EAG-W-07-01

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1410 North Hilton • Boise, Idaho 83706 • (208) 373-0502

C.L. "Butch" Otter, Governor
Toni Hardesty, Director

June 26, 2007

TSP&S-142/2007

Mr. Robert V. DeShazo, Jr.
Eagle Water Company, Inc.
172 W. State Street
Eagle, Idaho 83616

Mr. James Rees, P.E.
MTC, Inc.
707 N. 27th Street
Boise, Idaho 83702

RE: Eagle Water Company *(City of Eagle, Ada County)*
Acceptance of Preliminary Engineering Report

Dear Mr. DeShazo and Mr. Rees:

The Idaho Department of Environmental Quality (DEQ) has reviewed the Preliminary Engineering Report for the Eagle Water Company (EWC) water system, received on June 18, 2007, and has determined that it satisfies the requirements for such a document as set forth in the DEQ/EWC Consent Order signed by both parties on February 17, 2006. In accordance with that Consent Order, DEQ hereby directs EWC to change the title of the document to "Final Engineering Report", and submit it to DEQ for formal approval.

Please call me with any questions at 373-0514, or contact me via e-mail at peter.bair@deq.idaho.gov.

Sincerely,

Peter S. Bair, P.E.
Technical II Engineer

PSB:sjt

C: Tiffany Floyd, Drinking Water Manager, DEQ Boise Regional Office
Mark Mason, P.E. Engineering Manager, DEQ Boise Regional Office
Stephanie Ebright, Attorney General's Office, DEQ State Office
Monty Marchus, P.E., DEQ Boise Regional Office
Molly O'Leary, Richardson & O'Leary PLLC, P.O. Box 7218, Boise, Idaho 83707
BRO Source File
TSP&S Reading File

MTC, INC.
CONSULTING ENGINEERS, SURVEYORS, AND PLANNERS
707 N. 27TH ST. BOISE, IDAHO 83702-3113 (208) 345-0780 FAX (208) 343-8967

Ms. Tiffany Floyd, Regional Drinking Water Manager
Department of Environmental Quality
Boise Regional Office
1445 N. Orchard St.
Boise, ID 83706

June 27, 2007
Project 05-840

Dear Ms. Floyd;

Transmitted herewith are three copies of the Final Engineering Report on the Eagle Water Company, Inc. water system as required by 1076 / 16RO Consent Order.

We look forward to assisting you in any manner necessary during you review of this report. Please contact us directly if you have any questions.

Yours truly,

James M. Rees P.E.
MTC. Inc.

MTC, INC.
CONSULTING ENGINEERS, SURVEYORS, AND PLANNERS
707 N. 27TH ST. BOISE, IDAHO 83702-3113 (208) 345-0780 FAX (208) 343-8967

June 27, 2007

Project 05-840

Mr. Robert V. DeShazo, Jr.
Eagle Water Company, Inc.
P.O. Box 455
Eagle, ID 83616

Dear Mr. DeShazo,

Transmitted herewith is the Final Engineering Report performed on the Eagle Water Company, Inc. Water System.

We sincerely appreciate the opportunity to be of service to you on this project and we look forward to continue to serve you.

Yours truly,

James M. Rees P.E.
MTC Inc.

FINAL ENGINEERING REPORT

on the

Water Supply System Study
For
Eagle Water Company, Inc,
Eagle, Idaho

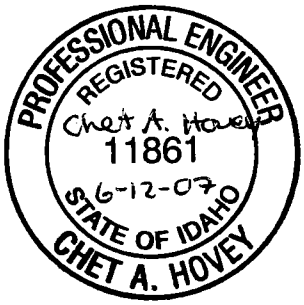
By
MTC Engineers Inc.
707 N. 27th Street
Boise, Idaho 83702

June 2007

ENGINEER'S CERTIFICATION AND DECLARATION

James M. Rees and Chet A. Hovey, hereby certify that they are Registered Professional Civil Engineers in the state of Idaho. They declare that this ~~Preliminary~~ Final Engineering Report was prepared under their direct supervision for Eagle Water Company, Inc., Ada County, Idaho.

James M. Rees, P.E.
Idaho Reg. 1830



Chet A. Hovey, P. E.
Idaho Reg. 11861

Acknowledgements

We wish to acknowledge the willing cooperation and assistance of the staff of Eagle Water Company and the City of Eagle. Particularly we acknowledge the efforts of Mrs. Betty Holt, Norman Revels and Mrs. Toni Velie at Eagle Water Company in providing us with the meter records necessary to perform the consumption analysis. Your patience and forbearance were exemplary. We would also like to acknowledge the modeling efforts provided by Ward Engineering Group. Thank You.

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707 N. 27TH ST. BOISE, IDAHO 83702-3113 (208) 345-0780 FAX (208) 343-8967

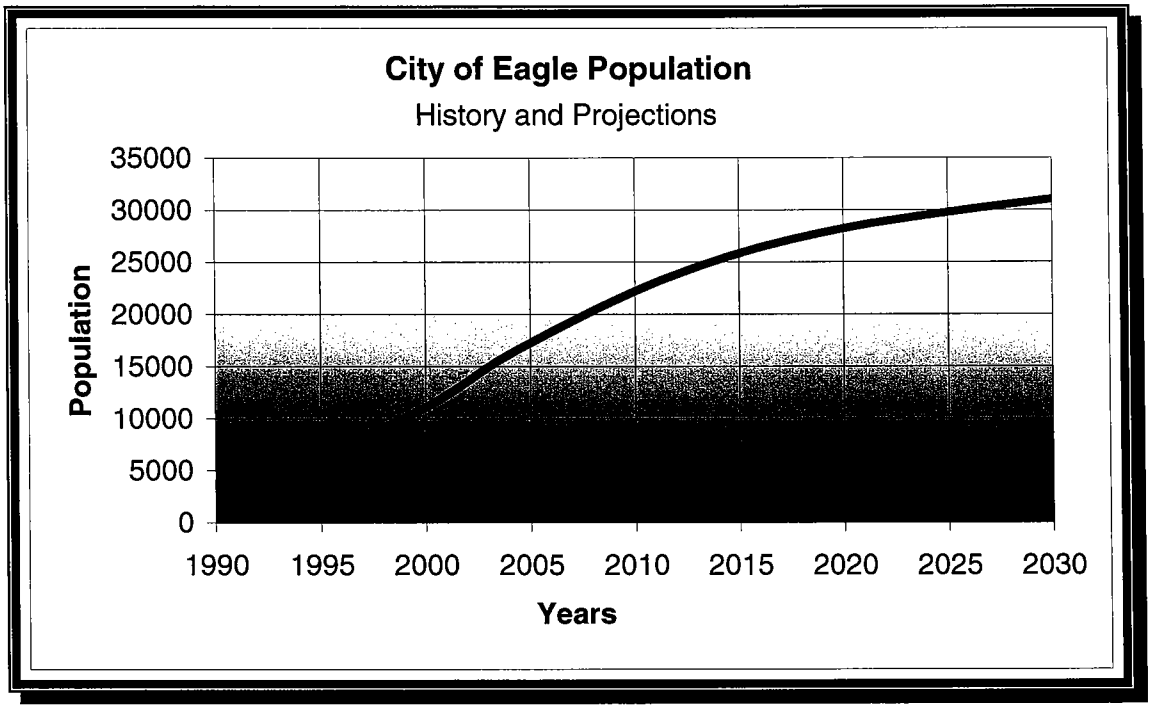
Mr. Robert V. DeShazo, Jr.
Eagle Water Company, Inc.
P.O Box 455
Eagle, ID 83616

June 27, 2007
Project 05-840

Dear Mr. DeShazo,

The Final Engineering Report characterizes the water system of Eagle Water Company (EWC) for the purpose of 1) to identify current system pressure and supply deficiencies, if and 2) to identify and analyze potential remedial actions, and 3) to generate a model for EWC to use as a tool in current and future planning, monitoring, and management. The scope of the Final Engineering Report was system-wide. At the current time, the Idaho Department of Environmental Quality (IDEQ) has place a development moratorium on the Company's certified service area until potential remedial actions are identified.

The City of Eagle has been a significant growth pattern. Census and population estimates (as obtained from the Idaho State Department of Commerce and Labor and other sources) and population projects from the demographic group COMPASS of IDAHO was integrated to develop the chart below which was used in estimating population and growth rates:



Portions of this growth were by annexation and were outside the Company's service area. However, growth has also occurred within the EWC service area through population growth, residential infilling, and an expanding commercial base. This is shown in the table below by the increase in the number of residential and commercial accounts serviced for the current water accounts and the anticipated water accounts for 2010 and 2026.

Water Accounts Summary

Year	Residential Accounts	Commercial Accounts	Agricultural Accounts	Total Water System Accounts
2006 w/ Approved Developments	2,924	358	112	3,394
2010	3,333	408	112	3,853
2026	3,603	530	112	4,245

The above table above indicates, the assumption that growth will only occur in Residential and Commercial accounts. Agricultural accounts would conservatively

remain constant even though Agricultural accounts will likely decrease as development occurs. In addition, the City of Eagle has policy that all new development must be equipped with a pressurized secondary irrigation system utilizing existing irrigation water rights.

The maximum day demand data was obtained from EWC personnel. The data indicates a steadily increasing which is attributed to the increase in water accounts served. To determine the maximum day demand per account and if it's changing with time, the maximum day demand was divided by the number accounts for the years 2003 through 2006. The results are listed in the table below.

The maximum day demand results are listed in the table below.

Maximum Day Demand

Year	Maximum Day Demand (gpd)	Account Total	Maximum Day Demand per Account (gpm)
2003	4,647,000	2,745	1.18
2004	4,763,000	2,888	1.15
2005	5,180,000	3,196	1.13
2006	5,261,000	3,261	1.12

The table shows a continual decrease with time for maximum day demand per account. In projecting future demands on the water system, it is conservatively assumed that each water account would have a maximum day demand of 1.12 gpm instead of following the downward trend.

The peak hour flow demand was determined from available flow data, industry references, and peaking factors used by local water systems. A list of some of the industry references and peaking factors from local water systems are shown below.

System Demand

Reference	Peaking Factor for Peak Hour Flow Demand
Dewberry and Davis Land Development Handbook	1.58
City of Eagle	1.50
Star Sewer and Water District's	1.45
City of Meridian Water Master Plan Update	1.38

After careful consideration and discussion with IDEQ (See Appendix D), it was agreed that a peaking factor of 1.50 be used from maximum day demand to peak hour flow. Thus, each water account would have a peak hour flow demand of 1.68 gpm (1.12 gpm*1.5). As part of the agreement of using a 1.5 peaking factor for peak hour flow, EWC will monitor the system for peak hour flow and maximum day demand this summer (2007) in order to validate the decision.

Each water account was considered a dwelling unit (D.U.). The plan of study was to utilize computer based modeling software, calibrate the model to available existing system data, and then test various scenarios in the model to see their impact on the overall system's modeled operation.

A computer model was setup to simulate the following: maximum day demand with fire flow and the peak hour flow demand under the existing 2006 water system w/ approved developments, 2006 with required improvements, the projected 2010 water system, and projected 2026 water system. Each of these scenarios was run with Well #4 off and then Well #6 off per the General Design Conditions (Section 501.17.a).

Specific standards (utilized in this modeling) establishing pressure, flow and redundancy requirements were obtained from *Idaho Rules for Public Drinking Water Systems (IRPDWS)*. These standards require a minimum zone pressure of 20 psi during the maximum day demand plus fire flow scenario. The system also needs to meet the system wide operational pressure standards of 100 psi maximum and a minimum of 40 psi during normal operations and peak hour flow demand.

