

RF 2
ST

PERMIT TO CONSTRUCT

PERMIT NO. 87-451
See Conditions

X New
Renewal
Modified

Grandview Gardens Trailer Park

This permit hereby authorizes the applicant:

Chuck Kinder
311 W Yellowstone Ave
Cody, WY 82414

to construct, install or modify additional leach field on an existing septic tank and leach field system according to the procedures and conditions of the application number 87-451. The facility is located in Tract 70, T51N, R102W in the county of Park, in the State of Wyoming. This permit shall be effective for a period of six (6) months from the date of issuance of this permit.

The issuance of this permit provides that the Department of Environmental Quality has evaluated and determined that the application meets minimum applicable construction and design standards. The compliance with construction standards and the operation and maintenance of the facility to meet the applicant's engineer's design are the responsibility of the applicant, owner, or operator.

The authority to construct granted by this permit does not mean or imply that the Wyoming Department of Environmental Quality guarantees or ensures that the permitted facility, when constructed will meet applicable discharge permit conditions or other effluent or operational requirements.

Nothing in this permit constitutes an endorsement of the construction or the design of the facility described herein. This permit indicates only that standards of design and construction required by the Environmental Quality Act have been met. The state assumes no liability for, and does not in any way guarantee the performance of, the permittee in the exercise of its activities allowed under this permit. The permittee understands that it is solely responsible to any third parties for any liability arising from the construction or operation of the facility described herein. By the issuance of this permit, the state does not in any way waive its sovereign immunity.

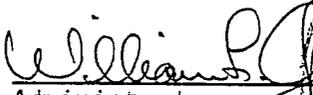
The permittee shall allow authorized representatives from the Department of Environmental Quality, Water Quality Division, upon the presentation of credentials and during working hours, to have access to inspect the facilities, at the above location, for the purpose of compliance with the provisions of this construction permit.

The permittee shall notify representatives from the Department of Environmental Quality, Water Quality Division the day construction commences and give an estimate of completion of the project. The authorized representative in your area can be contacted at the following address: District Engineer, State of Wyoming, Department of Environmental Quality, Water Quality Division, Herschler Building, 4th Floor West, 122 West 25th, Cheyenne, Wyoming 82002; telephone (307) 777-7781.

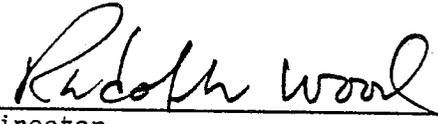
Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities or penalties established pursuant to any applicable state law or regulation.

The issuance of this permit does not convey any property rights in either real or personal property or any invasion of personal rights, nor any infringement of federal, state, or local laws or regulations.

AUTHORIZED BY:


Administrator
Water Quality Division




Director
Department of Environmental Quality

1-28-88
Date of Issuance

This permit does not supercede the requirements for obtaining any permit from local agencies.

Conditions for Permit 87-451

1. When the city sewer line is installed within 200 feet of that property referenced in this permit, the applicant must connect this system to the Cody sewer system.

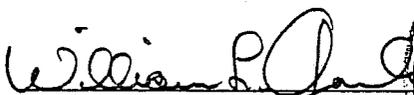
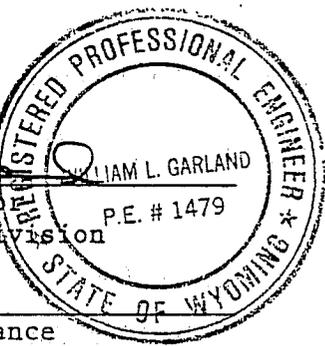
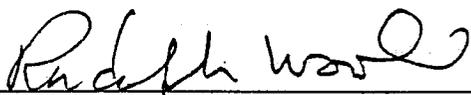
ing working hours, to have access to inspect the facilities, at the above location, for the purpose of compliance with the provisions of this construction permit.

The permittee shall notify representatives from the Department of Environmental Quality, Water Quality Division the day construction commences and give an estimate of completion of the project. The authorized representative in your area can be contacted at the following address: District Engineer, State of Wyoming, Department of Environmental Quality, Water Quality Division, 210 Lincoln, Lander, Wyoming 82520; telephone, 332-3144.

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities or penalties established pursuant to any applicable State law or regulation.

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

AUTHORIZED BY:

| | | |
|---|--|---|
|  _____ Administrator Water Quality Division 1-5-88 _____ Date of Issuance |  |  _____ Director Dept. of Environmental Quality |
|---|--|---|

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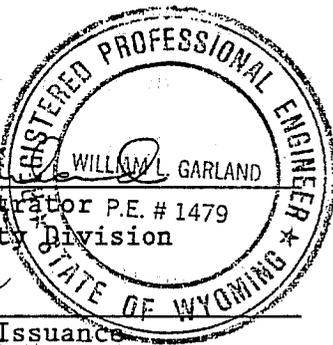
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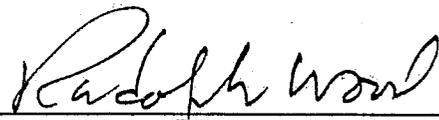
AUTHORIZED BY:



WILLIAM L. GARLAND
Administrator P.E. # 1479
Water Quality Division
1-28-88

Date of Issuance





Director
Dept. of Environmental Quality

This permit does not supercede the requirements for obtaining any permit from local agencies.

R.F

PERMIT TO CONSTRUCT

PERMIT NO. 87-454R
SEE SPECIAL CONDITIONS

New
Renewal
X Modified

South Baxter Evaporation Pond

This permit hereby authorizes the applicant:

Mountain Fuel Resources
ATTN: David Flaim
P O Box 11450
Salt Lake City, UT 84147

to construct, install or modify single cell (synthetically lined) evaporation pond with leak detection system according to the procedures and conditions of the application number 87-454R. The facility is located in S16 (SE $\frac{1}{4}$), T16N, R104W in the county of Sweetwater, in the State of Wyoming. This permit shall be effective for a period of two years (5 years maximum) from the date of issuance of this permit.

The issuance of this permit provides that the Department of Environmental Quality has evaluated and determined that the application meets minimum applicable construction and design standards. The compliance with construction standards and the operation and maintenance of the facility to meet the applicant's engineer's design are the responsibility of the applicant, owner, or operator.

The authority to construct granted by this permit does not mean or imply that the Wyoming Department of Environmental Quality guarantees or ensures that the permitted facility, when constructed will meet applicable discharge permit conditions or other effluent or operational requirements.

Nothing in this permit constitutes an endorsement of the construction or the design of the facility described herein. This permit indicates only that standards of design and construction required by the Environmental Quality Act have been met. The state assumes no liability for, and does not in any way guarantee the performance of, the permittee in the exercise of its activities allowed under this permit. The permittee understands that it is solely responsible to any third parties for any liability arising from the construction or operation of the facility described herein. By the issuance of this permit, the state does not in any way waive its sovereign immunity.

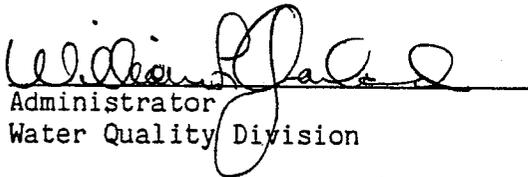
The permittee shall allow authorized representatives from the Department of Environmental Quality, Water Quality Division, upon the presentation of credentials and during working hours, to have access to inspect the facilities, at the above location, for the purpose of compliance with the provisions of this construction permit.

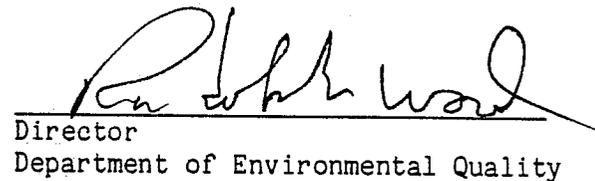
The permittee shall notify representatives from the Department of Environmental Quality, Water Quality Division the day construction commences and give an estimate of completion of the project. The authorized representative in your area can be contacted at the following address: District Engineer, State of Wyoming, Department of Environmental Quality, Water Quality Division, Herschler Building, 4th Floor West, 122 West 25th, Cheyenne, Wyoming 82002; telephone (307) 777-7781.

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities or penalties established pursuant to any applicable state law or regulation.

The issuance of this permit does not convey any property rights in either real or personal property or any invasion of personal rights, nor any infringement of federal, state, or local laws or regulations.

AUTHORIZED BY:


Administrator
Water Quality Division


Director
Department of Environmental Quality

11-2-88
Date of Issuance

This permit does not supercede the requirements for obtaining any permit from local agencies.

