OREGON WATER RESOURCE DEPARTMENT
WATER CONSERVATON, REUSE AND STORAGE
FEASIBILTY STUDY GRANT PROGRAM

I. Grant Information

Study Name: *Fifteenmile Watershed Managed Underground Storage Facilities Feasibility Study*

Type of Feasibility Study: ☐ Water Conservation ☐ Reuse ☐ Above-Ground Storage
☒ Storage Other Than Above-Ground [Including Aquifer Storage and Recovery (ASR)]

Program Funding Dollars Requested: $ $153,185 Total Cost of Feasibility Study: $ $316,470
Note: Request may not exceed $500,000

II. Applicant Information

Applicant Name: *Fifteenmile Watershed Council*		**Co-Applicant Name:**
Address:	*c/o Wasco County SWCD*	Address:
	2325 River Road, Suite 3, The Dalles, OR 97058	
Phone:	*(541) 296-6178*	Phone:
Fax:		Fax:
Email:		Email:

Principle Contact: *Shilah Olson*	
Address:	*Wasco County SWCD*
	2325 River Road, Suite 3, The Dalles, OR 97058
Phone:	*(541) 296-6178 x105*
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Email:	*shilah.olson@or.nacdnet.net*

Certification:

I certify that this application is a true and accurate representation of the proposed work for a project feasibility study and that I am authorized to sign as the Applicant or Co-Applicant. By the following signature, the Applicant certifies that they are aware of the requirements of an Oregon Water Resources Department grant, have read and agree to all conditions within the sample grant agreement and are prepared to conduct the feasibility study if awarded.

Applicant Signature: Shilah Olson Date: 2/1/16

Print Name: Shilah Olson Title: District Manager

III. Feasibility Study Summary

Please give a brief summary of the feasibility study using no more than 150 words.

Fifteenmile Watershed Council requests $153,185 to evaluate the potential application of managed underground storage facilities in the upper Fifteenmile Creek Watershed. The goal of the study is to determine the feasibility of developing and using below-ground storage to augment late season stream flows providing more stable water supplies. Fifteenmile watershed is home to Federally-listed threatened steelhead, other native fish species, and a vibrant farm community. As stream flow declines each summer, the Watermaster regulates junior water rights holders in order to protect senior users, including some instream rights. Low stream flow is identified as a primary limiting factor for viable fish populations. Also, portions of Fifteenmile streams exceed temperature requirements for salmon and trout rearing, migration, and spawning. Specifically, the study will evaluate below-ground storage opportunities in the basin and determine whether any potential storage facilities could meet the dual goal of benefitting both farms and fish.

IV. Grant Specifics

Section A. Common Criteria

Instructions: Please answer all questions contained in this section. It is anticipated that completed applications will result in additional pages.

1. Describe your goal and how this study helps to achieve the goal.

   Our goal is to achieve ecological and economic balance in the Fifteenmile Watershed by providing a sustainable water source for agriculure, aquatic species and their habitat, and to support local community values. Studying the feasibility and identifying the magnitude of potential benefits of managed underground storage is critical in weighing options and opportunites for both the agricultural community and the riparian environment. This study will help achieve this goal through analyzing the ecological, physical and economic aspects of underground storage facilities (this includes analyzing water availaliblity, studying the viability of the aquifers, exploring pumping costs, etc). Managed underground storage facilities hold great potential to augment flows in the Fifiteenmile watershed for the benefit of aquatic life. If deemed to be feasible, this will create an example of successful water resource management for others to follow.

2. Describe the water supply need(s) that the proposed project addresses. Identify any critical local, regional, or statewide water supply needs that implementation of the project associated with the feasibility study will address. **Responses should rely upon solid water availability and needs data/analysis.** For examples of water supply needs see "Criteria and Evaluation Guidance Document."

   This study is intended to determine the feasibility of managed underground storage facilities to assist in meeting instream ecological need and out of stream needs for irrigation. In addition, this study has implications for the municipal water supply needs of the City of Dufur. Each of these needs is discussed below.

   Instream Needs: Fifteenmile Creek provides habitat for a number of important native fish species. Until the late 1980's, Fifteenmile supported sport and tribal harvest of steelhead but this discontinued due to declining runs. Mid-Columbia Steelhead were listed as 'threatened' under the federal Endangered Species Act in 1999. The lowest reaches of Fifteenmile creek provide spawning habitat for Coho and Chinook salmon. Where water quality allows, resident red band trout are found in the Creek, as well as Cutthroat trout. In addition, The Warm Springs Tribe recently began studying Pacific lamprey use in the Creek. Historical data indicate that Fifteenmile was home to a significant population of these fish. Recently, the Confederated Tribes of Warm Springs have started harvesting lamprey in the Creek. Because Fifteenmile Creek is the last significant tributary before migrating lamprey reach The Dalles Dam—and lamprey passage at the dam is not optimal—Fifteenmile is a high priority area for lamprey.

   However, naturally low summer streamflows, exacerbated by irrigation withdrawals, are a major threat to the ongoing survival of these species. The Watershed Council, area irrigators, The Freshwater Trust, and local state and tribal fish biologists are all working together on a variety of strategies to restore flows to Fifteenmile Creek during the late summer. These partners have set an interim target maintaining five to seven cubic feet per second of flow at the mouth of Fifteenmile Creek in August to support native aquatic species.

   According to the Fifteenmile Subbasin Plan (Northwest Power and Conservation Council 2004), flow, temperature and habitat diversity are primary limiting factors impacting the native fish species in Fifteenmile Creek. Fifteenmile Creek has naturally low summer base flows that are exacerbated by irrigation withdrawals in the late summer. In fact, over 40 cfs of water rights have been allocated for agricultural purposes but estimated average natural flow in late summer is less than 6 cfs at the mouth. Due to water diversions, flow is often less than 1 cfs in the lower reach above Eightmile Creek, Fifteenmile's largest tributary.

   Steelhead health in the Fifteenmile sub-watershed is vital to the overall health of the Middle Columbia Steelhead Distinct Population Segment and restoring summer stream flows is a high priority restoration action

under the Middle Columbia River Recovery plan, the Fifteenmile Subbasin Plan, and the Fifteenmile Watershed Assessment (all documents available upon request). Specifically, these plans identify low flows and the high stream temperatures these flows exacerbate, as two of the highest priority limiting factors to be addressed in the watershed.

