



February 25, 2009
Project No. 1082-101

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Mr. Jerry Sauter
Oregon Water Resources Department
725 Summer Street NE, Suite A
Salem, Oregon 97301-1271

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WATER RESOURCES DEPT
SALEM, OREGON

STORAGE PERMIT APPLICATION; SIX SHOOTER POND; SIX SHOOTER RANCH, WHEELER COUNTY, OREGON

Dear Mr. Sauter:

Enclosed please find a storage permit application, application map and two copies of the "*Report on General Construction & Configuration Aspects of the Six Shooter Dam & Reservoir*", December 19, 2008, Newton Consultants, Inc., for the existing Six Shooter Pond located on the Six Shooter Ranch, in Wheeler County, Oregon. Joel Clark, previously of the OWRD John Day office alerted Six Shooter Ranch personnel (Rob Williams) of the need to obtain a storage permit for this facility. The enclosed application and reports respond to this need.

The dam and pond were inspected by Randy Jones (Newton Consultants, Inc.) and me on September 17, 2008. The pond is about 7.5 acres in surface area and is impounded by an existing earth fill dam, 22 feet high at the maximum height. Storage is approximately 60 acre-feet. The area of the watershed upstream of the dam is about 347 acres.

Our research, including communications with relatives of prior ranch owners, indicates the pond was probably built prior to the 1960's. The observed condition of the dam is good. Some seepage was reflected in saturated soils in part of the downstream slope; however, seepage is very slow (no actual flow was observed) with clear water, through moderately to highly plastic clayey soil. Minimal erosion was noted in the outlet channel and no evidence of dam erosion by overtopping was observed. The facility has performed quite well considering its apparent age.

The enclosed report describes the project background, watershed, existing dam conditions, primary outlet works, emergency spillway, water use, conclusions and recommendations. The report also includes several figures and color aerial photographs with notations thereon regarding details of the project.

Communications to date relative to this application by Newton have been with the Pendleton OWRD office (June), George Robison, OWRD Dam Safety, and with you.

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Six Shooter Pond; Storage Permit Application

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Finally, we have enclosed a check in the amount of \$940 for the application fee.

We trust that the enclosed documents are sufficient for the OWRD to find that the application is complete and that processing can begin. Also, we are available for questions, discussion, or submittal of additional information if required to help move this application forward in a timely manner.

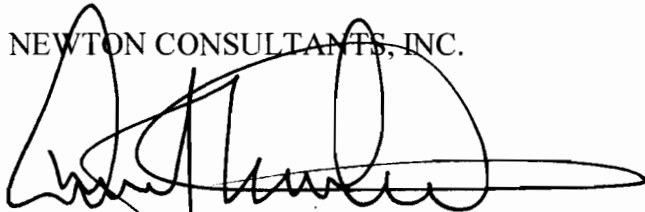
Randy Jones and I will be in Salem on March 2, 2009. Perhaps we can provide you with an overview of the project to assist you in gaining an understanding of the project.

Please contact me at (541) 504-9960 extension 211, or by e-mail at: dnewton@newtonconsultants.com if you have any questions.

Thank you for your help with this application.

Sincerely,

NEWTON CONSULTANTS, INC.



David J. Newton, P.E., C.E.G., C.W.R.E.
Principal Engineer & Engineering Geologist

- Enclosures:
1. Application for Permit to Store Water in a Reservoir & Application Map
 2. Two copies: *"Report on General Construction & Configuration Aspects of the Six Shooter Dam & Reservoir"*

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Oregon Water Resources Department
725 Summer Street NE, Suite A
Salem Oregon 97301-1266
(503) 986-0900
www.wrd.state.or.us

Application for a Permit to Store Water in a Reservoir (Standard Review)

Standard Review Process (ORS 537): You must use this form for any reservoir
storing more than 9.2 acre-feet *and* with a dam more than 10 feet high.

Use a separate form for each reservoir

Please type or print in dark ink. If your application is found to be incomplete or inaccurate, we will return it to you. If any requested information does not apply, insert "n/a". A summary of review criteria and procedures that are generally applicable to these applications is available at www.wrd.state.or.us/OWRD/PUBS/forms.shtml.

1. APPLICANT INFORMATION:

Applicant: Rob Williams
First Last

Mailing Address: 12993 SW Cornett Loop
Powell Butte Oregon 97753
City State Zip

Phone: 541 416-8111 541 416-1378
Home Work Other

*Fax: 541 447-4061 *Email Address: robeck@webformixair.com

I(We) make application for a permit to construct a reservoir and store the following described waters of
the State of Oregon. The name of the reservoir is Six Shooter Ranch Pond

2. SOURCE OF WATER for the proposed use: un-named tributary,
a tributary of Horseshoe Creek, a tributary of John Day River

Is the proposed use an enlargement of an existing dam/reservoir? ☐ Yes ☒ No

If the reservoir is not in channel of a stream, state how it is to be filled:

N/A - Existing reservoir is on Un-Named tributary of Horseshoe Creek, near its headwaters.
The watershed area upstream of the reservoir is approximately 347 acres in size.
Note: The reservoir is currently not permitted because it was built by previous owners before 1960.

For Department Use

App. No. R-87409 Permit No. _____ Date _____

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3. DAM HEIGHT AND COMPOSITION

The maximum height of the structure will be 22 feet above streambed or ground surface at the centerline of the crest of the dam.

Note: If your dam height is greater than or equal to 10.0' above land surface AND your reservoir will store equal to or greater than 9.2 acre-feet, engineered plans and specifications must be approved prior to storage of water.

The dam will be (check one): ☒ Earthfill ☐ Concrete ☐ Flash board ☐ Other

If "other" give description:

The earth fill dam is constructed and has functioned since before 1960. The top width is approximately 12.5 to 15 feet wide. Upstream slope is inclined at approximately 3 horizontal to 1 vertical, downstream slope inclined at approximately 1.5 horizontal to 1 vertical. See report "Report on General Construction & Configuration Aspects of the Six Shooter Dam & Reservoir", Dec. 2008, Newton Consultants, Inc.

4. PRIMARY OUTLET WORKS

Describe the location and the dimensions of the outlet conduit through the dam:

See attachment, Report on General Construction and Configuration Aspects of Six Shooter Dam and Reservoir. A wheel operated Guillotine-type slide gate is mounted on the downstream end of the outlet pipe extending through the dam near the base of dam embankment. Pipe type and diameter are unknown and not visible due to vegetation. Discharge observed during the September 17, 2008 site visit was approximately 0.5cfs. The outlet is located off-center of the dam, near the south abutment (see referenced report).

NOTE: Most dams across a natural stream channel will need an outlet conduit having a minimum diameter of 8 inches or greater.

5. EMERGENCY SPILLWAY

Describe the location and the dimensions of the spillway channel:

See attachment, Report on General Construction and Configuration Aspects of Six Shooter Dam and Reservoir. The spillway channel is approximately 11' wide and up to about 1' deep around north end of dam. Significant vegetation was observed in the channel during the inspection. The first channel segment from the pond is unlined and approximately 80' long and sloped at approximately 0.5%. The second segment steepens, is cobble-boulder lined, and connects the spillway channel to a natural drainage channel. The spillway appears to function; no evidence of historic dam over-topping or significant erosion was observed.

6. THE USE(s) of the impounded water will be:

The intended purpose of storing water at this location is for maintaining and enhancing local fish and wildlife and for recreation.

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7. **THE AMOUNT OF WATER** to be stored is: 60 acre-feet.
 The area submerged by the reservoir, when filled, will be 7.5 acres.

8. **PROJECT SCHEDULE** (List Month and Year)

Spillway modifications per referenced report begin
 Proposed date construction will begin: about June 15, 2009

Proposed date construction will be completed: Sept. 2009

Proposed date beneficial water use will begin: On-going (an existing structure)

9. **PROPERTY OWNERSHIP**

Do you own all the land where you propose to divert, transport, and use water?

☐ Yes (Please check appropriate box below then skip to section 10)

☐ There are no encumbrances

☐ This land is encumbered by easements, rights of way, roads or other encumbrances (please provide a copy of the recorded deed(s))

☒ No (Please check the appropriate box below)

☒ I have a recorded easement or written authorization permitting access.

☐ I do not currently have written authorization or easement permitting access.

Written authorization or an easement is not necessary, because the only
☐ affected lands I do not own are state-owned submersible lands, and this application is for irrigated and/or domestic use only (ORS 274.040).

You must provide the legal description of: (1) the property from which the water is to be diverted, (2) any property crossed by the proposed ditch, canal or other work, and (3) any property on which the water is to be used as depicted on the map. Water diverted from Tax Lot 500, SE1/4, SW1/4, Sec. 27, T10S, R23E W.M. Wheeler County. Water Use in Pond SW1/4 - SE1/4, SE1/4 - SW1/4, Sec. 27 and NE1/4 - NW1/4, Sec 34 and NW1/4 - NE1/4, Sec 34.

List the names and mailing addresses of all affected landowners*

Thomas Atwood is the current owner of record. The applicant is the managing partner of Robeck Enterprises, LLC that manages the property. Robeck Enterprises retains and is given all land management and financial decisions affecting the property. See attached documentation, Wheeler County Ownership information and Property Description from Amerititle.

* Attach additional sheet(s) if necessary.

10. MAP REQUIREMENTS The Department cannot process your application without accurate information showing the source of water and location of water use. You must include a map with this application form that clearly indicates the township, range, section and quarter/quarter section of the proposed reservoir location and place of use. The map must provide tax lot numbers. See the map guidelines sheet for detailed map specifications.

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Storage Water/3

WATER RESOURCES DEPT
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11. SIGNATURE

By my signature below I confirm that I understand:

- I am asking to use water specifically as described in this application.
- Evaluation of this application will be based on information provided in the application packet.
- I cannot legally use water until the Water Resources Department issues a permit to me.
- If I get a permit, I must not waste water.
- If development of the water use is not according to the terms of the permit, the permit can be canceled.
- The water use must be compatible with local comprehensive land use plans.
- Even if the Department issues a permit, I may have to stop using water to allow senior water right holders to get water to which they are entitled.

