RESOLUTION NO. R-024- 077

THE BOARD OF COUNTY COMMISSIONERS
OF THE COUNTY OF DOUGLAS, COLORADO

PRELIMINARY ORDER CONCERNING 2023 BANNOCK DRIVE LOCAL IMPROVEMENT DISTRICT, DOUGLAS COUNTY, COLORADO; REGARDING THE INITIATION OF A LOCAL IMPROVEMENT DISTRICT; ADOPTING PRELIMINARY PLANS, SPECIFICATIONS, AND COST ESTIMATES; REQUIRING A MAP OF PROPERTY TO BE ASSESSED AND AN APPROXIMATE ASSESSMENT SCHEDULE; DESCRIBING MATERIALS; SETTING THE DATE OF A PUBLIC HEARING; AND ORDERING PUBLICATION AND MAILING OF NOTICE OF HEARING TO OWNERS OF PROPERTY TO BE ASSESSED

WHEREAS, pursuant to part 6 of article 20 of title 30, Colorado Revised Statutes, as amended (the "Act"), the Board of County Commissioners (the "Board") of Douglas County, Colorado (the "County") has received petitions from the property owners representing more than half of the estimated costs to be burdened by any assessment (the "Petitioners") of the proposed 2023 Bannock Drive Local Improvement District, Douglas County, Colorado (the "Proposed District"); and

WHEREAS, the Board is required to initiate proceedings for the creation of the Proposed District for the purpose of acquiring, constructing and installing certain improvements including, without limitation (1) water mains and lot water service improvements ("Water Improvements"),(2) sanitary sewer main and lot sewer service improvements, ("Sewer Improvements"), (3) the roadway and drainage improvements, ("Roadway Improvements"), (4) natural gas mains by Black Hills Energy ("Gas Improvements") and (5) electrical mains by CORE Electric ("Electrical Improvements") in portions of Perry Park Filing 5, located in the County, as more particularly described in the form of Notice set forth herein and constituting a part hereof (the "Notice"), and other incidental and necessary improvements, to the extent moneys are available (collectively, the "Improvements") within the Proposed District, and to assess the cost thereof against the properties specially benefited thereby; and

WHEREAS, the Board has received a request by property owners within the boundary of the Proposed District, and intends to proceed with the formation of the Proposed District; and

WHEREAS, there has been prepared and filed with the County Clerk and Recorder preliminary cost estimates relating to the Improvements; and

WHEREAS, it is necessary that a preliminary order be made, adopting preliminary estimates, describing the materials to be used or stating that one of several specified materials shall be chosen, determining the number of installments and time at which the cost of the Improvements shall be payable, describing the property to be assessed for the cost of the

Improvements, and requiring an estimate of cost and a map by the County Public Works - Engineering staff, and adopting a schedule showing the approximate amounts to be assessed upon the several lots or parcels of property within the Proposed District; and

WHEREAS, this Resolution shall constitute the preliminary order required by the Act.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF COUNTY COMMISSIONERS OF DOUGLAS COUNTY, COLORADO:

Section 1. The preliminary estimate of cost, a map of the Proposed District, and schedule of approximate assessments prepared and filed are hereby adopted and approved by the Board for use in the construction of the Improvements within the Proposed District.

Section 2. The nature and location of the Improvements to be made in the Proposed District and the materials to be used in constructing the Improvements shall be generally as stated in the form of the Notice that appears below. The boundaries of the Proposed District shall be as set forth in the form of the Notice.

Section 3. The assessments to be levied for the Improvements shall be due and payable within 30 days after the final adoption of an assessing resolution (the "Assessing Resolution") by the Board assessing the cost of the Improvements against the property in the Proposed District. However, all such assessments may be paid, at the election of the owner, in ten annual installments of principal, interest and County Treasurer's collection fee. The first of said installments shall be due and payable not more than two years from the date of the Assessing Resolution, as determined in and by the Assessing Resolution. The entire cost shall therefore be payable within ten years of the first installment date. The times of payment of installments and interest thereon shall be the same as the times of payment for installments of property taxes. The rate of interest on unpaid and deferred installments shall be finally determined by the Board and set forth in the final Assessing Resolution.

Section 4. The property to be assessed for the cost of the Improvements shall be the property specially benefited thereby as more particularly described in the form of the Notice. The Board hereby determines that the method of assessing and allocating the probable costs of the Improvements as described in the Notice reflects the benefits, which accrue to each lot, parcel, or tract of land, on an equitable basis.

Section 5. A public hearing concerning the creation of the Proposed District and the construction of the Improvements therein shall be held on Tuesday, August 27, 2024, at 2:30p.m. at the County Philip S. Miller Building, 100 Third Street, Castle Rock, Colorado.

Section 6. Notice of the intention of the Board to create a local improvement district pursuant to the state statues and to construct the Improvements therein and of a public hearing thereon shall be given by the County Clerk by publication once in the Douglas County News Press, a newspaper of general circulation in the County, at least 30 days prior to the date of the hearing, as required by law. In addition, the Notice, being a brief written synopsis of the Improvements, shall be mailed by first-class mail to each property owner to be assessed for the cost of the Improvements who is included within the Proposed District. The mailed Notice shall be made on or about the date of publication of the notice of the hearing. The Notice shall be in substantially the following form:

[Form of Notice]

NOTICE

OF HEARING ON THE PROPOSED CREATION OF 2023 BANNOCK DRIVE LOCAL IMPROVEMENT DISTRICT, DOUGLAS COUNTY COLORADO, FOR THE PURPOSE OF CONSTRUCTION OF CERTAIN IMPROVEMENTS

All owners of real estate and property hereinafter described, and all persons generally are hereby notified that the Board of County Commissioners of Douglas County, Colorado (the "County") has adopted preliminary cost estimates for certain improvements to be acquired, constructed, and installed within a proposed local improvement district in the County, to be known as 2023 Bannock Drive Local Improvement District, Douglas County, Colorado (the "Proposed District").

1. A description of the boundaries of the Proposed District is as follows and includes generally the real property described herein:

Group A:

Lots 1-3, Block 7, Perry Park Filing 5
Lots 30-35, Block 7, Perry Park Filing 5
Lots 16-18, Block 8, Perry Park Filing 5
Lots 1-12, Block 9, Perry Park Filing 5
Lot 10, Block 10, Perry Park Filing 5
Lots 11-14, Block 11, Perry Park Filing 5
Lots 25-28, Block 12, Perry Park Filing 5

Group B:

Lot 29, Block 7, Perry Park Filing 5
Lots 10-15, Block 8, Perry Park Filing 5

The improvements to be made are as follows and are collectively referred to as the "Improvements":

Construction of water main and lot services, sanitary sewer main and lot services, roadway and drainage improvements by the County, installation of natural gas mains by Black Hills Energy, and installation of electric mains by CORE Electric Cooperative on the following roadways:

Roadway improvements shall consist of subgrade preparation, drainage improvements, shouldering with aggregate base course, or placement of curb and gutter, placement and preparation of road base and the installation of asphalt pavement on the following roadways:

- A portion of Delaware Drive
- Quivas Road from Delaware Drive to Bannock Drive
- A portion of Bannock Drive
- Crow Place
- A portion of Crow Road
- Other roadway connections as required

Each and every buildable lot or parcel listed below will receive one full assessment for the Improvements within the Proposed District:

Group A:

Lots 1-3, Block 7, Perry Park Filing 5Lots 30-35, Block 7, Perry Park Filing 5
Lots 16-18, Block 8, Perry Park Filing 5Lots 1-12, Block 9, Perry Park Filing 5
Lot 10, Block 10, Perry Park Filing 5
Lots 11-14, Block 11, Perry Park Filing 5
Lots 25-28, Block 12, Perry Park Filing 5

Group B:

Lot 29, Block 7, Perry Park Filing 5
Lots 10-15, Block 8, Perry Park Filing 5

The Improvements described above will be funded from legally available moneys of the County, private placement construction loan or by the issuance of special assessment bonds by the County (the "Financing"). The Financing shall be paid through special assessments

imposed against the real property included within the boundaries of the Proposed District and specifically benefited by the Improvements. The estimated total cost of constructing the Improvements, but less the amount expected to be provided by other sources as described in paragraph 5 below, is $10,430. The method of assessment shall be as follows:

Each buildable lot and parcel within the boundaries of the Proposed District shall be assessed an equal share of the total cost of the Improvements. The assessment for each buildable lot or parcel for the Improvements is estimated to be **The estimated maximum full per lot assessment is $266,000 for Group A and $226,000 for Group B.** The estimated costs of the Improvements exclude the costs of inspection, engineering, surveying, testing, incidentals, County administration, and general legal expenses. If such assessment is paid in installments, additional costs including interest and additional statutory County Treasurer collection fees will be added to such payments.

2. Assessments shall be payable either within thirty (30) days after publication of the resolution making the assessments on each parcel of land benefited, or in installments payable with interest and statutory County Treasurer collection fees over the term of the Financing, at the election of each property owner. The term of the Financing shall not exceed ten (10) years. If not paid in full within thirty (30) days as described, assessments shall be payable with interest at a rate not to exceed 12% per annum, in ten (10) annual installments.

3. The rate of interest on unpaid and deferred installments shall be determined by the Board of County Commissioners and set forth in the Assessing Resolution. In addition, County collections fees will be charged on full payments and installment payments as State law requires.

4. As shown by the estimates previously prepared and filed with the County Clerk, the probable total cost of the Improvements in the Proposed District, including, without limitation, construction, contingency, design, administration, and supervision, and legal is $10,360. Of said cost it is estimated that $0 will be paid by the County and the Perry Park Metro District for survey, design, administration, and construction management of the Improvements. The estimated maximum full per lot assessment is $266,000 for Group A and $226,000 for Group B will be assessed against the benefited property within the Proposed District.

Upon completion and acceptance of the Improvements or any part thereof, or as soon as the total actual cost thereof can be reasonably ascertained, such cost shall be apportioned to each lot or parcel of land in the Proposed District. Notice of such apportionment shall be given, and a hearing will be held prior to the adoption of the Assessing Resolution, all as provided by law.

5. Not less than 30 days after publication of this Notice, *i.e.,* on Tuesday, August 27, 2024, at 2:30 p.m., a resolution creating the Proposed District and authorizing the Improvements will be considered and a public hearing thereon will be held by the Board of County Commissioners at the Philip S. Miller Building, 100 Third Street, Castle Rock, Colorado.