CONDITIONS TO PERMIT TO CONSTRUCT #87-454R

1. Groundwater monitoring shall be performed as specified in the Operation and Maintenance Procedures Manual with the following Department of Environmental Quality (DEQ) changes and additions. Additional parameters needed to be sampled for are chromium, nitrate, and nitrite-N. The monitor wells to be sampled are CH-4, CH-3, and SBD3. All reports shall be submitted to Jake Strohman at the Herschler Building, 4th Floor West, 122 West 25th Street, Cheyenne, Wyoming 82002, within 30 days after the end of each quarter.
2. A detailed reclamation/closure plan shall be submitted to the DEQ/Water Quality Division, 210 Lincoln Street, Lander, Wyoming, 82520 for approval. No reclamation work shall be performed until the plan has been approved by the DEQ.

R7 ✓

PERMIT TO CONSTRUCT

- New
- Renewal
- Modified

Permit No. 87-454R
Ref. No. 85-82RR

* Conditions on Permit *

South Baxter Evaporation Pond
(Name of Facility)

This permit hereby authorizes the applicant (name and address):

Mountain Fuel Resources
ATTN: David Flaim
P.O. Box 11450

Salt Lake City, UT 84147

to construct, install, or modify a single cell (synthetically lined) evaporation
pond with leak detection system

facility according to the procedures and conditions of the

application No. 87-454. The facility is located in

sec. 16 (SE $\frac{1}{4}$) T16N, R104W

in the County of Sweetwater,

in the State of Wyoming. This permit shall be effective for a period of two (2)
years (five (5) years maximum) from the date of issuance of this permit.

The issuance of this permit provides that the Department of Environmental Quality has evaluated and determined that ~~the application meets minimum applicable construction and design standards.~~ The compliance with construction standards and the operation and maintenance of the facility to meet the applicant's engineer's design are the responsibility of the applicant, owner, or operator.

The authority to construct granted by this permit does not mean or imply that the Wyoming Department of Environmental Quality guarantees or insures that the permitted facility, when constructed, will meet applicable discharge permit conditions or other effluent or operational requirements.

Nothing in this permit constitutes an endorsement of the construction or the design of the facility described herein. This permit indicates only that standards of design and construction required by the Environmental Quality Act have been met. The State assumes no liability for, and does not in any way guarantee the performance of, the permittee in the exercise of its activities allowed under this permit. The Permittee understands that it is solely responsible to any third parties for any liability arising from the construction or operation of the facility described herein. By the issuance of this permit, the State does not in any way waive its sovereign immunity.

The permittee shall allow authorized representatives from the Department of Environmental Quality, Water Quality Division, upon the presentation of credentials and dur-

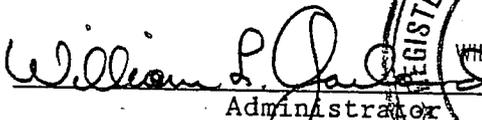
ing working hours, to have access to inspect the facilities, at the above location, for the purpose of compliance with the provisions of this construction permit.

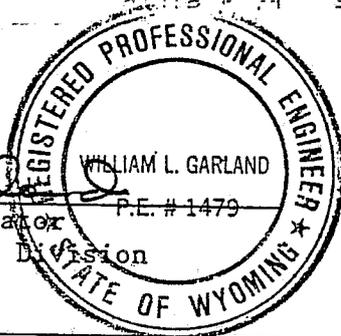
The permittee shall notify representatives from the Department of Environmental Quality, Water Quality Division the day construction commences and give an estimate of completion of the project. The authorized representative in your area can be contacted at the following address: District Engineer, State of Wyoming, Department of Environmental Quality, Water Quality Division, 210 Lincoln, Lander, Wyoming 82520; telephone, 332-3144.

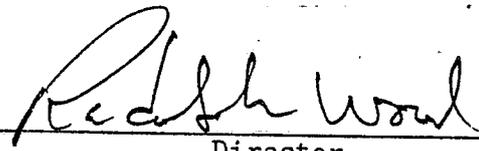
Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities or penalties established pursuant to any applicable State law or regulation.

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

AUTHORIZED BY:


Administrato
Water Quality Division
5-17-88
Date of Issuance




Director
Dept. of Environmental Quality

This permit does not supercede the requirements for obtaining any permit from local agencies.

Conditions On Permit

1. Groundwater monitoring shall be performed as specified in the Operation and Maintenance Procedures Manual and/or as requested by the DEQ. Groundwater monitoring reports which include the analytical results and static water level shall be submitted to Jake Strohman, DEQ/Water Quality Division, Herschler Building, 122 West 25th Street, Cheyenne, Wyoming, 82002; within 30 days of the sampling event.

2. A detailed reclamation/closure plan shall be submitted to the DEQ/Water Quality Division, 210 Lincoln Street, Lander, Wyoming, 82520 for approval. No reclamation work shall be performed until the plan has been approved by the DEQ.

WATER QUALITY DIVISION
GROUNDWATER SECTION
PERMIT APPLICATION REVIEW

APPLICATION NUMBER 87-454

DATE SUBMITTED FOR REVIEW 1/6/88

NAME AND LOCATION OF FACILITY MOUNTAIN FUEL RESOURCES
SOUTH BAXTER SWEETWATER PLANT
SWEETWATER COUNTY, WY

I have reviewed the plans and specifications with regard to all aspects of groundwater quality and find the following:

- No comment. The submittal is consistent with current groundwater protection procedures and requirements.
- Comments attached.

SIGNED Thomas R. Williams
TITLE GROUNDWATER ENGINEERING EVALUATOR
DATE 1/21/88

WYOMING
E.I.T. #
2242

ACCEPTED FOR RECORD 1-26-88
(Date)

Groundwater Control Supervisor
(John signed in red & didn't show up. ne 1-26-88)

RF



THE STATE OF WYOMING

MIKE SULLIVAN
GOVERNOR

Department of Environmental Quality

Herschler Building • 122 West 25th Street • Cheyenne, Wyoming 82002

Administration
(307) 777-7937

Air Quality Division
(307) 777-7391

Land Quality Division
(307) 777-7756
FAX (307) 634-0799

Solid Waste Management Program
(307) 777-7752

Water Quality Division
(307) 777-7781
FAX (307) 777-5973

August 27, 1993

Frank Dana
Star Valley Cheese Co-op
P.O. Box 436
Thayne, WY 83127

Re: WQD Permit # 87-456 Extension and Amendment of Permit

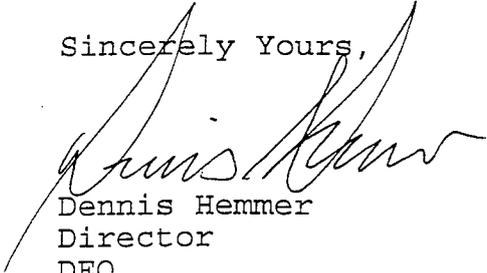
Dear Mr. Dana:

This letter is your notification of the extension of the Water Quality Division Permit # 87-456 for an additional five (5) years from this date. This authorization also amends the provisions of the current permit to allow application of cheese whey from six miles up to and not exceed 15 miles. The expiration of this permit is extended to August 27, 1998 by this action.

At the time a change in ownership occurs, a "Transfer of Ownership" form must be filed with this office for this permit and for your NPDES permit (WY0001546). The appropriate forms are enclosed for your use.

If you have any questions concerning this matter, feel free to contact me or William Garland at 777-7781.

Sincerely Yours,


Dennis Hemmer
Director
DEQ

DH/WLG/mad 34031.LTR

cc: William L. Garland, Admin., WQD

LAND APPLICATION PERMIT

Permit No. 87-456

* CONDITIONS ON PERMIT *

Star Valley Cheese Co-op
(Name of Facility)

This permit hereby authorizes the applicant (name and address):

Star Valley Cheese Co-op

P.O. Box 436

Thayne, WY 83127

to land apply cheese whey to approximately 1,630 acres of land within a six mile
radius of the cheese factory.

The application site is located in T34N, R118 and 119 W

in the County of Lincoln, in the State of Wyoming. This permit shall
be effective for a period of two (2) years (five (5) years maximum) from
the date of issuance of this permit.

The issuance of this permit provides that the Department of Environmental Quality
has evaluated and determined that the application meets minimum applicable
standards. The authority to land apply granted by this permit does not mean or
imply that the Wyoming Department of Environmental Quality guarantees or ensures
that the disposal method will meet applicable state requirements.

Nothing in this permit constitutes an endorsement of the disposal method described
herein. This permit indicates only that standards required by the Environmental
Quality Act have been met. The state assumes no liability for, and does not in
any way guarantee the performance of, the permittee in the exercise of its
activities allowed under this permit. The permittee understands that it is solely
responsible to any third parties for any liability arising from the disposal
method described herein. By the issuance of this permit, the state does not in
any way waive its sovereign immunity.

