SEPA ENVIRONMENTAL CHECKLIST

A. BACKGROUND

1. Name of proposed project, if applicable: Twin Lakes Water Storage Project

2. Name of applicant. Twin Lakes Aquifer Coalition (TLAC)

3. Address and phone number of applicant and contact person:

(Applicant) Dick Ewing – TLAC Chair, 25 Snowberry Lane, Winthrop, WA 98862-9753. (509) 996-2098
(Consultant) Dan Haller, Project Manager, Aspect Consulting, LLC, 123 East Yakima Avenue, Suite 250, Yakima, WA 98901, dhaller@aspectconsulting.com, (509) 895-5462.

4. Date checklist prepared: 12 July, 2012

5. Agency requesting checklist: Department of Ecology, Office of Columbia River

6. Proposed timing or schedule (including phasing, if applicable):

The project will ideally proceed in a phased manner to test conceptual design elements prior to constructing required system infrastructure. General phases and the anticipated implementation schedule are:

Pilot Testing (2013). Pilot testing may be conducted prior to design and construction of significant infrastructure (pipeline, pump station, etc.) to confirm conditions predicted through groundwater modeling. Results would be incorporated into system design. Although pilot testing is preferred, details regarding permitting, identifying sources of water and funding the test need to be resolved. Pilot testing is conceptualized to discharge water directly to Big Twin Lake for a period of time sufficient to affect a water level change in the surface and groundwater in the vicinity of the lake. Water levels in the surface and groundwater within the project area will be monitored throughout the test. Conceptual water sources for a pilot test include the Wolf Creek Reclamation District (WCRD) pipeline northwest of Big Twin Lake and temporary piping from a source near the Methow River. Water would be discharged directly to the Big Twin Lake using a temporary discharge structure to dissipate energy and prevent erosion.

Well Testing (2013 - 2014). A test well will be drilled near the Methow River on property owned by Haub Brothers Enterprises Trust (Parcel 3421030125) (Figure 1). Hydraulic testing of the well will be performed to confirm the availability of groundwater as a source prior to design and construction of significant infrastructure. In addition to testing the aquifer and well capacity, water levels in wells in the vicinity will be monitored to support an impairment analysis. Depending on the outcome of well testing, the test well will be constructed as a production well. A second production well is anticipated at the same location.

System Design and Construction (2013 - 2014). Remaining infrastructure including pipeline, pump station, and discharge structures (surface water and infiltration gallery) will be designed taking into consideration all results from previous project testing phases.

Project Start Up (2014). Upon completion of system construction, project start-up will commence.

Monitoring and Adaptive Management. This phase will begin upon project startup to gauge project success and to make operational adjustments. A project baseline monitoring network has been established and is currently on-going. This includes staff gauges to monitor lake levels that are recorded monthly in Barnsley, Big Twin, Little Twin, and Dibble Lakes. A continuous record of lake levels have been recorded by a transducer and datalogger installed in Big Twin Lake since June 2010. In addition, a continuous water level record is being obtained in two domestic wells equipped with transducers and dataloggers. Streamflow is monitored at two locations on Thompson Creek. The monitoring network was established by Aspect Consulting and is now operated and maintained by TLAC. Continued monitoring at these stations is anticipated to support adaptive management.

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.

No additional project elements are planned subsequent to completion of the phases outlined above in Item #6.

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

- Andonaegui, C., 2000, Salmon, Steelhead, and Bull Trout Habitat Limiting Factors, Water Resource Inventory Area 48, Final report, Washington State Conservation Commission, July 18, 2000.

- Aspect Consulting, LLC (Aspect), 2005, Report of Phase 1 Analysis, Twin Lakes Aquifer Coalition Water Right Application G4-34915 Cost Reimbursement Project. Bainbridge Island, Washington. Unpublished Work. March 28, 2005.

- Aspect Consulting, LLC (Aspect), 2009a, Memorandum RE: DRAFT Preliminary Feasibility Assessment of Multipurpose Storage, Twin Lakes Area, Okanogan County, Washington. Bainbridge Island, Washington. Unpublished Work. August 20, 2009.

- Aspect Consulting, LLC (Aspect), 2009b, Hydrogeologic Evaluation Report, Water Right Application G4-34915, Twin Lakes Aquifer Coalition, Cost Reimbursement Project. Bainbridge Island, Washington. Unpublished Work. December 29, 2009.

- Aspect Consulting, LLC (Aspect), 2009c, Memorandum RE: Evaluation of the Regulatory and Engineering Feasibility, Twin Lake Aquifer Coalition (TLAC), Water Right Application G4-34915. Bainbridge Island, Washington. Unpublished Work. December 31, 2009.

- Aspect Consulting, LLC (Aspect), 2010, Memorandum RE: DRAFT Permitting/Operations Strategy and Project Next Steps, Twin Lakes Aquifer Coalition (TLAC), Water Right Application G4-34915, Preliminary Feasibility Assessment of Multipurpose Storage, Twin Lakes Area, Okanogan County, Washington. Bainbridge Island, Washington. Unpublished Work. December 13, 2010.

- Aspect Consulting, LLC (Aspect), 2011a, Memorandum RE: DRAFT Twin Lakes Storage Project Overview. Bainbridge Island, Washington. Unpublished Work. September 8, 2011.

- Aspect Consulting, LLC (Aspect), 2011b, Memorandum RE: DRAFT Assessment of Maximizing Twin Lakes Project Storage. Bainbridge Island, Washington. Unpublished Work. September 22, 2011.

- Aspect Consulting, LLC (Aspect), 2011c, Unpublished Lake Level Data Collected from 2006 through 2011, provided to TLAC June, 2011. Bainbridge Island, Washington. Unpublished Work.

- Barksdale, J.D., 1975, Geology of the Methow Valley, Okanogan County, Washington. State of Washington Department of Natural Resources, Bulletin No. 68.

- Ely, D.M. and Risley, J.C., 2001, Use of a Precipitation-Runoff Model to Simulate Natural Streamflow Conditions in the Methow River Basin, Washington, United States Department of the Interior Geological Survey Water-Resources Investigations Report 01-4198.

- Ely, D.M., 2003, Precipitation-Runoff Simulations of Current and Natural Streamflow Conditions in the Methow River Basin, Washington, Washington, United States Department of the Interior Geological Survey Water-Resources Investigations Report 03-4246.

- Fisher, B., 2010, Upper Middle Methow Reach (M2) Habitat Improvement Project, Methow River, Washington, Methow Salmon Recovery Foundation, February 2010.

- Golder Associates Inc., 2003, Methow Basin (WRIA 48) Storage Assessment, Appendix F to the Methow Basin Watershed Plan.

- Herrera Environmental Consultants (Herrera), 2010, Twin Lakes Area Habitat Assessment, Technical Memorandum, prepared for Aspect Consulting. May 2010.

