

**ENVIRONMENTAL ASSESSMENT REPORT
EMIGRATION IMPROVEMENT DISTRICT
WATER SYSTEM PROJECT**

**FEDERAL SRF LOAN PROGRAM
PROJECT NUMBER 3810-3AD8-3F011**

Prepared for:

**Division of Drinking Water
Department of Environmental Quality, State of Utah
150 North 1950 West, P.O. Box 144830
Salt Lake City, Utah 84114-4830
Phone: (801) 536-4200**

August 2002

TABLE OF CONTENTS

	PAGE
TABLE OF CONTENTS	
LIST OF TABLES	
LIST OF ITEMS IN APPENDIX	
SECTION I – INTRODUCTION	1
PROJECT IDENTIFICATION	1
COMMENT PERIOD	1
BACKGROUND.....	2
PROJECT NEED AND DEVELOPMENT.....	4
PROJECT PLANNING AREA.....	5
AUTHORITY	6
PUBLIC PARTICIPATION	6
SECTION II - PROJECT NEED	8
WATER QUALITY AND QUANTITY	8
Water Quality	8
Water Quantity.....	8
WATER STORAGE	9
Existing Water Storage	9
Water Storage Demands.....	9
WATER SOURCES.....	9
Existing Water Sources.....	9
Source Capacity and System Demands.....	10
WATER DISTRIBUTION	12
Existing Water Distribution System	12
Water Distribution Demands	12
SECTION III - AFFECTED ENVIRONMENT/ENVIRONMENTAL CONSEQUENCES	13
FLOOD PLAINS	14
Affected Environment.....	14
Environmental Consequences	14
Mitigation	15
WETLANDS	15
Affected Environment.....	15
Environmental Consequences	15
Mitigation	15
CULTURAL RESOURCES	15
Affected Environment.....	15
Environmental Consequences	16
Mitigation	16
BIOLOGICAL RESOURCES	16
Affected Environment.....	16
Fisheries Resources.....	16
Threatened, Endangered, or Sensitive Species and Vegetation Impacts.....	17
Vegetational Impacts.....	17
Brigham Fork Well.....	20

Burr Fork Creek Water Line Crossing	20
Environmental Consequences	20
Fisheries Resources.....	20
Threatened, Endangered, and Sensitive Species	22
Vegetational Impacts.....	22
Brigham Fork Well.....	22
Burr Fork Creek Water Line Crossing.....	23
Summary	23
Purpose of the SCA Permitting Process	24
Stream Flow Measurements	24
Investigation of Construction Activities Prior to Completion of Environmental Process	24
Justification of the District for Constructing the Crossing Prior to Completion of EA Process.....	25
Response by Division of Drinking Water to the District's Justification.....	26
Drinking Water Board Action.....	27
Mitigation – Threatened, Endangered and Other Sensitive Species.....	27
Aquatic and Terrestrial Wildlife	28
Vegetation Impact	28
Brigham Fork Well.....	29
Burr Fork Water Line Crossings	29
Meeting to Determine Environmental Damage from Construction Would be Corrected	29
Literature Cited.....	30
PRIME AND IMPORTANT FARMLAND	30
Affected Environment.....	30
Environmental Consequences	30
Mitigation	30
AIR QUALITY	30
Affected Environment.....	30
Environmental Consequences	30
Mitigation	30
SECTION IV - PROPOSED PROJECT AND ALTERNATIVES	31
ALTERNATIVE #1 - No Action	31
ALTERNATIVE #2 - City Water Source: Total Canyon	31
ALTERNATIVE #3 - Local Sources: Canyon-Wide Water System	32
ALTERNATIVE #4 - Requested Water Service System.....	32
SELECTED ALTERNATIVE	33
PRELIMINARY COST ESTIMATE.....	33

LIST OF TABLES

NO.	TITLE	
II-1	EXISTING AND POTENTIAL WATER SOURCES	10
III-1	STATE LISTED TES SPECIES	17
III-2	OBSERVED WILDLIFE	18
III-3	RIPARIAN AND UPLAND OAK BRUSH VEGETATION	19
IV-1	ESTIMATED SYSTEM EXPANSION PROJECT COSTS	33
IV-2	ALLOCATED CONSTRUCTION COSTS	35
IV-3	SERVICE AREA ESTIMATED MONTHLY BILL	37
IV-4	ESTIMATED REVENUE SOURCES FOR THE PROJECT	38

LIST OF ITEMS IN APPENDIX A

FIGURE 1 - PROPOSED WATER SYSTEM

FIGURE 2 - PROTECTION ZONES FOR FREEZE CREEK WELLS 1 AND 2 AND BRIGHAM FORK WELL

PUBLIC HEARING MINUTES (AUGUST 30, 2001)

BOARD OF TRUSTEE MEETING MINUTES (SEE DISTRICT WEB PAGE
www.emigrationcanyon.org)

TWO STREAM ALTERATION PERMITS

LETTERS TO AND FROM CROSS-CUTTER AGENCIES AND OTHER RELATED
CORRESPONDENCE

TECHNICAL MEMORANDUM – HYDROGEOLOGY AND POTENTIAL IMPACT TO STREAM
FLOWS FROM PROPOSED WELL DRILLING

TECHNICAL MEMORANDUM - REVIEW OF EMIGRATION CANYON BIOLOGY AND
POTENTIAL IMPACTS OF PROPOSED WATER DEVELOPMENT

EMIGRATION IMPROVEMENT DISTRICT ECONOMIC ANALYSIS FOR IMPOSITION OF
IMPACT FEES FOR WATER SYSTEM FACILITIES EXPANSION

EMIGRATION IMPROVEMENT DISTRICT RESOLUTION ENACTING AMENDED IMPACT
FEE RULES AND REGULATIONS GOVERNING THE IMPOSITION OF IMPACT FEES AND
APPEAL PROCEDURES FOR THE REVIEW OF CONTESTED IMPACT FEES

EMIGRATION IMPROVEMENT DISTRICT DRAFT POLICY FOR THE ENACTMENT OF
RULES AND REGULATIONS GOVERNING WATER RIGHT CAPACITY REQUIREMENTS

UTAH OPEN LANDS CORRESPONDENCE

LIST OF ITEMS IN APPENDIX B

STREAM ALTERATION PERMIT

COMMENT LETTER FROM US DEPARTMENT OF THE INTERIOR FISH AND WILDLIFE SERVICE

COMMENT E-MAIL LETTER FROM DIVISION OF WILDLIFE RESOURCES

MINUTES TO MARCH 7, 2002 PUBLIC HEARING

MINUTES OF MARCH 18, 2002 BOARD OF TRUSTEES MEETING

EID BOARD OF TRUSTEES FISHERY PRESERVATION RESOLUTION

PUBLIC COMMENT LETTERS

DESIGN SEED MIX

STREAM FLOW MEASUREMENTS

SECTION I

INTRODUCTION

I. PROJECT IDENTIFICATION

Loan Applicant: Emigration Improvement District
C/o Fred A. Smolka, Manager
PO Box 58945
Salt Lake City, UT 84158

Funding Authority: Drinking Water Board, State of Utah

Funding Program: Federal State Revolving Fund (SRF) Loan Program
Project Number: 3810-3AD8-3F011

Funding Amount: \$1,400,000 Loan from Drinking Water Board *¹
\$ 865,516 Matching Funds by District

\$2,265,516 Total Estimated Cost of Project

*¹ **NOTE:** The Drinking Water Board (Board) approved \$1,846,000 in funding. However, the Emigration Improvement District has said it will borrow less money than this in order to reduce the obligations of individual residents.

This Draft Environmental Assessment (EA) Report presents a summary of the work and determinations made of the potential environmental impacts of the proposed construction project. Carollo Engineers, PC prepared the early versions of this report. The Emigration Improvement District (District) provided a lot of the information to Carollo Engineers. However, the Division of Drinking Water (Division), Department of Environmental Quality (DEQ), State of Utah has significantly edited the report. Some of the changes are a result of conclusions drawn by the Division that are different from previous conclusions, input from the public, and construction activities undertaken by the District prior to completion of the environmental review process. **A report of each of the aforementioned construction activities and actions taken by the Division can be found in sub-sections of Section III, titled “Brigham Fork Well” and “Burr Fork Creek Waterline Crossing”.**

COMMENT PERIOD

Generally, the public and other interested parties have 30 days to respond to a *DRAFT* Environmental Assessment (EA) Report once a Finding of No Significant Impact (FONSI) has been issued and published. At the end of the public respond period, comments by the public and other interested parties are reviewed and evaluated. If it were decided that the information given and the determinations made are sufficiently accurate and appropriate, then the draft report

would become a final report. Copies of the *Draft* EA Report will be provided to several cross cutter agencies and the USEPA. Any of these agencies may have comments about the report. The FONSI was published Sunday, June 2, 2002 in the Public Notice Section of the Deseret News. No administrative action will be taken for at least thirty (30) days following that publication. The USEPA said it will review the report to see if the State of Utah has taken appropriate action in response to the construction work performed by the Emigration Improvement District before the environmental review had been completed for the project. For more information regarding the preparation and content of these documents contact:

Kenneth E. Wilde
Division of Drinking Water
Department of Environmental Quality, State of Utah
150 North 1950 West, P.O. Box 144830
Salt Lake City, Utah 84114-4830
Phone: (801) 536-4200 or 536-0048

BACKGROUND

Emigration Canyon is located on the western slopes of the Wasatch Mountain range perpendicular to the east boundary of Salt Lake City. The Emigration Improvement District (EID), formed in 1968 to provide water and sewer service to residents of Emigration Canyon, encompasses the canyon drainage from the Salt Lake City boundary easterly. However, the District currently provides water services only to the Emigration Oaks Subdivision, which is located on the northerly side of the canyon. Residents of Emigration Place receive water services from Salt Lake City.

All other existing residents get their water through individual wells and several small water-distribution systems supplied from wells and springs. Wastewater is treated independently by homeowners by individual septic tanks and drain fields. Salt Lake County provides flood control and garbage services and maintains the single two-lane highway up the canyon.

The concept of a Canyon-Wide Water System for Emigration Canyon has been discussed since 1968. However, to date, one has never been fully developed because canyon residents have been concerned that a Canyon-Wide Water System would only increase the potential for development and create an adverse impact on the natural resources within the canyon. Several years ago a canyon-wide bond resolution failed to pass. Some canyon residents have continued to resist a canyon-wide water system, but housing development has proceeded in the canyon in spite of the lack of a canyon-wide water system. An increased number of small residential wells have been developed, and water resources in the canyon are being used up without adequate control that a water system would provide.

EID has made a conscious decision to respond to requests of certain residents and take a proactive approach to expanding the Emigration Oaks water system. The District believes that any water system improvements or expansions made in the Canyon should be engineered to be useable in a potential canyon-wide system and that a master plan for the entire Canyon should be created and periodically updated to accommodate this goal. Those who favor a canyon-wide water system argue that the District could better preserve and utilize water resources, protect

natural streams that flow within the canyon and provide a more reliable and sanitary water system for all residents in the canyon. EID's perspective is that in the past, residents have resisted development within the canyon and the development has proceeded despite the resistance. Therefore, EID determined that it was better to be proactive and begin development of a Water System Plan in an effort to better manage and control its water resources.