6. An estimate of costs, a map, and a schedule showing the approximate amount to be assessed and all resolutions and proceedings are on file and may be seen and examined by any person interested at the County Department of Public Works - Engineering, Engineering Services Division, 100 Third Street, Castle Rock, Colorado at any time during business hours on or before the date specified in paragraph 6 hereof.

7. Owners of any real property to be assessed may appear before the Board and be heard at the public hearing. All complaints and objections that may be made in writing concerning the Improvements by the owner or owners of any real property to be assessed will be heard and determined by the Board of County Commissioners at the public hearing referred to above, or at some adjournment thereof, before final action thereon.

DATED this 9th day of July 2024.

/s/ Sheri Davis (SEAL)
County Clerk and Recorder
Douglas County, Colorado

Published in: *Douglas County News Press*
To be published on: Thursday, July 18, 2024

[Forward copy of notice as printed in newspaper to County Attorney]
[End form of Notice]

Section 7. Should any one or more sections or provisions of this Resolution be judicially determined invalid or unenforceable, such determination shall not affect, impair, or invalidate the remaining sections or provisions hereof, the intention being that the various sections or provisions hereof are severable.

PASSED AND ADOPTED this 9th day of July 2024, in Castle Rock, Douglas County, Colorado.

THE BOARD OF COUNTY COMMISSIONERS OF THE COUNTY OF DOUGLAS, COLORADO

BY:

DocuSigned by:
Geo. P. Teal
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GEORGE TEAL, Chair

DocuSigned by:

ATTEST:

DocuSigned by:
Hayley Hall
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HAYLEY HALL, Clerk to the Board

TST Infrastructure
CONSULTING ENGINEERS

MEMORANDUM

TO: Perry Park Water and Sanitation District Board of Directors

FROM: TST Infrastructure, LLC

CC: TST Infrastructure, LLC File

SUBJECT: Water and Sewer Service Feasibility Study for a portion of Bannock Drive, Quivas Road, and a portion of Delaware Drive

DATE: October 8, 2020

This study summarizes the potential impacts to Perry Park Water and Sanitation District's (PPWSD's) system by providing water and sanitary sewer service to 41 currently undeveloped, single-family lots on Bannock Drive east of Cheyenne Drive and west of Red Rock Drive.

I. General:

The study area consists of 41 single-family lots, with sizes of approximately 1.0 acre. These lots are located in the Perry Park West region on Bannock Drive east of Cheyenne Drive, along Quivas Road, and Delaware Drive southwest of Elati Road. The lots are distributed between Blocks 7 and 12 in Perry Park Filing #5, with eleven lots in Block 7 (Lots 1 through 3 and Lots 28-35), nine lots in Block 8 (Lots 10 through 18), twelve lots in Block 9 (Lots 1 through 12), one lot in Block 10 (Lot 10), four lots in Block 11 (Lot 11 through 14) and four lots in Block 12 (Lots 25-28). The study area also includes two tracts of land belonging to Perry Park Metropolitan District. Currently all lots are undeveloped.

Figure A shows the boundaries of the study area and lot lines of the 41 lots. The study area is located in the current district service boundary and is considered part of the Current Service Area per the District's April 2016 Master Plan. Water service provisions are described in Section II of this Study, and wastewater service provisions are described in Section III. For a vicinity map of the study area, please reference Figure A.

II. Water:

Current Water System in the Vicinity of the Study Area: (Please reference Figure B.) Per the current PPWSD Master Plan, this area is planned to be split between Perry Park West Region, Pressure Zone 5 and Pressure Zone 3, with the existing nearby water distribution pipes are in Pressure Zone 3. At full buildout, Pressure Zone 5 will be served by the future Pressure Zone 5 water storage tank and associated distribution piping, neither of which are currently constructed. This evaluation focuses on the feasibility of providing water service to the study area by completing water and sewer main extensions as shown in Figure A without first constructing the future Pressure Zone 5 water storage tank and distribution piping.

Water modeling analysis was performed to determine the level of service which can be provided to the lots in the study area using the existing infrastructure of Pressure Zone 3 and extending

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the water line to serve the study area. Water service can be provided to the study area by extending an 8-inch diameter waterline piping west from the existing waterline in Bannock Drive to the existing waterline at the intersection of Bannock Drive and Crow Drive. Additional connections to the existing water line would be made at the intersection of Delaware Drive and Elati Road. Dead end waterlines are required at 10-inch diameter.

Summary of Required Water System Improvements: All proposed waterlines, appurtenances, water services, and fire hydrants shall be installed in accordance with the Perry Park Water and Sanitation District's Rules and Regulations. The spacing of all proposed fire hydrants, hydrant valves, and main line valves will need to meet current Perry Park Water and Sanitation District's Rules and Regulations. Prior to installation, developers and contractors should submit final sizing of all water services to the District for approval.

In evaluation of the improvements required to provide adequate fire protection and domestic water service to the study area it was determined that an 8-inch diameter waterline extended from the existing waterline in Bannock Drive to the west end of the study area could provide adequate fire protection and water service to the study area. In areas where the water line does not complete a loop, 10-inch diameter water line should be used. For water service to be provided to the study area, it is recommended that the water lines be installed as described in this study.

Per the current PPWSD Master Plan, a pressure reducing valve is planned to be installed at the intersection of Bannock Drive and Crow Drive. This PRV would reduce the water pressure from the future Zone 5 Tank. Although this evaluation does not include the installation of a PRV at this time, it is recommended that measures be taken to reduce the construction and service impact when the PRV is installed.

1. **Water System and Service:** Please reference Figure C. Fire protection and domestic water service could be provided to the study area by completing the following improvements:

    - Approximately 4,000 linear feet of 8-inch diameter waterline extending from the existing 10-inch diameter waterline located at Block 8, Lot 10 and extending west on Bannock Drive to the intersection of Crow Drive, north on Quivas Road to Delaware Drive, and from the intersection of Quivas Road and Delaware Drive to the intersection of Delaware Drive and Elati Road.
    - Approximately 1,000 linear feet of 10-inch diameter water line extending from the intersection of Bannock Drive and Crow Place south on Crow Place, from the intersection of Crow Drive and Bannock Drive west on Bannock Drive to the western lot line of Block 9, Lot 12, and from the intersection of Quivas Road and Delaware Drive west on Delaware Drive to the western lot line of Block 11, Lot 11.
    - 13 fire hydrants installed at approximately 500 feet of spacing within the Bannock Drive, Delaware Drive, and Quivas Road ROW .
    - 41 water service stubs.

- Two manholes or vaults for future PRV installation. One at the intersection of Crow Place and Bannock Drive and the other at the intersection of Delaware Drive and Elati Road.
- District policy requires installation of water improvements in roadways when applicable.

Fire Protection: One of the primary concerns when considering development within the District is the water system's capabilities of providing fire protection. Adequate fire protection is defined as the capability of the system to furnish 1,000 gallons per minute (gpm) with a minimum residual pressure of 20 pounds per square inch (psi) for a period of two (2) hours at any single location. Per the 2016 Master Plan, the minimum system pressure for domestic water service is 35 psi and design maximum pressure guideline is 150 psi.

To evaluate the adequacy of the water system to provide fire protection to the study area, the current system water model was run assuming complete occupancy of the study area with the 8-inch water main extending from the existing 10-inch water main located at the east end of the study area to Crow Drive, north on Quivas Road to Delaware Drive, and from the intersection of Quivas Road and Delaware Drive to the intersection of Delaware Drive and Elati Road. A 10-inch waterline will need to be installed where the waterline does not complete a loop. It was assumed that each of the residential lots evaluated would be developed for single family residential use.

Fire Flow Scenario: A fire flow model run was evaluated at several locations within the study area. The model run assessed the expected available fire flow at each location during system-wide max day demand conditions, while maintaining at least 20 psi residual pressure at all other locations in the distribution system.

Based on the result of modeling this scenario, fire protection can be provided to the study area by installing water system improvements as described above and shown in Figure C. Figure D shows the expected available fire flow during max day demand conditions (worst case scenario) ranges from 1,033 gpm to 1,489 gpm while maintaining 20 psi residual at all other points in the distribution system.

Domestic Water Service: To study the domestic water service capabilities of the District's system to the study area, a single peak-hour demand scenario was completed. The current system water model was run with the study area added and assuming complete occupancy of the study area.

Domestic Water Service Scenario: A model run was performed with a peak-hour demand applied to the distribution system. The results indicate that the available domestic service pressures within the study area range from 35 to 104 psi. The District's requirements for domestic water service requires that a minimum water pressure of 35 psi to each lot. Based on the result of modeling this scenario, domestic water service can be provided to the study area by installing water system improvements as described above and shown in Figure C. Please reference Figures C-E for the information for the on anticipated domestic service pressures.

III. Water Availability:

Note: In the preparation of this study, water demand and supply district-wide are considered, as the West Region consumes more water than can be generated in the West region. Also, the East Region supply and treatment infrastructure is capable of providing water to both the East and West service regions of PPWSD.

Current Water Demand: The District defines water demand based on Equivalent Residential Units (EQRs). EQRs are defined based on meter size. The following table shows the number of EQRs represented by each meter size.

Meter Size	Corresponding EQRs
5/8"	1
3/4"	1.5
1"	2.5
1 ½"	5
2"	8

Referencing the June 2020 Systems Report, prepared by SEMOCOR, Inc., and discussions with District Staff, the District provides water service to a total of 1,497 taps, of which 837 are located in the West region and 660 are located in the East region. Converting taps to EQRs using the table above results in 1,653 EQRs. The difference between the number of taps (1,497) and the number of EQRs (1,653) can be accounted for by the taps in service equating to more than one EQR. Water to the study area would be provided by the West Region Water Treatment and Supply System under normal operating conditions.

Potential of Immediate Demand: In addition to the 1,653 EQRs currently served, the District has accepted a number of main line extensions and development projects (completed water infrastructure installation) which could potentially require immediate demand. The District has 251 EQRs which fall into this category. These projects were previously platted lots within the current District service boundary and, because of the current availability of service infrastructure, could add to the immediate demand. Of these 251 additional EQRs, 171 EQRs are located within the West Region.