The permittee shall allow authorized representatives from the Department of
Environmental Quality, Water Quality Division, upon the presentation of
credentials and during working hours, to have access to inspect the application
site at the above location, for the purpose of compliance with the provisions of
this permit.

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities or penalties established pursuant to any applicable state law or regulation.

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations.

AUTHORIZED BY:


William L. Garland Administrator P.E. #1479
Water Quality Division

Richard Wood Director
Dept. of Environmental Quality

4-21-88
Date of Issuance

This permit does not supercede the requirements for obtaining any permit from local agencies.

* CONDITIONS ON PERMIT *

1. The total annual liquid application rates will not exceed 4 acre inches on any tract of land.
2. Whey will be applied to tracts of land only by truck application rather than delivery via irrigation ditches.
3. Accurate records will be maintained of the whey volumes delivered, date of delivery, whey recipients, and acreage over which the whey is applied.
4. Permanent soil sampling sites will be located on tracts 6 and 9, to include one location on each site, and a background site. These will be selected in the field. Samples will be taken at the surface 6" and each successive 12 inches to the gravel layer during early June and early September during the term of the permit. All samples will be analyzed for pH, ECe, nitrate, nitrogen, available phosphorus and exchangeable potassium.
5. Groundwater sampling sites will be located at the upgradient wells on Tracts 6 and 9, and the downgradient springs on the same tracts, as agreed upon in the fall of 1987. Samples will be taken at the same time that the soil samples are taken, i.e. early June and early September. Analytical parameters will include pH, TDS and nitrate nitrogen. Groundwater sampling will be conducted at these times throughout the term of the permit, and results will be promptly submitted to the designated groundwater engineering evaluator in Cheyenne.
6. Attainment of 10 ppm nitrate nitrogen in soil samples below the root zone, as defined in the field, or in any groundwater samples will be cause for prohibiting further whey applications to the site.
7. If whey is to be land applied upon lands not identified in this permit, additional information shall be submitted to this Division identifying those tracts.

Review and Final Comments on the Star Valley Cheese Coop Land Application Permit Application - #87-456

The Star Valley Cheese Coop has been releasing cheese whey to local farmers for land application for several years (see Table I). Varying amounts of whey have been applied on 18 tracts of land within a maximum six mile radius of the town of Thayne, Wyoming (see base map). The best estimate of the total acreage utilized is 1,629.11 acres rather than the 1,875 round figure submitted by SVCC. Table II provides the individual tract acreages, and the best estimates of legal descriptions.

Whey Application Rate

The average annual per acre whey application rate as derived from the figures reported in Table I is 28,082.11 gallons per acre, which is equivalent to 1.03 inches/ac/yr. The range in application rates is from a minimum of 2,150.5 gallons/ac/yr (or 0.08 inches) to a maximum of 102,827.7 gallons/ac/yr (or 3.79 inches).

Waste Characterization

The SVCC permit application relied heavily on generic whey constituent analyses as presented in Tables I and II of the July, 1986 Enviro Enterprises report, "Whey as a Resource for Ranchers and Farmers", which was prepared for the Intermountain Milk Association of Beaver, Utah. Actual analyses of the SVCC whey were confined to constituents of interest to cheesemakers, including percent fat, protein, lactose, ash and total solids. SVCC generates whey as a byproduct of the production of provolone, mozzarella and ricotta cheese. The resultant ricotta whey is "deproteinized" and consequently low in nitrogen. Waste activated sludge is added back into the whey (letter - 8/29/85) to increase the total nitrogen content. An attachment to Enviro Enterprises letter of June 14, 1986 indicates an average protein value of 0.82% for the SVCC ricotta whey. This value is indicated as the design basis for the permit.

Nitrogen Application Rate

Using 0.82% protein as the design basis for the permit:

- = 28,082.11 gallons/acre/yr - whey application rate
- = 234,204.80 lbs/ac/yr - mass loading
- x 0.82% protein
- = 1,920.48 lbs protein/ac/yr
- x 16% nitrogen (ave) in protein
- = 307.28 lbs nitrogen/ac/yr, this equates to 0.13% nitrogen on a wet weight basis, or 2.20% nitrogen on a dry weight basis (6% solids).

This figure is reasonably close to the 1.44% nitrogen given in Table 2 of the July, 1986 report.

Table 3 which was included in the assessment of the "The Impact of Organics on Arid and Semi Arid Soils" provides an analytical comparison of animal manure, whey and sewage sludge. Nitrogen is partitioned into total N, ammonia nitrogen and nitrate nitrogen. Since the nitrogen composition of whey is given as 2.1% total nitrogen only, one must assume that nitrogen occurs solely in the organic phase in cheese whey, and therefore, that land application does not provide immediate plant available nitrogen. Conversation with Frank Dana of SVCC indicates that the crop being grown usually responds more to a second application of whey. This can be interpreted as a indication of mineralization or organic nitrogen from the first application, or simply that the timing of the first application was not favorable. Actual analysis of SVCC whey for nutrients would provide clarification for the calculation of a nitrogen balance.

Nitrogen Balance

The June, 1986 analyses of three soil samples from tracts 1, 4 and 6 indicate a nitrate nitrogen concentration of 19.80, 15.20 and 16.30 ppm (ug/g) respectively. Using the 16.30 ppm figure for tract #6, this equates to 32.64 lbs/acre 6" of plant available nitrogen (PAN). The sample from tract #1 also included nitrate analyses at 12, 20 and 30 inch depths. Nitrate concentrations were 9.23, 4.90 and 8.37 ppm, respectively. The 30 inch sample was at bedrock. These numbers indicate a trend of decline in nitrification with depth until the soil-rock interface is reached, a lack of excessive nitrate concentration in the percolate water, or increasing denitrification with depth ($N_2O\uparrow$, $N_2\uparrow$ production) until the soil-rock interface is reached.

The major crops grown on the sites used for whey application are barley and posture grass. The average yield of irrigated barley in Lincoln County according to Wyoming Agricultural Statistics (1982) was 56 bushels/acre. Assuming that the average annual whey application promotes greater than average yields, 70 bushels/acre of barley production was chosen as the crop yield goal for the nitrogen balance.

The accompanying chart, Table III, the Estimated organic nitrogen buildup per acre on land used for whey application by SVCC, was based on the organic mineralization rates supplied in Table 6-7 of the Enviro Enterprises letter of 8/29/85 to Bill Locke. Waste sludges from the SBR basins (Figure 3, same letter) are aerobically stabilized, yielding higher mineralization rates than anaerobically digested, or composted sludge, but less than unstabilized primary and waste activated sludges. (The chart is taken from sewage sludge investigations).

Table III indicates that the average rate of whey application, 28,082.11 gallons/acre will result in a post growing season nitrogen residual of 150.68 lbs in the surface 6 inches of soil during year 4-5. This probably is the critical time period for evolution of nitrate nitrogen in the lower profile if the same application rate continues and is not balanced by volatilization, crop uptake and denitrification losses. Tables 8 and 9 of the July, 1986 report are referenced as defining allowable application rates somewhere within the range of 2-4 acre inches per year, based on the accumulation of a nitrogen residual, and forms of nitrogen and other nutrients, as related to time (weeks) after planting. Although the cycle of building and decline of nitrification is documented under lab and field conditions, the data presented are not defined as to soil depth, and therefore

make the restriction of a maximum application rate based on nitrogen "break-through" difficult to predict.

In lieu of this, the standard proposed here for determining the maximum acceptable annual and/or cumulative application rate is the accumulation of a nitrate residual of 20 lbs/acre (10 ppm) below the root zone, as determined in the field. The soil analysis from Tract #1 indicates a decline in nitrates to the 20 inch depth, with a 70% increase at the 30 inch depth (gravel), although the value is below the 10 ppm criterion. The limitations of this data are that it represents only one point in time and at only one soil moisture status situation. The sampling did occur at the time of year when the nitrates, etc. are most likely to migrate to groundwater, and the presence of significant concentrations of nitrates indicates the profile was probably unsaturated at the time of sampling.

Well and spring water samples were taken on tracts 6 and 9 in the fall of 1987. The analytical data verify that nitrates are moving through the soil profile into the groundwater at concentrations lower than 1 mg/l.

Phosphorus

The P_2O_5 requirement for the production of 70 bushels of barley on a medium textured soils is 40 lbs/acre. Soil analyses uniformly indicate nondetectable concentrations of P_2O_5 . If we use 0.5% P concentration in the whey (Table 2, July, 1986 report), then:

$$234,204.80 \text{ lbs/ac/yr} \times 0.005 = 1,171.00 \text{ lbs/ac/yr. P application rate}$$

The phosphorus addition to these soils due to whey application appears to supply the nutrient that is most limiting, thereby providing a substantial growth increment if applied at critical growth stages when soil pH, moisture and temperature are not limiting availability. The greatest supply of available phosphorus occurs at a pH of 6.5. The soil analysis provided with this application indicates a range of soil pH's from 7.22 to 7.40 for Tracts 1, 4 and 6. In this range, the forms of available phosphorus are divided somewhat equally between $H_2PO_4^{2-}$, the latter form of orthophosphate being somewhat more slowly absorbed by plant roots than $H_2PO_4^-$.