I certify that the information I have provided in this application is an accurate representation of the proposed water use and is true and correct to the best of my knowledge:

Applicant: Robert Nathan 3-4-09
Signature (If more than one applicant, all must sign.) Date

Before you submit your application be sure to:

- Answer each question completely.
- Attach a legible map that includes township, range, section, quarter/quarter and tax lot.
- Include a Land Use Information Form or receipt stub signed by a local official.
- Include the legal description of all the property involved with this application. You may include a copy of your deed land sales contract or title insurance policy to meet this requirement.
- Include a check payable to the Oregon Water Resources Department for the appropriate amount. The Department's fee schedule can be found at www.wrd.state.or.us or call (503) 986-0900.

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Wheeler County Ownership Information (2/26/09)

Thomas Atwood:
T10SR23E Tax Lot 500

=====
Account Number : 1308
Centroid : 10S23E000050000
=====

04/15/02 020138
04/19/02 020144
11/18/04 040433
02/02/05 050041
W.D. 01/18/07 070014
EASEMENT 03/30/07 070111
07/05/07 070249
070250
070251
070252
070253
070254
Q.C. 07/11/07 070361
070362
070363
070364
HUNTING RIGHTS Q.C. 07/12/07 070268
Hunting Rights B.S. 11/26/07 070438
P.R.D. 11/26/07 070439
B.S. 08/08/08 20080267

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EXHIBIT B
(New Six Shooter)

Property description
from Amerititle (2/26/09)

Located in WHEELER COUNTY, OREGON:

TRACT I

Township 10 South, Range 22 East of the Willamette Meridian:

- Section 23: SE $\frac{1}{4}$, SAVE AND EXCEPT a tract described as follows: Beginning at the Northwest corner of the NW $\frac{1}{4}$ SE $\frac{1}{4}$, running thence South $\frac{1}{8}$ mile; thence Northeasterly to the Northeast corner of said forty; thence West $\frac{1}{4}$ mile to the place of beginning.
- Section 24: All.
- Section 25: All, EXCEPT SE $\frac{1}{4}$ NW $\frac{1}{4}$.
- Section 26: NE $\frac{1}{4}$ NE $\frac{1}{4}$.
- Section 36: All.

Township 10 South, Range 23 East of the Willamette Meridian:

- Section 17: SW $\frac{1}{4}$; W $\frac{1}{2}$ SE $\frac{1}{4}$.
- Section 18: E $\frac{1}{2}$ SW $\frac{1}{4}$; SE $\frac{1}{4}$.
- Section 19: All, (fractional).
- Section 20: W $\frac{1}{2}$; W $\frac{1}{2}$ NE $\frac{1}{4}$.
- Section 29: N $\frac{1}{2}$ NW $\frac{1}{4}$; SE $\frac{1}{4}$ NW $\frac{1}{4}$; NW $\frac{1}{4}$ NE $\frac{1}{4}$; SW $\frac{1}{4}$; W $\frac{1}{2}$ SE $\frac{1}{4}$.
- Section 30: All, (fractional).
- Section 31: All, (fractional).
- Section 32: NW $\frac{1}{4}$; W $\frac{1}{2}$ SW $\frac{1}{4}$.

Township 11 South, Range 22 East of the Willamette Meridian:

- Section 1: Lot 1; SE $\frac{1}{4}$ NE $\frac{1}{4}$; E $\frac{1}{2}$ SE $\frac{1}{4}$; SW $\frac{1}{4}$ SW $\frac{1}{4}$.
- Section 11: The East 660 feet thereof, Except the NE $\frac{1}{4}$ NE $\frac{1}{4}$.
- Section 12: W $\frac{1}{2}$; W $\frac{1}{2}$ E $\frac{1}{2}$.
- Section 14: SE $\frac{1}{4}$ NE $\frac{1}{4}$; E $\frac{1}{2}$ SE $\frac{1}{4}$.
- Section 23: The East 660 feet of the N $\frac{1}{2}$.

Township 11 South, Range 23 East of the Willamette Meridian:

- Section 5: W $\frac{1}{2}$ W $\frac{1}{2}$.
- Section 6: All, (fractional).

TRACT II

Township 10 South, Range 23 East of the Willamette Meridian:

- Section 10: That part of the SW $\frac{1}{4}$ lying West of the centerline of the Richmond County Road No. 4.
- Section 14: That part of the SW $\frac{1}{4}$ lying West of the centerline of the Richmond County Road No. 4.
- Section 15: That part of the W $\frac{1}{2}$ lying West of the centerline of the Richmond County Road No. 4.
- Section 16: SE $\frac{1}{4}$; SW $\frac{1}{4}$ NE $\frac{1}{4}$.
- Section 17: SE $\frac{1}{4}$ SE $\frac{1}{4}$.
- Section 20: E $\frac{1}{2}$ NE $\frac{1}{4}$; SE $\frac{1}{4}$.
- Section 21: All.
- Section 22: All.
- Section 23: That part lying West of the centerline of the Richmond County Road No. 4.

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- Section 24: S $\frac{1}{2}$ SW $\frac{1}{4}$, SAVE AND EXCEPT a tract described as follows: Beginning at the Northeast corner of said S $\frac{1}{2}$ SW $\frac{1}{4}$; thence South 55 degrees West a distance of 1436.00 feet, more or less to the centerline of the Richmond County Road No. 4, thence Northwesterly along said centerline to the North line of said S $\frac{1}{2}$ SW $\frac{1}{4}$; thence East along said North line to the point of beginning.
- Section 25: W $\frac{1}{2}$ W $\frac{1}{2}$; Those parts of the NE $\frac{1}{4}$ SW $\frac{1}{4}$ and the SE $\frac{1}{4}$ NW $\frac{1}{4}$ and of the S $\frac{1}{2}$ S $\frac{1}{2}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$ lying West of the centerline of the Richmond County Road No. 4; N $\frac{1}{2}$ S $\frac{1}{2}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$; N $\frac{1}{2}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$.
- Section 26: All, EXCEPT SE $\frac{1}{4}$ NW $\frac{1}{4}$.
- Section 27: All.
- Section 28: N $\frac{1}{2}$; N $\frac{1}{2}$ SW $\frac{1}{4}$; SW $\frac{1}{4}$ SW $\frac{1}{4}$; E $\frac{1}{2}$ SE $\frac{1}{4}$.
- Section 29: S $\frac{1}{2}$ NE $\frac{1}{4}$; E $\frac{1}{2}$ SE $\frac{1}{4}$.
- Section 32: NE $\frac{1}{4}$; E $\frac{1}{2}$ SW $\frac{1}{4}$; NW $\frac{1}{4}$ SE $\frac{1}{4}$; SE $\frac{1}{4}$ SE $\frac{1}{4}$.
- Section 33: SW $\frac{1}{4}$ NW $\frac{1}{4}$; SE $\frac{1}{4}$ NE $\frac{1}{4}$; S $\frac{1}{2}$ SW $\frac{1}{4}$; SW $\frac{1}{4}$ SE $\frac{1}{4}$.
- Section 34: All.
- Section 35: All.
- Section 36: That part lying West of the centerline of the Richmond County Road No. 4.

Township 11 South, Range 22 East of the Willamette Meridian:

- Section 12: E $\frac{1}{2}$ E $\frac{1}{2}$.
- Section 13: All.
- Section 24: N $\frac{1}{2}$.

Township 11 South, Range 23 East of the Willamette Meridian:

- Section 1: That part lying West of the centerline of the Richmond County Road No. 4.
- Section 2: All, (fractional).
- Section 3: All, (fractional).
- Section 4: All, (fractional), EXCEPT SE $\frac{1}{4}$ NE $\frac{1}{4}$.
- Section 5: Lots 1, 2 and 3: SE $\frac{1}{4}$ NW $\frac{1}{4}$; SE $\frac{1}{4}$ NE $\frac{1}{4}$; E $\frac{1}{2}$ SW $\frac{1}{4}$; SE $\frac{1}{4}$.
- Section 7: All, (fractional), EXCEPT Lot 4.
- Section 8: All.
- Section 9: N $\frac{1}{2}$; N $\frac{1}{2}$ S $\frac{1}{2}$; SW $\frac{1}{4}$ SW $\frac{1}{4}$.
- Section 10: N $\frac{1}{2}$; N $\frac{1}{2}$ S $\frac{1}{2}$.
- Section 11: N $\frac{1}{2}$; N $\frac{1}{2}$ SE $\frac{1}{4}$.
- Section 12: That part of the NW $\frac{1}{4}$ NW $\frac{1}{4}$ lying West of the centerline of the Richmond County Road No. 4.
- Section 17: NW $\frac{1}{4}$ NW $\frac{1}{4}$; S $\frac{1}{2}$ NW $\frac{1}{4}$; NE $\frac{1}{4}$ NE $\frac{1}{4}$; SW $\frac{1}{4}$ NE $\frac{1}{4}$; N $\frac{1}{2}$ SW $\frac{1}{4}$; NW $\frac{1}{4}$ SE $\frac{1}{4}$.
- Section 18: Lots 1, 2, 3 and 4; E $\frac{1}{2}$ NW $\frac{1}{4}$; NE $\frac{1}{4}$; E $\frac{1}{2}$ SW $\frac{1}{4}$; N $\frac{1}{2}$ SE $\frac{1}{4}$.
- Section 19: NE $\frac{1}{4}$ NW $\frac{1}{4}$.

TRACT III

Township 10 South, Range 23 East of the Willamette Meridian:

- Section 28: W $\frac{1}{2}$ SE $\frac{1}{4}$; SE $\frac{1}{4}$ SW $\frac{1}{4}$.
- Section 32: NE $\frac{1}{4}$ SE $\frac{1}{4}$.
- Section 33: N $\frac{1}{2}$ N $\frac{1}{2}$; SW $\frac{1}{4}$ NE $\frac{1}{4}$; SE $\frac{1}{4}$ NW $\frac{1}{4}$; N $\frac{1}{2}$ S $\frac{1}{2}$.