- IRZ Consulting, LLC (IRZ), January 6, 2003a, Final Interim Report, Twin Lakes Aquifer Recharge Project.

- IRZ Consulting, June 30, 2003b, Final Conceptual Design Report, Twin Lakes Aquifer Recharge Project.

- IRZ Consulting, July 22, 2004, Groundwater Model of Twin Lakes Aquifer.

- Kauffman, K.G. and Bucknell, J.R., 1976, Water Resources Management Program Report of the Methow River Basin. Washington Department of Ecology River Basin Program Series Publication No. 4, December 1976.

- Konrad, C.P., 2003, Assessment of Ground-Water Storage Through Artificial Recharge at Six Sites in the Methow River Basin, Washington, United States Department of the Interior Geological Survey unpublished.

- Konrad, C.P., 2004, Simulated Water-Management Alternatives using the Modular Modeling System for the Methow River Basin, Washington, United States Department of the Interior Geological Survey Water-Open File Report 2004-1051.

- Konrad, C.P., Drost, B. W., and Wagner, R. J., 2003, Hydrogeology of the Unconsolidated Sediments, Water Quality, and Ground-Water/Surface-Water Exchanges in the Methow River Basin, Okanogan County, Washington, United States Department of the Interior Geological Survey Water-Resources Investigations Report 2003-4244, August 4, 2005.

- Methow Basin Planning Unit, 2005, Methow Basin (WRIA 48) Watershed Plan. June 20, 2005.

- Methow Watershed Council, 2009, Final Detailed Implementation Plan, Methow River Basin (WRIA 48). October 29, 2009.

- Natural Resources Conservation Service (NRCS), 2012, Web Soil Survey, 2012 online at http://websoilsurvey.nrcs.usda.gov/app/

- Northwest Power Planning Council, 2002, Methow Subbasin Summary, Draft Report, May 17, 2002.

- Palmer, S.P., Magsino, S.L., Bilderback, E.L., Poelstra, J.L., Folger, D.S., and Niggemann, R.A., 2004. Liquefaction Susceptibility and Site Class Maps of Washington State, By County. Washington Division of Geology and Earth Resource Open File Report 2004-20, September 2004.

- United Stated Bureau of Reclamation (USBR), 2008, Methow Subbasin Geomorphic Assessment, Okanogan County Technical Appendices, Department of the Interior Bureau of Reclamation, February, 2008.

- United Stated Bureau of Reclamation (USBR), 2008, Big Valley Reach Assessment, Methow River, United States Department of the Interior Bureau of Reclamation, August, 2008.

- United Stated Bureau of Reclamation (USBR), 2010, Middle Methow Reach Assessment, United States Department of the Interior Bureau of Reclamation, August, 2010.

- Washington Departments of Fish and Wildlife and Ecology, 2011, Columbia River Instream Atlas Project, Final Report, Ecology Publication Number 11-12-015.

- Washington Department of Fish and Wildlife, 2012, Priority Species Habitat on the Web, online at http://wdfw.wa.gov/mapping/phs/.

- Washington Department of Natural Resources Division of Geology and Earth Resources, 2012, Washington Interactive Geologic Map, 2012, online at: http://wigm.dnr.wa.gov/.

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain. None known.

10. List any government approvals or permits that will be needed for your proposal, if known.

State

- Department of Ecology – Groundwater right under application G4-34915 (preliminary permit or temporary permit may also be necessary for pilot testing).
- Construction Stormwater General Permit.

Based on a June 19, 2012 meeting with Ecology, neither an NPDES nor a State Waste Discharge Permit is anticipated to be required.

A Hydraulic Project Approval (HPA) may be necessary. A proposed boulder cascade method of discharging water to the lakes and aquifer may avoid HPA permitting.

County

The following are confirmed required permits from Okanogan County.

- Zoning Conditional Use Permit – Required for pump station.
- Building Permit – Required for the proposed pump station if greater than 120 square feet (otherwise exempt).

Grading – No permit required in Okanogan County; however, projects grading more than 100 cubic yards (CY) of material require County SEPA input. TLAC Project elements grading > 100 CY of material may include the infiltration gallery and discharge structures at Big Twin Lake, Barnsley Lake and the Kettle.

Waterline Road Crossing – Public Works Department requires crossing permit for any County road. A County road crossing is anticipated beneath Twin Lakes Road at the intersection with Wolf Creek Road.

Right-of-Way Franchise – Public Works Department requires purchase of franchise for any pipeline/utility alignment more than 200 consecutive feet within County right-of-way (ROW). The following sections of proposed alignment are anticipated to require franchise.

- 1,700 feet along the east side of Wolf Creek Road ROW from where it leaves Parcel 3421030125 southeast to the intersection with Twin Lakes Road.

- 1,200 feet along the east side of Twin Lakes Road from Wolf Creek Road southwest to a private drive accessing Barnsley Lake.

A Shoreline Substantial Development Permit may be necessary. Required work for the withdrawal works is approximately 600 to 800 feet outside the ordinary high water level for the Methow River. Work will occur adjacent to Big Twin Lake related to construction of the boulder cascade feature.

It appears that the proposed work is located outside of the floodplain. If work in the floodplain is needed, a Floodplain Development Permit would be required.

Wolf Creek Reclamation District

- Support for pilot testing (potentially through temporary transfer of shares, or a temporary water right).

Various easements on private property are anticipated including:

Wells and Pump Station

- Parcel No. 3421030125 owned by Haub Brothers Enterprises Trust.

Waterline and Discharge Structures

- Parcel Nos. 3421030125 and 3421100036 owned by Haub Brothers Enterprises Trust
- Parcel No. 3421104005 owned by Haub Brothers Enterprises Trust. Waterline and discharge structures for Barnsley Lake and the Kettle.
- Barnsley Lake Drive, private, partially developed road adjoining County road, owned by Haub Brothers Enterprises Trust (Assessor Map indicates it is County road, but Public Works Department indicates it is private).
- Parcel No. 3421100024 owned by Albright.
- Parcel No. 7470000002 including Twin Lakes Drive, Barnaby Road and open space for proposed infiltration gallery, owned by Sun Mountain Ranch Club. Waterline crossing is anticipated beneath Twin Lakes Drive (gravel road) at the intersection with Barnaby Road in the Twin Lakes Development. These are private roads.
- Parcel No. 3421154002 owned by Johnson Family Trust.
- Parcel No. 3421151003 owned by Johnson Family Trust. Waterline and discharge structure to Big Twin Lake.

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)

In 2004, the Washington State Legislature provided $750,000 to the Department of Ecology to evaluate and issue decisions on water right applications for restoration of Twin Lakes in the Methow Valley (Section 318,

2003-2005 Capital Budget). The funding was provided to address declining lake levels since 2001 due in part to conversion of unlined irrigation canals to pressurized pipe in the recharge area of the lakes. The project area and key feature are shown in Figure 1.