Potential Demand, Approved Construction Plans (waiting for construction): The District has approved construction plans that are the final step for provisions of water service and fire protection. These areas could create demand on the system following completion. A summary of the approved construction plans, their system location, and their potential demand are as follows:

Study Area	Type of Lots	No. of EQRs
Country Club	Residential	3 EQRs
Bannock Drive 2018*	Residential	10 EQRs
Poncho Drive*	Residential	14 EQRs
Total	**Residential**	**27 EQR's**

**Construction plans are being finalized*

Potential of Approved Feasibility Studies: There are currently two approved feasibility studies, as shown in the table below.

Study Area	Type of Lots	No. of EQRs	Approved Date
DGKS	Residential	17 EQRs	Mar 20, 2019
7100 Fox Circle	Residential	1 EQR	Feb 21, 2018
Total	**Residential**	**18 EQRs**	

Total Potential Immediate Demands: The district-wide potential immediate demand - considering areas with approved feasibility studies, areas that the District has already committed service to, and areas with approved construction plans - total 296 EQRs.

Treated Water Capacity (Treatment Capacity and Treated Water Storage): As previously mentioned, the District currently provides water service to 1,653 EQRs. This equates to a max-day demand of 926 gpm (1,653 EQRs x 0.56 gpm/EQR).

The District has two water treatment plants (WTPs). The Glen Grove WTP (GGWTP) is located in the District's West Region and the Sageport WTP (SWTP) is located in the District's East Region.

The district-wide water treatment infrastructure (East and West Regions) is capable of providing approximately 1,032 gpm. The East Region's Sageport WTP provides 910 gpm assuming all filters are operating and in service and a well capacity of 812 gpm. The District's West Region's GGWTP provides 220 gpm.

The District has a number of treated water storage tanks. A description of their storage capacities is as follows:

Name of Storage Facility	Max Available Storage Vol. 100% Full (gallons)
Hog John Tank No. 1	300,000
Hog John Tank No. 2	150,000
Echo Hills Tank No. 1	500,000
Echo Hills Tank No. 2	333,000
School House Tank	800,000
Sageport WTP Clearwell	100,000
Glen Grove Clearwell	38,000
Total Volume	**2,221,000**
Required Fire Storage	**-240,000**
Available Storage for Continuous Max Day Demand Events	**1,981,000**

When considering available treated water storage, it is important to note that a reserve of water storage equal to 240,000 gallons must be kept for fire protection as indicated in the table above and in the 2016 Master Plan.

During normal operation, WTPs and water storage are utilized to provide water to the District. If the District encounters a problem with one of the WTPs and the treatment capacity is temporarily reduced, the additional treated water is supplied using the District's treated water storage. In order to estimate the water available in storage a conservative factor of safety is applied to the max-day demand to account for unforeseen, short-term shortages in treatment capacity. The District utilizes a factor of safety equal to twenty-five percent (25%) resulting in a treatment capacity equal to 774 gpm (1032 gpm x 75%). In the unforeseen event that the District WTPs are not capable of producing 774 gpm, the difference is subsidized from the District's treated water storage system.

Using the District's max-day demand of 0.56 gpm/EQR, the 41 EQRs proposed in the study area would generate a demand of approximately 23 gpm during a max-day event. These estimates are made by assuming 41 single-family residential lots in the development. The addition of the study area would increase the max-day demand for the District to 949 gpm. This max-day demand can be met by the District using the treatment capacity and the treated water storage.

The following table illustrates the number of days the District could rely on their available treated water storage to supply a district-wide, continuous, max-day demand event. For this analysis, treatment capacity with the safety factor applied was used to determine the amount of water which would need to be subsidized by treated water storage. The District tanks for this scenario were assumed to be full and the days of available storage capacity maintain 240,000 gallons left in reserve for fire protection.

	Projected Max-Day Demand	District Wide Treatment Capacity (including safety factor)	Treatment capacity to be subsidized by storage	Available Storage Volume 100% Full Accounting for fire protection	Days of Available Storage from 100% full storages to Cover shortages in treatment capacity during Max-Day Event
	(gpm)	(gpm)	(gpm)	(Gallons)	(Days)
Current Demand	926	774	152	1,981,000	8.76
Current Demand & Study Area	949	774	175	1,981,000	7.86
Current Demand, Study Area, & All Potential Demands	1115	774	341	1,981,000	4.03

As previously stated, the current district-wide treatment capacity is equal to 774 gpm and the current max-day demand is 926 gpm; therefore, the treatment capacity is 152 gpm (774 gpm – 926 gpm) less than the max-day demand. However, as shown in the previous table, when the District's treated water storage is included, the District can meet the max-day demand using the worst-case scenario evaluated (operating at 75% of max capacity) for more than eight days. It should be noted that max-day events occur a limited number of times per year and treated water storage is kept as close to full as possible during load season (typically when max-day events occur).

Based on the analysis, the 41 lots within the study area could be added and the District could meet the associated max-day demands using treatment capacity and treated water storage capacity without the Pressure Zone 5 water storage tank. In the event that all of the lots that could add immediate demands and the study area are developed in the near future, the District can meet the associated max-day demands using treatment capacity and treated water storage capacity.

IV. Sanitary Sewer:

Current Sewer System in the Vicinity of the Study Area: The proposed development is located in Perry Park West and is served by the West Sewer Collection and Waucondah Wastewater Treatment Plant (WWTP). The nearest existing sanitary sewer lines to the study area are located east of the study area in Bannock Drive. The configuration of the existing sewer collection system is shown in Figure F. All required sanitary sewer lines, sanitary sewer manholes, sanitary sewer services, and appurtenances will need to meet current Perry Park Water and Sanitation District's Standards and Specifications.

Evaluation of Sewer Service: In order to evaluate existing surface elevations in the study area, the existing sewer main elevations were estimated. Surface elevations were estimated through the use of LiDAR data by Douglas County. Existing sewer main elevations and manhole invert elevations were determined from the District's as-built drawings.

Summary of Required Sewer System Improvements: Please reference Figures G and H. In order to provide sewer service to the study area, the following minimum sewer system improvements are required. All proposed sewer services, sewer lines, and appurtenances shall be installed in accordance with PPWSD's Rules and Regulations and Standards and Specifications.

1. **Sanitary Sewer System and Service:** Sewer service to the study area could be provided by completing the following improvements:

    - Approximately 5,000 linear feet of 8-inch diameter sewer line installed in Bannock Drive, Quivas Road, and Delaware Drive Right-of-Way. Note that there is a portion of the sewer main in Bannock Drive that requires deep sewer (27 to 42 feet deep) to eliminate a lift station. The final depth will depend on the final road design. Figure H shows Bannock Drive at a 6% maximum road slope which would result an approximately 27 feet deep sewer. If Douglas County allows a steeper road slope, deeper sewer in this area will be required and special considerations may be required.
    - 24 sanitary sewer manholes.
    - Sewer service stubs and associated cleanouts constructed to serve each of the 41 single-family lots in the study area installed in conformance with the PPWSD Standards and Specifications.
    - In the event that a sewer service would require a grinder pump, the installation and maintenance of the grinder pump and service line forcemain will be the responsibility of the builder and subsequent homeowner.

V. Wastewater Treatment Capacity:

Current Demand: Referencing the June 2020 Systems Report, prepared by SEMOCOR, Inc, the District provides wastewater collection and treatment services to 806 taps in the West Region. The Waucondah WWTP and Collection System serves the PPWSD West Region and would be utilized to collect, transport, and treat wastewater from the study area.

Potential of Immediate Demand: The District has accepted a number of main line extensions and development projects (completed sewer service infrastructure installation) which could potentially add near-term demand. The District has 246 taps which fall into this category. This figure is a district-wide number, with approximately 171 of these lots attributed to the West Region. These projects were previously platted lots within the current service boundary, and, because of the current availability of service infrastructure, could potentially add immediate demand.

Potential Demand, Approved Construction Plans (waiting for construction): In addition to the 806 sewer taps currently served and the 171 lots which could require service in the immediate future, the District has accepted a construction plan which would increase the demand. This approved construction plan is the final step towards installation of wastewater collection infrastructure. This area could create near-term demand on the system following construction. A summary of the approved construction plans and potential wastewater treatment demands to the Wauconda WWTP and West Collection System are as follows:

Study Area	Type of Lots	No. of EQRs
Country Club (west)	Residential	3 EQRs
Bannock Drive 2018*	Residential	10 EQRs
Total	**Residential**	**13 EQRs**

**Construction plans are being finalized*

Potential of Approved Feasibility Studies: Currently, there are two approved feasibility studies within the West Collection System area, as shown in the table below.

Study Area	Type of Lots	No. of EQRs	Approved Date
DGKS	Residential	16 EQRs	Mar 20, 2019
7100 Fox Circle	Residential	1 EQR	Feb 21, 2018
Total	**Residential**	**17 EQRs**	

Total Potential Immediate Demands: The number of sewer taps (EQRs) which could add immediate demand to the system is 201. This is calculated from the number of lots in the West Collection System area that the District has committed service to (171), has approved feasibility studies for (17), or has approved construction plans for (13). The number of EQRs which the District is presently serving (806) plus the number of potential immediate EQRs (201) equals 1,007 EQRs.

Treatment Capacity: As previously mentioned, the District currently provides wastewater treatment services to 806 EQRs. The Waucondah WWTP has a permitted capacity of 320,000 gpd. The June 2019 through June 2020 Systems Reports indicated the maximum month average daily flow to the plant was 185,000 gpd in April 2020. Per the maximum month average daily flow, the Waucondah WWTP is at 57.8% of permitted capacity. The remaining 42.2% capacity equals approximately 135,000 gpd.

Using the maximum month average daily flow rate for April 2020 of 185,000 gpd, the average daily flow rate per tap equals approximately 231 gpd per tap (185,000 gpd / 803 taps).The estimated wastewater treatment demand generated by the improvements associated with the study area equals 9,471 gallons per day (gpd) for the 41 lots in the study area. The EQRs associated with the study area improvements would consume 7.02% (9,471 gpd / 135,000 gpd) of the remaining treatment reserve. In the event that all of the lots which could add immediate

demand in the study area are developed in the near future, the treatment capacity would be equal to 61% of permitted capacity, with 39% of treatment capacity available for the future.

Incorporating the total potential immediate demands into the WWTP, there is a total of 242 additional EQRs (201 EQRs from total potential immediate demand + 41 EQRs from the study area). Utilizing the approximately 231 gpd per tap, the demand generated by all immediate demands is 55,902 gpd (231 gpd/tap x 242 EQRs). The EQRs associated with total potential immediate demand plus the study area improvements would consume 41.4% (55,902 gpd/135,000gpd) of the remaining treatment reserve. In the event that all of the lots which could add immediate demand in the study area and potential immediate demand are developed in the near future, the treatment capacity would be equal to 75% of permitted capacity with 25% of the treatment capacity available for the future.