TRACT IV

Township 10 South, Range 23 East of the Willamette Meridian:

- Section 16: E $\frac{1}{2}$ NE $\frac{1}{4}$.

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TRACT V

Township 11 South, Range 23 East of the Willamette Meridian:

Section 9: $SE\frac{1}{4}SW\frac{1}{4}$; $S\frac{1}{2}SE\frac{1}{4}$.

Section 10: $S\frac{1}{2}S\frac{1}{2}$.

Section 11: $N\frac{1}{2}SW\frac{1}{4}$.

Section 19: Lot 1; that part of Lot 2 lying North and West of a diagonal line running from the Northeast corner to the Southwest corner of said Lot 2 and indicated on the ground by a fence.

TRACT VI

Township 11 South, Range 23 East of the Willamette Meridian:

Section 17: $SW\frac{1}{4}SW\frac{1}{4}$.

Section 18: $S\frac{1}{2}SE\frac{1}{4}$.

TRACT VII

Township 10 South, Range 23 East of the Willamette Meridian:

Section 32: $SW\frac{1}{4}SE\frac{1}{4}$.

Section 33: $SE\frac{1}{4}SE\frac{1}{4}$.

Township 11 South, Range 23 East of the Willamette Meridian:

Section 4: $SE\frac{1}{4}NE\frac{1}{4}$.

Section 5: $SW\frac{1}{4}NE\frac{1}{4}$.

TRACT VIII

Township 11 South, Range 23 East of the Willamette Meridian:

Section 7: Lot 4.

Section 17: $NE\frac{1}{4}NW\frac{1}{4}$; $NW\frac{1}{4}NE\frac{1}{4}$.

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Oregon Water Resources Department
Land Use Information Form

R-87409



THIS FORM IS NOT REQUIRED IF: 1) water is to be diverted, conveyed, and/or used only on federal lands; or 2) the application is for a water-right transfer, allocation of conserved water, exchange, permit amendment, or ground water registration modification, and all of the following apply: a) only the place of use is proposed for change, b) there are no structural changes, c) the use of water is for irrigation, and d) the use is located in an irrigation district or exclusive farm-use zone.

Applicant Name: Rob Williams, President Robeck Enterprises, LLC
Mailing Address: 12993 SW Cornett Loop
City: Powell Butte State: OR Zip: 97753 Day Phone: 541-416-8111

This application is related to a Measure 37 claim. ☐ Yes ☒ No

A. Land and Location

Please include the following information for all tax lots where water will be diverted (taken from its source), conveyed (transported), or used. Applicants for municipal use, or irrigation uses within irrigation districts may substitute existing and proposed service-area boundaries for the tax-lot information requested below.

Township	Range	Section	¼ ¼	Tax Lot #	Plan Designation (e.g. Rural Residential/RR-5)	Water to be:	Proposed Land Use:
10S	23E	34	NW NE	500	FU	☐ Diverted ☒ Conveyed ☒ Used	reservoir
10S	23E	27	SE SW	500	FU	☒ Diverted ☒ Conveyed ☒ Used	reservoir
10S	23E	27	SW SE	500	FU	☐ Diverted ☒ Conveyed ☒ Used	reservoir
						☐ Diverted ☐ Conveyed ☐ Used	

List all counties and cities where water is proposed to be diverted, conveyed, or used. Wheeler County, OR

B. Description of Proposed Use

Type of application to be filed with the Water Resources Department:

- ☒ Permit to Use or Store Water ☐ Water-Right Transfer ☐ Exchange of Water
☐ Allocation of Conserved Water ☐ Limited Water Use License
☐ Permit Amendment or Ground Water Registration Modification

Source of water: ☐ Reservoir/Pond ☐ Ground Water ☒ Surface Water (name) tributary of Horseshoe Creek

Estimated quantity of water needed: 60 ☐ cubic feet per second ☐ gallons per minute ☒ acre-feet

Intended use of water: ☐ Irrigation ☐ Commercial ☐ Industrial ☐ Domestic for household(s)
☐ Municipal ☐ Quasi-municipal ☐ Instream ☒ Other Fish and wildlife habitat enhancement

Briefly describe: The purpose for storing water at this location is for maintaining and enhancing local fish and wildlife. An existing reservoir and dam are located on the site but are not currently permitted.

Note to applicant: If the Land Use Information Form cannot be completed while you wait, please have a local government representative sign the receipt below and include it with the application filed with the Water Resources Department.

Receipt for Request for Land Use Information

State of Oregon
Water Resources Department
725 Summer Street NE, Suite A
Salem, OR 97301-1266

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Wheeler County**Fax**

To: Herb	From: Wheeler Co Planner
Fax: 503-986-0901	Date: 3/5/09
Phone: 1-541-763-2126 (WC Planning)	Pages: 2
Re: Water Sign Off	CC:

☐ **Urgent** ☒ **For Review** ☐ **Please Comment** ☐ **Please Reply** ☐ **Please Recycle**

Herb:

I wrote the applicable wording of 3.1(4)(h) dealing with aquatic species which as close as anything comes in our Comp. Plan. Otherwise, as I noted, it not regulated by our plan.

Robin Hunt-Palazo
Wheeler County Planning Director
1-541-763-2126 office
1-541-763-2026 fax

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WATER RESOURCES DIVISION
SALISBURY, CT

For Local Government Use Only

The following section must be completed by a planning official from each county and city listed unless the project will be located entirely within the city limits. In that case, only the city planning agency must complete this form.

This deals only with the local land-use plan. Do not include approval for activities such as building or grading permits.

Please check the appropriate box below and provide the requested information

- (a) Land uses to be served by proposed water uses (including proposed construction) are allowed outright or are not regulated by your comprehensive plan. Cite applicable ordinance section(s): 3.1(4)(b) "... maintenance & harvesting of aquatic species."
 otherwise not regulated
- (b) Land uses to be served by proposed water uses (including proposed construction) involve discretionary land-use approvals as listed in the table below. (Please attach documentation of applicable land-use approvals which have already been obtained. Record of Action/land-use decision and accompanying findings are sufficient)
 If approvals have been obtained but all appeal periods have not ended, check "Being pursued".

Type of Land-Use Approval Needed (e.g. plan amendments, rezones, conditional-use permits, etc.)	Cite Most Significant, Applicable Plan Policies & Ordinance Section References	Land-Use Approval:	
		☐ Obtained ☐ Denied	☐ Being pursued ☐ Not being pursued
		☐ Obtained ☐ Denied	☐ Being pursued ☐ Not being pursued
		☐ Obtained ☐ Denied	☐ Being pursued ☐ Not being pursued
		☐ Obtained ☐ Denied	☐ Being pursued ☐ Not being pursued
		☐ Obtained ☐ Denied	☐ Being pursued ☐ Not being pursued

Local governments are invited to express special land-use concerns or make recommendations to the Water Resources Department regarding this proposed use of water below, or on a separate sheet.

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SALEM, OREGONName: Robin Hunt-PalazoTitle: Wheeler County Planning DirSignature: [Signature]Phone: 541-763-2126 Date: 1-5-2009Government Entity: Wheeler County

Note to local government representative: Please complete this form or sign the receipt below and return it to the applicant. If you sign the receipt, you will have 30 days from the Water Resources Department's notice date to return the completed Land Use Information Form or WRD may presume the land use associated with the proposed use of water is compatible with local comprehensive plans.

For Local Government Use Only

The following section must be completed by a planning official from each county and city listed unless the project will be located entirely within the city limits. In that case, only the city planning agency must complete this form.

This deals only with the local land-use plan. Do not include approval for activities such as building or grading permits.

**Please check the appropriate box below and provide the requested information**

- ☒ Land uses to be served by proposed water uses (including proposed construction) are allowed outright or are not regulated by your comprehensive plan. Cite applicable ordinance section(s): _____.
- ☐ Land uses to be served by proposed water uses (including proposed construction) involve discretionary land-use approvals as listed in the table below. (Please attach documentation of applicable land-use approvals which have already been obtained. Record of Action/land-use decision and accompanying findings are sufficient.)
If approvals have been obtained but all appeal periods have not ended, check "Being pursued".

Type of Land-Use Approval Needed (e.g. plan amendments, rezones, conditional-use permits, etc.)	Cite Most Significant, Applicable Plan Policies & Ordinance Section References	Land-Use Approval:	
		☐ Obtained ☐ Denied	☐ Being pursued ☐ Not being pursued
		☐ Obtained ☐ Denied	☐ Being pursued ☐ Not being pursued
		☐ Obtained ☐ Denied	☐ Being pursued ☐ Not being pursued
		☐ Obtained ☐ Denied	☐ Being pursued ☐ Not being pursued
		☐ Obtained ☐ Denied	☐ Being pursued ☐ Not being pursued

Local governments are invited to express special land-use concerns or make recommendations to the Water Resources Department regarding this proposed use of water below, or on a separate sheet.

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MAR 05 2009

WATER RESOURCES
SALES

Name: Robin Hunt-Palazo Title: Wheeler County Planning Dir
 Signature: [Signature] Phone: 541-763-2126 Date: 1-5-2009
 Government Entity: Wheeler County

Note to local government representative: Please complete this form or sign the receipt below and return it to the applicant. If you sign the receipt, you will have 30 days from the Water Resources Department's notice date to return the completed Land Use Information Form or WRD may presume the land use associated with the proposed use of water is compatible with local comprehensive plans.

For Local Government Use Only

The following section must be completed by a planning official from each county and city listed unless the project will be located entirely within the city limits. In that case, only the city planning agency must complete this form.

This deals only with the local land-use plan. Do not include approval for activities such as building or grading permits.