Potassium

The soil analysis indicates an average of 0.65 meq/100g for the 3 sample sites. $0.65 \times 39.1 \text{ eq wt} = 25.5 \text{ ppm (mg/kg)}$ which equals 51.15 lbs/acre. The K_2O recommendation for the production of 70 bu/acre is 112 lbs/acre. $112 - 51.15 = 60.85 \text{ lbs/acre}$ to be supplied by the whey application.

$$234,204.80 \text{ lbs/ac} \times 1.75\% \text{ (Table 3)} = 4,098.58 \text{ lbs/ac/yr.}$$

The whey supplies considerably more than the potassium deficit for barley production, some of which may be retained by the soil exchange complex with successive whey applications.

Salt Buildup

According to Table 10 of the July, 1986 report, salt accumulation from whey application is appreciable, as measured by ECe, but declines to background within 16 months.

Recommended Permit Conditions:

1. The total annual liquid application rates will not exceed 4 acre inches on any tract of land.
2. Whey will be applied to tracts of land only by truck application rather than delivery via irrigation ditches.
3. Accurate records will be maintained of the whey volumes delivered, date of delivery, whey recipients, and acreage over which the whey is applied.
4. Permanent soil sampling sites will be located on tracts 6 and 9, to include one location on each site, and a background site. These will be selected in the field. Samples will be taken at the surface 6" and each successive 12 inches to the gravel layer during early June and early September during the term of the permit. All samples will be analyzed for pH, ECe, nitrate nitrogen, available phosphorus and exchangeable potassium.
5. Groundwater sampling sites will be located at the upgradient wells on Tracts 6 and 9, and the downgradient springs on the same tracts, as agreed upon in the fall of 1987. Samples will be taken at the same time that the soil samples are taken, i.e. early June and early September. Analytical parameters will include pH, TDS and nitrate nitrogen. Groundwater sampling will be conducted at these times throughout the term of the permit, and results will be promptly submitted to the designated groundwater engineering evaluator in Cheyenne.
6. Attainment of 10 ppm nitrate nitrogen in soil samples below the root zone, as defined in the field, or in any groundwater samples will be cause for prohibiting further whey applications to the site.

/jn



THE STATE OF WYOMING

MIKE SULLIVAN
GOVERNOR



Department of Environmental Quality

Herschler Building • 122 West 25th Street • Cheyenne, Wyoming 82002

Administration
(307) 777-7937

Air Quality Division
(307) 777-7391

Land Quality Division
(307) 777-7756
FAX (307) 634-0799

Solid Waste Management Program
(307) 777-7752

Water Quality Division
(307) 777-7781
FAX (307) 777-5973

May 17, 1991

Fred L. Oedekoven
Oedekoven Water and Hot Oil Service
Recluse, Wyoming 82825

RE: Morse Ranch #4
Permit UIC 87-457 class I
Campbell County, Wyoming

Dear Mr. Oedekoven:

Enclosed please find one copy of the inspection report for the annual inspection conducted on May 8, 1991. During this inspection, no violations of the permit were noted, and no improvements are required.

Sincerely,

Robert Lucht, P.E.
UIC Program Supervisor
Water Quality Division

RL/jt

Enclosure

xc: Jake Strohman
Barbara Conklin, EPA Region VIII

STATE OF WYOMING
DEPARTMENT OF ENVIRONMENTAL QUALITY/WATER QUALITY DIVISIONUIC Class I Wastewater Disposal Well
Well Inspection ReportWDEQ Inspector Robert F. Lucht, P.E. Title UIC Program SupervisorName of Facility Oedekoven Water and Hot Oil Service - Morse Ranch #4
Recluse, Wyoming 82825, Attention Fred Oedekoven, 682-4951Inspection Date May 8, 1991Well Name/Number Morse Ranch Unit 4 UIC Permit Number: UIC 87-457Well Site Inspection Well site was clean with not evidence of spillage.
Wellhead itself is properly maintained.Flow Measurement

Injection Rate:

Type of Device: Turbine MeterManufacturers Name/ Model Number: Halliburton LO-II serial number
LO-31037Description of Measurement: Standard turbine meter with
instantaneous and totallizer digital readout recorded manually
once a day.Remarks

Injection Pressure:

Type of Device: Standard helical coil tube pressure chart
recorder.Manufacturers Name/ Model Number: Barton 242E-41222Description of Measurement: Injection line is hydraulically
connected to the chart recorder by means of a small diameter
stainless steel line. This line ends in a coiled tube which allows
increases in pressure to tend to unwind the coil. This very small
movement is amplified mechanically to the pen on a chart
recorder. This particular chart recorder records 0-300 psi on the
injection pen. Charts are 7 day charts.Remarks Chart recorder is inside the injection plant.

Annulus Pressure

Type of Device: Standard helical coil tube chart recorder.

Manufacturers Name/ Model Number: PMC Equipment Company, Serial Number 891220

Description of Measurement: 0-3000 psig on a 7 day chart. Similar method of recording to the injection pressure.

Remarks Chart recorder is located in the wellhead enclosure. Annulus pressure is also tracked by a Murphy kill switch which will shut off the well if annulus pressure gets outside of preset limits. Murphy switch was set at 450 psi and 1350 psi. Verified the operation of this switch by having the pumper kill the well with this switch. Everything was operational.

Record Review

Injection Rate:

Records Reviewed

From June Month 90 Year Through May Month 91 Year

Remarks: All records required are being kept and all records appear to show the same readings as submitted. Meter readings are being recorded daily as required.

Injection Pressure:

Records Reviewed

From June Month 90 Year Through May Month 91 Year

Remarks: Chart shows that there was a maximum pressure of 1260 psig at the beginning of January, 1991. This declined to 750 PSIG at the end of three days shut in. There was no injection for January. At the end of the month, the well declined to 600 psig. All records were as submitted. There were no violations found.

Annulus Pressure:

Records Reviewed

From June Month 90 Year Through May Month 91 Year

Remarks: Annulus pressure in January 1050 psig. Annulus pressure is higher than I would like to see it, but steps have been taken to dampen out swings. There is a nitrogen gas blanket on this annulus. Annulus pressure is inversely tracking injection pressure because of temperature effects.

Maintenance Records:

Remarks: Well was acidized 11/29/90 ISIP 1690 psig. The last mechanical integrity test was a casing pressure test conducted 5/11/90.

Calibration Records:

Remarks: The last calibration on the chart recorder purchased from Swan Specialties was 01/01/90

Sample Collection Quality Assurance:

Sample Collection Procedure No samples taken during this inspection

Sample Analysis Procedure Energy Laboratories in Gillette does most of the required analyses for Oedekoven.

Water Quality Analytical Results:

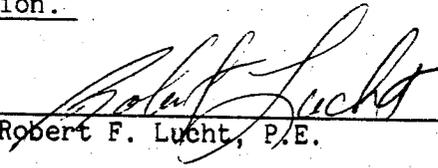
Parameter Exceeding Permit Limits None

Explanation _____

Remedial Action _____

Additional Comments Oedekoven is presently using Nalco 3900 corrosion and scale inhibitor in the injection line. Occasionally uses a biocide in the tanks when they become foul. This entire operation is properly maintained and all records are in order. Overall, an excellent facility. Pictures were taken during this inspection.

WDEQ Inspector Signature



Robert F. Lucht, P.E.



THE STATE OF WYOMING



MIKE SULLIVAN
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Department of Environmental Quality

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Solid Waste Management Program
(307) 777-7752

Water Quality Division
(307) 777-7781
FAX (307) 777-5973

January 8, 1991

Fred L. Oedekoven
Oedekoven Water and Hot Oil Service
Recluse, Wyoming 82825

RE: Morse Ranch #4
Permit UIC 87-457 class I
Campbell County, Wyoming

Dear Mr. Oedekoven:

Enclosed please find one copy of the analyses on the injected wastewater taken during the last annual inspection on 6/26/90. These analyses show that the wastewater contains the components which one would expect in oilfield produced water, namely Benzene, Ethylbenzene, Toluene, Xylenes, and Phenols.

These analyses show that the injection stream contains unexpectedly high levels of lead and cadmium. Until further notice please have the injection stream sampled quarterly and analyzed for lead and cadmium. These analyses shall be reported in the quarterly injection report for the quarter in which they were taken. Due to the lead times required for analyses, samples should be taken toward the end of the first month of each quarter so that the analyses will be available when needed.

