Hearing Documents

File 3 of 5

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September 12, 2006

RECEIVED
SEP 14 2006
DEPARTMENT OF
WATER RESOURCES

Gary Spackman
Hearing Officer
Idaho Department of Water Resources
PO Box 83720
Boise, Idaho 83720-0098

RE: Diamond A Livestock

Dear Mr. Spackman:

Pursuant to your Order to Augment Record, dated August 24, 2006, please find enclosed the originals of the following:

A. Affidavit of Robert Ohlensehlen dated September 12, 2006 with Exhibits A, B and C attached.

B. Second Affidavit of Robert Ohlensehlen dated September 12, 2006.

It is my understanding that the Affidavits and related exhibits will be included in the record pursuant to your Order.

Very truly yours,

FREDERICKSEN WILLIAMS MESERVY & LOTHSPEICH, LLP

ROBERT E. WILLIAMS

REW/bsb
Encl.
c: Diamond A Livestock, Inc.
Heidi Olson
Polly Ann Huggins
Nichole Reed
Le Ann Reed
Steve Paulin
Christine Davis
Robert Ohlensehlen
\\Ws4\c\data\Faulkner - Diamond A\Spackman 09 12 06.doc

ROBERT E. WILLIAMS
IDAHO STATE BAR NO. 1693
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Attorney for Applicant Diamond A. Livestock, Inc.

BEFORE THE DEPARTMENT OF WATER RESOURCES

OF THE STATE OF IDAHO

IN THE MATTER OF APPLICATIONS FOR TRANSFER NOS. 72177 & 72178 DIAMOND A LIVESTOCK, INC. Applicant HEIDI OLSON, POLLY ANN HUGGINS, NICOLE REED, STEVE PAULIN, LEANN REED, & CHRISTINE DAVIS, Protestants	SOURCE: Groundwater County: Gooding SECOND AFFIDAVIT OF ROBERT OHLENSEHLEN

STATE OF IDAHO)
:ss.
County of Jerome)

ROBERT OHLENSEHLEN, first being duly sworn, deposes and says as follows:

1. I am a certified Nutrient Management Planner for the Idaho Department of Agriculture.

2. I have substantial experience in preparing Nutrient Management Plans within the State of Idaho and have acted as a University of Idaho Extension Agent, specializing in dairy related matters for many years.

3. This Affidavit is based upon my personal knowledge.

4. Recently, questions have arisen about the presence of phosphorus in excess of "threshold" limits in many fields related to dairies in Gooding County, Idaho.

5. Phosphorus is not necessarily a contaminate. Idaho has chosen to make it the limiting nutrient for livestock manure application. Although phosphorus has not been shown to be detrimental to animals, humans or plants even at levels much higher than those reported on some fields in Gooding County, Idaho, the Idaho Department of Agriculture has chosen phosphorus as the limiting nutrient because of the impact it can have, under certain conditions, on surface water.

6. Many other states have chosen to make nitrogen the limiting nutrient in terms of manure application. In some midwestern states, levels of phosphorus as high as 2500 ppm are associated with nitrogen levels that are otherwise appropriate. In any case, application of dairy and beef manure to fields to provide the amount of nitrogen needed will result in double the amount of phosphorus needed.

7. In Idaho where soils have a high potential for surface water runoff the threshold levels for phosphorus have been established at 40 ppm. Where soils have low potential for surface water runoff and the soils are more than 60" deep the threshold has been established at 30 ppm. Shallow soils (less than 60") have 20 ppm threshold limits. Presently, in soils where the threshold level of phosphorus has not been reached, livestock manure may be legally applied to the nitrogen level. It is my opinion that continued application at this level would insure the phosphorus threshold level to be reached at some point. When that threshold level is reached, the application of manure to soil is limited to crop uptake amounts sometimes referred to as the crop removal level.

8. It is not correct that if a threshold limit for phosphorus is reached, normal production of crops can no longer be accomplished. The threshold level is simply a point at which a producer must evaluate the practices they are currently employing to produce crops to limit the potential for increasing phosphorus levels even more.

9. Concerning the recent publication of data regarding excessive phosphorus levels associated with dairies in Gooding County, I have the following comments:

A. The statistics used may not represent a cross section of the dairies in the county but arbitrary samples of Idaho Department of Agriculture.

B. The data reported represents only approximately 10 % of the total land being used for manure application.

C. The data does not indicate what the trend on those fields represents. Are the numbers increasing or decreasing? Some fields may actually be improving under Nutrient Management Planning.

D. Were the fields in question a surface water resource concern or a ground water resource concern? Wells are tested at different levels depending on which resource is the concern. Since phosphorus is not highly mobile in the soil, phosphorus readings in the 0" – 12" level may be high while low in the 18" – 24" level where the test must be taken for ground water resource concerns.

E. Higher phosphorus levels may be expected if testing was done in the spring when the manure was being applied to fields. The testing would be lower after a growing season when the nutrients would have been uptaken.

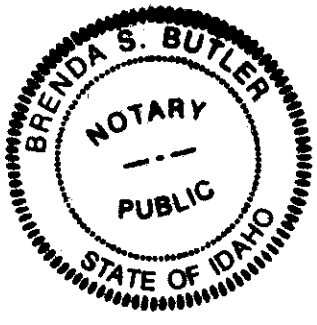
F. The testing does not recognize that there is a substantial amount of commercial fertilizer still being applied throughout Gooding County. Commercial fertilizer is a significant source of phosphorus. Its application is presently unregulated by the State.

FURTHER YOUR AFFIANT SAYETH NAUGHT.

Robert Ohlensehlen

ROBERT OHLENSEHLEN

SUBSCRIBED AND SWORN To before me this 13 day of September, 2006.



Brenda S. Butler

Notary Public for Idaho
Residing at Gooding
Comm. Expires: 3/5/2010

10/6 - Original in Gary's office.

ROBERT E. WILLIAMS
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RECEIVED
OCT 06 2006
DEPT. OF WATER RESOURCES
SOUTHERN REGION

Attorney for Applicant Diamond A Livestock, Inc.

BEFORE THE DEPARTMENT OF WATER RESOURCES

OF THE STATE OF IDAHO

IN THE MATTER OF APPLICATIONS FOR TRANSFER NOS. 72177 & 72178 DIAMOND A LIVESTOCK, INC. Applicant HEIDI OLSON, POLLY ANN HUGGINS, NICOLE REED, STEVE PAULIN, LEANN REED, & CHRISTINE DAVIS, Protestants	SOURCE: Groundwater County: Gooding MOTION TO STRIKE, OR RULE DOCUMENTS INADMISSIBLE, AND RESPONSE TO SUBMISSION OF MATERIAL BY PROTESTANTS

T72177:
37-21491
37-21492

COMES NOW, Diamond A Livestock, Inc., Applicant herein, through ROBERT E. WILLIAMS, of the firm Fredericksen, Williams, Meservy & Lothspeich, LLP, and moves the Hearing Officer, pursuant to Idaho Department of Water Resources ("IDWR") Rules of Procedure 260 and 600, for an Order striking from the record, or, alternatively, ruling as inadmissible certain documents recently provided by the Protestants.

This Motion is brought for the reasons that the material sought to be stricken is not responsive to the Order to Augment Record, dated August 24, 2006, and that the information is otherwise irrelevant to any issue before IDWR in this proceeding.

A. THE LETTER DATED SEPTEMBER 13, 2006 ADDRESSED TO THE "HONORABLE SPACKMAN" SIGNED BY HEIDI OLSON AND POLLY ANN HUGGINS, EXCEPT FOR THE FIRST THREE (3) PARAGRAPHS OF THE LETTER, ENDING WITH THE SENTENCE:

"THERE ARE ONLY 115,000 IRRIGATED ACRES IN GOODING COUNTY TO DISPOSE OF THE MANURE."

1. The Order to Augment Record, dated August 24, 2006 ("Order") as it pertains to Protestants, provides that:

> "Protestants shall submit information about the meaning and significance of the numbers 26 and 40 handwritten above the last two spreadsheet columns in Protestants Exhibit "D" and any information about locations of the fields identified by the spreadsheet that are associated with or nearby the Diamond A operation... ...the Protestants may submit any more recent, additional information about relevant contaminate levels in Gooding County. This information should also identify its proximity to the Diamond A operation."

The Protestants' letter of September 13, 2006, (hereinafter "Letter") provided limited relevant information in the first three paragraphs of the letter. The rest of the Letter is non responsive to, and is outside of, the parameters of the Order. It is also otherwise inadmissible because it is irrelevant, as shown by:

a. The fourth paragraph of the Letter quotes Dale Westermann, a soil scientist on a hearsay basis. The rest of that paragraph is argumentative and offers unsupported statements about the adequacy of irrigated agricultural land in Gooding County as a whole to adequately dispose of the waste from the Applicant's proposed truck wash facility. Nothing in that paragraph pertains to Applicant's request or its ability to agronomically apply the waste from its truck wash facility on its own property. The paragraph is also argumentative.

b. The fifth paragraph of the Letter does not provide "more recent, additional information" about relevant contaminate levels in Gooding County. Instead, it references letters and other statements from individuals cumulative of evidence and arguments made by the Protestants during the hearing. The paragraph does

not address the Applicant's proposed operation or the proximity of "problem areas" to Applicant's property.

c. The sixth paragraph of the Letter is a reiteration of arguments made during and after the hearing. It does not provide any "more recent, additional information" about relevant contaminate levels in Gooding County or the proximity of problem areas to Applicant's proposed operations.

d. The seventh paragraph of the Letter is also a restatement of arguments made by the Protestants earlier and does not provide the "more recent additional information" sought by the Order.

e. The eighth paragraph of the Letter also does not respond to the Order and is argumentative.

f. The ninth paragraph of the Letter contains references to Caroline Elexpuru's letter, which also should be stricken or ruled inadmissible for the reasons explained hereafter. This paragraph also refers to litigation filed by Brian Ravenscroft against a dairy. On the basis of the personal knowledge of this writer, no such suit has been filed. A sixty day letter under the Clean Water Act has been filed by Mr. Ravenscroft against a dairy. However, the sixty day letter, and any law suit that may be subsequently filed, contains allegations only. Nothing Mr. Ravenscroft is doing is relevant to any issue pending in this transfer proceeding. Nothing in the ninth paragraph is related to Applicant's operation.

g. The tenth paragraph of the Letter contains new information not produced at the hearing which is not in any way relevant to the issues which are lawfully before the IDWR in this transfer proceeding. The paragraph is also not responsive to the request for additional information regarding phosphorous levels on Applicant's operations, or nearby.

B. THE LETTER OF CAROLINE ELEXPERU SHOULD ALSO BE STRICKEN FROM THE RECORD OR DEEMED INADMISSIBLE BECAUSE IT IS IRRELEVANT FOR THE FOLLOWING REASONS:

1. Ms. Elexpuru cites her political career and the history of some matters that were presented to her during her tenure on the Gooding County Commission as the basis for her views. She generalizes about water quality and Gooding County being poor, and assumes with no proof, that the dairies are the reason for it. This is hearsay, opinion and conjecture. The hard data concerning nitrates and other contaminates in the area near Applicant's operation that is part of the record wholly contradicts Ms. Elexpuru's opinions.

2. The second full paragraph on page 2 of Ms. Elexpuru's letter refers to an Ag Weekly article stating that roughly 97 of 100 fields operated by dairies in Gooding County exceed the state's phosphorous levels. The rest of Ms. Elexpuru's letter reiterates her political views and demonstrates a failure to understand nutrient management planning, its purposes and how it is monitored. There is no information in Ms. Elexpuru's letter that contradicts Applicant's explanations through Robert Ohlensehlen that when fields are at the phosphorous threshold level, compliance with nutrient management planning is achieved by applying additional phosphorous at the crop uptake level only. This is exactly the procedure that the Applicant has stated it will adhere to. Ms. Elexpuru's rantings are essentially an argument for the IDWR to exercise zoning or other authority to override the actions of the Gooding County Commissioners, the Department of Agriculture, the Department of Water Resources and other agencies which have given credence to the pending application to the Faulkner's proposed truck washing facility in the name of water quality protection. Her letter fails to connect her allegations to Applicant's proposed operation in any way.

3. The photographs provided by Ms. Elexpuru, and the references in her letter to Faulkner's operations, depict and refer to operations of John Faulkner, who has his own livestock and related operations wholly independent of the businesses of the Applicant. Likewise, Ms. Elexpuru's references to Faulkner Livestock Operations are to operations of John Faulkner, not those of the Applicant. They are not relevant for the reasons set forth above.

4. None of Ms. Elexperu's material is responsive to the Order's request for "more recent, additional information about relevant contaminate levels" in Gooding County. It is completely unresponsive to phosphorus management on the Applicant's property.

C. THE LETTER OF MR. DAVID MAESTAS, DATED SEPTEMBER 9, 2006 SHOULD ALSO BE STRICKEN OR DECLARED INADMISSIBLE IN ITS ENTIRETY. IT PROVIDES NO "MORE RECENT, ADDITIONAL INFORMATION ABOUT RELEVANT CONTAMINATION LEVELS IN GOODING COUNTY" AND IS ALSO IRRELEVANT BECAUSE:

1. Mr. Maestas is incorrect that the Idaho State Department of Agriculture has determined that dairy fields in the County have exceeded their "maximum contamination level." The threshold limits for nutrient management planning are just that and are not "maximum contamination levels". Mr. Maestas' comments also demonstrate a complete misunderstanding of nutrient management planning in Idaho. Because phosphorus threshold limits are exceeded does not mean the owner of the fields is in violation of the act and regulations constituting nutrient management planning. Exceeding threshold limits does not mean anyone has or will be injured thereby. Instead, as explained by the Applicant, exceeding threshold limits requires the Applicant to not apply nutrients at more than the crop uptake level. Idaho Code § 37-401(3) and (4) and their accompanying regulations require that less than the crop uptake level of nutrients be applied if phosphorous limits remain above the threshold limits. Mr. Maestas does not connect his comments to Applicant's proposed operations in any way.

2. Mr. Maestas' letter does not contain one scintilla of evidence relevant to Applicant's proposed operations or its ability to agronomically apply nutrients to its fields as it has proposed. None of the other letters or other evidence submitted by the Protestants does so either. The evidence submitted by the Applicants, that it will be able to comply with the Nutrient Management Planning standards by using its own property for such purpose remains unrefuted.

D. THE DECISION IN *DAVISCO FOODS V. GOODING COUNTY* IS A 2005 IDAHO SUPREME COURT CASE THAT HAS NO RELEVANCE TO ANY OF THE ISSUES LAWFULLY PENDING BEFORE THE IDWR ON THIS PENDING TRANSFER APPLICATION. LIKEWISE, THE DOCUMENTS FROM THE HAWLEY TROXELL ENNIS HAWLEY LAW FIRM DATED 2003 ARE IN THE SAME CATEGORY, AS IS THE JULY 1, 2001, NRDC PUBLICATION ENTITLED "*HEALTH EFFECTS OF LAGOONS AND SPRAY FIELDS*." NONE OF THE MATERIAL RESPONDS TO THE ORDER'S REQUEST TO PROVIDE "MORE RECENT, ADDITIONAL INFORMATION ABOUT RELEVANT CONTAMINATE

LEVELS IN GOODING COUNTY," NOR DO THEY DISCUSS THE APPLICANT'S OPERATIONS AND PROPOSALS.

E. RICHARD CARLSON'S PUBLIC RECORDS REQUEST TO THE IDAHO DEPARTMENT OF AGRICULTURE DATED JULY 29, 2005 IS ALSO IRRELEVANT TO THE ISSUES OF THIS CASE AND IS UNRESPONSIVE TO THE ORDER FOR THE REASONS PREVIOUSLY STATED.

F. THE REST OF THE MATERIAL ATTACHED TO THE LETTER CONSISTS OF LETTERS FROM PARTICIPANTS AND RELATED MATERIALS FROM PROCEEDINGS BEFORE THE GOODING COUNTY PLANNING AND ZONING COMMISSION AND GOODING COUNTY BOARD OF COMMISSIONERS WHICH EITHER LED TO THE ISSUANCE OF THIS APPLICANT'S SPECIAL USE PERMIT, OR WHICH LED TO THE DENIAL OF PERMITS SOUGHT BY OTHER PERSONS. THE PROTESTANTS VIEW THE HEARING OFFICER'S ORDER AS AN INVITATION FOR THE IDWR TO OVERRULE WHAT GOODING COUNTY HAS ALREADY DONE, BECAUSE THE GOODING COUNTY PROCEEDINGS WERE CONTESTED BY THEM. NO LINK BETWEEN ANY OF THESE MATERIALS AND THE STATUTORY ELEMENTS FOR APPROVAL OF A WATER TRANSFER HAS BEEN SHOWN. NONE OF THESE MATERIALS DISCUSSES THIS APPLICANT'S ABILITY TO MANAGE PHOSPHORUS AT ALL. NONE OF THE MATERIALS ARE RESPONSIVE TO THE ORDER FOR THE REASONS PREVIOUSLY STATED.

CONCLUSION

In an apparent effort to obtain additional evidence on the issue of potential injury to the quality of groundwater in the area of the Applicant's proposed truck wash facility, the Hearing Officer entered an Order to Augment the Record, seeking clarification of some data in Applicant's Nutrient Management Plan and additional information regarding the existence of phosphorus levels in the area. Applicant responded by providing affidavits of Robert Ohlensehlen and accompanying exhibits which are directly responsive to the Order. Test data was provided showing that the very fields where Applicant proposes to apply liquid and solid waste from its facilities do not exceed the present threshold phosphorus limit of 20 ppm currently.

Protestants provided a letter containing three (3) paragraphs of arguably responsive material explaining the written numbers on one of their exhibits referenced Nutrient Management Planning Threshold Phosphorus Limits. The rest of the letter and other submissions collectively amount to an emotional diatribe generally condemning dairies (not livestock truck wash facilities) and asking IDWR to overrule the Conditional Use Permit already issued by

Gooding County, and to ignore the statutes, regulations and rulings of the Idaho Department of Agriculture, the Idaho Department of Environmental Quality and other agencies which apply to Applicant's proposed facilities, because the Protestants do not agree with the Conditional Use Permit or the rest of the law. The IDWR has no authority to do this. The majority of the Protestant's letter of September 13, 2006, and all materials submitted with it, should be stricken from the record and/or ruled irrelevant, because none of the documents respond to any of the issues of the Order or are relevant to any issue lawfully before the IDWR in this transfer proceeding.

Applicant continues to maintain that the record in this proceeding establishes that it has met, and will meet, each requirement of law pertaining to the proper management of nutrients or any other aspect of its proposed truck wash facility.

Dated this 5 day of October, 2006.

FREDERICKSEN, WILLIAMS, MESERVY & LOTHSPEICH, LLP

ROBERT E. WILLIAMS
Attorney for Applicant

CERTIFICATE OF SERVICE

I HEREBY CERTIFY That on this 5 day of October, 2006, I served a true and correct copy of the foregoing document on the person(s) whose names and addresses appear below by the method indicated:

IDWR Document Repository PO Box 83720 Boise ID 83720-0098	☑ U.S. Mail, postage prepaid ☐ Hand Delivery ☐ Court Folder ☐ Facsimile ☐ Federal Express
Allen D. Merritt IDWR – Southern Region 1341 Fillmore St Ste 200 Twin Falls ID 83301	☑ U.S. Mail, postage prepaid ☐ Hand Delivery ☐ Court Folder ☐ Facsimile ☐ Federal Express

Heidi Olson 2154 B Hwy 46 Gooding, Idaho 83330	☑ U.S. Mail, postage prepaid ☐ Hand Delivery ☐ Court Folder ☐ Facsimile ☐ Federal Express
Polly Ann Huggins PO Box 382 Gooding, Idaho 83330	☑ U.S. Mail, postage prepaid ☐ Hand Delivery ☐ Court Folder ☐ Facsimile ☐ Federal Express
Nicole Reed Le Ann Reed 2094 Hwy 46 Gooding, Idaho 83330	☑ U.S. Mail, postage prepaid ☐ Hand Delivery ☐ Court Folder ☐ Facsimile ☐ Federal Express
Steve Paulin 2185 S 1800 E Gooding, Idaho 83330	☑ U.S. Mail, postage prepaid ☐ Hand Delivery ☐ Court Folder ☐ Facsimile ☐ Federal Express
Christine Davis PO Box 386 Hagerman, Idaho 83332	☑ U.S. Mail, postage prepaid ☐ Hand Delivery ☐ Court Folder ☐ Facsimile ☐ Federal Express

ROBERT E. WILLIAMS

BEFORE THE DEPARTMENT OF WATER RESOURCES

OF THE STATE OF IDAHO

IN THE MATTER OF APPLICATION FOR TRANSFER NOS. 72177 & 72178 IN THE NAME OF DIAMOND A LIVESTOCK, INC.	)))))	**ORDER TO AUGMENT RECORD**

On August 8, 2005, Diamond A Livestock, Inc. ("Diamond A") filed two applications for transfer with the Idaho Department of Water Resources ("IDWR"). IDWR assigned transfer numbers 72177 and 72178 to the applications. The applications for transfer were published, and were protested by Christine Davis, Polly Ann Huggins, Heidi Olson, Steve Paulin, LeeAnn Reed, and Nicole Reed. IDWR conducted a hearing for the protests on June 13, 2006. Polly Ann Huggins, Heidi Olson, and LeeAnn Reed appeared at the hearing and represented themselves. Christine Davis, Steve Paulin and Nicole Reed did not appear at the hearing. Rob Williams, Attorney at Law, appeared on behalf of Diamond A.

Application for transfer no. 72177 proposes a change in nature of use for two water rights (along with other components of the water rights) to supply water to a proposed commercial truck wash. Diamond A prepared a nutrient management plan for the commercial truck wash. The nutrient management plan was received into evidence as Applicant's Exhibit no. 9.

Although the beginning materials in Applicant's Exhibit no. 9 are labeled "Commercial Livestock Washing Facility," the details of the nutrient management plan are titled "Diamond A Truck Wash and Feedlot Nutrient Management Plan." Much of the nutrient management plan contains information about application of waste from the feedlot.

Testimony at the hearing established that liquid waste from the truck wash would be applied to a 72-acre pasture, irrigated by a circular pivot, and identified as "Pasture 1." The pasture is located in the S1/2 of the SE of Section 19, and in the N1/2NE1/4 of Section 30, T6S, R15E.

A section of the nutrient management plan titled "Annual Nutrient Budget" begins on page 29. A table at the bottom of page 29 shows the nutrient requirements for the pasture grass and the nutrients added by various sources.

The hearing officer understands that phosphorus concentrations should not exceed the crop uptake, and that the limited phosphorus uptake by the plants often governs the amount of waste that can be applied to a field.

Despite testimony at the hearing that liquid waste would be applied to Pasture 1, the annual nutrient budget for Pasture 1 on page 29 lists "0" nutrients derived from "Truck Wash Liquids." Furthermore, the hearing officer believes there is no opportunity for application of additional nutrients to Pasture 1 because the crop phosphorus requirement equals the phosphorus added from other sources. Any additional nutrients would exceed the crop uptake, resulting in possible contamination.

Beginning on page 6 of the nutrient management plan, there is another summary titled "Manure Application Rate Requirement by Year." The table on page 7 tabulates the predicted nutrients applied to the Pasture 1 from various sources for the years 2006, 2007, 2008, and 2009. A component of the total nutrients are derived from "Truck Wash Liquids."

The hearing officer believes the tables are inconsistent. As a result, the hearing officer is concerned that the nutrient management plan does not accurately describe how the waste from the truck wash will be land applied.

The purpose of this order is to allow the applicant to resolve the identified inconsistencies, and to revise the nutrient management plan, if necessary, to reflect how the waste from the truck wash will be managed.

In addition to the above request, the hearing officer seeks additional information about phosphorus contamination. The protestants offered a tabular summary of phosphorus concentrations at various locations in Gooding County. The document is mark as "Protestants' Exhibit D." The column titles identify information that assists the Idaho Department of Agriculture identify the location and size of fields where waste is applied, where information about the contaminants can be found, when tests were conducted, and two columns of numerical values. There is no information that would link the information to Diamond A, its operations, or any other operation nearby.

Above the headings of the last two columns containing numerical values (titled SWSampleP and GWSampleP), someone hand wrote the numbers "26" and "40." During review of the nutrient management plan, the hearing officer found some information in the record that may relate to these numbers. Nonetheless, the record does not contain an explanation of the numbers or their importance. The protestants should submit a written explanation of the significance of what the numbers mean and any explanation about their significance. In addition, the protestants should submit any information that would link the data to Diamond A, its operations, or any other operation nearby.

Finally, the hearing officer seeks more recent, additional information available to the parties about phosphorus concentrations in Gooding County, and, if possible, the location of the problems.

ORDER

IT IS HEREBY ORDERED that, on or before **September 15, 2006** the parties shall augment the record in the above titled matter, by serving on the hearing officer and all other parties, the following:

1. Diamond A shall submit any revisions to Applicant's Exhibit no. 9 (Nutrient Management Plan) to resolve inconsistencies or conflicts in the nutrient management plan.

2. The protestants shall submit information about the meaning and significance of the numbers "26" and "40" handwritten about the last two spreadsheet columns in Protestant's Exhibit D, and any information about location of the fields identified by the spreadsheet that are associated with or nearby the Diamond A operation.

3. Diamond A and the protestants may submit any more recent, additional information about relevant contaminant levels in Gooding County. This information should also identify proximity to the Diamond A operation.

IT IS FURTHER ORDERED that, on or before **September 29, 2006**, non-submitting parties may rebut the additional information.

IT IS FURTHER ORDERED that, on or before **October 13, 2006**, any party may request a hearing about the additional information submitted.

Dated this 24th day of August, 2006.

Gary Spackman

Gary Spackman
Hearing Officer

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that on this 25th day of August, 2006, a true and correct copy of the document(s) described below were served by placing a copy of the same in the United States mail, postage prepaid and properly addressed to the following:

Document(s) Served: Order to Augment Record

DIAMOND A LIVESTOCK
1997 S 1875 E
GOODING ID 83330

ROBERT E WILLIAMS
FREDERICKSEN WILLIAM & MESERVY
PO BOX 168
JEROME ID 83338

HEIDI OLSON
2154 B HWY 46
GOODING ID 83330

POLLY ANN HUGGINS
PO BOX 382
GOODING ID 83330

NICHOLE REED
LE ANN REED
2094 HWY 46
GOODING ID 83330

STEVE PAULIN
2185 S 1800 E
GOODING ID 83330

CHRISTINE DAVIS
2726 S 850 E
HAGERMAN ID 83332

Deborah J. Gibson

Deborah J. Gibson
Administrative Assistant
Water Allocation Bureau

ROBERT E. WILLIAMS
IDAHO STATE BAR NO. 1693
FREDERICKSEN, WILLIAMS, MESERVY & LOTHSPEICH, LLP
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Attorney for Applicant Diamond A. Livestock, Inc.

BEFORE THE DEPARTMENT OF WATER RESOURCES

OF THE STATE OF IDAHO

IN THE MATTER OF APPLICATIONS FOR TRANSFER NOS. 72177 & 72178 DIAMOND A LIVESTOCK, INC. Applicant HEIDI OLSON, POLLY ANN HUGGINS, NICOLE REED, STEVE PAULIN, LEANN REED, & CHRISTINE DAVIS, Protestants	SOURCE: Groundwater County: Gooding AFFIDAVIT OF ROBERT OHLENSEHLEN

STATE OF IDAHO)
:ss.
County of Jerome)

ROBERT OHLENSEHLEN, first being duly sworn, deposes and says as follows:

1. I am a certified Nutrient Management Planner who prepared the Nutrient Management Plan for Diamond A Livestock, Inc., Applicant herein.

2. The Nutrient Management Plan I prepared was approved by the Idaho Department of Agriculture on May 24, 2006. It was included as part of Applicant's Exhibit 8, admitted into evidence at the hearing held in this matter on June 13, 2006.

3. I have reviewed the Order to Augment Record of the Hearing Officer on August 24, 2006. I have also reviewed the Nutrient Management Plan I prepared in light of the directives in the Order. I have the following comments:

A. The Nutrient Management Plan for Diamond A Livestock, Inc., was prepared utilizing "Idaho One Plan" software, developed by the Idaho State Department of Agriculture, and identified by them as the preferred means of preparing a Nutrient Management Plan in order to promote consistency between plans.

B. When I reviewed the Table at Page 6 of the Plan and the table for Pasture 1 on page 29 of the original Plan, I noted the discrepancy identified by Mr. Spackman between the data on Page 29 for Pasture 1 and the Table on Page 7 of the original plan.

C. I discovered that when the Idaho One Plan software program is updated, as it was during the past year, the updated program does not always pick up data from plans prepared in a prior version. I believe that is what happened in the case in question.

D. After confirming the discrepancy noted by Mr. Spackman, I re-ran the program. This time, the identical data was recalculated correctly. The report for Pasture 1, which originally appeared on Page 29 of the Plan now correctly notes the truck wash liquids and solids that will be applied to Pasture 1.

E. I have attached as **EXHIBIT A** hereto tables from the revised version of the Nutrient Management Plan, dated September 1, 2006. The Nutrient budget summary for the year 2000 for Pasture 1, appearing on Page 3 of the tables from the revised report, collectively attached hereto as Exhibit A replaces the table on Page 29 for Pasture 1 identified by Mr. Spackman in his order.

F. The values from the tables originally found on Page 6 of the original Report, which were also referenced by Mr. Spackman in his Order to Augment Record, remain the same in the revised version of the Plan and were initially correct.

G. The values in the table on Page 3 of Exhibit A attached hereto are consistent with crop uptake requirements for that pasture.

4. Diamond A Livestock, Inc., has recently conducted a soil test on the field where liquid and solid waste from the truck wash facility is proposed to be applied. A copy of the test, dated September 7, 2006, is attached hereto as **EXHIBIT B**. The test demonstrates that at the 18"-24" depth, the relevant depth where ground water contamination is the resource concern, as is the

case with this field, the phosphorus threshold of 20 ppm has been reached. This means that nutrients can be applied lawfully to this field at the crop uptake rate which is the rate identified in Diamond A Livestock, Inc.'s approved Nutrient Management Plan.

5. Diamond A Livestock, Inc., has an additional 470 acres in the immediate area of the proposed truck wash site, that could serve as fields for the receipt of liquid or solid waste from the facility.

6. The combined acres for the feedlot and truck wash facility necessary for the lawful receipt of nutrients under the approved Nutrient Management Plan is 473. Diamond A Livestock, Inc., owns 549 farmable acres in the area adjacent to the feedlot and truck wash facility sites that are available for application of liquid and solid waste.

7. On August 28, 2006, the State of Idaho Department of Agriculture issued a Permit for a truck wash facility consistent with what has been proposed. A copy of the Permit is attached hereto as **EXHIBIT C**.

FURTHER YOUR AFFIANT SAYETH NAUGHT.

Robert Ohlensehlen
ROBERT OHLENSEHLEN

SUBSCRIBED AND SWORN To before me this 12 day of September, 2006.

BRENDA S. BUTLER NOTARY PUBLIC STATE OF IDAHO

Brenda S. Butler
Notary Public for Idaho
Residing at: Gooding
Comm. Expires: 3/5/2010

Nutrient Management Solutions, LLC
Solutions for Animals, Plants and People

September 6, 2006

Response to request to augment record in regard to IDWR Transfer Nos. 72117 & 72178, Faulkner Water Transfer.

The section titled "Annual Nutrient Budget" that was referenced by Mr. Spackman, who was the hearing officer for the Faulkner Water Transfer, is from a nutrient management plan prepared using the Idaho OnePlan Software. OnePlan is the accepted software program that has been identified by the Idaho State Department of Agriculture as the preferred means of preparing a nutrient management plan. When the software program is updated, which occurred during the past year, the updated program does not always pick up data from plans prepared in a previous version. This is what I believe is the case with the plan in question.

After reviewing the plan I located a section that was identified by Mr. Spackman where the malfunction of the software apparently created the discrepancies to which he referred in his letter. The calculations appear to have been correct in the distribution of the nutrients on the farmland; however, the sources of the nutrients were apparently not populated in the data fields in the report. The section in question on the printout from the program refers to the actual nutrient budget for an individual field for a single year. The year that is referenced for this plan would be the year 2007.

When I ran the program again to recalculate the data, it recalculated the data correctly. When the report was recalculated the values were properly populated on the field in question. As stated in the hearing, 100% of the liquids would be applied to the pasture, identified as Pasture 1. In addition to the liquids there will also be manure from the animals pastured during the growing season, plus the application of 4 tons per acre of the truck wash's separated solids. Applications at these rates are, in fact, consistent with crop uptake. These values were taken from the tables found on Page 6 as referenced by Mr. Spackman. These values were correct in the original plan and remain the same in the current printing of the plan.

I would also submit some comment regarding the issue of phosphorus levels in the soil in Gooding County. To begin, phosphorus is not necessarily a contaminant; rather it is the nutrient that has been chosen as the limiting nutrient for livestock manure application. This distinction is based on the impact phosphorus can have, under the right conditions, on surface water. Phosphorus has not been shown to be detrimental to humans, animals or plants even at levels that are much higher than those reported in Gooding County.

The dairy industry became subject to nutrient management planning in 2000 with any operation that had a permit to ship milk being required to submit a nutrient management plan by July 2000. The purpose of requiring dairy producers to have nutrient management plans was to insure that nutrients were being applied in an environmentally-appropriate manner. Initial plans

EXHIBIT A

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were prepared using a variety of processes and formats. The OnePlan Software was developed to provide continuity in the planning process.

The early discussions regarding nutrient management planning were focused on determining the best method of establishing acceptable application rates for nutrients. Many states chose to address application of manure in terms of nitrogen application rates. In light of the fact that nitrogen in the form of nitrate poses a threat to human health many states have identified nitrogen as the limiting nutrient in the application of livestock manure.

Application of manure to provide the nutrient needs of a specific crop where nitrogen was the limiting factor of application has led to levels of phosphorus reported as high as 2500 ppm in some Midwestern states. In most cases application of dairy and beef manure to provide the nitrogen needed for crop production will result in the application of double the amount of phosphorus needed. While elevated levels of phosphorus have not posed any health related problems, clearly, extreme levels that exceed the amount needed to sustain crop production are a poor use of the resource. University of Idaho fertilizer guides call for no additional phosphorus application when soil test levels exceed 12ppm, with the exception of some heavy phosphorus feeders, crops such as potatoes.

Phosphorus was thought to be a relatively immobile nutrient; however, research in the past few years has indicated that phosphorus may be more mobile than was previously believed. The major source of movement of phosphorus occurs when soil particles laden with phosphorus are carried off of the fields by surface water runoff. This runoff carries phosphorus to streams and rivers where the nutrient can result in algae blooms and eutrophication of surface water.

Where soils have a high potential for surface water runoff, the threshold level for phosphorus in the soil has be established at 40ppm. Where soils have low potential for surface runoff and the soils are deep (> 60") the threshold has been established at 30ppm, while those with shallow soils (< 60") are established at 20ppm.

The threshold levels have been established by Natural Resource Conservation Service and University of Idaho scientists in consultation with the Department of Environmental Quality and US Environmental Protection Agency. In soils where the threshold level of phosphorus has not been reached, livestock manure may legally be applied to the nitrogen level. Continued application at this level will certainly insure that the phosphorus threshold level will be reached. When the threshold level is reached the application of manure to soils is limited to crop uptake levels, or more correctly, the crop removal, level. This level would be equal to the amount of crop and/or crop residue that is removed from the field where nutrients have been applied.

There seems to be a misnomer that the threshold level is a point where the soil is contaminated and normal production can no longer be accomplished. The threshold level is simply a point at which a producer needs to evaluate the practices they are currently employing to produce crops to limit the potential for increasing phosphorus levels even higher.

The recent article regarding phosphorus levels in Gooding County has created a panic that is largely based on a lack of understanding and has become an excuse to attack livestock producers by those who are opposed to livestock production.

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- First, the statistics may not represent a cross section of the dairies in the county, but rather a group of producers who were arbitrarily sampled by ISDA.
- Secondly, the data reported represents only a fraction of the total land being used for manure application. (Approximately 10% based on information from ISDA)
- Thirdly, the data does not indicate what the trend on these fields represents. Are the numbers higher or lower than when the program began in 2000? Some of these fields may actually be improving.
- Fourth, were the fields tagged as surface water resource concerns or ground water resource concerns? A field could have high phosphorus readings in the 0-12" level of soil and low readings at the 18-24" level, which is where the test must be taken for ground water resource concerns. Remember, in the soil, phosphorus is not very mobile.
- Fifth, a field could have a higher level of phosphorus depending on when the tests were taken. Many of the tests were taken in the spring at the time manure was being applied to the fields. One must ask if the soil tests were taken before or after the manure was applied. If the test was taken after manure application, did the sample contain raw manure?
- Finally, it is important to recognize that there is still a substantial amount of commercial fertilizer that is being applied in Gooding County. It comes under no regulation at all.

In conclusion, the article that was in the paper, like so many things, may be being used out of context to paint a picture that is different than the norm, or it may, in fact, represent the average. The one thing that is certain is that there is a need to monitor what is happening in the soil to insure that we are not misusing the nutrients found in livestock manure. We need to be sure that the best use is being made of a valuable resource.

Sincerely,

Robert Ohlensehlen
Certified Nutrient management Planner
Professional Animal Scientist

Enclosure

RO:jk

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Faulkner Truck Wash NMP – Revision 9/05/2006

The following tables have been extracted from the Faulkner Truck Wash – Nutrient Management Plan Revised 9/1/06

FIELD: Field 1 87 acres

Name	Man App		Solid Stack(s)	Truck Wash Solids	Mineralization		Total	
			11 T/ac	2 T/ac				
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2006)	Y	N	18	5	N	0	N	23
		P	61	8			P	69
		K	92	9			K	101
			17 T/ac	0 T/ac				
Corn, Field, Silage, S-ID, Irrigated(2007)	Y	N	28	0	N	12	N	40
		P	94	0			P	94
		K	143	0			K	143
			17 T/ac	0 T/ac				
Sugarbeets, S-ID, Irrigated(2008)	Y	N	28	0	N	0	N	28
		P	94	0			P	94
		K	143	0			K	143
			17 T/ac	0 T/ac				
Corn, Field, Silage, Double Cropped, S-ID, Irrigated(2009)	Y	N	28	0	N	15	N	43
		P	94	0			P	94
		K	143	0			K	143
			17 T/ac	0 T/ac				
Potatoes, S-ID, Irrigated(2010)	Y	N	28	0	N	15	N	43
		P	94	0			P	94
		K	143	0			K	143
			17 T/ac	0 T/ac				
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2011)	Y	N	28	0	N	15	N	43
		P	94	0			P	94
		K	143	0			K	143
			17 T/ac	0 T/ac				
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2012)	Y	N	28	0	N	15	N	43
		P	94	0			P	94
		K	143	0			K	143
			17 T/ac	0 T/ac				
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2013)	Y	N	28	0	N	15	N	43
		P	94	0			P	94
		K	143	0			K	143
			17 T/ac	0 T/ac				
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2014)	Y	N	28	0	N	15	N	43
		P	94	0			P	94
		K	143	0			K	143

Nutrient Budget Summary – for year 2007

Field: Field 1 **Crop:** Corn, Field, Silage, S-ID, Irrigated **Yield:** 32

	N	P2O5	K2O
Crop Nutrient Requirement	250	128	293
Nutrients From Soil	?		
from Mineralized Nitrogen	0		
from Prior Crops	0		
from Prior Bio-Nutrients	12		
from Irrigation Water	0		0
Nutrient Balance from above *	237.5	128.2	293
Solid Stack(s)	28	94	143
Truck Wash Solids	0	0	0
Estimated Remaining Nutrients Required *	210	34	150
Commercial Fertilizer Application	0	0	0
Final Nutrient Balance *	210	34	150

Positive values indicate additional nutrients are required; negative values indicate a nutrient surplus

Acceptable: Sustainable agronomic rate.

Faulkner Truck Wash NMP – Revision 9/05/2006

FIELD: Pasture 1 72 acres

Name	Man App		Pasture(s)	Solid Stack(s)	Truck Wash Liquids	Truck Wash Solids	Mineralization		Total	
			8 T/ac	2 T/ac	100 %	0 T/ac				
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated(2006)	Y	N	5	4	14	0	N	0	N	23
		P	60	12	14	0			P	86
		K	69	19	16	0			K	104
			8 T/ac	0 T/ac	102 %	4 T/ac				
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated(2007)	Y	N	5	0	14	12	N	13	N	44
		P	60	0	14	19			P	93
		K	69	0	16	22			K	107
			8 T/ac	0 T/ac	102 %	4 T/ac				
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated(2008)	Y	N	5	0	14	12	N	17	N	48
		P	60	0	14	19			P	93
		K	69	0	16	22			K	107
			8 T/ac	0 T/ac	102 %	4 T/ac				
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated(2009)	Y	N	5	0	14	12	N	17	N	48
		P	60	0	14	19			P	93
		K	69	0	16	22			K	107

Nutrient Budget Summary – for year 2007

Field: Pasture 1 **Crop:** Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated **Yield:** 5

	N	P205	K20
Crop Nutrient Requirement	150	92	259
Nutrients From Soil	?		
from Mineralized Nitrogen	0		
from Prior Crops	0		
from Prior Bio-Nutrients	12		
from Irrigation Water	0		0
Nutrient Balance from above *	137.8	91.6	259.2
Pasture(s)	5	60	69
Solid Stack(s)	0	0	0
Truck Wash Liquids	14	14	16
Truck Wash Solids	12	19	22
Estimated Remaining Nutrients Required *	107	-1	152
Commercial Fertilizer Application	0	0	0
Final Nutrient Balance *	107	-1	152

Positive values indicate additional nutrients are required; negative values indicate a nutrient surplus

Acceptable: Sustainable agronomic rate.

Faulkner Truck Wash NMP – Revision 9/05/2006

FIELD: Pasture 2 85 acres

Name	Man App		Feedlot Solids	Pasture(s)	Mineralization		Total	
			6 T/ac	6 T/ac				
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated(2006)	Y	N	17	4	N	0	N	21
		P	27	46			P	73
		K	31	53			K	84
			6 T/ac	6 T/ac				
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated(2007)	Y	N	17	4	N	11	N	32
		P	27	46			P	73
		K	31	53			K	84
			6 T/ac	6 T/ac				
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated(2008)	Y	N	17	4	N	11	N	32
		P	27	46			P	73
		K	31	53			K	84
			6 T/ac	6 T/ac				
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated(2009)	Y	N	17	4	N	11	N	32
		P	27	46			P	73
		K	31	53			K	84

Nutrient Budget Summary – for year 2007

Field: Pasture 2 **Crop:** Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated **Yield:** 4

	N	P205	K20
Crop Nutrient Requirement	150	73	207
Nutrients From Soil	?		
from Mineralized Nitrogen	0		
from Prior Crops	0		
from Prior Bio-Nutrients	11		
from Irrigation Water	0		0
Nutrient Balance from above *	138.6	73.3	207.4
Feedlot Solids	17	27	31
Pasture(s)	4	46	53
Estimated Remaining Nutrients Required *	118	0	123
Commercial Fertilizer Application	0	0	0
Final Nutrient Balance *	118	0	123

* Positive values indicate additional nutrients are required; negative values indicate a nutrient surplus

Acceptable: Sustainable agronomic rate.

Faulkner Truck Wash NMP – Revision 9/05/2006

FIELD: Field 2 95 acres

Name	Man App		Feedlot Solids	Mineralization		Total	
			21 T/ac				
Corn, Field, Silage, S-ID, Irrigated(2006)	Y	N	56	N	21	N	77
		P	91			P	91
		K	105			K	105
			21 T/ac				
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2007)	Y	N	56	N	21	N	77
		P	91			P	91
		K	105			K	105
			21 T/ac				
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2008)	Y	N	56	N	31	N	87
		P	91			P	91
		K	105			K	105
			21 T/ac				
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2009)	Y	N	56	N	31	N	87
		P	91			P	91
		K	105			K	105
			21 T/ac				
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2010)	Y	N	56	N	31	N	87
		P	91			P	91
		K	105			K	105
			21 T/ac				
Barley, Spring, S-ID(2011)	Y	N	56	N	76	N	132
		P	91			P	91
		K	105			K	105
			21 T/ac				
Barley, Spring, S-ID(2012)	Y	N	56	N	76	N	132
		P	91			P	91
		K	105			K	105
			21 T/ac				
Corn, Field, Silage, S-ID, Irrigated(2013)	Y	N	56	N	31	N	87
		P	91			P	91
		K	105			K	105

Nutrient Budget Summary – for year 2007

Field: Field 2 **Crop:** Corn, Field, Silage, S-ID, Irrigated **Yield:** 32

	N	P205	K20
Crop Nutrient Requirement	250	128	293
Nutrients From Soil	?		
from Mineralized Nitrogen	0		
from Prior Crops	-10		
from Prior Bio-Nutrients	31		
from Irrigation Water	0		0
Nutrient Balance from above *	228.7	128.2	293
Feedlot Solids	56	91	105
Estimated Remaining Nutrients Required *	173	37	188
Commercial Fertilizer Application	0	0	0
Final Nutrient Balance *	173	37	188

* Positive values indicate additional nutrients are required; negative values indicate a nutrient surplus

Acceptable: Sustainable agronomic rate.

Faulkner Truck Wash NMP – Revision 9/05/2006

FIELD: Field 3 4 acres

Name	Man App		Feedlot Solids	Mineralization		Total	
			18 T/ac				
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2006)	Y	N	48	N	27	N	75
		P	78			P	78
		K	90			K	90
			18 T/ac				
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2007)	Y	N	48	N	27	N	75
		P	78			P	78
		K	90			K	90
			18 T/ac				
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2008)	Y	N	48	N	27	N	75
		P	78			P	78
		K	90			K	90
			18 T/ac				
Barley, Spring, S-ID(2009)	Y	N	48	N	72	N	120
		P	78			P	78
		K	90			K	90
			18 T/ac				
Barley, Spring, S-ID(2010)	Y	N	48	N	72	N	120
		P	78			P	78
		K	90			K	90
			18 T/ac				
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2011)	Y	N	48	N	27	N	75
		P	78			P	78
		K	90			K	90

Nutrient Budget Summary – for year 2007

Field: Field 3 **Crop:** Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated **Yield:** 7.5

	N	P205	K20
Crop Nutrient Requirement	399	93	383
Nutrients From Soil	?		
from Mineralized Nitrogen	0		
from Prior Crops	0		
from Prior Bio-Nutrients	27		
from Irrigation Water	0		0
Nutrient Balance from above *	372	92.7	383.4
Feedlot Solids	48	78	90
Estimated Remaining Nutrients Required *	324	15	293
Commercial Fertilizer Application	0	0	0
Final Nutrient Balance *	324	15	293

* Positive values indicate additional nutrients are required; negative values indicate a nutrient surplus

Acceptable: Sustainable agronomic rate.

Faulkner Truck Wash NMP – Revision 9/05/2006

FIELD: Field 4 4 acres

Name	Man App		Feedlot Solids	Mineralization		Total	
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2006)	Y		18 T/ac				
		N	48	N	27	N	75
		P	78			P	78
		K	90			K	90
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2007)	Y		18 T/ac				
		N	48	N	27	N	75
		P	78			P	78
		K	90			K	90
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2008)	Y		18 T/ac				
		N	48	N	27	N	75
		P	78			P	78
		K	90			K	90
Barley, Spring, S-ID(2009)	Y		18 T/ac				
		N	48	N	72	N	120
		P	78			P	78
		K	90			K	90
Barley, Spring, S-ID(2010)	Y		18 T/ac				
		N	48	N	72	N	120
		P	78			P	78
		K	90			K	90
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2011)	Y		18 T/ac				
		N	48	N	27	N	75
		P	78			P	78
		K	90			K	90

Nutrient Budget Summary – for year 2007

Field: Field 4 **Crop:** Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated **Yield:** 7.5

	N	P205	K20
Crop Nutrient Requirement	399	93	383
Nutrients From Soil	?		
from Mineralized Nitrogen	0		
from Prior Crops	0		
from Prior Bio-Nutrients	27		
from Irrigation Water	0		0
Nutrient Balance from above *	372	92.7	383.4
Feedlot Solids	48	78	90
Estimated Remaining Nutrients Required *	324	15	293
Commercial Fertilizer Application	0	0	0
Final Nutrient Balance *	324	15	293

* Positive values indicate additional nutrients are required; negative values indicate a nutrient surplus

Acceptable: Sustainable agronomic rate.

Faulkner Truck Wash NMP – Revision 9/05/2006

FIELD: Field 5 62 acres

Name	Man App		Feedlot Solids	Mineralization		Total	
			21 T/ac				
Corn, Field, Silage, S-ID, Irrigated(2006)	Y	N	56	N	21	N	77
		P	91			P	91
		K	105			K	105
			21 T/ac				
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2007)	Y	N	56	N	21	N	77
		P	91			P	91
		K	105			K	105
			21 T/ac				
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2008)	Y	N	56	N	31	N	87
		P	91			P	91
		K	105			K	105
			21 T/ac				
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2009)	Y	N	56	N	31	N	87
		P	91			P	91
		K	105			K	105
			21 T/ac				
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2010)	Y	N	56	N	31	N	87
		P	91			P	91
		K	105			K	105
			21 T/ac				
Barley, Spring, S-ID(2011)	Y	N	56	N	76	N	132
		P	91			P	91
		K	105			K	105
			21 T/ac				
Barley, Spring, S-ID(2012)	Y	N	56	N	76	N	132
		P	91			P	91
		K	105			K	105
			21 T/ac				
Corn, Field, Silage, S-ID, Irrigated(2013)	Y	N	56	N	31	N	87
		P	91			P	91
		K	105			K	105

Nutrient Budget Summary – for year 2007

Field: Field 5 **Crop:** Corn, Field, Silage, S-ID, Irrigated **Yield:** 32

	N	P2O5	K2O
Crop Nutrient Requirement	250	128	293
Nutrients From Soil	?		
from Mineralized Nitrogen	0		
from Prior Crops	-10		
from Prior Bio-Nutrients	31		
from Irrigation Water	0		0
Nutrient Balance from above *	228.7	128.2	293
Feedlot Solids	56	91	105
Estimated Remaining Nutrients Required *	173	37	188
Commercial Fertilizer Application	0	0	0
Final Nutrient Balance *	173	37	188

* Positive values indicate additional nutrients are required; negative values indicate a nutrient surplus

Acceptable: Sustainable agronomic rate.

Faulkner Truck Wash NMP – Revision 9/05/2006

FIELD: Field 6 5 acres

Name	Man App		Feedlot Solids	Pasture(s)	Mineralization		Total	
			0 T/ac	14 T/ac				
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated(2006)	Y	N	0	7	N	4	N	11
		P	0	92			P	92
		K	0	105			K	105
			0 T/ac	14 T/ac				
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated(2007)	Y	N	0	7	N	4	N	11
		P	0	92			P	92
		K	0	105			K	105
			0 T/ac	14 T/ac				
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated(2008)	Y	N	0	7	N	4	N	11
		P	0	92			P	92
		K	0	105			K	105

Nutrient Budget Summary – for year 2007

Field: Field 6 **Crop:** Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated **Yield:** 5

	N	P205	K20
Crop Nutrient Requirement	150	92	259
Nutrients From Soil	?		
from Mineralized Nitrogen	0		
from Prior Crops	0		
from Prior Bio-Nutrients	4		
from Irrigation Water	0		0
Nutrient Balance from above *	146	91.6	259.2
Feedlot Solids	0	0	0
Pasture(s)	7	92	105
Estimated Remaining Nutrients Required *	139	0	154
Commercial Fertilizer Application	0	0	0
Final Nutrient Balance *	139	0	154

* Positive values indicate additional nutrients are required; negative values indicate a nutrient surplus

Acceptable: Sustainable agronomic rate.