Please check the appropriate box below and provide the requested information

- ☒ Land uses to be served by proposed water uses (including proposed construction) are allowed outright or are not regulated by your comprehensive plan. Cite applicable ordinance section(s): _____.
- ☐ Land uses to be served by proposed water uses (including proposed construction) involve discretionary land-use approvals as listed in the table below. (Please attach documentation of applicable land-use approvals which have already been obtained. Record of Action/land-use decision and accompanying findings are sufficient.)
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WATER RESOURCES DEPARTMENT
SALEM, OREGON

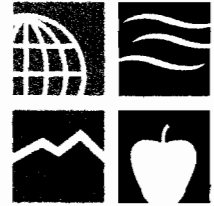
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NEWTON

CONSULTANTS INC.

Earth, Water and Rock Specialists



REPORT ON GENERAL CONSTRUCTION AND CONFIGURATION ASPECTS OF THE SIX SHOOTER DAM AND RESERVOIR

**Six Shooter Ranch
Wheeler County, Oregon**

Prepared for:

Robeck Enterprises, LLC
12993 SW Cornett Loop
Powell Butte, OR. 97753

December 19, 2008

Project No.: 1082-101

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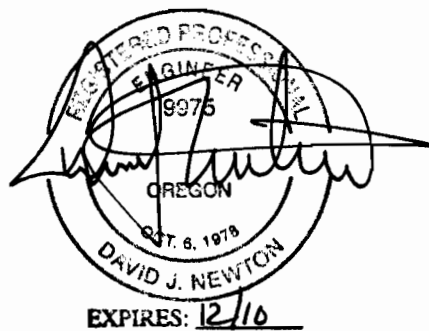
MAR 05 2009

WATER RESOURCES DEPT
SALEM, OREGON

REPORT ON GENERAL CONSTRUCTION AND CONFIGURATION ASPECTS OF THE SIX SHOOTER DAM AND RESERVOIR

SIX SHOOTER RANCH WHEELER COUNTY, OREGON

December 19, 2008



Prepared for:

Robeck Enterprises, LLC

Prepared by:

Newton Consultants, Inc.
521 SW 6th Street, Suite 100
Redmond, Oregon 97756

Project No. 1082-101

REPORT ON GENERAL CONSTRUCTION AND CONFIGURATION ASPECTS OF THE SIX SHOOTER DAM AND RESERVOIR

SIX SHOOTER RANCH WHEELER COUNTY, OREGON

December 19, 2008

INTRODUCTION AND BACKGROUND

Newton Consultants, Inc. was retained by Robeck Enterprises, LLC to respond to concerns the District 21 Watermaster, Mr. Joel Clark, has about bringing the 7.5 acre Six Shooter Pond into compliance with Oregon statutory and regulatory requirements relative to water rights and dam safety. The pond is located on the Six Shooter Ranch northeast of Mitchell, Oregon on Tax Lot 500, in T10S, R23E, in the SE $\frac{1}{4}$ of the SW $\frac{1}{4}$ and SW $\frac{1}{4}$ of the SE $\frac{1}{4}$ of Section 27 and in the NE $\frac{1}{4}$ of NW $\frac{1}{4}$ and NW $\frac{1}{4}$ of the NE $\frac{1}{4}$ of Section 34. The general location is shown on Figure 1 (Vicinity Map). The pond and its watershed are located approximately $\frac{1}{4}$ mile east of Floating Prairie and approximately 1 mile east of Baldy (ridge), the highest point in the vicinity. Figure 2, Watershed Map, shows the location of Six Shooter Pond and the surrounding area.

Robeck Enterprises and its President, Mr. Rob Williams, have owned the property since June of 2007. The physical conditions of the approximately 26,000 acre ranch were inherited as part of the purchase. The Watermaster, using online aerial photographs, had discovered the Six Shooter Pond and found that no permit for the dam or the pond was recorded in Oregon Water Resources Department (OWRD) files. Mr. Williams response and desire is to bring the dam and pond into regulatory compliance and to continue to store water for its intended purpose. The sole intended purpose of storing water at this location is for maintaining and enhancing local fish and wildlife. 'Donaldson' rainbow trout were planted in the reservoir many years ago and, more recently, sturgeon were added. The reservoir also is a significant local water source for the numerous transient elk and deer population.

Newton was specifically asked to investigate the existing conditions of the dam, the pond and its watershed, and to prepare an application to the Oregon Water Resources Department (OWRD) to permit the dam and to allow for continued water storage. A site visit to the remote pond was made on September 17, 2008 by Newton employees. The descriptions and findings presented in this report are based on site observations by David J. Newton, P.E., C.E.G. and Randy Jones, both of Newton Consultants, Inc.

The ranch has a rich and varied history of uses including grazing, hunting, cropping and timber harvest. According to a family member of a previous owner, the dam was likely constructed by the Hudspeth family during their involvement with the property for timber harvesting prior to the 1960's (personal communication, Mr. Russell Rhoden). Current use of the property overall is solely limited to managing land cover and water for enhancement of fish and wildlife resources.

THE WATERSHED

The watershed for the Six Shooter Pond is shown on Figure 2. A photograph of the watershed looking west from the Pond is shown on Figure 3. The general character of the 347 acre watershed is rolling to very slightly incised open timberland. Much of the contributing catchment area to the pond was burned by wildfire in the mid-1970s. However, large portions of the drainage are now being recolonized by Lodgepole pine seedlings, native grasses and fireweed. Approximately 60 percent of the small watershed has regenerated pine cover. Cattle grazing was terminated upon the purchase of the property in the spring of 2007, and the condition and abundance of grasses and shrubs on the watershed now represents a significant ground cover.

The highest point in the slightly concave-shaped watershed is on Baldy (ridge) at 5,820 feet and the lowest point at the Six Shooter Pond spillway is approximately 4,880 feet in elevation. The USGS has mapped one stream which flows into the pond, showing drainage off of the lower slopes of Baldy (ridge) and draining eastward to the pond. On-the-ground observations revealed a spring discharge area from Floating Prairie that is adjacent to the WSW of the pond. Immediately adjacent to the southwest edge of the pond is another minor spring discharge area.

It is important also to add a general description of downstream landscape conditions due to the local watermaster's concern regarding the volume of water stored in the pond. Downstream and due east of the pond, drainage discharges through a slightly incised fold that eventually flows onto Six Shooter Prairie atop an old alluvial fan. The micro-topography of the fan directs water to the northeast, where Six Shooter Pond eventually contributes to Horseshoe Creek, in turn, a tributary to the John Day River. Clearly, the upper watershed of the Six Shooter pond is a headwater source for Horseshoe Creek. The nearest structures include Richmond-Six Shooter Road approximately 3 miles to the east and several livestock sheds approximately 3 to 4 miles northeast. No other structures or improved roads exist downstream of the Six Shooter Pond for many miles.

EXISTING DAM CONDITIONS

The Six Shooter Pond and earth dam are shown in plan view on Figure 4. The crest of the approximately 1,300 foot long dam ranges from an average width of 15 feet at the north end to 12.5 feet at the south end as measured in the field during the site visit. The

crest is covered by a cap of ½" to 2" and 4"-0" crushed basaltic rock, a minor component of which is sub-rounded material. Intermixed fines appear as dark-brown, slightly clayey silt. The asymmetric dam has an upstream slope of approximately 3:1 and a downstream slope of approximately 1.5:1. The asymmetry is very constant in section throughout the length of the dam. The approximate cross-section geometry of the dam is shown on Figure 5, and on the photographs in Figures 6 and 7.

The approximate maximum height of the dam from the lowest point at the toe to the crest is 22 feet. The downstream face of the dam is generally covered by a cap of 2"- to 4"-0" crushed basaltic rock, but large areas of exposed reddish-brown clayey materials are present. The southern part of the downstream face of the dam is covered with crushed rock, ranging in size from 4" to 6" in diameter. Native grasses dominate the vegetative cover on the downstream face, though a minor cover of thistles and rabbitbrush was observed. The upstream face of the dam was also covered by a cap layer of 2"- to 4"-0" crushed basaltic rock, visible downward beyond the range of vision into the water.

A 10- to 15-foot wide, nearly level bench of native soils intermixed with larger (4" to 8") angular and sub-angular native cobbles and boulders is located on the downstream slope of the dam, near the dam toe. This bench is approximately 250' long, extending along the south central portion of the dam face. Some minor seepage was observed near the toe, but was limited to areas around the bench. Two minor seepage areas north and south of the bench were also observed. However, as noted, an area along the topmost edge of the bench was saturated, with some limited evidence of saturation extending up the downstream face of the dam for about 2 to 3 feet in one isolated spot.

Immediately adjacent to the south end of the dam is a large borrow pit. The pit is at least 70 feet in average width, over 210 feet in length, and about 6 feet in average depth. The southern and western margins of the pit, were excavated in such a way leaving high, concave slopes of up to 25 feet above the natural grade. Deep-reddish-brown clayey soils were observed as the dominant materials in the areas of the exposed pit surface. When wetted, 3- to 4-inch long ribbons can be rolled from this material, suggesting a moderate to high degree of plasticity based on the Unified Soil Classification Code.

It is apparent that the reddish-brown clayey soils exposed in the dam embankment came from the borrow pit. This material is readily observed in large areas of the downstream face of the dam, and is evident on downstream ground surfaces beyond the dam's toe. Observations of reddish clayey soils in other exposures on the dam indicate they comprise a significant portion of the dam embankment.

No visual evidence of major slumps or boils was observed and seepage from the ground near the dam toe appears to be very slow. The observed soils materials used in the dam are quite plastic and would resist piping reasonably well considering criteria for resistance of earth dam materials to piping (Foundations and Earth Structures, Design Manual 7.2, Department of the Navy, Naval Facilities Engineering Command, May 1982). Localized over-steepening of the downstream dam face was observed in one

seepage area toward the south end of the dam. This feature could be the result of minor sloughing that occurred slowly over a long period of time. No locations of clear, definitive and active sloughing of the downstream dam face were observed. The downstream face of the dam and the bench area are illustrated on the photographs in Figures 8 and 9.