Irrigation Needs: According to the Fifteenmile Watershed Assessment (Wasco Co. SWCD 2003), the eastern two thirds (187,497 acres) of Fifteenmile Watershed is zoned for agriculture with wheat as the dominant crop. Irrigated agriculture makes up 7,440 acres consisting of hay, pasture and orchards. A majority of producers irrigate their crops by diverting surface water from Fifteenmile, Ramsey and Eightmile creeks, while most orchards in the watershed rely on irrigation wells within Columbia River Basalt Group aquifers. Studies by OWRD have demonstrated surface-water groundwater connections along Fifteenmile. Efforts are still underway to quantify this connection. As flows decline each summer, the Watermaster regulates junior water rights holders in order to protect senior users, including some instream rights. Through NRCS and other program initiatives, about 820 acres of irrigated farmland have implemented irrigation efficiency practices, such as soil moisture monitoring, and meters were installed on all 45 major irrigation diversions (OWEB grant #210-4027 completion report). During the 2013 irrigation season, about 1,500 acre-feet of surface water were used for irrigation. However, the total annual volume allowed by all irrigation water rights is about 5,770 acre-feet.

Municipal needs: The City of Dufur has growing concerns about the certainty of their wells and water sources. They are working to evaluate their wells to ensure the City does not run out of water during summer months. This is a very serious situation as ground water and surface water resources become more scarce. The City of Dufur holds surface water rights on Fifteenmile Creek, which are currently leased in-stream. They are very interested in the feasibility of managed underground storage facilities and the implications for the City's long-term water supply.

Water availability was recently examined through an above-ground water storage study conducted by Anderson Perry for the Fifteenmile Watershed Council (Anderson Perry & Associates, Inc, Fifteenmile Creek Watershed Aboveground Storage Feasibility Study, 2015. 99 p. report. Job #597-03). The results at this point remain inconclusive pending additional data; however, it appears that 1,921 acre-feet would be available during the months of January and February. While significant amounts of water are technically available under a 50% exceedance scenario, a significant amount of the water will need to be dedicated to bypass, optimum peak, flushing and other ecological flows thus reducing the total available for storage. One of the major technical points of investigation under this proposed feasibility study is to better quantify the suite of ecological flows that need to be protected and the impact that protection would have on managed underground storage facilities. Additionally, per the Fifteenmile Creek Subbasin Reservation (OAR 690-504-0160), 5,000 acre-feet of un-appropriated water in Fifteenmile creek and 3,500 acre-feet in Larch Creek are reserved for multipurpose storage reservoirs.

3. Explain how the proposed project will meet the water supply need(s), and indicate what percentage of that need will be met. (For example: If your water supply need is 20,000 acre-feet of additional water and the project will supply 10,000 additional acre-feet, 50 percent of your need will be met).

Managed underground storage facilities could help meet the Fifteenmile watershed's water supply needs by providing a source of water for supplemental irrigation during summer low flow periods, which would enable irrigators to leave natural flow in the Creek for native fish. Currently, Fifteenmile watershed has no water storage ability. This project has the potential to supply 100% of irrigator need through stored water while augmenting stream flows for the benefit of aquatic life.

Fifteenmile Creek has approximately 5,770 acre-feet of total annual irrigation water right volume on paper. In reality, due to crop rotations that include wheat (only irrigated through early summer) and Watermaster regulation due to an active instream leasing program, total diversions for irrigation in any given year are significantly less than the total annual paper water right volume. For example, metered diversions on Fifteenmile and Ramsey creeks, which represent almost all active diversions, in 2013 totaled less than 2,000 acre-feet for the entire summer.

A recent above-ground storage feasibility study determined that 1,921 acre-feet would be available for winter storage (in January and February) based on ecological flows (Anderson Perry & Associates, Inc, Fifteenmile Creek Watershed Aboveground Storage Feasibility Study, 2015. 99 p. report. Job #597-03). Based on existing demand, 1,921 acre-foot storage facilities would provide almost enough water to completely satisfy Fifteenmile's annual irrigation needs. The aim of this planning effort is to determine how stored water could supplement late summer water use, thereby leaving natural flows instream for ecological benefit.

4. Describe the technical aspects of the feasibility study and why your approach is appropriate for accomplishing the specific study goals and objectives.

   Many technical aspects for the managed underground storage facilities were addressed through a recent above-ground storage feasibility study (Anderson Perry & Associates, Inc, Fifteenmile Creek Watershed Aboveground Storage Feasibility Study, 2015. 99 p. report. Job #597-03). Through the above-ground feasibility study, potential hurdles were also identified. The foremost consideration is the high capital cost ($13 million). A lower cost alternative ($4.2 million) that eliminates ditch piping has been proposed; however, with flows being only identified as available in January and February, freezing along the 49,000 feet of unlined ditch is a serious concern. Furthermore, the unlined ditch in question is a serious resource concern in itself, being leaky and prone to failure in places. Above-ground storage subjects that are being investigated further include: land and/or easement acquisition, liability and risk management associated with above-ground storage, water harvest quantities within annual timeframes, and overall costs. These questions have led partners to explore alternative water storage methods. Managed underground storage facilities were identified in the study as a cost-effective alternative. This alternative will be examined using a phased approach, which is appropriate because it allows for critical off-ramps throughout the study.

   Phase one will examine hydrogeology to determine if the alluvial aquifer (source water diversion) and storage aquifer (Columbia River Basalt group) will support managed underground storage facilities. This will be conducted through "desktop" assessment of existing data. Suitability factors that will be analyzed for each potential project site will include geology, topography, delivery logistics and other issues as identified by experts contracted to conduct the study. Phase one will update the water availability analysis conducted in the above-ground storage feasibility study. Phase one will also include physical concerns; will identify locations and willing landowners where it is feasible to divert water; and will include evaluation of existing infrastructure. Regulatory considerations will include a review of options for the water rights associated with managed underground storage facilities and associated costs of each option. In addition to the water rights analysis, a review of other local, state, and federal permit requirements for managed underground storage facilities will be included. Phase one will also incude an initial alternatives evaluation, including initial planning level cost estimates, fatal flaw evaluation, key unknowns, and recommendations for field assessment. If the project is deemed unfeasible at anytime during phase one, the study will conclude.

   Phase two will involve gaining access from willing landowners on at least two alluvial aquifer stream bottom land sites. Test wells will then be drilled in alluvial sediments to obtain geologic samples to characterize the nature of the alluvial materials. Test wells will also be used to complete aquifer pumping tests to assess hydrogeologic characteristics of the alluvial aquifer. Water will be extracted from the shallow alluvial system and used to recharge the basalt storage aquifer. These test assessments will help identify the nature of existing groundwater and surface water interactions and examine whether hydraulic boundaries in local basalt aquifers could limit storage volumes and injection and recovery rates. Additionally, a water quality analysis will be conducted to determine if source water is suitable for recharge, extraction and application. The water quality analysis will include turbidity, temperature and contaminates.

