GREEN RIVER VALLEY WATER DISTRICT
85 E. Les Turner Rd.
P.O. Box 399
Cave City, KY 42127
(270) 773-2135
David Paige, Manager

TTY1-800-648-6056

June 18, 2009

Mr. Ryan Gatewood, Director
Division of Filings
Kentucky Public Service Commission
211 Sower Blvd.
P O Box 615
Frankfort, Kentucky 40601

Re: CASE NO. 2009-00162

Green River Valley Water District ("Green River") received the letters from the Commission, dated June 8, 2009, setting our filing deficiencies in the above referenced case. The purpose of this filing is to correct all deficiencies.

Green River requests that the Commission approve this filing as quickly as possible. Bids were opened May 28, 2009 and Green River would like to construct the facilities prior to bids expiring.

Sincerely,

Jack London

Jack London, Chairman
Green River Valley Water Dist.

JL/js

RE: Case No 2009-00162
Filing Deficiencies

1. Filing deficiencies pursuant to 807 KAR 5:001:

   Section 9(2) (b) 807 KAR 5:001: Section 9(2)(b) ....Copies of franchises or permits, if any, from the proper public authority for the proposed new construction or extension, if not previously filed with the Commission.

   807 KAR 5:001: Section 9(2)(b). No franchised or permits are required as set out on Page 2, of the application.

   Section 9(2)(d) 807 KAR 5:001: Section 9(2)(d) ....Three (3) maps to suitable scale (preferably not more than two (2) miles per inch) showing the location or route of the proposed new construction or extension, as well as the location of scale of any like facilities owned by others located anywhere within the map area with adequate identification as to the ownership of such other facilities.

   807 KAR 5:001: Section (9)(2((d). Three maps were filed as part of the application. Additional maps will be sent by Water Management Services, LLC under separate cover.

   Section 9(2)(f) 807 KAR 5:001: Section 9(2)(f) ....An estimated cost of operation after the proposed facilities are completed.

   807 KAR 5:001 Section (9)(2)(f). The estimated cost of operation after the proposed facilities are completed. The funding needs are shown on Page 7 of the application. The estimated cost of operation equal $3,779,600 as set out on Page 7 of the application.

   Amortized over 30 years this amount equals 125,986. This amount would be the additional operating expense of Green River.

2. Filing deficiencies pursuant to KRS 322.340

   KRS 322.340 Engineering plans, specification, plats and report for the proposed construction. The engineering documents prepared by a registered engineer, requires that they by signed, sealed and dated by an engineer registered in Kentucky.

   KRS 322.340. A signed, sealed and dated copy of the engineering plans, specifications, plats and report of the

proposed construction were included in the filing. Will be sent again by Water Management Services, LLC under separate cover.

RE: Case No 2009-00162
Filing Deficiencies

1. Filing deficiencies pursuant to 807 KAR 5:001:

807 KAR 5:001: Section 11(1)(a) Statement of original cost of applicant's property and the cost to the applicant, if different.

807 KAR 5:001: Section (11)(1)(a). The audit report is attached.

807 KAR 5:001 Section 11(1)(b) If Bonds or Notes or Other Indebtedness is proposed: Full description of all terms

807 KAR 5:001: Section 11(1)(b) If Bonds or Notes or Other Indebtedness is proposed: Whether the debt is to be secured and if so a description of how it's secured.

807 KAR 5:001: Section (11)(1)(b). A full description of the loan from Kentucky Rural Water Finance Corporation is included in the original filing. No other information is available.

807 KAR 5:001: Section 11(2)(c) If property to be acquired: Detailed estimates by USOA account number.

807 KAR 5:001: Section 11(2)(c) If property to be acquired: Maps and plans of property.

807 KAR 5:001 Section 11(2)(c). Property is to be acquired: A one (1) acre tract of land and easement for the purchase price of $25,000, included in the original application. Enclosed you will find two new maps and description of property and easement.

807 KAR 5:001 Section 6(5) Bonds: Description of Each Class Issued

807 KAR 5:001 Section 6(5) Bonds: How Secured

807 KAR 5:001: Section 6(5). Bonds will be issued through the Kentucky Rural Water Finance Corporation. All information was included in the original application dated April 17, 2009.

807 KAR 5:001: Section 6(9) Detailed income statement and balance sheet.

807 KAR 5:001: Section 6(9). A copy of the 2007 annual report is on file with the Commission. An audit report is enclosed.

SUITE 401
2 INTERNATIONAL PLAZA
NASHVILLE, TENNESSEE 37217

TELEPHONE: 615/366-6088
FAX: 615/366-6203

Water Management Services, LLC

ENGINEERING • PLANNING • OPERATIONS • RATE STUDIES

June 16, 2009

Mr. Ryan Gatewood, Director
Division of Filings
Public Service Commission
211 Sower Blvd.
P.O. Box 615
Frankfort, KY 4062-0615

Re: Case No. 2009-00162
Filing Deficiencies

Dear Mr. Gatewood,

Your letter to the Green River Valley Water District dated June 8th 2009, details certain deficiencies in the initial filing to the Public Service Commission. As instructed by the District please find enclosed ten (10) copies of the following documents;

- Plans and Specifications for the following projects;
    1. Highway 31-E Water Trans Mission Main;
    2. State Route 1846 Water Storage Reservoir
    3. Various Water Distribution Mains (EPA Grant Funds)
    4. Clearwell and Pump Additions to the Water Treatment Plant (EPA Grant Funds)
- Copies of the Kentucky Division of Water approval letters;
- Engineering Reports including the following;
    1. Additions and Modifications to Water Transmission and Storage Facilities Funded by the Federal Special Appropriation Grant Project;
    2. Additions and Modifications to Water Transmission and Storage Facilities;
    3. Additions and Modifications to Water Treatment Plant 500,000 Gallon Clearwell Addition Federal Special Appropriation Grant Project;
    4. Hydraulic Memorandum for the Hwy 31E Water Transmission Main Project and Proposed Water Storage Reservoir;
    5. Hydraulic Memorandum for the EPA Funded Water Main Extensions
- Maps showing the location of each project.

The requested numbers of copies are included for each individual project pertaining to Case No. 2009-00162. Should you require additional information in regard to this matter, please contact us.

Sincerely,

Steven Jones P.E.

CC: David Paige, GRVWD

DEED OF CONVEYANCE

FROM: **Teresa L. Druen, single,** of 31 Church Street, Canmer, Kentucky, 42722, **GRANTOR.**

TO: **Green River Valley Water District,** of 85 E. Les Turner Road, Cave City, Kentucky, 42127, **GRANTEE, its successors and assigns.**

TAX BILL TO: Green River Valley Water District, 85 E. Les Turner Road, Cave City, Ky, 42127

DATE OF CONVEYANCE: _____, 2009

CONSIDERATION: For and in consideration of the sum of Twenty Five Thousand Dollars ($25,000.00), cash in hand paid.

LEGAL DESCRIPTION

In **HART COUNTY,** Kentucky

Unless stated otherwise, any monument referred to herein as a "rebar with cap" is a set 5/8" rebar, eighteen (18") in length, with a plastic cap stamped "Richard Wood PLS 3690." All bearings stated herein are referred to the magnetic meridian as observed on March 26th, 2008, along the North line of the above described property:

Beginning at a set 5/8" rebar with cap on a 50' Easement for Ingress & Egress, a corner to Teresa Lynn Druen, (being a portion of Deed Book 287 Page 132); thence with new lines of Teresa Lynn Druen, crossing said 50' Easement for Ingress & Egress, N 79 deg. 24 min. 52 sec. W 50.00 feet to a set 5/8" rebar with cap on said 50' Easement for Ingress & Egress, a corner to Teresa Lynn Druen, (being a portion of Deed Book 287 Page 132), thence continuing with new lines of Teresa Lynn Druen, N 79 deg. 24 min. 53 sec. E 208.72 feet to a set 5/8" rebar with cap; thence S 79 deg. 24 min. 52 sec. E 208.72 feet to a set 5/8" rebar with cap, (being located S 57 deg. 34 min. 16 sec. W 180.34 feet from a found stone, parent tract corner); thence S 10 deg. 35 min. 08 sec. W 208.72 feet to the POINT OF BEGINNING and CONTAINING 1.000 ACRES, more or less according to survey by Richard Wood, P.L.S. #3609, Pride Engineering & Land Surveying Inc. dated July 1st, 2008.

SOURCE OF TITLE:

Being a portion of the same property conveyed to Teresa Lynn Druen, single, by Deed dated March 15, 2007, from Willie Druen Osborne and Herman Osborne, and same being duly recorded in Deed Book 287, Page 132, in the Office of the Hart County Court Clerk. See also Plat recorded in Plat Cabinet _____, Sheet _____.

INTEREST CONVEYED: All to GRANTEE, its successors and assigns forever.

WARRANTY PROVISIONS: General.

DATE OF POSSESSION: Upon delivery of deed.

PAYMENT OF TAXES: 2008 property taxes shall be prorated between the parties

CERTIFICATION OF VALUE: The Grantor and Grantee certify the consideration stated is the full consideration. The GRANTOR and GRANTEE acknowledge their understanding that falsification of the stated consideration or sale price is a Class D felony, subject to one to five years imprisonment and fines up to ten thousand dollars ($10,000).

TO HAVE AND TO HOLD the above-described property together with all the rights, privileges, appurtenances, and improvements thereunto belonging to the GRANTEE, its successors and assigns forever, with covenant of general warranty of title.

Teresa L. Druen

Teresa L. Druen, GRANTOR

Green River Valley Water District, GRANTEE

BY: _____

ITS: _____

NOTARY

COMMONWEALTH OF KENTUCKY
COUNTY OF HART

This Deed transfer and Certification of Value was acknowledged, subscribed and sworn to before me this 15 day of January, 2009, by Teresa L. Druen, Grantor, to be her free act and deed.

NOTARY, State at Large, KY
MY COMMISSION EXPIRES: 5/6/2010

COMMONWEALTH OF KENTUCKY
COUNTY OF HART

This Deed transfer and Certification of Value was acknowledged, subscribed and sworn to before me this _____ day of _____, 2009, by _____ in his capacity as _____ of Green River Valley Water District, Grantee, to be his free act and deed.

_____
NOTARY, State at Large
MY COMMISSION EXPIRES: _____

PREPARED WITHOUT TITLE SEARCH

THIS INSTRUMENT WAS PREPARED BY:

_____
JUSTIN BAIRD
BAIRD LAW OFFICE
P.O. Box 187
Munfordville, Ky 42765
(270) 524-2004

DEED OF EASEMENT

THIS DEED OF EASEMENT made by and between TERESA L. DRUEN, single, of 31 Church Street, Canmer, Kentucky, 42722, **GRANTOR**, and GREEN RIVER VALLEY WATER DISTRICT, of 85 E. Les Turner Road, Cave City, Kentucky, 42127, **GRANTEE**,

WITNESSETH:

That whereas the GRANTOR is the fee simple owner of property more particularly described in Deed Book 287, at Page 132, in the Office of the Clerk of the Hart County Court.

The GRANTOR does give, grant, and convey unto the GRANTEE, its successors and assigns, the below described easement over her property:

> Unless stated otherwise, any monument referred to herein as a "rebar with cap" is a set 5/8" rebar, eighteen (18") in length, with a plastic cap stamped "Richard Wood PLS 3609." All bearings stated herein are referred to the magnetic meridian as observed on March 26th, 2008, along the North line of the above described property:
>
> **50' EASEMENT FOR THE PURPOSE OF INGRESS & EGRESS:**
>
> **BEGINNING** at a found 5/8" rebar with cap stamped "MC ESTES" on the Right-of-Way of Kentucky Highway # 1846, (60' Right-of-Way), being on a 50' Easement for the Purpose of Ingress & Egress, a corner to Payton Place, (Lot #4, Plat Cabinet "A" Slide 372); **THENCE** with the lines of Payton Place, (Lots # 4, 5, 6, and 7, Plat Cabinet "A" Slide 372), **S 79 deg. 24 min. 52 sec. E 542.35 feet** to a set 5/8" rebar with cap, a corner to Payton Place, and a corner to Teresa Lynn Druen, (being a portion of Deed Book 287 Page 132); **THENCE** with new lines of Teresa Lynn Druen, **S 10 deg. 35 min. 08 sec. W 123.03 feet** to a set 5/8" rebar with cap on said 50' Easement for the Purpose of Ingress & Egress, a corner to Teresa Lynn Druen, and a corner to Teresa Lynn Druen, (being a portion of Deed Book 287 Page 132, to be sold to Green River Valley Water District); **THENCE** with the line of Teresa Lynn Druen, (to be sold to Green River Valley Water District), **N 79 deg. 24 min. 52 sec. W 50.00**

feet to a set 5/8" rebar with cap, a corner with Teresa Lynn Druen, (to be sold to Green River Valley Water District), and a corner with Teresa Lynn Druen, (being a portion of Deed Book 287 Page 132); **THENCE** continuing with new lines of Teresa Lynn Druen, **N 10 deg. 35 min. 08 sec. E 73.03 feet** to a set 5/8" rebar with cap; **THENCE N 79 deg. 24 min. 52 sec. W 497.92 feet** to a set 5/8" rebar with cap on the Right-of-Way of Kentucky Highway # 1846, (60' Right-of-Way), a new corner to Teresa Lynn Druen; **THENCE** with the Right-of-Way of Kentucky Highway # 1846, **N 16 deg. 56 min. 29 sec. E 50.31 feet** to the **POINT OF BEGINNING** and **CONTAINING 30,908 SQUARE FEET OR 0.710 ACRES**, more or less according to survey by Richard Wood, P.L.S. # 3609, Pride Engineering & Land Surveying Inc. dated July 1st, 2008.

See also Plat recorded in Plat Cabinet _____, Sheet _____, in the Office of the Hart County Court Clerk.

NOTE: THIS PROPERTY IS SUBJECT TO ANY EXISTING RIGHTS OF WAYS OR EASEMENTS.

This Easement shall benefit the heirs and assigns of both GRANTEE and GRANTOR. GRANTEE shall be responsible for maintaining said easement. The road shall be kept as a private road. This Easement will terminate at such time as GRANTEE abandons the easement or stops use of the water tower.

TO HAVE AND TO HOLD the same with all appurtenances thereunto belonging to the GRANTEE, in fee simple, and the GRANTOR does hereby covenant with the GRANTEE that she will warrant the title to the property herein conveyed with all covenants of General Warranty.

GRANTOR:

Teresa L. Druen

TERESA L. DRUEN

GRANTEE:

GREEN RIVER VALLEY WATER DISTRICT

BY: _____

ITS: _____

COMMONWEALTH OF KENTUCKY
COUNTY OF HART

The foregoing Deed of Easement was SUBSCRIBED, SWORN TO AND ACKNOWLEDGED before me on this 15 day of January, 2009, by TERESA L. DRUEN, Grantor, to be her free act and deed.

NOTARY PUBLIC
MY COMMISSION EXPIRES: 5/6/2010

COMMONWEALTH OF KENTUCKY
COUNTY OF HART

The foregoing Deed of Easement was SUBSCRIBED, SWORN TO AND ACKNOWLEDGED before me on this _____ day of _____, 2009, by _____, in his capacity as _____ of Green River Valley Water District, Grantee, to be his free act and deed.

NOTARY PUBLIC
MY COMMISSION EXPIRES: _____

THIS INSTRUMENT PREPARED BY:

JUSTIN BAIRD
BAIRD LAW OFFICE
P.O. BOX 187
MUNFORDVILLE, KY 42765
(270) 524-2004

Green River Valley Water District

Financial Statements

June 30, 2008 and 2007

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CAMPBELL, MYERS & RUTLEDGE, PLLC

CERTIFIED PUBLIC ACCOUNTANTS

SKIP R. CAMPBELL, CPA
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INDEPENDENT AUDITOR'S REPORT

Green River Valley Water District
Cave City, Kentucky

We have audited the accompanying financial statements of the business-type activities of Green River Valley Water District, as of and for the years ended June 30, 2008 and 2007, which collectively comprise the District's basic financial statements as listed in the table of contents. These financial statements are the responsibility of Green River Valley Water District's management. Our responsibility is to express opinions on these financial statements based on our audit.

We conducted our audit in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Controller General of the United States. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audit provides a reasonable basis for our opinions.

In our opinion, the financial statements referred to above present fairly, in all material respects, the respective financial position of the business-type activities of Green River Valley Water District as of June 30, 2008 and 2007, and the respective changes in financial position and, cash flows thereof for the years then ended in conformity with accounting principles generally accepted in the United States of America.

In accordance with *Government Auditing Standards*, we have also issued our report dated August 25, 2008 on our consideration of Green River Valley Water District's internal control over financial reporting and on our tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements and other matters. The purpose of that report is to describe the scope of our testing of internal control over financial reporting and compliance and the results of that testing, and not to provide an opinion on the internal control over financial reporting or on compliance. That report is an integral part of an audit performed in accordance with *Government Auditing Standards* and are important in assessing the results of our audit.

The management's discussion and analysis on pages 3 through 6 are not a required part of the basic financial statements but are supplementary information required by accounting principles generally accepted in the United States of America. We have applied certain limited procedures, which consisted principally of inquiries of management regarding the methods of measurement and presentation of the required supplementary information. However, we did not audit the information and express no opinion on it.

Our audit was conducted for the purpose of forming opinions on the financial statements that collectively comprise Green River Valley Water District's basic financial statements. The schedules of operating expenses and customer growth on pages 22-24 are presented for purposes of additional analysis and are not a required part of the basic financial statements. These schedules have been subjected to the auditing procedures applied in the audit of the basic financial statements and, in our opinion, are fairly stated in all material respects in relation to the basic financial statements taken as a whole.

Campbell, Myers & Rutledge, PLLC

Certified Public Accountants

Glasgow, Kentucky

August 25, 2008

MANAGEMENT'S DISCUSSION AND ANALYSIS

As management of the Green River Valley Water District, we offer readers of the District's financial statements this narrative overview of the financial activities of the District for the fiscal years ending June 30, 2008 and 2007. We encourage readers to consider the information presented here in conjunction with the District's financial statements and notes to the basic financial statements to enhance their understanding of the District's financial performance.

Financial Highlights

For the year ending June 30, 2008, total operating and non-operating revenues (including capital contributions) totaled $4,070,006. This represents a 3% increase in revenues from the prior year. The increase was primarily due to increased operating revenues.

Expenses amounted to $2,901,257 a decrease of 1% from the prior year. This decrease was primarily due to the decrease in interest expense, and personnel costs.

Total assets increased by $76,672, while total liabilities decreased by $303,640. These changes resulted in an increase in net assets of $377,312.

At June 30, 2008, Green River Valley Water District is in process of developing final plans for installing a new 16" water transmission main from Hardyville to near Cave City and a one million gallon storage tank to take care of future growth of the communities. The projected cost is approximately $7,000,000. The project will be financed with a $6,500,000 bond issue and a KIA grant of approximately $500,000. The bond issue will be shared between the District $3.5 million, Horse Cave Water Company $2 million and Caveland Environmental Authority $1 million.

The District is also in the process of securing grants from EPA ($1,000,000) and KIA ($300,000) for construction of water lines and a clearwell at the water plant.

Overview of the Financial Statements

This report consists of this Management's Discussion and Analysis report, the Independent Auditor's Report, Financial Statements and Supplementary Information. The Financial Statements include notes which explain in detail some of the information included in the Financial Statements.

Required Financial Statements

The financial statements of Green River Valley Water District report information of Green River Valley Water District using accounting methods similar to those used by private sector companies. These statements offer short and long-term financial information about its activities. The Statement of Net Assets includes all of Green River Valley Water District's assets and liabilities and provides information about the nature and amounts of investments in resources (assets) and the obligations to Green River Valley Water District creditors (liabilities). It also provides the basis for evaluation the capital structure of Green River Valley Water District and assessing the liquidity and financial flexibility of Green River Valley Water District.

All of the current year's revenues and expenses are accounted for in the Statement of Revenues, Expenses and Changes in Net Assets. This statement measures the success of Green River Valley Water District's operations over the past year and can be used to determine whether Green River Valley Water District has successfully recovered all its costs through its user fees and other charges, profitability and credit worthiness.

The final required financial statement is the Statement of Cash Flows. The statement reports cash receipts, cash payments, and net changes in cash resulting from operations, investing and financing activities and provides answers to such questions as where did cash come from, what was cash used for, and what was the change in the cash balance during the reporting period.

Financial Analysis of Green River Valley Water District

Green River Valley Water District
Summary of Net Assets
June 30, 2008 and 2007

	2008	2007
Assets		
Total Current Assets	$ 1,385,033	$ 1,429,756
Total Restricted Assets	1,527,144	1,370,057
Net Capital Assets	19,397,544	19,436,236
Total Assets	$ 22,309,721	$ 22,236,049
Liabilities		
Total Current Liabilities	256,397	$ 237,345
Total Liabilities Payable from Restricted Assets	698,266	787,358
Total Long-term Liabilities	12,567,000	12,800,600
Total Liabilities	$ 13,521,663	$ 13,825,303
Net Assets		
Invested in capital assets, net of related debt	$ 6,336,944	$ 5,848,278
Restricted for equipment replacement	687,608	670,511
Restricted for construction projects	261,845	68,922
Restricted for debt retirement	577,691	630,624
Unrestricted	923,970	1,192,411
Total Net Assets	$ 8,788,058	$ 8,410,746

The largest portion (72%) of the District's net assets reflects its investment in capital assets, less any related debt used to acquire those assets still outstanding. This represents a 3% increase from the prior year. This increase is primarily due to the plant and infrastructure expansion that the District has incurred during fiscal year 2008. The Company uses these capital assets to provide services to citizens and consumers; consequently, these assets are not available for future spending.

Restricted net assets (17%) represent resources that are subject to external restrictions on how they may be used. This amount has decreased by 2% from the prior year, primarily due to transfers and interest earnings within these accounts.

The balance (11%) of unrestricted net assets may be used to meet the Company's ongoing obligations to citizens, consumers and creditors. This has decreased 3% from the prior year.

Green River Valley Water District
Summary of Changes in Net Assets
For the Years Ended June 30, 2008 and 2007

	2008	2007
Total operating revenues	$ 3,337,369	$ 3,182,375
Total operating expenses	3,054,358	3,048,487
Operating Income	283,011	133,888
Total non-operating revenue (expenses)	(488,206)	(506,996)
Income before capital contributions	(205,195)	(373,108)
Capital contributions	582,507	640,002
Increase in net assets	377,312	266,894
Beginning of year	8,410,746	8,143,852
End of year	$ 8,788,058	$ 8,410,746

Net assets increased by $377,312, an increase from the prior year of $110,418.

Capital Asset Changes

At June 30, 2008, the District had invested $19.40 million in capital assets net of accumulated depreciation. This amount represents a net decrease of $38,692. This decrease is the result of, the depreciation expense for the year exceeding current year additions.

Debt Administration

At June 30, 2008, the District had $13,060,600 bonds outstanding, a decrease of $225,200 from the prior year's balance of $13,285,800. This decrease resulted from current year payments of $485,200 and an additional bond issue of $260,000 during the year. The District incurred $561,418 of interest expense associated with long term debt, of which $5,229 was capitalized.

Request for Information

This financial report is designed to provide our customers and creditors with a general overview of Green River Valley Water District's finances and to demonstrate Green River Valley Water District's accountability for the funds it receives. If you have any questions about this report or need any additional information, please contact the Green River Valley Water District at P.O. Box 399, Cave City, Kentucky 42127, or by phone (270) 773-2135.

	2008	2007
Liabilities		
Current Liabilities		
Accounts payable and accrued liabilities	$ 207,222	$ 195,636
Customer deposits	49,175	41,709
Total Current Liabilities	256,397	237,345
Liabilities Payable from Restricted Assets		
Construction accounts payable	-	95,957
Current maturities of long-term debt	493,600	485,200
Accrued interest	204,666	206,201
Total Liabilities Payable from Restricted Assets	698,266	787,358
Long-term Liabilities		
Long-term debt, less current maturities	12,567,000	12,800,600
Total Long-term Liabilities	12,567,000	12,800,600
Total Liabilities	13,521,663	13,825,303
Net Assets		
Net Assets		
Invested in capital assets, net of related debt	6,336,944	5,848,278
Restricted for debt retirement	577,691	630,624
Restricted for equipment replacement	687,608	670,511
Restricted for construction projects	261,845	68,922
Unrestricted	923,970	1,192,411
Total Net Assets	$ 8,788,058	$ 8,410,746

The accompanying notes are an integral part of the financial statements.

GREEN RIVER VALLEY WATER DISTRICT
Statement of Revenues, Expenses and Changes in Net Assets
For the Years Ended June 30, 2008 and 2007

	2008	2007
Operating revenue:		
Metered water sales:		
Residential	$ 1,912,206	$ 1,906,358
Commercial	258,971	240,993
	2,171,177	2,147,352
Wholesale water sales:		
Horse Cave	347,364	279,351
Cave City	215,058	193,046
Munfordville	105,768	120,126
Larue County	136,660	127,668
Bonnieville	47,906	20,094
Green-Taylor	60,344	52,815
CEA	14,948	53,712
	928,048	846,811
Other operating revenues:		
Cash water sales	584	1,036
Revenues from maintenance and contract work, net of expenses of $82,147 and $74,172 respectively	154,308	101,210
Forfeited discounts	54,326	53,933
Miscellaneous	28,926	32,034
	238,144	188,213
Total operating revenues	3,337,369	3,182,375
Operating expenses:		
Source of supply and pumping expenses:		
Operations	343,381	370,129
Maintenance	6,681	40,374
Water treatment expenses:		
Operations	309,440	284,062
Transmission and distribution:		
Operations	107,401	103,423
Maintenance	675,762	626,110
Customer accounts expenses	263,039	290,303
Administrative and general expenses	490,957	496,397
Depreciation and amortization	791,437	775,058
Taxes other than income	66,260	62,632
Total operating expenses	3,054,358	3,048,487
Operating income	283,011	133,888

The accompanying notes are an integral part of the financial statements.

GREEN RIVER VALLEY WATER DISTRICT
Statement of Revenues, Expenses and Changes in Net Assets
For the Years Ended June 30, 2008 and 2007

	2008	2007
Nonoperating revenue (expenses):		
Interest income	$ 67,983	$ 62,360
Interest on long-term debt	(556,189)	(569,356)
Total nonoperating revenue (expenses)	(488,206)	(506,996)
Income before capital contributions	(205,195)	(373,108)
Capital Contributions	582,507	640,002
Increase in net assets	377,312	266,894
Net assets:		
Beginning of year	8,410,746	8,143,852
End of year	$ 8,788,058	$ 8,410,746

The accompanying notes are an integral part of the financial statements.

GREEN RIVER VALLEY WATER DISTRICT
Statement of Cash Flows
For the Years Ended June 30, 2008 and 2007

	2008	2007
Cash flows from operating activities:		
Cash receipts from customers	$ 3,527,052	$ 3,254,299
Cash payments to suppliers for goods and services	(1,574,122)	(1,515,768)
Cash payments to employees for services	(762,971)	(760,780)
Net cash provided (used) by operating activities	1,189,959	977,751
Cash flows from capital and related financing activities:		
Proceeds from issuance of long-term debt	260,000	-
Bond issuance costs	(4,633)	-
Principal paid on long-term debt	(485,200)	(469,300)
Interest paid on long-term debt	(556,189)	(569,356)
Cash paid for capital assets	(865,935)	(663,760)
Capital contributions	582,507	640,002
Net cash provided (used) in financing activities	(1,069,450)	(1,062,414)
Cash flows from investing activities:		
Purchase of short-term investments	(4,622)	(4,019)
Investment Income	67,983	62,360
Net cash provided by (used) in investing activities	63,361	58,341
Net increase (decrease) in cash and cash equivalents	183,870	(26,322)
Cash and cash equivalents, beginning of year	1,463,840	1,490,162
Cash and cash equivalents, end of year	$ 1,647,710	$ 1,463,840
Reconciliation of operating income to net cash provided by operating activities:		
Operating income	283,011	133,887
Adjustments to reconcile operating income to net cash provided by operating activities:		
Depreciation	791,437	775,058
Gain on sale of assets		-
Changes in assets and liabilities:		
(Increase) decrease in accounts receivable	137,517	71,924
(Increase) decrease in prepaid and other assets	1,043	4,502
(Increase) decrease in plant materials and supplies	(42,101)	(22,191)
Increase (decrease) in accounts payable	11,586	5,899
Increase (decrease) in customer deposits	7,466	8,673
Nonoperating revenues		
Net cash provided (used) by operating activities	$ 1,189,959	$ 977,751

The accompanying notes are an integral part of the financial statements.

Note 1 – Description of Entity and Summary of Significant Accounting Policies

Organization
Green River Valley Water District was organized in 1962 under KRS 74:010 to provide water to sections of Barren, Hart and Larue counties. In addition to the above, the District also wholesales water to certain other cities and water districts. The commissioners are appointed for specified terms by the respective county judges.