Lastly, there was some evidence of rodent burrowing in the upstream dam face on the very south end, exposing more reddish brown clayey soil (indicating clay is abundant at-depth). No other rodent burrow holes were noted along either the upstream or downstream dam faces, except for minor, scattered burrow holes at the very south end on downstream slope about 5 feet below the crest.

PRIMARY OUTLET WORKS

A wheel-operated Guillotine-type slide gate exists toward the southern part of the dam. The gate was installed near the toe of the dam and the slide-gate was observed within a 10-inch steel "H-channel" steel girder segment. This segment of "H-channel" steel was probably driven vertically into the ground. The wheel, with its threaded control rod, was welded atop the girder to operate the slide. The gate appears to be operable, and on the date of inspection, discharge of approximately 0.5 cfs was observed. Discharged water flows within a large-boulder and cobble-lined channel downstream, arcing toward the northeast where it joins flow from the spillway discharge off the north end of the dam.

EMERGENCY SPILLWAY

An emergency spillway was constructed at the north end of the dam. The spillway entrance is shown on the right side of the photograph in Figure 10. Flow estimated at about 0.5 cfs was observed in the spillway during the site observations. The water surface elevation in the pond was about 1.5 feet below the top of the dam crest at its southern end and about 0.5 feet below the crest near the central part of the dam. No visual evidence of spillway erosion or historic overtopping of the dam was observed during the site visit.

The spillway channel arcs around the north end of the dam. At the uppermost throat, the nearly level (estimated slope of 0.5-.75 percent) spillway channel averages 11 feet wide and is up to 1 foot in depth (as estimated in the field during the site visit). Significant aquatic vegetation (mainly of small-fruited bullrush) was present in the outlet channel, forming a dense cover that extended downstream from the entrance approximately 80 feet to a point about in-line with the long axis of the dam. At this point the channel slope increases, flow becomes more turbulent, and the channel is lined with cobble to boulder class rock. The spillway, looking toward the pond, is shown on the photograph in Figure 11. Figure 12 shows a photograph looking in the spillway flow direction.

Existing Flow Capacity

The flow capacity of the existing emergency spillway channel was estimated based on the following data and observations during the site visit:

- Top width of 11 feet,
- Bottom width of 8 feet (approximate),
- Flow depth 1 foot,
- Slope ranging from 0.5 to 0.75 (estimated), and
- Manning coefficient of 0.05 (channel choked with vegetation).
- Equation: $Q = 1.486/n \times A \times S^{0.5} \times R^{0.67}$

Where:

- Q = flow in cfs
- n = Manning roughness coefficient
- A = Cross-sectional area of flow
- S = Channel slope
- R = Hydraulic radius

The flow capacity is estimated to be about 20 cfs.

Adequacy of Existing Flow Capacity

Adequacy of spillway flow capacity is based essentially on the ability of a spillway to pass the design runoff flow without overtopping the dam. The design flow must be passed with at least two feet of freeboard between the top of the dam and the elevation of the water surface in the spillway.

The design storm to be used in calculating the flow to be carried by the spillway depends on the hazard class of a dam and reservoir. The hazard class of the dam and pond depends on risk for loss of life at downstream locations during a dam breach.

The dam and pond are located in a relatively remote area. The only public facility in the site vicinity is Richmond-Six Shooter Road, located about 3 miles east and downstream from the dam. Topography of the drainage into which the pond would discharge indicates flow would split near and upstream from the Road. Some flow would move north and some flow would move south, and some flow would spread over a relatively wide depressed area upstream of the Road. It appears that all or most of the surge from a full breach discharge of 60 acre-feet would be absorbed by storage capacity in the drainage system upstream from the Road. Some livestock sheds are located approximately 3 to 4 miles northeast of the Pond. No bridges or human-occupied structures are located on or near the stream within a distance of at least 5 miles downstream from the dam. Based on this information obtained from aerial photos and considering the maximum storage capacity of the pond at roughly 60 acre-feet, the hazard potential for the dam and pond is low.

Historic flow events were evaluated on the basis of the gage on the John Day River at Service Creek. Since the dam was built approximately 50 years ago and in order to

consider historic performance of the existing spillway, flow events at the Service Creek gage were evaluated to determine timing of major flow events after the dam was in place. No obvious visual evidence of dam overtopping or significant erosion was observed during the site visit suggesting that the spillway has successfully passed flows over the 50+ year life of the pond without damage to the dam.

Service Creek gage data was used to generate the graph of the Recurrence Interval of Annual Maximum Daily Flow Rate for John Day River at Service Creek, Water Years 1930-2007 shown on Figure 13. Our present knowledge suggests the dam was built in the 1950's. Figure 13 shows the magnitude of maximum daily flows related to the recurrence interval for the John Day River at Service Creek. Maximum flows are also shown for the years 1965, 1970, 1996 and 1997. The estimated return frequency of events for these specific dates using Figure 13 is tabulated below.

<u>EVENT</u>	<u>FLOW</u>	<u>ESTIMATED RETURN FREQUENCY</u>
1965	36,000 cfs	79 years
1970	25,000 cfs	19 years
1996	27,000 cfs	26 years
1997	30,000 cfs	38 years

Assuming the above events also reflect relatively high runoff conditions from the Six Shooter Pond's watershed during those same events, the existing spillway appears to have functioned in a satisfactory manner under historic circumstances since the dam was built. These inferences together with the pond location being remote from human-occupied dwellings and other public facilities suggest that dam modifications beyond cleaning and maintenance could be modest and focused on increasing freeboard by expanding the emergency spillway.

Recommended Spillway Channel Dimensions

The existing emergency spillway is required to pass storm runoff with 2 feet of freeboard between the top of the dam and water surface elevation in the spillway under a design runoff event. Spillway dimensions relate to flow rate and depth of flow; therefore, a flow rate is necessary to establish basic required spillway dimensions.

The maximum existing capacity of the spillway is estimated at 20 cfs. Applying a safety factor of 2.0 to this flow rate results in a rate of 40 cfs for establishing spillway capacity and required dimensions. Improving the spillway capacity to twice the existing capacity is reasonable based on evidence of historic performance.

Assuming an arbitrary top elevation for the dam at 10.0 feet (at the lowest point near the central area of the dam), the elevation of the water surface of the pond near the center of the existing dam would be about 9.5 feet based on the site observations. To achieve 2 feet of freeboard under a 40 cfs flow in the spillway, the maximum pond water surface

elevation must be lowered; however, this could have detrimental effect on both habitat and fish and must be considered in providing sufficient freeboard. Alternatively, widening the spillway channel to reduce flow depth and raising the dam with earth materials excavated from spillway enlargement could be done to provide the required spillway and freeboard and to reduce the amount that the pond water surface must be lowered.

Assuming a trapezoidal channel cross-section and a channel slope (in direction of flow) of 0.5 percent, the spillway channel width at the surface of a 40 cfs flow should be at least 22 feet and the bottom width should be at least 18 feet. The actual depth of the spillway channel depends on critical flow depth at spillway entry plus allowance for 2.0 feet of freeboard. The critical entry flow depth at 40 cfs accounting for critical depth conditions and velocity of 2.68 feet per second is 0.69 feet. Accounting for additional entry losses, the total flow depth at entry becomes 0.84 feet. Adding 2.0 feet of freeboard brings the spillway channel depth to 2.84 feet.

Assuming an arbitrary elevation for the top of the existing dam at 10 feet before spillway modifications, the bottom of the spillway channel nearest the dam would then need to be at an elevation of 7.16 feet ($10.00 \text{ feet} - 2.84 \text{ feet} = 7.16 \text{ feet}$).

Assuming an elevation of 9.5 feet for the pond water surface elevation, deepening the spillway to elevation 7.16 feet would lower the pond water surface by 2.34 feet with no flow in the spillway channel. This may not be desirable. The required freeboard could be achieved by the combined result of raising the top of the dam and excavating the spillway channel. If the dam was raised 1.0 foot to a uniform elevation of 11.0 feet and the spillway was excavated to a depth of 1.84 feet at the inlet, to elevation 8.16 feet, the pond water surface would be lowered about 1.34 feet with no flow in the spillway. Raising the dam by 1.0 foot would result in top width of approximately 11 feet for most of the dam and about 9 feet near the south end. Additional top widening near the south end of the dam is recommended to provide a minimum width of 11 feet. The dam could be elevated with materials excavated from the spillway channel. The resulting spillway cross-section is illustrated on Figure 14. This configuration should extend from the inlet near the dam, downstream to the confluence with the existing natural drainage into which the present spillway discharges.

The estimated flow velocity in the spillway for the above geometric conditions and spillway slope of 0.50 percent is 2.68 feet per second. Criteria for permissible maximum slope in erodible soils (*Practical Hydraulics, 2nd Edition*, Andrew L. Simon, John Wiley & Sons, Inc., 1981) indicates the maximum slope is 0.55 percent for clayey silt soils (Plasticity Index 6 to 10). Soils observed in the spillway are consistent with clayey silt materials and although erosion potential is low at the proposed slope of 0.50 percent considering soil conditions and historic performance, amoring the channel with crushed or naturally broken rock is recommended to reduce long-term maintenance potential.

WATER USE

It is the intention of the current owner, Mr. Williams, to continue to use water stored in the pond for the benefit of fish and wildlife. Presently, "Donaldson" rainbow trout thrive in the pond, as well as hybridized sturgeon. Judging by the amount of animal tracks, it is apparent that wildlife use of water from the pond is significant.

While aquatic vegetation was observed on the pond's margins (dominated by potomageton and niad), the observed cover did not appear to approach a "nuisance" level. However, the owner has requested that Newton consider means of treating aquatic vegetation, which as may be warranted at some time in the future.

The Oregon Water Resources Department Water Availability Analysis shows that storage water is available in the Horseshoe Creek sub-watershed (ID# 30620421) from December through June (at 50% exceedance). Pond maintenance water will be critical to sustaining wildlife use and the existing fish populations in the pond. Exploring opportunities for maintaining a consistent water level in the pond (pond maintenance) will be a future effort with OWRD.

