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Hydraulics

Hydrology

Water Resources

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APR 30 2003

Department of Water Resources  
Southern Region

April 30, 2003

Mr. Corbin Knowles  
Idaho Department of Water Resources  
1341 Fillmore Street, Suite 200  
Twin Falls, ID 83301

Re: DeWit Dairy

Dear Corbin:

Enclosed is the letter and attachments sent to Rob Williams in regards to the water requirements for DeWit Dairy #2. Please review and call me with any comments you may have.

Sincerely,

*Heather Maxson*  
for Chuck E. Brockway, P.E., Ph.D.

Enclosures

cc: Rob Williams

CHARLES E.  
BROCKWAY,  
PH.D., P.E.

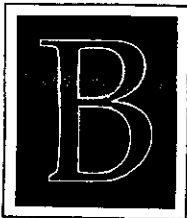
CHARLES G.  
BROCKWAY,  
PH.D., P.E.

2016 NORTH  
WASHINGTON  
STREET • SUITE 4

TWIN FALLS,  
IDAHO 83301

208•736•8543

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Department of Water Resources  
Boise, Idaho

April 25, 2003

Mr. Rob Williams  
Fredricksen, Williams & Merservy  
P.O. Box 168  
Jerome, ID 83338-0168

Subject: Water Requirements for DeWit Dairy (Water Right 36-08491)

Dear Rob:

I have reviewed the water requirements based on the information in your letter of March 27, 2003, regarding the animal numbers and operations of the DeWit Dairy No. 2. I believe that the proposed discharge and annual volume in the amendment for licensing of water right 36-08491 will be inadequate for operation of the dairy.

The proposed amendments allow 0.33 cfs and 66.0 acre-feet per year. I ran the *IDWR Dairy Water Use Worksheet* utilizing the number of animals allowed under the Gooding County CAFO (1300 milking cows, 300 dry cows and 500 heifers) and it indicates an estimated discharge requirement of 0.30 cfs (0.23 for drinking water and 0.07 for commercial) and an annual volume requirement of 67.9 acre feet. (50.4 af for drinking and 17.5 af for commercial).

Assuming the milking cows and dry cows drink 35 gal/day and the larger heifers drink 17 gal/day, a reasonable estimate of maximum daily discharge can be made. A conservative estimate is that the daily volume is supplied in an 8-hour period. Based on 1600 milking and dry cows and 500 heifers, an estimate for a peak day discharge for drinking water is 0.27 cfs. With a daily discharge of 0.07 cfs for commercial use, the total estimated daily discharge requirement would be 0.34 cfs. This is somewhat greater than the recommended 0.33 cfs rate.

I also estimated the annual volume requirement using the *Brockway Engineering Livestock Confinement Operations Water Requirements and Consumptive Use Worksheet* based on the Gooding County CAFO numbers. This worksheet was developed in conjunction with the University of Idaho Extension staff and has been utilized extensively. This worksheet estimates

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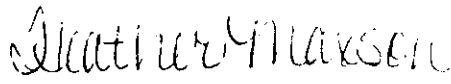
an annual total diversion requirement of 78.9 acre-feet (62.6 af for drinking water and 17.5 af for commercial). This estimate is in excess of the *IDWR Dairy Worksheet* estimate and considerably in excess of the proposed license volume of 66.0 acre feet per year.

Our experience in comparing the estimates using the *IDWR Dairy Worksheet* and the *Brockway Engineering Worksheet* with measured annual volumes is that both estimates are sometimes lower than measured volume use. This can result in the applicants being required to secure additional water to avoid violations of even recent licenses or transfers.

I believe that a reasonable diversion rate for this water right, based on the animal numbers allowed under the CAFO, should be at least 0.37 cfs (166 gpm). A reasonable annual diversion volume should be 79 acre-feet. This is based on the reported operation of the dairy, which includes no sprinklers in holding pens and also no flushing.

I am enclosing copies of the *IDWR Dairy Worksheet* and *Brockway Engineering Worksheet* for your information. Please let me know if you need additional information.

Sincerely,

  
for Charles E. Brockway P.E. PhD.

Enclosure: *IDWR Dairy Worksheet* for Dairy #2  
*Brockway Engineering Worksheet* for Dairy #2

