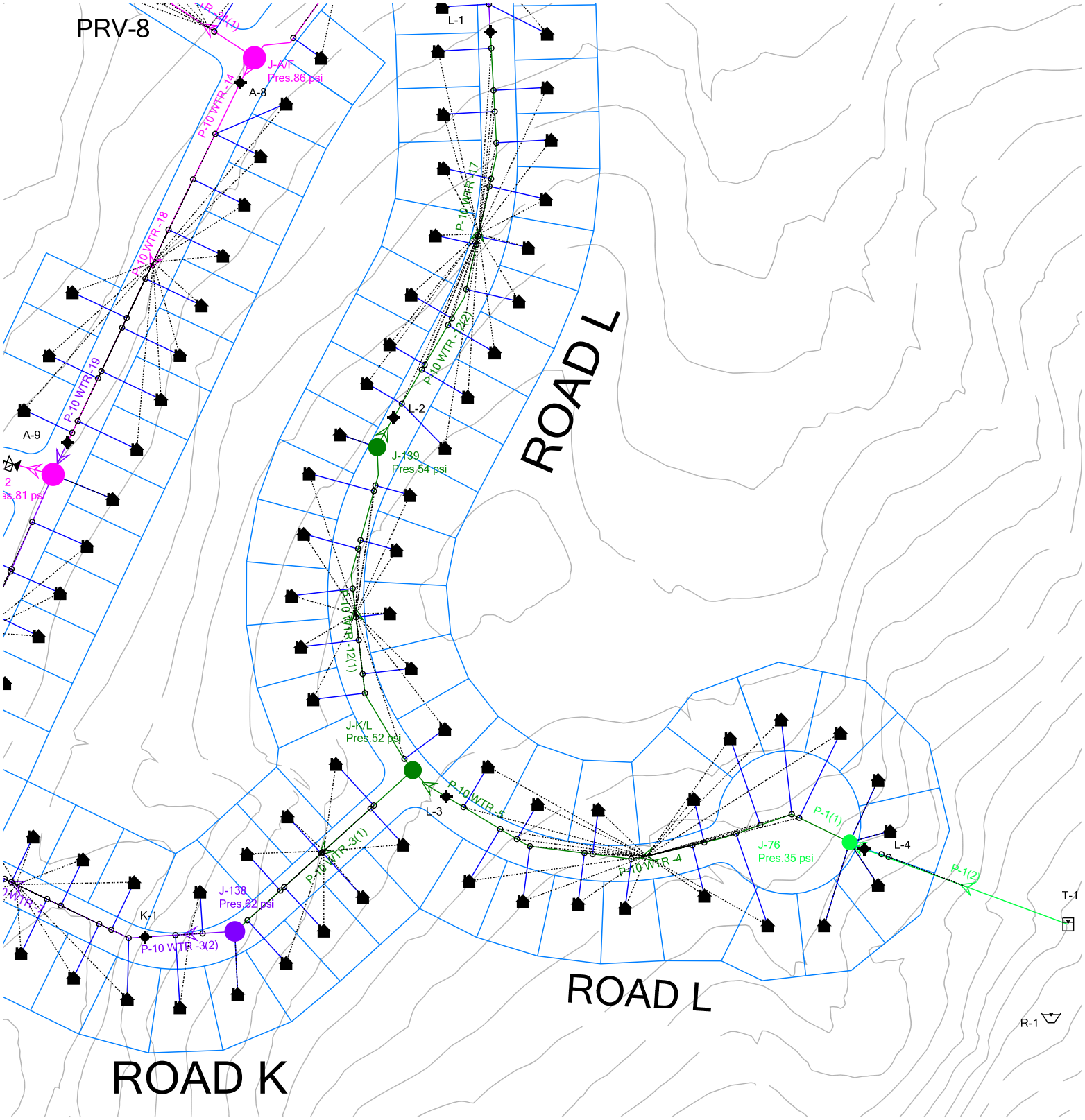
Not to scale

Scenario: Clovewood - Average Day **- Map 3 of 15**

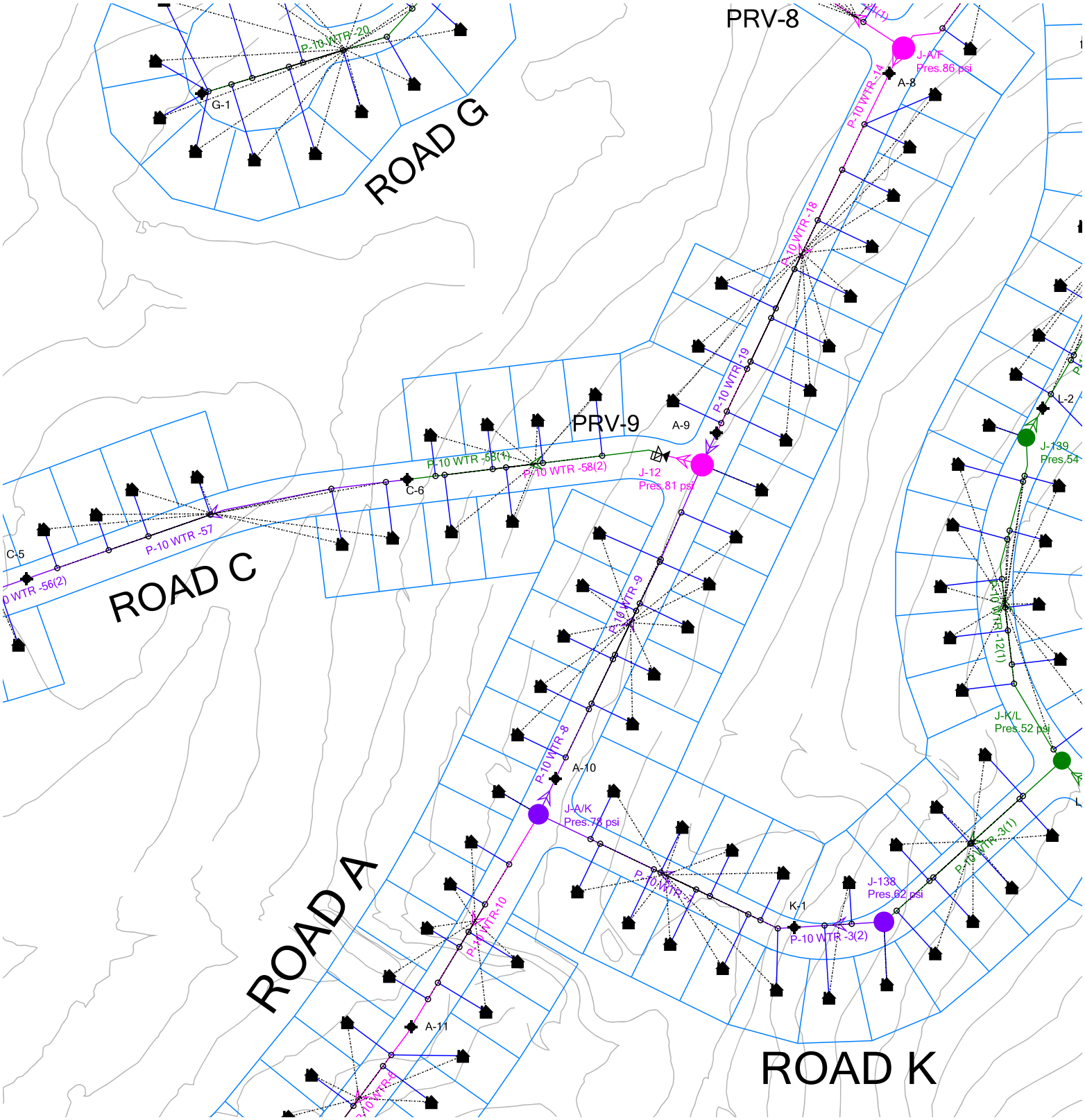


Not to scale

Scenario: Clovewood - Average Day **- Map 4 of 15**

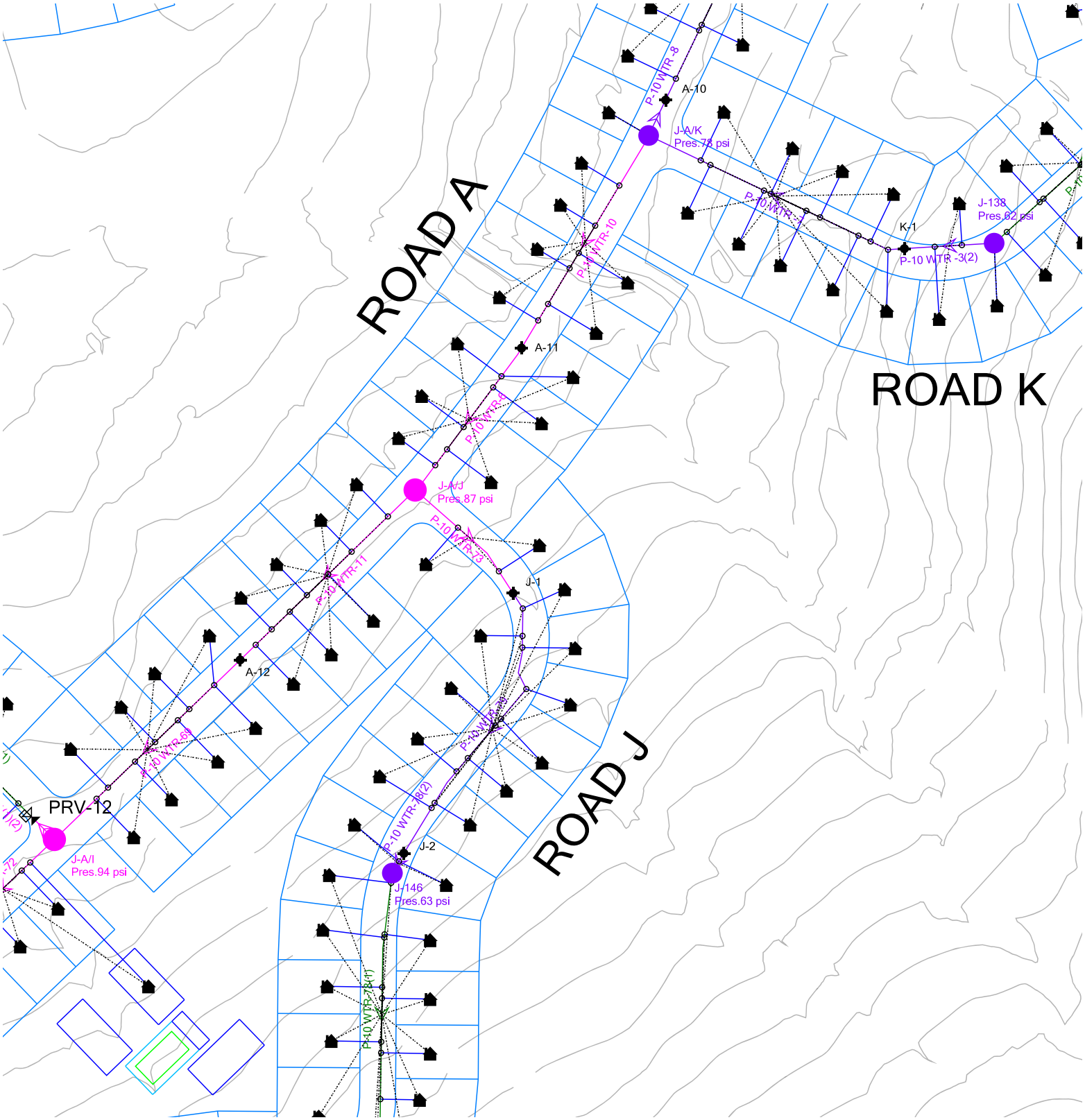


Not to scale


PRV-8
PRV-9
ROAD G
ROAD C
ROAD A
ROAD K
G-1
P-10 WTR -20
J-A/T
Pres.86 psi
A-8
P-10 WTR -14
P-10 WTR -18
P-10 WTR -19
A-9
J-12
Pres.81 psi
P-10 WTR -58(1)
P-10 WTR -58(2)
C-6
C-5
P-10 WTR -57
P-10 WTR -56(2)
L-2
J-139
Pres.54
P-10 WTR -12(1)
J-K/L
Pres.52 psi
P-10 WTR -9
P-10 WTR -8
A-10
J-A/K
Pres.78 psi
P-10 WTR -10
P-10 WTR -3(1)
J-138
Pres.62 psi
K-1
P-10 WTR -3(2)
A-11