Calibration of the model was verified comparing modeling results with actual fire hydrant flow test data. Two separate scenarios were used to verify that the model reflects actual field conditions. The scenarios were before and after Well #7 was put into service and a total of 8 fire hydrant flow tests were compared. The model agrees with reasonable variance to measured field conditions. Varying pressure and flow availability within the system are likely when using data from different hours during the day, years, and seasons.

The modeling results for the different scenarios were analyzed to identify improvements to the system and make recommendations. One of these evaluated improvements was the use of a water storage facility. The concept of utilizing a tank for a supplemental source when one of the wells is out of service was studied from several angles. The recommended storage capacity of one million gallons was used for the study. To be effective the tank must supply water to the highest service connection with the required working pressure of 40 psi. This would require the minimum operating water level of the tank to be around elevation 2840 feet. The tank must be located outside the existing certificated area for proper elevation or EWC would need to construct an elevated tank. There are few, if any, locations available for the construction of an elevated tank. Two locations outside the service area were evaluated for a tank location. To fill either of the tanks, a tank booster pump station would be required. Due to siting, easements, and economics concerns along with the need for an additional water supply in the near future; it was determined that a water storage facility would be nice but not a necessity.

A computer model was setup to simulate the following: maximum day demand with fire flow and the peak hour flow demand under the existing 2006 Water System w/ Approved Developments, 2006 with Required Improvements, the projected 2010 Water System, and projected 2026 Water System. Each of these scenarios was run with Well #4 off and then Well #6 off per the General Design Conditions (Section 501.17.a).

After evaluating and modeling numerous options, a list of recommendations were developed. The recommendations were divided into the following categories: Mandatory, Future, Suggested, and Completed Actions. Mandatory Actions are those

immediately required to bring the system into compliance with regulations. Future Actions are recommendations required to support future development. Suggested Actions are items that would optimize the water system but are not required. Completed Actions are recent improvements that have been beneficial to the current water system. For ease of implementation and organization, the action categories have been divided into two subcategories: (1) planning items and (2) construction projects.

MANADATORY ACTIONS

PLANNING ITEMS

A list of MANDATORY planning items to bring the water system into compliance is as follows:

- None

CONSTRUCTION PROJECTS

The following list of MANDATORY construction projects along with their construction priority has been developed to increase the service pressure, available fire flow, and water supply within the water system. However, the 2006 Approved Development analysis identified improvement project-related deficiencies within the existing water system. As the model results indicated, the maximum day demand plus fire flow, with Well #4 off, identified 5 residential junctions in the upper pressure zone with fire flow availability less than 1000 gpm and the minimum fire flow for commercial junctions of 1668 gpm. The peak hour demand indicated that the pressure dropped below 40 psi when Well #4 off and then again when Well #6 is off. The results for the 2006 Approved Development indicate the need for the following list of Mandatory construction projects to bring the water system into compliance with IRPDWS requirements.

Priority #	Date	Description	Cost Estimate
1	(2007-2008)	Water Interconnect ..... Interconnect water systems with either United Water or City of Eagle for emergency flow redundancy. The United Water	$151,250

interconnect should be made on Floating Feather Road just downstream of the proposed PRSV to feed the lower pressure zone. The United Water Interconnect should be designed to produce 1845 gpm at 61.5 PSI. The City of Eagle interconnect should be made upstream of the proposed PRSV to feed the upper pressure zone. This interconnect should be designed to produce 1845 gpm at 74 PSI. Cost estimate is for United Water Interconnect as modeled in the report and would require a traffic rated vault, miscellaneous valves, flow meter, and appurtenances.

Cost Itemization

Construction		$ 125,000
Engineering (12%)		$ 12,500
	Subtotal	$ 137,500
	Contingency (10%)	$ 13,750
	Total	$ 151,250

Timeline Overview

Design	July 2007
Permitted	September 2007
Construction	December 2007

2 (2007) Install PRSV on Floating Feather Road $43,120

Replace existing throttling valve with a pressure reducing/sustaining valve. In the water model, the upstream pressure setting was set at 72.5 psi and downstream pressure remained near 55 psi.

Cost Itemization

Construction		$ 35,000
Engineering (12%)		$ 4,200
	Subtotal	$ 39,200
	Contingency (10%)	$ 3,920
	Total	$ 43,120

Timeline Overview

Design	July 2007
Permitted	August 2007
Construction	December 2007, Will be installed during low flow conditions.

FUTURE ACTIONS

PLANNING ITEMS

A list of FUTURE planning recommendations is as follows:

- None

CONSTRUCTION PROJECTS

The list below is for Future construction projects which have been selected to able the water system to service the anticipated growth and also eliminate reliance on the proposed water interconnect.

Priority #	Date	Description	Cost Estimate
1	(2008-???*)	New Water Source	$898,040

There are two viable options to increase the available water supply within the water system. The first option would be to renovate existing water sources for additional supply and equip these sources with emergency backup power. The second option would be to drill and construct new water source which would be equipped with emergency backup power. As

previously stated, the water requirement of 2365 gpm is required for the 2010 and 2026 Scenarios. This item also includes associated piping ($35/ft at 1350 ft) and land ($150,000).

Cost Itemization

Construction		$ 785,000
Engineering (4%)		$ 31,400
	Subtotal	$ 816,400
	Contingency (10%)	$ 81,640
	Total	$ 898,040

Timeline Overview

Siting	October 2007
Design	February 2008
Permitted	October 2008
Construction	December 2008

* The questions marks for the completion date indicate the uncertainty associated with siting and permitting a new water source.

2 (2008-2009) Well #2 Booster Pump Station Modification $38,115

Increase the pumping head in Booster Pump Station #2 by replacing existing pumps with pumps that produce a combined flow 640 gpm at 148' TDH. This will enable the use of the 90,000 gallon Well #2 water storage tank to attenuate the peak demand on the water sources. The model was setup with two pumps in operation for convenience only. Any major pump modifications made will require the pumping station to be equipped with redundant pumping capacity. It should be designed with either a duplex pumping station with equal sized pumps or a triplex pumping station with two identical smaller pumps and a jockey pump meeting the required flow and head parameters.

Cost Itemization

Construction		$ 31,500
Engineering (10%)		$ 3,150
	Subtotal	$ 34,650
	Contingency (10%)	$ 3,465
	Total	$ 38,115

Timeline Overview

Design	March 2008
Approval	July 2008
Construction	November 2008

(As Developed)

West Enchantment Street, West Cobblestone Way, and West Yellowstone Street Piping Interconnect $30/ft @ 3,740 ft plus Bore & Jack $50,000, ...$253,616

Increase the capacity of fire flow near Well #6 when it is off line. It should be a requirement of the developer of residential parcel #2 to make the looped connection including the bore and jack under the canal. The cost should be split between the developer and EWC.

Cost Itemization

Construction		$ 209,600
Engineering (10%)		$ 20,960
	Subtotal	$ 230,560
	Contingency (10%)	$ 23,056
	Total	$ 253,616

Timeline Overview – Will be development driven.

SUGGESTED ACTIONS

PLANNING ITEMS

A list of SUGGESTED planning recommendations is as follows:

- Provide notification to users in the upper pressure zone that the Main Booster Pump Station is not equipped with backup emergency power or a redundant pump. This could result in temporary loss of pressure during power outages or pump failure.
- EWC will keep the City of Eagle's plumbing inspectors informed of areas within the service area that have service pressures greater than 80 psi. A figure identifying junctions which have service pressure greater than 80 psi under any of the scenarios is included in Appendix K.
- All new construction within the 80 psi or greater pressure areas will have a recommendation to be equipped with a individual pressure reducing valve along with a thermal expansion tank.
- All new subdivisions, if possible, should be a looped system.
- Minimum 8" waterlines in residential areas and 12" waterlines in commercial areas.
- No booster pumps should be connected to the water system unless they are owned and operated by EWC and any currently unauthorized pumps should be removed, per *Recommended Standards for Water Works, 2003 (Ten States Standards).*
- As development occurs around existing subdivisions, it should be required, to connect to the existing subdivisions creating piping loops within the water system. Multiple existing subdivisions are being serviced from one feed line, thus limiting fire flow availability and a redundant water supply.
- All proposed developments should require a fee for a water model analysis prior to approval. It is suggested that developers be required to submit electronic copies of plans to be integrated into the water model for preliminary plat review.

CONSTRUCTION PROJECTS

A list of Suggested construction projects have been developed for operational purposes for the water system.

Priority #	Date	Description	Cost Estimate
1	(N/A)	Pump Redundancy for the Main Booster Pump Station ..$51,744 Provide pumping redundancy through either a water system interconnect to the upper pressure zone (the City of Eagle Water Interconnect) or an additional pump in the Main Booster Pump Station.	

Cost Itemization

Construction	$ 42,000	
Engineering (12%)		$ 5,040
Subtotal	$ 47,040	
Contingency (10%)		$ 4,704
Total	$ 51,744	

Timeline Overview

Design	2 Months
Permitted	1 Month
Construction	1 Month, during a low demand period.

2	(N/A)	Install Recording Flow Monitors .....$47,080 Install recording flow meters on Well #4, Well #7, Well #6, Well #1, Main Booster Pump Station, and Booster Pump Station #2.

Cost Itemization

Construction	$ 42,000	
Engineering (Specs Only)	$ 800	
Subtotal	$ 42,800	
Contingency (10%)		$ 4,280

Total	$ 47,080

Timeline Overview

Design	2 Months
Permitting	2 Months
Construction	3 Months

COMPLETED ACTIONS

PLANNING ITEMS

A list of COMPLETED planning recommendations is as follows:

- Planning and implementation of Well #7.

CONSTRUCTION PROJECTS

A list of Completed construction projects performed by EWC in an effort to increase source availability within the water system is provided below.

Priority #	Date	Description	Cost Estimate
Completed	(2006)	New Water Source – Well #7 (Constructed and Online)	$638,600

Construct new water source and associated piping with emergency backup power supply. (Per EWC's understanding of the consent order, EWC must indicate what specific actions are required to bring the water system into compliance. Additional source was determined the #1 priority and Well #7 and interconnect listed below was construction. Therefore, it is included as our #1 priority for improvement).

Cost Itemization

Construction	$ 620,000
Engineering	$ 18,600
Total	$ 638,600

Timeline Overview - Completed

Completed (2006) Well #7 Interconnect (Constructed and Online) $153,300

Construct new transmission piping from Well #7 to existing piping along Eagle Bypass.

Cost Itemization

Construction		$ 146,000
Engineering		$ 7,300
	Total	$ 153,300

Timeline Overview - Completed

Completed (2007) Repair Well #4 ..... $56,100

Well #4 is currently being rebuilt to provide additional water source. The reconditioned pump will be online prior to summer demand of 2007.

Cost Itemization

Construction		$ 51,000
	Subtotal	$ 51,000
	Contingency (10%)	$ 5,100
	Total	$ 56,100

Costs are estimates only and because final billing has yet to be received and finalized.

Timeline Overview - Completed

Financial Plan

The following calculations have been prepared by Geneva Trent, CPA, for Eagle Water Company, Inc. Eagle Water Company intends to file an Application with the Idaho Public Utilities Commission (IPUC) to finance the recommended system improvements, as needed. If the system improvements and related surcharges are approved by the

IPUC, Eagle Water would seek commercial financing for the projects and the borrowed funds would then be repaid through a surcharge on customers' usage.