   The above-ground storage study collected and analyzed a significant deal of information that pertains to managed underground storage facilities. Environmental analysis data that can be reexamined and built upon includes:

- *An analysis of necessary bypass, optimum peak, flushing and other ecological flows and the impact of storage on those flows.*

- *Identification of positive and negative environmental impacts resulting from implementation of the managed underground storage facilities and alternatives will include:*

• *Specifics of where and when in-stream flow augmentation will occur;*

• *Impacts to aquatic species and habitat from water withdrawals during periods of water availability;*

• *Impact on stream temperature;*

• *An environmental evaluation that identifies the potential long-term and short-term environmental and social impacts using the NRCS Environmental Evaluation Method.*

The final specific area of investigation will include an economic analysis of the cost effectiveness of identified managed underground storage facilities compared with above ground storage facilities and other alternatives that could meet the watershed's current and future in and out of stream water needs. Conservation and efficiency alternatives were evaluated in the previous study. There is room for improvement in these areas; however, there are not enough potential water savings to solve the problem with conservation alone.

5. Describe how the feasibility study will be performed. Include:
    a. General summary statement that describes the study progression.
    b. When the feasibility study will begin.
    c. Listing of key tasks to be accomplished with each task having:
        i. Title
        ii. Timeline for completion
        iii. Description of the activities to be performed in this key task
        iv. Description of the resources necessary for accomplishing the key task

    Example:

    (i) Streamflow measurement;
    (ii) September-April;
    (iii) Weekly streamflow measurements will be performed to gather hydrographic data for the hydrologic analysis to take place in May;
    (iv) A technician will be hired to perform the streamflow measurements.

    (Key tasks listed here are to be placed in Section VI. Project Feasibility Study Schedule for a quick reference "graphical" representation of the schedule.)

a.) Our goal is to achieve ecological and economic balance in the Fifteenmile Watershed, creating an example of successful water resource management for others to follow. This study will help the Fifteenmile Watershed Council achieve its goal through analyzing the ecological, physical and economic aspects of managed underground storage facilities. The study will be conducted in two phases with critical off-ramps and fatal-flaw analysis, allowing the study to complete if at any time the project is deemed un-feasible. Phase one involves a "desktop" concept assessment (compile and synthesize hydrogeologic framework; update water availability analysis; infrastructure evaluation; regulatory feasibility; initial alternatives evaluation). Phase two involves field data collection (alluvial sediment characterization; basalt well data collection; updated feasibility evaluation and project roadmap).

b.) The planning study will start immediately in July 2016 and be completed by December 2017.

c.) The following work elements would be performed as part of the current feasibility study. Whenever possible we will tier to the previous feasibility study utilizing what we know. For more detailed timelines see Section VI.

TASK 1

i) Compile and synthesize hydrogeologic framework

ii) July 2016 – December 2016

iii) Working in collaboration with OWRD staff, compile and synthesize existing information into a working conceptual model for the project area with the specific objective of understanding, to the extent possible:

• The distribution and characteristics of the alluvial sediments adjacent to the stream and potential basalt storage aquifers

• Groundwater and surface water quality

• Groundwater and surface water interactions

• The locations and producing zones of existing basalt groundwater users

• Initial identification of target basalt aquifer storage zones to avoid undue interference with existing users, loss of water

• Identify potentially favorable locations for field assessment of source water diversion using riverbank filtration

iv) Information to be compiled may include well logs, geologic mapping, groundwater level data, seepage runs, and water quality data.

TASK 2

i) Update water availability analysis

ii) July 2016 – December 2016

iii) This objective of this task is to refine the analysis of water availability completed as part of the surface storage project to account for potentially differing diversion locations and to understand variability in physical water availability. The task will include:

• Updating the water availability analysis completed as part of the surface storage project to account for changing the location of diversion downstream.

• Evaluating the potential variance in physical availability on annual basis from updated streamflow data

• Identifying forward-looking uncertainties that might affect the availability of water for storage

iv) A hydrologic determination of surface water availability for storage during high stream flow periods on a daily time scale, including potential rates, durations, and volumes. On going data collection and assessment in progress. Note: Data was compiled and analyzed in the previous study; however OWRD hydrologists have indicated that more data collection is necessary. (OWRD hydrologist)

TASK 3

i) Infrastructure Evaluation

ii) July 2016 – December 2016

iii) The objective of this task is to identify potential opportunities and limitations related to using existing infrastructure for a subsurface storage project for streamflow enhancement. The task will include the following elements:

- *Evaluation of the potential suitability of existing basalt supply wells.*
- *Identification of exchange opportunities involving senior surface water holders who also may have groundwater wells.*
- *Power availability and limitations*
- *Land ownership and use*

iv) This task will be conducted by a qualified contractor.

TASK 4

i) Update regulatory feasibility

ii) July 2016 – December 2016

iii) The objective of this task is to update the regulatory feasibility evaluation completed for the surface storage study to reflect the issues and requirements for a subsurface storage project under State of Oregon rules

iv) This task will be conducted by a qualified contractor.

TASK 5

i) Initial alternatives evaluation

ii) January 2017 – March 2017

iii) The objective of this task is to complete an initial screening of potential subsurface storage alternatives to determine whether to initiate the next phase of the feasibility study. This task will include:

- *Identification of preliminary alternatives*
- *Initial planning level cost estimates*
- *Fatal flaw evaluation*
- *Identify key unknowns*
- *Develop recommendations for field assessment*

iv) The product of this task will include a summary technical memorandum that incorporates the results of each of the Phase 1 tasks. This memorandum will serve as final project documentation should a fatal flaw to the storage concept be identified during the first phase of activities.

TASK 6

i) Alluvial Sediment Characterization

ii) April 2017 – December 2017

iii) The objective of this task is to complete a field investigation of alluvial sediment characteristics at two or three sites. Elements of this task include:

- *Obtain access to potentially suitable bottom land near the stream from willing landowners at two or three locations*
- *Evaluate the texture, distribution at each location by drilling four to six exploratory borings each site and complete up to three observation wells and one test well*
- *Evaluate the hydraulic characteristics and water quality at each site by completing a pumping test.*
- *This task will be conducted by a qualified contractor.*

TASK 7

i) Basalt Well Data Collection

ii) April 2017 – December 2017

iii) The objective of this task is, using existing basalt wells in the area, evaluate the presence and effects of potential hydraulic boundaries on the feasibility of utilizing basalt aquifers for a subsurface storage project.

