



Oregon Water Resources Department
725 Summer Street NE, Suite A
Salem Oregon 97301-1271
(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. However, to obtain authorization for multiple reservoirs, multiple forms may be combined into one application if filed at the same time.

Please type or print in dark ink. If your application is found to be incomplete or inaccurate, we will return it to you. 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: Kelly Bruun
First Last
Mailing Address: 10990 SE Grizzly Mt. Rd
Madras Oregon 97741
City State Zip
Phone: 503 781-5353
Home Work Other
Fax: _____ E-Mail Address*: kbruun@earthlink.net

* By providing an e-mail address, consent is given to receive all correspondence from the department electronically. (paper copies of the final order documents will also be mailed.)

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 Newbill Creek Reservoir.

2. SOURCE OF WATER for the proposed use: Newbill Creek,
a tributary of Willow Creek, a tributary of the Deschutes 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:

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For Department Use

App. No. R-87832 Permit No. _____ Date _____

3. DAM HEIGHT AND COMPOSITION

The maximum height of the structure will be 12'6" ** feet above streambed or ground surface at the centerline of the crest of the dam. ** Minimum dam height allowing 2 ft freeboard at spillway design flow.

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 dam is primarily earthfill. Inserted in the south dam abutment is a 53 foot wide concrete spillway fitted with three sets of wooden flash boards.

4. PRIMARY OUTLET WORKS

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

The primary outlet is an 18 inch "Agri-Drain Inlet Water level Control Structure" that has removable stop blocks that regulate the reservoir in 5 inch or 7 inch increments.

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:

The existing spillway is a 53 foot wide concrete channel fitted with wooden flash boards that raise the water level 2.5 feet above the bottom of the concrete spillway. There are three sets of flash boards supported by two 8 inch concrete columns in the spillway channel. Therefore, the nominal spillway width is 51.67 feet. There is 2.5 feet of freeboard above the top of the flash boards. Note: The applicant recognizes that the spillway will need to be expanded / modified to accommodate a 100 year flow event.

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

Wildlife, Aquatic Life, and Recreation.

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7. THE AMOUNT OF WATER to be stored is: 145.55 * acre-feet.

The area submerged by the reservoir, when filled, will be 22.20 acres.

* Current water right certificate 83380 authorizes 23.0 acre-feet of storage; this application seeks additional 122.55 acre-feet for total storage volume of 145.55 acre-feet. Storage to be accomplished during March and April only.

8. PROJECT SCHEDULE: (List Month and Year)

Proposed date construction work will begin: July 2013

Proposed date construction work will be completed: Oct 2013

Proposed date water use will be completed: Oct 2018

Is this project fully or partially funded by the American Recovery and Reinvestment Act? (Federal stimulus dollars) NO

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)

X 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 an 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 irrigation 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.

List the names and mailing addresses of all affected landowners:

11. WITHIN A DISTRICT

☐ Check here if the point of diversion or place of use are located within or served by an irrigation or other water district.

Irrigation District Name N/A	Address	
City	State	Zip

R-87832

11. 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.

12. 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:



Signature (If more than one applicant, all must sign.)

July 31, 2012

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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JEFFERSON COUNTY TITLE COMPANY

31303

12-15-3800, 3900
#742, #743
7-44

20011283



After recording return to:

Kelly Bruun

4335 SW Humphrey Blvd.

Portland, OR 97221

Until a change is requested all tax statements shall be sent to the following address:

Kelly Bruun

4335 SW Humphrey Blvd.

Portland, OR 97221

Escrow No. 0150045

Title No. 31303

STATE OF OREGON

COUNTY OF JEFFERSON

I CERTIFY that the within instrument of writing was received for the record on the 5th day of April A.D. 2001 at 11:34 o'clock A. M. and recorded in DEED MF# 20011283 of said County

Kathleen B. Marston, County Clerk #36

By heyrone w. d. w. Deputy

JEFFERSON COUNTY,

THIS SPACE RESERVED FOR RECORDER'S USE GREEN

2001 APR -5 AM 11:34

KATHLEEN B. MARSTON
COUNTY CLERK

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STATUTORY WARRANTY DEED

John Shamon and Martha Lawrence, as tenants in common, Grantor, conveys and warrants to Kelly C. Bruun and Barbara M. Bruun, husband and wife, Grantee, the following described real property free of liens and encumbrances, except as specifically set forth herein:

West three quarters of the Southwest quarter of the Southeast quarter of Section 26; East half of Section 34; Northwest quarter, North half of the Southwest quarter, West three quarters of the Northwest quarter of the Southeast quarter, and the West three quarters of the West half of the Northeast quarter of Section 35, Township 12 South, Range 15 East of the Willamette Meridian, Jefferson County, Oregon; South half of the South half of Section 35, Township 12 South, Range 15 East of the Willamette Meridian, Jefferson County, Oregon;

EXCEPT THE FOLLOWING: All of the property in Township 12 South, Range 15 East of the Willamette Meridian, Jefferson County, Oregon located in the West three quarters of the Northwest quarter of the Southeast quarter; the East half of the Southwest quarter of the Southeast quarter; and the Southeast quarter of the Southeast quarter of Section 35.

This property is free of liens and encumbrances, EXCEPT:

1. Taxes for the current year and possible prior years have been farm deferred pursuant to ORS 308.370 and 308.403.
2. The rights of the public in and to that portion of the above property lying within the limits of County roads or Highways.
3. Existing telephone, telegraph, power lines, roads, railroads, highways, ditches, canals and pipelines.
4. Conditions and Reservations as set out in Bargain and Sale Deed recorded January 22, 1988, as instrument #880099, and Correction Bargain and Sale Deed recorded December 22, 1995, as instrument #955151.
5. The effect, if any, of the mineral reservation set forth in Correction Bargain and Sale Deed, recorded December 22, 1995, as instrument #955151.
6. Exceptions and reservations for oil, gas and mineral rights, as contained in that Deed recorded June 24, 1999, as instrument #992943.