The attached surcharge calculations indicate the percentage that Eagle Water's customers might be required to pay over-and-above current water rates, for the various recommended improvements, if approved by the IPUC.

Eagle Water has been ordered by the IPUC to submit an Application for financing necessary systems improvements by July 15, 2007. Eagle Water is prepared to do so immediately upon DEQ's acceptance of its Preliminary Engineering Report.

Eagle Water Company

Calculation of Surcharge Amounts for Proposed Improvements
at June 10, 2007

MANDATORY ACTIONS – Construction Projects:

Priority #1 - Water Interconnect

Cost of Priority 1		$ 151,250.00	
Estimated bank loan fees		1,500.00	
Amount Financed		$ 152,750.00	
Term (estimated)		5 years	
Interest Rate		9.50%	
Monthly Payments Required		$ 3,208.00	(approximate)
Annual Cash Required		$ 38,496.00	
Multiplied by Gross-up	(from below)	127.88%	
Total Annual Surcharge		$ 49,228.68	
Divided by Total Annual Revenue		$ 729,590.00	(2006 revenues)
Surcharge		6.747%	

2006 Customers	Revenues	Percent of Total
Residential	$ 542,947.52	74.42%
Commercial	186,642.53	25.58%
Totals	$ 729,590.05	100.00%

Calculation of Gross-Up Factor for Taxes:

1)	100.00%	taxable	
2)	8.00%	State Tax Rate	
3)	92.00%	Federal Taxable	
4)	13.80%	Effective Federal Tax Rate	(Federal Rate 15%)
5)	21.80%	Composite Tax Rate	2) + 4)
6)	78.20%	Net After Tax Income	
7)	127.88%	Gross-up Factor	

Priority #2 - Install PRSV on Floating Feather Road

Cost of Priority 2	$ 43,120.00		
Estimated bank loan fees	400.00		
Amount Financed	$ 43,520.00		
Term (estimated)	1 year		
Interest Rate		9.50%	
Monthly Payments Required	$ 3,816.00		(approximate)
Annual Cash Required	$ 45,792.00		
Multiplied by Gross-up		127.88%	
Total Annual Surcharge	$ 58,558.81		
Divided by Total Annual Revenue	$ 729,590.00		(2006 revenues)
Surcharge		8.026%	

FUTURE ACTIONS - Construction Projects:

Priority #1 - New Water Source

Cost of Priority 1	$ 898,040.00		
Estimated bank loan fees	9,000.00		
Amount Financed	$ 907,040.00		
Term (estimated)	10 years		
Interest Rate		9.50%	
Monthly Payments Required	$ 11,737.00		(approximate)
Annual Cash Required	$ 140,844.00		
Multiplied by Gross-up		127.88%	
Total Annual Surcharge	$ 180,111.31		
Divided by Total Annual Revenue	$ 729,590.00		(2006 revenues)
Surcharge		24.687%	

Priority #2 - Well #2 Booster Pump Station Modification

Cost of Priority 2	$ 38,115.00		
Estimated bank loan fees	400.00		
Amount Financed	$ 38,515.00		
Term (estimated)	1 year		
Interest Rate		9.50%	
Monthly Payments Required	$ 3,377.00		(approximate)
Annual Cash Required	$ 40,524.00		
Multiplied by Gross-up		127.88%	
Total Annual Surcharge	$ 51,822.09		
Divided by Total Annual Revenue	$ 729,590.00		(2006 revenues)
Surcharge		7.103%	

SUGGESTED ACTIONS - Construction Projects:

Priority #1 - Pump Redundancy for the Main Booster Pump Station

Cost of Priority 1	$ 51,744.00		
Estimated bank loan fees	500.00		
Amount Financed	$ 52,244.00		
Term (estimated)	2 years		
Interest Rate		9.50%	
Monthly Payments Required	$ 2,400.00		(approximate)
Annual Cash Required	$ 28,800.00		
Multiplied by Gross-up		127.88%	
Total Annual Surcharge	$ 36,829.44		
Divided by Total Annual Revenue	$ 729,590.00		(2006 revenues)
Surcharge		5.048%	

Priority #2 - Install Recording Flow Monitors

Cost of Priority 2	$ 47,080.00		
Estimated bank loan fees	450.00		
Amount Financed	$ 47,530.00		
Term (estimated)	1 year		
Interest Rate		9.50%	
Monthly Payments Required	$ 4,167.60		(approximate)
Annual Cash Required	$ 50,011.20		
Multiplied by Gross-up		127.88%	
Total Annual Surcharge	$ 63,954.32		
Divided by Total Annual Revenue	$ 729,590.00		(2006 revenues)
Surcharge		8.766%	

We sincerely appreciate the opportunity to be of service to you on this project and we look forward to continuing to serve you.

Yours truly,

James M. Rees, P.E.
MTC, Inc.

Authorization

Pursuant to the contract agreement between the Engineers, MTC, Inc. (MTC) and Eagle Water Company, Inc. (EWC or "the Company"), MTC, Inc. has performed this water distribution system study on the Company's system.

Purpose, Need, and Plan of Study

The purpose of the investigation was 1) to identify current system pressure and supply deficiencies, if any 2) to identify and analyze potential remedial actions, and 3) to generate a model for the Company to use as a tool in current and future planning, monitoring, and management. The scope of the investigation was system-wide. At the current time, the Idaho Department of Environmental Quality (IDEQ) has placed a development moratorium on the Company's certified service area until potential remedial actions are identified.

The principle need for the study was to identify facility improvements, if any, needed to eliminate low pressures.

The need for additional supply has long been recognized. In the early 1990's, a well was proposed near State Highway 55 (SH-55) and Hill Road. However, access was a major obstacle and the well was never drilled. Well #4 was completed in 1992 near the South-central area of the service area. Well #6[1] was completed in 1996 near the West end of the service area. A connection began from Well #6 thence West on State Street and North on Ballantyne Road to Country Side Subdivision. The plan was to continue North on Ballantyne Road then East to the existing Floating Feather mainline. The request for this service area was denied by the IPUC so the connection was never made. Another possible routing through the proposed Covenant Hill Subdivision was also thwarted when the subdivision area was removed from the Company's service area by the IPUC and assigned to the service area of United Water-Idaho.

In the meantime, the City of Eagle has been in a significant growth pattern. Census and population estimates (as obtained from the Idaho State Department of Commerce and Labor and other sources) are shown below:

[1] There is no Well #5.

Historical Population Data

1990	4,577
1995	6,777
2000	11,085
2004	16,176

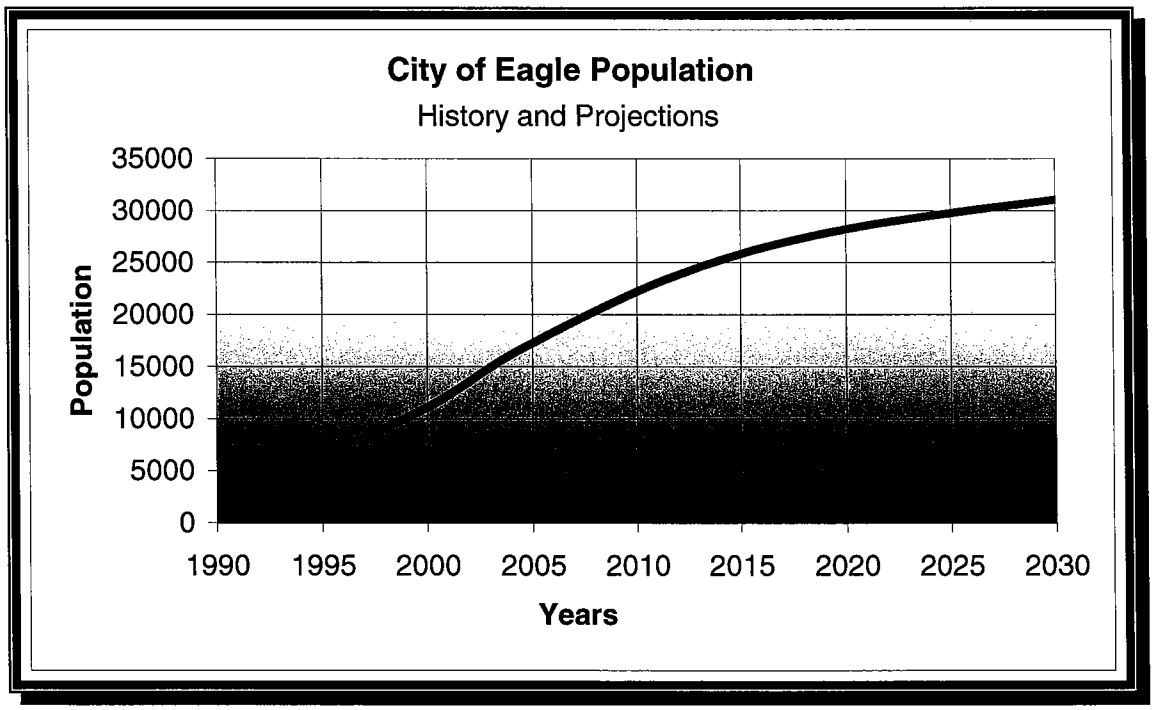
The 2006 population estimate by the City of Eagle is 20,130.

The demographic group COMPASS of IDAHO, a regional planning agency, provided the following population figures:

Population Projects

2005	19,124
2010	22,227
2015	25,854
2020	28,216
2025	29,785
2030	31,043

The chart below shows historical data in conjunction with growth projections for the City of Eagle.



Portions of this growth were by annexation and were outside the Company's service area. However, growth has also occurred within the EWC service area through population growth, residential infilling, and an expanding commercial base. This is shown by the increase in the number of residential and commercial accounts serviced. Further information about water accounts will be provided later within this summary. The need for additional supply will continue to increase with the additional demand placed on the system by the increase in the population.

EWC needs an updated master plan to keep pace with the growth in its service area and to continue to provide cost effective, quality service to its customers. EWC is addressing the above by working to stay ahead of the curve and anticipate domestic water supply needs and fire flow requirements.

The plan of study was to utilize computer based modeling software, calibrate the model to available existing system data, and then test various scenarios in the model to see their impact on the overall system's modeled operation. Based on system evaluations, the system improvements will be identified with a prioritization and cost estimate.

Generalized Description of the Existing Conditions and Water System

The certified service area of EWC, Inc. lies in portions of Sections 2, 3, 4, 8, 9, 10, 11, 14, 15, and 16, in T. 4N., R. 1E., B.M., City of Eagle, Ada County, Idaho. Physiographically it is on the alluvial fan of Dry Creek together with portions of the adjacent Boise Front foothills and the Boise River floodplain. It also consists of all the land North of the North Channel of the Boise River between River Miles ~42 and ~46. Portions in the North and East lie on terraced alluvium left by the down cutting of the Boise River. Topographically the majority of the service area lies West of the Boise Front foothills between elevations 2650 feet and 2546 feet; the balance rises to the East to an elevation of 2743± feet. The geology (as read in the well logs) is generally coarse sand to silts and clays, with minor horizontal lenses of coarser grained materials from major storm events, as would be expected at the mouth of a major drainage. The soils in the alluvial fan areas are in the Notus-Moulton-Falk series while those on the foothills are in the Quincy-Lankbush-Brent series.[2] With the exception of Dry Creek, the surface hydrology has been significantly modified by over a century of agricultural activity and by urban/suburban development. Groundwater is encountered between 2 and 40 feet below ground surface. Depending on proximity to the river, the well depths may vary from 230 to 466 feet with a drawdown that varies from 60 to 160 feet.