In 1998, the Boyer Company and Freeze Creek Water Company (owners of the Emigration Oaks Water System) approached the EID board about EID acquiring the water system that serves Emigration Oaks. The acquisition was negotiated and EID began to operate the Emigration Oaks water system in June 1998. Subsequent to the acquisition, the EID board has been approached by several other entities that operate small water systems in Emigration Canyon. The entities requested that EID acquire and operate their systems. In addition, a number of individual residents in the canyon that have marginal water systems or individual systems with marginal water quality and/or marginal water supply have approached EID about providing water service.

The EID board retained Carollo Engineers to review a previously prepared water master plan (1994 Water Master Plan) to determine whether components proposed in 1994 could be implemented into a new EID Water System Plan. It was determined that by integrating existing systems and providing water service to only those who request it, the beginnings of a viable regional system could be developed to provide safe reliable water to canyon residents.

The EID made application to the Drinking Water Board for a Federal SRF Loan to help fund the first phases of the regional system and were authorized a loan for \$1,256,000 on January 3, 2001. After initial field investigations and well testing, it was determined that to meet the water source requirements a second additional well would need to be added to the project along with additional piping and improvements. Subsequently, EID requested a \$590,000 increase to the amount of the loan. On April 13, 2001 the Board authorized the requested increase to the loan resulting in a total loan amount of \$1,846,000.

In order to repay the loan the District will have to require significantly higher impact fees and monthly water bills of homeowners, whose homes would be connected to the District water system, than it has historically charged. The District has spent several months analyzing how much it would have to charge its water users. It has proposed postponing the drilling of the Pinecrest/Nugget Formation well and transmission line that would connect it into the water system. This would reduce the cost of the project and charges to the homeowners. The District thinks the Brigham Fork well and the other existing wells have the capacity to provide water to the 312 homes that would eventually be connected to the system. They propose to make the Pinecrest Well part of the next expansion project. The intent of the Board is to include approval in the FONSI for the construction of both the Nugget formation well near the top of the mine trail as well as the pipeline and necessary appurtenances along the mine trail required to connect the well with the proposed storage reservoir. Also, the recently drilled well in Brigham Fork resulted in higher costs than anticipated. So, exclusion of cost of the second well in the Nugget Formation and the appurtenant piping for the time being will substantially lower the cost of the project. The District estimates it will only need \$1,400,000 of the SRF loan at this time. The District wants to hold the remaining \$446,000 in loan funds for the next expansion project which has not yet been specifically identified.

The State does not necessarily agree with the District's conclusion that the existing wells and Brigham Fork well will provide a sufficient water supply for the 312 homes. However, the District is working with their hydrogeologist who is the expert on this canyon. So, if he thinks they are okay, then there is a good chance they are.

PROJECT NEED AND DEVELOPMENT

The main purpose of this expansion project is to provide a reliable and safe drinking water source to canyon residents who have long been trying to make do on an individual basis with limited success. Several times and at many residences the wells have gone dry during the hot summer months. This continues to be the case, and has been compounded by the back-to-back drought years in 2000 and 2001. The loss of water in wells seems to occur sooner and at an increasing number of residences. This intuitively will only get worse as the canyon continues to experience development and the demands for water continue to increase.

Another benefit of this proposed project is that it will provide distribution, storage and fire protection to residents who have petitioned to connect into the EID distribution system. Some residents have experienced coliform counts in their water and some people have experienced a reduction in the capacity of their existing water supply or even a complete loss of water. Additionally, the project provides an enhancement and upgrade to the Emigration Oaks water system, which has inadequacies in supply and storage facilities. The project includes providing a new well for water supply to meet the demands of the system and eliminate the manual importing of water for culinary purposes that several of the residences currently practice.

Since taking over the Emigration Oaks water system, EID has received petitions from various homeowner associations and a variety of individual homeowners to include them in the EID system. Additionally, EID has a commitment to provide water to an additional 113 future homes as part of the agreement that resulted in EID assuming ownership of the Emigration Oaks water system.

It has been recommended that the water storage tank be constructed to impound 1.0 million gallons of water. This is needed to provide an adequate supply of stored water for the District to meet peak demands, to provide a reserve water supply if and when a power outage or other problem interrupts the supply of drinking water from the District's springs and wells, to provide adequate fire flow, and to allow for some emergency storage.

The distribution system recommended for conveyance of water to subdivisions and individual residences is necessary to provide the safe reliable supply of water during peak demand periods and in the case of a fire event. Another need for the construction of this system is to provide a distribution system that meets the drinking water standards and guidelines of the State.

The EID has obtained necessary approvals and used District funds to drill a new well in the Brigham Fork drainage. This well appears to be adequate for the needs of the proposed project and will eliminate the immediate need to drill a well in the Nugget formation within the next several years. Storage capacity is inadequate and a one million-gallon underground concrete reservoir is planned subject to final funding approval.

PROJECT PLANNING AREA

The proposed one million gallon underground concrete storage tank would be located on the saddle just south of Wildflower Knoll high on the West slope of Burr Fork, on a parcel of ground owned by Salt Lake City Corporation. The District has purchased easements for the construction of the storage tank and required piping from Salt Lake City Corporation. A 200' x 300' parcel located in the Northwest 1/4 of Section 28, Township 1 North, Range 2 East, Salt Lake Base and Meridian has been approved as the site.

The newly drilled Brigham Fork well is located on a site approximately 200 feet west of the stream and 25 feet south of the Forest Service property line. It is located on private property owned by Steven Creamer. The well is located in the South 1/2 of the Northeast 1/4 of Section 28, Township 1 North, Range 2 East, Salt Lake Base and Meridian.

The District thinks it will not need the proposed Nugget well right now, but will probably need it in the future, if additional projects for expansion are undertaken. The District may need it before the remaining 113 homes are constructed in the Emigration Oaks Subdivision. Location of the well will require additional input from the District's hydrogeologist. But, it will probably be located somewhere near the mine trail where it crosses the southern boundary of the Nugget formation in Burr Fork Canyon. This is in the eastern 1/2 of Section 21, Township 1 North, Range 2 East, Salt Lake Base and Meridian. Professionals for the District feel that the Nugget formation can be a very productive and consistent source of water for the canyon, while holding impacts on the stream to a minimum. See the report by Don Barnett.

The proposed pipelines for this expansion project for the most part would be located in existing dirt roads, except where the line would front the homes it would serve in which case the line would be in paved roadways. One section of pipe would be installed outside of any roadway and essentially follow a trail from just east of the reservoir where it would leave the mine road and head easterly down through a small side canyon off Burr Fork to the Burr Fork Canyon Road. This pipeline is required to convey water from the storage tank to the pipeline in the Burr Fork Canyon road.

This section of pipeline will require a crossing under Burr Fork Creek at approximately 6975 Emigration Canyon in Burr Fork Canyon. The plan is to bury a 12-inch diameter-casing pipe under the stream so that the top of the pipe is at least 5 feet below the lowest place in the stream. An eight-inch pipe will then be inserted inside the casing. This procedure will allow for future repair and maintenance to the pipe without having to again trench across the stream should the need for repair or replacement arise. The District made application with the State Engineers Office, Division of Water Rights, State of Utah to run this casing and water main across the creek and for stream crossings with service lines to individual homes. On March 14, 2002 the Division of Water Rights issued Stream Channel Alteration Permit Number 02-57-10SA to EID. The permit places various requirements on EID for the construction of the crossing. Three stream crossings included in the application 02-57-10SA are for road culverts that are in the Killyon Canyon branch of the stream. The transmission pipeline will cross under these existing culverts. This are not obvious in the Permit, therefore EID must provide a copy of its application to explain them.

A second application was submitted for service laterals that will cross the creeks to homes that have been constructed across the creeks from the canyon roads in Burr Fork and Killyon Canyon. These service laterals will be either 3/4-inch or 1-inch in diameter and for 18 of the potential 20 stream crossings will be constructed in the existing driveways. Two of the 20 lots do not have an existing home, so there are no culverts or driveways under which to locate the stream crossings. Hence at these locations State of the Art technology (such as directional drilling) is available for installing these small lines under the streambed with minimum disruption to the stream or surrounding terrain. On March 14, 2002 the Division of Water Rights also issued Stream Channel Alteration Permit Number 02-57-09SA to EID to install these service connections across Killyon Canyon and Burr Fork Creeks. Copies of the Permits are included in the Appendix.

Water crossings for individual service connections will be addressed on a case by case basis. If the driveway alignment is not a good solution for the installation of the water line, then one of the State of the Art technologies will be used to install the small service lateral connection.

The storage tank, well, and pipeline alignments for this project are shown on Figure 1 in the Appendix. This figure shows the District boundaries, the existing pipelines, and the features proposed for this project.

AUTHORITY

The estimated cost of the project is \$2,265,516. The Drinking Water Board for the State of Utah has authorized a loan to Emigration Improvement District for the above referenced project in the amount of \$1,846,000. The District (EID) will probably only use \$1,400,000 of the loan for this project and will provide approximately \$865,516 for the project from existing District funds. EID will revise its user fee/rate structure and will adopt an impact and connection fee policy, as presented in Section IV and the Appendix, to help fund the project. EID has secured the services of Carollo Engineers and Barnett International Water Consulting to assist them with design and construction management of the project.

PUBLIC PARTICIPATION

Excerpts of the minutes of the District's Board of Trustees meetings and work sessions that relate to the Environmental Assessment for the past several years have been entered on the District's web site at www.emigrationcanyon.org.

The District held a public hearing on September 15, 2000 at the Salt Lake County Complex at 2100 South and State Street for the purpose of giving the public an opportunity for input as to whether or not the District should proceed with water development in Emigration Canyon. All present were given time to express their views. Twenty people spoke in favor of proceeding while four expressed reservations.

Various meetings were held at Camp Kostopulos, the residence of Fred Smolka, the offices of the Division of Drinking Water, Department of Environmental Quality, the law firm Parsons, Davies, Kinghorn & Peters, and Carollo Engineers during consideration of the water project development.

A Public Hearing for this *Draft* Environmental Assessment Report was held at 7:00 p.m. on Thursday, August 30, 2001 at Camp Kostopulos, 2500 Emigration Canyon Road, Salt Lake County, Utah. A copy of the minutes of the meeting is included in the Appendix.

A second public hearing was also held at Camp Kostopulos on Thursday, March 7, 2002 at 7:00 p.m. at which time the findings of this *Draft* EA Report were again discussed with the public. A copy of the minutes of the second hearing is also included in the Appendix.

SECTION II

PROJECT NEED

Water Quality and Quantity

Water Quality: Over the years the canyon has experienced water pollution problems. A proposal for a canyon-wide water system came forth from the District in 1968 shortly after the District's creation. A canyon organization, The Citizens of Emigration Canyon - a predecessor of the community council - responded to the proposal by launching a study that included among other things a study of water quality. A subcommittee of the CEC was organized to do the study. In the water quality study, a controlled test was conducted which included about 50% of the wells in existence in the canyon at the time. Approximately 50% of the wells tested showed some coliform counts. There was no correlation between depth of well and pollution, or of location in the canyon and pollution.