Continued flow diversion to the pond is requested in a permit for the above months (see Storage Application). No evidence of dam over-topping was observed, no observation of surface water inflow was observed, and a total observed discharge from the reservoir of 1.0 cfs were noted on September 17, 2008. Based on the best of observations made, it appears the pond water level is in balance between inflow and outflow. This suggests a pond maintenance need of approximately 1.0 cfs – a quantity that would allow water to flow through the system.

CONCLUSIONS

All observations made of the existing dam very clearly suggest the design and quality of construction and materials used are excellent. No discovery was made of any concerted or scheduled past dam maintenance, which attests to the substantial character and quality of the dam and the stability of the impoundment.

No downstream structures exist within several miles of the dam. This combined with the quality of the dam suggests the reservoir and dam is a low-hazard class facility.

The watershed is obviously in a process of recovery after past fires, and is rapidly being recolonized by coniferous forest cover and grasses. Stored water uses for fish and wildlife are valid uses per Oregon Revised Statutes, and water is available for storage in this sub-watershed per the OWRD.

The landowner has commercial-quality generators and pumps available to assist in the evacuation of water from the pond should more senior water right holders downstream

request water at some point in the future and the OWRD Director requires water to be evacuated from the pond. These generators and pumps are of capacities used in wildland fire suppression.

The outlet control works appear to be functional, and any minor seepage at the dam appear also not to represent any significant structural concern.

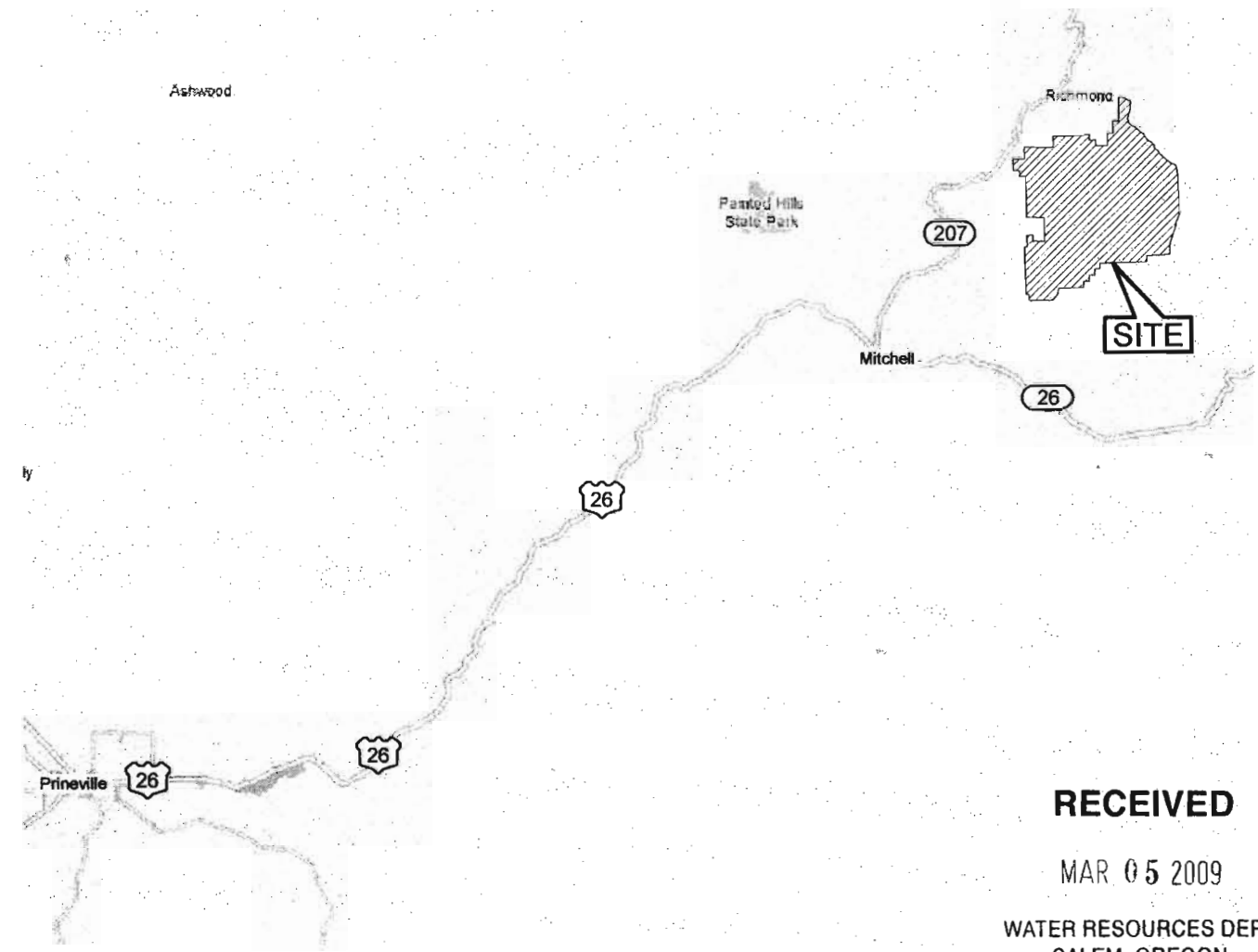
RECOMMENDATIONS

Two actions are recommended to comply with minimum state dam design standards: 1) spillway modification, and 2) increase the freeboard to 2 feet.

The spillway should be improved to pass storm runoff flow with at least 2 feet of freeboard between the top of the dam and the water surface elevation under the selected flow condition (40 cfs spillway discharge). The required configuration of the spillway channel is described below:

- Arbitrary elevation of top of dam: 11.0 feet (after raising the top 1.0 foot)
- Required elevation of spillway channel bottom at inlet : 8.16 feet
- Trapezoidal-shaped spillway cross-section.
- Top width of spillway channel: 22 feet
- Bottom width of spillway channel: 18 feet
- Spillway slope (in direction of flow): 0.50 percent
- Lower maximum pond water surface elevation by 1.34 feet.
- Raise top elevation of dam by 1.0 feet (to arbitrary elevation 11.0 feet).
- New spillway channel should be armored with 4" layer of 2" minus crushed rock, or naturally broken, angular talus rock in same size range.

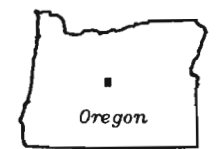
These recommendations are made to allow for the maximum on-going beneficial use of stored water for fish and wildlife and to meet minimum state requirements.



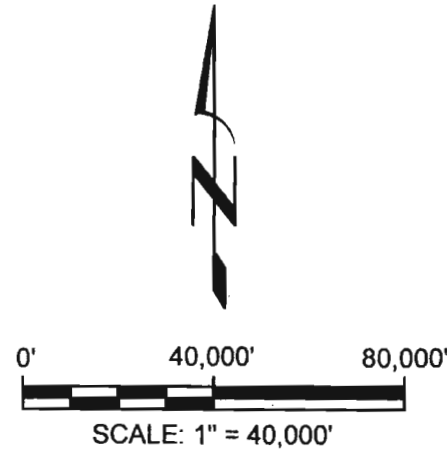
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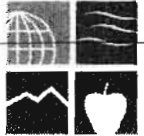


Google Internet Map



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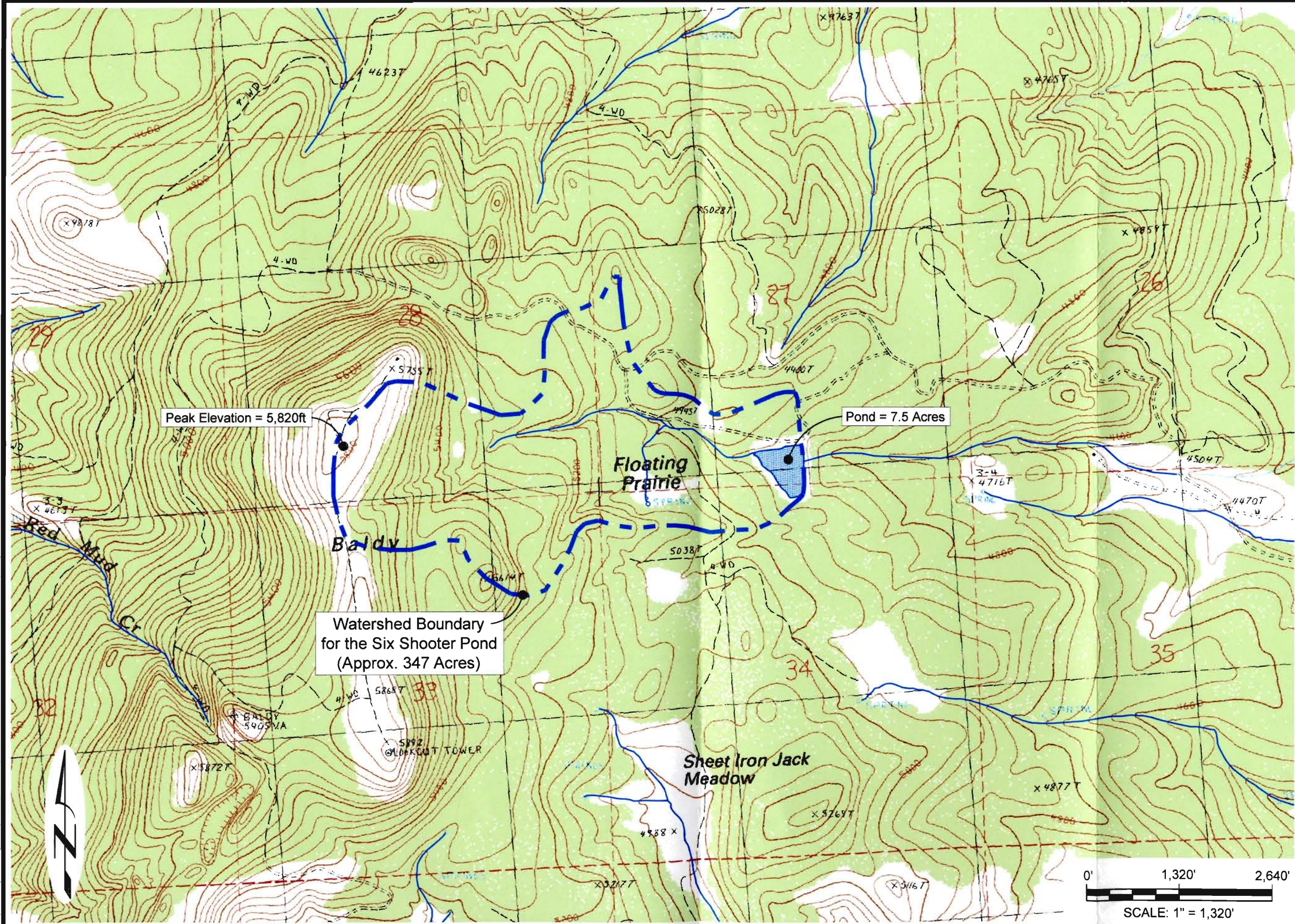
NEWTON
CONSULTANTS INC.
Earth, Water and Rock Specialists
Ph: 541 604-9969 Fax: 541 504-9961