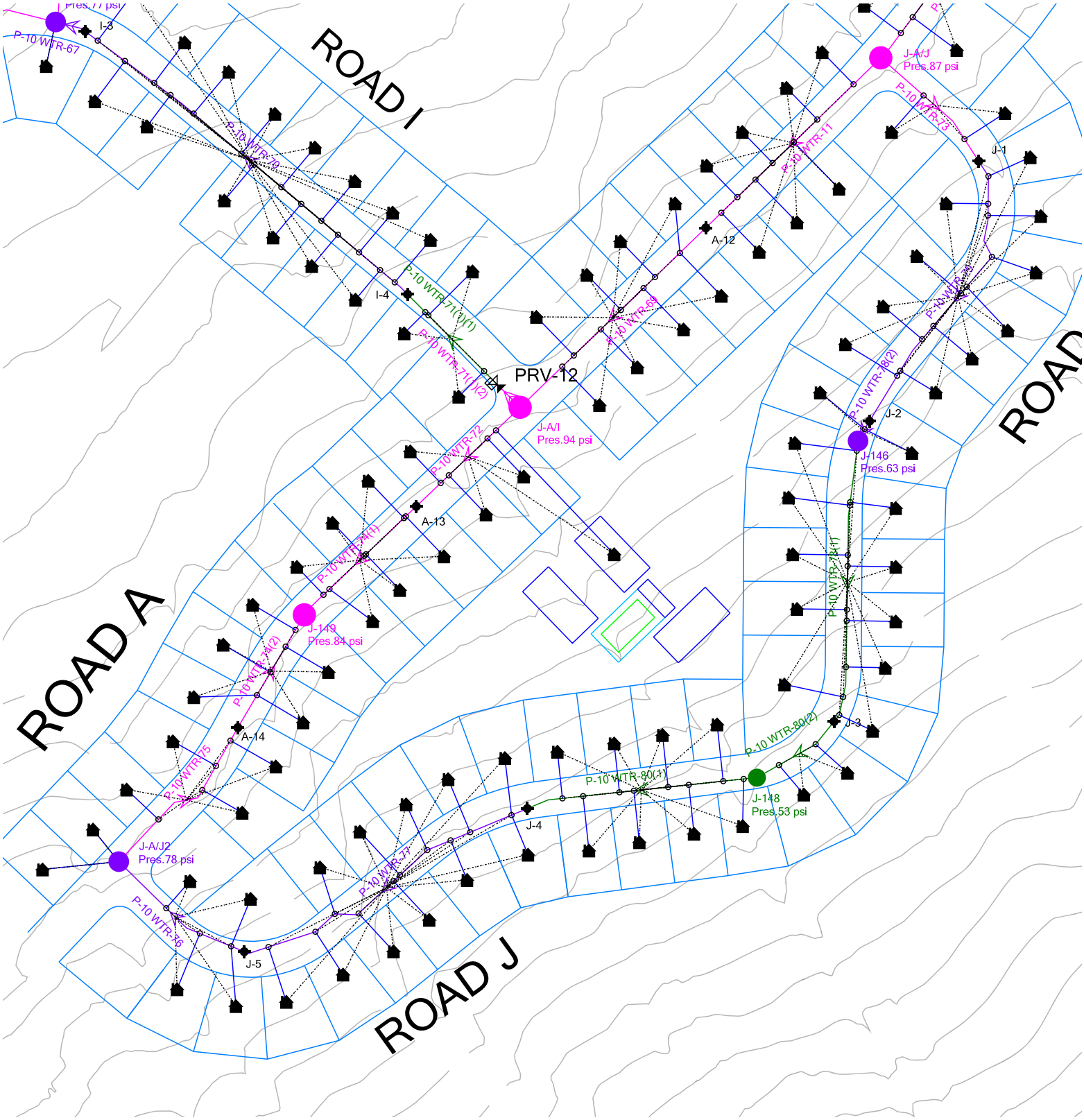
Not to scale

Scenario: Clovewood - Average Day **- Map 6 of 15**



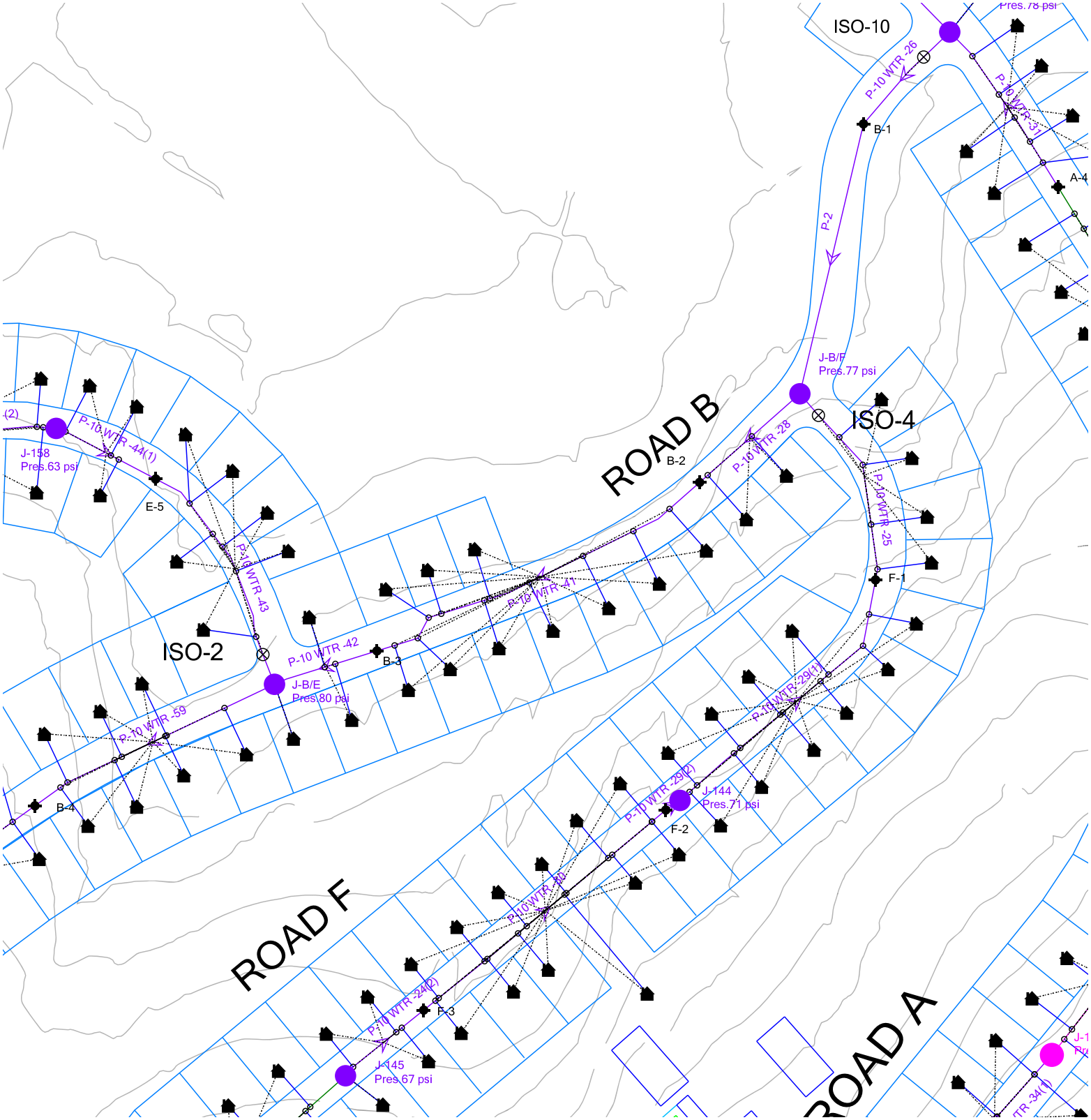
Not to scale

Scenario: Clovewood - Average Day **- Map 7 of 15**



Not to scale

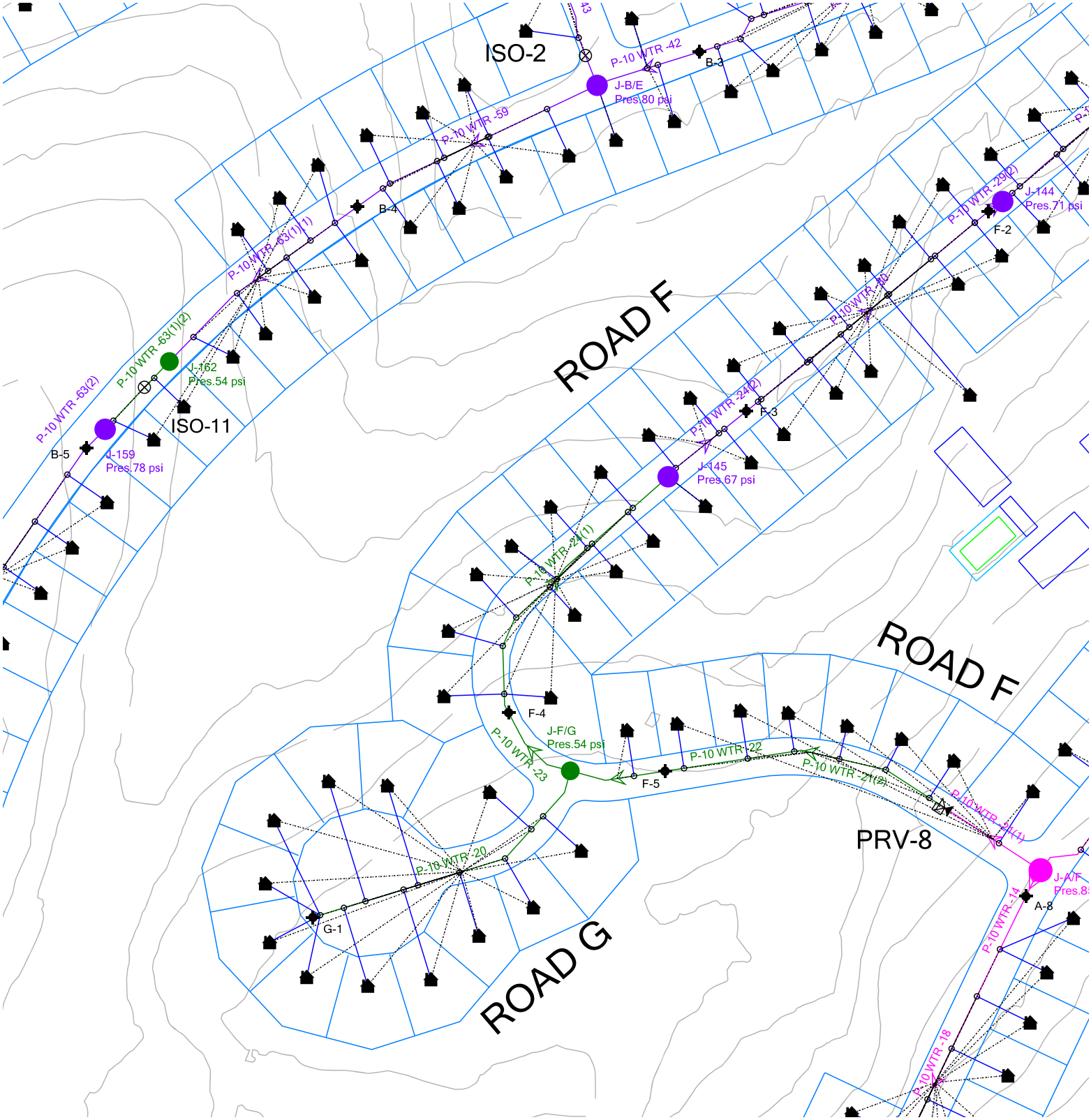
Scenario: Clovewood - Average Day **- Map 8 of 15**



Not to scale

Clovewood.wtg

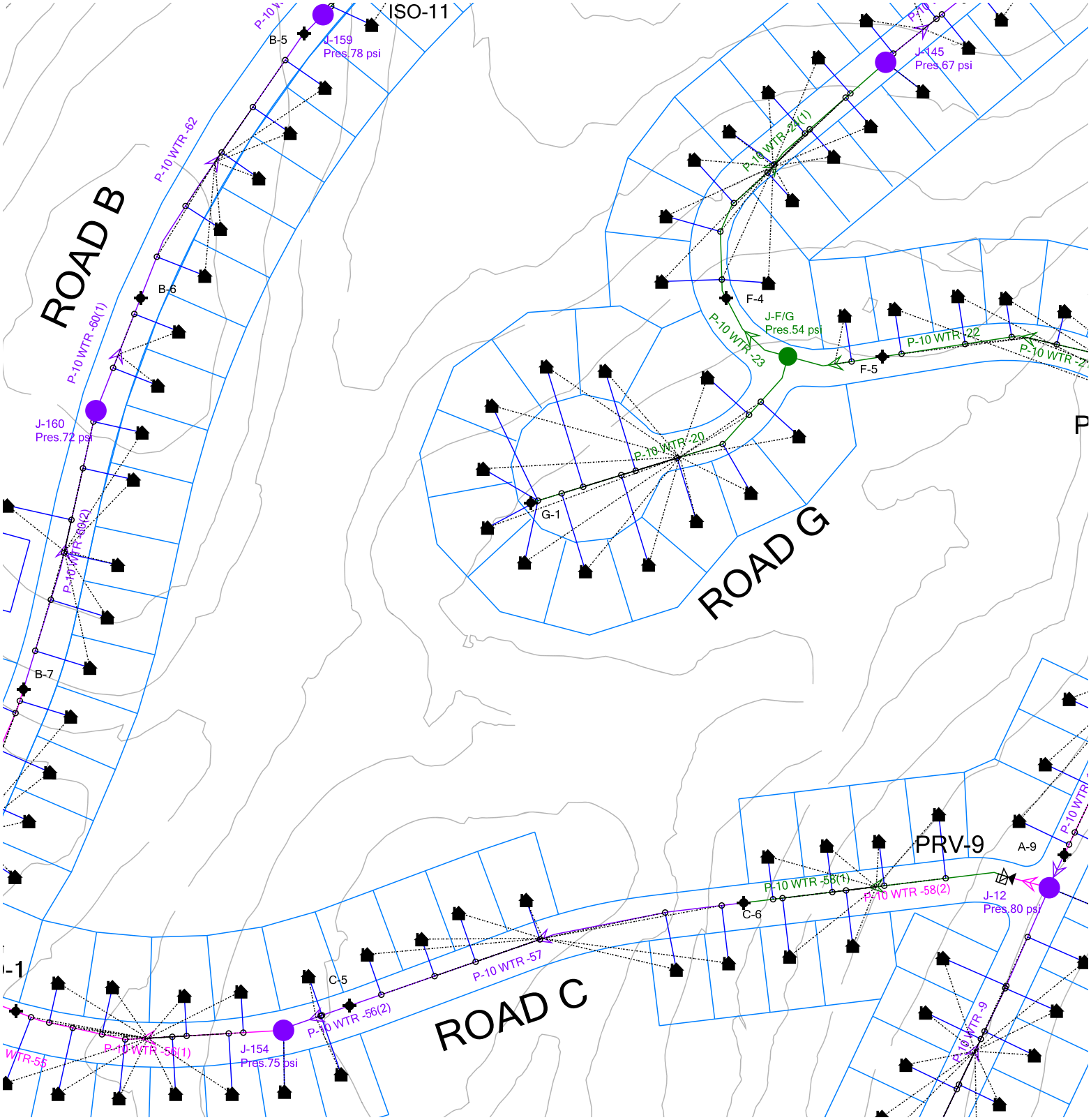
Scenario: Clovewood - Average Day **- Map 9 of 15**



Not to scale

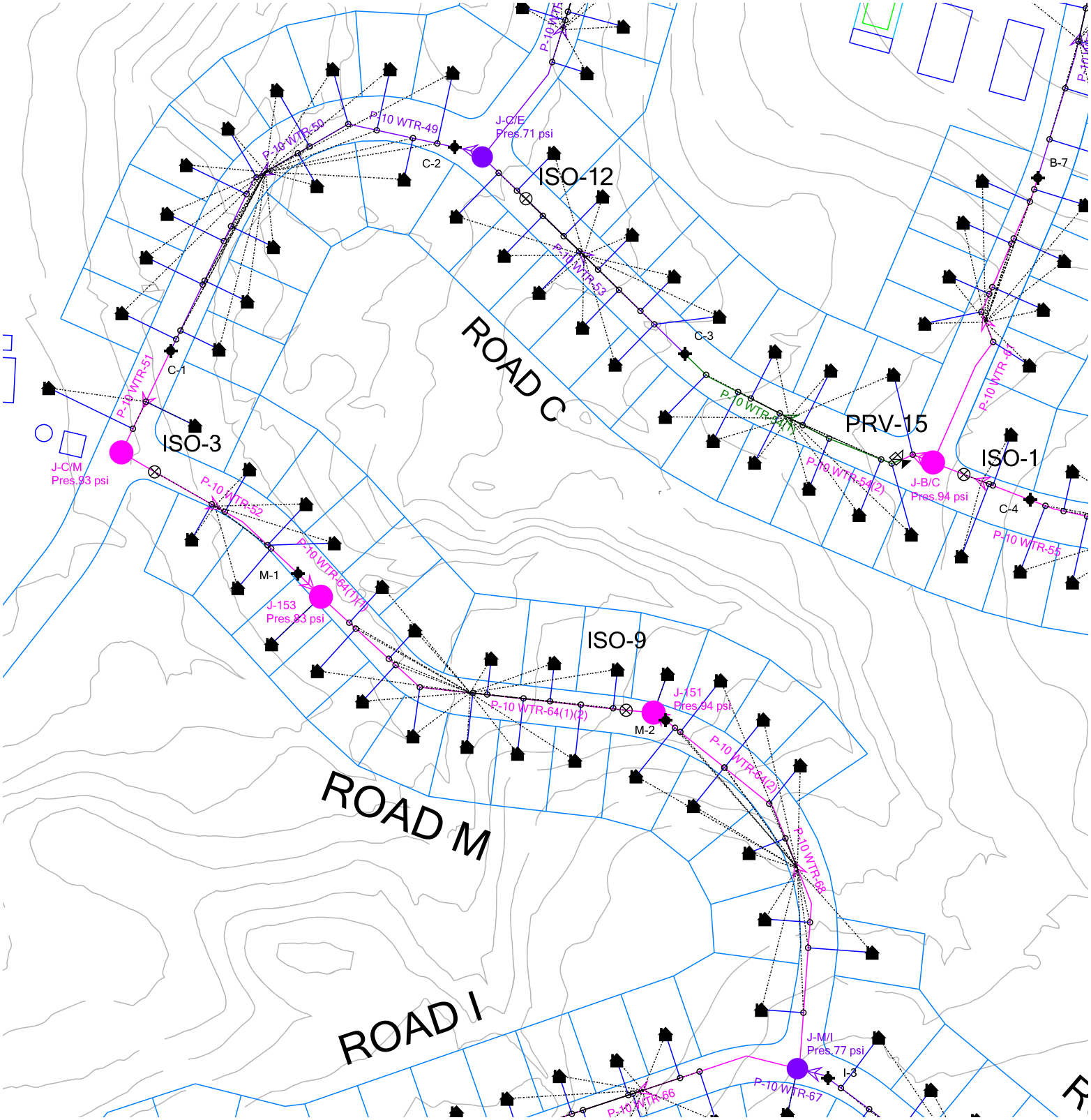
Clovewood.wtg

Scenario: Clovewood - Average Day **- Map 10 of 15**

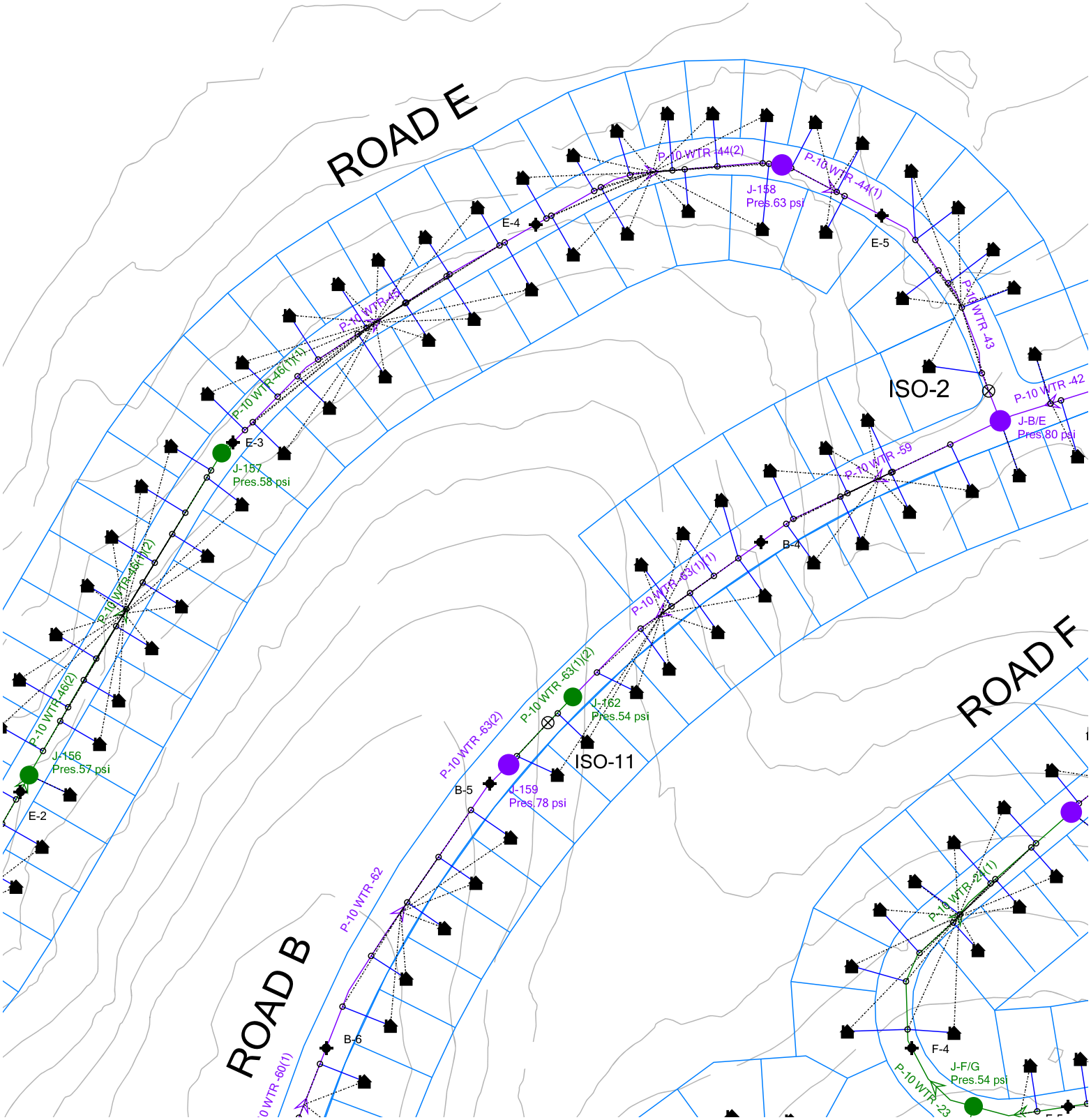


Not to scale

Scenario: Clovewood - Average Day **- Map 11 of 15**

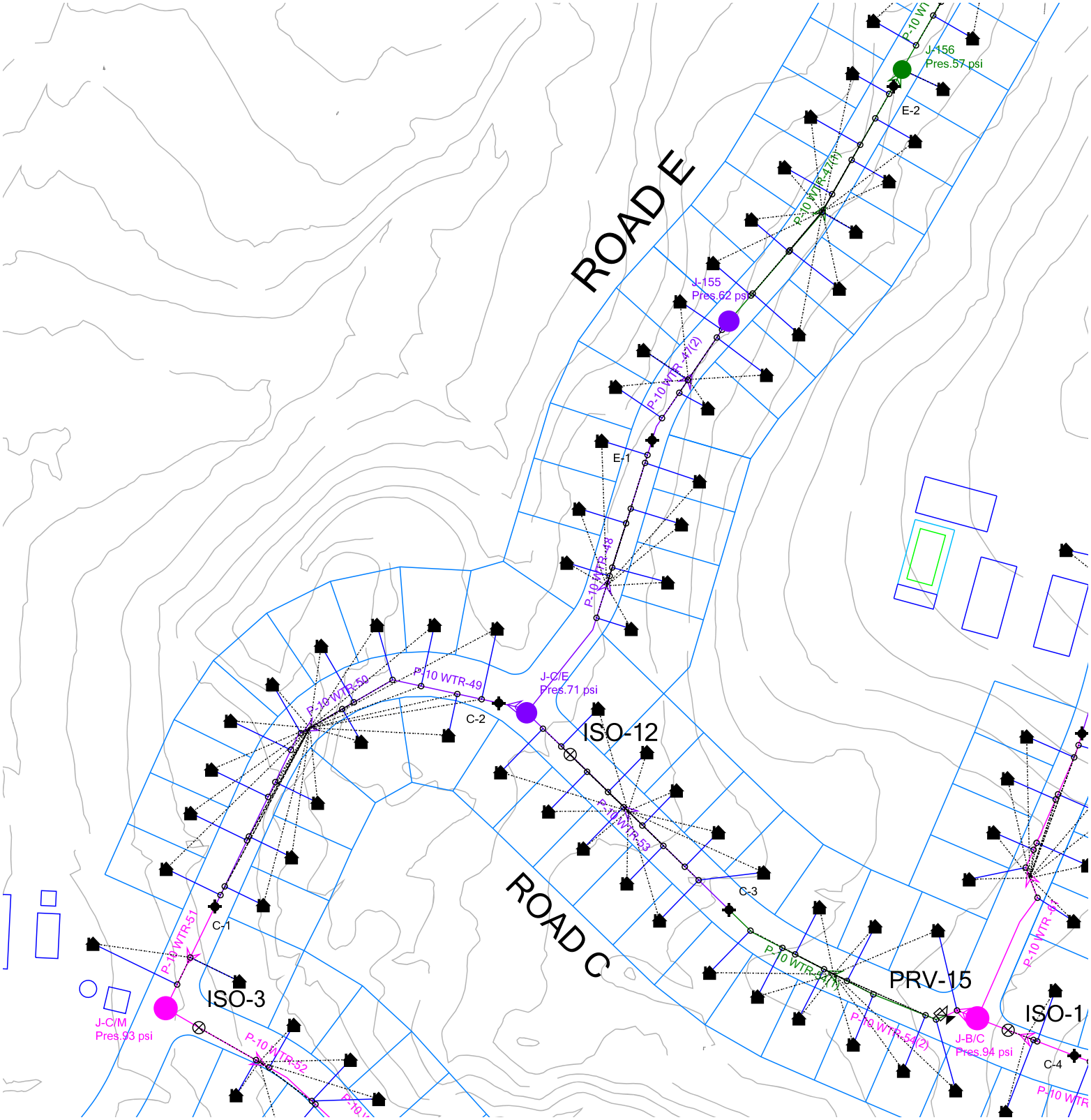


Not to scale


ROAD E
ROAD F
ROAD B
P-10 WTR-44(2)
P-10 WTR-44(1)
J-158
Pres.63 psi
E-4
E-5
P-10 WTR-43
P-10 WTR-46(1)(1)
E-3
J-157
Pres.58 psi
ISO-2
P-10 WTR-42
J-B/E
Pres.80 psi
P-10 WTR-59
B-4
P-10 WTR-46(1)(2)
P-10 WTR-46(2)
J-156
Pres.57 psi
E-2
P-10 WTR-63(1)(1)
P-10 WTR-63(1)(2)
J-162
Pres.54 psi
ISO-11
P-10 WTR-63(2)
B-5
J-159
Pres.78 psi
P-10 WTR-62
B-6
P-10 WTR-60(1)
P-10 WTR-23(1)
F-4
J-F/G
Pres.54 psi
P-10 WTR-23

