

LEEDS TOWN
WASTEWATER STUDY

February 2000

FINAL REPORT
Project # 9911-034



APPROVED
Utah State Dept. of Environmental Quality
Utah Water Quality Board

Date: 5/30/2000

WB Review Engineer [Signature]
Executive Secretary [Signature]

JONES & DEMILLE ENGINEERING

45 East 500 North
Richfield, UT 84701
435-896-8266
Fax 435-896-8268

~~225 N. Bluff, Suite 12~~
~~St. George, UT 84770~~
~~435-656-0257~~
~~Fax 435-656-3849~~

TABLE OF CONTENTS

EXECUTIVE SUMMARY	1
SECTION 1 INTRODUCTION	4
SECTION 2 STUDY OVERVIEW	6
SECTION 3 EVALUATION CRITERIA	8
3.1 Design Criteria.	8
3.2 Population Projections.	9
SECTION 4 WASTEWATER FLOWS	10
4.1 Design Year.	10
4.2 Average Daily and Peak Daily Flows.	10
4.3 Harrisburg Resort, Peak Daily Flow for the Year 2020.	11
4.4 Harrisburg Pressure Line Capacity.	11
SECTION 5 WASTEWATER COLLECTION, TRANSMISSION, AND TREATMENT ...	12
5.1 Collection and Transmission.	12
5.2 Wastewater Treatment	12
SECTION 6 ECONOMIC ANALYSIS OF ALTERNATIVES	14
6.1 Alternative #1	14
6.2 Alternative #2	14
6.3 Alternative #3	16
6.4 Alternative #4	19
6.5 Alternative #5	22
6.6 Funding Needs for Alternatives	24
6.7 User Fee Comparison of Alternatives	24
SECTION 7 PROJECT FINANCE	26
7.1 Funding	26
7.2 User Fees	26
SECTION 8 RECOMMENDATIONS	29
SECTION 9 PUBLIC COORDINATION	30
SECTION 10 ENVIRONMENTAL COORDINATION	31
SECTION 11 CONCLUSION	32

APPENDIX

- A Ash Creek Special service District Rate & Impact Fee Schedule & Agreement
- B Harrisburg Resort Wastewater Calculation
- C Air Vacuum Collection System Information
- D User Fee Information
- E Public Information & Correspondence.
- F Septic System Density Recommendations
- G Environmental Documentation

EXECUTIVE SUMMARY

Leeds Town completed a wastewater study in October of 1996. The study was funded by the State Department of Environmental Quality (DEQ) in the form of an advance. The purpose of the study was to determine the cost and feasibility of completing a wastewater collection system in Leeds to collect and transmit wastewater to the Ash Creek Special Service District lagoons. The basis of the study was that Leeds would complete its own collection system and work with Ash Creek to facilitate an agreement for the operation and maintenance of the system and treatment of the wastewater.

The study resulted in the development of recommendations and cost estimates for a collection system, pump stations, and treatment of wastewater by Ash Creek. Based on preliminary information from Ash Creek, a recommendation for funding was made to complete the system. The study recommended applications for funding from USDA- Rural Development, and the State Water Quality Board. As part of the application process, public hearings were held to obtain public input. The public hearings were not very well attended, but those in attendance were supportive of completing a wastewater system in Leeds.

The Town submitted applications to Rural Development and DEQ in the fall of 1996. Leeds attended meetings with the Water Quality Board and was eventually successful in obtaining an offer for funding in April of 1997 in the amount of a loan of \$255,000 and a grant for \$450,000. The stipulation attached to the offer was that the Town would get an acceptable show of public support before the funds could be released. The definition of what was an adequate show of public support was left for Leeds to determine. In March of 1997, Rural Development sent Leeds' application to the national pooling in Washington D.C. In April of 1997, Leeds Town was awarded funding from the Rural Development pooling in Washington D.C. Rural Development offered Leeds Town a loan of \$160,000 and a grant of \$495,000. The total project financing was \$1,360,000 after all funding was complete. The funding package resulted in a 70% grant for the project.

The mandate from the Water Quality Board to obtain public support was still uncompleted in May of 1997. During this time period, the Mayor resigned and there were changes on the Council. The public support process of the project was delayed as new people became involved. The new Mayor and Council Members needed some time to become familiar with the project and begin work on the public support process.

Two amendments to the original engineering agreement for the study were made to provide additional engineering services to assist the Town with information and technical assistance to complete the public support process, and to negotiate connection and user fees with Ash Creek. Leeds Town was not satisfied with the result of negotiations with Ash Creek and the resultant impact fees and user fees. As a result of this, the Town chose to pursue alternative treatment processes. The Town also decided to investigate alternative collection methods beyond the gravity system and pressure system. The interest of the Town in this process was to try and maintain project costs as funded but to enable the Town to own, operate, and maintain their own system independent of Ash Creek.

Strong encouragement by the funding agencies was made to the Town to complete the public support process. Other public information meetings were held. Pamphlets were mailed to all residents and finally the Council went door to door with a questionnaire to obtain a vote for support or no support of the wastewater system. In council meeting on September 9, 1998, the results of the door to door survey were given to the public. There were a total of 107 responses. 56 voted in favor of Leeds Town developing a sewer system, 47 were opposed to a sewer system, and 2 were undecided. There was a show of public support as a result of the survey. The Council Members held a discussion on the matter and voted to proceed with the project.

Since the September 9, 1998 meeting, there have been questions regarding the system treatment that the Town should pursue. DEQ has determined that the study will not be complete and the project cannot proceed until the Town Council votes on a selected option for wastewater treatment. Both funding agencies agree that there should be a resolution by the Council regarding the treatment of wastewater before the engineering of plans and specifications can be completed.

In an effort to facilitate this decision by the Town, the study was amended to include comparisons of 5 alternatives of treatment. This amendment also considered the funding of these 5 options and possible implications to the present funding offered by DEQ and USDA- Rural Development. The recommendation for the treatment process will be based on funding availability and economics.

The amendment to the study was presented for consideration at a council meeting January 1999. The funding agencies felt they could not hold funds any longer and requested that the Council take a formal action to recommend how the wastewater from Leeds will be treated. If the selected option was within the present funding, the Town would proceed with design engineering. If the

option selected was beyond the funding offered, the Town would have to apply for additional funding.

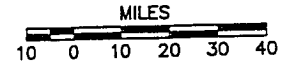
The recommendation was for the Town's wastewater to be treated by Ash Creek and the Town join the District. After some consideration of other alternatives the Town decided to proceed with treatment by Ash Creek. However, the project was never fully on track because of concerns about costs to users, joining Ash Creek, and project timing. At a Town Council meeting on February 8, 2000, the project ended because the motion to annex into Ash Creek Special Service District failed to receive a second. The Town is not going to proceed with the project at this time.

SECTION 1
INTRODUCTION

Leeds Town, just off Interstate 15, is approximately 20 miles northeast of St. George and southeast of the Pine Valley mountains. A location map is included on the following page. The community began as an outgrowth of nearby Harrisburg when immigrants from Leeds, Yorkshire, England moved to the site in 1867 when silver mining was big in the area. Mining is no longer found in this area, but the town is growing continually as more people are moving to the Dixie Region. Leeds is a residential community consisting of retirees and residents that commute to work in other areas of Washington County.