Vicinity Map
Six Shooter Pond
Wheeler County, Oregon

DESIGNED BY: R.Jones	DRAWN BY: S.Schenck	DATE: Dec 2008	PROJECT NO. 1082-101	FIGURE 1
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NEWTON
CONSULTANTS INC.
Earth, Water and Rock Specialists
Ph: 541 504-9960 Fax: 541 504-9961

Watershed Map
Six Shooter Pond
Wheeler County, Oregon

DESIGNED BY: R. Jones

DRAWN BY: S. Schenck

DATE: FEB 2009

PROJECT NO. 1082-101

FIGURE 2



Figure 3
 Typical Watershed Conditions Showing
 Recolonizing Conifer Cover and Grassland Regrowth.
 View to Southwest

NEWTON
 CONSULTANTS INC.
 Earth, Water and Rock Specialists
 Pn: 541 504-8960
 Fax: 541 504-9961



Watershed Conditions
 Six Shooter Pond
 Wheeler County, Oregon

DESIGNED BY:

R. Jones

DRAWN BY:

S. Schenck

DATE:

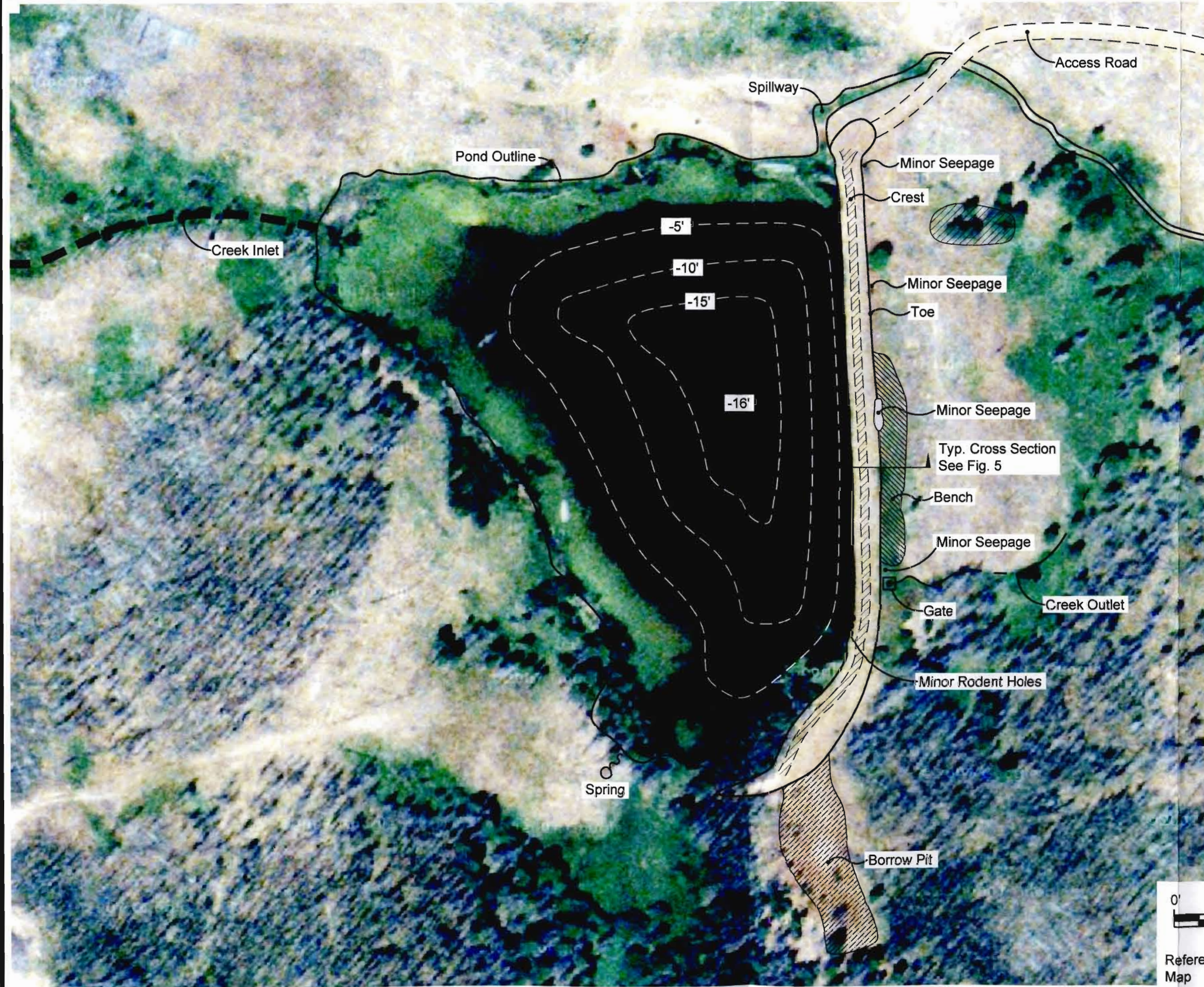
Dec 2008

PROJECT NO.

1082-101

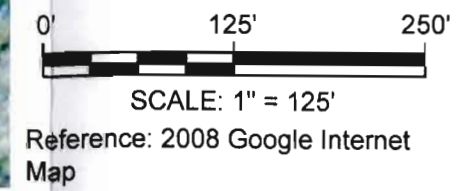
FIGURE

3



NOTES

1. Water deposits shown in Pond area are estimated based on visual observations.

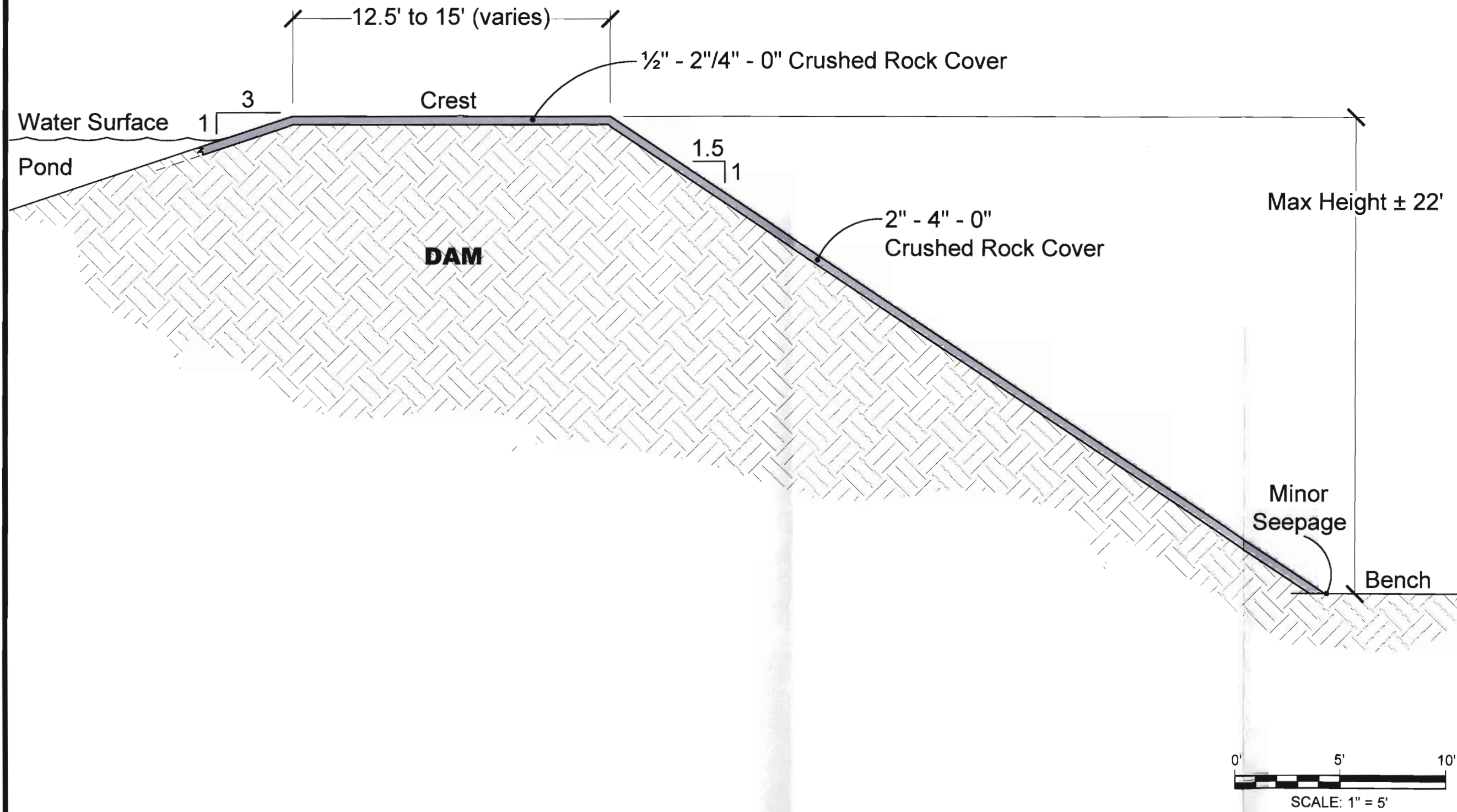


Plan View of Observed Estimated Features & Conditions

Six Shooter Pond
Wheeler County, Oregon

DESIGNED BY:	R. Jones	DRAWN BY:	S. Schenck	DATE:	DEC 2008	PROJECT NO:	1082-101	FIGURE	4
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Illustrative Dam Cross-Section
Six Shooter Pond
Wheeler County, Oregon

DESIGNED BY:

R. Jones

DRAWN BY:

S. Schenck

DATE:

DEC 2008

PROJECT NO.

