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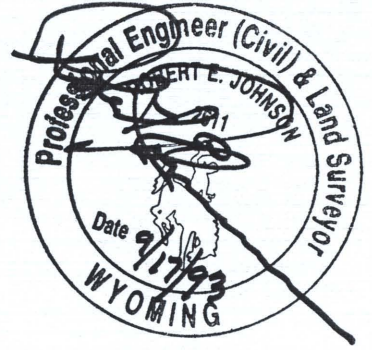
Physical Address:

Wyoming Hall, Room 249
University of Wyoming
Laramie, WY 82071

Phone: (307) 766-6651

Fax: (307) 766-3785

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JOHNSON-FERMELIA Co. Inc.

CONSULTING ENGINEERS, ARCHITECTS AND SURVEYORS

**WATERSHED MANAGEMENT
CONTROL PLAN**

**PINEDALE
WATER SUPPLY PROJECT**

LEVEL II

SUBMITTED TO

WYOMING WATER DEVELOPMENT COMMISSION

1515 Ninth Street
Rock Springs, Wyoming 82901

SEPTEMBER 1993

Phone (307) 362-7519



1515 NINTH STREET
ROCK SPRINGS, WYOMING 82901
PHONE (307) 362-7519

FAX NO. (307) 362-7569

JOHNSON-FERMELIA CO. INC.

CONSULTING ENGINEERS, ARCHITECTS AND SURVEYORS

6 December 1993
Project No. 3285-92E

Mr. Mike Carnevale
Wyoming Water Development Commission
4th Floor West
122 West 25th Street
Cheyenne, WY 82002

**Subject: Watershed Management Control Plan
Pinedale Water Supply Project**

Dear Mr. Carnevale:

We are transmitting herewith forty copies of the above report. Combined with the ten copies already submitted, this transmittal will fulfill the fifty copies required. Also included is one set of reproducible originals.

Thanks for the assistance and consideration you provided during the course of this study.

Sincerely,

A handwritten signature in black ink, appearing to read 'Robert E. Johnson', written over a horizontal line.

Robert E. Johnson, PE & LS
Project Manager

encs.

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WATERSHED MANAGEMENT CONTROL PLAN

Fremont Lake, Wyoming

I. INTRODUCTION

A. Background

The Town of Pinedale, Wyoming has historically obtained its water supply from Fremont Lake, a large pristine cold water lake at the foot of the Wind River Mountain Range. The lake is nine miles long, about one mile wide and 608 feet deep at its deepest point.

The quality of the water conveyed from the lake is excellent and totally satisfactory for potable purposes; however, the provisions of the Safe Drinking Water Act (SDWA), Surface Water Treatment Rule (SWTR) and the EPA requirements impose stringent conditions on water users who obtain their water supplies from surface water sources. It has, therefore, become necessary for the Town of Pinedale to look closely at the ramifications associated with continued use of water from Fremont Lake.

Furthermore, as the State of Wyoming has not assumed primacy for implementation of the Safe Drinking Water Act, the Town has been in direct contact with the Denver Office of the Environmental Protection Agency (EPA) and, in that regard, two letters from the EPA play a very important role in the direction and objectives of the studies and investigations involved with this Watershed Management Control Plan. These letters are referred to as:

1. *"EPA Letter to Town of Pinedale - March 17, 1992."*
2. *"EPA Letter to Town of Pinedale - June 10, 1992 and Administrative Consent Order Docket No. 8-PWS VIII - 92-21, PWS ID # 560041C."*

B. EPA Letter to Town of Pinedale - March 17, 1992

The March 17 letter was sent Certified Mail Return Receipt Requested, addressed to the Honorable Miriam Carlson, Mayor, and signed by Debra J. Kovars, Chief, P.W.S. Implementation and Enforcement Section, Region VIII. This letter was in response to a letter from Pinedale to the EPA, dated January 22, 1992, which expressed an interest on the part of Pinedale to continue to use unfiltered Fremont Lake water. The Pinedale letter also transmitted a watershed control program which was requested by EPA.

The March EPA letter stated that a comprehensive watershed control program includes:

- A base map or maps delineating the watershed land ownership, land use zoning, sewage disposal works, water intake, activities on the lake
- Inventory of animal populations
- Activities subject to permitting requirements
- Risk assessment
- Description of existing and future actions to safeguard the watershed inclusive of landowner agreements
- Prohibition of recreational activity near the water supply intake
- Prohibition of sewer discharge in the watershed
- A monitoring program
- An annual report
- Long term plan of implementation.

The letter defined a time schedule and addressed disinfection criteria and further recommended filtration. Continued source water monitoring, as required by SWTR, was also referenced.

**C. EPA Letter to Town of Pinedale - June 10, 1992
and Administrative Consent Order**

The June 10 letter from EPA to the Town of Pinedale was sent Certified Mail Return Receipt Requested to the Honorable Miriam Carlson, Mayor, and signed by Max H. Dodson, Director, Water Management Division, Region VIII.

This letter transmitted "Administrative Consent Order," dealing with the Town's effort to meet the criteria to avoid filtration and to ensure compliance with the disinfection requirement for a public water system. The letter also defined some time schedules and commented on applicable possible penalties.

The Administrative Consent Order:

- Defined statutory authority
- Presented findings that:
 1. Pinedale is a municipality within the meaning of applicable Federal Law.
 2. The Town owns and operates the Municipal Water System.
 3. The system is a "community water system."
 4. The Town owns and operates a Public Water System and is subject to compliance with Federal Regulations.
 5. The system is supplied solely by Fremont Lake, a surface water source.
 6. 40 CFR §141.70 establishes criteria to require filtration.
 7. 40 CFR §141.7 establishes criteria to provide treatment.
 8. 40 CFR §141.71 establishes criteria for avoiding filtration.
 9. Pinedale uses a surface water source, does not filter and does not meet disinfection requirements specified under 40 CFR §141.72 (a).

- Stipulated an order to:
 1. Continue to monitor source water conditions as required by Federal Regulations.
 2. Submit detailed plans for monitoring a watershed control plan.
 3. Maintain a watershed control program by July 31, 1993.
 4. Provide for an annual on-site inspection of the watershed control program.
 5. Submit detailed plans to EPA by July 31, 1993 for system modifications to achieve inactivation rates in compliance with Federal Regulations.
 6. Complete system modifications to maintain disinfection by June 30, 1995.
 7. Continue to monitor residual disinfectant concentrations.
 8. Submit detailed plans to EPA for redundant disinfection by July 31, 1992.
 9. Provide a written report to EPA by December 31, 1992.
 10. Complete system modifications for consistent compliance by June 30, 1995.
 11. Initiate filtration within 18 months of failure of system to comply with Federal Regulations.
 12. Comply with Federal Regulations by reporting any failure to comply with National Primary Drinking Water Regulations to EPA and the State within 48 hours of any such failure.

The Administrative Consent Order also presented General Provisions to the effect that:

1. The Order does not constitute a waiver, suspension or modification to any applicable Federal Regulations or provisions of the SDWA.
2. Violation of any terms of the Order may subject the Town of Pinedale to civil penalties.

3. Violation of the requirements of SDWA may subject the Town to civil penalties.
4. The Order does not relieve the Town of any responsibilities of any other federal, state or local laws.
5. Town of Pinedale waives its right to hearing when the Administrative Consent Order becomes effective.
6. The Order becomes effective upon the signature of both parties.

The Administrative Consent order was not signed by the Town of Pinedale as of the date of this Watershed Management Control Plan.

D. Wyoming Water Development Commission Phase I Study and Report

The Wyoming Water Development Commission (WWDC) authorized a Level II study on the Pinedale Water Supply Project by a Contract dated July 16, 1993 with Johnson-Fermelia Co., Inc. (JFC).

▪ **Technical Team**

The technical team assigned to this study consisted of professional personnel from the following firms:

Johnson-Fermelia Co. Inc. Rock Springs, Wyoming	Management/Prime Consultant
Lidstone & Anderson, Inc. Fort Collins, Colorado	Watershed Management Planning/SDWA Interpretation
T.S.T. Engineers Fort Collins, Colorado	Water Treatment
Bishop-Brogden Associates Inc. Lakewood, Colorado	Geology and Groundwater
Dana Consulting Laramie, Wyoming	Geology and Groundwater

■ **Investigation, Field Work and Meetings**

The investigation and field work was conducted from July 1992 on through January 1993. The investigation included data research, field reconnaissance, personal contacts, reconnaissance by boat and a fly-over of Fremont Lake and Pine Creek and Fremont Creek watersheds to the Continental Divide.

Meetings conducted during the course of the work included:

1. Scoping Meeting in Pinedale with the EPA, WWDC, Mayor and Town Council - September 14, 1992.
2. Meeting with WWDC Staff in Cheyenne - January 21, 1993.
3. Meeting with EPA Staff in Denver, Colorado - January 22, 1993.

■ **Alternatives Studied**

The alternatives that were examined are divided into two basic categories:

1. Filtered System
2. Unfiltered System

Facilities considered in the filtered system consisted of:

1. 3 M Bag Filter Pilot Test Run
2. Improved Disinfection and Storage
3. Fluoridation
4. Rapid Rate Filtration
5. Slow Sand Filtration
6. Diatomaceous Earth Filtration

Facilities or options considered in the unfiltered system included:

1. Improved Disinfection and Storage
2. Fluoridation

3. Conversion to a Groundwater Source
4. Glacial Moraine Diversion
5. Watershed Management Control Plan

The 3M Bag Filter pilot test run proved to be unsatisfactory due to the short bag-life experienced during the pilot run. This alternative was therefore dropped from further consideration.

The glacial moraine diversion was initially identified as a potentially viable option because of the possibility that wells drilled into the glacial moraine might produce water in sufficient quantity and quality to avoid filtration. Essentially, the glacial moraine deposits would provide a filtering affect on groundwater moving from the lake into the wells. The work conducted during the groundwater investigation phase of the study revealed that the geological conditions around the lake were not conducive to this theory. Therefore, the glacial moraine diversion concept was dropped from further consideration.

Ultimately, five alternates were examined in sufficient depth to develop estimates of capital and operating costs. These five alternates are explained as follows:

<u>Alternate</u>	<u>Project Features</u>
I.	Rapid Rate Filtration, Storage and Improved Disinfection
II.	Slow Sand Filtration, Storage and Improved Disinfection
III.	Diatomaceous Earth Filtration, Storage and Improved Disinfection
IV.	Improved Disinfection, Storage and Watershed Management Control Plan
V.	Conversion to a Groundwater Source

Alternates I, II and III apply to a filtered system and Alternates IV and V involve a non-filtered system.

- **Project Costs**

Capital, operating, present worth of operating costs, and total present worth costs are presented in the following table.

PRESENT WORTH COSTS

ALTERNATE	CAPITAL COSTS	ANNUAL OPERATING COSTS	PRESENT WORTH* OF OPERATING COSTS	TOTAL PRESENT WORTH COSTS
I	\$1,469,930.00	\$82,795.00	\$1,139,670.00	\$2,729,900.00
II	\$2,286,870.00	\$62,406.00	\$859,020.00	\$3,145,890.00
III	\$1,380,460.00	\$109,040.00	\$1,500,940.00	\$2,881,400.00
IV	\$690,800.00	**\$61,546.00	\$847,200.00	\$1,538,000.00
V	\$1,924,500.00	\$113,500.00	\$1,562,000.00	\$3,516,500.00

* Present Worth - 30 years @ 6%

** Includes \$10,000 per year for Watershed Management Control Plan

- **Comments on Unfiltered System**

It must be pointed out that there are various potential problems associated with the Unfiltered System (Alternate IV) that incorporates a watershed management control plan into the operation of the system. These potential problems consist of events or conditions which are referred to as "triggering mechanisms" that would force abandonment of the unfiltered plan and conversion to a filtered system. These "triggers" include eleven events or conditions that are specified in: Chapter 40, Code of Federal Regulations; the Safe Drinking Water Act (SDWA); Surface Water Treatment Rules (SWTR); and the EPA Letters of March 17, 1992 and June 10, 1992; and the Administrative Consent Order.

■ **Least Cost Alternatives**

Further analysis was completed for Alternates I and III for the Filtered System Alternatives and Alternate IV for Unfiltered Alternatives to determine their impacts on water rates. These alternates were chosen for further analysis due to the lower overall present worth costs. The small difference in present worth costs between Alternates I and III required further examination to see which alternate actually resulted in lower estimates of water rates.

■ **Funding Sources**

Costs and financial obligations to the Town of Pinedale that would result from a specific water project were calculated on the assumption that:

1. The cost of some project features would qualify for a 50% grant and a 50% loan from the Wyoming Farm Loan Board (WFLB).
2. The cost of other features within the same project would qualify for a 67% grant and 33% loan from the Wyoming Water Development Commission (WWDC).
3. The loan portion of funding received from WFLB would be repaid over 30 years at 8 1/2% interest.
4. The loan portion of funding received from WWDC would be repaid over 30 years at 4 % interest.

Costs of the alternates studied were therefore categorized as to funding source and the resultant water rates were calculated accordingly.

■ **Projected Water Rates**

The following table provides the impact on water rates that would result from Alternates I, III and IV.

IMPACTS ON WATER RATES

TYPE OF SERVICE	EXISTING QUARTERLY RATE	QUARTERLY WATER RATES RESULTING FROM ALTERNATE		
		I	III	IV
Residence	\$30.42	\$74.22	\$79.40	\$56.28
Business	\$38.88	\$94.87	\$101.48	\$71.93
Bar	\$75.96	\$185.34	\$198.26	\$140.53
Apartment with 6 Units	\$185.52	\$445.35	\$476.38	\$337.66
Motel with 15 units	\$178.20	\$434.81	\$465.10	\$329.67

The information presented in the foregoing table clearly demonstrates that:

1. The construction and subsequent operation of an unfiltered water system inclusive of a watershed management control plan (Alternate IV) will have a significant impact on water rates in the Town of Pinedale.
2. The construction and subsequent operation of a filtered water system (Alternates I or III) will impose a serious and dramatic impact on water rates in the Town of Pinedale.

■ **Draft Phase I Report**

A Draft Phase I Report on the Pinedale Water Supply Project was completed and submitted to the Town of Pinedale and WWDC on February 15, 1993. That report presented the procedures, methodology, data, findings and conclusions of the investigations conducted in 1992. Most of the data and information presented in this Watershed Management Control Plan is drawn from the Draft Phase I Report.

Appropriate drawings and maps were submitted with that report. These drawings are also made a part of this Watershed Management Control Plan.

- **Public Meeting - March 29, 1993**

The findings, data, conclusions and maps of the Draft Phase I Report on the Pinedale Water Supply Project were presented to the Mayor, Town Council and residents of Pinedale in a public meeting on March 29, 1993 in the Sublette County Courthouse.

- **Selected Plan**

The Town of Pinedale requested that WWDC authorize JFC to proceed with a Phase II effort of the Pinedale Water Supply Project further defining Alternate IV of the Draft Report subsequent to the March 29 Public Meeting. This alternate considered an unfiltered system and embraced the development of the Watershed Management Control Plan as herein presented.

- **Contract Amendment**

The WWDC authorized JFC to proceed with the Watershed Management Control Plan pursuant to Amendment No. III to their contract.