Measurement Focus and Basis of Accounting
The term *measurement focus* is used to denote what is being measured and reported in the District's financial statements. The District is accounted for on the flow of economic resources measurement focus. Under this measurement focus, all assets and all liabilities associated with the operations are included in the Statement of Net Assets.

The term *basis of accounting* is used to determine when a transaction or event is recognized on the District's financial statements. The District uses the full accrual basis of accounting. Under this basis, revenues are recorded when earned and expenses are recorded when incurred, even though actual payment or receipt may not occur until after the period ends.

Financial Statement Presentation
The District has elected under GASB Statement *No. 20, Accounting and Financial Reporting for Proprietary Funds and Other Governmental Activities That Use Proprietary Fund Accounting,* to apply all applicable GASB pronouncements as well as any applicable pronouncements of the Financial Accounting Standards Board, the Accounting Principles Board, or any Accounting Research Bulletins issued on or before November 30, 1989, unless these pronouncements conflict with or contradict GASB pronouncements.

The accounts of the District are organized on the basis of a proprietary fund type, specifically an enterprise fund. The activities of this fund are accounted for with a separate set of self-balancing accounts that comprise the District's assets, liabilities, net assets, revenues and expenses. Enterprise Funds account for activities; (i) that are financed with debt that is secured solely by a pledge of the net revenues from fees and charges of the activity, (ii) that are required by laws or regulations that the activity's costs of providing services, including capital costs (such as depreciation or debt service), be recovered with fees and charges, rather than with taxes or similar revenues, or (iii) that the pricing policies of the activity establish fees and charges designed to recover its costs, including capital costs (such as depreciation or debt service).

On July 1, 2003, the District adopted the provisions of Governmental Accounting Standards Board (GASB) No. 34 *"Basic Financial Statements – and Management's Discussion and Analysis – for State and Local Governments."* GASB 34 established standards for external financial reporting for all state and local governmental entities which includes a statement of net assets, a statement of activities and changes in net assets and a statement of cash flows. It requires the classification of net assets into three components: (i) invested in capital assets, net of related debt, (ii) restricted, and (iii) unrestricted.

Note 1 – Description of Entity and Summary of Significant Accounting Policies, Continued

These classifications are defined as follows:

- *Invested in capital assets, net of related debt* - This component of net assets consists of capital assets, net of accumulated depreciation and reduced by the outstanding balances of any bonds, mortgages, notes or other borrowings that are attributable to the acquisition, construction or improvement of those assets.

- *Restricted* - This component of net assets consists of constraints imposed by creditors (such as through debt covenants), grantors, contributors, or laws or regulations of other governments or constraints imposed by law through constitutional provisions or enabling legislation.

- *Unrestricted net assets* - This component of net assets consists of net assets that do not meet the definition of "restricted" or "invested in capital assets, net of related debt."

Cash and Investments
The District considers all highly liquid investments with maturities of three months or less when purchased to be cash equivalents. Investments are reported at fair market value.

Receivables
Accounts Receivable totaled $276,798 of which all was due from retail and wholesale customers.

The District uses the direct write-off method to account for bad debts. No allowance for bad debts has been provided, as no material write-offs are expected for receivables as of June 30, 2008. The direct write-off method does not significantly depart from generally accepted accounting principles. As of June 30, 2008 and 2007, bad debts were $13,548 and $18,175 respectively.

Capital Assets
The utility plant in service is stated at cost. The cost of additions to the utility plant and major replacements of retired units of property is capitalized. Cost includes direct labor, outside services, materials and transportation, employee fringe benefits, overhead, and interest on funds borrowed to finance construction. The cost and accumulated depreciation of property sold or retired is deducted from capital assets, and any profit or loss resulting from the disposal is credited or charged in the non operating section of the statement of revenues, expenses and changes in net assets. The cost of current repairs, maintenance, and minor replacements is charged to expense as incurred. Depreciation has been provided over estimated useful lives of the assets using the straight-line method. Depreciation expense for the years ended June 30, 2008 and 2007 was $789,904 and $773,962, respectively.

The estimated useful lives of capital assets are as follows:

Utility plant	50 years
Equipment	10 years
Other	10 -20 years

Note 1 – Description of Entity and Summary of Significant Accounting Policies, Continued

Compensated Absences
Accumulated unpaid vacation and sick pay amounts are accrued when benefits vest to employees and the unpaid liability is reflected in accrued liabilities.

Long-Term Obligations
Long-term debt and other obligations are reported as liabilities on the Statement of Net Assets. Bond premiums and discounts are deferred and amortized over the life of the bonds.

Operating Revenues and Expenses
Operating revenues and expenses consists of those revenues that result from the ongoing principal operations of the District. Operating revenues consist primarily of charges for services. Non operating revenues and expenses consist of those revenues and expenses that are related to financing and investing type of activities and result from non exchange transactions.

Capital Contributions
Transmission and distribution system assets contributed to the District by installers are capitalized at the installers' costs and recorded as capital contributions when received. Also included in capital contributions are various grants received for infrastructure and payments received from customers for tap fees.

Income Taxes
The District is exempt from federal and state income taxes.

Extraordinary and Special Items
Extraordinary items are transactions or other events that are both unusual in nature and infrequent in occurrence. Special items are significant transactions or other events within the control of management that are either unusual in nature or infrequent in occurrence. If such items exist during the reporting period, they are reported separately in the statement of revenues, expenses and changes in net assets.

Use of Restricted/Unrestricted Net Assets
When an expense is incurred for purposes for which both restricted and unrestricted net assets are available, the District's policy is to apply restricted net assets first.

Note 2 – Cash and Investments

Depreciation Fund
The ordinances authorizing the various bond issues of the District require monthly transfers into a depreciation fund. These funds can be used for capital improvements, expansions and extraordinary repairs. The maximum requirement in these funds is $277,200, and after this balance is reached transfers can cease. At June 30, 2008, the District had a fund balance that exceeded the maximum annual requirement.

Note 2 – Cash and Investments, Concluded

Bond and Interest Redemption Fund
The ordinances authorizing the various bond issues require a monthly deposit of one-twelfth of the annual bond and interest due currently. The District has made all required deposits into these accounts.

Deposits
At year end, the carrying amount of the District's cash deposits was $1,647,711 and the bank balances were $1,655,636. The difference between book and bank balances primarily represents checks that have been issued, but have not cleared the bank as of June 30, 2008.

The District's investments included four certificates of deposit totaling $728,194 with two different financial institutions at rates of approximately 3.6% to 3.8% and maturity dates ranging from three months to two years.

The cash and investment accounts of the District are considered time and savings deposits and are insured up to $100,000 per financial institution. All of the Districts cash and investment accounts were insured by FDIC or by a financial institution. The District had securities pledged for deposits in excess of FDIC limits in the amount of $1,921,398 at a total of three separate financial institutions at June 30, 2008. The District also had $645,668 of deposits at one financial institution all of which were held as Federal Treasury Bills and $11,176 of deposits at another institution that are held as trust accounts and insured by the financial institution.

The nature of the District's cash and investments and being restricted or unrestricted is as follows:

As reflected in the Statement of Net Assets:

	2008	2007
Unrestricted:		
Cash and cash equivalents	$ 726,897	$ 679,783
Investments	121,863	117,241
Restricted:		
Cash and cash equivalents	920,813	784,057
Investments	606,331	586,000
Total Cash and Investments	$ 2,375,904	$ 2,167,081

Note 3 – Capital Assets

Capital asset activity for the year ended June 30, 2008 and 2007 was as follows:

	Balance June 30, 2007	Additions	Deletions	Balance June 30, 2008
Non Depreciable Assets:				
Construction in Progress	$ -	$ 5,229	$ -	$ 5,229
Land & Land Rights	71,176			71,176
L & L Rights Structures & Improvements	66,496			66,496
L & L Rights Water Treatment	16,288			16,288
L & L Rights Hydrants	6,900	-	-	6,900
Total Non Depreciable Assets	160,860	5,229	-	166,089
Depreciable Assets:				
Structures & Improvements	3,549,809	2,178	-	3,551,987
Structures & Improvements Office Bldg.	123,363	1,719	-	125,082
Collecting and Impounding Reservoirs	39,464	-	(789)	38,675
River Intakes	453,279	-	-	453,279
Supply Mains	312,627	-	-	312,627
Electric Pumping Equip	2,851,291	28,125	-	2,879,416
Water Treatment Equip	1,261,222	-	-	1,261,222
Distr Reserv & Stand Pipes	1,906,198	2,284	-	1,908,482
T & D Mains	14,985,634	564,765	-	15,550,399
Services	855,755	9,723	-	865,478
Meters	1,293,914	75,545	-	1,369,459
Meter Installation	157,159	-	-	157,159
Hydrants	98,302	-	-	98,302
Other Plant	9,565	-	-	9,565
Office Furniture & Equip	222,059	35,642	-	257,701
Trans Equip	458,817	29,834	-	488,651
Tools Shop & Equip	128,076	-	(7,311)	120,765
Lab Equip	3,343	-	-	3,343
Power Oper Equip	273,945	249	-	274,194
Communication Equip	119,073	3,229	-	122,304
Total Depreciable Assets	29,102,896	763,751	(8,100)	29,848,091
Total Capital Assets	29,263,756	768,980	(8,100)	30,014,180
Less: Accumulated Depreciation	(9,827,520)	(789,904)	-	(10,616,636)
	$ 19,436,236	$ (20,924)	$ -	$ 19,397,544

Note 3 – Capital Assets, Concluded:

	Balance June 30, 2006	Additions	Deletions	Balance June 30, 2007
Non Depreciable Assets:				
Land & Land Rights	$ 71,176	$ -	$ -	$ 71,176
L & L Rights Structures & Improvements	66,496			66,496
L & L Rights Water Treatment	16,288			16,288
L & L Rights Hydrants	6,900	-	-	6,900
Total Non Depreciable Assets	160,860	-	-	160,860
Depreciable Assets:				
Structures & Improvements	3,484,652	65,157	-	3,549,809
Structures & Improvements Office Bldg.	123,363	-	-	123,363
Collecting and Impounding Reservoirs	39,464	-	-	39,464
River Intakes	453,279	-	-	453,279
Supply Mains	312,627	-	-	312,627
Electric Pumping Equip	2,831,829	19,462	-	2,851,291
Water Treatment Equip	1,261,222	-	-	1,261,222
Distr Reserv & Stand Pipes	1,906,198	-	-	1,906,198
T & D Mains	14,649,238	336,396	-	14,985,634
Services	845,475	10,280	-	855,755
Meters	1,232,117	61,797	-	1,293,914
Meter Installation	157,159	-	-	157,159
Hydrants	84,764	13,538	-	98,302
Other Plant	9,565	-	-	9,565
Office Furniture & Equip	200,253	21,806	-	222,059
Trans Equip	458,218	599	-	458,817
Tools Shop & Equip	123,140	4,936	-	128,076
Lab Equip	3,343	-	-	3,343
Power Oper Equip	273,945	-	-	273,945
Communication Equip	119,075	-	-	119,075
Total Depreciable Assets	28,568,925	533,971	-	29,102,896
Total Capital Assets	28,729,785	533,971	-	29,263,756
Less: Accumulated Depreciation	(9,053,558)	(773,962)	-	(9,827,520)
	$ 19,676,227	$ (239,991)	$ -	$ 19,436,236

Note 4 – Pension Plan

The District contributes to a defined contribution pension plan for employees who meet certain requirements as to age and length of service. Funding is based upon the level of funding method and there are no unfunded prior service costs. The District contributes 10% of employees' salaries and employees contribute nothing to the plan. Contributions by Green River Valley Water District to this plan, included in operations, were approximately $59,400 and $57,409 for the years ended June 30, 2008 and 2007, respectively.

Note 5 – Long-Term Debt

Long-term debt consists of the following at June 30, 2008:

Series 1996-A Water Revenue Bonds issued in the amount of $1,050,000; due in annual installments on April 1 ranging from $14,000 to $16,000 through April, 2035; interest rate 4.5% due semi-annually on April 1 and October 1.	$	900,000
Series 1996-B Water Revenue Bonds issued in the amount of $650,000; due in annual installments on April 15 ranging from $9,000 to $34,500 through April, 2035; interest rate 4.5% due semi-annually on April 1 and October 1.		556,000
Series 1996-C Water Revenue Bonds issued in the amount of $249,000; due in annual installments on April 15 ranging from $3,500 to $12,500 through April, 2036; interest rate 4.5% due semi-annually on April 1 and October 1.		217,000
Series 2001 Public Projects Revenue Bonds issued on December 18, 2002 in the amount of $519,000; due in annual installments on January 1 ranging from $28,000 to $44,000 through July, 2018; interest rate of 5.09% due semi-annually on January 1 and July 1.		373,000
Series 2003 Revenue Refunding Bonds issued on October 29, 2003 in the amount of $2,166,200; due in annual installments on January 1 ranging from $8,600 to $234,300 through January, 2019; interest rates ranging from 2.06% to 5.06% due semi-annually on January 1 and July 1.		1,679,600
Series 2004B Revenue Refunding Bonds issued on April 27, 2004 in the amount of $3,567,000; due in annual installments on January 1 ranging from $50,000 to $202,000 through January, 2028; interest rates ranging from 2.280% to 4.405% due semi-annually on January 1 and July 1.		2,829,000
Series 2004D Revenue Refunding Bonds issued on October 29, 2004 in the amount of $2,166,200; due in annual installments on January 1 ranging from $8,600 to $234,300 through January, 2019; interest rates ranging from 2.06% to 5.06% due semi-annually on January 1 and July 1.		1,350,000
Series 2004A Revenue Refunding Bonds issued on August 12, 2004 in the amount of $5,000,000; due in annual installments on April 1 ranging from $52,000 to $266,000 through April, 2044; interest rate of 4.5% due semi-annually on April 1 and October 1.		4,896,000
Series 2008A Revenue Flexible Term Financing Bonds issued on January 30, 2008 in the amount of $260,000; due in one payment January 1,2010. Interest is due at the rate of 4.0% semi-annually on January 1 and July 1.		260,000
Total bonds	$	13,060,600

Note 5 – Long-Term Debt, Continued

Principal and interest maturities of bonded debt are as follows:

Future Maturities

	Principal	Interest	Total
2009	493,600	554,243	1,047,843
2010	791,900	536,677	1,328,577
2011	531,900	507,455	1,039,355
2012	510,500	487,959	998,459
2013	550,400	445,866	996,266
2014-2018	2,585,400	2,102,808	4,688,208
2019-2023	2,050,500	1,561,027	3,611,527
2024-2028	1,485,000	1,121,917	2,606,917
2029-2033	1,233,500	744,750	1,978,250
2034-2038	1,095,500	521,505	1,617,005
2039-2043	1,217,000	271,755	1,488,755
2043-2046	515,400	20,616	536,016
Total	$ 13,060,600	$ 8,876,578	$ 21,937,178

Bonded debt activities for the year ended June 30, 2008, are as follows:

	Balance June 30, 2007	Additions	Debt Payments and Reductions	Balance June 30, 2008	Amount Due within One Year
Series 1996A	917,000	-	(17,000)	900,000	18,000
Series 1996B	567,000	-	(11,000)	556,000	11,000
Series 1996C	221,000	-	(4,000)	217,000	4,000
Series 2001	404,000	-	(31,000)	373,000	31,000
Series 2003	1,795,800	-	(116,200)	1,679,600	118,600
Series 2004 B	3,019,000	-	(190,000)	2,829,000	194,000
Series 2004 D	1,414,000	-	(64,000)	1,350,000	65,000
Series 2004 A	4,948,000	-	(52,000)	4,896,000	52,000
Series 2008 A	-	260,000	-	260,000	-
	$ 13,285,800	$ 260,000	$ (485,200)	$ 13,060,600	$ 493,600

Capitalization of Interest:
Interest costs incurred during construction are capitalized, net of interest income from proceeds of tax-exempt debt as part of the cost of the related assets of the District. Interest capitalized for the year ended June 30, 2008 and 2007, was $5,229 and $0, respectively.

Note 5 – Long-Term Debt, Concluded

Arbitrage
The Tax Reform Act of 1986 instituted certain arbitrage restrictions with respect to the issuance of tax-exempt bonds after August 31, 1986. Arbitrage regulations deal with the investment of all tax-exempt bond proceeds at an interest yield greater than the interest yield paid to bondholders. Generally, all interest paid to bondholders can be retroactively rendered taxable if applicable rebates are not reported and paid to the Internal Revenue Service (IRS) at least every five years. During the current year, the District performed calculations of excess investment earnings on various bonds and financings and at June 30, 2008, does not expect to incur a liability.

Note 6 –Commitments

The District has received a commitment from the Kentucky Infrastructure Authority in the amount of $500,000 on a cost reimbursement basis for water line expansion projects. In addition $155,521 of prior unused grant funds was approved for line extensions for a total of $655,521. As of June 30, 2008 the District had received all of these funds.

The District has also received a commitment from the Metcalfe County Fiscal Court in 2007 for water line expansion projects in Metcalfe County in the amount of $140,800. This commitment is on a cost reimbursement basis and as of June 30, 2008, the District had received all of these funds.

Supplemental Information

GREEN RIVER VALLEY WATER DISTRICT
Schedule of Operating Expenses
For the Year Ended June 30, 2007

	Source of Supply and Pumping Expenses		Water Treatment Expenses		Transmission and Distribution		Customer Accounts Expenses	Administrative and General Expenses	Total (Memorandum Only)
	Operations	Maintenance	Operating	Maintenance	Operating	Maintenance			
Salaries and wages - employees	$ 94,314	$ -	$ 76,721	$ -	$ -	$ 241,050	$ 128,429	$ 207,241	$ 747,755
Salaries and wages - directors	-	-	-	-	-	-	-	13,025	13,025
Employee pensions and benefits	9,512	-	9,511	-	-	14,015	12,755	33,461	79,253
Purchased water	33,012	-	-	-	-	-	-	-	33,012
Purchased power	180,801	-	-	-	103,423	-	-	11,293	295,516
Chemicals	-	-	128,743	-	-	-	-	-	128,743
Materials and supplies	6,387	-	9,495	-	-	32,214	31,181	10,263	89,539
Contractual services - accounting	-	-	-	-	-	-	-	28,200	28,200
Contractual services - legal	-	-	-	-	-	-	-	2,641	2,641
Contractual services - customer accounts	-	-	-	-	-	-	-	-	-
Contractual services - other	-	40,374	22,091	-	-	156,751	-	27,630	246,846
Transportation expense	-	-	-	-	-	56,892	21,600	3,000	81,492
Insurance - vehicle	-	-		-	-	7,358	3,920	6,327	17,605
Insurance - liability	1,447	-	1,177	-	-	3,699	1,971	3,181	11,475
Insurance - workers' compensation	2,822	-	2,295	-	-	7,212	3,842	6,200	22,371
Insurance - other	41,834	-	34,030	-	-	106,920	56,966	91,924	331,674
Bad debt expense	-	-	-	-	-	-	18,175	-	18,175
Miscellaneous	-	-	-	-	-	-	11,464	52,010	63,475
Totals	$ 370,129	$ 40,374	$ 284,062	$ -	$ 103,423	$ 626,110	$ 290,303	$ 496,397	$ 2,210,797

GREEN RIVER VALLEY WATER DISTRICT
Schedule of Operating Expenses
For the Year Ended June 30, 2008

	Source of Supply and Pumping Expenses		Water Treatment Expenses		Transmission and Distribution		Customer Accounts Expenses	Administrative and General Expenses	Total (Memorandum Only)
	Operations	Maintenance	Operating	Maintenance	Operating	Maintenance			
Salaries and wages - employees	$ 100,021	$ -	$ 83,597	$ -	$ -	$ 235,313	$ 120,340	$ 211,026	$ 750,296
Salaries and wages - directors	-	-	-	-	-	-	-	12,675	12,675
Employee pensions and benefits	11,135	-	10,429	-	-	16,372	10,324	22,651	70,912
Purchased water	27,344	-	-	-	-	-	-	-	27,344
Purchased power	152,024	-	-	-	107,401	-	-	12,863	272,289
Chemicals	-	-	151,019	-	-	-	-	-	151,019
Materials and supplies	7,165	-	9,277	-	-	51,743	36,500	12,166	116,851
Contractual services - accounting	-	-	-	-	-	-	-	34,250	34,250
Contractual services - legal	-	-	-	-	-	-	-	1,958	1,958
Contractual services - customer accounts	-	-	-	-	-	-	3,780	-	3,780
Contractual services - other	-	6,681	16,930	-	-	172,984	-	23,368	219,963
Transportation expense	-	-	-	-	-	85,028	21,600	3,000	109,628
Insurance - vehicle	-	-		-	-	6,826	3,491	6,121	16,438
Insurance - liability	502	-	419	-	-	1,180	603	1,058	3,762
Insurance - workers' compensation	2,859	-	2,389	-	-	6,726	3,440	6,031	21,445
Insurance - other	42,331	-	35,380	-	-	99,590	50,931	89,311	317,543
Bad debt expense	-	-	-	-	-	-	11,156	-	11,156
Miscellaneous	-	-	-	-	-	-	874	54,479	55,353
Totals	$ 343,381	$ 6,681	$ 309,440	$ -	$ 107,401	$ 675,762	$ 263,039	$ 490,957	$ 2,196,661

GREEN RIVER VALLEY WATER DISTRICT
SCHEDULE OF CUSTOMER GROWTH
June 30, 2008

Customer Growth:

	Number of Customers			
Year	District	Cave City	Horse Cave	Total
1972	534	647	738	1,919
1973	589	660	767	2,016
1974	1,029	684	780	2,493
1975	1,085	682	780	2,547
1976	1,153	698	809	2,660
1977	1,201	717	821	2,739
1978	1,294	750	828	2,872
1979	1,857	773	832	3,462
1980	2,037	794	842	3,673
1981	2,142	800	839	3,781
1982	2,170	803	841	3,814
1983	2,170	817	857	3,844
1984	2,208	833	853	3,894
1985	2,267	827	859	3,953
1986	2,942	852	861	4,655
1987	3,016	857	876	4,749
1988	3,157	924	895	4,976
1989	3,263	917	902	5,082
1990	3,471	928	899	5,298
1991	4,011	941	911	5,863
1992	4,089	936	913	5,938
1993	4,383	959	926	6,268
1994	4,514	979	921	6,414
1995	4,644	1,040	933	6,617
1996	4,839	1,038	927	6,804
1997	5,059	1,048	919	7,026
1998	5,341	1,049	935	7,325
1999	5,500	1,084	940	7,524
2000	5,740	1,083	950	7,773
2001	5,806	1,077	944	7,827
2002	5,935	1,077	945	7,957
2003	6,117	1,101	930	8,148
2004	6,192	1,093	930	8,215
2005	6,233	1,080	910	8,223
2006	6,415	1,108	933	8,456
2007	6,527	1,117	952	8,596
2008	6,641	1,139	962	8,742

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REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING AND ON COMPLIANCE AND OTHER MATTERS BASED ON AN AUDIT OF FINANCIAL STATEMENTS PERFORMED IN ACCORDANCE WITH *GOVERNMENT AUDITING STANDARDS*

Green River Valley Water District
Cave City, KY.

We have audited the financial statements of the business-type activities of Green River Valley Water District, as of and for the years ended June 30, 2008 and 2007, which comprise the Green River Valley Water District's basic financial statements and have issued our report thereon dated August 25, 2008. We conducted our audit in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards,* issued by the Comptroller General of the United States.

Internal Control Over Financial Reporting

In planning and performing our audit, we considered Green River Valley Water District's internal control over financial reporting as a basis for designing our auditing procedures for the purpose of expressing our opinions on the financial statements, but not for the purpose of expressing an opinion on the effectiveness of the Green River Valley Water District's internal control over financial reporting. Accordingly, we do not express an opinion on the effectiveness of the Green River Valley Water District's internal control over financial reporting.

Our consideration of internal control over financial reporting was for the limited purpose described in the preceding paragraph and would not necessarily identify all deficiencies in internal control over financial reporting that might be significant deficiencies or material weaknesses. However, as discussed below, we identified certain deficiencies in internal control over financial reporting that we consider to be significant deficiencies.

A control deficiency exists when the design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to prevent or detect misstatements on a timely basis. A significant deficiency is a control deficiency, or combination of control deficiencies, that adversely affects the Green River Valley Water District's ability to initiate, authorize, record, process, or report financial data reliably in accordance with generally accepted accounting principles such that there is more than a remote likelihood that a misstatement of the Green River Valley Water District's financial statements that is more than inconsequential will not be prevented or detected by the Green River Valley Water District's internal control.

A material weakness is a significant deficiency, or combination of significant deficiencies, that results in more than a remote likelihood that a material misstatement of the financial statements will not be prevented or detected by the Green River Valley Water District's internal control.

We consider the deficiencies below to be significant deficiencies in internal control:

One individual is in charge of customer receipts, posting to customer accounts and making deposits. Good internal control requires that no one person handle all elements of a single transaction. We recommend that someone else prepare the deposit and another person review and initial the balancing of receipts to posting report, deposit and customer payment stubs.

Our consideration of internal control over financial reporting was for the limited purpose described in the first paragraph of this section and would not necessarily identify all deficiencies in internal control that might be significant deficiencies or material weaknesses. We did not identify any deficiencies in internal control over financial reporting that we consider to be material weaknesses, as defined above.

Compliance and Other Matters

As part of obtaining reasonable assurance about whether Green River Valley Water District's financial statements are free of material misstatement, we performed tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements, noncompliance with which could have a direct and material effect on the determination of financial statement amounts. However, providing an opinion on compliance with those provisions was not an objective of our audit, and accordingly, we do not express such an opinion. The results of our tests disclosed no instances of noncompliance or other matters that are required to be reported under *Government Auditing Standards*.

We noted certain matters that we reported to management of Green River Valley Water District, in a separate letter dated August 25, 2008.

This report is intended solely for the information and use of management, board of commissioners, and grantor entities and is not intended to be and should not be used by anyone other than these specified parties.