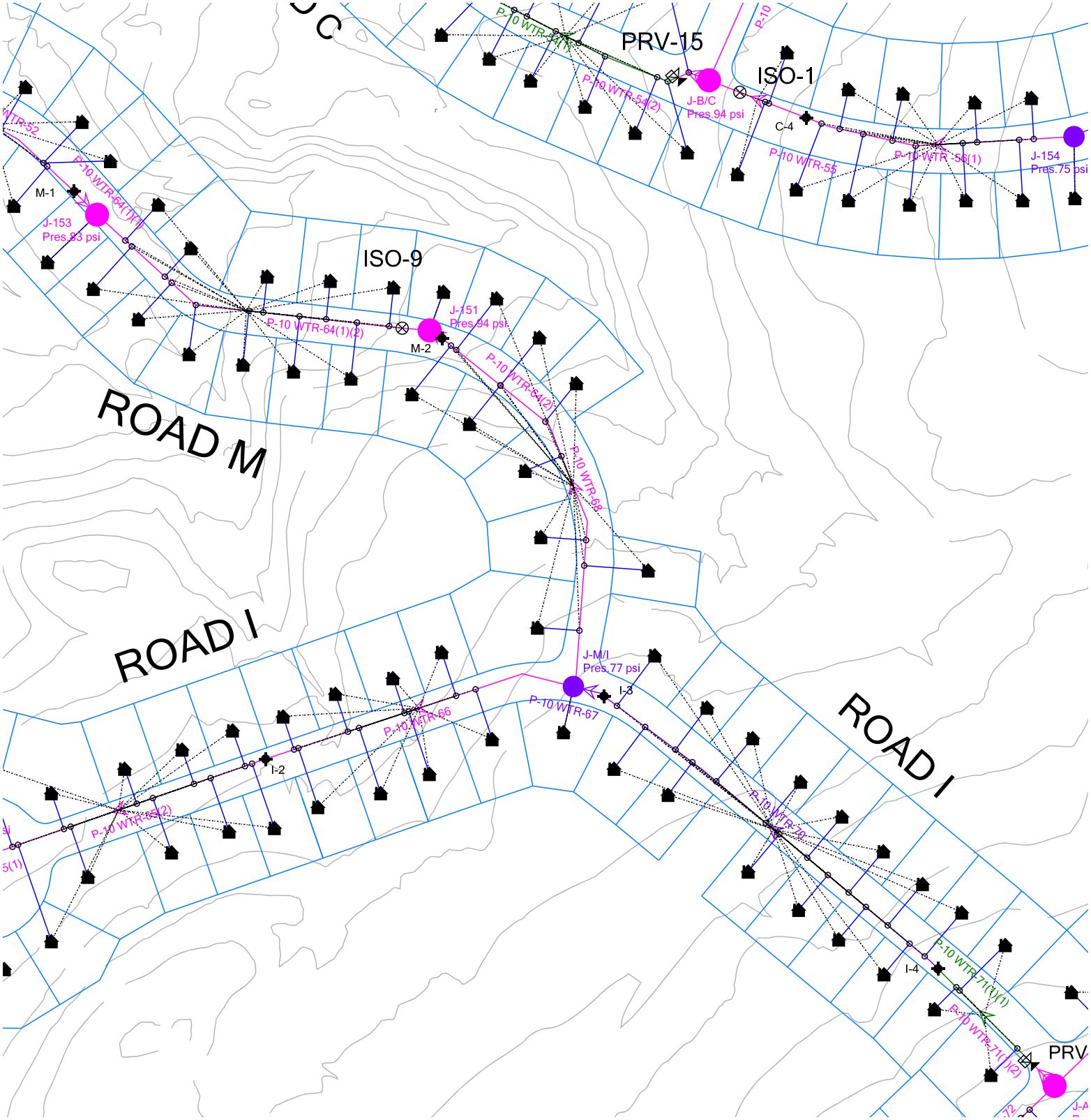
Not to scale

Scenario: Clovewood - Average Day **- Map 13 of 15**

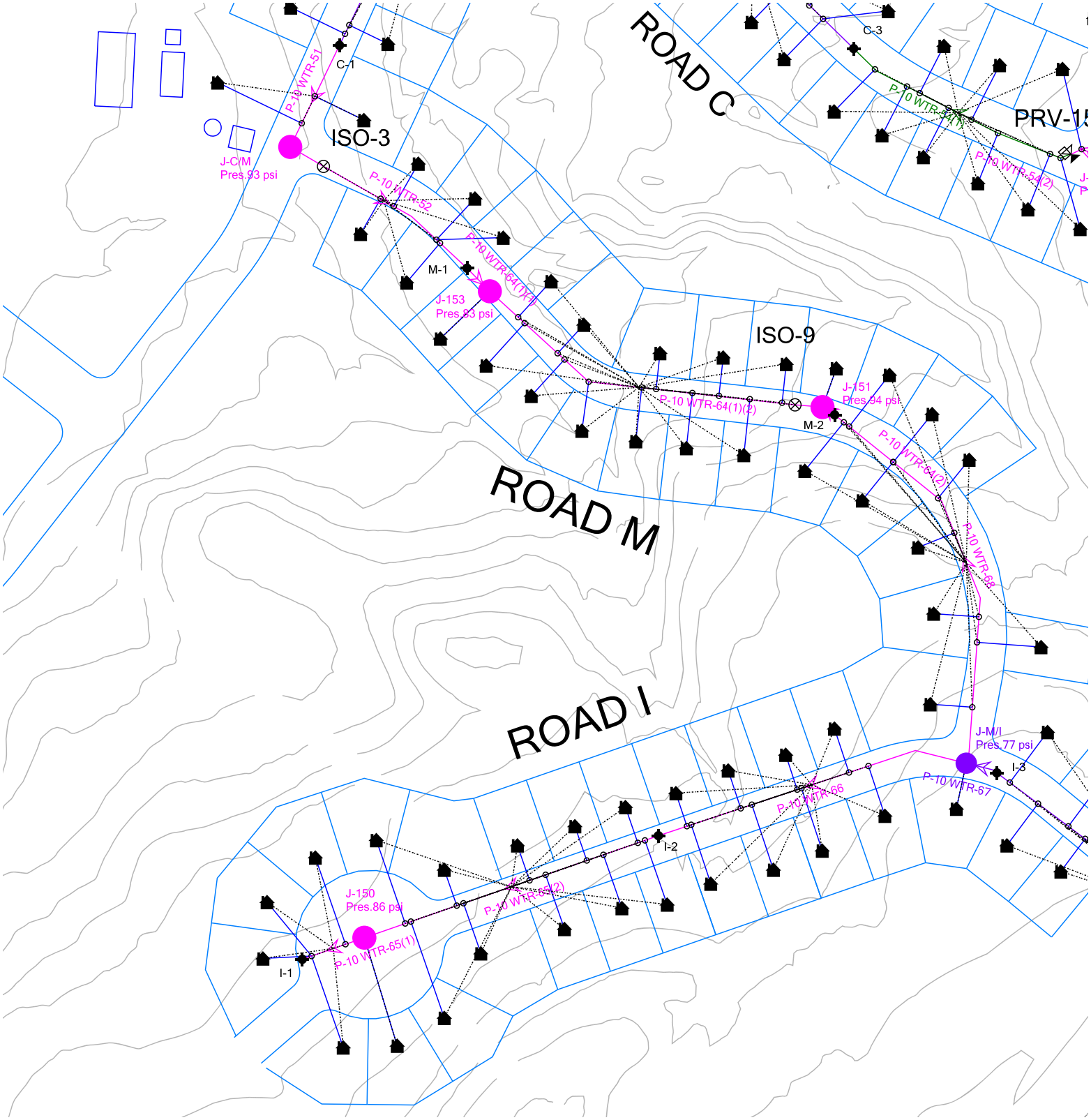


Not to scale

Clovewood.wtg


PRV-15
ISO-1
J-B/C
Pres.94 psi
C-4
J-154
Pres.75 psi
M-1
J-153
Pres.83 psi
ISO-9
J-151
Pres.94 psi
M-2
ROAD M
ROAD I
J-M/I
Pres.77 psi
I-3
I-2
I-4
ROAD I
PRV

Not to scale


ROAD C
ROAD M
ROAD I
ISO-3
ISO-9
C-1
C-3
M-1
M-2
I-1
I-2
I-3
PRV-15
J-C/M
Pres.93 psi
J-153
Pres.83 psi
J-151
Pres.94 psi
J-150
Pres.86 psi
J-M/I
Pres.77 psi
P-10 WTR-51
P-10 WTR-52
P-10 WTR-64(1)(1)
P-10 WTR-64(1)(2)
P-10 WTR-64(2)
P-10 WTR-65(1)
P-10 WTR-65(2)
P-10 WTR-66
P-10 WTR-67
P-10 WTR-68
P-10 WTR-44(1)
P-10 WTR-54(2)

Appendix B

WaterCAD System Analysis Results

Clovewood - Steady State - Avg. Daily Demand

Scenario Summary	
ID	1
Label	Clovewood - Average Day
Notes	
Active Topology	Base Active Topology
User Data Extensions	Base User Data Extensions
Physical	Base Physical
Demand	Clovewood to Pipe
Initial Settings	Base Initial Settings
Operational	Base Operational
Age	Base Age
Constituent	Base Constituent
Trace	Base Trace
Fire Flow	Base Fire Flow
Energy Cost	Base Energy Cost
Pressure Dependent Demand	Base Pressure Dependent Demand
Transient	Base Transient
Failure History	Base Failure History
SCADA	Base SCADA
Steady State / EPS Solver Calculation Options	Base Calculation Options
Transient Solver Calculation Options	Base Calculation Options

Clovewood - Steady State - Avg. Daily Demand

Network Inventory			
Pipe	110	Pump Station	0
Lateral	606	Variable Speed Pump Battery	0
Junction	40	SCADA Element	0
Hydrant	58	PRV	5
Tank	1	PSV	0
-Circular	1	PBV	0
-Non-Circular	0	FCV	0
-Variable Area	0	TCV	0
Reservoir	1	GPV	0
Tap	566	Isolation Valve	8
Pump	0	Spot Elevation	0
Customer Meter	606		

Clovewood - Steady State - Avg. Daily Demand

Hydraulic Summary			
Time Analysis Type	Steady State	Simulation Start Date	1/1/2000
Friction Method	Hazen-Williams	Hydraulic Time Step	1.000
Accuracy	0.001	Duration	24.000
Trials	40	Calculation Type	Hydraulics Only

Clovewood - Steady State - Avg. Daily Demand

Pressure Pipe Inventory

Diameter (in)	Length (PVC) (ft)	Length (All Materials) (ft)	Volume (MG)
10.0	29,026	29,026	0.12
12.0	926	926	0.01
All Diameters	29,952	29,952	0.12

Clovewood - Steady State - Avg. Daily Demand

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)
P-10 WTR -82	30	J-A/H-2	A-3	10.0	PVC	150.0	-19	0.08
P-10 WTR -37	335	J-A/H-2	H-4	10.0	PVC	150.0	8	0.03
P-10 WTR -141	33	J-A/H-1	H-1	10.0	PVC	150.0	4	0.01
P-10 WTR -81	351	J-A/H-1	A-1	10.0	PVC	150.0	-4	0.02
P-10 WTR-49	41	J-C/E	C-2	10.0	PVC	150.0	10	0.04
P-10 WTR-53	380	J-C/E	C-3	10.0	PVC	150.0	-34	0.14
P-10 WTR -14	40	J-A/F	A-8	10.0	PVC	150.0	11	0.05
P-10 WTR -13	352	J-A/F	J-A/L	10.0	PVC	150.0	-32	0.13
P-10 WTR -21(1)	153	J-A/F	PRV-8	10.0	PVC	150.0	18	0.07
P-10 WTR-67	44	J-M/I	I-3	10.0	PVC	150.0	-10	0.04
P-10 WTR -8	55	J-A/K	A-10	10.0	PVC	150.0	48	0.19
P-10 WTR -5	60	J-K/L	L-3	10.0	PVC	150.0	-185	0.76
P-10 WTR -3(1)	335	J-K/L	J-138	10.0	PVC	150.0	100	0.41
P-10 WTR -12(1)	476	J-K/L	J-139	10.0	PVC	150.0	83	0.34
P-10 WTR -23	120	J-F/G	F-4	10.0	PVC	150.0	14	0.06
P-10 WTR -22	130	J-F/G	F-5	10.0	PVC	150.0	-18	0.07
P-10 WTR-55	140	J-B/C	C-4	10.0	PVC	150.0	-45	0.18
P-10 WTR -61	421	J-B/C	B-7	10.0	PVC	150.0	5	0.02
P-10 WTR -43	330	J-B/E	E-5	10.0	PVC	150.0	0	0.00
P-10 WTR -59	362	J-B/E	B-4	10.0	PVC	150.0	3	0.01
P-10 WTR -16	150	J-A/L	A-7	10.0	PVC	150.0	43	0.17
P-10 WTR -15	260	J-A/L	L-1	10.0	PVC	150.0	-77	0.31
P-10 WTR-52	290	J-C/M	M-1	10.0	PVC	150.0	4	0.02
P-10 WTR -26	170	J-A/B	B-1	10.0	PVC	150.0	9	0.04
P-10 WTR -31	255	J-A/B	A-4	10.0	PVC	150.0	-31	0.13
P-10 WTR -28	180	J-B/F	B-2	10.0	PVC	150.0	9	0.04
P-10 WTR -25	284	J-B/F	F-1	10.0	PVC	150.0	0	0.00
P-10 WTR-73	200	J-A/J	J-1	10.0	PVC	150.0	18	0.07
P-10 WTR-6	247	J-A/J	A-11	10.0	PVC	150.0	-45	0.18
P-10 WTR-11	340	J-A/J	A-12	10.0	PVC	150.0	22	0.09
P-10 WTR-72	200	J-A/I	A-13	10.0	PVC	150.0	1	0.01
P-10 WTR-76	219	J-A/J2	J-5	10.0	PVC	150.0	-5	0.02
P-10 WTR -142	264	A-3	J-A/B	10.0	PVC	150.0	-19	0.08
P-10 WTR -40	422	A-2	J-A/H-2	10.0	PVC	150.0	-8	0.03
P-10 WTR -39(1)	288	A-1	J-141	10.0	PVC	150.0	-4	0.02
P-10 WTR -38	487	H-2	H-1	10.0	PVC	150.0	-2	0.01
P-10 WTR -35	510	H-3	H-2	10.0	PVC	150.0	3	0.01
P-10 WTR -36(1)	22	H-3	J-140	10.0	PVC	150.0	-5	0.02
P-10 WTR -34(1)	232	A-7	J-143	10.0	PVC	150.0	43	0.17
P-10 WTR -24(1)	413	F-4	J-145	10.0	PVC	150.0	13	0.05
P-10 WTR -32	485	A-5	A-4	10.0	PVC	150.0	34	0.14
P-10 WTR -33(1)	234	A-5	PRV-2	10.0	PVC	150.0	-37	0.15
P-10 WTR -18	556	A-8	A-9	10.0	PVC	150.0	9	0.04
P-2	373	B-1	J-B/F	10.0	PVC	150.0	9	0.04
P-10 WTR -30	422	F-2	F-3	10.0	PVC	150.0	-6	0.02
P-10 WTR -29(1)	412	F-1	J-144	10.0	PVC	150.0	-1	0.00
P-10 WTR-69	360	A-12	J-A/I	10.0	PVC	150.0	22	0.09
P-10 WTR-78(1)	396	J-3	J-146	10.0	PVC	150.0	-11	0.05
P-10 WTR-75	259	A-14	J-A/J2	10.0	PVC	150.0	-2	0.01

Clovewood - Steady State - Avg. Daily Demand

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)
P-10 WTR -17	570	L-2	L-1	10.0	PVC	150.0	80	0.33
P-10 WTR -4	600	L-3	J-76	12.0	PVC	150.0	-185	0.53
P-10 WTR-10	345	A-11	J-A/K	10.0	PVC	150.0	-45	0.18
P-10 WTR-74(1)	218	A-13	J-149	10.0	PVC	150.0	1	0.01
P-10 WTR -9	483	A-10	J-12	10.0	PVC	150.0	48	0.19
P-10 WTR-79	427	J-2	J-1	10.0	PVC	150.0	-17	0.07
P-10 WTR-77	456	J-5	J-4	10.0	PVC	150.0	-7	0.03
P-10 WTR -19	49	A-9	J-12	10.0	PVC	150.0	8	0.03
P-10 WTR -7	392	K-1	J-A/K	10.0	PVC	150.0	97	0.40
P-10 WTR-80(1)	324	J-4	J-148	10.0	PVC	150.0	-8	0.03
P-10 WTR -57	550	C-5	C-6	10.0	PVC	150.0	-49	0.20
P-10 WTR -42	145	B-3	J-B/E	10.0	PVC	150.0	6	0.02
P-10 WTR -62	420	B-5	B-6	10.0	PVC	150.0	-1	0.00
P-10 WTR -56(1)	366	C-4	J-154	10.0	PVC	150.0	-45	0.18
P-10 WTR -58(1)	359	C-6	PRV-9	10.0	PVC	150.0	-52	0.21
P-10 WTR -63(1)(1)	329	B-4	J-162	10.0	PVC	150.0	3	0.01
P-10 WTR -60(1)	163	B-6	J-160	10.0	PVC	150.0	-2	0.01
P-10 WTR -41	500	B-2	B-3	10.0	PVC	150.0	7	0.03
P-10 WTR -20	420	G-1	J-F/G	10.0	PVC	150.0	0	0.00
P-10 WTR-47(1)	388	E-2	J-155	10.0	PVC	150.0	-14	0.06
P-10 WTR -44(1)	151	E-5	J-158	10.0	PVC	150.0	-2	0.01
P-10 WTR-46(1)(1)	20	E-3	J-157	10.0	PVC	150.0	-10	0.04
P-10 WTR -48	410	E-1	J-C/E	10.0	PVC	150.0	-19	0.08
P-10 WTR-45	505	E-4	E-3	10.0	PVC	150.0	-8	0.03
P-10 WTR-54(1)	333	C-3	PRV-15	10.0	PVC	150.0	-37	0.15
P-10 WTR-51	152	C-1	J-C/M	10.0	PVC	150.0	6	0.02
P-10 WTR-64(1)(1)	44	M-1	J-153	10.0	PVC	150.0	4	0.01
P-10 WTR-68	548	M-2	J-M/I	10.0	PVC	150.0	0	0.00
P-10 WTR-71(1)(1)	177	I-4	PRV-12	10.0	PVC	150.0	-16	0.06
P-10 WTR-70	580	I-3	I-4	10.0	PVC	150.0	-13	0.05
P-10 WTR-50	550	C-2	C-1	10.0	PVC	150.0	8	0.03
P-10 WTR-66	435	I-2	J-M/I	10.0	PVC	150.0	-5	0.02
P-10 WTR-65(1)	88	I-1	J-150	10.0	PVC	150.0	0	0.00
P-10 WTR -3(2)	125	J-138	K-1	10.0	PVC	150.0	97	0.40
P-10 WTR -12(2)	48	J-139	L-2	10.0	PVC	150.0	82	0.33
P-10 WTR -36(2)	369	J-140	H-4	10.0	PVC	150.0	-8	0.03
P-10 WTR -39(2)	193	J-141	A-2	10.0	PVC	150.0	-8	0.03
P-10 WTR -34(2)	258	J-143	A-6	10.0	PVC	150.0	39	0.16
P-10 WTR -29(2)	23	J-144	F-2	10.0	PVC	150.0	-4	0.02
P-10 WTR -24(2)	139	J-145	F-3	10.0	PVC	150.0	9	0.04
P-10 WTR-78(2)	32	J-146	J-2	10.0	PVC	150.0	-15	0.06
P-10 WTR-80(2)	135	J-148	J-3	10.0	PVC	150.0	-11	0.05
P-10 WTR-74(2)	182	J-149	A-14	10.0	PVC	150.0	-2	0.01
P-10 WTR-65(2)	419	J-150	I-2	10.0	PVC	150.0	-5	0.02
P-10 WTR-64(2)	20	J-151	M-2	10.0	PVC	150.0	0	0.00
P-10 WTR-64(1)(2)	496	J-153	J-151	10.0	PVC	150.0	0	0.00
P-10 WTR -56(2)	96	J-154	C-5	10.0	PVC	150.0	-49	0.20
P-10 WTR -47(2)	191	J-155	E-1	10.0	PVC	150.0	-19	0.08
P-10 WTR-46(2)	25	J-156	E-2	10.0	PVC	150.0	-14	0.06