No widespread controlled tests of water quality have been conducted since that time. During the last few years several canyon residents have approached the District with concern because tests of their water disclosed coliform counts. Further inquiry has revealed that there are many individual wells that periodically show coliform counts. Both Little Oaks/Young Oaks and the Killyon Canyon/Lower Burr Fork Canyon areas have experienced impure water in recent years.

Other than the Emigration Oaks water system and the Emigration Place water which is provided by Salt Lake City, and the three small water systems mentioned elsewhere in this report, most of the canyon homes are serviced by individual wells. No systematic plan is in place to assure that the waters are free of pollution and there is no systematic plan for treatment if impure waters are detected. The proposed expansion of the Emigration Oaks water system will provide a solution to these problems for at least a portion of the homes in the canyon. Future phases of expansion could further enhance the chances for a safe water supply by providing monitoring and treatment where required.

Water Quantity: For many years residents of Emigration Canyon have had essentially all of the water they have needed if they were willing to drill their wells deep enough to find the supply. As the population continues to grow, the water resources in the canyon are being shared with more and more people. Not surprisingly, many wells have been drying up. Each year the water supply in each well is affected not only by the rain and snowfall for the year, but from competition from other wells near by vying for the same supply. Many residents have had to deepen their wells or drill new wells because their source has disappeared. Many have said that they were not concerned because their source was plentiful only to find their source becoming scarce also. During the last two low water years a number of residents' wells have completely dried up. Individuals do not generally have a way to monitor the level of the water in their wells or determine fluctuations. So long as water keeps flowing they think everything is fine, while in reality, they may be getting dangerously close to running out of water.

One purpose of the expansion of the existing Emigration Oaks water system is to provide other canyon residents equal access to dependable, predictable and monitored use of existing water

resources. The District hydrologist feels that several large commercial grade wells somewhat removed from the canyon creek can provide a dependable, safe supply of water. Most of the use of small wells near the stream could be discontinued, thus improving the flow of the stream. The option of being able to monitor sources of water and control the location in the canyon the water is used from to optimize stream flow and recharging of ground waters is quite appealing.

WATER STORAGE

Existing Water Storage: An existing reinforced concrete reservoir with a capacity of 300,000 gallons services the existing Emigration Oaks subdivision for EID. The sizing of this reservoir was based on fire code regulations that were in effect at the time the development was proposed (1984). At that time the fire flow requirements were 1250 gpm for two hours. Since that time the National Fire Code has been revised and Salt Lake County, the jurisdictional agency, has adopted the revised code.

Water Storage Demands: EID has established that the water storage requirement for the District, in addition to the 300,000-gallon reservoir, is approximately 1 million gallons. This storage capacity requirement is made up of three parts: one for the peak day indoor and outdoor uses established by the State of Utah Division of Drinking Water, the second for fire flow requirements to meet the National Fire Code standards, and the third for excess capacity to meet emergency requirements, some of which may be available to meet future user needs.

New Fire Code requirements allocate fire flows on the basis of structure size. A copy of fire storage requirements was prepared in a Technical Memorandum dated September 27, 1999. The largest residence in the Emigration Oaks development currently is approximately 15,000 square feet. The fire flow requirement for a structure of this size is 3,250 gpm for a 3-hour duration. Storage required for this fire flow requirement is 585,000 gallons.

The peak day indoor and outdoor use requirements, separate from and in addition to the fire storage requirements, are 400 gallons per connection for indoor storage and 1,873 gallons per irrigated acre (for a zone 2 climate area). Combining the storage requirements for peak indoor and outdoor use with the fire flow storage requirements and allowing for a small amount of future storage capacity, EID concluded that a one-million gallon storage reservoir would be required.

WATER SOURCES

Existing Water Sources: A number of water sources in the canyon were investigated by Horrocks/Carollo Engineers (HCE) and Barnett Intermountain Water Consulting (BIWC) in the 1994 Master Plan. These sources included 10 known spring sources and seven known well sources within the canyon. These sources are depicted on maps in the 1994 Water Master Plan. They are not proposed as part of the project, but are presented to help residents and government agencies know where potential viable water sources are located.

Flow measurements were made at most of the spring sources and comparisons with other existing wells were made for the potential well sources in an effort to estimate the approximate yield of the canyon water sources. These sources were evaluated with regard to the Groundwater Source Protection and Surface Water Treatment Rule as they relate to protection of potential drinking water sources from surface water or other contamination sources. Based on this analysis, six of these sources were eliminated from consideration. One other source, the Meyer Well is an individual well source and was evaluated primarily to determine the possibility of constructing another well in the Pinecrest area for the EID water system. Therefore, this well was not considered further for incorporation into the water system.

Sources Capacity and System Demands: It is anticipated that EID can develop sufficient water supply from the existing three wells (listed as 1, 2 and 3 in Table II-1) to provide for all of the residences within this expansion project. The drilling of the Pinecrest/Nugget Formation Well (Well #4 in Table II-1) and related pipeline to transport water to the one million gallon reservoir have been assessed as to effect on the environment within this assessment. Other sources within the canyon as listed below are not proposed to be included within this project and the environmental impact of developing these sources has not been considered in this assessment.

The Division of Drinking Water is not convinced that the first three wells have sufficient capacity for the 312 residential connections referenced later in this report. Even with wells numbers 1 & 2, EID had difficulty keeping water in the storage tank two summers ago with only about 110 users in Emigration Oaks Subdivision. This project proposes to nearly triple the number of homes being served while only increasing the water supply by 50%. EID has stated that by working with the homeowners they were able to reduce water use last summer enough to keep up with the supply. However, it is the opinion of the Division that EID will probably have to drill the Pinecrest/Nugget Formation Well in order to provide enough water for all of the 312 homes.

Table II-1 Existing and Potential Water Sources		
Emigration Improvement District		
	Source	Estimated Production (gpm)
Considered in this assessment:		
Existing Wells:		
1.	Emigration Oaks Well #1	50
2.	Emigration Oaks Well #2	150
3.	Brigham Fork (Creamer land) Well	100
4.	3400 Well (Young Oaks/Little Oaks)	50

Potential Well:		
5.	Pinecrest/Nugget Formation Well	100
Not Considered in this assessment:		
Potential Wells:		
6.	Last Camp Well	100
7.	Brigham Fork Rock Quarry Well	72
Potential Spring Sources for Future Projects:		
8.	Thomas Spring	80
9.	Secret Spring	40
Total		742

Also, the Division notes that two paragraphs ahead of Table II-1, the writer of this report references the Pinecrest/Nugget Well as well #4, but the table shows it as well #5.

Further analysis and monitoring will be conducted strategically to meet the water demand needs of additional residents that request water services from the EID water system in the future. The new Brigham Fork well is shown on Figure 2 in the Appendix, and in the opinion of Carollo Engineering, PC appears to be sufficient in production to avoid the need to drill a second well in support of this project. However, the Division is not convinced this is the case, as stated prior to Table II-1. However, it is likely that by adding the Pinecrest/Nugget Formation well, the District should have a large enough water supply for all 312 lots. Since the potential environmental impact of drilling this well has been assessed within this assessment. A “Finding of No Significant Impact” would include the Pinecrest/Nugget Formation Well and the necessary appurtenances and piping to connect it to the proposed one million gallon reservoir.

If the springs were to be considered in the future, the impact on the environment would need to be assessed carefully. This would include evaluation of impacts that previous phases of the project have had on stream flows among other assessments. The District recently passed Resolution making a commitment to gather stream flow data in cooperation with State and Federal agencies. The purpose of this effort is to establish a database which could be used in the future to determine the beneficial or detrimental effect of drilling the Brigham Fork Well and future wells and reducing the removal of water from shallow water sources at individual residences. This would expand their existing monitoring program. The information gathered would/could provide a basis for evaluating potential effects of the development of springs and wells in the future. The main objective would be to determine what impact spring development would have on riparian habitat and the Bonneville Cutthroat Trout.

WATER DISTRIBUTION

Existing Water Distribution System: The existing distribution system that serves the Emigration Oaks Subdivision is adequate to serve the requirements of the first 100 lots in the subdivision. It includes the distribution piping, valves, hydrants, the 300,000-gallon storage tank discussed above, two wells and other appurtenances. Additional phases of the subdivision added homes that required expansion of the distribution system.

A number of other water systems exist within the canyon that could be incorporated into the EID water system. The larger systems include:

1. A system owned by the Young Oaks Subdivision immediately west of the Emigration Oaks Subdivision, which is planned for inclusion in this project.
2. A system owned by the Pinecrest Pipeline Operating Company in the Pinecrest area.
3. Spring Glen Subdivision.

Several other small systems exist in the canyon. Each of the large and small systems need to be evaluated in detail to determine whether they comply with DDW and fire code standards as requests are made to incorporate them into the EID water system. The existing water systems are shown in maps in the 1994 Water Master Plan.

Water Distribution Demands: At present, approximately 330 dwelling units and 19,300 square feet of commercial space exist within Emigration Canyon. It is felt that Emigration Canyon Road, in its present condition and without considerable improvement and realignment, cannot support more than approximately 700 dwelling units within the canyon. Based on Emigration Canyon Community Council's and Salt Lake County Planning Division's desire to maintain a minimum level of service D on Emigration Canyon Road, it was decided to limit the estimated buildout dwelling units to 700 units. It is also estimated that the Emigration Canyon Water Supply can only support about 700 homes based on a report prepared by Barnett Intermountain Water Consultants.

Water demands for existing and buildout were developed based on State of Utah standards for municipal water systems in comparable climates. Existing maximum day and average day water demands are estimated at 515,330 gpd (358 gpm) and 204,235 gpd (142 gpm), respectively. Estimated maximum day demand and average day demand for the limited buildout (700 dwelling units and approximately 17,300 square feet of commercial space) are 1,190,200 gpd (826 gpm) and 455,000 gpd (316 gpm), respectively.

Delivery of water to meet the demands presented above will be done through the Distribution System. The existing pipelines need to be connected to the new source supplies and to the storage reservoirs to make it a complete system. As subdivisions and individual residences request service and are brought online, the piping distribution system needs to be evaluated to ensure a safe and operationally viable delivery throughout all of the system. New distribution lines will be required as residences and subdivisions are brought online. These will be presented along with the request for each of the respective subdivisions or expansion areas.

SECTION III

AFFECTED ENVIRONMENT/ENVIRONMENTAL CONSEQUENCES

Initially, letters dated December 6, 2000 describing the proposed drinking water system improvements with a location map were sent to the below listed seven Cross-Cutter agencies by the Division of Drinking Water (Division), DEQ, State of Utah. The letters requested a response within 30 days of receipt of the letter. Copies of the notification letters, responses from the cross-cutters and other related documents are included in the Appendix.

Chief, Utah Regulatory Office, Corps of Engineers, Department of the Army
Compliance archaeologist, Division of State History (State Historic Preservation Office)
Director, Division of Air Quality, DEQ, State of Utah
Director, Division of Wildlife Resources, DNR, State of Utah
Program Specialist, Region VIII, Federal Emergency Management Agency
State Soil Scientist, Natural Resources Conservation Service, USDA
Utah Field Supervisor, Fish and Wildlife Service, U.S. Department of Interior

All seven Cross-Cutters responded to the letters. Based on their responses and additionally acquired information, further work was performed to evaluate potential effects to the environment. More than one response has been received from the Division of Wildlife Resources (DWR) and the US Fish and Wildlife Service (Service). Copies of reports summarizing this additional work are available upon request.