THEORETICAL FLOW ESTIMATION WORKSHEET

REQUIRED DAIRY DATA

NUMBER OF MILKING CATTLE \_\_\_\_\_ 1300  
 NUMBER OF DRY CATTLE \_\_\_\_\_ 300  
 NUMBER OF REPLACEMENT CATTLE: 0-3 MONTHS \_\_\_\_\_ 0  
     3-4 MONTHS \_\_\_\_\_ 0  
     5-8 MONTHS \_\_\_\_\_ 0  
     9-12 MONTHS \_\_\_\_\_ 150  
     13-15 MONTHS \_\_\_\_\_ 150  
     16-24 MONTHS \_\_\_\_\_ 200  
 ENTER 1 FOR MANUAL COW WASHING, 2 FOR AUTOMATIC, OR 3 IF  
 SPRINKLERS ARE USED TO FLUSH HOLDING PEN AND WASH COWS \_\_\_\_\_ 1  
 IF SPRINKLERS ARE USED: NUMBER OF SPRINKLERS IN HOLDING PEN \_\_\_\_\_  
     NOZZLE DISCHARGE (USE 5.0 GPM IF UNKNOWN) \_\_\_\_\_  
     OPERATION TIME OF SPRINKLERS (MIN/DAY) \_\_\_\_\_  
 NUMBER OF MILKINGS PER DAY \_\_\_\_\_ 3  
 AVG. LBS. OF MILK PRODUCED PER DAY PER ANIMAL (IDAHO AVG IS 70 LBS.) \_\_\_\_\_ 69  
 HOURS PER DAY PUMP OPERATES FOR STOCKWATER USE \_\_\_\_\_ 8.0  
 HOURS PER DAY PUMP OPERATES FOR COMMERCIAL USE \_\_\_\_\_ 8.0  
 IS RECYCLED WATER USED TO FLUSH MILKHOUSE AND PARLOR FLOORS? \_\_\_\_\_ no  
 IS RECYCLED WATER USED TO WASH COWS? \_\_\_\_\_ no  
 IS A PLATE COOLER USED? \_\_\_\_\_ yes  
 IS RECYCLED WATER USED FOR PLATE COOLER? (IF NO PLATE COOLER,  
 LEAVE BLANK) \_\_\_\_\_ no  
 IF CORRAL MISTERS ARE USED: NUMBER OF MISTERS IN HOLDING PEN \_\_\_\_\_  
     NOZZLE DISCHARGE (GPM) \_\_\_\_\_  
     OPERATION TIME OF MISTERS (MIN/DAY) \_\_\_\_\_  
     DAYS PER YEAR MISTERS ARE USED \_\_\_\_\_

CALCULATIONS

DIVERSION RATE (CFR):

STOCKWATER  
 MILKING CATTLE (BASED ON MILK PRODUCTION) \_\_\_\_\_ 0.18  
 DRY CATTLE @17.0 GPM/HD \_\_\_\_\_ 0.02  
 REPLACEMENT CATTLE \_\_\_\_\_ 0.03  
 TOTAL \_\_\_\_\_ 0.23

COMMERCIAL  
 TOTAL \_\_\_\_\_ 0.07

TOTAL DIVERSION RATE \_\_\_\_\_ 0.30

DIVERSION VOLUME (AF/A):

STOCKWATER  
 MILKING CATTLE \_\_\_\_\_ 41.0  
 DRY CATTLE \_\_\_\_\_ 4.5  
 REPLACEMENT CATTLE \_\_\_\_\_ 4.9  
 TOTAL \_\_\_\_\_ 50.4

COMMERCIAL  
 WASHING OF BULK TANK AND RELATED EQUIPMENT \_\_\_\_\_ 0.8  
 BACKFLUSH \_\_\_\_\_ 2.2  
 PARLOR/MILKHOUSE/HOLDING PEN CLEANUP \_\_\_\_\_ 3.0  
 CATTLE WASHING BASED UPON METHOD OF WASHING \_\_\_\_\_ 2.2  
 PLATE COOLER \_\_\_\_\_ 11.6  
 CORRAL MISTERS \_\_\_\_\_ 0.0  
 TOTAL \_\_\_\_\_ 17.8

TOTAL DIVERSION VOLUME \_\_\_\_\_ 67.8

CONSUMPTIVE USE VOLUME (AF/A)(assuming 100% consumptive):

STOCKWATER \_\_\_\_\_ 50.4  
 COMMERCIAL \_\_\_\_\_ 17.8  
 TOTAL CONSUMPTIVE USE \_\_\_\_\_ 67.8

REQUIRED PUMP INFORMATION

|                                   | PUMP 1 | PUMP 2 | PUMP 3 | PUMP 4 | PUMP 5 |
|-----------------------------------|--------|--------|--------|--------|--------|
| PUMP HORSEPOWER (HP) _____        | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   |
| LIFT (FT) _____                   | 0      | 0      | 0      | 0      | 0      |
| DISCHARGE PRESSURE (PSI) _____    | 0      | 0      | 0      | 0      | 0      |
| FRICTION LOSSES (FT) _____        | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| HOURS PER DAY PUMP OPERATES _____ | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

CALCULATIONS

|                                     | PUMP 1 | PUMP 2 | PUMP 3 | PUMP 4 | PUMP 5 |
|-------------------------------------|--------|--------|--------|--------|--------|
| THEORETICAL FLOW RATE (CFS) * _____ | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   |
| DIVERSION VOLUME (AF/A) ** _____    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

\* PUMP EFFICIENCY WAS ASSUMED TO BE 70%

\*\* DIVERSION VOLUME IS THE ABSOLUTE MAXIMUM VOLUME BASED ON THE  
 THEORETICAL FLOW RATE ASSUMING PUMP RUNS EVERY DAY OF THE YEAR

EVALUATION OF EQUIVALENT IRRIGATED ACREAGE

IRRIGATION RIGHT (BEFORE CHANGE)

DIVERSION RATE \_\_\_\_\_ 2.10 CFS  
 ACRES OF IRRIGATION \_\_\_\_\_ 155.0 ACRES  
 DIVERSION VOLUME \_\_\_\_\_ 4.0 AC FT/AC  
 CONSUMPTIVE USE VOLUME \_\_\_\_\_ 0.0 AC FT/AC  
 IRRIGATION IS BEING CONVERTED FOR WHICH PORTION OF THE  
 DAIRY OPERATION: STOCKWATER (S), COMMERCIAL (C) OR  
 BOTH (B)? \_\_\_\_\_ B