Campbell, Myers & Ratledge, PLLC

August 25, 2008

GREEN RIVER VALLEY WATER DISTRICT
BUDGET FOR THE YEAR ENDING JUNE 30, 2009

	ACTUAL 2008	BUDGET 2009
REVENUES:		
METERED WATER SALES	$ 1,912,206	$ 2,002,000
METERED WATER SALES COMM	258,971	265,000
SALES FOR IRRIGATION PURPOSES	584	1,000
SALES WATER CAVE CITY	215,508	228,000
SALES WATER HORSE CAVE	347,364	367,000
SALES WATER MUNFORDVILLE	105,768	112,000
SALES WATER LARUE CO	136,660	145,000
SALES WATER BONNIEVILLE	47,906	50,000
SALES WATER GREEN TAYLOR	60,344	64,000
MAMMOTH CAVE CEA	14,948	16,000
FORFEITED DISCOUNTS	54,326	55,000
MISC SERVICE REVENUE	14,864	15,000
GRANT REVENUE	530,105	-
TAP FEE INCOME	52,402	60,000
INTEREST INCOME	67,983	60,000
CONTRACT LABOR GARB & SEWER	14,062	15,000
REVENUE OFJOBBING & CONTSTRUCTION	235,554	172,000
TOTAL REVENUE	4,069,555	3,627,000
EXPENDITURES:		
COST OFJOBBING & CONSTRUCTION	52,432	55,000
COST OFJOBBING & CONST. HC & CC	28,814	15,000
SALARY PUMPING PLANT	100,021	103,000
SALARY OPER WATER TREATMENT	83,597	86,000
SALARY MAINTENANCE T & D	235,313	242,000
SALARY CUSTOMER ACCTS	120,340	124,000
SALARY ADMINISTRATIVE	211,026	217,000
SALARIES DIRECTORS	12,675	13,000
PAYROLL TAXES	62,484	64,000
EMPLOYEE P&B OPER PUMPING	11,135	12,000
EMPLOYEE P&B OPER WATER TREATM	10,429	11,000
EMPLOYEE P&B MAINT T&D	16,372	17,000
EMPLOYEE P&B CUSTOMER ACCTS	10,324	11,000
EMPLOYEE P&B GENERAL & ADMIN	22,651	24,000
UNEMPLOYMENT INS	3,773	4,000
PURCHASED WATER	27,344	5,000
PURCHASED POWER OPER PUMPING	152,024	165,000
PURCHASED POWER OPER T &D	107,401	115,000
PURCHASED POWER ADMIN & GEN	12,863	12,000
CHEMICALS OPER WATER TREATMENT	151,019	155,000
MAT & SUPPLIES OPER PUMPING	7,165	7,000
MAT & SUPPLIES OPER WATER TREA	9,277	9,000
MAT & SUPPLIES MAINT T & D	51,743	52,000
MAT & SUPPLIES CUSTOMER ACCTS	36,500	38,000
MAT & SUPPLIES ADMIN & GEN	12,166	12,000
CONTRACTUAL SERVICES, AUDIT AND ACCOU	34,250	34,000

CONTRACTUAL SERVICES. LEGAL	1,958	3,500
CONTRACTUAL SERVICES OTHER PLANT	6,431	40,000
CONTRACTUAL SERVICES WATER TREATMEN	16,930	117,000
CONTRACTUAL SERVICES T&D MAINT	172,984	174,000
CONTRACTUAL SERVICES CUSTOMER ACCOU	3,780	4,000
CONTRACTUAL SERVICES ADMIN & GENERAL	23,368	24,000
TRANSPORTATION EXPENSES T&D	85,278	86,000
TRANSPORTATION EXPENSES CUSTOMER AC	21,600	22,000
TRANSPORTATION EXPENSES ADMIN & GENEI	3,000	4,000
VEHICLE INSURANCE	16,438	18,000
LIAB INSURANCE	3,762	4,000
WORKERS COMPENSATION	21,445	22,000
DENTAL INSURANCE	3,864	5,000
HEALTH INSURANCE	254,962	258,000
LIFE INSURANCE	10,750	11,000
PROPERTY INSURANCE	38,511	40,000
COMMISSIONERS INSURANCE	4,533	5,000
BOND INSURANCE	4,967	5,000
BAD DEBTS	11,156	12,000
MISC CUSTOMER ACCTS	874	1,000
DEPRECIATION EXPENSE	789,904	790,000
AMORTIZATION EXPENSE	1,533	1,500
MISCELLANEOUS ADMIN & GENERAL	54,887	55,000
INTEREST ON LONG-TERM DEBT	556,189	545,000
TOTAL EXPENSES	3,692,243	3,849,000
NET INCOME (LOSS)	$ 377,312	$ (222,000)

OTHER BUDGETED AMOUNTS :

NET INCOME	(222,000)
ADD: DEPRECIATION	790,000
FUNDS AVAILABLE	568,000
DEBT PRINCIPAL RETIREMENT	485,200
CAPITALIZED WAGES	15,000
	500,200
NET INCREASE IN CASH	$ 67,800

STEVEN L. BESHEAR
GOVERNOR

LEONARD K. PETERS
SECRETARY

ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
DIVISION OF WATER
200 FAIR OAKS LANE, 4TH FLOOR
FRANKFORT, KENTUCKY 40601
www.kentucky.gov

June 17, 2009

Mr. David Page, Manager
Green River Valley Water District
PO Box 399
Cave City, KY 42127

RE: Green River Valley Water District
AI#: 1776, APE20090009
PWSID # 0500166-09-009
WTP Clearwell Addition
Hart County, KY

Dear Mr. Page:

We have received the Plans and Specifications for the above referenced project. The project consists of installation of a 500,000 gallon Clearwell addition at the Water Treatment Plant. The existing 400,000 gallon Clearwell, the existing 300,000 gallon Clearwell, and the existing 200,000 gallon Clearwell must remain in service. This is to advise that plans and specifications covering the above referenced subject are APPROVED with respect to sanitary features of design as of this date with the following stipulations:

1. The capacity of the treatment plant shall remain at 6.0 MGD (4167 gpm).

The following information and requirements relate to the EPA Special Appropriation Grant (SPAP) process:

1. You will receive one (1) set of approved plans and specifications. An identical set should be made available at the project site at all times. If modifications are made to the plans and specifications prior to bidding, then four (4) complete sets of revised plans and specifications shall be submitted to the Division of Water for approval. Our notice of approval will be issued at a later date by separate correspondence.

2. Clear site certificates of all involved properties must be submitted to the Division of Water prior to construction.

3. You are hereby authorized to advertise for bids to construct this project. In addition to other notices, you shall advertise the bid for thirty (30) days prior to the Bid Opening date in the newspaper with the largest circulation in your area. Please provide the bid opening date to Alison Simpson, at the Division of Water. Alison Simpson may be reached at (502) 564-3410, extension 4591 or by E-mail at alison.simpson@ky.gov.

4. A set of AS-BID plans and specifications (with any APPROVAL conditions addressed) and a copy of the Advertisement shall be submitted to the Division of Water when the project is advertised. These items will be reviewed as part of the Authority to Award process.

5. The attached Project Review and Cost Summary form is to be completed and signed after bids have been received and then submitted along with the supporting documents indicated on the form. Your signature on this form will certify that all the information to be retained by the recipient has been secured and is available for review by the Division at the pre-construction conference. The complete bid package should be submitted to the Division of Water within fourteen (14) days after the bid opening.

6. Upon approval of the bid documents, the Division of Water will authorize you to award the construction contract, and arrange for a pre-construction conference. Division of Water staff **must** be present at this pre-construction conference.

7. You are cautioned that the advertisement and award of this contract will be subject to the laws and regulations that govern the EPA SPAP process.

8. Please be advised that the construction contract is subject to the Equal Employment Opportunity requirements contained in Executive Order 11246. Equal Employment opportunity affirmative action by the prime contractor and all subcontractors is mandated throughout the duration of the contract. Documentation of efforts to comply with Executive Order 11246, Equal Employment Opportunity in accordance with the EPA Special Notice to Bidders is required.

9. Documentation of compliance with the DBE Fair Share Policy in accordance with 40 CFR 31.36(e) is required and must be submitted to the Division of Water within fourteen (14) days of the bid opening.

10. If sanitary features of the approved plans are to be changed during construction, the engineer shall submit the revision to the Division of Water for approval prior to implementation of the modification. Written approval from the Division of Water must be granted prior to on-site work dedicated to the adjustment.

11. When this project is completed, the owner shall submit a written certification to the Division of Water that the above referenced water facilities have been constructed and tested in accordance with the approved plans. Such certification shall be signed by a licensed professional engineer.

12. When this project is completed, the engineer shall submit as-built drawings to the Division of Water.

This approval has been issued under the provisions of KRS Chapter 224 and regulations promulgated pursuant thereto. Issuance of this approval does not relieve the applicant from the responsibility of obtaining any other permits or licenses required by this Cabinet and other state, federal and local agencies.

Unless construction on this project commences within one year from the date of this approval letter, Green River Valley Water District shall request an official extension from the Division of Water prior to the first anniversary of this approval letter, or re-submit the original plans and specifications for a new comprehensive review

If you have any questions concerning this project, please contact me, at (502) 564-8158, extension 4835.

Sincerely,

James M. (Mike) Riley. PE
Environmental Engineer II,
Engineering Section
Water Infrastructure Branch
Division of Water

Enclosures
C: Water Mgmt Services
Dave Holroyd, US EPA, Region IV
Hart County Health Department
Public Service Commission
Bowling Green Regional Office

WATER MANAGEMENT SERVICES, LLC

Phone: (615) 366-6088
Fax: (615) 366-6203
E-mail: sjones@wmsengineers.com

Suite 401
2 International Plaza
Nashville, Tennessee 37217

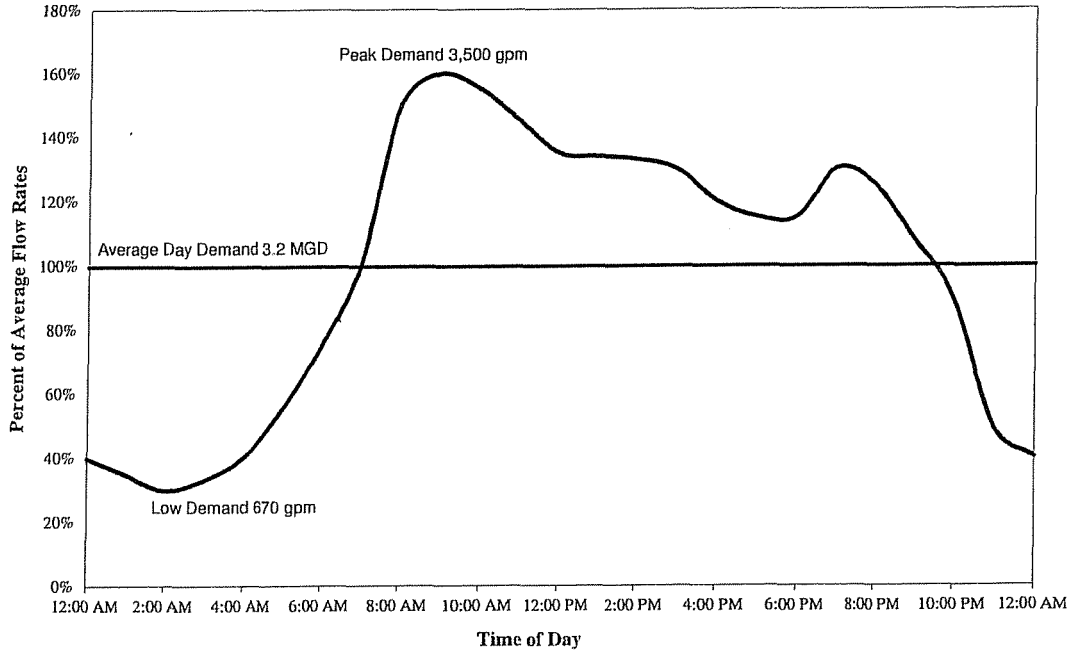
Facsimile / Memorandum

To: David Page
@ Fax: 270-773-5261
CC: Sam McIlwain
From: Steven Jones
Date: February 26, 2009
Re: Hwy. 31E Water Transmission Main Project Proposed Water Storage Reservoir
Pages: 2, including this page

As required by the Kentucky Division of Water, we have completed an analysis to determine the turnover rate of water in the proposed one million gallon storage tank. For this proposed tank the turnover of water is dependent upon two major factors. The first is that the high service pump operation ultimately determines the potential for daily turnover. For proper turnover, WTP operators must allow the tank to fluctuate to meet peak demands instead of increasing the plants high service rate. The increased volume of the proposed tank will facilitate that operation.

The second factor is based on variations in peak hourly flows. As you well know, water systems experience swings in demand throughout the day. Presented below is a demand curve which was developed for the southern region of the District's water system.

Typical Municpal Water System
Hourly Flow Rates



The turnover rate of the tank was based on the yearly average flow for the southern portion of the water system. The average flow for 2008 was approximately 3.2 MGD. This demand curve represents that average day demand. Peak demands, for the computer analysis, were approximately 3,500 gpm.

The following parameters were used as part of the computer analysis:

- A single variable speed high service pump was operated at 1,600 rpm until tank levels dropped to 825 feet. (approximately 1,775 gpm)
- Water storage tanks were refilled based on the operation of two high service pumps at full speed. (approximately 3,650 gpm)
- Water system analysis was based on a start time full tanks and demand equal to that a 7:00 AM on the demand curve.
- Analysis was complete after 72-hours of simulation.

Based on the above parameters the computer model estimated that 57 feet of turnover would be achievable over a 72-hour period. An attached spreadsheet details the computer analysis of the water system. Based on these results the proposed tank can achieve a full turnover once every 50 hours. This meets the three day criteria established by the Division of Water.

Hour	Time	Demand	Horse Cave Tank (ft)	Proposed Tank (ft)	Water Plant Pump Rate (gpm)	Level Change Proposed Tank (ft)	Cumulative Level Change Proposed Tank (ft)	Level Change Horse Cave Tank (ft)	Cumulative Level Change Horse Cave Tank (ft)
0	Initial Setup		840	840	-	-	-	-	-
1	7:00 AM	2213	838	839	1740	1	1	2	2
2	8:00 AM	3320	834	837	1775	2	3	4	6
3	9:00 AM	3540	832	834	1800	3	6	2	8
4	10:00 AM	3429	829	832	1810	2	8	3	11
5	11:00 AM	3210	827	830	1820	2	10	2	13
6	12:00 PM	2990	825	828	1825	2	12	2	15
7	1:00 PM	2970	830	831	3660		12		15
8	2:00 PM	2950	833	835	3640		12		15
9	3:00 PM	2885	837	838	3610		12		15
10	4:00 PM	2650	835	837	1760	1	13	2	17
11	5:00 PM	2540	834	836	1770	1	14	1	18
12	6:00 PM	2885	832	834	1780	2	16	2	20
13	7:00 PM	2775	830	833	1792	1	17	2	22
14	8:00 PM	2385	830	832	1790	1	18		22
15	9:00 PM	1960	829	831	1785	1	19	1	23
16	10:00 PM	1090	830	831	1770		19		23
17	11:00 PM	890	831	831	1760		19		23
18	12:00 AM	890	831	832	2360		19		23
19	1:00 AM	670	832	833	2350		19		23
20	2:00 AM	730	833	834	2335		19		23
21	3:00 AM	850	834	835	2330		19		23
22	4:00 AM	1026	835	836	2315		19		23
23	5:00 AM	1411	837	837	3430		19		23
24	6:00 AM	1924	840	839	3420		19		23
25	7:00 AM	2213	838	838	1740	1	20	2	25
26	8:00 AM	3320	834	836	1775	2	22	4	29
27	9:00 AM	3540	832	833	1800	3	25	2	31
28	10:00 AM	3429	829	831	1810	2	27	3	34
29	11:00 AM	3210	827	829	1820	2	29	2	36
30	12:00 PM	2990	825	827	1825	2	31	2	38
31	1:00 PM	2970	830	830	3660		31		38
32	2:00 PM	2950	833	834	3640		31		38
33	3:00 PM	2885	837	837	3610		31		38
34	4:00 PM	2650	835	836	1760	1	32	2	40
35	5:00 PM	2540	834	835	1770	1	33	1	41
36	6:00 PM	2885	832	833	1780	2	35	2	43
37	7:00 PM	2775	830	832	1792	1	36	2	45
38	8:00 PM	2385	829	831	1790	1	37	1	46
39	9:00 PM	1960	830	830	1785	1	38		46
40	10:00 PM	1090	830	831	1770		38		46
41	11:00 PM	890	831	832	1760		38		46
42	12:00 AM	890	832	833	2360		38		46
43	1:00 AM	670	832	833	2350		38		46
44	2:00 AM	730	833	834	2335		38		46
45	3:00 AM	850	834	835	2330		38		46
46	4:00 AM	1026	835	836	2315		38		46
47	5:00 AM	1411	837	837	3430		38		46
48	6:00 AM	1924	840	839	3420		38		46
49	7:00 AM	2213	838	838	1740	1	39	2	48
50	8:00 AM	3320	834	836	1775	2	41	4	52
51	9:00 AM	3540	832	833	1800	3	44	2	54
52	10:00 AM	3429	829	831	1810	2	46	3	57
53	11:00 AM	3210	827	829	1820	2	48	2	59
54	12:00 PM	2990	825	827	1825	2	50	2	61
55	1:00 PM	2970	830	829	3660		50		61
56	2:00 PM	2950	833	833	3640		50		61
57	3:00 PM	2885	837	836	3610		50		61
58	4:00 PM	2650	835	835	1760	1	51	2	63
59	5:00 PM	2540	834	834	1770	1	52	1	64
60	6:00 PM	2885	832	832	1780	2	54	2	66
61	7:00 PM	2775	830	831	1792	1	55	2	68
62	8:00 PM	2385	829	830	1790	1	56	1	69
63	9:00 PM	1960	830	829	1785	1	57		69
64	10:00 PM	1090	830	831	1770		57		69
65	11:00 PM	890	831	832	1760		57		69
66	12:00 AM	890	832	833	2360		57		69
67	1:00 AM	670	832	833	2350		57		69
68	2:00 AM	730	833	834	2335		57		69
69	3:00 AM	850	834	835	2330		57		69
70	4:00 AM	1026	835	836	2315		57		69
71	5:00 AM	1411	837	837	3430		57		69
72	6:00 AM	1924	840	839	3420	**Total Turnover**	**57**	**Total Turnover**	**69**

WATER MANAGEMENT SERVICES, LLC

Phone: (615) 366-6088
Fax: (615) 366-6203
E-mail: sjones@wmsengineers.com

Suite 401
2 International Plaza
Nashville, Tennessee 37217

Memorandum

To: David Page
CC: Sam McIlwain
From: Steven Jones
Date: March 11, 2009
Re: Hwy. 31E Water Transmission Main Project (WMS #08193)

We have reviewed the hydraulics of the Green River Valley Water System for the Hwy. 31E Water Transmission Main Project. The enclosed maps show the location of the water main and proposed tank as well as the computer nodes to indicate calculated pressure along the alignment of the proposed Hwy. 31-E transmission main. The ground elevations, along the alignment of the proposed transmission main, range between 650 and 760 feet with the vast majority of alignment having an elevation of approximately 680 feet.

The purpose of the 16-inch transmission main is to provide water to the Horse Cave – Cave City Area, and to maintain pressures for that area by maintaining an appropriate water level in the proposed water storage reservoir. The transmission main will not provide for any new services but will improve service to existing customers.

The following hydraulic calculations are based on the water level in the storage reservoirs being ten (10) feet below the overflow elevations. The calculations assume average demands on the water system. Flows from the high service pumps greater than the average demand of the water system will flow into the water storage reservoirs. The following table displays both the pressure and the hydraulic grade line (HGL) for each node with no pump operation, one pump operation, and two pump operation.

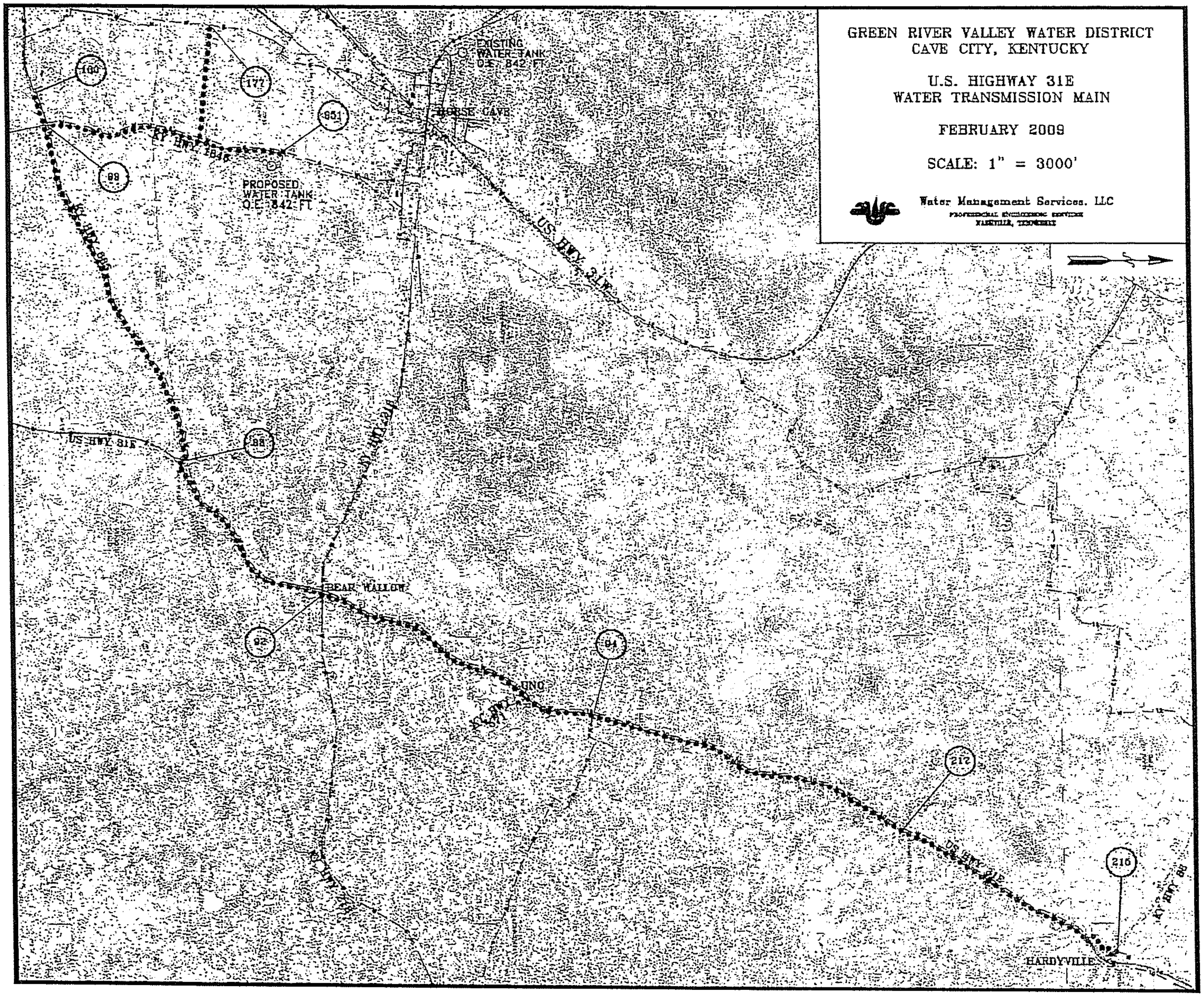
Node	Elevation	Average System Demand WTP Output 0 gpm		Average System Demand WTP 1-pump operation		Average System Demand WTP 2-pump operation	
83	695 ft	56 psi	824 ft	67 psi	850 ft	74 psi	866 ft
92	641 ft	79 psi	823 ft	98 psi	867 ft	109 psi	893 ft
94	626 ft	86 psi	825 ft	108 psi	875 ft	121 psi	906 ft
99	740 ft	38 psi	828 ft	43 psi	839 ft	45 psi	844 ft
100	760 ft	29 psi	827 ft	34 psi	839 ft	36 psi	843 ft
147	635 ft	84 psi	829 ft	86 psi	834 ft	87 psi	836 ft
215	704 ft	51 psi	822 ft	84 psi	898 ft	104 psi	944 ft
217	678 ft	62 psi	821 ft	90 psi	886 ft	106 psi	923 ft
951	750 ft	35 psi	831 ft	36 psi	833 ft	37 psi	835 ft

To review the DoW flushing requirements a flow resulting in a flushing velocity of 2.5 ft/s must be achieved while maintaining a minimum residual pressure of 20 psi in the distribution system. Hydraulic calculations were completed to ensure adequate flushing velocities in the 16-inch water transmission main.

The hydraulic analysis for the turnover of the proposed water storage reservoir detailed that the level will routinely drop to 830 feet. At that elevation and with two pump operation the hydraulic computer model calculates that approximately 1,700 gpm enters the proposed storage reservoir via the proposed 16-inch water transmission main. The 1,700 gpm flow rate results in a 2.7 fps velocity in the transmission main. The following table displays both the pressure and the hydraulic grade line (HGL) for this scenario.

Node	Elevation	Residual Pressures at Flushing	HGL
83	695 ft	76 psi	871 ft
92	641 ft	112 psi	900 ft
94	626 ft	124 psi	912 ft
99	740 ft	48 psi	851 ft
100	760 ft	39 psi	850 ft
147	635 ft	86 psi	834 ft
215	704 ft	106 psi	949 ft
217	678 ft	109 psi	930 ft
951	750 ft	36 psi	833 ft

These results indicate that the required flushing velocities will routinely be achieved through normal system operation, and that the minimum required pressure of 20 psi can be maintained under those conditions. Therefore, we recommend the installation of the water transmission main.


GREEN RIVER VALLEY WATER DISTRICT
CAVE CITY, KENTUCKY
U.S. HIGHWAY 31E
WATER TRANSMISSION MAIN
FEBRUARY 2009
SCALE: 1" = 3000'
Water Management Services, LLC
EXISTING WATER TANK O.E. 842 FT
HORSE CAVE
PROPOSED WATER TANK O.E. 842 FT
KY HWY 1846
US HWY 31W
US HWY 31E
BEAR WALLOW
HARDYVILLE
100
177
851
99
88
92
94
212
216

WATER MANAGEMENT SERVICES, LLC

PHONE: (615) 366-6088
FAX: (615) 366-6203
E-MAIL: sjones@wmsengineers.com

Suite 401
2 International Plaza
Nashville, Tennessee 37217

Memorandum

To: David Paige
From: Steven Jones
cc: Sam McIllwain, Tim Graves
Date: February 27, 2009
Re: EPA Funded Water Main Extensions

We have reviewed the hydraulics of the Green River Valley Water System for the EPA Funded Water Main Extensions to analyze the installation of the various water main extensions. The enclosed maps show the locations of the various water main extensions as well as the nodes in the vicinity of the proposed installations. These pressures were generated under average flow conditions and with all tanks influencing the pressures assumed to have water levels ten (10) feet below the overflow elevation of the tank.

The pressures (psi) calculated by the hydraulic system model are listed below for various system conditions for each of the water main extension projects. To review the DoW flushing requirements, a flow equal to $10\sqrt{n}$ was used to calculate the instantaneous demand on the system, and a flow of 55 gpm was used to result in a flushing velocity of 2.5 ft/s in proposed 3-inch water mains, and a flow of 100 gpm was used for 4-inch water mains. The enclosed maps show the locations of the nodes listed below.

Hopewell Church Road Water Main Extension

It is estimated that this 3-inch water main extension will serve six (6) homes which equates to an instantaneous demand of 25 gpm using the DoW criteria. In addition the elimination of the dead end water mains will improve the overall quality of water for the customers that are currently serviced by the distribution system in this general area.

Node	Node Elevation	Average System Demand (psi)	Instantaneous Demand (psi)	Flushing Conditions (psi)
197	736	81	79	77
198	661	83	81	78
199	636	100	99	97
201	633	104	103	101
564	662	102	74	59

These results indicate that the minimum required pressure of 30 psi can be maintained under peak operating conditions and a minimum pressure of 20 psi can be maintained under flushing conditions of 55 gpm. Therefore, we recommend the installation of the 3-inch water main.

D. Williams Road Water Main Extension

It is estimated that this 3-inch water main extension will serve twelve (12) homes which equates to an instantaneous demand of 35 gpm using the DoW criteria.

Node	Node Elevation	Average System Demand (psi)	Instantaneous Demand (psi)	Flushing Conditions (psi) At Node 514	Flushing Conditions (psi) At Node 515
256	656	91	88	83	83
511	538	144	141	134	134
512	700	81	78	64	64
514	600	122	119	91	100
515	640	105	102	83	79
754	840	56	55	51	51

These results indicate that the minimum required pressure of 30 psi can be maintained under peak operating conditions and a minimum pressure of 20 psi can be maintained under flushing conditions of 55 gpm. Therefore, we recommend the installation of the 3-inch water main.

Priceville Road Water Main Extension

It is estimated that this 3-inch water main extension will serve eight (8) homes which equates to an instantaneous demand of 28 gpm using the DoW criteria.

Node	Node Elevation	Average System Demand (psi)	Instantaneous Demand (psi)	Flushing Conditions (psi)
571	654	119	112	100
572	740	81	65	35
720	660	116	113	106
721	650	121	119	116

These results indicate that the minimum required pressure of 30 psi can be maintained under peak operating conditions and a minimum pressure of 20 psi can be maintained under flushing conditions of 55 gpm. Therefore, we recommend the installation of the 3-inch water main.

Marshall Highbaugh Road Water Main Extension

It is estimated that this 3-inch water main extension will serve four (4) homes which equates to an instantaneous demand of 20 gpm using the DoW criteria. In addition the elimination of the dead end water mains will improve the overall quality of water for the customers that are currently serviced by the distribution system in this general area.

Node	Node Elevation	Average System Demand (psi)	Instantaneous Demand (psi)	Flushing Conditions (psi)
Frenchman's Knob Water Storage Tank O.E. 955 ft				
368	840	39	37	30
369	860	30	28	21
467	660	126	124	120
469	617	122	121	121
470	840	44	40	31

These results indicate that the minimum required pressure of 30 psi can be maintained under peak operating conditions and a minimum pressure of 20 psi can be maintained under flushing conditions of 55 gpm. Therefore, we recommend the installation of the 3-inch water main.

Francis Gardner Road Water Main Extension

It is estimated that this 3-inch water main extension will serve four (4) homes which equates to an instantaneous demand of 20 gpm using the DoW criteria.

Node	Node Elevation	Average System Demand (psi)	Instantaneous Demand (psi)	Flushing Conditions (psi)
239	600	165	162	154
240	654	141	138	130
569	600	164	162	153
570	570	145	140	117

These results indicate that the minimum required pressure of 30 psi can be maintained under peak operating conditions and a minimum pressure of 20 psi can be maintained under flushing conditions of 55 gpm. Therefore, we recommend the installation of the 3-inch water main.

Wells Road Water Main Extension

It is estimated that this 3-inch water main extension will serve one (1) homes which equates to an instantaneous demand of 10 gpm using the DoW criteria.

Node	Node Elevation	Average System Demand (psi)	Instantaneous Demand (psi)	Flushing Conditions (psi)
500	511	184	184	184
516	520	180	179	177
518	580	155	153	146

These results indicate that the minimum required pressure of 30 psi can be maintained under peak operating conditions and a minimum pressure of 20 psi can be maintained under flushing conditions of 55 gpm. Therefore, we recommend the installation of the 3-inch water main.