The Utah State Division of Water Rights (DWRi) has been involved, because it issued two Stream Channel Alteration Permits to the District for crossing Burr Fork Creek and Killyon Canyon Creek. In a letter dated June 10, 2002 the above referenced office told the District that “the State Engineer’s Office is satisfied with the mitigation work completed. However, formal compliance will not be issued until the project is complete.”

The following is a summary of the evaluation of potential environmental consequences of the proposed project:

As stated in the Introduction, Section I, portions of two facilities were constructed prior to completion of the environmental assessment process. They are 1) the drilling and construction of the Brigham Fork Well and 2) the construction of the 8-inch waterline across Burr Fork Creek. Documentation of what occurred, what actions have been taken to remedy the situations and to correct any impacts, and other relevant information has been placed in this section of the report. Since potentially the most critical impact would be to the Bonneville cutthroat trout and the riparian habitat, in general, this information has been placed in the “Biological Resources” subsection of the report.

FLOOD PLAINS

Affected Environment:

One stream crossing for the transmission line from the storage reservoir to the Burr Fork/Killyon Canyon service area will be required for this project. The stream crossing will occur on land that the District has purchased from the Michael Cosgrave family trust. The land, identified as Lot 44, is actually composed of two parcels at the address of 1227 North Burrs Lane (parcel numbers 10-27-176-001-0000 and 10-27-176-002-0000) and is undevelopable because it is too small and is in the creek bed. It is approximately 50 feet wide by 120 feet long. With the creek running through the middle of the property the lot is rendered undevelopable not only by size but also by the stream setback requirements. The steep embankments on either side of Burr Fork creek also rendered the property un-developable. The elevation of the stream crossing at this location is 5980 feet. The spot for this crossing is located approximately 300 feet downstream of the end point of the Flood Insurance Study. Construction of the 8-inch main transmission line at this crossing and three existing culvert crossings in Killyon Canyon shall comply with the requirements of Stream Channel Alteration Permit Number 02-57-10SA.

Service laterals at various residences will require a stream crossing. For example; when a residence is across the creek from the main access road where the transmission main will be located a service lateral will need to cross the stream to bring the service to the house. In this instance the service lateral will be 1) installed in existing driveways across the stream, over or under existing culverts or, 2) drilled, employing directional drilling techniques to cross the stream and minimize the impact to the stream. The exact location of these stream crossings will be determined in the field at the time of construction by the engineer, the homeowner, and the contractor. Construction of service lateral lines shall comply with Stream Channel Alteration Permit Number 02-57-09-SA.

Environmental Consequences:

Salt Lake County Flood Control performed a Flood Insurance Study in the unincorporated areas of Salt Lake County for the Federal Emergency Management Agency (FEMA). This study places the elevation of the 100-Year Flood at the transmission line stream crossing on Burr Fork creek at 5984 feet elevation. The streambed at this same location is slightly above 5980 feet elevation (See Attachment 3). Burr Fork Creek is not a listed flood control facility, hence it does not need a construction permit from Salt Lake County Flood Control, but it will require an UPDES Storm Discharge permit from the Division of Water Quality. The crossing will be performed by the following construction method:

This construction method will require a three-phase approach to constructing the crossing. It will require a cofferdam somewhere near mid-channel, diverting the stream to one side of the cofferdam and installing a carrier pipe on the other side. The carrier pipe will be installed at a depth of five feet below the bottom of the streambed. Once the pipe is installed and plugged, the stream will then be diverted to the opposite side of the coffer dam and the second phase of installing the carrier pipe will proceed on the newly dewatered side. Once the carrier pipe is installed the third phase will be performed which consists of installing the water transmission

line inside the carrier pipe. Once the transmission line is connected, disinfected, tested and approved, the coffer dam would be removed and the disturbed areas would be revegetated with native species and reestablished to match the existing conditions as close as is practicable.

Mitigation:

Impacts to Burr Fork will be mitigated by minimizing the disturbance due to construction and limiting the corridor across the creek bed to 50 feet wide. A 6-inch thick concrete pad, eleven feet wide and extending to the 100 year flood line would be installed with 5 feet of cover as per the State requirement between the flowline and the crown of the casing pipe. Once the transmission pipe is installed, native vegetation would be replanted to reclaim the surface and restore it to the previous existing conditions.

In order to diminish any effect on the Bonneville Cutthroat Trout and in response to the time frame suggested by the Utah Wildlife Resource Services, the District will construct the main 8" pipe stream crossing either before May or after June to avoid the BCT spawning season. Observations will be made to insure that there are no spawning trout present at the time of construction. Silt fencing will be used in the stream along with caution taken to avoid allowing sediment to wash down stream. Mr. Sakaguchi of the Utah Department of Wildlife Resources sent an e-mail letter to Chuck Williams of the Division of Water Rights, which is attached in the Appendix. This letter sets forth some other important issues dealing with revegetation that the District will carry out during its revegetation.

In various locations the transmission main is located in the roadway on the opposite side of the stream or creek from the residence needing the service connection. In this instance the service lateral will be drilled employing directional drilling techniques to cross the stream and minimize the impact to the stream. The exact location of these stream crossings will be determined in the field at the time of construction by the engineer, the landowner, and the contractor.

WETLANDS

Affected Environment: No jurisdictional wetlands were found at the project site.

Environmental Consequences: This project presents no environmental consequences, because there are no jurisdictional wetlands in the project area.

Mitigation: No mitigation measures need to be developed, because there are no jurisdictional wetlands in the project area.

CULTURAL RESOURCES

Affected Environment: In the attached letter from the Division of State History, Utah State Historical Society, the Preservation Office concurs with a determination of No Historic Properties Affected for the project.

Environmental Consequences: This project presents no environmental consequences, because there are no historic properties in the project area.

Mitigation: No mitigation measures need to be developed, because there are no known historic properties in the project area. However, if any archaeological artifacts are unearthed during construction, work will be immediately stopped. The District will promptly notify the State Historic Preservation Officer and the Division of Drinking Water. These agencies will make a timely determination of the steps necessary to mitigate adverse environmental impacts on the artifacts.

BIOLOGICAL RESOURCES

Affected Environment - General:

The affected environment for the Emigration Improvement District Water System Project includes the upland, riparian, and aquatic habitat associated with the Burr Fork and the Brigham Fork of Emigration Creek in Emigration Canyon, Utah. The proposed project includes the recently drilled culinary well in the Brigham Fork drainage of Emigration Canyon, a 1,000,000 million gallon concrete water storage tank, and a pipeline delivery system for the residents in the canyon. The Brigham Fork well has been drilled to a 1,200-foot depth and was drilled at a 30-degree angle off vertical to angle away from the Brigham Fork streambed to avoid any percolating stream water being captured by the well. A microscopic particulate analysis (MPA) test performed on the Brigham Fork well showed no influence of surface water on the new well water. Brigham Fork is one of the three largest tributaries to Emigration Creek. It contains mature riparian habitats and is identified as having an A4 to B4 stream channel type (Rosgen 1996). This channel type is characterized as having a relatively steep gradient with a gravelly substrate.

Fisheries Resources

Emigration Creek and its tributaries support a population of Bonneville cutthroat trout (*Oncorhynchus clarki utah*). While the trout is not listed as threatened or endangered under the Endangered Species Act, it is considered a sensitive species by the State of Utah. The Bonneville cutthroat trout is currently managed under a Conservation Agreement (Lentsch et al. 1997) which is a voluntary cooperative plan among several resource management agencies designed to identify and resolve threats to the species. The Conservation Agreement provides a mechanism for proactive conservation and protection measures to be implemented to benefit the species. The goal of the Conservation Agreement is to significantly reduce or eliminate the threats to the Bonneville cutthroat trout that may eventually cause it to be federally listed. The major threats identified for the Bonneville cutthroat trout include among other things habitat degradation and water diversion. The population of trout in the upper reaches of Emigration Creek has recently been identified as a 99% genetically pure strain of Bonneville cutthroat trout making this population genetically valuable to wildlife managers.

Threatened, Endangered, or Sensitive Species and Vegetation Impacts

No known federally listed TES species occur in Emigration Canyon that would be affected by the proposed project (pending UDWR). However, the Bonneville cutthroat trout could be impacted by this project if it is not managed correctly and by future construction in the canyon.

There are several state listed TES species that have been observed in Emigration Canyon (UDNR 2001). Table III-1 outlines what species have been observed in the canyon, when it was observed, and the type of protection the State of Utah gives to it.

Table III-1 State Listed TES Species Emigration Canyon			
Common Name	Scientific Name	Last Observed	Protection *
Bonneville cutthroat trout	<i>Oncorhynchus clarki utah</i>	2001	CS
Toquerville springsnail	<i>Pyrgulopsis kolobensis</i>	7/6/1993	None
Northern goshawk (nesting)	<i>Accipiter gentilis</i>	6/29/1992	SP
Northern flying squirrel	<i>Glaucomys sabrinus</i>	3/15/1972	SD
Beckwith violet (bird-foot violet)	<i>Viola beckwithii</i>	4/30/1941	None
Broadleaf penstemon	<i>Penstemon platyphyllus</i>	7/12/1941	None
American redstart (nesting)	<i>Setophaga ruticilla</i>	6/7/1923	None
Utah fleabane	<i>Erigeron arenarioides</i>	7/17/1909	None
Carved glyph	<i>Glyphyalinia indentata</i>	1886	None

*CS: Conservation Species that is receiving special management to preclude federal listing.

SP: Species of Special Concern due to decreases in population, distribution, and/or habitat availability.

SD: Species of Special Concern due to limited distribution, i.e., occurs in limited areas and/or numbers due to a restricted or specialized habitat.

None: Species listed in this table without state or federal government protection are considered rare and are being tracked by the UDWR's Natural Heritage Program tracking list.

Vegetation Impacts

Emigration Canyon supports a relatively intact, mature riparian habitat which is important for a variety of wildlife species, including several species of mammals, songbirds, and reptiles (Table III-2). The riparian habitat is dominated by cottonwood, box elder, alder, and willow with an understory dominated by starry false solomons seal and Jacob's ladder (Table III-3). This riparian vegetation plays an important ecosystem function in maintaining and protecting the water quality of this drainage.

According to current plans, the proposed pipeline would make one riparian habitat crossing on the Burr Fork of Emigration Creek about 1 mile above the confluence of Killyon Canyon. The stream channel in this area is six to eight feet wide, six to eleven inches deep, and has a predominantly gravel substrate. The macroinvertebrate community in this reach of the Burr Fork included mayflies (Ephemeroptera), caddisflies (Trichoptera), flatworms (Platyhelminthes) and small leeches (Hirudinea). The riparian vegetation in this area is very thick and dominated by cottonwood, willow, and dogwood, as well as herbaceous species such as false solomon seal and Jacob's ladder. An area approximately 50 feet wide along the pipeline alignment considered riparian habitat would be disturbed during the installation of the pipeline in this area.

The majority of the proposed water storage and delivery system would be constructed across upland oak brush habitat in pre-existing trails and roadways. This oak brush habitat is dominated by gambels oak, big sagebrush, and curleaf mountain mahogany with an understory of various grasses (Table III-3). Building this storage and delivery system along pre-existing trails and roadways is expected to reduce additional disturbance in these habitats. However, several sections of these pre-existing trails and roadways would need to be widened and improved in order for equipment to access the construction zone.