TLAC applied for a groundwater right under application G4-34915 on October 7, 2003. The application requests a water right appropriation within the Methow River Basin, Water Resources Inventory Area (WRIA) 48, for a maximum withdrawal of 4,500 gallons per minute (gpm) and a quantity of 2,000 acre-feet from wells located near the Methow River. The proposed purpose of use listed on the application is as follows:

- Restore and maintain Twin Lakes Aquifer levels.
- Restore and maintain recreational trout fishing in Big and Little Twin Lakes.
- Restore and maintain riparian habitat and lowland habitat for aquatic species and mammals that use Barnsley and Twin Lakes.
- Water storage enhancement for increasing streamflow in the mainstem Methow River and Thompson Creek during low flow periods.
- Restore natural aesthetic appeal of lake areas.
- Increase recreational opportunities.
- Maintain or enhance water quality for trout fishery and recreation.

The project consists of two proposed wells located in hydraulic continuity with the Methow River in Section 3, T. 34 N., R. 21 E.W.M. Water withdrawn from the wells is conveyed to Big Twin Lake via approximately 12,500 feet of pipeline up to 16-inch diameter. Lateral diversion points on the pipeline divert water to Barnsley Lake, the Kettle, and to an infiltration gallery located between Barnsley and Big Twin Lakes.

A groundwater model has been constructed of the lake and aquifer system. The model was used to evaluate various pumping scenarios and the fate of water withdrawn from the wells and discharged to the lake/aquifer system. TLAC proposed to pump from the Methow River only when flows are above the adopted minimum instream flows in WAC 173-548 (e.g., an interruptible withdrawal). Based on the groundwater modeling, TLAC amended Application G4-34915 in August 2012 to 2,000 gpm and 800 acre-feet and removed the intent to increase streamflow in Thompson Creek. The amendment also clarified that although 800 acre-feet is needed in the first 10 years, long-term maintenance pumping is on the order of 550 acre-feet is expected. The maximum lake and aquifer storage capacity in the Twin Lakes area is approximately 1,600 acre-feet.

Approximately 70% of the water withdrawn from the Methow River returns to the river through the aquifer system. That return flow has been modeled and some water returns to the river each month. Therefore, although the withdrawals are interruptible, the return flow is continuous and available for mitigation of new downstream uses. The project is proposed to be funded by Department of Ecology's Office of the Columbia River (OCR). OCR's goal in funding storage projects is to benefit both instream and out-of-stream uses. In this case, after the primary uses of lake and aquifer stabilization, on-site habitat, recreation, and fisheries benefits are realized, secondary benefits can also be achieved. Based on 70% return flow, at steady state approximately 300 to 450 acre-feet of water will be available to be trusted to OCR. Although the pumping from the river will be interruptible, the return flow will be continuous, which is well-suited for OCR benefits.

Work completed during groundwater modeling includes an assessment of whether existing and/or future domestic wells will have a significant effect on water being used to augment lake levels. Model results indicate the sustainable yield of the aquifer appears sufficient to support future buildout with or without the TLAC project (Aspect, 2009b).

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

The Twin Lakes Water Storage project area occupies portions of Sections 2, 3, 10, 11, 14, 15, 23 and 24 of T. 34 N., R. 21 E.W.M. southwest of Winthrop in Okanogan County. Figure 1 shows approximate project area boundaries and key site features. The project area was estimated from groundwater mapping (Aspect, 2009b) and encompasses the approximate extent of the aquifer that is projected to experience increased water levels resulting from water that is put into storage. Big Twin, Little Twin, Dibble Lake, Barnsley Lakes and a portion of Thompson Creek lie completely within the project area.

B. ENVIRONMENTAL ELEMENTS

1. Earth

a. General description of the site.

Project area topography is characterized by flat terrain in the Methow River Valley and rolling terrain elsewhere. The geologic origins of the project area as a glacial outwash kettle and kame environment produced numerous gentle ridges and enclosed depressions (kettles). Kettles fill with water forming lakes and ponds where they intersect the groundwater table.

b. What is the steepest slope on the site (approximate percent slope)?

Slopes throughout the project are typically less than 5 percent. Steepest slopes occur along the western and southern end of Big Twin Lake above the targeted lake fill elevation. Slopes that will be inundated under proposed conditions are less than 10 percent. Slopes along the proposed pipeline alignment and at the proposed infiltration gallery are less than 5 percent.

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any prime farmland.

Surface soils (agricultural soils) generally form from underlying geologic units. The geology of the Twin Lakes project area is dominantly unconsolidated glacial sediments of both fine-grained and coarse-grained, glaciofluvial units (sediments deposited by streams originating from glaciers) that overlie bedrock. Exposures of bedrock are rare and evaluation of the subsurface indicates a bedrock ridge (region of more shallow bedrock beneath glacial sediments) is present along the eastern boundary of the project area. Overall, the fine-grained units within the project area generally consist of glacial till and glaciolacustrine silts and clays, while the coarse-grained units primarily consist of sands and gravels (Konrad and others, 2003).

Mapped agricultural soils (NRCS, 2012) in the project area where infrastructure will be built include:

- Haley ashy fine sandy loam, 8-25% slopes
- Owhi gravelly ashy fine sandy loam, 0-25% slopes, extremely stony
- Owhi gravelly ashy fine sandy loam, 0-8% slopes
- Newbon gravelly loam, 0-8% slopes
- Winthrop gravelly loamy sand, 0-15% slopes

Agriculture, consisting of grass and pasture cultivation, occurs on all of these soils except the extremely stony Owhi gravelly ashy fine sandy loam. The proposed project will have minimal impact to cultivated lands.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

Examination of a geologic information in a 1:100,000 scale map compilation from Washington Department of Natural Resources (WDNR, 2012) indicates no mapped landslides are present in the project area. No signs of slope instability within the project area were noted over several years of field work supporting hydrologic data collection. Lake bank stability was assessed under several water level change scenarios to be moderate at Big Twin Lake and high at Barnsley Lake (Herrera, 2010).

e. Describe the purpose, type, and approximate quantities of any filling or grading proposed. Indicate source of fill.

No fill is anticipated. Grading up to 1,000 CY of material is anticipated to construct the infiltration gallery and potentially at the boulder cascade channel discharge structure to Big Twin Lake. Smaller volumes are anticipated to be graded to construct discharge structures at Barnsley Lake and the Kettle.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

The completed project is not anticipated to result in erosion of soils. Measures to prevent erosion are discussed below.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

Minimal impervious surfaces associated with the pump station (roof, concrete pad) are anticipated.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

The project will seek coverage under the Ecology's Construction Stormwater General Permit. Compliance with permit requirements will include development and implementation of a Stormwater Pollution Prevention Plan, water quality monitoring as applicable, and use of established Best Management Practices (BMPs) to implement temporary erosion and sedimentation control (TESC) measures for construction activities. Final site stabilization will be achieved to fulfill the permit.