While the potential immediate demands and the study area have shown they could be constructed and still meet permit limits, the District is currently completing a thorough evaluation of all processes at the Waucondah WWTP to confirm the actual capacity of each process meets the permitted capacity. There is potential that the study would show that improvements are required to the Waucondah WWTP to allow additional demands. Based on the results of the permitted treatment capacity, the District can provide treatment services to the study area including all potential immediate demands included, but some processes within the Waucondah WWTP may require upgrades to accommodate the study area.

Lift Station Capacity: All wastewater from the study area could flow to the Red Rock Lift Station. Red Rock Lift Station serves approximately 342 lots. The permitted hydraulic capacity for Red Rock Lift Station is 0.25 MGD with a max day of 0.40 MGD. The June and July Lift Station Log Sheets indicated an average daily flow of 21,000 gpd or 0.021 MGD. On average the lift station services 8.4% of its permitted capacity. The remaining 91.6% capacity equals approximately 0.229 MGD. The max daily flow from the lift station was approximately 41,000 gallons. On max day events, the lift station operates at 10.3% of its permitted capacity.

The estimated wastewater flow increase generated by the improvements associated with this study equals approximately 9,471 gpd. The EQRs associated with the study area improvements would consume 4.1% of the remaining hydraulic design capacity.

Sanitary Sewer Collection System: As part of the evaluation for the proposed improvements, sewer line capacities were verified to confirm adequate capacity for the additional flow from the study area. Currently, the West Collection System provides services to 806 taps (per the June 2020 Systems Report). With the additional 41 lots being evaluated for sewer service, the West Collection System will provide services to 847 taps (806 existing taps + 41 new taps). The capacity of the last segment of sewer pipe prior to entering the Waucondah WWTP, between manhole A-2 and A-1, was of greatest concern. At peak flow the sewer line segment of most concern is at 64% of full flow capacity; therefore, no sewer lines approach full flow capacity with the additional flow from the study area. With existing deman, the potential immediate demand and the study area, there are a total of 1,048 EQRs. At peak flow the sewer line segment of the most concern is at 80% of full flow capacity. In the event that all of the lots which could add immediate demands

and the study area are developed in the near future, no sewer lines approach full flow capacity even with the additional flow from the study area and all potential immediate demands included.

Based on the results of the collection system capacity evaluation, the District can provide wastewater collection services to the study area including all potential immediate demands included.

VI. Conclusion:

After reviewing the current system including the study area, the following summarizes the recommended improvements to the District infrastructure to provide water and sewer service to the study area:

1. Fire Protection and Domestic Water Service:
    - Approximately 4,000 linear feet of 8-inch diameter waterline extending from the existing 10-inch diameter waterline located at Block 8, Lot 10 and extending west on Bannock Drive to the intersection of Crow Drive, north on Quivas Road to Delaware Drive, and from the intersection of Quivas Road and Delaware Drive to the intersection of Delaware Drive and Elati Road.
    - Approximately 1,000 linear feet of 10-inch diameter water line extending from the intersection of Bannock Drive and Crow Place south on Crow Place, from the intersection of Crow Drive and Bannock Drive west on Bannock Drive to the western lot line of Block 9, Lot 12, and from the intersection of Quivas Road and Delaware Drive west on Delaware Drive to the western lot line of Block 11, Lot 11.
    - 13 fire hydrants installed at approximately 500 feet of spacing within the Bannock Drive, Delaware Drive, and Quivas Road ROW .
    - 41 water service stubs.
    - Two manholes or vaults for future PRV installation. One at the intersection of Crow Place and Bannock Drive and the other at the intersection of Delaware Drive and Elati Road.
    - District policy requires installation of water improvements in roadways when applicable.

2. Treated Water Capacity:
    - The District currently uses treatment capacity and treated water storage to meet the max-day demands. With the construction of the 41 lots in the study area, the District max-day demand is estimated to increase by 23 gpm and can be met by the District. As shown in this feasibility study the District has adequate treated water storage, while still providing fire protection, to subsidize the treatment capacity during a max-day event for the current water services and the addition of the study area.

3. Sewer System and Service:
    - Approximately 5,000 linear feet of 8-inch diameter sewer line installed in Bannock Drive, Quivas Road, and Delaware Drive Right-of-Way. Note that there is a portion

of the sewer main in Bannock Drive that requires deep sewer (27 to 42 feet deep) to eliminate a lift station. The final depth will depend on the final road design. Figure H shows Bannock Drive at a 6% maximum road slope which would result an approximately 27 feet deep sewer. If Douglas County allows a steeper road slope, deeper sewer in this area will be required and special considerations may be required.

- 24 sanitary sewer manholes.
- Sewer service stubs and associated cleanouts constructed to serve each of the 41 single-family lots in the study area installed in conformance with the PPWSD Standards and Specifications.
- In the event that a sewer service would require a grinder pump, the installation and maintenance of the grinder pump and service line forcemain will be the responsibility of the builder and subsequent homeowner.

4. Sewer Treatment:
   - Based on the information and analysis presented, the District has adequate permitted capacity at the Waucondah WWTP to treat the additional wastewater from the improvements associated with the study area. The District is undertaking a study of the Waucondah WWTP that may show that upgrades are required to meet the permitted capacity. Additionally, the existing sewer collection system was determined to have adequate capacity to serve the lots from the study area.

5. Red Rock Lift Station Capacity
   - Based on the information and analysis presented in this study, the District has adequate capacity at the Red Rock Lift Station to pump the additional wastewater due to the improvements within the study area

Based on the analysis performed in this study, and assuming that items 1 – 5 listed above are included, it is recommended that the study area as described for fire protection, domestic water service, and sewer service be accepted. The approved study area improvements must meet the District's requirements for installation of sewer and water infrastructure.

Other items to note, it is the responsibility of the applicant to satisfy the County's requirements for road improvements to the study area.

This Feasibility Study will expire two years from the date of acceptance by the Perry Park Water and Sanitation District Board.

Sincerely,
TST Infrastructure, LLC

Michael Gerstner, P.E.
Principal

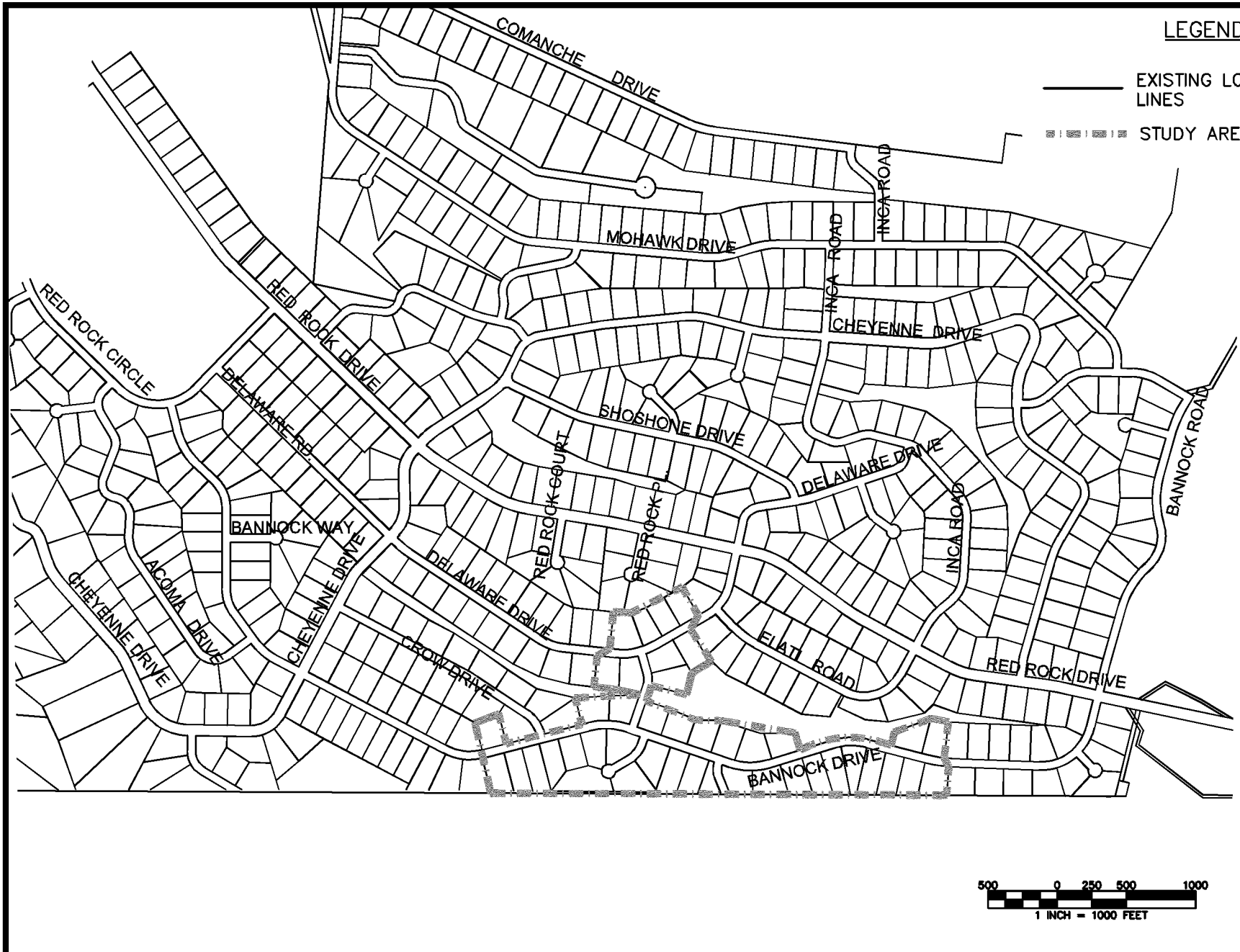


FIGURE A – VICINITY MAP OF STUDY AREA – PERRY PARK WEST

1" = 1000'

PERRY PARK WATER AND SANITATION DISTRICT	
TST INFRASTRUCTURE, LLC Consulting Engineers	BANNOCK DRIVE FEASIBILITY STUDY
	FIGURE A - VICINITY MAP OF STUDY AREA
	JOB NO. 032.068.00 / DATE SEPTEMBER 202(