Sincerely,

Robert Lucht, P.E.
UIC Program Supervisor
Water Quality Division

RL/jt

xc: Jake Strohmman



THE STATE OF WYOMING



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Water Quality Division
(307) 777-7781

May 30, 1990

Fred L. Oedekoven
Oedekoven Water and Hot Oil Service
Recluse, Wyoming 82825

RE: Morse Ranch #4
Permit UIC 87-457 class I
Campbell County, Wyoming

Dear Mr. Oedekoven:

I would like to schedule an annual inspection of the above mentioned facility, on Tuesday, June 26, 1990. I will meet you at the wellhead on June 26 at 1:00 PM. This inspection will cover all aspects of the operation of this well. During this inspection, I will want to see records of the pressure fall off curve required on page 5 of the permit. I will also want to see all required instrumentation in place and operating. If at all possible, I want to see the well actually injecting fluid so that tests can be made of the various shutin devices on the well. I will also need to sample the injectate at that time for compliance with the permit. Provision needs to be made to take samples of the injectate.

During this inspection, I would also like to split samples with you on the shallow well required to be monitored by the permit. That sampling will fulfill your requirements for this year. You will have to provide sample bottles for your lab, and I will provide everything for our lab.

An annual inspection of a class I well also requires that we observe the records being kept on this well. I will need to see your records concerning injection pressure and volume, and any required tests during this last year.

Sincerely,

Robert Lucht, P.E.
UIC Program Supervisor
Water Quality Division

RL/jt

xc: Jake Strohmman



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Water Quality Division
(307) 777-7781

March 23, 1988

Fred Oedekoven, V.P.
Oedekoven Water and Hot Oil Service
Recluse, Wyoming 82825

Re: Morse Ranch Unit #4
GPC 87-457 Class I UIC
Campbell County, Wyoming

Dear Mr. Oedekoven:

Enclosed find the final permit on this well. You are authorized to begin construction immediately.

Please pay special attention to the requirements for running a cement bond log and radioactive tracer log. Copies of these logs showing good mechanical integrity must be submitted prior to injection of any fluid.

We are looking forward to a long and trouble free relationship on this well and also on the Olsen #1A well. Please read these permits and make the effort to comply with all provisions. Violation of any of the provisions of these permits will be cause for increased reporting requirements, premature closure, or even fines of up to \$10,000 per day.

Sincerely,

William L. Garland
Administrator
Water Quality Division

WLG/RL/jn

Enclosure

cc: Mike Strieby, EPA, Denver
Janie Nelson, OGCC
Dick Stockdale, State Engineer's Office
Lisa Green, Permitco

DEPARTMENT OF ENVIRONMENTAL QUALITY
STATE OF WYOMING
GROUNDWATER POLLUTION CONTROL PERMIT
AUTHORIZATION TO DISCHARGE INTO UNDERGROUND RECEIVERS
(Permit to Inject)

(X) New

Permit Number:

() Modified

GPC 87-457
UIC CLASS I

In compliance with the Wyoming Environmental Quality Act (W.S. 35-11-101 through 1104, specifically 301(a)(i) through (iv), Laws 1973, Ch. 250, Section 1) and Water Quality Rules and Regulations Chapter IX (September 4, 1980),

OEDEKOVEN WATER AND HOT OIL SERVICE
Recluse, Wyoming 82825
(307) 682-4951

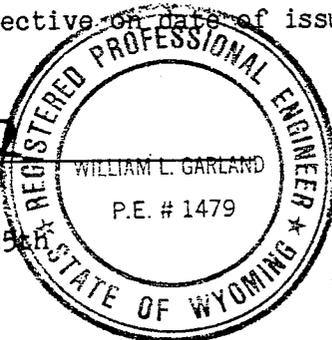
is authorized to operate

The Morse Ranch Unit #4 Disposal well, in the NW $\frac{1}{4}$ SW $\frac{1}{4}$, S1, T55N, R73W, Campbell County, Wyoming as a commercial well for the disposal of oil field produced water and other industrial wastes

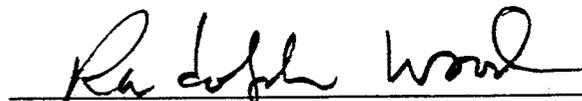
according to procedures and conditions of the application GPC 87-457 and requirements and other conditions of this permit.

This permit shall become effective on date of issuance.


Administrator
Water Quality Division
Herschler Building, 122 W. 25th
Cheyenne, WY 82002
Phone: (307) 777-7781



March 21, 1988
Date


Director
Department of Environmental Quality
Herschler Building, 122 W. 25th
Cheyenne, WY 82002

3-21-88
Date

A. Discharge (Injection) Zone and Area of Review

The injection zone is the entire the Muddy Formation, and it is presently perforated at the interval 7092-7110 below the surface. Injection and disposal into any other subsurface interval is not authorized without prior approval. Discharge to the surface is not authorized by this permit. Construction any holding pond on the surface is specifically not authorized by this permit.

B. Groundwater Classification

The water in the injection zone is Class VI:

1. Groundwater is located so as to make normal use economically and technologically impractical;
2. Groundwater in the receiving formations is associated with accumulations of hydrocarbons;
3. The groundwater quality in the injection zone is in excess of 14, 000 ppm in total dissolved solids.

C. Authorized Operations

The permittee is authorized to inject into the Minnelusa formation through perforations at 7092-7110 feet below the surface, oil field produced waters (sic 13). Additional zones within the Muddy Formation may be perforated with prior approval of the Water Quality Division. Existing sources of produced water have been identified in the application. New sources will be identified prior to injection.

Hazardous waste as identified by EPA under 40 CFR 261.3 are not allowed under any circumstances.

Oedekoven Water and Hot Oil Service is the only hauler authorized to use this well. For this reason, an extensive computer control system will not be needed at the surface.

The maximum discharge (injection) pressure shall not exceed 1,850 psi at the surface.

Within one year of issuance of this permit a step rate test will be run to validate that maximum injection pressure is below the fracture pressure of the Muddy Formation.

The discharge (injection) rate will vary. Permittee shall obtain approval for a rate in excess of 2,500 barrels per day (105,000 gallons per day) of all wastes to be disposed of.

If at any time, the maximum authorized pressure or rate is exceeded, permittee shall report this fact to the Administrator or his representative orally within 24 hours of knowledge of the fact. A written submission shall be provided within 5 days of the time

permittee becomes aware of the circumstances.

Permittee is required to monitor the injection and annulus pressures and injection rate continuously. Continuous monitoring requirements for annulus will be satisfied by the installation of a Murphy Fluid Pack High-Low kill switch. This switch shall be set to stop the injection pump if the annulus pressure drops below 400 psi or if the annulus pressure increases above a maximum of 1,400 psi. The high pressure kill switch can be set at a lower pressure if the permittee desires.

The permittee is required to record the source of all produced water injected by lease name and date, and the quantity injected in standard barrels.

D. Proper Operation and Maintenance

The permittee is required to conduct the operation in accordance with statements, representations and procedures presented in the complete permit application and supporting documents, as accepted and approved by the administrator.

The permittee is required at all times to properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve permit compliance. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training and adequate laboratory and process controls, including appropriate quality assurance procedures.

The subsurface discharge (injection) authorized by permit shall be consistent with the conditions and content of the permit; any modifications which will result in a violation of permit conditions shall be reported by submission of a new or amended permit application and shall not be implemented until a new or modified permit has been issued.

E. Entry and Inspection

The permittee shall allow the administrator, or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to:

1. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
3. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
4. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the appropriate rules and

regulations of the Department, any substances or parameters at any location.

F. Environmental Monitoring Program for Groundwaters of the State

1. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.
2. The permittee shall prepare records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation to be retained for a period of at least 3 years after closure of the facility.
3. Records of monitoring information shall include:
 - a. The date, exact place, and time of sampling or measurements;
 - b. The name(s) of individual(s) who performed the sampling or measurements;
 - c. The date(s) analyses were performed;
 - d. Names of individuals who performed the analyses;
 - e. The analytical techniques or methods used; and
 - f. The results of such analyses.
4. The prescribed program for this permitted activity is as follows:

Obtain one full analysis for all Chapter VIII parameters (except radiometrics) for each of the two existing water wells within the Area of Review. These two wells are permitted by the State Engineer's office as P42041W and P40713W. Submit this information prior to injection. Annually, in time for inclusion in the annual report, analyze these wells for TDS, cond., SO₄, CL, and pH.

G. Requirements for Monitoring the Discharge

Discharge (injection) volume and/or pressure shall be controlled and monitored to prevent fracturing of confining strata.

Injection and annulus pressures and injection rate (volume) shall be monitored continuously. Records of maximum daily injection pressure and volumes shall be kept and be available for inspection by representatives of the Water Quality Division.