Clovewood - Steady State - Avg. Daily Demand

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)
P-10 WTR-46(1)(2)	505	J-157	J-156	10.0	PVC	150.0	-12	0.05
P-10 WTR -44(2)	349	J-158	E-4	10.0	PVC	150.0	-6	0.02
P-10 WTR -63(2)	36	J-159	B-5	10.0	PVC	150.0	0	0.00
P-10 WTR -60(2)	388	J-160	B-7	10.0	PVC	150.0	-5	0.02
P-10 WTR -33(2)	315	PRV-2	A-6	10.0	PVC	150.0	-37	0.15
P-10 WTR -21(2)	396	PRV-8	F-5	10.0	PVC	150.0	18	0.07
P-10 WTR -58(2)	57	PRV-9	J-12	10.0	PVC	150.0	-52	0.21
P-10 WTR-71(1)(2)	45	PRV-12	J-A/I	10.0	PVC	150.0	-16	0.06
P-10 WTR-54(2)	45	PRV-15	J-B/C	10.0	PVC	150.0	-37	0.15
P-10 WTR -63(1)(2)	126	J-162	J-159	10.0	PVC	150.0	0	0.00

Clovewood - Steady State - Avg. Daily Demand

Junction Table - Time: 0.00 hours

Label	Elevation (ft)	Zone	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-76	825.00	<None>	<Collection: 0 items>	5	906.97	35
J-K/L	787.50	<None>	<Collection: 0 items>	2	906.91	52
J-148	784.36	<None>	<Collection: 0 items>	3	906.84	53
J-139	782.50	<None>	<Collection: 0 items>	2	906.88	54
J-138	764.58	<None>	<Collection: 0 items>	2	906.88	62
J-146	760.35	<None>	<Collection: 0 items>	4	906.84	63
J-F/G	666.00	<None>	<Collection: 0 items>	4	791.28	54
J-162	639.35	<None>	<Collection: 0 items>	3	764.89	54
J-A/L	756.50	<None>	<Collection: 0 items>	3	906.85	65
J-156	596.86	<None>	<Collection: 0 items>	2	728.22	57
J-157	594.11	<None>	<Collection: 0 items>	2	728.22	58
J-140	626.50	<None>	<Collection: 0 items>	4	764.89	60
J-155	585.28	<None>	<Collection: 0 items>	5	728.22	62
J-158	581.96	<None>	<Collection: 0 items>	4	728.22	63
J-145	637.56	<None>	<Collection: 0 items>	4	791.27	67
J-A/J2	727.00	<None>	<Collection: 0 items>	3	906.84	78
J-A/K	726.00	<None>	<Collection: 0 items>	5	906.85	78
J-144	627.84	<None>	<Collection: 0 items>	3	791.27	71
J-12	720.00	<None>	<Collection: 0 items>	3	906.84	81
J-C/E	563.00	<None>	<Collection: 0 items>	5	728.22	71
J-160	665.10	<None>	<Collection: 0 items>	4	832.27	72
J-143	712.42	<None>	<Collection: 0 items>	4	906.84	84
J-149	711.89	<None>	<Collection: 0 items>	3	906.84	84
J-154	659.39	<None>	<Collection: 0 items>	4	832.28	75
J-A/F	708.00	<None>	<Collection: 0 items>	3	906.84	86
J-B/F	588.00	<None>	<Collection: 0 items>	1	764.89	77

Clovewood - Steady State - Avg. Daily Demand

Junction Table - Time: 0.00 hours

Label	Elevation (ft)	Zone	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-M/I	627.00	<None>	<Collection: 0 items>	5	804.19	77
J-A/J	705.50	<None>	<Collection: 0 items>	4	906.84	87
J-159	651.90	<None>	<Collection: 0 items>	0	832.27	78
J-A/B	584.00	<None>	<Collection: 0 items>	3	764.89	78
J-B/E	580.00	<None>	<Collection: 0 items>	3	764.89	80
J-141	576.37	<None>	<Collection: 0 items>	3	764.89	82
J-A/H-2	576.00	<None>	<Collection: 0 items>	3	764.89	82
J-153	537.29	<None>	<Collection: 0 items>	4	728.22	83
J-A/I	690.00	<None>	<Collection: 0 items>	5	906.84	94
J-150	605.79	<None>	<Collection: 0 items>	4	804.19	86
J-A/H-1	559.00	<None>	<Collection: 0 items>	1	764.89	89
J-C/M	512.50	<None>	<Collection: 0 items>	2	728.22	93
J-B/C	615.00	<None>	<Collection: 0 items>	3	832.27	94
J-151	586.04	<None>	<Collection: 0 items>	0	804.19	94

Clovewood - Steady State - Avg. Daily Demand

Hydrant Table - Time: 0.00 hours

Label	Diameter (Hydrant Lateral) (in)	Include Hydrant Lateral Loss?	Length (Hydrant Lateral) (ft)	Elevation (ft)	Hydraulic Grade (ft)	Demand (gpm)	Pressure (psi)
L-3	6.0	True	20	794.00	906.92	0	49
J-3	6.0	True	20	789.50	906.84	0	51
L-2	6.0	True	20	782.00	906.88	2	54
J-4	6.0	True	20	772.00	906.84	1	58
A-5	6.0	True	20	649.00	764.90	4	50
F-5	6.0	True	20	675.00	791.28	0	50
G-1	6.0	True	20	671.00	791.28	0	52
I-4	6.0	True	20	683.00	804.19	3	52
F-4	6.0	True	20	667.50	791.28	0	54
J-2	6.0	True	20	758.00	906.84	2	64
K-1	6.0	True	20	756.00	906.88	0	65
E-2	6.0	True	20	597.00	728.22	0	57
C-3	6.0	True	20	595.00	728.23	3	58
E-3	6.0	True	20	594.00	728.22	2	58
C-6	6.0	True	20	696.00	832.29	3	59
E-4	6.0	True	20	586.50	728.22	2	61
H-3	6.0	True	20	622.00	764.89	2	62
J-5	6.0	True	20	740.50	906.84	2	72
E-5	6.0	True	20	580.00	728.22	2	64
E-1	6.0	True	20	579.50	728.22	0	64
A-10	6.0	True	20	733.00	906.85	0	75
L-1	6.0	True	20	729.50	906.86	3	77
B-6	6.0	True	20	675.00	832.27	1	68
B-4	6.0	True	20	606.50	764.89	0	69
C-2	6.0	True	20	568.50	728.22	2	69
A-9	6.0	True	20	724.50	906.84	1	79
F-2	6.0	True	20	629.00	791.27	2	70
A-14	6.0	True	20	721.00	906.84	0	80
F-3	6.0	True	20	627.50	791.27	3	71
H-4	6.0	True	20	601.00	764.89	0	71
A-4	6.0	True	20	601.00	764.90	2	71
C-5	6.0	True	20	668.00	832.28	1	71
A-7	6.0	True	20	720.00	906.84	0	81
J-1	6.0	True	20	718.00	906.84	1	82
A-8	6.0	True	20	714.50	906.84	2	83
I-3	6.0	True	20	632.00	804.19	2	74
A-11	6.0	True	20	712.00	906.85	0	84
B-2	6.0	True	20	590.50	764.89	2	75
H-2	6.0	True	20	589.50	764.89	4	76
B-5	6.0	True	20	655.50	832.27	1	76
B-3	6.0	True	20	586.50	764.89	1	77
B-1	6.0	True	20	586.00	764.89	0	77
A-6	6.0	True	20	704.00	906.84	2	88
A-2	6.0	True	20	584.00	764.89	0	78
A-3	6.0	True	20	583.00	764.89	0	79
A-12	6.0	True	20	702.50	906.84	0	88
A-13	6.0	True	20	701.00	906.84	0	89
F-1	6.0	True	20	607.00	791.27	1	80

Clovewood - Steady State - Avg. Daily Demand

Hydrant Table - Time: 0.00 hours

Label	Diameter (Hydrant Lateral) (in)	Include Hydrant Lateral Loss?	Length (Hydrant Lateral) (ft)	Elevation (ft)	Hydraulic Grade (ft)	Demand (gpm)	Pressure (psi)
I-2	6.0	True	20	619.00	804.19	0	80
B-7	6.0	True	20	641.50	832.27	0	83
M-1	6.0	True	20	533.00	728.22	0	84
A-1	6.0	True	20	565.00	764.89	0	86
H-1	6.0	True	20	564.50	764.89	2	87
I-1	6.0	True	20	603.00	804.19	0	87
C-1	6.0	True	20	522.50	728.22	2	89
C-4	6.0	True	20	626.50	832.28	0	89
M-2	6.0	True	20	588.00	804.19	0	94

Clovewood - Steady State - Avg. Daily Demand

PRV Table - Time: 0.00 hours

Label	Elevation (ft)	Diameter (Valve) (in)	Hydraulic Grade Setting (Initial) (ft)	Pressure Setting (Initial) (psi)	Flow (gpm)	Hydraulic Grade (From) (ft)	Hydraulic Grade (To) (ft)	Headloss (ft)
PRV-2	672.42	10.0	764.84	40	37	906.84	764.90	141.93
PRV-8	698.79	10.0	791.21	40	18	906.84	791.28	115.57
PRV-9	716.69	10.0	832.22	50	52	906.84	832.30	74.54
PRV-12	688.58	10.0	804.10	50	16	906.84	804.19	102.65
PRV-15	612.62	10.0	728.15	50	37	832.27	728.23	104.04

Isolation Valve Table - Time: 0.00 hours

Label	Is Operable?	Diameter (Valve) (in)	Referenced Pipe	Flow (gpm)	Hydraulic Grade (ft)	Velocity (ft/s)
ISO-1	True	10.0	P-10 WTR-55	45	832.28	0.18
ISO-2	True	10.0	P-10 WTR -43	0	(N/A)	0.00
ISO-3	True	10.0	P-10 WTR-52	4	728.22	0.02
ISO-4	True	10.0	P-10 WTR -25	0	(N/A)	0.00
ISO-9	True	10.0	P-10 WTR-64 (1)(2)	0	(N/A)	0.00
ISO-10	True	10.0	P-10 WTR -26	9	764.89	0.04
ISO-11	True	10.0	P-10 WTR -63 (1)(2)	0	(N/A)	0.00
ISO-12	True	10.0	P-10 WTR-53	34	728.22	0.14

Time (hours)	T-1 - Clovewood - Average Day - Diameter (ft)	T-1 - Clovewood - Average Day - Flow (Out net) (gpm)	T-1 - Clovewood - Average Day - Hydraulic Grade (ft)	T-1 - Clovewood - Average Day - Level (Calculated) (ft)	T-1 - Clovewood - Average Day - Percent Full (%)	T-1 - Clovewood - Average Day - Volume (Calculated) (MG)
0.00	48.00	190	907.00	27.00	95.7	0.30

Clovewood - Steady State - Peak Hourly Demand (Avg. x 5)

Scenario Summary	
ID	2344
Label	Res x5 Peak
Notes	
Active Topology	Base Active Topology
User Data Extensions	Base User Data Extensions
Physical	Base Physical
Demand	Res x5 peak
Initial Settings	Base Initial Settings
Operational	Base Operational
Age	Base Age
Constituent	Base Constituent
Trace	Base Trace
Fire Flow	Base Fire Flow
Energy Cost	Base Energy Cost
Pressure Dependent Demand	Base Pressure Dependent Demand
Transient	Base Transient
Failure History	Base Failure History
SCADA	Base SCADA
Steady State / EPS Solver Calculation Options	Base Calculation Options
Transient Solver Calculation Options	Base Calculation Options

Clovewood - Steady State - Peak Hourly Demand (Avg. x 5)

Network Inventory			
Pipe	110	Pump Station	0
Lateral	606	Variable Speed Pump Battery	0
Junction	40	SCADA Element	0
Hydrant	58	PRV	5
Tank	1	PSV	0
-Circular	1	PBV	0
-Non-Circular	0	FCV	0
-Variable Area	0	TCV	0
Reservoir	1	GPV	0
Tap	566	Isolation Valve	8
Pump	0	Spot Elevation	0
Customer Meter	606		

Clovewood - Steady State - Peak Hourly Demand (Avg. x 5)

Hydraulic Summary			
Time Analysis Type	Steady State	Simulation Start Date	1/1/2000
Friction Method	Hazen-Williams	Hydraulic Time Step	1.000
Accuracy	0.001	Duration	24.000
Trials	40	Calculation Type	Hydraulics Only

Clovewood - Steady State - Peak Hourly Demand (Avg. x 5)

Pressure Pipe Inventory

Diameter (in)	Length (PVC) (ft)	Length (All Materials) (ft)	Volume (MG)
10.0	29,026	29,026	0.12
12.0	926	926	0.01
All Diameters	29,952	29,952	0.12

Clovewood - Steady State - Peak Hourly Demand (Avg. x 5)

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)
P-10 WTR -82	30	J-A/H-2	A-3	10.0	PVC	150.0	-95	0.39
P-10 WTR -37	335	J-A/H-2	H-4	10.0	PVC	150.0	42	0.17
P-10 WTR -141	33	J-A/H-1	H-1	10.0	PVC	150.0	18	0.07
P-10 WTR -81	351	J-A/H-1	A-1	10.0	PVC	150.0	-22	0.09
P-10 WTR-49	41	J-C/E	C-2	10.0	PVC	150.0	50	0.21
P-10 WTR-53	380	J-C/E	C-3	10.0	PVC	150.0	-169	0.69
P-10 WTR -14	40	J-A/F	A-8	10.0	PVC	150.0	57	0.23
P-10 WTR -13	352	J-A/F	J-A/L	10.0	PVC	150.0	-159	0.65
P-10 WTR -21(1)	153	J-A/F	PRV-8	10.0	PVC	150.0	88	0.36
P-10 WTR-67	44	J-M/I	I-3	10.0	PVC	150.0	-52	0.21
P-10 WTR -8	55	J-A/K	A-10	10.0	PVC	150.0	238	0.97
P-10 WTR -5	60	J-K/L	L-3	10.0	PVC	150.0	-926	3.78
P-10 WTR -3(1)	335	J-K/L	J-138	10.0	PVC	150.0	498	2.03
P-10 WTR -12(1)	476	J-K/L	J-139	10.0	PVC	150.0	417	1.70
P-10 WTR -23	120	J-F/G	F-4	10.0	PVC	150.0	68	0.28
P-10 WTR -22	130	J-F/G	F-5	10.0	PVC	150.0	-88	0.36
P-10 WTR-55	140	J-B/C	C-4	10.0	PVC	150.0	-225	0.92
P-10 WTR -61	421	J-B/C	B-7	10.0	PVC	150.0	27	0.11
P-10 WTR -43	330	J-B/E	E-5	10.0	PVC	150.0	0	0.00
P-10 WTR -59	362	J-B/E	B-4	10.0	PVC	150.0	14	0.06
P-10 WTR -16	150	J-A/L	A-7	10.0	PVC	150.0	213	0.87
P-10 WTR -15	260	J-A/L	L-1	10.0	PVC	150.0	-385	1.57
P-10 WTR-52	290	J-C/M	M-1	10.0	PVC	150.0	19	0.08
P-10 WTR -26	170	J-A/B	B-1	10.0	PVC	150.0	47	0.19
P-10 WTR -31	255	J-A/B	A-4	10.0	PVC	150.0	-157	0.64
P-10 WTR -28	180	J-B/F	B-2	10.0	PVC	150.0	44	0.18
P-10 WTR -25	284	J-B/F	F-1	10.0	PVC	150.0	0	0.00
P-10 WTR-73	200	J-A/J	J-1	10.0	PVC	150.0	90	0.37
P-10 WTR-6	247	J-A/J	A-11	10.0	PVC	150.0	-223	0.91
P-10 WTR-11	340	J-A/J	A-12	10.0	PVC	150.0	110	0.45
P-10 WTR-72	200	J-A/I	A-13	10.0	PVC	150.0	7	0.03
P-10 WTR-76	219	J-A/J2	J-5	10.0	PVC	150.0	-24	0.10
P-10 WTR -142	264	A-3	J-A/B	10.0	PVC	150.0	-95	0.39
P-10 WTR -40	422	A-2	J-A/H-2	10.0	PVC	150.0	-38	0.16
P-10 WTR -39(1)	288	A-1	J-141	10.0	PVC	150.0	-22	0.09
P-10 WTR -38	487	H-2	H-1	10.0	PVC	150.0	-8	0.03
P-10 WTR -35	510	H-3	H-2	10.0	PVC	150.0	13	0.05
P-10 WTR -36(1)	22	H-3	J-140	10.0	PVC	150.0	-23	0.10
P-10 WTR -34(1)	232	A-7	J-143	10.0	PVC	150.0	213	0.87
P-10 WTR -24(1)	413	F-4	J-145	10.0	PVC	150.0	67	0.27
P-10 WTR -32	485	A-5	A-4	10.0	PVC	150.0	168	0.69
P-10 WTR -33(1)	234	A-5	PRV-2	10.0	PVC	150.0	-185	0.76
P-10 WTR -18	556	A-8	A-9	10.0	PVC	150.0	46	0.19
P-2	373	B-1	J-B/F	10.0	PVC	150.0	47	0.19
P-10 WTR -30	422	F-2	F-3	10.0	PVC	150.0	-31	0.12
P-10 WTR -29(1)	412	F-1	J-144	10.0	PVC	150.0	-6	0.02
P-10 WTR-69	360	A-12	J-A/I	10.0	PVC	150.0	109	0.45
P-10 WTR-78(1)	396	J-3	J-146	10.0	PVC	150.0	-57	0.23
P-10 WTR-75	259	A-14	J-A/J2	10.0	PVC	150.0	-10	0.04