1082-101

FIGURE

5



Figure 6
Dam Crest
View to South

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Earth, Water and Rock Specialists
Ptn: 541 504-9980
Fax: 541 504-9961



Dam Crest Looking South
Six Shooter Pond
Wheeler County, Oregon

DESIGNED BY:
R. Jones

DRAWN BY:
S. Schenck

DATE:
Dec 2008

PROJECT NO.
1082-101

FIGURE
6



Figure 7
Dam Crest
View to North

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Dam Crest Looking North
Six Shooter Pond
Wheeler County, Oregon

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FIGURE
7



Figure 8

Typical Exposure of Reddish-Brown Clayey-Silt Used in Dam Construction

NEWTON CONSULTANTS INC. Earth, Water and Rock Specialists POC: 541 504-9980 FAX: 541 504-9981		Exposed Reddish-Brown Clay Six Shooter Pond Wheeler County, Oregon	
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		FIGURE	8



Figure 9

Typical Downslope Dam Face Conditions
View to South

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Dam Face Conditions
Six Shooter Pond
Wheeler County, Oregon

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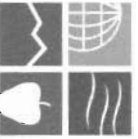
FIGURE

9



Figure 10
Inlet to Emergency Spillway
View to North North-West

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Inlet of Emergency Spillway
Six Shooter Pond
Wheeler County, Oregon

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FIGURE
10



Figure 11

Spillway Conditions on Sept. 17, 2008
View to South

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Spillway Conditions on Sept. 17, 2008
Six Shooter Pond
Wheeler County, Oregon

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FIGURE

11



Figure 12

Spillway Conditions on Sept. 17, 2008 at Extreme North End of Dam
View to East

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Spillway Conditions on Sept. 17, 2008
Six Shooter Pond
Wheeler County, Oregon

DESIGNED BY:

R. Jones

DRAWN BY:

S. Schenck

DATE:

Dec 2008

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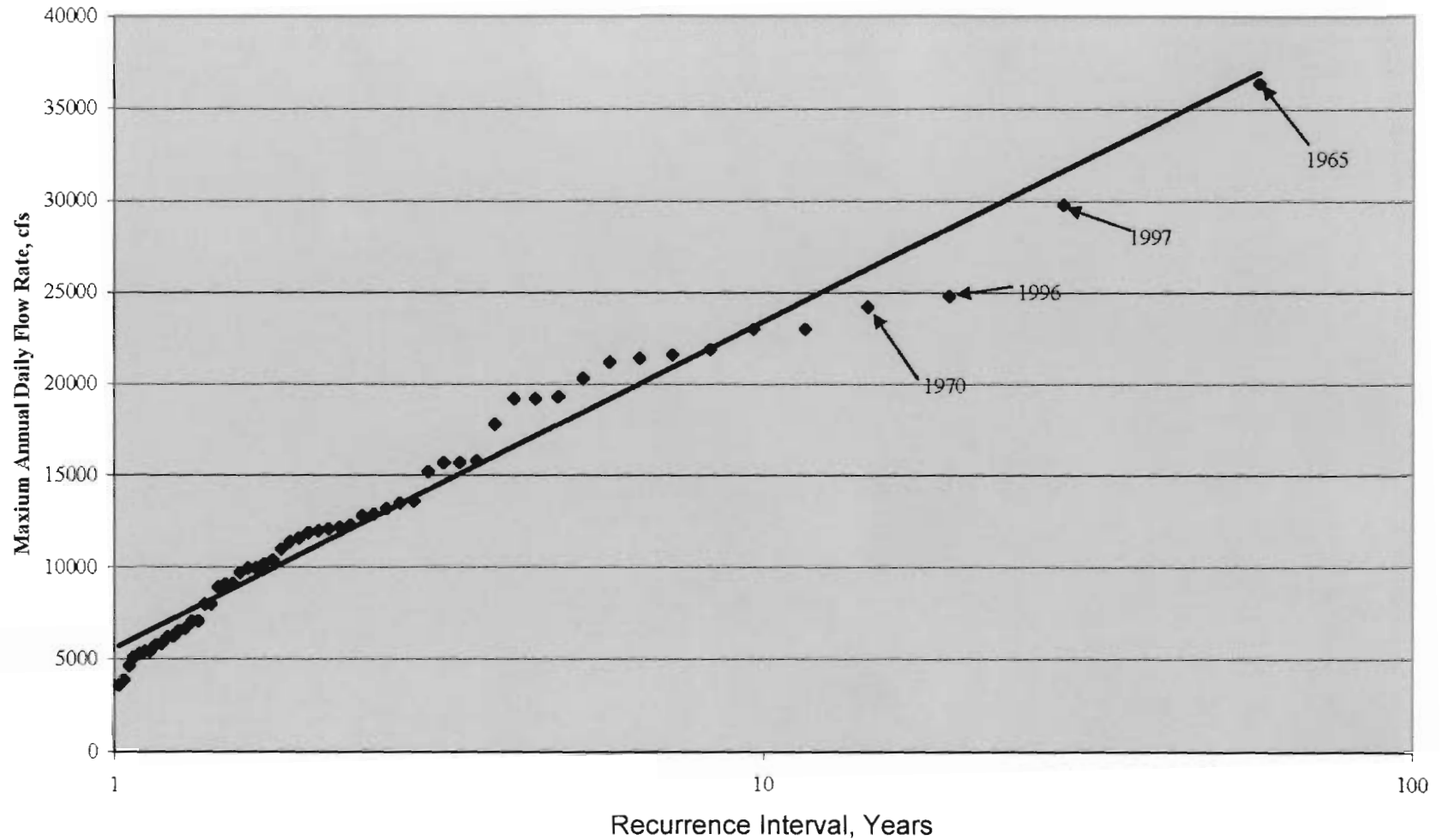
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FIGURE

12

Figure 13

Recurrence Interval Of Annual Maximum Daily Flow Rate For John Day River At
Service Creek, Water Years 1930 - 2007



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Flow Return Frequency
Six Shooter Pond
Wheeler County, Oregon

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DATE:

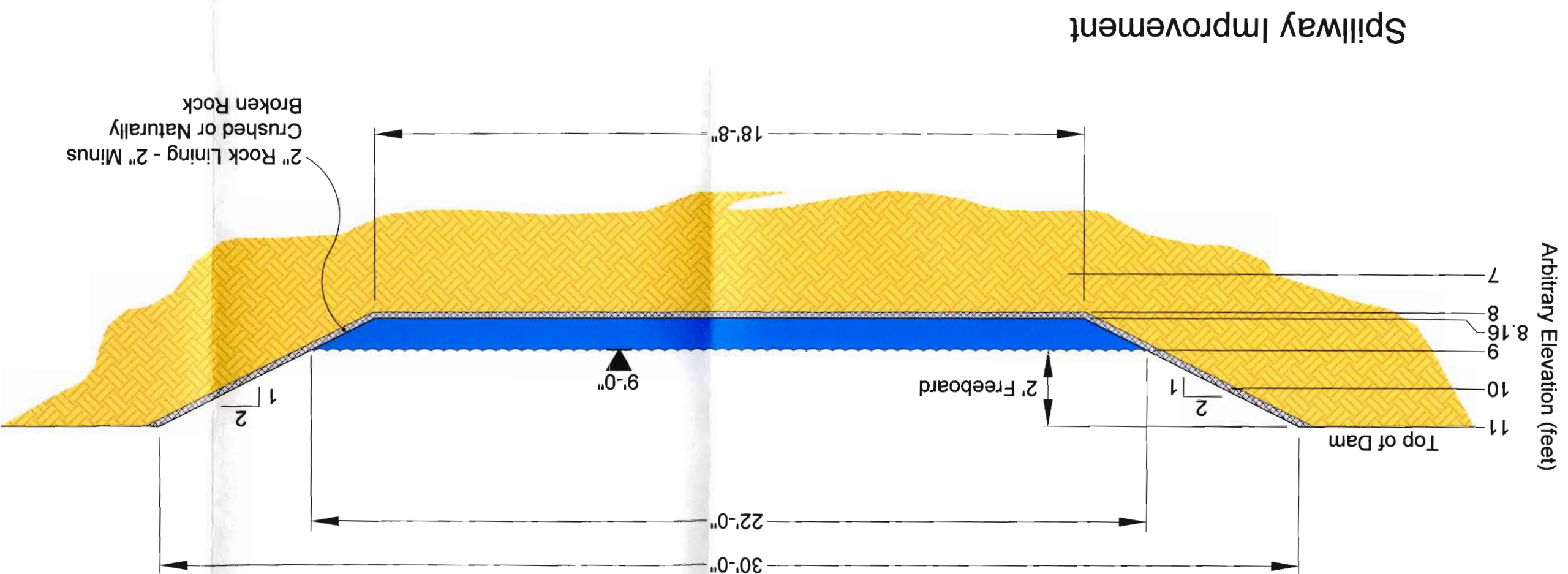
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FIGURE

13



Spillway Improvement Illustration

Six Shooter Pond Wheeler County, Oregon