THIS INSTRUMENT WILL NOT ALLOW USE OF THE PROPERTY DESCRIBED IN THIS INSTRUMENT IN VIOLATION OF APPLICABLE LAND USE LAWS AND REGULATIONS, BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON ACQUIRING FEE TITLE TO THE PROPERTY SHOULD CHECK WITH THE APPROPRIATE CITY OR COUNTY PLANNING DEPARTMENT TO VERIFY APPROVED USES AND TO DETERMINE ANY LIMITS ON LAWSUITS AGAINST FARMING OR FOREST PRACTICES AS DEFINED IN ORS 30.930.

The true consideration for this conveyance is \$862,500.00 (Here comply with the requirements of ORS 93.030)

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Land Use Information Form

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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

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NOTE TO APPLICANTS

In order for your application to be processed by the Water Resources Department (WRD), this Land Use Information Form must be completed by a local government planning official in the jurisdiction(s) where your water right will be used and developed. The planning official may choose to complete the form while you wait, or return the receipt stub to you. Applications received by WRD without the Land Use Form or the receipt stub will be returned to you. Please be aware that your application will not be approved without land use approval.

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) The existing and proposed water use is located entirely within lands zoned for exclusive farm-use or within an irrigation district;
 - b) The application involves a change in place of use only;
 - c) The change does not involve the placement or modification of structures, including but not limited to water diversion, impoundment, distribution facilities, water wells and well houses; and
 - d) The application involves irrigation water uses only.

NOTE TO LOCAL GOVERNMENTS

The person presenting the attached Land Use Information Form is applying for or modifying a water right. The Water Resources Department (WRD) requires its applicants to obtain land-use information to be sure the water rights do not result in land uses that are incompatible with your comprehensive plan. Please complete the form or detach the receipt stub and return it to the applicant for inclusion in their water right application. You will receive notice once the applicant formally submits his or her request to the WRD. The notice will give more information about WRD's water rights process and provide additional comment opportunities. You will have 30 days from the date of the notice to complete the land-use form and return it to the WRD. If no land-use information is received from you within that 30-day period, the WRD may presume the land use associated with the proposed water right is compatible with your comprehensive plan. Your attention to this request for information is greatly appreciated by the Water Resources Department. If you have any questions concerning this form, please contact the WRD's Customer Service Group at 503-986-0801.

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Land Use Information Form



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

Applicant: Kelly Bruun
First Last

Mailing Address: 10990 SE Grizzly Mountain Road

Madras OR 97741 Daytime Phone: 503 781-5353
City State Zip

A. Land and Location

Please include the following information for all tax lots where water will be diverted (taken from its source), conveyed (transported), and/or used or developed. 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:
T12S	R15E	34	SW-NE	3800	Range Land	☒ Diverted	☒ Conveyed	☒ Used	Storage
T12S	R15E	34	NW-SE	3800	Range Land	☒ Diverted	☒ Conveyed	☒ Used	Reservoir
T12S	R15E	34	NE-SE	3800	Range Land	☒ Diverted	☒ Conveyed	☒ Used	"" ""
T12S	R15E	34	SE-NE	3800	Range Land	☒ Diverted	☒ Conveyed	☒ Used	"" ""

List all counties and cities where water is proposed to be diverted, conveyed, and/or used or developed:

Jefferson County

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 ☐ Permit Amendment or Ground Water Registration Modification
☐ Limited Water Use License ☐ Allocation of Conserved Water ☐ Exchange of Water

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

Estimated quantity of water needed: 123 ☐ 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 Reservoir Storage

Briefly describe:

Use of Stored Reservoir Water is for Wildlife, Aquatic Life,

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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 the proposed water uses (including proposed construction) are allowed outright or are not regulated by your comprehensive plan. Cite applicable ordinance section(s): JCC 301.2(A)
- ☐ Land uses to be served by the 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
		☐ 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.

NONE

Name: PHIL STENBECK Title: PLANNING DIRECTOR
Signature: [Signature] Phone: (541) 475-4462 Date: 8/3/12
Government Entity: JEFFERSON 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.





August 8, 2012
Project No.: 1133-101

Keith Mills, P.E.
Dam Safety Division
Oregon Water Resources Department
725 Summer Street NE, Suite A
Salem, Oregon 97301

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WATER RESOURCES DEPT
SALEM, OREGON

**PERMIT TO STORE WATER IN A RESERVOIR (STANDARD REVIEW)
NEWBILL CREEK RESERVOIR; SIX SPRINGS RANCH;
JEFFERSON COUNTY, OREGON**

To Whom It May Concern:

This letter presents a new application (standard review Application) for permit to store additional water in the existing Newbill Creek Reservoir for wildlife enhancement and protection purposes. The reservoir is located on the Six Springs Ranch in Jefferson County, Oregon. The Application requests authorization to store an additional 123 acre-feet of water in the existing reservoir. The reservoir is presently authorized for water storage by certificate 83380.

The additional water requested in this Application is intended to achieve the following project goals:

- Adjust the total authorized storage to correct under-estimation of existing storage volume in connection with original application R-84819 and subsequent Certificate 83380; and in conjunction, increase storage in the reservoir for wildlife enhancement and protection through expanded and modified shoreline, local depth modifications, channel areas and small islands. These proposed improvements are intended to improve nesting areas and habitat for water fowl and to also improve protection from predators (islands);
- Increase reservoir storage that is available for fire suppression in the area. As noted in the 2006 Claim of Beneficial Use for certification, the reservoir was a source of water for fire-fighting the Aubrey Butte fire in 2005.
- As part of an integrated plan of habitat and watershed enhancements by the Six Springs Ranch to improve the overall wildlife benefits of the ranch. The ranch owns a significant portion of the Newbill Creek watershed above the reservoir

and is currently planning continued improvements to hydrologic conditions in the watershed and to improving and expanding wildlife habitat for native species.