A quarterly report is required to be submitted within 30 days of the end of each calendar quarter. This report shall contain:

1. The maximum and minimum daily injection pressure (not an average pressure but an instantaneous pressure) and maximum and minimum daily injection volume for each month within the

quarter, and the dates that these maximums and minimums were reached. The accumulated total volume of waste injected for each month and the accumulated total volume injected to date.

2. The maximum and minimum daily annulus pressure and a detailed operating log for that days operation.
3. A typical analysis of each new source of oil-field produced water. These analyses should include major cations and anions, pH, and TDS. A more detailed analysis may be required by the Water Quality Division if circumstances warrant such action.
4. Oil field produced water from the Muddy Formation will be exempt from #3 above in the following area:

T55-58N, R72+73W: all sections
5. Oil field produced water from the Minnelusa Formation will be exempt from #3 above in the following area:

T50-58N, R73-80W: all sections
6. Total volumes of formation produced water disposed of is required. A list of leases that produced water is also required. The list of leases shall include the township and range where they are located.
7. Any non-compliance, MIT, or significant event during the quarter. If quarterly reports should eventually show a record of being submitted late, the Administrator may substitute more stringent monthly report requirements.
8. The average injection pressure for each month calculated by averaging the maximum pressures for each day.

H. Test Procedures

Test procedures for the determination of water quality parameters and constituents shall be in accord with provisions of Water Quality Rules and Regulations Chapter VIII, Section 7.

I. Records and Reports

1. The permittee shall retain copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the report or application.
2. The permittee shall give notice to the administrator as soon as possible of any planned physical alterations or additions to the permitted facility.
3. The permittee shall give advance notice to the administrator of any planned changes in the permitted facility or activity which may result in

noncompliance with permit requirements.

4. Monitoring results shall be reported at intervals specified in Section C and/or Section G of this permit.
5. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date.
6. The permittee shall report any noncompliance which may endanger health or the environment, orally within 24 hours from the time the permittee becomes aware of the circumstances. The report should include:
 - a. Any monitoring or other information which indicates that any contaminant may cause an endangerment to a usable groundwater of the state.
 - b. Any noncompliance with a permit condition or malfunction of the discharge (injection) system which may cause fluid migration into or between usable groundwaters of the state.

A written submission shall be provided within 5 days of the time the permittee becomes aware of the circumstances. This written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue, and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

7. The permittee shall report all instances of noncompliance not reported otherwise, at the time monitoring reports are submitted; such reports shall contain the information listed in 6. above.
8. Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the administrator, it shall promptly submit such facts or information.
9. The permittee shall retain all records concerning the nature and composition of injected fluids until 5 years after completion of any specified plugging and abandonment procedures. The administrator may require the owner/operator to deliver the records to the administrator at the conclusion of the retention period.
10. A subsurface discharge (injection) well may not commence subsurface discharge (injection) until, following public notice and an opportunity for hearing, a groundwater pollution control permit has been issued by the department for the proposed operation, and:
 - a. Well construction is complete and the permittee has submitted notice of completion of construction to the administrator, and
 - b. The administrator has inspected or otherwise reviewed the subsurface

discharge (injection) well and finds it in compliance with the conditions of the permit; or the permittee has not received notice from the administrator of intent to inspect or otherwise review the facility within 13 days of the notice of a. above, in which case prior inspection or review is waived, and

c. Well mechanical integrity testing has been proven or demonstrated to the satisfaction of the administrator.

11. Annual reports shall be submitted to the administrator within 30 days following the anniversary date of the permit. The annual report shall consist of the 4th quarterly report along with a summary of the year's operation. This summary shall include the maximum injection pressure for the year and the date on which it was reached, the maximum injected volume for the year and the date on which it was reached; the total volume of oilfield produced waters injected and the total volume of all other wastes injected. The annual report shall include significant events for the year such as Mechanical Integrity Tests, and any non-compliance with permit conditions.

12. A comprehensive report for an aborted or curtailed operation authorized by this permit shall be submitted to the administrator within 30 days of complete termination of the injection (discharge) or associated activity, in lieu of an annual report.

J. Permit Actions

After notice and opportunity for a hearing, a permit may be modified, suspended or revoked in whole or part during its term for cause which includes, but is not limited to, any of the following:

1. Violation of the permit;
2. Obtaining a permit by misrepresentation or failure of the discharge well or system.

Each permit is reviewed at least once every 5 years, and may be reviewed more frequently.

A permit may be modified at any time as may be required, including for conformity with changes in regulations or standards which occur after the permit is issued.

A permit may be modified in whole or part in order to apply more, or less, stringent standards; or prohibitions for a toxic or other substance present in the permittee's discharge, as may be ordered by the council.

This operation (permit) can be terminated by authority of the administrator for one or more permit violations.

Public notice of the permit review and request for public comment will be made every 10 years by the administrator.

K. Mechanical Integrity

Each discharge well and associated discharge facilities is required to have mechanical integrity which demonstrates the unimpaired condition of the well and facilities. The approved procedures for demonstrating the mechanical integrity for the well and facilities handling the discharge authorized by this permit consist of:

At a minimum of once a year and more frequently if required by the Department of Environmental Quality, Water Quality Division, the permittee shall demonstrate the continued sound and unimpaired condition of all components of the injection well by mechanical integrity testing. An injection well has mechanical integrity if there is no significant leak in the casing, tubing and packer; and there is no significant movement of injected fluids through vertical channels adjacent to the well bore. The absence of leaks will be determined by holding 2,000 psi on the annulus for 15 minutes.

At a minimum of once every 5 years and more frequently if required by the administrator, the permittee shall prove the absence of fluid movement through vertical channels. The absence of fluid movement through vertical channels will be determined by an injection well profile (radioactive tracer log), or a temperature log, or other acceptable method.

Prior to injection of any fluid under this permit, the applicant shall demonstrate mechanical integrity of the well and the fluid tight condition of the surface facilities. A cement bond and a radioactive tracer log shall be run prior to the start of injection. If either of these logs indicates the need for repair, that log shall be re-done after the repair.

The casing-tubing annulus must be filled with water mixed with a corrosion inhibitor. The permittee will submit, along with his first quarterly report a description of the corrosion inhibitor used. Records of any fluids added to the annulus must be kept and submitted along with the quarterly report. The casing/tubing annulus shall be pressurized to 400 psi and this pressure held permanently. Any drop or gain in pressure that is sustained for 24 hours or more shall be reported to Water Quality Division immediately.

Nothing in this permit constitutes an endorsement of the construction or the design of the facility described herein. This permit indicates only that standards of design and construction required by the Environmental Quality Act have been met. The state assumes no liability for, and does not in any way guarantee the performance of the permittee in the exercise of the activities allowed under this permit. The permittee understands that it is solely responsible to any third party for any liability arising from the construction or operation of the facility described herein. By issuance of this permit, the state does not in any way waive its sovereign immunity.

The operation (discharge) of any well or system will terminate immediately if

mechanical integrity of the well or system fails and/or a leak or unauthorized fluid movement occurs. The discharge shall be discontinued until mechanical integrity has been restored and permission to continue the discharge has been obtained from the administrator.

The Morse Ranch Unit #4 disposal well was drilled November 25, 1970 to a total depth of 7,202 feet. 169' of 8 5/8", 32# ST+C new casing was run and cemented with 150 sacks of cement. 5 1/2" production casing (15.5# and 17#) was run to a depth of 7,195' and cemented with 250 sacks of cement.

The disposal well is equipped with a Baker Model R double grip packer set at 7,050 feet. Injection is through 7,073 feet of 2 7/8" tubing.

Perforations, 2 holes per foot, are at 7,092 to 7,098 feet.

L. Abandonment

The permittee shall notify the administrator at least 180 days before well abandonment. Immediately following the permanent cessation of subsurface discharge or related activity, or where a well has not been completed, the applicant/permittee shall notify the director and follow the procedures prescribed by the director for plugging and abandonment or the discontinuance of related activities:

Water Quality Division abandonment requirements shall be coordinated with requirements of the Wyoming Oil and Gas Conservation Commission (WOGCC). In no case shall the required abandonment procedure be less than that required by WOGCC at the time of abandonment.

The Water Quality Division will require that a squeeze cementing operation be performed through the perforated interval, until no additional cement can be pumped. Fracture pressure of 2,057 psi shall not be exceeded during this squeeze. After removing the tubing and packer, 200 sacks of cement shall be spotted on the bottom of the hole. In no case shall surface casing be recovered. If possible and desired, the remaining production casing may be cut above the bottom plug and recovered. If this is done, the well bore shall be mudded up to meet the requirements of 35-11-404 of the Environmental Quality Act and Land Quality Regulations, Chapter 15.