CALCULATIONS

|                                                         |              |
|---------------------------------------------------------|--------------|
| IRRIGATION DIVERSION RATE PER ACRE _____                | 0.014 CFS/AC |
| REDUCTION OF IRRIGATION BASED ON DIVERSION RATE _____   | 22.1 ACRES   |
| REDUCTION OF IRRIGATION BASED ON DIVERSION VOLUME _____ | 17.0 ACRES   |
| REDUCTION OF IRRIGATION BASED ON CONSUMPTIVE USE _____  | 0.0 ACRES    |

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 Southern District

# Livestock Confinement Operations

## Water Requirements and Consumptive Use Worksheet

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Department of Water Resources  
Clark County, Nevada

COMPLETE BLUE HIGHLIGHTED SECTIONS ONLY

Prepared for: DeWitt Dairy  
2011 Bob Barton HWY  
Wendell ID 83355

Revision: 9801  
Run Date: 4/23/03

Remarks: Evaluation of water requirements for amendment for licensing water right 36-08491 Dairy #2  
Animal numbers based on R. Williams letter

### Herd Information - User Input

Number of milking cows 1200  
Number of dry cows 300  
Number of other adult dry animals 0

Breed: Large

#### Calves at age:

1 month 0  
2 months 0  
3 months 0  
4 months 0

#### Heifers at age:

5 months 150  
15 - 18 months 150  
18 - 24 months 300  
Total 300

### ANIMAL INFORMATION

Use defaults or enter values if known

Average body weight 1400 lbs

Milk fat percentage 3.6 %

Average days dry 60

Annual milk yield per animal 26000 lbs/year

Percent dry matter in ration 90 %

Nearest weather station Jerome

Number of milkings/day 3

Check: Total herd size based on days dry 1825

### Lagoon Information - User Input

| Lagoon Number | Top width | Top length | SS (h:v) | Max depth | Average depth factor | % days with water | Top Area | Bottom Area | Average Area |
|---------------|-----------|------------|----------|-----------|----------------------|-------------------|----------|-------------|--------------|
| 1 Est         | 200       | 200        | 2        | 8         | 0.5                  | 90                | 40000    | 33856       | 36928        |
| 2             | 0         | 0          | 0        | 0         | 0                    | 0                 | 0        | 0           | 0            |
| 3             | 0         | 0          | 0        | 0         | 0                    | 0                 | 0        | 0           | 0            |
| 4             | 0         | 0          | 0        | 0         | 0                    | 0                 | 0        | 0           | 0            |
| 5             | 0         | 0          | 0        | 0         | 0                    | 0                 | 0        | 0           | 0            |
| 6             | 0         | 0          | 0        | 0         | 0                    | 0                 | 0        | 0           | 0            |
| 7             | 0         | 0          | 0        | 0         | 0                    | 0                 | 0        | 0           | 0            |
| 8             | 0         | 0          | 0        | 0         | 0                    | 0                 | 0        | 0           | 0            |
| 9             | 0         | 0          | 0        | 0         | 0                    | 0                 | 0        | 0           | 0            |
| 10            | 0         | 0          | 0        | 0         | 0                    | 0                 | 0        | 0           | 0            |
| TOTAL ACRES   |           |            |          |           |                      |                   | 0.92     | 0.78        | 0.85         |

## Facility Information - LCO Input

|                                          | Holding<br>Pen 1 | Holding<br>Pen 2 |                                        |
|------------------------------------------|------------------|------------------|----------------------------------------|
| Holding pen active                       | 0                | 0                | (0 = not used or nonexistent)          |
| Number of sprinklers in pen              | 0                | 0                |                                        |
| Average line pressure                    | 50               | 60               | psi                                    |
| Sprinkler nozzle size - primary          | 5/32             | 5/32             | inches                                 |
| Sprinkler nozzle size - secondary        | 9/64             | 0                | (enter 0 for single-nozzle sprinklers) |
| Daily operation time of sprinklers       | 96               | 0                | minutes                                |
| Percent of days per year cows are washed | 100              | 0                | %                                      |

|                           |        |
|---------------------------|--------|
| Number of free stalls     | 0      |
| Length of each free stall | 0 feet |
| Width of each free stall  | 0 feet |

Is the feeding area flushed to lagoon?  
Is this housing area flushed to lagoon?

No  
No

Flushing recycle rate

| Barn | Feeding | Housing |
|------|---------|---------|
| 0    | 0       |         |

### CLEANING / FLUSHING VOLUMES

Use defaults or enter manufacturer volumes

|                                        |          |                    |         |
|----------------------------------------|----------|--------------------|---------|
| Cleaning parlor floor                  | 3000 gal | Cleaning pipeline  | 400 gal |
| Cleaning milking room                  | 200 gal  | Cleaning equipment | 200 gal |
| Cleaning bulk tank                     | 400 gal  |                    |         |
| Additional flush of holding pen (opt.) | gal      |                    |         |

## Land Application Information - User Input

|                      |              |
|----------------------|--------------|
| Type of system       | Center Pivot |
| Predominant cropping | Alfalfa      |

Percent of waste water which goes  
to meet crop irrigation requirement

90 %

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Southern Region

## Stockwater Component

### Drinking Water Calculation for Lactating Cows

|                             |                |
|-----------------------------|----------------|
| 4% fat-corrected milk yield | 24440 lbs/year |
| Daily average FCM yield     | 80.13 lbs/day  |
| Daily average milk yield    | 85.25 lbs/day  |
| Estimated DMI               | 53.18 lbs/day  |