II. EPA LETTER TO TOWN OF PINEDALE - MARCH 17, 1992

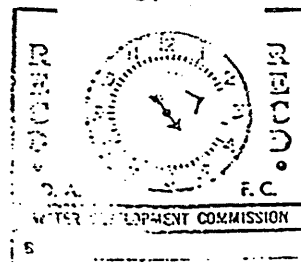
The Town of Pinedale submitted a Watershed Control Plan to the EPA in January of 1992. The EPA commented negatively on the proposed watershed control plan and the Town's January 22, 1992 letter in a letter to the Town of Pinedale dated March 17, 1992. The EPA letter is included in its entirety on the following pages.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VIII
999 18th STREET - SUITE 500
DENVER, COLORADO 80202-2466

APR 17 1992

APR 27 '92 AM



Ref: 8WM-DW-PWSI&E

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Honorable Miriam Carlson, Mayor
Town of Pinedale
Box 709
Pinedale, WY 82941

Re: Watershed Control
Program
PWS ID# 5600041C

Dear Mayor Carlson:

Thank you very much for the letter dated January 22, 1992 regarding the requirements for the Town of Pinedale to remain unfiltered under the Surface Water Treatment Rule (SWTR).

EPA has carefully reviewed the package you submitted. However, EPA cannot accept the watershed control program for the Town of Pinedale. This is because the watershed control program package was not complete. The package also did not state the specific actions required to protect and monitor the Fremont Lake watershed.

A comprehensive watershed control program should include the following items in addition to the items you have already submitted :

- * A base map (USGS 7 1/2 minute quadrangles or equivalent) delineating the Fremont Lake watershed. The map should identify the land ownership, land use types, zoning for future developments, soil types, septic tank locations, water intake, commercial & recreational activities, and sewer outflows.
- * Animal types and population that have potential to transmit pathogens should be identified.
- * Activities subject to the Local, State or Federal permit/approval should be identified by location and discussed. These activities include, but are not limited to: water pollution control permits, hazardous waste facilities, and solid waste facilities.

- * Risk assessment of both man-made and natural activities on watershed and water supply quality. These should emphasize pathogenic organisms, turbidity, organic and inorganic chemical contaminants (petroleum, fertilizers and pesticides) from human developments and recreational activities in the watershed.
- * A control program which describes existing and future actions to protect the Fremont Lake watershed, Fremont Lake shoreline, inflow tributary shoreline, and water supply intake structure. This control program must include written agreements with landowners within the watershed.
- * A control program which prohibits recreational activities near the water supply intake structure.
- * A control program which prohibits sewer discharges in the watershed.
- * A monitoring program for the source water in addition to the requirements under the SWTR should be developed. Source water quality parameters such as pH, color, nutrient loading, nitrates, phosphorus, viruses, Giardia, Cryptosporidium, total THM formation potential, and taste and odor, should be monitored.
- * An annual report shall be submitted to EPA for review. This annual report shall include description of watershed activities, identification of water quality concern, identification of contaminants or activities damaging to the water quality, description of emergency plan, description of any alternate sources and delineation of a chain of command.
- * A long-term plan to implement the watershed control program, such as human and financial commitments, must be developed.

The complete watershed control program, as outlined above, shall be submitted to EPA for review within 30 days from the date of this letter. Pinedale will be evaluated further to determine whether it can remain unfiltered after the complete watershed control program is reviewed by EPA.

Honorable Miriam Carlson, Mayor
Town of Pinedale
Page 3

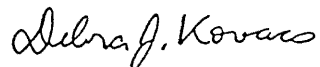
Meanwhile, the Town of Pinedale needs to meet the disinfection requirements as determined by the CT values. Pinedale has been in violation by not providing adequate disinfection since January 1, 1992. Since Pinedale is in the process of modifying the distribution system to increase the disinfectant retention time to meet this CT requirement, EPA will issue an Administrative Order on Consent (AOC) to the Town of Pinedale. This AOC will serve as a compliance agreement between EPA and Pinedale.

We strongly recommend that the Town of Pinedale install filtration, not only because the watershed control program is complicated, but due to the existing taste and odor problems associated with algae. There is no indication that this existing algal problem can be relieved in the future. Studies by the USGS concluded that about 800 tons (500 cubic meters) of net sediments are transported to Fremont Lake annually. The trophic state in the Fremont Lake may be degraded by these sediments and recreational activities. In order to ensure that Pinedale citizens receive consistently safe water, filtration may be necessary in the future.

The Town of Pinedale has to continue monitoring the source water quality and meet the source water quality criteria as required by the SWTR. Any violation of this filtration avoidance criteria will automatically trigger required filtration installation within 18 months of the date of the violation.

If you have any questions or need further information, please do not hesitate to contact Mary Wu at 1-800-227-8917, Ext. 1413; or 1-303-293-1413.

Sincerely,



Debra J. Kovacs, Chief
PWS Implementation and
Enforcement Section

It can be noted the foregoing letter states that *"since Pinedale is in the process of modifying the distribution system to increase the disinfectant retention time to meet this CT requirement, EPA will issue an Administrative Order and Consent to the Town of Pinedale."* The referenced Administrative Consent Order was submitted to the Town by Certified Mail Return Receipt Requested letter dated June 10, 1992.

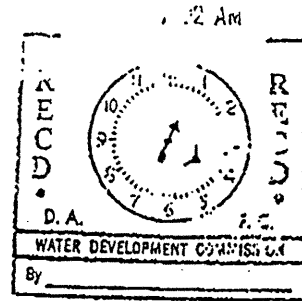
**III. EPA LETTER TO TOWN OF PINEDALE - JUNE 10, 1992
AND ADMINISTRATIVE CONSENT ORDER**

The EPA letter of June 10, 1992 and Administrative Consent Order are presented on the following pages:



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
 REGION VIII
 999 18th STREET • SUITE 500
 DENVER, COLORADO 80202-2466

JUN 10 1992



Ref: 8WM-DW-PWSIE

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Honorable Miriam Carlson
 Mayor, Town of Pinedale
 P.O. Box 709
 Pinedale, Wyoming 82941

Re: Administrative Consent Order
 Docket No. 8-PWS-VIII-92-21
 PWS ID # 5600041C

Dear Mayor Carlson:

Enclosed you will find a document entitled "Administrative Consent Order". As explained in more detail below, its purpose is to deal with the issue of the Town of Pinedale's effort to meet the criteria to avoid filtration and to ensure compliance with disinfection requirements for public water systems supplied by a surface water source.

As you are aware, the National Primary Drinking Water Regulations require filtration as a treatment technique for public water systems supplied by a surface water source and which do not meet the criteria for avoiding filtration. It is our understanding that the Town of Pinedale would like the opportunity to meet the criteria for avoiding filtration and that the Town of Pinedale is willing to make to the system modifications necessary to comply with disinfection requirements for public water systems supplied by a surface water source.

In view of the circumstances, EPA proposes to issue the enclosed Administrative Consent Order. The Order would be signed on behalf of both the EPA and the Town of Pinedale. The Order would obligate the Town of Pinedale to continue to monitor the Pinedale Municipal Water System to determine that the system can meet the criteria for avoiding filtration and would obligate the Town to perform the system modifications required to maintain disinfection treatment for consistent compliance with the disinfection aspects of the surface water treatment rule. The

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Town of Pinedale
Docket No. 8-PWS-VIII-92-21
Page 2 of 2

Order also requires that the Town of Pinedale must install filtration and meet the criteria for filtered systems within 18 months of the failure of the system to meet any of the requirements for avoiding filtration.

Although EPA does not expect that the Town of Pinedale will fail to comply with the terms of the enclosed Administrative Consent Order, a violation of the Order would subject the Town to the same sanctions as a violation of other EPA administrative orders for public water supplies. A violator of a public water supply compliance order issued under the Safe Drinking Water Act, 42 U.S.C. Section 300f, et seq. is subject to an administratively assessed civil penalty not to exceed \$5,000, or a court-imposed penalty not to exceed \$25,000 per day of violation.

Please sign and return the enclosed order at your earliest convenience. After issuance, an executed copy will be returned to you. If you have any questions or comments, please contact John Gillis at (303) 294-7118 or Margaret (Peggy) Livingston at (303) 294-7551.

Sincerely,



Max H. Dodson, Director
Water Management Division

Enclosure

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VIII

IN THE MATTER OF)	
)	
Town of Pinedale)	Docket No.8-PWS-VIII-92-21
P.O. Box 709)	
Pinedale, Wyoming 82941)	ADMINISTRATIVE CONSENT
)	ORDER
Proceedings under Section 1414(g))	
of the Safe Drinking Water Act,)	
42 U.S.C. §300g-3(g))	

STATUTORY AUTHORITY

The following Findings are made and Order issued under the authority vested in the Administrator of the U.S. Environmental Protection Agency (EPA) by Section 1414(g) of the Safe Drinking Water Act (the Act), 42 U.S. §300g-3(g). The Administrator of the U.S. EPA has delegated the authority to take these actions to the Regional Administrator of Region VIII, who in turn has delegated them to the Director of the Water Management Division, Region VIII.

FINDINGS

1. The Town of Pinedale (Respondent) is a municipality and therefore a "person" within the meaning of 40 CFR §141.2.
2. Respondent owns and operates a system, the Pinedale Municipal Water System, located in Sublette County, Wyoming, for the provision to the public of piped water for human consumption.

3. The Pinedale Municipal Water System has at least 15 service connections and serves at least 25 year-round residents and is therefore a "community water system" within the meaning of Section 1401(4) of the Act, 42 U.S.C. §300f(4), and 40 CFR §141.2.
4. Respondent owns and operates a public water system and is therefore a "supplier of water" within the meaning of Section 1401(5) of the Act, 42 U.S.C. §300 f(5) and 40 CFR §141.2. Respondent is therefore subject to the requirements of Part B of the Act, 42 U.S.C. §300g, and its implementing regulations, 40 CFR Part 141.
5. According to a January 1984 sanitary survey by the EPA, Respondent operates a system that is supplied solely by a surface water source, Fremont Lake.
6. 40 CFR §141.70, effective December 31, 1990, establishes criteria under which filtration is required as a treatment technique for public water systems supplied by a surface water source.
7. 40 CFR §141.70, effective December 31, 1990, establishes criteria under which public water systems with a surface water source must provide treatment of that source water that complies with treatment technique requirements stated in 40 CFR §141.70(a)
8. 40 CFR §141.71, establishes criteria for avoiding filtration. A public water system that uses a surface

water source must meet all of the conditions of §141.71(a) and §141.71(b), and is subject to §141.71(c).

9. The Pinedale Municipal Water System uses a surface water source and currently does not use filtration as a treatment technique. The Pinedale Municipal Water System does not meet the disinfection requirements, as specified in 40 CFR §141.72(a), for a public water system that does not provide filtration treatment.

ORDER

Based on the foregoing Findings, and pursuant to the authority of Section 1414(g) of the Act, it is hereby ORDERED and AGREED that:

1. Respondents shall continue to monitor source water conditions of the Pinedale Municipal Water System, as specified in 40 CFR §141.74(b)(1) and (2), and meet the source water quality criteria specified in 40 CFR §141.71(a). Appropriate records shall be maintained, and be available to EPA, to confirm that the conditions of §141.71(a) have been met. Respondent shall report the results to EPA within the first ten (10) days following the month analytical results are received, as required by 40 CFR §141.75(a).
2. By July 31, 1993 Respondent shall submit to EPA detailed plans for maintaining a watershed control

program as required in 40 CFR §141.71(b)(2). The plans shall include a schedule for consistent compliance with 40 CFR §141.71(b)(2). The plans and schedule for the watershed control program will be incorporated into this ORDER upon written approval by EPA.

3. By July 31, 1993 Respondent shall maintain a watershed control program for consistent compliance with 40 CFR §141.71(b)(2).
4. The Pinedale Municipal Water System must be subject to an annual on-site inspection to assess the watershed control program and disinfection treatment process as required by 40 CFR §141.71(c).
5. By July 31, 1993 Respondent shall submit to EPA detailed plans for system modifications necessary for the public water system to achieve the inactivation rates specified in 40 CFR §141.72(a)(1), following the procedure specified in 40 CFR §141.74(b)(3). The plans shall include proposed system modifications, estimated costs of the modifications, and a schedule for consistent compliance with 40 CFR §141.72(a)(1). The plans and schedule for the disinfection will be incorporated into this ORDER upon written approval by EPA.

6. By June 30, 1995 Respondent shall complete system modifications required to maintain disinfection treatment for consistent compliance with 40 CFR §141.72(a)(1).
7. Respondent shall continue to monitor the residual disinfectant concentration, as specified in 40 CFR §141.74(b)(5), and meet the residual disinfectant concentration specified in 40 CFR §141.72(a)(3) and (4). Appropriate records shall be maintained, and be available to EPA, to confirm that the conditions of §141.72(a)(3) and (4) have been met. Respondent shall report the results to EPA within the first ten (10) days following the month analytical results are received, as required by 40 CFR §141.75(a).
8. By July 31, 1992 Respondent shall submit to EPA detailed plans for a redundant disinfection system for consistent compliance with 40 CFR §141.72(a)(2). The plans shall include proposed system modifications, estimated costs of the modifications, and a schedule for consistent compliance with 40 CFR §141.72(a)(2). The plans and schedule for the disinfection system will be incorporated into this ORDER upon written approval by EPA.

9. By December 31, 1992 Respondent shall provide to EPA a written report on the status of planned and completed modifications for the system. Thereafter, Respondent shall submit quarterly reports on progress made towards completing modifications to the system.
10. By June 30, 1995 Respondent shall complete system modifications required for consistent compliance with 40 CFR §141.72(a)(2).
11. Within 18 months of the failure of Respondent's system to meet any of the requirements of §141.71(a) and §141.71(b), the system must have installed filtration and meet the criteria for filtered systems specified in §141.72(b) and §141.73.
12. Upon the effective date of this ORDER, Respondent shall comply with 40 CFR §141.31(b) by reporting to EPA and the State within forty-eight (48) hours any failure to comply with any National Primary Drinking Water Regulation (40 CFR Part 141).

GENERAL PROVISIONS

1. This ORDER does not constitute a waiver, suspension, or modification of the requirements of 40 CFR §141.1 et seq., or the Safe Drinking Water Act, which remain in full force and effect. Issuance of this ORDER is not an election by EPA to forego any civil or any criminal action otherwise authorized under the Act.

2. Violation of any term of this ORDER may subject Respondents to an administrative civil penalty of up to \$5,000 under Section 1414(g)(3)(B) of the Act, 42 U.S.C. §300g-3(g)(3)(B) or a civil penalty of not more than \$25,000 per day of violation, assessed by the U.S. District Court, under Section 1414(g)(3)(A) and (C) of the Act, 42 U.S.C. §300g-3(g)(3)(A) and (C).
3. Violation of any requirement of the Safe Drinking Water Act (SDWA) or its implementing regulation may subject Respondents to a civil penalty of not more than \$25,000 per day of violations, assessed by an appropriate U. S. District Court, under Section 1414(g)(3)(A) and (C) of the Act, 42 U.S.C. §300g-3(g)(3)(A) and (C).
4. This ORDER does not relieve Respondent of any responsibilities or liabilities established pursuant to any applicable federal, state, or local law.
5. Hearing Waiver. When this Administrative Consent Order becomes effective, Respondent waives its right to a hearing on the matters contained herein pursuant to Section 1414(g) of the Act.

6. This Administrative Consent Order shall take effect upon the signature of both parties.

Max H. Dodson 6/9/92
Max H. Dodson, Director Date
Water Management Division

CONSENT: Miriam Carlson represents that she is the Mayor of the Town of Pinedale, the municipality that owns and operates the Pinedale Municipal Water System that is the subject of this ORDER and that she has the authority to bind the Town of Pinedale.