Clovewood - Steady State - Peak Hourly Demand (Avg. x 5)

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)
P-10 WTR -17	570	L-2	L-1	10.0	PVC	150.0	398	1.63
P-10 WTR -4	600	L-3	J-76	12.0	PVC	150.0	-926	2.63
P-10 WTR-10	345	A-11	J-A/K	10.0	PVC	150.0	-223	0.91
P-10 WTR-74(1)	218	A-13	J-149	10.0	PVC	150.0	7	0.03
P-10 WTR -9	483	A-10	J-12	10.0	PVC	150.0	238	0.97
P-10 WTR-79	427	J-2	J-1	10.0	PVC	150.0	-84	0.34
P-10 WTR-77	456	J-5	J-4	10.0	PVC	150.0	-35	0.14
P-10 WTR -19	49	A-9	J-12	10.0	PVC	150.0	41	0.17
P-10 WTR -7	392	K-1	J-A/K	10.0	PVC	150.0	485	1.98
P-10 WTR-80(1)	324	J-4	J-148	10.0	PVC	150.0	-42	0.17
P-10 WTR -57	550	C-5	C-6	10.0	PVC	150.0	-246	1.01
P-10 WTR -42	145	B-3	J-B/E	10.0	PVC	150.0	29	0.12
P-10 WTR -62	420	B-5	B-6	10.0	PVC	150.0	-3	0.01
P-10 WTR -56(1)	366	C-4	J-154	10.0	PVC	150.0	-225	0.92
P-10 WTR -58(1)	359	C-6	PRV-9	10.0	PVC	150.0	-262	1.07
P-10 WTR -63(1)(1)	329	B-4	J-162	10.0	PVC	150.0	13	0.05
P-10 WTR -60(1)	163	B-6	J-160	10.0	PVC	150.0	-8	0.03
P-10 WTR -41	500	B-2	B-3	10.0	PVC	150.0	34	0.14
P-10 WTR -20	420	G-1	J-F/G	10.0	PVC	150.0	0	0.00
P-10 WTR-47(1)	388	E-2	J-155	10.0	PVC	150.0	-70	0.29
P-10 WTR -44(1)	151	E-5	J-158	10.0	PVC	150.0	-9	0.04
P-10 WTR-46(1)(1)	20	E-3	J-157	10.0	PVC	150.0	-49	0.20
P-10 WTR -48	410	E-1	J-C/E	10.0	PVC	150.0	-93	0.38
P-10 WTR-45	505	E-4	E-3	10.0	PVC	150.0	-40	0.16
P-10 WTR-54(1)	333	C-3	PRV-15	10.0	PVC	150.0	-183	0.75
P-10 WTR-51	152	C-1	J-C/M	10.0	PVC	150.0	29	0.12
P-10 WTR-64(1)(1)	44	M-1	J-153	10.0	PVC	150.0	18	0.07
P-10 WTR-68	548	M-2	J-M/I	10.0	PVC	150.0	-2	0.01
P-10 WTR-71(1)(1)	177	I-4	PRV-12	10.0	PVC	150.0	-78	0.32
P-10 WTR-70	580	I-3	I-4	10.0	PVC	150.0	-64	0.26
P-10 WTR-50	550	C-2	C-1	10.0	PVC	150.0	38	0.16
P-10 WTR-66	435	I-2	J-M/I	10.0	PVC	150.0	-23	0.09
P-10 WTR-65(1)	88	I-1	J-150	10.0	PVC	150.0	-2	0.01
P-10 WTR -3(2)	125	J-138	K-1	10.0	PVC	150.0	485	1.98
P-10 WTR -12(2)	48	J-139	L-2	10.0	PVC	150.0	408	1.67
P-10 WTR -36(2)	369	J-140	H-4	10.0	PVC	150.0	-42	0.17
P-10 WTR -39(2)	193	J-141	A-2	10.0	PVC	150.0	-38	0.16
P-10 WTR -34(2)	258	J-143	A-6	10.0	PVC	150.0	194	0.79
P-10 WTR -29(2)	23	J-144	F-2	10.0	PVC	150.0	-21	0.09
P-10 WTR -24(2)	139	J-145	F-3	10.0	PVC	150.0	46	0.19
P-10 WTR-78(2)	32	J-146	J-2	10.0	PVC	150.0	-74	0.30
P-10 WTR-80(2)	135	J-148	J-3	10.0	PVC	150.0	-57	0.23
P-10 WTR-74(2)	182	J-149	A-14	10.0	PVC	150.0	-9	0.04
P-10 WTR-65(2)	419	J-150	I-2	10.0	PVC	150.0	-23	0.09
P-10 WTR-64(2)	20	J-151	M-2	10.0	PVC	150.0	-2	0.01
P-10 WTR-64(1)(2)	496	J-153	J-151	10.0	PVC	150.0	0	0.00
P-10 WTR -56(2)	96	J-154	C-5	10.0	PVC	150.0	-243	0.99
P-10 WTR -47(2)	191	J-155	E-1	10.0	PVC	150.0	-93	0.38
P-10 WTR-46(2)	25	J-156	E-2	10.0	PVC	150.0	-70	0.29

Clovewood - Steady State - Peak Hourly Demand (Avg. x 5)

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)
P-10 WTR-46(1)(2)	505	J-157	J-156	10.0	PVC	150.0	-59	0.24
P-10 WTR -44(2)	349	J-158	E-4	10.0	PVC	150.0	-29	0.12
P-10 WTR -63(2)	36	J-159	B-5	10.0	PVC	150.0	0	0.00
P-10 WTR -60(2)	388	J-160	B-7	10.0	PVC	150.0	-27	0.11
P-10 WTR -33(2)	315	PRV-2	A-6	10.0	PVC	150.0	-185	0.76
P-10 WTR -21(2)	396	PRV-8	F-5	10.0	PVC	150.0	88	0.36
P-10 WTR -58(2)	57	PRV-9	J-12	10.0	PVC	150.0	-262	1.07
P-10 WTR-71(1)(2)	45	PRV-12	J-A/I	10.0	PVC	150.0	-78	0.32
P-10 WTR-54(2)	45	PRV-15	J-B/C	10.0	PVC	150.0	-183	0.75
P-10 WTR -63(1)(2)	126	J-162	J-159	10.0	PVC	150.0	0	0.00

Clovewood - Steady State - Peak Hourly Demand (Avg. x 5)

Junction Table - Time: 0.00 hours

Label	Elevation (ft)	Zone	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-76	825.00	<None>	<Collection: 0 items>	26	906.42	35
J-K/L	787.50	<None>	<Collection: 0 items>	11	905.17	51
J-148	784.36	<None>	<Collection: 0 items>	15	903.87	52
J-139	782.50	<None>	<Collection: 0 items>	9	904.72	53
J-138	764.58	<None>	<Collection: 0 items>	12	904.73	61
J-146	760.35	<None>	<Collection: 0 items>	18	903.88	62
J-F/G	666.00	<None>	<Collection: 0 items>	20	791.25	54
J-162	639.35	<None>	<Collection: 0 items>	13	764.71	54
J-A/L	756.50	<None>	<Collection: 0 items>	13	903.98	64
J-156	596.86	<None>	<Collection: 0 items>	11	728.05	57
J-157	594.11	<None>	<Collection: 0 items>	11	728.03	58
J-140	626.50	<None>	<Collection: 0 items>	18	764.70	60
J-155	585.28	<None>	<Collection: 0 items>	23	728.06	62
J-158	581.96	<None>	<Collection: 0 items>	20	728.03	63
J-145	637.56	<None>	<Collection: 0 items>	21	791.23	66
J-A/J2	727.00	<None>	<Collection: 0 items>	14	903.86	77
J-A/K	726.00	<None>	<Collection: 0 items>	24	904.09	77
J-144	627.84	<None>	<Collection: 0 items>	15	791.23	71
J-12	720.00	<None>	<Collection: 0 items>	17	903.91	80
J-C/E	563.00	<None>	<Collection: 0 items>	25	728.10	71
J-160	665.10	<None>	<Collection: 0 items>	19	831.78	72
J-143	712.42	<None>	<Collection: 0 items>	18	903.88	83
J-149	711.89	<None>	<Collection: 0 items>	16	903.86	83
J-154	659.39	<None>	<Collection: 0 items>	18	831.93	75
J-A/F	708.00	<None>	<Collection: 0 items>	14	903.92	85
J-B/F	588.00	<None>	<Collection: 0 items>	3	764.72	76

Clovewood - Steady State - Peak Hourly Demand (Avg. x 5)

Junction Table - Time: 0.00 hours

Label	Elevation (ft)	Zone	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-M/I	627.00	<None>	<Collection: 0 items>	27	804.16	77
J-A/J	705.50	<None>	<Collection: 0 items>	22	903.92	86
J-159	651.90	<None>	<Collection: 0 items>	0	831.78	78
J-A/B	584.00	<None>	<Collection: 0 items>	14	764.73	78
J-B/E	580.00	<None>	<Collection: 0 items>	15	764.71	80
J-141	576.37	<None>	<Collection: 0 items>	16	764.71	81
J-A/H-2	576.00	<None>	<Collection: 0 items>	15	764.71	82
J-153	537.29	<None>	<Collection: 0 items>	18	728.09	83
J-A/I	690.00	<None>	<Collection: 0 items>	24	903.86	93
J-150	605.79	<None>	<Collection: 0 items>	21	804.16	86
J-A/H-1	559.00	<None>	<Collection: 0 items>	5	764.70	89
J-C/M	512.50	<None>	<Collection: 0 items>	10	728.09	93
J-B/C	615.00	<None>	<Collection: 0 items>	15	831.78	94
J-151	586.04	<None>	<Collection: 0 items>	2	804.16	94

Clovewood - Steady State - Peak Hourly Demand (Avg. x 5)

Hydrant Table - Time: 0.00 hours

Label	Diameter (Hydrant Lateral) (in)	Include Hydrant Lateral Loss?	Length (Hydrant Lateral) (ft)	Elevation (ft)	Hydraulic Grade (ft)	Demand (gpm)	Pressure (psi)
L-3	6.0	True	20	794.00	905.41	0	48
J-3	6.0	True	20	789.50	903.87	0	49
L-2	6.0	True	20	782.00	904.68	10	53
J-4	6.0	True	20	772.00	903.87	7	57
A-5	6.0	True	20	649.00	764.85	18	50
F-5	6.0	True	20	675.00	791.26	0	50
G-1	6.0	True	20	671.00	791.25	0	52
I-4	6.0	True	20	683.00	804.18	14	52
F-4	6.0	True	20	667.50	791.25	1	54
J-2	6.0	True	20	758.00	903.88	10	63
K-1	6.0	True	20	756.00	904.58	0	64
E-2	6.0	True	20	597.00	728.05	0	57
C-3	6.0	True	20	595.00	728.16	14	58
E-3	6.0	True	20	594.00	728.03	9	58
C-6	6.0	True	20	696.00	832.16	15	59
E-4	6.0	True	20	586.50	728.03	11	61
H-3	6.0	True	20	622.00	764.70	11	62
J-5	6.0	True	20	740.50	903.86	11	71
E-5	6.0	True	20	580.00	728.03	9	64
E-1	6.0	True	20	579.50	728.07	0	64
A-10	6.0	True	20	733.00	904.07	0	74
L-1	6.0	True	20	729.50	904.19	14	76
B-6	6.0	True	20	675.00	831.78	5	68
B-4	6.0	True	20	606.50	764.71	1	68
C-2	6.0	True	20	568.50	728.10	12	69
A-9	6.0	True	20	724.50	903.91	5	78
F-2	6.0	True	20	629.00	791.23	9	70
A-14	6.0	True	20	721.00	903.86	1	79
F-3	6.0	True	20	627.50	791.23	16	71
H-4	6.0	True	20	601.00	764.71	0	71
A-4	6.0	True	20	601.00	764.77	11	71
C-5	6.0	True	20	668.00	831.97	3	71
A-7	6.0	True	20	720.00	903.94	0	80
J-1	6.0	True	20	718.00	903.91	6	80
A-8	6.0	True	20	714.50	903.92	11	82
I-3	6.0	True	20	632.00	804.16	12	74
A-11	6.0	True	20	712.00	903.99	1	83
B-2	6.0	True	20	590.50	764.72	11	75
H-2	6.0	True	20	589.50	764.70	21	76
B-5	6.0	True	20	655.50	831.78	3	76
B-3	6.0	True	20	586.50	764.71	5	77
B-1	6.0	True	20	586.00	764.73	0	77
A-6	6.0	True	20	704.00	903.82	9	86
A-2	6.0	True	20	584.00	764.71	0	78
A-3	6.0	True	20	583.00	764.71	0	79
A-12	6.0	True	20	702.50	903.89	1	87
A-13	6.0	True	20	701.00	903.86	0	88
F-1	6.0	True	20	607.00	791.23	6	80

Clovewood - Steady State - Peak Hourly Demand (Avg. x 5)

Hydrant Table - Time: 0.00 hours

Label	Diameter (Hydrant Lateral) (in)	Include Hydrant Lateral Loss?	Length (Hydrant Lateral) (ft)	Elevation (ft)	Hydraulic Grade (ft)	Demand (gpm)	Pressure (psi)
I-2	6.0	True	20	619.00	804.16	0	80
B-7	6.0	True	20	641.50	831.78	0	82
M-1	6.0	True	20	533.00	728.09	1	84
A-1	6.0	True	20	565.00	764.70	0	86
H-1	6.0	True	20	564.50	764.70	10	87
I-1	6.0	True	20	603.00	804.16	2	87
C-1	6.0	True	20	522.50	728.09	9	89
C-4	6.0	True	20	626.50	831.82	0	89
M-2	6.0	True	20	588.00	804.16	0	94

Clovewood - Steady State - Peak Hourly Demand (Avg. x 5)

PRV Table - Time: 0.00 hours

Label	Elevation (ft)	Diameter (Valve) (in)	Hydraulic Grade Setting (Initial) (ft)	Pressure Setting (Initial) (psi)	Flow (gpm)	Hydraulic Grade (From) (ft)	Hydraulic Grade (To) (ft)	Headloss (ft)
PRV-2	672.42	10.0	764.84	40	185	903.75	764.90	138.85
PRV-8	698.79	10.0	791.21	40	88	903.92	791.28	112.64
PRV-9	716.69	10.0	832.22	50	262	903.89	832.30	71.59
PRV-12	688.58	10.0	804.10	50	78	903.86	804.19	99.67
PRV-15	612.62	10.0	728.15	50	183	831.77	728.23	103.54

Isolation Valve Table - Time: 0.00 hours

Label	Is Operable?	Diameter (Valve) (in)	Referenced Pipe	Flow (gpm)	Hydraulic Grade (ft)	Velocity (ft/s)
ISO-1	True	10.0	P-10 WTR-55	225	831.80	0.92
ISO-2	True	10.0	P-10 WTR -43	0	(N/A)	0.00
ISO-3	True	10.0	P-10 WTR-52	19	728.09	0.08
ISO-4	True	10.0	P-10 WTR -25	0	(N/A)	0.00
ISO-9	True	10.0	P-10 WTR-64 (1)(2)	0	(N/A)	0.00
ISO-10	True	10.0	P-10 WTR -26	47	764.73	0.19
ISO-11	True	10.0	P-10 WTR -63 (1)(2)	0	(N/A)	0.00
ISO-12	True	10.0	P-10 WTR-53	169	728.11	0.69

Time (hours)	T-1 - Res x5 Peak - Diameter (ft)	T-1 - Res x5 Peak - Flow (Out net) (gpm)	T-1 - Res x5 Peak - Hydraulic Grade (ft)	T-1 - Res x5 Peak - Level (Calculated) (ft)	T-1 - Res x5 Peak - Percent Full (%)	T-1 - Res x5 Peak - Volume (Calculated) (MG)
0.00	48.00	951	907.00	27.00	95.7	0.30

Clovewood - Max Day + 1000 GPM @ Hydrant L-4 (Highest)

Hydrant Table - Time: 0.00 hours

Label	Diameter (Hydrant Lateral) (in)	Include Hydrant Lateral Loss?	Length (Hydrant Lateral) (ft)	Elevation (ft)	Hydraulic Grade (ft)	Demand (gpm)	Pressure (psi)
L-4	6.0	True	20	828.81	882.65	1,000	23
L-3	6.0	True	20	794.00	884.74	0	39
J-3	6.0	True	20	789.50	884.46	0	41
L-2	6.0	True	20	782.00	884.60	4	44
J-4	6.0	True	20	772.00	884.45	3	49
A-5	6.0	True	20	649.00	764.89	7	50
F-5	6.0	True	20	675.00	791.27	0	50
G-1	6.0	True	20	671.00	791.27	0	52
I-4	6.0	True	20	683.00	804.19	5	52
F-4	6.0	True	20	667.50	791.27	0	54
J-2	6.0	True	20	758.00	884.46	4	55
K-1	6.0	True	20	756.00	884.58	0	56
E-2	6.0	True	20	597.00	728.20	0	57
C-3	6.0	True	20	595.00	728.22	6	58
E-3	6.0	True	20	594.00	728.19	4	58
C-6	6.0	True	20	696.00	832.27	6	59
E-4	6.0	True	20	586.50	728.19	4	61
H-3	6.0	True	20	622.00	764.87	4	62
J-5	6.0	True	20	740.50	884.45	4	62
E-5	6.0	True	20	580.00	728.19	4	64
E-1	6.0	True	20	579.50	728.20	0	64
A-10	6.0	True	20	733.00	884.49	0	66
L-1	6.0	True	20	729.50	884.51	5	67
B-6	6.0	True	20	675.00	832.21	2	68
B-4	6.0	True	20	606.50	764.87	0	69
C-2	6.0	True	20	568.50	728.21	5	69
A-9	6.0	True	20	724.50	884.46	2	69
F-2	6.0	True	20	629.00	791.27	4	70
A-14	6.0	True	20	721.00	884.45	0	71
F-3	6.0	True	20	627.50	791.27	6	71
H-4	6.0	True	20	601.00	764.87	0	71
A-4	6.0	True	20	601.00	764.88	4	71
C-5	6.0	True	20	668.00	832.24	1	71
A-7	6.0	True	20	720.00	884.47	0	71
J-1	6.0	True	20	718.00	884.46	2	72
A-8	6.0	True	20	714.50	884.46	5	74
I-3	6.0	True	20	632.00	804.18	5	74
A-11	6.0	True	20	712.00	884.48	0	75
B-2	6.0	True	20	590.50	764.87	4	75
H-2	6.0	True	20	589.50	764.87	8	76
B-5	6.0	True	20	655.50	832.21	1	76
B-3	6.0	True	20	586.50	764.87	2	77
B-1	6.0	True	20	586.00	764.87	0	77
A-6	6.0	True	20	704.00	884.45	4	78
A-2	6.0	True	20	584.00	764.87	0	78
A-3	6.0	True	20	583.00	764.87	0	79
A-12	6.0	True	20	702.50	884.46	0	79
A-13	6.0	True	20	701.00	884.45	0	79

Clovewood - Max Day + 1000 GPM @ Hydrant L-4 (Highest)