#### METHOD 1: Kertz

|                                    |                                  |
|------------------------------------|----------------------------------|
| Estimated total water intake (TWI) | 318.4 lbs/day or<br>38.2 gal/day |
| As-fed feed daily intake           | 59.1 as-fed lb/day               |
| Water content of feed              | 5.91 lb/day in feed              |
| Drinking water intake              | 312.5 lb/day or<br>37.5 gal/day  |

Drinking water requirement  
for lactating cows

44970 gal/day  
50.4 ac-ft/year

#### METHOD 2: Holter and Urban

Regression equation with DMI, milk production, and dry matter %

Drinking water intake      111.0 liters/day  
29.3 gal/day

35182 gal/day  
39.4 ac-ft/year

Maximum drinking water requirement      50.4 ac-ft/year

### Drinking Water Calculation for Dry Cows

|                               |              |
|-------------------------------|--------------|
| Estimated DMI                 | 26.6 lbs/day |
| Average drinking water intake | 13 gal/day   |

Average drinking water requirement      3900 gal/day  
4.4 ac-ft/year

### Drinking Water Calculation for Replacement Herd (Calves and Heifers)

| Age      | GPD | Ac-Ft/year |
|----------|-----|------------|
| 1 mo     | 0   | 0.00       |
| 2 mo     | 0   | 0.00       |
| 3 mo     | 0   | 0.00       |
| 4 mo     | 0   | 0.00       |
| 5 mo     | 630 | 0.71       |
| 15-18 mo | 975 | 1.09       |
| 18-24 mo | 0   | 0.00       |

Drinking water requirement      1605      1.80  
for replacement herd      gpd      ac-ft/year

TOTAL STOCKWATER COMPONENT      56.5      AC-FT/YEAR

APR 20 2003  
Department of Water Resources  
Bureau of Water

## Consumptive Use Calculation

### A. Lagoon Evaporation

|                                                |                 |         |
|------------------------------------------------|-----------------|---------|
| Annual reference ET (Allen & Brockway , 1983)  | 4.51 feet       |         |
| Annual open water coeff (Kohler Nordenson Fox) | 0.90            |         |
| Annual open water (lagoon) evaporation         | 4.06 feet       |         |
| Manual override: Input annual lagoon evap      | feet            |         |
| Total lagoon water surface area at full        | 40000 sq. ft.   |         |
| Total lagoon bottom area                       | 33856 sq. ft.   |         |
| Average surface area when water is present     | 33235 sq. ft. = | 0.76 ac |

Total lagoon evaporation

**3.10 ac-ft/year**

### B. Animal usage: milk, metabolism, and excretion loss

|                                                  |                   |                                    |
|--------------------------------------------------|-------------------|------------------------------------|
|                                                  | Milking           | Dry                                |
| Waste excretion volume per cow                   | 1.3               | 1.3 ft <sup>3</sup> /day/1000lb    |
| Water content                                    | 87.5              | 88.4 %                             |
| Total water volume in excrement                  | 14294             | 3610 gal/day                       |
| Percent of excrement flushed to lagoons          | 15 %              | (based on areas which are flushed) |
| Consumptive use (evap.) of water in excrement    | 85 %              |                                    |
| Consumptive use (evap.) volume                   | 15219 gal/day     |                                    |
| Excrement c.u. attributable to drinking water    | 14937 gal/day     |                                    |
| Total milk production - assume 100% leaves site  | 102295 lbs/day or | 12266 gal/day                      |
| Water content of milk                            | 10671 gal/day     |                                    |
| Water content attributable to drinking water     | 10473 gal/day     |                                    |
| Water use for animal metabolism                  | 21144 gal/day     |                                    |
| Metabolism water attributable to drinking water  | 20752 gal/day     |                                    |
| Consumptive use - replacement herd (100%)        | 1605 gal/day      |                                    |
| Total animal consumptive use from drinking water | 47767 gal/day or  | <b>53.5 ac-ft/year</b>             |
| Percent of drinking water intake                 | 97.7 %            |                                    |

### C. Parlor/holding pen cleanup

|                                            |                        |            |
|--------------------------------------------|------------------------|------------|
| Average sprinkler washing system evap loss | 2 %                    |            |
| Free stall total area                      | 0 sq. ft. =            | 0.00 acres |
| Length of time free stall concrete is wet  | 1 hr/day               |            |
| Average evaporation from wet concrete      | 0.15 in./day           |            |
| Sprinkler system loss volume               | 0.00 ac-ft/year        |            |
| Free stall evaporation volume              | 0.00 ac-ft/year        |            |
| Total cleanup loss                         | <b>0.00 ac-ft/year</b> |            |

### D. Land application site

|                                                   |                        |  |
|---------------------------------------------------|------------------------|--|
| Crop evapotranspiration                           | 3.29 ac-ft/ac/year     |  |
| Irrigation diversion volume                       | 4.11 ac-ft/ac/year     |  |
| System efficiency                                 | 80 %                   |  |
| Waste water volume to lagoons                     | 19.2 ac-ft/year        |  |
| Waste water volume available for land application | 16.1 ac-ft/year        |  |
| Total crop consumptive use of waste water         | <b>11.6 ac-ft/year</b> |  |

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Department of Water Resources  
University of California, Davis