Faulkner Truck Wash NMP – Revision 9/05/2006

FIELD: Field 7 3 acres

Name	Man App		Feedlot Solids	Pasture(s)	Mineralization		Total	
			0 T/ac	14 T/ac				
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated(2006)	Y	N	0	7	N	4	N	11
		P	0	92			P	92
		K	0	105			K	105
			0 T/ac	14 T/ac				
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated(2007)	Y	N	0	7	N	4	N	11
		P	0	92			P	92
		K	0	105			K	105
			0 T/ac	14 T/ac				
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated(2008)	Y	N	0	7	N	4	N	11
		P	0	92			P	92
		K	0	105			K	105

Nutrient Budget Summary – for year 2007

Field: Field 7 **Crop:** Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated **Yield:** 5

	N	P205	K20
Crop Nutrient Requirement	150	92	259
Nutrients From Soil	?		
from Mineralized Nitrogen	0		
from Prior Crops	0		
from Prior Bio-Nutrients	4		
from Irrigation Water	0		0
Nutrient Balance from above *	146	91.6	259
Feedlot Solids	0	0	0
Pasture(s)	7	92	105
Estimated Remaining Nutrients Required *	139	0	154
Commercial Fertilizer Application	0	0	0
Final Nutrient Balance *	139	0	154

* Positive values indicate additional nutrients are required; negative values indicate a nutrient surplus

Acceptable: Sustainable agronomic rate.

Faulkner Truck Wash NMP – Revision 9/05/2006

FIELD: Field 8 8 acres

Name	Man App		Feedlot Solids	Pasture(s)	Mineralization		Total	
			0 T/ac	14 T/ac				
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated(2006)	Y	N	0	7	N	4	N	11
		P	0	92			P	92
		K	0	105			K	105
			0 T/ac	14 T/ac				
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated(2007)	Y	N	0	7	N	4	N	11
		P	0	92			P	92
		K	0	105			K	105
			0 T/ac	14 T/ac				
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated(2008)	Y	N	0	7	N	4	N	11
		P	0	92			P	92
		K	0	105			K	105

Nutrient Budget Summary – for year 2007

Field: Field 8 **Crop:** Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated **Yield:** 5

	N	P205	K20
Crop Nutrient Requirement	150	92	259
Nutrients From Soil	?		
from Mineralized Nitrogen	0		
from Prior Crops	0		
from Prior Bio-Nutrients	4		
from Irrigation Water	0		0
Nutrient Balance from above *	146	91.6	259.2
Feedlot Solids	0	0	0
Pasture(s)	7	92	105
Estimated Remaining Nutrients Required *	139	0	154
Commercial Fertilizer Application	0	0	0
Final Nutrient Balance *	139	0	154

* Positive values indicate additional nutrients are required; negative values indicate a nutrient surplus

Acceptable: Sustainable agronomic rate.

Faulkner Truck Wash NMP – Revision 9/05/2006

FIELD: Field 9 4 acres

Name	Man App		Feedlot Solids	Pasture(s)	Mineralization		Total	
			0 T/ac	14 T/ac				
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated(2006)	Y	N	0	7	N	4	N	11
		P	0	92			P	92
		K	0	105			K	105
			0 T/ac	14 T/ac				
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated(2007)	Y	N	0	7	N	4	N	11
		P	0	92			P	92
		K	0	105			K	105
			0 T/ac	14 T/ac				
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated(2008)	Y	N	0	7	N	4	N	11
		P	0	92			P	92
		K	0	105			K	105

Nutrient Budget Summary – for year 2007

Field: Field 9 **Crop:** Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated **Yield:** 5

	N	P205	K20
Crop Nutrient Requirement	150	92	259
Nutrients From Soil	?		
from Mineralized Nitrogen	0		
from Prior Crops	0		
from Prior Bio-Nutrients	4		
from Irrigation Water	0		0
Nutrient Balance from above *	146	91.6	259.2
Feedlot Solids	0	0	0
Pasture(s)	7	92	105
Estimated Remaining Nutrients Required *	139	0	154
Commercial Fertilizer Application	0	0	0
Final Nutrient Balance *	139	0	154

Positive values indicate additional nutrients are required; negative values indicate a nutrient surplus

Acceptable: Sustainable agronomic rate.

Faulkner Truck Wash NMP – Revision 9/05/2006

FIELD: Field 10 48 acres

Name	Man App		Feedlot Solids	Mineralization		Total	
Barley, Spring, S-ID(2006)	Y		15 T/ac				
		N	40	N	43	N	83
		P	65			P	65
		K	75			K	75
Barley, Spring, S-ID(2007)	Y		15 T/ac				
		N	40	N	67	N	107
		P	65			P	65
		K	75			K	75
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2008)	Y		15 T/ac				
		N	40	N	22	N	62
		P	65			P	65
		K	75			K	75
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2009)	Y		15 T/ac				
		N	40	N	22	N	62
		P	65			P	65
		K	75			K	75
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2010)	Y		15 T/ac				
		N	40	N	22	N	62
		P	65			P	65
		K	75			K	75
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2011)	Y		15 T/ac				
		N	40	N	22	N	62
		P	65			P	65
		K	75			K	75
Barley, Spring, S-ID(2012)	Y		18 T/ac				
		N	48	N	67	N	115
		P	78			P	78
		K	90			K	90

Nutrient Budget Summary – for year 2007

Field: Field 10 **Crop:** Barley, Spring, S-ID **Yield:** 130

	N	P2O5	K2O
Crop Nutrient Requirement	210	65	32
Nutrients From Soil	?		
from Mineralized Nitrogen	45		
from Prior Crops	-24		
from Prior Bio-Nutrients	22		
from Irrigation Water	0		0
Nutrient Balance from above *	166.5	65	32.2
Feedlot Solids	40	65	75
Estimated Remaining Nutrients Required *	126	0	-43
Commercial Fertilizer Application	0	0	0
Final Nutrient Balance *	126	0	-43

* Positive values indicate additional nutrients are required; negative values indicate a nutrient surplus

Acceptable: Sustainable agronomic rate.

Faulkner Truck Wash NMP – Revision 9/05/2006

FIELD: Field 11 36 acres

Name	Man App		Feedlot Solids	Pasture(s)	Mineralization		Total	
			0 T/ac	14 T/ac				
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated(2006)	Y	N	0	7	N	4	N	11
		P	0	92			P	92
		K	0	105			K	105
			0 T/ac	14 T/ac				
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated(2007)	Y	N	0	7	N	4	N	11
		P	0	92			P	92
		K	0	105			K	105
			0 T/ac	14 T/ac				
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated(2008)	Y	N	0	7	N	4	N	11
		P	0	92			P	92
		K	0	105			K	105

Nutrient Budget Summary – for year 2007

Field: Field 11 **Crop:** Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated **Yield:** 5

	N	P205	K20
Crop Nutrient Requirement	150	92	259
Nutrients From Soil	?		
from Mineralized Nitrogen	0		
from Prior Crops	0		
from Prior Bio-Nutrients	4		
from Irrigation Water	0		0
Nutrient Balance from above *	146	91.6	259 ?
Pasture(s)	7	92	105
Estimated Remaining Nutrients Required *	139	0	155
Commercial Fertilizer Application	0	0	0
Final Nutrient Balance *	139	0	155

* Positive values indicate additional nutrients are required; negative values indicate a nutrient surplus

Acceptable: Sustainable agronomic rate.

Faulkner Truck Wash NMP – Revision 9/05/2006

FIELD: Field 12 34 acres

Name	Man App		Feedlot Solids	Mineralization		Total	
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2006)	Y		15 T/ac				
		N	39	N	22	N	61
		P	63			P	63
		K	73			K	73
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2007)	Y		15 T/ac				
		N	39	N	22	N	61
		P	63			P	63
		K	73			K	73
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2008)	Y		15 T/ac				
		N	39	N	22	N	61
		P	63			P	63
		K	73			K	73
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2009)	Y		15 T/ac				
		N	39	N	22	N	61
		P	63			P	63
		K	73			K	73
Barley, Spring, S-ID(2010)	Y		15 T/ac				
		N	39	N	67	N	106
		P	63			P	63
		K	73			K	73
Sugarbeets, S-ID, Irrigated(2011)	Y		15 T/ac				
		N	39	N	22	N	61
		P	63			P	63
		K	73			K	73
Barley, Spring, S-ID(2012)	Y		15 T/ac				
		N	39	N	67	N	106
		P	63			P	63
		K	73			K	73
Potatoes, S-ID, Irrigated(2013)	Y		15 T/ac				
		N	39	N	22	N	61
		P	63			P	63
		K	73			K	73
Barley, Spring, S-ID(2014)	Y		15 T/ac				
		N	39	N	67	N	106
		P	63			P	63
		K	73			K	73

Faulkner Truck Wash NMP – Revision 9/05/2006

Nutrient Budget Summary – for year 2007

Field: Field 12 **Crop:** Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated **Yield:** 7.5

	N	P2O5	K2O
Crop Nutrient Requirement	399	93	383
Nutrients From Soil	?		
from Mineralized Nitrogen	0		
from Prior Crops	0		
from Prior Bio-Nutrients	22		
from Irrigation Water	0		0
Nutrient Balance from above *	377.2	92.7	383.4
Feedlot Solids	39	63	73
Estimated Remaining Nutrients Required *	338	30	310
Commercial Fertilizer Application	0	0	0
Final Nutrient Balance *	338	30	310

Positive values indicate additional nutrients are required; negative values indicate a nutrient surplus
Acceptable: Sustainable agronomic rate.

Faulkner Truck Wash NMP – Revision 9/05/2006

Multiple One Plan - Summary Sheet

Faulkner Truck Washing Facility, Feedlot Facility and Cattle Grazing

		Tons Applied			% Appl.	Pounds			%
Nutrients Used OnSite	Farmable Acres	Pasture	Separated Solids	Solid Stack	Waste Pond	N	P_2O_5	K_2O	OnSite
Base Farm	547	1,870	288	6,660	192	33,608	51,963	71,813	100%
Farm 2	-	-	-	-	-	-	-	-	0%
Farm 3	-	-	-	-	-	-	-	-	0%
Farm 4	-	-	-	-	-	-	-	-	
Farm 5	-	-	-	-	-	-	-	-	
Totals for Onsite	**547**	**1,870**	**288**	**6,660**	**192**	**33,608**	**51,963**	**71,813**	

Pounds Per Ton	Pasture	Separated Solids	Solid Stack	Waste Pond
N	1.4	6.0	4.1	11.4
P_2O_5	8.0	4.3	5.2	5.2
K_2O	8.8	5.0	7.9	6.0

Nutrient Distribution on Facility

	Total Tons	Pounds N	Pounds P_2O_5	Pounds K_2O	% of Total
Total Nutrients Produced	14,644	57,586	80,326	115,979	
Bedded Pack Heifers & Dry Cows	6,322	25,735	33,006	50,017	41.1%
Pasture(s)	1,498	2,066	11,975	13,239	14.9%
Separated Solid(s)	310	1,860	1,345	1,556	1.7%
Solid Stack(s)	6,322	25,735	33,006	50,017	41.1%
Waste Storage Pond(s)	192	2,190	994	1,150	1.2%
Nutrients Used Onsite	15,332	59,343	84,969	121,830	105.8%
Nutrients Exported to Other Farms	(688)	(1,757)	(4,643)	(5,851)	-6%
Number of Acres Needed For Export Based on 100 Pounds P_2O_5 per acre....				(46.43)	Acres

SOIL TEST DATA SHEET

FARMER'S NAME Diamond A Livestock

ADDRESS

Lab No. 3321-3323

Date Sampled: 9/6/06

Date Analyzed: 9/7/06

DEALER: Gooding Seed Co.

Taken by: Al

FIELD SAMPLE NO.	ACRES	CROP TO BE GROWN	LAST CROP GROWN	YIELD GOAL	COMMENTS ON SAMPLE
West		Pasture	Pasture		Complete

FIELD No.	LAB No.	pH	NITROGEN			PHOSPHORUS		K	SO_4-S	$CaCO_3$	MICRONUTRIENTS					SALT
			O.M. %	NO_3-N p.p.m.	NH_4-N p.p.m.	H2O Sol	Bicarb	p.p.m.	p.p.m.	%	Zn	Fe	Mn	Cu	B	m.m.
West 0-12"	3321	7.9	1.5	4	0.5	1.3	31	455	5	0.5	1.0	18.2	5.6	0.8	0.8	0.2
12-18	3322			3	0.0	0.7	27	505	8							
18-24	3323			3	0.0	0.6	20	400	6							

SUGGESTED FERTILIZER APPLICATION LBS/ACRE

	N	P_2O_5	K_2O	SO_4-S	Zn	Fe	Mn	Cu	B
West Pasture > Pasture	90	0	0	40	2	0	0	0	0
Spring →									

Remarks:

Thanks! Al

Tremblay Consulting Inc. 394 South 335 East Jerome, Idaho 83338 324-1148

PH,EC: Saturated Paste; NO3-N, NH-4: CaSO4 1:5 Extraction, Colorimetric; PO4 Olsen 1:20 Extraction Colorimetric, K: 1:10 Amm-Acetate AA; Organic Matter Walkley-Black

EXHIBIT B

State of Idaho
Department of Agriculture

Permit for Commercial Livestock Truck Washing Facility

THIS PERMIT CERTIFIES THAT **DIAMOND A TRUCK WASH** of Gooding, Idaho, having complied with the provisions of IDAPA 02.04.23, by submitting the required application, and having agreed to comply with and abide by all terms of IDAPA 02.04.23, is this day, August 28, 2006, granted a permit to operate a Commercial Livestock Truck Washing Facility.

PERMIT NO. 004

PERMIT EXPIRES: 2 YEARS FROM THE DATE OF ISSUE

Director of Agriculture

Deputy Administrator, Division of Animal Industries

PERMIT MUST BE POSTED IN A CONSPICUOUS PLACE IN THE TRUCK WASHING FACILITY AND IS NOT TRANSFERABLE.

EXHIBIT
C

Spackman, Gary

From: Merritt, Allen
Sent: Friday, July 28, 2006 5:03 PM
To: Spackman, Gary
Subject: Memo File

MEMORANDUM

Date: July 28, 2006
To: Transfer 72177

From: amerritt

Re: sufficiency memo

These two transfers were filed by Diamond A Livestock Inc. and should be processed together since they are related. In preparation to processing these two transfers decreed right 37-2514 was split into two pieces (37-21490 for irrigation of 158 acres involved in transfer 72178 and 37-21491 for irrigation of 2 acres involved with SRBA claim 37-21492 in transfer 72177).
Transfer 72177 proposes development of a new truck washing facility. Two (2) acres are to be dried up (37-21491) and the water used at the new facility in combination with the water right associated with an old truck washing facility (37-21492). The existing well currently used by the old facility is to be used for the new facility. The new truck washing facility is to be located just east of the old facility. Waste water from the facility will be land applied next to the new facility.
Transfer 72178 modifies the acres irrigated under the majority of the remainder of right 37-2514 (37-21490) reshaping the place of use to cover an existing pivot system.
· Authority to File:
Applicant is listed as current owner on IDWR records for both decreed water rights and the SRBA claim involved in these two transfers. (Decreed right 37-2514 was split by ownership to facilitate processing of these two transfers in parallel.) Included in the file are deeds to the property and a release letter from a lien-holder on the property.
· Water Right Validity:
Rights 37-21490 and 37-21491 are children of decree 37-2514 which was recently reviewed in the SRBA and partially decreed. Claim 37-21492 records the historical domestic use limited to 2500 gpd for the existing truck wash.
· Injury to Other Water Rights:
None anticipated. Transfer will result in a reduction in the maximum allowed diversion volume maintaining current consumptive use rate. Note that the change in PD for right 37-21491 is all within the same ESPA cell so no need for model analysis.

· Enlargement of Use:
None if appropriate conditions and limits are implemented. The change of nature of use from irrigation of 2 acres to water to be used in the truck wash and then land applied will be similar in nature. Diversion volume will be limited to 4 afa/acre dried up and with the water to be land applied the consumptive use will be similar to irrigation.
The decreed record for 37-2514 infers that water is combined with North Side Canal Co. shares but included in the file is a letter from NSCC indicating no shares have ever been associated with the lands in Section 30 where the 2 acres are being dried up. No documentation was provided regarding NSCC use in Section 19 so it is unknown whether share are associated with those lands.

MEMORANDUM

· Local Public Interest:
No issues identified.

· Beneficial Use/Conservation of Water Resources:
The proposed uses are recognized as beneficial uses of water and appear to utilize common application efficiencies.

Review of the application finds there is no clear inconsistency with criteria set forth in Section 42-222 Idaho Code preventing processing of this application.

HEARING
ROSTER OF ATTENDANCE

IN THE MATTER OF APPLICATIONS FOR TRANSFER NOS. 72177 & 72178 IN THE NAME OF DIAMOND A LIVESTOCK, INC.	)))))	**HEARING HELD** **June 13, 2006** **Hearing Officer: Gary Spackman**

NAME	ADDRESS	REPRESENTING
Heidi Olson	2154 B Hwy 46 Gooding	self
Polly Ann Huggins	P.O. Box 382 Gooding, ID	SELF
Jay Faulkner	1877 E 2000 S Gooding	Diamond A Livestock
Rob Williams	117 S Adams, Jerome	Diamond A Livestock
Marvin L. Brockway	2016 N. Washington #1	Brockway Engr.
Cathy Pavkov	2115 SH 46, Gooding, ID 83330	Diamond A
Susan Faulkner	1997 S 1875 E Gooding, ID 83330	Diamond A Livestock
Fred Faulkner	1997 S 1875 E Gooding, ID 83330	Diamond A Livestock
Becky Faulkner	1877 E. 2000 S Gooding ID 83330	Diamond A Livestock
Robert Oldenseehlen	1247 F. 1/2 Ave East Twin Falls ID 83301	Nutrient Mgmt Solutions
LeAnn Reed	2094 Hwy 46 Gooding, ID 83330	Self

HEARING EXHIBIT LIST

IN THE MATTER OF APPLICATIONS FOR TRANSFER NOS. 72177 & 72178 IN THE NAME OF DIAMOND A LIVESTOCK, INC.

HEARING HELD
June 13, 2006
Hearing Officer: Gary Spackman
Notes by Allen Merritt

EXHIBIT NUMBER	EXHIBIT DESCRIPTION	STATUS OF EVIDENCE INTRODUCED	ADMITTED
Applic 1	Map Fig 1		x
2	Map Fig 3		x
3	Map Site	not offer	
4	Well Interference Study		x
5	Well Logs		x
6	GW Quality		x
7	Analysis		x
8	Water Q Summary	not offer	
9	Permit Materials (binder)		x
2A	Map		x
Protest A	3/28/05 Letter Venter		x
B	State Water Plan		x
C	Rules 02.04.23		x
D	Letter + Attachments	Gary will rule in decision	—
E	Rauenscroft Data	not received	

EXHIBIT NUMBER	EXHIBIT DESCRIPTION	STATUS OF EVIDENCE	
		INTRODUCED	ADMITTED
F	Soil Survey		X
G	Truck Wash Permit - Pasco	not received	

TESTIMONY LOG

IN THE MATTER OF APPLICATIONS FOR TRANSFER NOS. 72177 & 72178 IN THE NAME OF DIAMOND A LIVESTOCK, INC.

HEARING HELD
June 13, 2006
Hearing Officer: Gary Spackman

TAPE NUMBER 1

TAPE TO	LOCATION FROM	TESTIMONY DESCRIPTION
0000	0116	Gary's Intro
0117	1060	Jay Faulkner - Direct
1060	1600	X - by Huggins of Jay Faulkner
1600	1640	Re-direct
1640	1700	Re - cross
1700	2035	Staff questions
.		
2060	3308	Charles G. Brockway - Direct
3308	3850	X - by Huggins of Brockway
3856	3944	Re-direct
3948	4047	Re - X
4047	4268	? by Gary
4268	4323	? by Gary of Brockway
4360	4616	Recall Dr. Brockway & ? by Gary
4616	5451	Robert Ohlenseler - Direct
5451	6404	X-exam by Huggins
6404	6517	Re-direct
6517	7049	? by Gary
	7290	
7294		Protestant's exhibits
7824		Huggins - Direct
8272	8406	X-exam by williams of Huggins
8550		Closing arguments - williams
8628	8842	Huggins closing arguments.
8842	8996	Williams response

End of Tape 1

TAPE TO	LOCATION FROM	TESTIMONY DESCRIPTION
Tape 2		
0000	0040	Continue Williams Closing
0050		Hussins
0098	0343	Guy's closing comments
		End of Record

T 72177 & T 72178

Notes: ADR Tape Log

Tape 1

0241 Exhibit #1 admitted
0277 Exhibit #9 admitted
0300 Irvis Transfer
0486 Truckwash out Transfer
0670 Gooding Co. Special Use Permit
0700 Need for Dept Agri Permit
0795 Apply water on East pivot.
* different from initial application
0988 Meter pipeline going to Truckwash
1017 Use of facility (trucks per day)
1134 Pressure & use of cleaning equipment
1169 Overrule the objection
1441 No detergents
2172 T 27178 Brockway Comments
No injury
No Enlargement
2221 T27177 Brockway Comments
2590 Exhibits 2 & 2A admitted
2604 Exhibit #5 well logs
2750 Exhibit #4
2907 No impact - not measurable.
2930 WQ issues. Minutes
3077 Exhibit #6
3127 Consider running transfer tool
3247 Exhibit #7
4400 Stats of domestic uses
? about domestic exemptions

4616 — Robert Ohlensclam
Commercial Truck wash facility
IDAPA 02.04.23
Application with Agriculture for facility.

4806 Need 9 to 11 acres for liquid

max of 30 acres for solids or liquid.

5100 Construction of C2500m

5760 Pp 18 of plan about potential pathogens.

5890 Dept of Agri authority released from DEQ for this type of facility.

6800 Augment record with Agri truck wash facility.

(Hassing Testimony

7824
7979 — Exhibit A comments
8056 — Exhibit C
8142 Exhibit F
8200 — Feelings about breaking the law.
8272 —
8384 — No basis for illegal use for Agri permit requirement
8628 —

STATE OF IDAHO
WATER DISTRICT 130
C/O IDAHO DEPARTMENT OF WATER RESOURCES
1341 FILLMORE ST STE 200
TWIN FALLS ID 83301-3380
TELEPHONE NUMBER (208) 736-3033

IDWR DIRECTOR
KARL J. DREHER

WATERMASTER
CINDY YENTER

March 28, 2005

JAY FAULKNER
DIAMOND A LIVESTOCK INC
1997 S 1875 E
GOODING ID 83330

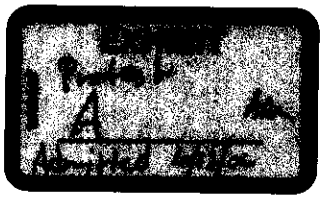
RE: Water Right Requirements for Proposed Expansion of Commercial Truck Wash Facility

Dear Jay:

Thank you for meeting with me on Friday to discuss the present setup and proposed plans for expansion of a commercial truck wash. Presently, the wash operation consists of a dirt pad, pressurized wash hose and a small settling pond. Water is drawn from a well which also serves the adjacent feedlot and one home. You indicated the in-line pressure booster pump is not operating, but that washing has still occurred using the ambient water system pressure only. Estimated output of the pressurized hose is 20-25 gallons per minute (gpm). Estimated capacity of the wash hose without the pressure booster is around 35-40 gpm. Under either flow scenario, a single wash with duration of no more than 60 minutes, would use less than 2500 gallons of water. According to handwritten records of use, in the form of a sign-in sheet which I found on the wall inside the wash shed, only two washes have occurred on separate days during March 2005.

The plans you showed me for the expanded facility include two wash bays with concrete pads, a new pressure pump and a 10,000 gallon holding tank. The holding tank would receive water from the existing well. This morning I had a conversation with Michael Sliman, Sliman and Butler Irrigation, who indicated that the new pressure booster pump you have considered would supply 20 gpm to one hose, or 40 gpm to two hoses, pumping from the holding tank rather than directly from the well.

Commercial water uses of less than 2500 gallons per day do not require a water right, however, the flow limitation for this exemption is 18 gallons per minute (Idaho Code § 42-111(b)). In the case of the new facility, my concern is the rate of flow and total daily volume *into the holding tank*. So long as the diversion rate to the tank does not exceed 18 gpm *and* total daily diversions do not exceed 2500 gallons, the operation would be within the statutory exemption. My impression of your plans, however, are that you expect a return from your investment, and this would require more than one or two washes per day. Even using impounded water, a maximum average of only 2 washes per day could be maintained without exceeding the 2500 gallon per day exemption limit. Therefore, your planned expansion will ultimately require a water right.



Diamond A Livestock holds a water right from ground water, for irrigation of lands immediately to the south of the feedlot. A brief analysis of use under this right indicates that several acres of land could be taken out of production and that portion of the water right would be eligible for transfer to year-round commercial use for the truck wash. For every acre of land idled under this right, up to 2600 gallons of water per day could be available for the truck wash. If acres are not available under this right, they would have to be identified from another water right under your control, or be purchased from someone else. At this time, an application for transfer has not been filed.

Water District 130 has jurisdiction of ground water diversions in the Magic Valley. Exempted uses of water are not directly regulated, but violations of exempted uses, including the diversion of water without a valid water right, are subject to watermaster control. If plans for this facility move forward, my requirements are as follows:

- Submittal of an Application for Transfer to the Idaho Department of Water Resources which seeks to transfer a sufficient amount of water to year-round commercial use, based on the anticipated operational volume of the truck wash.
- If the facility is operated prior to approval of a water right transfer, installation of an in-line flow meter in the supply line to the new truck wash, upstream from the holding tank and in a location accessible to the watermaster. This flow meter shall be installed to manufacturer's specifications and shall have the capacity to measure both instantaneous flow and totalized volume.

Until a valid water right transfer is approved, either wash facility will be restricted to 18 gallons per minute instantaneous diversion rate and 2500 gallons per day total diversion volume. The Watermaster of Water District 130 will confirm, during unannounced visits, the diversion rate and total daily diversion volume at the facility.

This letter in no way guarantees the approval of a water right transfer, nor does it convey approval of any other state, local or federal requirements for this facility. Water District 130 has no jurisdiction over waste water storage or disposal.

Please contact me if you have any further questions, and please keep me advised as to the status of this project.

Regards,

Cindy Yenter

Cindy Yenter
Watermaster
Water District 130

STATE OF IDAHO
WATER DISTRICT 130
C/O IDAHO DEPARTMENT OF WATER RESOURCES
1341 FILLMORE ST STE 200
TWIN FALLS ID 83301-3380
TELEPHONE NUMBER (208) 736-3033

IDWR DIRECTOR
KARL J. DREHER

WATERMASTER
CINDY YENTER

March 28, 2005

JAY FAULKNER
DIAMOND A LIVESTOCK INC
1997 S 1875 E
GOODING ID 83330

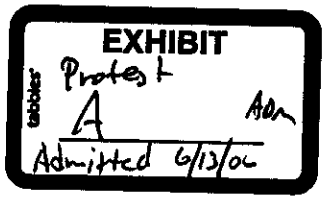
RE: Water Right Requirements for Proposed Expansion of Commercial Truck Wash Facility

Dear Jay:

Thank you for meeting with me on Friday to discuss the present setup and proposed plans for expansion of a commercial truck wash. Presently, the wash operation consists of a dirt pad, pressurized wash hose and a small settling pond. Water is drawn from a well which also serves the adjacent feedlot and one home. You indicated the in-line pressure booster pump is not operating, but that washing has still occurred using the ambient water system pressure only. Estimated output of the pressurized hose is 20-25 gallons per minute (gpm). Estimated capacity of the wash hose without the pressure booster is around 35-40 gpm. Under either flow scenario, a single wash with duration of no more than 60 minutes, would use less than 2500 gallons of water. According to handwritten records of use, in the form of a sign-in sheet which I found on the wall inside the wash shed, only two washes have occurred on separate days during March 2005.

The plans you showed me for the expanded facility include two wash bays with concrete pads, a new pressure pump and a 10,000 gallon holding tank. The holding tank would receive water from the existing well. This morning I had a conversation with Michael Sliman, Sliman and Butler Irrigation, who indicated that the new pressure booster pump you have considered would supply 20 gpm to one hose, or 40 gpm to two hoses, pumping from the holding tank rather than directly from the well.

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Water District 130 has jurisdiction of ground water diversions in the Magic Valley. Exempted uses of water are not directly regulated, but violations of exempted uses, including the diversion of water without a valid water right, are subject to watermaster control. If plans for this facility move forward, my requirements are as follows:

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- If the facility is operated prior to approval of a water right transfer, installation of an in-line flow meter in the supply line to the new truck wash, upstream from the holding tank and in a location accessible to the watermaster. This flow meter shall be installed to manufacturer's specifications and shall have the capacity to measure both instantaneous flow and totalized volume.

Until a valid water right transfer is approved, either wash facility will be restricted to 18 gallons per minute instantaneous diversion rate and 2500 gallons per day total diversion volume. The Watermaster of Water District 130 will confirm, during unannounced visits, the diversion rate and total daily diversion volume at the facility.

This letter in no way guarantees the approval of a water right transfer, nor does it convey approval of any other state, local or federal requirements for this facility. Water District 130 has no jurisdiction over waste water storage or disposal.

Please contact me if you have any further questions, and please keep me advised as to the status of this project.

Regards,

Cindy Yenter

Cindy Yenter
Watermaster
Water District 130

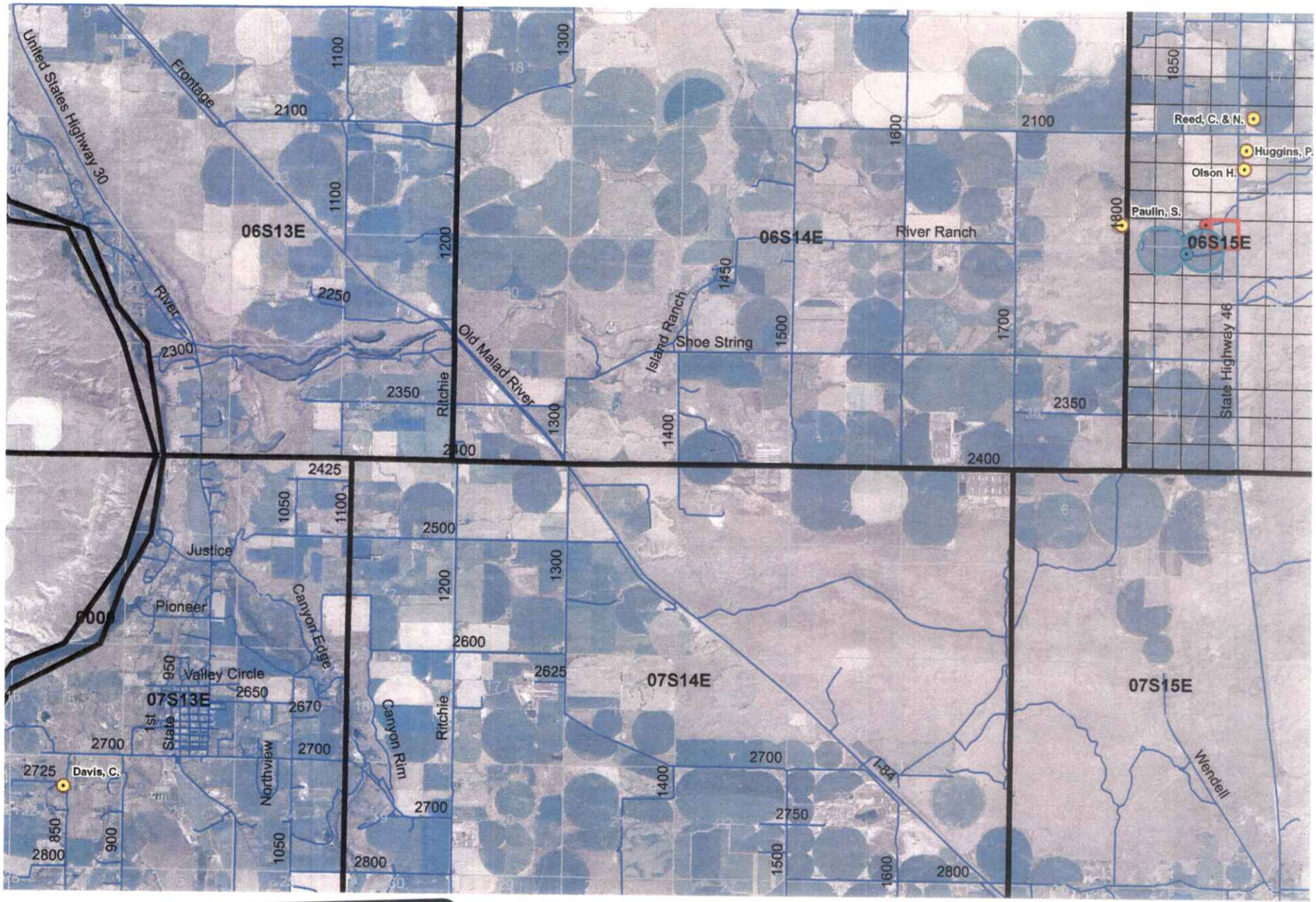


EXHIBIT
tabbies
Applicant
1
Admitted 6/15/06

DIAMOND A LIVESTOCK
Water Right Transfer
NAIP 2004 Aerial

FIGURE 1

Legend
- Protestants
- Proposed POU 72178
- POD 72178
- Proposed POU 72177
- Proposed POD 72177
- Township-Range
- Roads
- Section_Lines

N

BROCKWAY ENGINEERING, PLLC.
ALR - APRIL 20, 2006

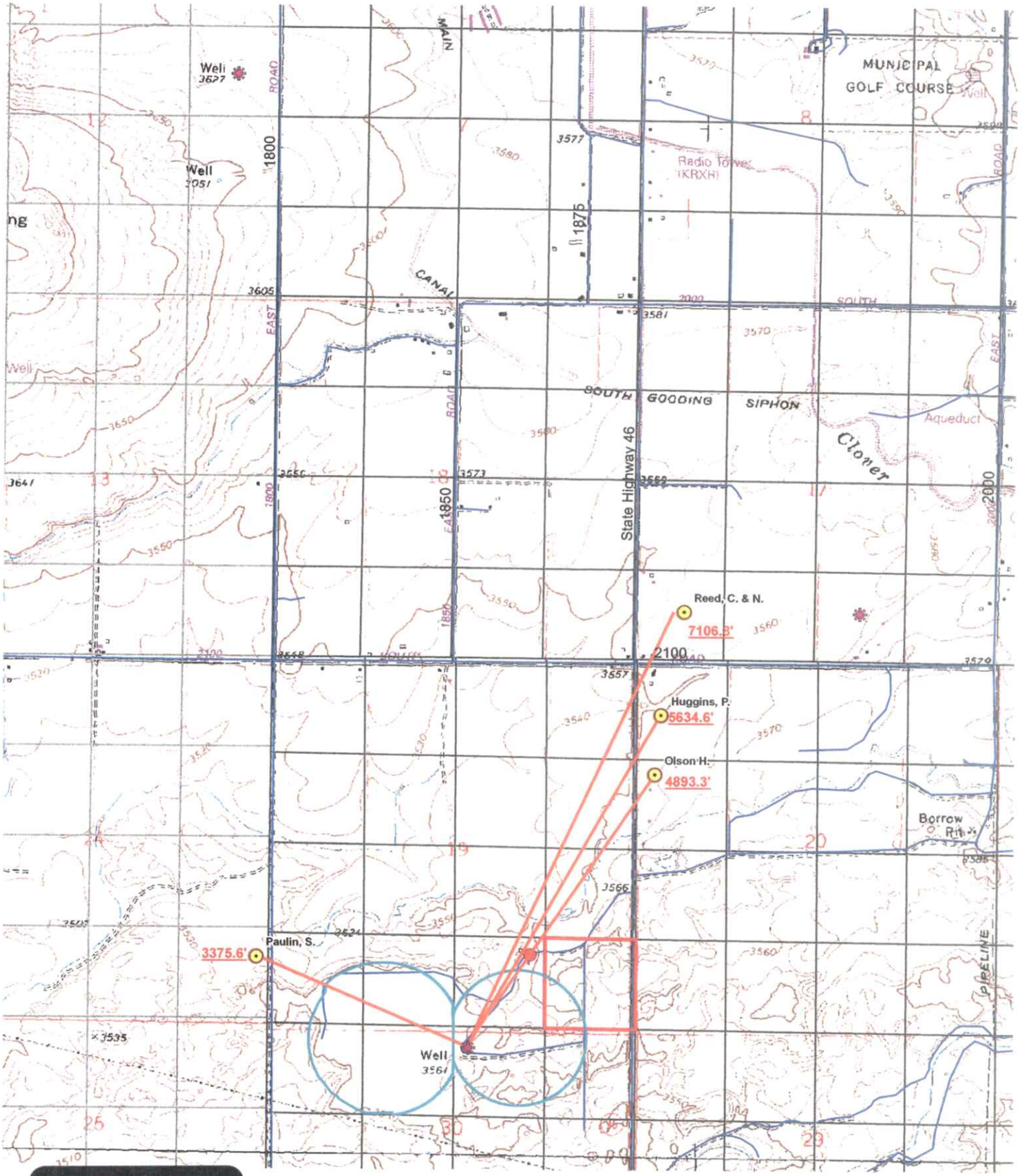


EXHIBIT
Applicant
2
Admitted 9/7/06

DIAMOND A LIVESTOCK
Distance to Irrigation Well & EDMS Well Sites
NAIP 2004 Aerial

Legend
- EDMS Wells
- Protestants
- Proposed POU 72178
- Proposed POU 72177
- Proposed POD 72177
- Distance
- Roads

N

BROCKWAY ENGINEERING, PLLC.
ALR - APRIL 24, 2006

FIGURE 3

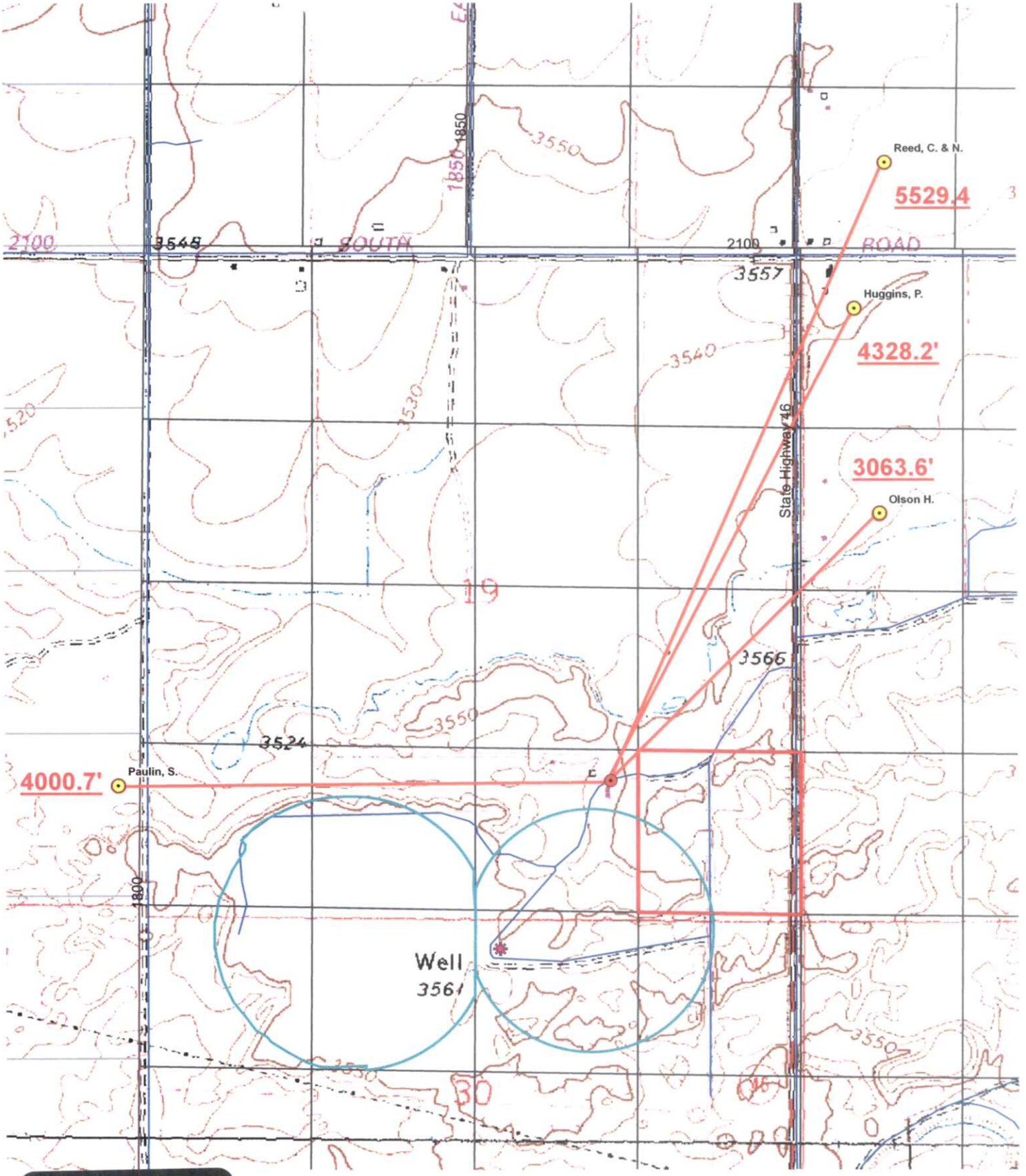


EXHIBIT
Applic
2A
Adm Hrd 9/5/06

DIAMOND A LIVESTOCK
Distance to Irrigation Well & EDMS Well Sites
NAIP 2004 Aerial

Legend
- EDMS Wells
- Protestants
- Proposed POU 72178
- Proposed POU 72177
- Proposed POD 72177
- Distance
- Roads

N

BROCKWAY ENGINEERING, PLLC.
ALR - JUNE 12, 2006

FIGURE 3

WELL DRAWDOWN ESTIMATION
DIAMOND A LIVESTOCK - TRUCK WASH

Drawdown estimated using Theis approach
Brockway Engineering, PLLC

		Peak Daily Demand for 30 days	
Hydraulic conductivity	1436 ft/day	Pumping rate	36 gpm = 0.08 cfs
Saturated thickness	500 feet	Pumping time	720 hrs
Transmissitivity	5370640 gpd/ft		
Storage coefficient	0.08		

Time		R = 0.50 feet			R = 100 feet			R = 500 feet			R = 3375 feet			R = 7100 feet		
(days)	(hrs)	u	W(u)	z (feet)	u	W(u)	z (feet)	u	W(u)	z (feet)	u	W(u)	z (feet)	u	W(u)	z (feet)
0	0	--	--	0.00	--	--	0.00	--	--	0.00	--	--	0.00	--	--	0.00
1.25	30	5.6E-09	18.428	0.01	2.2E-04	7.832	0.01	5.6E-03	4.619	0.00	2.5E-01	1.032	0.00	1.1E+00	0.179	0.00
2.5	60	2.8E-09	19.122	0.01	1.1E-04	8.525	0.01	2.8E-03	5.309	0.00	1.3E-01	1.610	0.00	5.6E-01	0.491	0.00
3.75	90	1.9E-09	19.527	0.02	7.4E-05	8.931	0.01	1.9E-03	5.713	0.00	8.5E-02	1.975	0.00	3.7E-01	0.747	0.00
5	120	1.4E-09	19.815	0.02	5.6E-05	9.218	0.01	1.4E-03	6.001	0.00	6.3E-02	2.243	0.00	2.8E-01	0.955	0.00
6.25	150	1.1E-09	20.038	0.02	4.5E-05	9.441	0.01	1.1E-03	6.224	0.00	5.1E-02	2.453	0.00	2.2E-01	1.129	0.00
7.5	180	9.3E-10	20.220	0.02	3.7E-05	9.624	0.01	9.3E-04	6.406	0.00	4.2E-02	2.628	0.00	1.9E-01	1.277	0.00
8.75	210	8.0E-10	20.374	0.02	3.2E-05	9.778	0.01	8.0E-04	6.560	0.01	3.6E-02	2.776	0.00	1.6E-01	1.407	0.00
10	240	7.0E-10	20.508	0.02	2.8E-05	9.911	0.01	7.0E-04	6.693	0.01	3.2E-02	2.905	0.00	1.4E-01	1.522	0.00
11.25	270	6.2E-10	20.626	0.02	2.5E-05	10.029	0.01	6.2E-04	6.811	0.01	2.8E-02	3.019	0.00	1.2E-01	1.625	0.00
12.5	300	5.6E-10	20.731	0.02	2.2E-05	10.134	0.01	5.6E-04	6.916	0.01	2.5E-02	3.122	0.00	1.1E-01	1.718	0.00
13.75	330	5.1E-10	20.826	0.02	2.0E-05	10.230	0.01	5.1E-04	7.011	0.01	2.3E-02	3.215	0.00	1.0E-01	1.804	0.00
15	360	4.6E-10	20.913	0.02	1.9E-05	10.317	0.01	4.6E-04	7.098	0.01	2.1E-02	3.300	0.00	9.4E-02	1.883	0.00
16.25	390	4.3E-10	20.993	0.02	1.7E-05	10.397	0.01	4.3E-04	7.178	0.01	2.0E-02	3.378	0.00	8.6E-02	1.956	0.00
17.5	420	4.0E-10	21.068	0.02	1.6E-05	10.471	0.01	4.0E-04	7.252	0.01	1.8E-02	3.451	0.00	8.0E-02	2.024	0.00
18.75	450	3.7E-10	21.137	0.02	1.5E-05	10.540	0.01	3.7E-04	7.321	0.01	1.7E-02	3.519	0.00	7.5E-02	2.088	0.00
20	480	3.5E-10	21.201	0.02	1.4E-05	10.604	0.01	3.5E-04	7.386	0.01	1.6E-02	3.582	0.00	7.0E-02	2.148	0.00
21.25	510	3.3E-10	21.262	0.02	1.3E-05	10.665	0.01	3.3E-04	7.447	0.01	1.5E-02	3.642	0.00	6.6E-02	2.205	0.00
22.5	540	3.1E-10	21.319	0.02	1.2E-05	10.722	0.01	3.1E-04	7.504	0.01	1.4E-02	3.698	0.00	6.2E-02	2.258	0.00
23.75	570	2.9E-10	21.373	0.02	1.2E-05	10.776	0.01	2.9E-04	7.558	0.01	1.3E-02	3.752	0.00	5.9E-02	2.309	0.00
25	600	2.8E-10	21.424	0.02	1.1E-05	10.828	0.01	2.8E-04	7.609	0.01	1.3E-02	3.802	0.00	5.6E-02	2.358	0.00
26.25	630	2.7E-10	21.473	0.02	1.1E-05	10.876	0.01	2.7E-04	7.658	0.01	1.2E-02	3.850	0.00	5.3E-02	2.404	0.00
27.5	660	2.5E-10	21.520	0.02	1.0E-05	10.923	0.01	2.5E-04	7.704	0.01	1.2E-02	3.896	0.00	5.1E-02	2.448	0.00
28.75	690	2.4E-10	21.564	0.02	9.7E-06	10.967	0.01	2.4E-04	7.749	0.01	1.1E-02	3.940	0.00	4.9E-02	2.490	0.00
30	720	2.3E-10	21.607	0.02	9.3E-06	11.010	0.01	2.3E-04	7.791	0.01	1.1E-02	3.982	0.00	4.7E-02	2.531	0.00
31.25	750	2.2E-10	21.647	0.02	8.9E-06	11.051	0.01	2.2E-04	7.832	0.01	1.0E-02	4.023	0.00	4.5E-02	2.570	0.00

EXHIBIT
tabbies Applicant
4
Admitted 6/13/06

WELL DRAWDOWN ESTIMATION
DIAMOND A LIVESTOCK - TRUCK WASH

Drawdown estimated using Theis approach
Brockway Engineering, PLLC

Hydraulic conductivity	1436 ft/day		Average Day Demand for 365 days	
Saturated thickness	500 feet	Pumping rate	7 gpm =	0.01 cfs
Transmissitivity	5370640 gpd/ft	Pumping time	8760 hrs	
Storage coefficient	0.08			

Time		R = 0.50 feet			R = 100 feet			R = 500 feet			R = 3375 feet			R = 7100 feet		
(days)	(hrs)	u	W(u)	z (feet)	u	W(u)	z (feet)	u	W(u)	z (feet)	u	W(u)	z (feet)	u	W(u)	z (feet)
0	0	--	--	0.00	--	--	0.00	--	--	0.00	--	--	0.00	--	--	0.00
15.208333	365	4.6E-10	20.927	0.00	1.8E-05	10.331	0.00	4.6E-04	7.112	0.00	2.1E-02	3.313	0.00	9.2E-02	1.895	0.00
30.416667	730	2.3E-10	21.620	0.00	9.2E-06	11.024	0.00	2.3E-04	7.805	0.00	1.0E-02	3.996	0.00	4.6E-02	2.544	0.00
45.625	1095	1.5E-10	22.026	0.00	6.1E-06	11.429	0.00	1.5E-04	8.210	0.00	7.0E-03	4.398	0.00	3.1E-02	2.934	0.00
60.833333	1460	1.1E-10	22.313	0.00	4.6E-06	11.717	0.00	1.1E-04	8.498	0.00	5.2E-03	4.684	0.00	2.3E-02	3.214	0.00
76.041667	1825	9.2E-11	22.537	0.00	3.7E-06	11.940	0.00	9.2E-05	8.721	0.00	4.2E-03	4.906	0.00	1.8E-02	3.433	0.00
91.25	2190	7.6E-11	22.719	0.00	3.1E-06	12.122	0.00	7.6E-05	8.904	0.00	3.5E-03	5.088	0.00	1.5E-02	3.612	0.00
106.45833	2555	6.5E-11	22.873	0.00	2.6E-06	12.276	0.00	6.5E-05	9.058	0.00	3.0E-03	5.241	0.00	1.3E-02	3.764	0.00
121.66667	2920	5.7E-11	23.007	0.00	2.3E-06	12.410	0.00	5.7E-05	9.191	0.00	2.6E-03	5.375	0.00	1.2E-02	3.896	0.00
136.875	3285	5.1E-11	23.124	0.00	2.0E-06	12.528	0.00	5.1E-05	9.309	0.00	2.3E-03	5.492	0.00	1.0E-02	4.013	0.00
152.08333	3650	4.6E-11	23.230	0.00	1.8E-06	12.633	0.00	4.6E-05	9.414	0.00	2.1E-03	5.597	0.00	9.2E-03	4.117	0.00
167.29167	4015	4.2E-11	23.325	0.00	1.7E-06	12.728	0.00	4.2E-05	9.510	0.00	1.9E-03	5.692	0.00	8.4E-03	4.211	0.00
182.5	4380	3.8E-11	23.412	0.00	1.5E-06	12.815	0.00	3.8E-05	9.597	0.00	1.7E-03	5.779	0.00	7.7E-03	4.298	0.00
197.70833	4745	3.5E-11	23.492	0.00	1.4E-06	12.896	0.00	3.5E-05	9.677	0.00	1.6E-03	5.859	0.00	7.1E-03	4.377	0.00
212.91667	5110	3.3E-11	23.566	0.00	1.3E-06	12.970	0.00	3.3E-05	9.751	0.00	1.5E-03	5.933	0.00	6.6E-03	4.451	0.00
228.125	5475	3.1E-11	23.635	0.00	1.2E-06	13.039	0.00	3.1E-05	9.820	0.00	1.4E-03	6.002	0.00	6.2E-03	4.519	0.00
243.33333	5840	2.9E-11	23.700	0.00	1.1E-06	13.103	0.00	2.9E-05	9.884	0.00	1.3E-03	6.066	0.00	5.8E-03	4.584	0.00
258.54167	6205	2.7E-11	23.760	0.00	1.1E-06	13.164	0.00	2.7E-05	9.945	0.00	1.2E-03	6.127	0.00	5.4E-03	4.644	0.00
273.75	6570	2.5E-11	23.818	0.00	1.0E-06	13.221	0.00	2.5E-05	10.002	0.00	1.2E-03	6.184	0.00	5.1E-03	4.701	0.00
288.95833	6935	2.4E-11	23.872	0.00	9.6E-07	13.275	0.00	2.4E-05	10.056	0.00	1.1E-03	6.238	0.00	4.9E-03	4.754	0.00
304.16667	7300	2.3E-11	23.923	0.00	9.2E-07	13.326	0.00	2.3E-05	10.107	0.00	1.0E-03	6.289	0.00	4.6E-03	4.806	0.00
319.375	7665	2.2E-11	23.972	0.00	8.7E-07	13.375	0.00	2.2E-05	10.156	0.00	9.9E-04	6.338	0.00	4.4E-03	4.854	0.00
334.58333	8030	2.1E-11	24.018	0.00	8.3E-07	13.422	0.00	2.1E-05	10.203	0.00	9.5E-04	6.385	0.00	4.2E-03	4.900	0.00
349.79167	8395	2.0E-11	24.063	0.00	8.0E-07	13.466	0.00	2.0E-05	10.247	0.00	9.1E-04	6.429	0.00	4.0E-03	4.945	0.00
365	8760	1.9E-11	24.105	0.00	7.6E-07	13.509	0.00	1.9E-05	10.290	0.00	8.7E-04	6.472	0.00	3.8E-03	4.987	0.00
380.20833	9125	1.8E-11	24.146	0.00	7.3E-07	13.549	0.00	1.8E-05	10.331	0.00	8.3E-04	6.512	0.00	3.7E-03	5.028	0.00