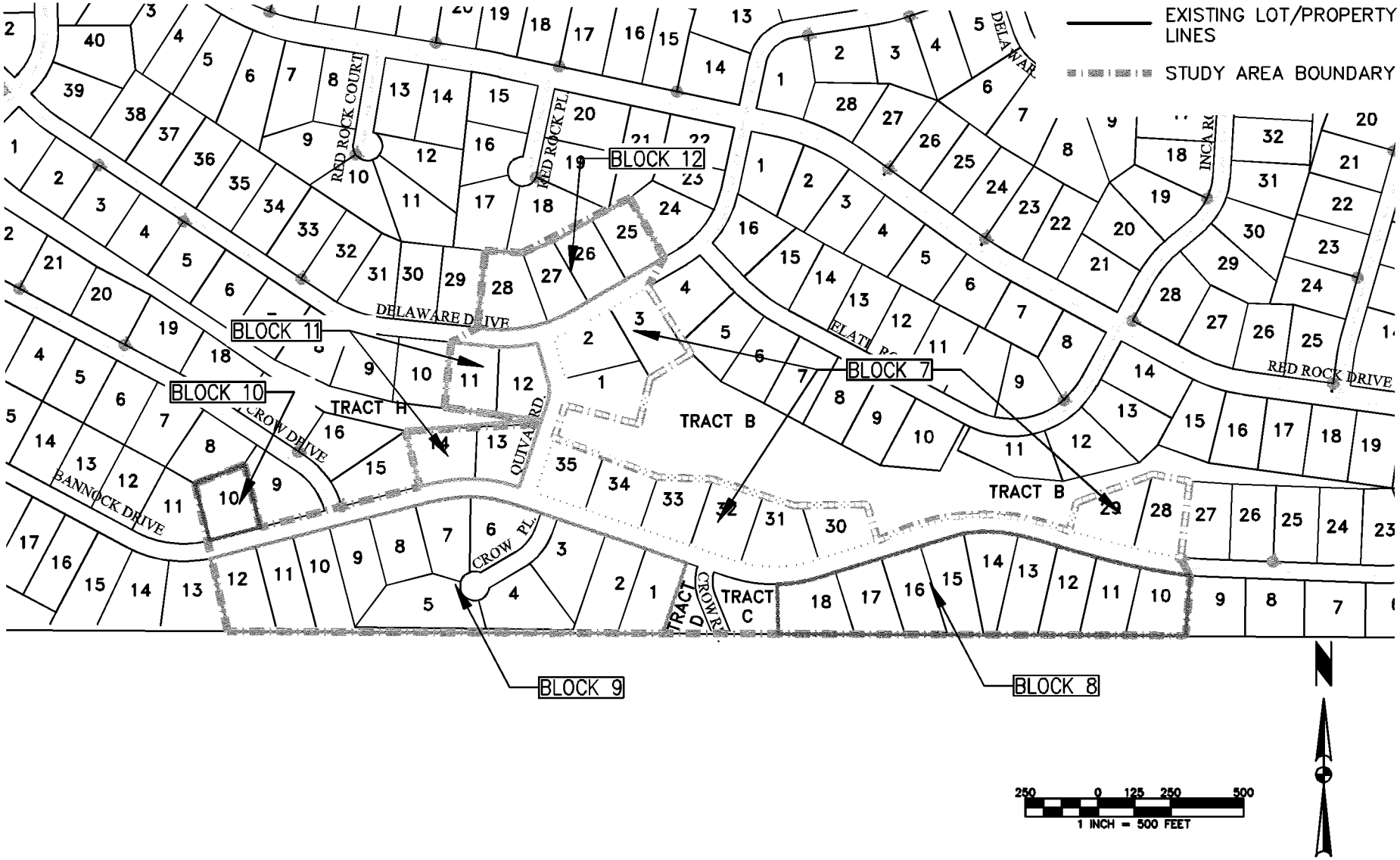


FIGURE B– EXISTING WATER SYSTEM
1" = 500'

PERRY PARK WATER AND SANITATION DISTRICT	
TST INFRASTRUCTURE, LLC Consulting Engineers	BANNOCK DRIVE FEASIBILITY STUDY
	FIGURE B - EXISTING WATER SYSTEM
	JOB NO. 032.068.00 / DATE SEPTEMBER 2020

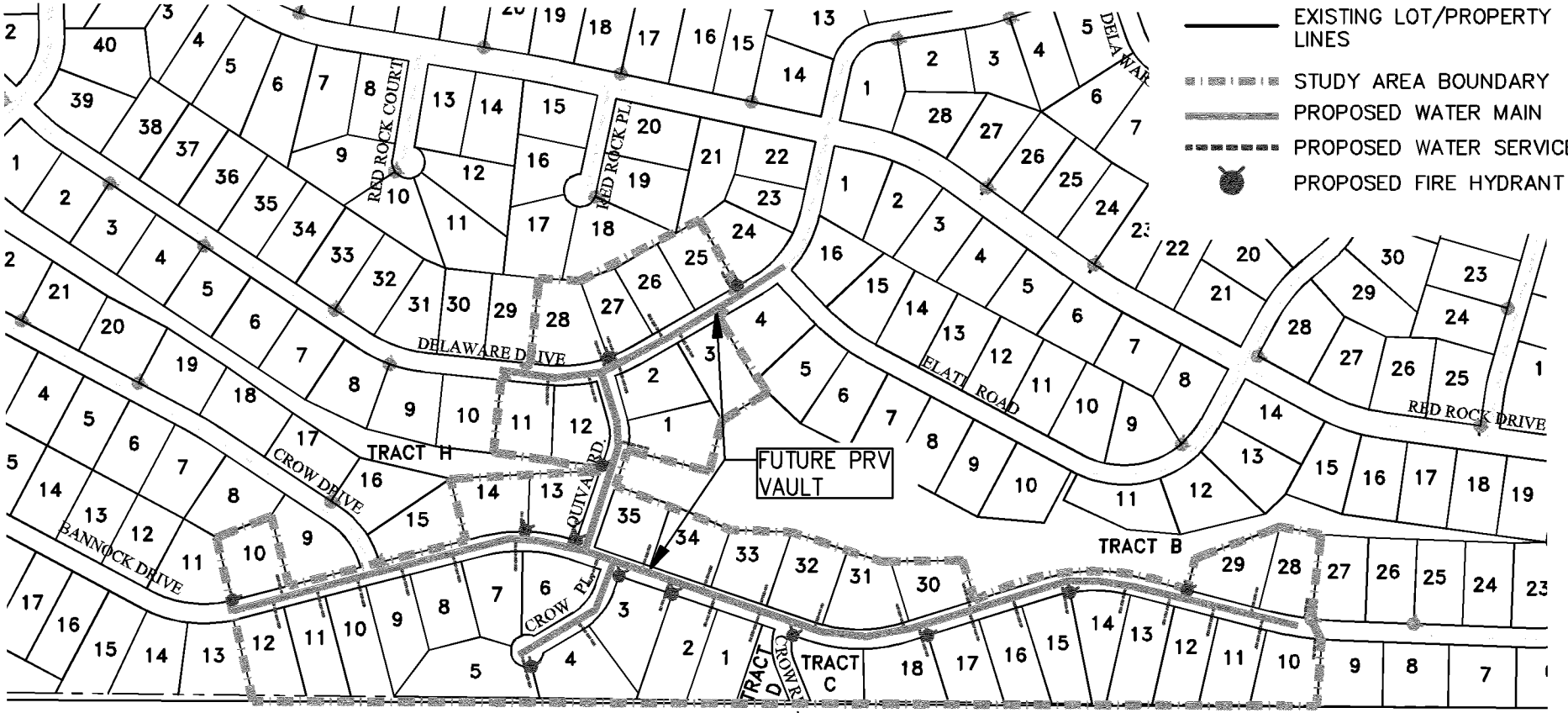


FIGURE C– REQUIRED WATER IMPROVEMENTS
1" = 500'

PERRY PARK WATER AND SANITATION DISTRICT	
TST INFRASTRUCTURE, LLC Consulting Engineers	BANNOCK DRIVE FEASIBILITY STUDY FIGURE C - REQUIRED WATER IMPROVEMENTS
JOB NO. 032.068.00	DATE SEPTEMBER 202(