## Commercial Component

### Milking Parlor Water Usage Calculation

Volume needed per milking in each parlor for:

|                       |          |                    |         |
|-----------------------|----------|--------------------|---------|
| Cleaning parlor floor | 3000 gal | Cleaning pipeline  | 400 gal |
| Cleaning milkroom     | 200 gal  | Cleaning equipment | 200 gal |
| Cleaning bulk tank    | 400 gal  | Cleaning cows      | 600 gal |

|                              |               |
|------------------------------|---------------|
| Total milking parlor volume  | 14400 gal/day |
| Second milking parlor volume | 0 gal/day     |
| Recycled water               | 0 gal/day     |

16.13 ac-ft/year

### Holding Pen Water Usage Calculation

|                             | Pen 1 | Pen 2     |
|-----------------------------|-------|-----------|
| Output of primary nozzle    | 5.02  | 5.5 gpm   |
| Output of secondary nozzle  | 4.07  | 0 gpm     |
| Holding pen flushing volume | 0     | 0 gal     |
| Additional flush volume     | 0     | 0 gal     |
| Sprinkler volume            | 0     | 0 gal/day |
| Total holding pen volume    | 0     | 0 gal/day |
| Recycled water              | 0     | 0 gal/day |

0.00 ac-ft/year

### Other Flushing Water Calculation

Daily volume needed for:

|                       |           |
|-----------------------|-----------|
| Feeding area flushing | 0 gal/day |
| Housing area flushing | 0 gal/day |

|                             |           |
|-----------------------------|-----------|
| Total other flushing volume | 0 gal/day |
| Recycled water              | 0         |

0.00 ac-ft/year

TOTAL COMMERCIAL COMPONENT 16.1 AC-FT/YEAR

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Southern Region

## Consumptive Use Calculation

### A. Lagoon Evaporation

|                                                |                 |         |
|------------------------------------------------|-----------------|---------|
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| Annual open water coeff (Kohler Nordenson Fox) | 0.90            |         |
| Annual open water (lagoon) evaporation         | 4.06 feet       |         |
| Manual override: Input annual lagoon evap      | feet            |         |
| Total lagoon water surface area at full        | 40000 sq. ft.   |         |
| Total lagoon bottom area                       | 33856 sq. ft.   |         |
| Average surface area when water is present     | 33235 sq. ft. = | 0.76 ac |
| Total lagoon evaporation                       | 3.10 ac-ft/year |         |

### B. Animal usage: milk, metabolism, and excretion loss

|                                                  | Milking                                 | Dry                             |
|--------------------------------------------------|-----------------------------------------|---------------------------------|
| Waste excretion volume per cow                   | 1.3                                     | 1.3 ft <sup>3</sup> /day/1000lb |
| Water content                                    | 87.5                                    | 88.4 %                          |
| Total water volume in excrement                  | 14294                                   | 3610 gal/day                    |
| Percent of excrement flushed to lagoons          | 15 % (based on areas which are flushed) |                                 |
| Consumptive use (evap.) of water in excrement    | 85 %                                    |                                 |
| Consumptive use (evap.) volume                   | 15219 gal/day                           |                                 |
| Excrement c.u. attributable to drinking water    | 14937 gal/day                           |                                 |
| Total milk production - assume 100% leaves site  | 102295 lbs/day or                       | 12266 gal/day                   |
| Water content of milk                            | 10671 gal/day                           |                                 |
| Water content attributable to drinking water     | 10473 gal/day                           |                                 |
| Water use for animal metabolism                  | 21144 gal/day                           |                                 |
| Metabolism water attributable to drinking water  | 20752 gal/day                           |                                 |
| Consumptive use - replacement herd (100%)        | 1605 gal/day                            |                                 |
| Total animal consumptive use from drinking water | 47767 gal/day or                        | 53.5 ac-ft/year                 |
| Percent of drinking water intake                 | 97.7 %                                  |                                 |

### C. Parlor/holding pen cleanup

|                                            |                 |            |
|--------------------------------------------|-----------------|------------|
| Average sprinkler washing system evap loss | 2 %             |            |
| Free stall total area                      | 0 sq. ft. =     | 0.00 acres |
| Length of time free stall concrete is wet  | 1 hr/day        |            |
| Average evaporation from wet concrete      | 0.15 in./day    |            |
| Sprinkler system loss volume               | 0.00 ac-ft/year |            |
| Free stall evaporation volume              | 0.00 ac-ft/year |            |
| Total cleanup loss                         | 0.00 ac-ft/year |            |

### D. Land application site

|                                                   |                    |  |
|---------------------------------------------------|--------------------|--|
| Crop evapotranspiration                           | 3.29 ac-ft/ac/year |  |
| Irrigation diversion volume                       | 4.11 ac-ft/ac/year |  |
| System efficiency                                 | 80 %               |  |
| Waste water volume to lagoons                     | 19.2 ac-ft/year    |  |
| Waste water volume available for land application | 16.1 ac-ft/year    |  |
| Total crop consumptive use of waste water         | 11.6 ac-ft/year    |  |

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Department of Water Resources  
Southern Region

## Summary

### Drinking Water

|                                       |      |
|---------------------------------------|------|
| Milking herd                          | 50.4 |
| Non-milking herd (dry cows)           | 4.4  |
| Replacement herd (calves and heifers) | 1.8  |

|                             |                 |
|-----------------------------|-----------------|
| Total drinking water volume | 56.5 ac-ft/year |
|-----------------------------|-----------------|