Miriam Carlson, Mayor Date
Town of Pinedale, Wyoming

IV. PINEDALE WATER SUPPLY AND EXISTING SYSTEM

A. History

Prior to 1973, the Town of Pinedale obtained its water supply directly from Pine Creek upstream of the town. A new transmission pipeline, intake and chlorination/metering facility was constructed in 1973 that draws water directly from Fremont Lake. There are no residential meters on service lines from the Town's distribution system.

B. Existing Water Demands

Water demands for 1992 are tabulated as follows:

MONTH	MONTHLY DEMAND (mg.)	DAILY (mg.)
JANUARY	32	1.03
FEBRUARY	30	1.03
MARCH	32	1.03
APRIL	29	0.97
MAY	31	1.00
JUNE	35	1.19
JULY	36	1.16
AUGUST	37	1.19
SEPTEMBER	37	1.23
OCTOBER	35	1.13
NOVEMBER	37	1.23
DECEMBER	37	1.19

Peak months - September and November - 1,230,000 gal.

The monthly demands were determined from a flow reading taken by Town personnel in gallons per minute at some point in time during the working day and multiplying by 1440 to arrive at a total flow for the day. Daily flows were then tabulated to arrive at a monthly flow. The instantaneous flow rate may vary from that taken for the flow reading throughout the day.

The population of Pinedale is presently 1181 people. Dividing the daily water demands by the population provides the gallons per capita per day (gpcpd) usage.

$$\begin{array}{l} \text{Gallons per capita per day (gpcpd)} \\ \text{Average day for peak month} \\ \text{Gallons per capita per day (gpcpd)} = \frac{1,230,000}{1,181} = 1,041 \end{array}$$

This is an extremely high gpcpd usage figure which is attributable to the following factors:

1. The system is unmetered.
2. Soils in the area are very sandy and granular; therefore, overwatering of lawns is common.
3. Water is billed at a flat monthly rate considering type of service, i.e., residence, business, etc.
4. Winter water usage is high because townspeople leave faucets running to prevent freeze up during cold winter conditions.

However, 1,041 gpcpd usage is comparable to other communities in western Wyoming, such as Cokeville and Afton, where water is unmetered and billed on a flat monthly rate.

C. Projected Water Demands

Projections for water demands were developed using existing water usage figures and applying gpcpd demands to population growth figures developed by applying data for

projected growth in Sublette County populations found in Wyoming Data Handbook, 1989.

ANNUAL POPULATION AND POPULATION FORECAST FOR WYOMING COUNTIES 1985-1998 (SUBLETTE COUNTY)

YEARS	POPULATION	POPULATION INCREASE	PERCENT INCREASE
1990	5112		
1991	5361	249	
1992	5397	36	
1993	5434	37	0.68
1994	5467	33	0.61
1995	5498	31	0.57
1996	5529	31	0.56
1997	5560	31	0.56
1998	5591	31	0.56
			AVE. = 0.59

POPULATION PROJECTIONS - TOWN OF PINEDALE

YEAR	POPULATION	DAILY WATER DEMANDS*
1992	1181	1,229,421
1993	1189	1,240,000
1994	1196	1,250,000
1995	1203	1,250,000
2000	1237	1,290,000
2022**	1389	1,450,000

* Using 1,041 gpcd

** Assumed payout for 30 years project life.

D. Existing Water Transmission System

The Pinedale water supply is drawn into the transmission system through a pipe intake that extends 650 feet out into Fremont Lake. The intake is 70 feet below the surface

of the lake and consists of 16 inch diameter polyethylene pipe. The water is conveyed from the lake to a chlorination and metering facility through 2777 feet of 18 inch diameter pipe. From there it is conveyed through 10,038 feet of 14 inch diameter pipe to a junction point consisting of 10 and 12 inch diameter pipelines. The transmission pipeline is depicted on Sheet #1 of the Drawings accompanying this plan.

There is no backup chlorination capability and no storage capacity in the system.

V. FREMONT LAKE AND SURROUNDING AREA

A description of the Fremont Lake and surrounding area is provided at this point to better inform the reader of the setting and conditions that must be dealt with and considered in meeting the objectives of the Town and complying with the terms expressed in the EPA letters to the Town and the Administrative Consent Order.

Fremont Lake is nine miles long, over 600 feet deep at its deepest point and about one mile wide. The lake is depicted on several of the maps submitted with this Watershed Management Control Plan.

The lake contains 1,370,348 acre feet of water and its turnover time is about eleven years.

The quality of water obtained from the lake by the Town of Pinedale is excellent. Water quality data is presented in the following table.

WATER QUALITY - FREMONT LAKE

	RECOMMENDED MCL	FREMONT LAKE
CATIONS	MG/L	MG/L
Sodium	115	3
Potassium	20	4
Magnesium	125	1
Calcium	200	2.3
ANIONS	MG/L	MG/L
Chloride	250	3
Fluoride	4.0* (2.0)	0.1
Nitrate	10*	< .2
Sulfate	250	2.3
Bicarbonate	150	9
TRACE ELEMENT ANALYSIS	MG/L	MG/L
Barium	1.0*	.003
Cadmium	0.010*	.002
Chromium	0.05*	.0005
Copper	1.0	.002
Iron	0.3	.014
Lead	.05*	.001
Manganese	.05	.012
Zinc	5.0	.0005
OTHER CONSTITUENTS	MG/L	MG/L
pH	6.5 - 8.5	7.5
Conductivity		20
Total Alkalinity	65	11
Hardness	500	9.2
Total Dissolved Solids	500	13
Turbidity	1 NTU	0.2 NTU
Silica	--	2
Fecal Coliform	20/100 ml	< 2/100
Total Coliform	100/100 ml	< 8/100**

	RECOMMENDED MCL	FREMONT LAKE
VOLATILES	MG/L	MG/L
Vinyl Chloride	.002	< 0.50
1,1 Dichloroethylene	.1P	< 0.50
1,1,1-Trichloroethane	0.2	< 0.50
Carbon Tetrachloride	.005	< 0.50
Benzene	.005	< 0.50
1,2 Dichloroethane	.005	< 0.50
Trichloroethylene	.005	< 0.50
1,4 Dichlorobenzene	.6P	< 0.50
Chloroform	U	5.30
Bromodichloromethane	U	0.58
Dibromochloromethane	U	< 0.50
Bromoform	U	< 0.50

- * Primary MCL (MCL = Maximum contaminant level)
- ** Ave. = 8/100 (2/100 Low - 50/100 High 11/23/92)
- P = Proposed
- U = Unregulated VOC's
- < = (Symbol for "less than") Generally indicates the limiting capability of the analytical equipment and procedures used in determining the stated value.

The lake is entirely surrounded by lands within the Bridger National Forest. The Bridger Wilderness Boundary is just upstream of the point where the inlet, Pine Creek, enters the lake. Major watersheds supplying the lake are the Pine Creek and Fremont Creek watersheds, all of which lie within the Bridger Wilderness Area between the upper end of the lake and the Continental Divide. Elevations range from 7,519 (the water surface elevation of the lake) to 13,745, the top of Fremont Peak.

The following cabin sites and developments exist on the lake under Forest Service Leases:

1. South Shore
2. Sylvan Bay
3. South Shore Marina

One recently developed subdivision, Lake Ridge Subdivision, exists on private land a short distance from the shore of the lake. These cabin sites and developments are shown on maps accompanying this control plan.

U. S. Forest Service Campsites on the lake consist of:

1. East Shore Campsite.
2. North Shore Campsite - boat access only.
3. Inlet Campsite - boat access only.

A swimming beach is found on the South Shore.

Forest Service Grazing Allotments exist on Forest Service lands around the lake.

Wildlife that are found around or on the lake consist of:

1. Elk
2. Deer
3. Antelope
4. Moose
5. Bighorn Sheep (summer range)
6. Beaver and Muskrat
7. Other small animals

Cabin sites and the marina on the South Shore utilize septic tanks and leach field sewage treatment facilities. Wet wells and pumps are installed downstream of the septic tanks which pump wastewater uphill to leach fields situated on a bench some distance from the lake shore and down-gradient of groundwater tables interconnected to the lake.

Cabin sites at Sylvan Bay are served by septic tanks and leach fields. The leach fields discharge to groundwater tables up-gradient of the lake level.

Forest Service campsites on the East Shore and the swimming beach on the South Shore are served with vault type restroom facilities that are periodically pumped into tank trucks that

transport the contents out of the basin. Campsites on the north (west) shore and inlet are served with pit type toilets.

All of the foregoing improvements, conditions and use factors are presented on the maps accompanying this report. A description of these maps can be found on pages 35 through 39.

Recreational activities on or around the lake include:

1. Boating
2. Water Skiing
3. Fishing
4. Camping
5. Ice Fishing
6. Snowmobiling
7. Cross Country Skiing
8. Backpacking and Hiking
9. Hunting

VI. WATERSHED MANAGEMENT CONTROL PLAN

A. Forward

As stated earlier, this Watershed Management Control Plan is formulated in response to the letters from the EPA to the Town of Pinedale:

1. EPA Letter to Town of Pinedale - March 17, 1992
2. EPA Letter to Town of Pinedale - June 10, 1992 and Administrative Consent Order Docket No. 8-PWS VIII-92-21 PWS ID #560041C

The March EPA letter stated that a comprehensive watershed control program includes:

- A base map or maps delineating the watershed land ownership, land use zoning, sewage disposal works, water intake, activities on the lake
- Inventory of animal populations
- Activities subject to permitting requirements
- Risk assessment
- Description of existing and future actions to safeguard the watershed inclusive of landowner agreements
- Prohibition of recreational activity near the water supply intake
- Prohibition of sewer discharge in the watershed
- A monitoring program
- An annual report
- Long term plan of implementation

The letter defined a time schedule and addressed disinfection criteria and further recommended filtration. Continued source water monitoring, as required by SWTR, was also referenced.

Disinfection criteria, water monitoring required by SWTR and schedules applicable to those items are not referenced herein. These subjects are addressed in the Pinedale Water Supply Project Phase II Report.

The June EPA letter referenced the following items relative to the Watershed Management Control Plan:

- Submittal of detailed plans for a watershed control plan to EPA by July 31, 1993 together with a schedule.
- Maintenance of a watershed control plan by July 31, 1993.
- Annual on-site inspection to evaluate the Watershed Management Control Plan and assess conditions and activities in the watershed.

Other references were made in the June letter concerning: system modifications to achieve inactivation compliance; time of system modifications for disinfection; monitoring of treated water and reporting; detailed plans and costs for redundant disinfection; written report on the status of planned and completed system modifications; deadline for complete system modifications and possible requirements for construction or installation of filtration; reporting and penalties concerning disinfection.

Those subjects concerning system disinfection are addressed in the Phase II Pinedale Water Supply Project Report and are not commented on herein; however, each of the above referenced items concerning the Watershed Management Control Plan are addressed in this plan. Costs for this Watershed Management Control Plan are presented in the Phase II Report together with other costs for disinfection, storage, etc.

B. Mapping

The following maps are submitted with this Watershed Management Control Plan and are to be considered as an integral part thereof:

<u>Drawing Title</u>	<u>Sheet No.</u>
Water System Fremont Lake & Pinedale	1
Ownership Fremont Lake	2
U.S. Forest Service Improvements (Lake Ridge Subdivision) Fremont Lake	3
South Shore Summer Homes	4
Lake Ridge Subdivision	5

<u>Drawing Title</u>	<u>Sheet No.</u>
Sylvan Bay Summer Homes	6
Grazing Allotments and Watershed	7
Natural Conditions	8
Big Game Distribution	9
Fremont Lake Watershed Management Control Plan - Intake Control Zone and Monitoring Points	10

The significant information on each of these maps is explained as follows:

Sheet 1 - Water System - Fremont Lake and Pinedale

This map shows the location of:

1. Existing intake
2. Transmission pipeline
3. Chlorination/metering facility
4. Proposed chemical feed and standby power building
5. Proposed water storage tank

Sheet 2 - Fremont Lake - Land Ownership

This map depicts what lands are:

1. U.S. Forest Service
2. U.S. Bureau of Land Management
3. State
4. Privately owned.

Sheet 3 - Fremont Lake - U.S. Forest Service Improvements and Lake Ridge Subdivision

This map shows the location of all Forest Service improvements on the lake and the Lake Ridge Subdivision.

Sheet 4 - South Shore Summer Homes

This map portrays the permitted lots, permit boundary and permitted lots that have existing improvements on the south shore of the lake.

Sheet 5 - Lake Ridge Subdivision

This map shows the layout of the lots, roads and proposed homesites on the eleven platted lots in the Lake Ridge Subdivision.

Sheet 6 - Sylvan Bay Summer Homes

This map shows the permitted lots, roads and location of existing summer homes at the Sylvan Bay Summer Home Development. There are eighty lots in the development, of which forty five have existing cabins.

Sheet 7 - Pinedale Area - Grazing Allotments and Watershed

This map shows the grazing allotments on the National Forest and BLM lands; the Forest boundary; Wilderness boundary and limits of the Fremont Lake Watershed to the continental divide.

Sheet 8 - Fremont Lake - Natural Conditions

This map identifies active and inactive beaver lodges on the lake, watershed boundary around the lake and plant community transmission zones (forest to sagebrush).

Sheet 9 - Fremont Lake - Big Game Distributing

This map demonstrates:

1. Crucial big game range
2. Limits of antelope range
3. Antelope migration routes
4. Deer migration routes
5. Parturition boundary
6. Limits of elk range
7. Boundary between elk spring/summer/fall and winter areas
8. Elk migration route

*Sheet 10 - Fremont Lake - Watershed Management Control Plan
Monitoring Points and Intake Control Zone*

This map depicts the recommended locations where water samples will be routinely collected and analyzed for water quality data on the lake as specified in this Watershed Management Control Plan and the proposed intake control zone prohibiting boating and ice fishing around the intake to the Pinedale water system.

C. Animal Types and Population

Animals found in the Fremont Lake Watershed include:

1. Cattle
2. Antelope
3. Mule deer
4. Elk
5. Moose
6. Beaver and muskrats
7. Numerous other small animals

Sheets 7, 8 and 9 of the maps present information relative to animal types found in the watershed.

The Soda Lake Grazing Allotment is contiguous to the west shore of the lake. Grazing allotments on the east side do not extend to the lake shore; however, stock can occasionally wander to the lake because fencing is not totally intact on the west boundary of Fremont Lake Individual and Pole Creek grazing allotments.

The following table presents estimates of animal population on the watershed of the lake during the summer and winter seasons.

ANIMAL TYPE	POPULATION	
	SUMMER	WINTER
Cattle	200	0
Antelope	50	0
Mule Deer	750	150
Elk	450	150
Moose	100	30
Beaver & Muskrat	?	?
Big Horn Sheep	100	0
Other	?	?
Totals	1650	330

Other animals include:

- Coyotes
- Bobcats
- Badgers
- Porcupines
- Domestic pets

No information exists on the numbers of these animals inhabiting the Fremont Lake Watershed.

The numbers given for cattle and wildlife are strictly based on estimates. Wildlife counts are made in the winter when big game animals congregate on winter range. These counts provide numbers for wildlife that summer in large areas of which the Fremont Lake watershed is only a small portion. Therefore, the figures can only be estimated. The figures for wildlife were graciously provided by Mr. Doug McWhirter, Wildlife Biologist, Pinedale Office of the Wyoming Game and Fish Department. The estimated figure for cattle was provided by Renae Bragonje, Range Conservationist, Pinedale Office, United States Forest Service. She stated the number of cattle shown in the table are in the watershed for no more than 45 days per year. They would be part of the herd permitted on Fremont Ridge Unit.

D. Local, State and Federal Permitted Activities

The following activities are permitted on the lake and in the watershed by the agencies specified.