[2] Soil Survey of Ada County, Idaho; USDA Soil Conservation Service, 1977.

The Southern boundary of the service area is the North Channel of the Boise River which is in the City of Eagle's designated Scenic Corridor. The majority of the area is developed and in general, the native fauna and flora have been supplanted by domestic pets, decorative plantings and grasses.

One well is located planimetrically in the mapped fringe area of the Boise River floodplain; however, it is elevated above the 100-year base flood elevation as required by ordinance of City of Eagle.

With an estimated 2006 population of 20,130, the City of Eagle covers about 17 square miles. The Company's water distribution system lies generally within the City of Eagle and its area of impact. In 2006, service was provided to 2889 residential accounts, 260 commercial accounts, and 112 landscaping accounts.

The supply and distribution systems, owned and operated by the Company are the primary subject of this study. Included in the study are six wells (#1, #2, #3, #4, #6, and #7) and associated pumping stations, one water storage facility for Well #2 Booster Pump Station, two booster pump stations (Main and Well #2), and approximately 54 miles of waterline, with appurtenances, of which about one mile (less than 2% of the overall system) is smaller than 6-inch. All these smaller lines serve five or fewer customers and/or short cul-de-sacs, and all are without fire hydrants and flows are acceptable. See Appendix A for system inventory.

The existing water supply is pumped groundwater from the deep aquifers under the Boise River floodplain. All wells have been permitted by the Idaho Department of Water Resources and the logs are located in their offices. See Appendix B for copies of the well logs.

Water Quality/Security

The water quality is good and meets the public drinking water standards. In addition to specific testing required by the IDEQ, EWC personnel perform wellhead tests monthly. There have been no known problems with the water quality.

All well/pump house facilities are securely locked. Each facility is inspected daily and the pumping quantities and pressures are recorded.

Source Protection Plan

A Source Protection Plan is on file in the EWC office. Currently, the system operator monitors the provisions of the Source Protection Plan in operation of EWC's system. General source protection practices include (but are not limited to) the following:

1. Well houses shall not be used for storage of any chemicals.
2. Well house access is limited to operating staff and persons they admit. No person shall be admitted into a well house unless a member of the operating staff is present.
3. Well sites are visited daily by maintenance personnel in the course of operation and any potential source of contamination is immediately noted and removed.

According to the EWC personnel (Tom Gilbert), A Source Water Assessment Final Report was prepared by IDEQ that defined the potential for water contaminates.

The current know sanitary survey deficiencies are as follows:

1. Auxiliary fuel tank and piping in Well House #2 is not double walled and does not have spill containment structure. To resolve these issues, EWC will provide spill containment through elevated doorway thresholds.

A Brief System History

Eagle Ranch Water Company was formed in 1972 to serve the Eagle Ranch Subdivision. In 1974, the Company applied to the Idaho Public Utilities Commission for a ruling to establish the Eagle Ranch Water Company. In 1976, the Public Utilities Commission ruled on case No. U-1116-1 Order No. 12621 to establish Eagle Ranch Water Company. At that time, there were 150 customers and Well # 1 was the only well in the system. As the customer base grew, Well #2 was drilled and integrated into the system. Eagle Hills subdivision water system was acquired and it's well was designated as Well #3. Due to problems of sand production at high flow rates above 350 gpm, Well #3 is currently only used during high demand periods. It has been equipped with a sand separator which minimized the sanding problems and the well is normally operating below 350 gpm.

In the 1980's, the company name was changed to Eagle Water Company, Inc (EWC). Water meters were added in 1986 and the billing rate was changed from a flat rate basis to a meter rate basis. Well #4 was drilled and added to the system in 1992. With the expansion of the City of Eagle, Well #6 was drilled in 1996 in order to:

1.) Serve the West side of the service area,

2.) Provide additional supply for the system once this well was looped to the North and connected to the existing EWC 12" mainline on Floating Feather Road. (This connection has yet to be made due to removal of the intended connection route from EWC's service area by the PUC.)

The Floating Feather 12" mainline is a major line to the higher East end of the service area.[3]

WaterCAD® Modeling

As with any computer modeling, there are often differences between data from a model and the actual workings of the system. We have compared the actual water system performance against the model results and are satisfied with the correlation.

Current Modeling Project

This modeling effort began during the fall of 2005 utilizing Haestad Methods' WaterCAD® v7.0 software. The model required the following input for analysis:

i. Horizontal and vertical geometry
ii. Water source information
iii. Water storage
iv. Pumping information
v. Consumption data
vi. Calibration
vii. Performance criteria

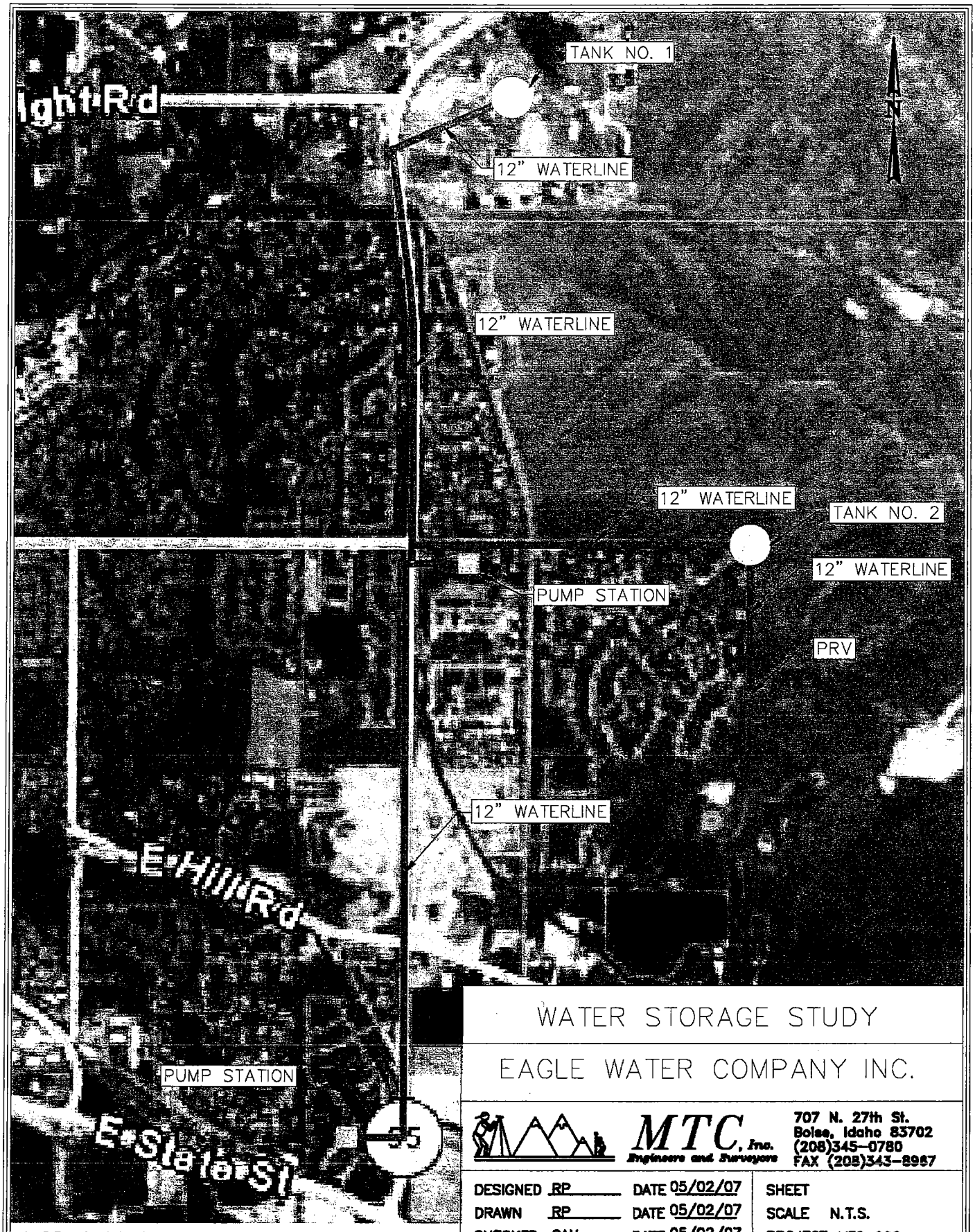
i.) Horizontal and vertical geometry was obtained from EWC and MTC Engineers. Pipe number and junction node numbers were then assigned to an AutoCAD® model. The model was then imported as the background layer of the WaterCAD® model and used as the guide for constructing the WaterCAD® model. Node elevations were obtained from existing record drawings and topographical mapping. System demands, water sources, and other controlling hydraulic features were incorporated within the model. This established the base model.

ii.) Water source for the EWC system is groundwater pumped from six wells. Information regarding the wells was obtained from the IDWR well logs, test pump records, EWC records, and MTC Engineers' records. This information includes well stratigraphy, depth, diameter, casing, screen placement, and pumping/drawdown data.

[3] The service area has an elevation difference of ~187 feet from its Western edge, West of Well No. 6 (elevation 2546 feet), to the East end of Big Springs Boulevard (elevation 2733 feet). This equates to a pressure difference of 81± psi.

From water consumption and production data, it was obvious that an additional water source was required and new Well #7 was drilled and constructed. The new Well #7 is located in the NE^4 of the SW^4 of Section 15, T.4N., R.1E., B.M., Ada County, Idaho. Well #7 has just recently been completed and put online during the course of completing this report. Well #7 was originally tested at 1350 gpm with 130 feet of drawdown. This was because the driller and test pumping company set the test pump at 160 feet. The production pump was installed at 200 feet. The well was later test pumped with the production pump at 1800 gpm with a total drawdown of 190 feet. It is anticipated that with additional testing and further development of the well, the capacity of the well could be increased.

iii.) Water storage for the system has been evaluated. The concept of utilizing a tank for a supplemental source when one of the wells is out of service was studied from several angles. The recommended storage capacity of one million gallons was used for the study. To be effective the tank must supply water to the highest service connection with the required working pressure of 40 psi. This would require the minimum operating water level of the tank to be 2840 feet or greater pending headlosses on transmission lines. The tank must be located outside the existing certificated area for proper elevation or EWC would need to construct an elevated tank. There are few, if any, locations available for the construction of an elevated tank and viewshed impacts would likely be a major problem. Two locations outside the service area were identified and evaluated for possible tank sitings. See the attached Water Storage Study map for locations. The first study area is near the Skateboard Park and the second is near the Northeast Corner of Sage Acres Subdivision, which are both located on Ada County property. To fill either of the tanks, a tank booster pump station would be required. The Skateboard Park location would require a pump station close enough to the source of supply that a single pipe could be constructed for the fill pipe. Pressure reducing valves would need to be installed on other lines in three places. A location for the pump station could be a problem. An estimated cost for the tank is $900,000. Piping would be another $168,000 to $336,000 depending on location. For evaluation comparison, a budget of $336,000 will be used for piping. The tank booster pump station would be equipped with duplex pumping and standby power for an estimated cost of $125,000. The pump building was estimated at another $60,000 to construct. (The cost for the Sage Acres location would be more than the Skateboard Park location.) The estimated total for the foregoing is $1,421,000. On the other hand, a new well and pump with backup power close to the existing 12" line is estimated at less than $800,000. Due to siting, easements, and economics concerns along with the need for an additional water supply in the near future; it was determined that a water storage facility would be nice but not a necessity.



MAPPING SOURCE: GOOGLE EARTH

WATER STORAGE STUDY

EAGLE WATER COMPANY INC.