### Commercial

|                         |       |
|-------------------------|-------|
| Milking parlor          | 16.13 |
| Holding pen and cleanup | 0.0   |
| Other flushing water    | 0.00  |

|                         |                 |
|-------------------------|-----------------|
| Total commercial volume | 16.1 ac-ft/year |
|-------------------------|-----------------|

|                                    |               |
|------------------------------------|---------------|
| TOTAL DIVERSION VOLUME REQUIREMENT | 72.7 AC-FT/YR |
|------------------------------------|---------------|

### Consumptive Use

|                                          |      |
|------------------------------------------|------|
| Lagoon evaporation                       | 3.10 |
| Animal milk, excretion, & metabolism     | 53.5 |
| Parlor and holding pen cleanup           | 0.00 |
| Crop consumptive use on land application | 11.6 |

|                       |                 |
|-----------------------|-----------------|
| Total consumptive use | 68.2 ac-ft/year |
|-----------------------|-----------------|

|                                      |        |
|--------------------------------------|--------|
| Percent of diversion volume consumed | 93.8 % |
|--------------------------------------|--------|

|                                              |         |
|----------------------------------------------|---------|
| Annual crop consumptive use - IDWR allowable | 3.0 afa |
|----------------------------------------------|---------|

|                            |            |
|----------------------------|------------|
| Equivalent irrigated acres | 22.7 acres |
|----------------------------|------------|

|                                             |               |
|---------------------------------------------|---------------|
| Diversion volume to acres conversion factor | 3.20 ac-ft/ac |
|---------------------------------------------|---------------|

RECEIVED

APR 30 2003

Department of Water Resources  
Southern Region

STATE OF IDAHO  
DEPARTMENT OF WATER RESOURCES

USE TYPEWRITER OR  
BALLPOINT PEN

# WELL DRILLER'S REPORT

State law requires that this report be filed with the Director, Department of Water Resources within 30 days after the completion or abandonment of the well.