Wheeler and Polley Road Water Main Extension

It is estimated that this 3-inch water main extension along Wheeler Road will serve three (3) homes which equates to an instantaneous demand of 17 gpm using the DoW criteria. The 3-inch and 4-inch water main extension along Polley Road will serve seven (7) homes which equates to an instantaneous demand of 26 gpm

Node	Node Elevation	Average System Demand (psi)	Instantaneous Demand (psi)	Flushing Conditions (psi) At Node 519	Flushing Conditions (psi) At Node 520
300	748	76	74	69	60
309	818	45	42	37	24
308	810	48	46	40	28
460	787	51	48	41	34
519	797	49	44	29	20
520	780	60	56	48	24
521	783	52	49	36	26
881	780	52	49	38	29

These results indicate that the minimum required pressure of 30 psi can be maintained under peak operating conditions and a minimum pressure of 20 psi can be maintained under flushing conditions of 55 gpm. Therefore, we recommend the installation of the 3-inch and 4-inch water mains.

Willie Rice and Dewey Kidd Road Water Main Extension

It is estimated that this 3-inch water main extension will serve six (6) homes which equates to an instantaneous demand of 25 gpm using the DoW criteria. This portion of the extension runs along Rockland Mills Road between nodes 603 and 604 on the attached map.

Node	Node Elevation	Average System Demand (psi)	Instantaneous Demand (psi)	Flushing Conditions (psi) At Node 567	Flushing Conditions (psi) At Node 568
Hudgins Water Storage Tank O.E. 920 feet					
252	771	90	87	81	81
565	815	71	66	61	61
566	790	81	76	63	63
567	800	77	72	47	59
568	734	106	100	87	73

These results indicate that the minimum required pressure of 30 psi can be maintained under peak operating conditions and a minimum pressure of 20 psi can be maintained under flushing conditions of 55 gpm. Therefore, we recommend the installation of the 3-inch water main.

Chestnut Grove Road Water Main Extension

It is estimated that this 3-inch water main extension will serve six (6) homes which equates to an instantaneous demand of 25 gpm using the DoW criteria.

Node	Node Elevation	Average System Demand (psi)	Instantaneous Demand (psi)	Flushing Conditions (psi)
Frenchman's Knob Water Storage Tank O.E. 955 feet				
575	840	49	46	30
577	710	106	105	104
870	689	115	114	112

These results indicate that the minimum required pressure of 30 psi can be maintained under peak operating conditions and a minimum pressure of 20 psi can be maintained under flushing conditions of 55 gpm. Therefore, we recommend the installation of the 3-inch water main.

Chestnut Grove Cemetery Road Water Main Extension

Latitude – 37° 19' 35" N Longitude - 85° 54' 16" W

The proposed water line extensions along Chestnut Grove Cemetery Road will require the installation of a water booster station. The pressures (psi) calculated by the hydraulic system model are listed below for average and peak system operating conditions, with single pump operation. The average flow based on the number of customers served was set to be 12 gpm,

and the total instantaneous peak flow based on DOW criteria of 35 gpm. This range of flows was established to be the typical operating range for the station. Under this condition the discharge pressure was set at 125 psi.

Node	Node Elevation	Average System Demand (psi)	Instantaneous Demand (psi)	Flushing Conditions (psi)
524	820	125	125	135
525	1000	45	35	31
528	880	98	97	107
765	734	83	82	80

As demonstrated by the computer model the use of a variable speed booster pump station stabilizes the pressures for customers. These results indicate that the minimum required pressure of 30 psi can be maintained under peak operating conditions and a minimum pressure of 20 psi can be maintained under flushing conditions of 55 gpm. Therefore, we recommend the installation of the 3-inch water main and the variable speed booster station.

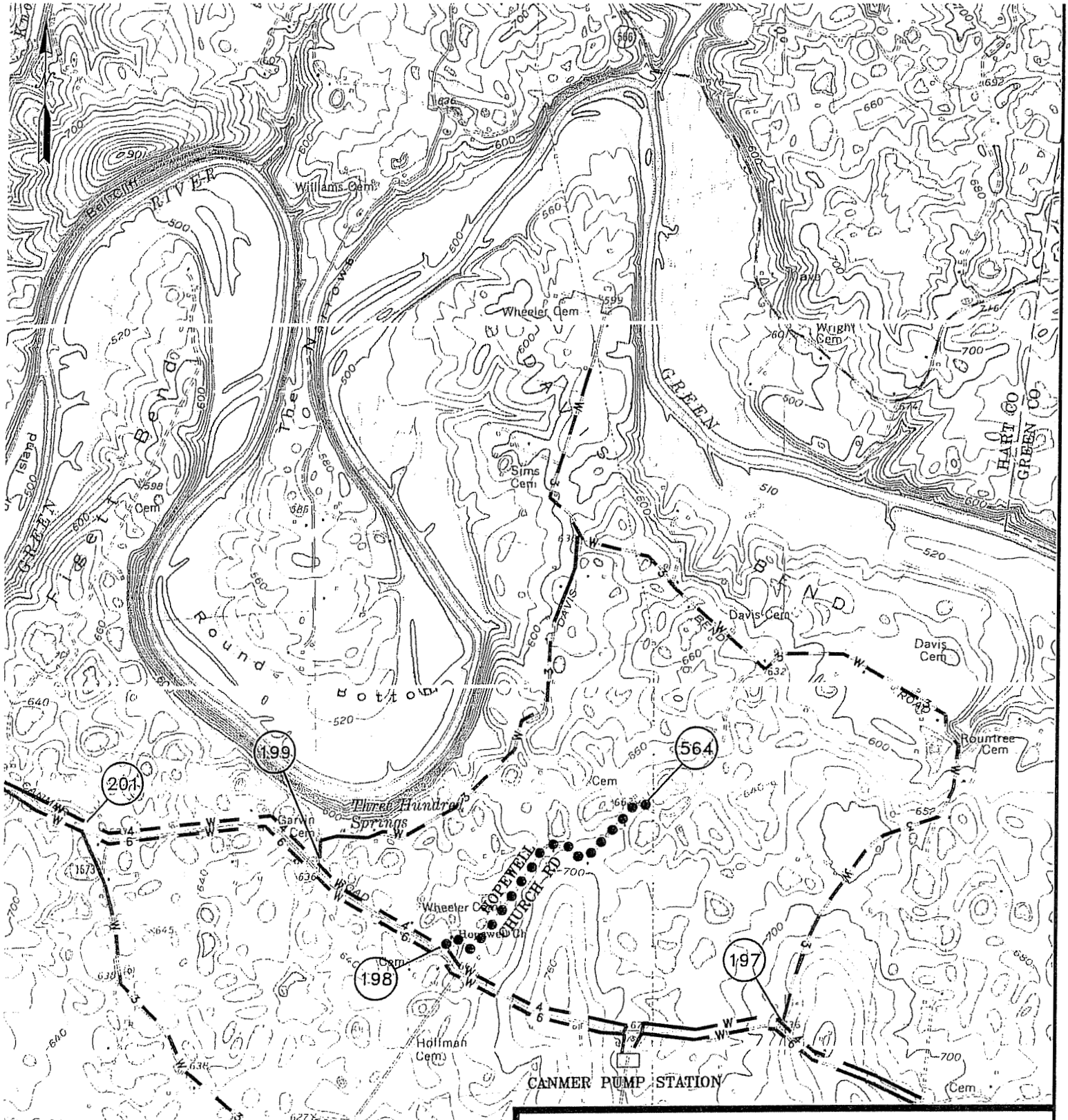
Buckner Hill Road Water Booster Station

Latitude – 37° 21' 06" N Longitude - 85° 52' 55" W

The pressures (psi) calculated by the hydraulic system model are listed below for average and peak system operating conditions, with single pump operation. The average flow based on the number of customers served was set to be 12 gpm, and the total instantaneous peak flow based on DOW criteria of 35 gpm. This range of flows was established to be the typical operating range for the station. Under this condition the discharge pressure was set at 153 psi. Flushing was achieved based on two pump operation.

Node	Node Elevation	Average System Demand (psi)	Instantaneous Demand (psi)	Flushing Conditions (psi)
522	710	153	153	167
523	951	47	36	32
526	880	79	75	83
527	884	76	69	71
577	710	97	96	95

As demonstrated by the computer model the use of a variable speed booster pump station stabilizes the pressures for customers. These results also indicate that the minimum required pressure of 30 psi can be maintained under peak operating conditions and a minimum pressure of 20 psi can be maintained under flushing conditions of 55 gpm. Therefore, we recommend the installation of the 3-inch water main and the variable speed booster station.



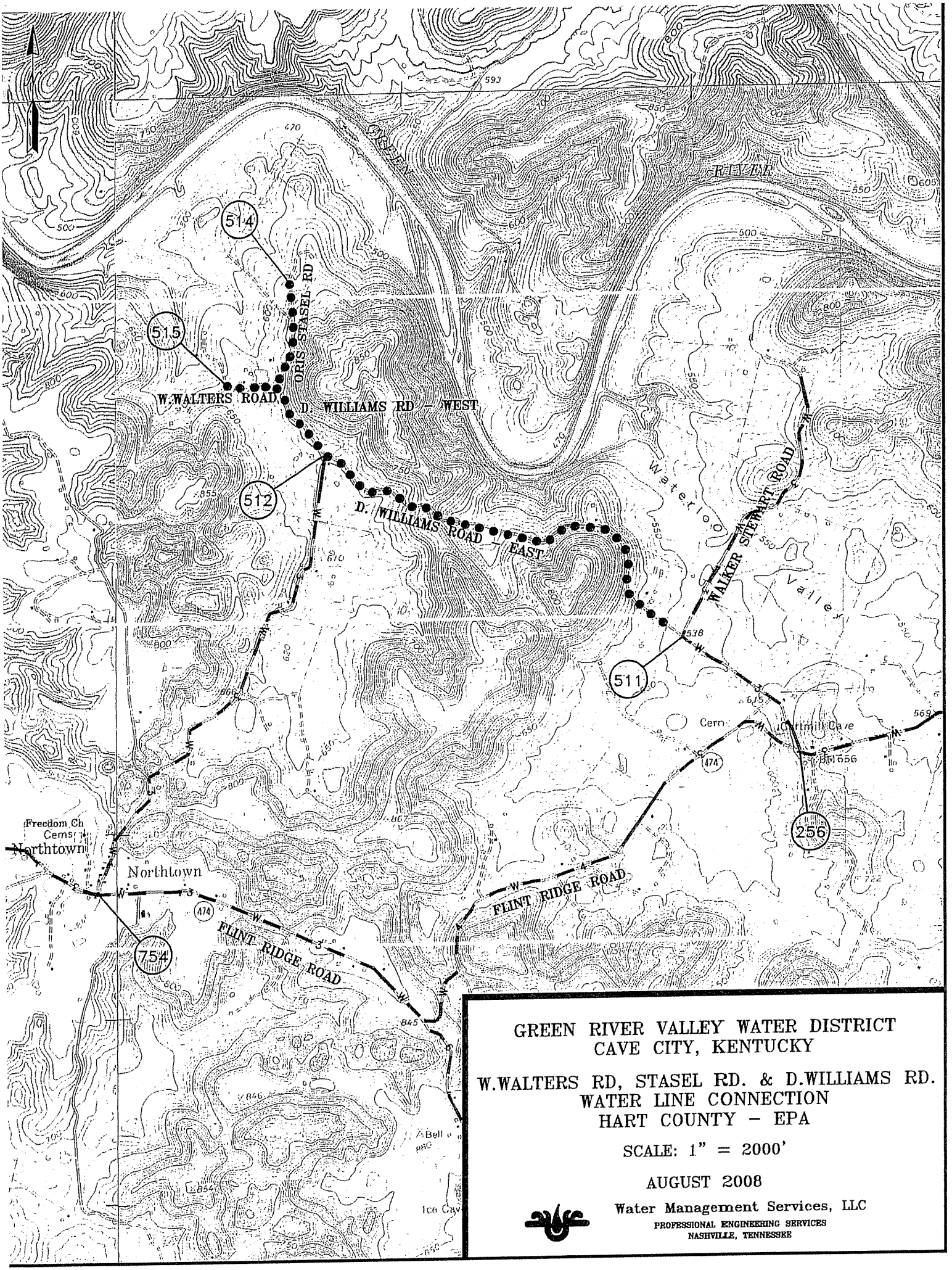
GREEN RIVER VALLEY WATER DISTRICT
CAVE CITY, KENTUCKY

HOPEWELL CHURCH ROAD
WATER LINE CONNECTION
HART COUNTY – EPA

SCALE: 1" = 2000'

AUGUST 2008

Water Management Services, LLC
PROFESSIONAL ENGINEERING SERVICES
NASHVILLE, TENNESSEE



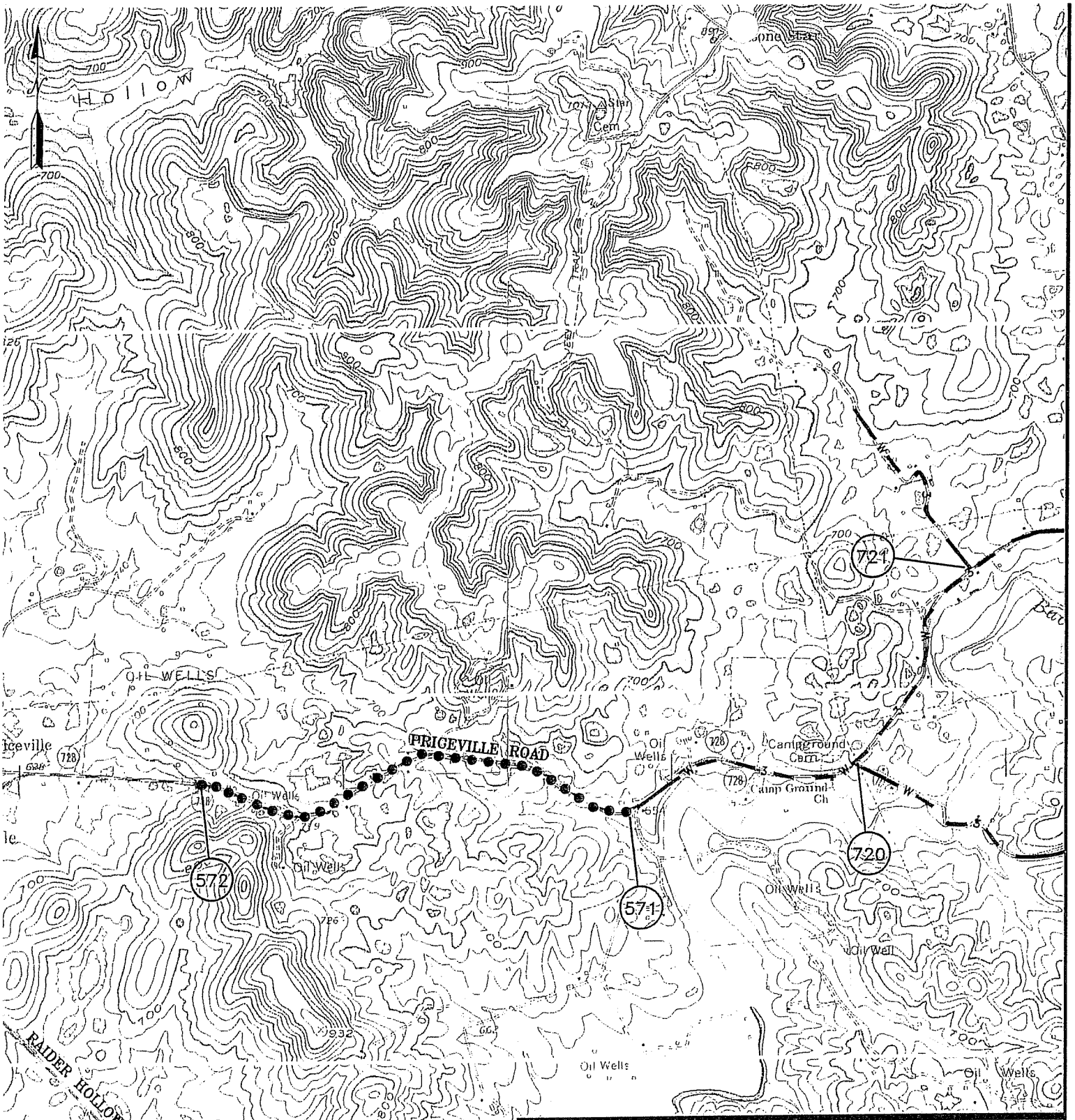
GREEN RIVER VALLEY WATER DISTRICT
CAVE CITY, KENTUCKY

W.WALTERS RD, STASEL RD. & D.WILLIAMS RD.
WATER LINE CONNECTION
HART COUNTY – EPA

SCALE: 1" = 2000'

AUGUST 2008

Water Management Services, LLC
PROFESSIONAL ENGINEERING SERVICES
NASHVILLE, TENNESSEE



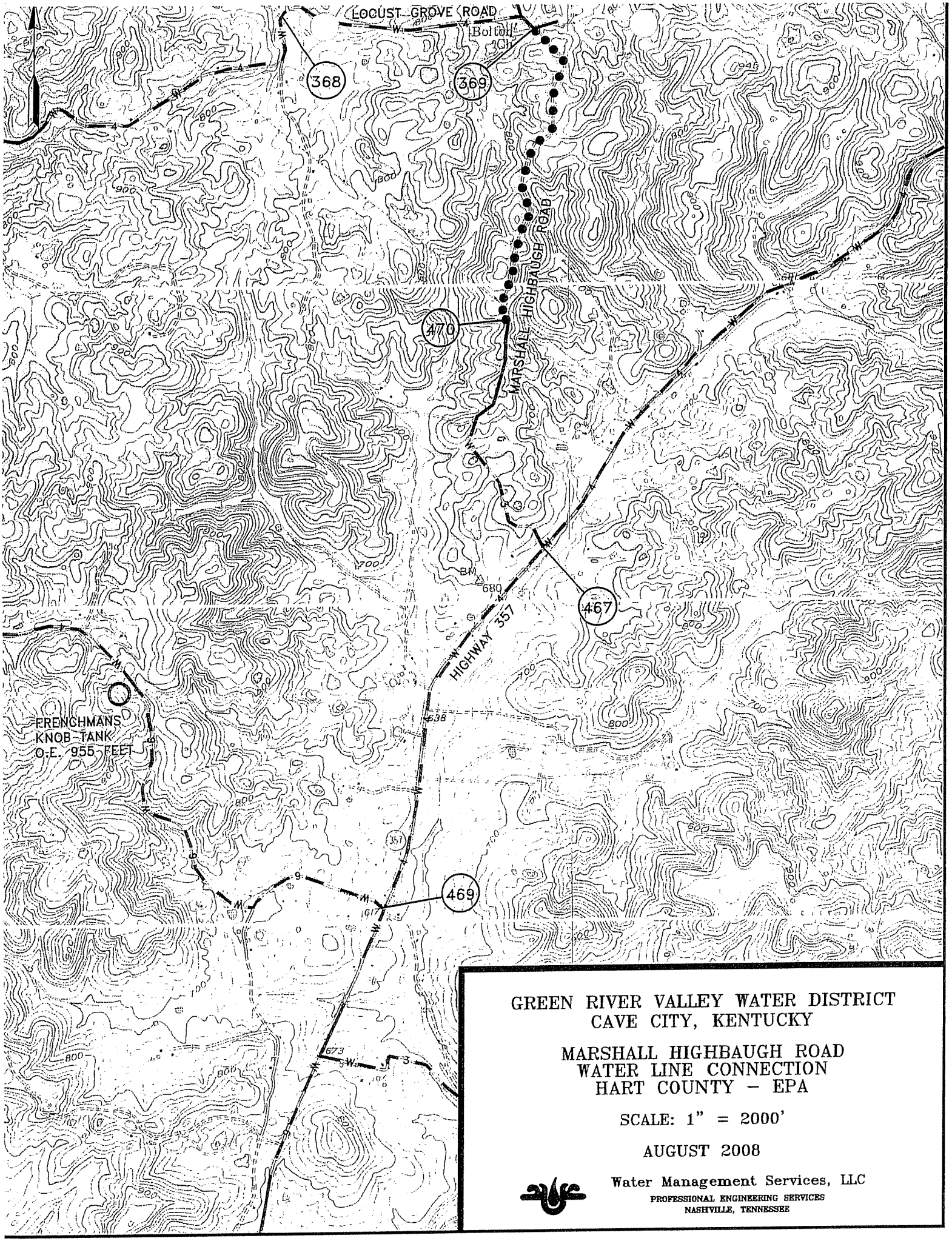
GREEN RIVER VALLEY WATER DISTRICT
CAVE CITY, KENTUCKY

PRICEVILLE ROAD
WATER LINE CONNECTION
HART COUNTY – EPA

SCALE: 1" = 2000'

AUGUST 2008

Water Management Services, LLC
PROFESSIONAL ENGINEERING SERVICES
NASHVILLE, TENNESSEE



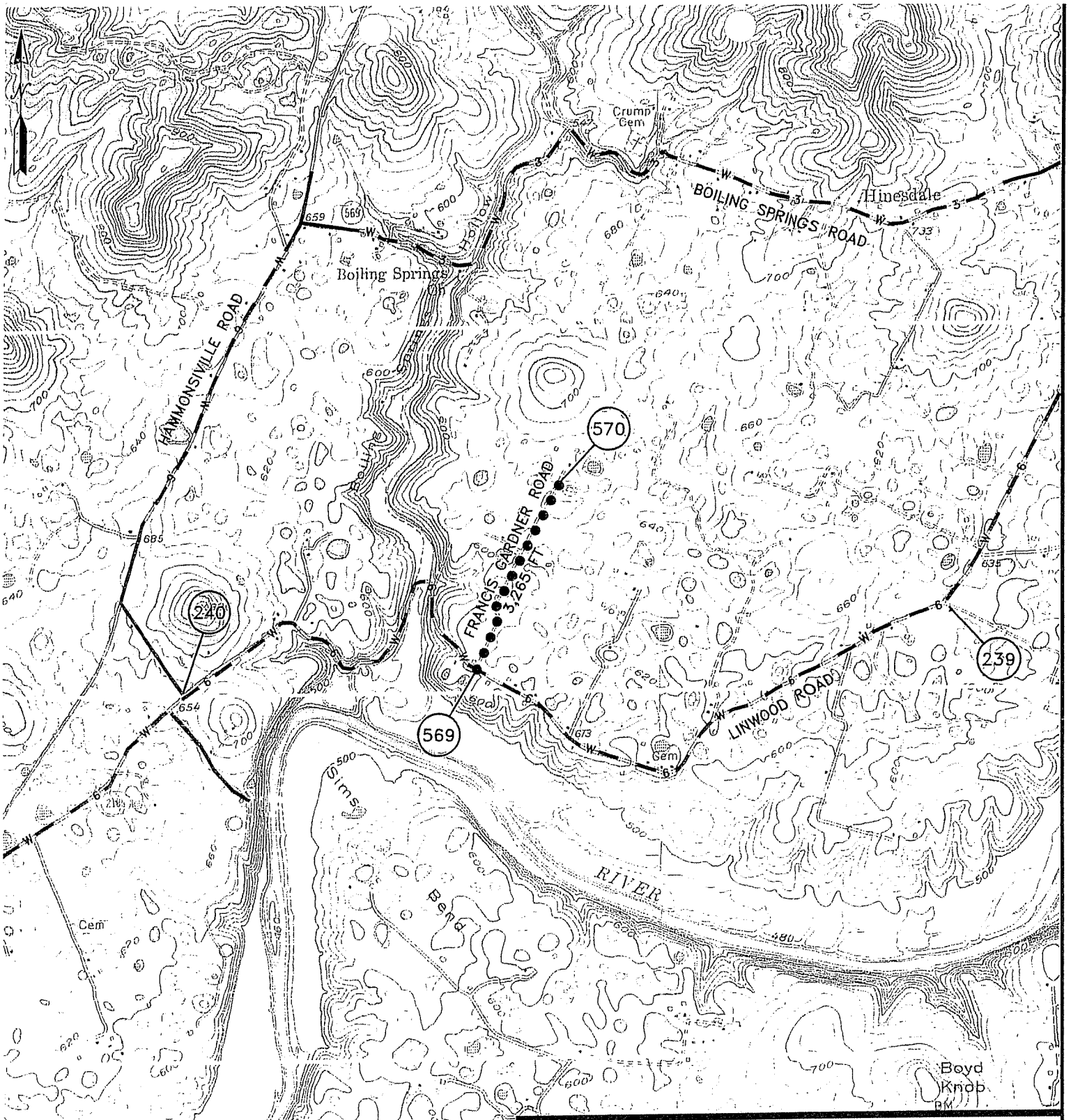
GREEN RIVER VALLEY WATER DISTRICT
CAVE CITY, KENTUCKY

MARSHALL HIGHBAUGH ROAD
WATER LINE CONNECTION
HART COUNTY – EPA

SCALE: 1" = 2000'

AUGUST 2008

Water Management Services, LLC
PROFESSIONAL ENGINEERING SERVICES
NASHVILLE, TENNESSEE



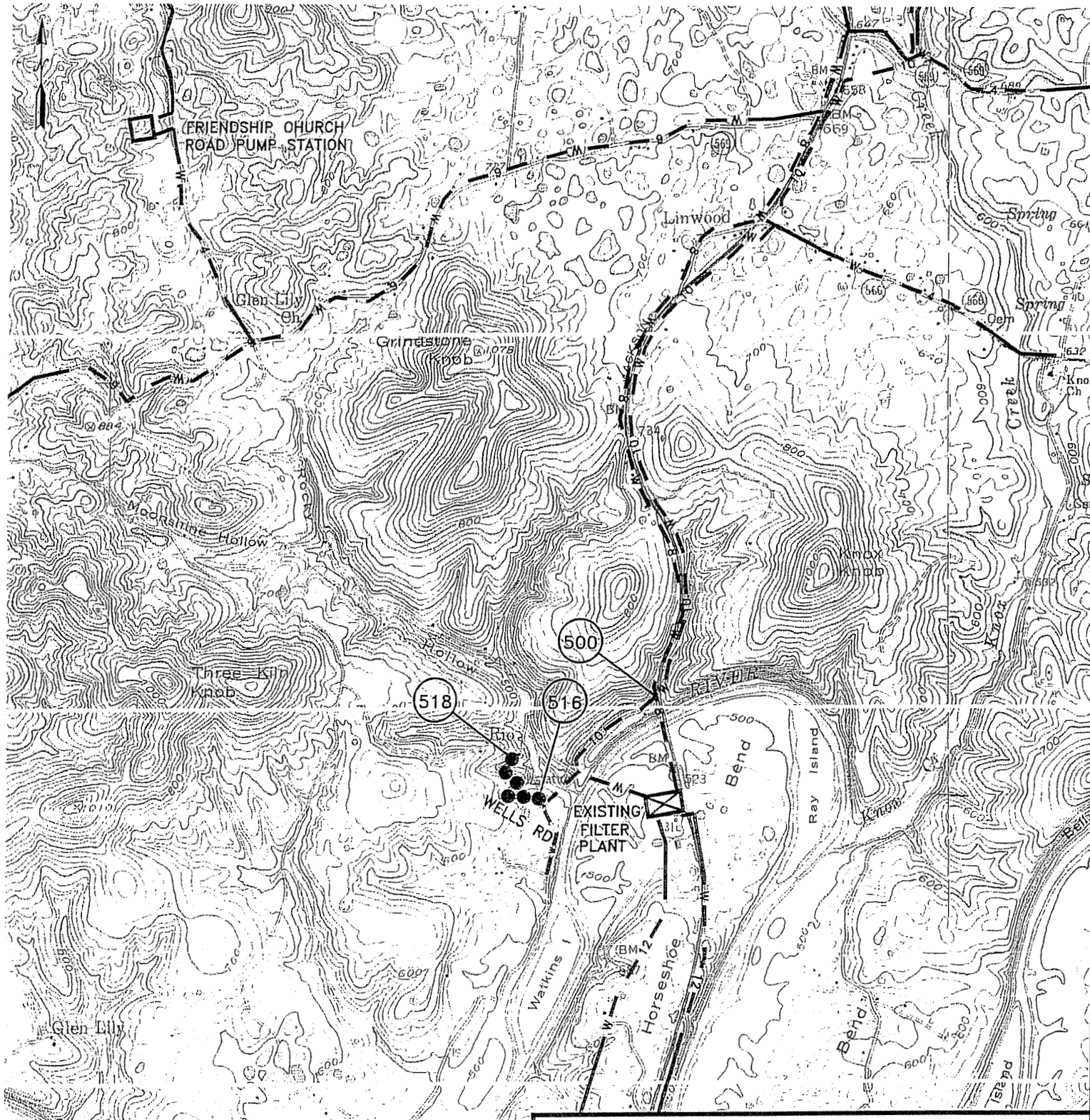
GREEN RIVER VALLEY WATER DISTRICT
CAVE CITY, KENTUCKY

FRANCIS GARDNER ROAD
WATER LINE CONNECTION
HART COUNTY – EPA

SCALE: 1" = 2000'