MTC, Inc. Engineers and Surveyors
707 N. 27th St.
Boise, Idaho 83702
(208)345-0780
FAX (208)343-8957

DESIGNED	RP	DATE 05/02/07	SHEET
DRAWN	RP	DATE 05/02/07	SCALE N.T.S.
CHECKED	CAH	DATE 05/02/07	PROJECT MTC 002

iv.) Pump information was obtained from the pump identification plates, manufacturer's catalogues, well logs, test pump records, and EWC records. Pumping curves were either obtained from the manufacturer's pump performance curves or hand generated. EWC also provided information on the pump controller settings for the variable speed pumps (VSP) and the fixed speed pumps with on/off pressure settings.

v.) Consumption data for commercial and residential customers was provided by EWC. This data was used to assign proportional flows to each node within the model. A copy of this data is included in Appendix C. In addition to this information, EWC provided the total annual demand and the maximum day demand for the years 2003 through 2006 as shown below.

System Demand

Year	Annual Demand (gallons)	Date when Maximum Day Demand Occurred	Maximum Day Demand (gpd)
2003	675,334,680	7/13/03	4,647,000
2004	689,607,640	8/16/04	4,763,000
2005	624,127,005	7/17/05	5,180,000
2006	815,222,000	8/27/06	5,261,000

Annual demand data can fluctuate from one year to another. Some of the variables include weather variations, system improvements, and such things as a water service rate changes designed to encourage water conservation in high demand seasons. Typical variations may occur, for example see the 2005 data.

The average day demand is calculated based on annual production determined by meter readings. As previously noted, annual demand data may fluctuate from year to year. Thus the average day demand was calculated using the average from 2003 through 2006 as shown below.

Determination of Average Day Demand

Year	Annual Demand (gallons)	Account Total	Year Demand per Account (gallons)	Day Demand per Account (gpm)
2003	675,334,680	2,745	246,024	0.47
2004	689,607,640	2,888	238,784	0.45
2005	624,127,005	3,196	195,284	0.37
2006	815,222,000	3,261	249,991	0.48
			Average	**0.44**

The average day demand per account, shown in the table above in bold, was multiplied by the estimated account totals to project annual day demands for the different scenarios.

The maximum day demand is steadily increasing due to the increase in water accounts served. To determine the maximum day demand per account and if it's changing with time, the maximum day demand was divided by the number accounts for the years 2003 through 2006. The results are listed in the table below.

Maximum Day Demand

Year	Maximum Day Demand (gpd)	Account Total	Maximum Day Demand per Account (gpm)
2003	4,647,000	2,745	1.18
2004	4,763,000	2,888	1.15
2005	5,180,000	3,196	1.13
2006	5,261,000	3,261	1.12

The table shows a continual decrease with time for maximum day demand per account. In projecting future demands on the water system, it is conservatively assumed that each water account would have a maximum day demand of 1.12 gpm instead of following the downward trend.

The peak hour flow demand was determined from available flow data, industry references, and peaking factors used by local water systems. A list of some of the industry references and peaking factors from local water systems are shown below.

System Demand

Reference	Peaking Factor for Peak Hour Flow Demand
Dewberry and Davis Land Development Handbook	1.58
City of Eagle	1.50
Star Sewer and Water District's	1.45
City of Meridian Water Master Plan Update	1.38

After careful consideration and discussion with IDEQ (See Appendix D), it was agreed that a peaking factor of 1.50 be used from maximum day demand to peak hour flow. Thus, each water account would have a peak hour flow demand of 1.68 gpm (1.12 gpm*1.5). As part of the agreement of using a 1.5 peaking factor for peak hour flow, EWC will monitor the system for peak hour flow and maximum day demand this summer (2007) in order to validate the decision.

Furthermore, each water account was considered a dwelling unit (D.U.). Using the AutoCAD®/WaterCAD® model, each D.U. was assigned to a specific node and a flow demand according to each scenario.

vi.) Calibration of the model was verified comparing modeling results with actual fire hydrant flow test data. Fire hydrant flow test data is included in Appendix E. Two separate scenarios were used to verify that the model reflects actual field conditions. The scenarios were before and after Well #7 was put into service. The modeling output for calibration is included in Appendix F. The following tables show the results of the two scenarios.

Before Well #7 Hydrant Flow Summary

Location	Date	Time	Corresponding Junction	Pressure at 1500 gpm (psi)	Model Pressure at 1500 gpm (psi)
Big Springs/Sage Hollow	8/05/05	13:40 - 14:21	J-415	28	25
2528 East Sadie - Ringo	8/09/05	14:19 - 14:25	J-502	46	50
Ancona Business Park	11/16/04	13:53 - 14:02	J-623	76	73
Eagle River – S. Bridgeway	2/23/06	10:21 - 10:31	J-447	80	77
Rockie Mountain Business Park	2/10/06	10:42 - 10:51	J-398	83	86

After Well #7 Hydrant Flow Summary

Location	Date	Time	Corresponding Junction	Pressure at 1500 gpm (psi)	Model Pressure at 1500 gpm (psi)
HomeDepot	8/16/06	14:00 - 14:05	J-605	84	83
Big Springs & Prairie Eagle Springs	8/31/06	14:55 - 15:00	J-415	42	42
Edgewood & Clubhouse	8/31/06	15:16 - 15:24	J-116	53	50

As shown in the tables above, the model agrees with reasonable variance to measured field conditions. Varying pressure and flow availability within the system are likely when using data from different hours during the day, years, and seasons.

vii.) Performance criteria are listed in the general requirements for all public water systems found in the *Idaho Rules for Public Drinking Water Systems* (IRPDWS) and the *Recommended Standards for Water Works* (RSWW). Additional information supplementing the IRPDWS and RSWW was provided by Mr. Monty Marchus, P.E., IDEQ-Boise Office, in his Design File Notes (DFN) titled *Pressure Requirements-Public Water Systems* and *Design Flows-Public Water Systems*. Additional correspondence with IDEQ and an interpretation of rules is included in Appendix D. During these correspondences, the maximum day demand and the peak hour flow demand were agreed upon based on a system monitoring plan. Specific standards

(utilized in this modeling) establishing pressure, flow and redundancy requirements were obtained from *Idaho Rules for Public Drinking Water Systems (IRPDWS).* These standards require a minimum zone pressure of 20 psi during the maximum day demand plus fire flow scenario. The system also needs to meet the system wide operational pressure standards of 100 psi maximum and a minimum of 40 psi during normal operations and peak hour flow demand.

WaterCAD® Modeling Results

A computer model was setup to simulate the following: maximum day demand with fire flow and the peak hour flow demand under the existing 2006 Water System w/ Approved Developments, 2006 with Required Improvements, the projected 2010 Water System, and projected 2026 Water System. Each of these scenarios was run with Well #4 off and then Well #6 off per the General Design Conditions (Section 501.17.a). Since the water system is considered a pumping system and is not equipped with storage, the system is required to meet the maximum day demand plus fire flow conditions and the peak hour flow demand with the largest well out of service. Due to the nature of the water system, having multiple water sources and pressure zones, the system was modeled with Well #4 off and then Well #6 off to determine the sensitivity of the system to these water sources. As will be discussed later, the proposed Well #8 was used for modeling purposes only for the 2010 and 2026 modeling scenarios. Well #8 was used to allow additional flow to enter the water system. Increased flow may also be available through improvements to existing sources or a new source. For example, the pump and motor for Well #4 were recently rebuilt to factory specifications to increase flow availability. However, the revised pump curve for Well #4 was used only in the 2010 and 2026 scenarios due to the limited pumping data available from the rebuilt pump. In addition to Well #4, additional water supply may be available by modifications to Well #6, Well #7, and Well #2 Booster Pump Station.

Figures of the water system are shown in Appendix G. The Fire Marshal of Eagle Fire Department has informed MTC that the minimum fire flow requirements for one and two family dwellings having area less than 3,600 square feet shall be 1,000 gpm. Any structure requiring more than 1,000 gpm must be approved by the Fire Marshal and other means of protection may be required. A waiver was granted to Eagle Water Company if fire flow of 1000 gpm is maintained within the system under the maximum day demand scenario (for correspondence with the Fire Marshall, see Appendix H). However, for insurance rate purposes only, the model was setup to determine which residential fire hydrants do not have a 1,500 gpm fire flow while maintaining a minimum system pressure of 20 psi. In addition, all commercial accounts which have a fire flow availability of less than 2500 gpm were identified.

2006 Scenario w/ Approved Developments

The 2006 Scenario w/ Approved Developments includes the existing water system, Well #7 and related infrastructure along with the new St. Lukes Medical Center, Shadow View Subdivision, and Gladstone Subdivision approved developments.

The average daily flow and maximum day demand was determined using water data as discussed and reviewed by IDEQ (see Appendix D). A summary of the water demands that includes all scenarios is shown in the table below.

Projected Water Demand

Year	Average Daily Flow (gpm)	Maximum Day Flow (gpm)	Peak Hour Flow (gpm)
2006	1442.54[1]	3653.50[2]	5480.25[3]
2006 w/ Approved Developments	1501.37[1]	3801.28[2]	5701.92[3]
2006 w/ Required Improvements	1501.37[1]	3801.28[2]	5701.92[3]
2010	1704.42[1]	4315.36[2]	6473.04[3]
2026	1877.82[1]	4754.40[2]	7131.60[3]

1 Average Daily Flow = Average Day Demand per Account (0.44 gpm previously shown in "Determination of Average Day Demand" table) multiplied by the # of Accounts. The # of Accounts for the 2006 values was obtained from the "Maximum Day Demand" table on page 10 and the other values were obtained from the "Water Accounts Summary" table on page 19.

2 Maximum Day Flow was determined by recorded daily flows provided by EWC.

3 Peak Hour Flow = Maximum Day Flow multiplied by the 1.5 Peaking Factor.

Note that the 2006 projected water demand was included in the table for reference only. The one improvement made to the existing water system for modeling purposes was the replacement of a butterfly valve in Floating Feather Road with a pressure reducing/sustaining valve.

A summary of the modeling results for the maximum day demand plus fire flow are shown in the table below with all the wells in operation, then with Well #4 off, and then with Well #6 off. The modeling output for the maximum day demand plus fire flow is included in Appendix I. A figure showing the location of residential and commercial junctions is included in Appendix G.

2006 w/ Approved Developments Maximum Day Demand *Plus Fire Flow* Modeling Results

Scenario	Minimum System Working Pressure under Maximum Day Demand (psi)	Minimum Fire Flow Within the Water System for Residential Junctions (gpm)	# of Residential Junctions Below Fire Flow Availability of 1,000 gpm	# of Residential Junctions Below Fire Flow Availability of 1,500 gpm	Minimum Fire Flow Within the Water System for Commercial Junctions (gpm)	# of Commercial Junctions Below Fire Flow Availability of 2500 gpm
All Improvements On	44	1370	0	36	3191	0
Well #4 Off	41	974	5	57	1700	11
Well #6 Off	44	1061	0	49	2787	0

Note: Minimum system pressure of 20 psi or greater was maintained to determine fire flow availability per IRPDWS requirements.

The modeling results indicate the reliance of the water system on having all water sources available under maximum day demand plus fire flow. Figures are provided, in the modeling output located in Appendix I, identifying the fire hydrant flow availability under each scenario and junction pressure at maximum day demand.