Hydrant Table - Time: 0.00 hours

Label	Diameter (Hydrant Lateral) (in)	Include Hydrant Lateral Loss?	Length (Hydrant Lateral) (ft)	Elevation (ft)	Hydraulic Grade (ft)	Demand (gpm)	Pressure (psi)
F-1	6.0	True	20	607.00	791.27	2	80
I-2	6.0	True	20	619.00	804.18	0	80
B-7	6.0	True	20	641.50	832.21	0	83
M-1	6.0	True	20	533.00	728.20	0	84
A-1	6.0	True	20	565.00	764.87	0	86
H-1	6.0	True	20	564.50	764.87	4	87
I-1	6.0	True	20	603.00	804.18	1	87
C-1	6.0	True	20	522.50	728.20	4	89
C-4	6.0	True	20	626.50	832.21	0	89
M-2	6.0	True	20	588.00	804.18	0	94

Clovewood - Max Day + 1000 GPM @ Hydrant L-4 (Highest)

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)
P-10 WTR -82	30	J-A/H-2	A-3	10.0	PVC	150.0	-38	0.16
P-10 WTR -37	335	J-A/H-2	H-4	10.0	PVC	150.0	17	0.07
P-10 WTR -141	33	J-A/H-1	H-1	10.0	PVC	150.0	7	0.03
P-10 WTR -81	351	J-A/H-1	A-1	10.0	PVC	150.0	-9	0.04
P-10 WTR-49	41	J-C/E	C-2	10.0	PVC	150.0	20	0.08
P-10 WTR-53	380	J-C/E	C-3	10.0	PVC	150.0	-67	0.28
P-10 WTR -14	40	J-A/F	A-8	10.0	PVC	150.0	23	0.09
P-10 WTR -13	352	J-A/F	J-A/L	10.0	PVC	150.0	-64	0.26
P-10 WTR -21(1)	153	J-A/F	PRV-8	10.0	PVC	150.0	35	0.14
P-10 WTR-67	44	J-M/I	I-3	10.0	PVC	150.0	-21	0.08
P-10 WTR -8	55	J-A/K	A-10	10.0	PVC	150.0	95	0.39
P-10 WTR -5	60	J-K/L	L-3	10.0	PVC	150.0	-370	1.51
P-10 WTR -3(1)	335	J-K/L	J-138	10.0	PVC	150.0	199	0.81
P-10 WTR -12(1)	476	J-K/L	J-139	10.0	PVC	150.0	167	0.68
P-10 WTR -23	120	J-F/G	F-4	10.0	PVC	150.0	27	0.11
P-10 WTR -22	130	J-F/G	F-5	10.0	PVC	150.0	-35	0.14
P-10 WTR-55	140	J-B/C	C-4	10.0	PVC	150.0	-90	0.37
P-10 WTR -61	421	J-B/C	B-7	10.0	PVC	150.0	11	0.04
P-10 WTR -43	330	J-B/E	E-5	10.0	PVC	150.0	0	0.00
P-10 WTR -59	362	J-B/E	B-4	10.0	PVC	150.0	5	0.02
P-10 WTR -16	150	J-A/L	A-7	10.0	PVC	150.0	85	0.35
P-10 WTR -15	260	J-A/L	L-1	10.0	PVC	150.0	-154	0.63
P-10 WTR-52	290	J-C/M	M-1	10.0	PVC	150.0	8	0.03
P-10 WTR -26	170	J-A/B	B-1	10.0	PVC	150.0	19	0.08
P-10 WTR -31	255	J-A/B	A-4	10.0	PVC	150.0	-63	0.26
P-10 WTR -28	180	J-B/F	B-2	10.0	PVC	150.0	18	0.07
P-10 WTR -25	284	J-B/F	F-1	10.0	PVC	150.0	0	0.00
P-10 WTR-73	200	J-A/J	J-1	10.0	PVC	150.0	36	0.15
P-10 WTR-6	247	J-A/J	A-11	10.0	PVC	150.0	-89	0.36
P-10 WTR-11	340	J-A/J	A-12	10.0	PVC	150.0	44	0.18
P-10 WTR-72	200	J-A/I	A-13	10.0	PVC	150.0	3	0.01
P-10 WTR-76	219	J-A/J2	J-5	10.0	PVC	150.0	-10	0.04
P-1(1)	23	J-76	L-4	12.0	PVC	150.0	-381	1.08
P-10 WTR -142	264	A-3	J-A/B	10.0	PVC	150.0	-38	0.16
P-10 WTR -40	422	A-2	J-A/H-2	10.0	PVC	150.0	-15	0.06
P-10 WTR -39(1)	288	A-1	J-141	10.0	PVC	150.0	-9	0.04
P-10 WTR -38	487	H-2	H-1	10.0	PVC	150.0	-3	0.01
P-10 WTR -35	510	H-3	H-2	10.0	PVC	150.0	5	0.02
P-10 WTR -36(1)	22	H-3	J-140	10.0	PVC	150.0	-9	0.04
P-10 WTR -34(1)	232	A-7	J-143	10.0	PVC	150.0	85	0.35
P-10 WTR -24(1)	413	F-4	J-145	10.0	PVC	150.0	27	0.11
P-10 WTR -32	485	A-5	A-4	10.0	PVC	150.0	67	0.27
P-10 WTR -33(1)	234	A-5	PRV-2	10.0	PVC	150.0	-74	0.30
P-10 WTR -18	556	A-8	A-9	10.0	PVC	150.0	18	0.08
P-2	373	B-1	J-B/F	10.0	PVC	150.0	19	0.08
P-10 WTR -30	422	F-2	F-3	10.0	PVC	150.0	-12	0.05
P-10 WTR -29(1)	412	F-1	J-144	10.0	PVC	150.0	-2	0.01
P-10 WTR-69	360	A-12	J-A/I	10.0	PVC	150.0	44	0.18
P-10 WTR-78(1)	396	J-3	J-146	10.0	PVC	150.0	-23	0.09

Clovewood - Max Day + 1000 GPM @ Hydrant L-4 (Highest)

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)
P-10 WTR-75	259	A-14	J-A/J2	10.0	PVC	150.0	-4	0.02
P-10 WTR -17	570	L-2	L-1	10.0	PVC	150.0	159	0.65
P-10 WTR -4	600	L-3	J-76	12.0	PVC	150.0	-370	1.05
P-10 WTR-10	345	A-11	J-A/K	10.0	PVC	150.0	-89	0.37
P-10 WTR-74(1)	218	A-13	J-149	10.0	PVC	150.0	3	0.01
P-10 WTR -9	483	A-10	J-12	10.0	PVC	150.0	95	0.39
P-10 WTR-79	427	J-2	J-1	10.0	PVC	150.0	-34	0.14
P-10 WTR-77	456	J-5	J-4	10.0	PVC	150.0	-14	0.06
P-10 WTR -19	49	A-9	J-12	10.0	PVC	150.0	16	0.07
P-10 WTR -7	392	K-1	J-A/K	10.0	PVC	150.0	194	0.79
P-10 WTR-80(1)	324	J-4	J-148	10.0	PVC	150.0	-17	0.07
P-10 WTR -57	550	C-5	C-6	10.0	PVC	150.0	-99	0.40
P-10 WTR -42	145	B-3	J-B/E	10.0	PVC	150.0	12	0.05
P-10 WTR -62	420	B-5	B-6	10.0	PVC	150.0	-1	0.00
P-10 WTR -56(1)	366	C-4	J-154	10.0	PVC	150.0	-90	0.37
P-10 WTR -58(1)	359	C-6	PRV-9	10.0	PVC	150.0	-105	0.43
P-10 WTR -63(1)(1)	329	B-4	J-162	10.0	PVC	150.0	5	0.02
P-10 WTR -60(1)	163	B-6	J-160	10.0	PVC	150.0	-3	0.01
P-10 WTR -41	500	B-2	B-3	10.0	PVC	150.0	13	0.05
P-10 WTR -20	420	G-1	J-F/G	10.0	PVC	150.0	0	0.00
P-10 WTR-47(1)	388	E-2	J-155	10.0	PVC	150.0	-28	0.11
P-10 WTR -44(1)	151	E-5	J-158	10.0	PVC	150.0	-4	0.01
P-10 WTR-46(1)(1)	20	E-3	J-157	10.0	PVC	150.0	-20	0.08
P-10 WTR -48	410	E-1	J-C/E	10.0	PVC	150.0	-37	0.15
P-10 WTR-45	505	E-4	E-3	10.0	PVC	150.0	-16	0.06
P-10 WTR-54(1)	333	C-3	PRV-15	10.0	PVC	150.0	-73	0.30
P-10 WTR-51	152	C-1	J-C/M	10.0	PVC	150.0	12	0.05
P-10 WTR-64(1)(1)	44	M-1	J-153	10.0	PVC	150.0	7	0.03
P-10 WTR-68	548	M-2	J-M/I	10.0	PVC	150.0	-1	0.00
P-10 WTR-71(1)(1)	177	I-4	PRV-12	10.0	PVC	150.0	-31	0.13
P-10 WTR-70	580	I-3	I-4	10.0	PVC	150.0	-26	0.10
P-10 WTR-50	550	C-2	C-1	10.0	PVC	150.0	15	0.06
P-10 WTR-66	435	I-2	J-M/I	10.0	PVC	150.0	-9	0.04
P-10 WTR-65(1)	88	I-1	J-150	10.0	PVC	150.0	-1	0.00
P-10 WTR -3(2)	125	J-138	K-1	10.0	PVC	150.0	194	0.79
P-10 WTR -12(2)	48	J-139	L-2	10.0	PVC	150.0	163	0.67
P-10 WTR -36(2)	369	J-140	H-4	10.0	PVC	150.0	-17	0.07
P-10 WTR -39(2)	193	J-141	A-2	10.0	PVC	150.0	-15	0.06
P-10 WTR -34(2)	258	J-143	A-6	10.0	PVC	150.0	78	0.32
P-10 WTR -29(2)	23	J-144	F-2	10.0	PVC	150.0	-9	0.03
P-10 WTR -24(2)	139	J-145	F-3	10.0	PVC	150.0	19	0.08
P-10 WTR-78(2)	32	J-146	J-2	10.0	PVC	150.0	-30	0.12
P-10 WTR-80(2)	135	J-148	J-3	10.0	PVC	150.0	-23	0.09
P-10 WTR-74(2)	182	J-149	A-14	10.0	PVC	150.0	-4	0.01
P-10 WTR-65(2)	419	J-150	I-2	10.0	PVC	150.0	-9	0.04
P-10 WTR-64(2)	20	J-151	M-2	10.0	PVC	150.0	-1	0.00
P-10 WTR-64(1)(2)	496	J-153	J-151	10.0	PVC	150.0	0	0.00
P-10 WTR -56(2)	96	J-154	C-5	10.0	PVC	150.0	-97	0.40
P-10 WTR -47(2)	191	J-155	E-1	10.0	PVC	150.0	-37	0.15

Clovewood - Max Day + 1000 GPM @ Hydrant L-4 (Highest)

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)
P-10 WTR-46(2)	25	J-156	E-2	10.0	PVC	150.0	-28	0.11
P-10 WTR-46(1)(2)	505	J-157	J-156	10.0	PVC	150.0	-24	0.10
P-10 WTR -44(2)	349	J-158	E-4	10.0	PVC	150.0	-12	0.05
P-10 WTR -63(2)	36	J-159	B-5	10.0	PVC	150.0	0	0.00
P-10 WTR -60(2)	388	J-160	B-7	10.0	PVC	150.0	-11	0.04
P-10 WTR -33(2)	315	PRV-2	A-6	10.0	PVC	150.0	-74	0.30
P-10 WTR -21(2)	396	PRV-8	F-5	10.0	PVC	150.0	35	0.14
P-10 WTR -58(2)	57	PRV-9	J-12	10.0	PVC	150.0	-105	0.43
P-10 WTR-71(1)(2)	45	PRV-12	J-A/I	10.0	PVC	150.0	-31	0.13
P-10 WTR-54(2)	45	PRV-15	J-B/C	10.0	PVC	150.0	-73	0.30
P-10 WTR -63(1)(2)	126	J-162	J-159	10.0	PVC	150.0	0	0.00
P-1(2)	303	L-4	T-1	12.0	PVC	150.0	-1,381	3.92

Clovewood - Max Day + 1000 GPM @ Hydrant J-3 (Highest South)

Hydrant Table - Time: 0.00 hours

Label	Diameter (Hydrant Lateral) (in)	Include Hydrant Lateral Loss?	Length (Hydrant Lateral) (ft)	Elevation (ft)	Hydraulic Grade (ft)	Demand (gpm)	Pressure (psi)
L-4	6.0	True	20	828.81	884.93	0	24
L-3	6.0	True	20	794.00	882.76	0	38
J-3	6.0	True	20	789.50	871.55	1,000	35
L-2	6.0	True	20	782.00	881.51	4	43
J-4	6.0	True	20	772.00	874.17	3	44
A-5	6.0	True	20	649.00	764.89	7	50
F-5	6.0	True	20	675.00	791.27	0	50
G-1	6.0	True	20	671.00	791.27	0	52
I-4	6.0	True	20	683.00	804.19	5	52
F-4	6.0	True	20	667.50	791.27	0	54
J-2	6.0	True	20	758.00	874.71	4	50
K-1	6.0	True	20	756.00	880.67	0	54
E-2	6.0	True	20	597.00	728.20	0	57
C-3	6.0	True	20	595.00	728.22	6	58
E-3	6.0	True	20	594.00	728.19	4	58
C-6	6.0	True	20	696.00	832.27	6	59
E-4	6.0	True	20	586.50	728.19	4	61
H-3	6.0	True	20	622.00	764.87	4	62
J-5	6.0	True	20	740.50	874.51	4	58
E-5	6.0	True	20	580.00	728.19	4	64
E-1	6.0	True	20	579.50	728.20	0	64
A-10	6.0	True	20	733.00	879.35	0	63
L-1	6.0	True	20	729.50	880.72	5	65
B-6	6.0	True	20	675.00	832.21	2	68
B-4	6.0	True	20	606.50	764.87	0	69
C-2	6.0	True	20	568.50	728.21	5	69
A-9	6.0	True	20	724.50	879.58	2	67
F-2	6.0	True	20	629.00	791.27	4	70
A-14	6.0	True	20	721.00	874.88	0	67
F-3	6.0	True	20	627.50	791.27	6	71
H-4	6.0	True	20	601.00	764.87	0	71
A-4	6.0	True	20	601.00	764.88	4	71
C-5	6.0	True	20	668.00	832.24	1	71
A-7	6.0	True	20	720.00	880.36	0	69
J-1	6.0	True	20	718.00	875.62	2	68
A-8	6.0	True	20	714.50	880.00	5	72
I-3	6.0	True	20	632.00	804.18	5	74
A-11	6.0	True	20	712.00	877.42	0	72
B-2	6.0	True	20	590.50	764.87	4	75
H-2	6.0	True	20	589.50	764.87	8	76
B-5	6.0	True	20	655.50	832.21	1	76
B-3	6.0	True	20	586.50	764.87	2	77
B-1	6.0	True	20	586.00	764.87	0	77
A-6	6.0	True	20	704.00	880.34	4	76
A-2	6.0	True	20	584.00	764.87	0	78
A-3	6.0	True	20	583.00	764.87	0	79
A-12	6.0	True	20	702.50	875.72	0	75
A-13	6.0	True	20	701.00	875.20	0	75

Clovewood - Max Day + 1000 GPM @ Hydrant J-3 (Highest South)

Hydrant Table - Time: 0.00 hours

Label	Diameter (Hydrant Lateral) (in)	Include Hydrant Lateral Loss?	Length (Hydrant Lateral) (ft)	Elevation (ft)	Hydraulic Grade (ft)	Demand (gpm)	Pressure (psi)
F-1	6.0	True	20	607.00	791.27	2	80
I-2	6.0	True	20	619.00	804.18	0	80
B-7	6.0	True	20	641.50	832.21	0	83
M-1	6.0	True	20	533.00	728.20	0	84
A-1	6.0	True	20	565.00	764.87	0	86
H-1	6.0	True	20	564.50	764.87	4	87
I-1	6.0	True	20	603.00	804.18	1	87
C-1	6.0	True	20	522.50	728.20	4	89
C-4	6.0	True	20	626.50	832.21	0	89
M-2	6.0	True	20	588.00	804.18	0	94

Clovewood - Max Day + 1000 GPM @ Hydrant J-3 (Highest South)

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)
P-10 WTR -82	30	J-A/H-2	A-3	10.0	PVC	150.0	-38	0.16
P-10 WTR -37	335	J-A/H-2	H-4	10.0	PVC	150.0	17	0.07
P-10 WTR -141	33	J-A/H-1	H-1	10.0	PVC	150.0	7	0.03
P-10 WTR -81	351	J-A/H-1	A-1	10.0	PVC	150.0	-9	0.04
P-10 WTR-49	41	J-C/E	C-2	10.0	PVC	150.0	20	0.08
P-10 WTR-53	380	J-C/E	C-3	10.0	PVC	150.0	-67	0.28
P-10 WTR -14	40	J-A/F	A-8	10.0	PVC	150.0	379	1.55
P-10 WTR -13	352	J-A/F	J-A/L	10.0	PVC	150.0	-419	1.71
P-10 WTR -21(1)	153	J-A/F	PRV-8	10.0	PVC	150.0	35	0.14
P-10 WTR-67	44	J-M/I	I-3	10.0	PVC	150.0	-21	0.08
P-10 WTR -8	55	J-A/K	A-10	10.0	PVC	150.0	-261	1.06
P-10 WTR -5	60	J-K/L	L-3	10.0	PVC	150.0	-1,370	5.60
P-10 WTR -3(1)	335	J-K/L	J-138	10.0	PVC	150.0	843	3.45
P-10 WTR -12(1)	476	J-K/L	J-139	10.0	PVC	150.0	522	2.13
P-10 WTR -23	120	J-F/G	F-4	10.0	PVC	150.0	27	0.11
P-10 WTR -22	130	J-F/G	F-5	10.0	PVC	150.0	-35	0.14
P-10 WTR-55	140	J-B/C	C-4	10.0	PVC	150.0	-90	0.37
P-10 WTR -61	421	J-B/C	B-7	10.0	PVC	150.0	11	0.04
P-10 WTR -43	330	J-B/E	E-5	10.0	PVC	150.0	0	0.00
P-10 WTR -59	362	J-B/E	B-4	10.0	PVC	150.0	5	0.02
P-10 WTR -16	150	J-A/L	A-7	10.0	PVC	150.0	85	0.35
P-10 WTR -15	260	J-A/L	L-1	10.0	PVC	150.0	-509	2.08
P-10 WTR-52	290	J-C/M	M-1	10.0	PVC	150.0	8	0.03
P-10 WTR -26	170	J-A/B	B-1	10.0	PVC	150.0	19	0.08
P-10 WTR -31	255	J-A/B	A-4	10.0	PVC	150.0	-63	0.26
P-10 WTR -28	180	J-B/F	B-2	10.0	PVC	150.0	18	0.07
P-10 WTR -25	284	J-B/F	F-1	10.0	PVC	150.0	0	0.00
P-10 WTR-73	200	J-A/J	J-1	10.0	PVC	150.0	652	2.66
P-10 WTR-6	247	J-A/J	A-11	10.0	PVC	150.0	-1,089	4.45
P-10 WTR-11	340	J-A/J	A-12	10.0	PVC	150.0	428	1.75
P-10 WTR-72	200	J-A/I	A-13	10.0	PVC	150.0	387	1.58
P-10 WTR-76	219	J-A/J2	J-5	10.0	PVC	150.0	374	1.53
P-1(1)	23	J-76	L-4	12.0	PVC	150.0	-1,381	3.92
P-10 WTR -142	264	A-3	J-A/B	10.0	PVC	150.0	-38	0.16
P-10 WTR -40	422	A-2	J-A/H-2	10.0	PVC	150.0	-15	0.06
P-10 WTR -39(1)	288	A-1	J-141	10.0	PVC	150.0	-9	0.04
P-10 WTR -38	487	H-2	H-1	10.0	PVC	150.0	-3	0.01
P-10 WTR -35	510	H-3	H-2	10.0	PVC	150.0	5	0.02
P-10 WTR -36(1)	22	H-3	J-140	10.0	PVC	150.0	-9	0.04
P-10 WTR -34(1)	232	A-7	J-143	10.0	PVC	150.0	85	0.35
P-10 WTR -24(1)	413	F-4	J-145	10.0	PVC	150.0	27	0.11
P-10 WTR -32	485	A-5	A-4	10.0	PVC	150.0	67	0.27
P-10 WTR -33(1)	234	A-5	PRV-2	10.0	PVC	150.0	-74	0.30
P-10 WTR -18	556	A-8	A-9	10.0	PVC	150.0	374	1.53
P-2	373	B-1	J-B/F	10.0	PVC	150.0	19	0.08
P-10 WTR -30	422	F-2	F-3	10.0	PVC	150.0	-12	0.05
P-10 WTR -29(1)	412	F-1	J-144	10.0	PVC	150.0	-2	0.01
P-10 WTR-69	360	A-12	J-A/I	10.0	PVC	150.0	428	1.75
P-10 WTR-78(1)	396	J-3	J-146	10.0	PVC	150.0	-639	2.61