Figure 4. Drawdown versus time and radial distance from the pumping well
Q = 36 gpm, T = 5370640 gpd/ft, Sc = 0.08

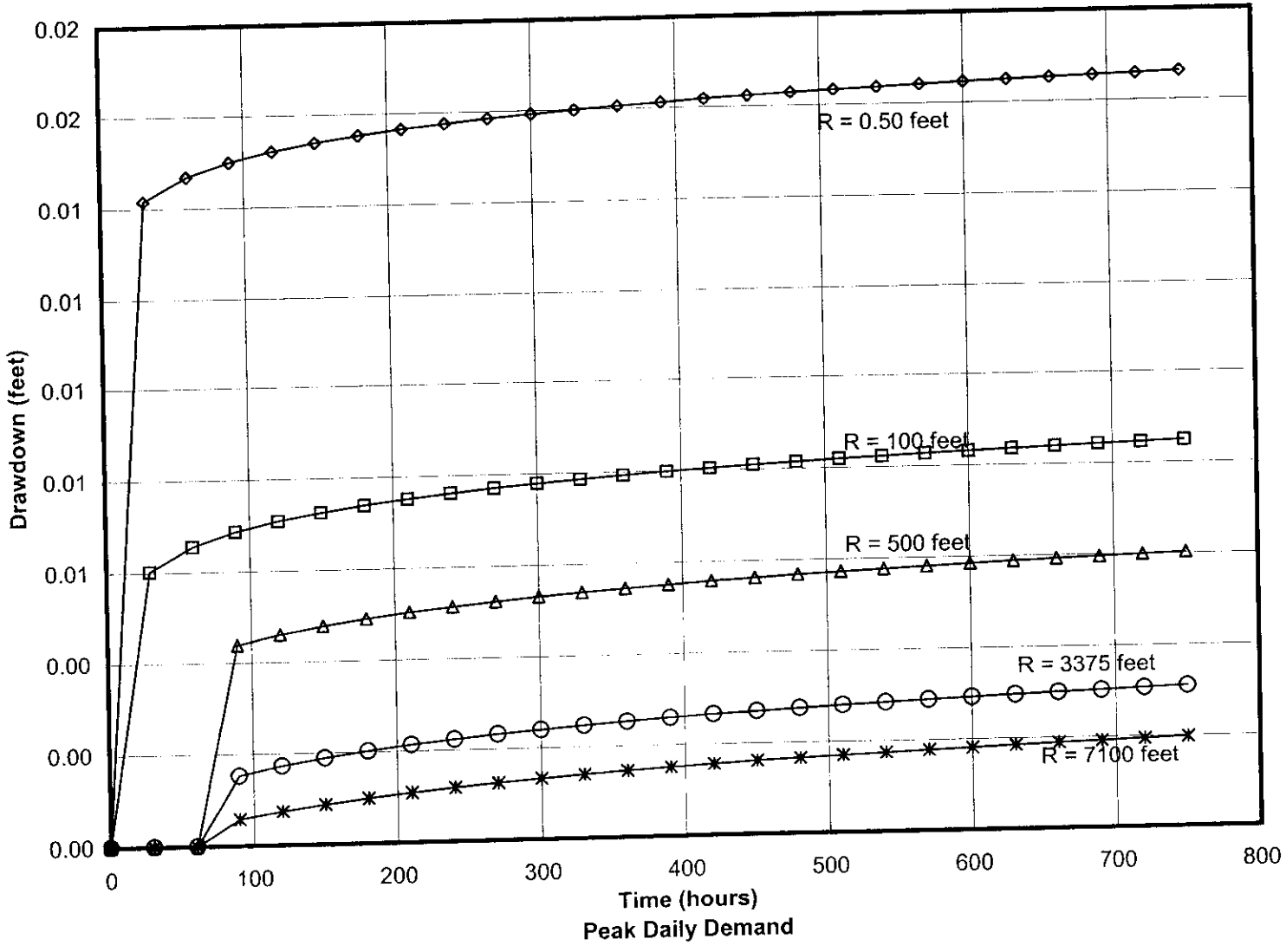
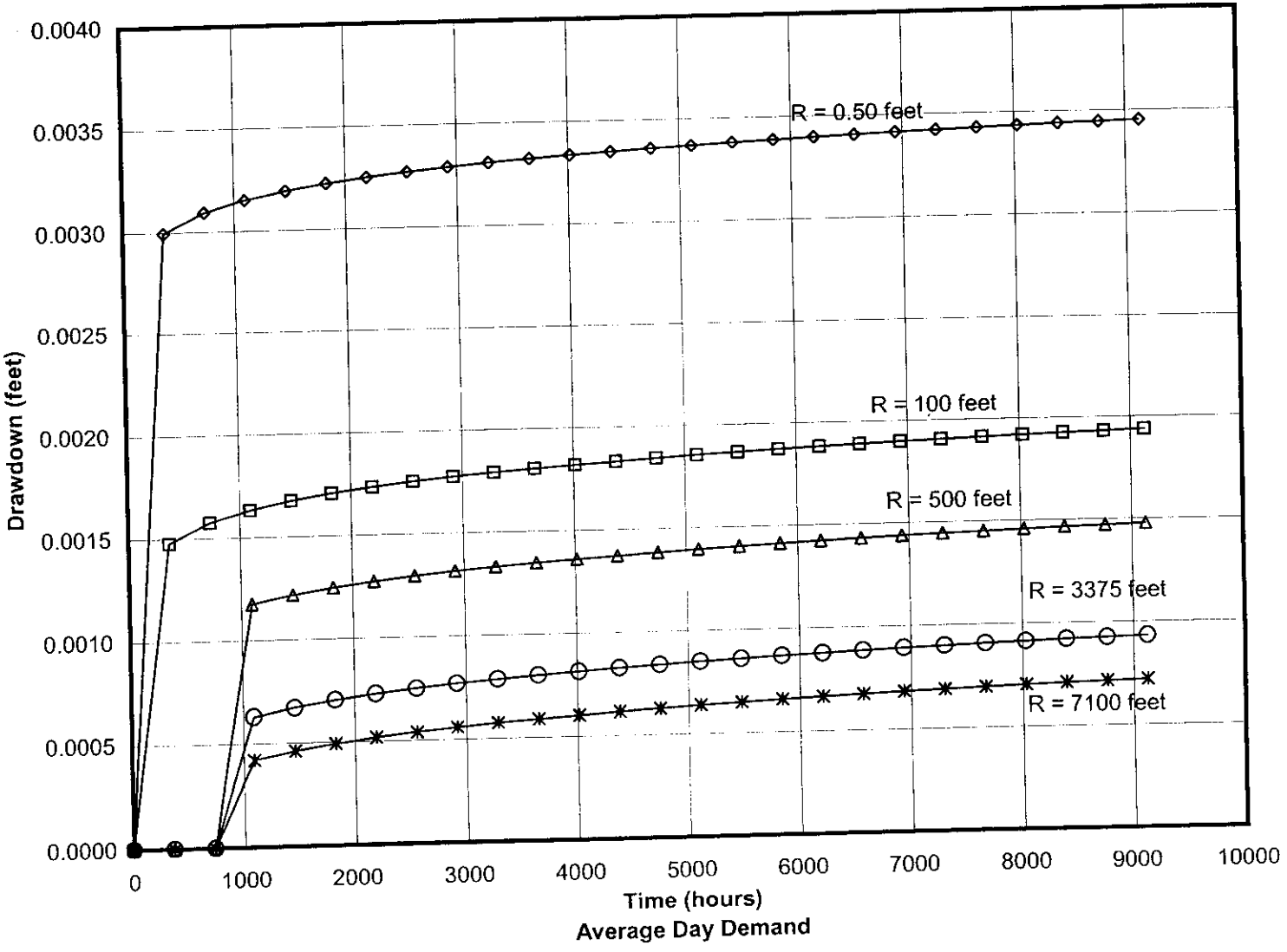


Figure 5. Drawdown versus time and radial distance from the pumping well
Q = 7 gpm, T = 5370640 gpd/ft, Sc = 0.08



Form 238-7
4/92

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES

RECEIVED
AUG 24 1993
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.

EXHIBIT
Applicant
5
Admitted 6/12/06

1. WELL OWNER

Name Hilkner Land + Livestock

Address 1989 S 1875 E Gooding

Drilling Permit No. 36 93-S-0152, 37-93-C-0029 000

Water Right Permit No. 36-2504 37-08005

2. NATURE OF WORK

☒ New well ☐ Deepened ☐ Replacement
☐ Well diameter increase ☐ Modification
☐ Abandoned (describe abandonment or modification procedures such as liners, screen, materials, plug depths, etc. in lithologic log, section 9.)

3. PROPOSED USE

☐ Domestic ☒ Irrigation ☐ Monitor
☐ Industrial ☐ Stock ☐ Waste Disposal or Injection
☐ Other _____ (specify type)

4. METHOD DRILLED

☒ Rotary ☒ Air ☐ Auger ☐ Reverse rotary
☐ Cable ☐ Mud ☐ Other _____ (backhoe, hydraulic, etc.)

5. WELL CONSTRUCTION

Casing schedule: ☒ Steel ☐ Concrete ☐ Other _____

Thickness	Diameter	From	To
.25 inches	16 inches	+ 1 feet	16 feet
_____ inches	_____ inches	_____ feet	_____ feet
_____ inches	_____ inches	_____ feet	_____ feet

Was casing drive shoe used? ☐ Yes ☒ No
Was a packer or seal used? ☐ Yes ☒ No
Perforated? ☐ Yes ☒ No
How perforated? ☐ Factory ☐ Knife ☐ Torch ☐ Gun
Size of perforation? _____ inches by _____ inches

Number	From	To
_____ perforations	_____ feet	_____ feet
_____ perforations	_____ feet	_____ feet
_____ perforations	_____ feet	_____ feet

Well screen installed? ☐ Yes ☒ No
Manufacturer _____ Type _____
Top Packer or Headpipe _____
Bottom of Tailpipe _____

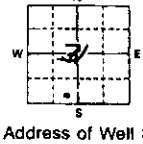
Diameter ____ Slot size ____ Set from ____ feet to ____ feet
Diameter ____ Slot size ____ Set from ____ feet to ____ feet
Gravel packed? ☐ Yes ☒ No ☐ Size of gravel _____
Placed from _____ feet to _____ feet

Surface seal depth 18 Material used in seal: ☒ Cement grout
☐ Bentonite ☐ Puddling clay ☐ _____
Sealing procedure used: ☐ Slurry pit
☐ Temp. surface casing ☐ Overbore to seal depth
Method of joining casing: ☐ Threaded ☐ Welded
☐ Solvent Weld ☐ Cemented between strata

Describe access port 2" welded steel pipe + cap plate

6. LOCATION OF WELL

Sketch map location **must** agree with written location.



Subdivision Name _____
Lot No. _____ Block No. _____
County Gooding
Address of Well Site See sketch 1/2 mile S. of Hwy 46 on E. side
(give at least name of road)
SE ¼ SW ¼ Sec. 31, T. 6 S, R. 15 E ☒ or W ☐

7. WATER LEVEL

Static water level 228 feet below land surface.
Flowing? ☐ Yes ☒ No G.P.M. flow _____
Artesian closed-in pressure _____ p.s.i.
Controlled by: ☐ Valve ☐ Cap ☐ Plug
Temperature 85 °F. Quality _____
Describe artesian or temperature zones below.

8. WELL TEST DATA

081405

☐ Pump ☐ Bailer ☐ Air ☐ Other _____

Discharge G.P.M.	Pumping Level	Hours Pumped

9. LITHOLOGIC LOG

Bore Diam.	Depth From	Depth To	Material	Water Yes	Water No
17	0	13	Top Soil		X
17	13	16	Bl Lava		
15	16	19	"		
	19	28	Gray Lava		
	28	29	Cinders		
	29	31	Br Clay		
	31	87	Gray Lava		
	87	89	Red "		
	89	94	Red Sandy Clay		
	94	136	Gray Lava		
	136	143	Broken Bl Lava		
	143	218	Bl Lava		
	218	224	Soft Broken Red + bl Lava		
	224	240	Gray Lava		
	240	244	Broken Red + bl Lava	Y	
	244	255	Bl Lava		
	255	258	Gray Lava		
	258	263	Soft Broken bl Lava	X	
	263	270	Red + bl Cinders	X	
	270	280	Gray Lava		

Inspected 7-12-93 JS

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JUL 08 1993
Department of Water Resources
Southern Region Office

10.

Work started 5-10-93 finished 5-15-93

11. DRILLER'S CERTIFICATION

I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Firm Name Eaton drilling Firm No. 26
Address Wendell Date _____
Signed by Drilling Supervisor _____
and
(Operator) Dave Carby
(If different than the Drilling Supervisor)

USE ADDITIONAL SHEETS IF NECESSARY — FORWARD THE WHITE COPY TO THE DEPARTMENT

Basin 37

Form 238-7 App 873280 — 0355382
11/97 JGE Per 784321

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

CA

Office Use Only
Inspected by _____
Twp ____ Rge ____ Sec ____
____ 1/4 ____ 1/4 ____ 1/4
Lat: : : Long: : :

1. WELL TAG NO. D 0023311
DRILLING PERMIT NO. 784321
Other IDWR No. 37-10604

2. OWNER:
Name Diamond A Livestock
Address 1997 S. 1875 E.
City Gooding State ID Zip 83330

3. LOCATION OF WELL by legal description:
Sketch map location must agree with written location.

N / W / E / S

Twp. 6 North ☐ or South ☒
Rge. 15 East ☒ or West ☐
Sec. 19 ____ 1/4 (10 acres) SW 1/4 (40 acres) SE 1/4 (160 acres)
Gov't Lot ____ County Gooding
Lat: Long:
Address of Well Site 2175 HWY 46 1/4 mi. City Gooding
(Give at least name of road + Distance to Road or Landmark)
Lt. ____ Blk. ____ Sub. Name ____

4. USE:
☐ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation
☐ Thermal ☐ Injection ☒ Other livestock

5. TYPE OF WORK: check all that apply
☐ New Well ☐ Modify ☐ Abandonment ☒ Other replacement (Replacement etc.)

6. DRILL METHOD:
☒ Air Rotary ☐ Cable ☐ Mud Rotary ☐ Other ____

7. SEALING PROCEDURES:

Seal/Filter Pack Material	From	To	AMOUNT Sacks or Pounds	METHOD
bentonite	0	19	200 lbs.	dry pour

Was drive shoe used? ☐ Y ☒ N Shoe Depth(s) ____
Was drive shoe seal tested? ☐ Y ☒ N How? ____

8. CASING/LINER:

Diameter	From	To	Guage	Material	Casing	Liner	Welded	Threaded
6"	+1	19	.250	steel	☒	☐	☒	☐
5"	15	177	.188	steel	☐	☒	☒	☐
					☐	☐	☐	☐

Length of Headpipe 1' Length of Tailpipe ____

9. PERFORATIONS/SCREENS:
☐ Perforations Method ____
☐ Screens Screen Type ____

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
						☐	☐
						☐	☐
						☐	☐

10. STATIC WATER LEVEL OR ARTESIAN PRESSURE:
240 ft. below ground Artesian pressure ____ lb.
Depth flow encountered ____ ft. Describe access port or control devices: well cap

11. WELL TESTS:
☐ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian

Yield gal./min.	Drawdown	Pumping Level	Time

Water Temp. <85 Bottom hole temp. <85
Water Quality test or comments: ____
Depth first Water Encounter ____

12. LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Water Y	Water N
8	0	3	top soil		
8	3	19	black lava		
6	19	44	black lava		
6	44	61	red & black ash		
6	61	76	medium hard black lava		
6	76	108	black lava		
6	108	109	broken lava		
6	109	111	black lava		
6	111	112	crevice		
6	112	131	hard lava		
6	131	139	cinders		
6	139	144	hard lava		
6	144	162	soft broken lava & cinders		
6	162	204	hard lava		
6	204	214	medium hard lava & breaks		
6	214	234	hard lava		
6	234	239	medium hard lava		
6	239	240	broken lava	X	
6	240	252	hard lava		
6	252	257	medium hard lava & breaks	X	
6	257	274	hard lava		
6	274	281	medium hard lava & breaks	X	
6	281	285	medium hard lava		

RECEIVED
OCT 16 2002
Department of Water Resources
Southern Region

Completed Depth 285' (Measurable)
Date: Started 8/27/2002 Completed 8/27/2002

13. DRILLER'S CERTIFICATION:
I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Company Name Eaton Drilling & pump Service, Inc. Firm No. 26
Firm Official [signature] Date 9/2/2002
and
Driller or Operator [signature] Date 9/2/2002
(Sign once if Firm Official & Operator)

FORWARD WHITE COPY TO WATER RESOURCES

Form 238-7
4/92

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.

1. WELL OWNER
Name Fran K Crossen
Address 3451-A-S 1800 E Jerdell Id
Drilling Permit No. 36-93-S-0218
Water Right Permit No. _____

2. NATURE OF WORK
☒ New well ☐ Deepened ☒ Replacement
☐ Well diameter increase ☐ Modification
☐ Abandoned (describe abandonment or modification procedures such as liners, screen, materials, plug depths, etc. in lithologic log, section 9.)

3. PROPOSED USE
☒ Domestic ☐ Irrigation ☐ Monitor
☐ Industrial ☒ Stock ☐ Waste Disposal or Injection
☐ Other _____ (specify type)

4. METHOD DRILLED
☒ Rotary ☒ Air ☐ Auger ☐ Reverse rotary
☐ Cable ☐ Mud ☐ Other _____ (backhoe, hydraulic, etc.)

5. WELL CONSTRUCTION
Casing schedule: ☒ Steel ☐ Concrete ☐ Other _____

Thickness	Diameter	From	To
.25 inches	6 inches	+ 1 feet	19 feet
_____ inches	_____ inches	_____ feet	_____ feet
_____ inches	_____ inches	_____ feet	_____ feet

Was casing drive shoe used? ☐ Yes ☒ No
Was a packer or seal used? ☐ Yes ☒ No
Perforated? ☐ Yes ☒ No
How perforated? ☐ Factory ☐ Knife ☐ Torch ☐ Gun
Size of perforation? _____ inches by _____ inches

Number	From	To
_____ perforations	_____ feet	_____ feet
_____ perforations	_____ feet	_____ feet
_____ perforations	_____ feet	_____ feet

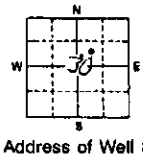
Well screen installed? ☐ Yes ☒ No
Manufacturer _____ Type _____
Top Packer or Headpipe _____
Bottom of Tailpipe _____

Diameter ____ Slot size ____ Set from ____ feet to ____ feet
Diameter ____ Slot size ____ Set from ____ feet to ____ feet
Gravel packed? ☐ Yes ☒ No ☐ Size of gravel _____
Placed from _____ feet to _____ feet

Surface seal depth 19' Material used in seal: ☐ Cement grout
☒ Bentonite ☐ Puddling clay ☐ _____
Sealing procedure used: ☐ Slurry pit
☐ Temp. surface casing ☒ Overbore to seal depth
Method of joining casing: ☐ Threaded ☐ Welded
☐ Solvent Weld ☐ Cemented between strata

Describe access port Sanitary Well Cap

6. LOCATION OF WELL
Sketch map location **must** agree with written location.



Subdivision Name _____
Lot No. _____ Block No. _____
County Gooding
Address of Well Site _____ (give at least name of road)
SW ¼ NE ¼ Sec. 30, T. 8 N ☐ or S ☒, R. 15 E ☒ or W ☐

7. WATER LEVEL
Static water level 70 feet below land surface.
Flowing? ☐ Yes ☒ No G.P.M. flow _____
Artesian closed-in pressure _____ p.s.i.
Controlled by: ☐ Valve ☐ Cap ☐ Plug
Temperature 85° °F. Quality _____
Describe artesian or temperature zones below.

8. WELL TEST DATA
☐ Pump ☐ Bailer ☐ Air ☐ Other _____

Discharge G.P.M.	Pumping Level	Hours Pumped

70296

9. LITHOLOGIC LOG

Bore Diam.	Depth From	Depth To	Material	Water Yes	Water No
8	0	4	Top Soil		
8	4	19	Gray Lava		
6	19	41	"		
	41	42	Cinderss		
	42	63	Gray Lava		
	63	64	Cinderss		
	64	86	Gray Lava		
	86	92	Soft, broken & Lava	X	
	92	107	Hard no returns		
	107	109	Soft broken	X	
	109	111	Cinderss	X	
	111	116	Soft, broken + Cinders	X	
	116	124	Hard		
	124	125	Soft, broken	X	
	125	130	Hard		

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JUN 24 1993
Department of Water Resources
Southern Region Office

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FEB 09 1994
AUG 10 1993
Department of Water Resources

10.
Work started 6-9-93 finished 6-9-93

11. DRILLER'S CERTIFICATION
I/We certify that all minimum well construction standards were complied with at the time the rig was removed.
Firm Name Eaton Drilling Firm No. 26
Address Jerdell Date 6-10-93
Signed by Drilling Supervisor _____
and
(Operator) _____
(If different than the Drilling Supervisor)

USE ADDITIONAL SHEETS IF NECESSARY — FORWARD THE WHITE COPY TO THE DEPARTMENT

Form 238-7
4/92

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES

RECEIVE
FEB 24 1993
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.

1. WELL OWNER
Name Paul Kaer Land + Livestock
Address 1989 S 1875 E Gooding
Drilling Permit No. 37-92-S-138-000
Water Right Permit No. _____

2. NATURE OF WORK
☒ New well ☐ Deepened ☐ Replacement
☐ Well diameter increase ☐ Modification
☐ Abandoned (describe abandonment or modification procedures such as liners, screen, materials, plug depths, etc. in lithologic log, section 9.)

3. PROPOSED USE
☒ Domestic ☐ Irrigation ☐ Monitor
☐ Industrial ☐ Stock ☐ Waste Disposal or Injection
☐ Other _____ (specify type)

4. METHOD DRILLED
☒ Rotary ☒ Air ☐ Auger ☐ Reverse rotary
☐ Cable ☐ Mud ☐ Other _____ (backhoe, hydraulic, etc.)

5. WELL CONSTRUCTION
Casing schedule: ☒ Steel ☐ Concrete ☐ Other _____

Thickness	Diameter	From	To
.25 inches	6 inches	+ 1 feet	170 feet
_____ inches	_____ inches	_____ feet	_____ feet
_____ inches	_____ inches	_____ feet	_____ feet

Was casing drive shoe used? ☒ Yes ☐ No
Was a packer or seal used? ☐ Yes ☒ No
Perforated? ☐ Yes ☒ No
How perforated? ☐ Factory ☐ Knife ☐ Torch ☐ Gun
Size of perforation? _____ inches by _____ inches

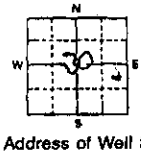
Number	From	To
_____ perforations	_____ feet	_____ feet
_____ perforations	_____ feet	_____ feet
_____ perforations	_____ feet	_____ feet

Well screen installed? ☐ Yes ☒ No
Manufacturer _____ Type _____
Top Packer or Headpipe _____
Bottom of Tailpipe _____

Diameter ____ Slot size ____ Set from ____ feet to ____ feet
Diameter ____ Slot size ____ Set from ____ feet to ____ feet
Gravel packed? ☐ Yes ☒ No ☐ Size of gravel _____
Placed from _____ feet to _____ feet

Surface seal depth 19' Material used in seal: ☐ Cement grout
☒ Bentonite ☐ Puddling clay ☐ _____
Sealing procedure used: ☐ Slurry pit
☐ Temp. surface casing ☒ Overbore to seal depth
Method of joining casing: ☐ Threaded ☐ Welded
☐ Solvent Weld ☐ Cemented between strata
Describe access port San Tory Well Cap

6. LOCATION OF WELL
Sketch map location must agree with written location.



Subdivision Name _____
Lot No. _____ Block No. _____
County Gooding
Address of Well Site 1/4 mi. To W. Shoestring Rd
(give at least name of road)
NW ¼ SE ¼ Sec. 30, T. 6 N ☐ or S ☒, R. 15 E ☒ or W ☐

7. WATER LEVEL 248
Static water level [redacted] feet below land surface.
Flowing? ☐ Yes ☒ No G.P.M. flow _____
Artesian closed-in pressure _____ p.s.i.
Controlled by: ☐ Valve ☐ Cap ☐ Plug
Temperature ~65 °F. Quality _____
Describe artesian or temperature zones below.

8. WELL TEST DATA
☐ Pump ☐ Bailer ☐ Air ☐ Other _____

Discharge G.P.M.	Pumping Level	Hours Pumped

9. LITHOLOGIC LOG 103808

Bore Diam.	Depth From	Depth To	Material	Water Yes	Water No
8	0	4	Top Soil		X
	4	49	Gray Lava		
	49	53	Red + bl Cinders		
	53	69	Br Lava		
	69	78	Red + Bl Cinders		
6	78	81	Br Lava		
	81	97	Br Clay		
	97	147	Br Lava		
	147	150	Soft broken no Actives		
	150	152	Clevasse		
	152	158	Hard		
	158	170	[redacted] Cinders		
	170	210	Hard		
	210	217	Soft broken Lava		
	217	243	Hard		
	243	249	Soft bl Lava	X	
	249	250	Clevasse	X	
↓	250	280	Hard Lava		

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SEP 10 1992
Department of Water Resources
Southern Region Office

10.
Work started 8-27-92 finished 8-28-92

11. DRILLER'S CERTIFICATION
I/We certify that all minimum well construction standards were complied with at the time the rig was removed.
Firm Name Eaton Drilling Firm No. 26
Address Wendell Date 9-4-92
Signed by Drilling Supervisor Dave Eaton
and
(Operator) [redacted]
(If different than the Drilling Supervisor)

MICROFILMED
AUG 09 1993

USE ADDITIONAL SHEETS IF NECESSARY — FORWARD THE WHITE COPY TO THE DEPARTMENT

App 891009

Form 238-7
11/97 JGE

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

Office Use Only
Inspected by _____
Twp _____ Rge _____ Sec _____
____ 1/4 ____ 1/4 ____ 1/4
Lat: : : Long: : :

1. WELL TAG NO. D _____
DRILLING PERMIT NO. _____
Other IDWR No. 836003

2. OWNER:
Name Bunker Land and Livestock
Address 198 E 1875 S
City Gooding State ID Zip 83330

3. LOCATION OF WELL by legal description:
Sketch map location must agree with written location.

N / W / E / S

Twp. 6 S North ☐ or South ☑
Rge. 15 E ☑ or West ☐
Sec. 30 NE 1/4 NE 1/4 SE 1/4
Gov't Lot ____ County Gooding
Lat: Long:
Address of Well Site Hagerling Rd
2300 S & mi W of Hwy 46 City Nearest Gooding
Lt. ____ Blk. ____ Sub. Name ____

4. USE:
☑ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation
☐ Thermal ☐ Injection ☐ Other _____

5. TYPE OF WORK: check all that apply (Replacement etc.)
☐ New Well ☐ Modify ☒ Abandonment ☐ Other _____

6. DRILL METHOD:
☐ Air Rotary ☐ Cable ☐ Mud Rotary ☐ Other U

7. SEALING PROCEDURES:

Seal/Filter Pack Material	From	To	AMOUNT Sacks or Pounds	METHOD
Bentonite Chips	156'	0	56	dry pour

Was drive shoe used? ☐Y ☐N Shoe Depth(s) _____
Was drive shoe seal tested? ☐Y ☐N How? _____

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
					☐	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐

Length of Headpipe _____ Length of Tailpipe _____

9. PERFORATIONS/SCREENS:
☐ Perforations Method _____
☐ Screens Screen Type _____

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
						☐	☐
						☐	☐
						☐	☐

10. STATIC WATER LEVEL OR ARTESIAN PRESSURE:
_____ ft. below ground Artesian pressure _____ lb.
Depth flow encountered _____ ft. Describe access port or control devices: _____

11. WELL TESTS:
☐ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian

Yield gal./min.	Drawdown	Pumping Level	Time

Water Temp. _____ Bottom hole temp. _____
Water Quality test or comments: _____
Depth first Water Encountered _____

12. LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Water Y	Water N
			SCANNED		
			Abandone well		
			well caved in bottom to 156'		
			56 bags		

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DEC 02 2005
Department of Water Resources

RECEIVED
NOV 22 2005
Department of Water Resources
Southern Region

Completed Depth _____ (Measurable)
Date: Started 9-18-05 Completed 9-18-05

13. DRILLER'S CERTIFICATION:
I/We certify that all minimum well construction standards were complied with at the time the rig was removed.
Company Name Eaton Drilling Firm No. 26
Firm Official Larry Eaton Date 9-18-05
and
Driller or Operator _____ Date _____
(Sign once if Firm Official & Operator)

FORWARD WHITE COPY TO WATER RESOURCES

Form 238-7
7/94

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

Use Typewriter or Ball Point Pen

093254

1. DRILLING PERMIT NO. 37-96-S-0003-000
Other IDWR No.

2. OWNER:
Name Harold Olson
Address 1628 S 1750 E
City Gooding State Id Zip 83330

3. LOCATION OF WELL by legal description:
Sketch map location must agree with written location.

N / W / E / S

Twp. 6 North ☐ or South ☒
Rge. 15 East ☒ or West ☐
Sec. 20 ____ 1/4 SW 1/4 NW 1/4
Gov't Lot ____ County Gooding

Address of Well Site 2174 SJ
Hwy. 46 City Gooding
(Give at least name of road + Distance to Road or Landmark)

Lt. ____ Blk. ____ Sub. Name ____

4. PROPOSED USE:
☒ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation
☐ Thermal ☐ Injection ☐ Other

5. TYPE OF WORK
☒ New Well ☐ Modify or Repair ☐ Replacement ☐ Abandonment

6. DRILL METHOD
☐ Mud Rotary ☒ Air Rotary ☐ Cable ☐ Other

7. SEALING PROCEDURES

SEAL/FILTER PACK Material	From	To	AMOUNT Sacks or Pounds	METHOD
Bentonite	0	180	2200 lbs	

Was drive shoe used? ☒ Y ☐ N Shoe Depth(s)
Was drive shoe seal tested? Y ☐ N ☒ How?

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
6	1	179	.25	Steel	☒	☐	☒	☐
					☐	☐	☐	☐
					☐	☐	☐	☐

Length of Headpipe 1' Length of Tailpipe

9. PERFORATIONS/SCREENS
☐ Perforations Method
☐ Screens Screen Type

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
						☐	☐
						☐	☐
						☐	☐

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APR 16 1996
Department of Water Resources

10. STATIC WATER LEVEL OR ARTESIAN PRESSURE:
248 ft. below ground Artesian pressure ____ lb.
Depth flow encountered ____ ft. Describe access port or control devices: Well Cap

11. WELL TESTS:
☐ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian

Yield gal./min.	Drawdown	Pumping Level	Time

Water Temp. ~85° Bottom hole temp.
Water Quality test or comments:

12. LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Water Y	Water N
8	0	4	Top Soil		
	4	27	BSL LAVA		
	27	43	Red Ash		
	43	69	BSL LAVA		
	69	71	BSL Clay		
	71	92	BSL LAVA		
	92	94	Cinders		
	94	109	BSL LAVA		
	109	110	Crevasse NO RETURNS		
	110	116	Hard		
	116	124	Med Hard		
	124	133	Cinders Loose		
	133	150	Hard		
	150	159	Cinders Loose		
	159	164	Hard		
	164	168	Cinders Loose		
	168	174	Broken LAVA		
	174	179	Hard		
6	179	221	Hard		
	221	223	Broken		
	223	228	Hard		
	228	234	Med Hard + breaks	X	X
	234	256	Hard		
	256	259	Broken	X	
	259	265	Med Hard		
	265	268	Broken	X	
	268	279	Hard		
	279	284	Cinders Loose	X	
	284	286	Hard		
	286	289	Cinders	X	
V	289	292	Hard		

MAR 20 1996
Department of Water Resources
Southern Region

AUG 21 1996

Completed Depth 282 (Measurable)
Date: Started 2-11-96 Completed 2-12-96

13. DRILLER'S CERTIFICATION
I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Firm Name Eaton Drilling Firm No. 26
Firm Official [signature] Date 2-26-96
and
Supervisor or Operator Dave Cook Date 2-22-96
(Sign once if Firm Official & Operator)

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Basin 37
App 870465
Per 775226

J 347080

Form 238-7
11/97 JGE

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

C

Office Use Only
Inspected by
Twp ____ Rge ____ Sec ____
____ 1/4 ____ 1/4 ____ 1/4
Lat: : : Long: : :

1. WELL TAG NO. D 0016938
DRILLING PERMIT NO.
Other IDWR No.

2. OWNER:
Name Polly Ann Huggins
Address P.O. Box 382
City Gooding State ID Zip 83330

3. LOCATION OF WELL by legal description:
Sketch map location must agree with written location.

N / W / E / S

Twp. 6 North ☐ or South ☒
Rge. 15 East ☒ or West ☐
Sec. 20 ____ 1/4 (10 acres) NW 1/4 (40 acres) NW 1/4 (160 acres)
Gov't Lot ____ County Gooding
Lat: Long:
Address of Well Site 1905 E. 2100 S.
City Gooding
(Give at least name of road + Distance to Road or Landmark)
Lt. ____ Blk. ____ Sub. Name ____

4. USE:
☒ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation
☐ Thermal ☐ Injection ☐ Other

5. TYPE OF WORK: check all that apply (Replacement etc.)
☒ New Well ☐ Modify ☐ Abandonment ☒ Other replacement

6. DRILL METHOD:
☒ Air Rotary ☐ Cable ☐ Mud Rotary ☐ Other

7. SEALING PROCEDURES:

Seal/Filter Pack Material	From	To	AMOUNT Sacks or Pounds	METHOD
bentonite	0	18	350 lbs.	dry pour

Was drive shoe used? ☐ Y ☒ N Shoe Depth(s)
Was drive shoe seal tested? ☐ Y ☒ N How?

8. CASING/LINER:

Diameter	From	To	Guage	Material	Casing	Liner	Welded	Threaded
6"	+2	18	.250	steel	☒	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐

Length of Headpipe 1' Length of Tailpipe

9. PERFORATIONS/SCREENS:
☐ Perforations Method
☐ Screens Screen Type

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
						☐	☐
						☐	☐
						☐	☐

10. STATIC WATER LEVEL OR ARTESIAN PRESSURE:
237 ft. below ground Artesian pressure lb.
Depth flow encountered ft. Describe access port or control devices: well cap

11. WELL TESTS:
☐ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian

Yield gal./min.	Drawdown	Pumping Level	Time

Water Temp. <85 Bottom hole temp. <85
Water Quality test or comments:
Depth first Water Encounter 238'

12. LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Water Y	Water N
8	0	6	top soil		
8	6	18	hard lava		
6	18	37	medium hard lava		
6	37	40	red ash & silt		
6	40	60	medium lava		
6	60	61	cinders		
6	61	78	medium red lava		
6	78	84	soft lava, ash & cinders		
6	84	92	medium lava		
6	92	94	soft broken lava & cinders		
6	94	98	medium lava		
6	98	100	crevice		
6	100	135	medium red lava		
6	135	141	red lava & cinders		
6	141	198	medium red lava		
6	198	201	soft lava & cinders		
6	201	238	medium to soft brown lava	X	
6	238	241	soft lava & cinders	X	
6	241	275	medium lava		
6	275	281	cinders & soft lava	X	
6	281	298	medium lava		
6	298	300	broken lava, cinders & talc	X	

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APR 18 2002
Department of Water Resources
Southern Region

Completed Depth 300' (Measurable)
Date: Started 3/14/2002 Completed 3/14/2002

13. DRILLER'S CERTIFICATION:
I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Company Name Eaton Drilling & pump Service, Inc. Firm No. 26
Firm Official Larry Huber Date 3/14/2002
and
Driller or Operator Marvin Short Date 3/14/2002
(Sign once if Firm Official & Operator)

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11/97

Bas n 37
CA

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

Office Use Only
Inspected by _____
Twp ____ Rge ____ Sec ____
____ 1/4 ____ 1/4 ____ 1/4
Lat: : : Long: : :

1. WELL TAG NO. D 347082
DRILLING PERMIT NO. 97 01167
Other IDWR No. 175228

2. OWNER:
Name Polly Ann Huggins
Address _____
City _____ State ____ Zip ____

3. LOCATION OF WELL by legal description:
Sketch map location must agree with written location.

N / W / E / S

Twp. 6S North ☐ or South ☒
Rge. 15 East ☒ or West ☐
Sec. 20 ____ 1/4 NW 1/4 NW 1/4 (10 acres / 40 acres / 160 acres)
Gov't Lot ____ County Gooding
Lat: : : Long: : :
Address of Well Site 1905 E. 2100 S
City Gooding
(Give at least name of road + Distance to Road or Landmark)

Lt. _____ Blk. _____ Sub. Name _____

4. USE:
☒ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation
☐ Thermal ☐ Injection ☐ Other _____

5. TYPE OF WORK check all that apply (Replacement etc.)
☐ New Well ☐ Modify ☒ Abandonment ☐ Other _____

6. DRILL METHOD
☐ Air Rotary ☐ Cable ☐ Mud Rotary ☐ Other _____

7. SEALING PROCEDURES

SEAL/FILTER PACK Material	From	To	AMOUNT Sacks or Pounds	METHOD
3/8" enviroplug	8	239	62 bags	dry pour

Was drive shoe used? ☐Y ☐ N Shoe Depth(s) _____
Was drive shoe seal tested? ☐ Y☐ N How? _____

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
					☐	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐

Length of Headpipe _____ Length of Tailpipe _____

9. PERFORATIONS/SCREENS
Perforations Method _____
Screens Screen Type _____

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
						☐	☐
						☐	☐
						☐	☐

10. STATIC WATER LEVEL OR ARTESIAN PRESSURE:
No O ft. below ground Artesian pressure ____ lb.
water Depth flow encountered ____ ft. Describe access port or control devices: _____

11. WELL TESTS:
☐ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian

Yield gal./min.	Drawdown	Pumping Level	Time

Water Temp. _____ Bottom hole temp. ____
Water Quality test or comments: _____
Depth first Water Encounter ____

12. LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Water Y	Water N
			Abandonment of well		

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MAY 15 2002
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Southern Region

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JUN 07 2002
Department of Water Resources
Southern Region

Completed Depth 239' (Measurable)
Date: Started 3/21/02 Completed 3/21/02

13. DRILLER'S CERTIFICATION
I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Company Name Eaton Firm No. 26
Firm Official _____ Date 3-21-02
and
Driller or Operator _____ Date _____

Form 238-7
1/94

C

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

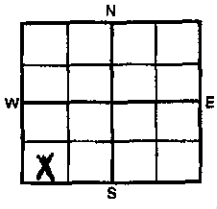
Use Typewriter or Ball Point Pen

56689

1. DRILLING PERMIT NO. 37 - 94 - S - 0103 - 000
Other IDWR No.

2. OWNER:
Name Dan Reed
Address 2295 South 1600 East
City Gooding State ID Zip 83330

3. LOCATION OF WELL by legal description:
Sketch map location must agree with written location.



Twp. 6 North ☐ or South ☒
Rge. 15 East ☒ or West ☐
Sec. 17, 10 acres 1/4 40 acres SW 1/4 160 acres SW 1/4
Gov't Lot ____ County Gooding

Address of Well Site
City
(Give at least name of road + Distance to Road or Landmark)

Lt. Blk. Sub. Name

4. PROPOSED USE:
☒ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation
☐ Thermal ☐ Injection ☐ Other

5. TYPE OF WORK
☒ New Well ☐ Modify or Repair ☐ Replacement ☐ Abandonment

6. DRILL METHOD
☐ Mud Rotary ☒ Air Rotary ☐ Cable ☐ Other

7. SEALING PROCEDURES

SEAL/FILTER PACK Material	From	To	AMOUNT Sacks or Pounds	METHOD
Bentonite	0	179	10 S	Poured
Overbore to seal depth				

Was drive shoe used? Y ☒ N ☐
Was drive shoe seal tested? Y ☐ N ☒ How?

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
6"	+2	179	.250	Steel	☒	☐	☒	☐
					☐	☐	☐	☐
					☐	☐	☐	☐

Length of Headpipe Length of Tailpipe

9. PERFORATIONS/SCREENS
☐ Perforations Method
☐ Screens Screen Type

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
						☐	☐
						☐	☐
						☐	☐

10. STATIC WATER LEVEL OR ARTESIAN PRESSURE:
221 ft. below ground Artesian pressure ____ lb.
Depth flow encountered ____ ft. Describe access port or control devices:

11. WELL TESTS:
☐ Pump ☐ Baller ☐ Air ☐ Flowing Artesian

Yield gal./min.	Drawdown	Hours Tested	Time

Water Temp. Bottom hole temp.
Water Quality test or comments:

JUL 26 1994
Department of Water Resources
Southern Region Office

12. LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Water Y	Water N
8"	0	18	Topsoil		x
	18	29	Gray basalt		x
	29	33	Brown basalt		x
	33	74	Gray basalt		x
	74	92	Brown basalt		x
	92	138	Gray basalt		x
	138	145	Fractured basalt		x
	145	147	Big crack, lost circulation		x
	147	153	Basalt		x
	153	165	Fractured basalt		x
	165	174	Cinders		x
	174	179	Fractured basalt		x
	179	227	Basalt		x
	227	235	Black cinders	x	
	235	241	Basalt		x
	241	244	Cinders	x	
	244	300	Fractured basalt	x	

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AUG 15
Department of Water Resources

Completed Depth 300 ft. (Measurable)
Date: Started 7-22-94 Completed 7-22-94

13. DRILLER'S CERTIFICATION
I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Firm Name Elsing Drilling Firm No. 31
Firm Official Arnold Elsing Date 7-25-94
and
Supervisor or Operator Lloyd Wood Date 7-25-94
(Sign once if Firm Official & Operator)

MAY 08 1995

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C

Form 238-7
3/95

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

Use Typewriter or Ballpoint Pen

065994

Office Use Only
Inspected by _____
Twp____ Rge____ Sec____
____1/4 ____1/4 ____1/4
Lat: : : Long: : :

1. DRILLING PERMIT NO. 37-97-S-0061-000
Other IDWR No. _____

2. OWNER:
Name Steve Paulin
Address 1905 E 2100 S
City Gooding State Id Zip 83330

3. LOCATION OF WELL by legal description:
Sketch map location must agree with written location.

N / W / E / S

Twp. 6 North ☐ or South ☒
Rge. 14 East ☒ or West ☐
Sec. 24, ____ 1/4 SE 1/4 SE 1/4
(10 acres / 40 acres / 160 acres)
Gov't Lot ____ County Gooding
Lat: : : Long: : :
Address of Well Site 1800 S. 2090 E.
City Gooding
(Give at least name of road + Distance to Road or Landmark)

Lt. _____ Blk. _____ Sub. Name _____

4. USE:
☒ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation
☐ Thermal ☐ Injection ☐ Other _____

5. TYPE OF WORK check all that apply (Replacement etc.)
☒ New Well ☐ Modify ☐ Abandonment ☐ Other _____

6. DRILL METHOD
☒ Air Rotary ☐ Cable ☐ Mud Rotary ☐ Other _____

7. SEALING PROCEDURES

SEAL/FILTER PACK Material	From	To	AMOUNT Sacks or Pounds	METHOD
Bentonite	0	199	1800 lbs	

Was drive shoe used? ☒ Y ☐ N Shoe Depth(s) _____
Was drive shoe seal tested? ☐ Y ☒ N How? _____

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
6"	1	199	.25	Steel	☒	☐	☒	☐
					☐	☐	☐	☐
					☐	☐	☐	☐

Length of Headpipe 1' Length of Tailpipe _____

9. PERFORATIONS/SCREENS
☐ Perforations Method _____
☐ Screens Screen Type _____

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
						☐	☐
						☐	☐
						☐	☐

10. STATIC WATER LEVEL OR ARTESIAN PRESSURE:
250 ft. below ground Artesian pressure _____ lb.
Depth flow encountered _____ ft. Describe access port or control devices: well cap

11. WELL TESTS:
☐ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian

Yield gal./min.	Drawdown	Pumping Level	Time

Water Temp. < 85° Bottom hole temp. _____
Water Quality test or comments: _____
Depth first Water Encountered _____

12. LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Water Y	Water N
8"	0	4	Top Soil		
	4	18	Lava		
	18	23	Lava		
	23	28	Red Ash		
	28	53	Lava		
	53	57	Red Ash		
	57	64	Gray Lava		
	64	108	Black basalt		
	108	110	Crevise		
	110	116	Lava		
	116	120	Red Cinders		
	120	150	Lava		
	150	160	Black cinders		
	160	162	Crevise		
	162	195	broken basalt		
↓	195	200	med hard basalt		
6"	200	210	med hard basalt		
↓	210	305	broken basalt & Lost cuttings X		

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SEP 04 1997
Department of Water Resources
Southern Region

RECEIVED
OCT 10 1997
Department of Water Resources

Completed Depth 322 (Measurable)
Date: Started 7-9-97 Completed 7-16-97

13. DRILLER'S CERTIFICATION
I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Firm Name Eaton Drilling Firm No. 26
Firm Official [signature] Date 7-23-97
and
Supervisor or Operator [signature] Date 7-23-97
(Sign once if Firm Official/Operator)

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Form 238-7
3/95

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

Use Typewriter or Ballpoint Pen

Office Use Only
Inspected by _____
Twp____ Rge____ Sec____
____1/4 ____1/4 ____1/4
Lat: : : Long: : :

1. DRILLING PERMIT NO. 36-97-5-0091-000 **66002**
Other IDWR No. IAG 0000 2038

2. OWNER:
Name Rick + Christy Davis
Address P.O. Box 749
City Hagerman State Id Zip 83332

3. LOCATION OF WELL by legal description:
Sketch map location must agree with written location.

N / W / E / S

Twp. 7 North ☐ or South ☒
Rge. 13 East ☒ or West ☐
Sec. 22, ____ 1/4 SW 1/4 NE 1/4 (10 acres / 40 acres / 160 acres)
Gov't Lot ____ County Gooding
Lat: : : Long: S :
Address of Well Site 2732 8.50 E
City Hagerman
(Give at least name of road + Distance to Road or Landmark)

Lt.____ Blk.____ Sub. Name____

4. USE:
☒ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation
☐ Thermal ☐ Injection ☐ Other____

5. TYPE OF WORK check all that apply (Replacement etc.)
☒ New Well ☐ Modify ☐ Abandonment ☐ Other____

6. DRILL METHOD
☒ Air Rotary ☐ Cable ☐ Mud Rotary ☐ Other____

7. SEALING PROCEDURES

SEAL/FILTER PACK Material	From	To	AMOUNT Sacks or Pounds	METHOD
Bentonite	0	19	200 lbs	

Was drive shoe used? ☐ Y ☒ N Shoe Depth(s)____
Was drive shoe seal tested? ☐ Y ☒ N How?____

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
6	1	19	.25	Steel	☒	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐

Length of Headpipe 1 Length of Tailpipe____

9. PERFORATIONS/SCREENS
☐ Perforations Method____
☐ Screens Screen Type____

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
						☐	☐
						☐	☐
						☐	☐

10. STATIC WATER LEVEL OR ARTESIAN PRESSURE:
78 ft. below ground Artesian pressure ____ lb.
Depth flow encountered ____ ft. Describe access port or control devices: Well Cap

11. WELL TESTS:
☐ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian

Yield gal./min.	Drawdown	Pumping Level	Time

Water Temp. ~85° Bottom hole temp. ____
Water Quality test or comments: ____
Depth first Water Encountered ____

12. LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Water Y	Water N
8	0	4	Top Soil		
8	4	19	BSI Lava		
6	19	23	" "		
	23	25	Broken		
	25	84	BSI Lava		
	84	87	Cinders	X	
	87	91	BSI Lava		
	91	116	BSI Lava + breaks	X	
	116	133	BSI Lava		
	133	138	Broken + Cinders	X	
↓	138	140	Soft broken Cinders	X	

RECEIVED
SEP 04 1997
Department of Water Resources
Southern Region
RECEIVED
OCT 10 1997
Department of Water Resources

Completed Depth 140 (Measurable)
Date: Started 7-25-97 Completed 7-25-97

13. DRILLER'S CERTIFICATION
I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Firm Name Eaton Drilling Firm No. 26
Firm Official [signature] Date 8-4-97
and
Supervisor or Operator [signature] Date 8-1-97
(Sign once if Firm Official & Operator)

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GROUNDWATER QUALITY IN THE DIRECT VICINITY OF PROPOSED TRUCK WASH

Project:	Diamond A Livestock - Truck Wash
Location of proposed facilities:	T6S, R15E, Section 19
Parameter:	Nitrate-nitrogen
Data sources:	USGS, State of Idaho
Data criteria:	Recent test data (~1990 or later), preferably multiple samples.

Two wells within approx. 3 miles of the site have one or more data points.