AUGUST 2008

Water Management Services, LLC
PROFESSIONAL ENGINEERING SERVICES
NASHVILLE, TENNESSEE



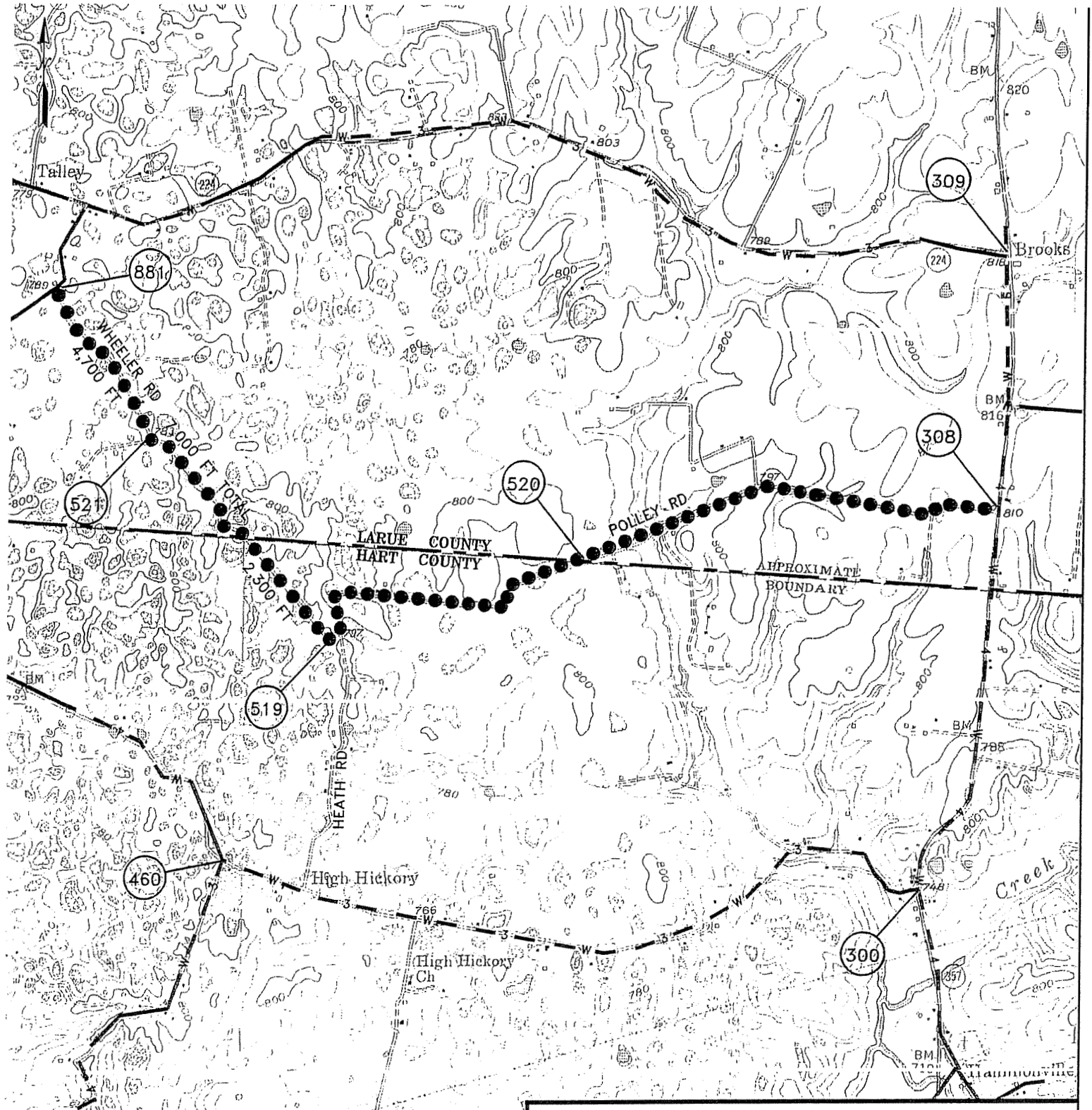
GREEN RIVER VALLEY WATER DISTRICT
CAVE CITY, KENTUCKY

WELLS (CHARLES) ROAD
WATER LINE EXTENSION
HART COUNTY –EPA

AUGUST 2008

SCALE: 1" = 2000'

Water Management Services, LLC
PROFESSIONAL ENGINEERING SERVICES
NASHVILLE, TENNESSEE



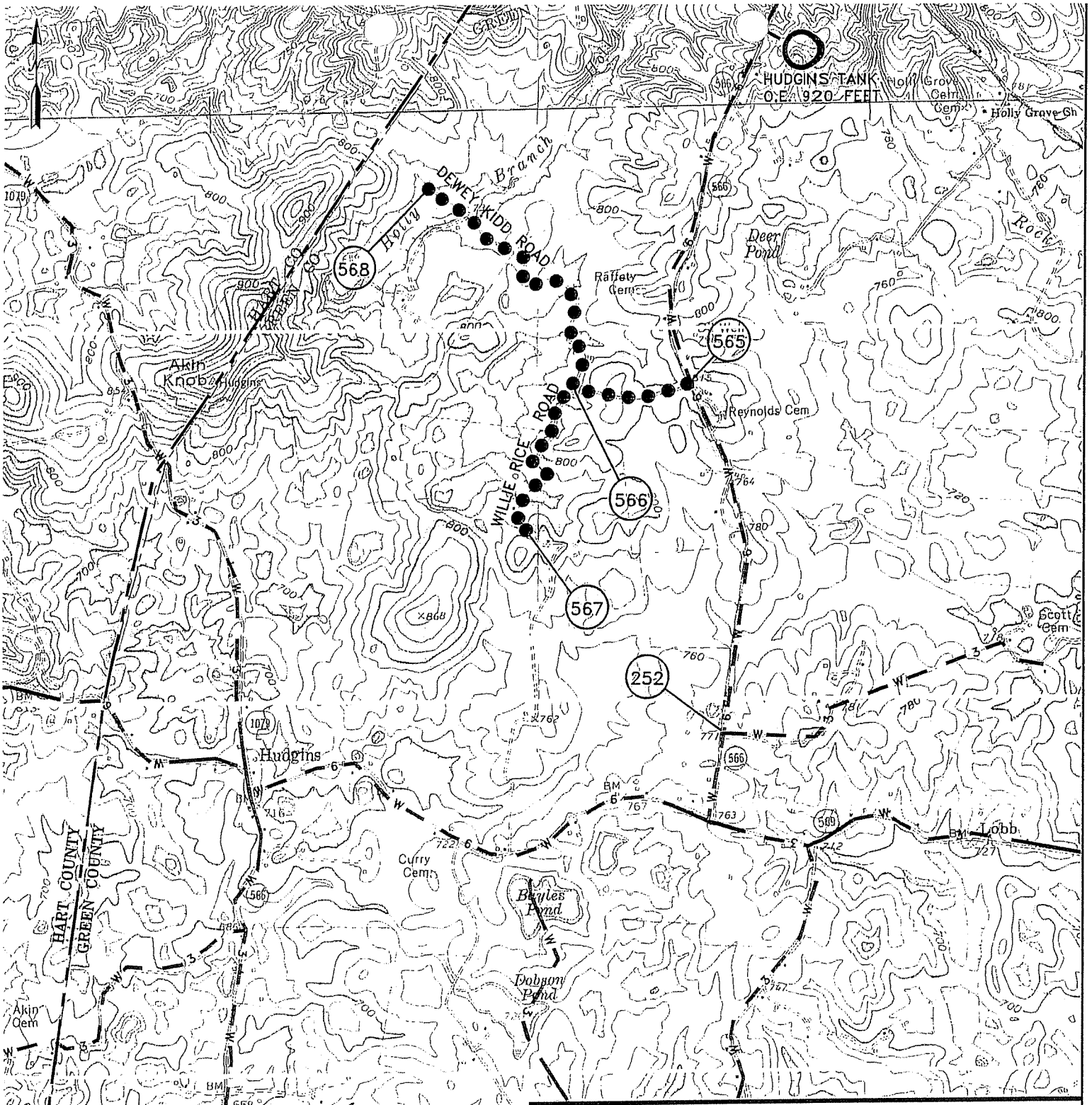
GREEN RIVER VALLEY WATER DISTRICT
CAVE CITY, KENTUCKY

WHEELER ROAD & POLLEY ROAD
WATER LINE EXTENSIONS
HART & LARUE COUNTY – EPA

AUGUST 2008

SCALE: 1" = 2000'

Water Management Services, LLC
PROFESSIONAL ENGINEERING SERVICES
NASHVILLE, TENNESSEE



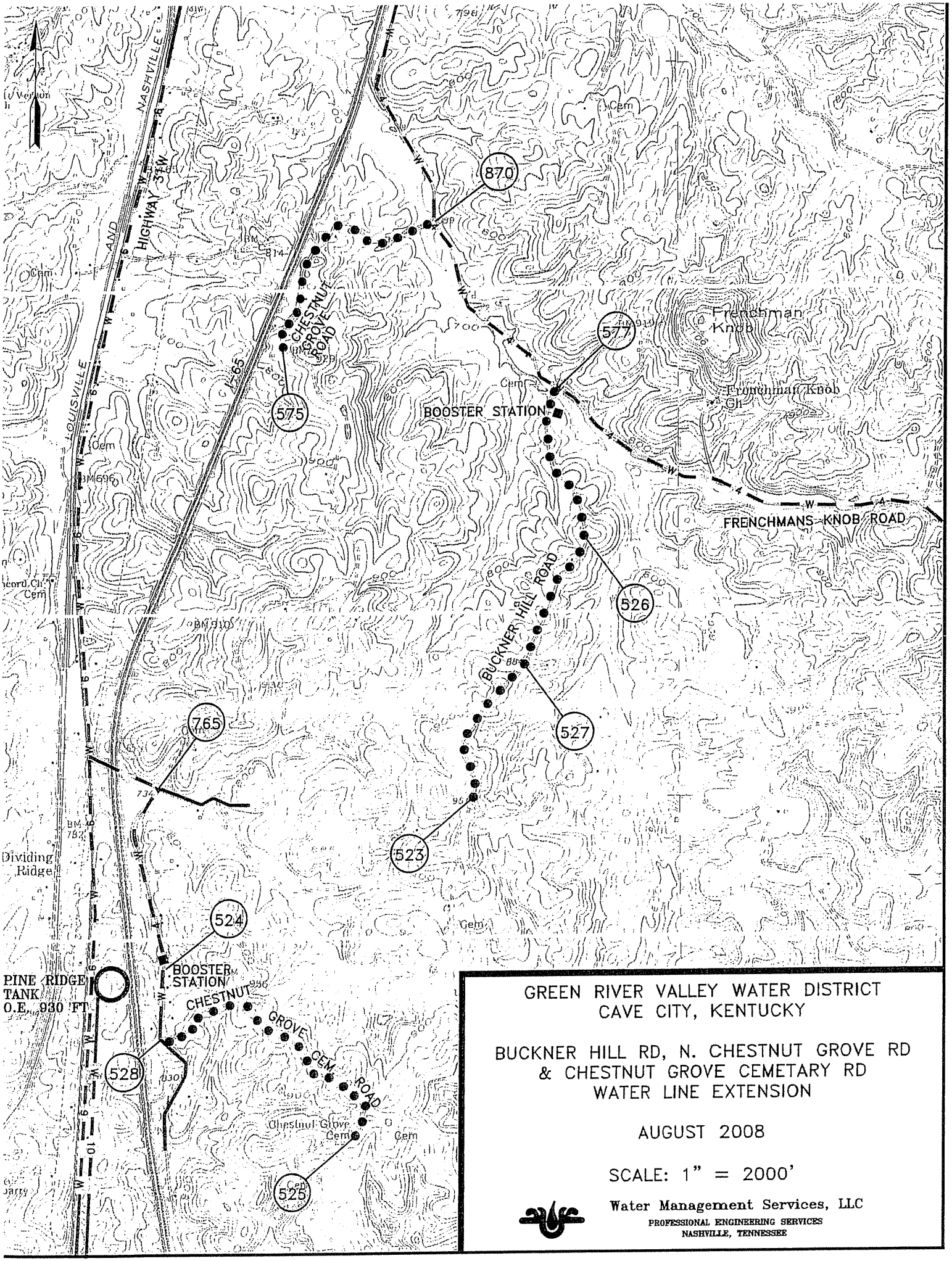
GREEN RIVER VALLEY WATER DISTRICT
CAVE CITY, KENTUCKY

DEWEY KIDD RD & WILLIE RICE RD
WATER LINE EXTENSION
GREEN COUNTY – EPA

AUGUST 2008

SCALE: 1" = 2000'

Water Management Services, LLC
PROFESSIONAL ENGINEERING SERVICES
NASHVILLE, TENNESSEE



GREEN RIVER VALLEY WATER DISTRICT
CAVE CITY, KENTUCKY

BUCKNER HILL RD, N. CHESTNUT GROVE RD
& CHESTNUT GROVE CEMETARY RD
WATER LINE EXTENSION

AUGUST 2008

SCALE: 1" = 2000'

Water Management Services, LLC
PROFESSIONAL ENGINEERING SERVICES
NASHVILLE, TENNESSEE

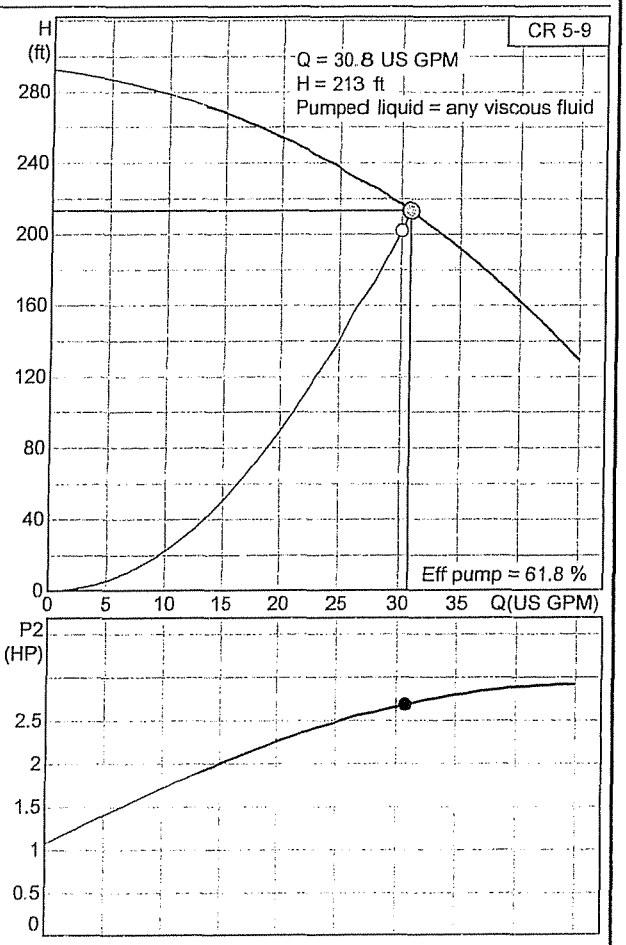
WATER & WASTE EQUIPMENT

Company name: Water & Waste Equipment, Inc.
Created by: Carey Davis
Phone: (615) 907-4000
Fax: (615) 907-8900
Date: 3/4/2009

Project: Green River Valley Water District
Reference number: 090304cd-1
Position:

Client: Water Management
Client number:
Contact: Steven Jones

Description	Value
Product name:	CR 5-9 A-FGJ-A-E HQQE
Product Number:	96084264
EAN number:	5700395191028
Technical:	
Speed for pump data:	3457 rpm
Rated flow:	30.38 US GPM
Rated head:	206 ft
Impellers:	9
Type of shaft seal:	HQQE
Approvals on nameplate:	NEMA
Stages:	9
Pump version:	A
Model.	A
Cooling:	TEFC
Materials:	
Material, pump housing:	Cast iron EN-JL1030 DIN W.-Nr. 25 B ASTM
Material, impeller:	Stainless steel 1.4301 DIN W.-Nr. 304 AISI
Material code:	A
Code for rubber:	E
Installation:	
Maximum ambient temperature:	104 °F
Max pressure at stated temp:	363 / 250 psi/°F 363 / -4 psi/°F
Standard, pipe connection:	ANSI
Connect code:	FGJ
Size, pipe connection:	1 1/4"
Pressure stage, pipe connec.:	Class 300
Flange size for motor:	182TC
Liquid:	
Liquid temperature range:	-4 .. 248 °F
Electrical data:	
Motor type:	3634L
Number of poles:	2
P2:	3 HP
Power (P2) required by pump.	3 HP 3 HP
Mains frequency:	60 Hz
Rated voltage:	1 x 115 / 208-230 V
Service factor.	1,15
Rated current:	29 / 16-14,5 A
Rated speed:	3450 rpm
Insulation class (IEC 85):	F
Motor protection:	NONE
Motor Number:	84Z04014
Others:	
Net weight:	96 4 lb
Gross weight:	104 lb
Shipping volume:	2.83 ft³



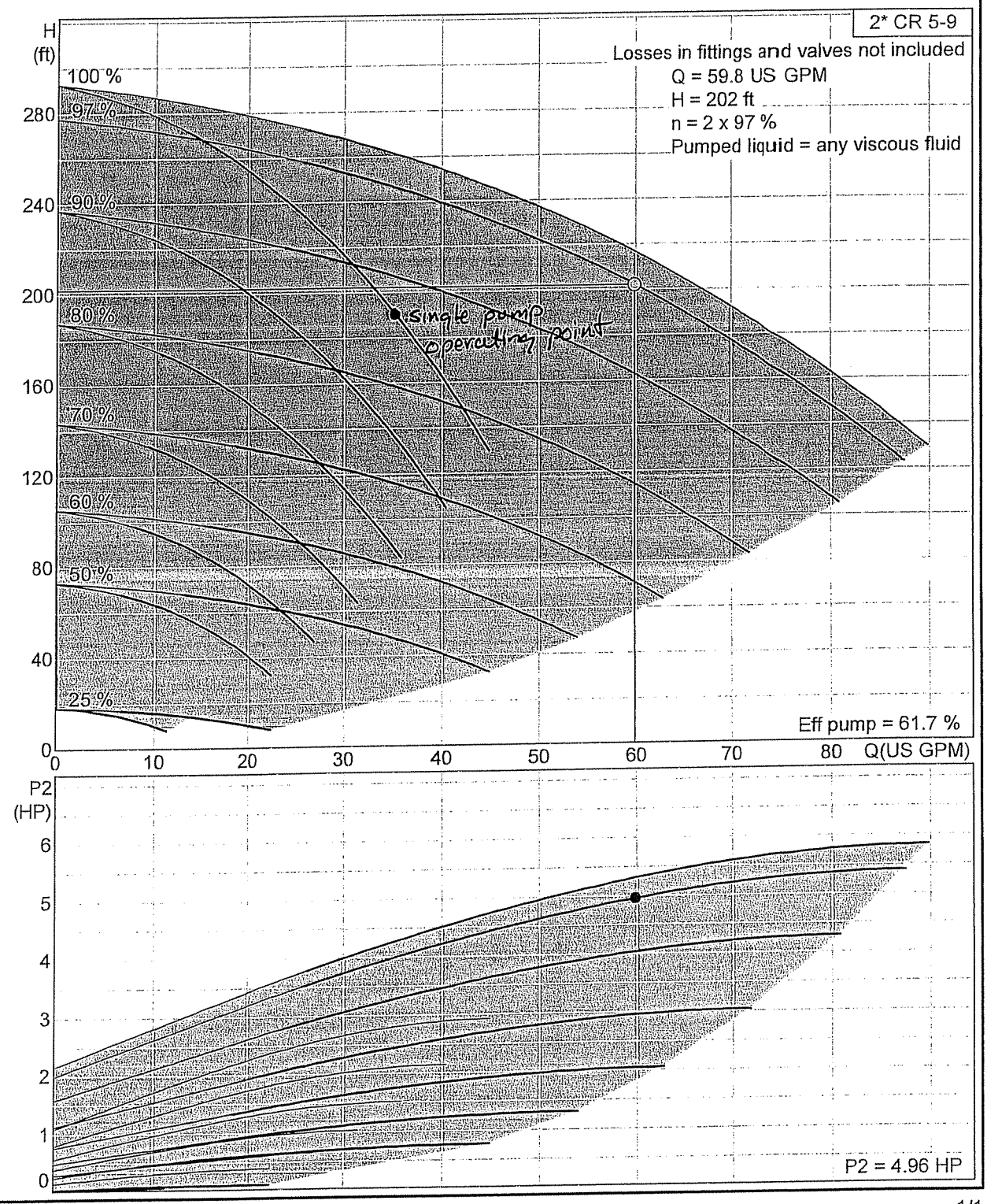
GRUNDFOS®

Company name: Water & Waste Equipment, Inc.
Created by: Carey Davis
Phone: (615) 907-4000
Fax: (615) 907-8900
Date: 3/4/2009

Project: Chestnut Grove
Reference number: 2 pumps parallel operation
Position:

Client:
Client number:
Contact:

96084264 CR 5-9



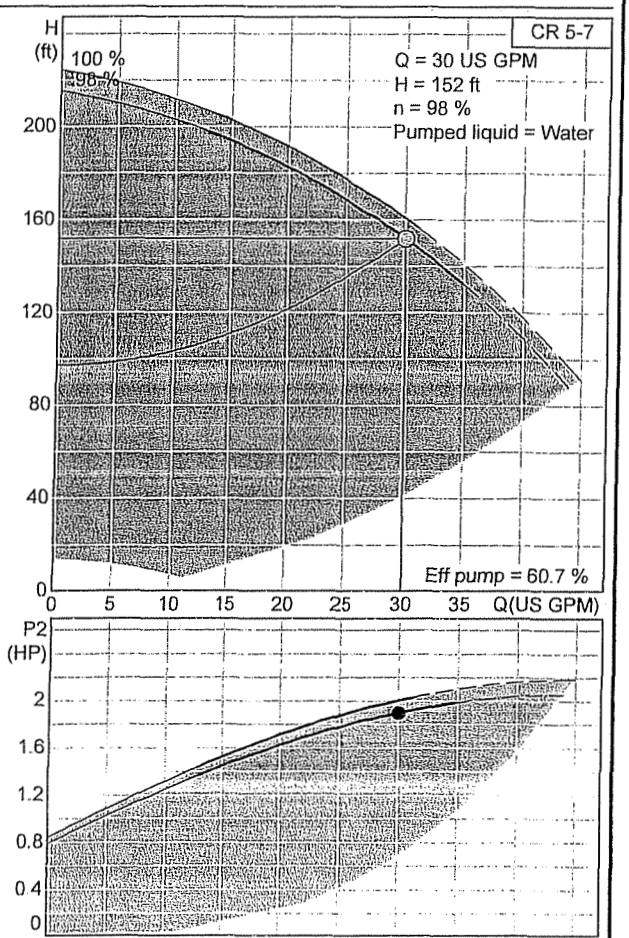
GRUNDFOS

Company name: Water & Waste Equipment, Inc.
Created by: Carey Davis
Phone: (615) 907-4000
Fax: (615) 907-8900
Date: 3/4/2009

Project: Green River Valley Water
Reference number: 090304cd-2
Position:

Client: Water Management
Client number:
Contact: Steven Jones

Description	Value
Product name:	CR 5-7 A-FGJ-A-E HQQE
Product Number.	96084260
EAN number:	5700395190984
Technical.	
Speed for pump data:	3499 rpm
Rated flow:	30.38 US GPM
Rated head:	158 ft
Impellers:	7
Type of shaft seal.	HQQE
Approvals on nameplate:	NEMA
Stages:	7
Pump version:	A
Model:	A
Cooling:	TEFC
Materials:	
Material, pump housing.	Cast iron EN-JL1030 DIN W.-Nr. 25 B ASTM
Material, impeller:	Stainless steel 1.4301 DIN W.-Nr. 304 AISI
Material code:	A
Code for rubber.	E
Installation.	
Maximum ambient temperature.	104 °F
Max pressure at stated temp:	363 / 250 psi/°F 363 / -4 psi/°F
Standard, pipe connection.	ANSI
Connect code.	FGJ
Size, pipe connection.	1 1/4"
Pressure stage, pipe connec :	Class 300
Flange size for motor.	56C
Liquid:	
Liquid temperature range.	-4 .. 248 °F
Electrical data:	
Motor type:	3535L
Number of poles.	2
P2:	2 HP
Power (P2) required by pump:	2 HP 2 HP
Mains frequency.	60 Hz
Rated voltage.	1 x 115 / 230 V
Service factor.	1,15
Rated current.	23 / 11.5 A
Rated speed:	3450 rpm
Insulation class (IEC 85):	F
Motor protection:	NONE
Motor Number:	84Z04010
Others.	
Net weight.	77.6 lb
Gross weight.	85.3 lb
Shipping volume:	2.83 ft³

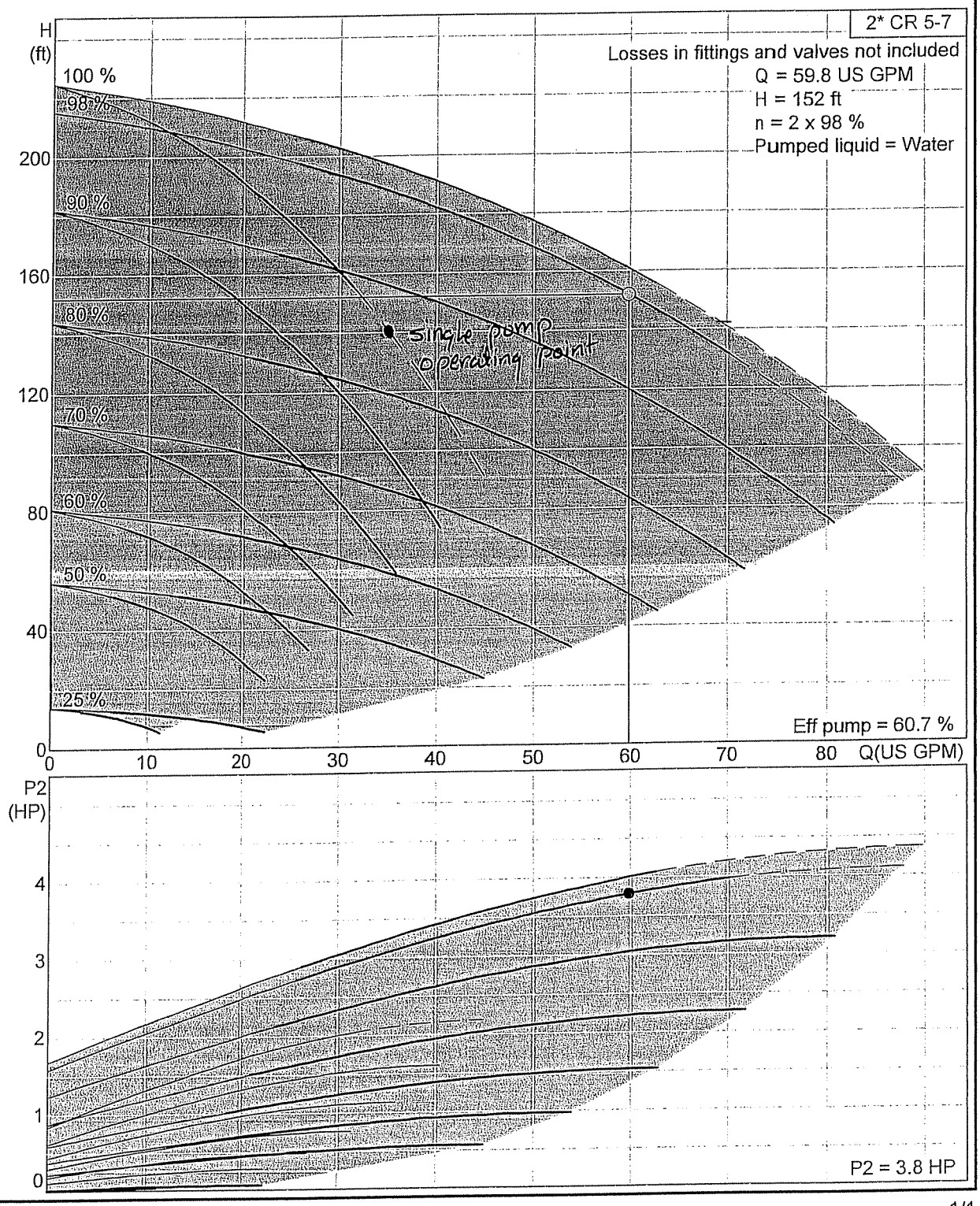


GRUNDFOS

Company name:	Water & Waste Equipment, Inc.
Created by:	Carey Davis
Phone:	(615) 907-4000
Fax:	(615) 907-8900
Date:	3/4/2009

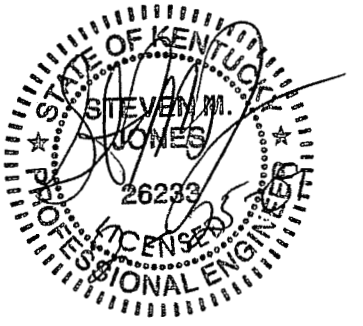
Project:	Buckner Parallel VFD	**Client:**	Water Management
Reference number:		**Client number:**	
Position:		**Contact:**	

96084260 CR 5-7



PRELIMINARY ENGINEERING REPORT
FOR
GREEN RIVER VALLEY WATER DISTRICT

ADDITIONS AND MODIFICATIONS
TO
WATER TRANSMISSION AND STORAGE FACILITIES



FEBRUARY 2009

Prepared By:
WATER MANAGEMENT SERVICES
SUITE 401
2 INTERNATIONAL PLAZA
NASHVILLE, TENNESSEE 37217

Telephone: 615/ 366-6088

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I INTRODUCTION

A. Background Information

In 1959, provisions of Chapter 74 of the Kentucky Revised Statutes allowed officials to organize the Green River Valley Water District (GRVWD). As originally organized, the service area of the GRVWD included portions of Hart County. In 1960, the County Court of Barren County granted GRVWD permission to annex areas of Barren County. Areas of Green County, Larue County, and Metcalfe County were later included in GRVWD's service area. Enclosed in the appendix of this Report is **Map No. 1**, which indicates the present service area or boundaries of the GRVWD.