| <p><b>1. WELL OWNER</b></p> <p>Name: <u>Neil DeWitt</u></p> <p>Address: <u>2011 Bob Baiten Hwy Wendell</u></p> <p>Owner's Permit No. <u>36-81-5-087</u></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <p><b>7. WATER LEVEL</b></p> <p>Static water level <u>100</u> feet below land surface.</p> <p>Flowing? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No G.P.M. flow _____</p> <p>Artesian closed-in pressure _____ p.s.i.</p> <p>Controlled by: <input type="checkbox"/> Valve <input type="checkbox"/> Cap <input type="checkbox"/> Plug</p> <p>Temperature <u>-85</u> °F. Quality _____</p> <p><small>Describe artesian or temperature zones below.</small></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                  |                         |              |                     |                     |               |                |    |     |    |   |   |   |          |                                                                                                 |  |   |   |    |                      |      |    |   |    |    |                      |  |  |   |    |    |                                                                                                                                                                                                                                                                                                                                                                                              |  |  |   |    |    |                      |  |  |   |    |    |                         |  |  |   |    |    |           |  |  |   |    |     |           |  |  |   |     |     |      |  |  |   |     |     |      |  |  |   |     |     |      |  |  |   |     |     |           |  |  |   |     |     |      |  |  |   |     |     |        |  |  |   |     |     |      |  |  |   |     |     |           |  |  |   |     |     |      |  |  |
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---|----|----------------------|--|--|---|----|----|-------------------------|--|--|---|----|----|-----------|--|--|---|----|-----|-----------|--|--|---|-----|-----|------|--|--|---|-----|-----|------|--|--|---|-----|-----|------|--|--|---|-----|-----|-----------|--|--|---|-----|-----|------|--|--|---|-----|-----|--------|--|--|---|-----|-----|------|--|--|---|-----|-----|-----------|--|--|---|-----|-----|------|--|--|
| <p><b>2. NATURE OF WORK</b></p> <p><input checked="" type="checkbox"/> New well <input type="checkbox"/> Deepened <input type="checkbox"/> Replacement</p> <p><small>Describe diameter increase</small></p> <p><small>Abandoned (describe abandonment procedures such as materials, plug depths, etc. in lithologic log)</small></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <p><b>8. WELL TEST DATA</b></p> <p><input type="checkbox"/> Pump <input type="checkbox"/> Bailor <input type="checkbox"/> Air <input type="checkbox"/> Other _____</p> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Discharge G.P.M.</th> <th>Pumping Level</th> <th>Hours Pumped</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Discharge G.P.M. | Pumping Level           | Hours Pumped |                     |                     |               |                |    |     |    |   |   |   |          |                                                                                                 |  |   |   |    |                      |      |    |   |    |    |                      |  |  |   |    |    |                                                                                                                                                                                                                                                                                                                                                                                              |  |  |   |    |    |                      |  |  |   |    |    |                         |  |  |   |    |    |           |  |  |   |    |     |           |  |  |   |     |     |      |  |  |   |     |     |      |  |  |   |     |     |      |  |  |   |     |     |           |  |  |   |     |     |      |  |  |   |     |     |        |  |  |   |     |     |      |  |  |   |     |     |           |  |  |   |     |     |      |  |  |
| Discharge G.P.M.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       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                                                                                                                                                                                                                           | Hours Pumped     |                         |              |                     |                     |               |                |    |     |    |   |   |   |          |                                                                                                 |  |   |   |    |                      |      |    |   |    |    |                      |  |  |   |    |    |                                                                                                                                                                                                                                                                                                                                                                                              |  |  |   |    | 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| <p><b>3. PROPOSED USE</b></p> <p><input type="checkbox"/> Domestic <input type="checkbox"/> Irrigation <input type="checkbox"/> Test <input type="checkbox"/> Municipal</p> <p><input type="checkbox"/> Industrial <input type="checkbox"/> Stock <input type="checkbox"/> Waste Disposal or Injection</p> <p><input checked="" type="checkbox"/> Other <u>Dairy - Commercial</u> (specify type)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <p><b>9. LITHOLOGIC LOG</b></p> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Bore Diam.</th> <th colspan="2">Depth</th> <th rowspan="2">Material</th> <th colspan="2">Water</th> </tr> <tr> <th>From</th> <th>To</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr><td>8</td><td>0</td><td>5</td><td>Top soil</td><td> </td><td> </td></tr> <tr><td>8</td><td>5</td><td>19</td><td>Hard Lava Rock Black</td><td> </td><td> </td></tr> <tr><td>8</td><td>19</td><td>21</td><td>Hard Lava Rock Black</td><td> </td><td> </td></tr> <tr><td>8</td><td>21</td><td>23</td><td>Reddish Brown Clay</td><td> </td><td> </td></tr> <tr><td>8</td><td>23</td><td>25</td><td>Hard Lava Rock Black</td><td> </td><td> </td></tr> <tr><td>8</td><td>25</td><td>27</td><td>Clay with Lvs. C. Hinge</td><td> </td><td> </td></tr> <tr><td>8</td><td>27</td><td>30</td><td>Hard Lava</td><td> </td><td> </td></tr> <tr><td>8</td><td>30</td><td>105</td><td>Med. Hard</td><td> </td><td> </td></tr> <tr><td>8</td><td>105</td><td>115</td><td>Hard</td><td> </td><td> </td></tr> <tr><td>8</td><td>115</td><td>121</td><td>Clay</td><td> </td><td> </td></tr> <tr><td>8</td><td>121</td><td>125</td><td>Hard</td><td> </td><td> </td></tr> <tr><td>8</td><td>125</td><td>130</td><td>Med. Hard</td><td> </td><td> </td></tr> <tr><td>8</td><td>130</td><td>135</td><td>Clay</td><td> </td><td> </td></tr> <tr><td>8</td><td>135</td><td>138</td><td>Gravel</td><td> </td><td> </td></tr> <tr><td>8</td><td>138</td><td>141</td><td>Clay</td><td> </td><td> </td></tr> <tr><td>8</td><td>141</td><td>148</td><td>Soft Rock</td><td> </td><td> </td></tr> <tr><td>8</td><td>148</td><td>155</td><td>Hard</td><td> </td><td> </td></tr> </tbody> </table> | Bore Diam.       | Depth                   |              | Material            | Water               |               | From           | To | Yes | No | 8 | 0 | 5 | Top soil |                                                                                                 |  | 8 | 5 | 19 | Hard Lava Rock Black |      |    | 8 | 19 | 21 | Hard Lava Rock Black |  |  | 8 | 21 | 23 | Reddish Brown Clay                                                                                                                                                                                                                                                                                                                                                                           |  |  | 8 | 23 | 25 | Hard Lava Rock Black |  |  | 8 | 25 | 27 | Clay with Lvs. C. Hinge |  |  | 8 | 27 | 30 | Hard Lava |  |  | 8 | 30 | 105 | Med. Hard |  |  | 8 | 105 | 115 | Hard |  |  | 8 | 115 | 121 | Clay |  |  | 8 | 121 | 125 | Hard |  |  | 8 | 125 | 130 | Med. Hard |  |  | 8 | 130 | 135 | Clay |  |  | 8 | 135 | 138 | Gravel |  |  | 8 | 138 | 141 | Clay |  |  | 8 | 141 | 148 | Soft Rock |  |  | 8 | 148 | 155 | Hard |  |  |