Table III-2 Observed Wildlife Emigration Canyon	
western tanager	<i>Piranga ludoviciana</i>
black-headed grosbeak	<i>Pheucticus melanocephalus</i>
American robin	<i>Turdus migratorius</i>
broad-tailed hummingbird	<i>Selasphorus platycercus</i>
elk (scat)	<i>Cervus canadensis</i>
mule deer (scat)	<i>Odocoileus hemionus</i>
garter snake	<i>Thamnophis elegans</i>
Note: Wildlife observed along the project corridor in Emigration Canyon during site visit on June 11, 2001.	

Table III-3 Riparian and Upland Oak Brush Vegetation Emigration Canyon			
Riparian Habitat		Upland Oak Brush Habitat	
narrowleaf cottonwood	<i>Populus augustifolia</i>	gambels oak	<i>Quercus gambellii</i>
box elder	<i>Acer negundo</i>	Oregon grape	<i>Mahonia repens</i>
rock mountain ash	<i>Sorbus scopulina</i>	sagewort	<i>Artemisia ludoviciana</i>
chokecherry	<i>Prunus virginiana</i>	big sagebrush	<i>Artemisia tridentata</i>
redoiser dogwood	<i>Cornus sericea</i>	antelope bitterbrush	<i>Pershia tridentata</i>
coyote willow	<i>Salix exigua</i>	green rabbitbrush	<i>Chrysothamnus viscidiflorus</i>
mountain alder	<i>Alnus incana</i>	curleaf mountain mahogany	<i>Cercocarpus ledifolius</i>
bigtoothed maple	<i>Acer grandidentatum</i>	alfalfa	<i>Medicago sativa</i>
white fir	<i>Abies concolor</i>	yellow sweetclover	<i>Melilotus officinalis</i>
mountain lover	<i>Pachystima myrsinites</i>	arrowleaf balsamroot	<i>Balsamorhiza sagittata</i>
buckbrush	<i>Ceanothus velutinus</i>	penstemon	<i>Penstemon sp.</i>
mountain snowberry	<i>Symphoricarpus oreophilus</i>	Utah sweet pea	<i>Lathyrus pauciflorus</i>
burdock	<i>Arctium lappa</i>	curley doc	<i>Rumex crispus</i>
thimbleberry	<i>Rubus parviflorus</i>	hounds tongue	<i>Cynoglossum officinale</i>
mallow-leaved ninebark	<i>Physocarpus malvaceus</i>	thistle	<i>Cirsium sp.</i>
wild rose	<i>Rosa sp.</i>	wild onion	<i>Allium sp.</i>
sedge	<i>Carex sp.</i>	scarlet gilia	<i>Ipomopsis aggregata</i>
cow parsnip	<i>Heracleum lanatum</i>	yellow salsify	<i>Tragopogond dubious</i>
Richard's geranium	<i>Geranium richardsonii</i>	sulfur buckwheat	<i>Eriogonum umbellatum</i>
sticky geranium	<i>Geranium viscosissimum</i>	whorled buckwheat	<i>Eriogonum heracleoides</i>
starry false solomons seal	<i>Smilacina stellata</i>	forget-me-not	<i>Hackelia sp.</i>
Jacob's ladder	<i>Polemonium foliosissimum</i>	yarrow	<i>Achillea millefolium</i>
stinging nettle	<i>Urtica dioica</i>	crested wheatgrass	<i>Agropyron cristatum</i>
fendlers meadowrue	<i>Thalictrum fendleri</i>	slender wheatgrass	<i>Elymus trachycaulus</i>
bluebells	<i>Mertensia sp.</i>	smooth brome	<i>Bromus inermis</i>
orchard grass	<i>Dactylis glomerata</i>	Great Basin wildrye	<i>Elymus cinereus</i>
		bulbous bluegrass	<i>Poa bulbosa</i>
		cheatgrass	<i>Bromus tectorum</i>
		foxtail barley	<i>Hordeum jubatum</i>
		needle and thread	<i>Stipa comata</i>
Note: Observed during site visit on July 11, 2001			

Affected Environment – Brigham Fork Well: The District started drilling this well before the environmental review process had been completed. Therefore, the circumstances of this action, potential environmental impact, and relevant issues have been specifically addressed.

Generally, the proposed site for this well is upland oak brush habitat and is not considered particularly sensitive. Since TES Species were not found in this area, the greatest concerns are erosion and the potential for invasive plant species to replace existing vegetation in areas disturbed by construction activities.

Affected Environment – Burr Fork Creek Waterline Crossing: In late April the Emigration Improvement District constructed the 8-inch waterline across Burr Fork Creek prior to completion of the environmental review process. The crossing was made by open cutting/trenching. Apparently, the contractor diverted the water past the site so he could construct one side of the crossing at a time. The circumstances of this construction activity, potential environmental impacts, and relevant issues are being addressed specifically.

The two principal environmental concerns pertaining to the creek crossing were/are protection of the Bonneville cutthroat trout and the riparian habitat, itself. The District had received a Stream Channel Alteration (SCA) Permit {Corps of Engineers 404 permit}, Permit Number 02-57-10SA dated March 14, 2002 from the Utah State Division of Water Rights and a Building Permit from Salt Lake County. But, it did not have Plan Approval from the Division of Drinking Water nor had the environmental review process been completed. The SCA permit placed 16 conditions on the District. The conditions were required in order to protect the trout and habitat. Further discussion of this matter is in “Environmental Consequences – Burr Fork Creek Waterline Crossing”.

Environmental Consequences - General:

Fisheries Resources

The primary concern of the proposed project is a decrease of instream flows in Emigration Canyon and its tributaries due to groundwater pumping at the new Brigham’s Fork well and the proposed nugget formation well site. Decreased instream flows could have the potential to adversely affect the aquatic and the riparian habitats and the Bonneville cutthroat trout population in the canyon. Currently, culinary water is provided to existing residents in the Emigration Oaks, Emigration Place, and Pinecrest subdivisions through several small water-distribution systems supplied by public wells and springs. The residents living along Emigration Creek between the Emigration Oaks turnoff to the Pinecrest subdivision are supplied with culinary water by private, shallow, stream side wells and springs on their individual properties. Based on observations and a Microscopic Particulate Analysis (MPA) test of the new Brigham’s Fork well water, Barnett Intermountain Water Consultants believe that the Brigham Fork well will not have an influence on stream flow in the Brigham’s Fork of Emigration Creek. The potential Pinecrest/Nugget Formation well in Burr Fork (which would not be part of this project but would probably be included in any further projects undertaken in response to residents in

need of water service) is estimated to reduce instream flow in the Burr Fork of Emigration Creek between Pinecrest and the confluence of Killyon Canyon by about 2-3 percent. However, this water withdrawal is expected to be offset by the closure of the private wells in Emigration Canyon resulting in an estimated 2-3 percent increase in late summer instream flow in Emigration Creek. The potential negative impacts of these proposed wells on the Bonneville Cutthroat trout would likely be negligible because the proposed project would cause little net water depletion in the main stem of the Emigration Creek where most of the trout are found. Replacing water removed from the canyon by shallow individual wells with two larger wells having little known direct effect on stream flows could actually enhance environmental habitat conditions (increase stream flows) in the canyon. This could include improved conditions in tributary streams to Emigration Creek, which provide spawning habitat (as a minimum) to the Bonneville Cutthroat trout (BCT).

The District at its March 18, 2002 Board of Trustees meeting discussed steps that could be taken to assist State agencies in maintaining stream flow and preserving the fishery. After consultation with the Division of Drinking Water, the Division of Wildlife Resources and the US Fish and Wildlife, the Board adopted a resolution of commitment on the part of the District to cooperate with the Utah Division of Water Rights, Utah Division of Drinking Water and the Utah Division of Wildlife Resources to establish an "instream flow regime". A copy of the resolution is included in the Appendix. According to the District this resolution is in harmony with longstanding prior resolutions of the Board of the District to follow policy that makes stream flow a primary objective of the District. For the District, maintaining stream flow has a three-fold purpose: 1) Attempting to keep wells of residents along the stream from running out of water, since most of the wells are in communication with the stream, 2) maintain fisheries and aquatic life, and 3) provide water for flora and fauna along the streambanks. These are primary values that residents of the canyon enjoy and would like to preserve.

The replanting and reseeded of the disrupted areas will be done with a mix recommended by SWCA, the District's environmental consulting specialists. A copy of their communication that includes the list of seed and plant mix is attached in the Appendix. The exact replanting and reseeded plan (including plant removal and salvage strategies) must receive the final approval from the Division of Wildlife Resources.

In order to minimize direct project impacts to BCT and the stream and riparian habitat during and after construction, and in keeping with the recommendations of the US Fish and Wildlife Service, during construction the District will plug the trench with a clay plug on each side of the stream to eliminate surface water from draining into the creek through the new pipeline trench. The District will also use best management practices during construction to protect fish and wildlife including the 10 items listed on the March 7, 2002 letter from Henry R. Maddux of the USF&W sent to Mr. Chuck Williamson of the Utah Division of Water Rights who subsequently issued the two requested "Stream Alteration Permits". Copies of the letter and the permits and the applications for the permits are attached in the Appendix.

Short-term sedimentation from construction associated with pipeline crossing on the Burr Fork could have a detrimental effect on trout habitat in Emigration Creek. This sedimentation impact could be minimized by trenching the stream at low flows, diverting stream flows around the

construction area, and revegetating and controlling erosion at the stream crossing. During drilling of the Brigham's Fork well essentially all of the sediment was kept out of the streambeds. Further, current regulations require that sediment that enters the stream must be monitored and minimized according to State standards.

Threatened, Endangered, and Sensitive Species

There are currently no known state or federally listed TES species in Emigration Canyon that would be affected by the proposed project other than the previously mentioned Bonneville cutthroat trout.

Vegetation Impacts

Significant soil disturbance will be associated with the construction of the storage tank and waterlines. The disturbance for the water storage tank should be contained to a 1.37 acre parcel of land owned by Salt Lake City Corporation for which the District says it has already purchased an easement for construction of the tank. Approximately half of the site will be disturbed for the construction while maintaining the oak brush habitat on the higher elevations of the site above the tank. Most of the disturbance for the pipeline would be limited to the widening of pre-existing roadways and trails through the upland oak brush habitat. As stated previously, the water project has one major riparian habitat crossing. That crossing is located on Burr Fork Creek. The crossing has impacted an area estimated at just over 100 long by about 30 to 55 feet wide of riparian vegetation.

Environmental Consequences - Brigham Fork Well:

The District hired a well driller who started drilling the well in early winter 2001. The Division of Drinking Water had given "plan approval" for the work. When the Division (Kenneth Wilde) learned that construction had begun prior to completion of the environmental assessment, he inquired with the District. The District referred the Division to the Authorization Letter from the Drinking Water Board (Board) that required the District to prove it had sufficient source capacity before the proceeds of the loan would be made available to them. Mr. Wilde also spoke with Don Barnett about the drilling procedures and the strategy for preventing soil erosion and other damage to the environment. Mr. Barnett, consultant to the District, explained what they were requiring the driller to do in order to avoid environmental impacts. It was understandable that the District thought it had to drill the well as soon as possible in order to avoid unnecessary delays and that this justification was in harmony with the authorization letter from the Board.