A standard, dry hole marker shall be erected over the abandoned well. The surface casing shall be blind flanged at the braden head flange and the dry hole marker can be welded to this flange.

M. Duties of the Permittee

It is a duty of the permittee to:

1. Comply with all permit conditions;
2. Halt or reduce activity -- it shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce

the permitted activity in order to maintain compliance with the permit conditions;

3. Take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this permit;
4. Furnish to the administrator within a reasonable time, any information which the administrator may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit; and furnish to the administrator, upon request, copies of records required to be kept by this permit.

N. Financial Responsibility

The permittee is required to maintain financial responsibility and resources in form approved by the director, to close, plug and abandon the discharge operation in a manner prescribed by the director.

The required Certificate of Financial Responsibility has been submitted.

O. Special Measures the Director Finds Necessary:

The injection pumps and controls shall be secured in a locked building. This building shall be locked during any period of inactivity.

Continuous recording devices to measure injection and annulus pressures and injection rate (volume) shall be installed and operational within 90 days following permit issuance.

P. Special Permit Conditions:

Pollution or waste which migrates into an aquifer containing a usable groundwater of the state is a violation of the permit.

Mechanical integrity -- operations terminate immediately if mechanical integrity of well or system fails and/or a leak or unauthorized fluid movement occurs.

Q. Signatories Requirement

All reports required by this permit and other requested information shall be signed as follows:

For a corporation -- by a principal executive officer of at least the level of vice-president;

For a partnership or sole proprietorship -- by a general partner or the proprietor, respectively;

For a municipality, state, federal or other public agency -- by either a principal executive officer or ranking elected official; or

By a duly authorized representative for any of the above. A person is a duly authorized representative only if:

1. The authorization is made in writing by one of the described principals;
2. The authorization specifies either an individual or position having responsibility for the overall operation of the regulated facility or activity; and
3. The written authorization is submitted to the administrator.

If an authorization is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization must be submitted to the administrator prior to or together with any reports or information, to be signed by an authorized representative.

Any person signing a report or other requested information shall make the following certification:

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

R. Noncompliance

Any permit noncompliance constitutes a violation of the permit.

The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification or planned changes or anticipated noncompliance, does not stay any permit condition.

S. Permit Transfer

The owner/operator of record (permittee) is always responsible for permit compliance. A permit holder cannot transfer his permit without approval of the department director.

T. Responsibilities

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities or penalties established pursuant to any applicable state law or regulation.

U. Property Rights

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any

infringement of federal, state or local laws or regulations.

V. Severability

The provisions of this permit are severable, and if any provision of the permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.



THE STATE OF WYOMING

MIKE SULLIVAN
GOVERNOR



Department of Environmental Quality

| | | | | |
|----------------------------------|--|---|--|--|
| Administration (307) 777-7937 | Air Quality Division (307) 777-7391 | Land Quality Division (307) 777-7756 | Solid Waste Management Program (307) 777-7752 | Water Quality Division (307) 777-7781 |
|----------------------------------|--|---|--|--|

January 8, 1988

Mr. Fred Oedekoven, VP
Oedekoven Water and Hot Oil Services Inc.
Recluse, WY 82825

RE: Morse Ranch Unit No. 4, GPC 87-457, Campbell County, Wyoming

Dear Mr. Oedekoven:

I have received your application for a permit on behalf of Oedekoven Water and Hot Oil Service. The following are the comments on this application:

1. Our permit applications must be signed by the responsible individual in the owning company. By mistake all three copies submitted have xerox signatures. Please send us the appropriate page with Fred Oedekoven's original signature.
2. I have checked your Area of Review (AOR) calculations and find them acceptable when compared with the equation shown in Chapter IX of our regulations.
3. My review of your submittal indicates that the 6 holes that penetrate your receiver within your AOR are:

| <u>Name of Well</u> | <u>Status</u> |
|-----------------------------|-------------------------|
| *McMahon-Bullington 1-Morse | Dry |
| *Davis 3 Gallion-Federal | Dry |
| *Davis 1 Earl-Federal | Dry |
| Davis 3-Z Morse Ranch | Shut in |
| *Davis 2 Gallion-Federal | Shut in |
| Davis 1-Z Morse Ranch | Proposed injection well |

*Wells marked with an asterisk were not documented with completion or plugging information. These are several pages that are so illegible that I cannot tell which well they belong to. Please provide clean copies.

4. Fracture pressure:

Your data indicates that the fracture gradient is .75 psi/ft, or 5319 psi BHP.

With a fluid density of 1.1, and a tubing loss of 18 psi/1000 ft, I get a maximum surface pressure of:

| | |
|---|-----------------|
| Fracture pressure | 5319 psi |
| -Static water pressure (7110 x 62.4 x 1.1/144) | -3389 psi |
| +Tubing friction loss (7073 x 18/1000) | + 127 psi |
| Total Surface fracture pressure | <u>2057 psi</u> |
| -10% factor of safety | - 206 |
| Maximum allowable pressure | <u>1851 psi</u> |

I will therefore limit any permit issued to 1850 psi until such time as a step injection test can be run to verify the actual fracture pressure in the well. A step test will be run within 1 year of commencing operations.

5. The application states that no Cement Bond Log was ever run on this well. The regulations require that the applicant show that there be mechanical integrity before injection and prove the absence of flow behind casing. Therefore, Oedekoven Water and Hot Oil Service will be required to run a Cement Bond Log and repair any bad cement areas from the TD up through the Mowry Formation. Subsequent to any required cementing operation, a Radioactive Tracer Log will be required. All of this information shall be in hand prior to the start of injection. Water Quality Division shall be allowed 14 days to review this information before the start of injection. The annulus shall also be tested to 2000 psi for 15 minutes prior to the start of injection.

6. The water quality analysis submitted with the application indicates that the proposed receiver is class VI because of a TDS of 14,953 mg/l. The produced water to be disposed of contains 8,288 mg/l TDS. The applicant has stated that these two analyses are typical of wells in the "immediate area". In order to reduce the required paper work, the Water Quality Division will stipulate that the produced water from the Muddy Formation in the following area is acceptable for disposal without submittal of additional assays:

T55N, R73W: all
T56N, R73W: all
T55N, R72W: all
T56N, R72W: all

Produced water within this area still must be accounted for by lease. As with your other permit, we will not require a separate analysis for each lease.

Produced water from any other formation (other than the Muddy) or from any lease outside this area will still require submission of an analysis with the quarterly report.

7. The application shows that there are two water wells within your area of review. One of these wells, the Morse Ranch, Muddy Sand Unit Water Supply well is owned by Davis Oil Company. This well is 1100 feet deep and taps the Fort Union Formation. The second well is owned by Pittsburg and Midway Coal Company and monitors a near surface aquifer at 40 feet.

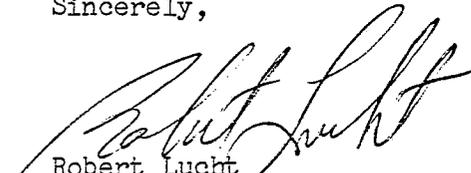
The applicant will be required to obtain 1 sample from each of these two wells and analyze for a full suite of Chapter VIII parameters except radiometrics. If existing analyses can be obtained from the owners they may be used.

Yearly, in time for inclusion of the results in the annual report, these two wells shall be sampled and analyzed for TDS, cond., SO₄, CL and pH. Submission of the first sampling results will be required before injection can take place.

8. The "Mechanical Integrity Test" required after each acidizing job will include only the annulus pressure test. The Radioactive Tracer Survey will only be required every 5 years.

None of the above 8 items are sufficient to hold up the issuing of this permit. For this reason, I will start the public review period on January 18, 1988 and it will run until February 19, 1988.