For the "All Improvements On" analysis, there were 36 residential junctions identified that had fire flow availability less than 1500 gpm (but well within the exception approved by the Fire Marshall). From the Figure provided in Appendix I, the location of these residential junctions identified in green, are all located in the upper pressure zone. This indicates the limited pumping capacity of the Main Booster Pump Station to provide fire flow in the upper pressure zone.

For the "Well #4 Off" analysis, there are 5 residential junctions below the fire flow availability of 1000 gpm, 57 junctions below the fire flow availability of 1500 gpm, and 11 commercial junctions below a fire flow availability of 2500 gpm. Fire flow availability in the upper pressure zone is limited by the amount of water available for the Main Booster Pump Station due to suction pressure restraints. This indicates the reliance of the water system on having all water sources available under the maximum day demand plus fire flow demands.

For the "Well #6 Off" analysis, there were 49 residential junctions with an available fire flow below 1500 gpm. This also indicates the reliance of the water system on having all water sources available during the Maximum day demand plus fire flow demands, but identifies that the worst case scenario is when Well #4 is off.

A summary of the modeling result for peak hour flow demand is shown in the table below with all the wells in operation, then with Well #4 off, and then with Well #6 off. The modeling output for the peak hour flow demand is included in Appendix J.

2006 w/ Approved Developments Peak Hour Flow Demand Modeling Results

Scenario	Minimum System Working Pressure (psi)	# of Junctions below 40 psi	# of Junctions above 80 psi	Maximum System Working Pressure (psi)
All Improvements On	40	0	360	< 100
Well #4 Off	22	65	40	< 100
Well #6 Off	38	2	84	< 97

The results from the peak hour flow demand are similar to the maximum day demand plus fire flow. The system is very dependent on having each of the water sources working properly to maintain a system pressure above 40 psi. The system's worst case scenario is when Well #4 is off. A figure is provided, in the modeling output located in Appendix J, identifying the pressures within the system under each scenario for peak hour flow demand.

The results from modeling performed for the 2006 w/ Approved Development indicates the need for additional source capacity within the system. The current capacity of the existing 2006 Scenario w/ Approved Developments is limited due to the requirement of having one well out of service. As the figures in each scenario confirm, the Main Booster Pump Station limits the fire flow availability in the upper pressure zone. The most sever case is when Well #4 is turned off. This is due to the lack of available water and pressure on the suction side of the Main Booster Pump Station.

The main booster pump station is not presently equipped with enough capacity to utilize the combined flow from Well #4 and Well #7. However as previously stated, the pumping capacity of the Main Booster Pump Station is governed by the amount of available water when either of the wells is turned off. Because an additional source is being planned, the suction pressure will be raised and the need for upgrading the Main Booster Pump Station is removed. However, it is recommended that EWC work on providing pumping redundancy.

Well #4 pump and motor was recently rebuilt to increase water generation within the system. The revised pump curve has been used only in the 2010 and 2026 scenarios because of the limited field data.

Currently, the pumping capacity of Well #6 is limited due to the 100 psi maximum pressure requirement and the pressure loses between Well #6 and the rest of the water system.

By reducing the pressure loses between Well #6 and the rest of the water system, a greater flow is available without over pressuring the system or over utilization of the water source.

Also shown in the pump reports (under some of the scenarios), PMP 2.1-2.3 located in Booster Pump Station #2 are shown as being turned off. The model automatically turns pumps off when they cannot supply enough pressure to overcome the system working pressure. When the pressure is reduced within the system as shown when Well #4 is off, PMP 2.1-2.3 are actively pumping.

In summary, additional capacity may be available depending on location of proposed connection and /or modifications to pumping capacity of existing sources. Standby power and redundancy, or equivalent as provided in the rules, would be required for new facilities or full upgrades to existing facilities.

It is recommended that all proposed improvements be thoroughly investigated through modeling prior to approval. In addition, it is proposed that a water interconnect be constructed with either United Water or the City of Eagle and utilized until improvements identified in the 2010 Scenario are completed. The next scenario investigates the required improvements utilizing a water interconnect to bring the system in compliance and provide surplus capacity for potential development.

2006 Scenario with Required Improvements

For this scenario, the previous 2006 Scenario with Approved Developments was copied and system improvements were made to bring the entire water system into compliance. For projected water demand, see the Water Demand Table located in the 2006 w/ Approved Developments Scenario write-up.

System modifications are shown on figures included in Appendix G. Required modifications to bring the existing water system into compliance are listed below.

- Water Interconnect – Additional water supply through a system interconnect is currently being pursued with both United Water and the City of Eagle. The calculated hydraulic grade for the United Water Interconnect is 2807 feet and the City of Eagle Interconnect is 2840 feet. With the differences in hydraulic grades, the City of Eagle connection could feed the upper pressure zone which feeds the lower zone while the United Water connection could only feed the lower pressure zone. The worst case scenario for the water system would be to utilize the United Water Interconnect which has a lower hydraulic grade of 2807 feet feeding the lower pressure zone. The downstream pressure

setting of the valve would be 2786 feet which would rely on the Main Booster Pump Station to feed the upper pressure zone. As previously stated, it should be noted that Well #4 has recently been rebuilt to produce additional water. The additional pumping capacity was not included in this scenario due to the lack of pumping data.

- Floating Feather Road Pressure Reducing/Sustaining Valve – Currently a butterfly valve is used to regulate pressure between the upper and lower pressure zones. The addition of a pressure reducing/pressure sustaining valve is required to provide a more consistent hydraulic grade in the upper pressure zone.

A summary of the modeling result for maximum day demand plus fire flow is shown in the table below with all the wells in operation, then with Well #4 off, and then with Well #6 off. The modeling output for the maximum day demand plus fire flow is included in Appendix I. A figure showing the location of residential and commercial junctions is included in Appendix G.

2006 w/ Required Improvements Maximum Day Demand *Plus Fire Flow* Modeling Results

Scenario	Minimum System Working Pressure under Maximum Day Demand (psi)	Minimum Fire Flow Within the Water System for Residential Junctions (gpm)	# of Residential Junctions Below Fire Flow Availability of 1,000 gpm	# of Residential Junctions Below Fire Flow Availability of 1,500 gpm	Minimum Fire Flow Within the Water System for Commercial Junctions (gpm)	# of Commercial Junctions Below Fire Flow Availability of 2500 gpm
All Improvements On	44	1511	0	0	3419	0
Well #4 Off	42	1234	0	37	2588	0
Well #6 Off	44	1093	0	9	3208	0

Note: Minimum system pressure of 20 psi or greater was maintained to determine fire flow availability per IRPDWS requirements.

The modeling results for maximum day demand plus fire flow indicates that the recommended required improvements bring the water system into IRPDWS requirements. Figures are provided, in the modeling output located in Appendix I, identifying the fire hydrant flow availability and junction pressures for maximum day demand plus fire flow for each scenario.

A summary of the modeling result for peak hour flow demand is shown in the table below with all the wells in operation, then with Well #4 off, and then with Well #6 off. The modeling output for the peak hour flow demand is included in Appendix J.

2006 w/ Required Improvements Peak Hour Flow Demand Modeling Results

Scenario	Minimum System Working Pressure (psi)	# of Junctions below 40 psi	# of Junctions above 80 psi	Maximum System Working Pressure (psi)
All Improvements On	42	0	416	< 100
Well #4 Off	39.0	1, J-416	270	< 100
Well #6 Off	41	0	388	< 97

The results for peak hour demand indicate that the required improvements bring the water system into compliance with IRPDWS requirements. There is one junction J-416 below the 40 psi requirement. However, this is viewed as acceptable and within the limits of the model for such a complicated system. A figure is provided, in the modeling output located in Appendix J, identifying the pressures within the system under each scenario for peak hour demand.

The table below shows the flow and requirements needed from the water system interconnect to maintain a downstream pressure of 61.5 psi under the different scenarios.

2006 w/ Required Improvements Interconnect Water Source Requirements

Scenario	Maximum Day Demand Flow (gpm)	Maximum Day Demand Plus Fire Flow* (gpm)	Peak Hour Flow Demand Flow (gpm)
All Improvements On	184	1000	962
Well #4 Off	792	1714	1845
Well #6 Off	213	1062	1366

*These numbers were obtained manually by placing a fire flow demand of 1000 gpm within the model at junction J-280 to get an estimate. This should only be considered as an estimate.

In comparing the 2006 w/ Approved Developments modeling results to the 2006 w/ Required Improvements modeling results, a transformation is apparent.

With the addition of the water supply interconnect and the pressure reducing sustaining valve in Floating Feather Road, the water system has a capacity for additional residential and commercial connections. Each new connection should be carefully analyzed utilizing the model and engineering judgment to determine the effect on the water system and also the water interconnect.

2010 Scenario

Growth rates were estimated using the City of Eagle's population predictions and applied to EWC's water accounts. Currently, EWC has three types of water accounts; Residential,

Commercial, and Agricultural. The following table lists the current water accounts and the anticipated water accounts for 2010 and 2026.

Water Accounts Summary

Year	Residential Accounts	Commercial Accounts	Agricultural Accounts	Total Water System Accounts
2006 w/ Approved Developments	2,924	358	112	3,394
2010	3,333	408	112	3,853
2026	3,603	530	112	4,245

As the table above indicates, the assumption was used that growth will only occur in Residential and Commercial accounts. Agricultural accounts would conservatively remain constant even though Agricultural accounts will decrease as development occurs. In addition, the City of Eagle has a policy that all new development must be equipped with a pressurized secondary irrigation system utilizing existing irrigation water rights.

A planning unit was assigned for both residential and commercial growth. The residential planning unit for ultimate build-out was assumed at 2.25 D.U.s/acre. The available properties for development within the service area were evaluated and 301.6 acres were identified for potential residential growth. Using population projections from the City of Eagle and applying the growth rate to existing residential connections, a total of 409 residential D.U.s were estimated for the year 2010. These additional residential connections were evenly distributed among the potential residential growth areas of the service area. See figures located in Appendix G for further information. The resulting density was 1.36 D.U.s/acre, which indicates build-out would take place after the year 2010 and is estimated to occur in 2014 using the City of Eagle's population projections.

The commercial development planning unit can vary with end use. For planning purposes, a commercial development planning unit of 2.5 D.U.s/acre was used as ultimate build-out. Estimated additional commercial connections were determined by using the population projections from the City of Eagle and applying the growth rate to existing commercial connections. For the 2010 Scenario, an additional 50 commercial D.U.s was estimated above the 2006 w/ Approved Developments Scenario. Six commercial development parcels containing 162.2 acres were identified in the 20-year development window. For the 2010 Scenario (as shown in the figures located in Appendix G), the 50 commercial D.U.s were added to only development parcels #1 and #2. This is based on direct contact and correspondence with potential developers. The St. Lukes Medical Center was included in the 2006 w/ Approved Developments Scenario.

For projected water demand, see the Water Demand Table located in the 2006 w/ Approved Developments Scenario write-up.

System modifications are shown on figures included in Appendix G. Modifications to the model from the previous 2006 Scenario w/ Approved Developments are listed separately below. The proposed water interconnect must remain in place until the following improvements are implemented and the system is in compliance with IRPDWS requirements.

- Additional Water Source – Additional water supply was added to the lower pressure zone and designated as Well #8. This additional source may be obtained by improvements to existing water sources such as Well #3, Well #6, and/or Well #7 or construction of a new water source.
- Well #2 Booster Pump Station Modification – The model indicated that modification to the booster pumps in the Well #2 Booster Pump Station is required. For ease of modeling, the pump curves for PMP 2.1 and 2.2 were modified to add additional head and PMP 2.3 was turned off.
- Repairs to Well #4 – The pump and motor for Well #4 was recently rebuilt to manufacturer's specifications. The pump curve was replaced with the revised pumping curves provided by the manufacturer.