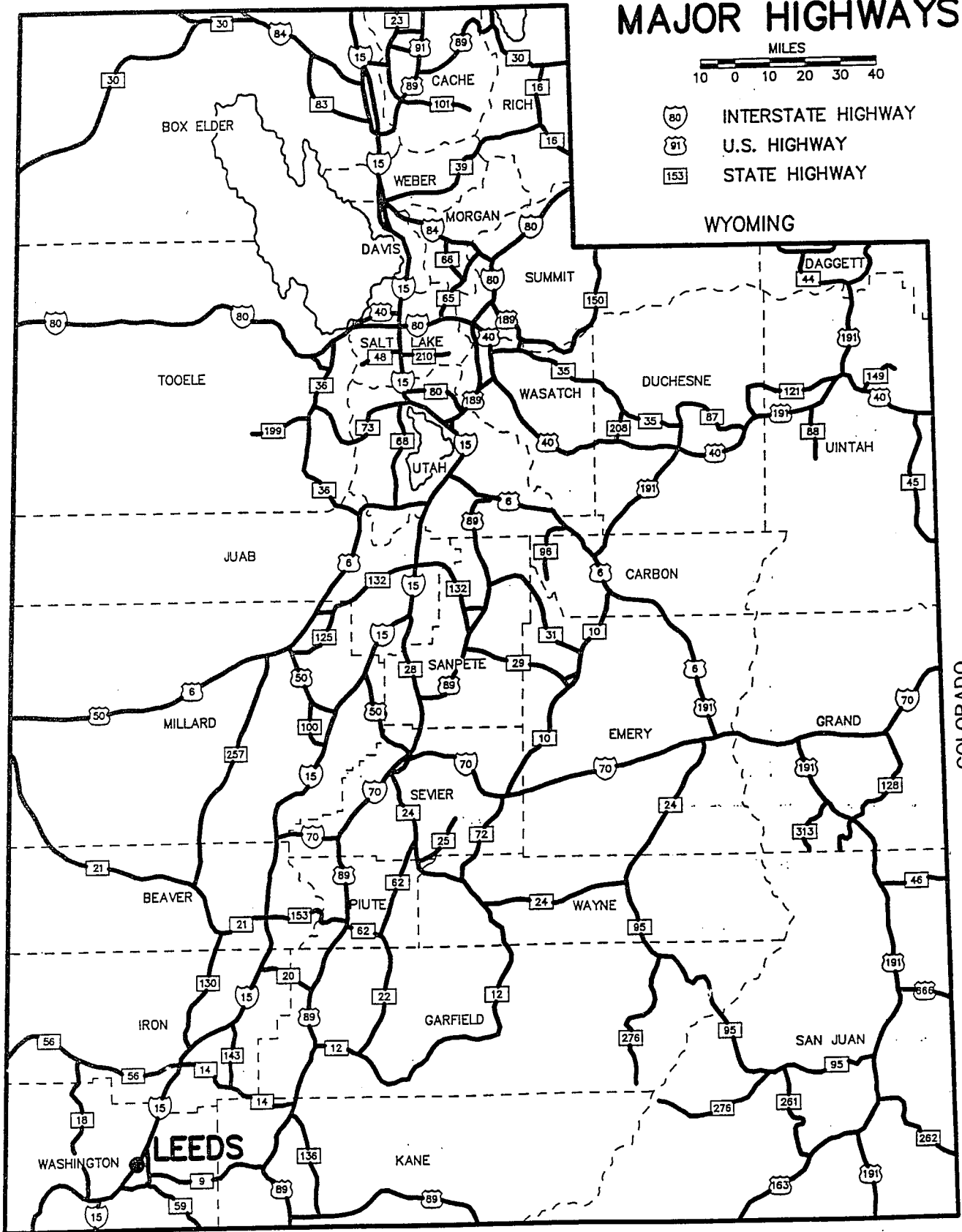
Leeds Town does not have a community wastewater system. The system of waste disposal is through individual systems, which consists of septic tanks and drain fields. Many of the individual systems are experiencing problems with ground water and drainfield failures due to poor soil conditions. The Town is concerned that these problems combined with growth may compromise the ground water quality. Therefore, the Town Council commissioned this study to determine the feasibility of funding and constructing a community wide system. This study was funded by the State of Utah Water Quality Board. Appendix F contains information concerning recommended septic system densities based on a study for the Washington County Water Conservancy District.

STATE OF UTAH MAJOR HIGHWAYS



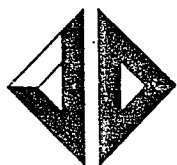
- INTERSTATE HIGHWAY
- U.S. HIGHWAY
- STATE HIGHWAY

NEVADA



COLORADO

ARIZONA



Jones & DeMille Engineering

45 East 500 North - P.O. Box 757
Richfield, Utah 84701
(801) 896-8266

**LEEDS TOWN
LOCATION MAP**

SECTION 2 STUDY OVERVIEW

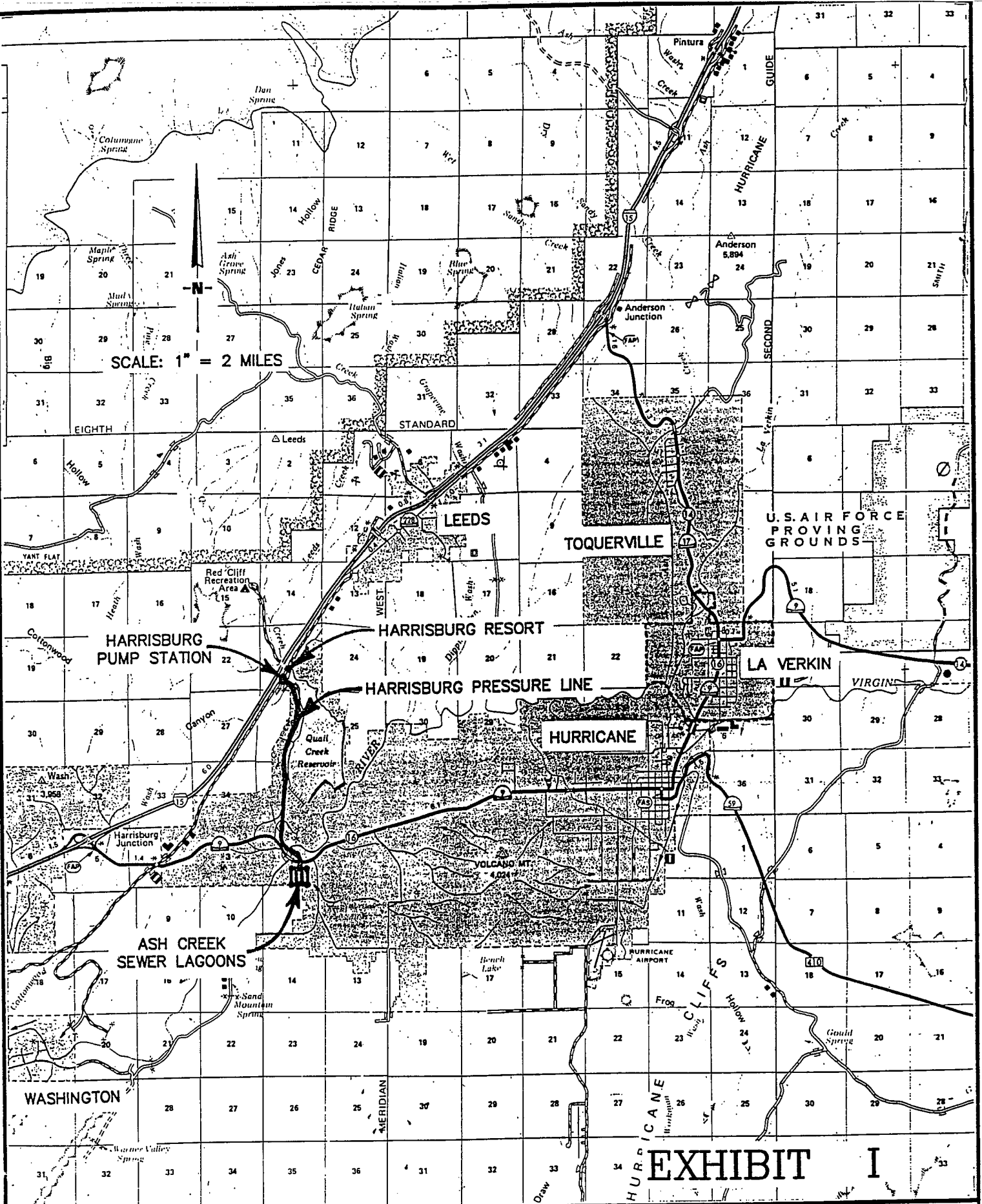
The wastewater needs of the central part of Washington County including Toquerville, LaVerkin, and Hurricane are being provided for by the Ash Creek Special Service District. Leeds Town is geographically in a position to be able to participate with these other communities in the Ash Creek Special Service District. Leeds is a small community with limited resources and it is not practical for them to fund, construct, and operate a wastewater treatment facility. Total containment lagoons and land applications were considered as possible treatment systems that Leeds could afford to operate. However, there was not an affordable suitable site available near the Town.