- *Working with OWRD staff, identify one or more existing basalt wells with willing owners in the vicinity of potential diversion locations to test.*
- *Working with OWRD staff, instrument and complete a pumping test of the well(s) to evaluate aquifer boundary conditions*
- *Using the results of the testing, bracket potential injection/recovery rates and storage volumes for a target storage aquifer using a reasonable range of transmissivities and storage coefficients. Note that a subsurface storage project may necessarily target a deeper basalt storage aquifer than existing wells draw from to avoid interference and loss of stored water. Consequently, aquifer parameters derived from testing of existing wells may not represent those of a deeper aquifer. However, aquifer boundary conditions created by structures such as faults are likely to cross cut and similarly affect deeper and shallower basalt aquifers.*
- *This task will be conducted by a qualified contractor.*

TASK 8

i) Updated Feasibility Evaluation and Project Roadmap

ii) October 2017 – December 2017

iii) The objective of this task is to complete an abbreviated summary of the feasibility of developing a subsurface storage project as final project documentation. The summary will include the following elements:

- *An assessment of the feasibility of diverting water from alluvial sediments for storage, identification of potential target locations and identification of uncertainties*
- *An initial assessment of the range of storage volumes, injection/recovery rates for a storage aquifer*
- *Development of a conceptual subsurface storage system plan, including identifying potential exchange opportunities, possible locations for constructing alluvial sediment diversion(s), possible locations and drilling targets for storage wells*
- *Updated costs*

iv) This task will be conducted by a qualified contractor.

TASK 9

i) Committee Oversight

ii) July 2016 – December 2017

iii) A steering committee consisting of members of the Fifteenmile Watershed Council, partner agencies, and affected community members will be convened as needed to provide direction and oversight to the staff and qualified contractors.

iv) Committee participation is anticipated from members of the Watershed Council, affected landowners and community members, and partner agencies (NOAA, ODFW, OWRD, NRCS, USGS, DEQ, etc).

TASK 10

i) Project Management

ii) July 2016 – December 2017

iii) SWCD staff will provide project management, including public contracting, grant administration, risk management, overall coordination with contractors and committee members, review draft documents, provide technical and administrative inputs and oversight, and other associated tasks.

iv) Qualified SWCD staff will be assigned to this task.

TASK 10

i) Administration

ii) July 2016 – December 2017

iii) Wasco County SWCD will provide overall project administration. Overhead costs include accounting fees, contract advertising, insurance, risk management, staff oversight, rent, repairs, supplies, taxes, telephone bills, travel expenditures, and utilities.

iv) Qualified SWCD staff will be assigned to this task.

6. Please provide the following data and information for the proposed project and the project's sources of water supply:

a. The location of the proposed project. Include the basin, county, township, range and section. Attach a **map** that identifies the project's implementation area to this application.

Specific storage locations of the associated project is in the Fifteenmile watershed (Hood Basin HUC-8: 17070105) in northern Wasco County, have not been determined. The watershed is about 40 miles long and two to fifteen miles wide. Fifteenmile creek originates in the eastern Cascades east of Mount Hood near Lookout Mountain (elevation 6,525 feet), flows through rolling Columbia Plateau farmland, and into the Columbia River just downstream of The Dalles dam (elevation 78 feet). The town of Dufur (population 600) is the only city within the watershed, located at an elevation of 1,320 feet at about river mile 30 along the banks of Fifteenmile Creek. Mean annual precipitation varies between 60 inches near the headwaters and only 11 inches near the mouth. The highest peak flows tend to occur between January and March. The tributaries to Fifteenmile are Eightmile, Fivemile, Dry, Ramsey, and Larch creeks.

b. The name(s) and river mile(s) of the source water and what they are tributary to, if applicable.

Decisions about specific storage locations have not been made. These decisions will be made based on assessments including but not limited to: hydrogeology, water recharge rates, storage volume and water quality. The most likely sites will be along Fifteenmile Creek upstream of the City of Dufur.

c. Whether the project will be off-channel or on-channel (for above-ground storage only).

N/A

d. Water availability to meet project storage. For above-ground storage the Department typically evaluates availability using a 50 percent exceedance water availability analysis.

Water availability was examined through Anderson Perry's recent above ground water storage study (Anderson Perry & Associates, Inc, Fifteenmile Creek Watershed Aboveground Storage Feasibility Study, 2015. 99 p. report. Job #597-03). The results at this point remain inconclusive pending additional data; however, it appears

that 1,921 acre-feet would be available during the months of January and February. While significant amounts of water are technically available under a 50% exceedance scenario, a significant amount of the water will need to be dedicated to bypass, optimum peak, flushing and other ecological flows thus reducing the total available to store. One of the major technical points of investigation under this proposed feasibility study is to better quantify the suite of ecological flows that need to be protected and the impact that protection would have on managed underground storage facilities. Additionally, per the Fifteenmile Creek Subbasin Reservation (OAR 690-504-0160), 5,000 acre-feet of un-appropriated water in Fifteenmile creek and 3,500 acre-feet in Larch Creek are reserved for multipurpose storage reservoirs.

e. Proposed purposes and/or uses of conserved or stored water.

Stored water developed under this proposal would primarily be used for irrigation to help offset the need to divert water from Fifteenmile Creek during summer low flows.

f. Environmental flow needs and water quality requirements of supply source water bodies.

Fifteenmile Creek has several established state instream water rights in place from RM 44.5 to the mouth during the summer months as follows: 20 cfs in June, 13 cfs in July, 13 cfs in August and 4 cfs in September. As a result of many streams in Fifteenmile not meeting Clean Water Act water quality standards for temperature requirements for salmon and trout spawning, rearing and migration, a temperature Total Maximum Daily Load was adopted for the Mid-Columbia Hood Subbasin in 2008. Improving stream flow and restoring riparian vegetation were identified as two of the land management activities most likely to improve stream temperatures.

Local partners have identified an interim flow restoration target to benefit aquatic species (primarily summer rearing juvenile steelhead and lamprey) of five to seven cfs at the mouth of Fifteenmile Creek in August.

7. What local, state or federal project permitting requirements/issues/approvals do you anticipate in order for the feasibility study to be conducted? If approvals are required, indicate whether you have obtained them. If you have not obtained the necessary permits/governmental approval, describe the steps you have taken to obtain them. If no permits are needed, please provide explanation.

   Permits are not likely for phase one of the study. There will likely be permitting requirements for completing phase two of the proposed feasibility study including permits for drilling test wells. The proposed work elements include the identification of permitting requirements and the permitting/regulatory pathway for implementation.

8. Describe the level of involvement, interest and/or commitment of local entities associated with the feasibility study. Describe how the feasibility study and/or proposed project will benefit/impact these entities. Attach letters of support if available.