Local

Sewage Facilities:

All septic tank and leach field construction (small wastewater disposal systems) must be permitted by the Sublette County Office of Planning and Zoning.

Building permits must also be obtained from the County to construct housing facilities.

State of Wyoming

All boats on the lake must display Wyoming, or the state of origin, registration. Wyoming boat registration is administered by the Wyoming Game and Fish Department.

All hunters and fishermen in the watershed pursuing those activities during legal seasons must possess a Wyoming Conservation Stamp and the appropriate licenses. Hunting and fishing seasons are established by the Wyoming Game and Fish Department.

The construction of public water systems must be permitted by the Wyoming Department of Environmental Quality. Wells and water rights on any water development in the watershed must be permitted by the Wyoming State Engineer's Office. Construction activities on the lake or any stream must be authorized pursuant to a 402 permit issued by the Wyoming Department of Environmental Quality. The construction of landfills must be permitted by the Wyoming Department of Environmental Quality.

Federal

Construction that infringes on the lake or any stream in the watershed must be authorized under a 404 permit issued by the United States Corps of Engineers.

All logging must be permitted by the U. S. Forest Service. The construction of roads, boat ramps and parking areas must be authorized by the U.S. Forest Service on lands administered by that agency.

Public water systems must be permitted by the Environmental Protection Agency and the Wyoming Department of Environmental Quality.

E. Risk Assessment of Potential for Contamination

There are several potential sources to contaminate the water in Fremont Lake. These include:

1. Animals in the watershed.
2. Subsurface discharge from septic systems in Sylvan Bay Summer Home Development.
3. Activities and facilities in the Fremont Campground and Boat Ramp.
4. Swimming at the Sandy Beach Picnic Area.
5. Activities and facilities at the Lakeside Lodge.
6. Facilities and activity at the South Shore Summer Home Development.
7. Boating emanating from the Lower Fremont Boat Ramp.
8. The presence of beaver on the lower end of the lake.
9. Boating and water skiing on the lake.
10. Ice fishing activity on the lake.

The potential for contamination from each of these potential sources is discussed further.

1. Animals in the watershed.

Livestock has been present in the watershed since the turn of the century. Wildlife has been there since the end of the ice age. There is no evidence of measurable contamination from these sources; however, that does not mean that there has not been a minor degree of contamination resulting from this source.

2. Subsurface discharge from septic systems in the Sylvan Bay Summer Home Development.

This poses a significant possibility for contamination in the lake adjacent to the development. No site specific data exists for this possibility.

3. Activities and facilities at the Fremont Lake Campground and Boat Ramp.

The presence of humans and pets in and near the water pose a significant potential source of contaminants at this location in the lake. Also, boats travelling to and from the boat ramp create the possibility of contaminants entering the water.

No site specific data on water quality exists at this location to assess the degree of contamination that may be occurring in this area of the lake.

4. Swimming at the Sandy Beach Picnic Area.

These activities pose a potential source of contamination at this point on the lake.

5. Activities and facilities at the Lakeside Lodge.

These facilities pose a potential source of contamination in the lake. It is pointed out, however, that it is unlikely that contamination is resulting from the septic system serving this facility because the discharge from the septic tanks is pumped up to a leach field installed on a bench above the lodge.

The master plan for the Lakeside Lodge provides for the future development of the following additional units:

Motel	15 units
Cabins	6 units
Campground	15 sites
Boat slips	8 spaces
Dry boat storage	15 spaces

The Forest Service has indicated that this additional development will occur at such time as the Lodge owners undertake to do so.

No site specific data is available for water quality at this location.

6. Facilities and activity at the South Shore Summer Home Development.

Thirty-one lots were initially planned for development on the south shore of the lake in addition to the Lakeside Lodge. Twelve of these lots are presently occupied. The Forest Service has indicated that the leases on the remaining unoccupied lots have been cancelled.

A snowmobile race is held each winter near the south shore and intake to the water system.

There is a potential for contamination from these sources. The discharge from septic tanks installed in this area is pumped to leach fields installed on a bench

above the summer homes. However, the presence of people, snow machines and pets in, near and over the water poses a possible source of contamination.

7. Boating traffic to and from the Lower Fremont Boat Ramp.

Boat traffic in this location presents a potential for water degradation at this location.

8. The presence of beaver on the lower end of the lake.

Beavers are considered to be a potential source of giardia. Their presence on the lower end of the lake poses a threat of contamination due to giardia.

9. Boating and water skiing.

Boating activity is quite prevalent on the lake for fishing, cruising and water skiing. Cabin cruisers are not uncommon and on-board lodging is routine. Cabin cruisers are often anchored in quiet bays around the lake.

Although water skiing is noted, the lake is not extremely popular for water skiing due to its cold temperature.

These pursuits pose a potential for introducing pathogenic organisms into the lake, the most significant of which is an event where an operator of a cabin cruiser discharges his holding tank directly into the lake. This is presently prohibited and signage at the boat ramp notifies the public accordingly.

10. Ice Fishing.

Ice fishing is a very popular winter sport on the lake. This poses a potential for deterioration in water quality and source of pathogenic organisms due to the

fact that contaminants can concentrate on the ice throughout the winter to be released into the lake in a short period of time when the ice breaks up in the spring. This generally occurs in May.

In summary, there are several factors and conditions that can contribute to contaminating water in Fremont Lake. Historically, the degree of contamination resulting from these factors and conditions has not been extensive enough to significantly degrade water entering the intake to the Pinedale water supply system due to the huge volume of water contained in the lake. However, it is essential that baseline data concerning water quality be collected at strategic points around the lake to evaluate existing quality conditions. Additional water quality data should then be routinely collected to evaluate seasonal and annual trends. This will provide a means to have advance warning of serious water quality deterioration and to know the source of what is causing the diminishment in water quality so that appropriate remedial action can be taken.

F. Control Plan to Protect the Fremont Lake Watershed

The control plan proposed herein contains the following salient features:

1. Educating the public to the awareness that the Fremont Lake Watershed is the source of Pinedale's potable water supply. This can be accomplished by erecting informational signs at all campgrounds, boat ramps and trailheads in the watershed.
2. Affecting agreements with the landowners in the watershed to prevent activities on their land that would contribute to contaminating water in Fremont Lake. These agreements would include language to:
 - a. Forbid the storage of fuels, pesticides, herbicides and chemicals on their property. Existing fuel storage at Lakeside Lodge

would continue, together with fuel storage for home heating purposes at existing summer homes on the lake.

- b. Limit development to that which already exists or is presently planned other than in the Lake Ridge Subdivision and Lakeside Lodge.
 - c. Require that all small wastewater disposal systems will be permitted and inspected by Sublette County.
 - d. Prohibit stabling livestock in the watershed other than that which presently exists and which is allowed by zoning ordinances in the Lake Ridge Subdivision.
3. Obtain commitments from the U.S. Forest Service that continued curtailment of development on Forest Service summer home leases at Sylvan Bay and the South Shore be maintained in full force and effect. The Forest Service withdrew development of one-half the lots planned to be leased on Fremont Lake in 1971. This was based on an unpublished report in 1970 (Source: Luna Leopold 9/15/92).
 4. Assurance that Sublette County require permits and will inspect future construction of small wastewater disposal facilities in the Lake Ridge Subdivision and any replacements to existing septic tank and leach fields to insure that they are installed in full compliance with Wyoming Department of Environmental Quality criteria. Sublette County presently requires this of all small waste water disposal facilities.
 5. A commitment from the Forest Service and Bureau of Land Management that sanitary landfills will not be allowed in the watershed.

G. Prohibiting Recreational Activity near the Intake

The existing intake is located seventy feet beneath the surface of the lake, 650 feet off the south shore. The intake is depicted on Sheet 1 of the Drawings. The Lower

Fremont Boat Ramp is located approximately 800 feet from the intake (see Sheet 3 of the Drawings). Closing this boat ramp to further use is recommended as a part of this watershed control plan.

The Wyoming Game and Fish Department, in conjunction with the U.S. Forest Service, is presently planning to improve this boat ramp to accommodate large boats which will increase boat traffic around the intake significantly. The improved boat ramp will create traffic patterns that pass over the existing intake. These conditions enhance the potential for contamination to the Pinedale water supply and therefore total closure of the boat ramp is proposed. This closure will require agreement thereto by the Forest Service and Wyoming Game and Fish Department.

The creation of a control zone prohibiting boating and ice fishing is proposed within a radius of one thousand feet of the water intake. This radius should be defined on the lake by the placement of floating, orange colored buoys as shown on Sheet 10 of the Drawings.

H. Monitoring Program

The potential or possibility of water quality degradation and contamination at various locations around the lake was addressed earlier. Six water quality monitoring points are proposed on the lake as part of this Watershed Management Control Plan. These points are shown on Sheet 10 of the drawings and are identified in the following table.

Point No.	Comments
1.	Located offshore from the Sylvan Bay Summer Home Development to monitor water quality affected by the homes in the development.
2.	Located off a small peninsula near the Fremont Lake Campground to monitor water quality conditions affected by activities in the campground.
3.	Located offshore near the Lake Ridge Subdivision to assess water quality that may be affected by development of the subdivision.
4.	Located offshore between the Sandy Beach Picnic Area and Lake Shore Lodge to monitor water quality effects from swimming and boating at the Sandy Beach.
5.	Essentially, this point is located at the intake. Water quality from this point will be determined from samples drawn from the transmission pipeline upstream of the chlorinator. This sampling will be in addition to that required by the Surface Water Treatment Rule.
6.	Located off of Higgins Point on the west shoreline of the lake to monitor water supply impacts from wildlife and livestock that inhabit the west shore of the lake.

Water sampling at these locations will be performed on an annual basis on the following dates: May 15 or immediately after the ice goes off the lake, whichever is later, August 15, November 15 and February 15. The lake is generally frozen from December until mid-May. The results of the water quality analysis from the first round of sampling will be used as baseline data for comparison to all subsequent analyses.

The water samples will be analyzed for the following constituents:

	RECOMMENDED MCL
CATIONS	MG/L
Sodium	115
Potassium	20
Magnesium	125
Calcium	200
Phosphorous	-
ANIONS	MG/L
Chloride	250
Fluoride	4.0* (2.0)
Nitrate	10*
Sulfate	250
Bicarbonate	150
TRACE ELEMENT ANALYSIS	MG/L
Barium	1.0*
Cadmium	0.010*
Chromium	0.05*
Copper	1.0
Iron	0.3
Lead	.05*
Manganese	.05
Zinc	5.0

OTHER CONSTITUENTS	MG/L
pH	6.5 - 8.5
Conductivity	
Total Alkalinity	65
Hardness	500
Total Dissolved Solids	500
Turbidity	1 NTU
Silica	--
Fecal Coliform	20/100 ml
Total Coliform	100/100 ml
Giardia	
Cryptosporidium	

* Primary MCL (MCL = Maximum Contaminant Level)

The location of the water quality sampling points should be permanently marked onshore with a steel post or pipe four feet in height firmly implanted in a concrete base. The samples should be taken directly offshore from the post in twenty feet of water. The sample should be drawn from a depth of ten feet below the surface.

The following procedures and protocol should be followed in collecting water samples from the lake. Drawing the samples for water quality analysis should be done pursuant to directions from the laboratory where the samples will be analyzed. Two different laboratories will be involved: one to test for giardia and cryptosporidium and another to test for all other constituents listed. There are very few laboratories that perform giardia and cryptosporidium analysis, therefore, one specific lab is recommended for these tests. Any EPA approved lab can perform analysis for all other constituents.

The laboratory that is recommended for giardia and cryptosporidium analysis is:

CH Diagnostic and Consulting Services, Inc.
2210 Empire Avenue
Loveland, Colorado 80538
Phone: (303) 667-9789

Sampling for constituents other than giardia and cryptosporidium will require drawing approximately 2-1/2 liters of water into 3 or 4 containers from the specified depth of 10 feet. Specimen bottles will be furnished by the lab - some of which will contain additives or preservatives placed in the bottles by the lab prior to shipping them to Pinedale.

There are a number of different methods to draw the samples from the lake; however, sampling for giardia and cryptosporidium will require the use of a portable pump that can be used to draw all water samples.

Water analysis for giardia and cryptosporidium will require pumping 500 to 1000 gallons of water through a one-micron filter cartridge. The filter case and cartridge will be furnished by the laboratory. The Town of Pinedale will have to furnish a portable centrifugal pump.

The pump should have a capacity of approximately 3 gallons per minute and its discharge should be fitted with a flow meter and totalizer adaptable for connecting to the filter case. The suction hose should be about fifteen feet in length with a check valve on the lower end. The discharge hose should be approximately 20 feet in length with floats so that the discharge from the pump will return to the lake at sufficient distance from the pump intake to avoid recirculating the discharge back through the pump and filter. Three to six hours of pumping will be necessary to pump the specified quantity of water through the filter. A portable generator will be needed to operate the pump for the time required. The generator voltage should be compatible with that required to drive the pump.

The following equipment will be necessary to perform the water quality sampling:

1. Boat with anchor and line (summer)
2. Snow machine and sled (winter)
3. Small electric centrifugal pump (3 gallons per minute) with flow meter and totalizer
4. Filter and case (furnished by lab)
5. Portable generator
6. Specimen bottles (furnished by lab)
7. Ice auger (winter)
8. Portable shelter (winter)
9. Notebook

The lake should be patrolled once a year to locate beaver lodges in the southern portion. The southern portion being defined as the lake surface south of the north line of Section 12, T34N, R109W and Section 7, T34N, R108W. A beaver trapping program should be initiated with the Wyoming Game and Fish Commission if beaver lodges are found in this portion of the lake. The lodges should be destroyed to prevent the proliferation of beavers in the south end of the lake. The location of existing beaver lodges is shown on Sheet 8 of the Drawings. Only four lodges were noted in 1992, one of which was thought to be active.

The southern portion of the lake should also be monitored for the presence of dead animal carcasses in the water. This could be accomplished by posting signs at all boat ramps requesting that anyone observing a dead animal in the water notify the Town of Pinedale so that the carcass can be removed from the lake.

I. Annual Report

A written report will be submitted to EPA each year. The first report will be sent on or about January 15, 1995. This date will provide sufficient time to receive the results of the November 15, 1994 water monitoring program and to prepare the report.

The initial report should address the following items:

1. Date and Period Covered

The date of the report should be clearly stated together with a description of the time period that is covered and addressed in the report.

2. Author

The name and title of the author of the report should be presented.

3. Intake Control Zone

A narrative should be included describing how the control zone prohibiting boating and ice fishing within a radius of 1000 feet of the intake has been marked or defined.

4. Signage

The wording, size and location of all signs informing the public that Fremont Lake is the water supply source for the Town of Pinedale should be included. Also the location of all signs advising the public to notify the Town of the presence of any dead animals in the lake should be given.

5. Land Owner Agreements

The status of agreements between landowners in the watershed and the Town of Pinedale should be explained.

6. Sampling Points

The report should explain how the sampling points are identified and permanently marked on the lakeshore.

7. Sampling Procedure

The procedure for drawing water samples should be explained. The make and type of all sampling bottles and devices should be given.

8. Analytical Laboratories

The names and addresses of the laboratories performing water quality analysis should be stated. The lab should be EPA approved.

9. Water Quality Analysis

The results of the water quality analysis should be listed in tabular form for all constituents with columns for the results of the May 15, August 15, November 15 and February 15 samples side by side to allow comparison from one date to the next.

10. Commentary

A commentary should be provided which highlights variations in values. Water quality concerns should be addressed.