Well: 06S15E30ABB1
Irrigation well on site

Date	NO3-N
6/2/1970	4.70
8/4/1970	3.10
8/18/1989	1.20
7/29/1992	1.20
7/24/1995	1.40
8/10/1998	1.40
7/25/2001	1.13

Well: 06S15E17DCD1
Approx. 1.25 miles NE of site (up-gradient)

Date	NO3-N
7/30/1993	1.10
7/30/1997	1.64
7/2/2001	1.01

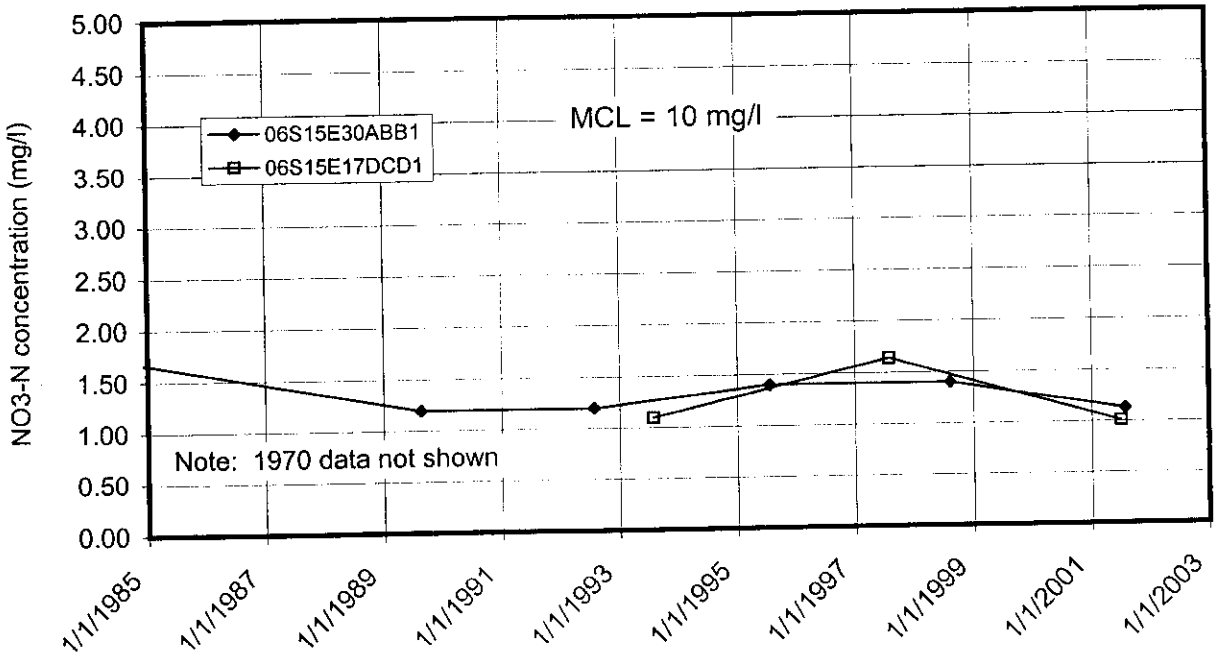


EXHIBIT
tabbies
Applicant
6
Admitted 6/12/06

ANALYSIS OF WATER RIGHT TRANSFER TO DAIRY: 72177

Brockway Engineering, PLLC 6/1/06

Diamond A Livestock Truck Wash
Long Term Water Use

*****TYPICAL YEAR Long Term*****

Water rights: Existing commercial right 37-21492 & Irrigation right 37-21491

ET determined from Allen & Brockway (1983) using Jerome station

Alfalfa CIR **920** mm/year
3.02 af/ac

CURRENT

Usage: 2.0 acres irrigation with GW as primary source
plus existing commerical facility w/ land app of waste

Total irrigated area	2.0 acres (g.w.)
Crop consumptive irrig.req't	3.02 ac-ft/acre
Diversion volume	4.0 ac-ft/acre
Irrigation Diversion Volume	8 ac-ft/year
Existing facility diversion volume	2.8 ac-ft/yr
Existing facility consumptive use*	2.1 ac-ft/yr
Maximum diversion rate - both rights	0.08 cfs

Water balance calculation:
(All values in acre-feet)

Total irrigation water applied to crop	8.0
Total volume used by existing comm. right	2.8
Volume supplied by g.w.	**10.8**
Total consumptive irrigation req't	6.0
Consumptive use of existing comm. right	2.1
C.U. supplied by g.w.	**8.1**
Return to aquifer	2.7
Aquifer net gain/loss	**-8.1**

AFTER TRANSFER

Usage: Proposed facility, land application of waste

Irrigated area	0.0 acres
Crop consumptive irrig.req't	3.02 ac-ft/acre
Diversion volume for irrig.	4.0 ac-ft/ac
Facility diversion volume	10.8 ac-ft/yr
Facility consumptive use*	8.1 ac-ft/yr
Maximum diversion rate	0.08 cfs

Water balance calculation:
(All values in acre-feet)

Total irrigation water applied to crop	0
Total volume used in facility	10.8
Total volume needed on site	10.8
Volume supplied by g.w.	**10.8**
Consumptive irrig.req't of crop	0.0
Consumptive use of facility*	8.1
Total consumptive req't	8.1
C.U. supplied by g.w.	**8.1**
Return to aquifer	2.7
Aquifer net gain/loss	**-8.1**

Notes:
* Water is land applied, therefore consumptive use is assumed to be 75% of diversion volume based on irrigation efficiency

EXHIBIT
Applicant
7
Admitted 9/13/06

FREDERICKSEN, WILLIAMS & MESERVY
ATTORNEYS AT LAW
117 S ADAMS ST - P.O. BOX 168
JEROME, ID 83338-0168

Diamond A- Truck Wash Facility
Permit Application Materials

tabbies
EXHIBIT
Applicant
9
Admitted 6/13/06

Nutrient Management Solutions, LLC

Solutions for Animals, Plants and People

June 1, 2006

DIAMOND A - TRUCK WASH FACILITY
PERMIT APPLICATION MATERIALS

Prepared for Diamond A Livestock

Description of Facilities:

The proposed truck wash facility is located in T-6S R-15E in Section 19. The physical location of the facility is 2.65 miles south of the junction of US Hwy 26 and State Hwy 46 in Gooding, Idaho.

The site also serves as the location of an existing feedlot facility. The feedlot is permitted for 3,500 animal units in Gooding County. Currently the facility is being used for up to 2,750 head of beef and 600 dairy heifers. The beef cattle being fed range in weight from 500 to 1,300 lbs. The feedlot's heaviest use for beef animals will be from weaning time in September/October until the first of March. There may be cattle in the lot through June and the permit allows for the lot to be occupied year round. In addition to the beef cattle in the feedlot, there are up to 600 head of dairy heifers averaging 600 lbs in weight that are housed for short term to year round as well. There are up to an average of 435 head of yearling beef animals that are run on the pasture that is a part of the farming operation. There are also times during the year when mature beef animals may be on the farm to do aftermath grazing. The number and duration of these animals varies greatly.

Refer to the attached information relative to the truck wash to obtain specifics on the assumptions used in determining the water used and the manure which is a part of the plan for the truck wash.

The following pages provide the necessary information to obtain a permit from the State of Idaho for a Commercial Truck Washing Facility.

For questions please feel free to contact me.

Sincerely,

Bob Ohlensehlen

Bob Ohlensehlen
Certified Nutrient Management Planner
Professional Animal Scientist

1247 FILER AVENUE EAST, TWIN FALLS ID 83301
(208) 736-6081 or Cell (208) 308-8845, Cell (208) 539-1279, Fax (208) 736-1916
Email: nmscafo@cableone.net

Application for Commercial Livestock Truck Washing Facility

In Accordance with IDAPA 02.04.23

1. **Name of Owner/Operator of CLTWF**

   Diamond A Livestock

   Owners:

   Fred Faulkner
   1997 S 1875 E
   Gooding, ID 83330
   (208) 934-5391

   Jay Faulkner
   1877 E 2000 S
   Gooding, ID 83301
   Home Phone: (208) 934-9088
   Cell Phone (208) 539-6652

2. **Physical Location of the CLTWF**

   2175 State Highway 46
   Gooding, ID 83301
   2.65 Miles South of Intersection of US Hwy 26 and State Hwy 46 – on West Side of Road

3. **Scaled Vicinity Map with Site Location**

   Vicinity Map with Site Location Including the following:

   a. Homes, schools, churches etc within 1 mile – Refer to **Exhibit 1**
   b. Private and community domestic water wells, irrigation wells, existing monitoring wells and injection wells –source IDWR – Refer to **Exhibit 1**
   c. Irrigation canals, irrigation laterals, rivers, streams, springs, lakes, reservoirs and designated wetlands within 1 mile. – Refer to **Exhibit 1**
   d. Location of all land application sites – Refer to **Exhibit 2**
   e. FEMA Flood zones or other appropriate flood data for the CLTWF site and all land application sites – Refer to **Exhibit 3**
   f. Topographic map of the area within one mile of the site – **Exhibit 4**

4. **Scaled Site Plan** – Showing buildings , process waste water and manure storage areas, piping and roadways. Truck Wash Site – Refer to **Exhibit 5A, 5B, 5C & 5D**

5. **Land Application System** – A detailed description of the description of the proposed management practices and methods used to make land application including:

   a. Calculations used in determining water and manure containment requirements – Refer to **Exhibit 6A & 6B**.
   b. Timing, frequency and duration of practices. – Refer to **Exhibit 7**
   c. Proximity of land application sites to residential and public use areas. – Refer to **Exhibit 7**

6. **Nutrient Management Plan** – a NMP for all land where manure or process waste water from the CLTWF is land applied. – Refer to **Exhibit 8** Note: Since the facility is associated with a feedlot facility all of the livestock operation is included in the Nutrient Management Plan. The land owned by the applicants is adequate for the manure produced by both the livestock and the truck washing facility.

Signature of Applicants-

_____ _____

Fred Faulkner Date

_____ _____

Jay Faulkner Date

Fau...er
Truck Wash
and Feedlot Map

DIAMOND A TRUCK WASH
EXHIBIT #1
VICINITY MAP –
HOME, WELLS, CANALS

Clover Creek
State Highway 46
Lateral X-4
Shoe String
SOUTH
2100
1800
1850
06S15E17
06S15E18
06S14E13
06S15E19
06S14E24
06S15E20
06S15E29
06S15E30
06S14E25
06S15E31
06S14E36
06S15E32

Domestic-Single Residence
247 Static - Feet
305 Total Depth Feet

Domestic-Single Residence
250 Static - Feet
0 Total Depth Feet

Domestic-Single Residence
250 Static - Feet
0 Total Depth Feet

Stockwater
83 Static - Feet
0 Total Depth Feet

Domestic-Multiple Individual
88 Static - Feet
0 Total Depth Feet

Domestic-Single Residence
219 Static - Feet
285 Total Depth Feet

Domestic-Single Residence
221 Static - Feet
0 Total Depth Feet

Domestic-Single Residence
226 Static - Feet
0 Total Depth Feet

Domestic
245 Static - Feet
300 Total Depth Feet

Domestic-Single Residence
255 Static - Feet
0 Total Depth Feet

Domestic
300 Feet Deep

Domestic-Single Residence
237 Static - Feet
300 Total Depth Feet

Domestic
0 Static - Feet
62 Total Depth Feet

Domestic-Single Residence
195 Static - Feet
0 Total Depth Feet

Domestic
209 Static - Feet
245 Total Depth Feet

Domestic
222 Static - Feet
0 Total Depth Feet

Domestic-Single Residence
195 Static - Feet
0 Total Depth Feet

Domestic-Single Residence
248 Static - Feet
0 Total Depth Feet

Domestic-Single Residence
205 Static - Feet
0 Total Depth Feet

Domestic-Single Residence
218 Static - Feet
0 Total Depth Feet

Domestic-Single Residence
240 Static - Feet
285 Total Depth Feet

Domestic-Single Residence
240 Static - Feet
285 Total Depth Feet

House

Corral 535 * 240
Corral 445 * 215
Corral 450 * 400
Corral 450 * 600
Corral 450 * 715
Corral 650 * 395
Corral 585 * 230
Corral 450 * 275
Corral 150 * 80
Shop
Corral 130 * 70
Hay Storage
Truck Wash

Domestic-Single Residence
143 Static - Feet
0 Total Depth Feet

Domestic-Single Residence
239 Static - Feet
318 Total Depth Feet

Domestic-Single Residence
239 Static - Feet
318 Total Depth Feet

Domestic
196 Static - Feet
198 Total Depth Feet

Well
3561

Commercial
70 Static - Feet
0 Total Depth Feet

Domestic-Single Residence
248 Static - Feet
0 Total Depth Feet

Domestic-Single Residence
247 Static - Feet
300 Total Depth Feet

Domestic
0 Static - Feet
13 Total Depth Feet

Domestic
175 Static - Feet
201 Total Depth Feet

Domestic
225 Static - Feet
0 Total Depth Feet

Domestic-Single Residence
216 Static - Feet
0 Total Depth Feet

Domestic-Single Residence
240 Static - Feet
0 Total Depth Feet

Domestic-Single Residence
224 Static - Feet
0 Total Depth Feet

Domestic-Single Residence
115 Static - Feet
0 Total Depth Feet

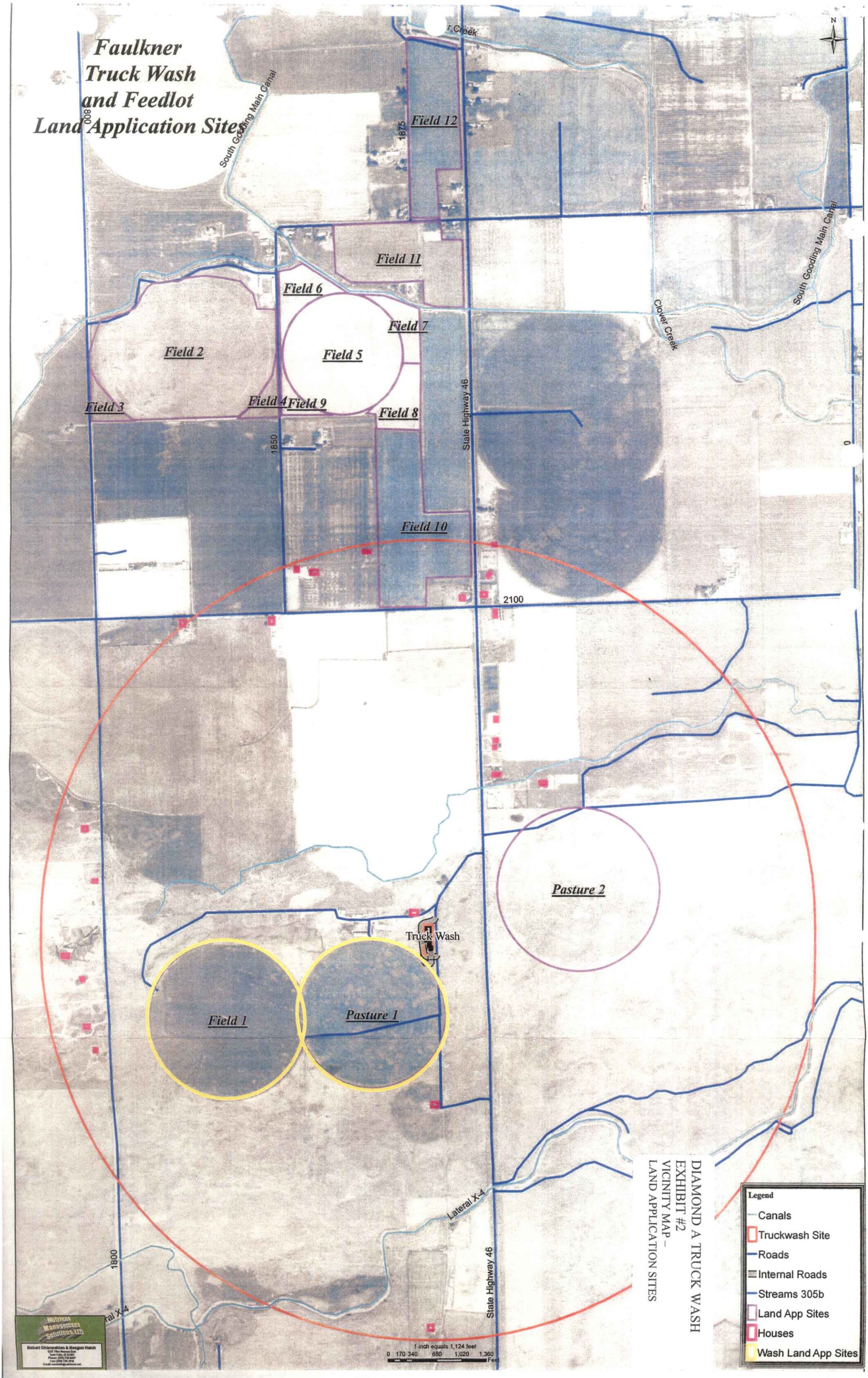
Domestic
110 Static - Feet
160 Total Depth Feet

Legend
- Injection wellls
- Monitoring Wells
- Wells
- Canals
- Houses
- Truckwash Site
- Roads
- Internal Roads
- Corrals
- Sections
- Streams 305b

1 inch equals 1,049 feet
0 160 320 640 960 1,280 Feet

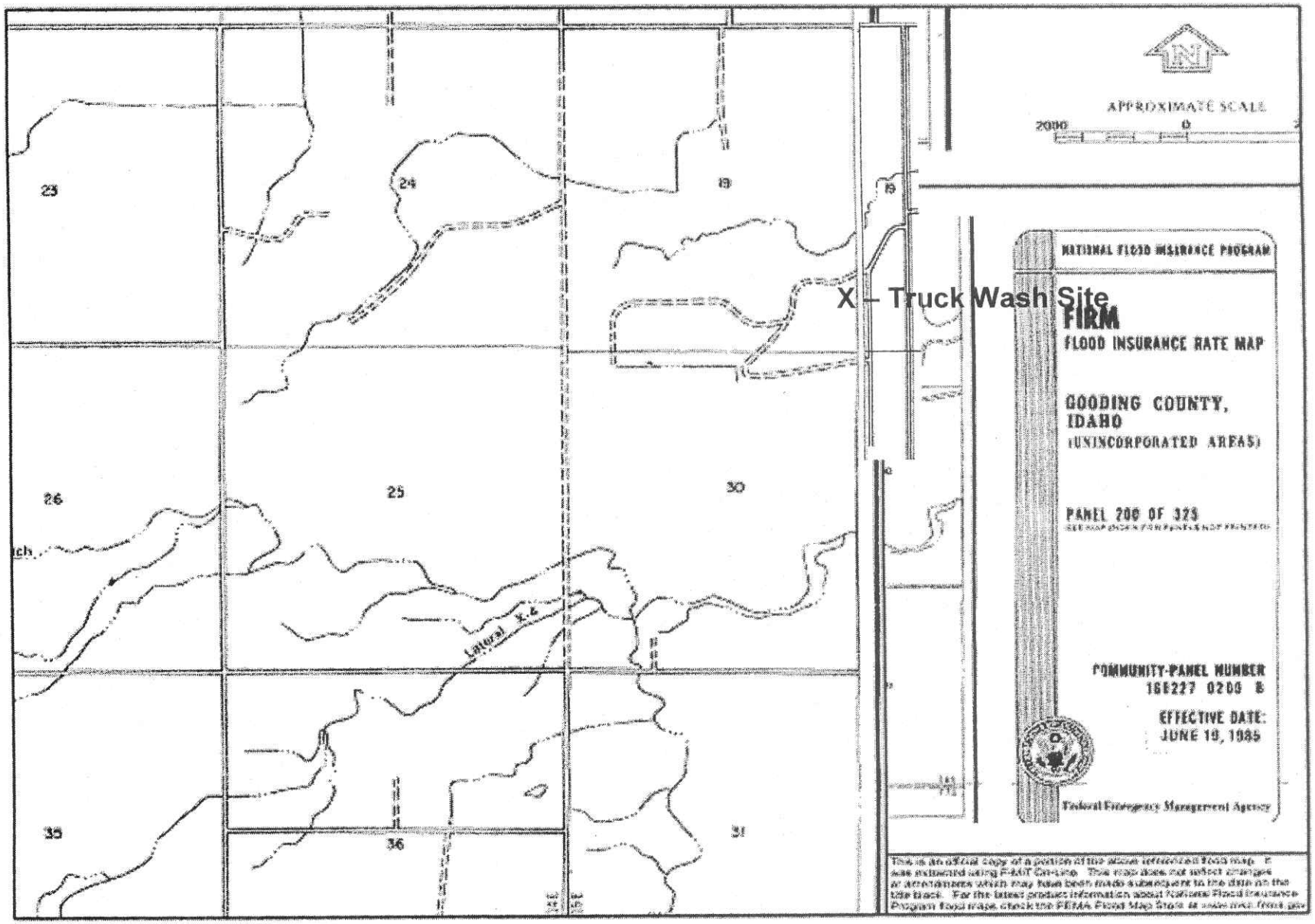
Nutrient Management Solutions, LLC
Robert Ohlensehlen & Reagon Hatch

Faulkner Truck Wash and Feedlot Land Application Sites



DIAMOND A TRUCK WASH
EXHIBIT #2
VICINITY MAP –
LAND APPLICATION SITES

Nutrient Management Solutions, LLC
Robert Ohlensehlen & Reagon Hatch



DIAMOND A TRUCK WASH
EXHIBIT #3
FEMA FLOOD ZONE MAP

Faulkner
Truck Wash
and Feedlot Map

DIAMOND A TRUCK WASH
EXHIBIT #4
TOPOGRAPHICAL MAP

Legend
- Truckwash Site
- Roads
- Internal Roads
- Corrals
- sections

1 inch equals 1,067 feet
0 162.5325 650 975 1,300 Feet

Nutrient Management Solutions, LLC
Robert Ohlensehlen & Reagon Hatch
1247 Flint Avenue East
Twin Falls, ID 83301
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Email: www.nmsolutions.net

Faulkner Truck Wash Site Plan

N

Storage Pond
290' * 106' * 10'
129,100 CuFt

Storage Area for
Separated Solids

Drive Through Wash
24' * 70'

Solid Separator 2 Cells 12'* 40' * 3'

Storage Area for
Separated Solids

Solid Separator 2 Cells 12'* 40' * 3'

Back-In Wash
24' * 70'

Roadway
20' Wide All Weather - Gravel
45' Minimum Radius Turns
30' access to road - with culverts

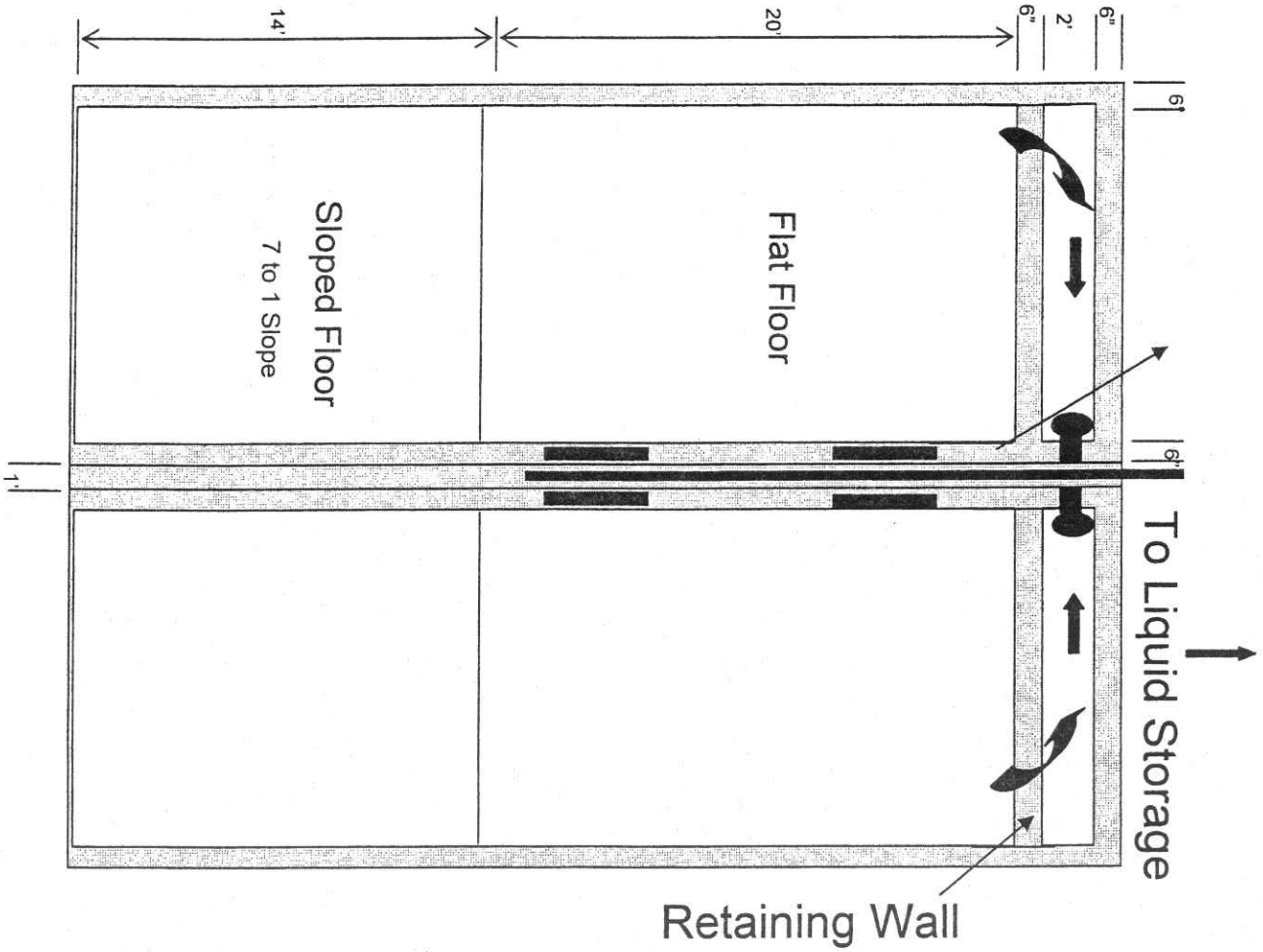
1 inch equals 37 feet

0 10 20 40 60 80
Feet

DIAMOND A TRUCK WASH
EXHIBIT #5A
SCALED SITE PLAN
TRUCK WASH DETAIL

Nutrient Management Solutions, LLC
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DIAMOND A TRUCK WASH
EXHIBIT #5C
SCALED SITE PLAN
SOLID SEPARATOR – TOP VIEW



Solid Separator - 2 cell – Top view

Faulkner Truck Wash and Feedlot Map

DIAMOND A TRUCK WASH
EXHIBIT #5D
SCALED SITE PLAN
TRUCK WASH & FEEDLOT

N

06S15E19

Corral 535 * 240

Corral 445 * 235

Corral 450 * 275

Corral 650 * 395

Corral 450 * 400

Corral 450 * 600

Corral 450 * 715

Building

Corral 150 * 80

Corral 150 * 80

Corral 150 * 70

Corral 130 * 70

Shop

House

Corral 130 * 70

Barn

Hay Storage

Truck Wash

1800

Corral 585 * 240

06S14E24

06S15E30

1 inch equals 287 feet

0 70 140 280 420 560 Feet

Legend

- Truckwash Site
- Roads
- Internal Roads
- Corrals
- sections

Nutrient Management Solutions, LLC

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Fred / Jay Faulkner - Truck Wash Facility

Water Usage

	High	Low		
Trucks per Day	6	2		
Gallons per Truck.....	1,500	1,500	Gallons	
Wash Time @ 25gpm.....	60	60	Minutes	
Total Daily Water Use....	9,000	3,000	Gallons Per Day	

Permitted Water

10.8 Acre Feet Annually
3,518,951 Gallons Annually
11,279 Gallons / Day 52 weeks
6 days per week

DIAMOND A TRUCK WASH
EXHIBIT #6A
WATER USE CALCS

Manure To Be Handled

Avg Time on Trucks.....	4 hour
Average Wt of Cattle.....	1000 pounds
Average Number of Head	45 Head
Amount of Shavings.....	120 cuft / truck
% Trucks with Shavings..	20%
% of Solds Separated	60%
Time to Store Water.....	150 days

Waste Water to be Stored

	Daily	Annual		
Average Water Use.....	6,000	2,190,000	Gallons	6.7 **Acre Ft**
Water to be Stored.....		120,321	Cu.Ft.	
Manure from Trucks.....	53	16,380	Cu.Ft.	10
Solids to Storage Pond....	21	6,552	Cu.Ft.	
Separated Solids.....	32	9,828	Cu.Ft.	

Storage Pond

Storage Required in this Structure.....	126,873	**Cu. Ft.**
Number of Cells in the Storage.....	1	
Width of Storage Cells.....	50	Feet
Length of Storage Cells.....	530	Feet
Depth of Storage Cells.....	10	Feet
Freeboard for Storage.....	1	Feet
Side Slope of Interior Walls.....	2	to 1
Total Amount of Storage in this Structure...	**128,016**	**Cu. Ft.**

Additional Storage Needed..... - Cu.Ft.

Separator Sizing

Number of Times to Clean Annually..	12		With both cells empty on November 1
Number of Cells.....	4		the wash will last until
Width of Cells.....	12	Feet	
Depth of Cells.....	2	Feet	
Overall Length of Cells.....	34	Feet	
Freeboard.....	6	inches	
Slope of Apron.....	7	to 1	14 Feet Length of Slope
Volume of Separators.....	1,818	CuFt	20 Feet Rectangular Portion
Volume Needed.....	1,760	CuFt for	30 days

Livestock Manure Value Used		Nitrogen lb/day	P_2O_5 lb/day	K_2O lb /day	Nitrogen lb/cuft	P_2O_5 lb/cuft	K_2O lb /cuft
	1.3 CuFt	0.26	0.19	0.22	0.187	0.137	0.158

			Nitrogen / Day	P_2O_5 / Day	K_2O / Day		P_2O_5 / Annual	Acres @ 100 Lbs	Acres @ 80 Lbs
Manure from Trucks Daily.....	53	CuFt	9.82	7.18	8.31				
Manure to Liquid Storage.....	21	CuFt	3.93	2.87	3.32		896	9.0	11.2
Manure Solids Separated.....	32	CuFt	5.89	4.31	4.99		1343	13.4	16.8

N lb/1000gal	P_2O_5 lb/1000 gal	K_2O lb /1000 gal
0.621	0.454	0.525

N lb/Ton	P_2O_5 lb/Ton	K_2O lb /Ton
5.94	4.34	5.02

Gallons of Liquids. 2,190,000 Gallons
Tons of Solids..... 310 Tons

DIAMOND A TRUCK WASH
EXHIBIT #6B
MANURE CONTAIN REQUIREMENTS

DIAMOND A TRUCK WASH & FEEDLOT

Land Application System –

The following document provides a detailed description of the proposed management practices of the truck wash and the methods used to make land application including:

a. Calculations used in determining water and manure containment requirements

The calculations used to determine the storage of water and the amount of solids that will be separated from the process water are included in **Exhibit 6**. The expected high number of washes per day is estimated to be 6, while the low is expected to be 2, with the average being 3 per day. The expected water use will be 6,000 gallons per day. Washing the average number of trucks 6 days per week for 52 weeks per year would require a total of 6.7 acre feet of water.

Manure calculations are based on the expected time that animals will be on the truck. Using the manure excretion value for 1,000 lb beef cattle for an average 4-hour trip, the expected manure would be 16.7% of the daily excretion of manure for the 45 animals on an individual truck. In addition to manure, an estimated 20% of the trucks being washed would have shavings in the truck.

To increase the time between sludge removal for the storage pond, a solid separator will be used to remove an estimated 60% of the solids. The separated manure and bedding solids will be stored adjacent to the separator cells until they are land applied in the spring and fall on cropland in accordance with the NMP. Any runoff from the storage area will be either contained with berms or it will be allowed to drain into the storage pond.

The truck wash facility is designed to be operated 6 days per week for 52 weeks per year. In reality there is little likelihood it will be operated in the winter months of December and January, or at the least, the frequency of use will be substantially below the calculated average. The reduced operation during times of the year such as the winter will result in a system being constructed that exceeds the needs based on actual usage.

b. Timing, frequency and duration of practices. – Refer to **Exhibit 7**

The application of liquids will occur during the growing season. The land to which the liquids will be applied is in permanent irrigated grass pasture. Since the land is in permanent pasture the growing season would be extended beyond that normally expected where row crops are produced. As such the length of containment used for containment of process water used was 150 days. The required land to apply the liquids based on the application of phosphorus would be between 9 & 11.2 acres, depending on the productivity of the pasture. The land application site which is designated on the land application maps as Pasture 1 is 72 acres in area.

Additional land is required for the application of solids. The amount of land needed for solids application is 13.4 – 16.8 acres, again depending on the productivity of the crop being raised. Clearly the pasture and cropland designated as Field 1 are more than adequate to accommodate the nutrients found in the material generated by the truck wash.

The timing of application of liquids would be expected to occur as needed from April 1 through November 1. The pond will be kept at a minimum level during the warm months to provide a reduction in the potential for odors. The application of liquids will be done using gated pipe; this practice will also be a deterrent to odors.

Application of the solids will occur in the spring prior to planting and in the fall after harvest on cropland. Solids applied to cropland will be incorporated as soon as is practical after application, generally within one week of application.

c. **Proximity of land application sites to residential and public use areas.** – Refer to **Exhibit 7**

The nearest home is 440' from the pasture where liquids will be applied; however, the liquids will be likely be applied on the north side of the pasture which would increase the distance to 1,365' or farther. The next nearest home is located 2,860' to the northwest of the pasture where liquids will be applied. The application of solids will be made to the pasture and to the cropland designated as Field 1, which is located farther from these two homes, but is located 750 feet to the west of another home.

There is also a veterinary clinic which is located 2,250' northeast of the wash facility and 2,340' northwest of the liquid application site.

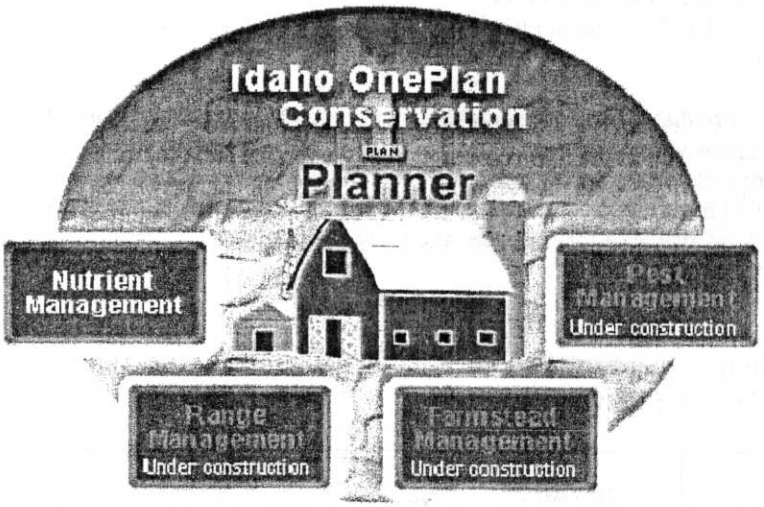
Exhibit 7 shows the application areas for the truck wash specifically as well as for the rest of the nutrients being applied from the feedlot facility.

DIAMOND A TRUCK WASH
EXHIBIT #8
NUTRIENT MANAGEMENT PLAN

Diamond A Truck Wash & Feedlot Nutrient Management Plan

Agriculture . . .

Launching into the Future



Nutrient Management Plan Prepared For:

Fred Faulkner
(208) 934-5391
Jay Faulkner
(208) 934-9088
Faulkner Truck Wash

Certified Planner:

Robert Ohlensehlen
Certified Nutrient Management Planner, Nutrient Management Solutions
(208) 736-6081

Producer Signature: _____ Certified Planner Signature: Robert Ohlensehlen

Date Completed: 5/24/06

The information provided by those using the "Idaho OnePlan" shall be deemed to be trade secrets, production records, or other proprietary information and shall be kept confidential and shall be exempt from enclosure pursuant to section 9-340D, Idaho Code. (Title 22 Chapter 27.17D6)

PRODUCER SUMMARY

Facility Summary – This plan is prepared to meet the requirements for a new truck wash facility permit. The facility is located at T-6S R-15E in Section 19. The site is also the location of an existing feedlot facility. The feedlot is permitted for 3500 animal units in Gooding County. Currently the facility is being used for up to 275o head of beef animals. The beef cattle being fed range in weight from 500 to 1300lbs. The feedlot is most heavily used from weaning time in September/October until the first of March. There may be cattle in the lot through June and the permit allows for the lot to be occupied year round. In addition to the beef cattle in the feedlot, there are up to 600 head of dairy heifers that are housed from short term to year round as well. There are up to an average of 435 head of yearling beef animals that are run on the pasture that is a part of the farming operation. There are also times during the year when mature beef animals may be on the farm to do aftermath grazing. The number and duration of these animals varies greatly.

Refer to the attached information relative to the truck wash to obtain specifics on the assumptions used in determining the water used and the manure which is a part of the plan for the truck wash.

Manure Application
The amount of land is more that sufficient to handle the nutrients produced from those animals that graze the pasture and the aftermath grazing as well as the normal operation of the feedlot and the truck wash. The corrals are rarely cleaned but for the purposes of this plan the estimate is that 50% of the manure in the corrals is hauled out and land applied annually. Liquid manure from the truck wash will be applied to the pasture adjacent to the wash facility using gated pipe. The land available for the application will accommodate the application with out any risk of runoff from the owned property.

Resource Concerns
The following table lists the resource concerns for the cropland that will be used for land application of solid and liquid waste.

Field	Resource Concern	P Threshold (ppm)	P Threshold Soil Test Depth
Field 1	Groundwater < 5'	20	18 - 24"
Pasture 1	Groundwater < 5'	20	18 - 24"
Pasture 2	Groundwater < 5'	20	18 - 24"
Field 2	Surface Water	40	0 - 12"
Field 3	Surface Water	40	0 - 12"
Field 4	Surface Water	40	0 - 12"
Field 5	Surface Water	40	0 - 12"
Field 6	Surface Water	40	0 - 12"
Field 7	Surface Water	40	0 - 12"
Field 8	Surface Water	40	0 - 12"
Field 9	Surface Water	40	0 - 12"
Field 10	Surface Water	40	0 - 12"
Field 11	Surface Water	40	0 - 12"
Field 12	Surface Water	40	0 - 12"

All fields, except for field 11, are sprinkler irrigated; however, several of the fields may have runoff occur due to slopes or drainages that run through the field. The fields where runoff is a concern are classed as having a surface water concern; those having no runoff are classed as ground water concern.

Fields having a shallow water table or a limiting layer will have a threshold of 20ppm while those with greater than 5 feed to water will have a threshold of 30 ppm. It is important to understand that the depth to water is impacted by the underlying soils and layers. Cobbles and bedrock can reduce the depth to the water table. The fields with surface water concerns will have a phosphorus threshold of 40ppm. Surface water resource concerns require that regulatory soil tests be taken from the 0-12" depth. The farmland with a ground water resource concern will require regulatory soil tests to be taken from the 0-12" depth and from the 18-24" depth. The threshold for ground water concerns in this case would be either 20ppm or 30ppm, as indicated in the table above, using the Olsen Test in the 18-24" sample of soil.

Storage and Handling Plan Requirements

Liquid effluent application is to begin and end with irrigation season. In the fall, liquid effluent accumulated in waste pond after the irrigation season may be applied to a growing crop or crop stubble prior to November 15th. When applying wastewater outside of the application window you are required to contact the Idaho Department of Agriculture, Dairy Bureau (208) 332-8550 prior to application.

Nutrient Management Plan Requirements

The producer will maintain field level records for a minimum of five years and make them available for review at routine waste inspections by ISDA personnel. These records must include.

- Soil tests. The producer must soil test all fields to which nutrients (commercial fertilizer or manure) will be applied that year. If nutrients are not applied to a field, a test will not be required that year. Soil tests will however, be required prior to any future nutrient application. These soil tests should be taken from 0-12 inches and should be used to develop the annual nutrient budget for each field.

    1. For fields that are classified as being a surface water concern, the phosphorus threshold is 40 ppm. If the phosphorus test exceeds 40 ppm, the producer shall not apply phosphorus (commercial fertilizer or manure) in excess of the estimated annual crop phosphorus uptake.
    2. For fields that are classified as being a groundwater concern, soil tests for phosphorus from the 18-24 inch zone are required to track phosphorus trends. The producer is required to test these fields at this zone (18-24 inches) at least every five years. If the phosphorus test exceeds 20 or 30 ppm (depends on soil depth) the producer shall not apply phosphorus (commercial fertilizer or manure) in excess of the estimated annual crop phosphorus uptake.

- Quantities, analyses and sources of nutrients applied.
- Approximate dates and methods nutrients were applied.
- Crops planted, planting and harvest dates, yields, and crop residues removed.
- Dates of annual review and person performing the review and recommendations that resulted from the review.

Facility Testing Requirements

Regulatory soil phosphorus samples are required from each Field every 3-5 years. Samples will be taken from the 0-12" soil depth for surface water concerns, and the 18-24" depth for groundwater concerns. The samples will be reviewed for phosphorus level and compared with previous test data. These tests will indicate compliance with the nutrient management plan. The producer is not responsible to take or analyze these samples. Refer to the Field Phosphorus Threshold table in Resource Concern section of the OnePlan NMP printout for individual field resource concerns and phosphorus threshold.

Irrigation Management Plan Requirements

There are no irrigation management requirements at this time.

Recommendations for Best Management Practices

The following Best Management Practices should be followed:

1. Waste water applied to cropland should be applied during the growing season. Waste water applied outside the growing season must be done in accordance with the water balance in the plan or by obtaining permission from the Idaho Department of Agriculture.

2. Waste water should be mixed with irrigation water at a ratio of 10-to-1 or more to reduce odor and problems associated with applying waste water through irrigation equipment.

3. Irrigation equipment used to apply liquids should be of the type that uses low pressure and has drop nozzles to reduce atomizing the water/waste mix to reduce drift and odor dispersion.

4. Do not over irrigate cropland to conserve water and nutrients. In addition, over irrigation will increase the incidence of nutrients being moved through the crop root zone beyond the reach of plants.

5. Avoid application of liquids on weekends an in the evening as dispersion of odors is poor in the evening creating potential problems with the neighbors. The weekends and holidays are times when neighbors may be more prone to activities that do not tolerate unpleasant odors.

6. Examine manure storage areas frequently to verify that waste is being properly stored and contained. Guard against storing manure where it may have access to surface or ground water sources.

7. When manure is applied to cropland, till it into the soil as soon as possible to reduce nitrogen loss, to prevent runoff and to reduce odors.

8. Keep accurate records of the following:
   a. Crop rotations
   b. Crop yields
   c. Date of manure application
   d. Amount of manure applied
   e. Type of manure applied (liquids - solids)
   f. Weather conditions before, during and after application
   g. Tillage dates and methods used for incorporation

9. Records must also include the exported manure. At a minimum the records must include the name of the recipient of the manure, the amount exported and the date on which it was exported.

Manure Application Rate Requirement By Year
FIELD: Field 1 87 acres

Name	Man App		Solid Stack(s)	Truck Wash Solids	Mineralization		Total	
			11 T/ac	2 T/ac				
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2006)	Y	N	21	5	N	0	N	26
		P	61	8			P	69
		K	92	9			K	101
			17 T/ac	0 T/ac				
Corn, Field, Silage, S-ID, Irrigated(2007)	Y	N	33	0	N	14	N	47
		P	94	0			P	94
		K	143	0			K	143
			17 T/ac	0 T/ac				
Sugarbeets, S-ID, Irrigated(2008)	Y	N	33	0	N	3	N	36
		P	94	0			P	94
		K	143	0			K	143
			17 T/ac	0 T/ac				
Corn, Field, Silage, Double Cropped, S-ID, Irrigated(2009)	Y	N	33	0	N	18	N	51
		P	94	0			P	94
		K	143	0			K	143
			17 T/ac	0 T/ac				
Potatoes, S-ID, Irrigated(2010)	Y	N	33	0	N	18	N	51
		P	94	0			P	94
		K	143	0			K	143
			17 T/ac	0 T/ac				
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2011)	Y	N	33	0	N	18	N	51
		P	94	0			P	94
		K	143	0			K	143
			17 T/ac	0 T/ac				
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2012)	Y	N	33	0	N	18	N	51
		P	94	0			P	94
		K	143	0			K	143
			17 T/ac	0 T/ac				
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2013)	Y	N	33	0	N	18	N	51
		P	94	0			P	94
		K	143	0			K	143
			17 T/ac	0 T/ac				
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2014)	Y	N	33	0	N	18	N	51
		P	94	0			P	94
		K	143	0			K	143

FIELD: Pasture 2 85 acres

Name	Man App		Pasture(s)	Mineralization		Total	
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated(2005)	Y		7 T/ac				
		N	4	N	0	N	4
		P	56			P	56
		K	64			K	64
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated(2006)	Y		6 T/ac				
		N	4	N	2	N	6
		P	46			P	46
		K	53			K	53
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated(2007)	Y		6 T/ac				
		N	4	N	2	N	6
		P	46			P	46
		K	53			K	53

FIELD: Field 2 95 acres

Name	Man App		Feedlot Solids	Mineralization		Total	
Corn, Field, Silage, S-ID, Irrigated(2005)	Y		21 T/ac				
		N	56	N	0	N	56
		P	91			P	91
		K	105			K	105
Corn, Field, Silage, S-ID, Irrigated(2006)	Y		21 T/ac				
		N	56	N	21	N	77
		P	91			P	91
		K	105			K	105
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2007)	Y		21 T/ac				
		N	56	N	21	N	77
		P	91			P	91
		K	105			K	105
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2008)	Y		21 T/ac				
		N	56	N	31	N	87
		P	91			P	91
		K	105			K	105
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2009)	Y		21 T/ac				
		N	56	N	31	N	87
		P	91			P	91
		K	105			K	105

FIELD: Pasture 2 85 acres

Name	Man App		Pasture(s)	Mineralization		Total	
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated(2005)	Y		7 T/ac				
		N	4	N	0	N	4
		P	56			P	56
		K	64			K	64
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated(2006)	Y		6 T/ac				
		N	4	N	2	N	6
		P	46			P	46
		K	53			K	53
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated(2007)	Y		6 T/ac				
		N	4	N	2	N	6
		P	46			P	46
		K	53			K	53

FIELD: Field 2 95 acres

Name	Man App		Feedlot Solids	Mineralization		Total	
Corn, Field, Silage, S-ID, Irrigated(2005)	Y		21 T/ac				
		N	56	N	0	N	56
		P	91			P	91
		K	105			K	105
Corn, Field, Silage, S-ID, Irrigated(2006)	Y		21 T/ac				
		N	56	N	21	N	77
		P	91			P	91
		K	105			K	105
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2007)	Y		21 T/ac				
		N	56	N	21	N	77
		P	91			P	91
		K	105			K	105
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2008)	Y		21 T/ac				
		N	56	N	31	N	87
		P	91			P	91
		K	105			K	105
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2009)	Y		21 T/ac				
		N	56	N	31	N	87
		P	91			P	91
		K	105			K	105

Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2010)	Y		21 T/ac				
		N	56	N	31	N	87
		P	91			P	91
		K	105			K	105
Barley, Spring, S-ID(2011)	Y		21 T/ac				
		N	56	N	76	N	132
		P	91			P	91
		K	105			K	105
Barley, Spring, S-ID(2012)	Y		21 T/ac				
		N	56	N	76	N	132
		P	91			P	91
		K	105			K	105
Corn, Field, Silage, S-ID, Irrigated(2013)	Y		21 T/ac				
		N	56	N	31	N	87
		P	91			P	91
		K	105			K	105

FIELD: Field 3 4 acres

Name	Man App		Feedlot Solids	Mineralization		Total	
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2005)	Y		18 T/ac				
		N	48	N	0	N	48
		P	78			P	78
		K	90			K	90
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2006)	Y		18 T/ac				
		N	48	N	27	N	75
		P	78			P	78
		K	90			K	90
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2007)	Y		18 T/ac				
		N	48	N	27	N	75
		P	78			P	78
		K	90			K	90
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2008)	Y		18 T/ac				
		N	48	N	27	N	75
		P	78			P	78
		K	90			K	90
Barley, Spring, S-ID(2009)	Y		18 T/ac				
		N	48	N	72	N	120
		P	78			P	78
		K	90			K	90

Barley, Spring, S-ID(2010)	Y		18 T/ac				
		N	48	N	72	N	120
		P	78			P	78
		K	90			K	90
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2011)	Y		18 T/ac				
		N	48	N	27	N	75
		P	78			P	78
		K	90			K	90

FIELD: Field 4 4 acres

Name	Man App		Feedlot Solids	Mineralization		Total	
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2005)	Y		18 T/ac				
		N	48	N	0	N	48
		P	78			P	78
		K	90			K	90
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2006)	Y		18 T/ac				
		N	48	N	27	N	75
		P	78			P	78
		K	90			K	90
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2007)	Y		18 T/ac				
		N	48	N	27	N	75
		P	78			P	78
		K	90			K	90
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2008)	Y		18 T/ac				
		N	48	N	27	N	75
		P	78			P	78
		K	90			K	90
Barley, Spring, S-ID(2009)	Y		18 T/ac				
		N	48	N	72	N	120
		P	78			P	78
		K	90			K	90
Barley, Spring, S-ID(2010)	Y		18 T/ac				
		N	48	N	72	N	120
		P	78			P	78
		K	90			K	90
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2011)	Y		18 T/ac				
		N	48	N	27	N	75
		P	78			P	78
		K	90			K	90

FIELD: Field 5 62 acres

Name	Man App		Feedlot Solids	Mineralization		Total	
			21 T/ac				
Corn, Field, Silage, S-ID, Irrigated(2005)	Y	N	56	N	0	N	56
		P	91			P	91
		K	105			K	105
			21 T/ac				
Corn, Field, Silage, S-ID, Irrigated(2006)	Y	N	56	N	21	N	77
		P	91			P	91
		K	105			K	105
			21 T/ac				
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2007)	Y	N	56	N	21	N	77
		P	91			P	91
		K	105			K	105
			21 T/ac				
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2008)	Y	N	56	N	31	N	87
		P	91			P	91
		K	105			K	105
			21 T/ac				
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2009)	Y	N	56	N	31	N	87
		P	91			P	91
		K	105			K	105
			21 T/ac				
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2010)	Y	N	56	N	31	N	87
		P	91			P	91
		K	105			K	105
			21 T/ac				
Barley, Spring, S-ID(2011)	Y	N	56	N	76	N	132
		P	91			P	91
		K	105			K	105
			21 T/ac				
Barley, Spring, S-ID(2012)	Y	N	56	N	76	N	132
		P	91			P	91
		K	105			K	105
			21 T/ac				
Corn, Field, Silage, S-ID, Irrigated(2013)	Y	N	56	N	31	N	87
		P	91			P	91
		K	105			K	105

FIELD: Field 6 5 acres

Name	Man App		Feedlot Solids	Pasture(s)	Mineralization		Total	
			0 T/ac	14 T/ac				
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated(2005)	Y	N	0	7	N	0	N	7
		P	0	92			P	92
		K	0	105			K	105
			0 T/ac	14 T/ac				
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated(2006)	Y	N	0	7	N	4	N	11
		P	0	92			P	92
		K	0	105			K	105
			0 T/ac	14 T/ac				
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated(2007)	Y	N	0	7	N	4	N	11
		P	0	92			P	92
		K	0	105			K	105
			0 T/ac	14 T/ac				
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated(2008)	Y	N	0	7	N	4	N	11
		P	0	92			P	92
		K	0	105			K	105

FIELD: Field 7 3 acres

Name	Man App		Feedlot Solids	Pasture(s)	Mineralization		Total	
			0 T/ac	14 T/ac				
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated(2005)	Y	N	0	7	N	0	N	7
		P	0	92			P	92
		K	0	105			K	105
			0 T/ac	14 T/ac				
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated(2006)	Y	N	0	7	N	4	N	11
		P	0	92			P	92
		K	0	105			K	105
			0 T/ac	14 T/ac				
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated(2007)	Y	N	0	7	N	4	N	11
		P	0	92			P	92
		K	0	105			K	105
			0 T/ac	14 T/ac				
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated(2008)	Y	N	0	7	N	4	N	11
		P	0	92			P	92
		K	0	105			K	105

FIELD: Field 8 8 acres

Name	Man App		Feedlot Solids	Pasture(s)	Mineralization		Total	
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated(2005)	Y		0 T/ac	14 T/ac				
		N	0	7	N	0	N	7
		P	0	92			P	92
		K	0	105			K	105
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated(2006)	Y		0 T/ac	14 T/ac				
		N	0	7	N	4	N	11
		P	0	92			P	92
		K	0	105			K	105
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated(2007)	Y		0 T/ac	14 T/ac				
		N	0	7	N	4	N	11
		P	0	92			P	92
		K	0	105			K	105
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated(2008)	Y		0 T/ac	14 T/ac				
		N	0	7	N	4	N	11
		P	0	92			P	92
		K	0	105			K	105

FIELD: Field 9 4 acres

Name	Man App		Feedlot Solids	Pasture(s)	Mineralization		Total	
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated(2005)	Y		0 T/ac	14 T/ac				
		N	0	7	N	0	N	7
		P	0	92			P	92
		K	0	105			K	105
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated(2006)	Y		0 T/ac	14 T/ac				
		N	0	7	N	4	N	11
		P	0	92			P	92
		K	0	105			K	105
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated(2007)	Y		0 T/ac	14 T/ac				
		N	0	7	N	4	N	11
		P	0	92			P	92
		K	0	105			K	105
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated(2008)	Y		0 T/ac	14 T/ac				
		N	0	7	N	4	N	11
		P	0	92			P	92
		K	0	105			K	105

FIELD: Field 10 48 acres

Name	Man App		Feedlot Solids	Mineralization		Total	
Barley, Spring, S-ID(2005)	Y		15 T/ac				
		N	40	N	45	N	85
		P	65			P	65
		K	75			K	75
Barley, Spring, S-ID(2006)	Y		15 T/ac				
		N	40	N	43	N	83
		P	65			P	65
		K	75			K	75
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2007)	Y		15 T/ac				
		N	40	N	-2	N	38
		P	65			P	65
		K	75			K	75
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2008)	Y		15 T/ac				
		N	40	N	22	N	62
		P	65			P	65
		K	75			K	75
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2009)	Y		15 T/ac				
		N	40	N	22	N	62
		P	65			P	65
		K	75			K	75
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2010)	Y		15 T/ac				
		N	40	N	22	N	62
		P	65			P	65
		K	75			K	75
Barley, Spring, S-ID(2011)	Y		15 T/ac				
		N	40	N	67	N	107
		P	65			P	65
		K	75			K	75

FIELD: Field 11 36 acres

Name	Man App		Feedlot Solids	Pasture(s)	Mineralization		Total	
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated(2005)	Y		0 T/ac	14 T/ac				
		N	0	7	N	0	N	7
		P	0	92			P	92
		K	0	105			K	105
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated(2006)	Y		0 T/ac	14 T/ac				
		N	0	7	N	4	N	11
		P	0	92			P	92
		K	0	105			K	105
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated(2007)	Y		0 T/ac	14 T/ac				
		N	0	7	N	4	N	11
		P	0	92			P	92
		K	0	105			K	105
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated(2008)	Y		0 T/ac	14 T/ac				
		N	0	7	N	4	N	11
		P	0	92			P	92
		K	0	105			K	105

FIELD: Field 12 34 acres

Name	Man App		Feedlot Solids	Mineralization		Total	
Barley, Spring, S-ID(2005)	Y		15 T/ac				
		N	39	N	45	N	84
		P	63			P	63
		K	73			K	73
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2006)	Y		15 T/ac				
		N	39	N	22	N	61
		P	63			P	63
		K	73			K	73
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2007)	Y		15 T/ac				
		N	39	N	22	N	61
		P	63			P	63
		K	73			K	73
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2008)	Y		15 T/ac				
		N	39	N	22	N	61
		P	63			P	63
		K	73			K	73

Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated(2009)	Y		15 T/ac				
		N	39	N	22	N	61
		P	63			P	63
		K	73			K	73
Barley, Spring, S-ID(2010)	Y		15 T/ac				
		N	39	N	67	N	106
		P	63			P	63
		K	73			K	73
Sugarbeets, S-ID, Irrigated(2011)	Y		15 T/ac				
		N	39	N	22	N	61
		P	63			P	63
		K	73			K	73
Barley, Spring, S-ID(2012)	Y		15 T/ac				
		N	39	N	67	N	106
		P	63			P	63
		K	73			K	73
Potatoes, S-ID, Irrigated(2013)	Y		15 T/ac				
		N	39	N	22	N	61
		P	63			P	63
		K	73			K	73
Barley, Spring, S-ID(2014)	Y		15 T/ac				
		N	39	N	67	N	106
		P	63			P	63
		K	73			K	73

Minimum Acres Required for Manure Application

Manure Group	Acres
Bedded Pack	330
Pasture(s)	120
Solid Stack(s)	330
Truck Wash Liquids	10
Truck Wash Solids	13

The acreage in the table is based on an average crop uptake of 100 lbs P2O5 per acre. These acreage numbers are for estimating export acreage needed.