Based on this justification and the assurances from Mr. Barnett, Mr. Wilde agreed to let the District continue with the drilling, development, and construction of the well. If environmental damage has occurred or does occur as a direct result of this construction work, the District will be required to mitigate that damage.

Environmental Consequences - Burr Fork Creek Waterline Crossing:

Summary: Investigations of the site were made in May by the Division of Drinking Water (Division), the Division of Wildlife Resources (DWR), and the Division of Water Rights (Water Rights). These investigations have been summarized below. Based on the observations and conclusions of staff of these three agencies, the Division has made the following conclusions about negative impacts associated with the construction of the creek crossing:

1. The combination of the timing of the construction work and the failure of the District to immediately revegetate the stream banks combined to cause negative impacts to the riparian habitat. The sediment deposition impacted spawning habitat.
2. These same two factors combined may have also caused negative impacts to the Bonneville Cutthroat Trout.
3. The District may not have complied with conditions numbers 3, 11, 12, and 14 of its Stream Channel Alteration Permit Number 02-57-10SA. However, the District would most likely say it did comply. Technically, it has one year to comply with conditions numbers 11, 12, and 14 of the permit, revegetating the site. The issue about whether or not the crossing was made at low flow as required by condition 3 may be argued. (See discussion of stream flows, below.)
4. A major intent of the Stream Channel Alteration permitting process is to establish parameters for the protection of the environment from adverse environmental impacts resulting from the proposed construction work. In spite of any technicalities, negative environmental impacts were sustained, at least, as an indirect result of the construction activity.
5. The vegetation suffered negative environmental impacts.
6. If the District would have waited until at least mid-summer to construct the crossing and would have revegetated the site immediately after they had completed the construction work in a manner consistent with items 11, 12, and 14 of the SCA permit, most of the negative impacts probably would have been avoided.

The construction work itself may have been accomplished in an acceptable manner. Most of the negative impacts are a result of not adequately revegetating the stream channel immediately after making the crossing. If the work had been performed after mid-summer the impacts would have probably been less, because erosion due to lower stream flows would have probably been less. In addition to probably having less of a sedimentation the concerns for impacts on trout spawning would have been less, because the stream would have had months to clean itself up before the next spawning season. With lower stream flows it would have been easier to plant at the creek and have the plants growing similarly to how they were growing prior to construction.

Because this fishery has not been carefully studied in the past and because of the lack of resources to make a more thorough investigation, it was not possible to better quantify the negative environmental impacts. But, other indirect results of this activity might have been a disruption in spawning by the Bonneville Cutthroat Trout in Burr Fork. This type of active erosion and deposition of sediment in the gravels can create unsuitable conditions for spawning below the construction site. The continuing deposition of sediment can also smother fish eggs and fry. Additionally, the erosion and deposition of sediment can adversely affect macroinvertebrates.

Purposes of the SCA Permitting Process: (Add items 3, 11, 12, & 14) The purpose of the permitting process is to assess potential problems a project may have and develop guidelines/parameters for the construction work which will prevent or minimize any negative impacts. The principal environmental concerns pertaining to the creek crossing are protection of the Bonneville cutthroat trout and the riparian habitat, itself. SCA permit placed 16 conditions on the District in order to protect the trout and habitat. The three most critical conditions are in items numbers 3 and 12. Item 3 states that the “Work must be accomplished during a period of low flow.” And it says, “instream work should not occur if fish are actively spawning” or if eggs are present, which is generally during May and June. Item 12 requires that “Disturbed riparian areas must be planted with naturally-occurring vegetation.” It gives instructions for revegetating the site with dogwood, willows, river birch or alder close to the stream and other species that tolerate drier soils higher on the bank. Item 11 also addresses the removal of vegetation and revegetation at the construction site.

Stream Flow Measurements: According to stream measurement data acquired over the past five years by Salt Lake County (Dan Schenck, hydrologist) the creek flow peaked during April during four of those years. In 1999 it peaked in May. The highest flows usually occurred in April and May, and sometimes started in late March and extended into June. The Burr Fork crossing was constructed after the stream flow had risen from the winter flow of about 0.9 cfs to around 10 cfs. For 2000, 2001, and 2002 this would be considered high flow, not low flow. But, compared with a high in 1998 of 39.8 cfs on April 24 and a high in 1999 of 31.4 cfs on May 14, someone might argue that 10 cfs is still relatively low. The figures representing the flow data measurements, referenced above, are in Appendix B.

Investigations of Construction Activity Prior to Completion of Environmental Process: On April 30, 2002 the Division was informed that the crossing had been made and Mr. Kenneth Wilde, PE, inspected the site. The most notable things about the project site were:

1. The streambed for several hundred feet below the construction site had deposits of silt or clay with a reddish-brown or orange-brown color.
2. The stream flow was relatively high and many times the rate of the winter flow, which the Division considers low flow.
3. The disturbed trench and work areas were bare soil and rock, and had not been replanted.
4. Silt fencing had been placed near the foot of slope on both sides of the creek as an erosion barrier.
5. Some erosion was occurring along the banks of the creek. The stream water did not seem as clear as it would normally be.
6. The contractor had left some partially buried debris at the site; e.g. a yellow pre-mixed concrete sack. This poses the question of how much debris the contractor buried on-site that could inhibit good root growth necessary for restoration of the vegetation.

On May 15, 2002 Mr. Doug Sakaguchi, Habitat Manager, Division of Wildlife Resources (DWR), State of Utah, (one of the cross-cutter agencies) visited the site and took photographs. His office notified Water Rights and the Division of their concerns. He also found unsatisfactory conditions, including:

1. Fine sediments from the streams banks were probably continuing to be deposited downstream of the pipeline crossing because of high runoff from recent rains actively eroding the banks.
2. The natural tendency of the stream to meander (in the now straightened channel) was eroding the unprotected banks.
3. The sediments were impacting the substrates in which trout spawn. They were probably making spawning difficult, because of silting in gravels, and were making areas unsuitable for spawning.
4. The increased and constant deposition of fine sediments will suffocate any eggs and fry that might be present in gravels downstream of the sediment source.
5. Macroinvertebrates will also be adversely affected by the sediments.
6. The District had placed fiber mats and a few trees above the silt fencing on the steep slopes. The habitat manager for DWR had intended that the District would save some of the native plants and replant them. They had not been saved and replanted. The SCA permit states in item 11, "...then revegetating with native species will be required, especially of woody shrubs." And item 12 states, "Disturbed riparian area must be planted with naturally-occurring vegetation." But, the permit did not precisely state that existing native plants at the site needed to be stockpiled, kept alive as much as possible, and replanted.
7. The area between the silt fencing and the creek was not revegetated. The part of the stream banks that are most susceptible to erosion from the stream itself appeared to be unprotected and actively eroding. Normally, the tree and brush growth along the creek is fairly dense. The permit specifies the planting of "... (red osier dogwood, willows, river birch or alder need to be planted close to the stream; other species tolerate drier soils higher up the bank)". Planting along the edge of the creek would have protected the habitat and the bank from so much erosion.

On May 23, 2002 Charles Williamson, Stream Alteration Specialist, Division of Water Rights, and Doug Sakaguchi, DWR, met with representatives of the District, including their engineer. They discussed mitigation of the site. See the subsection "Mitigation – Burr Fork Creek Waterline Crossing" for details.

Justification of the District for Constructing the Crossing Prior to Completion of the EA Process: The District has not put a justification in writing. However, in meetings and telephone conversations District representatives have explained why they performed the work. The following statements are not quotes, but are a summary of what they said.

1. The District said they understood from Division personnel that they could construct the crossing prior to completion of the environmental review process, but ran the risk of complications, such as:
 - a. They risked a potential lawsuit from the public or some other entity.
 - b. If for some reason the EA showed that they could not build the project or build it yet, the District might end up losing any money they had spent.
2. They said that the Division never specifically told the Board of Trustees, the Manager, or their Engineer to not construct the crossing.

3. They thought that they had to construct the crossing prior to May 2002 or else they would not be able to do it until about September or October, after the water level of the creek had dropped back to low flow. Their concern was that they planned to build the rest of the project during the summer, but that they would not be able to provide drinking water to any homes in the Burr Fork and Killyon Canyons until October, if they had to wait until the fall to construct the crossing.
4. They thought that constructing the crossing in April would cause no negative impacts on the Bonneville Cutthroat Trout, because the construction work would be completed by then.
5. They thought that by waiting until July to construct the crossing, they ran the risk of having to pay someone to monitor the creek for signs of trout, eggs, and newly hatched trout, to make sure they would not be interfering with spawning.
6. They said they were frustrated, because the environmental assessment had taken much longer than they had planned for it to take and put them many months behind in their construction schedule. They said they thought that if they didn't construct the crossing in April they would not be able to provide drinking water to the proposed users this summer during an anticipated draught. This would mean many people would not have an adequate, safe, source of drinking water this summer.

Response by Division of Drinking Water to the District's Justification: The Division had told the District to wait until the EA process was complete before proceeding with construction of the crossing. Division staff thinks the District should have waited. In the Division's opinion, the District management made a poor decision based on inaccurate and incomplete information, and that if they had sought out the necessary information they would have also known that they should not construct the crossing in April and that constructing it in April provided no benefits. The following information is presented by the Division in answer to the justification provided by the District:

1. It seems like there was discussion months earlier about the potential problems of lawsuits and running the risk of losing money spent on construction of facilities built before the EA process had been completed. However, in more recent months when the District had talked about proceeding with the crossing, staff had told them verbally they should not do it. And in an e-mail from Ken Wilde to Fred Smolka, Manager, Emigration Improvement District, at 10:21 am on April 12, 2002 Mr. Wilde told Mr. Smolka the District had to wait to start construction until after the 30-day public notice period and their engineer still had to submit plans and specs. (Of particular note are items a & e of 2.) The e-mail was opened by Mr. Smolka before any construction work had been started.
 - “2. Before you can start construction of the project the following must also occur:
 - a. The draft EA cannot become a final document until after the 30 day waiting period after publication of the FONSI to out if we get any more comments or questions.
 - e. Carollo must submit plans and specs for review by our office and have them approved. These must contain the MBE/WBE requirements.”

2. The Authorization Letter from the Drinking Water Board says the EA process must be completed before the District can proceed with the project.
3. Constructing the crossing prior to May provided no advantages. They and their engineer apparently never talked about the plan submittal and approval, and the possible construction schedule. Their engineer had not even submitted plans and specifications for the project to the Division (for approval) and didn't do so until later in May. By the time they have plan approval, open bids, go through the MBE/WBE review process, and can start construction of the remainder of the project it will be July.
4. Since Burr Fork usually has its greatest flows April and May, and is usually back to a fairly low flow by July, they had no advantage in constructing prior to July. The Salt Lake County Flood Office has been measuring the creek flows for Burr Fork for the past five (5) years. Tables with that information are in the appendix. The flows had pretty much peaked for the year when the District proceeded with construction of the crossing.
5. The Division had tried to convince the District to not build the waterline in April, because they should be able to build it in mid-summer. And in a voice message left about a week before they started construction the Division tried to convince the District's engineer that they did not have to be in a hurry to construct the crossing in April, because the flows should be okay mid-summer. (The Engineer may argue that this is not the meaning he got from the voice message.)
6. The Division can sympathize with the District that the process has been a long and frustrating process. But, the process was nearly complete when they made the crossing. The Division received the last clearance letter from a cross cutter the last week of May. So the process could have been completed by early June 2002.