KRS 74.120 (2) allows GRVWD to contract water services to other water districts and municipalities. Under this provision of law, GRVWD provides water services to the municipalities of Munfordville and Bonnieville. While these entities purchase wholesale water from the GRVWD, they operate their own water systems.

The municipalities of Cave City and Horse Cave also purchase wholesale water from GRVWD. Until recently, these municipalities also contracted with GRVWD to operate their water systems. After the recent purchase by Caveland Environmental Authority, Inc. (CEA) of the Cave City Water System, CEA operates the Cave City water system, but CEA continues, as contracted, to purchase wholesale water from GRVWD.

Other smaller municipal entities within the service area of GRVWD do not own or operate a water system and, therefore, are within the service area of the GRVWD. These other smaller municipal entities and remaining rural areas of GRVWD's service area depend on GRVWD for water service. In addition to serving the water needs within GRVWD's boundaries, GRVWD also sells water to Larue County Water District, Green - Taylor Water District and Caveland Environmental Authority, Inc.

GRVWD operates under regulations of the Kentucky Public Service Commission (PSC). Management responsibilities rests with the Board of GRVWD, which consists of five (5) commissioners; three (3) from Hart County appointed by the Hart County Judge Executive and two (2) from Barren County appointed by the Barren County Judge Executive.

The catalyst for the formation of the GRVWD was recurring water shortages and poor water quality from wells used for both public and private water sources. For the most part, the geology within the GRVWD service area is Karst having numerous sinkholes. Ground water usually consists of underground streams, which use caverns and fissures for flow paths for subsurface water. The source of this ground water is primarily surface water entering underground caverns through opening in sinkholes; thus subjecting these ground water sources to pollutant from various sources. Because of this geology setting, ground water supplies from wells in the GRVWD service area are generally unreliable sources of drinking water.

Because of this topography situation, the primary source of water for the GRVWD water system is the Green River and the Rio Verde Spring. To allow the utilization of these water sources, GRVWD constructed a water treatment facility adjacent to the Green River near the Rio Verde Spring. To distribute this treated water to the GRVWD water system required the construction of a system of water transmission mains and storage facilities. Since the inception of the GRVWD, numerous upgrades and expansions of the treatment facilities and water transmission system have occurred.

Recently, GRVWD completed an expansion of the water treatment facilities. Application for funding for that expansion required an engineering report to examine the short and long-term needs for water treatment facilities including associated transmission and storage facilities. In addition to the expansion of the water treatment facilities, findings of that report determined that an additional upgrade to the water transmission facilities would be required; the timing would be dependent on the growth in water demands.

In addition to these upgrades of existing facilities, there is existing population within the GRVWD's service area that does not have availability to potable water. Because of the previously described Karst topography, such extensions are necessary to provide safe water for public use while maintaining economic stability of GRVWD's service area.

Utilizing federal and state grants whenever available as well as GRVWD funds, either cash reserves or borrowed funds, GRVWD has an active and ongoing construction program to extend water mains to areas without potable water. The Board of GRVWD considers such extensions of potable water as an essential responsibility of GRVWD, limited only by the financial feasibility of such endeavors.

B. Purpose of the Report

A review of the water demands in the Horse Cave and Cave City areas finds that recent increases in peak flows have exceeded the nominal capacity of existing water transmission mains that supply water to the Horse Cave and Cave City area. These increases in water demands results from growth in population combined with growth in industrial and commercial water consumptions.

As described later in this Report, there is a need to implement upgrades of transmission mains and water storage facilities. As discussed later in this Report, the estimate of probable project cost for an upgrade in water transmission mains and the construction of new water storage facilities is about $5.4 million.

In consideration of the above, the purpose of this Report is to detail the size, capacity, and configuration of water facilities recommended and to summarize the estimate of projects costs for implementing the construction of these facilities. Upon approval of the findings and recommendations of this Report, this Report will accompany documents for justification of needed water rate adjustments. This Report will also accompany the submittal of construction plans and specifications for approval from the Kentucky Division of Water.

II. EVALUATION OF EXISTING WATER DEMANDS

A. General

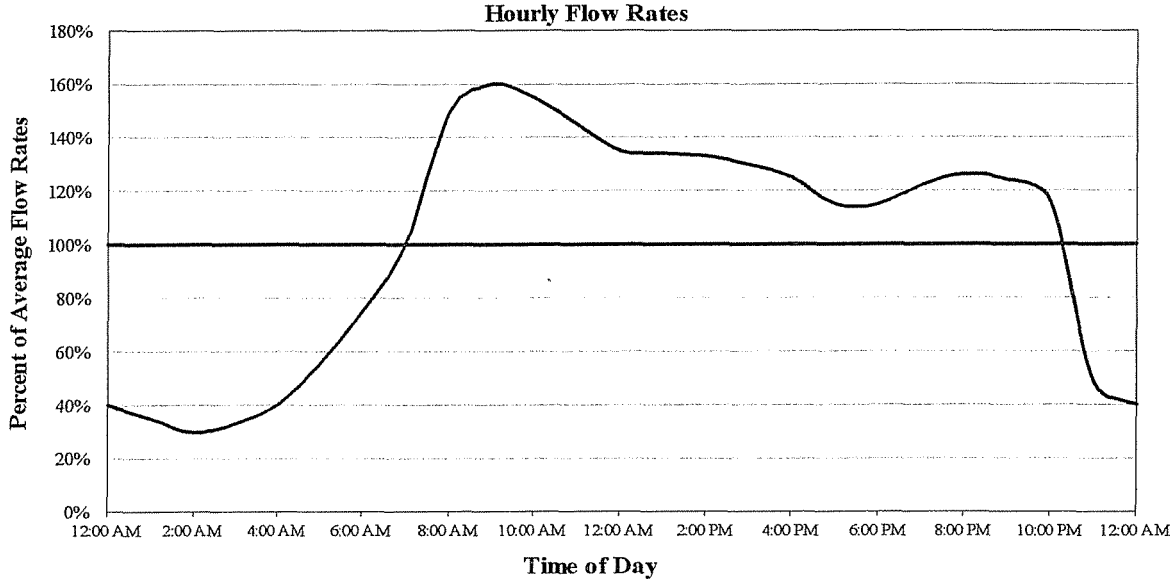
To meet current water demands in the Horse Cave and Cave City areas results in excessive pump pressures, which limit the outputs of the finished water pumps that are located at the water treatment plant. This limitation in pump output results in difficulties in maintaining adequate water levels in the Horse Cave water storage tank. This condition becomes more critical with the growth in water demands in the Horse Cave area.

All public water systems, including water treatment facilities, finished water pumps, transmission mains, and distribution systems, must have the capacity to meet peak water demands. If the system does not have the capacity to meet peak demands, inadequate water pressures will occur and rationing of water will be necessary.

A review of GRVWD's water consumption records for a recent 15-month period found the average month flow entering Horse Cave was 24,020,000 gallons per month with a peak-month water demand of 32,215,000 gallons. On an average basis, this equates to an average rate of 548 gallons per minute (gpm) for the average month and average rate of 735 gpm for the peak month. These rates are monthly averages and do not reflect peak flow rates that occur on peak days and during peak hours.

Relative to peak hourly rates, **Figure II-1** below is a graph showing fluctuations in water demands typical for a municipal water system. The significance of this graph is that peak

Figure II-1
Typical Municpal Water System
Hourly Flow Rates



hourly rates of about 1.6 times the daily average 24-hour flow rate will occur on a daily basis. While storage tanks will supply water to meet some of this hourly demand, the high service pumps and transmission mains must have the capability to supply much of the peak hourly water demands.

In addition to fluctuations in peak hourly water demands, there are also fluctuations in daily and monthly water demands. As stated above, the recent review of GRVWD's billing records found that for the period under review the average-month water demand was 548 gpm versus the maximum-month average water demand of 735 gpm. This represents a fluctuation of about 134 percent.

Table II-1 below lists published data for fluctuation between average and maximum days within average and maximum months. Using the typical figures listed below, an estimate of the average day for the maximum month is 822 gpm. An estimate of the maximum day for the maximum month is 986 gpm. Therefore, under current water demand conditions, the capacity of high service pumps and transmission main needs to be at least 986 gpm.

Table II-1
Typical Fluctuations in Water Use [1]

	Percentage of Average Demand	
Design Conditions	**Range**	**Typical**
Average Day - Maximum Month	120 - 170	150
Maximum Day - Maximum Month	160 - 220	180

Under current water demands, a summary of current peak flow conditions are as follows:

- Average Day – Average Month – 548 gpm
- Maximum Day – Average Month – 658 gpm
- Average Day – Maximum Month – 822 gpm
- Maximum Day – Maximum Month – 986 gpm

These water demands represent current demands and do not consider added future water demands. Further, these water demands also do not address hourly demands. With adequate water storage facilities, peak hourly demands would add about 20 percent to the above water demands.

Conservatively, existing water demands in the Horse Cave / Cave City area require a pumping and transmission system with a capacity of about 1,200 gpm.

[1] Metcalf & Eddy, Inc., Water and Wastewater Engineering, Third Edition, McGraw-Hill, Inc., New York, 1991.

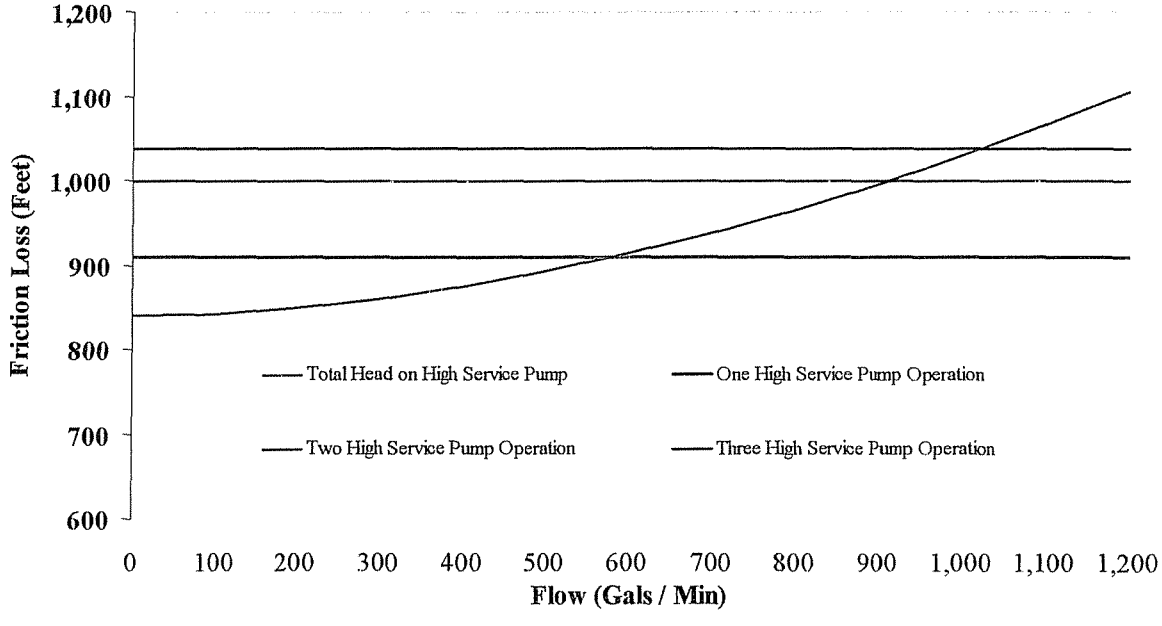
III. Evaluation of the Water Transmission System

A. Evaluation of the Existing 12-inch Water Transmission Main

Figure III-1 below summarizes a series of computer analyses conducted to evaluate the capacity of the existing 12-inch transmission main supplying water to Horse Cave / Cave City area. As indicated on following **Map 2**, the existing 12-inch transmission main under evaluation begins at the intersection of Jack McGuire Road and State Route 88 and ends inside Horse Cave. **Map 3** contained in the appendix of this Report also shows this transmission main as well as other water mains with the GRVWD service area.

In **Figure III-1**, the blue line represents the hydraulic elevation at the high service pumps needed to deliver various flows through the existing 12-inch transmission main. These analyses find that under average conditions about 84 percent of the water entering Horse Cave / Cave City enters through this existing 12-inch water transmission main. Under average conditions, about 16 percent enters through an existing 8-inch water main routed along Highway 335.

Figure III-1
Analysis of Transmission System to Horse Cave
Existing 12-inch Water Transmission Main



In **Figure III-1** above, the point that the horizontal green line crosses the blue line represents the output of one high service pump. Under this analysis, operation of one high service pump will deliver about 580 gpm through the existing 12-inch water transmission

main and about 110 gpm through the existing 8-inch water main. The rate of water entering Horse Cave with one pump operation is about 690 gpm. This 690-gpm rate represents approximately the daily water demands for the Horse Cave / Cave City area.

Therefore, a finding of these analyses is that a one-pump operation, on a continuous basis, is not sufficient to meet various daily fluctuations in water demands. There are occasions when one pump will meet daily water demands, but water demands require a two-pump operation to meet daily peaks and daily water demands that are above average. This conclusion agrees with actual pumping records experienced at the water treatment plant.

In **Figure III-1**, the point that the red line crosses the blue line represents the output of two high service pumps. Operation of two high service pumps will deliver about 900 gpm through the existing 12-inch water transmission main and about 140 gpm through the existing 8-inch water main. The total entering Horse Cave with a two-pump operation is about 1,040 gpm. This 1,040-gpm rate is less than the suggested 1,200-gpm rate needed to meet existing peak demands. Therefore, while a two-pump operation will meet most existing water demands, the capacity of a two-pump operation is insufficient using prudent design standards.

Finally, the point the black horizontal line crosses the blue line represents the output of operating three identical pumps. Operation of three high service pumps will deliver about 1,020 gpm through the existing 12-inch water transmission main and about 150 gpm through the existing 8-inch water main. The total entering Horse Cave with one pump operation is about 1,170 gpm. This 1,040-gpm rate is slightly less than the suggested 1,200-gpm rate needed to meet existing peak demands.

Therefore, while a three-pump operation will meet existing water demands, the capacity of a three-pump operation will be insufficient when expected future water demands are included. A conclusion of these analyses is that the water transmission mains between the water treatment plant and the Horse Cave / Cave City area are not adequate to meet existing and future water demands and additional pump capacity cannot overcome limitation of the existing transmission mains.

Therefore, based on this conclusion, this Report recommends upgrades and additions to the water transmission and storage facilities.

B. Evaluation of a Parallel 12-inch Transmission Main

As indicated above, the average flow rate of water entering the Horse Cave / Cave City area is about 548 gpm. On the average, Horse Cave and Cave City consume about 78 percent of that amount. The remaining 22 percent, which includes water going to the Mammoth Cave National Park, goes to GRVWD water customers. Therefore, Horse Cave and Cave City currently use a majority (78 percent) of the capacity of the existing water transmission system.

In early 2007, Marzetti began operation of a "salad dressing" manufacturing facility located in the Horse Cave Industrial Park. That event, coupled with recent and proposed expansions of manufacturing facilities of Dart Container Corporation and the construction of the Sister Schubert's Bakery, has resulted in substantial increases in water demands by "water using" industries, which are located inside Horse Cave.

Marzetti initially projected a water demand of 60,000 gallons per day. However, the actual water demand for the Marzetti facility is more than twice that amount. In additions, Marzetti plans for the additions of more manufacturing lines, which will further increases in their water demands. Estimates are the average water demand could increase to about 180,000 gallons per day with peak days of 270,000 gallons or more.

Dart Container Corporation has expansions underway that also will substantially increase their water demand. Currently, Dart's water demand totals about 140,000 gallons per day with peak months of about 180,000 gallons per day. Upon completion of proposed expansions, projections of water demands from Dart facilities are more than double current usages.

Sister Schubert's Bakery began operation in August of 2007. Therefore, the review of GRVWD billing records and estimates of water demands for the Horse Cave did not fully account for this facility. A review of available records suggests that water demands for the Sister Schubert facility will be in the range of 20,000 to 30,000 gallons per day.

In summary, the combined water demands of Marzetti, Dart Container, and Sister Schubert's Bakery total nearly 700,000 gallons per day. This water demand represents an

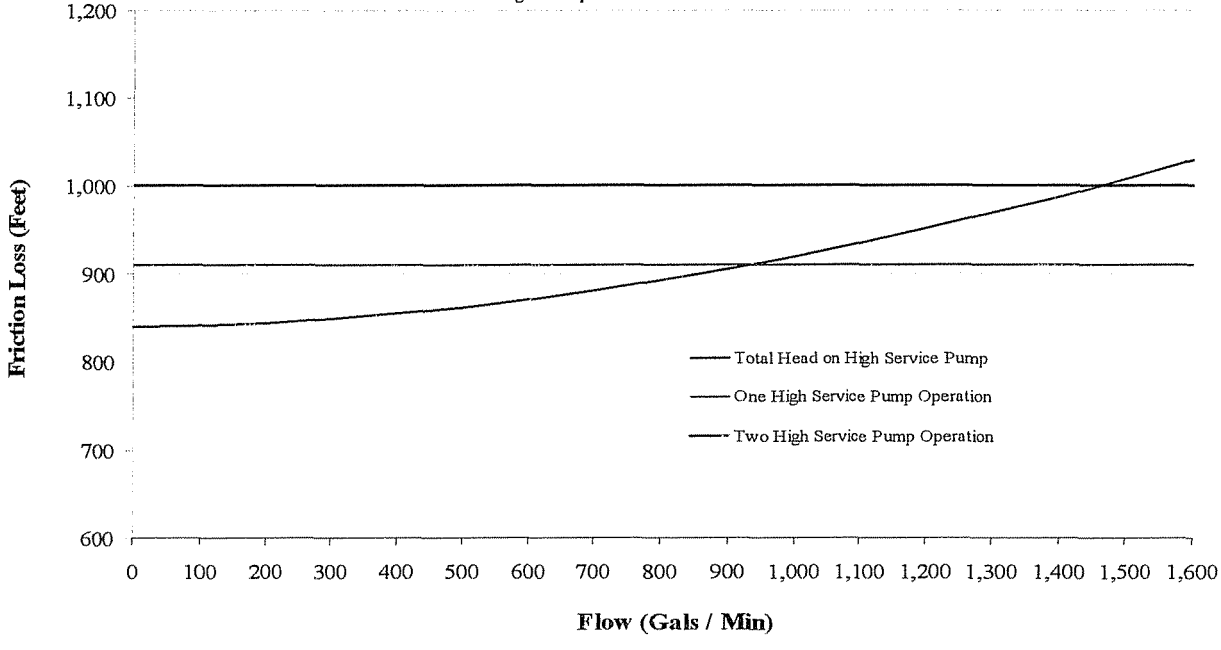
increase of about 450,000 gallons per day, which equates to an increase in average demand rate of about 315 gallons per minute (gpm). Peak demands could be in the range of 500 gpm.

Therefore, the recommended capacity needed by water transmission facilities to accommodate near-term projections of flows is a minimum of 1,600 gpm.

Figure III-2 below summarizes a series of computer analyses conducted to evaluate the capacity of the installation of a 12-inch water transmission main parallel to existing 12-inch transmission main supplying water to Horse Cave. **Map 2** indicates the route configuration of that parallel water transmission main.

Similar as before, the blue line represents the pressures needed to deliver various flow amounts through the existing and proposed parallel 12-inch transmission mains. These analyses find that under average conditions about 90 percent of the water entering Horse Cave / Cave City enters through this existing 12-inch water transmission main. The remaining 10 percent enters through the existing 8-inch water main along Highway 335.

Figure III-2
Analysis of Transmission System to Horse Cave
Existing & Proposed 12-inch Water Mains



In **Figure III-2**, the point that the horizontal green line crosses the blue line represents the output of one high service pump. Under this analysis, operation of one high service pump will deliver about 940 gpm through the parallel existing and proposed 12-inch water transmission mains and about 100 gpm through the existing 8-inch water main. The total entering Horse Cave with one pump operation is about 1,040 gpm.

The point that the black line crosses the blue line represents the output of two high service pumps. Operation of two high service pumps will deliver about 1,480 gpm through the existing 12-inch water transmission main and about 140 gpm through the existing 8-inch water main. The total entering Horse Cave with two- pump operation is about 1,620 gpm. This 1,620-gpm rate is about equal to the suggested 1,600-gpm rate needed to meet existing and proposed peak demands.

Including capacity of the existing 8-inch along Highway 335, a three-pump operation will exceed 1,700 gpm through the proposed and existing 12-inch transmission mains. While this increase in capacity may meet the needs of Horse Cave and Cave City, the resultant capacity is somewhat limiting considering GRVWD has additional needs in other areas of the remainder of the GRVWD service area.

C. Allocation of Project Costs

Summarizing the above, the construction of a parallel 12-inch water transmission main will serve primarily the needs of Horse Cave and Cave City (Caveland Environmental Authority). Relative to the contractual requirements of such an endeavor, the agreement between GRVWD and the municipalities of Horse Cave and Cave City dated June 15, 1961 contains the following provisions.

"(b) The district agrees that after completion of such facilities (initial facilities), any extension of water lines, installation of meters and service settings, etc., which are made in order to furnish water service to more remote customers of the District itself, will not be relevant to the interests of the cities and shall not have any bearing upon the adequacy of rates charged by the District to the customers of the respective cities under alternative (b) of paragraph X or to the cities under the wholesale alternative (c) of paragraph X. Such extension of District facilities for District customers shall be paid for by the District out of its own Depreciation Fund, for which reasonable allowance is made in the schedule of rate initially agreed upon; and if the District shall require funds for such purposes in excess of that which is available in its own Depreciation Fund, it may issue additional Revenue Bonds in order to provide the same, ..."

"(c) In corresponding fashion, Horse Cave and Cave City agree with the District that if expansion of the District's commonly used installations and facilities for obtaining the water supply, treatment the same, conducting the same to the Horse Cave-Cave City area, and providing adequate storage, shall be necessary by increasing demands of customers of both cities, then the costs thereof should not equitably be charged to the District's own customers. To the extent that the District may find it necessary to provide additional capital funds for such reason, any required rate adjustments shall be made in the rates for services to the cities and cities' customers, and not in rates charged to customers of the District itself.

(d) In the event a city shall demand such expansion of commonly used facilities for reasons identifiably its own (e.g., for a new industrial customer using large quantities of water, for example) such city shall have the privilege of electing to either (a) provide the necessary capital funds by issuing its own revenue bonds, or (b) agreeing to a higher level of rates charged by the District to that city or its customers."

In consideration of the above provisions, **Table III-1** below presents an estimate of probable project costs of installing a parallel 12-inch water transmission main and water storage tank. As shown on **Map 2** and as described below, the divisions of the overall project included five segments.

- Segment 1 – From the intersection of Highway 88 and McGuire Road parallel to the route of the existing 12-inch water main to the Intersection of Highway 31-W with Shortcut Road;
- Segment 2 – Along Shortcut Road to intersection of Highway 218;
- Segment 3 – From the intersection of Shortcut Road and Highway 218 routed along Highway 1846 to the site of the proposed water storage tank;
- Segment 4 – Connection of the proposed water storage tank to the existing 16-inch water main inside Horse Cave that serves the industrial park; and
- Segment 5 – Proposed water storage tank.

Table III-1
Proposed Parallel 12-Inch Water Transmission Main
Estimate of Probable Project Costs

Project Description	Length (ft)	Cost/ft	Estimated Cost
Segment 1 - 12-inch Water Main	39,500	$45.00	$1,777,500
Segment 2 - 12-inch Water Main	8,800	$49.00	$431,200
Segment 3 - 12-inch Water Main	7,400	$49.00	$362,600
Segment 4 - 12-inch Water Main	8,000	$45.00	$360,000
Segment 5 - 12-inch Water Main	1,000	$45.00	$45,000
Subtotal			$2,976,300
Other Project Costs @ 20 Percent			$595,260
Total Project Cost of Transmission System			$3,571,560
Segment 6 - Water Storage Tank	N/A	N/A	$822,000
Other Project Costs @ 20 Percent			$164,400
Total Project Cost of Storage Tank			$986,400
Total Estimate of Probable Project Costs			$4,557,960

As stated above, the estimated project costs for the parallel 12-inch water transmission main and water storage tank is about $4.6 million. Recently, the Kentucky Infrastructure Authority (KIA) notified GRVWD of an award of a $500,000 grant to assist in the funding of a water storage tank in the Horse Cave / Cave City Area.

Previously, the examination of water demands that occurred during the previously described 15-month period found that about 78 percent of the demand was applicable to Horse Cave and Cave City and remaining 22 percent was applicable to GRVWD.

Table III-2 presents allocation ratios resulting from preliminary discussions between entities. Allowing for future demands applicable mainly to Horse Cave and Cave City, this Report finds it appropriate GRVWD fund entirely the proposed water storage tank. This Report further finds that future water demands by Horse Cave and Cave City would reduce GRVWD's ratio from the previously indicated 22 percent and that the following 16 percent ratio for GRVWD is appropriate.

As indicated below, Horse Cave and CEA combined portions would be $3.0 million and GRVWD portion would about $1.6 million with $0.5 million being from a KIA grant.

Table III-2
Alignment Paralleling Existing 12-inch Water Transmission Main
Preliminary Allocation of Costs Between Entities

Horse Cave Portion	CEA Portion	GRVWD Portion	KIA Grant	Total
Water Transmission Mains				
$2,000,000	$1,000,000	$571,560		$3,571,560
56.0%	28.0%	16.0%		100.0%
Water Storage Tank		$486,400	$500,000	$986,400
$2,000,000	$1,000,000	$1,057,960	$500,000	$4,557,960

The installation of the parallel 12-inch transmission main does not provide GRVWD with additional capacity needed to serve anticipated growth in GRVWD water customers. In previous engineering reports, a water transmission main routed along Highway 31-E was recommended. Such an alignment would better serve GRVWD water in the southern and eastern portion of the service area.