- Provide recreational opportunities for the Ranch.

Although the storage permit application is hereby submitted to initiate the OWRD review and processing activities relative to adjustment in authorized storage, other considerations are presently being addressed relative to engineering and spillway improvement to pass a 100-year design storm flow. In this regard, engineered plans and specifications for spillway improvement will be submitted to the OWRD Dam Safety Division in the near future. We appreciate the support from the OWRD staff in our prior water right work and trust that this storage permit application will be processed in a timely manner.

If there are questions regarding this letter or the attached Application, please contact me at your earliest convenience to allow quick response to any questions and to promote timely processing of the Application. My contact information is below:

David J. Newton, P.E., C.W.R.E., C.E.G.
Newton Consultants, Inc.
P.O. Box 1728
Redmond, Oregon 97756
(541) 504-9960, extension 211
dnewton@newtonconsultants.com

Sincerely,

NEWTON CONSULTANTS, INC.



David J. Newton, P.E., C.E.G., C.W.R.E.
Principal

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WATER RESOURCES DEPT
SALEM, OREGON

August 7, 2012
Project No. 1133-101



Mr. Keith Mills, P.E.
Oregon Water Resources Department
Dam Safety Division
725 Summer Street NE, Suite A
Salem, Oregon 97301

**OWRD DAM SAFETY INSPECTION FORM, NEWBILL CREEK RESERVOIR;
CERTIFICATE 83380**

Dear Keith:

Newton Consultants, Inc. (Newton) conducted a dam safety inspection of the Newbill Creek Reservoir (Certificate 83380), located on the Six Springs Ranch in Jefferson County, Oregon. The inspection, on June 20, 2012, was to observe and report on condition of the reservoir, dam and spillway. The OWRD Dam Safety Inspection Form was used as an inspection guide.

Enclosed herewith please find the completed Dam Safety Inspection Form (Exhibit A) and the Supplemental Information (Exhibit B) document. The Exhibit B document provides additional information to supplement certain information recorded on the Dam Safety Inspection Form.

The inspection and related spillway analysis indicated the capacity of the existing spillway is insufficient to pass the 100-year design flow. Six Springs Ranch acknowledged this and improvements are now being planned to increase flow capacity of the spillway.

Please contact me if you have any questions regarding the Inspection Form or Supplemental Information document. I am available at dnewton@newtonconsultants.com or at (541) 540-9960 extension 211.

Thank you for your assistance with this project.

Sincerely,

NEWTON CONSULTANTS, INC.


David J. Newton, P.E., C.E.G., C.W.R.E.
President

Encl (2): OWRD Dam Safety Inspection Form (Exhibit A)
Supplemental Information (Exhibit B)

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R-87852



State of Oregon
Water Resources Department
725 Summer Street NE, Suite A
Salem, Oregon 97301-1271
(503) 986-0900

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Exhibit 'A'

Dam Safety Inspection Form

Name of Dam or Reservoir: Newbill Creek Reservoir Date: June 20, 2012
Permit/Certificate: 83380 District: 11 NID: _____ File: _____
Height: Apx. 13.14' Storage: 29.6 Ac-Ft Photo Attached: Yes Hazard: ☒ Low ☐ Medium ☐ High EAP: _____
Inspector: J. Newton Weather: Sunny - Warm Score: 4.2

Prior inspection:

Next inspection:

Component	Observation and Remarks	Rating
I. Primary Dam	☒ Earthen ☐ Rock Zoned ☐ Concrete ☐ Other	
Upstream slope	See Attached Exhibit 'B'	4
Crest	See Attached Exhibit 'B'	5
Downstream slope	See Attached Exhibit 'B'	4
Right abutment	See Attached Exhibit 'B'	4
Left abutment	See Attached Exhibit 'B'	4
Toe	See Attached Exhibit 'B'	4
Auxiliary dam/dike??	Yes ☐ No ☒ If "Yes", include on separate inspection form.	N/A

II. Reservoir	Pool level/elevation: <u>39.79'</u>	Point of reference: <u>Agri-Drain</u>
Floating debris/trash	None Observed	5
Landslides/erosion	None Observed	5
Log boom	None Observed	5

III. Instrumentation	Flow Rate	Water Level	Description/Condition	
Toe drains	N/A	N/A	Dam not equipped with Toe Drain	N/A
Weirs/flumes	0	0.54'	Water Level Maintained by Flashboards in Emergency Spillway	4
Monitoring wells	N/A	N/A	Dam not equipped with Monitoring Wells	N/A
Other	N/A	N/A	N/A	N/A

Name of Dam or Reservoir: Newbill Creek Reservoir

Date: June 6, 2012

IV. Primary Outlet	☒ Manual	☐ Power Assist	☐ Other
Trickle tube	Agri-Drain		4
Inlet structure	See Attached Exhibit 'B'		4
Outlet structure	18 inch PVC Culvert into outlet box and natural drainage		4
Control works/stem	Controlled by step blocks within the Agri-Drain, currently covered		4
Low level conduit	Diameter: 18"	PVC	4
Valve/sluice gate	Date last fully cycled. Month: N/A Year: N/A		N/A
Trash rack	Not Equipped		N/A
Secondary outlet??	Yes ☐ No ☒ If "Yes", include on separate inspection form.		N/A

V. Emergency Spillway	☐ Earthen/Sod	☐ Rock	☒ Concrete	☐ Other
Flashboards	Wooden flashboards installed; See Attached Exhibit 'B' and Attached Spillway & 100yr flow calculations			3
Control gate	Not Equipped			N/A
Approach channel	See Attached Exhibit 'B'			4
Discharge channel	See Attached Exhibit 'B'			4
Stilling basin	Not Equipped			N/A
Auxiliary spillway??	Yes ☐ No ☒ If "Yes", include on separate inspection form.			N/A