A summary of the modeling result for maximum day demand plus fire flow is shown in the table below with all the wells in operation, then with Well #4 off, and then with Well #6 off. The modeling output for the maximum day demand plus fire flow is included in Appendix I. A figure showing the location of residential and commercial junctions is included in Appendix G.

2010 Maximum Day Demand Plus Fire Flow Modeling Results

Scenario	Minimum System Working Pressure under Maximum Day Demand (psi)	Minimum Fire Flow Within the Water System for Residential Junctions (gpm)	# of Residential Junctions Below Fire Flow Availability of 1,000 gpm	# of Residential Junctions Below Fire Flow Availability of 1,500 gpm	Minimum Fire Flow Within the Water System for Commercial Junctions (gpm)	# of Commercial Junctions Below Fire Flow Availability of 2500 gpm
All Improvements On	43	1438	0	5	3637	0
Well #4 Off	43	1401	0	35	3108	0
Well #6 Off	43	1068	0	16	3465	0

Note: Minimum system pressure of 20 psi or greater was maintained to determine fire flow availability per IRPDWS requirements.

Figures are provided, in the modeling output located in Appendix I, identifying the fire hydrant flow availability and junction pressures at maximum day demand under each scenario. The modeling output for maximum day demand confirms the proposed system modifications, without utilizing the water interconnect, will bring the existing water system into compliance with IRPDWS requirements.

A summary of the modeling result for peak hour flow demand is shown in the table below with all the wells in operation, then with Well #4 off, and then with Well #6 off. The modeling output for the peak hour flow demand is included in Appendix J.

2010 Peak Hour Flow Demand Modeling Results

Scenario	Minimum System Working Pressure (psi)	# of Junctions below 40 psi	# of Junctions above 80 psi	Maximum System Working Pressure (psi)
All Improvements On	42	0	443	< 100
Well #4 Off	39.6	1, J-416	326	< 100
Well #6 Off	42	0	429	< 99

A figure is provided, in the modeling output located in Appendix J, identifying the pressures within the system under each scenario for peak hour demand. There is one junction J-416 which is below the 40 psi requirement. However, this is viewed as acceptable and within the limits of the model for such a complicated system. The modeling output for peak hour demand confirms the proposed system modifications, without utilizing the water interconnect, will bring the existing water system into compliance with IRPDWS requirements.

The table below shows the flow and head requirements for additional water supply under the different scenarios.

2010 Maximum Day Demand Additional Water Source Requirements

Scenario	Maximum Day Demand		Maximum Day Demand Plus Fire Flow*		Peak Hour Flow Demand	
	Flow (gpm)	Pump Head (ft)	Flow (gpm)	Pump Head (ft)	Flow (gpm)	Pump Head (ft)
All Improvements On	894	361	1411	361	1018	365
Well #4 Off	2120	371	2330	366	2350	359
Well #6 Off	758	361	1318	361	1096	365

*These numbers were obtained manually by placing a fire flow demand of 1000 gpm within the model at junction J-628 to get an estimate. Thus, this should only be considered as a good estimate and is specific the location and hydraulic characteristics used for Well #8.

With the addition of the new water supply in the 2010 Scenario and the other proposed improvements, the system has a capacity for an estimated additional 444 residential connections and 148 commercial connections.

2026 Scenario

As previously discussed growth rates were estimated using the City of Eagle's population predictions and applied to EWC's water accounts. See Water Accounts Summary Table located in the 2010 Scenario write-up.

A planning unit was assigned for both residential and commercial growth. The residential planning unit for ultimate build-out was assumed at 2.25 D.U.s/acre. The available properties for development within the service area were evaluated and 301.6 acres were identified for potential residential growth. Using population projections from the City of Eagle and applying the growth rate to existing residential connections, build-out of 679 residential D.U.s would occur in 2014. These additional residential connections were evenly distributed among the potential residential growth areas of the service area for the ultimate build-out scenario. See figures located in Appendix G for further information.

The commercial development planning unit can vary with end use. For planning purposes, a commercial development planning unit of 2.5 D.U.s/acre was used as ultimate build-out. Estimated additional commercial connections were determined by using the population projections from the City of Eagle and applying the growth rate to existing commercial connections. For the 2026 Scenario, an additional 172 commercial D.U.s was estimated above the 2006 w/ Approved Developments Scenario. See figures located in Appendix G for more details. Six commercial development parcels containing 162.2 acres were identified in the 20-year development window excluding the St. Lukes Medical Center. The 2026 density is therefore 1.06 D.U.s/acre. Build-out is estimated beyond the 20-year projection.

For projected water demand, see Water Demand Table located in the 2006 w/ Approved Developments Scenario write-up.

System modifications are shown on figures included in Appendix G. Modifications to the model from the previous 2010 Scenario are listed separately below.

- West Enchantment Street, West Cobblestone Way, and West Yellowstone Street Piping Interconnect – The capacity of Well #6 is not optimized throughout the water system due to pressure restraints and pressure losses within the system. The original idea was to interconnect Well #6 with the main trunk line in Floating Feather Road. Due to the

prevention of EWC service to the Covenant Hills Subdivision, the original idea is no longer feasible. This leaves the construction of the piping interconnect as the next preferred option. As development occurs, this interconnect should be constructed as part of the infrastructure.

A summary of the modeling results for maximum day demand plus fire flow is shown in the table below with all the wells in operation, then with Well #4 off, and then with Well #6 off. The modeling output for the maximum day demand plus fire flow is included in Appendix I. Figures are provided, in the modeling output located in Appendix I, identifying the fire hydrant flow availability and junction pressure under maximum day demand under each scenario. A figure showing the location of residential and commercial junctions is included in Appendix G.

2026 Maximum Day Demand Plus Fire Flow Modeling Results

Scenario	Minimum System Working Pressure under Maximum Day Demand (psi)	Minimum Fire Flow Within the Water System for Residential Junctions (gpm)	# of Residential Junctions Below Fire Flow Availability of 1,000 gpm	# of Residential Junctions Below Fire Flow Availability of 1,500 gpm	Minimum Fire Flow Within the Water System for Commercial Junctions (gpm)	# of Commercial Junctions Below Fire Flow Availability of 2500 gpm
All Improvements On	43	1397	0	34	3659	0
Well #4 Off	43	1332	0	37	3226	0
Well #6 Off	43	1389	0	35	3460	0

Note: Minimum system pressure of 20 psi or greater was maintained to determine fire flow availability per IRPDWS requirements.

The modeling output for each scenario for the maximum day demand indicates the water system is in compliance with IRPDWS requirements.

A summary of the modeling results for peak hour flow demand is shown in the table below with all the wells in operation, then with Well #4 off, and then with Well #6 off. The modeling output for the peak hour flow demand is included in Appendix J.

2026 Peak Hour Flow Demand Modeling Results

Scenario	Minimum System Working Pressure (psi)	# of Junctions below 40 psi	# of Junctions above 80 psi	Maximum System Working Pressure (psi)
All Improvements On	42	0	425	< 100
Well #4 Off	39.3	1, J-416	296	< 100
Well #6 Off	41	0	409	< 98

A figure is provided, in the modeling output located in Appendix J, identifying the pressures within the system under each scenario for peak hour demand. There is one junction J-416 which is below the 40 psi requirement. However, this is viewed as acceptable and within the limits of the model for such a complicated system. The modeling output for each scenario for the peak hour demand indicates the water system is in compliance with IRPDWS requirements.

The table below shows the flow and head requirements from additional water source under the different scenarios.

2026 Maximum Day Demand Additional Water Source Requirements

Scenario	Maximum Day Demand		Maximum Day Demand Plus Fire Flow*		Peak Hour Flow Demand	
	Flow (gpm)	Pump Head (ft)	Flow (gpm)	Pump Head (ft)	Flow (gpm)	Pump Head (ft)
All Improvements On	730	363	1584	363	1444	368
Well #4 Off	1809	370	2338	363	2361	355
Well #6 Off	684	363	1547	363	1688	368

*These numbers were obtained manually by placing a fire flow demand of 1000 gpm within the model at junction J-628 to get an estimate. Thus, this should only be considered as a good estimate.

With the addition of 2365 gpm of new water source in the 2026 Scenario and the other proposed improvements, the system has a capacity for complete build-out for residential connections and the estimated 260 commercial connections.

Recommendations

The recommendations have been divided into the following categories: Mandatory, Future, Suggested, and Completed Actions. Mandatory Actions are those immediately required to bring the system into compliance with regulations. Future Actions are recommendations required to support future development. Suggested Actions are items that would optimize the water system but are not required. Completed Actions are recent improvements that have been beneficial to the current water system. For ease of implementation and organization, the action categories have been divided into two subcategories: (1) planning items and (2) construction projects.

MANADATORY ACTIONS

PLANNING ITEMS

A list of MANDATORY planning items to bring the water system into compliance is as follows:

- None

CONSTRUCTION PROJECTS

The following list of MANDATORY construction projects along with their construction priority has been developed to increase the service pressure, available fire flow, and water supply within the water system. However, the 2006 Approved Development analysis identified improvement project-related deficiencies within the existing water system. As the model results indicated, the maximum day demand plus fire flow, with Well #4 off, identified 5 residential junctions in the upper pressure zone with fire flow availability less than 1000 gpm and the minimum fire flow for commercial junctions of 1668 gpm. The peak hour demand indicated that the pressure dropped below 40 psi when Well #4 off and then again when Well #6 is off. The results for the 2006 Approved Development indicate the need for the following list of Mandatory construction projects to bring the water system into compliance with IRPDWS requirements.

Priority #	Date	Description	Cost Estimate
1	(2007-2008)	Water Interconnect Interconnect water systems with either United Water or City of Eagle for emergency flow redundancy. The United Water interconnect should be made on Floating Feather Road just downstream of the proposed PRSV to feed the lower pressure zone. The United Water Interconnect should be designed to produce 1845 gpm at 61.5 PSI. The City of Eagle interconnect should be made upstream of the proposed PRSV to feed the upper pressure zone. This interconnect should be designed to produce 1845 gpm at 74 PSI. Cost estimate is for United Water Interconnect as modeled in the report and would require a traffic rated vault, miscellaneous valves, flow meter, and appurtenances.	$151,250

Cost Itemization

Construction		$ 125,000
Engineering (12%)		$ 12,500
	Subtotal	$ 137,500
	Contingency (10%)	$ 13,750
	Total	$ 151,250

Timeline Overview

Design	July 2007
Permitted	September 2007
Construction	December 2007

2 (2007) Install PRSV on Floating Feather Road $43,120

Replace existing throttling valve with a pressure reducing/sustaining valve. In the water model, the upstream pressure setting was set at 72.5 psi and downstream pressure remained near 55 psi.

Cost Itemization

Construction		$ 35,000
Engineering (12%)		$ 4,200
	Subtotal	$ 39,200
	Contingency (10%)	$ 3,920
	Total	$ 43,120

Timeline Overview

Design	July 2007
Permitted	August 2007
Construction	December 2007, Will be installed during low flow conditions.

FUTURE ACTIONS

PLANNING ITEMS

A list of FUTURE planning recommendations is as follows:

- None

CONSTRUCTION PROJECTS

The list below is for Future construction projects which have been selected to able the water system to service the anticipated growth and also eliminate reliance on the proposed water interconnect.