11. Watershed Activities

Activities in the watershed should be described with particular emphasis on any unusual activities or conditions that may involve the introduction of contaminants into the lake or otherwise be damaging to water quality.

12. Emergency Plan

An emergency plan should be defined in the event that a contaminant enters the water supply. It should include an emergency public information plan to inform water users to boil water if such an option is advisable. The names and phone numbers of doctors that could be contacted to obtain advice on what procedures to follow should be presented in the Emergency Plan together with the phone number of the County Sanitation Office. A public information officer should be appointed to implement this aspect of the plan.

Alternative water sources should be explained in the event of chemical contamination.

13. Alternate Sources

There are several alternate sources for water if it should be necessary to abandon the existing water source on an emergency basis. These include:

- a. Small domestic wells in the area
- b. The New Fork River
- c. Pole Creek
- d. The Green River
- e. The Town of Big Piney

Pole Creek, New Fork River and Green River would have to be filtered and disinfected. The source of an emergency package water treatment plan should be given in the report (i.e., Wyoming National Guard).

The nearest source for potable water, other than local wells, is the Town of Big Piney, 31 miles away. Water would have to be trucked from Big Piney to Pinedale.

14. Chain of Command

The Town Council and Mayor should adopt a chain of command to be implemented in the event of an emergency. This chain of command should include:

- The Mayor
- The Director of Public Works
- A Public Information Officer
- Other Town Personnel
- The County Sanitation Officer
- Law Enforcement Personnel

J. Long Term Plan

The Town should adopt a long term plan to implement the Watershed Management Control Plan as identified herein. This plan should include:

1. Creation of Watershed Management Control Plan Committee consisting of the Mayor and/or members of the Town Council and local citizens.
2. Appointment of a Watershed Management Control Plan Manager or Coordinator.
3. Appointment of a Public Information Officer.
4. Designating persons for the chain of command to be implemented in the event of an emergency.
5. Adopting schedules to implement and maintain the plan.
6. Commitment of the financial resources necessary to carry the plan forward.

7. Authorizing the signing of an appropriate Administrative Consent Order as applicable to the Watershed Management Control Program.
8. Implementing other measures necessary to comply with the SWTR as referenced in the Administrative Consent Order Docket No. 8 - PWS - VIII - 92-4 dated June 6, 1992 or revisions and amendments thereto relative to maintaining and operating an unfiltered system.
9. Submitting detailed plans as herein referenced for a Watershed Control Plan to EPA including a schedule.
10. Maintaining a Watershed Management Control Plan as referenced herein in compliance with the following schedules.

K. Schedules

The development and implementation of the Watershed Control Program for the Fremont Lake Watershed should progress in conformance with the following schedule.

SCHEDULE FOR IMPLEMENTATION WATERSHED MANAGEMENT CONTROL PLAN Fremont Lake, Wyoming

TASK / ACTIVITY	1993				1994												1995			
	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR
REVIEW - WATERSHED MANAGEMENT CONTROL PLAN																				
1. Town of Pinedale and WWDC																				
2. EPA																				
PLAN AUTHORIZATION BY TOWN ADMINISTRATION																				
IMPLEMENTATION OF PHYSICAL FEATURES																				
1. Monitoring Points																				
2. Signage																				
3. Intake Control Zone																				
MONITORING PROGRAM						X			X			X			X			X		→
LANDOWNERS AGREEMENTS																				
1. U.S. Forest Service																				
2. BLM																				
3. Private Owners / Lessees																				
COMMITMENTS FROM SUBLETTE COUNTY																				
CLOSURE OF SOUTH FREMONT BOAT RAMP																				
1. Wyoming Game and Fish Department																				
2. U.S. Forest Service																				
ANNUAL REPORT																				→

VII. COLLATERAL COMPLIANCE

A. Forward

The EPA letters to the Town of Pinedale dated March 17, 1992 and June 10, 1992, and the Administrative Consent Order identify several issues and requirements that are outside of this Watershed Management Control Plan that must be complied with or considered in order for the Town to continue to use unfiltered water from Fremont Lake. These issues are identified and addressed in the Pinedale Water Supply Project Phase I and Phase II Reports. Facilities and their related costs necessary to achieve this compliance are also described in those reports.

Failure to comply with any of these collateral requirements will result in the Town being ordered by the EPA to install filtration.

These requirements are briefly described in this section.

B. Compliance with CT Values

The Town must meet the disinfection requirements (CT values) as specified in Chapter 40, Code of Federal Regulations (CFR), Section §141.71(b). Pinedale has been in violation of this requirement due to inadequate disinfection since January 1, 1992. Improvements to their water system to comply with applicable regulations are outlined in the Phase I and Phase II Reports which recommend that a water storage tank be constructed to increase the disinfectant retention time sufficiently to satisfy the CT criteria.

C. Continued Monitoring of Source Water

Pinedale will be required by EPA to continue to monitor source water conditions of its water system as specified in 40 CFR §141.74 (b) (1) and (2), and meet the source

water quality criteria specified in 40 CFR §141.71 (a). Appropriate records should be maintained, and be available to EPA, to confirm that the conditions of §141.71 (a) have been met. The Town is required to report the results to EPA within the first ten (10) days following the month analytical results are received, as required by 40 CFR §141.75 (a).

D. Filtration Avoidance Criteria

40 CFR §141.71 establishes criteria for avoiding filtration. A public water system that uses a surface water source such as Fremont Lake must meet all of the conditions of §141.71 (a) and 141.71 (b) and is subject to §141.71 (c).

E. Detailed Plans, Costs and Schedules

The Town was directed to submit to EPA detailed plans for system modifications necessary for the public water system to achieve the inactivation rates specified in 40 CFR §141.72 (a) (1), following the procedure specified in 40 CFR §141.74 (b) (3). Plans for system modifications were to be submitted to the EPA by July 31, 1993. The plans are to include proposed system modifications, estimated costs of the modifications, and a schedule for consistent compliance with 40 CFR §141.72 (a) (1).

These plans, costs and schedules are explained in detail in the Phase II Report for the Pinedale Water Supply Project.

F. Completion of System Modifications

The EPA has ordered Pinedale to complete modifications to their system by June 30, 1995 as necessary to maintain disinfection treatment for consistent compliance with 40 CFR §141.72 (a) (1). As stated above, system modifications and scheduling thereof are addressed in the Phase II Report.

G. Continued Monitoring and Reporting for Residual Disinfection

Pinedale is required by EPA to continue to monitor residual disinfectant concentration as specified in 40 CFR 141.70 (b) (5) and to meet the residual disinfectant concentration specified in 40 CFR §141.72 (a) (3) and (4). Appropriate records shall be maintained, and be available to EPA, to confirm that the conditions of §141.72 (a) (3) and (4) have been met. The Town should report the results to EPA within the first ten (10) days following the month analytical results are received, as required by 40 CFR §141.75 (a).

H. Detailed Plans, Costs and Schedules - Redundant Disinfection

The Town has been ordered to submit detailed plans for a redundant disinfection system for consistent compliance with 40 CFR §141.72 (a) (2). These plans were to be submitted by July 31, 1992. The plans should include proposed system modifications, estimated costs of the modifications, and a schedule for consistent compliance with 40 CFR §141.72 (a) (2).

These items are addressed in the Phase II Report for Pinedale Water Supply Project.

I. Written Report

Pinedale has been directed by EPA to provide a written report on the status of planned and completed modifications to the system. This report was to be submitted to EPA by December 31, 1992. Thereafter, Pinedale was to submit quarterly reports on the progress toward completing modifications to the system. The Phase II Report is considered to satisfy the stipulation for the referenced written report.

J. Completion of System Modifications

The EPA has mandated that Pinedale complete system modifications essential for consistent compliance with 40 CFR §141.72 (a) (2) by June 30, 1995. Meeting this deadline is dependent on authorization of funding by Wyoming Water Development Commission and the Wyoming Farm Loan Board. Funding requirements and schedules are addressed in the Phase II Report.

K. Reporting to EPA

Pinedale must comply with 40 CFR §141.31 (b) by reporting to EPA and the State with forty-eight (48) hours of any failure to comply with any of the provision of 40 CFR Part 141 - National Primary Drinking Water Regulation.

VIII. TRIGGERING MECHANISMS

The following Table 1 - Triggering Mechanisms for Filtration, based on Chapter 40 Code of Federal Regulations, summarizes criteria and the maximum number of violations that cannot be exceeded in order to continue to operate an unfiltered system. Exceeding any of the stated number of violations will result in being ordered by the EPA to install filtration. Those mechanisms highlighted in yellow apply directly to the Watershed Management Control Plan. All the others relate to collateral compliance in order for the Town of Pinedale to continue to operate an unfiltered system.

Table 1 Triggering Mechanisms for Filtration, Based on Chapter 40, Code of Federal Regulations.

Section	Violation Type	Standard	Filtration Triggers
Source Water Criteria Violations			
§ 141.71 (a)	Fecal or total coliform occurrence exceeding standards in > 10% of samples over a rolling 6 month period.	Fecal coliform ≤ 20/100 ml Total coliform ≤ 100/100 ml	The first violation
§ 141.71 (a)	A source water turbidity event exceeding 5 NTUs.	5 NTUs	If all violations are unusual and unpredictable (U and U): the third violation in a rolling 12 month period or the sixth violation in a 120 month period. Alternatively: the first violation not due to "U and U" circumstance.
Site Specific Criteria Violations			
§ 141.71 (b)	A failure to meet the required CT values more than one day in any month.	$\frac{CT_{alc}}{CT_{99.9}} \geq 1.0$	The second violation in a rolling twelve month period if neither violation was due to "U and U" circumstance. The third violation under any circumstance.
§ 141.72 (a)	The residual disinfectant concentration entering the system is < 0.2 mg/l for more than 4 hours.	0.2 mg/l	The first violation, unless "U and U".
§ 141.72 (a)	The residual disinfectant concentration is not detected in more than 5% of the samples per month in two consecutive months.	Heterotrophic bacteria concentration ≤ 500/ml	The first violation, unless the failure is not due to a deficiency in source water treatment.
§ 141.72 (a)	The lack of redundant disinfection components or the lack of approved automatic shut-off of delivery of water to the distribution system.	Shut-off of water to the distribution system when the concentration is < 0.2 mg/l	The first violation.
§ 141.71 (b)	The determination that a system's watershed control program is inadequate.	Regulatory agency determination	The first violation.
§ 141.71 (b)	The determination that an on-site inspection warrants filtration.	Regulatory agency determination	The first violation.
§ 141.71 (b)	The determination that a waterborne disease outbreak caused by failure of the treatment system.	Regulatory agency determination	The first violation, unless there is a determination that the system has been modified to prevent a recurrence.
TCR § 141.63 (a)	A violation of the total coliform maximum contaminate level (MCL).	If more than 40 samples; < 5% samples test positive If less than 40 samples; no more than one sample can test positive	The second violation in a rolling 12 month period, unless there is a determination that a violation was not caused by source water treatment deficiencies.
TTHM § 141.12	A violation of the TTHM maximum contaminate level (MCL).	Chlorinated Hydrocarbons Endrin - 0.0002 mg/l Lindane - 0.004 mg/l Methoxychlor - 0.1 mg/l Toxaphene - 0.005 mg/l Chlorophenoxy 2,4-D - 0.1 mg/l 2,4,5-TP Silvex - 0.01 mg/l	The first violation.

IX. ANNUAL ON-SITE INSPECTION

The Pinedale Water System is subject to an annual on-site inspection to assess this Watershed Management Control Plan and referenced program, together with disinfection treatment processes and works, as required by 40 CFR §141.71 (c) upon acceptance and approval thereof by EPA. These provisions, along with all applicable requirements, will presumably be stated in a Revised Administrative Consent Order.

X. COMMENTARY

A. Requirements to Install Filtration

The EPA has recommended that the Town of Pinedale select to install filtration in their water supply system. The implementation of the Watershed Management Control Plan requires commitments and cooperation of:

1. United States Forest Service
2. Wyoming Game and Fish
3. United States Bureau of Land Management
4. Numerous Private Parties (Lessees and Landowners)

Satisfactory cooperation of all these parties may not be workable or possible, in which case implementation of the Watershed Management Control Plan cannot be achieved. The result will be that EPA will order the installation of filtration as they have initially proposed.

B. Administrative Consent Order

The provisions of this Watershed Management Control Plan and the collateral compliance will be incorporated into a revised Administrative Consent Order which, upon acceptance thereof, will have to be authorized for signature by the Mayor of Pinedale.

C. Penalties and Fines

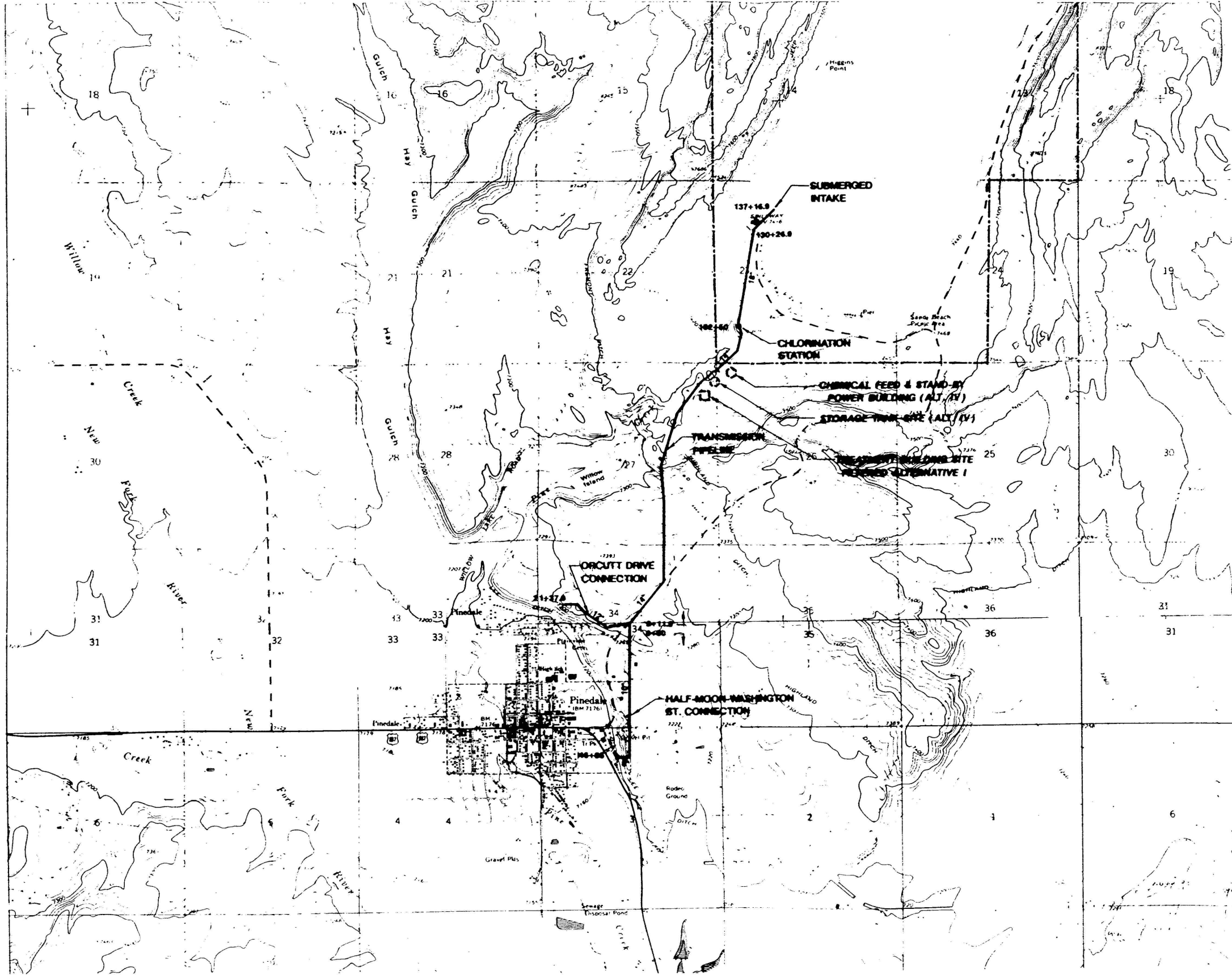
Violation of any term of the Final Administrative Consent Order may subject Pinedale to an administrative civil penalty of up to \$5,000 under Section 1414 (g) (3) (B) of the Act, 42 U.S.C. §300g-3(g) (3) (B) or a civil penalty of not more than \$25,000 per day of violation, assessed by the U.S. District Court, under Section 1414 (g) (3) (A) and (C) of the Act, 42 U.S.C. §300g-3(g) (3) (A) and (C).