VI. Security	
Fencing, signage	Wire fence restricts livestock entering reservoir area
Vehicle access road	Across top of Dam
On Site Dam Tender	Yes ☐ No ☒ Name:
Emergency Plan	Yes ☐ No ☒ Not required ☒

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Rating Criteria: Observed Structural or Mechanical Condition

5 – Very Good

4 – Acceptable

3 – Unsatisfactory

1 – Repair or Replace

10/2005 DMS

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EXHIBIT B

SUPPLEMENTAL INFORMATION

TO ACCOMPANY OWRD DAM SAFETY INSPECTION FORM

NEWBILL CREEK RESERVOIR – CERTIFICATE 83380

JEFFERSON COUNTY, OREGON

August 7, 2012

This document accompanies the OWRD Dam Safety Form (Form) completed by Newton Consultants, Inc. for the Newbill Creek Reservoir, Certificate 83380, Jefferson County, Oregon. The purpose of this document is to provide additional, more explanatory details for certain of the individual line items included on the Form. The information provided below is organized using the same numbering system as the Form; specific line items may be adequately addressed on the Form and only included herein as redundant responses to the Form. Redundant responses are marked with an asterisk (*).

I. Primary Dam - Earthen

Upstream Slope

The upstream slope, as measured during the June 20, 2012 site visit, varied between 2.5 and 3 feet horizontal to 1 foot vertical. Measurements were made by taking elevation readings on the upstream slope of the dam at approximately 4 locations across the dam face where the slope appeared to be the steepest. Elevation readings were taken based on the difference between the reservoir water surface elevation and the submerged dam face. Readings were taken down the dam face until the water depth reached 3 feet (the maximum depth allowable with a survey rod and Newton field representative wading into the reservoir).

Riprap (appearing to be rhyolitic), sized roughly between 3 inches and 5 inches exists on the upper part of the upstream dam slope. The thickness of the riprap blanket is approximately 6 inches. The riprap appears to extend downward into the reservoir to a depth of approximately 2 to 2.5 feet below the water surface. The bottom edge of the riprap was located by visual observation and probing with a survey rod. The existing reservoir fetch based on a southwesterly wind direction (generally prevalent) and wave impact on the dam is approximately 1,200 feet.

Crest

The dam crest has been raised from its original elevation by the addition of rock fill and a crushed rock cap for vehicular traffic. . The depth of the rock fill and cap was measured

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at 100 foot intervals across the top of the dam and found to range between approximately 0.7 feet and 2 feet. The top elevation (relative elevation) of the dam was also determined at 100-foot intervals to check variations across the dam. The resulting profile is shown on the attached Figure 1 ("Top of Dam Elevation Profile"). The overall condition of the dam crest appeared to be very good.

Downstream Slope

The downstream slope of the dam varied in slope angle between approximately 2 feet horizontal to 1 foot vertical, to greater than 3 feet horizontal to 1 foot vertical. The downstream slope was grass covered earth and appeared to be relatively free of deep rooted vegetation.

Right Abutment

The right abutment of the dam, as viewed looking at the downstream slope, contains the rectangular concrete emergency spillway. The spillway was constructed by excavation into the abutment. The abutment does not display surface cracks or visible seepage around the dam as observed during the June 20, 2012 site visit.

Left Abutment

The left abutment of the dam, as viewed looking at the downstream slope, ties into the natural slope of the land and does not display surface cracks or visible seepage around the dam as observed during the June 20, 2012 site visit.

Toe

Minor amounts of seepage were observed near the toe of the downstream dam slope. Seepage areas were noted near the middle to the westerly end of the dam, at the base of the toe. Seepage was not observed on the face of the downstream dam slope. Seeps were expressed as damp, to saturated soil with a visible change in vegetation; in a single localized area observed to be approximately 6 feet in size, a few small 6-inch or less diameter seep exposures void of vegetation were observed. Observed seepage water was clear.

Three hand-excavated holes at depths of 10 to 11 inches were used to explore seepage locations and attempt to gain some quantification of seepage rate. The depth of the holes was limited by apparent bedrock material. Two of the 3 holes exposed saturated soil without in-filling of seepage water. The third excavation, at the site of a vegetation free area, could not be emptied of water. As water was shovel-bailed from the excavated hole, the upper 4 to 5 inches of water could be vacated from the hole while seepage inflow maintained water pooling in the bottom part of the hole.

Water emerging from the seep areas was clear, indicating no transport of fine soils. Construction of the dam included a core trench as documented in photographs provided by the Six Springs Ranch owner. Photographs and notations thereon indicate the cutoff trench was excavated to a minimum depth of 10 feet with Cat 235. The cutoff trench width is approximately 8 feet (bulldozer blade width). Photos show the cutoff trench

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being backfilled with “damp clay” from the reservoir area and compacted with a sheepsfoot roller. Considering the cutoff trench construction and seep areas at the base of the dam toe, it appears more likely that the seepage water is passing from the reservoir through underlying fractured bedrock to the discharge areas near the toe of the dam. The seeps appear to have no adverse effect on the stability of the dam.

II. Reservoir

*Floating Debris/Trash

None observed at time of site visit.

*Landslide/erosion

None observed at time of site visit.

*Log Boom

None observed at time of site visit

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III. Instrumentation

*Toe Drains

Dam not equipped with Toe Drain.

Weirs/Flumes

Reservoir water level was maintained at time of site visit by wooden flash boards installed in the concrete emergency spillway. The flashboards were mounted to increase the storage over the crest elevation of the emergency spillway by an additional 2.5 feet.