Discharge structures at Big Twin Lake, Barnsley Lake and the Kettle feature will be designed and constructed in a manner to provide erosion control.

2. Air

a. What types of emissions to the air would result from the proposal (i.e., dust, automobile, odors, industrial wood smoke) during construction and when the project is completed? If any, generally describe and give approximate quantities if known.

Temporary dust emissions would occur during construction. No long-term emissions are expected.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe. None known.

c. Proposed measures to reduce or control emissions or other impacts to air, if any:

Dust abatement during construction is expected.

3. Water

a. Surface Water:

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

Key surface water features include the Methow River, Thompson Creek and several lakes/ponds (Figure 1). The Methow River bounds the project area to the north and east and lies down gradient of the storage project. Thompson Creek (a perennial Methow River Tributary) is located south of Big Twin Lake on the southern end of the project area. The Creek provides some recharge to the lake and aquifer system and is located up-gradient of the storage project except in the southeastern portion of the project area. Four lakes and one depression that is currently dry but will be filled as part of the TLAC project are describe in Table 1.

Table 1. Surface Water Bodies in the Twin Lakes Storage Project Area.

Lake	Location	Surface Area (acres)	Maximum Depth (feet)
Big Twin Lake	T. 34 N., R. 21 E., Section 15	79	67
Little Twin Lake	T. 34 N., R. 21 E., Section 15	23	33
Barnsley Lake	T. 34 N., R. 21 E., Section 10	9.5	20
Kettle Feature	T. 34 N., R. 21 E., Section 10	Dry	-
Dibble Lake	T. 34 N., R. 21 E., Section 23	4	-

Big Twin and Little Twin Lakes are in direct hydraulic continuity. Barnsley Lake and the Kettle are anticipated to be in direct hydraulic continuity once water levels are increased (the Kettle is currently dry). Barnsley Lake and Dibble Lake lie down gradient from Big Twin Lake.

The water environment will be affected by withdrawals from and return flow to the Methow River and increased water levels in lakes and ponds within the project area.

<u>Withdrawals from the River</u>

Withdrawals from two wells in hydraulic continuity with the Methow River will occur up to 2,000 gpm (4.5 cfs) during periods authorized under Groundwater Right Application G4-34915. Because much of this water will come from aquifer storage, it is unlikely the Methow River will experience the full 4.5 cfs withdrawal at any given time.

TLAC proposes to withdraw groundwater when flows in the Methow River meet or exceed the Minimum Instream Flow (MIF) adopted in WAC 173-548. Analysis of flow records (Aspect, 2011a) indicates flows are generally above the MIF between April and September (approximately 80% of the time), but drop below the MIF with more frequency between October and April (approximately 60% of the time). In addition to consideration of the MIF, the TLAC project withdrawal window has been restricted to an April through September timeframe. This constraint was imposed to eliminate operations during winter months when less water is available, availability occurs for shorter duration, and the lakes are typically frozen.

The wells are located near Fog Horn Irrigation Ditch, which is not expected to be adversely affected by pumping from the wells.

Return Flow to the Methow River

The project will provide benefits to instream flows on the Methow River, particularly in the winter low flow months. Groundwater modeling indicates approximately 370 AF or about 70% of the water withdrawn from the Methow River returns to the river through the aquifer system (Aspect, 2011b). The balance is attributed to evapotranspiration and year-to-year changes in storage. Return flow to the river would occur over the course of the year at a rate of approximately 0.5 cfs (Aspect, 2011a) making it available for instream use mitigation of new downstream uses. About 150 afy of this return flow will augment streamflows during the low flow winter months from October through March. The vast majority of groundwater from storage would return to the river to the north, near the pumping wells. Some groundwater would flow south from Big Twin Lake and return to the river near the High School by-passing about a 3-mile reach of the Methow River (Aspect, 2009c).

Water Levels in Lakes and Ponds

The TLAC storage project will result in increased water levels in several water bodies in the project area. Water level elevations under existing and proposed conditions are shown in Table 2.

Observed water levels have declined in surface water bodies within the project area since about 1999 due to operational changes in the WRCD ditch and decreased precipitation (IRZ, 2003b). Historic water levels in Big Twin Lake were typically maintained at an elevation of about 1,800 feet above sea level (asl) prior to 1999 (Figure 2). Water levels collected by Aspect Consulting since 2006 (Figure 2) show elevation in Big Twin Lake has ranged from about 1,777 to about 1,795 feet asl (Aspect unpublished data, 2011c). Water levels have declined in Little Twin and Barnsley Lakes during this period consistent with Big Twin Lake.

The TLAC storage project will restore historic water levels in surface water bodies in the project area. Maximum fill levels (Table 2) for surface water bodies affected by the storage project were established through TLAC coordinated with property owners potentially affected by increased water levels in Big Twin and Barnsley Lakes and the Kettle. No property owners are anticipated to be affected by increased water levels in Little Twin Lake. Stakes were set at Big Twin Lake, Barnsley Lake and the Kettle establishing the maximum fill level for these lakes and a survey was completed. The target water level proposed for Big Twin Lake (1,799 ft) is 1 foot lower than maximum (1,800 ft) to allow for an operational contingency to prevent overfilling during high runoff years. Annual water level fluctuations under proposed conditions for Big and Little Twin Lakes will be less than under existing conditions with the lowest water level occurring in winter.

Table 2. Water Level Elevations under Existing and Proposed Conditions.

Lake	Existing Water Level Elevation (ft asl)	Proposed Maximum Water level Elevation (ft asl)	Existing Water Level Fluctuation (ft)	Proposed Water Level Fluctuation (ft)
Big Twin Lake	1,777 – 1,795	1,800	18	1-2
Little Twin Lake	1,777 – 1,793	1,800	16	1-2
Barnsley Lake	1,773 – 1,776	1,785	3	5-7
Kettle Feature	Dry	1,785	-	5-7
Dibble Lake	1,776 – 1,781	1783	5	1-2

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

Yes. The discharge structures at Big Twin and Barnsley Lakes could be constructed within 200 feet of Ordinary High Water (OHW) for these lakes. The withdrawal works are located approximately 600 to 800 feet from the Methow River OHW.

The discharge structure at Big Twin Lake will consist of a short "boulder cascade" channel from the property line of Big Twin Campground (Parcel No. 3421151003) to the lake, a distance of up to 500 feet. The channel will have a natural appearance with large rocks anchored in place. The boulder cascade would provide energy dissipation, some oxygenation, and will limit erosion at the lake shore where the recharge water is discharged. Design elements will include considerations for habitat including spawning sites for resident fish allowing some self-propagation of the Big Twin Lake fish (Aspect Consulting, 2011a).