Hydraulic Balance

Wastewater applications should begin and end with the irrigation season. Depending on weather and soil conditions, applications outside of this window may be allowed. Lagoons must be emptied in the fall. Fall application of effluent must be completed prior to November 15th. No

application will be allowed to frozen or snow covered ground. Spring applications prior to the start of the irrigation season may be allowed if moisture or nutrients are needed to enhance crop production. You must contact the Department of Agriculture, Dairy Bureau (208) 332-8550 prior to any wastewater application outside of the irrigation season. The need for wastewater application outside of the irrigation season will be evaluated on a case by case basis. Factors considered in granting approval will be but are not limited to the following; date, existing and forecasted weather conditions, moisture content of the soil, water holding capacity of the soil, frost layers in the soil, and crop needs.

Annual Soil Test

Annual soils tests must be taken every year from every field to determine a commercial fertilization rate. If commercial fertilizer isn't applied (for a perennial crop), annual soil samples are not required. If you do not apply commercial fertilizer, a complete soil analysis will need to be conducted initially to determine the nutrient baseline.

Faulkner Truck Wash

ANALYSIS OF RESOURCE CONCERNS

INTRODUCTION

The purpose of this nutrient management plan is to meet agricultural production goals and to certify that manure and nutrients are properly managed to minimize adverse impact to surface or groundwater. Plans are written in cooperation with the producer to:

1) Assure proper containment of animal manure and process waste water.

2) Assess resource concerns which exist on the property.

3) Budget nutrient sources to optimize crop water and nutrient needs. Nutrient sources include commercial fertilizers, animal manure, mineralization of previous crop soil organic matter, accounting of residues, and irrigation water.

4) When applicable, assess irrigation water management to minimize movement of nutrients beyond the root zone or with runoff.

If animal manure and/or commercial fertilizers are not properly managed, contaminants may negatively impact surface and/or groundwater. Some water resource contaminants associated with poorly managed animal manure and fertilizers are:

Phosphorus in the soil readily adsorbs to soil particles; thus, erosion of soil by surface runoff is the general mode of phosphorus transport. Even at very low concentrations, phosphorus can result in plant and algae blooms in surface water bodies. Alga blooms are a nuisance to boaters, irrigators, and others. Toxins released by certain algae can be lethal

to livestock or other animals that drink the water. Dissolved oxygen in the water is depleted as algae die and decompose, sometimes causing fish kills.

Nitrogen in the form of nitrate (NO_3^-) is highly water-soluble and will move with water, particularly down the soil profile past the root zone if not utilized by plants (thus becoming a groundwater contamination issue).Nitrates are toxic to infants under 6 months, and to livestock at high concentrations. In surface water, excess nitrogen, like phosphorus, can result in nuisance plant and algae growth.

Organic matter in high load decreases dissolved oxygen in a surface water body when it decomposes. Low levels of dissolved oxygen is harmful or even fatal to fish and other aquatic life.

Bacteria and microorganism illnesses (pathogens) potentially transmitted through water by animal manure include Giardia, Typhoid Fever, Cryptosporidium, and Cholera. Pathogens from animal waste can negatively impact surface and groundwater quality.

FACILITY DESCRIPTION
Owner Information

Owner (1): Diamond A - Fred Faulkner
Address: 1997 S 1875 E , Gooding, ID 83330
Phone: (208) 934-5391

Owner (2): Jay Faulkner **Address:** 1877 E 2000 S, Gooding, ID 83301
Phone: (208) 934-9088 Home Phone (208) 539-6652 Cell Phone

Location
Site Map: Facility site plan illustrated in Figure 1

Soil Conservation District: Gooding
County: Gooding
Watershed Basin: Big Wood (USGS Hydrologic Unit Code # 17040213)

ANALYSIS OF RESOURCE CONCERNS

Farm Resource Concerns

Faulkner Truck Wash is located in a watershed containing water quality limited stream segments listed according to the Clean Water Act. Stream segments are listed because a water quality parameter prevents the attainment of the "Fishable/Swimmable" goal of the Clean Water Act.

WATERBODY	BOUNDARIES	BACT	CHAN STAB	DO	FLOW ALT	HAB ALT	MET HG	MET	NH3	NUTR	O_G	ORG	PEST	PH	SAL	SED	TDG	TEMP	UNKN	*
Baker Creek	Headwaters to Norton Creek	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	☐
Big Wood River	Glendale Diversion to T1NR18ES35	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	☐
Big Wood River	Highway 75 to Little Wood River	1	0	1	1	0	0	0	1	1	0	0	0	0	0	1	0	0	0	☐
Big Wood River	Little Wood River to Interstate	1	0	1	1	0	0	0	1	1	0	0	0	0	0	1	0	0	0	☑
Big Wood River	Magic Reservoir to Highway 75	0	0	0	1	0	0	0	0	1	0	0	0	0	0	1	0	0	0	☐
Big Wood River	Trail Creek to Glendale Diversion	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	☐
Cove Creek	Headwaters to East Fk Wood River	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	☐
Croy Creek	Elk Creek to Big Wood River	0	0	0	1	0	0	0	0	1	0	0	0	0	0	1	0	0	0	☐
Eagle Creek	Headwaters to Big Wood River	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	☐
East Fork Rock	Headwaters to Rock Creek	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	☐
East Fork Wood	Headwaters to Blind Canyon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	☐
Greenhorn Cree	Headwaters to Big Wood River	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	☐

Horse Creek	Headwaters to Big Wood River	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Lake Creek	Headwaters to Big Wood River	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Owl Creek	Headwaters to Big Wood River	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Placer Creek	Headwaters to Warm Springs Creek	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Quigley Creek	Headwaters to mouth	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Rock Creek	Headwaters to Magic Reservoir	1	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	1	0
Seamans Creek	Headwaters to Big Wood River	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Thorn Creek	Thorn Reservoir to Schooler Creek	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	

Faulkner Truck Wash is not located in a critical Nitrate-Nitrogen management area. Nitrate Management Areas are designated based upon ground water quality sampling results. Two priority groups exist as follows:

Priority 1 is designated because at least 25% of the ground water sampling locations within the area exceed 5-milligrams/liter nitrate. This is one-half of the maximum contaminant level of 10-milligrams/liter nitrate. This nitrate concentration is considered evidence of significant degradation. Public drinking water systems are required to increase monitoring frequency when this level is reached.

Priority 2 is designated because at least 50% of the ground water sampling locations within the area exceed 2-milligrams/liter nitrate. This concentration threshold provides an indication of human-caused (anthropogenic) impacts. The upper limit for naturally occurring (background) concentrations of nitrate is considered to be about 2 mg/l.

Faulkner Truck Wash is located in a sole source aquifer area - Eastern Snake River Plain Aquifer.

Field Resource Concerns

- No Resource Concerns -

Depth Limiting Subsurface Features

Field Name	Subsurface Feature	Depth from Surface (in)
Field 1	Fractured Bedrock	25
	Water Table	>72
Pasture 1	Fractured Bedrock	25
	Water Table	>72
Pasture 2	Fractured Bedrock	25
	Water Table	>72
Field 2	Hard Pan	20
	Fractured Bedrock	21
	Water Table	>72

Field 3	Hard Pan	20
	Fractured Bedrock	21
	Water Table	>72
Field 4	Water Table	>72
Field 5	Hard Pan	20
	Fractured Bedrock	21
	Water Table	>72
Field 6	Hard Pan	20
	Fractured Bedrock	21
	Water Table	>72
Field 7	Hard Pan	20
	Fractured Bedrock	21
	Water Table	>72
Field 8	Hard Pan	22
	Fractured Bedrock	20
	Water Table	>72
Field 9	Water Table	>72
Field 10	Hard Pan	22
	Fractured Bedrock	20
	Water Table	>72
Field 11	Hard Pan	20
	Fractured Bedrock	21
	Water Table	>72
Field 12	Water Table	>72

Well Testing Results:

Well	Date	Hardness	EC	PH	K	Nitrates	Nitrites	NH3	Na	Carbonate	Bicarbonate
No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data

ISDA REGULATIONS AND THE IDAHO NUTRIENT MANAGEMENT STANDARD

Nutrient management plans for animal agricultural operations regulated by the Idaho State Department of Agriculture (ISDA) must be approved by the Idaho State Department of Agriculture and must follow the Natural Resource Conservation Service (NRCS) Agriculture Waste Management Field Handbook and the Idaho Nutrient Management Standard. ISDA regulation and the Standard use soil test phosphorus as the indicator for environmental impact from agricultural production practices. The Idaho Nutrient Management Standard is based on a threshold soil test phosphorus level (TH), above which there is no agronomic advantage to application of phosphorus.

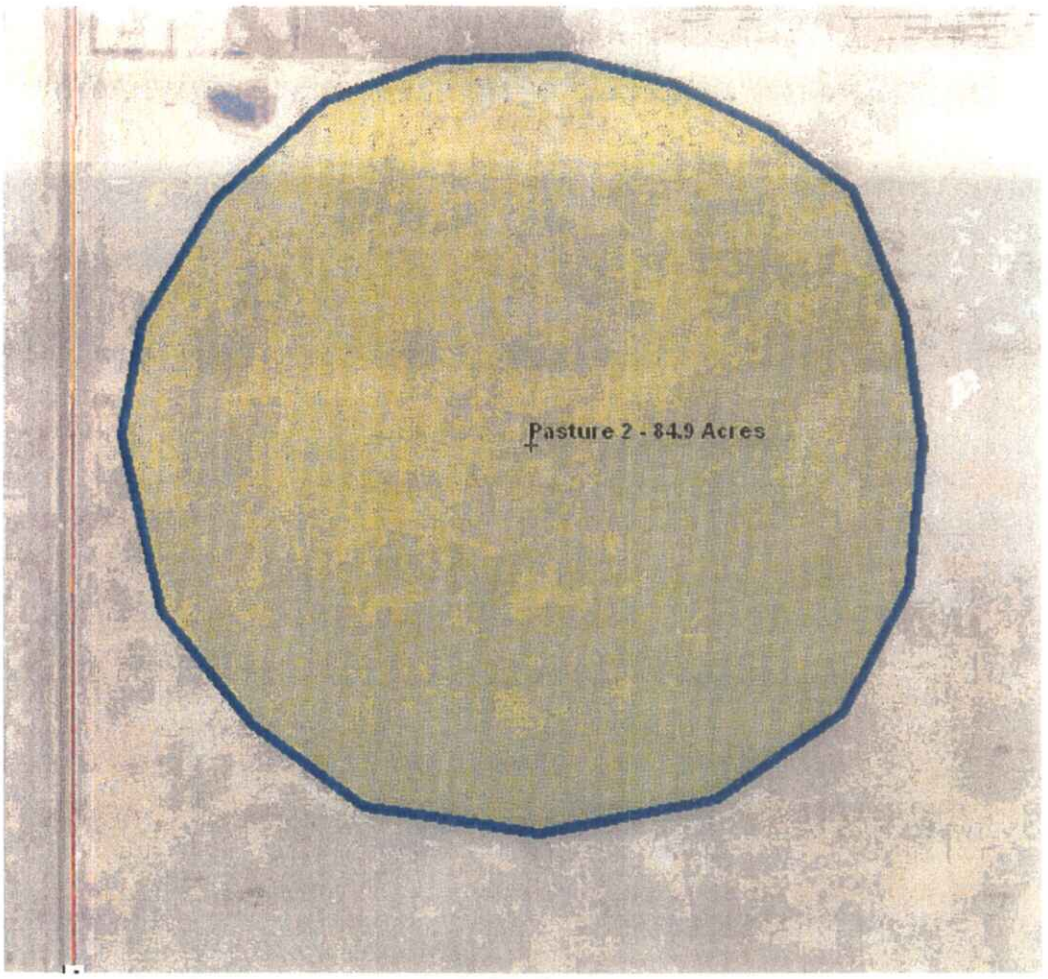
The Idaho Nutrient Management Standard categorizes fields as a surface water concern or a groundwater concern. A surface water concern indicates that runoff leaves the contiguous operating unit from normal storm events, rain on snow, frozen ground, or irrigation. The soil phosphorus threshold for a field with a surface water concern is 40 ppm phosphorus for basic soils (pH > 7) tested with the Olsen method; 60 ppm phosphorus for acidic soils (pH < 7) tested with the Bray method; and 6 ppm phosphorus for acidic soils tested with the Morgan method (0-12"Soil Sample Depth).

A groundwater resource concern indicates that runoff does not leave the contiguous operating unit from normal storm events, rain on snow, frozen ground, or irrigation. There are two sub-categories for fields identified as having a groundwater concern. The first category applies to fields with a resource concern within the first five feet of the soil profile. A resource concern could be shallow soils, gravel, cobble, bedrock, high groundwater table, or a drained field. These fields are indicated as a groundwater concern <5'. The soil phosphorus threshold for a field with a groundwater concern <5' is 20 ppm phosphorus for soils tested with the Olsen method; 25 ppm phosphorus for soils tested with the Bray method and 2.5ppm phosphorus for soils tested with the Morgan method (18-24" Soil Sample Depth).

If a field is not classified as having a surface water concern or a groundwater <5' concern, by default it is classified as having a groundwater concern >5'. The soil phosphorus threshold for a field with a groundwater concern >5' is 30 ppm phosphorus for soils tested with the Olsen method; 45 ppm phosphorus for soils tested with the Bray method; and 4.5 ppm phosphorus for soils tested with the Morgan method (18-24" Soil Sample Depth).

Field Phosphorus Threshold

Field	Resource Concern	P Threshold (ppm)	P Threshold Soil Test Depth
Field 1	Groundwater < 5'	20	18 - 24"
Pasture 1	Groundwater < 5'	20	18 - 24"
Pasture 2	Groundwater < 5'	20	18 - 24"
Field 2	Surface Water	40	0 - 12"
Field 3	Surface Water	40	0 - 12"
Field 4	Surface Water	40	0 - 12"
Field 5	Surface Water	40	0 - 12"
Field 6	Surface Water	40	0 - 12"
Field 7	Surface Water	40	0 - 12"
Field 8	Surface Water	40	0 - 12"
Field 9	Surface Water	40	0 - 12"
Field 10	Surface Water	40	0 - 12"
Field 11	Surface Water	40	0 - 12"
Field 12	Surface Water	40	0 - 12"


Pasture 2 - 84.9 Acres

Farm Location
Idaho Transverse Mercator
Coordinates of the farm center (meters): X = 2440941.89727008, Y = 1297846.43035188
Map Scale: 1 : 38

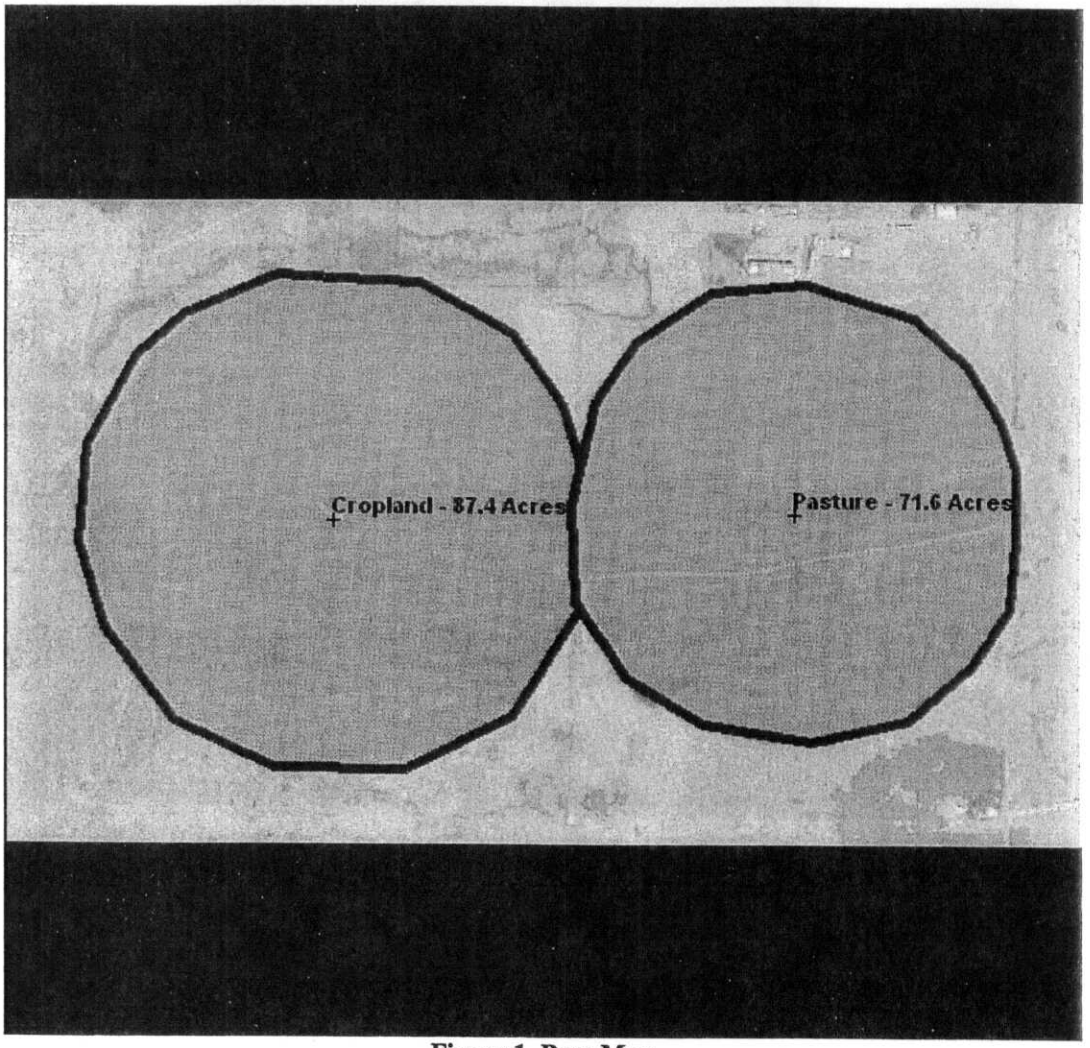
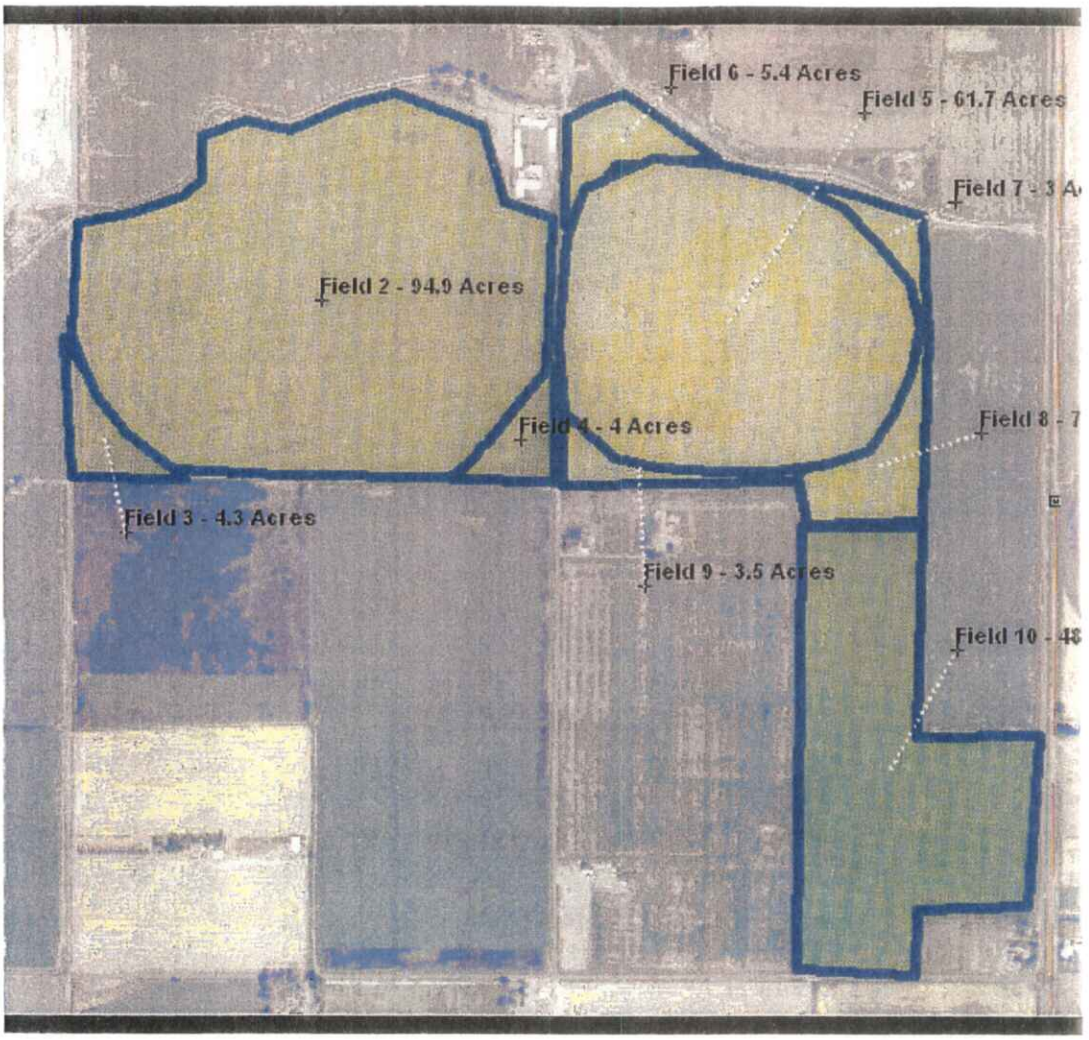
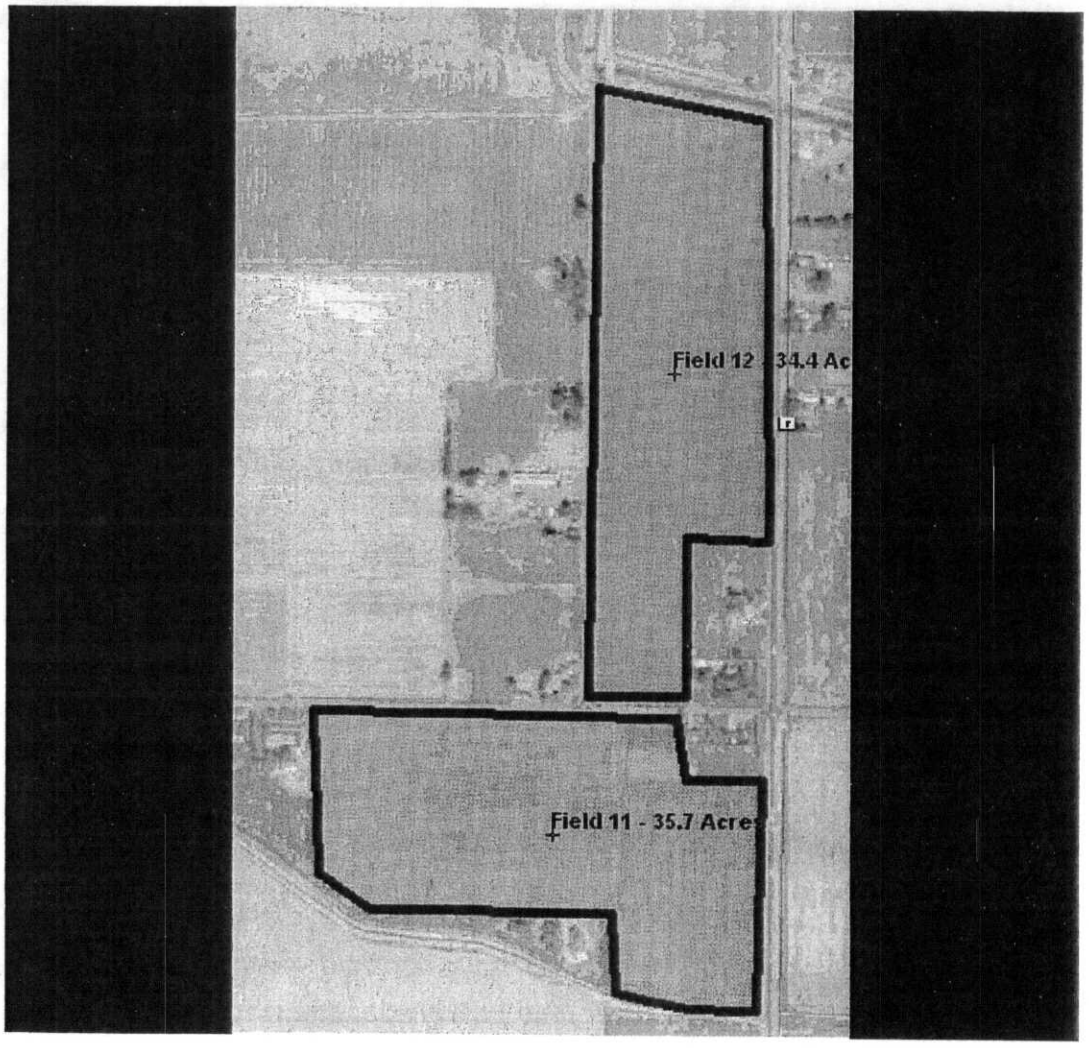
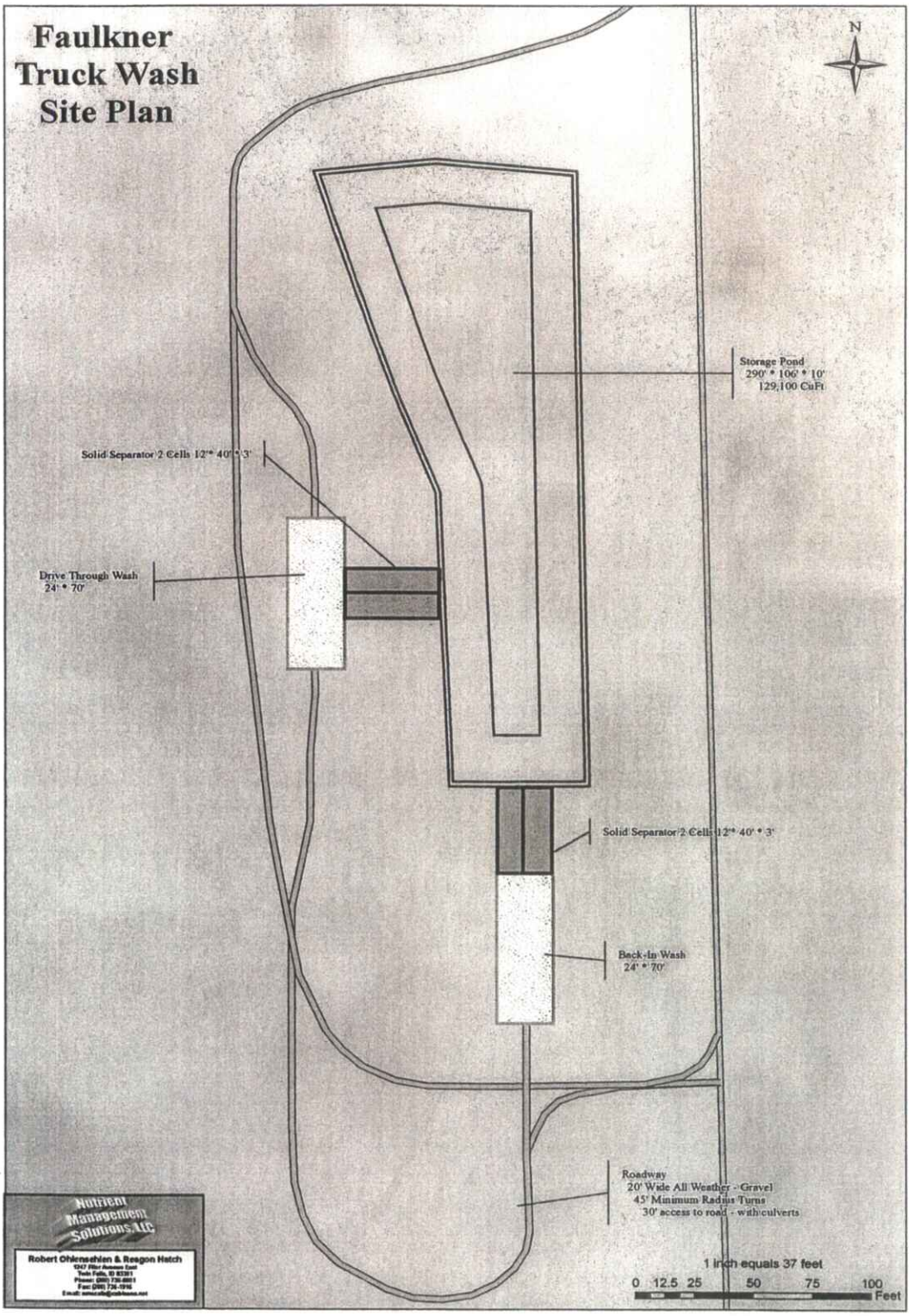


Figure 1. Base Map


Field 6 - 5.4 Acres
Field 5 - 61.7 Acres
Field 7 - 3 A
Field 2 - 94.9 Acres
Field 4 - 4 Acres
Field 8 - 7
Field 3 - 4.3 Acres
Field 9 - 3.5 Acres
Field 10 - 48

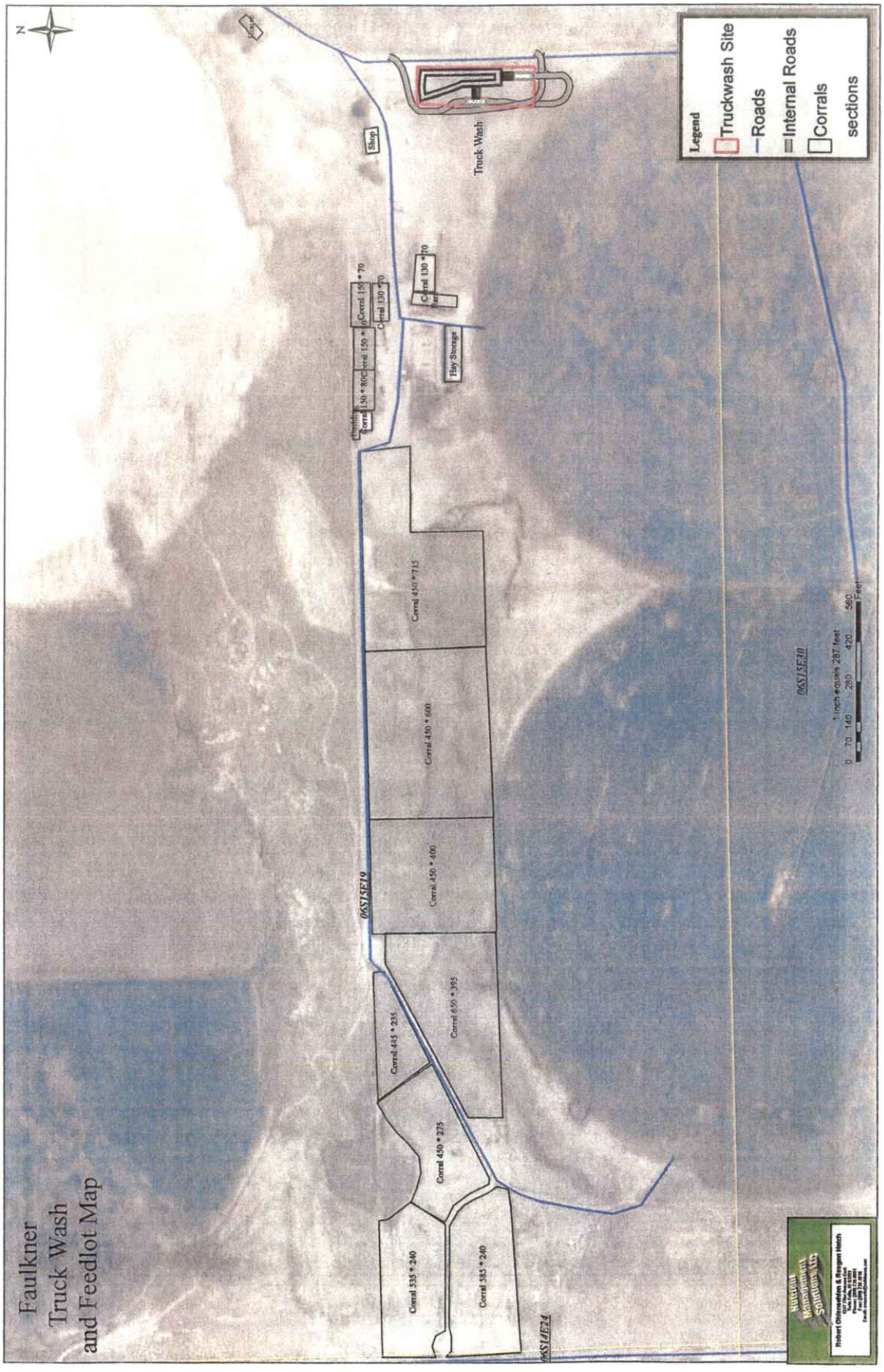

Field 12 - 34.4 Ac
Field 11 - 35.7 Acre

Farm Location
Idaho Transverse Mercator
Coordinates of the farm center (meters): X = 2440941.89727008, Y = 1297846.43035188
Map Scale: 1 :



38

Figure 2. Farmstead Map


Faulkner
Truck Wash
and Feedlot Map
N
Legend
Truckwash Site
Roads
Internal Roads
Corrals
sections
Truck Wash
Shop
Hay Storage
Corral 150 * 70
Corral 130 * 70
Corral 130 * 70
Corral 150 * 70
Corral 130 * 80
Corral 450 * 715
Corral 450 * 600
Corral 450 * 400
Corral 650 * 395
Corral 445 * 255
Corral 450 * 275
Corral 535 * 240
Corral 585 * 240
06S15E19
06S15E20
06S14E24
1 inch equals 287 feet
0 70 140 280 420 560
Feet

ANNUAL NUTRIENT BUDGET

The following crop nutrient budget is based on soil test data and cropping information. It is for one year for the following field and specified crop information:

Nutrient Budget Summary

Field: Field 1 **Crop:** Corn, Field, Silage, S-ID, Irrigated **Yield:** 32

	N	P205	K20
Crop Nutrient Requirement	250	128	293
Nutrients From Soil	?		
from Mineralized Nitrogen	0		
from Prior Crops	0		
from Prior Bio-Nutrients	14		
from Irrigation Water	0		0
Nutrient Balance from above *	236.2	128.2	293
Solid Stack(s)	28	79	119
Truck Wash Solids	0	0	0
Estimated Remaining Nutrients Required *	208	49	174
Commercial Fertilizer Application	0	0	0
Final Nutrient Balance *	208	49	174

* Positive values indicate additional nutrients are required; negative values indicate a nutrient surplus
Acceptable: Sustainable agronomic rate.

Field: Pasture 1 **Crop:** Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated **Yield:** 5

	N	P205	K20
Crop Nutrient Requirement	150	92	259
Nutrients From Soil	?		
from Mineralized Nitrogen	0		
from Prior Crops	0		
from Prior Bio-Nutrients	12		
from Irrigation Water	0		0
Nutrient Balance from above *	137.8	91.6	259.2
Pasture(s)	5	60	69
Solid Stack(s)	0	0	0
Truck Wash Liquids	14	14	16
Truck Wash Solids	12	19	22
Estimated Remaining Nutrients Required *	107	-1	152
Commercial Fertilizer Application	0	0	0
Final Nutrient Balance *	107	-1	152

Positive values indicate additional nutrients are required; negative values indicate a nutrient surplus
Acceptable: Sustainable agronomic rate.

Extracted from Affidavit of Robert Ohlensehlen, dated Sept. 12, 2006.
Gary Spackman 11/1/2006

Field: Pasture 2 **Crop:** Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated **Yield:** 4

	N	P205	K20
Crop Nutrient Requirement	150	73	207
Nutrients From Soil	?		
from Mineralized Nitrogen	0		
from Prior Crops	0		
from Prior Bio-Nutrients	8		
from Irrigation Water	0		0
Nutrient Balance from above *	141.5	73.3	207.4
Feedlot Solids	19	30	35
Pasture(s)	4	46	53
Estimated Remaining Nutrients Required *	119	-3	119
Commercial Fertilizer Application	0	0	0
Final Nutrient Balance *	119	-3	119

* Positive values indicate additional nutrients are required; negative values indicate a nutrient surplus

Acceptable: Sustainable agronomic rate.

Field: Field 2 **Crop:** Corn, Field, Silage, S-ID, Irrigated **Yield:** 32

	N	P205	K20
Crop Nutrient Requirement	250	128	293
Nutrients From Soil	?		
from Mineralized Nitrogen	0		
from Prior Crops	-10		
from Prior Bio-Nutrients	31		
from Irrigation Water	0		0
Nutrient Balance from above *	228.7	128.2	293
Feedlot Solids	56	91	105
Estimated Remaining Nutrients Required *	173	37	188
Commercial Fertilizer Application	0	0	0
Final Nutrient Balance *	173	37	188

* Positive values indicate additional nutrients are required; negative values indicate a nutrient surplus

Acceptable: Sustainable agronomic rate.

Field: Field 3 **Crop:** Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated **Yield:** 7.5

	N	P205	K20
Crop Nutrient Requirement	399	93	383
Nutrients From Soil	?		
from Mineralized Nitrogen	0		
from Prior Crops	0		
from Prior Bio-Nutrients	27		
from Irrigation Water	0		0
Nutrient Balance from above *	372	92.7	383.4
Feedlot Solids	48	78	90
Estimated Remaining Nutrients Required *	324	15	293
Commercial Fertilizer Application	0	0	0
Final Nutrient Balance *	324	15	293

* Positive values indicate additional nutrients are required; negative values indicate a nutrient surplus

Acceptable: Sustainable agronomic rate.

Field: Field 4 **Crop:** Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated **Yield:** 7.5

	N	P205	K20
Crop Nutrient Requirement	399	93	383
Nutrients From Soil	?		
from Mineralized Nitrogen	0		
from Prior Crops	0		
from Prior Bio-Nutrients	27		
from Irrigation Water	0		0
Nutrient Balance from above *	372	92.7	383.4
Feedlot Solids	48	78	90
Estimated Remaining Nutrients Required *	324	15	293
Commercial Fertilizer Application	0	0	0
Final Nutrient Balance *	324	15	293

* Positive values indicate additional nutrients are required; negative values indicate a nutrient surplus

Acceptable: Sustainable agronomic rate.

Field: Field 5 **Crop:** Corn, Field, Silage, S-ID, Irrigated **Yield:** 32

	N	P205	K20
Crop Nutrient Requirement	250	128	293
Nutrients From Soil	?		
from Mineralized Nitrogen	0		
from Prior Crops	-10		
from Prior Bio-Nutrients	31		
from Irrigation Water	0		0
Nutrient Balance from above *	228.7	128.2	293
Feedlot Solids	56	91	105
Estimated Remaining Nutrients Required *	173	37	188
Commercial Fertilizer Application	0	0	0
Final Nutrient Balance *	173	37	188

* Positive values indicate additional nutrients are required; negative values indicate a nutrient surplus

Acceptable: Sustainable agronomic rate.

Field: Field 6 **Crop:** Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated **Yield:** 5

	N	P205	K20
Crop Nutrient Requirement	150	92	259
Nutrients From Soil	?		
from Mineralized Nitrogen	0		
from Prior Crops	0		
from Prior Bio-Nutrients	4		
from Irrigation Water	0		0
Nutrient Balance from above *	146	91.6	259.2
Feedlot Solids	0	0	0
Pasture(s)	7	92	105
Estimated Remaining Nutrients Required *	139	0	154
Commercial Fertilizer Application	0	0	0
Final Nutrient Balance *	139	0	154

* Positive values indicate additional nutrients are required; negative values indicate a nutrient surplus

Acceptable: Sustainable agronomic rate.

Field: Field 7 **Crop:** Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated **Yield:** 5

	N	P205	K20
Crop Nutrient Requirement	150	92	259
Nutrients From Soil	?		
from Mineralized Nitrogen	0		
from Prior Crops	0		
from Prior Bio-Nutrients	4		
from Irrigation Water	0		0
Nutrient Balance from above *	146	91.6	259.2
Feedlot Solids	0	0	0
Pasture(s)	7	92	105
Estimated Remaining Nutrients Required *	139	0	154
Commercial Fertilizer Application	0	0	0
Final Nutrient Balance *	139	0	154

* Positive values indicate additional nutrients are required; negative values indicate a nutrient surplus

Acceptable: Sustainable agronomic rate.

Field: Field 8 **Crop:** Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated **Yield:** 5

	N	P205	K20
Crop Nutrient Requirement	150	92	259
Nutrients From Soil	?		
from Mineralized Nitrogen	0		
from Prior Crops	0		
from Prior Bio-Nutrients	4		
from Irrigation Water	0		0
Nutrient Balance from above *	146	91.6	259.2
Feedlot Solids	0	0	0
Pasture(s)	7	92	105
Estimated Remaining Nutrients Required *	139	0	154
Commercial Fertilizer Application	0	0	0
Final Nutrient Balance *	139	0	154

* Positive values indicate additional nutrients are required; negative values indicate a nutrient surplus

Acceptable: Sustainable agronomic rate.

Field: Field 9 **Crop:** Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated **Yield:** 5

	N	P205	K20
Crop Nutrient Requirement	150	92	259
Nutrients From Soil	?		
from Mineralized Nitrogen	0		
from Prior Crops	0		
from Prior Bio-Nutrients	4		
from Irrigation Water	0		0
Nutrient Balance from above *	146	91.6	259.2
Feedlot Solids	0	0	0
Pasture(s)	7	92	105
Estimated Remaining Nutrients Required *	139	0	154
Commercial Fertilizer Application	0	0	0
Final Nutrient Balance *	139	0	154

- Positive values indicate additional nutrients are required; negative values indicate a nutrient surplus

Acceptable: Sustainable agronomic rate.

Field: Field 10 **Crop:** Barley, Spring, S-ID **Yield:** 130

	N	P205	K20
Crop Nutrient Requirement	210	49	32
Nutrients From Soil	?		
from Mineralized Nitrogen	45		
from Prior Crops	-24		
from Prior Bio-Nutrients	22		
from Irrigation Water	0		0
Nutrient Balance from above *	166.5	48.6	32.2
Feedlot Solids	40	65	75
Estimated Remaining Nutrients Required *	126	-16	-43
Commercial Fertilizer Application	0	0	0
Final Nutrient Balance *	126	-16	-43

* Positive values indicate additional nutrients are required; negative values indicate a nutrient surplus

Rate may result in crop nutrient deficit or a potential resource concern.

Acceptable: Sustainable agronomic rate.

Field: Field 11 **Crop:** Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated **Yield:** 5

	N	P205	K20
Crop Nutrient Requirement	150	92	259
Nutrients From Soil	?		
from Mineralized Nitrogen	0		
from Prior Crops	0		
from Prior Bio-Nutrients	2		
from Irrigation Water	0		0
Nutrient Balance from above *	147.6	91.6	259.2
Pasture(s)	4	54	63
Estimated Remaining Nutrients Required *	144	38	196
Commercial Fertilizer Application	0	0	0
Final Nutrient Balance *	144	38	196

* Positive values indicate additional nutrients are required; negative values indicate a nutrient surplus

Acceptable: Sustainable agronomic rate.

Field: Field 12 **Crop:** Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated **Yield:** 7.5

	N	P205	K20
Crop Nutrient Requirement	399	93	383
Nutrients From Soil	?		
from Mineralized Nitrogen	0		
from Prior Crops	0		
from Prior Bio-Nutrients	22		
from Irrigation Water	0		0
Nutrient Balance from above *	377.2	92.7	383.4
Feedlot Solids	39	63	73
Estimated Remaining Nutrients Required *	338	30	310
Commercial Fertilizer Application	0	0	0
Final Nutrient Balance *	338	30	310

Positive values indicate additional nutrients are required; negative values indicate a nutrient surplus

- Acceptable: Sustainable agronomic rate.

ANALYSIS OF ANIMAL SYSTEM

WASTE STORAGE AND HANDLING

Livestock Unit Waste Characteristics

Description	Animal	Number	Average Animal Weight	Days Collected	Housing	Bedding Type	Bedding (tons)	Waste (tons)
Feedlot	Beef - High forage diet	2,750	650	120	Open Lot	Long Straw	997	6,757
Beef Yearlings	Beef - High forage diet	435	650	170	Open Lot	None	0	1,498
Dairy Heifers	Dairy Heifer	600	600	365	Open Lot	Long Straw	611	5,887

Manure/Biosolid Groups

Manure Group	Storage Type	Application Method	Days to Incorporation	Nitrogen Retention (%)	Annual Volume (ft3)	Annual Weight (tons)
Bedded Pack	Manure Stored in Open Lot, Arid Region	Broadcast, Incorporated deeper than 3 inches	4-7 days	48	187,509	6,322
Pasture(s)	Pasture	Broadcast, no incorporation, with containment	>7 days	14	49,237	1,498
Solid Stack(s)	Manure Stored in Open Lot, Arid Region	Broadcast, Incorporated deeper than 3 inches	4-7 days	48	187,509	6,322
Truck Wash Liquids	Waste Storage Pond, Diluted > 50%	Irrigation	N/A	75	6,552	192
Truck Wash Solids	Manure Stored in Open Lot, Arid Region	Broadcast, Incorporated deeper than 3 inches	4-7 days	80	74,519	310

*in Nitrogen Retention % Column means "Overridden Nitrogen Values"
Assisted Mode has been turned off.