*Monitoring Wells

Dam not equipped with monitoring wells.

IV. Primary Outlet – Manual

Trickle Tube

The dam is equipped with an *Agri-Drain Inlet Water Level Control Structure* that has removable stop blocks that can regulate the reservoir in 5-inch or 7-inch increments. During the June 20, 2012 site visit, the top of the Agri-Drain was covered with a steel plate. The the reservoir water surface was being held by flashboards in the spillway to a depth of 0.54 feet above the top of the Agri-Drain. Based on the construction details provided by the Ranch, the Agri-Drain is 12 feet in height, with the bottom of the Agri-Drain excavated 2 feet below the native ground surface. Based on this description of the Agri-Drain height and the water level over the Agri-Drain, the reservoir is 10.54 feet in

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maximum depth. The minimum height of the dam (at the lowest point on the dam top near the spillway) is 13.04 feet.

Review of the Claim of Beneficial Use (COBU) filed with the OWRD by Elwyn Ross, P.E., C.W.R.E. in 2005 to certificate the storage permit indicates the volume of the reservoir was calculated for COBU purposes at 23 acre-feet (the authorized storage volume under certificate 83380). The basis for this calculation is a maximum water surface elevation of 39.25 feet (top of the Agri-Drain outlet works). Review of available topographic maps for the reservoir site indicates no correlation with a mean sea level elevation, suggesting that elevations in the COBU are relative and probably tied to an assumed, but unidentified datum. Considering that the reservoir water surface on June 20, 2012 was 0.54 feet above the top of the Agri-Drain structure, the corresponding water surface elevation was 39.79 feet. Using the storage/capacity curve calculations included in the COBU, the reservoir is currently storing up to approximately 29.6 acre feet of water.

The storage/capacity curve summary table from the COBU is shown below with an area capacity curve generated by Newton to estimate the storage volume based on the COBU storage values.

Elevation (ft)	Surface Area (Ac)	Storage (AF)
34.0	0.0	0.0
35.0	1.0	1.0
36.0	2.78	3.8
37.0	4.41	8.2
38.0	6.11	14.30
39.0	7.80	22.00
39.25		23
40.0	9.79	32.00

Source of above table, September 16, 2005 Elwyn Ross COBU for permit G-13317.

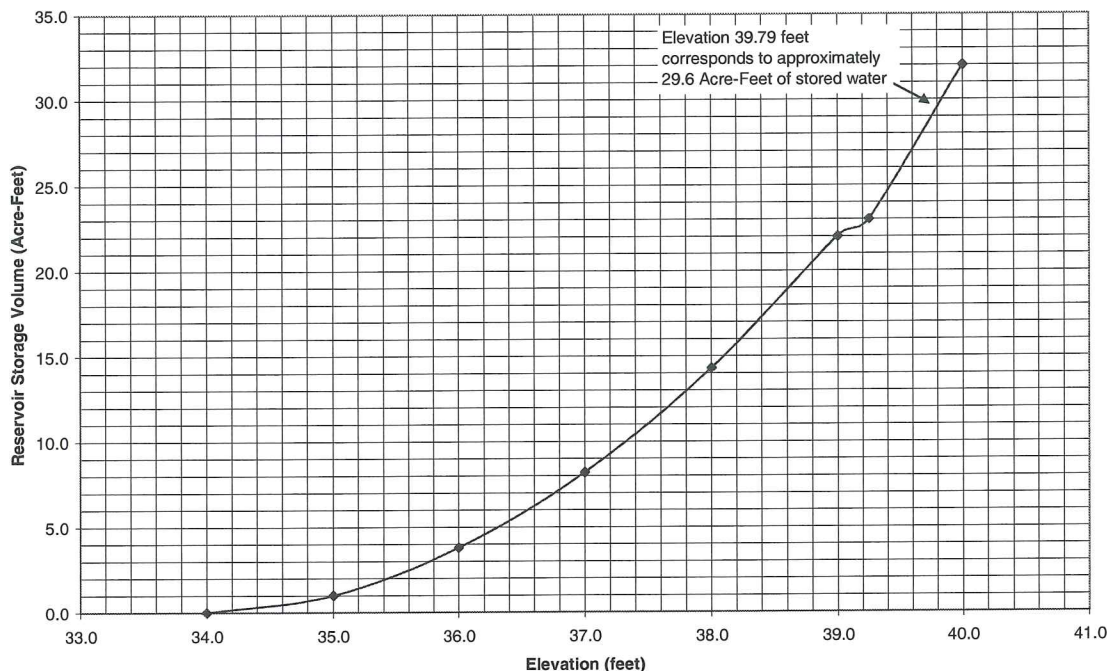
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Stage/Capacity Curve (2005 Ross COBU Values)



Inlet Structure

Inlet structure for the primary outlet of the reservoir is the *Agri-Drain Inline Water Level Control Structure* that measures approximately 2 feet by 1.5 feet in plan view and 12 feet high (as reported by the Ranch).

Outlet Structure

Outlet structure is an 18 inch nominal diameter PVC pipe conveying water from the bottom of the Agri-Drain to the downstream side of the dam beyond the dam toe. The outlet pipe discharges water into a small outlet box that resides in the natural drainage course.

*Control works/stem

PVC outlet pipe is open to flow.

*Low level conduit

18-inch Diameter PVC pipe conveyed from Agri-Drain to beyond toe of downstream side of dam.

V. Emergency Spillway – Concrete

Flashboards

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At the time of the June 20, 2012 site visit, wooden flashboards were installed in the concrete emergency spillway holding the reservoir to an approximate height of 2.5 feet above the bottom of the spillway (reservoir water surface elevation of 39.79 feet based on elevation of 39.25 feet reported in COBU for the top of the Agri-Drain outlet structure).