There are currently two ways to access the existing Ash Creek Lagoon system. One is through the Harrisburg trunk line and the other is through the collection line that has been built to the WalMart complex and industrial park.

The Harrisburg line was installed by the developer of the Harrisburg resort. The Harrisburg resort community was born when Quail Creek was constructed. The housing in Harrisburg primarily is for retirement and second homes. The housing is dense and thus requires a community wastewater system. Harrisburg has a collection system, pump station, and long pressure outfall line that goes to the Ash Creek wastewater lagoons. Exhibit 1 shows the location of the outfall line and the Ash Creek lagoons. The Harrisburg pressure line also services Quail Creek State Park and the St. George Water Treatment Plant. This line consists of approximately 22,000 feet of eight inch PVC and approximately 2,000 feet of 6 inch PVC, with the six inch line being at the end of the outfall line. The pump and line are currently owned, operated, and maintained by the Ash Creek Special Service District. Ash Creek has indicated that Leeds town can connect to this pressure line.

WalMart and the industrial park are in Hurricane City and these improvements were installed by a special improvement district. The engineer for Hurricane indicated that the line was built by and for the adjacent property owners and does not have capacity to handle any additional wastewater. Ash Creek discouraged pursuing a connection to this line.

The Town of Leeds and their Engineer have met with the Ash Creek Special Service District at two regularly scheduled meetings. In addition to meeting with the Board, there has been regular discussion and coordination with the Service District Manager, Darwin Hall. The purpose for the



Jones & DeMille Engineering
 45 East 500 North - P.O. Box 757
 Richfield, Utah 84701
 (801) 896-8266

**LEEDS TOWN,
 HARRISBURG RESORT
 & ASH CREEK LAGOONS**

meetings and coordination was to get some firm commitments from Ash Creek. The information available at this point is as follows:

1. Ash Creek has agreed to treat and dispose of the wastewater delivered by Leeds to the Ash Creek wastewater lagoons.
2. Ash Creek has agreed to allow Leeds to connect to the existing eight inch pressure sewer at Harrisburg. Leeds will upgrade the pumping station at Harrisburg as needed.
3. Ash Creek will maintain and operate the Leeds collection system and transmission system.
4. Ash Creek will charge Leeds Town an impact fee of \$1,500 per residential connection. The impact fees for commercial connections are attached in Appendix A.
5. Ash Creek will charge Leeds Town \$15.00 per month per residential connection for operation and maintenance. Commercial, industrial, schools, and churches will be charged \$19.00 for the first 12,000 gallons of culinary water used plus \$1.77 per 1,000 gallons over the 12,000 gallons.

The user rates and impact fees that Leeds will be paying to Ash Creek will be the same fees Ash Creek is currently charging existing users. In addition to the monthly operation and maintenance fees, Leeds users will also have to pay to retire any debt service that may be incurred to construct the wastewater collection system.

This study will attempt to give Leeds Town the information they need to determine the feasibility and affordability of a community system. If there is public support, Leeds can use the study to seek the most favorable funding for the system.

SECTION 3 EVALUATION CRITERIA

This section will briefly state some of the criteria used to perform a preliminary evaluation of the wastewater system needs for Leeds Town. Health Department criteria combined with current and future population will be used to determine the sizes of pipe, their location, pump sizes, and wastewater flows.

3.1 Design Criteria.

Wastewater Flows are based on the Administrative Rules for Design Requirements for Wastewater Collection for Treatment and Disposal Systems, June 5, 1992.

Average daily residential flows are based on 100 gallons per capita per day.

Commercial flows are based on the following:

Motels	62 gallons per capita per day
RV Parks	125 gallons per unit per day
Service Stations	250 gallons per pump per day
Modern Camps	35 gallons per camper per day
Restaurants	35 gallons per seat per day
Launderette	580 gallons per washer per day
Schools	20 gallons per person per day

Outfall sewer lines should be designed at 2.5 times the average daily rate.

Collector sewers should be designed at 4 times the average daily rate.

3.2 Population Projections.

The Town of Leeds has been experiencing a lot of growth over the past six years. There are several approaches for estimating the future growth rates and population of Leeds and the surrounding areas. One method is to use the 1990 census and the current population to determine growth rate and project it over the next ten, twenty, and fifty years. Another method is to use the Five County AOG population projections. In addition to these considerations the total land area available for development can also be used to determine the maximum build out of the area.

The population of Leeds in 1990, according to the census, was 254 persons. The estimated resident population by count by the Town is currently 420 persons. Based on this information the growth in Leeds has exceeded the Five County projections by about 43%. Both sets of information and projections are in the following Table.

TABLE 3.2 LEEDS POPULATION PROJECTIONS						
Source	1900 Census	1996	Percent Increase	2000	2010	2020
5 County AOG	254	310	1900-1996 22%	362	471	559
			Annual 3.38%			
Based on Growth from 1990-1996	254	420	1990-1996 65.4%	587	1357	2500
			Annual 8.74%			
Based on the average rate of the 5 County projections and the 1990-1996 growth rate	---	420	Annual increase 6%	530	950	1700

The average annual growth rate of 6% will be used for wastewater flow calculations in this study. It is believed this rate is most representative for a long term projection to the year 2020.

SECTION 4
WASTEWATER FLOWS

4.1 Design Year.

The design year to be used for this study will be the year 2020.

4.2 Average Daily and Peak Daily Flows.

The average daily and peak daily flows are represented in Table 4.2 below.

TABLE 4.2 LEEDS WASTEWATER FLOWS				
SOURCE	1996	2000	2010	2020
	Quantity	Quantity	Quantity	Quantity
	Gallons	Gallons	Gallons	Gallons
Residential, Persons	420	530	950	1,700
100 Gallons per Capita/Day	42,000	53,000	95,000	170,000
Motels 2.5 Persons/Room	0	33	66	100
62 Gallons / Capita/ Day	0	5,115	10,230	15,500
Laundromat	0	5	10	20
580 Gallons/ Day/ Washers	0	2,900	5,800	11,600
Restaurant, Seats	40	64	124	184
35 Gallons/ Seat/ Day	1,400	2,240	4,340	6,440
Small Businesses	4	10	20	40
200 Gallons/ Business/ Day	800	2,000	4,000	8,000
RV Sites (Full Service)	94	118	178	238
125 Gallons/ Site	11,750	14,750	22,250	29,750
Total Gallons Per Day	56,850	82,195	147,045	250,000
Daily Flow, gpm	40	57	102	174
Peak Daily Flow, gpm @ 2.5 x Daily	100	143	255	435

4.3 Harrisburg Resort, Peak Daily Flow for the Year 2020.

The peak daily design flow for the Harrisburg pressure sewer was taken from the design data prepared by Creamer and Noble, Engineering Consultants for the Harrisburg development in December 1987. A copy of those figures is included in Appendix B. The peak daily design flow from those figures is 420 gallons per minute. This rate is for 1,800 RV sites. There are currently 205 RV sites at the Harrisburg Resort. This flow was based on RV sites, not home sites. Many of the lots in the Harrisburg Development are being used for a second home retirement residents. As the resort develops, these flow rates should be re-evaluated.