Violation of any requirement of the Safe Drinking Water Act (SWDA) or its implementing regulation may subject Pinedale to a civil penalty of not more than \$25,000 per day of violations, assessed by an appropriate U.S. District Court, under Section 1414 (g) (3) (A) and (C) of the Act, 42 U.S.C. §300g-3(g) (3) (A) and (C).

D. Mandated Filtration

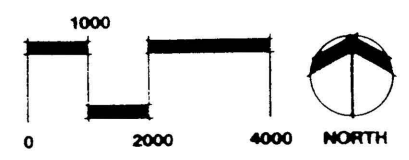
Pinedale's water system must have filtration installed to satisfy the criteria for a filtered system as specified in §141.72 (b) and §141.73 within 18 months of the failure of its water to meet any of the requirements of §141.71 (a) and 141.71 (b).

DRAWINGS

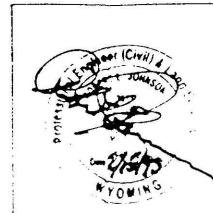


LEGEND

- EXISTING WATER LINE - SIZES AS NOTED
- ○ ○ POSSIBLE FUTURE FACILITIES



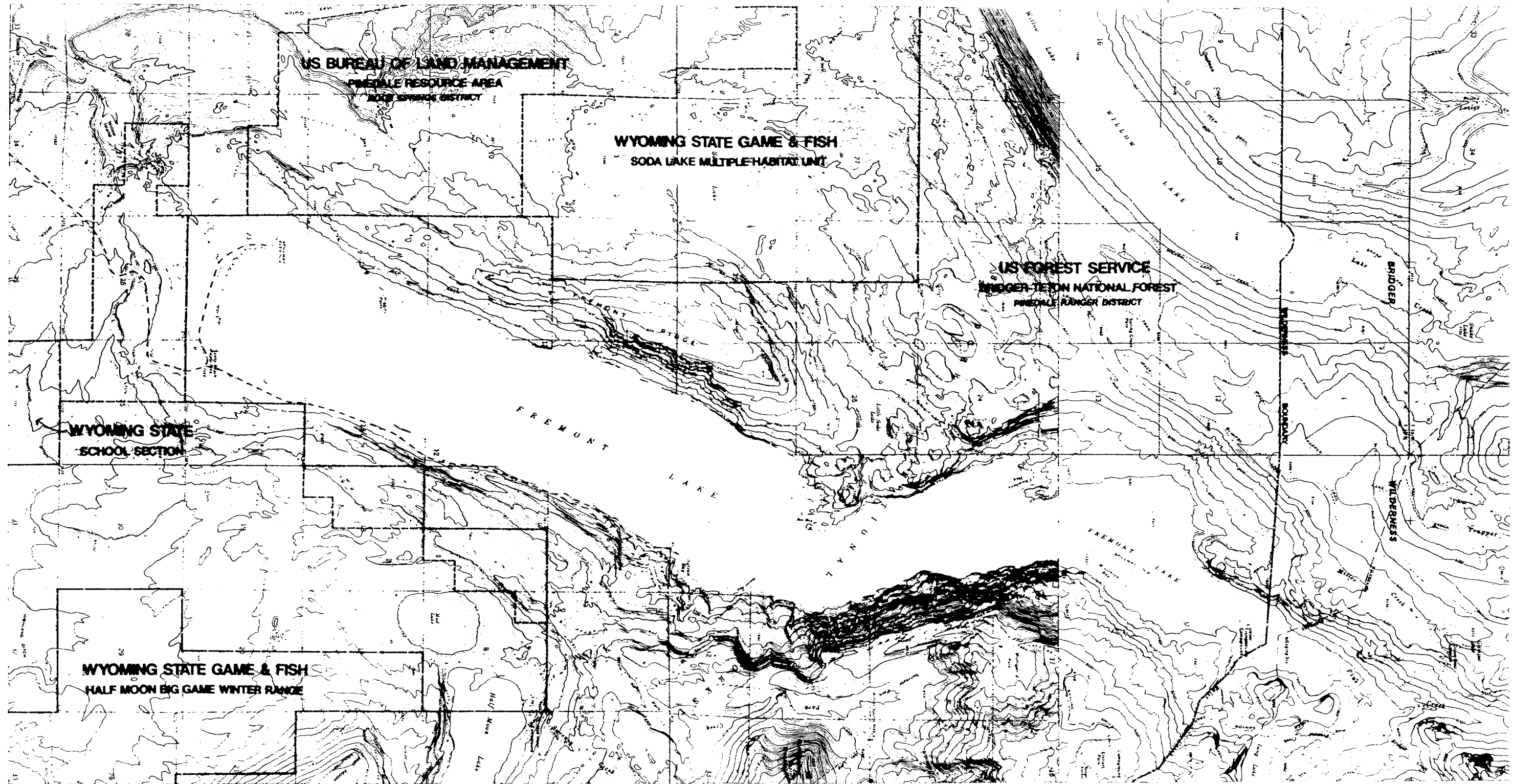
WATER SYSTEM



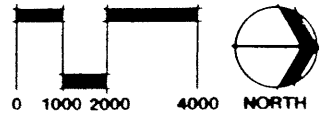
SCALE
DATE 2/15/93
REVISIONS
DRAWN BY TRP
CHECKED BY REJ
REFERENCES

PINEDALE WATER SUPPLY PROJECT
 WYOMING WATER DEVELOPMENT COMMISSION
FREMONT LAKE & PINEDALE

JFC Inc JOHNSON-FERMELIA Co. Inc.
 CONSULTING ENGINEERS AND
 LAND SURVEYORS
 1515 NINTH STREET
 ROCK SPRINGS, WYOMING 82901
 (307) 342-7819







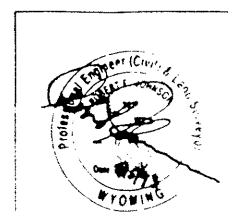
OWNERSHIP



NOTES

LEGEND

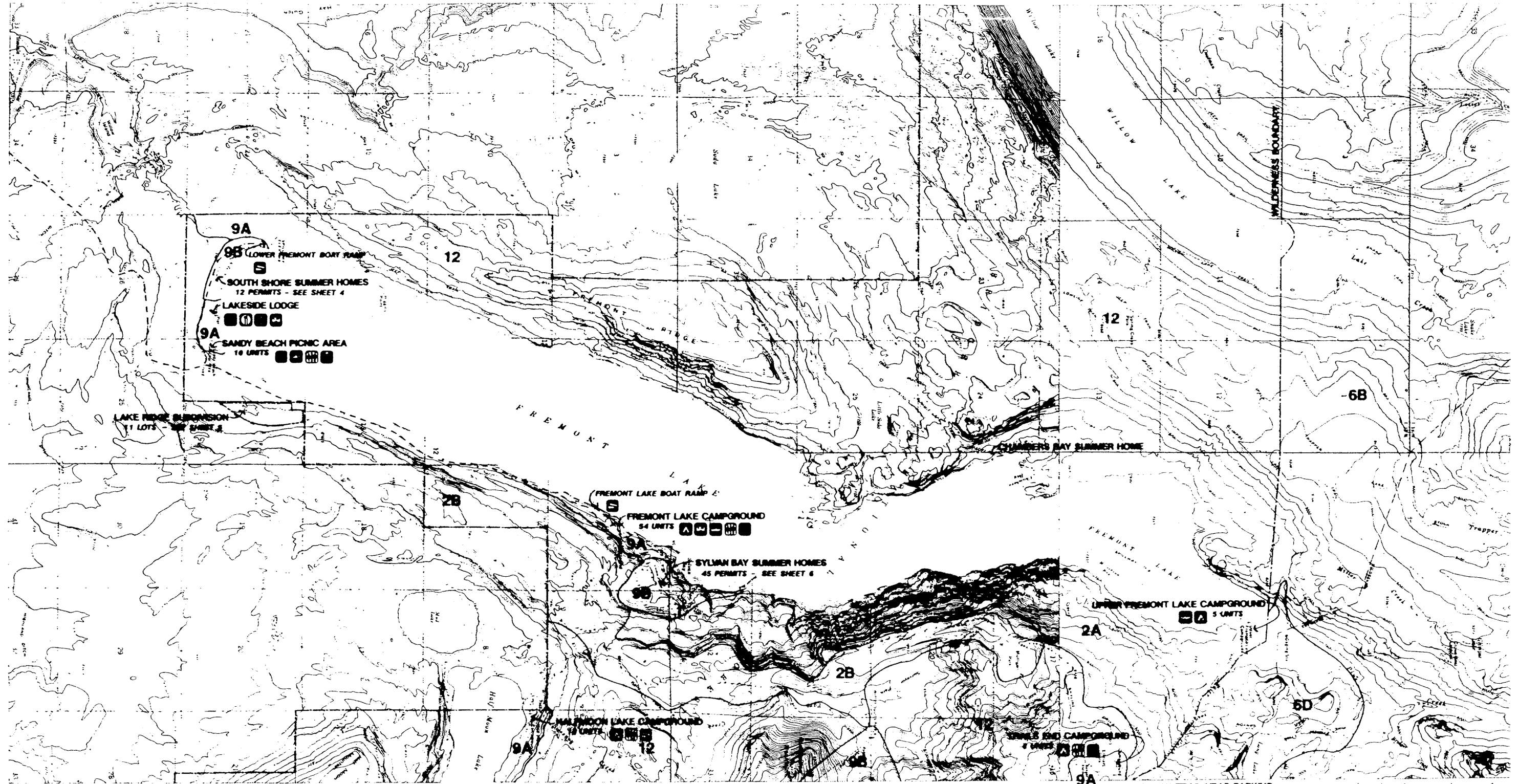
-  US FOREST SERVICE
-  BUREAU OF LAND MANAGEMENT
-  STATE LAND
-  PRIVATE



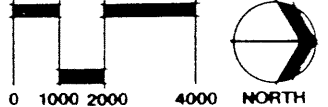
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DATE	2/15/93
REVISIONS	
DRAWN BY	RLB
CHECKED BY	REJ
REFERENCES	

PINEDALE WATER SUPPLY PROJECT
WYOMING WATER DEVELOPMENT COMMISSION
FREMONT LAKE

JFC INC JOHNSON-FERMELIA Co. Inc.
 CONSULTING ENGINEERS AND
 LAND SURVEYORS
 1515 NINTH STREET
 ROCK SPRING, WYOMING 82901
 (307) 842-7818



US FOREST SERVICE IMPROVEMENTS (& LAKE RIDGE SUBDIVISION)

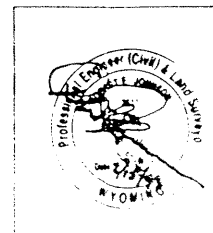


NOTES

SOURCE: US FOREST SERVICE BRIDGER-TETON NATIONAL FOREST
LAND & RESOURCE MANAGEMENT PLAN DATED 1990

LEGEND

- FOREST SERVICE MANAGEMENT PLAN
DESIRED FUTURE CONDITIONS
- 2A NON-MOTORIZED RECREATION AREAS
 - 2B MOTORIZED RECREATION AREAS
 - 6B WILDERNESS
 - 6D WILDERNESS
 - 9A DEVELOPED & ADMINISTRATIVE SITES
 - 9B SPECIAL USE RECREATION AREAS
 - 12 BACKCOUNTRY BIG GAME HUNTING, DISPERSED RECREATION, & WILDLIFE SECURITY AREAS

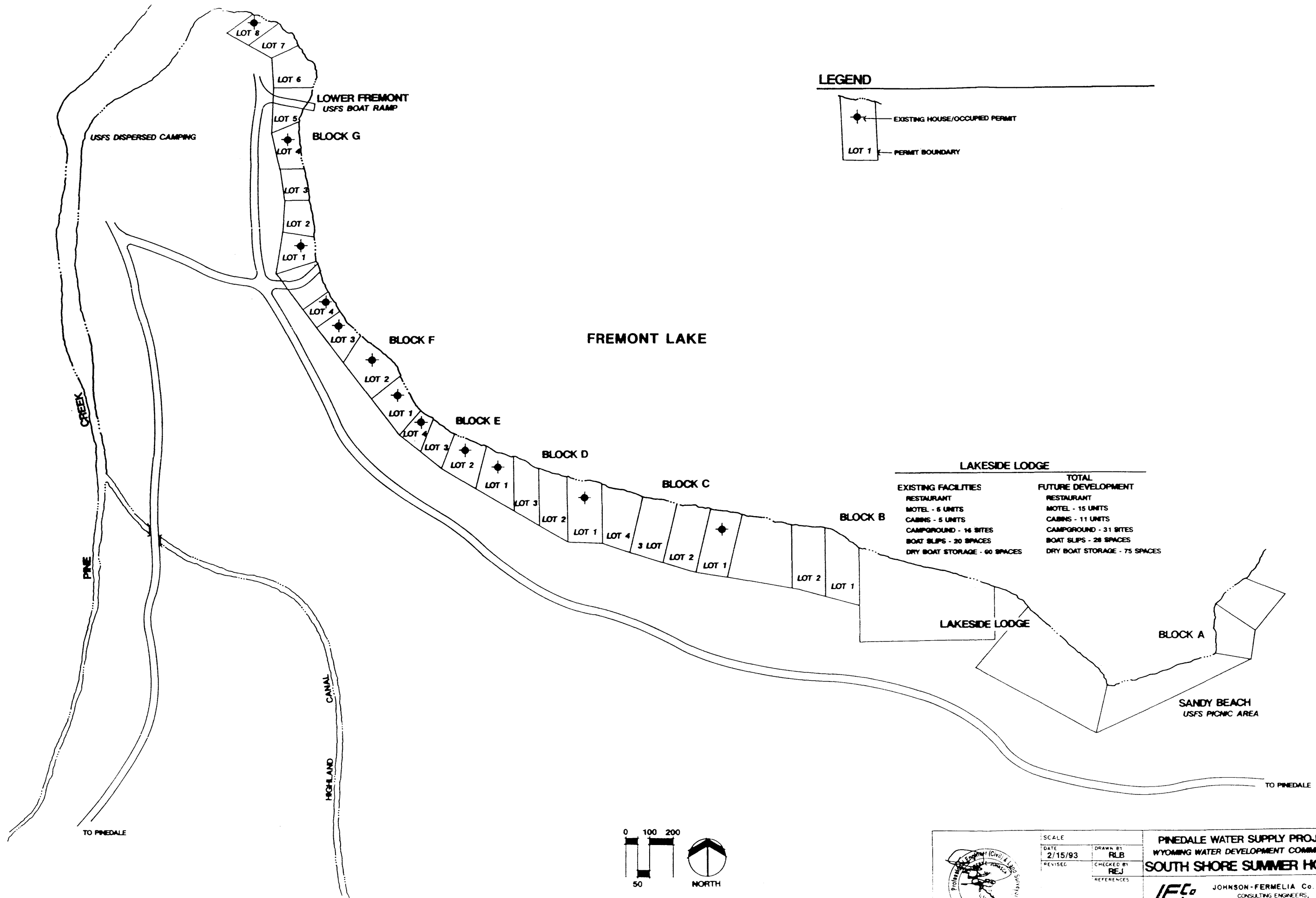


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REVISED
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REFERENCES