In response to a telephone call with Mr. Mills of OWRD Dam Safety Division, the 100-year flood recurrence flow was calculated along with the capacity of the emergency spillway, with and without the flashboards currently installed.

100 Year Flood Flow Rate

To determine the peak 100 year flood flow, Newton used the Oregon Water Resources Department Peak Flow Calculator tool which is accessible at:

http://apps.wrd.state.or.us/apps/sw/peak_discharge_map/. The tool allows a user to select the location of the dam on a given stream and then calculates peak flows for return periods of 2, 5, 10, 20, 25, 50, 100, and 500 years. The tool is based upon this document: *Estimation of Peak Discharges for Rural, Unregulated Streams in Eastern Oregon*, Open File Report SW 06-001, State of Oregon Water Resources Department. The tool provides the user with a print out that includes the following table of peak flows for various return periods and a map showing the watershed for which the peak flows were calculated. It also provides the input data that was used in the calculation of the peak flows. The print out is attached to this document.

Return Period, years	Peak Flow, cfs	95% Confidence	
		Lower Limit, cfs	Upper Limit, cfs
2	14.8	5.4	40.6
5	28	11.4	68.5
10	39	16.2	93.6
20	51.1	21.3	123
25	55.3	22.9	133
50	69	28.2	169
100	84.1	33.5	211
500	124	46.2	336

Spill Way Capacity

The existing spillway is a rectangular-shaped concrete channel 53 feet wide and 4 feet deep. The spillway is divided into 3 flow channels approximately 17 feet wide by concrete walls. Wing walls exist at the spillway inlet. The spillway includes a stop log control structure (flashboards) across the channel inlets. With the stop logs in place and a 2 foot freeboard maintained within the reservoir, there is only ½ foot of overflow depth to

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provide passage of flood flows. Using a general equationⁱ for weir flow over the top of the stop logs and a ½ foot of overflow head, the flow capacity of the spillway is 29 cfs.

If the stop logs are removed and a 2 foot freeboard maintained within the reservoir, the capacity of the spillway is 1,200 cfs based on Manning's equation. This calculation assumes that there is a slope in the channel of 0.001 and a k factor of 0.012.

*Control Gate

The dam is not equipped with a control gate.

Approach Channel

The approach channel of the emergency spillway grades from shaped earth to the concrete spillway sill. The reservoir bottom slopes upward to the inlet edge of concrete spillway floor. The concrete spillway channel is 12 feet long (in the flow direction). Flow from the spillway discharges into a discharge channel lined with crushed rock.

Discharge Channel

The discharge channel conveys flow from the emergency spillway around the toe of the dam and reconnects to the natural Newbill Creek flow channel. The discharge channel is graded to an approximate slope of 2.5 percent. The discharge channel varies in bottom width from approximately 53 feet wide at the concrete spillway outlet, down to a bottom width of approximately 20 feet at an approximate distance of 150 feet downstream of the spillway outlet. At this point the discharge channel turns to the north and begins to grade into the natural creek channel.

The bottom of the discharge channel is lined with crushed rock in the approximate 3-inch minus size range. Bedrock is exposed in several areas of the channel suggesting that downward erosion potential has limitations based on the rock presence. The bottom of the discharge channel transitions to the channel sides at varying angles of less than 3 feet horizontal to 1 foot vertical or flatter.

*Stilling Basin

The dam is not equipped with a stilling basin.

VI. Security

*Fencing

The reservoir area is wire fenced to restrict livestock from entering the reservoir area and to reduce the impact of livestock to wildlife habitat on the shores of the reservoir. Access to the reservoir is restricted by a locked gate.

Vehicle Access Road

The top of the dam was raised by the addition of crushed rock to create a drivable road base. The addition of the crushed rock sub-grade increased the overall height of the dam

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approximately 1 foot up to 2.5 feet at the locations measured during the June 20, 2012 site visit.

VII. Conclusions (Added Section)

The dam's spillway capacity must be expanded to meet the Department's requirements to pass a 100 year peak flow event while maintaining reservoir level 2 feet below the top of the impoundment. The Six Springs Ranch owner is proceeding with plans for engineering and implementation of provisions to increase the capacity of the spillway.