4.4 Harrisburg Pressure Line Capacity.

The combined peak daily flow of Harrisburg and Leeds for the year 2010 is approximately 675 gallons per minute, assuming the Harrisburg Resort completes its proposed development. This flow can be adequately transmitted by the Harrisburg line if the last 2,000 feet of six inch pipe is upgraded with a parallel eight inch pressure line.

SECTION 5

WASTEWATER COLLECTION, TRANSMISSION, AND TREATMENT

5.1 Collection and Transmission.

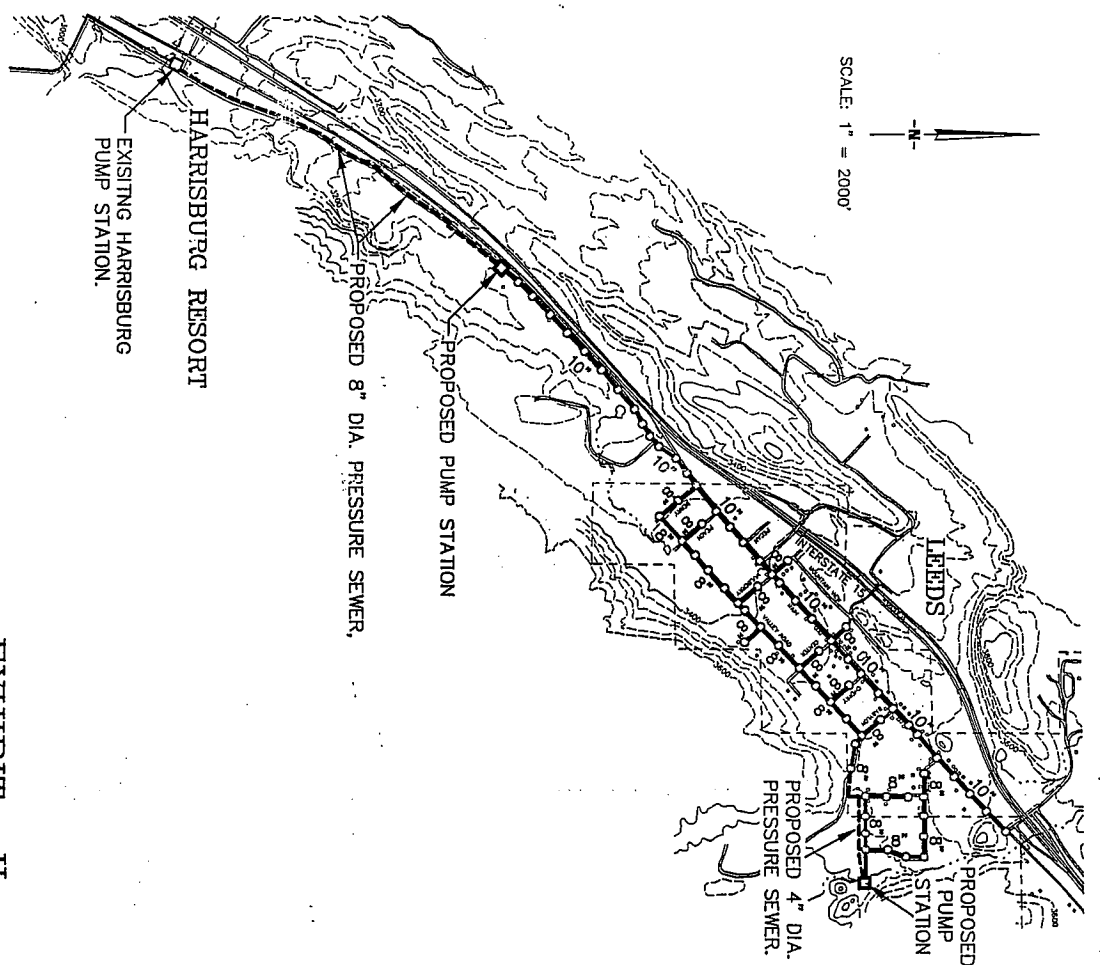
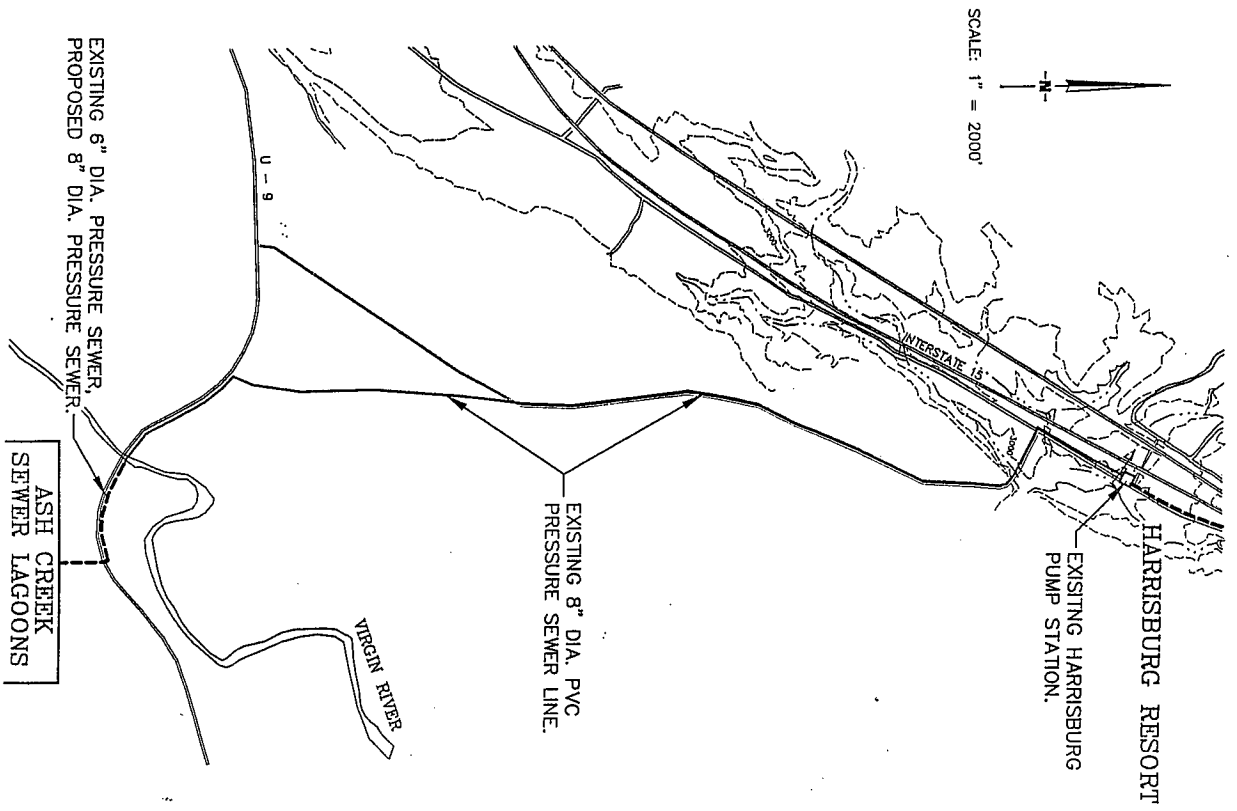
The 1996 cost estimate for the collection system through Leeds was based on a combination of gravity and pressure sewer. A lot of discussion and effort has occurred between the Town, funding agencies, and Engineer about different types of collection systems, and what type of system should be used and where each type should be used. The original costs assumed that the main part of Town would be placed on gravity sewer, and the northeast part of Town would be on pressure sewer. Exhibit II shows a preliminary system layout.

At this time, the specific type of collection system that Leeds Town will use has not been determined. This will be identified in the project design phase. The cost estimates for gravity sewer versus a vacuum sewer are about the same. The selected collection sewer types will be based on grades, accessibility, ground water and bedrock. Appendix C includes information on air vacuum collection systems.