Drinking Water Board Action: In its meeting of May 10, 2002 the Drinking Water Board (Board) reviewed the construction activities undertaken by the District previously discussed. The Board decided to remove the Burr Fork Creek Waterline Crossing from funding eligibility under this project. This is one of the options the USEPA said the Board had to remove itself from liability for the actions of the District with respect to the NEPA process. This means that none of the loan proceeds may be applied towards expenses for the creek crossing. This decision has the following meaning for the District:

1. The District must pay all of its expenses related to the Burr Fork Creek Waterline Crossing out of its own funds. These costs include, but are not limited to design, construction, inspection, etc. of the crossing facility.
2. The District must mitigate any negative environmental impacts directly or indirectly resulting from the construction of the crossing, and it must pay for said mitigation out of its own funds, in order for the remainder of the project to. Based on the findings of the environmental assessment process, the majority of the mitigation work for the District will be to revegetate the construction site as required by the DWRi and DWR.

Mitigation – Threatened, Endangered, and Other Sensitive Species:

Generally, it is a requirement that the District monitor water flows and minimize water depletions in areas where Bonneville cutthroat trout are known to occur in Emigration Creek.

The District's master plan includes drilling deep wells that have little direct connection with the canyon surface water flows and providing that water to canyon residents. Then residents can stop pumping from the myriad of shallow individual wells. The Board of Trustees has discussed a policy of requiring new participants in the water system to deed to the District certain amounts of water rights at the time the homeowner becomes a user of the water system. The intent is to increase the stream flow by reducing use of 1) a number of shallow wells, 2) some springs, and 3) direct or indirect diversions of water from the streams, all of which deplete the stream flow. The District passed a resolution to require potential customers to yield $\frac{3}{4}$ acre-feet of water per proposed connection. This policy entitled "Emigration Improvement District Policy for the Enactment of Rules and Regulations Governing Water Right Capacity Requirements" is included in the Appendix to this document. Another District resolution states that the District will cooperate with certain Federal and State regulatory agencies to help gather data about stream flows in the canyon. The intent of this resolution is to monitor stream flows and try to quantify the impact of replacing individual shallow wells with deep wells and to help prevent negative environmental impacts to the trout population. Barnett has suggested that the local creeks and streams should show an increase in flow once the individual wells affecting them have been abandoned.

Mitigation - Aquatic and Terrestrial Wildlife:

Mitigation for decreased instream flows in Emigration Canyon (if observed) and disturbed vegetation and soils due to this water development project would include the following:

- Control erosion in the construction areas and revegetate disturbed areas with native vegetation.
- Construct the Burr Fork stream crossing during low flow and route water around the construction area to minimize sedimentation downstream.
- Install flumes to monitor instream flows in Emigration Canyon and adjust the quantity of water being pumped from the proposed wells if instream flows decrease beyond an acceptable level due to the groundwater withdrawal.
- Acquire approximately 300 acres of watershed property in Brigham Fork and Burr Fork of Emigration Canyon and restrict use on these properties to maintain water quality in the drainage.
- Acquire water rights from the residents along Emigration Creek once the water delivery system is in place and the residents are connected to the system. Preserve these water rights to provide instream flows in Emigration Creek.

Mitigation - Vegetation Impacts: The following proposed mitigation measures would be implemented to control erosion and encourage native revegetation in these areas with a seed mix that is beneficial to wildlife. This seed mix must be preapproved by the UDWR.

Mitigation – Brigham Fork Well: It does not appear that any environmental damage has occurred from the well drilling/construction work that has been performed to date. However, if environmental damage does occur as a direct result of this and/or any of the proposed construction work, the District will be required to mitigate that damage.

Mitigation – Burr Fork Creek Waterline Crossing:

With proper revegetation the riparian habitat in the area of the construction work should be able to recover and also support spawning by the trout. The District is being required to mitigate the negative environmental impacts and to comply with the revegetation portion of its SCA permit now. Because it was not possible to make a more detailed evaluation of possible negative environmental impacts and no tangible evidence of impacts on the trout has been found, the District will only be expected to mitigate the damage at the crossing site by revegetating it and to otherwise comply with its SCA permit. It will not be expected to make any reparations for other possible environmental impacts unless evidence of other negative impacts is found.

Meeting to Determine How Environmental Damage from Construction Would be Corrected: On, May 23, 2002 Charles Williamson, Stream Alteration Specialist, Division of Water Rights (DWRi), and Doug Sakaguchi, DWR, met with District representatives. The reason for the meeting was to decide how the erosion at the creek crossing – waterline construction site could be stopped. The following is a summary of what the two agencies are requiring the District to do to mitigate the site of the waterline crossing:

1. Line the water's edge with "wattles". Willow wattles would be preferable, but may not be readily available, so straw wattles would be allowed. The wattles are to be partially buried and anchored.
2. Revegetation should consist of willow pole plantings gathered from adjacent or upstream sources as well as nursery stock planted in densities of 6 to 12 inches apart.
3. Pole planting should be just behind and up-gradient of the wattles.
4. River birch and/or red osier dogwood pole plantings would be appropriate to supplement the willows and create diversity. The pole planting would only need to be from the silt fences to the water's edge.
5. Doing the work as soon as possible to prevent any further erosion of the banks was recommended. The District was concerned about doing the work immediately, because the Drinking Water Board had told them to not perform any more construction work on the project. When they spoke with the Division of Drinking Water they were told that the Division also wanted them to revegetate the site as soon as possible and to comply with the recommendations of the DWR and DWRi.
6. The current configuration of the channel should not be modified.
7. Boulders may not be used for bank stabilization.
8. The District will plant additional trees and shrubs in the areas up slope of the silt fencing at a later date, but within the timeframe required by the SCA permit. This will be coordinated with DWRi. It may be necessary to temporarily irrigate these slopes to ensure plant survivability.

Literature Cited

Barnett, D.A. 2001. Review of the Emigrations Canyon hydrogeology and potential impact to stream flows from the proposed well drilling. Technical memorandum. Barnett Intermountain Water Consulting.

Lentsch, L., Y. Converse, J. Perkins. 1997. Conservation agreement and strategy for Bonneville cutthroat trout (*Oncorhynchus clarki utah*) in the State of Utah. Utah Division of Natural Resources. Publication Number 97-19.

Rosgen D. 1996. Applied river morphology. Wildland Hydrology. Pagosa Springs, CO.

UDNR. 2001. Email from A. Axel, UDNR Natural Heritage Program regarding the Emigration Canyon TES species occurrence request. UDNR, Salt Lake City, UT.

USFWS. 2001. Fax from R. Harris, USFWS to K. Wilde regarding the Emigration Improvement District Water System Expansion Project. USFWS Field Office, Salt Lake City, UT.

PRIME AND IMPORTANT FARMLAND

Affected Environment: There are no farmlands in the project area.

Environmental Consequences: This project presents no environmental consequences, because there are no farmlands in the project area.

Mitigation: No mitigation measures need to be developed, because there are no farmlands in the project area.

AIR QUALITY

Affected Environment: The proposed project is in a non-attainment area. This is an area that does not meet the National Ambient Air Quality Standards (NAAQS). See attached memo from Division of Air Quality.

Environmental Consequences: As a non-attainment area, the proposed project is subject to R307-309, Fugitive Emissions and Fugitive Dust, of the Utah Air Conservation Rules (UACR).

Mitigation: Submittal of a fugitive dust control plan to the Executive Secretary of the State Air Quality Board for approval will be required of the contractor once he has been awarded the construction of this project.

SECTION IV

PROPOSED PROJECT ALTERNATIVES

EID has developed a Capital Improvements Program that may be implemented over the next few years. The proposed project, for which current funding is sought, includes that portion of the Capital Improvements Program identified for the District's fiscal 2001 and 2002 years. The following discussion briefly describes alternative facilities considered for implementation.

This section briefly describes a No-Action Alternative and three other alternatives involving various water sources in the canyon and develops the rationale for rejecting or recommending an alternative. There are no alternatives for the pipeline route, except in the only road up the canyon, where a pipeline could be constructed without extreme costs and environmental concerns.

Alternative #1 – No Action

This alternative consists of basically doing nothing toward solving the problems or meeting the needs of water demand in the canyon. The No-Action alternative would not provide for construction of the EID Water System in any form. Therefore, the advantages of a new water system could not be realized.

There are numerous areas throughout the canyon where the water supply is inadequate; the water quality is suspect and where the distribution systems and storage tanks are too small for even normal demands let alone fire protection. Some people within the canyon have resorted to using creek water, which poses a health problem, and/or trucking in water. Several resident groups have also requested service from the EID. Therefore, the No-Project or "no action" alternative is not recommended.

Alternative #2 – City Water Source: Total Canyon

Consideration was given to using Salt Lake City as a water source and constructing a single water line up the canyon to cover all possible water requests. It was estimated that a minimum of five pressure zones would be required which in turn would require five pump stations and five reservoirs. The reservoirs would act as storage for one zone and pump operating control for the next zone.

This alternative is not likely to be accepted by the canyon residents for fear that the introduction of this new water supply to the canyon will promote development. The initial capital costs to construct the transmission system, the storage reservoirs, the pump stations, and the controls for such a complex system would be a burden that the local residents could not bare. An additional concern is the cost of purchasing water from Salt Lake City on a surplus water contract and pumping costs to lift water from the bottom of the canyon to the top. A surplus water contract requires customers to pay a considerably higher rate than City residents.

In response to a question on this idea, Mr. LeRoy Hooten, Department Head of the Salt Lake City Water Department, stated that it would be too expensive to pump the water all the way up the canyon and that if he were to undertake the project he would develop water sources high in the canyon and gravity flow down the canyon.

In a conceptual comparison to a local source alternative, it became obvious that the costs would be considerably higher and the energy consumption would be prohibitive. The first zone pipe would have to be oversized to carry the whole flow and succeeding zones oversized to carry the flows of the zones above them. The trunk lines of existing systems in the lower reaches would also be too small to carry the extra flows so parallel pipes would be required. There would also be the cost of five new pump stations and four new reservoirs. It was determined no one existing reservoir could be utilized. Pumping costs to lift all this water up the canyon would be prohibitive. For all these reasons, this alternative was not considered further.

Alternative #3 – Local Sources: Canyon-Wide Water System

Use of local sources and existing systems where feasible for a canyon-wide water system was studied and is detailed in the 1994 Water System Master Plan. This plan developed new sources of water, added storage and interconnected existing systems. The cost of a total system (Phase I and II) exceeded \$9 million in present day costs.

Although this was considerably less expensive in capital and operating costs than Alternative #2, it is costly for the residents to consider and may not be publicly acceptable to develop the entire system at one time. Public acceptability may be a problem because this alternative includes providing service to areas which have not requested or felt the need for new water service or water supply. In 1995, this alternative was presented to the public in the form of a bond election but was narrowly defeated and is not considered as a viable alternative at this time.