   Several entities are interested in the successful completion of this study, the majority represented through the membership, associates and advisors involved in the Fifteenmile Watershed Council. These entities all share common goals in supporting a healthy watershed to strengthen community vitality. The council has representation from wheat farmers, irrigators, City of Dufur, the US Forest Service, the United States Geological Survey, The Freshwater Trust, Oregon Department of Fish and Wildlife, Confederated Tribes of Warm Springs, Oregon Water Resources Department, Oregon Department of Environmental Quality, Wy'East Resource Conservation and Development, Wasco County Soil and Water Conservation District, Natural Resource Conservation Service, and the National Marine Fisheries Service. The watershed council has been focusing on making watershed improvements to water quantity, quality, and habitat since its inception in 1999.

A council committee representing a balance of the aforementioned interests, with the addition of the Wasco County Board of Commissioners, was formed to lead the previous above-ground storage feasibility effort. We plan to reconvene this group for continued guidance. Over the years, the council and partners have been successful in improving water quantity and quality of streams in Fifteenmile through various activities including on-farm irrigation efficiencies, instream leasing, ford elimination projects, and riparian fencing and planting. Despite these efforts, the reality is that surface water rights in the watershed are over allocated. During each irrigation season, as flows decline each summer, the Watermaster regulates junior water rights holders in order to protect senior users, including some instream rights.

Mid-Columbia steelhead, which spawn and rear in the watershed, were listed as threatened per the Endangered Species Act (ESA) in 1999. A fish kill due to low flows and lethal temperatures during the 2009 irrigation season was a recent event that underscores the reality of the water scarcity issue. Since then, the council has been working diligently on solutions to balance irrigation needs with ecological demand. As an interim solution, the council, with irrigators and partners, developed a plan to voluntary curtail irrigation when stream temperatures are predicted to be lethal to steelhead.

This plan transformed into today's FAST program (Fifteenmile Action to Stabilize Temperatures) and with finacial support from partners was successfully implemented in 2013-2015. During summer months lethal stream temperatures were predicted using a forecast model developed by the Oregon Department of Fish and Wildlife. In response, senior water rights holders participated in FAST keeping significant flow in stream for the benefit of aquatic organisms. For the past three irrigation seasons no fish kills have been documented. On track for 2016, the FAST program looks to be growing in irrigator participation, further restoring flow in the Fifteenmile watershed when aquatic organisms need it the most.

In addition to FAST, The Freshwater Trust (TFT) has been working with irrigators to lease instream flows for over a decade. TFT's instream lease efforts have been succesful in keeping additonal flow instream during hot summer months when ecological demand is high. The Mid-Columbia Steelhead Recovery Plan identifies a goal of 7 cfs base flow at the mouth of Fifteenmile to maintain a viable population. This goal may be difficult to meet through the instream lease program solely unless additional senior waters are leased instream.

Water stored subsurface will off-set summer withdrawals, restoring summer flows for fish during critical periods. Low streamflow and subsequent high stream temperatures have been identified as primary limiting factors for viable fish populations in the Middle Columbia River Recovery plan, the Fifteenmile Subbasin Plan, and the Fifteenmile Watershed Assessment (all documents available upon request). The feasibility study will evaluate these benefits and potential impacts identified by the council committee.

Letters of support have been provided by: The Confederated Tribes of Warm Springs Reservation of Oregon, NOAA Fisheries, Wasco County SWCD, Wy'East Resource Conservation & Development, The City of Dufur, Natural Resource Conservation Service, USGS, and The Freshwater Trust.

9. Identify when matching funds will be secured, from whom, and the dates of matching funds availability.

In-kind match will be provided by Wasco County Soil and Water Conservation District staff and the The Freshwater Trust staff. Wasco County Soil and Water Conservation District will also match funds with cash. Matched funds will be available to meet feasibility study timeframes.

10. Provide a description of the relevant professional qualifications and/or experience of the person(s) that will play key roles in performing the feasibility study. If the personnel have not been decided upon, include a description of the professional qualifications and/or experience of the person(s) you anticipate will play key roles in performing the feasibility study.

The Fifteenmile Watershed Council is the principle project proponent for this study through their fiscal sponsor Wasco County SWCD. District Manager and technical advisor to the Fifteenmile Watershed Council Shilah Olson, will serve as the project manager for the grant. Shilah has worked for the Wasco County SWCD for over ten years in a variety of roles, including district administration, conservation planning, and District management. She is a certified NRCS conservation planner and holds a Bachelor of Science degree in Natural Resources Management from Oregon State University. She has experience in financial management and budgeting, grants management, conservation operations, contracting, and work plan development and implementation.

The in-depth technical analysis (ecological flow, hydrogeology, water recharge, recovery rates, storage, water quality analysis, physical suitability, regulatory and economic) will be completed by contractor(s) to be selected through a competitive process with multi-disciplinary expertise in:

- *Ecological flow modeling;*
- *Subsurface hydrogeology, and engineering;*
- *Water quality analysis*
- *Water law and regulation of both instream and out- of-stream water uses; and*
- *Agricultural and natural resource economics*

As the council's fiscal sponsor, the Wasco County Soil and Water Conservation District (SWCD) will be responsible for the fiscal administration for project funding. The SWCD's office administrator, Tammy Tripp, will be responsible for the grant accounting. Tammy has extensive experience in grant fiscal administration through her 19 years of experience with the District. In 2014-2015, the district's total revenues were $1,051,523, of which over half was from various state and federal grant dollars.

The evaluation of potential long-term and short-term environmental impacts for each proposed storage site will be conducted by Wasco County SWCD NRCS-certified conservation planner Ryan Bessette. Ryan has worked as a NRCS-certified conservation planner since 1996 and has a wealth of experience relating to range and riparian systems, the Conservation Reserve Enhancement Program, and the National Environmental Policy Act.

We anticipate that Oregon Water Resources Department staff will assist with the surface water availability assessment as their time and resources allow. We worked with the following OWRD staff on the

previous above-ground storage feasibility study: Jonathan LaMarche, is an experienced OWRD hydrologist and registered professional engineer based in Bend. Since 1998, Jonathan has performed and published various hydrologic investigations of surface water, groundwater-surface interactions, and hydrologic flux related to basin-wide water budgets throughout Oregon. He is the lead OWRD scientist for Klamath Basin related studies. Currently, he is working with the watershed council on a hydrologic study of Fifteenmile watershed as part of a multi-year Oregon Watershed Enhancement Board monitoring and assessment grant. Bob Wood, the District Three Watermaster, based in The Dalles, will be the technical lead on assessing the region's long term water supply demands. Bob has worked for OWRD for several years and has extensive knowledge of the water supply and demands specific to Fifteenmile watershed.