5.2 Wastewater Treatment

The Town has had a lot of concern about the impact fees, user fees, and policies that would be imposed on Leeds if they become part of the Ash Creek Special Service District. The Town initiated the process to look at different treatment alternatives. The alternatives for treatment can be condensed into 5 options. Two of the options are to have Ash Creek provide wastewater treatment. The different alternatives are:

- Alternative #1: Connect the collection system to the Harrisburg pressure line and join the Ash Creek Special Service District.
- Alternative #2: Connect the collection system to the Harrisburg pressure line and contract with Ash Creek Special Service District to treat the wastewater.
- Alternative #3: Build a new facultative lagoon system.
- Alternative #4: Build a new mechanical treatment plant with discharge.
- Alternative #5: Build a new mechanical treatment plant with land application.



Jones & DeMille Engineering
 45 East 500 North - P.O. Box 757
 Richfield, Utah 84701
 (801) 896-9266

**LEEDS TOWN
 WASTEWATER IMPROVEMENTS**

EXHIBIT II

SECTION 6
ECONOMIC ANALYSIS OF ALTERNATIVES

6.1 Alternative #1

This alternative consists of installing a collection system of both gravity and pressure sewer lines in Leeds, a transmission to Harrisburg, a pump station above Harrisburg, and connection to Ash Creek Special Service District. The Leeds Town wastewater system would become part of Ash Creek. Ash Creek Special Service District will maintain the system Leeds Town installs.

The costs to Leeds users will be impact fees and monthly user fees. The negotiated impact fee for each equivalent residential user to be paid to Ash Creek during the first year will be \$1,088. After the first year, Ash Creek will charge \$1,500. The user fee is currently \$15.00 per equivalent residential user.

The cost estimate for this alternative is included on the following page.

6.2 Alternative #2

This alternative also includes connecting to the Ash Creek Harrisburg line, but instead of becoming part of Ash Creek, the Town will contract with Ash Creek to have them treat the wastewater at a cost per thousand gallons or at a cost per equivalent residential user. This will allow the Town to keep and maintain their own wastewater collection system.

The cost that Ash Creek will charge Leeds Town for treating the wastewater is \$1.78 per 1,000 gallons (\$20.48 average monthly cost per connection).

The cost estimate for this alternative is the same one used in 6.1 above and is included on the following page.

**COST ESTIMATE OF
ALTERNATIVES #1 & #2
CONNECTING TO ASH CREEK
LEEDS WASTEWATER IMPROVEMENTS**

November 24, 1998

Item #	Item	Quantity	Units	Unit Price	Cost
1	Mobilization	1	L. S.	\$35,000.00	\$35,000.00
2	10" Sewer Line	12000	L. F.	\$20.00	\$240,000.00
3	8" Sewer Line	15000	L. F.	\$17.00	\$255,000.00
4	8" Pressure Line	11000	L. F.	\$9.00	\$99,000.00
5	4" Pressure Line	1850	L. F.	\$5.00	\$9,250.00
6	4' Dia. Manholes	85	Each	\$1,600.00	\$136,000.00
7	Lift Station	2	Each	\$20,000.00	\$40,000.00
8	Asphalt Street Repair including UBC	3350	S. Y.	\$30.00	\$100,500.00
9	Gravel Street Repair	3000	S. Y.	\$8.00	\$24,000.00
10	4" Cleanout	120	Each	\$200.00	\$24,000.00
11	4" Service Line	6000	L. F.	\$8.00	\$48,000.00
12	4" Sewer Connection	120	Each	\$200.00	\$24,000.00
13	Highway Crossing at Lagoons	1	L. S.	\$26,750.00	\$26,750.00
	SUBTOTAL				\$1,061,500.00
14	Contingency				\$83,500.00
	TOTAL CONSTRUCTION				\$1,145,000.00
15	Right-of-ways, Easements, Etc.	1	L. S.	\$20,000.00	\$20,000.00
16	Design Engineering	1	L. S.	\$60,000.00	\$60,000.00
17	Construction Management	1	L. S.	\$60,000.00	\$60,000.00
18	Legal Fees & Bond Counsel	1	L. S.	\$15,000.00	\$15,000.00
19	Archaeology & Environmental	1	L. S.	\$30,000.00	\$30,000.00
20	Ash Creek Impact Fee	140	Conn.	\$1,100.00	\$154,000.00
21	Study & Planning Advance	1	L. S.	\$30,000.00	\$30,000.00
	SUBTOTAL				\$369,000.00
TOTAL PROJECT COST					\$1,514,000.00

6.3 Alternative #3

This alternative consists of building a new facultative lagoon system east of Town. This lagoon would treat all wastewater for Leeds Town up to the 2010 population projection of 950 persons. The Town would need to pump sewer collected on the south end of Town to the sewer lagoon location east of Town. The lagoons would consist of 4 - 5 acre cells (total area of 20 acres), with a primary cell of 5 acres.

The cost for this alternative is located on the following page. Exhibit III shows the preliminary location of the wastewater lagoons.

ALTERNATIVE #3 COST ESTIMATE
LAGOONS W/ GRAVITY
LEEDS WASTEWATER IMPROVEMENTS

November 24, 1998

Item #	Item	Quantity	Units	Unit Price	Cost
1	Mobilization	1	L. S.	\$80,000.00	\$80,000.00
2	8" Sewer Line	25000	L. F.	\$17.00	\$425,000.00
3	8" Pressure Line	5500	L. F.	\$9.00	\$49,500.00
4	6" Pressure Line	6500	L. F.	\$7.00	\$45,500.00
5	4' Dia. Manholes	80	Each	\$1,600.00	\$128,000.00
6	Lift Station	2	Each	\$20,000.00	\$40,000.00
7	Asphalt Street Repair including UBC	3350	S. Y.	\$30.00	\$100,500.00
8	Gravel Street Repair	3000	S. Y.	\$8.00	\$24,000.00
9	4" Cleanout	120	Each	\$200.00	\$24,000.00
10	4" Service Line	6000	L. F.	\$8.00	\$48,000.00
11	4" Sewer Connection	120	Each	\$200.00	\$24,000.00
12	Wastewater Lagoons	1	L. S.	\$500,000.00	\$500,000.00
	SUBTOTAL				\$1,488,500.00
13	Contingency				\$123,500.00
	TOTAL CONSTRUCTION				\$1,612,000.00
14	Right-of-ways, Easements, Etc.	1	L. S.	\$25,000.00	\$25,000.00
15	Design Engineering	1	L. S.	\$100,000.00	\$100,000.00
16	Construction Management	1	L. S.	\$140,000.00	\$140,000.00
17	Legal Fees & Bond Counsel	1	L. S.	\$15,000.00	\$15,000.00
18	Archaeology	1	L. S.	\$30,000.00	\$30,000.00
19	Environmental	1	L. S.	\$20,000.00	\$20,000.00
20	Study and Planning Advance	1	L. S.	\$30,000.00	\$30,000.00
	SUBTOTAL				\$360,000.00
TOTAL PROJECT COST					\$1,972,000.00