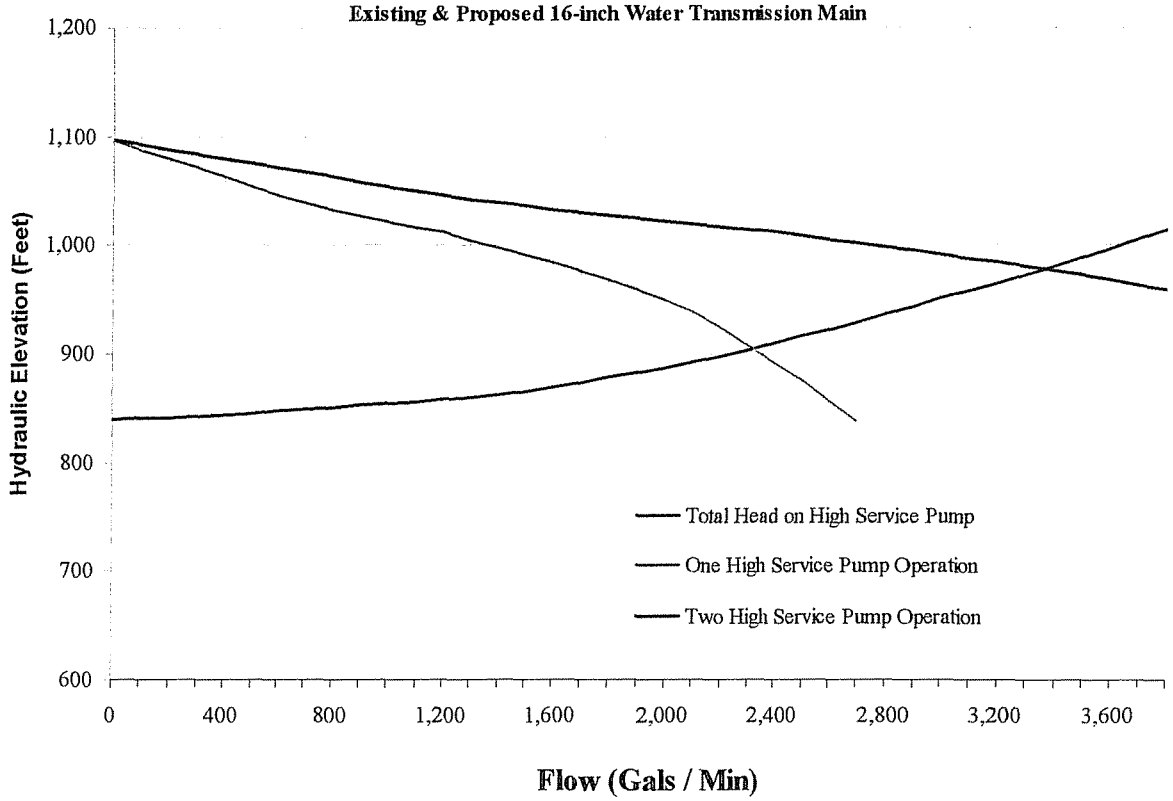
Recognizing this situation, the purpose of the cost estimate for the parallel 12-inch water transmission main was to establish the cost participation by Horse Cave / Cave City. As indicated above, this participation costs is $3.0 million dollars.

D. Evaluation of Proposed Highway 31-E Water Transmission Main

Included in appendix of the Report, **Map 3** indicates the routing of the proposed 16-inch water transmission main that would be routed generally along Highway 31-E and Highway 685. As indicated, this routing will result in connections to; 1) a proposed 1.0 million-gallon water storage tank; 2) the existing 16-inch water main located inside the Horse Cave Industrial Park; and 3) an existing 8-inch water main located along Lafferty Road.

Figure III-3 below summarizes the results a series of computer analyses conducted to evaluate the capacity of the installation of the proposed 16-inch water transmission main as described above and as shown on **Map 3** contained in the appendix of this Report.

Figure III-3
Analysis of Transmission System to Horse Cave
Existing & Proposed 16-inch Water Transmission Main



This above graphic presentation shows the relationship between pump curves for the existing high service pumps and the system head curve for the proposed 16-inch water transmission main combined with the existing 12-inch water transmission main.

The blue line represents the system head curve for the combined proposed and existing transmission mains. Under a no-flow condition, the starting hydraulic elevation for the system head curve is the elevation established by the proposed water storage tank, or about elevation 840. With increasing flows in the transmission mains, the high service pumps at the water treatment plant must increase the hydraulic elevation to overcome friction losses in the transmission mains. A plot of the calculated hydraulic elevations versus flows generates the system head curve as shown above.

The second component of this graphic presentation is a plot of the pump curves for the existing high service pumps. The point that the system head curve (blue line) crosses the pump curve line (red and green) represents the calculated output of the high service pumps. The red line is for a single or one pump operation. The green line is for a two-pump operation.

As indicated, one existing pump will discharge about 2,320 gpm or about 3.3 million gallons per day (MGD). Of this 2,320-gpm rate, approximately 1,472 gpm will flow through the proposed 16-inch water transmission main resulting in velocity of 2.35 feet per second. Operation of the second pump will result in a *"flushing"* velocity in excess of 2.5 feet per second.

A two-pump operation will discharge nearly 3,400 gpm or about 4.9 MGD. A one-pump operation will meet current peak water demands in the Horse Cave / Cave City area while providing an adequate reserve for growth within the GRVWD service area.

A two-pump operation will provide 1.6 MGD of additional reserve that should meet, for many years, any future reasonably expected water demands.

In addition to the capacity afforded by the existing pumps, the flatness of the system head curve will enable a further increase in capacity by going to a three-pump operation using existing pumps or by going to different high service pumps with greater pumping capacity.

The characteristic of pump curve for the existing high service pump is such that pump head conditions sharply declines after about 2,300 gpm. In the future, when there is more water demand, a change out of the high service pump will enable the continuous of a one-pump operation, if desired.

In **Table III-3** contains the estimate of probable project cost for the construction of the proposed 16-inch water transmission main and 1.0 million gallon water storage tank.

Table III-3
16-inch Transmission System
Alignment Along Highway 31-E & Highway 685
Estimate of Probable Project Costs

Project Description	Length (ft)	Cost/ft	Estimated Cost
Segment 1 - 16-inch Water Main	36,500	$52.00	$1,898,000
Segment 2 - 16-inch Water Main	25,000	$52.00	$1,300,000
Segment 3 - 16-inch Water Main	3,000	$52.00	$156,000
Segment 4 - 16-inch Water Main	5,000	$52.00	$260,000
Segment 4 - 12-inch Water Main	1,000	$45.00	$45,000
Subtotal			$3,659,000
Other Project Costs @ 20 Percent			$731,800
Total Project Cost of Transmission System			$4,390,800
Segment 6 - Water Storage Tank	N/A	N/A	$822,000
Other Project Costs @ 20 Percent			$164,400
Total Project Cost of Storage Tank			$986,400
Total Estimate of Probable Project Costs			$5,377,200

Maintaining the contribution amounts by Horse Cave and CEA at a combined $3,000,000, the allocation percentages become as tabulated below. GRVWD participation increases from $1,057,960 to $1,877,200.

Table III-4
16-inch Transmission System
Alignment Along Highway 31-E & Highway 685
Preliminary Allocation of Costs Between Entities

Horse Cave Portion	CEA Portion	GRVWD Portion	KIA Grant	Total
Water Transmission Mains				
$2,000,000	$1,000,000	$1,390,800		$4,390,800
45.5%	22.8%	31.7%		100.0%
Water Storage Tank		$486,400	$500,000	$986,400
$2,000,000	$1,000,000	$1,877,200	$500,000	$5,377,200

The above are estimates of costs prepared without the benefit of detailed construction drawings. In consideration therefore, prudent agreements with Horse Cave and CEA would allocate the final project costs based on the percentage listed above for each entity. Therefore, if the project costs were less than estimated, then all parties would share in the savings and, in turn, if the project costs were more, the parties should share in funding of the increased cost.

IV. FEDERAL SPECIAL APPROPRIATION PROJECT GRANT

A. Water Main Extensions

GRVWD recently receive notification of a federal Special Appropriation Project Grant (SPAP) of $1,000,000 (final $956,000) for drinking water projects. Qualification for this grant requires, at a minimum, a 45 percent match of the eligible project cost. Therefore, for the $956,000 SPAP grant, the project cost must be at least $1,738,182; thus, a minimum of $782,182 must be from local funds.

The earmark designation for the grant was entitled "The Green River Valley Water District in Hart County for Drinking Water Project". Under this designation, GRVWD can apply these funds for any water project(s). In consideration of the GRVWD's Board desire to extend water to population without public water, the first priority is to use these funds for water main extensions within the service area of GRVWD.

Table IV-1 below contains a listing of proposed water main extensions, length of water mains and estimates of project costs. Signed petitions by property owners requesting water service extensions were the basis of this list.

Table IV-1
Proposed Water Main Extension SPAP Grant
Estimate of Probable Construction Costs

Location	Water Main Size (inch)	Length (Ft)	Cost / Ft.	Lump Sum Item(s)	Total
Green County					
Willie Rice Road	3	5,700	$9.00	N/A	$ 51,300
Dewey Kidd Road	3	4,500	$9.00	N/A	$ 40,500
Larue County					
Polley Road	3	5,000	$9.00	N/A	$ 45,000
	4	6,000	$10.50	N/A	$ 63,000
Wheeler Road	3	2,400	$9.00	N/A	$ 21,600
Hart County					
Polley Road	3	3,500	$9.00	N/A	$ 31,500
Well Road	3	2,800	$9.00	N/A	$ 25,200
Francis Gardner Road	3	3,300	$9.00	N/A	$ 29,700
Marshall Highbaugh Road	3	2,500	$9.00	N/A	$ 22,500
Priceville Road	3	6,300	$9.00	N/A	$ 56,700
Chestnut Grove Road - South	3	4,300	$9.00	N/A	$ 38,700
	Pump Station			$50,000	$ 50,000
Chestnut Grove Road - North	3	3,400	$9.00	N/A	$ 30,600
Buckner Hill Road - North	3	8,500	$9.00	N/A	$ 76,500
	Pump Station			$50,000	$ 50,000
Williams Road - East	3	1,600	$9.00	N/A	$ 14,400
Williams Road - West	3	7,200	$9.00	N/A	$ 64,800
W. Walters - Cris Stasel Rd	3	3,800	$9.00	N/A	$ 34,200
Hopewell Church Road	3	4,000	$9.00	N/A	$ 36,000
	Total	74,800			$ 782,200

As indicated above, the estimate of probable construction costs for these water main extensions is $782,200. These water main extensions will serve about 70 to 80 residences. Without this grant assistance, there is no financial incentive to extend water services to these residences.

B. Clearwell Additions

In addition to these water mains, GRVWD has a need to replace two (2) existing steel clearwells located at the water treatment plants. These clearwells, which total 200,000 gallons of water storage, were part of the original water treatment facilities. Because of structural deficiencies, these existing clearwells are not suitable for rehabilitation. After some forty odd years of service, these clearwells have outlived their service life.

The project scope for the SPAP grant identified the construction of new concrete clearwell as part of the overall project to quantify for the 55 percent SPAP grant. **Table IV-2** below contains an estimate of probable construction cost for a 500,000-gallon concrete clearwell.

Since the existing clearwells housed backwash and high service pumps, the proposed clearwell will include a pump chamber. This pump chamber will contain replacements for the pumps housed on top of the existing clearwell. The pump chamber will also contain space for the installation of future high service pumps.

Table IV-2
Estimate of Probable Construction Cost
500,000 Gallon Clearwell Addition

Description	Total
Excavation - Clearwell	$100,000
Clearwell Concrete Structure	$900,000
High Service Pumps	$50,000
Piping	$350,000
Electrical	$150,000
Backfill	$50,000
Total	$1,600,000

V. SUMMARY AND RECOMMENDATIONS

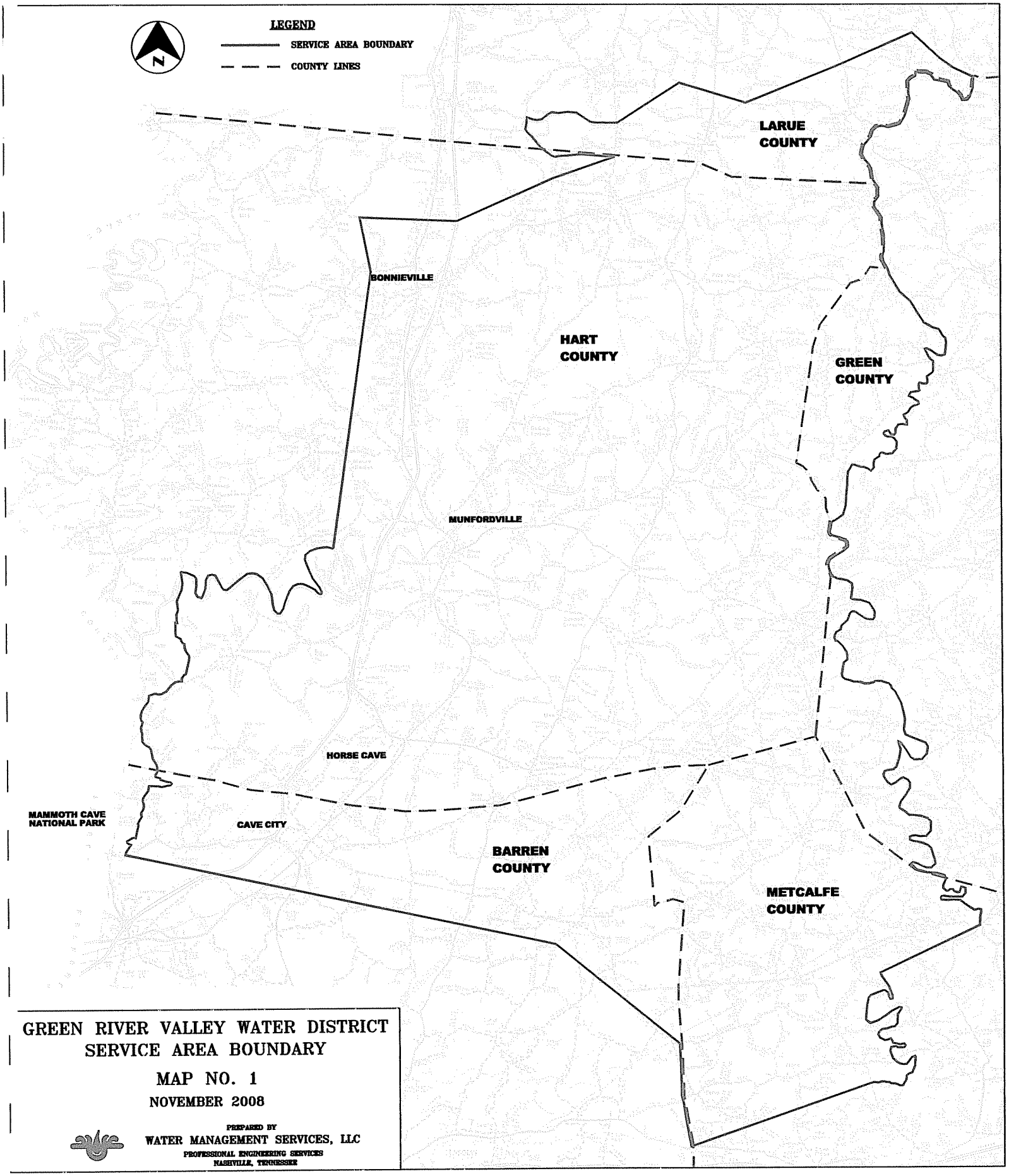
As discussed in Section III of this Report, one of the recommendations of this Report is the extension of a 16-inch water transmission main from the end of an existing 16-inch water transmission main located at Hardyville. From that starting point, the proposed 16-inch main would extend southward along Highway 331-E to the intersection of Highway 685. From Highway 685, the route of the proposed transmission main would be west with connections the following points; 1) a proposed 1.0 million-gallon water storage tank; 2) the existing 16-inch water main located inside the Horse Cave Industrial Park; and 3) an existing 8-inch water main located along Lafferty Road. **Map 4,** included in the appendix of this Report, shows the route for this proposed transmission main and connection points.

This Report also recommends the addition of some 74,800 feet of mainly 3-inch water mains and two (2) small water booster stations to serve 70 to 80 residences that are without public water. Funding for these water main extensions will be from a federal Special Appropriation Project grant that GRVWD recently received.

Since the Special Appropriation Project Grant requires a 45 percent of local funds, this Report recommends the replacement of two (2) existing steel clearwells at the water treatment plant with a reinforced concrete clearwell.

Table V-1
Summary of GRVWD Project Costs
Estimate of GRVWD Net Costs

Water Transmission Main	$3,659,000
500,000 Gallons Water Storage Tank	$822,000
Water Distribution Mains	$782,000
Clearwell	$1,600,000
Subtotal	$6,863,000
Contingencies & Other Project Costs @ 20 Percent	$1,372,600
Total	$8,235,600
Less Horse Cave& CEA Shares	$3,000,000
Less KIA & SPAP Grants	$1,456,000
Net GRVWD Funding Needs	$3,779,600



GREEN RIVER VALLEY WATER DISTRICT
SERVICE AREA BOUNDARY

MAP NO. 1

NOVEMBER 2008

PREPARED BY

WATER MANAGEMENT SERVICES, LLC

PROFESSIONAL ENGINEERING SERVICES

NASHVILLE, TENNESSEE

HWY 685 TANK

HORSE CAVE TANK

SEGMENT 4 8,000'

PROPOSED GROUND STORAGE TANK

HORSE CAVE

SEGMENT 3 7,400'

HART COUNTY

BARREN COUNTY

51,600 FEET

SEGMENT 2 8,800'

BEAR WALLOW BOOSTER STATION

PARALLEL 12-INCH WATER MAIN

UNO

SEGMENT 1 39,500'

BUNNELL CROSSING PUMP STATION

STATE ROUTE 88

JACK MCGUIRE ROAD

27,000 FEET

HARDYVILLE

CAMDION

EXISTING FILTER PLANT

GREEN RIVER VALLEY WATER DISTRICT

MAP 2

NOVEMBER 2008

LEGEND

- 8" EXISTING WATER LINES
- 10" EXISTING WATER LINES
- 12" EXISTING WATER TRANSMISSION MAIN
- 16" EXISTING WATER TRANSMISSION MAIN
- PROPOSED PARALLEL 12" TRANSMISSION MAIN
- MASTER METER

Water Management Services, LLC
PROFESSIONAL ENGINEERING SERVICES
NASHVILLE, TENNESSEE

HWY 685 TANK

SEGMENT 3

SEGMENT 4

SEGMENT 5

HART COUNTY

BARREN COUNTY

PROPOSED GROUND STORAGE TANK

HORSE CAVE TANK

HORSE CAVE

BEAR WALLOW BOOSTER STATION

SEGMENT 2

UNO

BUNNELL CROSSING PUMP STATION

STATE ROUTE 88

JACK MCGUIRE ROAD

HARDYVILLE

SEGMENT 1

CAMDION

EXISTING FILTER PLANT

GREEN RIVER VALLEY WATER DISTRICT

MAP 3

NOVEMBER 2008

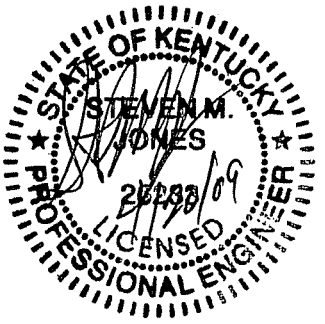
LEGEND

- 8" EXISTING WATER LINES
- 10" EXISTING WATER LINES
- 12" EXISTING WATER TRANSMISSION MAIN
- 16" EXISTING WATER TRANSMISSION MAIN
- PROPOSED 16" TRANSMISSION MAIN
- MASTER METER

Water Management Services, LLC
PROFESSIONAL ENGINEERING SERVICES
NASHVILLE, TENNESSEE

PRELIMINARY ENGINEERING REPORT
FOR
GREEN RIVER VALLEY WATER DISTRICT

ADDITIONS AND MODIFICATIONS
TO
WATER TREATMENT PLANT
500,000 GALLON CLEARWELL ADDITION
FEDERAL SPECIAL APPROPRIATION GRANT PROJECT



MARCH - 2009

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Telephone: 615/ 366-6088

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I. INTRODUCTION

A. Background Information

In 1959, provisions of Chapter 74 of the Kentucky Revised Statutes allowed officials to organize the Green River Valley Water District (GRVWD). As originally organized, the service area of the GRVWD included portions of Hart County. In 1960, the County Court of Barren County granted GRVWD permission to annex areas of Barren County. Areas of Green County, Larue County, and Metcalfe County were later included in GRVWD's service area.

KRS 74.120 (2) allows GRVWD to contract water services to other water districts and municipalities. Under this provision of law, GRVWD provides water services to the municipalities of Munfordville and Bonnieville. While these entities purchase wholesale water from the GRVWD, they operate their own water systems.

The municipalities of Cave City and Horse Cave also purchase wholesale water from GRVWD. Until recently, these municipalities also contracted with GRVWD to operate their water systems. After the recent purchase by Caveland Environmental Authority, Inc. (CEA) of the Cave City Water System, CEA operates the Cave City water system, but CEA continues, as contracted, to purchase wholesale water from GRVWD.

Other smaller municipal entities within the service area of GRVWD do not own or operate a water system and, therefore, are within the service area of the GRVWD. These other smaller municipal entities and remaining rural areas of GRVWD's service area depend on GRVWD for water service. In addition to serving the water needs within GRVWD's boundaries, GRVWD also sells water to Larue County Water District, Green - Taylor Water District and Caveland Environmental Authority, Inc.

GRVWD operates under regulations of the Kentucky Public Service Commission (PSC). Management responsibilities rests with the Board of GRVWD, which consists of five (5) commissioners; three (3) from Hart County appointed by the Hart County Judge Executive and two (2) from Barren County appointed by the Barren County Judge Executive.

The catalyst for the formation of the GRVWD was recurring shortages and poor water quality afforded by wells used for both public and private water sources. For the most part, the geology within the GRVWD service area is Karst having numerous sinkholes. Ground water usually consists of underground streams, which use caverns and fissures for flow paths. The source of this ground water is primarily surface water entering

underground caverns through opening in sinkholes; thus subjecting these ground water sources to pollutant from various sources. Because of this geology setting, ground water supplies from wells in the GRVWD service area are generally unreliable sources of drinking water.

Because of this topography situation, the primary source of water for the GRVWD water system is the Green River and the Rio Verde Spring. To allow the utilization of these water sources, GRVWD constructed a water treatment facility adjacent to the Green River near the Rio Verde Spring.

In 1961, initial construction began on GRVWD's water treatment, transmission, and distribution system. Among the many components included in that initial construction program were two (2) 100,000-gallon steel clearwells located at the water treatment plant.

Since 1961, high service and backwash pumps located atop these two (2) existing clearwells serve the needs of the water system. After nearly 50 years of service, these clearwells, which are in poor structural conditions, are not adequate to support these critical pumping facilities.

In addition to this situation, other steel clearwells located at the water treatment plant are also experiencing structural problems due to the severe corrosive conditions resulted from fluctuation in levels of chlorinated water. Some of these other tanks have over 30 years of service.

Therefore, there is a need to provide replacement for existing 100,000-gallon clearwells and to provide replacement for the existing pumps located atop these clearwells.

B. Purpose of the Report

This Report identifies the facilities needed to replace two (2) of the existing steel clearwells at the water treatment plant. In consideration of this, one purpose of this Report is to detail the size and configuration of the recommended clearwell, such that the clearwell will meet the regulatory requirement for contact time without pre chlorination at the water treatment plant.

The second purpose of this Report is to detail high service and backwash pumps to replace and upgrade the existing pumps located on top of the clearwells. This Report will also accompany the submittal of construction plans and specifications for approval from the Kentucky Division of Water.

II. REGULATORY CONSIDERATIONS

A. General

In compliance with the 1986 amendments to the Safe Drinking Water Act (SDWA), the EPA promulgated in 1989 the Surface Water Treatment Rule (SWTR). The SWTR established the National Primary Drinking Water Regulations (40 CFR Part 141) for all public waterworks using surface water sources or groundwater sources under direct influence of surface water. Basic requirements of the Surface Water Treatment Rule include the following:

- At all times, maintain a disinfectant (chlorine) residual within the water systems.
- Under guidelines published by EPA, provide a removal/inactivation of at least 99.9 percent (3 log) for Giardia and 99.99 percent (4 log) for viruses.

In 1996, amendments to the SDWA were issued which required the EPA to promulgate the Microbial / Disinfection By-products (M-DBP) cluster of rules. Briefly, these rules establish maximum limits on levels of turbidity for filtered water, minimum chlorine contact time before distribution, and maximum limits on disinfection byproducts in the water distribution system; namely total trihalomethane (TTHM), haloacetic acids (HAA5).

The development of a minimum inactivation ratio was due to concerns that water systems would reduce disinfection to meet Stage 1 DBPR requirements. The establishment of the 3-log removal/inactivation of Giardia and 4-log removal/inactivation of viruses, by EPA, was in order to provide protection from the majority of pathogens in source water. However, changes in disinfection practices which lowered the chlorine residual or relied upon a less effective oxidant could have resulted in some systems marginally meeting the removal/inactivation criterion or failing to meet the criterion at all times of operation.

To address these concerns EPA developed a method to calculate the effectiveness of disinfection practices for the inactivation of microorganisms. This method allows for the conversion of disinfection conditions to a theoretical level of inactivation for specific microorganisms based on a CT value. This approach allows water systems flexibility in the application of disinfectants without a significant increase in microbial risk.

B. Inactivation Ratio

Inactivation is based on the contact time between the water and the residual concentration of the disinfectant in the water. This is recognized as the CT value for the water plant. To determine this value the amount of free chlorine in the water is multiplied by the detention time to determine the CT value. The disinfection ratio is calculated by

dividing the calculated CT value by the required CT_{req} value set by the Environmental Protection Agency (EPA) and printed in the *EPA Guidance Manual Disinfection Profiling and Benchmarking*. These values are greatly impacted by the pH and temperature of the water.

The *EPA Guidance Manual Disinfection Profiling and Benchmarking* provides a way to calculate the detention time for basins if a tracer study has not been completed. The guidance documentation specifies calculations based on baffling coefficients that attempt to account for the short-circuiting of flows through basins and establish the T_{10} value. The T_{10} value is the minimum detention time experienced by 90% of the water.

Baffling coefficients are assigned by referencing the visual aids or **Table III-1**, which was published as part of the disinfection guide.

Table III-1

Baffling Condition	T_{10}/T	Baffling Description
Unbaffled (mixed flow)	0.1	None, agitated basin, very low length to width ratio, high inlet and outlet flow velocities. Can be approximately achieved in flash mix tank
Poor	0.3	Single or multiple unbaffled inlets and outlets, no intra-basin baffles
Average	0.5	Baffled inlet or outlet with some intra-basin baffles
Superior	0.7	Perforated inlet baffle, serpentine or perforated intra-basin baffles, outlet weir or perforated launders
Perfect (plug flow)	1.0	Very high length to width ratio (pipeline flow), perforated inlet, outlet, and intra-basin baffles

Water treatment facilities can receive a maximum credit of 2.5-log removal for the effective removal of organics based on the type of treatment provided. The GRVWD WTP currently receives 2.5 Log credit for removal. The remaining 0.5 log requirement for Giardia Cysts and 1.5-log requirement for viruses must be met through the application of disinfectants to achieve inactivation.

III. RECOMMENDATIONS

A. Clearwell

As indicated previously the recommendation of this Report is the construction of a new clearwell. The design of the proposed clearwell should be such that the clearwell acts as the wet well for the high service and backwash pumps. This will minimize the construction cost for the project by reducing structures and piping. However, the configuration of the clearwell should allow tank maintenance without interruption of pumping operation.

The proposed clearwell will be of rectangular design with perforated baffling at both the influent and effluent, in addition to intra-basin baffling in order to produce plug flow characteristics. Further, the proposed clearwell will include two separate units of 250,000 gallons each. In this manner, disinfection standards can be met with one side drained for routine inspection or other dewatering needs.

Table III-1 shows the effective volume and detention time of the proposed clearwell for the treatment plant maximum design flow of 6 MGD.

Table III-1

	Clearwell Volume Full (gal)	Low Water Level (%)	Baffling Coefficient	Effective Volume (gal)	Detention Time (min)
Two Unit Operation	500,000	60%	0.7	210,000	50
Single Unit Operation	250,000	60%	0.7	105,000	25

The inactivation of Giardia Cysts is the controlling value for the GRWVD Water Treatment Plant. As calculated by CT/ CT_{req}, the required inactivation ratio for the water treatment plant is a minimum of 1.0. **Table III-2** calculates the inactivation ratio for Giardia Cysts during winter months when the CT_{req} value is the greatest.

Parameters used in the calculations shown in **Table III-2** are as follows:

Flow – 6 MGD
Maximum pH – 7.5
Temperature – 0.5° C
Minimum chlorine residual in the clearwell -- 2.0 mg/l
CT_{req} – 95

Table III-2

	Detention Time (min)	Chlorine Residual (mg/l)	CT
Clearwell	50	2.0	100
$CT/ CT_{REQ} = 1.05$			

The calculated inactivation ratio for the proposed configuration would be 1.05. This demonstrates that the proposed configuration will allow the treatment plant the option to operate with large drops in clearwell levels, while maintaining the required inactivation ratio. The proposed clearwell will provide needed redundancy to insure that minimum inactivation requirements for microorganisms will be met without all the clearwells, at the water treatment plant, being in service.

The attached schematic drawings show the piping configuration to the proposed and existing clearwells. The site plan shows five (5) colored lines each identifying piping changes at the treatment plant. With the proposed clearwell, flow from the filters will be isolated from the existing clearwell. This is shown on the site plan by the red and blue lines. The red lines indicate how the flow from the filters will be redirected into the proposed clearwell, while the dark blue lines represent the piping modifications that will connect the new high service pump well to the existing clearwells and high service pumps.

The site plan schematic also shows the connections to the existing backwash line (green line), existing drain and overflow lines (orange lines), and the plant finished water mains (light blue lines). These modifications will allow for the chlorinated water from the filters to flow into the proposed clearwell, which as indicated, will provide sufficient contact time before pumping.