Clovewood - Max Day + 1000 GPM @ Hydrant J-3 (Highest South)

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)
P-10 WTR-75	259	A-14	J-A/J2	10.0	PVC	150.0	380	1.55
P-10 WTR -17	570	L-2	L-1	10.0	PVC	150.0	515	2.10
P-10 WTR -4	600	L-3	J-76	12.0	PVC	150.0	-1,370	3.89
P-10 WTR-10	345	A-11	J-A/K	10.0	PVC	150.0	-1,089	4.45
P-10 WTR-74(1)	218	A-13	J-149	10.0	PVC	150.0	387	1.58
P-10 WTR -9	483	A-10	J-12	10.0	PVC	150.0	-261	1.06
P-10 WTR-79	427	J-2	J-1	10.0	PVC	150.0	-650	2.65
P-10 WTR-77	456	J-5	J-4	10.0	PVC	150.0	370	1.51
P-10 WTR -19	49	A-9	J-12	10.0	PVC	150.0	372	1.52
P-10 WTR -7	392	K-1	J-A/K	10.0	PVC	150.0	839	3.43
P-10 WTR-80(1)	324	J-4	J-148	10.0	PVC	150.0	367	1.50
P-10 WTR -57	550	C-5	C-6	10.0	PVC	150.0	-99	0.40
P-10 WTR -42	145	B-3	J-B/E	10.0	PVC	150.0	12	0.05
P-10 WTR -62	420	B-5	B-6	10.0	PVC	150.0	-1	0.00
P-10 WTR -56(1)	366	C-4	J-154	10.0	PVC	150.0	-90	0.37
P-10 WTR -58(1)	359	C-6	PRV-9	10.0	PVC	150.0	-105	0.43
P-10 WTR -63(1)(1)	329	B-4	J-162	10.0	PVC	150.0	5	0.02
P-10 WTR -60(1)	163	B-6	J-160	10.0	PVC	150.0	-3	0.01
P-10 WTR -41	500	B-2	B-3	10.0	PVC	150.0	13	0.05
P-10 WTR -20	420	G-1	J-F/G	10.0	PVC	150.0	0	0.00
P-10 WTR-47(1)	388	E-2	J-155	10.0	PVC	150.0	-28	0.11
P-10 WTR -44(1)	151	E-5	J-158	10.0	PVC	150.0	-4	0.01
P-10 WTR-46(1)(1)	20	E-3	J-157	10.0	PVC	150.0	-20	0.08
P-10 WTR -48	410	E-1	J-C/E	10.0	PVC	150.0	-37	0.15
P-10 WTR-45	505	E-4	E-3	10.0	PVC	150.0	-16	0.06
P-10 WTR-54(1)	333	C-3	PRV-15	10.0	PVC	150.0	-73	0.30
P-10 WTR-51	152	C-1	J-C/M	10.0	PVC	150.0	12	0.05
P-10 WTR-64(1)(1)	44	M-1	J-153	10.0	PVC	150.0	7	0.03
P-10 WTR-68	548	M-2	J-M/I	10.0	PVC	150.0	-1	0.00
P-10 WTR-71(1)(1)	177	I-4	PRV-12	10.0	PVC	150.0	-31	0.13
P-10 WTR-70	580	I-3	I-4	10.0	PVC	150.0	-26	0.10
P-10 WTR-50	550	C-2	C-1	10.0	PVC	150.0	15	0.06
P-10 WTR-66	435	I-2	J-M/I	10.0	PVC	150.0	-9	0.04
P-10 WTR-65(1)	88	I-1	J-150	10.0	PVC	150.0	-1	0.00
P-10 WTR -3(2)	125	J-138	K-1	10.0	PVC	150.0	839	3.43
P-10 WTR -12(2)	48	J-139	L-2	10.0	PVC	150.0	519	2.12
P-10 WTR -36(2)	369	J-140	H-4	10.0	PVC	150.0	-17	0.07
P-10 WTR -39(2)	193	J-141	A-2	10.0	PVC	150.0	-15	0.06
P-10 WTR -34(2)	258	J-143	A-6	10.0	PVC	150.0	78	0.32
P-10 WTR -29(2)	23	J-144	F-2	10.0	PVC	150.0	-9	0.03
P-10 WTR -24(2)	139	J-145	F-3	10.0	PVC	150.0	19	0.08
P-10 WTR-78(2)	32	J-146	J-2	10.0	PVC	150.0	-646	2.64
P-10 WTR-80(2)	135	J-148	J-3	10.0	PVC	150.0	361	1.47
P-10 WTR-74(2)	182	J-149	A-14	10.0	PVC	150.0	380	1.55
P-10 WTR-65(2)	419	J-150	I-2	10.0	PVC	150.0	-9	0.04
P-10 WTR-64(2)	20	J-151	M-2	10.0	PVC	150.0	-1	0.00
P-10 WTR-64(1)(2)	496	J-153	J-151	10.0	PVC	150.0	0	0.00
P-10 WTR -56(2)	96	J-154	C-5	10.0	PVC	150.0	-97	0.40
P-10 WTR -47(2)	191	J-155	E-1	10.0	PVC	150.0	-37	0.15

Clovewood - Max Day + 1000 GPM @ Hydrant J-3 (Highest South)

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)
P-10 WTR-46(2)	25	J-156	E-2	10.0	PVC	150.0	-28	0.11
P-10 WTR-46(1)(2)	505	J-157	J-156	10.0	PVC	150.0	-24	0.10
P-10 WTR -44(2)	349	J-158	E-4	10.0	PVC	150.0	-12	0.05
P-10 WTR -63(2)	36	J-159	B-5	10.0	PVC	150.0	0	0.00
P-10 WTR -60(2)	388	J-160	B-7	10.0	PVC	150.0	-11	0.04
P-10 WTR -33(2)	315	PRV-2	A-6	10.0	PVC	150.0	-74	0.30
P-10 WTR -21(2)	396	PRV-8	F-5	10.0	PVC	150.0	35	0.14
P-10 WTR -58(2)	57	PRV-9	J-12	10.0	PVC	150.0	-105	0.43
P-10 WTR-71(1)(2)	45	PRV-12	J-A/I	10.0	PVC	150.0	-31	0.13
P-10 WTR-54(2)	45	PRV-15	J-B/C	10.0	PVC	150.0	-73	0.30
P-10 WTR -63(1)(2)	126	J-162	J-159	10.0	PVC	150.0	0	0.00
P-1(2)	303	L-4	T-1	12.0	PVC	150.0	-1,381	3.92

Clovewood - Max Day + 1000 GPM @ Hydrant H-3 (Highest most Distant)

Hydrant Table - Time: 0.00 hours

Label	Diameter (Hydrant Lateral) (in)	Include Hydrant Lateral Loss?	Length (Hydrant Lateral) (ft)	Elevation (ft)	Hydraulic Grade (ft)	Demand (gpm)	Pressure (psi)
L-4	6.0	True	20	828.81	884.93	0	24
L-3	6.0	True	20	794.00	882.76	0	38
J-3	6.0	True	20	789.50	880.45	0	39
L-2	6.0	True	20	782.00	880.89	4	43
J-4	6.0	True	20	772.00	880.45	3	47
A-5	6.0	True	20	649.00	763.64	7	50
F-5	6.0	True	20	675.00	791.27	0	50
G-1	6.0	True	20	671.00	791.27	0	52
I-4	6.0	True	20	683.00	804.19	5	52
F-4	6.0	True	20	667.50	791.27	0	54
J-2	6.0	True	20	758.00	880.45	4	53
K-1	6.0	True	20	756.00	881.30	0	54
E-2	6.0	True	20	597.00	728.20	0	57
C-3	6.0	True	20	595.00	728.22	6	58
E-3	6.0	True	20	594.00	728.19	4	58
C-6	6.0	True	20	696.00	832.27	6	59
E-4	6.0	True	20	586.50	728.19	4	61
H-3	6.0	True	20	622.00	754.31	1,004	57
J-5	6.0	True	20	740.50	880.45	4	61
E-5	6.0	True	20	580.00	728.19	4	64
E-1	6.0	True	20	579.50	728.20	0	64
A-10	6.0	True	20	733.00	880.41	0	64
L-1	6.0	True	20	729.50	879.44	5	65
B-6	6.0	True	20	675.00	832.21	2	68
B-4	6.0	True	20	606.50	759.71	0	66
C-2	6.0	True	20	568.50	728.21	5	69
A-9	6.0	True	20	724.50	879.64	2	67
F-2	6.0	True	20	629.00	791.27	4	70
A-14	6.0	True	20	721.00	880.45	0	69
F-3	6.0	True	20	627.50	791.27	6	71
H-4	6.0	True	20	601.00	757.48	0	68
A-4	6.0	True	20	601.00	761.06	4	69
C-5	6.0	True	20	668.00	832.24	1	71
A-7	6.0	True	20	720.00	877.96	0	68
J-1	6.0	True	20	718.00	880.46	2	70
A-8	6.0	True	20	714.50	879.10	5	71
I-3	6.0	True	20	632.00	804.18	5	74
A-11	6.0	True	20	712.00	880.47	0	73
B-2	6.0	True	20	590.50	759.71	4	73
H-2	6.0	True	20	589.50	756.95	8	72
B-5	6.0	True	20	655.50	832.21	1	76
B-3	6.0	True	20	586.50	759.71	2	75
B-1	6.0	True	20	586.00	759.71	0	75
A-6	6.0	True	20	704.00	875.28	4	74
A-2	6.0	True	20	584.00	757.91	0	75
A-3	6.0	True	20	583.00	758.37	0	76
A-12	6.0	True	20	702.50	880.46	0	77
A-13	6.0	True	20	701.00	880.45	0	78

Clovewood - Max Day + 1000 GPM @ Hydrant H-3 (Highest most Distant)

Hydrant Table - Time: 0.00 hours

Label	Diameter (Hydrant Lateral) (in)	Include Hydrant Lateral Loss?	Length (Hydrant Lateral) (ft)	Elevation (ft)	Hydraulic Grade (ft)	Demand (gpm)	Pressure (psi)
F-1	6.0	True	20	607.00	791.27	2	80
I-2	6.0	True	20	619.00	804.18	0	80
B-7	6.0	True	20	641.50	832.21	0	83
M-1	6.0	True	20	533.00	728.20	0	84
A-1	6.0	True	20	565.00	757.56	0	83
H-1	6.0	True	20	564.50	757.29	4	83
I-1	6.0	True	20	603.00	804.18	1	87
C-1	6.0	True	20	522.50	728.20	4	89
C-4	6.0	True	20	626.50	832.21	0	89
M-2	6.0	True	20	588.00	804.18	0	94

Clovewood - Max Day + 1000 GPM @ Hydrant H-3 (Highest most Distant)

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)
P-10 WTR -82	30	J-A/H-2	A-3	10.0	PVC	150.0	-1,038	4.24
P-10 WTR -37	335	J-A/H-2	H-4	10.0	PVC	150.0	665	2.72
P-10 WTR -141	33	J-A/H-1	H-1	10.0	PVC	150.0	359	1.47
P-10 WTR -81	351	J-A/H-1	A-1	10.0	PVC	150.0	-361	1.47
P-10 WTR-49	41	J-C/E	C-2	10.0	PVC	150.0	20	0.08
P-10 WTR-53	380	J-C/E	C-3	10.0	PVC	150.0	-67	0.28
P-10 WTR -14	40	J-A/F	A-8	10.0	PVC	150.0	-420	1.72
P-10 WTR -13	352	J-A/F	J-A/L	10.0	PVC	150.0	379	1.55
P-10 WTR -21(1)	153	J-A/F	PRV-8	10.0	PVC	150.0	35	0.14
P-10 WTR-67	44	J-M/I	I-3	10.0	PVC	150.0	-21	0.08
P-10 WTR -8	55	J-A/K	A-10	10.0	PVC	150.0	538	2.20
P-10 WTR -5	60	J-K/L	L-3	10.0	PVC	150.0	-1,370	5.60
P-10 WTR -3(1)	335	J-K/L	J-138	10.0	PVC	150.0	642	2.62
P-10 WTR -12(1)	476	J-K/L	J-139	10.0	PVC	150.0	724	2.96
P-10 WTR -23	120	J-F/G	F-4	10.0	PVC	150.0	27	0.11
P-10 WTR -22	130	J-F/G	F-5	10.0	PVC	150.0	-35	0.14
P-10 WTR-55	140	J-B/C	C-4	10.0	PVC	150.0	-90	0.37
P-10 WTR -61	421	J-B/C	B-7	10.0	PVC	150.0	11	0.04
P-10 WTR -43	330	J-B/E	E-5	10.0	PVC	150.0	0	0.00
P-10 WTR -59	362	J-B/E	B-4	10.0	PVC	150.0	5	0.02
P-10 WTR -16	150	J-A/L	A-7	10.0	PVC	150.0	1,085	4.43
P-10 WTR -15	260	J-A/L	L-1	10.0	PVC	150.0	-711	2.90
P-10 WTR-52	290	J-C/M	M-1	10.0	PVC	150.0	8	0.03
P-10 WTR -26	170	J-A/B	B-1	10.0	PVC	150.0	19	0.08
P-10 WTR -31	255	J-A/B	A-4	10.0	PVC	150.0	-1,063	4.34
P-10 WTR -28	180	J-B/F	B-2	10.0	PVC	150.0	18	0.07
P-10 WTR -25	284	J-B/F	F-1	10.0	PVC	150.0	0	0.00
P-10 WTR-73	200	J-A/J	J-1	10.0	PVC	150.0	36	0.15
P-10 WTR-6	247	J-A/J	A-11	10.0	PVC	150.0	-89	0.36
P-10 WTR-11	340	J-A/J	A-12	10.0	PVC	150.0	44	0.18
P-10 WTR-72	200	J-A/I	A-13	10.0	PVC	150.0	3	0.01
P-10 WTR-76	219	J-A/J2	J-5	10.0	PVC	150.0	-10	0.04
P-1(1)	23	J-76	L-4	12.0	PVC	150.0	-1,381	3.92
P-10 WTR -142	264	A-3	J-A/B	10.0	PVC	150.0	-1,038	4.24
P-10 WTR -40	422	A-2	J-A/H-2	10.0	PVC	150.0	-367	1.50
P-10 WTR -39(1)	288	A-1	J-141	10.0	PVC	150.0	-361	1.47
P-10 WTR -38	487	H-2	H-1	10.0	PVC	150.0	-355	1.45
P-10 WTR -35	510	H-3	H-2	10.0	PVC	150.0	-347	1.42
P-10 WTR -36(1)	22	H-3	J-140	10.0	PVC	150.0	-658	2.69
P-10 WTR -34(1)	232	A-7	J-143	10.0	PVC	150.0	1,085	4.43
P-10 WTR -24(1)	413	F-4	J-145	10.0	PVC	150.0	27	0.11
P-10 WTR -32	485	A-5	A-4	10.0	PVC	150.0	1,067	4.36
P-10 WTR -33(1)	234	A-5	PRV-2	10.0	PVC	150.0	-1,074	4.39
P-10 WTR -18	556	A-8	A-9	10.0	PVC	150.0	-425	1.73
P-2	373	B-1	J-B/F	10.0	PVC	150.0	19	0.08
P-10 WTR -30	422	F-2	F-3	10.0	PVC	150.0	-12	0.05
P-10 WTR -29(1)	412	F-1	J-144	10.0	PVC	150.0	-2	0.01
P-10 WTR-69	360	A-12	J-A/I	10.0	PVC	150.0	44	0.18
P-10 WTR-78(1)	396	J-3	J-146	10.0	PVC	150.0	-23	0.09

Clovewood - Max Day + 1000 GPM @ Hydrant H-3 (Highest most Distant)