Sincerely,



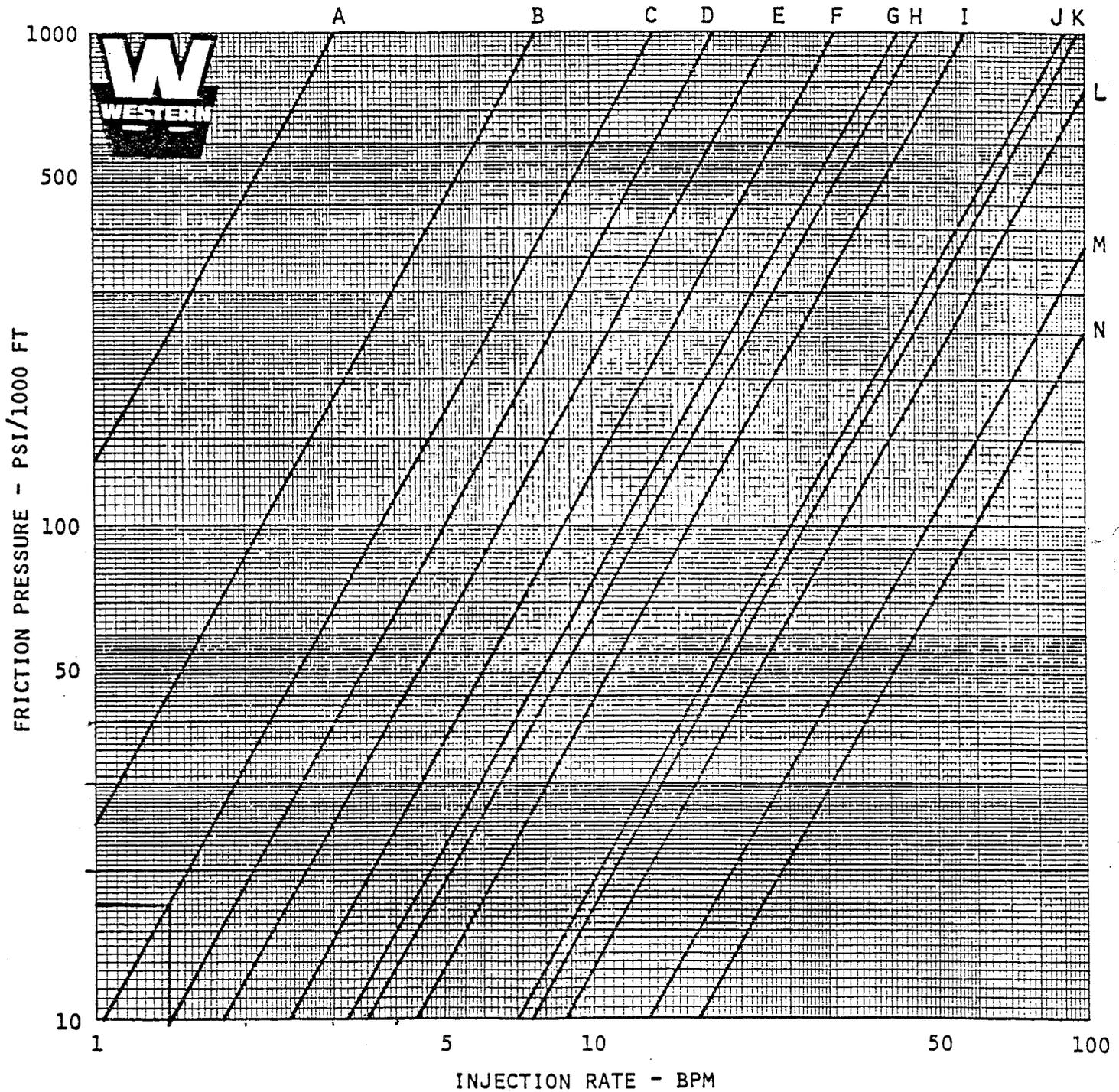
Robert Lucht
UIC Program Supervisor
Water Quality Division

RL/nc

cc: Larry Hartnett, Permitco, P O Box 44065, Denver, CO 80201-4065
Mike Strieby, US EPA, Region VIII, One Denver Place, 999 19th St, Suite 500,
Denver, CO 80202-2405 (w/encl)
Janie Nelson, WY Oil and Gas Commission, 777 W 1st Ave, Casper, WY 82602
(w/encl)
Dick Stockdale, WY State Engineer's Office, 4 E Herschler Bldg,
Cheyenne, WY 82002 (w/encl)

Morse Ranch Unit 4
10 LB BRINE

(4)



- A - 1 1/4", 2.4 lb tubing
- B - 2 3/8", 4.7 lb tubing
- C - 2 7/8", 6.5 lb tubing
- D - 2 3/8" x 4 1/2", 9.5 lb annulus
- E - 3 1/2", 9.3 lb tubing
- F - 2 7/8" x 5 1/2", 15.5 lb annulus
- G - 4", 11 lb tubing

- H - 2 3/8" x 5 1/2", 15.5 lb annulus
- I - 4 1/2", 9.5 lb casing
- J - 5 1/2", 15.5 lb casing
- K - 2 7/8" x 7", 23 lb annulus
- L - 2 3/8" x 7", 23 lb annulus
- M - 7", 23 lb casing
- N - 7 5/8", 29.7 lb casing

RF



THE STATE OF WYOMING

MIKE SULLIVAN
GOVERNOR



Department of Environmental Quality

Administration
(307) 777-7937

Air Quality Division
(307) 777-7391

Land Quality Division
(307) 777-7756

Solid Waste Management Program
(307) 777-7752

Water Quality Division
(307) 777-7781

January 18, 1988

STATE OF WYOMING PUBLIC NOTICE

PURPOSE OF PUBLIC NOTICE

THE PURPOSE OF THIS PUBLIC NOTICE IS TO INDICATE THE STATE OF WYOMING'S INTENTION TO ISSUE AN UNDERGROUND INJECTION CONTROL (UIC) PERMIT AND TO CLASSIFY THE RECEIVING GROUNDWATER OF THE STATE IN THE VICINITY OF THE PERMITTED INJECTION, UNDER THE WYOMING ENVIRONMENTAL QUALITY ACT (35-11-101 ET. SEQ. WYOMING STATUTES 1957, CUMULATIVE SUPPLEMENT 1973), AND DEPARTMENT OF ENVIRONMENTAL QUALITY WATER QUALITY RULES AND REGULATIONS CHAPTERS VIII AND IX (SEPTEMBER, 1980).

IT IS THE STATE OF WYOMING'S INTENTION TO ISSUE AN UNDERGROUND INJECTION CONTROL PERMIT FOR THE DISPOSAL OF OIL FIELD PRODUCED WATER.

APPLICANT INFORMATION

APPLICANT NAME: OEDEKOVEN WATER AND HOT OIL SERVICE

MAILING ADDRESS: RECLUSE, WYOMING 82725

FACILITY NAME AND LOCATION: MORSE RANCH UNIT #4 DISPOSAL WELL; NW $\frac{1}{4}$ SW $\frac{1}{4}$, S1, T55N, R73W, CAMPBELL COUNTY, WYOMING

PERMIT NUMBER: 87-457

Oedekoven Water and Hot Oil Service, Inc. intends to operate a commercial disposal well for the subsurface injection of oil-field produced waters and other industrial wastes into the Muddy Formation through perforations 7092-7110.

The wastes to be injected consist entirely of water brought to the surface in association with oil produced from numerous oil wells. The composition of this waste water varies, with the concentration of total dissolved solids in the range of from less than 10,000 to more than 200,000 mg/l.

Maximum injection pressure is limited to 1850 psig at the surface. The injection rate will vary. Prior approval must be obtained from the Water Quality Division if the total injection rate for produced water will be in excess of 2000 barrels (42 gallons/barrel) per day.

PERMIT REQUIREMENTS

The permit is issued for the life of the operation but is reviewed at least once every five (5) years and may be reviewed more frequently. Public notice of the permit review and request for public comment will be made every ten (10) years.

The proposed permit requires the permittee to monitor the injection and submit periodic reports.

The applicant has submitted information which documents the mechanical integrity of the disposal well. At a minimum of once every one (1) year and more frequently if required, the permittee must demonstrate the continued sound and unimpaired condition of all components of the injection well, by mechanical integrity testing.

STATE TENTATIVE DETERMINATIONS

The water in the injection zone within a one-mile radius of the disposal well is designated Class VI (unsuitable for use) because (1) groundwater is located so as to make normal use economically and technologically impractical, (2) groundwater in the receiving formation is associated with accumulations of hydrocarbons, and (3) the water in the receiving formation contains in excess of 14,000 mg/l of total dissolved solids.

Other tentative determinations have been made by the State of Wyoming relative to conditions to be imposed on the permit. These conditions will assure that usable groundwaters of the State will be protected and applicable provisions of State statutes and regulations will be followed.

PUBLIC COMMENTS

Public comments on the proposed operation, the proposed groundwater classification, and the State's intent, are invited prior to February 19, 1988. Comments may be directed to the Wyoming Department of Environmental Quality, Water Quality Division, Groundwater Section, Herschler Building, 4th Floor West, Cheyenne, Wyoming 82002. All comments received prior to February 19, 1988 will be considered.

Any interested person may request, in writing prior to February 19, 1988 a public hearing. The request should indicate the interest of the requesting party and reasons why a hearing is warranted.

If a hearing is not warranted, the final permit will be issued at the end of the comment period.

ADDITIONAL INFORMATION

Additional information may be obtained upon request by calling the State of Wyoming, (307) 777-7781, or by writing to the aforementioned address.

The complete application, draft permit, and related documents are available for review and inspection at the same aforementioned address.

Public Notice No. UIC 87-457

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