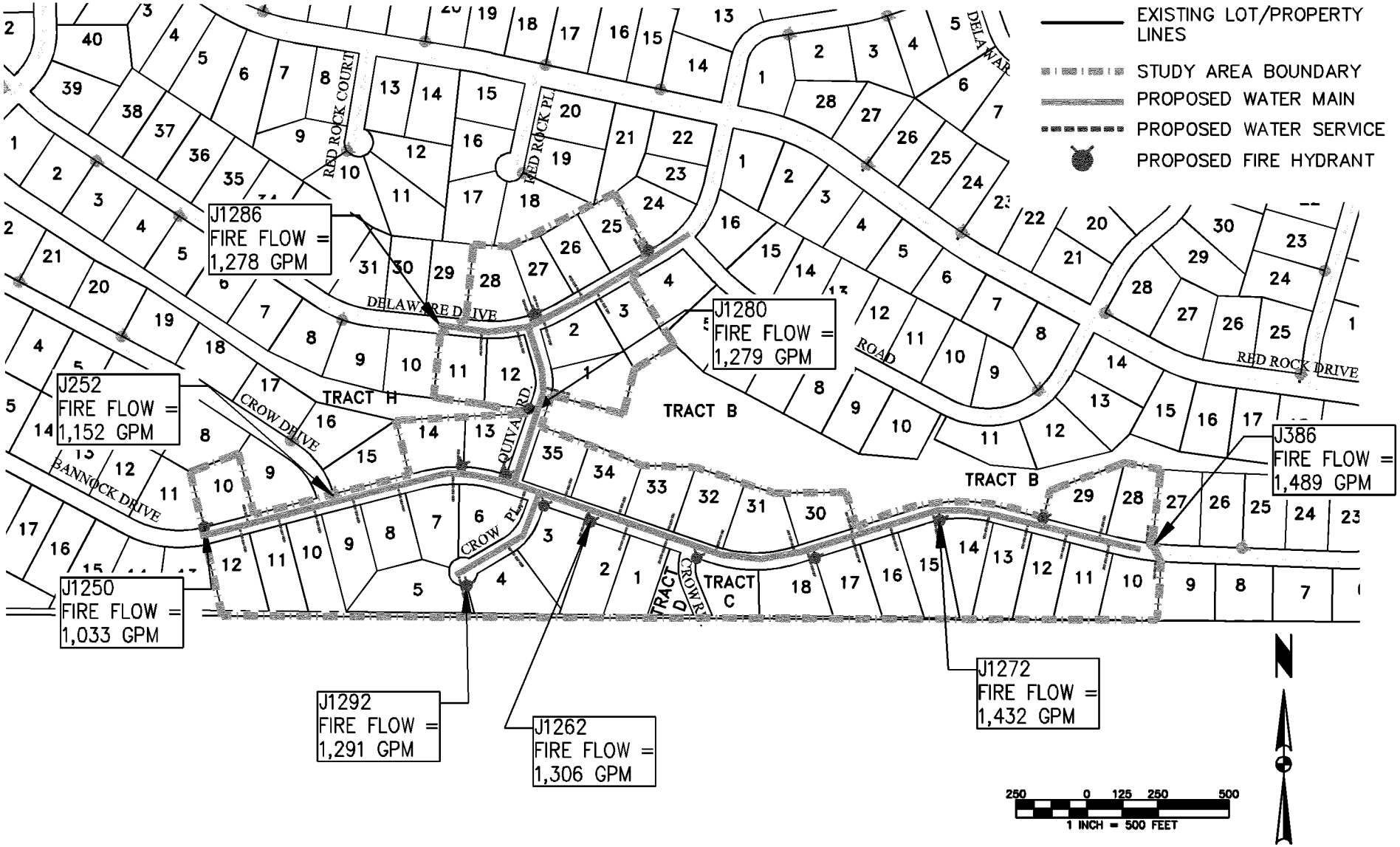


FIGURE D– FIRE FLOW AT MAX DAY DEMAND AND AT LEAST 20 PSI RESIDUAL PRESSURE

1" = 500'

PERRY PARK WATER AND SANITATION DISTRICT	
TST INFRASTRUCTURE, LLC Consulting Engineers	BANNOCK DRIVE FEASIBILITY STUDY
	FIGURE D - FIRE FLOW AT MAX DAY DEMAND & AT LEAST 20 PSI RESIDUAL PRESSURE
	JOB NO. 032.068.00
	DATE SEPTEMBER 202(

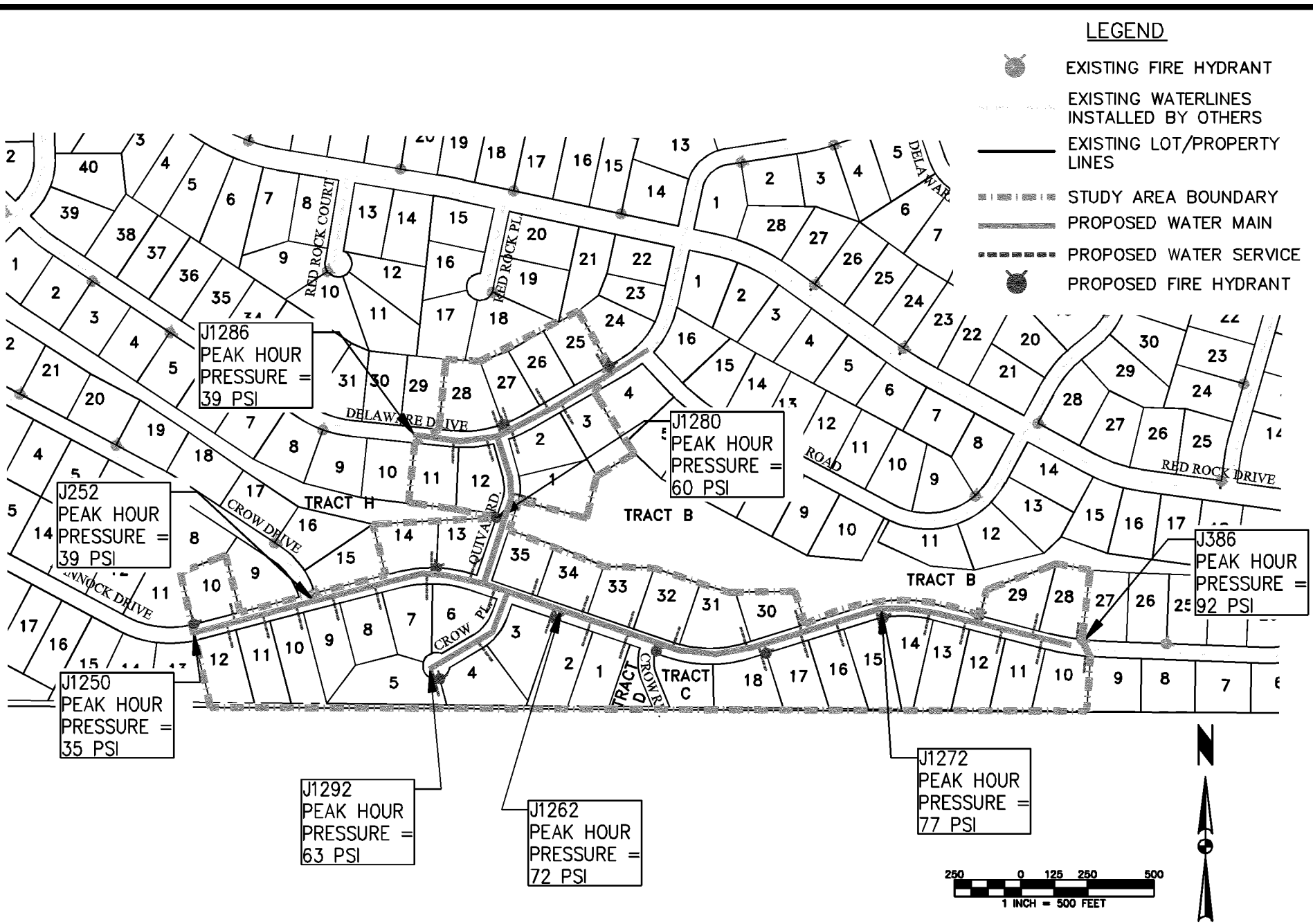


FIGURE E– SERVICE PRESSURES AT PEAK HOUR DEMAND

1" = 500'

PERRY PARK WATER AND SANITATION DISTRICT

TST INFRASTRUCTURE, LLC
Consulting Engineers

BANNOCK DRIVE FEASIBILITY STUDY

FIGURE E - SERVICE PRESSURES AT PEAK HOUR DEMANDS

JOB NO. 032.068.00

DATE SEPTEMBER 202(

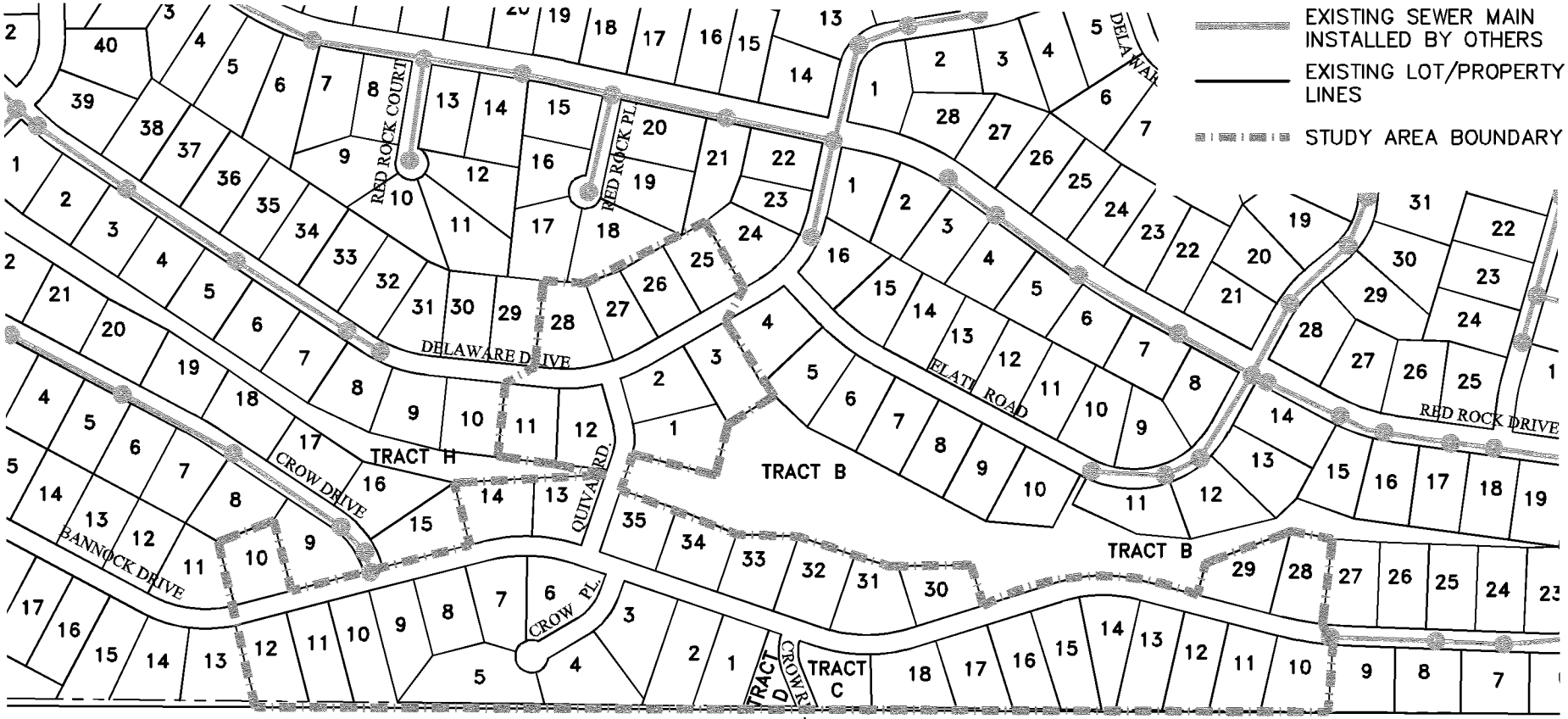


FIGURE F– EXISTING SEWER SYSTEM
1" = 500'

PERRY PARK WATER AND SANITATION DISTRICT	
TST INFRASTRUCTURE, LLC Consulting Engineers	BANNOCK DRIVE FEASIBILITY STUDY
	FIGURE F - EXISTING SEWER SYSTEM
	JOB NO. 032.068.00 / DATE SEPTEMBER 202(