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)
P-10 WTR-75	259	A-14	J-A/J2	10.0	PVC	150.0	-4	0.02
P-10 WTR -17	570	L-2	L-1	10.0	PVC	150.0	716	2.93
P-10 WTR -4	600	L-3	J-76	12.0	PVC	150.0	-1,370	3.89
P-10 WTR-10	345	A-11	J-A/K	10.0	PVC	150.0	-89	0.37
P-10 WTR-74(1)	218	A-13	J-149	10.0	PVC	150.0	3	0.01
P-10 WTR -9	483	A-10	J-12	10.0	PVC	150.0	538	2.20
P-10 WTR-79	427	J-2	J-1	10.0	PVC	150.0	-34	0.14
P-10 WTR-77	456	J-5	J-4	10.0	PVC	150.0	-14	0.06
P-10 WTR -19	49	A-9	J-12	10.0	PVC	150.0	-427	1.74
P-10 WTR -7	392	K-1	J-A/K	10.0	PVC	150.0	637	2.60
P-10 WTR-80(1)	324	J-4	J-148	10.0	PVC	150.0	-17	0.07
P-10 WTR -57	550	C-5	C-6	10.0	PVC	150.0	-99	0.40
P-10 WTR -42	145	B-3	J-B/E	10.0	PVC	150.0	12	0.05
P-10 WTR -62	420	B-5	B-6	10.0	PVC	150.0	-1	0.00
P-10 WTR -56(1)	366	C-4	J-154	10.0	PVC	150.0	-90	0.37
P-10 WTR -58(1)	359	C-6	PRV-9	10.0	PVC	150.0	-105	0.43
P-10 WTR -63(1)(1)	329	B-4	J-162	10.0	PVC	150.0	5	0.02
P-10 WTR -60(1)	163	B-6	J-160	10.0	PVC	150.0	-3	0.01
P-10 WTR -41	500	B-2	B-3	10.0	PVC	150.0	13	0.05
P-10 WTR -20	420	G-1	J-F/G	10.0	PVC	150.0	0	0.00
P-10 WTR-47(1)	388	E-2	J-155	10.0	PVC	150.0	-28	0.11
P-10 WTR -44(1)	151	E-5	J-158	10.0	PVC	150.0	-4	0.01
P-10 WTR-46(1)(1)	20	E-3	J-157	10.0	PVC	150.0	-20	0.08
P-10 WTR -48	410	E-1	J-C/E	10.0	PVC	150.0	-37	0.15
P-10 WTR-45	505	E-4	E-3	10.0	PVC	150.0	-16	0.06
P-10 WTR-54(1)	333	C-3	PRV-15	10.0	PVC	150.0	-73	0.30
P-10 WTR-51	152	C-1	J-C/M	10.0	PVC	150.0	12	0.05
P-10 WTR-64(1)(1)	44	M-1	J-153	10.0	PVC	150.0	7	0.03
P-10 WTR-68	548	M-2	J-M/I	10.0	PVC	150.0	-1	0.00
P-10 WTR-71(1)(1)	177	I-4	PRV-12	10.0	PVC	150.0	-31	0.13
P-10 WTR-70	580	I-3	I-4	10.0	PVC	150.0	-26	0.10
P-10 WTR-50	550	C-2	C-1	10.0	PVC	150.0	15	0.06
P-10 WTR-66	435	I-2	J-M/I	10.0	PVC	150.0	-9	0.04
P-10 WTR-65(1)	88	I-1	J-150	10.0	PVC	150.0	-1	0.00
P-10 WTR -3(2)	125	J-138	K-1	10.0	PVC	150.0	637	2.60
P-10 WTR -12(2)	48	J-139	L-2	10.0	PVC	150.0	720	2.94
P-10 WTR -36(2)	369	J-140	H-4	10.0	PVC	150.0	-665	2.72
P-10 WTR -39(2)	193	J-141	A-2	10.0	PVC	150.0	-367	1.50
P-10 WTR -34(2)	258	J-143	A-6	10.0	PVC	150.0	1,078	4.40
P-10 WTR -29(2)	23	J-144	F-2	10.0	PVC	150.0	-9	0.03
P-10 WTR -24(2)	139	J-145	F-3	10.0	PVC	150.0	19	0.08
P-10 WTR-78(2)	32	J-146	J-2	10.0	PVC	150.0	-30	0.12
P-10 WTR-80(2)	135	J-148	J-3	10.0	PVC	150.0	-23	0.09
P-10 WTR-74(2)	182	J-149	A-14	10.0	PVC	150.0	-4	0.01
P-10 WTR-65(2)	419	J-150	I-2	10.0	PVC	150.0	-9	0.04
P-10 WTR-64(2)	20	J-151	M-2	10.0	PVC	150.0	-1	0.00
P-10 WTR-64(1)(2)	496	J-153	J-151	10.0	PVC	150.0	0	0.00
P-10 WTR -56(2)	96	J-154	C-5	10.0	PVC	150.0	-97	0.40
P-10 WTR -47(2)	191	J-155	E-1	10.0	PVC	150.0	-37	0.15

Clovewood - Max Day + 1000 GPM @ Hydrant H-3 (Highest most Distant)

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)
P-10 WTR-46(2)	25	J-156	E-2	10.0	PVC	150.0	-28	0.11
P-10 WTR-46(1)(2)	505	J-157	J-156	10.0	PVC	150.0	-24	0.10
P-10 WTR -44(2)	349	J-158	E-4	10.0	PVC	150.0	-12	0.05
P-10 WTR -63(2)	36	J-159	B-5	10.0	PVC	150.0	0	0.00
P-10 WTR -60(2)	388	J-160	B-7	10.0	PVC	150.0	-11	0.04
P-10 WTR -33(2)	315	PRV-2	A-6	10.0	PVC	150.0	-1,074	4.39
P-10 WTR -21(2)	396	PRV-8	F-5	10.0	PVC	150.0	35	0.14
P-10 WTR -58(2)	57	PRV-9	J-12	10.0	PVC	150.0	-105	0.43
P-10 WTR-71(1)(2)	45	PRV-12	J-A/I	10.0	PVC	150.0	-31	0.13
P-10 WTR-54(2)	45	PRV-15	J-B/C	10.0	PVC	150.0	-73	0.30
P-10 WTR -63(1)(2)	126	J-162	J-159	10.0	PVC	150.0	0	0.00
P-1(2)	303	L-4	T-1	12.0	PVC	150.0	-1,381	3.92

Clovewood - Max Day + 1000 GPM @ Hydrant C-1 (Lowest)

Hydrant Table - Time: 0.00 hours

Label	Diameter (Hydrant Lateral) (in)	Include Hydrant Lateral Loss?	Length (Hydrant Lateral) (ft)	Elevation (ft)	Hydraulic Grade (ft)	Demand (gpm)	Pressure (psi)
L-4	6.0	True	20	828.81	884.93	0	24
L-3	6.0	True	20	794.00	882.76	0	38
J-3	6.0	True	20	789.50	879.78	0	39
L-2	6.0	True	20	782.00	881.29	4	43
J-4	6.0	True	20	772.00	879.78	3	47
A-5	6.0	True	20	649.00	764.89	7	50
F-5	6.0	True	20	675.00	791.27	0	50
G-1	6.0	True	20	671.00	791.27	0	52
I-4	6.0	True	20	683.00	804.19	5	52
F-4	6.0	True	20	667.50	791.27	0	54
J-2	6.0	True	20	758.00	879.78	4	53
K-1	6.0	True	20	756.00	880.93	0	54
E-2	6.0	True	20	597.00	724.40	0	55
C-3	6.0	True	20	595.00	726.44	6	57
E-3	6.0	True	20	594.00	724.40	4	56
C-6	6.0	True	20	696.00	830.26	6	58
E-4	6.0	True	20	586.50	724.40	4	60
H-3	6.0	True	20	622.00	764.87	4	62
J-5	6.0	True	20	740.50	879.78	4	60
E-5	6.0	True	20	580.00	724.40	4	62
E-1	6.0	True	20	579.50	724.41	0	63
A-10	6.0	True	20	733.00	879.70	0	63
L-1	6.0	True	20	729.50	880.26	5	65
B-6	6.0	True	20	675.00	823.83	2	64
B-4	6.0	True	20	606.50	764.87	0	69
C-2	6.0	True	20	568.50	724.21	5	67
A-9	6.0	True	20	724.50	878.69	2	67
F-2	6.0	True	20	629.00	791.27	4	70
A-14	6.0	True	20	721.00	879.78	0	69
F-3	6.0	True	20	627.50	791.27	6	71
H-4	6.0	True	20	601.00	764.87	0	71
A-4	6.0	True	20	601.00	764.88	4	71
C-5	6.0	True	20	668.00	827.17	1	69
A-7	6.0	True	20	720.00	879.79	0	69
J-1	6.0	True	20	718.00	879.78	2	70
A-8	6.0	True	20	714.50	879.30	5	71
I-3	6.0	True	20	632.00	804.18	5	74
A-11	6.0	True	20	712.00	879.80	0	73
B-2	6.0	True	20	590.50	764.87	4	75
H-2	6.0	True	20	589.50	764.87	8	76
B-5	6.0	True	20	655.50	823.83	1	73
B-3	6.0	True	20	586.50	764.87	2	77
B-1	6.0	True	20	586.00	764.87	0	77
A-6	6.0	True	20	704.00	879.77	4	76
A-2	6.0	True	20	584.00	764.87	0	78
A-3	6.0	True	20	583.00	764.87	0	79
A-12	6.0	True	20	702.50	879.78	0	77
A-13	6.0	True	20	701.00	879.78	0	77

Clovewood - Max Day + 1000 GPM @ Hydrant C-1 (Lowest)

Hydrant Table - Time: 0.00 hours

Label	Diameter (Hydrant Lateral) (in)	Include Hydrant Lateral Loss?	Length (Hydrant Lateral) (ft)	Elevation (ft)	Hydraulic Grade (ft)	Demand (gpm)	Pressure (psi)
F-1	6.0	True	20	607.00	791.27	2	80
I-2	6.0	True	20	619.00	804.18	0	80
B-7	6.0	True	20	641.50	823.83	0	79
M-1	6.0	True	20	533.00	721.54	0	82
A-1	6.0	True	20	565.00	764.87	0	86
H-1	6.0	True	20	564.50	764.87	4	87
I-1	6.0	True	20	603.00	804.18	1	87
C-1	6.0	True	20	522.50	719.24	1,004	85
C-4	6.0	True	20	626.50	824.60	0	86
M-2	6.0	True	20	588.00	804.18	0	94

Clovewood - Max Day + 1000 GPM @ Hydrant C-1 (Lowest)

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)
P-10 WTR -82	30	J-A/H-2	A-3	10.0	PVC	150.0	-38	0.16
P-10 WTR -37	335	J-A/H-2	H-4	10.0	PVC	150.0	17	0.07
P-10 WTR -141	33	J-A/H-1	H-1	10.0	PVC	150.0	7	0.03
P-10 WTR -81	351	J-A/H-1	A-1	10.0	PVC	150.0	-9	0.04
P-10 WTR-49	41	J-C/E	C-2	10.0	PVC	150.0	1,020	4.17
P-10 WTR-53	380	J-C/E	C-3	10.0	PVC	150.0	-1,067	4.36
P-10 WTR -14	40	J-A/F	A-8	10.0	PVC	150.0	457	1.87
P-10 WTR -13	352	J-A/F	J-A/L	10.0	PVC	150.0	-498	2.03
P-10 WTR -21(1)	153	J-A/F	PRV-8	10.0	PVC	150.0	35	0.14
P-10 WTR-67	44	J-M/I	I-3	10.0	PVC	150.0	-21	0.08
P-10 WTR -8	55	J-A/K	A-10	10.0	PVC	150.0	661	2.70
P-10 WTR -5	60	J-K/L	L-3	10.0	PVC	150.0	-1,370	5.60
P-10 WTR -3(1)	335	J-K/L	J-138	10.0	PVC	150.0	765	3.12
P-10 WTR -12(1)	476	J-K/L	J-139	10.0	PVC	150.0	601	2.46
P-10 WTR -23	120	J-F/G	F-4	10.0	PVC	150.0	27	0.11
P-10 WTR -22	130	J-F/G	F-5	10.0	PVC	150.0	-35	0.14
P-10 WTR-55	140	J-B/C	C-4	10.0	PVC	150.0	-1,090	4.45
P-10 WTR -61	421	J-B/C	B-7	10.0	PVC	150.0	11	0.04
P-10 WTR -43	330	J-B/E	E-5	10.0	PVC	150.0	0	0.00
P-10 WTR -59	362	J-B/E	B-4	10.0	PVC	150.0	5	0.02
P-10 WTR -16	150	J-A/L	A-7	10.0	PVC	150.0	85	0.35
P-10 WTR -15	260	J-A/L	L-1	10.0	PVC	150.0	-588	2.40
P-10 WTR-52	290	J-C/M	M-1	10.0	PVC	150.0	8	0.03
P-10 WTR -26	170	J-A/B	B-1	10.0	PVC	150.0	19	0.08
P-10 WTR -31	255	J-A/B	A-4	10.0	PVC	150.0	-63	0.26
P-10 WTR -28	180	J-B/F	B-2	10.0	PVC	150.0	18	0.07
P-10 WTR -25	284	J-B/F	F-1	10.0	PVC	150.0	0	0.00
P-10 WTR-73	200	J-A/J	J-1	10.0	PVC	150.0	36	0.15
P-10 WTR-6	247	J-A/J	A-11	10.0	PVC	150.0	-89	0.36
P-10 WTR-11	340	J-A/J	A-12	10.0	PVC	150.0	44	0.18
P-10 WTR-72	200	J-A/I	A-13	10.0	PVC	150.0	3	0.01
P-10 WTR-76	219	J-A/J2	J-5	10.0	PVC	150.0	-10	0.04
P-1(1)	23	J-76	L-4	12.0	PVC	150.0	-1,381	3.92
P-10 WTR -142	264	A-3	J-A/B	10.0	PVC	150.0	-38	0.16
P-10 WTR -40	422	A-2	J-A/H-2	10.0	PVC	150.0	-15	0.06
P-10 WTR -39(1)	288	A-1	J-141	10.0	PVC	150.0	-9	0.04
P-10 WTR -38	487	H-2	H-1	10.0	PVC	150.0	-3	0.01
P-10 WTR -35	510	H-3	H-2	10.0	PVC	150.0	5	0.02
P-10 WTR -36(1)	22	H-3	J-140	10.0	PVC	150.0	-9	0.04
P-10 WTR -34(1)	232	A-7	J-143	10.0	PVC	150.0	85	0.35
P-10 WTR -24(1)	413	F-4	J-145	10.0	PVC	150.0	27	0.11
P-10 WTR -32	485	A-5	A-4	10.0	PVC	150.0	67	0.27
P-10 WTR -33(1)	234	A-5	PRV-2	10.0	PVC	150.0	-74	0.30
P-10 WTR -18	556	A-8	A-9	10.0	PVC	150.0	453	1.85
P-2	373	B-1	J-B/F	10.0	PVC	150.0	19	0.08
P-10 WTR -30	422	F-2	F-3	10.0	PVC	150.0	-12	0.05
P-10 WTR -29(1)	412	F-1	J-144	10.0	PVC	150.0	-2	0.01
P-10 WTR-69	360	A-12	J-A/I	10.0	PVC	150.0	44	0.18
P-10 WTR-78(1)	396	J-3	J-146	10.0	PVC	150.0	-23	0.09

Clovewood - Max Day + 1000 GPM @ Hydrant C-1 (Lowest)

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)
P-10 WTR-75	259	A-14	J-A/J2	10.0	PVC	150.0	-4	0.02
P-10 WTR -17	570	L-2	L-1	10.0	PVC	150.0	594	2.43
P-10 WTR -4	600	L-3	J-76	12.0	PVC	150.0	-1,370	3.89
P-10 WTR-10	345	A-11	J-A/K	10.0	PVC	150.0	-89	0.36
P-10 WTR-74(1)	218	A-13	J-149	10.0	PVC	150.0	3	0.01
P-10 WTR -9	483	A-10	J-12	10.0	PVC	150.0	661	2.70
P-10 WTR-79	427	J-2	J-1	10.0	PVC	150.0	-34	0.14
P-10 WTR-77	456	J-5	J-4	10.0	PVC	150.0	-14	0.06
P-10 WTR -19	49	A-9	J-12	10.0	PVC	150.0	451	1.84
P-10 WTR -7	392	K-1	J-A/K	10.0	PVC	150.0	760	3.10
P-10 WTR-80(1)	324	J-4	J-148	10.0	PVC	150.0	-17	0.07
P-10 WTR -57	550	C-5	C-6	10.0	PVC	150.0	-1,099	4.49
P-10 WTR -42	145	B-3	J-B/E	10.0	PVC	150.0	12	0.05
P-10 WTR -62	420	B-5	B-6	10.0	PVC	150.0	-1	0.00
P-10 WTR -56(1)	366	C-4	J-154	10.0	PVC	150.0	-1,090	4.45
P-10 WTR -58(1)	359	C-6	PRV-9	10.0	PVC	150.0	-1,105	4.51
P-10 WTR -63(1)(1)	329	B-4	J-162	10.0	PVC	150.0	5	0.02
P-10 WTR -60(1)	163	B-6	J-160	10.0	PVC	150.0	-3	0.01
P-10 WTR -41	500	B-2	B-3	10.0	PVC	150.0	13	0.05
P-10 WTR -20	420	G-1	J-F/G	10.0	PVC	150.0	0	0.00
P-10 WTR-47(1)	388	E-2	J-155	10.0	PVC	150.0	-28	0.11
P-10 WTR -44(1)	151	E-5	J-158	10.0	PVC	150.0	-4	0.01
P-10 WTR-46(1)(1)	20	E-3	J-157	10.0	PVC	150.0	-20	0.08
P-10 WTR -48	410	E-1	J-C/E	10.0	PVC	150.0	-37	0.15
P-10 WTR-45	505	E-4	E-3	10.0	PVC	150.0	-16	0.06
P-10 WTR-54(1)	333	C-3	PRV-15	10.0	PVC	150.0	-1,073	4.38
P-10 WTR-51	152	C-1	J-C/M	10.0	PVC	150.0	12	0.05
P-10 WTR-64(1)(1)	44	M-1	J-153	10.0	PVC	150.0	7	0.03
P-10 WTR-68	548	M-2	J-M/I	10.0	PVC	150.0	-1	0.00
P-10 WTR-71(1)(1)	177	I-4	PRV-12	10.0	PVC	150.0	-31	0.13
P-10 WTR-70	580	I-3	I-4	10.0	PVC	150.0	-26	0.10
P-10 WTR-50	550	C-2	C-1	10.0	PVC	150.0	1,015	4.15
P-10 WTR-66	435	I-2	J-M/I	10.0	PVC	150.0	-9	0.04
P-10 WTR-65(1)	88	I-1	J-150	10.0	PVC	150.0	-1	0.00
P-10 WTR -3(2)	125	J-138	K-1	10.0	PVC	150.0	760	3.10
P-10 WTR -12(2)	48	J-139	L-2	10.0	PVC	150.0	598	2.44
P-10 WTR -36(2)	369	J-140	H-4	10.0	PVC	150.0	-17	0.07
P-10 WTR -39(2)	193	J-141	A-2	10.0	PVC	150.0	-15	0.06
P-10 WTR -34(2)	258	J-143	A-6	10.0	PVC	150.0	78	0.32
P-10 WTR -29(2)	23	J-144	F-2	10.0	PVC	150.0	-9	0.03
P-10 WTR -24(2)	139	J-145	F-3	10.0	PVC	150.0	19	0.08
P-10 WTR-78(2)	32	J-146	J-2	10.0	PVC	150.0	-30	0.12
P-10 WTR-80(2)	135	J-148	J-3	10.0	PVC	150.0	-23	0.09
P-10 WTR-74(2)	182	J-149	A-14	10.0	PVC	150.0	-4	0.01
P-10 WTR-65(2)	419	J-150	I-2	10.0	PVC	150.0	-9	0.04
P-10 WTR-64(2)	20	J-151	M-2	10.0	PVC	150.0	-1	0.00
P-10 WTR-64(1)(2)	496	J-153	J-151	10.0	PVC	150.0	0	0.00
P-10 WTR -56(2)	96	J-154	C-5	10.0	PVC	150.0	-1,097	4.48
P-10 WTR -47(2)	191	J-155	E-1	10.0	PVC	150.0	-37	0.15

Clovewood - Max Day + 1000 GPM @ Hydrant C-1 (Lowest)

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)
P-10 WTR-46(2)	25	J-156	E-2	10.0	PVC	150.0	-28	0.11
P-10 WTR-46(1)(2)	505	J-157	J-156	10.0	PVC	150.0	-24	0.10
P-10 WTR -44(2)	349	J-158	E-4	10.0	PVC	150.0	-12	0.05
P-10 WTR -63(2)	36	J-159	B-5	10.0	PVC	150.0	0	0.00
P-10 WTR -60(2)	388	J-160	B-7	10.0	PVC	150.0	-11	0.04
P-10 WTR -33(2)	315	PRV-2	A-6	10.0	PVC	150.0	-74	0.30
P-10 WTR -21(2)	396	PRV-8	F-5	10.0	PVC	150.0	35	0.14
P-10 WTR -58(2)	57	PRV-9	J-12	10.0	PVC	150.0	-1,105	4.51
P-10 WTR-71(1)(2)	45	PRV-12	J-A/I	10.0	PVC	150.0	-31	0.13
P-10 WTR-54(2)	45	PRV-15	J-B/C	10.0	PVC	150.0	-1,073	4.38
P-10 WTR -63(1)(2)	126	J-162	J-159	10.0	PVC	150.0	0	0.00
P-1(2)	303	L-4	T-1	12.0	PVC	150.0	-1,381	3.92