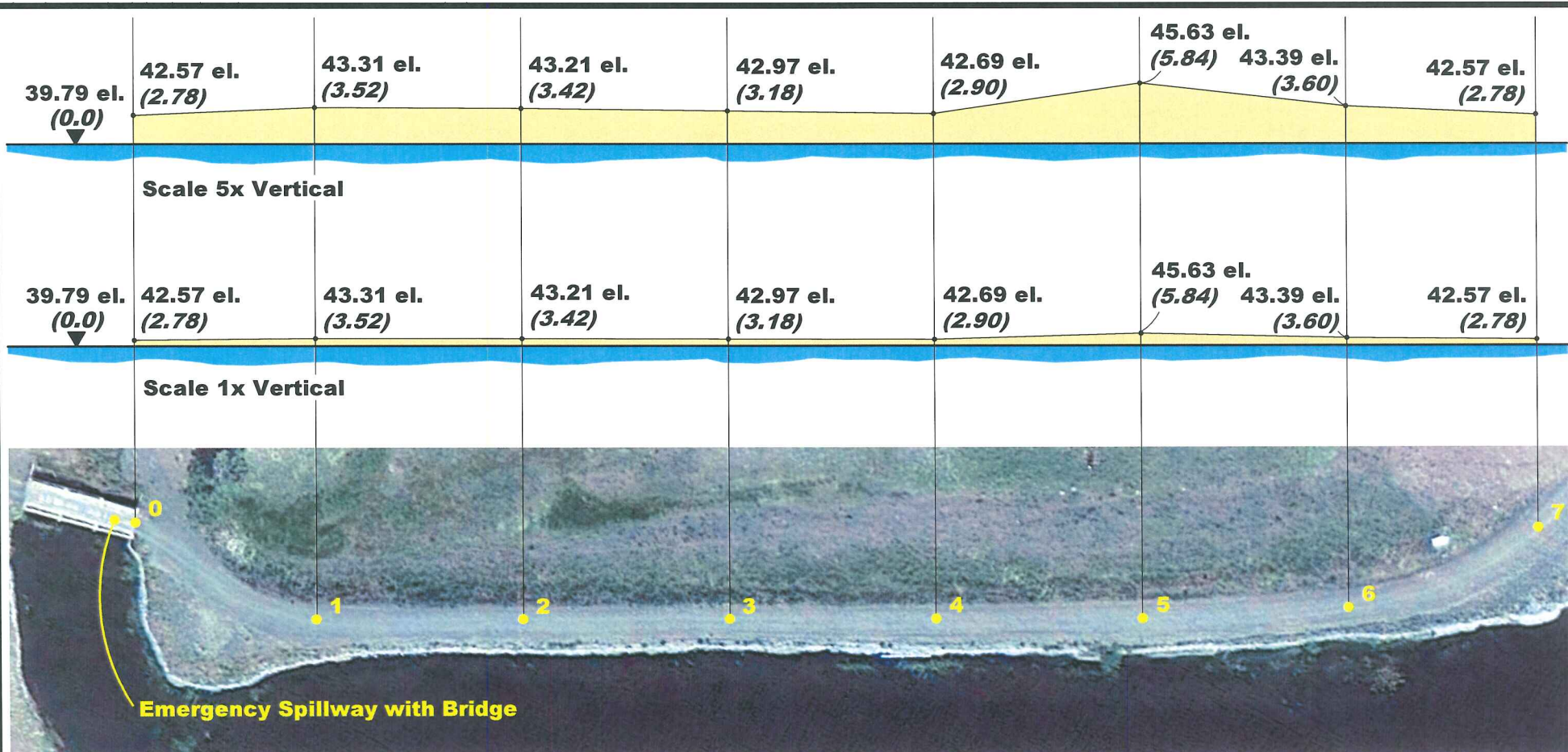
$$^i Q = 1.6 (\text{channel width})(\text{overflow head})^{3/2}$$

Attachments:

Printout of Oregon Water Resources Department Peak Flow estimate.

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SCALE: 1" = 75'

LEGEND

- 42.57 el.** ← Elevation as referenced by Erwin Ross, CWRE in 2006 COBU
- (2.78)** ← Height of dam over water surface elevation as observed during June 20, 2012 site inspection; water surface controlled by flashboards in emergency spillway.

NEWTON
CONSULTANTS INC.
Earth, Water and Rock Specialists
Ph: 541 504-9960 Fax: 541 504-9961

Top of Dam Elevation Profile - Newbill Creek Reservoir
Six Springs Ranch
Jefferson County, Oregon

DESIGNED BY: J. Newton	DRAWN BY: S. Schenck	DATE: Aug 2012	PROJECT NO. 1133-101	Figure 1
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PEAK DISCHARGES FOR SELECTED FREQUENCIES

Report prepared for: auto-delineation

Time: 10:27 AM

Date: 7/23/2012

Watershed Name: NEWBILL CR

PEAK DISCHARGE CALCULATION BY PREDICTION EQUATION

Peak discharges for the ungaged watershed have been determined from a set of hydrologic prediction equations derived using generalized least squares. The models relate peak discharges to physical watershed characteristics such as area and precipitation. The equations take this form:

$$Q(T) = (10.0^{C_0(T)}) * (CHR_1^{C_1(T)}) * \dots (CHR_n^{C_n(T)})$$

Q(T) = Peak Discharge for Return Period T

C_x(T) = Coefficient x for Return Period T

CHR₁ = The First Watershed Characteristic

CHR_n = The nth Watershed Characteristic

Note: * = multiplication, ^ = exponentiation

For this ungaged watershed, peak discharges were estimated using prediction equations for this flood region:

EAST SIDE WATERSHEDS - CENTRAL

Prediction Equation for East Side Watersheds - Central

$$Q(T) = (10.0^{C_0(T)}) * (X_1^{C_1(T)}) * (X_2^{C_2(T)}) * (X_3^{C_3(T)}) * (X_4^{C_4(T)}) * (X_5^{C_5(T)})$$

Q(T) = Peak Discharge for Return Period T

C_x(T) = Coefficient x for Return Period T

X₁ = Drainage Area (square miles)

X₂ = Mean Slope (degrees)

X₃ = Mean January Precip (inches)

X₄ = Mean January Min Temp (degrees Fahrenheit)

X₅ = Soils Depth to Bedrock (inches)

Note: * = multiplication, ^ = exponentiation

Prediction Equation Coefficients

Return Period	Coefficients					
T	C ₀ (T)	C ₁ (T)	C ₂ (T)	C ₃ (T)	C ₄ (T)	C ₅ (T)
2	2.169e-02	8.723e-01	-8.984e-01	2.381e+00	2.169e+00	-1.257e+00
5	1.062e+00	8.576e-01	-8.858e-01	2.025e+00	1.983e+00	-1.530e+00
10	1.450e+00	8.509e-01	-8.835e-01	1.857e+00	1.981e+00	-1.655e+00
20	1.702e+00	8.459e-01	-8.848e-01	1.733e+00	2.024e+00	-1.754e+00
25	1.765e+00	8.445e-01	-8.857e-01	1.699e+00	2.043e+00	-1.782e+00
50	1.924e+00	8.407e-01	-8.904e-01	1.610e+00	2.117e+00	-1.865e+00
100	2.038e+00	8.375e-01	-8.971e-01	1.538e+00	2.205e+00	-1.941e+00
500	2.184e+00	8.316e-01	-9.183e-01	1.416e+00	2.449e+00	-2.097e+00