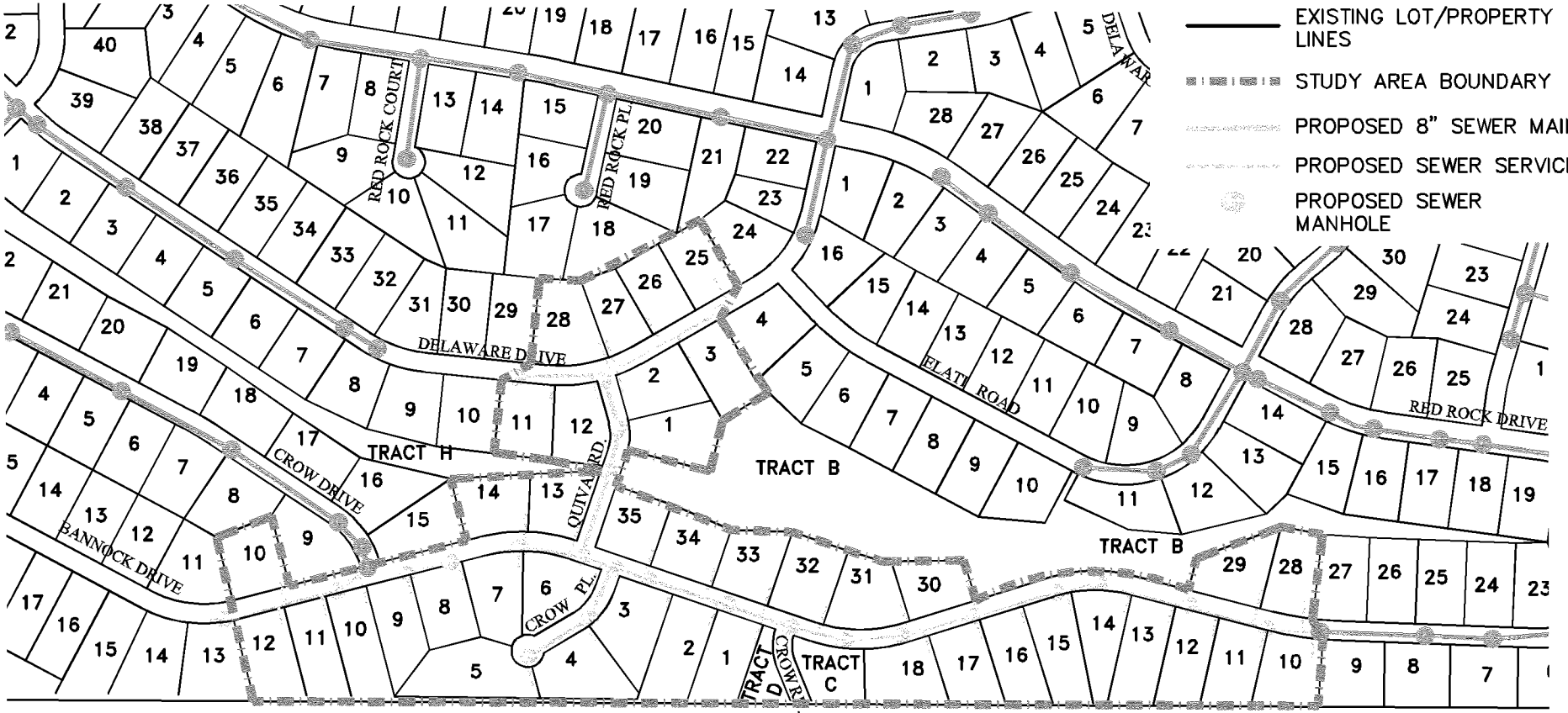


FIGURE G – REQUIRED SEWER IMPROVMENTS
1" = 500'

PERRY PARK WATER AND SANITATION DISTRICT

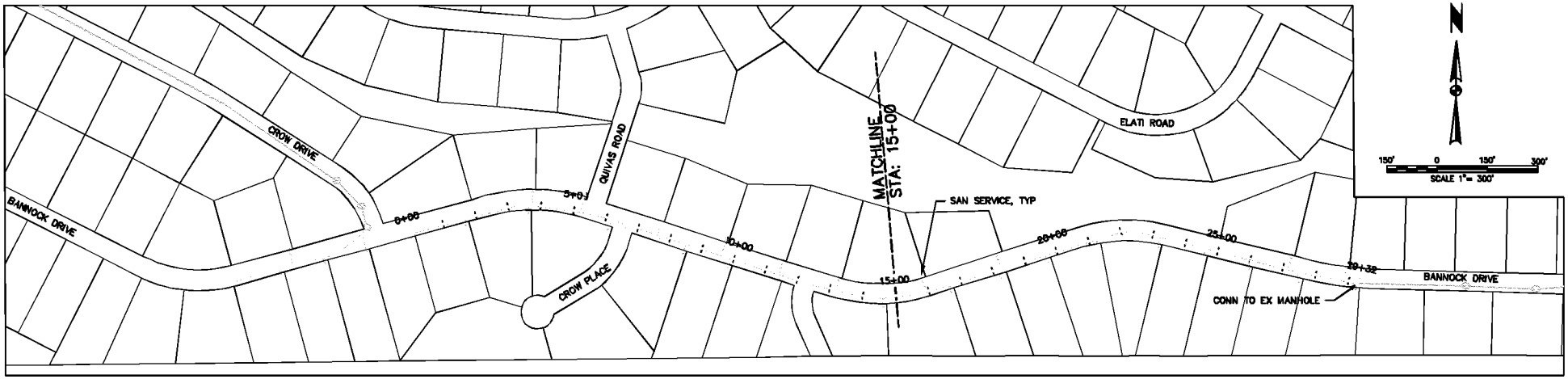
TST INFRASTRUCTURE, LLC
Consulting Engineers

BANNOCK DRIVE FEASIBILITY STUDY

FIGURE G - REQUIRED SEWER IMPROVEMENTS

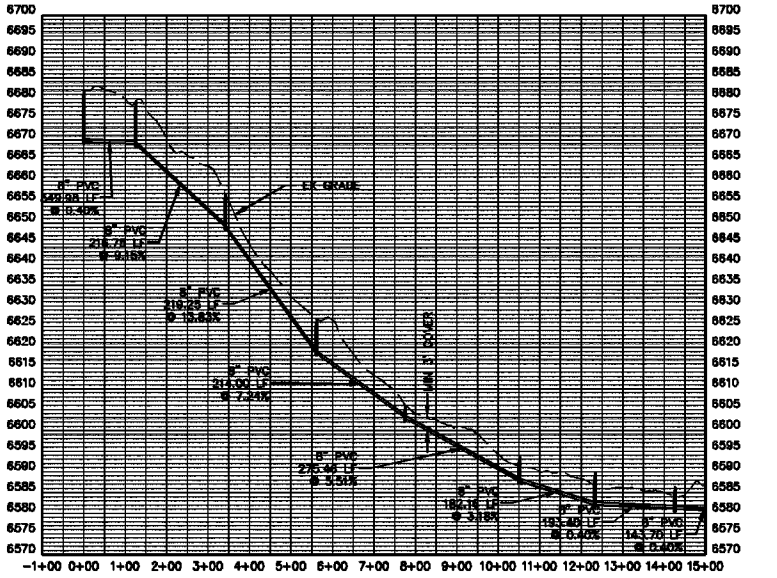
JOB NO. 032.068.00

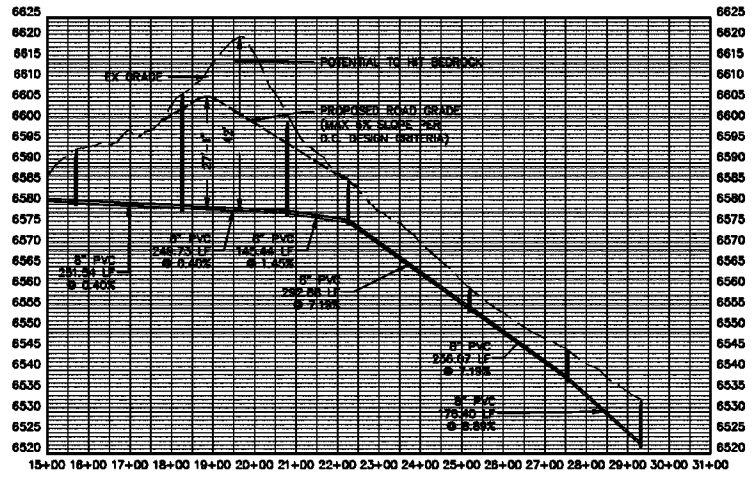
DATE SEPTEMBER 202(



BANNOCK DRIVE SEWER PLAN VIEW

SCALE: 1"=300'





BANNOCK DRIVE SEWER PROFILE
STA 19+00 TO STA 36+56
HORIZONTAL SCALE: 1"=300'
VERTICAL SCALE: 1"=10'

BANNOCK DRIVE SEWER PROFILE
STA 0+00 TO STA 19+00
HORIZONTAL SCALE: 1"=300'
VERTICAL SCALE: 1"=10'

CONCEPTUAL

NOTES:
1. PROFILES WERE DEVELOPED FROM DATA PROVIDED BY DOUGLAS COUNTY AND ARE NOT BASED ON ACTUAL SURVEY
2. ESTIMATED DESIGN FOR ROADWAY MAY NOT REFLECT ACTUAL FUTURE DESIGN OF ROADWAY
3. THE CONNECTION ELEVATION TO EXISTING SEWER WAS DETERMINED FROM INFORMATION PROVIDED BY OTHERS AND MAY NOT ACCURATELY REFLECT THE ACTUAL ELEVATION