The addition of the proposed clearwell will improve reliability for the water treatment plant. Therefore, it is a recommendation of this Report that the design and construction of the 500,000-gallon clearwell be undertaken.

B. High Service Pump Additions

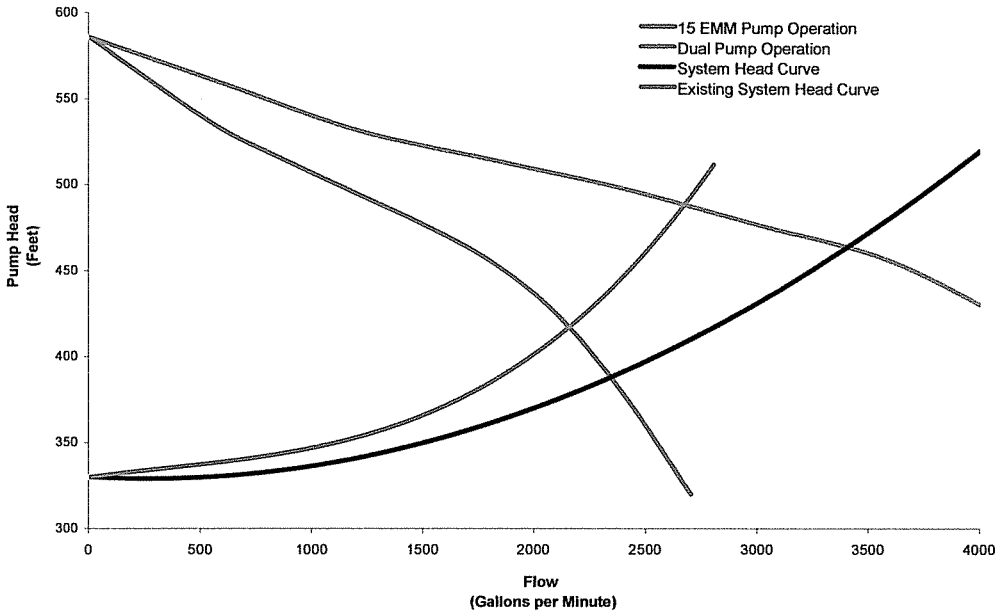
High service pumps added as part of the new clearwell. These proposed and existing high service pumps will use the existing clearwells as pumping storage; thus minimizing the drawdown on the water level within the proposed clearwell.

Figure III-1, on the next page, shows the relationship between pump curves for the existing high service pumps that will remain in service and the system head curve for the transmission main system. The points where the pump curves cross the system head

curves represent the calculated output of the existing high service pumps for 1-pump and 2-pump operation.

Figure III-1

GRVWD Existing High Service Pumps versus System Head Curves

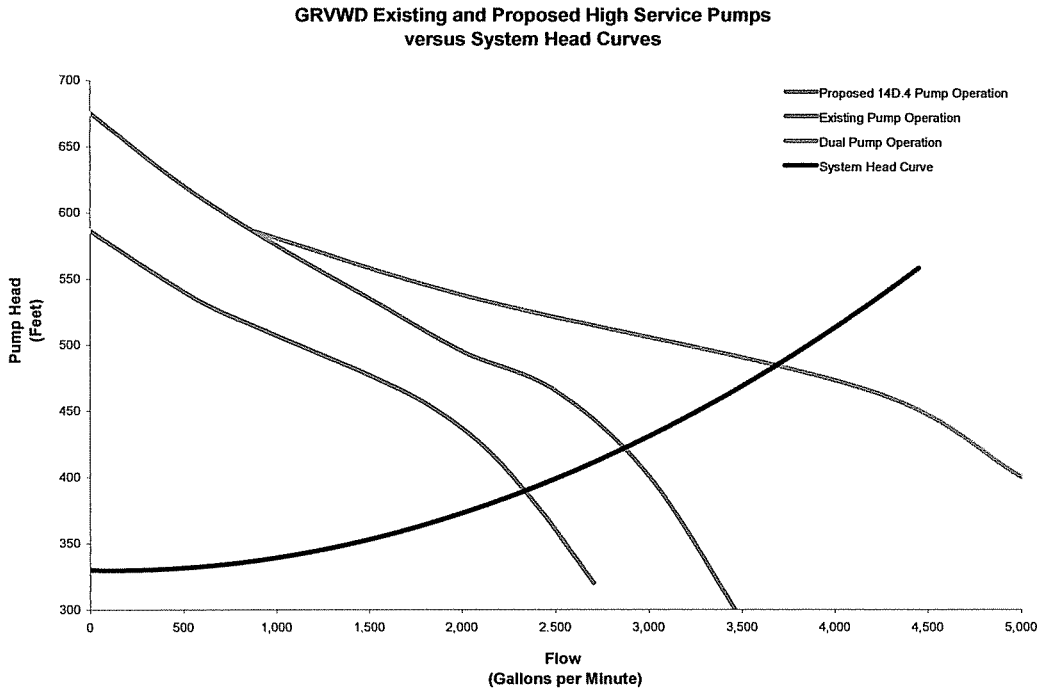


A previous Report, detailing additions to the water transmission and storage facilities for the southern portion of the GRVWD water system, establishes the average and peak demands for the system. That Report and an accompanying memorandum detailing the tank turnover rate for the proposed storage reservoir addition established the average and peak system demands for the average day. The average demand was 2,400 gpm with peak demands of approximately 3,600 gpm.

That Report also details the need of a water system to have adequate capacity to meet average day peak demands without reliance on water reservoirs. Based on this fact, the existing high service pumps will not meet the peak demands exerted on the water system. Therefore, it is a recommendation of this Report that new high service pumps be capable of meeting this demand while operating in conjunction with one of the existing high service pumps. In this way, the water treatment plant will have a backup pump for each of the high service pumps needed to meet the peak demands of the system.

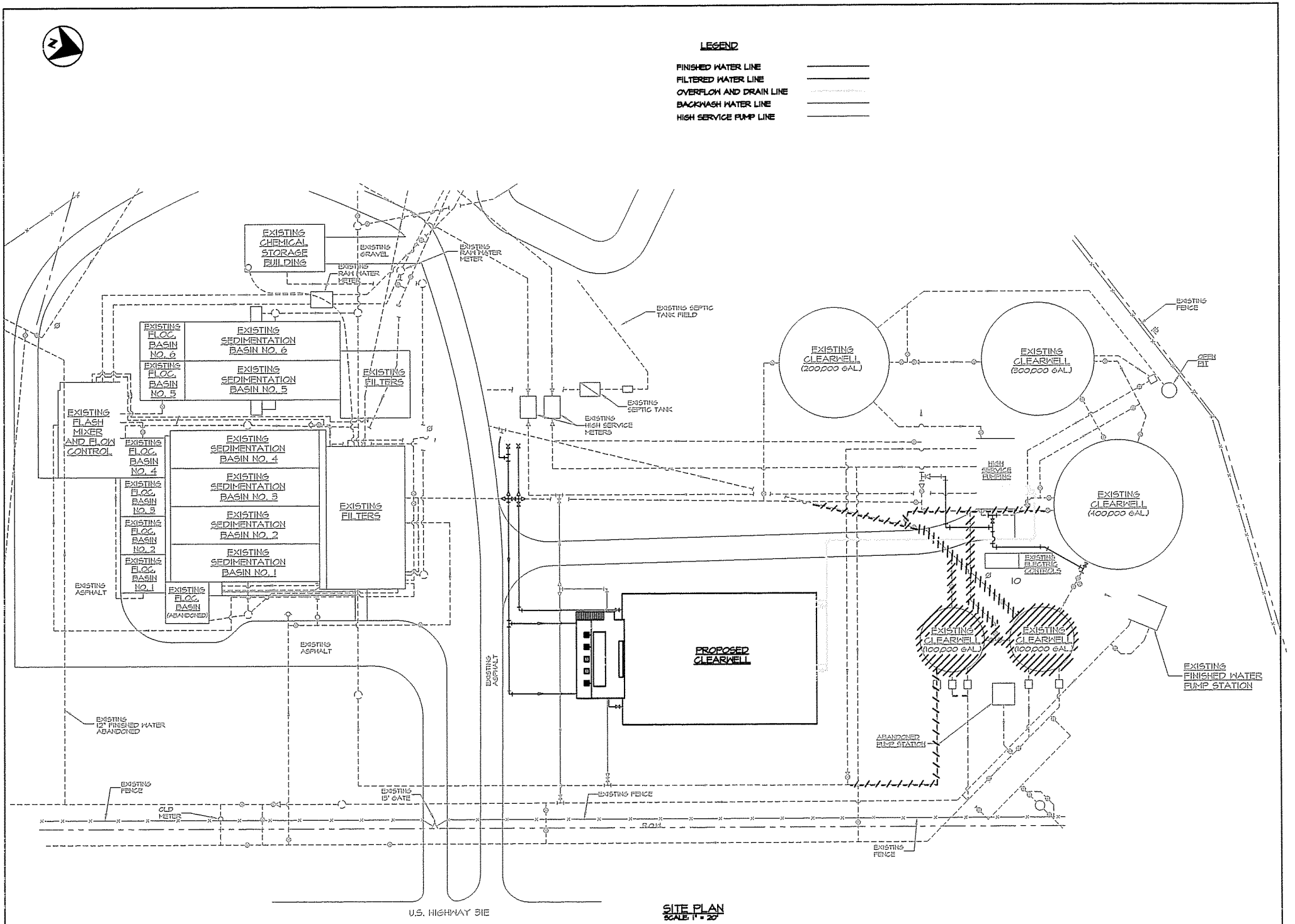
Based on a preliminary pump selection **Figure III-2** on the next page shows the relationship between pump curves for the existing and proposed high service pumps and the system head curve for the transmission main system.

Figure III-2

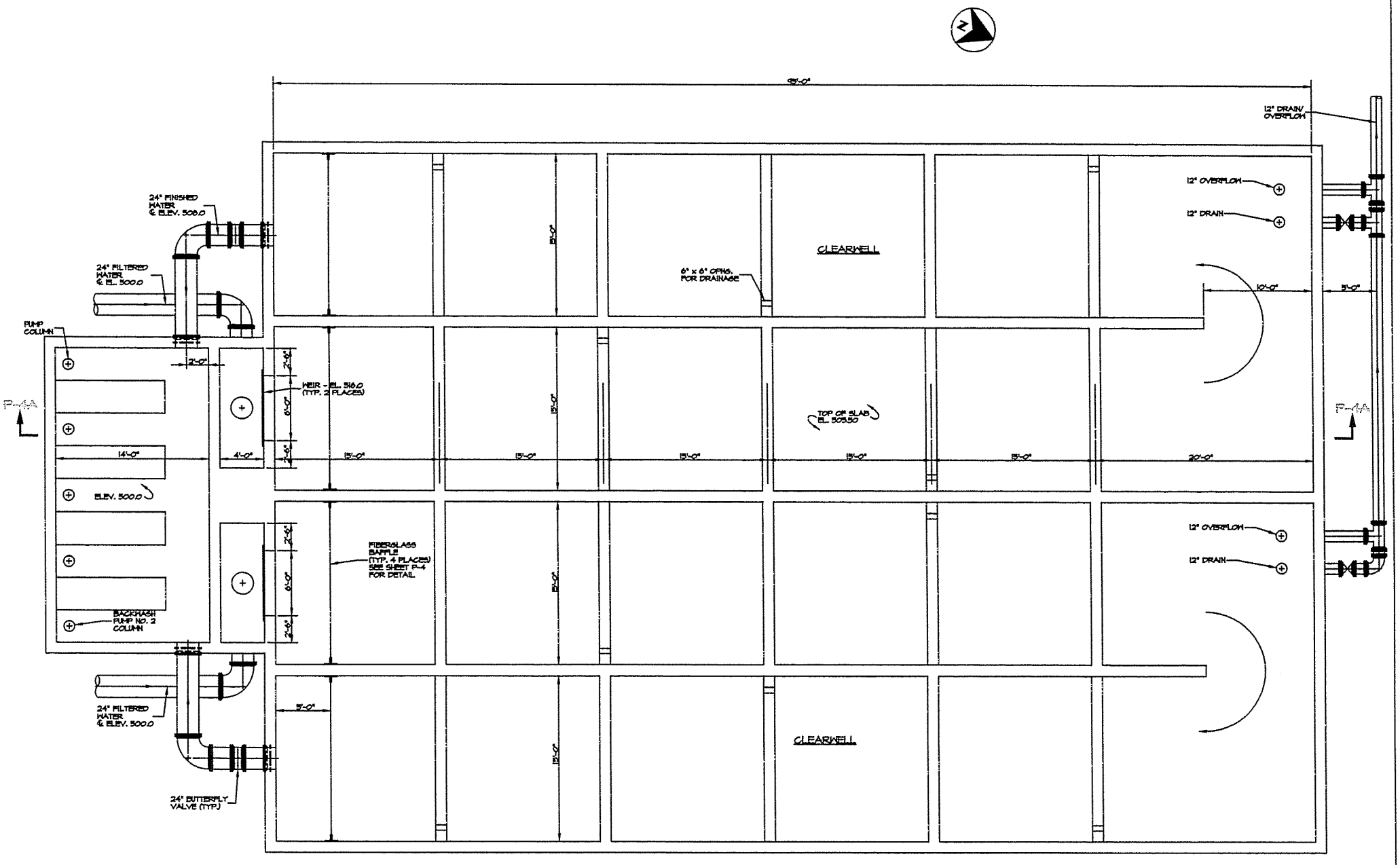


The attached pump curve, (Fairbanks Morse 14D.4), details the operational parameters for the proposed high service pumps. With the addition of these high service pumps, the water treatment facility will have the capacity to meet peak demands for water system. This will improve the reliability for the southern portion of the water system.

The proposed modifications at the water treatment plant will also require the installation of a new backwash pump. This pump shall be identical to the backwash pump, which received approval from the DoW for the most recent treatment plant expansion in 2002. The attached pump curve, for the Fairbanks Morse 17-H, details the operational parameters for the proposed backwash pump.

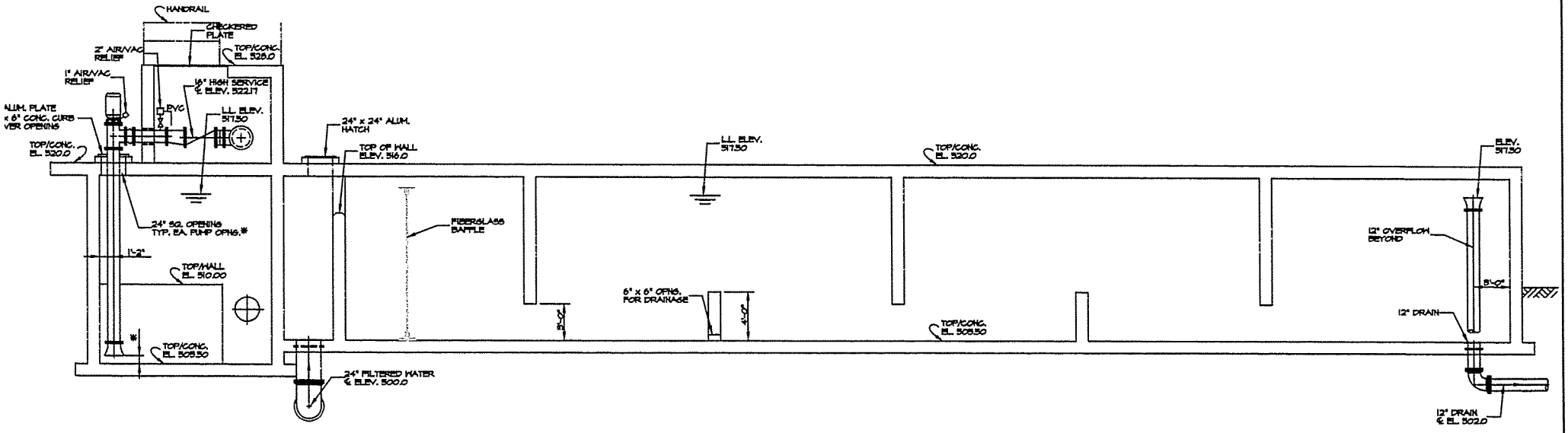


SITE PLAN
SCALE 1" = 20'

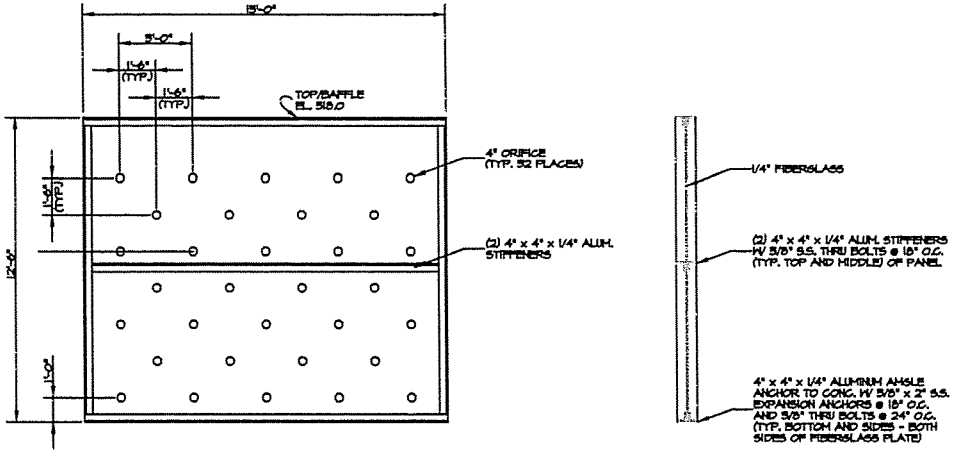


CLEARWELL BASE PLAN

SCALE: 1/4" = 1'-0"



SECTION F-4A
SCALE: 1/4" = 1' - 0"



FIBERGLASS BAFFLE DETAIL
SCALE: 3/8" = 1' - 0"

ompany:
ame:
Date: 6/16/2009

Fairbanks Morse
Pentair Water

Pump:

Size: 14D.4+ (5 stage)

Type: VERT.TURBINE
Synch speed: 1800 rpm

Speed: 1770 rpm
Dia: 11.375 in

Curve: 9PC-119438

Impeller:

Specific Speeds:

Ns: —
Nss: —

Dimensions:

Suction: 10 in
Discharge: 12 in

Vertical Turbine:

Bowl size: 14.3 in
Max lateral: 0.7 in
Thrust K factor: 15.5 lb/ft

ump Limits:

Temperature: 150 °F
Pressure: 400 psi g
Sphere size: 1.25 in

Power: 781 hp
Eye area: —

Search Criteria:

Flow: 2800 US gpm

Head: 430 ft

Fluid:

Water
Density: 62.25 lb/ft³
Viscosity: 1.105 cP

Temperature: 60 °F
Vapor pressure: 0.2563 psi a
Atm pressure: 14.7 psi a

NPSHa: —

Motor:

Standard: NEMA
Enclosure: TEFC

Size: 400 hp
Speed: 1800
Frame: 449T

Sizing criteria: Max Power on Design Curve

— Data Point —

Flow:	2800 US gpm
Head:	430 ft
Eff:	83.5%
Power:	364 hp
NPSHr:	22.5 ft

— Design Curve —

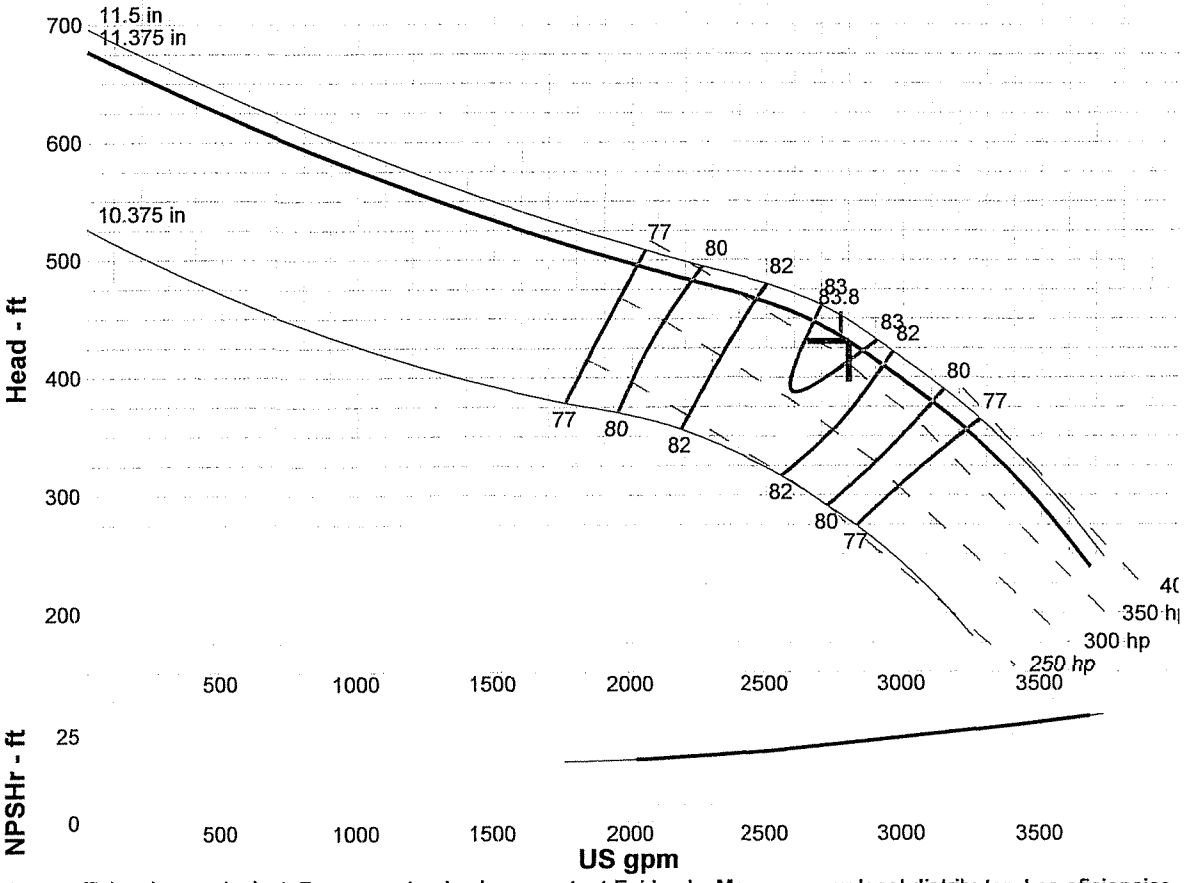
Shutoff head:	677 ft
Shutoff dP:	293 psi
Min flow:	—

BEP: 83.8% @ 2771 US gpm

NOL power:
376 hp @ 3230 US gpm

— Max Curve —

Max power:
392 hp @ 3279 US gpm



Curve efficiencies are typical. For guaranteed values, contact Fairbanks Morse or your local distributor. Las eficiencias en curvas son típicas. Para valores garantizados contacte a Fairbanks Morse o a su distribuidor local.

Performance Evaluation:

Flow US gpm	Speed rpm	Head ft	Efficiency %	Power hp	NPSHr ft
3360	1770	322	71.9	375	27.3
2800	1770	430	83.5	364	22.5
2240	1770	481	80.1	340	18.7
1680	1770	526	72	311	16.5
1120	1770	---	---	---	---

Selected from catalog: Fairbanks Morse Turbine.60 Vers: 3

Company:
Name:
Date: 6/16/2009

Fairbanks Morse
Pentair Water

Pump:

Size: 17H.1 (1 stage)

Type: VERT.TURBINE
Synch speed: 1200 rpm

Speed: 1170 rpm
Dia: 11.24 in

Curve:

Impeller:

Specific Speeds:

Ns: —
Nss: —

Dimensions:

Suction: 16.75 in
Discharge: 14 in

Vertical Turbine:

Bowl size: 16.9 in
Max lateral: 0.81 in
Thrust K factor: 18.5 lb/ft

Pump Limits:

Temperature: 150 °F
Pressure: 452 psi g
Sphere size: 1.48 in

Power: 516 hp
Eye area: —

Search Criteria:

Flow: —

Head: —

Fluid:

Water
Density: 62.25 lb/ft³
Viscosity: 1.105 cP

Temperature: 60 °F
Vapor pressure: 0.2563 psi a
Atm pressure: 14.7 psi a

NPSHa: —

Motor:

Standard: NEMA
Enclosure: TEFC

Size: 60 hp
Speed: 1200
Frame: 404T

Sizing criteria: Max Power on Design Curve

— Data Point —

Flow:	3785 US gpm
Head:	44.4 ft
Eff:	84%
Power:	50.5 hp
NPSHr:	18.9 ft

— Design Curve —

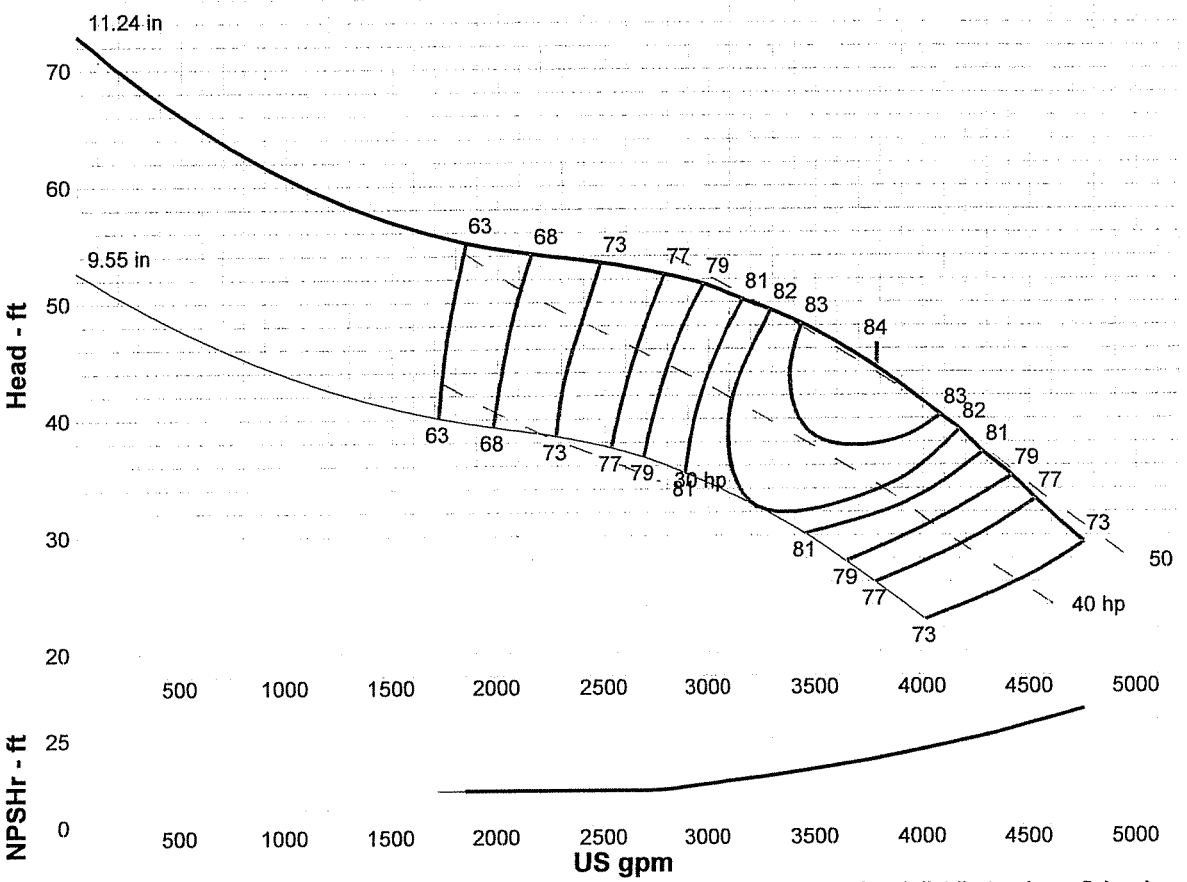
Shutoff head:	72.9 ft
Shutoff dP:	31.5 psi
Min flow:	—

BEP: 84% @ 3785 US gpm

NOL power:
50.5 hp @ 3785 US gpm

— Max Curve —

Max power:
50.5 hp @ 3785 US gpm



Curve efficiencies are typical. For guaranteed values, contact Fairbanks Morse or your local distributor. Las eficiencias en curvas son típicas. Para valores garantizados contacte a Fairbanks Morse o a su distribuidor local.

Performance Evaluation:

Flow US gpm	Speed rpm	Head ft	Efficiency %	Power hp	NPSHr ft
4564	1170	32.5	76.4	49	30
3803	1170	44.1	83.9	50.5	19.1
3042	1170	51.1	79.7	49.2	12.2
2282	1170	53.9	69.9	44.4	10
1521	1170	—	—	—	—

Selected from catalog: Fairbanks Morse Turbine.60 Vers: 3