| Bore Diam.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             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                                                                                                                                                                                                                           | 19               | Hard Lava Rock Black    |              |                     |                     |               |                |    |     |    |   |   |   |          |                                                                                                 |  |   |   |    |                      |      |    |   |    |    |                      |  |  |   |    |    |                                                                                                                                                                                                                                                                                                                                                                                              |  |  |   |    | 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                                                                                                                                                                                                                           | 23               | Reddish Brown Clay      |              |                     |                     |               |                |    |     |    |   |   |   |          |                                                                                                 |  |   |   |    |                      |      |    |   |    |    |                      |  |  |   |    |    |                                                                                                                                                                                                                                                                                                                                                                                              |  |  |   |    | 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                                                                                                                                                                                                                           | 25               | Hard Lava Rock Black    |              |                     |                     |               |                |    |     |    |   |   |   |          |                                                                                                 |  |   |   |    |                      |      |    |   |    |    |                      |  |  |   |    |    |                                                                                                                                                                                                                                                                                                                                                                                              |  |  |   |    | 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Hard               |              |                     |                     |               |                |    |     |    |   |   |   |          |                                                                                                 |  |   |   |    |                      |      |    |   |    |    |                      |  |  |   |    |    |                                                                                                                                                                                                                                                                                                                                                                                              |  |  |   |    |    |                      |  |  |   |    |    |                         |  |  |   |    |    |           |  |  |   |    |     |           |  |  |   |     |     |      |  |  |   |     |     |      |  |  |   |     |     |      |  |  |   |     |     |           |  |  |   |     |     |      |  |  |   |     |     |        |  |  |   |     |     |      |  |  |   |     |     |           |  |  |   |     |     |      |  |  |
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| <p><b>4. METHOD DRILLED</b></p> <p><input checked="" type="checkbox"/> Rotary <input checked="" type="checkbox"/> Air <input type="checkbox"/> Hydraulic <input type="checkbox"/> Reverse rotary</p> <p><input type="checkbox"/> Cable <input type="checkbox"/> Dug <input type="checkbox"/> Other _____</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <p><b>10.</b></p> <p>Work started <u>Nov 1<sup>st</sup> 89</u> finished <u>Nov 2<sup>nd</sup> 89</u></p>                                                                                                                                                                                                                                                                                                                                                                                                                               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| <p><b>5. WELL CONSTRUCTION</b></p> <p>Casing schedule: <input checked="" type="checkbox"/> Steel <input type="checkbox"/> Concrete <input type="checkbox"/> Other _____</p> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Thickness</th> <th>Diameter</th> <th>From</th> <th>To</th> </tr> </thead> <tbody> <tr> <td><u>0.025</u> inches</td> <td><u>8 7/8</u> inches</td> <td><u>1</u> feet</td> <td><u>19</u> feet</td> </tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table> <p>Was casing drive shoe used? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>Was a packer or seal used? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>Perforated? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>How perforated? <input type="checkbox"/> Factory <input type="checkbox"/> Knife <input type="checkbox"/> Torch <input type="checkbox"/> Gun</p> <p>Size of perforation _____ inches by _____ inches</p> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Number</th> <th>From</th> <th>To</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table> <p>Well screen installed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>Manufacturer's name _____</p> <p>Type _____ Model No. _____</p> <p>Diameter _____ Slot size _____ Set from _____ feet to _____ feet</p> <p>Diameter _____ Slot size _____ Set from _____ feet to _____ feet</p> <p>Gravel packed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Size of gravel _____</p> <p>Placed from _____ feet to _____ feet</p> <p>Surface seal depth <u>19</u> ft. Material used in seal: <input type="checkbox"/> Cement grout <input checked="" type="checkbox"/> Bentonite <input type="checkbox"/> Pudding clay <input type="checkbox"/> _____</p> <p>Sealing procedure used: <input type="checkbox"/> Slurry pit <input type="checkbox"/> Temp. surface casing <input type="checkbox"/> Overbore to seal depth</p> <p>Method of joining casing: <input type="checkbox"/> Threaded <input type="checkbox"/> Welded <input type="checkbox"/> Solvent Weld</p> <p><input type="checkbox"/> Cemented between strata</p> <p>Describe access port _____</p> | Thickness                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Diameter         | From                    | To           | <u>0.025</u> inches | <u>8 7/8</u> inches | <u>1</u> feet | <u>19</u> feet |    |     |    |   |   |   |          |                                                                                                 |  |   |   |    | Number               | From | To |   |    |    |                      |  |  |   |    |    | <p><b>11. DRILLERS CERTIFICATION</b></p> <p>I/We certify that all minimum well construction standards were complied with at the time the rig was removed.</p> <p>Firm Name <u>Eaton Drilling</u> Firm No. <u>26</u></p> <p>Address <u>Wendell</u> Date <u>13<sup>th</sup> Nov 89</u></p> <p>Signed by (Firm Official) <u>[Signature]</u></p> <p>and (Operator) <u>Robert W. Peterson</u></p> |  |  |   |    |    |                      |  |  |   |    |    |                         |  |  |   |    |    |           |  |  |   |    |     |           |  |  |   |     |     |      |  |  |   |     |     |      |  |  |   |     |     |      |  |  |   |     |     |           |  |  |   |     |     |      |  |  |   |     |     |        |  |  |   |     |     |      |  |  |   |     |     |           |  |  |   |     |     |      |  |  |
| Thickness                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              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| <p><b>6. LOCATION OF WELL</b></p> <p>Sketch map location must agree with written location.</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">N</td> <td colspan="4"></td> </tr> <tr> <td style="text-align: center;">W</td> <td style="text-align: center;">27</td> <td style="text-align: center;">E</td> <td colspan="2"></td> </tr> <tr> <td style="text-align: center;">S</td> <td colspan="4"></td> </tr> </table> <p>Subdivision Name _____</p> <p>Lot No. _____ Block No. _____</p> <p>County <u>Gooding</u></p> <p><u>NW 1/4 Sec. 27 T. 8 S. R. 15 E. X</u></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                  |                         |              |                     | W                   | 27            | E              |    |     | S  |   |   |   |          | <p><b>12. USE ADDITIONAL SHEETS IF NECESSARY - FORWARD THE WHITE COPY TO THE DEPARTMENT</b></p> |  |   |   |    |                      |      |    |   |    |    |                      |  |  |   |    |    |                                                                                                                                                                                                                                                                                                                                                                                              |  |  |   |    |    |                      |  |  |   |    |    |                         |  |  |   |    |    |           |  |  |   |    |     |           |  |  |   |     |     |      |  |  |   |     |     |      |  |  |   |     |     |      |  |  |   |     |     |           |  |  |   |     |     |      |  |  |   |     |     |        |  |  |   |     |     |      |  |  |   |     |     |           |  |  |   |     |     |      |  |  |
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