Alternative #4 – Requested Water Service System

This alternative only considers areas in which the residents have requested service from EID but leaves the option open to add new service when requested. Therefore, this alternative includes the Young Oaks/Little Oaks subdivisions and the Lower Burr Fork/Killyon Canyon areas. This alternative also includes a new well in Brigham's Fork and a new storage tank to meet the water demands and storage demands of EID. The EA for the canyon is being processed for environmental work canyon-wide so anyone requesting to be serviced in the near future can do so without extensive environmental costs. The cost of Phase I is estimated to be approximately \$2.265M and will be more acceptable to the homeowners being serviced than any of the other alternatives because they need a system so badly and their alternatives are minimal and more costly.

SELECTED ALTERNATIVE:

The District selected Alternative #4, the Engineer’s recommendation. This alternative contains: construction of a new 1 MG water reservoir and installation of new pipelines and facilities appurtenant to the reservoir; development and construction of a new well and well house in Brigham’s Fork, and appurtenant piping and controls; and construction/installation of the distribution pipeline in both the Young Oaks/Little Oaks subdivisions and in the Lower Burr Fork/Killyon Canyon areas. Alternative #4 allows for providing service to additional areas of the canyon that petition the District for service. The District’s capital facilities plan addresses the possibility that canyon residents may wish to continue expanding the existing system until it becomes a canyon-wide system. Each segment of expansion would be engineered and constructed to fit into a master canyon-wide water system with a charge to avoid duplications that would not be required in a canyon-wide system.

PRELIMINARY COST ESTIMATE

Table IV-1 Estimated System Expansion Project Costs	
Emigration Improvement District	
	Total
Brigham Fork Well	\$410,000
Distribution Piping (8-inch)	\$779,000
Reservoir, 1 MG	\$500,000
Land Acquisition	\$76,500
Appurtenances	\$90,000
Total Construction Costs	\$1,855,500
Construction Contingency (5%)	\$92,775
Engineering, Legal and Administration (15%)	\$292,241
Environmental Assessment	\$25,000
Total Estimated Project Cost	\$2,265,516

Participation in the proposed expansion project includes potential users from four areas of the canyon described hereafter. The two new service areas will require substantially more piping than the existing service areas in Emigration Oaks. The costs have been allocated to the service areas based on what it will cost to deliver service to the service areas. The Killyon/Lower Burr Fork service area requires substantially more piping and consequently has a much higher allocation of the construction costs. The costs for source supply development and storage are generally equivalent throughout all service areas and will be calculated on an Equivalent Residential Unit (ERU) basis. This means that regardless of location, one service connection, or

ERU is equivalent to any other service connection. Therefore the cost to develop source and the cost of storage can both be equally divided on an ERU basis among the project participants. However, costs to deliver or distribute the water to a service area will vary depending on distance from existing facilities or facilities required for other service areas.

Table IV-2 delineates the three major construction cost components (source, storage and distribution lines) of this project and how their costs are proposed to be allocated to service areas. These major construction cost components are listed down the left side of the table and then standard factors for contingency, engineering, construction management, legal and administration are added to arrive at the overall estimated project cost. Each service area has a varying degree of participation. There are four service areas defined within the project. Each

Table IV-2 Allocated Construction Costs Emigration Improvement District						
	District	Emigration Oaks:		Young/Little Oaks + Creamer/Plumb 7 Connections	Killyon/Bur r Fork	Total
		Phase 1-5 plus Creamer's 2 Lots	Phases 4a, 6, 6a			
Source:		304,439	131,859	85,321	83,381	605,000
Storage:	100,000	234,997	101,782	65,859	64,362	567,000
Distribution:		10,064	4,359	249,821	419,256	683,500
Contingency*	5,000	27,475	11,900	20,050	28,350	92,775
E/CM/Ad**	15,750	86,546	37,485	63,158	89,303	292,241
EA		12,580	5,449	3,526	3,446	25,000
Subtotal	120,750	676,101	292,834	487,733	688,098	2,265,516
Boyer Pmt		536,101	113,899	0	0	650,000
Reserve		140,000	0	0	0	140,000
Net Costs	120,750	0	178,935	487,735	688,098	1,475,516
Number of Connections		157	68	44	43	312
Cost Per Connection		0	2,631	11,085	16,002	
Notes: * 5% of all above items. ** 15% of all above items						

service area is listed across the top of Table IV-2. The boundary of each service area is physically separated from the other areas and is categorized as follows:

Emigration Oaks - Phase 1-5 (plus 2 Creamer lots): These are the lots in the early phases of the Boyer development that were approved as subdivisions at the time EID contracted to assume operation of the Freeze Creek water system. EID also agreed with Steven Creamer to provide two service connections in conjunction with development and installation of a distribution line through his 80 acre parcel of land on the East end of the Emigration Oaks development. There are currently 109 homes built on these 157 lots.

Emigration Oaks - Phase 4a, 6 and 6a: These are the “later phases” or the more recently approved subdivisions developed by the Boyer Company, including the lots created in conjunction with the secondary access road through the Burnett Property. There are no completed homes in this service area, but three homes are currently under construction.

Young Oaks/Little Oaks (plus Creamer/Plumb connections): These are the houses and/or lots in the Young Oaks/Little Oaks subdivisions that are proposed for connection to the EID distribution system. To provide service to this area, EID would make a connection to the existing system. EID would not use existing six-inch diameter pipe in these subdivisions, but would install eight-inch diameter pipe to meet EID standards and to meet fire flow requirements.

Killyon Canyon/Lower Burr Fork: These are the houses and/or lots located in the area from the cut-off to Little Mountain Easterly past the junction in the road and up both forks of the road - including all of the currently developed Killyon Canyon and those along the main road up lower Burr Fork Canyon Northward to the Forest Service boundary. An eight-inch line would be required to convey water from the storage reservoir to this area.

Proposed impact fees for each of the service areas are based on the cost to supply, store and distribute water to that particular service area. The source and storage costs are the same for each service connection or ERU. The distribution piping required to convey the water from the sources and storage reservoirs to a particular service area varies and consequently, impact fees vary for each service area. Costs to phase 1-5 and phase 4a, 6 and 6a of the Emigration Oaks include minimal additional distribution lines (connecting new source and reservoir to the existing system, which cost would be shared by the new service areas). The majority of their lines were installed previously.

The additional source and storage costs allocated to the phase 1-5 service area is entirely offset by funds already in the hands of EID and therefore no impact or other fees are proposed for assessment to this service area. The funds held by EID come from three sources: 1) \$140,000 has been accumulated over the past several years from funds paid by water users in phases 1-5 in excess of the operation and maintenance costs of the system, which funds were collected for the purpose of establishing a reserve for future costs of replacement and/or system improvements, 2) \$ 650,000 has been paid to EID by Boyer Company pursuant to agreements entered into with EID to make up for any deficiencies in the water system that was passed on to the EID as well as those assumed by EID as part of providing water services in connection with the secondary

access road to be built by Boyer Company, and 3) the District has and will collect funds for water right leases and property tax assessments of which \$120,750 will be used to help pay for storage capacity. The Funds in the hands of EID are to be used first to fully offset phase 1-5 allocated costs and secondly to offset as far as possible costs allocated to phases 4a, 6 and 6a with the \$120,750 going directly to pay for a portion of the storage reservoir. The funds in the hands of EID are not sufficient to cover all of the costs allocated to the later phases, which results in the necessity to assess impact fees on all lots in the later phases.

Customers would pay for their share of the system by up to three methods. 1) an impact fee, 2) a base/standby fee, and 3) a surcharge. The impact fee would vary and be charged to all users except Emigration Oaks phase 1-5 as set forth on Table IV-4. The base/standby fee would not apply to the Emigration Oaks service areas, but would apply to both Young Oaks/Little Oaks and Killyon/Lower Burr Fork service areas. The Surcharge would apply only to the Killyon/Lower Burr Fork service area. The base/standby fee and the surcharge essentially allow the users in the service area effected to finance that part of their cost over a twenty-year period at a minimal interest rate. If the customer is unable to pay their entire impact fee up front, EID will work with them to allow them to pay over time with a minimal interest rate approximately equal to what EID can earn on its invested funds with the Utah State Treasurers Fund.

EID wishes to have the same rates for water use for all water users. The rate per gallon would accelerate as use increases for all users. The differentiation between the service areas in monthly bills would be the add-on for the monthly base/standby fee and for the monthly surcharge. Table IV-2 and Table IV-4 reflects a plan whereby the impact fees would be kept fairly low with the difference being made up over 20 years which is the time over which the revenue bond must be paid back to the State of Utah. Assuming an individual user has average water use that would produce a bill, which would average \$50 per month in the two Emigration Oaks service areas and \$25 per month in the two new service areas, then the total average monthly bill would be as follows:

Table IV-3 Service Area Estimated Monthly Bill				
Emigration Improvement District				
Service Area	Water Use (\$)	Base/Standby Fee (\$)	Surcharge (\$)	Total (\$)
Emigration Oaks Phase 1-5	50			50
Emigration Oaks Phase 4a, 6, 6a	50			50
Young Oaks/Little Oaks	25	25		50
Killyon/Lower Burr Fork	25	25	25	75

Many of the Emigration Oaks customers monthly average bills are closer to \$50 per month, but it is anticipated that the other two service areas will use less water because of decreased demand for outdoor irrigation, as the Emigration Oaks tend to require more landscape irrigation. If the individual opts to have higher use, then his average monthly bill could be increased. A \$25 per

month average should allow for normal inside use plus a conservative outdoor irrigation plan in the summer.

Table IV-4 reflects the anticipated sources of funds to meet the debt service requirements for the proposed project:

Table IV-4 Estimated Revenue Sources for the Project Emigration Improvement District						
	District	Emigration Oaks Phase 1- 5 Creamer 2 lots	Emigration Oaks Phase 4a, 6, 6a	Young Oaks/Little Oaks & Creamer/Plumb 7 Connections	Killyon Canyon/Lower Burr Fork	Total
Number of Connections		157	68	44	43	312
Impact Fee per Connection		0	\$2,631	\$6,200	\$6,200	
Impact Fees	0	0	\$178,908	\$272,800	\$266,600	\$718,308
PV of Base/Standby Fee	0	0	\$0	\$217,228	\$212,291	\$429,519
PV of Rate Surcharge	0	0	\$0	\$0	\$212,291	\$212,291
Advance by District	\$120,750	0	\$0	\$0	\$0	\$120,750
Total Estimated Revenue	120,750	0	\$178,908	\$490,028	\$691,182	\$1,480,868

Further information related to the economic impact of this project is presented in the Appendix in two documents: 1) the Economic Analysis for Imposition of Impact Fees for Water System Facilities Expansion, and 2) the Resolution Enacting Amended Impact Fee Rules and Regulations Governing the Imposition of Impact Fees and Appeal Procedures for the Review of Contested Impact Fees. The final document in the Appendix is a policy for the handling of water rights that users desiring to connect into the EID system would follow. This policy was adopted by the Board of Trustees at its March 18, 2002 Board of Trustees meeting. It is titled “Emigration Improvement District Policy for the Enactment of Rules and Regulations Governing Water Right Capacity Requirements”.