Manure Group		Dairy Heifers	Feedlot	Beef Yearlings
Solid Stack(s)	% To Group	50	50	
Pasture(s)	% To Group	N/A		100
Bedded Pack	% To Group	50	50	

Annual Production of Nutrients

The nutrient values were calculated based on animal weight and nitrogen loss estimates as described in the NRCS Agricultural Waste Management Field Handbook guidelines (1996). The calculations are estimates, and manure testing is recommended for more accuracy, as manure nutrient content varies widely among operations.

Nutrient Distribution on Facility					
	Total Tons	Pounds N	Pounds P_2O_5	Pounds K_2O	% of Total
Total Nutrients Produced	14,644	57,586	80,326	115,979	
Bedded Pack Heifers & Dry Cows	6,322	25,735	33,006	50,017	41.1%
Pasture(s)	1,498	2,066	11,975	13,239	14.9%
Separated Solid Truck Wash	310	1,860	1,345	1,556	1.7%
Solid Stack(s)	6,322	25,735	33,006	50,017	41.1%
Waste Storage Pond Truck Wash	192	2,190	994	1,150	1.2%

No Comments

Dairy Water Values

Bulk Tank(s)		
Bulk Tank ID	Size	Volume
1	0	0

Comments

No Comments

MANURE STORAGE SUMMARY

Total Annual Liquid Capacity Required				
Bio-Nutrient Group	Recommended Capacity Cubic Feet	% Contained	Storage Days	Storage Vol. Cubic Feet
Truck Wash Liquids	6,552	100%	150	6,552
Process Water	120,321	100%	150	120,321

Total Annual Solid Capacity		
Bio-Nutrient Group	Recommended Capacity Cubic Feet	% Contained
Solid Stack(s)	187,509	0%
Pasture(s)	17,062	0%
Truck Wash Solids	74,519	100%
Bedded Pack	187,509	0%
Feedlot	225,129	0%
Dairy Heifers	137,968	0%

Existing Storage Containers		
Storage Unit Name	Days Stored	No Data
No Data	@[Days Stored]	No Data

New Storage Containers Required		
Storage Unit Name	Days Stored	No Data
Wash Storage	150 Days	No Data

Container Name	Volume (ft3)	Storage Period (Days)	Length	Width	Depth	Slope	Diameter	Existing	Proposed
Wash Storage	128,016	150	530	50	10	2	NA	No	Yes

Containment of Housing Facility Waste and Corral Runoff

It is important that water from housing facilities and contaminated runoff from corrals be contained and/or diverted to the lagoon storage system. As stated in the Idaho State Department of Agriculture (ISDA) regulation, a discharge is allowed only under large precipitation events (>25yr, 24hr storm event). Lagoon structures must be properly designed, operated, and maintained to contain all barn wastewater and contaminated runoff from a 25-year, 24-hour rainfall event for the site location and maintained to contain all runoff from accumulation of winter precipitation from a one in five-year winter. Animals confined in the CAFO may not have direct contact with canals, streams, lakes, or other surface waters.

Comments
No Comments

BIO-NUTRIENT EXPORT INFO

Exported Bio-Nutrient Summary					
Bio-Nutrient Group Name	**Amount**	**Consumer**	**Consumer's Address**	**Telephone**	**Acres**
No Data	No Data	No Data	No Data	No Data	No Data

ANALYSIS OF CROPPING SYSTEM

Farming Operation

Total Acres: 549.7

Crop Production History

THIS IS NOT A FERTILIZER RECOMMENDATION

Crop Rotation Name: Corn/Alf/Potato

Crop	Yield	Yield Units	N Requirement	P_2O_5 uptake	K_2O Requirement
Corn, Field, Silage, S-ID, Irrigated	32	tons/acre	250	128.2	240
Sugarbeets, S-ID, Irrigated	28	tons/acre	210	38.5	240
Corn, Field, Silage, Double Cropped, S-ID, Irrigated	32	tons/acre	250	153.9	240
Potatoes, S-ID, Irrigated	450	cwt/acre	260	61.8	725
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated	7.5	tons/acre	0	92.7	360
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated	7.5	tons/acre	0	92.7	360
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated	7.5	tons/acre	0	92.7	360
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated	7.5	tons/acre	0	92.7	360
Average				94	

* Nitrogen and Potassium Requirements assume zero credits.

THIS IS NOT A FERTILIZER RECOMMENDATION

Crop Rotation Name: Pasture

Crop	Yield	Yield Units	N Requirement	P_2O_5 uptake	K_2O Requirement
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated	5	tons/acre	150	91.6	200
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated	5	tons/acre	150	91.6	200
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated	5	tons/acre	150	91.6	200
Average				92	

*Nitrogen and Potassium Requirements assume zero credits.

Crop Rotation Name: Alf/Grain/SugarBeet/Pot

Crop	Yield	Yield Units	N Requirement	P_2O_5 uptake	K_2O Requirement
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated	7.5	tons/acre	0	92.7	360
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated	7.5	tons/acre	0	92.7	360
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated	7.5	tons/acre	0	92.7	360
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated	7.5	tons/acre	0	92.7	360
Barley, Spring, S-ID	130	bu/acre	210	48.6	240
Sugarbeets, S-ID, Irrigated	26.8	tons/acre	190	36.8	240
Barley, Spring, S-ID	130	bu/acre	210	48.6	240
Potatoes, S-ID, Irrigated	400	cwt/acre	240	55	700
Barley, Spring, S-ID	130	bu/acre	210	48.6	240

Crop Rotation Name: Pasture

Average				122	
Crop	Yield	Yield Units	N Requirement	P205 uptake	K20 Requirement
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated	4	tons/acre	150	73.3	200
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated	4	tons/acre	150	73.3	200
Average				73	

Crop Rotation Name: Alf/Grain

Crop	Yield	Yield Units	N Requirement	$P_2 0_5$ uptake	$K_2 0$ Requirement
Barley, Spring, S-ID	130	bu/acre	210	48.6	240
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated	7.5	tons/acre	0	92.7	360
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated	7.5	tons/acre	0	92.7	360
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated	7.5	tons/acre	0	92.7	360
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated	7.5	tons/acre	0	92.7	360
Barley, Spring, S-ID	130	bu/acre	210	48.6	240
Average				156	

* Nitrogen and Potassium Requirements assume zero credits.

THIS IS NOT A FERTILIZER RECOMMENDATION

Crop Rotation Name: Grain/Corn/Alf

Crop	Yield	Yield Units	N Requirement	P_2O_5 uptake	K_2O Requirement
Corn, Field, Silage, S-ID, Irrigated	32	tons/acre	250	128.2	240
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated	7.5	tons/acre	0	92.7	360
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated	7.5	tons/acre	0	92.7	360
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated	7.5	tons/acre	0	92.7	360
Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated	7.5	tons/acre	0	92.7	360
Barley, Spring, S-ID	130	bu/acre	210	48.6	240
Barley, Spring, S-ID	130	bu/acre	210	48.6	240
Corn, Field, Silage, S-ID, Irrigated	32	tons/acre	250	128.2	240
Average				145	

* Nitrogen and Potassium Requirements assume zero credits.

THIS IS NOT A FERTILIZER RECOMMENDATION

Crop Rotation Name: Pasture

Crop	Yield	Yield Units	N Requirement	P_2O_5 uptake	K_2O Requirement
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated	5	tons/acre	150	91.6	200
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated	5	tons/acre	150	91.6	200
Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated	5	tons/acre	150	91.6	200
Average				92	

* Nitrogen and Potassium Requirements assume zero credits.

Mapped Resource Concern(s)

Field Name	Acres	Resource Concern(s)
No Data	No Data	No Data

ANALYSIS OF IRRIGATION PRACTICES

Irrigation Management

Proper irrigation management depends on factors such as the following.

Irrigation Efficiency: The efficiency with which the irrigation wets the entire crop root zone. This takes losses that occur from evaporation, runoff and deep percolation.

Crop Evapotranspiration Rate (ET): The combined rate at which water from the soil profile is evaporated into the atmosphere and transpired from the crop. The rate is expressed in units of inches/day.

Management Allowable Depletion (MAD): The percentage of water, which can be depleted from the soil before the crop, experiences water deficiency stress.

Available Water Holding Capacity in the Soil (AWH): The amount of water the pores in the soil profile can hold against gravity. The AWH is expressed as inches of water per inch of soil.

Crop Rooting Depth: The depth in the soil profile to which the crop roots can penetrate.

APPENDIX A: ANALYSIS OF SOIL CHARACTERISTICS

Soil Survey (USDA NRCS) information was used to describe the soil variations across each field. **This is not absolute** and may vary for each specific situation. The soil map has broad areas that have distinctive pattern of soils, relief, and drainage. Each map unit on the soil map is a unique natural landscape. Typically, it consists of one or more major soils or miscellaneous areas and some minor soils or miscellaneous areas. It is named for the major soils or miscellaneous areas. Because the minor soils are not described in the following summary, the combined acreage for all major soils will be less than the acreage for each field.

Table 1. Soil type across each field

Field Name	Soil Type	Percentage	Approximate Acreage	Surface Texture[1]
Field 1	ROCK OUTCROP	20	14.77	
	KECKO	25	18.46	VFSL
	JESTRICK	40	29.54	VFSL
	ROCK OUTCROP	15	2.03	
	JESTRICK	35	4.74	LFS
	ACKELTON	40	5.42	LFS
Pasture 1	ROCK OUTCROP	20	2.12	
	KECKO	25	2.65	VFSL
	JESTRICK	40	4.24	VFSL
	ROCK OUTCROP	15	9.15	
	JESTRICK	35	21.36	LFS
	ACKELTON	40	24.41	LFS
Pasture 2	ROCK OUTCROP	15	12.74	
	JESTRICK	35	29.72	LFS
	ACKELTON	40	33.96	LFS
Field 2	POWER	25	3.17	VFSL
	POWER	55	7.31	VFSL
	PURDAM	35	4.65	VFSL
	SNOWMORE	35	4.44	VFSL
	PURDAM	25	3.17	VFSL
	POWER	100	68.95	SIL

Field 3	POWER	25	0.19	VFSL
	PURDAM	25	0.19	VFSL
	SNOWMORE	35	0.26	VFSL
	PURDAM	35	0.59	VFSL
	POWER	100	1.84	SIL
	POWER	55	0.93	VFSL
Field 4	POWER	100	4.02	SIL
Field 5	POWER	25	1.38	VFSL
	POWER	100	56.13	SIL
	SNOWMORE	35	1.93	VFSL
	PURDAM	25	1.38	VFSL
Field 6	SNOWMORE	35	0.44	VFSL
	PURDAM	25	0.31	VFSL
	POWER	25	0.31	VFSL
	POWER	100	4.19	SIL
Field 7	POWER	100	2.85	SIL
	SNOWMORE	35	0.04	VFSL
	PURDAM	25	0.03	VFSL
	POWER	25	0.03	VFSL
Field 8	POWER	100	6.86	SIL
	TICESKA	35	0.22	VFSL
	TAUNTON	25	0.16	VFSL
	MINVENO	20	0.13	VFSL
Field 9	POWER	100	3.46	SIL
Field 10	TAUNTON	25	3.55	VFSL
	TICESKA	35	4.97	VFSL
	POWER	100	34.22	SIL
	MINVENO	20	2.84	VFSL
Field 11	POWER	25	1.32	VFSL
	PURDAM	25	1.32	VFSL
	SNOWMORE	35	1.85	VFSL
	POWER	100	30.36	SIL
Field 12	POWER	100	34.38	SIL

Note: 1- See Appendix A.

Table 2 contains important soil characteristics for each of the fields identified in this plan. Each soil characteristic listed is representative for the entire field based on a weighted average. *(Caution: USDA NRCS Soil Survey information was used to estimate the values reported in Table 2.* ***These are not absolute values*** *and may vary for each specific situation. They are estimated values representative for each field.)* The following includes a brief description of each of those factors:

Dominant Surface Texture -- The predominant texture of the surface layer. Soil texture is the relative proportion, by weight, of the particle separate classes (sand, silt, and clay) finer than 2 mm in equivalent diameter. Soil texture influences engineering works and plant growth and is used as an indicator of how soils formed. (See Appendix A)

Available Water Capacity (AWC) -- The volume of water that should be available to plants if the soil, inclusive of fragments, were at field capacity. It is commonly defined as the difference between the amount of soil moisture at field capacity and the amount at permanent wilting point. Typical Available Water Capacities are 0.6 inches/foot for a Sand and 2.0 inches/foot for a Silt Loam. Available Water Capacity is an important soil property in developing water budgets, predicting droughtiness, designing and operating irrigation systems, designing drainage systems, protecting water resources, and predicting yields.

Surface Soil Erodibility Factor (K) -- A factor which quantifies the susceptibility of soil detachment by water. Factors vary from a low of 0.02 to a high of 0.64.

Soil Loss Tolerance (T) -- The maximum amount of erosion at which the quality of a soil as a medium for plant growth can be maintained.

Slope -- The difference in elevation between two points expressed as a percentage of the distance between those points.

Permeability -- The quality of the soil that enables water or air to move through it.

Permeability Class -- Permeability expressed by classes ranging from very rapid to impermeable. (See Appendix A)

Runoff Class - An index of the likelihood for runoff to occur based on inherent soil and slope characteristic. Runoff classes range from Negligible to Very High. (See Appendix A)

Surface pH -- A numerical expression of the relative acidity or alkalinity of the surface soil layer.

Surface pH Classification -- A general descriptive term for soil pH, acid or alkaline.

Table 3 contains additional important soil characteristics for each of the fields identified in this plan. Each soil characteristic listed represents a potential limiting condition within the soil profile (< 5 feet) across the field. *(Caution: USDA NRCS Soil Survey information was used to estimate*

the values reported in Table 2. ***These are not absolute values*** *and may vary for each specific situation. They are estimated values representative for each field.)* The following includes a brief description of each of those factors:

Soil Layer with > 50 % Gravel, Cobble or Stone -- A layer comprised of more than 50 % gravel, cobbles or stones.

Pan - A compact, dense layer in the soil that impedes the movement of water and the growth of roots. Examples include: *hardpan, claypan, plowpan*, and *fragipan*. (See Appendix A)

Rock -- A layer of rock in the soil that impedes the movement of water and the growth of roots.

Seasonal High Water Table -- A seasonal water table that exist near the surface.

Drainage Class - Drainage class identifies the natural drainage condition of the soil. It refers to the frequency and duration of wet periods. Alteration of the water regime by humans, either through drainage or irrigation, is not a consideration unless the alterations have significantly changed the morphology of the soil. (See Appendix A)

Hydrologic Group -- A group of soils having similar runoff potential under similar storm and cover conditions.

Table 2. Soil characteristics representative for each field

Field Name	Representative For Entire Field (Weighted Average)											
	Dominant Surface Texture & (Acreage)[1]	Total Available Water Capacity to 5 feet (in)	Surface Soil Erodibility Factor - K	Soil Loss Tolerance - T (tons/acre)	Calculated Sheet and Rill Erosion Rate[1] (tons/acre)	Calculated Irrigation Induced Erosion Rate[1] (tons/acre)	Slope (%)	Permeability (in/hour)	Permeability Class[1,2]	Runoff Class[1,3]	Surface pH	Surface pH Classification
Cropland	VFSL(73.85)	4.89	0.2	3	-1	-1	5.85	2.35	Moderately Rapid	L	7.3	Alkaline
Pasture 1	LFS(61.03)	5.02	0.12	3	-1	-1	5.86	2.51	Moderately Rapid	L	7.07	Alkaline
Pasture 2	LFS(93.96)	5.05	0.1	3	-1	-1	5.87	2.54	Moderately Rapid	L	7.02	Alkaline
Field 2	SIL(64.45)	10.03	0.41	5	-1	-1	1.78	0.37	Moderately Slow	L	7.19	Alkaline
Field 3	VFSL(2.44)	9.22	0.38	4	-1	-1	2.07	0.36	Moderately Slow	L	7.12	Alkaline
Field 4	SIL(3.99)	10.95	0.43	5	-1	-1	1.5	0.39	Moderately Slow	L	7.25	Alkaline
Field 5	SIL(58.38)	10.59	0.42	5	-1	-1	1.59	0.38	Moderately Slow	L	7.24	Alkaline
Field 6	SIL(4.19)	10.01	0.41	5	-1	-1	1.73	0.35	Moderately Slow	L	7.22	Alkaline
Field 7	SIL(2.85)	10.78	0.43	5	-1	-1	1.54	0.38	Moderately Slow	L	7.25	Alkaline
Field 8	SIL(6.86)	10.45	0.42	5	-1	-1	1.54	0.46	Moderately Slow	L	7.29	Alkaline
Field 9	SIL(3.48)	10.95	0.43	5	-1	-1	1.5	0.39	Moderately Slow	L	7.25	Alkaline
Field 10	SIL(34.22)	9.21	0.4	4	-1	-1	1.65	0.65	Moderate	L	7.4	Alkaline
Field 11	SIL(30.36)	10.35	0.42	5	-1	0.1	1.65	0.37	Moderately Slow	L	7.23	Alkaline
Field 12	SIL(34.38)	10.95	0.43	5	-1	-1	1.5	0.39	Moderately Slow	L	7.25	Alkaline

NOTES:

1 - See Appendix A.

2 - PERMEABILITY CLASSES: VR = Very Rapid, R = Rapid, MR = Moderately Rapid, M = Moderate, MS = Moderately Slow, S = Slow, VS = Very Slow, I = Impermeable.

3 - RUNOFF CLASS: N = Negligible, LV = Very Low, L = Low, M = Medium, H = High, HV = Very High.

Table 3. Soil characteristics that represent a potential limiting condition within the soil profile (< 5 feet) across the entire field.

Field Name	Depth to Limiting Layer < 5 feet - Soil Layer with > 50 % Gravel, Cobble or Stone					Depth to Limiting Layer < 5 feet - Pan[1]				
	Dominant Condition		Most Limiting Condition			Dominant Condition		Most Limiting Condition		
	Layer Description[1,2]	Acres	Layer Description[1,2]	Acres	Minimum Depth (in)	Layer Description	Acres	Layer Description	Acres	Minimum Depth (in)
Cropland	None Present	87.41		87.41	0	No Pan Present	87.41	No Pan Present	87.41	0
Pasture	None Present	71.64		71.64	0	No Pan Present	71.64	No Pan Present	71.64	0
Pasture 1	None Present	93.96		93.96	0	No Pan Present	93.96	No Pan Present	93.96	0
Pasture 2	None Present	93.96		93.96	0	No Pan Present	93.96	No Pan Present	93.96	0
Field 2	None Present	89.38		89.38	0	No Pan Present	80.79	Pan Present	8.59	20
Field 3	None Present	4.28		4.28	0	Pan Present	3.4	Pan Present	0.88	20
Field 4	None Present	3.99		3.99	0	Pan Present	3.99	Pan Present	3.99	0
Field 5	None Present	63.98		63.98	0	No Pan Present	62.33	Pan Present	1.65	20
Field 6	None Present	5.44		5.44	0	Pan Present	5.07	Pan Present	0.37	20
Field 7	None Present	2.97		2.97	0	Pan Present	2.93	Pan Present	0.03	20
Field 8	None Present	7.48		7.48	0	Pan Present	7.29	Pan Present	0.2	22
Field 9	None Present	3.48		3.48	0	Pan Present	3.48	Pan Present	3.48	0
Field 10	None Present	48.43		48.43	0	Pan Present	43.99	Pan Present	4.44	22
Field 11	None Present	35.65		35.65	0	Pan Present	34.1	Pan Present	1.56	20
Field 12	None Present	34.38		34.38	0	Pan Present	34.38	Pan Present	34.38	0

Field Name	Depth to Limiting Layer < 5 feet - Rock					Depth to Limiting Layer < 5 feet - Seasonal High Water Table				
	Dominant Condition		Most Limiting Condition			Dominant Condition		Most Limiting Condition		
	Layer Description	Acres	Layer Description	Acres	Minimum Depth (in)	Layer Description	Acres	Layer Description	Acres	Minimum Depth (in)
Field 1	Rock Layer Present	51.77	Rock Layer Present	51.77	25	No Water Table Present	87.41	No Water Table Present	87.41	6
Pasture 1	No Rock Layer Present	36.63	No Rock Layer Present	35.01	N/A	No Water Table Present	71.64	No Water Table Present	71.64	6
Pasture 2	No Rock Layer Present	50.11	No Rock Layer Present	43.85	N/A	No Water Table Present	93.96	No Water Table Present	93.96	6
Field 2	No Rock Layer Present	75.99	No Rock Layer Present	4.8	N/A	No Water Table Present	89.38	No Water Table Present	89.38	6
Field 3	No Rock Layer Present	3.09	No Rock Layer Present	0.31	N/A	Water Table Present	4.28	Water Table Present	4.28	6
Field 4	No Rock Layer Present	3.99	No Rock Layer Present	3.99	N/A	Water Table Present	3.99	Water Table Present	3.99	6
Field 5	No Rock Layer Present	60.02	No Rock Layer Present	2.31	N/A	No Water Table Present	63.98	No Water Table Present	63.98	6
Field 6	No Rock Layer Present	4.56	No Rock Layer Present	0.51	N/A	Water Table Present	5.44	Water Table Present	5.44	6
Field 7	No Rock Layer Present	2.89	No Rock Layer Present	0.05	N/A	Water Table Present	2.97	Water Table Present	2.97	6
Field 8	No Rock Layer Present	7.05	No Rock Layer Present	0.16	N/A	Water Table Present	7.48	Water Table Present	7.48	6
Field 9	No Rock Layer Present	3.48	No Rock Layer Present	3.48	N/A	Water Table Present	3.48	Water Table Present	3.48	6
Field 10	No Rock Layer Present	38.66	No Rock Layer Present	3.55	N/A	Water Table Present	48.43	Water Table Present	48.43	6
Field 11	No Rock Layer Present	31.92	No Rock Layer Present	2.18	N/A	Water Table Present	35.65	Water Table Present	35.65	6
Field 12	No Rock Layer Present	34.38	No Rock Layer Present	34.38	N/A	Water Table Present	34.38	Water Table Present	34.38	6

Field Name	Drainage Class[1,3]		Hydrologic Group[1]	
	Dominant Drainage Class	Acres	Dominant Hydrologic Group	Acres
Cropland	Somewhat excessively drained	73.85	B	87.41
Pasture 1	Well drained	61.03	B	71.64
Pasture 2	Well drained	93.96	B	93.96
Field 2	Well drained	89.38	B	77.73
Field 3	Well drained	4.28	B	3.53
Field 4	Well drained	3.99	B	3.99
Field 5	Well drained	63.98	B	58.38
Field 6	Well drained	5.44	B	4.19
Field 7	Well drained	2.97	B	2.85
Field 8	Well drained	7.48	B	6.86
Field 9	Well drained	3.48	B	3.48
Field 10	Well drained	48.43	B	34.22
Field 11	Well drained	35.65	B	30.36
Field 12	Well drained	34.38	B	34.38

NOTES:
1 - See Appendix A.
2 - GRAVEL, COBBLE, or STONE: GRV = Very Gravelly, GRX = Extremely Gravelly, CBV = Very Cobbly, CBX = Extremely Cobbly, STV = Very Stony, STX = Extremely Stony, WB = Weathered Bedrock, and UWB = Unweathered Bedrock.
3 - DRAINAGE CLASS: E = Excessively drained, SE = Somewhat Excessively drained, W = Well drained, MW = Moderately Well drained, SP = Somewhat Poorly drained, P = Poorly drained, VP = Very Poorly drained.

ANALYSIS OF SOIL CHARACTERISTICS LEGEND

Soil Pan

Hardpan – A hardened or cemented layer soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

Claypan – A slowly permeable soil horizon that contains much more clay than the horizon above it. A claypan is commonly hard when dry and plastic or stiff when wet.

Plowpan – A compacted layer formed in the soil directly below the plow layer.

Fragipan – A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restrict roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than deform slowly.

Soil Drainage Class

Excessively drained (E). Water is removed very rapidly. The occurrence of internal free water commonly is very rare or very deep. The soils are commonly coarse-textured and have very high hydraulic conductivity or are very shallow. They are not suited to crop production unless irrigated.

Somewhat excessively drained (SE). Water is removed from the soil rapidly. Internal free water occurrence commonly is very rare or very deep. The soils are commonly coarse-textured and have high saturated hydraulic conductivity or are very shallow. Without irrigation, only a narrow range of crops can be grown and yields are low.

Well drained (W). Water is removed from the soil readily but not rapidly. Internal free water occurrence commonly is deep or very deep; annual duration is not specified. Water is available to plants throughout most of the growing season in humid regions. Wetness does not inhibit growth of roots for significant periods during most growing seasons.

Moderately well drained (MW). Water is removed from the soil somewhat slowly during some periods of the year. Internal free water occurrence commonly is moderately deep and transitory through permanent. The soils are wet for only a short time within the rooting depth during the growing season, but long enough that most mesophytic crops are affected. They commonly have a moderately low or lower saturated hydraulic conductivity in a layer within the upper 1 m, periodically receive high rainfall, or both.

Somewhat poorly drained (SP). Water is removed slowly so that the soil is wet at a shallow depth for significant periods during the growing season. The occurrence of internal free water commonly is shallow to moderately deep and transitory to permanent. Wetness markedly restricts the growth of mesophytic crops, unless artificial drainage is provided. The soils commonly have one or more of the following characteristics: low or very low saturated hydraulic conductivity, a high water table, additional water from seepage, or nearly continuous rainfall.

Poorly drained (P). Water is removed so slowly that the soil is wet at shallow depths periodically during the growing season or remains wet for long periods. The occurrence of internal free water is shallow or very shallow and common or persistent. Free water is commonly at or near the surface long enough during the growing season so that most mesophytic crops cannot be grown, unless the soil is artificially drained. The soil, however, is not continuously wet directly below plow-depth. Free water at shallow depth is usually present. This water table is commonly the result of low or very low saturated hydraulic conductivity of nearly continuous rainfall, or of a combination of these.

Very poorly drained (VP). Water is removed from the soil so slowly that free water remains at or very near the ground surface during much of the growing season. The occurrence of internal free water is very shallow and persistent or permanent. Unless the soil is artificially drained, most mesophytic crops cannot be grown. The soils are commonly level or depressed and frequently ponded. If rainfall is high or nearly continuous, slope gradients may be greater.

Soil Hydrologic Group

Group A – Soils that have low runoff potential and high infiltration rates even when thoroughly wetted. They consist chiefly of deep, well to excessively drained sands and gravels. These soils have a high rate of water transmission (greater than 0.30 in/hr).

Group B – Soils that have moderate infiltration rates when thoroughly wetted. They consist chiefly of moderately deep to deep, moderately well to well drained soils with moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission (greater than 0.15 – 0.30 in/hr).

Group C – Soils that have low infiltration rates when thoroughly wetted. They consist chiefly of soils with a layer that impedes downward movement of water and soils with moderately fine to fine texture. These soils have a low rate of water transmission (greater than 0.05 - 0.15 in/hr).

Group D – Soils that have high runoff potential. They have very low infiltration rates when thoroughly wetted. They consist chiefly of clay soils with high swelling potential, soils with a permanent high water table, soils with a claypan or clay layer at or near the surface, and shallow soils over impervious material. These soils have a very low rate of water transmission (greater than 0.0 - 0.05 in/hr).

Soil Permeability Class

Very Rapid:	20.0 to 100.0 inches/hour
Rapid:	6.0 to 20.0 inches/hour
Moderately Rapid:	2.0 to 6.0 inches/hour
Moderate:	0.6 to 2.0 inches/hour
Moderately Slow:	0.2 to 0.6 inches/hour
Slow:	0.06 to 0.20 inches
Very Slow:	0.0015 to 0.06 inches/hour
Impermeable:	0.0000 to 0.0015 inches/hour

Soil Texture Modifiers, Texture Class and Terms Used in Lieu of Texture.

Texture Modifiers	
ASHY	Ashy
BY	Bouldery
BYV	Very bouldery
BYX	Extremely bouldery
CB	Cobbly
CBV	Very cobbly
CBX	Extremely cobbly
CN	Channery
CNV	Very channery
CNX	Extremely channery
COP	Coprogenous
DIA	Diatomaceous
FL	Flaggy
FLV	Very flaggy
FLX	Extremely flaggy
GR	Gravelly
GRC	Coarse gravelly
GRF	Fine gravelly
GRM	Medium gravelly
GRV	Very gravelly
GRX	Extremely gravelly
GS	Grassy
GYP	Gypsiferous
HB	Herbaceous
HYDR	Hydrous
MEDL	Medial
MK	Mucky
MR	Marly
MS	Mossy
PBY	Parabouldery
PBYV	Very Parabouldery
PBYX	Extremely Parabouldery
PCB	Paracobbly
PCBV	Very Paracobbly
PCBX	Extremely Paracobbly
PCN	Parachannery
PCNV	Very Parachannery
PCNX	Extremely Parachannery
PF	Permanently frozen
PFL	Paraflaggy
PFLV	Very Paraflaggy

Texture Class	
C	Clay
CL	Clay loam
COS	Coarse sand
COSL	Coarse sandy loam
FS	Fine sand
FSL	Fine sandy loam
L	Loam
LCOS	Loamy coarse sand
LFS	Loamy fine sand
LS	Loamy sand
LVFS	Loamy very fine sand
S	Sand
SC	Sandy clay
SCL	Sandy clay loam
SI	Silt
SIC	Silty clay
SICL	Silty clay loam
SIL	Silt loam
SL	Sandy loam
VFS	Very fine sand
VFSL	Very fine sandy loam

Terms used in lieu of texture	
BR	Bedrock
BY	Boulders
CB	Cobbles
CN	Channers
DUR	Duripan
FL	Flagstones
G	Gravel
HPM	Highly Decomposed plant material
MAT	Material
MPM	Moderately Decomposed plant material
MPT	Mucky peat
MUCK	Muck
OR	Ortstein
PBY	Paraboulders
PC	Petrocalcic
PCB	Paracobbles
PCN	Parachanners
PEAT	Peat
PF	Petroferric
PFL	Paraflagstones
PG	Paragravel
PGP	Petrogypsic
PL	Placic
PST	Parastones
SPM	Slightly Decomposed plant material
ST	Stones
W	Water

PFLX Extremely Paraflaggy
PGR Paragravelly
PGRV Very Paragravelly
PGRX Extremely Paragravelly
PST Parastony
PSTV Very Parastony
PSTX Extremely Parastony
PT Peaty
ST Stony
STV Very stony
STX Extremely stony
WD Woody

APPENDIX B: NUTRIENT RISK ANALYSIS

Phosphorus Runoff Risk Assessment

FIELD: Field 1
Overall Risk Rating: Medium
Medium potential for phosphorus loss. Some remediation measures should be undertaken to minimize the probability of phosphorus loss.

Soil Test P **Risk Rating:** Very High
Soil Test Depth / Phosphorus Concentration 0-12": No Valid Soil Test Data
Soil Test Depth / Phosphorus Concentration 18-24": No Valid Soil Test Data
Idaho Nutr. Management Standard Threshold: 20 **Soil Test Type:** Olsen
Comments: Soil test P is very high and may be approaching the critical Phosphorus Threshold. Test soils annually to monitor buildup or decline in soil P.

Phosphorus Fertilizer Application Rate **Risk Rating:** Very Low or N.A.
Phosphorus Application Rate: 0
Comments: No Data

Phosphorus Fertilizer Application Method **Risk Rating:** Medium
Phosphorus Application Method: Incorporated >3 inches (Disking/Chiseling)
Comments: For greatest phosphorus efficiency place commercial fertilizer P with planter or inject > 2".

Manure Phosphorus Application Rate **Risk Rating:** Medium
Manure Application Rate: 78.8
Comments: Sufficient soil P may be available for normal agronomic production after fertilization, except for possible response to a starter fertilizer for specific crops like potatoes (see Crop Specific Recommendations). A long range nutrient management plan will assist you in maintaining optimum P levels.

Manure Phosphorus Application Method **Risk Rating:** Medium
Manure Application Method: N/A
Comments: For greatest phosphorus efficiency inject organic P > 2" or plow.

Irrigation Runoff Index (Irrigated) **Risk Rating:** Very Low or N.A.
Comments: No Data

Surface Irrigation or Overhead Irrigation **Risk Rating:** Very Low or N.A.

Comments: No Data

Runoff Best Management Practices **Risk Rating:** Very Low or N.A.

List best management practices that mitigate runoff(See Appendix B)

Comments: No Data

Distance to Surface Water Body: 1 **Risk Rating:** Very Low or N.A.

Comments: No Data

FIELD: Pasture 1

Overall Risk Rating: Medium

Medium potential for phosphorus loss. Some remediation measures should be undertaken to minimize the probability of phosphorus loss.

Soil Test P **Risk Rating:** Very High

Soil Test Depth / Phosphorus Concentration 0-12": No Valid Soil Test Data

Soil Test Depth / Phosphorus Concentration 18-24": No Valid Soil Test Data

Idaho Nutr. Management Standard Threshold: 20 **Soil Test Type:** Olsen

Comments: Soil test P is very high and may be approaching the critical Phosphorus Threshold. Test soils annually to monitor buildup or decline in soil P.

Phosphorus Fertilizer Application Rate **Risk Rating:** Very Low or N.A.

Phosphorus Application Rate: 0

Comments: No Data

Phosphorus Fertilizer Application Method **Risk Rating:** Very High

Phosphorus Application Method: Surface applied no incorporation with containment

Comments: For greatest phosphorus efficiency place commercial fertilizer P with planter or inject > 2"; otherwise incorporate > 3" by disking, chiseling, etc.

Manure Phosphorus Application Rate **Risk Rating:** Medium

Manure Application Rate: 91.6

Comments: Sufficient soil P may be available for normal agronomic production after fertilization, except for possible response to a starter fertilizer for specific crops like potatoes (see Crop Specific Recommendations). A long range nutrient management plan will assist you in maintaining optimum P levels.

Manure Phosphorus Application Method **Risk Rating:** Undetermined

Manure Application Method: Incorporated < 3 inches (Harrowing/etc)

Comments: No Data

Irrigation Runoff Index (Irrigated) **Risk Rating:** Very Low or N.A.
Comments: No Data

Surface Irrigation or Overhead Irrigation **Risk Rating:** Very Low or N.A.
Comments: No Data

Runoff Best Management Practices **Risk Rating:** Very Low or N.A.
List best management practices that mitigate runoff(See Appendix B)
Comments: No Data

Distance to Surface Water Body: 1 **Risk Rating:** Very Low or N.A.
Comments: No Data

FIELD: Pasture 2
Overall Risk Rating: Medium
Medium potential for phosphorus loss. Some remediation measures should be undertaken to minimize the probability of phosphorus loss.
Soil Test P **Risk Rating:** Very High
Soil Test Depth / Phosphorus Concentration 0-12": No Valid Soil Test Data
Soil Test Depth / Phosphorus Concentration 18-24": No Valid Soil Test Data
Idaho Nutr. Management Standard Threshold: 20 **Soil Test Type:** Olsen
Comments: Soil test P is very high and may be approaching the critical Phosphorus Threshold. Test soils annually to monitor buildup or decline in soil P.

Phosphorus Fertilizer Application Rate **Risk Rating:** Very Low or N.A.
Phosphorus Application Rate: 0
Comments: No Data

Phosphorus Fertilizer Application Method **Risk Rating:** Very High
Phosphorus Application Method: Surface applied no incorporation with containment
Comments: For greatest phosphorus efficiency place commercial fertilizer P with planter or inject > 2"; otherwise incorporate > 3" by disking, chiseling, etc.

Manure Phosphorus Application Rate **Risk Rating:** Medium
Manure Application Rate: 76.6
Comments: Sufficient soil P may be available for normal agronomic production after fertilization, except for possible response to a starter fertilizer for specific crops like potatoes (see Crop Specific Recommendations). A long range nutrient management plan will assist you in maintaining optimum P levels.

Manure Phosphorus Application Method **Risk Rating:** Very High

Manure Application Method: N/A

Comments: For greatest phosphorus efficiency inject Organic P > 2" or plow; otherwise incorporate > 3" by disking, chiseling, etc.

Irrigation Runoff Index (Irrigated) **Risk Rating:** Very Low or N.A.

Comments: No Data

Surface Irrigation or Overhead Irrigation **Risk Rating:** Very Low or N.A.

Comments: No Data

Runoff Best Management Practices **Risk Rating:** Very Low or N.A.

List best management practices that mitigate runoff(See Appendix B)

Comments: No Data

Distance to Surface Water Body: 0.5 **Risk Rating:** Very Low or N.A.

Comments: No Data

FIELD: Field 2

Overall Risk Rating: Very High

Very high potential for phosphorus loss and adverse effects on surface and/or ground waters. All necessary soil and water conservation measures and a phosphorus management plan must be implemented to minimize phosphorus loss. Reference risk assessment below and consult a local resource conservation planning specialist and/or the OnePlan Conservation Planning module to determine appropriate Best Management Practices for this field.

Soil Test P **Risk Rating:** Critical

Soil Test Depth / Phosphorus Concentration 0-12": No Valid Soil Test Data

Soil Test Depth / Phosphorus Concentration 18-24": No Valid Soil Test Data

Idaho Nutr. Management Standard Threshold: 40 **Soil Test Type:** Olsen

Comments: Soil test P is above the Idaho Nutrient Management Standard Phosphorus Threshold. Test soils annually to monitor buildup or decline in soil P and to determine if your Nutrient Management Plan is successful in reducing soil P levels.

Phosphorus Fertilizer Application Rate **Risk Rating:** Very Low or N.A.

Phosphorus Application Rate: 0

Comments: No Data

Phosphorus Fertilizer Application Method **Risk Rating:** Medium

Phosphorus Application Method: Incorporated >3 inches (Disking/Chiseling)

Comments: For greatest phosphorus efficiency place commercial fertilizer P with planter or inject > 2".

Manure Phosphorus Application Rate **Risk Rating:**

Manure Application Rate: 144.9

Comments: Sufficient soil P is available for normal agronomic production except for possible response to a starter fertilizer for specific crops like potatoes (see Crop Specific Recommendations). Use crop removal rates or less to reduce soil P down to optimum levels. A long range nutrient management plan should be considered.

Manure Phosphorus Application Method **Risk Rating:** Medium

Manure Application Method: N/A

Comments: For greatest phosphorus efficiency inject organic P > 2" or plow.

Irrigation Runoff Index (Irrigated) **Risk Rating:** Very Low or N.A.

Comments: No Data

Surface Irrigation or Overhead Irrigation **Risk Rating:** Very Low or N.A.

Comments: No Data

Runoff Best Management Practices **Risk Rating:**

List best management practices that mitigate runoff(See Appendix B)

Comments: Consider implementing Conservation Practices on-field and off-field that reduce or eliminate runoff and erosion.

Distance to Surface Water Body: 1 **Risk Rating:** Very Low or N.A.

Comments: No Data

FIELD: Field 3

Overall Risk Rating: Very High

Very high potential for phosphorus loss and adverse effects on surface and/or ground waters. All necessary soil and water conservation measures and a phosphorus management plan must be implemented to minimize phosphorus loss. Reference risk assessment below and consult a local resource conservation planning specialist and/or the OnePlan Conservation Planning module to determine appropriate Best Management Practices for this field.

Soil Test P **Risk Rating:** Critical

Soil Test Depth / Phosphorus Concentration 0-12": No Valid Soil Test Data

Soil Test Depth / Phosphorus Concentration 18-24": No Valid Soil Test Data

Idaho Nutr. Management Standard Threshold: 40 **Soil Test Type:** Olsen

Comments: Soil test P is above the Idaho Nutrient Management Standard Phosphorus Threshold. Test soils annually to monitor buildup or decline in soil P and to determine if your Nutrient Management Plan is successful in reducing soil P levels.

Phosphorus Fertilizer Application Rate **Risk Rating:** Very Low or N.A.
Phosphorus Application Rate: 0
Comments: No Data

Phosphorus Fertilizer Application Method **Risk Rating:** Very Low or N.A.
Phosphorus Application Method: Not Applied
Comments: No Data

Manure Phosphorus Application Rate **Risk Rating:** Very Low or N.A.
Manure Application Rate: N/A
Comments: No Data

Manure Phosphorus Application Method **Risk Rating:** Medium
Manure Application Method: N/A
Comments: For greatest phosphorus efficiency inject organic P > 2" or plow.

Irrigation Runoff Index (Irrigated) **Risk Rating:** Very Low or N.A.
Comments: No Data

Surface Irrigation or Overhead Irrigation **Risk Rating:** Very Low or N.A.
Comments: No Data

Runoff Best Management Practices **Risk Rating:**
List best management practices that mitigate runoff(See Appendix B)
Comments: Consider implementing Conservation Practices on-field and off-field that reduce or eliminate runoff and erosion.

Distance to Surface Water Body: 1 **Risk Rating:** Very Low or N.A.
Comments: No Data

FIELD: Field 4
Overall Risk Rating: Very High
Very high potential for phosphorus loss and adverse effects on surface and/or ground waters. All necessary soil and water conservation measures and a phosphorus management plan must be implemented to minimize phosphorus loss. Reference risk assessment below and consult a local resource conservation planning specialist and/or the OnePlan Conservation Planning module to determine appropriate Best Management Practices for this field.
Soil Test P **Risk Rating:** Critical
Soil Test Depth / Phosphorus Concentration 0-12": No Valid Soil Test Data
Soil Test Depth / Phosphorus Concentration 18-24": No Valid Soil Test Data

Idaho Nutr. Management Standard Threshold: 40 **Soil Test Type:** Olsen

Comments: Soil test P is above the Idaho Nutrient Management Standard Phosphorus Threshold. Test soils annually to monitor buildup or decline in soil P and to determine if your Nutrient Management Plan is successful in reducing soil P levels.

Phosphorus Fertilizer Application Rate **Risk Rating:** Very Low or N.A.

Phosphorus Application Rate: 0

Comments: No Data

Phosphorus Fertilizer Application Method **Risk Rating:** Very Low or N.A.

Phosphorus Application Method: Not Applied

Comments: No Data

Manure Phosphorus Application Rate **Risk Rating:** Very Low or N.A.

Manure Application Rate: N/A

Comments: No Data

Manure Phosphorus Application Method **Risk Rating:** Medium

Manure Application Method: N/A

Comments: For greatest phosphorus efficiency inject organic P > 2" or plow.

Irrigation Runoff N/A **Risk Rating:** Low

Comments: No Data

Surface Irrigation or Overhead Irrigation **Risk Rating:** Very Low or N.A.

Comments: No Data

Runoff Best Management Practices **Risk Rating:** [illegible]

List best management practices that mitigate runoff(See Appendix B)

Comments: Consider implementing Conservation Practices on-field and off-field that reduce or eliminate runoff and erosion.

Distance to Surface Water Body: 1 **Risk Rating:** Very Low or N.A.

Comments: No Data

FIELD: Field 5
Overall Risk Rating: Very High
Very high potential for phosphorus loss and adverse effects on surface and/or ground waters. All necessary soil and water conservation measures and a phosphorus management plan must be implemented to minimize phosphorus loss. Reference risk assessment below and consult a local resource conservation planning specialist and/or the OnePlan Conservation Planning module to determine appropriate Best Management Practices for this field.

Soil Test P **Risk Rating:** Critical

Soil Test Depth / Phosphorus Concentration 0-12": No Valid Soil Test Data

Soil Test Depth / Phosphorus Concentration 18-24": No Valid Soil Test Data

Idaho Nutr. Management Standard Threshold: 40 **Soil Test Type:** Olsen

Comments: Soil test P is above the Idaho Nutrient Management Standard Phosphorus Threshold. Test soils annually to monitor buildup or decline in soil P and to determine if your Nutrient Management Plan is successful in reducing soil P levels.

Phosphorus Fertilizer Application Rate **Risk Rating:** Very Low or N.A.

Phosphorus Application Rate: 0

Comments: No Data

Phosphorus Fertilizer Application Method **Risk Rating:** Very Low or N.A.

Phosphorus Application Method: Not Applied

Comments: No Data

Manure Phosphorus Application Rate **Risk Rating:** Medium

Manure Application Rate: 68.5

Comments: Sufficient soil P may be available for normal agronomic production after fertilization, except for possible response to a starter fertilizer for specific crops like potatoes (see Crop Specific Recommendations). A long range nutrient management plan will assist you in maintaining optimum P levels.

Manure Phosphorus Application Method **Risk Rating:** Medium

Manure Application Method: N/A

Comments: For greatest phosphorus efficiency inject organic P > 2" or plow.

Irrigation Runoff Index (Irrigated) **Risk Rating:** Very High

Comments: No Data

Surface Irrigation or Overhead Irrigation **Risk Rating:** Very Low or N.A.

Comments: No Data

Runoff Best Management Practices **Risk Rating:**

List best management practices that mitigate runoff(See Appendix B)

Comments: Consider implementing Conservation Practices on-field and off-field that reduce or eliminate runoff and erosion.

Distance to Surface Water Body: 1 **Risk Rating:** Very Low or N.A.

Comments: No Data

FIELD: Field 6

Overall Risk Rating: Very High

Very high potential for phosphorus loss and adverse effects on surface and/or ground waters. All necessary soil and water conservation measures and a phosphorus management plan must be implemented to minimize phosphorus loss. Reference risk assessment below and consult a local resource conservation planning specialist and/or the OnePlan Conservation Planning module to determine appropriate Best Management Practices for this field.

Soil Test P **Risk Rating:** Critical

Soil Test Depth / Phosphorus Concentration 0-12": No Valid Soil Test Data

Soil Test Depth / Phosphorus Concentration 18-24": No Valid Soil Test Data

Idaho Nutr. Management Standard Threshold: 40 **Soil Test Type:** Olsen

Comments: Soil test P is above the Idaho Nutrient Management Standard Phosphorus Threshold. Test soils annually to monitor buildup or decline in soil P and to determine if your Nutrient Management Plan is successful in reducing soil P levels.

Phosphorus Fertilizer Application Rate **Risk Rating:** Very Low or N.A.

Phosphorus Application Rate: 0

Comments: No Data

Phosphorus Fertilizer Application Method **Risk Rating:** Very Low or N.A.

Phosphorus Application Method: Not Applied

Comments: No Data

Manure Phosphorus Application Rate **Risk Rating:** Medium

Manure Application Rate: 91.6

Comments: Sufficient soil P may be available for normal agronomic production after fertilization, except for possible response to a starter fertilizer for specific crops like potatoes (see Crop Specific Recommendations). A long range nutrient management plan will assist you in maintaining optimum P levels.

Manure Phosphorus Application Method **Risk Rating:** Very High

Manure Application Method: N/A

Comments: For greatest phosphorus efficiency inject Organic P > 2" or plow; otherwise incorporate > 3" by disking, chiseling, etc.

Irrigation Runoff Index (Irrigated) **Risk Rating:** Very High
Comments: No Data

Surface Irrigation or Overhead Irrigation **Risk Rating:** Very Low or N.A.
Comments: No Data

Runoff Best Management Practices **Risk Rating:**
List best management practices that mitigate runoff(See Appendix B)
Comments: Consider implementing Conservation Practices on-field and off-field that reduce or eliminate runoff and erosion.

Distance to Surface Water Body: 1 **Risk Rating:** Very Low or N.A.
Comments: No Data

FIELD: Field 7
Overall Risk Rating: Very High
Very high potential for phosphorus loss and adverse effects on surface and/or ground waters. All necessary soil and water conservation measures and a phosphorus management plan must be implemented to minimize phosphorus loss. Reference risk assessment below and consult a local resource conservation planning specialist and/or the OnePlan Conservation Planning module to determine appropriate Best Management Practices for this field.
Soil Test P **Risk Rating:** Critical
Soil Test Depth / Phosphorus Concentration 0-12": No Valid Soil Test Data
Soil Test Depth / Phosphorus Concentration 18-24": No Valid Soil Test Data
Idaho Nutr. Management Standard Threshold: 40 **Soil Test Type:** Olsen
Comments: Soil test P is above the Idaho Nutrient Management Standard Phosphorus Threshold. Test soils annually to monitor buildup or decline in soil P and to determine if your Nutrient Management Plan is successful in reducing soil P levels.

Phosphorus Fertilizer Application Rate **Risk Rating:** Very Low or N.A.
Phosphorus Application Rate: 0
Comments: No Data

Phosphorus Fertilizer Application Method **Risk Rating:** Very Low or N.A.
Phosphorus Application Method: Not Applied
Comments: No Data

Manure Phosphorus Application Rate **Risk Rating:** Medium

Manure Application Rate: 91.6

Comments: Sufficient soil P may be available for normal agronomic production after fertilization, except for possible response to a starter fertilizer for specific crops like potatoes (see Crop Specific Recommendations). A long range nutrient management plan will assist you in maintaining optimum P levels.

Manure Phosphorus Application Method **Risk Rating:** Very High

Manure Application Method: N/A

Comments: For greatest phosphorus efficiency inject Organic P > 2" or plow; otherwise incorporate > 3" by disking, chiseling, etc.

Irrigation Runoff Index (Irrigated) **Risk Rating:** Very High

Comments: No Data

Surface Irrigation or Overhead Irrigation **Risk Rating:** Very Low or N.A.

Comments: No Data

Runoff Best Management Practices **Risk Rating:**

List best management practices that mitigate runoff(See Appendix B)

Comments: Consider implementing Conservation Practices on-field and off-field that reduce or eliminate runoff and erosion.

Distance to Surface Water Body: 1 **Risk Rating:** Very Low or N.A.

Comments: No Data

FIELD: Field 8

Overall Risk Rating: Very High

Very high potential for phosphorus loss and adverse effects on surface and/or ground waters. All necessary soil and water conservation measures and a phosphorus management plan must be implemented to minimize phosphorus loss. Reference risk assessment below and consult a local resource conservation planning specialist and/or the OnePlan Conservation Planning module to determine appropriate Best Management Practices for this field.

Soil Test P **Risk Rating:** Critical

Soil Test Depth / Phosphorus Concentration 0-12": No Valid Soil Test Data

Soil Test Depth / Phosphorus Concentration 18-24": No Valid Soil Test Data

Idaho Nutr. Management Standard Threshold: 40 **Soil Test Type:** Olsen

Comments: Soil test P is above the Idaho Nutrient Management Standard Phosphorus Threshold. Test soils annually to monitor buildup or decline in soil P and to determine if your Nutrient Management Plan is successful in reducing soil P levels.

Phosphorus Fertilizer Application Rate **Risk Rating:** Very Low or N.A.

Phosphorus Application Rate: 0
Comments: No Data

Phosphorus Fertilizer Application Method **Risk Rating:** Very Low or N.A.
Phosphorus Application Method: Not Applied
Comments: No Data

Manure Phosphorus Application Rate **Risk Rating:** Medium
Manure Application Rate: 91.6
Comments: Sufficient soil P may be available for normal agronomic production after fertilization, except for possible response to a starter fertilizer for specific crops like potatoes (see Crop Specific Recommendations). A long range nutrient management plan will assist you in maintaining optimum P levels.

Manure Phosphorus Application Method **Risk Rating:** Very High
Manure Application Method: N/A
Comments: For greatest phosphorus efficiency inject Organic P > 2" or plow; otherwise incorporate > 3" by disking, chiseling, etc.

Irrigation Runoff Index (Irrigated) **Risk Rating:** Very High
Comments: No Data

Surface Irrigation or Overhead Irrigation **Risk Rating:** Very Low or N.A.
Comments: No Data

Runoff Best Management Practices **Risk Rating:**
List best management practices that mitigate runoff(See Appendix B)
Comments: Consider implementing Conservation Practices on-field and off-field that reduce or eliminate runoff and erosion.