Discharge structures at Barnsley Lake and the Kettle will be designed and constructed in a similar "natural" manner to provide functions for energy dissipation, some oxygenation and erosion control. However, these two structures will be substantially shorter and will not be designed to directly benefit habitat.

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

No filling or dredging of wetlands are anticipated.

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

No. The project will be supplied by groundwater.

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

No portion of the proposed project infrastructure lies within the 100-year floodplain (Figure 1).

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

No discharges of waste material are anticipated. The recharge of groundwater to the Methow River is not expected to result in increased temperature. A conceptual model characterizing temperature effects is being developed.

b. Ground Water:

1) Will ground water be withdrawn, or will water be discharged to ground water? Give general description, purpose, and approximate quantities if known.

Groundwater will be withdrawn from two proposed wells in hydraulic continuity with the Methow River located on Parcel No. 3421151003 in the N ½ of the SW Qtr Section 3, T 34N, R 21 EWM under Groundwater Right Application G4-34915.

Groundwater will be discharged to a proposed infiltration gallery located approximately 2,300 feet northwest of Big Twin Lake on Parcel No. 7470000002 in the SE Qtr of SW Qtr Section 10, T 34N, R 21EWM. The maximum rate of discharge to the infiltration gallery is 2,000 gpm for the purpose of increasing water storage in the Twin Lakes aquifer/surface water system.

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals…; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

No waste material is anticipated to be discharged to groundwater. No septic system will be installed.

c. Water runoff (including stormwater):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

The Twin Lakes Water Storage project will result in minimal increase in impervious surfaces (pump station roof and concrete pad) and no runoff.

2) Could waste materials enter ground or surface waters? If so, generally describe.

Discharge of groundwater from the wells to the infiltration gallery will result in no waste materials entering groundwater. Water will be conveyed directly from the wells to the infiltration gallery via buried pipeline.

d. Proposed measures to reduce or control surface, ground, and runoff water impacts, if any:

None.

4. Plants

a. Check or circle types of vegetation found on the site:

The Twin Lakes Area Habitat Assessment (Herrera, 2010) documents wetland, shrub-steppe and dry open forest vegetation occurring in the project area (Table 3).

Table 3. Plants documented in the Twin Lakes Storage Project Area (Herrera, 2010)

Common Name	
cattail	black hawthorn
softstem bulrush	willow
quaking aspen	bitterbrush
black cottonwood	bluebunch wheatgrass
serviceberry	wax currant
bitter cherry	ponderosa pine

b. What kind and amount of vegetation will be removed or altered?

Minor vegetation consisting primarily of grasses will be cleared at the pump station, infiltration gallery, pipeline alignment and boulder cascade discharge channel at Big Twin Lake. Vegetation along the pipeline alignment is expected to be restored to a natural state by seeding following backfill.

c. List threatened or endangered species known to be on or near the site.

A Biological Assessment for the Upper Middle Methow Reach (M2) Habitat Improvement Project (Fisher, 2010) indicates one plant, Ute ladies' tresses, is listed as threatened in the Methow Watershed. Field surveys conducted for the biological assessment found no occurrences of this plant in the M2 project area located between the Towns of Winthrop and Twisp.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

Native riparian vegetation will be planted along the boulder cascade discharge channel at Big Twin Lake to create shade and develop a more natural visual appearance.

5. Animals

a. Circle any birds and animals which have been observed on or near the site or are known to be on or near the site:

The Twin Lakes Area Habitat Assessment (Herrera, 2010) documents animals known to be present at the site (Table 4). Herrera also documented Rainbow trout (triploid) and Lahanton trout present in Big Twin and Little Twin Lakes that are stocked annually by WDFW. The Methow River in the project area provides habitat for fish including spring and summer Chinook, steelhead, coho and bull trout (Fisher, 2010).

Table 4. Animals documented in the Twin Lakes Storage Project Area (Herrera, 2010)

Common Name	
mule deer	songbirds
coyote	pileated woodpecker
squirrels	painted turtle
common loon	amphibians
mallard	bald eagle
Canada geese	golden eagle
great blue heron	osprey
red winged blackbird	red tailed hawk

b. List any threatened or endangered species known to be on or near the site.

A Biological Assessment for the Upper Middle Methow Reach (M2) Habitat Improvement Project (Fisher, 2010) indicates the federally-listed animals in Table 5 are present within the Methow River Watershed. The biological assessment determined the M2 project area located between the Towns of Winthrop and Twisp lies outside of suitable habitat for Canada lynx and northern spotted owl, is not likely to be used by grizzly bear and will not affect gray wolves. The Methow River in the Twin Lakes Storage Project area is known to be used by endangered Upper Columbia River spring Chinook salmon, Upper Columbia River steelhead, and Columbia River bull trout.

Table 5. Species listed under the Endangered Species Act known or suspected to occur in the Methow Watershed (from Fisher, 2010)

Common Name	Federal Status
spring Chinook salmon	Endangered
summer steelhead	Endangered
bull trout	Threatened
coho	Unlisted
Summer Chinook salmon	Unlisted
northern spotted owl	Threatened
gray wolf	Threatened
grizzly bear	Threatened
Canada lynx	Threatened

c. Is the site part of a migration route? If so, explain.

Potentially deer, geese, and duck migration through the site area.

d. Proposed measures to preserve or enhance wildlife, if any:

This project is intended to enhance aquatic habitat by:

- Increasing year-round water supplies in the Methow River.
- Stabilizing declining water levels in existing lakes (Big Twin, Little Twin, Dibble, Barnsley) that have occurred for over 10 years.
- Decreasing seasonal water level fluctuations in lakes (reservoir effect).
- Increasing shorelines and water volumes in lakes.
- Inundating reed-canary grass currently plaguing existing shorelines formed after water levels declined since about 2000.
- Creating new aquatic and wetland environment including a surface water body at the Kettle.
- Creating a boulder cascade discharge channel to Big Twin Lake that will be designed to facilitate spawning of resident fish from the lake.
- Improving the trout fishery at Big and Little Twin Lakes.

6. Energy and natural resources

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

Well pumps and booster pump stations will use electric power.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

No impacts on the potential use of solar power are anticipated.

c. What kinds of energy conservation features are included in the plans of this proposal?