11. If the project concept is ultimately deemed feasible, describe how the project will be implemented. Response should include a tentative funding plan for project implementation (e.g. other state or federally sponsored grant or loan programs) and the project proponent's track record in implementing similar projects.

    If deemed feasible the project will be implemented in a phased approach potentially using District, State, and Federal funding.

Wasco County SWCD has an extensive track record of securing conservation dollars from multiple sources to successfully implement a wide array of conservation projects. Related projects include: in-stream large woody debris, stream side riparian restoration and irrigation efficiency projects. All of these projects have benefited water quantity and quality, aquatic ecosystems and the communities of Wasco County whose lives depend on the conservation of water resources.

Section B. Unique Criteria

Instructions: Address the set of items below that applies to the type of feasibility study that this grant will fund.

☐ Water Conservation or ☐ Reuse

1. Water Conservation or Reuse projects that are identified by the Department in a statewide water assessment and inventory receive a preference in the scoring process. Contact the Department's Grant Specialist to include your project on the inventory.

2. Explain how the associated project will either: (a) mitigate the need to develop new water supplies and/or (b) use water more efficiently. Reference documentation and/or examples of the success of similar or comparable water conservation/reuse projects that would be available upon request.

3. Provide a description of: (a) Local, state and/or federal permitting requirements and issues posed by the **implementation** of the project associated with the feasibility study and (b) property ownership status within the project implementation area. If permitting or other approvals are not needed please indicate and provide an explanation.

☐ Above-Ground Storage

Please answer the following three questions **BEFORE** proceeding:

Will the project divert more than 500 acre-feet of surface water annually?	☐ Yes	☐ No
Will the project impound surface water on a perennial stream?	☐ Yes	☐ No
Will the project divert water from a stream that supports sensitive, threatened or endangered species?	☐ Yes	☐ No

If you answered "Yes" to any of these questions, by signature on this application, you are committing to include the following required elements in your feasibility study.

Describe how you intend to address the required elements in your feasibility study:

a) Analyses of by-pass, optimum peak, flushing and other ecological flows of the affected stream and the impact of the storage project on those flows.

b) Comparative analyses of alternative means of supplying water, including but not limited to the costs and benefits of water conservation and efficiency alternatives and the extent to which long-term water supply needs may be met using those alternatives.

c) Analyses of environmental harm or impacts from the proposed storage project.

d) Evaluation of the need for and feasibility of using stored water to augment instream flows to conserve, maintain and enhance aquatic life, fish life and any other ecological values.

Is the proposed storage project for municipal use?

☐ Yes ☐ No

If "Yes," then please describe how you intend to address the following required element in your feasibility study:

e) For a proposed storage project that is for municipal use, analysis of local and regional water demand and the proposed storage project's relationship to existing and planned water supply projects.

Proceed in addressing the following items:

1. Describe to what extent the project associated with the feasibility study includes provisions for using stored water to augment instream flows to conserve, maintain and enhance aquatic life, fish life or other ecological values. Projects that include the above provisions receive preference in the scoring process.

2. Provide a review of: (a) Local, state and/or federal permitting requirements and issues posed by the **implementation** of the project associated with the feasibility study and (b) property ownership status within the project implementation area.

☒ Storage Other Than Above-Ground [Including Aquifer Storage and Recovery (ASR)]

Please answer the following three questions **BEFORE** proceeding:

Will the project divert more than 500 acre-feet of surface water annually?	☒ Yes	☐ No
Will the project impound surface water on a perennial stream?	☐ Yes	☒ No
Will the project divert water from a stream that supports sensitive, threatened or endangered species?	☒ Yes	☐ No

If you answered "Yes" to any of these questions, by signature on this application, you are committing to include the following required elements in your feasibility *study.*

Describe how you intend to address the required elements in your feasibility study:

a) Analyses of by-pass, optimum peak, flushing and other ecological flows of the affected stream and the impact of the storage project on those flows.

One of the major components of the proposed study is a review of the bypass, optimum peak, flushing and other ecological flows necessary to support steelhead, lamprey, and other aquatic species and habitat needs in the Fifteenmile watershed. In particular, the study proponent anticipates working with the study contractors to the best of their ability given available resources to quantify these ecological flows and determine how much of the water available in the Fifteenmile watershed would need to be set aside (i.e. not diverted for storage) to protect these flows in their entirety. If financially possible, the instream flow incremental methodology will be applied at points of diversion and outlet of each potential managed underground storage facility. Much of this information was gathered through Anderson Perry's above-ground storage feasibility study, which will be reviewed and expanded upon (Anderson Perry & Associates, Inc, Fifteenmile Creek Watershed Aboveground Storage Feasibility Study, 2015. 99 p. report. Job #597-03).

b) Comparative analyses of alternative means of supplying water, including but not limited to the costs and benefits of water conservation and efficiency alternatives and the extent to which long-term water supply needs may be met using those alternatives.

The landowners in the Fifiteenmile Creek Basin have been proactive in their efforts to make the irrigation

in the valley more efficient. However, it was determined through a recent above ground storage facility feasability study that there are not many opportunities left for conservation and efficiency in the fifteenmile watershed (Anderson Perry & Associates, Inc, Fifteenmile Creek Watershed Aboveground Storage Feasibility Study, 2015. 99 p. report. Job #597-03). We also analyzed the feasability of an above ground storage facility and the conservation benefits associated with this project. Through the study, unknowns paired with high costs prompted partners to pursue alternative means of supplying water through a feasability study for managed underground water storage facilities.

c) Analyses of environmental harm or impacts from the proposed storage project.

The analysis of potential environmental harm from any proposed storage project will focus on two primary areas: 1) Possible changes in sediment transport and geomorphology resulting from diminished high flows during periods of water harvesting. 2) Potential impacts to steelhead, lamprey, and other local aquatic species from water withdrawals during periods of water availability. The environmental analysis from the previous study will inform this effort.

d) Evaluation of the need for and feasibility of using stored water to augment instream flows to conserve, maintain and enhance aquatic life, fish life and any other ecological values.

The primary purpose of the study outlined in this proposal is to determine the feasibility of using stored water, either through direct release (less likely) or supplementation of late summer irrigation needs (more likely), to increase later summer base flows to support steelhead, lamprey, and other local aquatic species and their habitat

Is the proposed storage project for municipal use?

☐ Yes ☒ No

If "Yes," then please describe how you intend to address the following required element in your feasibility study:

e) For a proposed storage project that is for municipal use, analysis of local and regional water demand and the proposed storage project's relationship to existing and planned water supply projects.