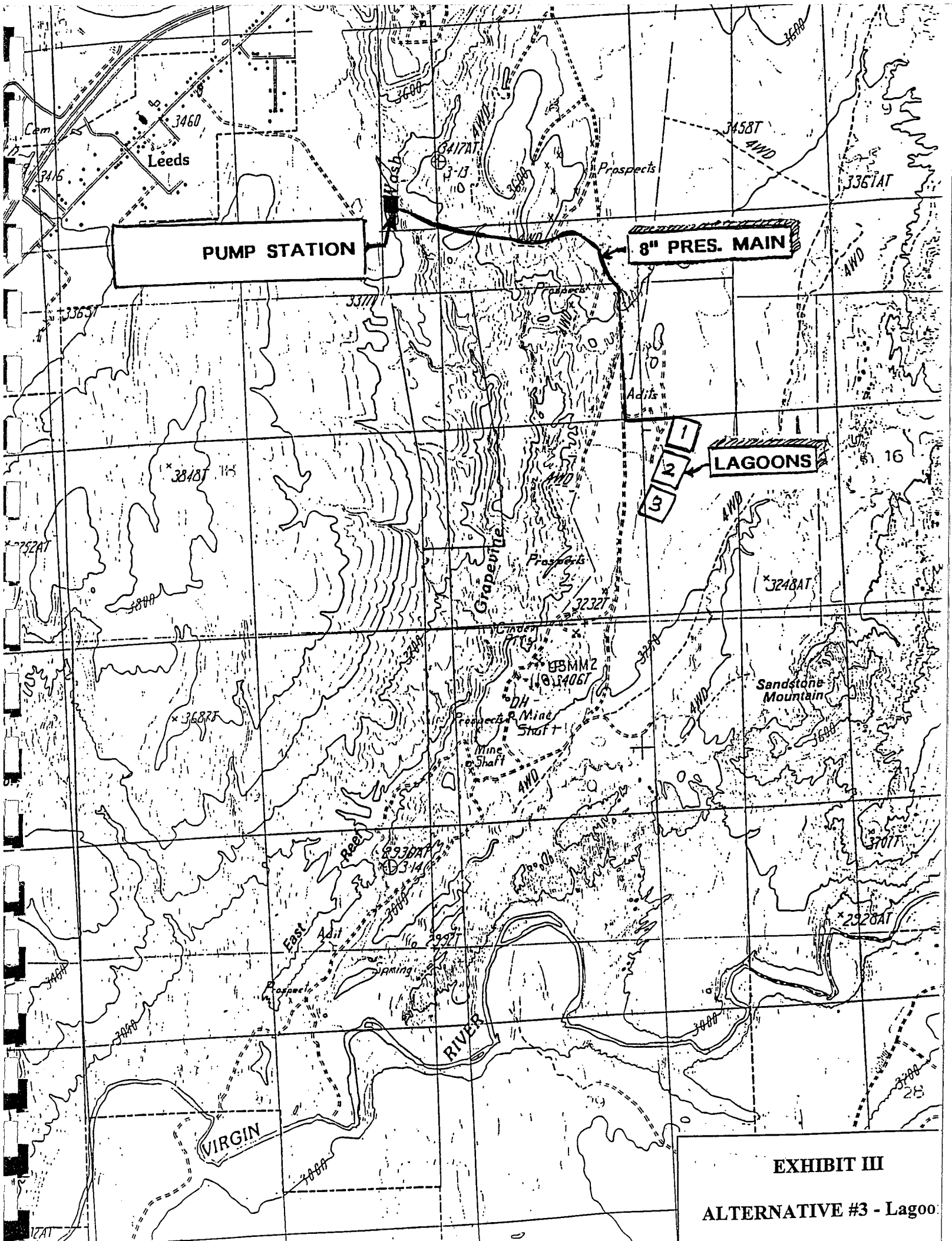


EXHIBIT III
ALTERNATIVE #3 - Lagoon

6.4 Alternative #4

This alternative includes a mechanical package treatment plant, which consists of aeration, denitrification and transfer modules where the wastewater will go through a typical batch treatment process. Also, the effluent would be discharged into local drainages, but the treatment process will be extensive to meet water quality standards. The effluent will need to meet the waste load allocation determined by the State Department of Environmental Quality.

The cost of the Package Treatment Plant with discharge is estimated at \$406,200. This cost breakdown is shown in the table below. The plant would treat 150,000 gallons per day, enough capacity for approximately 500 equivalent residential users.

COST ESTIMATE for a MECHANICAL PACKAGE TREATMENT PLANT w/ DISCHARGE January 27, 1999					
Item #	Item	Quantity	Units	Unit Price	Cost
1	Batch Treatment Plant (Equipment)*	1	L. S.	\$193,200.00	\$193,200.00
2	Plant Installation	1	L. S.	\$116,000.00	\$116,000.00
3	Site Purchase	0.5	Acre	\$20,000.00	\$10,000.00
4	Pump Facilities	1	L. S.	\$8,000.00	\$8,000.00
5	Power Line Installation	1	L. S.	\$15,000.00	\$15,000.00
6	Backup Generator	1	L. S.	\$25,000.00	\$25,000.00
7	Effluent Pipeline	1	L. S.	\$30,000.00	\$30,000.00
8	Chain Link Fence	600	L. F.	\$15.00	\$9,000.00
TOTAL PLANT COST					\$406,200.00

* Cost is from combining \$101,000 for Package Plant, \$21,900 for disinfection, \$38,000 for sand filter, \$11,000 for flow meter, \$17,300 for spare parts, and \$4,000 for freight.

The table on the next page contains the total project cost estimate for alternative #4.

**ALTERNATIVE #4 COST ESTIMATE
MECHANICAL PACKAGE TREATMENT W/ DISCHARGE
LEEDS WASTEWATER IMPROVEMENTS**

January 27, 1999

Item #	Item	Quantity	Units	Unit Price	Cost
1	Mobilization	1	L. S.	\$30,000.00	\$30,000.00
2	8" Sewer Line	25000	L. F.	\$17.00	\$425,000.00
3	4" Pressure Line	6000	L. F.	\$5.00	\$30,000.00
4	4' Dia. Manholes	80	Each	\$1,600.00	\$128,000.00
5	Lift Station	1	Each	\$20,000.00	\$20,000.00
6	Asphalt Street Repair including UBC	3350	S. Y.	\$30.00	\$100,500.00
7	Gravel Street Repair	3000	S. Y.	\$8.00	\$24,000.00
8	4" Cleanout	120	Each	\$200.00	\$24,000.00
9	4" Service Line	6000	L. F.	\$8.00	\$48,000.00
10	4" Sewer Connection	120	Each	\$200.00	\$24,000.00
11	Package Treatment Plant	1	L. S.	\$406,200.00	\$406,200.00
	SUBTOTAL				\$1,259,700.00
12	Contingency				\$101,300.00
	TOTAL CONSTRUCTION				\$1,361,000.00
13	Right-of-ways, Easements, Etc.	1	L. S.	\$20,000.00	\$20,000.00
14	Design Engineering	1	L. S.	\$80,000.00	\$80,000.00
15	Construction Management	1	L. S.	\$120,000.00	\$90,000.00
16	Legal Fees & Bond Counsel	1	L. S.	\$15,000.00	\$15,000.00
17	Archaeology	1	L. S.	\$30,000.00	\$30,000.00
18	Environmental	1	L. S.	\$8,000.00	\$8,000.00
19	Study and Planning Advance	1	L. S.	\$30,000.00	\$30,000.00
	SUBTOTAL				\$273,000.00
TOTAL PROJECT COST					\$1,634,000.00

The table on the next page shows projected operation and maintenance costs for this alternative.

PACKAGE TREATMENT PLANT w/ DISCHARGE
Projected Operation and Maintenance Costs

Item	Annual Cost
Electricity cost for Treatment Equipment	\$8,000 per year
Electricity cost for Pump Stations (2 each)	\$3,000 per year
Labor Cost for Treatment Plant	\$5,250 per year
Labor Cost for Collection System	\$2,500 per year
Sludge Hauling Cost	\$6,888 per year
Testing	\$858 per year
Administration Costs	\$1,440 per year
Sinking Fund	\$3,740 per year
Total	\$31,676 per year

This amount would be the lowest operation and maintenance costs could be if a part time certified operator could be hired to maintain the collection and treatment system. The operation and maintenance cost could be as much as \$50,000 per year if a full time operator was needed.

The \$31,676 per year will cost 140 users approximately \$19.00 per month.

6.5 Alternative #5

This alternative consists of a mechanical package treatment plant as described in the previous section, but instead of discharging into local drainages, the effluent will be stored in a 475,000 gallon storage tank and land applied to grow alfalfa.