List other proposed measures to reduce or control energy impacts, if any:

This project is being undertaken with consideration to taking advantage of periods of excess electrical power as a conservation measure. Pumping from the wells is proposed to occur when Methow River flows are above minimum instream flow levels with most pumping taking place in the spring. The proposed project offers potential to explore opportunistic-pumping during high power supply events, especially in spring when hydropower and wind power sources peak. Pumping and piping infrastructure will be designed for two pumping regimes (a higher initial filling regime and a lower sustainment regime). Because the system will be essentially be oversized once steady state is achieved, it will be possible to pump opportunistically at higher rates for shorter periods of time during project sustainment.

7. Environmental health

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe.

None are anticipated.

1) Describe special emergency services that might be required.

None.

2) Proposed measures to reduce or control environmental health hazards, if any:

No environmental health hazards are anticipated.

b. Noise

1) What types of noise exist in the area which may affect your project (e.g.: traffic, equipment, operation, other)?

Not applicable.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

Impacts from temporary noise related to construction activities during standard working hours (8-10 hours Monday through Friday). Pumps will create minor noise upon project completion.

3) Proposed measures to reduce or control noise impacts, if any:

Temporary construction noise will be mitigated by limiting activity to standard working days and hours. Noise associated with pumps will be mitigated by placing them in a pump station structure.

8. Land and shoreline use

a. What is the current use of the site and adjacent properties?

Figure 1 shows the layout of the proposed project.

The proposed site containing the wells and pump station is currently used for agriculture. The completed project will have minimal impact to existing agricultural land use. The adjacent parcel to the west is a fish hatchery. The completed project is not anticipated to impact hatchery operations.

Land along the proposed buried pipeline alignment is primarily used for agriculture. The pipeline will pass through a residential area (Twin Lakes Development). Pipeline alignment through the residential area is primarily along an existing private roadway alignment. The completed project is not anticipated to impact existing land uses.

The proposed of discharge structures at Big Twin and Barnsley Lakes and the Kettle are located in undeveloped areas. The discharge structures are not anticipated to affect land use on adjacent parcels.

The proposed infiltration gallery is located on an undeveloped parcel within the residential Twin Lakes development.

The proposed maximum water levels for the lakes and the Kettle were developed in coordination with affected property owners to ensure they will not impact existing structures or limit land use. Once the project is completed, the range of water level fluctuations in these water bodies will be less than is currently observed, significantly reducing the reservoir effect that seasonally exposes shorelines.

b. Has the site been used for agriculture? If so, describe.

As described above, land use is agricultural at the proposed locations for the wells and pump station and along about 2/3 of the pipeline alignment (Figure 1)

c. Describe any structures on the site.

Two structures are present on the parcel containing the wells and pump station. These structures are located over 1,000 feet south of the proposed location of the wells and pump station. Several structures are located adjacent to the proposed pipeline alignment. The parcel proposed for the infiltration gallery is undeveloped. Homes are present within 200 feet to the north and south of this location.

d. Will any structures be demolished? If so, what?

No structures are anticipated to be demolished.

e. What is the current zoning classification of the site?

The project area north of Barnsley Lake containing the wells and pump station is zoned Rural Residential (RR). The project area south of Barnsley Lake, including Barnsley Lake, the Kettle and the other lakes is zoned Methow Review District 5 (Valley Floor, MRD 5). A small region of the project area south of Dibble Lake is zoned Methow Review District 20 (Uplands, MRD 20).

f. What is the current comprehensive plan designation of the site?

The northern project area from the Methow River to south of Big Twin Lake is designated as Methow Comprehensive Plan (MCP) Sub-Unit B. All proposed project infrastructure lies within Sub-Unit B. A small region of the project area northeast of the proposed well site is designated as MCP Sub-Unit A-5. The region south of Big Twin Lake is designated as MCP Sub-Unit C.

g. If applicable, what is the current shoreline master program designation of the site?

The Methow River is designated in the Master Program for Okanogan County Shoreline Management (Shoreline Master Plan) as Rural Environment.

The boulder cascade discharge structure at Big Twin Lake lies within 200 feet of OHW. Big Twin Lake is designated in the Shoreline Master Plan as Conservancy Environment.

Other water bodies within the project area are not designated under the Shoreline Master Plan.

h. Has any part of the site been classified as an "environmentally sensitive" area? If so, specify.

The Okanogan County Chapter 14.12 addresses Critical Areas including wetlands, priority habitat, aquifer recharge areas and geologically hazardous areas. The Critical Areas Chapter indicates no maps have been developed specifically for the Critical Areas identified in the Chapter. Instead, maps from other agencies are referenced. The following summary was developed from review of agency maps.

Aquifer Recharge Areas- The following is from Okanogan County Code Chapter 14.12.220:

> "To date, no specific aquifer recharge studies have been performed in the county. It is generally acknowledged that the following areas have the potential to be aquifer recharge areas: rivers and creeks especially at their headwaters, forests, wetlands, lakes and ponds, alluvial fans, and areas within the 100-year floodplain. These areas are only considered aquifer recharge areas if certain porous soil types as identified by the Soil Conservation Service, 1980 Soil Survey of Okanogan County Area, Washington, are found to be present. (Ord. 94-2 § 2, 1994)."

The Twin Lakes Storage Project Area contains some features identified in the Okanogan County Code as Aquifer Recharge Areas.

Fish and Wildlife Habitat Conservation Areas- Washington Department of Fish and Wildlife (WDFW, 2012) Priority Habitat Species mapping indicates the project area includes habitat for the following:

- Northwest white-tailed deer
- Western gray squirrel
- Golden eagle
- Wolverine
- Townsend's big-eared bat

Additional plant and animal species including federally listed species known or suspected to use the project area are discussed in Sections B-4 and B-5 of this checklist.

Frequently Flooded Areas – Figure 1 shows 100-year flood plain associated with the Methow River. No project infrastructure lies within the flood plain.

Geologically Hazardous Areas – Washington Department of Natural Resources geologic mapping (WDNR, 2012), seismic hazard mapping (Palmer et al., 2004), and soils mapping (NRCS, 2012) indicate geologically hazardous areas include the following:

- Erosion Hazard Area: None identified affecting proposed project infrastructure.
- Landslide Hazard Areas: None identified.
- Mine Hazard Areas: None identified.
- Seismic Hazard Areas: The project area is mapped as Site Class D and Low to Very Low liquefaction susceptibility.
- Volcanic Hazard Areas: None identified.

Wetlands – National Wetlands Inventory mapping (Figure 1) indicates the following wetlands are present:

- Riverine wetlands associated with the Methow River.
- Lake wetlands associated with Big Twin and Little Twin Lakes.
- Freshwater Pond wetlands associated with Barnsley Lake, Dibble Lake and several smaller ponds.
- Freshwater Emergent wetlands associated with Big Twin Lake, Barnsley Lake, the Kettle and numerous smaller locations.
- Freshwater Forested/Shrub wetlands at several locations.
- Mapped wetlands potentially affected by the proposed project include inundation of Freshwater Emergent wetlands located at the Kettle and portions of the shoreline of Big Twin and Barnsley Lakes.

i. Approximately how many people would reside or work in the completed project?