N/A

Proceed in addressing the following items:

1. Underground storage projects that are identified by the Department in a statewide water assessment and inventory receive a preference in the scoring process. Contact the Department's Grant Specialist to include your project on the inventory.

   The managed underground storage facilities associated with this feasibility study have been identified by Oregon Water Resources Department's statewide water assessment and inventory. Please see the attached email correspondence with Jon Unger, OWRD Grant Specialist, documenting the inclusion of this project on the inventory.

2. Provide a review of: (a) Local, state and/or federal permitting requirements and issues posed by the **implementation** of the project associated with the feasibility study and (b) property ownership status within the project implementation area.

a) Regulatory considerations will include a review of options for the water rights associated with managed underground storage facilities and associated costs of each option. In addition to the water rights analysis, a review of other local, state, and federal permit requirements for managed underground storage facilities will be included.

b)Identifying ideal project locations with willing landowners is essential for the successful implementation of managed underground storage facilities. Private ownership is certainly a potential limiting factor but with a coordinated team approach and some flexability in project sites this potential hurdle will likely be overcome.

V. Match Funding Information

Applicants must demonstrate a minimum dollar-for-dollar match based on the total funding request. The match may include a) secured funding commitment from other sources, b) pending funding commitment from other sources, and/or c) the value of in-kind labor, equipment rental, and materials essential to the feasibility study. For secured funding, you must attach a letter of support from the match funding source that specifically mentions the dollar amount shown in the "Amount/Dollar Value" column. For pending resources, documentation showing a request for the matching funds must accompany the application.

In the "type" column below matching funds may include:	**In the "status" column below matching funds may have the following status:**
• **Cash** - Cash is direct expenditures made in support of the feasibility study by the applicant or partner*.	• **Secured** - Secured funding commitments from other sources.
• **In-Kind** - The value of in-kind labor, equipment rental and materials essential to the feasibility study provided by the applicant or partner.	• **Pending** - Pending commitments of funding from other sources. In such instances, Department funding will not be released prior to securing a commitment of the funds from other sources. Pending commitments of the funding must be secured within 12 months from the date of the award.

*"Partner" means a non-governmental or governmental person or entity that has committed funding, expertise, materials, labor, or other assistance to a proposed project planning study. OAR 690-600-0010.

Match Funding Source (if in-kind, briefly describe the nature of the contribution)	**Type** (✓ One)	**Status** (✓ One)	**Amount/ Dollar Value**	**Date Match Funds Available** *(Month/Year)*
Wasco county SWCD - contract work	☒ cash ☐ in-kind	☐ secured ☒ pending	*$101,400*	*July 16*
Wasco county SWCD - water conservation assesment, environmental impact analysis, project management, administration	☐ cash ☒ in-kind	☒ secured ☐ pending	*$52,385*	*July 16*
Fifteenmile council committee - steering & oversight	☐ cash ☒ in-kind	☐ secured ☒ pending	*$8,400*	*July 16*
The Freshwater Trust - technical review of feasibility study, steering	☐ cash ☒ in-kind	☐ secured ☒ pending	*$1,100*	*July 16*
	☐ cash ☐ in-kind	☐ secured ☐ pending		
	☐ cash ☐ in-kind	☐ secured ☐ pending		
	☐ cash ☐ in-kind	☐ secured ☐ pending		
	☐ cash ☐ in-kind	☐ secured ☐ pending		
	☐ cash ☐ in-kind	☐ secured ☐ pending		
	☐ cash ☐ in-kind	☐ secured ☐ pending		

VI. Feasibility Study Schedule

Estimated Study Duration: <u>July 1, 2016</u> to <u>December 1, 2017</u>

Place an "X" in the appropriate column to indicate when each Key Task of the project will take place.

	2016			2017				2018 & Beyond
Feasibility Study Key Tasks	**2nd Qtr**	**3rd Qtr**	**4th Qtr**	**1st Qtr**	**2nd Qtr**	**3rd Qtr**	**4th Qtr**	
Compile and synthesize hydrogeologic framework		X	X					
Update water availability analysis		X	X					
Infrastructure evaluation		X	X					
Update regulatory feasibilty		X	X					
Initial alternatives evaluation				X				
Alluvial sediment characterization					X	X	X	
Basalt well data collection					X	X	X	
Updated feasibility evaluation and project roadmap					X	X	X	
Committee oversight	X	X	X	X	X	X	X	
Project Management	X	X	X	X	X	X	X	
Administration	X	X	X	X	X	X	X	

- **Please Note**: Successful grantees must include all invoices and identify which key tasks are associated with each invoice when requesting financial reimbursement.

VII. Feasibility Study Budget

Section A

Please provide an estimated line item budget for the proposed feasibility study. Examples would include: labor, materials, equipment, contractual services and administrative costs.

Line Items	**Number of Units*** *(e.g. # of Hours)*	**Unit Cost** *(e.g. hourly rate)*	**In-Kind Match**	**Cash Match Funds**	**OWRD Grant Funds**	**Total Cost**
Staff Salary/Benefits	*950*	*$40.00*	*$38,000*	*$0*	*$0*	*$38,000*
Contractual/Consulting	*2400*	*$100.00*	*$0*	*$101,200*	*$138,800*	*$240,000*
Equipment (must be approved)	*0*	*$0.00*	*$0*	*$0*	*$0*	*$0*
Supplies	*10*	*$20.00*	*$0*	*$200*	*$0*	*$200*
Other: Staff salary / benefits: Fifteenmile committee (6 mtgs, 4 hrs prep/mtg, 10 members)	*240*	*$35.00*	*$8,400*	*$0*	*$0*	*$8,400*
Staff salary / benefits: TFT management - technical review, meeting support	*50*	*$22.00*	*$1,100*	*$0*	*$0*	*$1,100*
Administrative Costs**			*$14,385*		*$14,385*	*$28,770*
		Total for Section A	*$61,885*	*$101,400*	*$153,185*	*$316,470*
		Percentage for Section A	***20%***	***32%***	***48%***	***100%***

** Note: The "Unit" should be per "hour" or "day" – not per "project" or "contract."* *Units x Unit Costs = Total Cost*
*** Administrative Costs may not exceed 10 percent of the total funding requested from the Department*

Section B

If grant amount requested is $50,000 or greater, you MUST complete Section B. Key Tasks in Section B should be the same as the Key Tasks in Section VI (Feasibility Study Schedule).