Priority #	Date	Description	Cost Estimate
1	(2008-???*)	New Water Source	$898,040

There are two viable options to increase the available water supply within the water system. The first option would be to renovate existing water sources for additional supply and equip these sources with emergency backup power. The second option would be to drill and construct new water source which would be equipped with emergency backup power. As previously stated, the water requirement of 2365 gpm is required for the 2010 and 2026 Scenarios. This item also includes associated piping ($35/ft at 1350 ft) and land ($150,000).

Cost Itemization

Construction		$ 785,000
Engineering (4%)		$ 31,400
	Subtotal	$ 816,400
	Contingency (10%)	$ 81,640
	Total	$ 898,040

Timeline Overview

Siting	October 2007
Design	February 2008
Permitted	October 2008
Construction	December 2008

* The questions marks for the completion date indicate the uncertainty associated with siting and permitting a new water source.

2	(2008-2009)	Well #2 Booster Pump Station Modification	$38,115

Increase the pumping head in Booster Pump Station #2 by replacing existing pumps with pumps that produce a combined flow 640 gpm at 148' TDH. This will enable the use of the 90,000 gallon Well #2 water

storage tank to attenuate the peak demand on the water sources. The model was setup with two pumps in operation for convenience only. Any major pump modifications made will require the pumping station to be equipped with redundant pumping capacity. It should be designed with either a duplex pumping station with equal sized pumps or a triplex pumping station with two identical smaller pumps and a jockey pump meeting the required flow and head parameters.

Cost Itemization

Construction		$ 31,500
Engineering (10%)		$ 3,150
	Subtotal	$ 34,650
	Contingency (10%)	$ 3,465
	Total	$ 38,115

Timeline Overview

Design	March 2008
Approval	July 2008
Construction	November 2008

(As Developed)

West Enchantment Street, West Cobblestone Way, and West Yellowstone Street Piping Interconnect $30/ft @ 3,740 ft plus Bore & Jack $50,000, ... $253,616

Increase the capacity of fire flow near Well #6 when it is off line. It should be a requirement of the developer of residential parcel #2 to make the looped connection including the bore and jack under the canal. The cost should be split between the developer and EWC.

Cost Itemization

Construction		$ 209,600
Engineering (10%)		$ 20,960
	Subtotal	$ 230,560
	Contingency (10%)	$ 23,056
	Total	$ 253,616

Timeline Overview – Will be development driven.

SUGGESTED ACTIONS

PLANNING ITEMS

A list of SUGGESTED planning recommendations is as follows:

- Provide notification to users in the upper pressure zone that the Main Booster Pump Station is not equipped with backup emergency power or a redundant pump. This could result in temporary loss of pressure during power outages or pump failure.
- EWC will keep the City of Eagle's plumbing inspectors informed of areas within the service area that have service pressures greater than 80 psi. A figure identifying junctions which have service pressure greater than 80 psi under any of the scenarios is included in Appendix K.
- All new construction within the 80 psi or greater pressure areas will have a recommendation to be equipped with a individual pressure reducing valve along with a thermal expansion tank.
- All new subdivisions, if possible, should be a looped system.
- Minimum 8" waterlines in residential areas and 12" waterlines in commercial areas.
- No booster pumps should be connected to the water system unless they are owned and operated by EWC and any currently unauthorized pumps should be removed, per *Recommended Standards for Water Works, 2003 (Ten States Standards).*
- As development occurs around existing subdivisions, it should be required, to connect to the existing subdivisions creating piping loops within the water system. Multiple existing subdivisions are being serviced from one feed line, thus limiting fire flow availability and a redundant water supply.
- All proposed developments should require a fee for a water model analysis prior to approval. It is suggested that developers be required to submit electronic copies of plans to be integrated into the water model for preliminary plat review.

CONSTRUCTION PROJECTS

A list of Suggested construction projects have been developed for operational purposes for the water system.

Priority #	Date	Description	Cost Estimate

1 (N/A) Pump Redundancy for the Main Booster Pump Station..... $51,744

Provide pumping redundancy through either a water system interconnect to the upper pressure zone (the City of Eagle Water Interconnect) or an additional pump in the Main Booster Pump Station.

Cost Itemization

Construction		$ 42,000
Engineering (12%)		$ 5,040
	Subtotal	$ 47,040
	Contingency (10%)	$ 4,704
	Total	$ 51,744

Timeline Overview

Design	2 Months
Permitted	1 Month
Construction	1 Month, during a low demand period.

2 (N/A) Install Recording Flow Monitors $47,080

Install recording flow meters on Well #4, Well #7, Well #6, Well #1, Main Booster Pump Station, and Booster Pump Station #2.

Cost Itemization

Construction		$ 42,000
Engineering (Specs Only)		$ 800
	Subtotal	$ 42,800
	Contingency (10%)	$ 4,280
	Total	$ 47,080

Timeline Overview

Design	2 Months
Permitting	2 Months
Construction	3 Months

COMPLETED ACTIONS

PLANNING ITEMS

A list of COMPLETED planning recommendations is as follows:

- Planning and implementation of Well #7.

CONSTRUCTION PROJECTS

A list of Completed construction projects performed by EWC in an effort to increase source availability within the water system is provided below.

Priority #	Date	Description	Cost Estimate
Completed	(2006)	New Water Source – Well #7 (Constructed and Online)	$638,600

Construct new water source and associated piping with emergency backup power supply. (Per EWC's understanding of the consent order, EWC must indicate what specific actions are required to bring the water system into compliance. Additional source was determined the #1 priority and Well #7 and interconnect listed below was construction. Therefore, it is included as our #1 priority for improvement).

Cost Itemization

Construction	$ 620,000
Engineering	$ 18,600
Total	$ 638,600

Timeline Overview - Completed

Completed	(2006)	Well #7 Interconnect (Constructed and Online)	$153,300

Construct new transmission piping from Well #7 to existing piping along Eagle Bypass.

Cost Itemization

Construction	$ 146,000
Engineering	$ 7,300
Total	$ 153,300

Timeline Overview - Completed

Completed (2007) Repair Well #4 ..... $56,100

Well #4 is currently being rebuilt to provide additional water source. The reconditioned pump will be online prior to summer demand of 2007.

Cost Itemization

Construction		$ 51,000
	Subtotal	$ 51,000
	Contingency (10%)	$ 5,100
	Total	$ 56,100

Costs are estimates only and because final billing has yet to be received and finalized.

Timeline Overview - Completed

Financial Plan

The following calculations have been prepared by Geneva Trent, CPA, for Eagle Water Company, Inc. Eagle Water Company intends to file an Application with the Idaho Public Utilities Commission (IPUC) to finance the recommended system improvements, as needed. If the system improvements and related surcharges are approved by the IPUC, Eagle Water would seek commercial financing for the projects and the borrowed funds would then be repaid through a surcharge on customers' usage.

The attached surcharge calculations indicate the percentage that Eagle Water's customers might be required to pay over-and-above current water rates, for the various recommended improvements, if approved by the IPUC.

Eagle Water has been ordered by the IPUC to submit an Application for financing necessary systems improvements by July 15, 2007. Eagle Water is prepared to do so immediately upon DEQ's acceptance of its Preliminary Engineering Report.

Eagle Water Company

Calculation of Surcharge Amounts for Proposed Improvements
at June 10, 2007

MANDATORY ACTIONS – Construction Projects:

Priority #1 - Water Interconnect

Cost of Priority 1		$ 151,250.00	
Estimated bank loan fees		1,500.00	
Amount Financed		$ 152,750.00	
Term (estimated)		5 years	
Interest Rate		9.50%	
Monthly Payments Required		$ 3,208.00	(approximate)
Annual Cash Required		$ 38,496.00	
Multiplied by Gross-up	(from below)	127.88%	
Total Annual Surcharge		$ 49,228.68	
Divided by Total Annual Revenue		$ 729,590.00	(2006 revenues)
Surcharge		6.747%	

2006 Customers	Revenues	Percent of Total
Residential	$ 542,947.52	74.42%
Commercial	186,642.53	25.58%
Totals	$ 729,590.05	100.00%

Calculation of Gross-Up Factor for Taxes:

1)	100.00%	taxable	
2)	8.00%	State Tax Rate	
3)	92.00%	Federal Taxable	
4)	13.80%	Effective Federal Tax Rate	(Federal Rate 15%)
5)	21.80%	Composite Tax Rate	2) + 4)
6)	78.20%	Net After Tax Income	
7)	127.88%	Gross-up Factor	

Priority #2 - Install PRSV on Floating Feather Road

Cost of Priority 2	$ 43,120.00		
Estimated bank loan fees	400.00		
Amount Financed	$ 43,520.00		
Term (estimated)	1 year		
Interest Rate		9.50%	
Monthly Payments Required	$ 3,816.00		(approximate)
Annual Cash Required	$ 45,792.00		
Multiplied by Gross-up		127.88%	
Total Annual Surcharge	$ 58,558.81		
Divided by Total Annual Revenue	$ 729,590.00		(2006 revenues)
Surcharge		8.026%	

FUTURE ACTIONS - Construction Projects:

Priority #1 - New Water Source

Cost of Priority 1	$ 898,040.00		
Estimated bank loan fees	9,000.00		
Amount Financed	$ 907,040.00		
Term (estimated)	10 years		
Interest Rate		9.50%	
Monthly Payments Required	$ 11,737.00		(approximate)
Annual Cash Required	$ 140,844.00		
Multiplied by Gross-up		127.88%	
Total Annual Surcharge	$ 180,111.31		
Divided by Total Annual Revenue	$ 729,590.00		(2006 revenues)
Surcharge		24.687%	

Priority #2 - Well #2 Booster Pump Station Modification

Cost of Priority 2	$ 38,115.00		
Estimated bank loan fees	400.00		
Amount Financed	$ 38,515.00		
Term (estimated)	1 year		
Interest Rate		9.50%	
Monthly Payments Required	$ 3,377.00		(approximate)
Annual Cash Required	$ 40,524.00		
Multiplied by Gross-up		127.88%	
Total Annual Surcharge	$ 51,822.09		
Divided by Total Annual Revenue	$ 729,590.00		(2006 revenues)
Surcharge		7.103%	

SUGGESTED ACTIONS - Construction Projects:

Priority #1 - Pump Redundancy for the Main Booster Pump Station

Cost of Priority 1	$ 51,744.00		
Estimated bank loan fees	500.00		
Amount Financed	$ 52,244.00		
Term (estimated)	2 years		
Interest Rate		9.50%	
Monthly Payments Required	$ 2,400.00		(approximate)
Annual Cash Required	$ 28,800.00		
Multiplied by Gross-up		127.88%	
Total Annual Surcharge	$ 36,829.44		
Divided by Total Annual Revenue	$ 729,590.00		(2006 revenues)
Surcharge		5.048%	

Priority #2 - Install Recording Flow Monitors

Cost of Priority 2	$ 47,080.00		
Estimated bank loan fees	450.00		
Amount Financed	$ 47,530.00		
Term (estimated)	1 year		
Interest Rate		9.50%	
Monthly Payments Required	$ 4,167.60		(approximate)
Annual Cash Required	$ 50,011.20		
Multiplied by Gross-up		127.88%	
Total Annual Surcharge	$ 63,954.32		
Divided by Total Annual Revenue	$ 729,590.00		(2006 revenues)
Surcharge		8.766%	

EAG-W-07-02

THE FINAL ENGINEERING REPORT FOR EAGLE WATER CO. IS VOLUMINOUS AND THE APPENDICES WERE NOT SCANNED; SEE ORIGINAL FILE FOR THE COMPLETE REPORT