The cost of the Package Treatment Plant w/ land application is estimated at \$618,200. This cost breakdown is shown in the table below. The plant would also treat 150,000 gallons per day, enough capacity for approximately 500 equivalent residential users.

COST ESTIMATE					
for a					
MECHANICAL PACKAGE TREATMENT PLANT w/ LAND APPLICATION					
January 27, 1999					
Item #	Item	Quantity	Units	Unit Price	Cost
1	Batch Treatment Plant (Equipment)	1	L. S.	\$193,200.00	\$193,200.00
2	Plant Installation	1	L. S.	\$116,000.00	\$116,000.00
3	Site Purchase	5.5	Acre	\$20,000.00	\$110,000.00
4	Pump Facilities	1	L. S.	\$8,000.00	\$8,000.00
5	Power Line Installation	1	L. S.	\$15,000.00	\$15,000.00
6	Backup Generator	1	L. S.	\$25,000.00	\$25,000.00
7	Pump facility to Discharge Irrigation	1	L. S.	\$8,000.00	\$8,000.00
8	Pipe Facilities to pipe to irr. system	1	L. S.	\$30,000.00	\$30,000.00
9	Storage Tank	1	L. S.	\$53,000.00	\$53,000.00
10	Irr. System	1	L. S.	\$30,000.00	\$30,000.00
11	Chain Link Fence	2000	L. F.	\$15.00	\$30,000.00
TOTAL PLANT COST					\$618,200.00

The table on the next page contains the total project cost estimate for alternative #5.

ALTERNATIVE #5 COST ESTIMATE
MECHANICAL PACKAGE TREATMENT W/ LAND APPLICATION
LEEDS WASTEWATER IMPROVEMENTS

January 27, 1999

Item #	Item	Quantity	Units	Unit Price	Cost
1	Mobilization	1	L. S.	\$30,000.00	\$30,000.00
2	8" Sewer Line	25000	L. F.	\$17.00	\$425,000.00
3	4" Pressure Line	6000	L. F.	\$5.00	\$30,000.00
4	4' Dia. Manholes	80	Each	\$1,600.00	\$128,000.00
5	Lift Station	1	Each	\$20,000.00	\$20,000.00
6	Asphalt Street Repair including UBC	3350	S. Y.	\$30.00	\$100,500.00
7	Gravel Street Repair	3000	S. Y.	\$8.00	\$24,000.00
8	4" Cleanout	120	Each	\$200.00	\$24,000.00
9	4" Service Line	6000	L. F.	\$8.00	\$48,000.00
10	4" Sewer Connection	120	Each	\$200.00	\$24,000.00
11	Package Treatment Plant w/ Land Appl.	1	L. S.	\$618,200.00	\$618,200.00
	SUBTOTAL				\$1,471,700.00
12	Contingency				\$102,300.00
	TOTAL CONSTRUCTION				\$1,574,000.00
13	Right-of-ways, Easements, Etc.	1	L. S.	\$20,000.00	\$20,000.00
14	Design Engineering	1	L. S.	\$80,000.00	\$80,000.00
15	Construction Management	1	L. S.	\$120,000.00	\$90,000.00
16	Legal Fees & Bond Counsel	1	L. S.	\$15,000.00	\$15,000.00
17	Archaeology	1	L. S.	\$30,000.00	\$30,000.00
18	Environmental	1	L. S.	\$8,000.00	\$8,000.00
19	Study and Planning Advance	1	L. S.	\$30,000.00	\$30,000.00
	SUBTOTAL				\$273,000.00
TOTAL PROJECT COST					\$1,847,000.00

6.6 Funding Needs for Alternatives

The total funding that Leeds now has is \$945,000 in grant and \$415,000 in loan. Alternative #1 and #2 have an impact fee of \$1,088. This generates \$152,320, which will be paid to Ash Creek. The other alternatives have a impact fee of \$800 per user. This generates a total of \$112,000 shown as Leeds contribution. These figures are shown in the table below. Also included is the total capital cost for each alternative, the additional funding on top of \$1,360,000 and Leeds contribution to fund that alternative, and the additional monthly payment needed to pay off the additional funding.

FUNDING NEEDS FOR ALTERNATIVES

Alternative	Approved Grant	Approved Loan	Leeds Contribution	Total Capital Cost	Additional Funding Needed	Additional Monthly Payment
1	\$945,000	\$415,000	\$154,000	\$1,514,000	\$0	\$0
2	\$945,000	\$415,000	\$154,000	\$1,514,000	\$0	\$0
3	\$945,000	\$415,000	\$112,000	\$1,972,000	\$500,000	\$31,100
4	\$945,000	\$415,000	\$112,000	\$1,634,000	\$162,000	\$10,125
5	\$945,000	\$415,000	\$112,000	\$1,847,000	\$375,000	\$23,500

6.7 User Fee Comparison of Alternatives

The approved loan of \$415,000 will require a payment of \$15.50 per month for each user. The Department of Environmental Quality has indicated that the Town's choice to install a treatment facility would only be funded through an additional loan. The table on the next page totals the needed user fees to pay the existing debt service, additional debt needed, operation & maintenance costs, and sinking fund for equipment replacement.

MONTHLY USER FEE COMPARISON OF ALTERNATIVES

Item	Alternative #1	Alternative #2	Alternative #3	Alternative #4	Alternative #5
Debt Service for Approved Funding	\$15.50	\$15.50	\$15.50	\$15.50	\$15.50
Debt Service for Additional Funding	\$0.00	\$0.00	\$18.50	\$6.50	\$14.00
O&M Costs	\$15.00	\$23.00	\$10.00	\$19.00	\$24.00
Total Monthly Cost	\$30.50	\$38.50	\$44.00	\$41.00	\$53.50

SECTION 7
PROJECT FINANCE

7.1 Funding

Leeds town applied for funding for their wastewater project from the Water Quality Board and Rural Development. The total funding approved is \$1,360,000. The funding includes approximately 70 percent grant and 30 percent loan. The following table is a summary of the funding.

Project Funding	Amount
Grant from Rural Development:	\$495,000.00
Grant from water Quality Board:	\$450,000.00
Loan (20 years @ 0%) from Water Quality Board:	\$255,000.00
Loan (40 years @ 4.5%) from Rural Development:	\$160,000.00
Total Funding Available	\$1,360,000.00

Additional funding will be needed for alternative #3, #4, or #5 if one of these alternatives are chosen. The Town will have to reapply to the Water Quality Board or to Rural Development to receive additional funding. The funding agencies have indicated that any additional funding would most likely be additional loans and not grants.

7.2 User Fees

Alternative #1, which consists of joining Ash Creek Special Service District, would be the alternative with the lowest monthly user fees. An updated estimate for Alternate #1 is included on the following page. Ash Creek Special Service District recently approved a rate increase that will be effective on March 1, 2000. The Districts monthly residential fee will increase from \$15.00 to \$10.00 per month. Even with the Districts rate increase, Alternative #1 will have the lowest monthly user fees.

Appendix D contains detailed information on user fee calculations. The following table is a summary of the current user fees expected for the proposed Leeds wastewater system. It includes Ash Creek Special Service District rate increases.