Distance to Surface Water Body: 1 **Risk Rating:** Very Low or N.A.
Comments: No Data

FIELD: Field 9
Overall Risk Rating: Very High
Very high potential for phosphorus loss and adverse effects on surface and/or ground waters. All necessary soil and water conservation measures and a phosphorus management plan must be implemented to minimize phosphorus loss. Reference risk assessment below and consult a local resource conservation planning specialist and/or the OnePlan Conservation Planning module to determine appropriate Best Management Practices for this field.

Soil Test P **Risk Rating:** Critical
Soil Test Depth / Phosphorus Concentration 0-12": No Valid Soil Test Data
Soil Test Depth / Phosphorus Concentration 18-24": No Valid Soil Test Data
Idaho Nutr. Management Standard Threshold: 40 **Soil Test Type:** Olsen
Comments: Soil test P is above the Idaho Nutrient Management Standard Phosphorus Threshold. Test soils annually to monitor buildup or decline in soil P and to determine if your Nutrient Management Plan is successful in reducing soil P levels.

Phosphorus Fertilizer Application Rate **Risk Rating:** Very Low or N.A.
Phosphorus Application Rate: 0
Comments: No Data

Phosphorus Fertilizer Application Method **Risk Rating:** Very Low or N.A.
Phosphorus Application Method: Not Applied
Comments: No Data

Manure Phosphorus Application Rate **Risk Rating:** Medium
Manure Application Rate: 91.6
Comments: Sufficient soil P may be available for normal agronomic production after fertilization, except for possible response to a starter fertilizer for specific crops like potatoes (see Crop Specific Recommendations). A long range nutrient management plan will assist you in maintaining optimum P levels.

Manure Phosphorus Application Method **Risk Rating:** Very High
Manure Application Method: N/A
Comments: For greatest phosphorus efficiency inject Organic P > 2" or plow; otherwise incorporate > 3" by disking, chiseling, etc.

Irrigation Runoff Index (Irrigated) **Risk Rating:** Very High
Comments: No Data

Surface Irrigation or Overhead Irrigation **Risk Rating:** Very Low or N.A.
Comments: No Data

Runoff Best Management Practices **Risk Rating:**

List best management practices that mitigate runoff(See Appendix B)

Comments: Consider implementing Conservation Practices on-field and off-field that reduce or eliminate runoff and erosion.

Distance to Surface Water Body: 1 **Risk Rating:** Very Low or N.A.

Comments: No Data

FIELD: Field 10

Overall Risk Rating: Very High

Very high potential for phosphorus loss and adverse effects on surface and/or ground waters. All necessary soil and water conservation measures and a phosphorus management plan must be implemented to minimize phosphorus loss. Reference risk assessment below and consult a local resource conservation planning specialist and/or the OnePlan Conservation Planning module to determine appropriate Best Management Practices for this field.

Soil Test P **Risk Rating:** Critical

Soil Test Depth / Phosphorus Concentration 0-12": No Valid Soil Test Data

Soil Test Depth / Phosphorus Concentration 18-24": No Valid Soil Test Data

Idaho Nutr. Management Standard Threshold: 40 **Soil Test Type:** Olsen

Comments: Soil test P is above the Idaho Nutrient Management Standard Phosphorus Threshold. Test soils annually to monitor buildup or decline in soil P and to determine if your Nutrient Management Plan is successful in reducing soil P levels.

Phosphorus Fertilizer Application Rate **Risk Rating:** Very Low or N.A.

Phosphorus Application Rate: 0

Comments: No Data

Phosphorus Fertilizer Application Method **Risk Rating:** Medium

Phosphorus Application Method: Incorporated >3 inches (Disking/Chiseling)

Comments: For greatest phosphorus efficiency place commercial fertilizer P with planter or inject > 2".

Manure Phosphorus Application Rate **Risk Rating:** Very Low

Manure Application Rate: 0

Comments: Sufficient soil P is not available for normal agronomic production. Starter fertilizer is recommended for specific crops like potatoes (see Crop Specific Recommendations). Use recommended application rates and methods to maintain soil P at optimum levels.

Manure Phosphorus Application Method **Risk Rating:** Very Low

Manure Application Method: N/A

Comments: Great job!

Irrigation Runoff Index (Irrigated) **Risk Rating:** Very Low or N.A.
Comments: No Data

Surface Irrigation or Overhead Irrigation **Risk Rating:** Very Low or N.A.
Comments: No Data

Runoff Best Management Practices **Risk Rating:**
List best management practices that mitigate runoff(See Appendix B)
Comments: Consider implementing Conservation Practices on-field and off-field that reduce or eliminate runoff and erosion.

Distance to Surface Water Body: 1 **Risk Rating:** Very Low or N.A.
Comments: No Data

FIELD: Field 11
Overall Risk Rating: Very High
Very high potential for phosphorus loss and adverse effects on surface and/or ground waters. All necessary soil and water conservation measures and a phosphorus management plan must be implemented to minimize phosphorus loss. Reference risk assessment below and consult a local resource conservation planning specialist and/or the OnePlan Conservation Planning module to determine appropriate Best Management Practices for this field.
Soil Test P **Risk Rating:** Critical
Soil Test Depth / Phosphorus Concentration 0-12": No Valid Soil Test Data
Soil Test Depth / Phosphorus Concentration 18-24": No Valid Soil Test Data
Idaho Nutr. Management Standard Threshold: 40 **Soil Test Type:** Olsen
Comments: Soil test P is above the Idaho Nutrient Management Standard Phosphorus Threshold. Test soils annually to monitor buildup or decline in soil P and to determine if your Nutrient Management Plan is successful in reducing soil P levels.

Phosphorus Fertilizer Application Rate **Risk Rating:** Very Low or N.A.
Phosphorus Application Rate: 0
Comments: No Data

Phosphorus Fertilizer Application Method **Risk Rating:** Very High
Phosphorus Application Method: Surface applied no incorporation with containment
Comments: For greatest phosphorus efficiency place commercial fertilizer P with planter or inject > 2"; otherwise incorporate > 3" by disking, chiseling, etc.

Manure Phosphorus Application Rate **Risk Rating:** Medium

Manure Application Rate: 54.5

Comments: Sufficient soil P may be available for normal agronomic production after fertilization, except for possible response to a starter fertilizer for specific crops like potatoes (see Crop Specific Recommendations). A long range nutrient management plan will assist you in maintaining optimum P levels.

Manure Phosphorus Application Method **Risk Rating:** Very High

Manure Application Method: N/A

Comments: For greatest phosphorus efficiency inject Organic P > 2" or plow; otherwise incorporate > 3" by disking, chiseling, etc.

Irrigation Runoff Index (Irrigated) **Risk Rating:** Very Low or N.A.

Comments: No Data

Surface Irrigation or Overhead Irrigation **Risk Rating:** Low

Comments: Follow good soil conservation practices. Reduce tillage frequency and depth to maximize the amount of crop residue left on the surface to protect the soil from erosion. In addition, implement Best Management Practices (BMPs) like Straw Mulching, Polyacrylimide, etc.

Runoff Best Management Practices **Risk Rating:** Very High

List best management practices that mitigate runoff(See Appendix B)

Comments: Consider implementing Conservation Practices on-field and off-field that reduce or eliminate runoff and erosion.

Distance to Surface Water Body: 0 **Risk Rating:** Very High

Comments: Because of the high soil test P, runoff should be eliminated by converting to sprinkler irrigation or installing a tailwater recovery system; or sediment retention measures like filter strips or sediment basins should be installed to minimize offsite transport and loss of Phosphorus.

FIELD: Field 12

Overall Risk Rating: Very High

Very high potential for phosphorus loss and adverse effects on surface and/or ground waters. All necessary soil and water conservation measures and a phosphorus management plan must be implemented to minimize phosphorus loss. Reference risk assessment below and consult a local resource conservation planning specialist and/or the OnePlan Conservation Planning module to determine appropriate Best Management Practices for this field.

Soil Test P **Risk Rating:** Critical

Soil Test Depth / Phosphorus Concentration 0-12": No Valid Soil Test Data

Soil Test Depth / Phosphorus Concentration 18-24": No Valid Soil Test Data

Idaho Nutr. Management Standard Threshold: 40 **Soil Test Type:** Olsen

Comments: Soil test P is above the Idaho Nutrient Management Standard Phosphorus Threshold. Test soils annually to monitor buildup or decline in soil P and to determine if your Nutrient Management Plan is successful in reducing soil P levels.

Phosphorus Fertilizer Application Rate **Risk Rating:** Very Low or N.A.
Phosphorus Application Rate: 0
Comments: No Data

Phosphorus Fertilizer Application Method **Risk Rating:** Very Low or N.A.
Phosphorus Application Method: Not Applied
Comments: No Data

Manure Phosphorus Application Rate **Risk Rating:** Medium
Manure Application Rate: 63.1
Comments: Sufficient soil P may be available for normal agronomic production after fertilization, except for possible response to a starter fertilizer for specific crops like potatoes (see Crop Specific Recommendations). A long range nutrient management plan will assist you in maintaining optimum P levels.

Manure Phosphorus Application Method **Risk Rating:** Medium
Manure Application Method: Incorporated < 3 inches (Harrowing/etc)
Comments: For greatest phosphorus efficiency inject organic P > 2" or plow.

Irrigation Runoff Index (Irrigated) **Risk Rating:** Very Low or N.A.
Comments: No Data

Surface Irrigation or Overhead Irrigation **Risk Rating:** Very Low or N.A.
Comments: No Data

Runoff Best Management Practices **Risk Rating:**
List best management practices that mitigate runoff(See Appendix B)
Comments: Consider implementing Conservation Practices on-field and off-field that reduce or eliminate runoff and erosion.

Distance to Surface Water Body: 0 **Risk Rating:** Very High
Comments: Because of the high soil test P, runoff should be eliminated by converting to sprinkler irrigation or installing a tailwater recovery system; or sediment retention measures like filter strips or sediment basins should be installed to minimize offsite transport and loss of Phosphorus.

Nutrient Leaching Risk Assessment

FIELD: Field 1
Overall Risk Rating: Low
Leaching losses are probably not contributing to soluble nutrient leaching below the root zone.
Percolation **Risk Rating:** Very Low or N.A.
Deep Percolation (as % of Evapotranspiration): <5% Over ET
Comments: Nutrient leaching should not be a problem, however, there is a potential salt balance problem (and the crop's water requirement may not be completely satisfied). Evaluate whether adequate water is being applied to meet salt (leaching) requirements. If irrigation water has a high Electrical Conductivity (EC)/Sodium Adsorption Ration (SAR) salt balance may be critical.

Nitrogen Application Rate **Risk Rating:** Very Low or N.A.
Comments: Some potential for nitrogen leaching if excess water is applied from irrigation and/or precipitation events. Potential for yield reduction from a nitrogen deficiency. Use soil and/or plant test and appropriate fertilizer recommendation for determining nutrient application rates.

Nitrogen Application Timing **Risk Rating:** Medium
Comments: Use a nitrogen inhibitor to delay nitrification of ammonia-N until plant growth increases and additional nitrogen is needed.

Irrigation Efficiency **Risk Rating:** Very Low or N.A.
Comments: No Data

Soil/Water Table Depth **Risk Rating:** Medium
Comments: Because the dominant soils have moderate to high infiltration rates and water transmission, this field may be vulnerable to ground water contamination. Nutrient leaching and subsequent subsurface transport to ground water and interconnected surface water may be a concern.

FIELD: Pasture 1
Overall Risk Rating: Low
Leaching losses are probably not contributing to soluble nutrient leaching below the root zone.
Percolation **Risk Rating:** Very Low or N.A.
Deep Percolation (as % of Evapotranspiration): <5% Over ET
Comments: Nutrient leaching should not be a problem, however, there is a potential salt balance problem (and the crop's water requirement may not be completely satisfied). Evaluate whether adequate water is being applied to meet salt (leaching) requirements. If irrigation water has a high Electrical Conductivity (EC)/Sodium Adsorption Ration (SAR) salt balance may be critical.

Nitrogen Application Rate **Risk Rating:** Very Low or N.A.

Comments: Some potential for nitrogen leaching if excess water is applied from irrigation and/or precipitation events. Potential for yield reduction from a nitrogen deficiency. Use soil and/or plant test and appropriate fertilizer recommendation for determining nutrient application rates.

Nitrogen Application Timing **Risk Rating:** Medium

Comments: Use a nitrogen inhibitor to delay nitrification of ammonia-N until plant growth increases and additional nitrogen is needed.

Irrigation Efficiency **Risk Rating:** Very Low or N.A.

Comments: No Data

Soil/Water Table Depth **Risk Rating:** Medium

Comments: Because the dominant soils have moderate to high infiltration rates and water transmission, this field may be vulnerable to ground water contamination. Nutrient leaching and subsequent subsurface transport to ground water and interconnected surface water may be a concern.

FIELD: Pasture 2

Overall Risk Rating: Low

Leaching losses are probably not contributing to soluble nutrient leaching below the root zone.

Percolation **Risk Rating:** Very Low or N.A.

Deep Percolation (as % of Evapotranspiration): <5% Over ET

Comments: Nutrient leaching should not be a problem, however, there is a potential salt balance problem (and the crop's water requirement may not be completely satisfied). Evaluate whether adequate water is being applied to meet salt (leaching) requirements. If irrigation water has a high Electrical Conductivity (EC)/Sodium Adsorption Ration (SAR) salt balance may be critical.

Nitrogen Application Rate **Risk Rating:** Very Low or N.A.

Comments: Some potential for nitrogen leaching if excess water is applied from irrigation and/or precipitation events. Potential for yield reduction from a nitrogen deficiency. Use soil and/or plant test and appropriate fertilizer recommendation for determining nutrient application rates.

Nitrogen Application Timing **Risk Rating:** Medium

Comments: Use a nitrogen inhibitor to delay nitrification of ammonia-N until plant growth increases and additional nitrogen is needed.

Irrigation Efficiency **Risk Rating:** Very Low or N.A.

Comments: No Data

Soil/Water Table Depth **Risk Rating:** Medium

Comments: Because the dominant soils have moderate to high infiltration rates and water transmission, this field may be vulnerable to ground water contamination. Nutrient leaching and subsequent subsurface transport to ground water and interconnected surface water may be a concern.

FIELD: Field 2
Overall Risk Rating: Low
Leaching losses are probably not contributing to soluble nutrient leaching below the root zone.

Percolation **Risk Rating:** Very Low or N.A.

Deep Percolation (as % of Evapotranspiration): <5% Over ET

Comments: Nutrient leaching should not be a problem, however, there is a potential salt balance problem (and the crop's water requirement may not be completely satisfied). Evaluate whether adequate water is being applied to meet salt (leaching) requirements. If irrigation water has a high Electrical Conductivity (EC)/Sodium Adsorption Ration (SAR) salt balance may be critical.

Nitrogen Application Rate **Risk Rating:** Very Low or N.A.

Comments: Some potential for nitrogen leaching if excess water is applied from irrigation and/or precipitation events. Potential for yield reduction from a nitrogen deficiency. Use soil and/or plant test and appropriate fertilizer recommendation for determining nutrient application rates.

Nitrogen Application Timing **Risk Rating:** Medium

Comments: Use a nitrogen inhibitor to delay nitrification of ammonia-N until plant growth increases and additional nitrogen is needed.

Irrigation Efficiency **Risk Rating:** Very Low or N.A.

Comments: No Data

Soil/Water Table Depth **Risk Rating:** Medium

Comments: Because the dominant soils have moderate to high infiltration rates and water transmission, this field may be vulnerable to ground water contamination. Nutrient leaching and subsequent subsurface transport to ground water and interconnected surface water may be a concern.

FIELD: Field 3
Overall Risk Rating: Medium
Leaching losses may be contributing to soluble nutrient leaching below the root zone during some years.

Percolation **Risk Rating:** Very Low or N.A.

Deep Percolation (as % of Evapotranspiration): <5% Over ET

Comments: Nutrient leaching should not be a problem, however, there is a potential salt balance problem (and the crop's water requirement may not be completely satisfied). Evaluate whether adequate water is being applied to meet salt (leaching) requirements. If irrigation water has a high Electrical Conductivity (EC)/Sodium Adsorption Ration (SAR) salt balance may be critical.

Nitrogen Application Rate **Risk Rating:** Very Low or N.A.

Comments: Some potential for nitrogen leaching if excess water is applied from irrigation and/or precipitation events. Potential for yield reduction from a nitrogen deficiency. Use soil and/or plant test and appropriate fertilizer recommendation for determining nutrient application rates.

Nitrogen Application Timing **Risk Rating:** Very Low or N.A.

Comments: Revaluate Nitrogen recommendations to be sure that crop requirements are being adequately met. Good job! Follow Nitrogen application recommendations and apply according to crop growth needs.

Irrigation Efficiency **Risk Rating:** Very High

Comments: Check and maintain system for leaky joints and worn-out pumps, sprinklers or nozzles. Use flow controllers to improve efficiency. Be sure that the right amount of irrigation water is applied as uniformly as possible to meet crop needs and minimize leaching from the root zone. Check with irrigation professional to assure that crop growth requirements are being adequately met.

Soil/Water Table Depth **Risk Rating:** Medium

Comments: Because the dominant soils have moderate to high infiltration rates and water transmission, this field may be vulnerable to ground water contamination. Nutrient leaching and subsequent subsurface transport to ground water and interconnected surface water may be a concern.

FIELD: Field 4
Overall Risk Rating: Low
Leaching losses are probably not contributing to soluble nutrient leaching below the root zone.
Percolation **Risk Rating:**
Deep Percolation (as % of Evapotranspiration): <5% Over ET
Comments: No Data

Nitrogen Application Rate **Risk Rating:** Very Low or N.A.
Comments: No Data

Nitrogen Application Timing **Risk Rating:** Very Low or N.A.
Comments: No Data

Soil/Water Table Depth **Risk Rating:** Medium
Comments: No Data

FIELD: Field 5
Overall Risk Rating: Medium
Leaching losses may be contributing to soluble nutrient leaching below the root zone during some years.
Percolation **Risk Rating:** Very Low or N.A.
Deep Percolation (as % of Evapotranspiration): <5% Over ET
Comments: Nutrient leaching should not be a problem, however, there is a potential salt balance problem (and the crop's water requirement may not be completely satisfied). Evaluate whether adequate water is being applied to meet salt (leaching) requirements. If irrigation water has a high Electrical Conductivity (EC)/Sodium Adsorption Ration (SAR) salt balance may be critical.

Nitrogen Application Rate **Risk Rating:** Very Low or N.A.
Comments: Some potential for nitrogen leaching if excess water is applied from irrigation and/or precipitation events. Potential for yield reduction from a nitrogen deficiency. Use soil and/or plant test and appropriate fertilizer recommendation for determining nutrient application rates.

Nitrogen Application Timing **Risk Rating:** Very Low or N.A.
Comments: Good job! Follow Nitrogen application recommendations and apply according to crop growth needs.

Irrigation Efficiency **Risk Rating:** Very High
Comments: No Data

Soil/Water Table Depth **Risk Rating:** Medium

Comments: Because the dominant soils have moderate to high infiltration rates and water transmission, this field may be vulnerable to ground water contamination. Nutrient leaching and subsequent subsurface transport to ground water and interconnected surface water may be a concern.

FIELD: Field 6
Overall Risk Rating: Medium
Leaching losses may be contributing to soluble nutrient leaching below the root zone during some years.

Percolation **Risk Rating:** Very Low or N.A.

Deep Percolation (as % of Evapotranspiration): <5% Over ET

Comments: Nutrient leaching should not be a problem, however, there is a potential salt balance problem (and the crop's water requirement may not be completely satisfied). Evaluate whether adequate water is being applied to meet salt (leaching) requirements. If irrigation water has a high Electrical Conductivity (EC)/Sodium Adsorption Ration (SAR) salt balance may be critical.

Nitrogen Application Rate **Risk Rating:** Very Low or N.A.

Comments: Some potential for nitrogen leaching if excess water is applied from irrigation and/or precipitation events. Potential for yield reduction from a nitrogen deficiency. Use soil and/or plant test and appropriate fertilizer recommendation for determining nutrient application rates.

Nitrogen Application Timing **Risk Rating:** Very Low or N.A.

Comments: Good job! Follow Nitrogen application recommendations and apply according to crop growth needs.

Irrigation Efficiency **Risk Rating:** Very High

Comments: Check and maintain system for leaky joints and worn-out pumps, sprinklers or nozzles. Use flow controllers to improve efficiency. Be sure that the right amount of irrigation water is applied as uniformly as possible to meet crop needs and minimize leaching from the root zone. Check with irrigation professional to assure that crop growth requirements are being adequately met.

Soil/Water Table Depth **Risk Rating:** Medium

Comments: Because the dominant soils have moderate to high infiltration rates and water transmission, this field may be vulnerable to ground water contamination. Nutrient leaching and subsequent subsurface transport to ground water and interconnected surface water may be a concern.

FIELD: Field 7
Overall Risk Rating: Medium
Leaching losses may be contributing to soluble nutrient leaching below the root zone during some years.

Percolation **Risk Rating:** Very Low or N.A.

Deep Percolation (as % of Evapotranspiration): <5% Over ET

Comments: Nutrient leaching should not be a problem, however, there is a potential salt balance problem (and the crop's water requirement may not be completely satisfied). Evaluate whether adequate water is being applied to meet salt (leaching) requirements. If irrigation water has a high Electrical Conductivity (EC)/Sodium Adsorption Ration (SAR) salt balance may be critical.

Nitrogen Application Rate **Risk Rating:** Very Low or N.A.

Comments: Some potential for nitrogen leaching if excess water is applied from irrigation and/or precipitation events. Potential for yield reduction from a nitrogen deficiency. Use soil and/or plant test and appropriate fertilizer recommendation for determining nutrient application rates.

Nitrogen Application Timing **Risk Rating:** Very Low or N.A.

Comments: Good job! Follow Nitrogen application recommendations and apply according to crop growth needs.

Irrigation Efficiency **Risk Rating:** Very High

Comments: Check and maintain system for leaky joints and worn-out pumps, sprinklers or nozzles. Use flow controllers to improve efficiency. Be sure that the right amount of irrigation water is applied as uniformly as possible to meet crop needs and minimize leaching from the root zone. Check with irrigation professional to assure that crop growth requirements are being adequately met.

Soil/Water Table Depth **Risk Rating:** Medium

Comments: Because the dominant soils have moderate to high infiltration rates and water transmission, this field may be vulnerable to ground water contamination. Nutrient leaching and subsequent subsurface transport to ground water and interconnected surface water may be a concern.

FIELD: Field 8
Overall Risk Rating: Medium
Leaching losses may be contributing to soluble nutrient leaching below the root zone during some years.

Percolation **Risk Rating:** Very Low or N.A.

Deep Percolation (as % of Evapotranspiration): <5% Over ET

Comments: Nutrient leaching should not be a problem, however, there is a potential salt balance problem (and the crop's water requirement may not be completely satisfied). Evaluate whether adequate water is being applied to meet salt (leaching) requirements. If irrigation water has a high Electrical Conductivity (EC)/Sodium Adsorption Ration (SAR) salt balance may be critical.

Nitrogen Application Rate **Risk Rating:** Very Low or N.A.

Comments: Some potential for nitrogen leaching if excess water is applied from irrigation and/or precipitation events. Potential for yield reduction from a nitrogen deficiency. Use soil and/or plant test and appropriate fertilizer recommendation for determining nutrient application rates.

Nitrogen Application Timing **Risk Rating:** Very Low or N.A.

Comments: Good job! Follow Nitrogen application recommendations and apply according to crop growth needs.

Irrigation Efficiency **Risk Rating:** Very High

Comments: Check and maintain system for leaky joints and worn-out pumps, sprinklers or nozzles. Use flow controllers to improve efficiency. Be sure that the right amount of irrigation water is applied as uniformly as possible to meet crop needs and minimize leaching from the root zone. Check with irrigation professional to assure that crop growth requirements are being adequately met.

Soil/Water Table Depth **Risk Rating:** Medium

Comments: Because the dominant soils have moderate to high infiltration rates and water transmission, this field may be vulnerable to ground water contamination. Nutrient leaching and subsequent subsurface transport to ground water and interconnected surface water may be a concern.

FIELD: Field 9
Overall Risk Rating: Medium
Leaching losses may be contributing to soluble nutrient leaching below the root zone during some years.

Percolation **Risk Rating:** Very Low or N.A.

Deep Percolation (as % of Evapotranspiration): <5% Over ET

Comments: Nutrient leaching should not be a problem, however, there is a potential salt balance problem (and the crop's water requirement may not be completely satisfied). Evaluate whether adequate water is being applied to meet salt (leaching) requirements. If irrigation water has a high Electrical Conductivity (EC)/Sodium Adsorption Ration (SAR) salt balance may be critical.

Nitrogen Application Rate **Risk Rating:** Very Low or N.A.

Comments: Some potential for nitrogen leaching if excess water is applied from irrigation and/or precipitation events. Potential for yield reduction from a nitrogen deficiency. Use soil and/or plant test and appropriate fertilizer recommendation for determining nutrient application rates.

Nitrogen Application Timing **Risk Rating:** Very Low or N.A.

Comments: Good job! Follow Nitrogen application recommendations and apply according to crop growth needs.

Irrigation Efficiency **Risk Rating:** Very High

Comments: Check and maintain system for leaky joints and worn-out pumps, sprinklers or nozzles. Use flow controllers to improve efficiency. Be sure that the right amount of irrigation water is applied as uniformly as possible to meet crop needs and minimize leaching from the root zone. Check with irrigation professional to assure that crop growth requirements are being adequately met.

Soil/Water Table Depth **Risk Rating:** Medium

Comments: Because the dominant soils have moderate to high infiltration rates and water transmission, this field may be vulnerable to ground water contamination. Nutrient leaching and subsequent subsurface transport to ground water and interconnected surface water may be a concern.

FIELD: Field 10
Overall Risk Rating: Medium
Leaching losses may be contributing to soluble nutrient leaching below the root zone during some years.

Percolation **Risk Rating:** Very Low or N.A.

Deep Percolation (as % of Evapotranspiration): <5% Over ET

Comments: Nutrient leaching should not be a problem, however, there is a potential salt balance problem (and the crop's water requirement may not be completely satisfied). Evaluate whether adequate water is being applied to meet salt (leaching) requirements. If irrigation water has a high Electrical Conductivity (EC)/Sodium Adsorption Ration (SAR) salt balance may be critical.

Nitrogen Application Rate **Risk Rating:** Very Low or N.A.

Comments: Some potential for nitrogen leaching if excess water is applied from irrigation and/or precipitation events. Potential for yield reduction from a nitrogen deficiency. Use soil and/or plant test and appropriate fertilizer recommendation for determining nutrient application rates.

Nitrogen Application Timing **Risk Rating:** High

Comments: Follow Nitrogen application recommendations and apply according to crop growth needs. If all fertilizer nitrogen must be preplant applied in the spring then make applications when (there is the least potential for a leaching event following application). (If possible) use a nitrification inhibitor to delay nitrification of ammonia-nitrogen until plant growth increases and additional nitrogen is needed.

Irrigation Efficiency **Risk Rating:** Very High

Comments: Check and maintain system for leaky joints and worn-out pumps, sprinklers or nozzles. Use flow controllers to improve efficiency. Be sure that the right amount of irrigation water is applied as uniformly as possible to meet crop needs and minimize leaching from the root zone. Check with irrigation professional to assure that crop growth requirements are being adequately met.

Soil/Water Table Depth **Risk Rating:** Medium

Comments: Because the dominant soils have moderate to high infiltration rates and water transmission, this field may be vulnerable to ground water contamination. Nutrient leaching and subsequent subsurface transport to ground water and interconnected surface water may be a concern.

FIELD: Field 11

Overall Risk Rating: Medium

Leaching losses may be contributing to soluble nutrient leaching below the root zone during some years.

Percolation **Risk Rating:** Very Low or N.A.

Deep Percolation (as % of Evapotranspiration): <5% Over ET

Comments: Nutrient leaching should not be a problem, however, there is a potential salt balance problem (and the crop's water requirement may not be completely satisfied). Evaluate whether adequate water is being applied to meet salt (leaching) requirements. If irrigation water has a high Electrical Conductivity (EC)/Sodium Adsorption Ration (SAR) salt balance may be critical.

Nitrogen Application Rate **Risk Rating:** Very Low or N.A.

Comments: Some potential for nitrogen leaching if excess water is applied from irrigation and/or precipitation events. Potential for yield reduction from a nitrogen deficiency. Use soil and/or plant test and appropriate fertilizer recommendation for determining nutrient application rates.

Nitrogen Application Timing **Risk Rating:** Medium

Comments: Use a nitrogen inhibitor to delay nitrification of ammonia-N until plant growth increases and additional nitrogen is needed.

Irrigation Efficiency **Risk Rating:** Very High

Comments: Due to the low irrigation efficiency on this field, conversion to a more efficient irrigation system like Sprinkler or Drip Irrigation should be considered. If this is not possible consider shorter set times to minimize runoff and/or the length of run to minimize leaching. A Tailwater Recovery & Pumpback System will help to reduce or eliminate runoff. An additional consideration is to incorporate a Surge Irrigation that will help to reduce runoff and deep percolation losses. Be sure that the right amount of irrigation water is applied as uniformly as possible to meet crop needs and minimize leaching from the root zone. Check with irrigation professional to assure that crop growth requirements are being adequately met.

Soil/Water Table Depth **Risk Rating:** Medium

Comments: Because the dominant soils have moderate to high infiltration rates and water transmission, this field may be vulnerable to ground water contamination. Nutrient leaching and subsequent subsurface transport to ground water and interconnected surface water may be a concern.

FIELD: Field 12
Overall Risk Rating: Medium
Leaching losses may be contributing to soluble nutrient leaching below the root zone during some years.

Percolation **Risk Rating:** Very Low or N.A.

Deep Percolation (as % of Evapotranspiration): <5% Over ET

Comments: Nutrient leaching should not be a problem, however, there is a potential salt balance problem (and the crop's water requirement may not be completely satisfied). Evaluate whether adequate water is being applied to meet salt (leaching) requirements. If irrigation water has a high Electrical Conductivity (EC)/Sodium Adsorption Ration (SAR) salt balance may be critical.

Nitrogen Application Rate **Risk Rating:** Very Low or N.A.

Comments: Some potential for nitrogen leaching if excess water is applied from irrigation and/or precipitation events. Potential for yield reduction from a nitrogen deficiency. Use soil and/or plant test and appropriate fertilizer recommendation for determining nutrient application rates.

Nitrogen Application Timing **Risk Rating:** Very Low or N.A.

Comments: Good job! Follow Nitrogen application recommendations and apply according to crop growth needs.

Irrigation Efficiency **Risk Rating:** Very High

Comments: Check and maintain system for leaky joints and worn-out pumps, sprinklers or nozzles. Use flow controllers to improve efficiency. Be sure that the right amount of irrigation water is applied as uniformly as possible to meet crop needs and minimize leaching from the root zone. Check with irrigation professional to assure that crop growth requirements are being adequately met.

Soil/Water Table Depth **Risk Rating:** Medium

Comments: Because the dominant soils have moderate to high infiltration rates and water transmission, this field may be vulnerable to ground water contamination. Nutrient leaching and subsequent subsurface transport to ground water and interconnected surface water may be a concern.

NUTRIENT RISK ANALYSIS LEGEND

BMP	Definition	Purpose
Buffer Strip	Contour buffer strips are strips of perennial grass alternated with wider cultivated strips that are farmed on the contour.	Contour buffer strips slow runoff water and trap sediment. Consequently, soil erosion is generally reduced significantly by this practice. Sediments, nutrients, pesticides, and other potential pollutants are filtered out as water flows through the grass strips. The grass strips also provide food and cover for wildlife.
Channel Vegetation	Establishing and maintaining adequate plants on channel banks, berms, spoil, and associated areas.	To stabilize channel banks and adjacent areas and reduce erosion and sedimentation. To maintain or enhance the quality of the environment, including visual aspects and fish and wildlife habitat.
Chiseling and Subsoiling	Loosening the soil, without inverting and with a minimum of mixing of the surface soil, to shatter restrictive layers below normal plow depth that inhibit water movement or root development.	To improve water and root penetration and aeration.
Composting Facility	A composting facility is installed for biological stabilization of waste organic material.	The purpose of this practice is to biologically treat waste organic material and produce humus-like material that can be recycled as a soil amendment or organic fertilizer. The material may also be used by other acceptable methods of recycling that comply with laws, rules and regulations.

Conservation Cover	This practice involves establishing and maintaining a protective cover of perennial vegetation on land retired from agriculture production.	This practice reduces soil erosion, associated sedimentation, improves water quality, and creates or enhances wildlife habitat.
Conservation Cropping Sequence	Growing crops in a recurring sequence on the same field.	This practice may be applied as part of a best management practice to support one or more of the following: Reduce sheet and rill erosion, Reduce irrigation induced erosion, Reduce soil erosion from wind, Maintain or improve soil organic matter content, Manage deficient or excess plant nutrients, Improve water use efficiency, Manage saline seeps, Manage plant pests (weeds, insects, diseases), Provide food for domestic livestock, and Provide food and cover for wildlife.
Contour Farming	Farming sloping land in such a way that preparing land, planting, and cultivating are done on the contours. (This includes following established grades of terraces or diversion.)	To reduce erosion and control water.
Cover and Green Manure Crop	A crop of close-growing, legumes, or small grain grown primarily for seasonal protection and soil improvement. It usually is grown for 1 year or less, except where there is permanent cover as in orchards.	To control erosion during periods when the major crops do not furnish adequate cover; add organic material to the soil; and improve infiltration, aeration, and tilth.
Critical Area Planting	Planting vegetation on critically eroding areas that require extraordinary treatment.	This practice is used on highly erodible areas that cannot be stabilized by ordinary planting techniques and if left untreated may

		cause severe erosion or sediment damage. Examples of critical areas include the following: 1) Dams, dikes, levees, and other construction sites with very steep slopes, 2) Mine spoil and surface mined land with poor quality soil and possibly chemical problems, and 3) Agriculture land with severe gullies requiring specialized planting techniques and management.
Dike or Berm	An embankment constructed of earth or other suitable materials to protect land against overflow or to regulate water.	Dikes are used to: Permit improvement of agricultural land by preventing overflow and better use of drainage facilities, Prevent damage to land and property, Facilitate water storage and control in connection with wildlife and other developments, and Protect natural areas, scenic features and archeological sites from damage.
Diversion	A channel constructed across the slope with a supporting ridge on the lower side.	To divert excess water from one area for use or safe disposal in other areas.
Drip Irrigation	A planned irrigation system in which all necessary facilities are installed for efficiently applying water directly to the root zone of plants by means of applicators (orifices, emitters, porous tubing, perforated pipe) operated under low pressure. The applicators can be placed on or below the surface of the ground.	To efficiently apply water directly to the plant root zone to maintain soil moisture within the range for good plant growth and without excessive water loss, erosion, reduction in water quality, or salt accumulation.
Filter Strip	A strip or area of vegetation for removing pollutants water.	A filter strip reduces pollution by filtration, deposition, infiltration, absorption, adsorption, decomposition, and volatilization of sediment, organic matter, and

		other pollutants from runoff and waste water.
Fish Stream Improvement	Fish Stream Improvement is improving a stream channel to make or enhance fish habitat.	The purpose of the practice is to increase production of desired species of fish. The practice involves improving food supplies, shelter, spawning areas, water quality, and other elements of fish habitat.
Grade Stabilization Construction	A structure used to control the grade and head cutting in natural or artificial channels.	These structures are to: Stabilize the grade and control erosion in natural or artificial channels, prevent the formation or advance of gullies, enhance environmental quality, and reduce pollution hazards.
Grassed Waterway	A natural or constructed channel that is shaped or graded to required dimensions and established in suitable vegetation for the stable conveyance of runoff.	Grassed waterways convey runoff from terraces, diversions, or other water concentrations without causing erosion or flooding and to improve water quality.
Grazing Land Mechanical Treatment	Modifying physical soil and/or plant conditions with mechanical tools by treatments such as; pitting, contour furrowing, and ripping or sub-soiling.	This practice should be applied as part of a best management practice to support one or more of the following purposes: Fracture compacted soil layers and improve soil permeability, Reduce water runoff and increase infiltration, Break up sod bound conditions and thatch to increase plant vigor, and Renovate and stimulate plant community for greater productivity and yield.

Heavy Use Area Protection	Protecting heavily used areas by establishing vegetative cover, by surfacing with suitable materials, or by installing needed structures.	To stabilize urban, recreation, or facility areas frequently and intensely used by people, animals, or vehicles.
Irrigation Land Leveling	Reshaping the surface of land to be irrigated to planned grades.	To permit uniform and efficient application of irrigation water without causing erosion, loss of water quality, or damage to land by waterlogging and at the same time to provide for adequate surface drainage.
Irrigation Water Management	Irrigation water management is the process of determining and controlling the volume, frequency, and application rate of irrigation water in a planned, efficient manner.	Irrigation water management is applied as part of a conservation management system to support one or more of the following: Manage soil Moisture to promote desired crop response; Optimize use of available water supplies; Minimize irrigation induced soil erosion; Decrease non-point source pollution of surface and groundwater resources; Manage salts in the crop root zone; Manage air, soil, or plant micro-climate.
Mulching	Applying plant residues or other suitable materials not produced on the site to the soil surface.	To conserve moisture; prevent surface compaction or crusting; reduce runoff and erosion; control weeds; and help establish plant cover.
Polyacrylamide (PAM)	Polyacrylamide is an organic polymer formulated to stabilize soil when applied in irrigation water.	Water applied with PAM stabilizes soil aggregates which can then resist the erosive forces of water. If correctly applied, PAM will produce clear runoff water and reduce erosion within the field by over 90 percent.

Prescribed Grazing	Prescribed grazing is the controlled harvest of vegetation with grazing animals, managed with the intent to achieve a specific objective.	Application of this practice will manipulate the intensity, frequency, duration, and season of grazing to: 1) Improve water infiltration, 2) maintain or improve riparian and upland area vegetation, 3) protect stream banks from erosion, 4) manage for deposition of fecal material away from water bodies, and 5) promote ecological and economically stable plant communities which meet landowner objectives.
Residue Management (Conservation Tillage)	Managing the amount, orientation, and distribution of crop and other plant residue on the soil surface.	This practice may be applied as part of a conservation system to support one or more of the following: Reduce sheet and rill erosion. Reduce wind erosion. Maintain or improve soil organic matter content and tilth. Conserve soil moisture. Manage snow to increase plant available moisture. Provide food and escape cover for wildlife.
Riparian Forest Buffer	A riparian forest buffer is an area of trees and/or shrubs located adjacent to a body of water. The vegetation extends outward from the water body for a specified distance necessary to provide a minimum level of protection and/or enhancement.	The riparian forest buffer is a multi-purpose practice design to accomplish one or more of the following: Create shade to lower water temperatures and improve habitat for aquatic animals, Provide a source of debris necessary for healthy robust populations of aquatic organisms and wildlife, and Act as a buffer to filter out sediment, organic material, fertilizer, pesticides and other pollutants that may adversely impact the water body, including shallow ground water.

Sediment Basin	A basin constructed to collect and store debris or sediment.	A sediment basin may have the following uses: Preserve the capacity of reservoirs, ditches, canals, diversion, waterways, and streams, Prevent undesirable deposition on bottom lands and developed areas, Trap sediment originating from construction sites, and Reduce or abate pollution by providing basins for deposition and storage of silt, sand, gravel, stone, agricultural wastes, and other detritus.
Sprinkler System	A planned irrigation system in which all necessary facilities are installed for efficiently applying water by means of perforated pipes or nozzles operated under pressure.	To efficiently and uniformly apply irrigation water to maintain adequate soil moisture for optimum plant growth without causing excessive water loss, erosion, or reduced water quality.
Stream Channel Stabilization	Stabilizing the channel of a stream with suitable structures.	To control aggradation or degradation in a stream channel.
Streambank Protection	Using vegetation or structures to stabilize and protect banks of streams, lakes, estuaries, or excavated channels against scour and erosion.	To stabilize or protect banks of streams, lakes, estuaries, or excavated channels for one or more of the following purposes: Prevent the loss of land or damage to utilities, roads, buildings, or other facilities adjacent to the banks, Maintain the capacity of the channel, Control channel meander that would adversely affect downstream facilities, Reduce sediment loads causing downstream damages and pollution, and Improve the stream for recreation or as a habitat for fish and wildlife.

Stripcropping, Contour	Growing crops in a systematic arrangement of strips or bands on the contour to reduce water erosion. The crops are arranged so that a strip of grass or close-growing crop is alternated with a strip of clean-tilled crop or fallow or a strip of grass is alternated with a close-growing crop.	To reduce sheet and rill erosion and/or to reduce transport of sediment and other water-borne contaminants.
Stripcropping, Field	Growing crops in a systematic arrangement of strips or bands across the general slope (not on the contour) to reduce water erosion. The crops are arranged so that a strip of grass or a close-growing crop is alternated with a clean-tilled crop or fallow.	To help control erosion and runoff on sloping cropland where contour stripcropping is not practical.
Subsurface Drains	A Subsurface Drain is a conduit, such as corrugated plastic tubing, tile, or pipe, installed beneath the ground surface to collect and/or convey drainage water.	The purpose of a subsurface drain is to: Improve the environment for vegetation, Reduce erosion, Improve water quality, Collect ground water for beneficial use, Remove water from heavy use areas such as recreation areas, or around buildings, and Regulate water to control health hazards caused by pests.
Surge Irrigation	Surge irrigation is the intermittent application of water to furrows, corrugates, or borders creating a series of on and off periods of constant or variable time spans.	Surge allows a lighter application of water with a higher efficiency. The result is less deep percolation of water at the upper end of the field and a more uniform application.
Tailwater Recovery & Pumpback System	A facility to collect, store, and transport irrigation tailwater for reuse in a farm irrigation distribution system.	To conserve farm irrigation water supplies and water quality by collecting the water that runs off the field surface for reuse on the farm.

Terraces	An earth embankment, a channel, or a combination ridge and channel constructed across the slope.	Reduce slope length, reduce sediment content in runoff water, reduce erosion, Improve water quality, intercept and conduct surface runoff at a non-erosive velocity to a stable outlet, retain runoff for moisture conservation, prevent gully development, reform the land surface, improve farmability, and reduce flooding.
Use Exclusion	Excluding animals, people or vehicles from an area.	To protect, maintain, or improve the quantity and quality of the plant, animal, soil, air, water, and aesthetics resources and human health and safety.
Water and Sediment Control Basin	An earth embankment or a combination ridge and channel generally constructed across the slope and minor watercourses to form a sediment trap and water detention basin.	To improve farmability of sloping land, reduce watercourse and gully erosion, trap sediment, reduce and manage onsite and downstream runoff, and improve downstream water quality.
Watering Facility	A device (tank, trough, or other watertight container) for providing animal access to water.	To provide watering facilities for livestock and/or wildlife at selected locations in order to: 1) protect and enhance vegetative cover through proper distribution of grazing; 2) provide erosion control through better grassland management; or 3) protect streams, ponds and water supplies from contamination by providing alternative access to water.
Wetland Development/Restoration	The construction or restoration of a wetland facility to provide the hydrological and biological benefits of a wetland.	To develop or restore hydric soil conditions, hydrologic conditions, hydrophytic plant communities, and wetland functions.

APPENDIX C: CROP SPECIFIC GUIDELINES

Alfalfa, Hay, Cut Early Bloom, S-ID, Irrigated
UNIVERSITY OF IDAHO INFORMATION

SOIL SAMPLING
Environmental concerns have brought nutrient management in agriculture under increased scrutiny. A goal of sound nutrient management is to maximize the proportion of applied nutrients that is used by the crop (nutrient use efficiency). Soil sampling is a best management practice (BMP) for fertilizer management that will help improve nutrient use efficiency and protect the environment.
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FERTILIZER GUIDE

Nutrient requirements for alfalfa are relatively high compared to many other crops commonly grown in Idaho. Each ton of alfalfa hay removes about 60 lb nitrogen (N) per acre, 50 lb potassium (K) per acre, 30 lb calcium (Ca) per acre, 8 lb phosphorus (P) per acre, and about 6 lb per acre of both sulfur (S) and magnesium (Mg). Requirements for phosphorus and potassium fertilizers are much higher than for S, manganese (Mn), zinc (Zn), iron (Fe), and boron (B).

NITROGEN (N)

Essentially all nitrogen required by established alfalfa is provided by the symbiotic relationship with N-fixing Rhizobium bacteria and N mineralized from soil organic matter. Top dressed N usually does not improve yield, quality, or vigor of established stands. However, applications of 20 to 40 lb N per acre may be helpful during stand establishment prior to nodulation of the roots. Applied N would most likely be needed following small grain production in which the residue is returned to the soil. Application of larger amounts may inhibit nodulation, decrease symbiotic N fixation, and encourage grass weeds, thereby reducing alfalfa growth or quality when harvested. Alfalfa receiving appreciable amounts of animal manures, dairy effluent, or other organic N sources will also have reduced N fixation. The probability of an N response is usually greatest on coarse-textured soils with low organic matter content. Nitrogen fertilizer may be required for maximum alfalfa production and quality if the roots are poorly nodulated. Poor nodulation as well as poor Rhizobial activity and N-fixing capacity can result from a number of factors, including lack of proper seed inoculation at planting, diseases, insects, water deficits, nutrient deficiencies or toxicities, or other soil physical or chemical conditions that reduce the effectiveness of the Rhizobium inoculant. Poor inoculation results from not using inoculant, using inoculant that has lost its viability (expired shelf life), or using Rhizobium inoculant strains that are not effective. Poor inoculation, nodulation, or Rhizobial effectiveness is indicated when alfalfa protein is low (less than 18%) when cut at the early bloom stage. Healthy Rhizobium nodules should be pink when cut open if they are effectively fixing atmospheric N. If nodulation or Rhizobial effectiveness is limited by pests, water deficits, or soil conditions such as salinity, sodicity, nutrient deficiencies, or soil compaction, then attempts should be made to correct the problem through appropriate management practices. For more information on proper inoculation of alfalfa, refer to CIS 838, (Inoculation of Legumes in Idaho). Alfalfa is sometimes used to scavenge nutrients from soils receiving excessive animal manure or other biological waste applications. An alfalfa crop yielding 6 tons per acre can remove up to 360 lb of N per acre. However, excessive nitrogen uptake can increase the forage nitrate toxicity hazard for dairy and beef cattle. In addition, animal manure applications can promote grass and weed growth, which in turn can also increase the potential for nitrate toxicity if the population of the noxious weed Kochia increases.

Producers sometimes plant a companion crop when establishing alfalfa in order to increase the productivity of the first cutting. However, this practice is not recommended because the alfalfa stand typically is reduced by competition from the companion crop. If growers plant alfalfa with a companion crop, both crops compete for the available N. Under these conditions, N rates of 30 to 40 lb per acre are suggested if available soil N does not exceed 60 to 80 lb per acre.

PHOSPHORUS (P)
Adequate phosphorus availability is important for maintaining plant health, winter hardiness, and optimum root, stem, and leaf growth. Since phosphorus is relatively immobile in soil, P fertilizer should be incorporated into the soil prior to planting to raise soil P concentrations to optimum levels for early plant growth. The phosphorus recommendations presented are based on the soil test P concentration and free lime content in the top foot of soil, and the yield potential. Significant amounts of free lime in the soil will make less phosphorus available to plants as it precipitates soil solution P. Top dressed P applications can also be effective but should be made following harvest in the fall or in the spring before regrowth in order to maximize soil contact. Knifing ammonium polyphosphate (10-34-0) into the soil or applying surface bands in the fall or spring are also effective P fertilization methods for alfalfa. As the stand ages and plant density decreases, the ability of the alfalfa root system to take up P diminishes due to decreased soil P concentrations and root activity. Under these conditions, smaller P rates applied more frequently may increase P uptake efficiency. Effective sources of P for alfalfa include monoammonium phosphate (11-52-0), triple superphosphate (0-45-0), ammonium polyphosphate (10-34-0), and phosphoric acid. Fertilizer P can be broadcast as 11-52-0 or applied through the irrigation system as 10-34-0 with equal effectiveness. Phosphorus sources should be selected on the basis of cost, local availability, and equipment requirements.

POTASSIUM (K)
Alfalfa has a high potassium requirement. A crop of 8 tons per acre will remove about 480 lb of K2O per acre. Most Idaho soils and surface irrigation waters are naturally high in K. However, K deficiencies can develop in intensively cropped fields, particularly those fields cropped to alfalfa for many years. Sandy soils are generally more prone to developing K deficiencies than silt loam or clay soils and therefore have a higher probability of responding to K fertilization. Potassium movement in soils is limited, although it is more mobile than P. Like phosphorus, potassium fertilizer recommendations are based on calibrated relationships between soil test concentrations in the top foot of soil and yield response. Soil test K should generally be in the range of 160 to 200 ppm for optimum alfalfa yield. Potassium fertilizer should also be incorporated during seedbed preparation prior to establishment, or broadcast in the fall or early spring on established stands. Potassium chloride (0-0-60), potassium sulfate (0-0-52), K-Mag, and various liquid K fertilizers are all effective K sources for alfalfa. Potassium applications exceeding 300 lb K2O per acre should be split between fall and spring to avoid salt damage. Excessive K applications should be avoided since alfalfa will remove substantially more K than it needs for maximum yield. Excessive K concentrations in alfalfa can contribute to milk fever in dairy cattle.

SULFUR (S)
Sulfur is a key contributor to alfalfa yield and quality. Sulfur requirements for alfalfa vary with soil texture, leaching losses, soil test SO4-S concentration, and S content of the irrigation water. About 30 to 40 lb of SO4-S should be applied before planting to soils containing less than 10ppm SO4-S in the top foot of soil. This amount should provide adequate soil S for several years, provided the SO4-S is not leached from the rooting depth. The SO4-S form is mobile and can be leached to lower soil profile depths. For established alfalfa, sampling to a depth of two feet will provide a more accurate indication of S availability to alfalfa roots beyond the first foot. Areas irrigated with water from the Snake River or streams fed by return flow should have adequate S for alfalfa production. High rainfall areas, mountain valleys, and foothills are more

likely to have S deficiencies, particularly on course-textured soils with low organic matter content. Sulfur fertilizer sources should be carefully selected because elemental S must be converted to SO4-S by soil microorganisms before plant roots can take it up. Conversion of elemental S to SO4-S may take several months in warm, moist soil. Consequently, elemental S fertilizers usually cannot supply adequate levels of S to alfalfa in the year that it is applied. However, elemental S fertilizers can supply considerable S during the year following application. Sulfate-sulfur sources such as gypsum (calcium sulfate), ammonium sulfate (21-0-0), or potassium sulfate (0-0-52-18) are recommended to correct S deficiencies during the year of application.

SECONDARY NUTRIENTS AND MICRONUTRIENTS

CALCIUM (Ca) and MAGNESIUM (Mg) deficiencies in alfalfa are rare in the irrigated areas of southern Idaho. Most soils in the Snake River plain have adequate amounts of Ca and Mg for alfalfa production, although low soil Mg concentrations are sometimes encountered on very sandy soils that have been heavily fertilized with K for long periods. Under these conditions, applications of MgSO4 or K-Mag at 20 to 40 lb of Mg per acre may provide a benefit. Micronutrient applications should be based on recent soil test results.

BORON (B) deficiencies can usually be corrected by applying 2 to 3 lb of B per acre for the duration of the crop. However, on very sandy soils, or high rainfall areas where soils are subject to excessive leaching of B, annual applications of 1/2 to 1 lb of B per acre may be more Sulfur effective. Commonly used forms of B include boric acid, Borax, and sodium borate.