PERRY PARK WATER AND SANITATION DISTRICT

TST INFRASTRUCTURE, LLC
Consulting Engineers

BANNOCK FEASIBILITY SEWER PROFILE

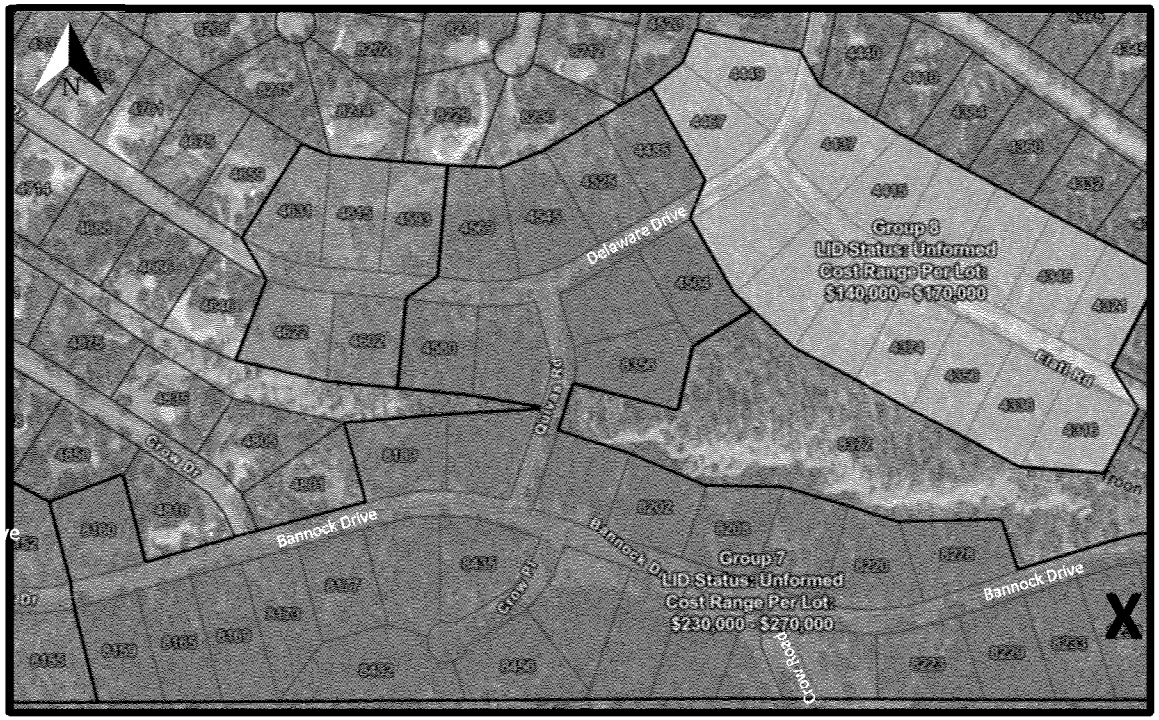
EXHIBIT H - SEWER FEASIBILITY

JOB NO. 032.068.00

DATE SEPTEMBER 2020

Boundary Map of LID

Bannock Drive (Group 7A)



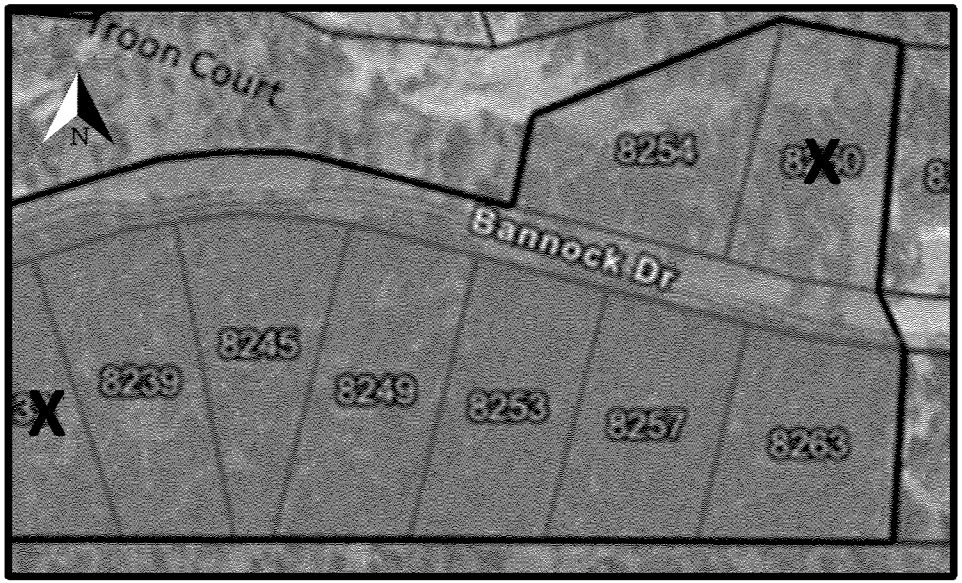
Legend

Lot included in LID

X Lot NOT included in LID

Boundary Map of LID

Bannock Drive (Group 7B)



Legend

Lot included in LID

X Lot NOT included in LID

Douglas County
Perry Park Area
Undeveloped Property Guidance
Conceptual Cost Estimate
April 24, 2024
Local Improvement District (LID) Group 7

Upgrades Benefitting All Lots

Description	Quantity	Units	Unit Price	Subtotal Cost
Water Upgrades				
Water Distribution Piping	5,500	LF	$ 130	$ 715,000
Water Service Connection	40	EA	$ 3,000	$ 120,000
Fire Hydrant*	12	EA	$ 15,000	$ 180,000
Gate Valve**	34	EA	$ 5,000	$ 170,000
PRV	2	EA	$ 175,000	$ 350,000
Water Main Connection	3	EA	$ 20,000	$ 60,000
Rock Excavation (Assume 1/4 of pipe installation)	1,300	CY	$ 60	$ 78,000
Sewer Upgrades				
Gravity Sewerline Piping	5,100	LF	$ 100	$ 510,000
Sewer Service Connection	40	EA	$ 3,000	$ 120,000
Manhole^	20	EA	$ 8,000	$ 160,000
Rock Excavation (Assume 1/4 of pipe installation)	1,200	CY	$ 60	$ 72,000
Road Upgrades				
Asphalt Paving (Assume 25 LF wide)	5,500	LF	$ 130	$ 715,000
Curb and Gutter	11,000	LF	$ 40	$ 440,000
Base Course (8-inch Deep)	3,500	CY	$ 80	$ 280,000
Subex/Grading Road	10,200	CY	$ 25	$ 255,000
Gas Upgrades				
Gas Main	11,000	LF	$ 10	$ 110,000
Gas Service Connection	40	EA	$ 2,000	$ 80,000
Electric Upgrades				
Electric Distribution Line	6,875	LF	$ 25	$ 171,875
Electric Service Connection	40	EA	$ 2,000	$ 80,000
Storm / Erosion Control				
Initial Erosion Control	11,000	LF	$ 10	$ 110,000
Clear and Grub	5	AC	$ 15,000	$ 75,000
Final Restoration	5	AC	$ 25,000	$ 125,000
Storm Sewer+	210	LF	$ 200	$ 42,000
Construction Subtotal (nearest $1,000)				**$ 5,019,000**
Low Contingency (nearest $1,000)	25	%	$ 5,019,000	$ 1,255,000
High Contingency (nearest $1,000)	50	%	$ 5,019,000	$ 2,510,000
Engineering (25%) (nearest $1,000)	25	%	$ 5,019,000	$ 1,255,000
Admin (5%) (nearest $1,000)	5	%	$ 5,019,000	$ 251,000
Total with Low Contingency				**$ 7,780,000**
Total with High Contingency				**$ 9,035,000**

Note: Project Total cost does not include any costs that may be required for Perry Park Water and Sanitation District Water Supply, Water Treatment or Wastewater Treatment upgrades.
*Based on max separation distance of 500 FT per PPWSD and end of waterlines
**Based on max separation distance of 600 FT per PPWSD and 3 valves at each intersection
^Based on max separation distance of 500 FT per PPWSD and one at each intersection
+Assumed 30' long culvert at all sides of each intersection

Number of Lots Benefitting from Upgrades: 40

Estimated Base Cost per Lot at Low Contingency: $ 195,000
Estimated Base Cost per Lot at High Contingency: $ 226,000

Properties Paying Base Cost Only (7B):
8239 Bannock Dr, 8245 Bannock Dr, 8249 Bannock Dr, 8253 Bannock Dr, 8257 Bannock Dr, 8263 Bannock Dr, 8254 Bannock Dr

Douglas County
Perry Park Area
Undeveloped Property Guidance
Conceptual Cost Estimate
April 24, 2024
Local Improvement District (LID) Group 7

Additional Required Upgrades Benefitting Western Lots (Group A Lots)

Description	Quantity	Units	Unit Price	Subtotal Cost
Sewer Upgrades				
Sewer Bore	725	LF	$ 1,000	$ 725,000
Construction Subtotal (nearest $10,000)				**$ 730,000**
Low Contingency (nearest $10,000)	25	%	$ 730,000	$ 183,000
High Contingency (nearest $10,000)	50	%	$ 730,000	$ 365,000
Engineering (25%) (nearest $10,000)	25	%	$ 730,000	$ 183,000
Admin (5%) (nearest $10,000)	5	%	$ 730,000	$ 37,000
Total with Low Contingency				**$ 1,133,000**
Total with High Contingency				**$ 1,315,000**

Number of Lots Benefitting from Additional Upgrades: 33

Estimated Additional Upgrade Cost Per Lot at Low Contingency: $ 34,000
Estimated Additional Upgrade Cost Per Lot at High Contingency: $ 40,000

Properties Requiring Additional Upgrades (7A):
8356 Quivas Rd, Lot 2 Blk 7 Perry Park 5, 4504 Delaware Dr, 4485 Delaware Dr, 4525 Delaware Dr, 4545 Delaware Dr, 4569 Delaware Dr, 4580 Delaware Dr, Lot 12 Blk 11 Perry Park 5, Lot 13 Blk 11 Perry Park 5, 8189 Bannock Dr, 8160 Bannock Dr, 8159 Bannock Dr, 8165 Bannock Dr, 8169 Bannock Dr, 8173 Bannock Dr, 8177 Bannock Dr, Lot 7 Blk 9 Perry Park 5, 8435 Crow Pl, 8482 Crow Pl, 8456 Crow Pl, Lot 3 Blk 9 Perry Park 5, 8203 Bannock Dr, 8209 Bannock Dr, 8223 Bannock Dr, 8229 Bannock Dr, 8233 Bannock Dr, 8228 Bannock Dr, 8220 Bannock Dr, 8214 Bannock Dr, 8208 Bannock Dr, 8202 Bannock Dr, Lot 35 Blk 7 Perry Park 5

Estimated Total Cost per Lot with Additional Upgrades at Low Contingency: $ 229,000
Estimated Total Cost per Lot with Additional Upgrades at High Contingency: $ 266,000