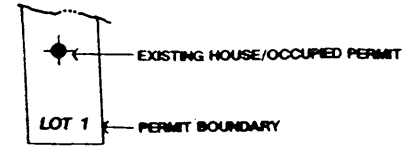
PINEDALE WATER SUPPLY PROJECT
WYOMING WATER DEVELOPMENT COMMISSION
FREMONT LAKE

JFC_{INC} JOHNSON-FERMELIA Co. Inc.
CONSULTING ENGINEERS AND
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1515 NINTH STREET
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(307) 342-7819

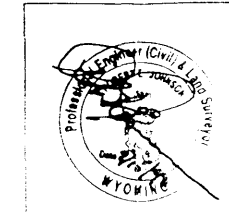
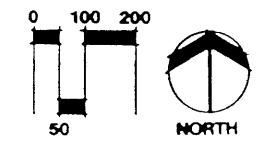
SHEET 3 OF 10 DRAWING NO. 3285 - 92E



LEGEND



LAKESIDE LODGE	
EXISTING FACILITIES	TOTAL FUTURE DEVELOPMENT
RESTAURANT	RESTAURANT
MOTEL - 6 UNITS	MOTEL - 15 UNITS
CABINS - 5 UNITS	CABINS - 11 UNITS
CAMPGROUND - 16 SITES	CAMPGROUND - 31 SITES
BOAT SLIPS - 20 SPACES	BOAT SLIPS - 28 SPACES
DRY BOAT STORAGE - 60 SPACES	DRY BOAT STORAGE - 75 SPACES



SCALE	DRAWN BY
DATE	CHECKED BY
REVISED	REFERENCES

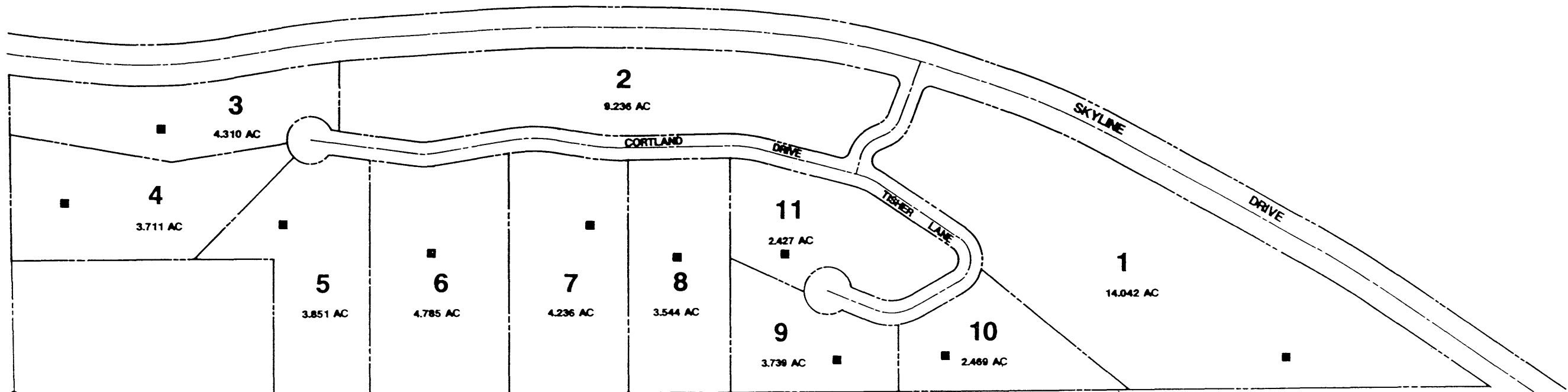
DATE: 2/15/93
 DRAWN BY: RLB
 CHECKED BY: REJ

PINEDALE WATER SUPPLY PROJECT
WYOMING WATER DEVELOPMENT COMMISSION
SOUTH SHORE SUMMER HOMES

JFC Inc JOHNSON-FERMELIA Co. Inc.
 CONSULTING ENGINEERS,
 ARCHITECTS AND SURVEYORS
 1515 NINTH STREET
 ROCKY SPRINGS, WYOMING 82501
 (307) 344-7414

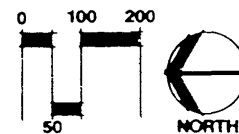
LEGEND

- PROPOSED HOME LOCATION
- NO IMPROVEMENTS HAVE BEEN MADE AS OF THE DATE OF THIS REPORT

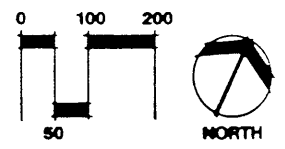
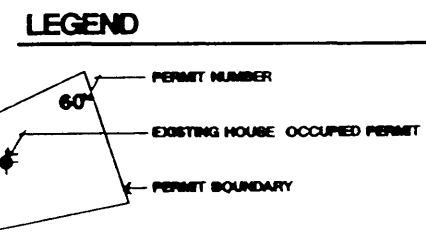
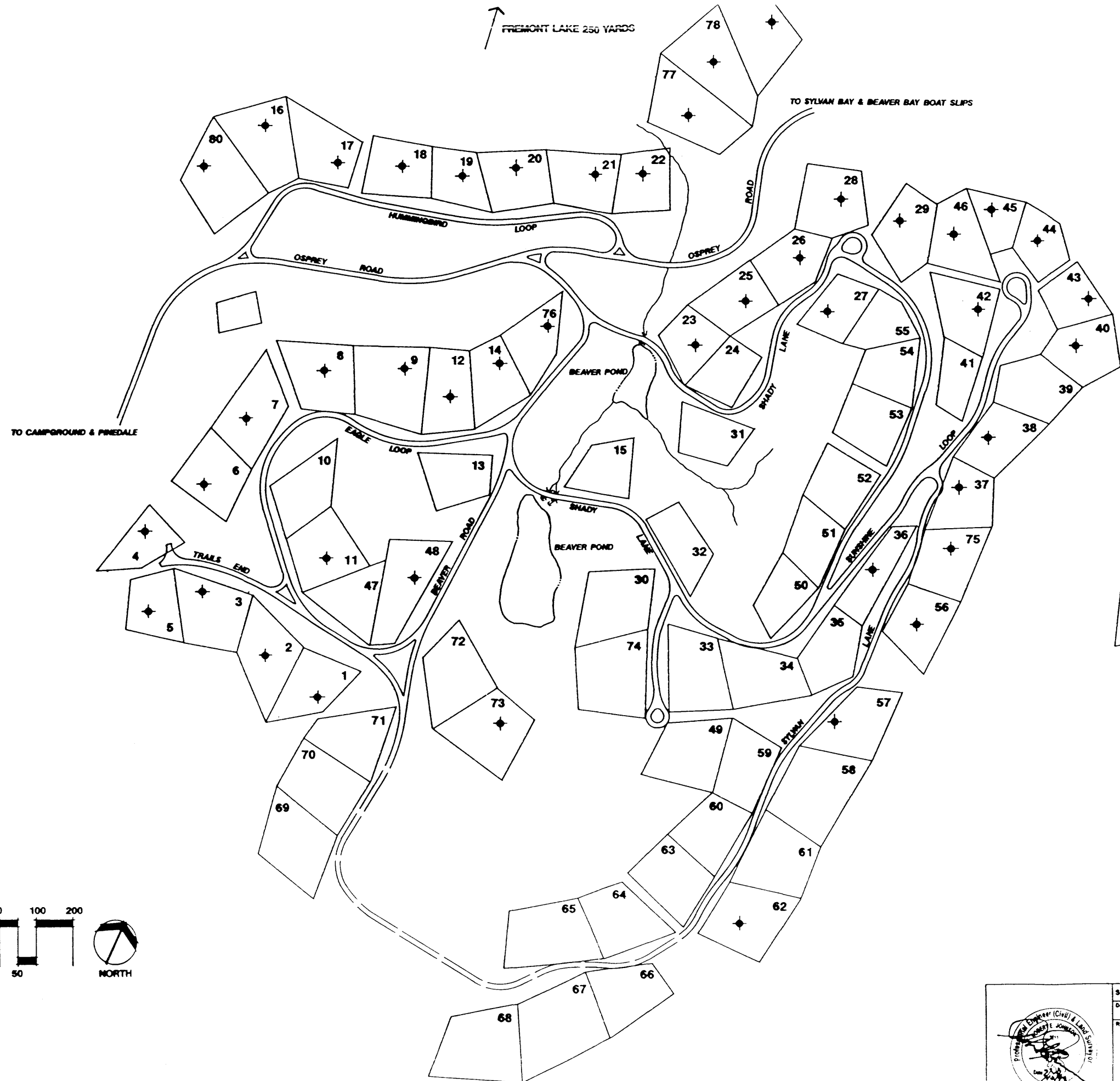


1/4 S. 24

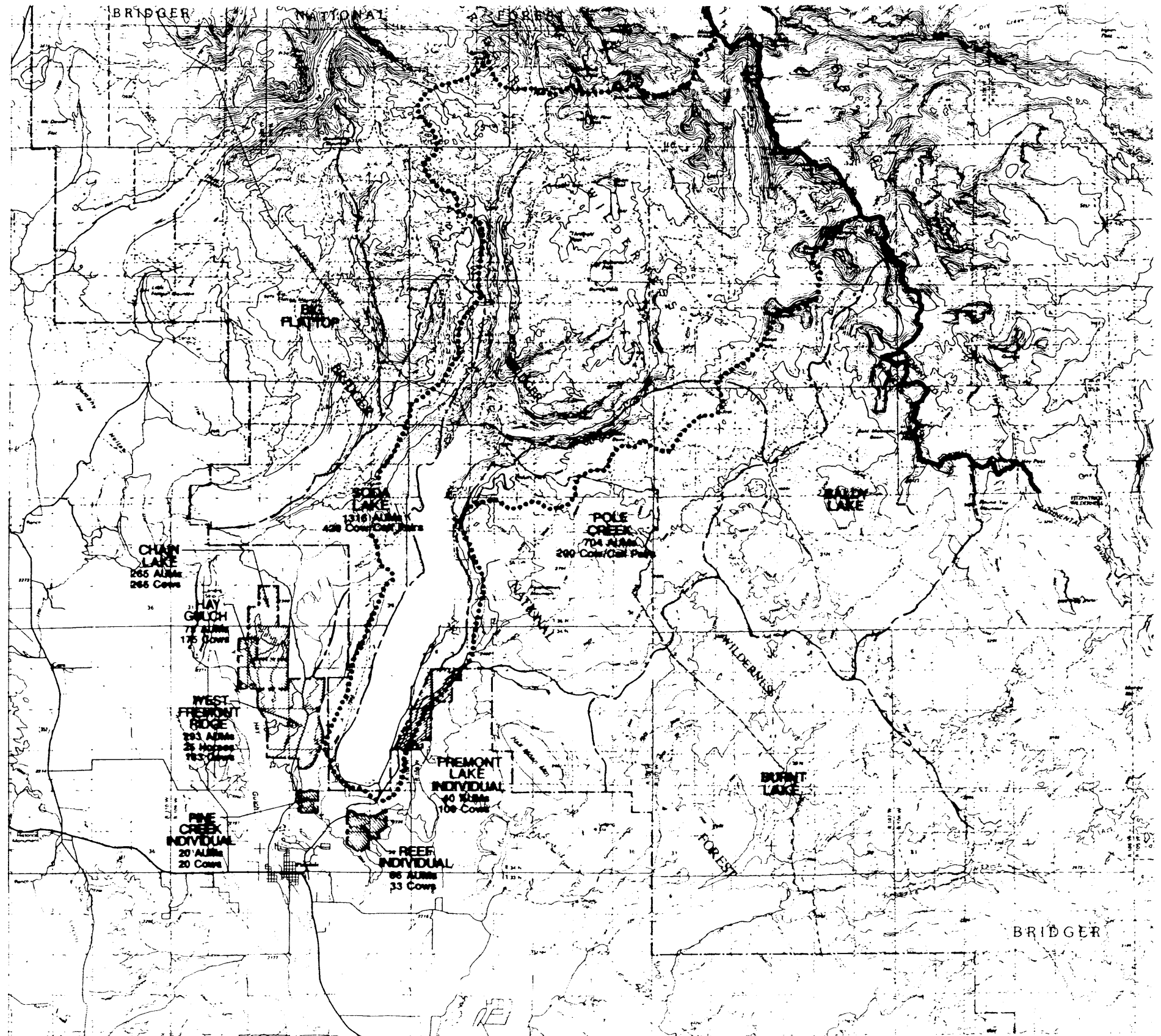
W 1/2 NE 1/4, NW 1/4 SE 1/4
SECTION 24, T 34 N, R 109 W



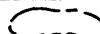
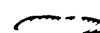



	SCALE	PINEDALE WATER SUPPLY PROJECT WYOMING WATER DEVELOPMENT COMMISSION LAKE RIDGE SUBDIVISION	
	DATE 2/15/93	DRAWN BY RLB	JOHNSON-FERMELIA Co. Inc. CONSULTING ENGINEERS, ARCHITECTS AND SURVEYORS 1515 NINTH STREET ROCK SPRINGS, WYOMING 82501 (307) 342-7818
	REVISED	CHECKED BY REJ	
	REFERENCES		
SHEET 5 OF 10		DRAWING NO 3285 - 92E	



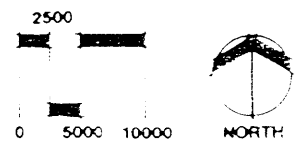
	SCALE	PINEDALE WATER SUPPLY PROJECT	
	DATE	DRAWN BY	WYOMING WATER DEVELOPMENT COMMISSION
	2/15/93	RLB	SYLVAN BAY SUMMER HOMES
	REVISED	CHECKED BY	
	REJ		
	REFERENCES		
		JOHNSON-FERMELIA Co. Inc. CONSULTING ENGINEERS AND LAND SURVEYORS 1525 NINTH STREET ROCK SPRINGS, WYOMING 82901 (307) 342-7414	
SHEET 6 OF 10		DRAWING NO. 3285-92E	



LEGEND

-  NATIONAL FOREST GRAZING ALLOTMENTS
-  BLM GRAZING ALLOTMENTS
-  NATIONAL FOREST BOUNDARY
-  WILDERNESS BOUNDARY
-  WATERSHED BOUNDARY

GRAZING ALLOTMENTS & WATERSHED



SCALE: 1" = 10,000'