Not applicable.

j. Approximately how many people would the completed project displace?

None.

k. Proposed measures to avoid or reduce displacement impacts, if any:

Not applicable.

L. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

The project has been developed through extensive coordination with landowners potentially impacted by the project to establish maximum fill levels for surface water bodies and locations and design of discharge structures. The wells and pump station will be located in a remote portion of a largely undeveloped parcel. The pipeline will be buried.

9. Housing

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

Not applicable.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

No housing units will be affected.

c. Proposed measures to reduce or control housing impacts, if any:

Not applicable.

10. Aesthetics

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

The pump station will be constructed to a height not to exceed 12 feet.

b. What views in the immediate vicinity would be altered or obstructed?

None.

c. Proposed measures to reduce or control aesthetic impacts, if any:

The majority of the project infrastructure will be buried. Discharge structures will be constructed to provide a natural appearance.

11. Light and glare

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

The pump station will include an outdoor light for safety of access during nighttime.

b. Could light or glare from the finished project be a safety hazard or interfere with views?

No.

c. What existing off-site sources of light or glare may affect your proposal?

Not applicable.

d. Proposed measures to reduce or control light and glare impacts, if any:

None proposed.

12. Recreation

a. What designated and informal recreational opportunities are in the immediate vicinity?

Washington Department of Fish and Wildlife manages the fishery in Big Twin and Little Twin Lakes and operates two recreational boat launches (one on each lake). Twin Lakes Campground relies heavily on the fishery in Big Twin Lake. The Twin Lakes fishery is used extensively by local fishermen. The Methow Fly Fisher's club and other fly fishing clubs around the state utilize Twin Lakes. Birding, swimming, and small boating are also recreational uses in the lakes.

b. Would the proposed project displace any existing recreational uses? If so, describe.

No. Increasing water levels in Big Twin and Little Twin Lakes is intended to increase recreational opportunities including enhancement of a trophy fishery in Big Twin Lake. Both entities have been extensively consulted throughout the development of the water storage project.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

Project development will continue ongoing coordination with WDFW and Twin Lakes Campground.

13. **Historic and cultural preservation**

a. Are there any places or objects listed on, or proposed for, national, state, or local preservation registers known to be on or next to the site? If so, generally describe.

There are no national registered historical sites in the project area. The only state listed property in the area is the Winthrop National Fish Hatchery (453A Twin Lakes Road).

b. Generally describe any landmarks or evidence of historic, archaeological, scientific, or cultural importance known to be on or next to the site.

Evidence of historic buildings includes some early 20th Century homesite and farm buildings in the project area. None will be affected by the proposed project.

c. Proposed measures to reduce or control impacts, if any:

The project is not anticipated to impact historical or cultural resources.

14. Transportation

a. Identify public streets and highways serving the site, and describe proposed access to the existing street system. Show on site plans, if any.

The wells and pump station will be accessed from Wolf Creek Road. Twin Lakes Road will provide access to Twin Lakes Drive (private) and the driveway for Twin Lakes Campground (private).

b. Is site currently served by public transit? If not, what is the approximate distance to the nearest transit stop?

Not applicable.

c. How many parking spaces would the completed project have? How many would the project eliminate?

Minimal parking spaces will be constructed at the pump station in accordance with the building permit for the structure.

d. Will the proposal require any new roads or streets, or improvements to existing roads or streets, not including driveways? If so, generally describe (indicate whether public or private).

A gravel surfaced road accessing the wells and pump station will be constructed on private property. The road will access from Wolf Creek Road.

e. Will the project use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe. Not applicable.

f. How many vehicular trips per day would be generated by the completed project? If known, indicate when peak volumes would occur.

Occasional operational vehicular trips to project infrastructure and monitoring locations will occur but not on a daily basis.

g. Proposed measures to reduce or control transportation impacts, if any: Not applicable.

15. Public services

a. Would the project result in an increased need for public services (for example: fire protection, police protection, health care, schools, other)? If so, generally describe. None are anticipated.

b. Proposed measures to reduce or control direct impacts on public services, if any. Not applicable.

16. Utilities

a. Circle utilities currently available at the site: Electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other _____

Power is anticipated to be available to the property line for the site of the proposed wells and pump station.

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

Power will be required for the wells and pump station.

C. SIGNATURE

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: Daniel R. Haller

Name of signee Daniel R. Haller – Aspect Consulting, LLC

Position and Agency/Organization Consultant for applicant Date Submitted: August 23, 2012

Attachments:

Figure 1 – Site Location and Features, Twin Lakes Water Storage Project
Figure 2 – Twin Lakes Aquifer Storage Project – Historic Lake Levels

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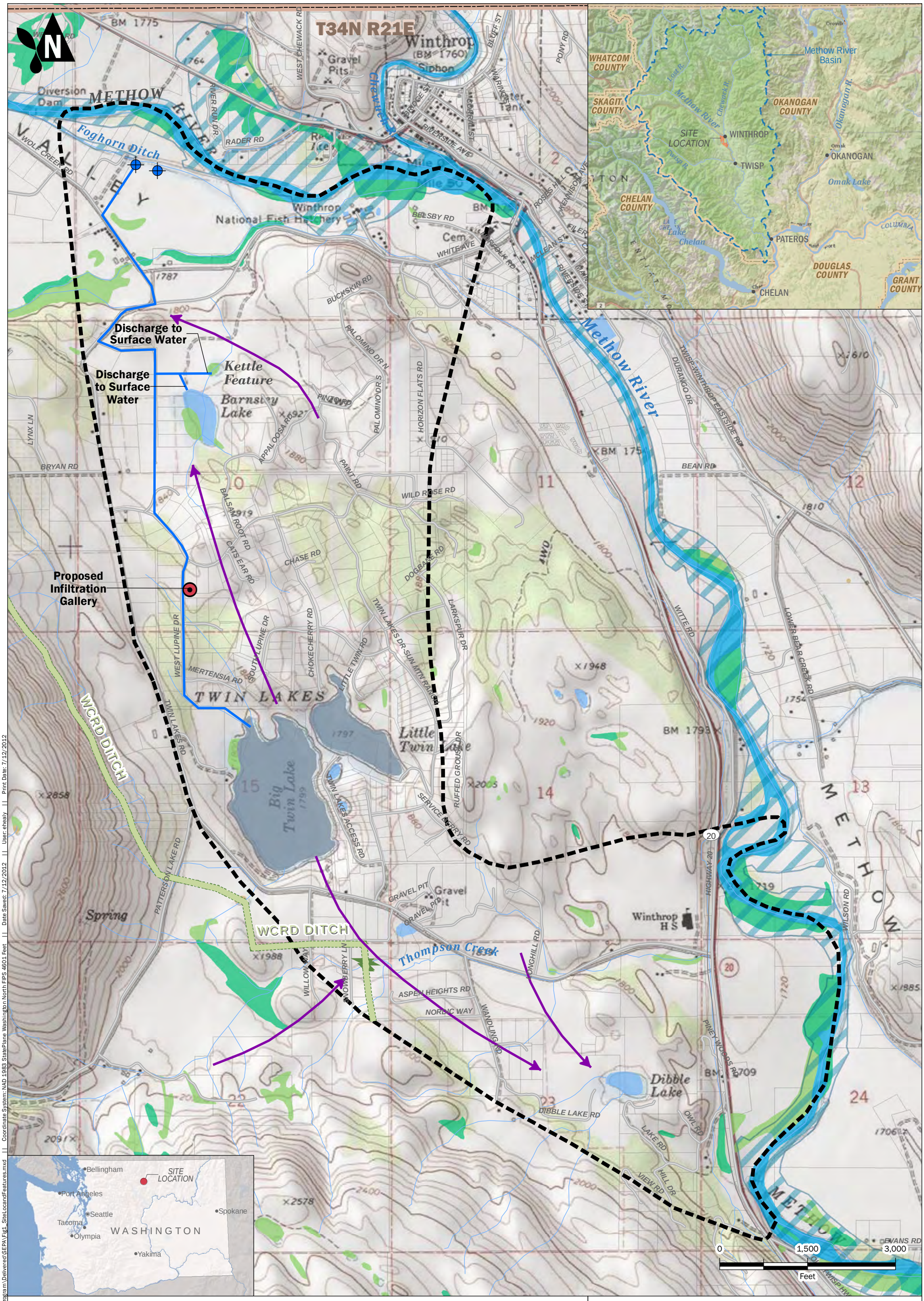