ZINC (Zn), MANGANESE (Mn), and IRON (Fe) deficiencies can be corrected by applying 5 to 10 lb per acre of the required nutrient using Zn, Mn, or Fe sulfates or other soluble forms.

MOLYBDENUM (Mo) availability is generally adequate in the alkaline soils that are prevalent in the irrigated areas of southern Idaho.

TISSUE TESTING

Plant tissue testing provides an effective means of evaluating the nutrient status of an established alfalfa stand. Samples should be collected from about 20 to 30 plants at early bloom in representative areas of the field that are free from water stress or obvious pest problems. The top six inches of the stem should be sampled and sent immediately to a soil testing lab for analysis. Sufficiency ranges for the various nutrients are presented below. Nutrient concentrations below these ranges indicate a need for supplemental fertilization. When nutrient deficiencies are identified during the growing season, the deficiencies can often be corrected by injecting water-soluble fertilizers through the sprinkler system. Liquid forms of N, P, K, S, and micronutrients are commonly available in Idaho and should be selected on the basis of cost relative to dry fertilizers and ease of application. If alfalfa is furrow irrigated, foliar sprays can be used to correct micronutrient deficiencies but avoid foliar applications of N, P, K, and S at high rates that can cause foliar burning.

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Corn, Field, Silage, S-ID, Irrigated
UNIVERSITY OF IDAHO INFORMATION

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FERTILIZER GUIDE

NITROGEN (N)
Nitrogen rates depend upon some of the following factors: previous crop, past fertilizer use, soil type and leaching hazard and realistic yield goal for the grower and the area.
Adequate N is necessary for maximum economic production of irrigated field corn used for silage or grain. Fertilizer N represents by far the largest share of the fertilizer costs for field corn

in Idaho. The amount of N required depends on many factors that influence total corn production and quality. These factors include length of growing season, corn hybrid, previous crop, past fertilizer use, soil type, leaching hazard and previous manuring. Estimates of both the N available to corn during the season and the yield potential of the crop should be considered when determining N fertilizer rates.

TOTAL N REQUIREMENTS BASED ON POTENTIAL YIELD - Fertilizer N rates should be used which correspond to the yield growers can reasonably expect under their soil and management conditions. The historical field corn yield obtained by a grower in a specific field or area generally provides a fair approximation of yield potential given a grower's traditional crop management. Projected changes in crop management (i.e. improved variety, better disease and weed control) designed to appreciably increase production may require adjustment of yield potential upward. Research has shown that the available N required to produce a good field corn yield depends on a variety of crop management practices. Factors such as weed, insect and disease control as well as irrigation, planting date and soil type can influence the N required by corn for maximum yield.

AVAILABLE NITROGEN - Available N in the soil includes mineralizable N (released from organic matter during the growing season) inorganic N as nitrate (N03-N) and ammonium (NH4-N), and N credits from previous cropping or manures. Each component of available N must be estimated for accurate determination of optimum fertilizer N rates.

MINERALIZABLE NITROGEN - Soils vary in their capacity to release N from organic matter during the growing season. The amount of N released depends on such factors as soil type, soil moisture, soil temperature, previous crop, and the history of fertilizer N applied. While soil organic matter content is frequently used to estimate annual mineralizable N contributions, in southern Idaho irrigated soils organic matter does not accurately predict the amount of N that is mineralized.

INORGANIC NITROGEN - Residual soil inorganic N (N03, NH4) can be evaluated most effectively with a soil test. Soil samples should be collected in foot increments to a depth of two feet, unless roots are restricted by dense soil layers or high water tables. Ammonium is generally low in preplant soil samples and thus contributes little to available N. However, it can be as high as or higher than N03-N. NH4-N should be determined along with N03-N, especially when there is reason to expect the presence of appreciable NH4-N, such as recent ammonium N fertilizer applications. Soil samples should be collected before seeding in the spring to represent the area to be fertilized.

NITROGEN FROM PREVIOUS CROP RESIDUES - Nitrogen associated with decomposition of previous crop residues should also be considered when estimating available N. Residues that require additional N for decomposition include cereal straw and mature corn stalks. Research has shown that 15 pounds of additional N are needed per ton of straw returned to the soil, up to a maximum of 50 pounds. For more information on compensating for cereal residues, refer to CIS 825, "Wheat Straw Management and Nitrogen Fertilizer Requirements." Row crop residues (potatoes, sugarbeets, and onions) generally do not require additional N for decomposition. Consequently, these residues have little effect on the N needs of field corn. Legume residues

from beans, peas, and alfalfa can release appreciable N during the following crop season that may not be reflected by the preplant soil test. This N is derived from the decomposition of both plant tops and nodulated root systems.

NITROGEN FROM MANURES - Soils in which field corn is grown occasionally receive animal manures or lagoon wastes. Nutrient contributions from these sources should also be taken into consideration when estimating available N for the next season. Manures can preclude the need for any fertilizer, depending on the rate applied and their nutrient composition. Manures can vary appreciably depending on the animal, how the manure is processed, and the kind and extent of bedding material. For the most accurate estimate of fertilizer equivalent values, the manure should be analyzed for its nutrient content.

IRRIGATION WATER - Irrigation waters derived from deep wells are generally low in N. More shallow wells can have significant levels of nitrogen because of leaching of nitrogen from impacts from commercial fertilizer use, animal waste, and improperly functioning septic systems. Irrigation waters from most districts are also low in N when diverted from its source. Background levels of N from original sources are generally about 2 parts per million (ppm). The more return flow included in diverted water sources, the higher the N content. Return flows may include N dissolved when irrigation waters pass through fields high in residual or recently added fertilizer N as well as from soluble fertilizer N applied with the irrigation water. Most irrigation districts should know the N content of the water they divert. Contact them for this information to determine the levels of N added with your irrigation water. However, since irrigation water N levels are influenced by upstream management, if you use irrigation water that receives runoff after it is diverted, only a water test can accurately evaluate the N added with irrigation waters. For each ppm or milligrams per liter (mg/L) of N reported in the water sample, multiply by 2.7 to get the N added per acre foot of water applied. For example, if the water sample contained 10 ppm of N, 3 acre feet of water applied would be the equivalent of 81 pounds of N per acre. Typically, of the water applied with furrow irrigation only 50 percent is retained on the field and the rest runs off the end. The net retention of N applied with furrow irrigation would, therefore, be about half of the water applied or about 40 pounds per acre in this example. If more or less of the irrigation water is retained with each wetting, then growers should adjust the water N contribution accordingly. Excessive irrigation by any method reduces N availability to field corn. Additional N may be needed under these conditions. Growers should not use aqua or anhydrous N through a sprinkler irrigation system. Water running soluble N sources with a furrow irrigation system can be an effective means of adding N. Two limitations of this practice are that (1) the application of the N with this method may not be as uniform as desired and (2) runoff containing the N may contaminate downstream surface waters. Growers can minimize the loss of N by shutting off the injection unit before the irrigation water reaches the end of the furrow. This practice should not substitute for careful consideration of N needs while N can be side dressed.

CALCULATION OF N APPLICATION RATES - To calculate the fertilizer N application rate, the following equation is used: Fertilizer application rate (deficit) or Over application of Nitrogen = (Total N required producing a given yield) - (Mineralizable N) - (Inorganic N measured by the soil test) - (previous crop/residue management) - (Manure Nitrogen) - (Irrigation Water)

TIMING OF NITROGEN APPLICATION - Coarse-textured soils, including sandy loams, loamy soils and sands, may lose N from leaching. For these soils, side dress a portion of the N at the time of the last cultivation. Sprinkler irrigation of corn under center pivots provides increased flexibility for providing N during the season. With sprinklers N can be injected into the system and applied with the water. On silt loam soils, split applications of N have not proven more effective as long as preplant N is adequately incorporated. High N rates (approaching 300 pounds per acre) broadcast and incorporated before planting may reduce early season corn growth. If high N rates are needed, split applications should be considered. High plant populations (above 28,000 to 30,000) and early plantings of longer season hybrids in the Treasure Valley will respond to high N rates provided there are no other limiting factors. High N rates will not compensate for reductions in stand or delayed plantings. High plant populations of field corn are more susceptible to N shortages because of greater competition among plants for limited N. Side dressing may cause root pruning depending on plant size, distance of shank from the row and placement depth. High N rates (above 300 pounds per acre) broadcast and incorporated before planting may reduce early season corn growth. If high N rates are needed, split applications should be considered. On sandy textured soils subject to leaching, side dress a portion of the N at the time of the last cultivation. Under sprinkler irrigations, N can be injected through the lines throughout the season. On silt loam soils, split applications of N have not proven more effective as long as preplant N is adequately incorporated.

PHOSPHORUS (P)
Adequate phosphorus is necessary for maximum production of field corn. The soil test for P is based on samples collected from the first foot of soil. The soil is extracted with sodium bicarbonate. Economic response to fertilizer P is more likely with cooler soil temperatures and soils with high lime content, particularly when planting long season hybrids. Phosphorus is an immobile nutrient that does not move appreciably from where it is placed. It should be mixed into the seedbed or banded within easy reach of the seedling roots before or during the planting operation.

POTASSIUM (K)
Field corn requires adequate potassium for optimum growth. Soil test K can be useful in determining the need for K fertilizers. The soil sample is taken from the first foot of soil and extracted with sodium bicarbonate. Fertilizer K rates are based on soil test.

SULFUR (S)
The major corn-growing regions in Idaho should not experience shortages of S. Areas with S deficiencies include some irrigated areas where both the soil and irrigation water are low in S. Snake River water is known to have high S concentrations. Coarse-textured soils including sandy loams, loamy sands and sands would be more susceptible to S deficiencies than silt loam soils. Where the need for S is evident, use 30 pounds per acre of sulfate-sulfur (S04).

MICRONUTRIENTS
1) Zinc (Zn) deficiencies occur primarily on soils that are eroded, leveled or where the exposed subsoil is higher in lime. The DTPA test on soil samples collected from the first foot can be used for identifying Zn fertilizer needs. Apply 10 pounds of Zn per acre when the soil test measures less than 0.6 ppm.

2) Other micronutrients have not been shown to limit corn production. "Shotgun" applications of micronutrient mixtures containing boron (B), copper (Cu), iron (Fe) and manganese (Mn) "for insurance" have not been shown to be economical and are not recommended.

SALINITY (SALTS)
Field corn has a low to moderate tolerance to accumulated salts. Soils with total salt readings above 3 or 4 mmhos/cm can be cropped effectively. Readings up to 6 are also satisfactory although more careful water management may be required.

Pasture, Good Condition-Root Depth 4 feet, S-ID, Irrigated
UNIVERSITY OF IDAHO INFORMATION

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FERTILIZER GUIDE

Lack of adequate fertilizer, improper irrigation management, poor stands, non-adapted plant species and poor grazing management are the major causes of low forage production in irrigated pastures. When properly managed, pastures will respond to fertilization and produce large quantities of high-quality forage and livestock products. Irrigated pastures are typically composed either of grass-legume mixtures or grasses alone. The composition of the pasture can be changed by fertilizer management and grazing method. Adapted and high-quality grasses for irrigated pastures include brome grass and orchard grass for well-drained soil, fescue and wheatgrass for saline soils and creeping meadow foxtail and reed canary grass for wet soil. These grasses make excellent summer regrowth. Highest producing grass-legume mixtures usually include one or more of the above grasses with a well-adapted legume variety. An adapted legume variety should have good winter hardiness and resistance to insects and diseases.

NITROGEN (N)
Nitrogen rates depend upon some of the following factors: previous crop, past fertilizer use, soil type and leaching hazard and realistic yield goal for the grower and the area. Grass pastures have responded well to nitrogen (N) fertilizer applications up to 150 pounds N per acre. The N rate depends upon the length of frost-free growing season and the number of cuttings or grazing periods. Production potential increases as the frost-free growing period is extended. Split applications of N fertilizer maintain a more uniform level of forage production through summer and fall. Broadcast 30 to 50 pounds N per acre per application after each cutting or grazing cycle, and irrigate to move N into the plant root zone. As the amount of legume increases in a grass/legume mixture, the need for N fertilizer decreases. When the legume composes over 60 percent of the mixture, responses from N are limited. Nitrogen applications will reduce the quantity of legume in a mixed species stand. Inoculation of legumes when the stand is established will reduce the need for N fertilization when legumes dominate the stand composition.

PHOSPHORUS (P)
Intensively managed, high-producing pasture may respond to phosphorus (P) fertilization. Grasses generally have a low P requirement, and legumes generally have a high P requirement. Thus, P fertilizer applications tend to encourage legumes. Phosphorus movement in soils is limited, so P fertilizer needs to be placed in the rooting zone. Apply phosphorus during seedbed preparation whenever possible. Top-dress established pastures with P fertilizer, preferably in the fall.

POTASSIUM (K)
Grasses have moderate potassium (K) requirements, and legumes have high K requirements. Idaho soils are usually high in natural K. Irrigation water contains K except in mountain streams. Potassium movement in soils is limited, though not to the same extent as that of phosphorus. Incorporate K during seedbed preparation or broadcast in the fall on established stands.

SULFUR (S)
Sulfur demand is greater for legumes than grasses. Sulfur requirements for grass and legumes will vary with soil texture, leaching losses, S soil test and S content of irrigation water. Apply 30 pounds of S to soil testing less than 10 ppm sulfate-sulfur (S04-S) in the plow layer. Areas irrigated with water from the Snake River and other streams fed by return flow should have adequate S. High rainfall areas, mountain valleys and foothill areas are likely areas for S deficiencies. Sulfur sources should be carefully selected due to variation in its availability to plants. Elemental sulfur must be converted so sulfate (S04) form by soil micro-organisms before it can be taken up by plants. Conversion of elemental S to S04 may take several months in warm moist soils. Elemental S fertilizers cannot supply adequate levels of S the year of application. However, these elemental S sources can supply considerable S the year after the initial application. Sulfate-sulfur sources are recommended to alleviate deficiencies the year of application.

MICRONUTRIENTS
Deficiencies of micronutrients such as zinc (Zn), copper (Cu), manganese (Mn) and iron (Fe) have not been observed on irrigated pastures in southern Idaho. Grasses and legumes are not sensitive to low levels of micronutrients as are row crops such as beans and corn. Boron (B) deficiencies may be observed on legumes in gravelly textured soils. If the soil tests less than 0.25 ppm B, apply 1 to 3 pounds of B per acre. Do not use higher rates because B is toxic to plants in excessive amounts.

GENERAL COMMENTS
1. Nitrogen and phosphorus are the elements needed most on Idaho irrigated pastures. Potassium, sulfur, zinc and boron may be needed. Their need is best determined by soil and plant tissue tests.

2. Legume population in a grass-legume mixture is reduced by nitrogen fertilization and increased by phosphorus and potassium addition when these nutrients are low in the soil.

3. Forage from properly fertilized grass or mixed grass-legume pastures has higher protein, providing higher quality livestock feed than unfertilized pastures.

4. Irrigated pastures make good use of sloping land, stony soils and shallow soils which are less desirable for row crops. Pastures reduce soil erosion during irrigation on sloping land.

5. Fertilizers are only one part of pasture management. Pastures are most profitable when plant selection, irrigation and harvest techniques are not limiting production.

6. Rotational grazing will provide more forage and greater returns than continuous grazing.

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Potatoes, S-ID, Irrigated
UNIVERSITY OF IDAHO INFORMATION

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GOOD SOIL SAMPLING starts with recognizing the soil fertility varies among and within fields. Soil sampling for plant nutrients should be done one to two weeks before the anticipated fertilizer application or planting date. To adequately characterize nutrient availability in a field, each soil sample submitted to a lab should consist of a composite of at least 20 individual subsamples representing the field's major soil characteristics. To determine Nitrogen availability, separate soil samples should be collected from the 0- to 12-inch depth and the 12- to 24-inch depth. All other nutrients require only a 0- to 12-inch sample. Samples should not be collected from poor production areas or wet spots unless specific recommendations are desired for those areas.
THE SUBSAMPLES should be thoroughly mixed in a clean plastic bucket, keeping the first-foot samples separate from the second-foot samples. About one pound of soil from each depth's composite sample should then be placed in a separate plastic-lined sampling bag. All requested information including grower's name, field identification, date, and previous crop should be provided with the sample. Soil samples should not be stored under warm conditions because microbial activity can change the extractable nitrate (NO3-N) and (NH4-N) concentrations. Accordingly, soil samples should be submitted to a local soil testing lab as quickly as possible to provide for accurate soil testing results. IF SIZABLE AREAS OF THE FIELD DIFFER in productivity or visual appearance, crop yield and quality the field may benefit from variable-rate fertilization. Current site-specific soil sampling and fertilizer application technologies provide useful options for providing optimal nutrient availability throughout the field. Information on soil nutrient mapping and variable-rate fertilization can be obtained by contacting an extension soil fertility specialist, your local county ag extension educator, crop advisor, or ag consultant. For more detailed information about soil sampling, refer to EXT 704, (Soil Sampling).

FERTILIZER GUIDE

NITROGEN (N)
Nitrogen rates depend upon some of the following factors: previous crop, past fertilizer use, soil type and leaching hazard and realistic yield goal for the grower and the area. Most Idaho potato fields will respond to fertilizer nitrogen (N). The N rate used, along with other management factors, particularly irrigation, can have a marked effect on the yield and quality of the potato crop.

TOTAL N REQUIREMENTS BASED ON POTENTIAL YIELD - Fertilizer N rates should be used which correspond to the yield growers can reasonably expect under their soil and management conditions. The historical potato yield obtained by a grower in a specific field or area generally provides a fair approximation of yield potential given a grower's traditional crop management. Projected changes in crop management (i.e. improved variety, better disease and weed control) designed to appreciably increase production may require adjustment of yield potential upward. Research has shown that the available N required to produce a good potato yield depends on a variety of crop management practices. Factors such as weed, insect and disease control as well as irrigation, planting date and soil type can influence the N required by potatoes for maximum yield.

AVAILABLE NITROGEN - Available N in the soil includes mineralizable N (released from organic matter during the growing season) inorganic N as nitrate (N03-N) and ammonium (NH4-N), and N credits from previous cropping or manures. Each component of available N must be estimated for accurate determination of optimum fertilizer N rates.

MINERALIZABLE NITROGEN - Soils vary in their capacity to release N from organic matter during the growing season. The amount of N released depends on such factors as soil type, soil moisture, soil temperature, previous crop, and the history of fertilizer N applied. While soil organic matter content is frequently used to estimate annual mineralizable N contributions, in southern Idaho irrigated soils organic matter does not accurately predict the amount of N that is mineralized.

INORGANIC NITROGEN - Residual soil inorganic N (N03, NH4) can be evaluated most effectively with a soil test. Soil samples should be collected in foot increments to a depth of two feet, unless roots are restricted by dense soil layers or high water tables. Ammonium is generally low in preplant soil samples and thus contributes little to available N. However, it can be as high as or higher than N03-N. NH4-N should be determined along with N03-N, especially when there is reason to expect the presence of appreciable NH4-N, such as recent ammonium N fertilizer applications. Soil samples should be collected before seeding in the spring to represent the area to be fertilized.

NITROGEN FROM PREVIOUS CROP RESIDUES - Nitrogen associated with decomposition of previous crop residues should also be considered when estimating available N. Residues that require additional N for decomposition include cereal straw and mature corn stalks. Research has shown that 15 pounds of additional N are needed per ton of straw returned to the soil, up to a maximum of 50 pounds. For more information on compensating for cereal residues, refer to CIS 825, (Wheat Straw Management and Nitrogen Fertilizer Requirements). Row crop residues (potatoes, sugarbeets, and onions) generally do not require additional N for decomposition. Consequently, these residues have little effect on the N needs of potatoes. Legume residues from beans, peas, and alfalfa can release appreciable N during the following crop season that may not be reflected by the preplant soil test. This N is derived from the decomposition of both plant tops and nodulated root systems.

NITROGEN FROM MANURES - Soils in which potatoes are grown rarely receive animal manures or lagoon wastes. Nutrient contributions from these sources should also be taken into consideration when estimating available N for the next season. Manures can preclude the need for any fertilizer, depending on the rate applied and their nutrient composition. Manures can vary appreciably depending on the animal, how the manure is processed, and the kind and extent of bedding material. For the most accurate estimate of fertilizer equivalent values, the manure should be analyzed for its nutrient content.

IRRIGATION WATER - Irrigation waters derived from deep wells are generally low in N. More shallow wells can have significant levels of nitrogen because of leaching of nitrogen from impacts from commercial fertilizer use, animal waste, and improperly functioning septic systems. Irrigation waters from most districts are also low in N when diverted from its source. Background levels of N from original sources are generally about 2 parts per million (ppm). The more return flow included in diverted water sources, the higher the N content. Return flows may include N dissolved when irrigation waters pass through fields high in residual or recently added fertilizer N as well as from soluble fertilizer N applied with the irrigation water. Most irrigation districts should know the N content of the water they divert. Contact them for this information to determine the levels of N added with your irrigation water. However, since irrigation water N levels are influenced by upstream management, if you use irrigation water that receives runoff after it is diverted, only a water test can accurately evaluate the N added with irrigation waters. For each ppm or milligrams per liter (mg/L) of N reported in the water sample, multiply by 2.7 to get the N added per acre foot of water applied. For example, if the water sample contained 10 ppm of N, 3 acre feet of water applied would be the equivalent of 81 pounds of N per acre. Typically, of the water applied with furrow irrigation only 50 percent is retained on the field and the rest runs off the end. The net retention of N applied with furrow irrigation would, therefore, be about half of the water applied or about 40 pounds per acre in this example. If more or less of the irrigation water is retained with each wetting, then growers should adjust the water N contribution accordingly. Excessive irrigation by any method reduces N availability to potatoes. Additional N may be needed under these conditions. Growers should not use aqua or anhydrous N through a sprinkler irrigation system. Water running soluble N sources with a furrow irrigation system can be an effective means of adding N. Two limitations of this practice are that (1) the application of the N with this method may not be as uniform as desired and (2) runoff containing the N may contaminate downstream surface waters. Growers can minimize the loss of N by shutting off the injection unit before the irrigation water reaches the end of the furrow. This practice should not substitute for careful consideration of N needs while N can be side dressed.

CALCULATION OF N APPLICATION RATES - To calculate the fertilizer N application rate, the following equation is used: Fertilizer application rate (deficit) or Over application of Nitrogen = (Total N required to produce a given yield) - (Mineralizable N) - (Inorganic N measured by the soil test) - (previous crop/residue management) - (Manure Nitrogen) -(Irrigation Water)

TIMING OF NITROGEN APPLICATION - Nitrogen fertilizer recommendations are for Russet Burbank potatoes grown on sandy loam soils. Adjustments are made for very sandy soils (add 30 lb N/acre) and silt loam soils (subtract 40 lb N/acre) to account for differences in nitrogen mineralization rates and nitrogen use efficiency. To maximize yield and quality, growers should

aim to have about 40 to 45% of their total N supply applied by row closure. Nitrogen applications made during tuber bulking should be guided by petiole sampling to maintain at least 15,000 ppm N03-N in the fourth petiole from the growing tip. Excess levels of soil N at or before tuberization can delay tuber growth, reduce yields and lower tuber specific gravity. Excess N in late summer and fall can delay maturity of the tubers. This delayed tuber maturity can adversely affect tuber storability and quality. The N needs of the potato crop are best met by split-application of N fertilizer. This involves applying lower rates of N fertilizer preplant and at planting, with the remainder of the crop's N needs applied with the irrigation water. Some cropping systems - for example, furrow irrigation - make it difficult to apply N fertilizer and get efficient plant uptake. Under these conditions most of the crop N needs are applied to the soil before planting. Nitrogen applied with irrigation water is an effective way to supplement the crop during the growing season. Do not use aqua or anhydrous ammonia in sprinkler system applications. Applications through a sprinkler system are not foliar fertilization.

PHOSPHORUS (P)

Potato plants need phosphorus for plant growth and will respond to P fertilizer if the soil test concentration is low. Phosphorus soil test for potatoes is based on an extraction with sodium bicarbonate. Soil samples for a phosphorus soil test should be taken from 0- to 12-inch depths. This depth of sampling is critical to achieve an accurate soil test P level. Deviation in sampling depth from the 12-inch depth may drastically alter soil test results. Phosphorus is immobile in soil and therefore does not move from where it is placed. Applied P fertilizer must be mixed into the seedbed before planting for best results. Banding P fertilizer along side plants has not been as effective as P fertilizer that has been broadcast and incorporated. Eroded or scraped areas, commonly referred to as "white soil" areas, may be low in available P because of its high content of "free lime." These areas should be tested and fertilized separately. To compensate for low P availability when free lime is present in the soil, rates of P are increased with increasing levels of free lime. Total phosphorus concentrations should be kept above 0.22% in the fourth petiole during tuber bulking.

POTASSIUM (K)

Potatoes require high levels of available potassium (K). Potassium is relatively immobile in the soil. For best results, K fertilizers should be applied preplant and mixed into the seedbed. Banding beside the plants has been used successfully but is not as effective as K fertilizer which has been broadcast and incorporated. Potassium fertilizer applications reduce specific gravity of harvested tubers. Potassium chloride fertilizer (KCl or muriate of potash) lowers specific gravity of tubers more than potassium sulfate fertilizer (K2SO4 or sulfate of potash). Growers should avoid over-fertilization of potatoes with K fertilizers. When specific gravity of tubers is important, potassium sulfate is the preferred K fertilizer source. Total potassium concentrations should be kept above 7.0% in the fourth petiole during tuber bulking.

SULFUR (S)

Potatoes generally do not respond to sulfur (S) fertilization. Sulfur response is most likely to occur in sandy soils and in areas where irrigation water sources are low in S. Water low in S includes mountain streams and some well waters. The more irrigation return-flow in the water source the greater the amount of dissolved, plant-available sulfate (S04) form. Elemental sulfur is not recommended because it is not immediately available to plants. Elemental sulfur will require several months from time of application until it is converted to plant-available form.

MICRONUTRIENTS
1) "Shotgun" application of micronutrients - I.e. complete mixes containing boron (B), copper (Cu), iron (Fe), manganese (Mn) and zinc (Zn) - "for insurance" are not recommended since these elements have not been shown to give an economical response. Soil tests for individual micronutrients are available and concentrations in the 0- to 1-inch soil sample are: B = 0.5 ppm, Cu = 0.2 ppm, Fe = 4.0 ppm, Mn = 2.0 ppm, Zn = 0.5 ppm. Critical concentrations represent values below which a response from the application of that micronutrient may be obtained.

2) Zinc deficiencies have not been widespread on potatoes although some crops in certain areas of southern Idaho do show a Zn deficiency. When the soil test for Zn is below the critical concentration or where land leveling or erosion has exposed white subsoil containing free lime, apply Zn fertilizer at a rate which will supply 10 pounds of Zn per acre or equivalent. This amount of Zn should be sufficient for 4 to 6 years of crop production.

GENERAL COMMENTS
1. The P, K, and Zn nutritional status of the plant should also be monitored during the growing season. The same petiole sample used for N03-N concentrations can also be used for this purpose. Guidelines for adequate concentrations of these and other nutrients in the petiole can be obtained from your county agricultural Extension agent, consultant, or fieldman.

2. Fertilizer materials containing P, K and Zn should be thoroughly incorporated into the root zone. These materials can be effectively applied in the fall.

Sugarbeets, S-ID, Irrigated
UNIVERSITY OF IDAHO INFORMATION

SOIL SAMPLING
Environmental concerns have brought nutrient management in agriculture under increased scrutiny. A goal of sound nutrient management is to maximize the proportion of applied nutrients that is used by the crop (nutrient use efficiency). Soil sampling is a best management practice (BMP) for fertilizer management that will help improve nutrient use efficiency and protect the environment.
SOIL SAMPLING is also one of the most important steps in a sound crop fertilization program. Poor soil sampling procedures account for more than 90 percent of all errors in fertilizer recommendations based on soil tests. Soil test results are only as good as the soil sample. Once you take a good sample, you must also handle it properly for it to remain a good sample. A good soil testing program can be divided into four operations: (1) taking the sample, (2) analyzing the sample, (3) interpreting the sample analyses, and (4) making the fertilizer recommendations.
GOOD SOIL SAMPLING starts with recognizing the soil fertility varies among and within fields. Soil sampling for plant nutrients should be done one to two weeks before the anticipated fertilizer application or planting date. To adequately characterize nutrient availability in a field, each soil sample submitted to a lab should consist of a composite of at least 20 individual subsamples representing the field's major soil characteristics. To determine Nitrogen availability, separate soil samples should be collected from the 0- to 12-inch depth and the 12- to 24-inch

depth. All other nutrients require only a 0- to 12-inch sample. Samples should not be collected from poor production areas or wet spots unless specific recommendations are desired for those areas.
THE SUBSAMPLES should be thoroughly mixed in a clean plastic bucket, keeping the first-foot samples separate from the second-foot samples. About one pound of soil from each depth's composite sample should then be placed in a separate plastic-lined sampling bag. All requested information including grower's name, field identification, date, and previous crop should be provided with the sample. Soil samples should not be stored under warm conditions because microbial activity can change the extractable nitrate (NO3-N) and (NH4-N) concentrations. Accordingly, soil samples should be submitted to a local soil testing lab as quickly as possible to provide for accurate soil testing results. IF SIZABLE AREAS OF THE FIELD DIFFER in productivity or visual appearance, crop yield and quality the field may benefit from variable-rate fertilization. Current site-specific soil sampling and fertilizer application technologies provide useful options for providing optimal nutrient availability throughout the field. Information on soil nutrient mapping and variable-rate fertilization can be obtained by contacting an extension soil fertility specialist, your local county ag extension educator, crop advisor, or ag consultant. For more detailed information about soil sampling, refer to EXT 704, (Soil Sampling).

FERTILIZER GUIDE

NITROGEN (N)
Nitrogen rates depend upon some of the following factors: previous crop, past fertilizer use, soil type and leaching hazard and realistic yield goal for the grower and the area. Controlling the amount of N available to the sugarbeet is critical in producing high beet tonnage with high sugar percentage. Nitrogen in excess can reduce sugar percentage and gross income per acre.

TOTAL N REQUIREMENTS BASED ON POTENTIAL YIELD
Fertilizer N rates should be used which correspond to the yield growers can reasonably expect under their soil and management conditions. The historical sugarbeet yield obtained by a grower in a specific field or area generally provides a fair approximation of yield potential given a grower's traditional crop management. Projected changes in crop management (i.e. improved variety, better disease and weed control) designed to appreciably increase production may require adjustment of yield potential upward.

AVAILABLE NITROGEN
Available N in the soil includes mineralizable N (released from organic matter during the growing season) inorganic N as nitrate (N03-N) and ammonium (NH4-N), and N credits from previous cropping or manures. Each component of available N must be estimated for accurate determination of optimum fertilizer N rates.

MINERALIZABLE NITROGEN - Soils vary in their capacity to release N from organic matter during the growing season. The amount of N released depends on such factors as soil type, soil moisture, soil temperature, previous crop, and the history of fertilizer N applied. Soils that retain moisture tend to mineralize more N than soils such as sandy loams, which dry out more rapidly. Mineralization of N is limited by cooler soil temperatures that limit soil biological activity. While soil organic matter content is frequently used to estimate annual mineralizable N

contributions, in southern Idaho irrigated soils organic matter does not accurately predict the amount of N that is mineralized.

INORGANIC NITROGEN - Residual soil inorganic N (N03, NH4) can be evaluated most effectively with a soil test. Accurate soil sampling and analysis in a high value crop like sugarbeets is one of the best investments that can be made and is highly recommended. A soil test measures the residual N carryover from the previous crop and provides the necessary information for accurate fertilizer application. Nitrate nitrogen (NO3-N) is mobile in the soil. Soil samples, therefore, should be taken from the 0- to 12-inch and 12- to 24-inch soil depths or the effective root zone. These depths should be sampled and kept separate for analysis. If the first foot is low in N (less than 5 ppm) but the sum of the first 2 feet is adequate, 20 to 40 pounds of N per acre may be applied to provide N until root growth is sufficient to reach the N in the second foot (about 4 to 5 weeks after emergence).

NITROGEN FROM PREVIOUS CROP RESIDUES - Nitrogen associated with decomposition of previous crop residues should also be considered when estimating available N. Residues that require additional N for decomposition include cereal straw and mature corn stalks. Research has shown that 15 pounds of additional N are needed per ton of straw returned to the soil, up to a maximum of 50 pounds. For more information on compensating for cereal residues, refer to CIS 825, (Wheat Straw Management and Nitrogen Fertilizer Requirements). Non-cereal residues (potatoes, sugarbeets, onions, beans, mint, and sweet corn) generally do not require additional N for decomposition. Consequently, these residues have little effect on the N needs of sugarbeets. Legume residues from beans, peas, and alfalfa can release appreciable N during the following crop season that may not be reflected by the preplant soil test. This N is derived from the decomposition of both plant tops and nodulated root systems.

NITROGEN FROM MANURES - Very few soils used for sugarbeets receive animal manures or lagoon wastes. Nutrient contributions from these sources should also be taken into consideration when estimating available N for the next season. Manures can preclude the need for any fertilizer, depending on the rate applied and their nutrient composition. Manures can vary appreciably depending on the animal, how the manure is processed, and the kind and extent of bedding material. For the most accurate estimate of fertilizer equivalent values, the manure should be analyzed for its nutrient content.

IRRIGATION WATER - Irrigation waters derived from deep wells are generally low in N. More shallow wells can have significant levels of nitrogen because of leaching of nitrogen from impacts from commercial fertilizer use, animal waste, and improperly functioning septic systems. Irrigation waters from most districts are also low in N when diverted from its source. Background levels of N from original sources are generally about 2 parts per million (ppm). The more return flow included in diverted water sources, the higher the N content. Return flows may include N dissolved when irrigation waters pass through fields high in residual or recently added fertilizer N as well as from soluble fertilizer N applied with the irrigation water. Most irrigation districts should know the N content of the water they divert. Contact them for this information to determine the levels of N added with your irrigation water. However, since irrigation water N levels are influenced by upstream management, if you use irrigation water that receives runoff after it is diverted, only a water test can accurately evaluate the N added with irrigation waters.

For each ppm or milligrams per liter (mg/L) of N reported in the water sample, multiply by 2.7 to get the N added per acre foot of water applied. For example, if the water sample contained 10 ppm of N, 3 acre feet of water applied would be the equivalent of 81 pounds of N per acre. Typically, of the water applied with furrow irrigation only 50 percent is retained on the field and the rest runs off the end. The net retention of N applied with furrow irrigation would, therefore, be about half of the water applied or about 40 pounds per acre in this example. If more or less of the irrigation water is retained with each wetting, then growers should adjust the water N contribution accordingly. Excessive irrigation by any method reduces N availability to sugarbeets. Additional N may be needed under these conditions. Growers should not use aqua or anhydrous N through a sprinkler irrigation system. Water running soluble N sources with a furrow irrigation system can be an effective means of adding N. Two limitations of this practice are that (1) the application of the N with this method may not be as uniform as desired and (2) runoff containing the N may contaminate downstream surface waters. Growers can minimize the loss of N by shutting off the injection unit before the irrigation water reaches the end of the furrow. This practice should not substitute for careful consideration of N needs while N can be side dressed.

CALCULATION OF N APPLICATION RATES - To calculate the fertilizer N application rate, the following equation is used: Fertilizer application rate (deficit) or Over application of Nitrogen = (Total N required to produce a given yield) - (Mineralizable N) - (Inorganic N measured by the soil test) - (previous crop/residue management) - (Manure Nitrogen) - (Irrigation Water)

TIMING OF NITROGEN APPLICATION - Nitrogen fertilizers can be fall applied on loam, silt loam, and clay soils. Winter leaching of N from the soil profile can be reduced to a minimum by applying N in the ammonium or urea forms when soil temperature is below 45 F. Greater efficiency may be obtained from preplant application in spring or by side dressing before July 1. Nitrogen applied after July 1 stimulates vegetative growth, lowers sugar percentage and extractability and contributes little to total sugar yield.
On sandy soils where over-irrigation and leaching of nitrogen are likely, side dressing or applications of nitrogen through irrigation water before July 1 are suggested for at least half of the rate used. Split N applications often increase nitrogen use efficiency, sugarbeet tonnage, and sugar production. Research conducted at the Kimberly R & E Center during 1992-1994 showed that split N fertilization generally increased estimated recoverable sugar and net economic return/acre compared to applying all N preplant. However, growers need to avoid applying significant amounts of N late in the growing season, which can stimulate top growth at the expense of sugar production. The practice of placing starter fertilizer with the seed is not recommended because it will reduce germination and result in poor stands.

PHOSPHORUS (P)
Sugarbeets will respond to P fertilizer if soil test levels are low. The soil test is based on extractable P present in the upper 12 inches of the soil. Phosphorus should be plowed down or applied to rough-plowed ground and worked into the seedbed. High rates should not be placed with or immediately below the seed. Side dressing is recommended when late applications are necessary.

POTASSIUM (K)
Sugarbeets require less K than potatoes or alfalfa but will respond to K fertilization if soil test levels are low. The soil test is based on the extractable K present in the upper 12 inches of the soil. Potassium should be incorporated into the seedbed.

SULFUR (S)
Sulfur is generally not deficient in the major sugarbeet-growing region of Idaho where the Snake River is the source of irrigation water. In areas known to be S deficient or where the soil test is less than 8 ppm in the 0- to 12-inch soil sample, apply 30 pounds S per acre.

MICRONUTRIENTS
Deficiencies of Zn are not widespread in sugarbeets. When the soil test for Zn is below 0.6 ppm in the upper 12 inches of the soil, or where land leveling has exposed white, limey subsoil, apply Zn fertilizer at a rate that supplies 10 pounds of zinc per acre or equivalent. "Shotgun" applications of micronutrient mixtures "for insurance" have not been necessary or economical; therefore, they are not recommended.

GENERAL COMMENTS
Uniform plant populations (110 to 130 plants per 100 feet of row) after thinning have produced the highest root yields and sugar percentages.

Barley, Spring, S-ID
UNIVERSITY OF IDAHO INFORMATION

SOIL SAMPLING
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SOIL SAMPLING is also one of the most important steps in a sound crop fertilization program. Poor soil sampling procedures account for more than 90 percent of all errors in fertilizer recommendations based on soil tests. Soil test results are only as good as the soil sample. Once you take a good sample, you must also handle it properly for it to remain a good sample. A good soil testing program can be divided into four operations: (1) taking the sample, (2) analyzing the sample, (3) interpreting the sample analyses, and (4) making the fertilizer recommendations.
GOOD SOIL SAMPLING starts with recognizing the soil fertility varies among and within fields. Soil sampling for plant nutrients should be done one to two weeks before the anticipated fertilizer application or planting date. To adequately characterize nutrient availability in a field, each soil sample submitted to a lab should consist of a composite of at least 20 individual subsamples representing the field's major soil characteristics. To determine Nitrogen availability, separate soil samples should be collected from the 0- to 12-inch depth and the 12- to 24-inch depth. All other nutrients require only a 0- to 12-inch sample. Samples should not be collected from poor production areas or wet spots unless specific recommendations are desired for those areas.

THE SUBSAMPLES should be thoroughly mixed in a clean plastic bucket, keeping the first-foot samples separate from the second-foot samples. About one pound of soil from each depth's composite sample should then be placed in a separate plastic-lined sampling bag. All requested information including grower's name, field identification, date, and previous crop should be provided with the sample. Soil samples should not be stored under warm conditions because microbial activity can change the extractable nitrate (NO3-N) and (NH4-N) concentrations. Accordingly, soil samples should be submitted to a local soil testing lab as quickly as possible to provide for accurate soil testing results. IF SIZABLE AREAS OF THE FIELD DIFFER in productivity or visual appearance, crop yield and quality the field may benefit from variable-rate fertilization. Current site-specific soil sampling and fertilizer application technologies provide useful options for providing optimal nutrient availability throughout the field. Information on soil nutrient mapping and variable-rate fertilization can be obtained by contacting an extension soil fertility specialist, your local county ag extension educator, crop advisor, or ag consultant. For more detailed information about soil sampling, refer to EXT 704, (Soil Sampling).

FERTILIZER GUIDE

NITROGEN (N)
Nitrogen application rates depend upon previous crops, previous N fertilizer additions, and release of N from organic matter, soil type, irrigation management and length of growing season. Enough N fertilizer should be applied to obtain maximum economic yield without significantly increasing protein content of standard barley varieties.
TOTAL N REQUIREMENTS BASED ON POTENTIAL YIELD - Fertilizer N rates should be used which correspond to the yield growers can reasonably expect under their soil and management conditions. The historical barley yield obtained by a grower in a specific field or area generally provides a fair approximation of yield potential given a grower's traditional crop management. Projected changes in crop management (i.e. improved variety, better disease and weed control) designed to appreciably increase production may require adjustment of yield potential upward. Research has shown that the available N required to produce a good barley yield depends on a variety of crop management practices. Factors such as weed, insect and disease control as well as irrigation, planting date and soil type can influence the N required by barley for maximum yield.
AVAILABLE NITROGEN - Available N in the soil includes mineralizable N (released from organic matter during the growing season) inorganic N as nitrate (N03-N) and ammonium (NH4-N), and N credits from previous cropping or manures. Each component of available N must be estimated for accurate determination of optimum fertilizer N rates.
MINERALIZABLE NITROGEN - Soils vary in their capacity to release N from organic matter during the growing season. The amount of N released depends on such factors as soil type, soil moisture, soil temperature, previous crop, and the history of fertilizer N applied. While soil organic matter content is frequently used to estimate annual mineralizable N contributions, in southern Idaho irrigated soils organic matter does not accurately predict the amount of N that is mineralized.
INORGANIC NITROGEN - Residual soil inorganic N (N03, NH4) can be evaluated most effectively with a soil test. Soil samples should be collected in foot increments to a depth of two feet, unless roots are restricted by dense soil layers or high water tables. Ammonium is generally

low in preplant soil samples and thus contributes little to available N. However, it can be as high as or higher than N03-N. NH4-N should be determined along with N03-N, especially when there is reason to expect the presence of appreciable NH4-N, such as recent ammonium N fertilizer applications. Soil samples should be collected before seeding in the spring to represent the area to be fertilized.

NITROGEN FROM PREVIOUS CROP RESIDUES - Nitrogen associated with decomposition of previous crop residues should also be considered when estimating available N. Residues that require additional N for decomposition include cereal straw and mature corn stalks. Research has shown that 15 pounds of additional N are needed per ton of straw returned to the soil, up to a maximum of 50 pounds. For more information on compensating for cereal residues, refer to CIS 825, (Wheat Straw Management and Nitrogen Fertilizer Requirements). Row crop residues (potatoes, sugarbeets, and onions) generally do not require additional N for decomposition. Consequently, these residues have little effect on the N needs of barley. Legume residues from beans, peas, and alfalfa can release appreciable N during the following crop season that may not be reflected by the preplant soil test. This N is derived from the decomposition of both plant tops and nodulated root systems.

NITROGEN FROM MANURES - Soils in which barley is grown occasionally receive animal manures or lagoon wastes. Nutrient contributions from these sources should also be taken into consideration when estimating available N for the next season. Manures can preclude the need for any fertilizer, depending on the rate applied and their nutrient composition. Manures can vary appreciably depending on the animal, how the manure is processed, and the kind and extent of bedding material. For the most accurate estimate of fertilizer equivalent values, the manure should be analyzed for its nutrient content.

IRRIGATION WATER - Irrigation waters derived from deep wells are generally low in N. More shallow wells can have significant levels of nitrogen because of leaching of nitrogen from impacts from commercial fertilizer use, animal waste, and improperly functioning septic systems. Irrigation waters from most districts are also low in N when diverted from its source. Background levels of N from original sources are generally about 2 parts per million (ppm). The more return flow included in diverted water sources, the higher the N content. Return flows may include N dissolved when irrigation waters pass through fields high in residual or recently added fertilizer N as well as from soluble fertilizer N applied with the irrigation water. Most irrigation districts should know the N content of the water they divert. Contact them for this information to determine the levels of N added with your irrigation water. However, since irrigation water N levels are influenced by upstream management, if you use irrigation water that receives runoff after it is diverted, only a water test can accurately evaluate the N added with irrigation waters. For each ppm or milligrams per liter (mg/L) of N reported in the water sample, multiply by 2.7 to get the N added per acre foot of water applied. For example, if the water sample contained 10 ppm of N, 3 acre feet of water applied would be the equivalent of 81 pounds of N per acre. Typically, of the water applied with furrow irrigation only 50 percent is retained on the field and the rest runs off the end. The net retention of N applied with furrow irrigation would, therefore, be about half of the water applied or about 40 pounds per acre in this example. If more or less of the irrigation water is retained with each wetting, then growers should adjust the water N contribution accordingly. Excessive irrigation by any method reduces N availability to barley. Additional N may be needed under these conditions. Growers should not use aqua or anhydrous N through a sprinkler irrigation system. Water running soluble N sources with a furrow irrigation system can be an effective means of adding N. Two limitations of this practice are that (1) the

application of the N with this method may not be as uniform as desired and (2) runoff containing the N may contaminate downstream surface waters. Growers can minimize the loss of N by shutting off the injection unit before the irrigation water reaches the end of the furrow. This practice should not substitute for careful consideration of N needs while N can be side dressed.
CALCULATION OF N APPLICATION RATES - To calculate the fertilizer N application rate, the following equation is used: Fertilizer application rate (deficit) or Over application of Nitrogen = (Total N required to produce a given yield) - (Mineralizable N) - (Inorganic N measured by the soil test) - (previous crop/residue management) - (Manure Nitrogen) - (Irrigation Water)
TIMING OF NITROGEN APPLICATION - Nitrogen (N) applied in the spring during seedbed preparation will be used more efficiently by the barley plant, especially on sandy soils in areas having heavy winter precipitation. Nitrogen applied to the crop after the boot stage and application of excessive rates of N can result in undesirably high protein levels and may also increase lodging.

PHOSPHORUS (P)
Irrigated spring barley requires adequate soil P for maximum economic yields. Soil testing for P provides a reasonable estimate of available P. Optimum P fertilizer rates depend on both soil test P and soil lime content. Plant maturity may be delayed when soil test P concentrations are low and free lime content is greater than 10 percent. However, grain yields are usually unaffected when the growing season is sufficient. When banding an ammonium P source (11-52-0) at rates above 20 lb per acre, separate the seed and the fertilizer material by two inches to avoid seedling damage from salts. For a detailed discussion of banding refer to PNW 283, (No-Till and Minimum Tillage Farming: Fertilizer Band Location for Cereal Root Access). Incorporate P fertilizer during seedbed preparation. Solution P, such as ammonium polyphosphate, may be applied through a sprinkler irrigation system. Check the compatibility of the irrigation water and the P material. If precipitates form, decrease the fertilizer concentration or increase the injection time.

POTASSIUM (K) AND CHLORIDE (Cl)
Soil test K is a reasonable indication of available K in southern Idaho soils. Incorporate K during seedbed preparation. Potassium chloride increases yields where take-all root rot is prevalent, regardless of the soil test K level. This response is due primarily to the chloride component. Barley yield may also increase when not infected with take-all if extractable soil Cl is below 30 lb per acre in the first two feet. Low soil Cl has been associated with physiological leaf spot. Soil Cl can be measured with a soil test. If soil test Cl is less than 8 ppm for the first two feet combined, apply 40 lb Cl per acre in the form of potassium chloride. Do not drill band Cl with the seed as germinating seed may be injured by excessive salts.

SULFUR (S)
Sulfur (S) fertilizer needs will vary depending on soil texture, soil organic matter level, leaching losses and sulfur content of irrigation water. Areas irrigated with Snake River water should not experience a shortage of S. High rainfall mountain valley and foothill areas of southern Idaho are most likely to respond to S fertilizer applications. A soil testing less than 8 ppm sulfate-S in the 0- to 12-inch soil depth and soils in areas known to be deficient in S should receive 20 to 40 pounds S/acre.

MICRONUTRIENTS
Micronutrients have not been shown to limit barley production in Southern Idaho. "Shotgun" applications of micronutrient mixtures containing boron (B), copper (Cu), iron (Fe) and manganese (Mn) "for insurance" have not been shown to be economical and are not recommended.

GENERAL COMMENTS
Avoid a heavy first irrigation on spring-planted barley to prevent water-logging the soil which reduces tillering and increases nitrogen leaching losses.

The above fertilizer guidelines are based on relationships established between University of Idaho soil test and crop yield response research. In this research, crop response to fertilizers was evaluated at several sites where the response to fertilizer differed. The recommendations reflect the general or overall response to fertilizers at specific soil test values and the response in individual fields can differ appreciably from the general table recommendation. Some sites will require less than the general recommendation, other sites more. Unfortunately, the science has not developed to the point where the table recommendations can account for all the unknown variables influencing the effectiveness of applied fertilizers at individual sites. The table fertilizer recommendations can only be used as general guides rather than specific recommendations for each and every field.

Furthermore, soil variability can sharply reduce the accuracy composite soil test values for individual fields. That is why large contiguous areas within fields should be sampled separately when they are known to differ in crop growth or soil characteristics known to influence the response to fertilizer. But soil variability frequently does not occur conveniently in large areas that can be sampled separately or fertilized differently. The fertilizer recommendations in most cases do not account for this variability. Soil test based recommendations may be excessive in some field areas and inadequate in other areas of the same field. The recommendations then will be appropriate only to the degree that the composite soil test values for fields actually represent the field. Thus, for fields that are highly variable, the fertilizer recommendations should be considered conservative estimates of fertilizers needed. All the more reason to consider the table fertilizer recommendations as general guides rather than specific recommendations for each and every field.

The fertilizer rates suggested in the tables will support above average yields if other factors are not limiting production. Therefore the recommendations assume that good crop management practices will be used, i.e. insect, disease, and weed control. Nutrient requirements can be met using either commercial fertilizers or equivalent organic matter sources, such as manure or compost, provided their nutrient content and relative availability are known or can be estimated from published literature. Soil test based recommended rates will not be appropriate if the soil samples are improperly taken or do not represent the area to be fertilized. For nitrogen in particular, recommendations will be most accurate when crop history is taken into account and projected yields are reasonable estimates based on long term records.

General Comments:

- Over irrigation and nutrient loss is a hazard. Optimum irrigation management is necessary to meet crop water use needs and avoid loss of nutrients through leaching beyond the root zone and runoff with irrigation tail water.

- Nitrogen leaching is particularly a concern on sandy soils. Optimum management may require split Nitrogen applications to meet crop needs.

- Weed, insect, and disease control significantly influence the efficiency and effectiveness of your fertilizer applications and ultimately crop yield and farm profitability.

- Phosphorus, potassium, and zinc nutrients can be effectively fall-applied as they are not readily leached over winter.

- Phosphorus can be budgeted for a crop rotation.

- If you have questions regarding the interpretation of this information, please contact your Extension Agricultural agent, Crop consultant, or your commodity company fieldman.

- Both farm profitability and water quality can be improved with efficient nutrient use. The following are recommendations in nutrient management, which will optimize nutrient use for crop production while protecting water quality:

1) Avoid the application of nutrient sources in close proximity to streams, wetlands, drainage ditches, areas of very shallow soils, and sinkholes.

2) Accurately calibrate nutrient application equipment to insure that recommended rates are applied.

3) Nitrogen recommendations for many crops are based on yield goals for the crops. It is important to establish realistic yield goals for each field based upon historical yield data, county averages, and your management practices to avoid unnecessary fertilizer costs and minimize potential water quality impairments.