**COST ESTIMATE OF
ALTERNATIVE #1 CONNECTING TO ASH CREEK
LEEDS WASTEWATER IMPROVEMENTS**

August 25, 1999

Item #	Item	Quantity	Units	Unit Price	Cost
1	Mobilization	1	L.S.	\$35,000.00	\$35,000.00
2	10" Sewer Line	12000	L.F.	\$20.00	\$240,000.00
3	8" Sewer Line	15000	L.F.	\$17.00	\$255,000.00
4	8" Pressure Line	11000	L.F.	\$9.00	\$99,000.00
5	4" Pressure Line	1850	L.F.	\$5.00	\$9,250.00
6	4' Dia. Manholes	85	Each	\$1,600.00	\$136,000.00
7	Lift Station	23350	Each	\$20,000.00	\$40,000.00
8	Asphalt Street Repair Including UBC	3000	S.Y.	\$30.00	\$100,500.00
9	Gravel Street Repair	120	S.Y.	\$8.00	\$24,000.00
10	4" Cleanout	6000	Each	\$200.00	\$24,000.00
11	4" Service Line	120	L.F.	\$8.00	\$48,000.00
12	4' Sewer Connection	120	Each	\$200.00	\$24,000.00
	SUBTOTAL				\$1,034,750.00
13	Contingency				\$110,250.00
	TOTAL CONSTRUCTION				\$1,145,000.00
14	Right-of-ways, Easements,#Etc.	1	L.S.	\$20,000.00	\$20,000.00
15	Design Engineering	1	L.S.	\$60,000.00	\$60,000.00
16	Construction Management	1	L.S.	\$60,000.00	\$60,000.00
17	Legal Fees & Bond Counsel	1	L.S.	\$15,000.00	\$15,000.00
18	Archaeology & Environmental	1	L.S.	\$30,000.00	\$30,000.00
19	Study & Planning Advance	1	L.S.	\$30,000.00	\$30,000.00
	SUBTOTAL				\$215,000.00
TOTAL PROJECT COST					\$1,360,000.00

MONTHLY RATE SUMMARY

USER CLASS	DISTRICT MONTHLY RATE	TOWN MONTHLY RATE	TOTAL MONTHLY RATE
I. Permanent Resident	\$18.00	\$13.60	\$31.60
II. Transitory Resident	\$9.00	\$6.80	\$15.80
III. Commercial - for first 12,000 gal	\$23.00	\$13.60	\$36.60
For each 1,000 gal over 12,000 gal	\$2.12	\$0.00	\$2.12
Impact Fee per ERU*			\$1,995.00

*Note: District has agreed that initial connections for Leeds Town will be \$1,088 per ERU.

Funding agencies generally compare user utility rates to the community's median adjusted gross income (MAGI) for determining grant amount and affordability. Sewer rates are generally expected to be around 1.4 percent of the MAGI. The estimated residential monthly user rate of \$31.60 per month for Leeds is 1.49 percent of their MAGI for 1998. This information is summarized in the following table.

Comparative Sewer Rate	Amount
Median Adjusted Gross Income (MAGI):	\$25,528.00
Monthly Comparative Rate (1.4% x MAGI/12):	\$29.78
Estimated Monthly Residential Rate:	\$31.60

The estimated monthly residential rate for Leeds Town will be a little over 1.4 percent of their MAGI. This rate would be considered affordable by many, but could be considered a hardship by those residents on fixed incomes.

SECTION 8

RECOMMENDATIONS

The recommendation from Jones & DeMille Engineering is based on economics of the proposed alternatives. It is recommended that Leeds Town select Alternative #1 (Connecting to Ash Creek Special Service District and becoming a member of the District).

Based on this recommendation Leeds Town applied for and obtained funding for the proposed wastewater project as indicated in the previous section. The Town has also been meeting with the Ash Creek Special Service District to come to an agreement on the terms for Leeds joining the District. Appendix A includes a copy of the latest proposed agreement between the Town and District.

SECTION 9

PUBLIC COORDINATION

In January and February of 1998, an information brochure was prepared and given to all individuals in town. This brochure informed citizens of the project cost, user fees, and impact fees. It also advised people of two public meetings in March.

There were two public meetings in March, a Public Information Meeting on March 11, 1998 and a Public Hearing on March 25, 1998.

During the public hearing in March, individuals not in favor of the wastewater system voiced their concerns and asked the Town to provide them more information toward the fees, such as the laterals being run to each individual home. The Town set up another public hearing for April 22, 1998.

After review of a signed petition to eliminate the project, the Town decided to conduct a formal vote with a voting pamphlet that the Councilmembers would take to each residence and business. The Town tried to answer all questions from concerned citizens about the project.

After the public hearing on April 22, 1998, the Town set up two work meetings in May to discuss the option of constructing their own sewer lagoons with verified cost estimates and gather information to put in the voting pamphlet and information sheet.

A voting pamphlet and information sheet were handed out the end of July and collected in August and the first part of September. There were 107 responses from the voting pamphlet. 56 are in favor of developing a sewer system and 47 are opposed to a sewer system. Of the 56 "In favor" responses, 8 desire to be part of Ash Creek and 9 desire to build their own lagoons. On September 9, 1998, the Town Council reviewed the results with the public, asked for their comments, and voted in favor of the wastewater system 3 to 2.

Since September 1998, other work meetings and council meetings were held to discuss the wastewater project. Copies of documentation for public coordination and correspondence are included in Appendix E.

SECTION 10
ENVIRONMENTAL COORDINATION

Rural Development has sent letters to the following resource agencies:

1. Bureau of Land Management (BLM).
2. Utah Department of Transportation (UDOT).
3. Corps of Engineers.
4. Fish and Wildlife Service (FWS).
5. State Historic Preservation Office (SHPO).

A copy of letters from Rural Development and the response letters from the resource agencies are included in Appendix G. Their responses are summarized as follows:

1. BLM - a right-of-way authorization will be required to cross BLM ground. Coordinate with Bill Mader for the line within the Red Cliffs Desert Reserve.
2. UDOT - an encroachment permit will be required for work along SR-288 (Main Street).
3. Corps of Engineers - complete a wetland delineation report.
4. FWS - a biological assessment must be prepared and Contact Bill Mader for potential habitant and presence of Mojave desert tortoise.
5. SHPO - hire a cultural resource contractor to assess the potential to affect cultural resources.

SECTION 11

CONCLUSION

This study was started in 1996 and has been in process for all most four years. There have been several changes in the elected officials of the Town, including the mayor and council members. The Town has tried to consider as many options as possible for their wastewater system. The delays have also threatened the Town's approved funding.

Near the end of 1999, it appeared that the project would go forward. In November the Town Council passed a resolution to be annexed into Ash Creek Special Service District and proceed with the project. In January 2000, two council members changed because of the elections. Because of this council change, the Washington County Commission requested that the new council take a re-vote on the resolution to be annexed into Ash Creek Special Service District. The County requested that the re-vote be completed before they proceed with the annexation process.

On February 8, 2000 at a Town Council Meeting, a motion was made to the new Town Council for the Town to be annexed into Ash Creek Special Service District. However, the motion failed due to the lack of a second. At that point, the Leeds Town wastewater project ended and will not be pursued any further at this time. The Town has withdrawn its request for funding.

Some of the major concerns that affected the Town's decision not to proceed with the project include cost impacts to the residents and businesses, joining Ash Creek Special Service District and project timing.

The Town was concerned with the monthly rate for home owners and especially businesses. The residents and businesses would also have to pay an impact fee and pay for the cost of their lateral lines on their property. There was concern expressed concerning the fact that the soils are very rocky and that this may cause the project to go over budget and increase the costs. The Town was concerned that the cost of the sewer would cause the businesses to shut down and then the Town would loose the tax revenue from those businesses. For a small Town like Leeds, that tax revenue is very important.

The Town had some concerns about joining Ash Creek Special Service District. The Town's preference was to have their own collection and treatment system that would allow them to be in control of the costs and rates. The timing of the District's rate increase was also a factor. Even with

these concerns, the Town did appreciate the fact that the District worked with the Town as much as possible, especially in reducing the initial impact fee.

The length of time that this project has been in process has had a negative impact. There have been changes in the Town Officials and loses in continuity. The longer the project took to develop, then the less enthusiasm there was for the project.

The Town feels that they only have a small population base and if there were more users, then the cost per user would be less. There were some comments that the developed subdivisions outside of the Leeds Town boundary should be included in the sewer system. That was beyond the scope of this study and was not investigated. That would be something to consider in the future.