DATE: 2/15/93

TRP

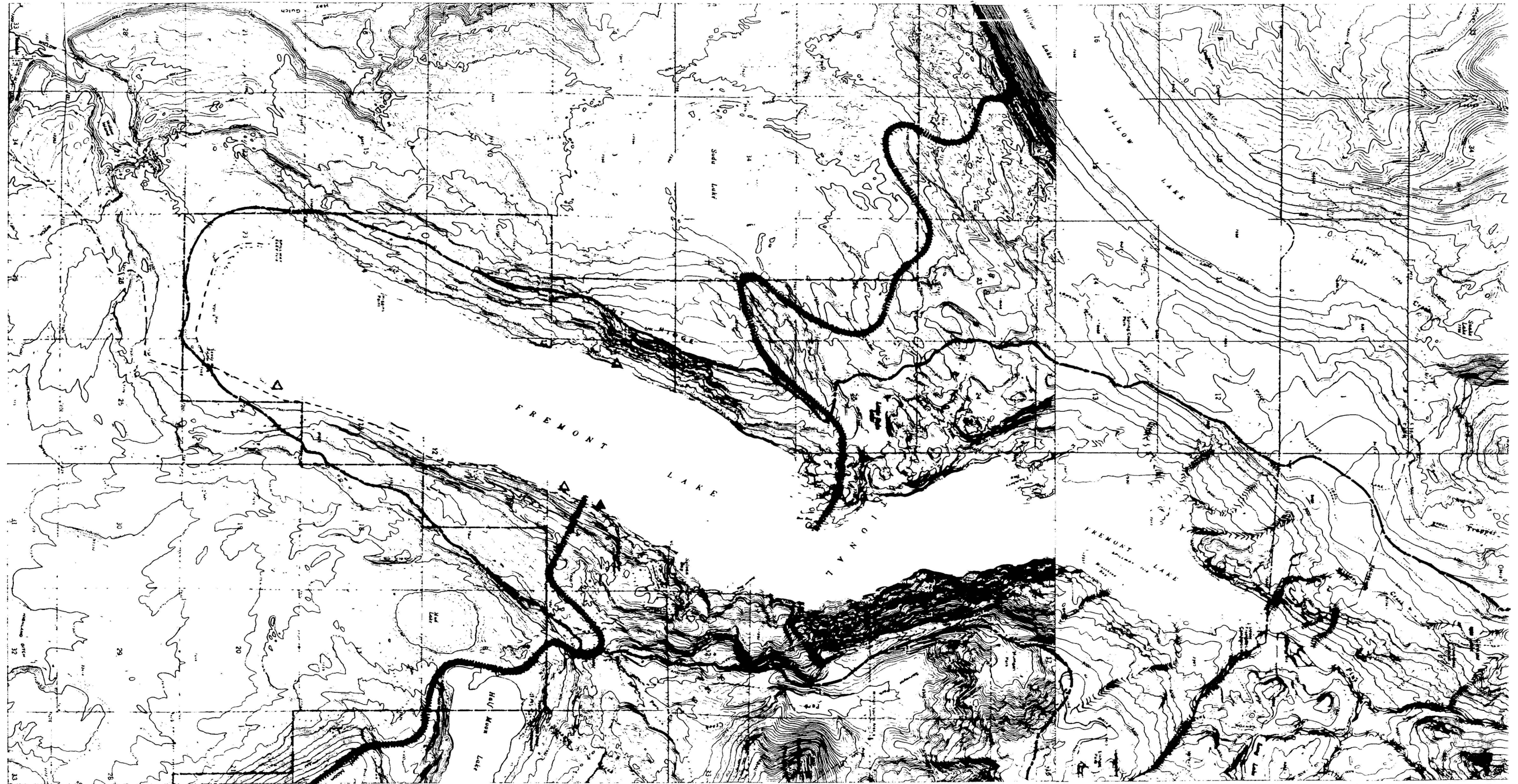
REJ

PINEDALE WATER SUPPLY PROJECT
WYOMING WATER DEVELOPMENT COMMISSION
PINEDALE AREA

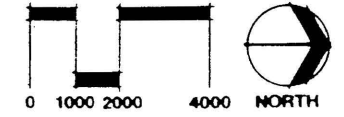
JFC Inc JOHNSON-FERMELIA Co. Inc.
 1020 E. 10TH ST.
 SPOKANE, IDAHO 83402
 208-325-1100

11 N. NINTH STREET
 SPOKANE, WYOMING 83401
 307-342-1514

7 10 DRAWING NO. 3285-92E



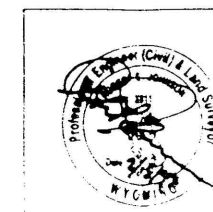
NATURAL CONDITIONS



NOTES

LEGEND

- ▲ ACTIVE BEAVER LODGES
- △ INACTIVE BEAVER LODGES
- WATERSHED BOUNDARY
- STREAMS & LAKES - WITHIN WATERSHED
- ▨ PLANT COMMUNITY TRANSITION ZONE
FOREST TO SAGEBRUSH

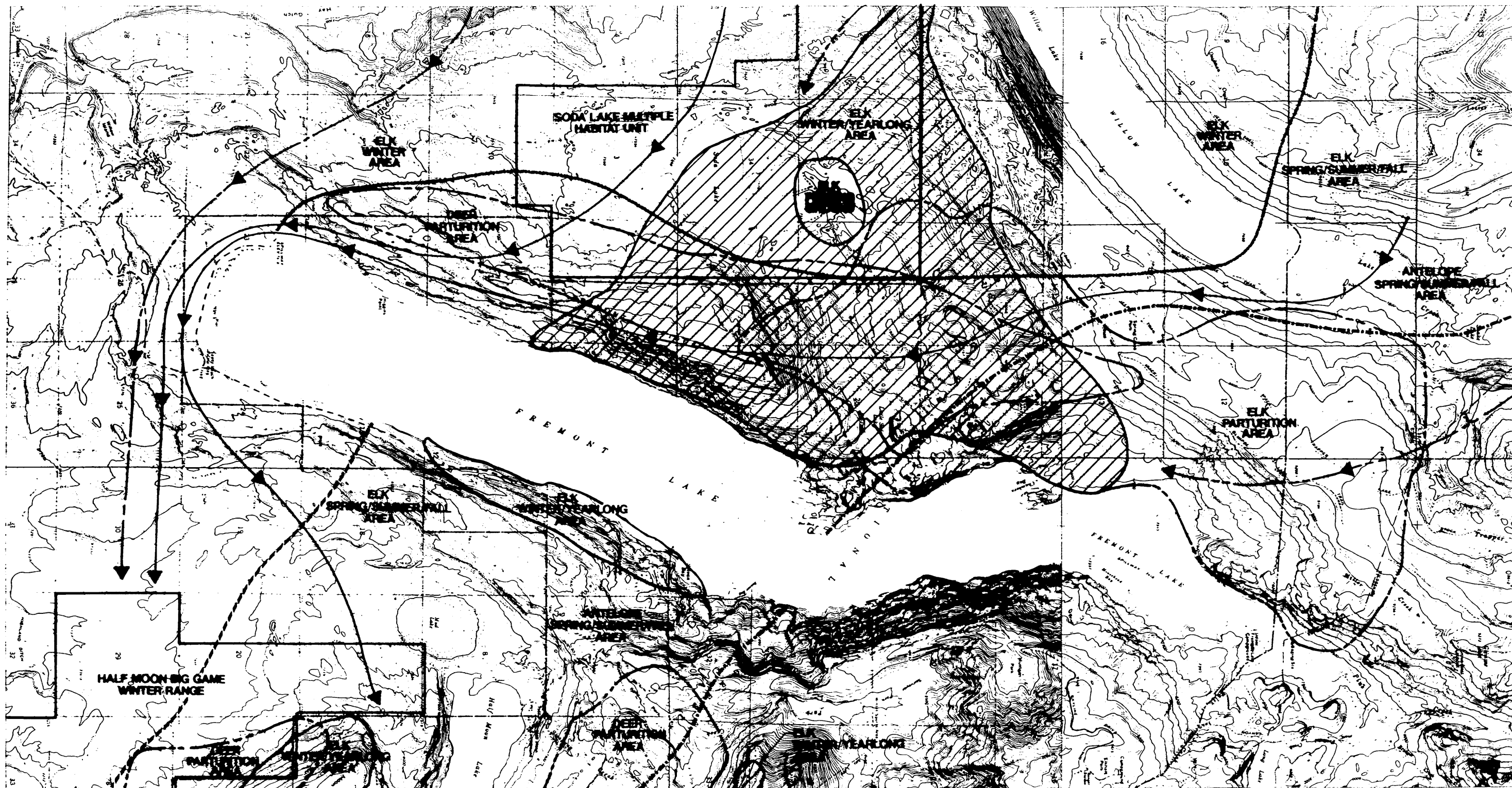


SCALE	1" = 2000'
DATE	2/15/93
REVISIONS	
DRAWN BY	RLB
CHECKED BY	REJ
REFERENCES	

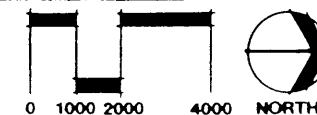
PINEDALE WATER SUPPLY PROJECT
WYOMING WATER DEVELOPMENT COMMISSION
FREMONT LAKE

JFCo Inc JOHNSON-FERMELIA Co. Inc.
CONSULTING ENGINEERS AND
LAND SURVEYORS
1515 NINTH STREET
ROCK SPRINGS, WYOMING 82901
(307) 342-7414

SHEET 8 OF 10 DRAWING NO. 3285 - 92E



BIG GAME DISTRIBUTION

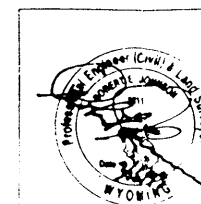


NOTES

SOURCE: WYOMING GAME & FISH DEPARTMENT
WILDLIFE DISTRIBUTION OVERLAYS

LEGEND

- CRUCIAL RANGE
- LIMITS OF ANTELOPE RANGE
- ANTELOPE MIGRATION ROUTES
- DEER MIGRATION ROUTES
- PARTURITION BOUNDARY
- LIMITS OF ELK RANGE
- BOUNDARY BETWEEN ELK SPRING/SUMMER/FALL AND WINTER AREAS
- ELK MIGRATION ROUTES

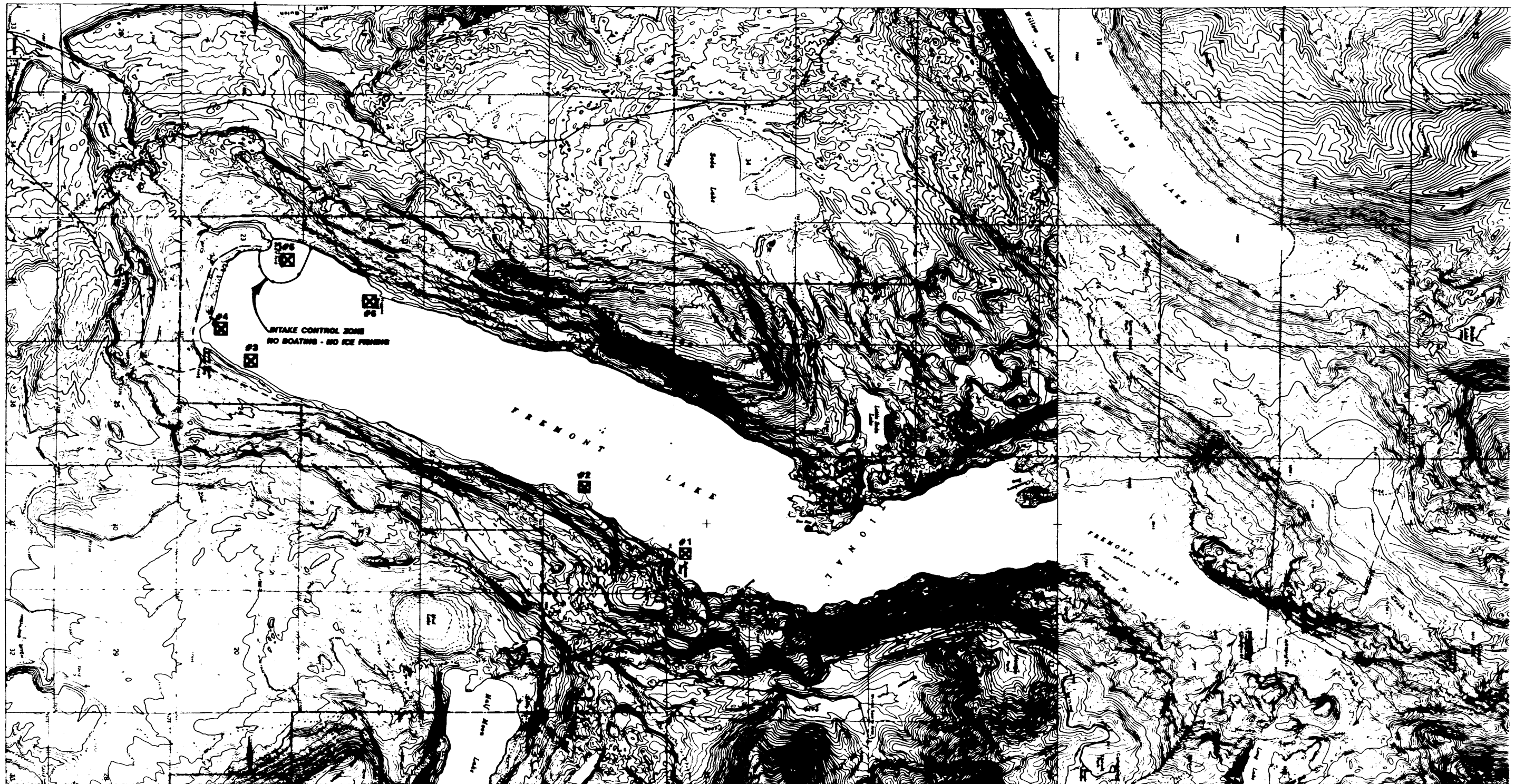


SCALE 1" = 2000'
DATE 2/15/93
DRAWN BY TRP
CHECKED BY REJ
REVISED
REFERENCES

PINEDALE WATER SUPPLY PROJECT
WYOMING WATER DEVELOPMENT COMMISSION
FREMONT LAKE

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INC
JOHNSON-FERMELIA Co. Inc.
CONSULTING ENGINEERS AND
LAND SURVEYORS
1515 NINTH STREET
ROCK SPRINGS, WYOMING 82901
(307) 342-7616

SHEET 9 OF 10 DRAWING NO. 3285-92E



WATERSHED MANAGEMENT CONTROL PLAN
MONITORING POINTS & INTAKE CONTROL ZONE

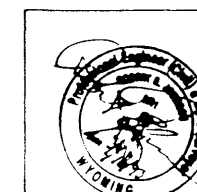


LEGEND

WATER QUALITY MONITORING POINT

NOTES

MONITORING PT.	REMARKS
#1	TO MONITOR IMPACTS FROM SYLVAN BAY SUMMER HOME DEVELOPMENT
#2	TO MONITOR IMPACTS FROM U.S.F.S. CAMPGROUND & SYLVAN BAY SUMMER HOME DEVELOPMENT
#3	TO MONITOR IMPACTS FROM LAKE RIDGE SUBDIVISION
#4	TO MONITOR IMPACTS FROM SANDY BEACH PICNIC AREA
#5	SOURCE WATER MONITORING (INTAKE TO SYSTEM)
#6	TO MONITOR IMPACTS FROM LIVESTOCK GRAZING ON WEST SHORE



SCALE 1" = 2000'
 DATE 2/15/83
 DRAWN BY SLA
 REVISIONS CHECKED BY REJ
 REFERENCES

PINEDALE WATER SUPPLY PROJECT
WYOMING WATER DEVELOPMENT COMMISSION
FREMONT LAKE

JFC **INC** **JOHNSON-FERMELIA Co. Inc.**
 CONSULTING ENGINEERS AND
 LAND SURVEYORS
 446 SOUTH STREET
 ROCK SPINGS, WYOMING 82901
 (307) 546-7500

SHEET 10 OF 10 DRAWING NO. 3285 - 02E