Required Watershed Characteristics

Drainage Area (square miles) 4.230

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Mean Slope	(degrees)	8.220
Mean January Precip	(inches)	1.700
Mean January Min Temp	(degrees Fahrenheit)	21.500
Soils Depth to Bedrock	(inches)	40.000

Selected Watershed Characteristics

Drainage Area	(square miles)	4.230
Maximum Relief	(feet)	1380.000
Mean Slope	(degrees)	8.220
Average Aspect	(degrees)	213.000
Mean Elevation	(feet)	4150.000
Precip Intensity 2-yr 1-day	(inches)	1.000
Mean January Precip	(inches)	1.700
Mean July Precip	(inches)	0.433
Mean Annual Snow Fall	(inches)	30.400
Mean January Min Temp	(degrees Fahrenheit)	21.500
Mean July Min Temp	(degrees Fahrenheit)	41.400
Mean January Max Temp	(degrees Fahrenheit)	39.800
Mean July Max Temp	(degrees Fahrenheit)	81.300
Soils Storage Capacity	(inches)	0.133
Soils Mean Permeability	(inches per hour)	0.921
Soils Depth to Bedrock	(inches)	40.000

PEAK DISCHARGE ESTIMATES BASED ON PREDICTION EQUATIONS

Return	Peak	95%	Confidence
Period	Flow	Lower	Upper
		Limit	Limit
years	cfs	cfs	cfs
2	14.8	5.4	40.6
5	28.0	11.4	68.5
10	39.0	16.2	93.6
20	51.1	21.3	123
25	55.3	22.9	133
50	69.0	28.2	169
100	84.1	33.5	211
500	124	46.2	336

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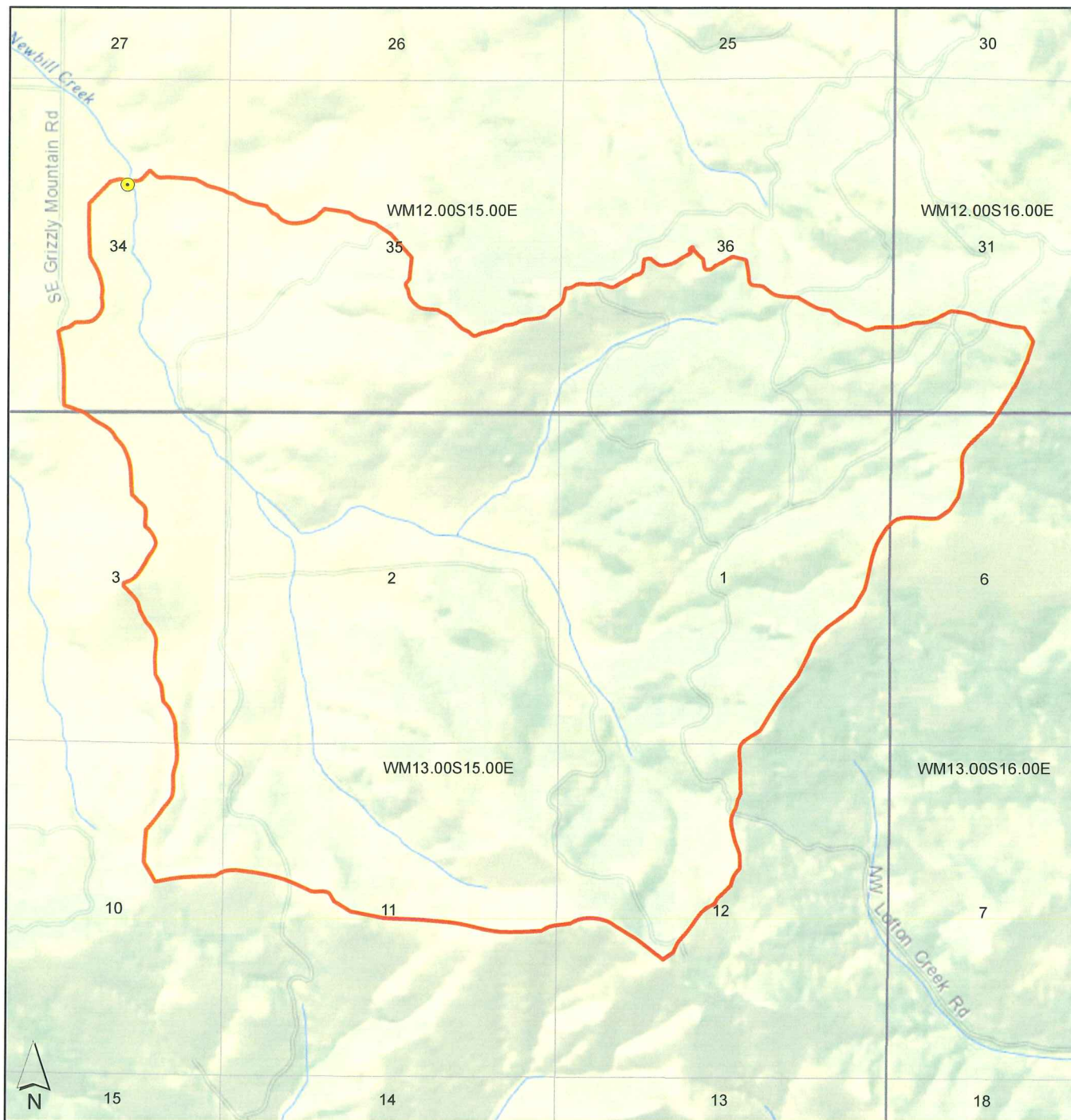
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Peak Discharge Estimation

Oregon Water Resources Department

Date: July 23, 2012



Disclaimer:

This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

Legend

- Pour Point
- Watershed

0 0.125 0.25 0.5 0.75 1 Miles



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