National Wetalnds Inventory
(U.S. Fish & Wildlife Service)

- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Riverine
- Other

- Proposed Infiltration Gallery
- Proposed
- Groundwater Flow Direction

- WCRD Ditch
- Project Area
- Proposed 12-inch Pipeline
- 100-year Flood Plain

Section 22 — Township & Range T32N R21E

Site Location and Features, Twin Lakes Water Storage Project

State Environmental Policy Act Checklist - Twin Lakes Aquifer Coalition
Methow Valley, Washington

Aspect CONSULTING	JUL-2012	BY: BMS / EAH	FIGURE NO.
	PROJECT NO. 090180 - 13	REV BY: ---	1

GIS Path: T:\projects_8\Twin_Lakes\ColumbiaRiverProgram\Delivered\SEPA\Fig1_SiteLocandFeatures.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 7/12/2012 || User: ehealy || Print Date: 7/12/2012

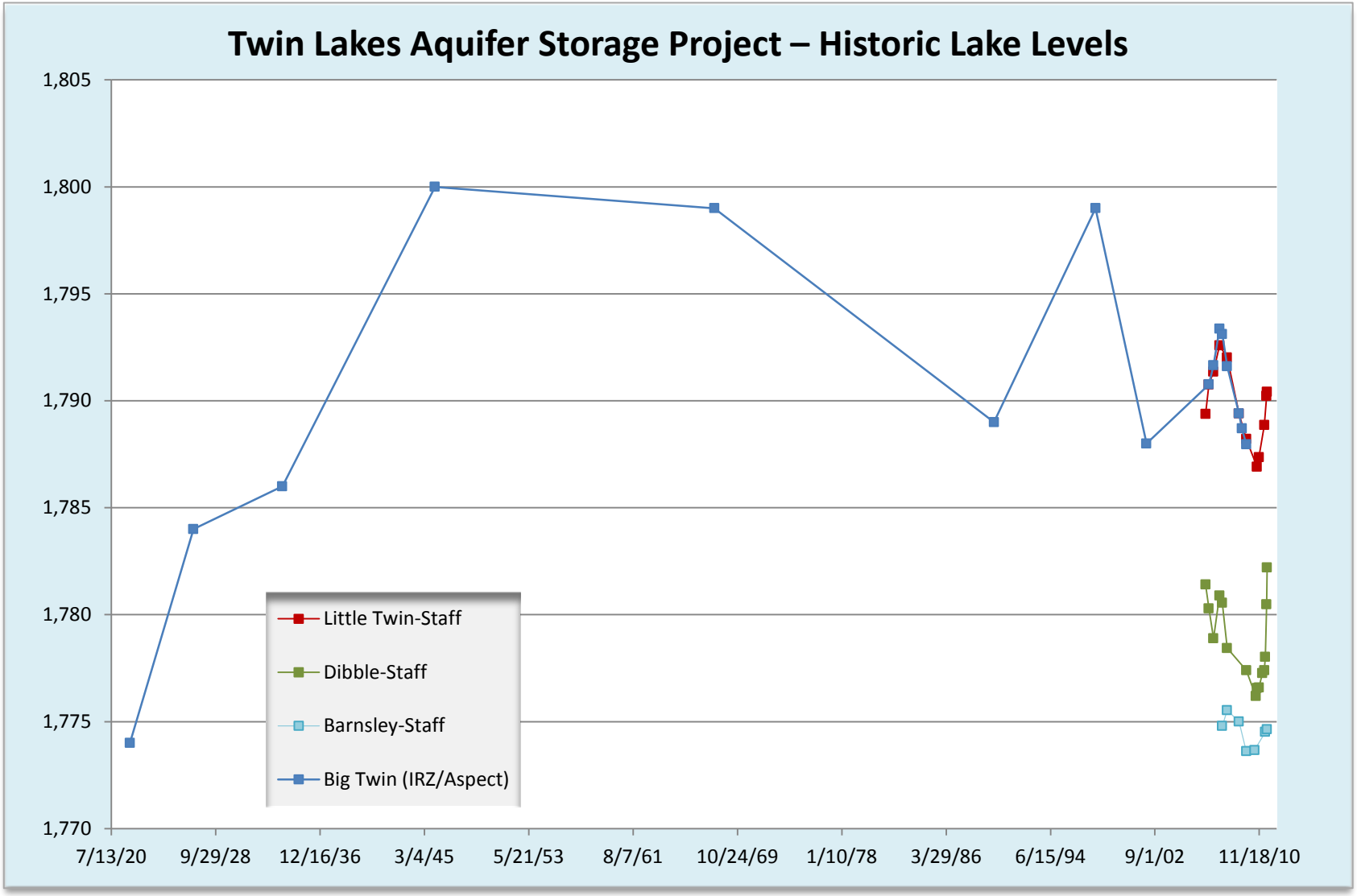

Figure 2

State Environmental Policy Act Checklist - Twin Lakes Aquifer Coalition, Methow Valley, WA