Feasibility Study Key Tasks	In-Kind Match	Cash Match Funds	OWRD Grant Funds	Total Cost
Compile and synthesize hydrogeologic framework	*$6,000*		*$10,000*	*$16,000*
Update water availability analysis	*$5,000*		*$10,000*	*$15,000*
Infrastructure evaluation			*$20,000*	*$180,000*
Update regulatory feasibilty	*$10,000*			*$10,000*
Initial alternatives evaluation		*$45,600*	*$44,400*	*$10,000*
Alluvial sediment characterization	*$5,000*	*$45,600*	*$44,400*	*$15,000*
Basalt well data collection		*$10,200*	*$10,000*	*$20,200*
Updated feasibility evaluation and project roadmap	*$12,000*			*$12,000*
Committee oversight	*$9,500*			*$9,500*
Project Management				
Administration	*$14,385*		*$14,385*	*$28,770*
Total for Section B	*$61,885*	*$101,400*	*$153,185*	*$316,470*

Totals in Section B must match the totals in Section A

APPLICATION CHECKLIST

Instructions: Use this checklist to ensure that your application is complete. An incomplete application will jeopardize your application's review. **This form does not need to be included in your application packet.**

General

If submitting electronically, the preferred format is either a Microsoft word or Adobe pdf

- ☐ Only one application is included with the packet (other applications must be sent separately).

Paper submissions only

- ☐ The application and attachments are on 8 ½" x 11" paper.
- ☐ The application and attachments are single-sided.
- ☐ The application and attachments are not stapled or bound.

Section I – Grant Information

- ☐ All questions in this section have been answered.
- ☐ The Grant Dollars Requested and the Total Project Cost mirror the totals shown in Section VII.

Section II – Applicant Information

- ☐ All contact information for the applicant(s) and fiscal officer is complete and current.
- ☐ The certification is signed by an authorized signer.

Section III – Feasibility Study Summary

- ☐ A brief summary, of no more than 150 words, is complete.

Section IV – Grant Specifics

- ☐ All questions in Section A have been answered.
- ☐ If the type of feasibility study is water conservation, reuse or storage other than above-ground, you have contacted the Department and requested project be added to the Oregon Water Resources Department's statewide water assessment and inventory.
- ☐ All applicable questions for the type of grant requested have been answered.

Section V – Match Funding Information

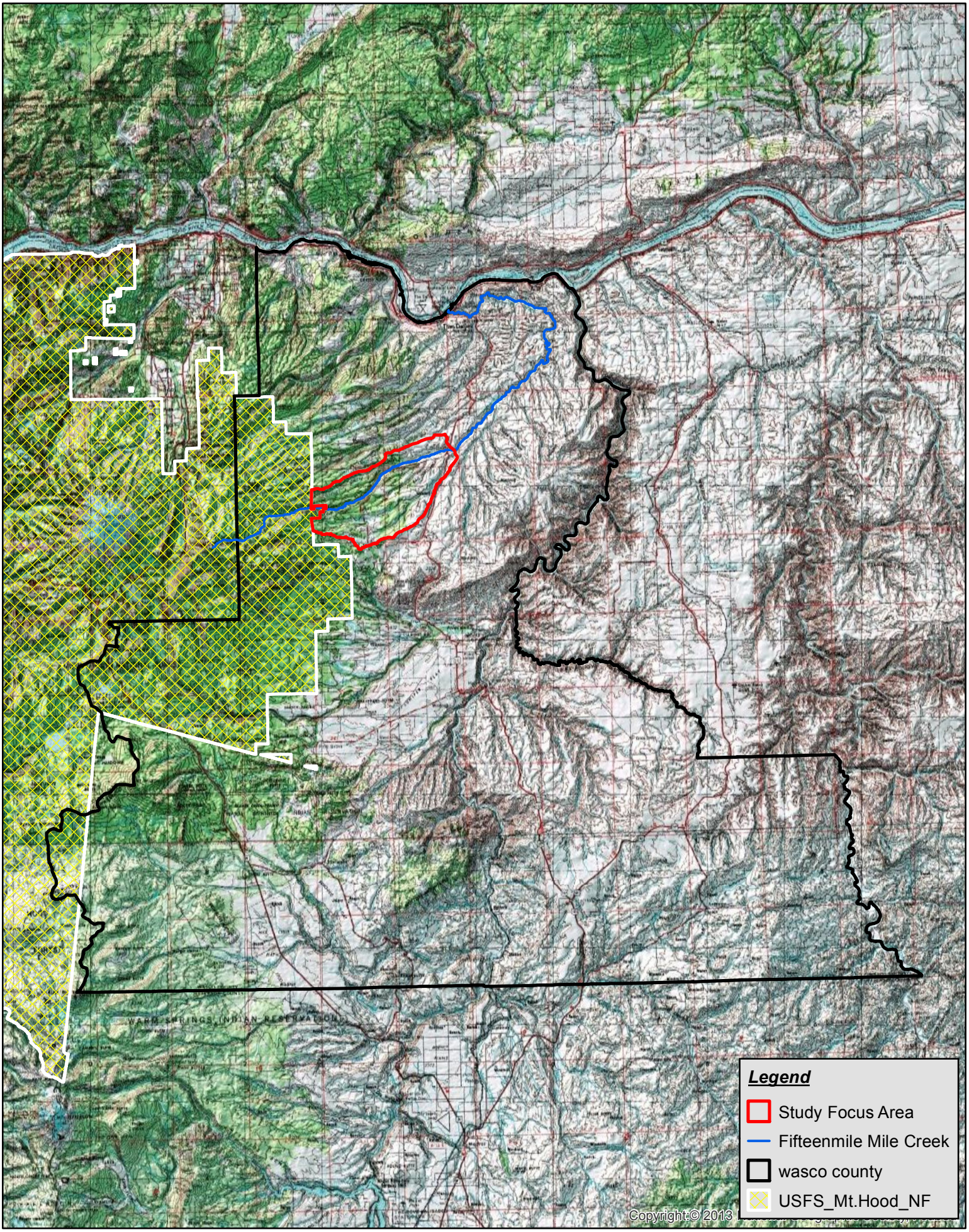
- ☐ Applicant has identified that at least 50 percent match has been sought, secured or expended.
- ☐ Letters of support are included for "secured" match funding sources.
- ☐ Documentation is included for "expended" match funds.
- ☐ Documentation is included for "pending" match funds.

Section VI – Feasibility Study Schedule

- ☐ Estimated project duration dates have been supplied.
- ☐ All Key Tasks of the project are listed.

Section VII – Feasibility Study Budget

- ☐ Section A is complete.
- ☐ Administration costs do not exceed 10 percent of the requested OWRD Grant Funds.
- ☐ If grant amount requested is $50,000 or greater, Section B has been completed.
- ☐ All Key Tasks listed in Section B mirror the Key Tasks listed in Section VI.



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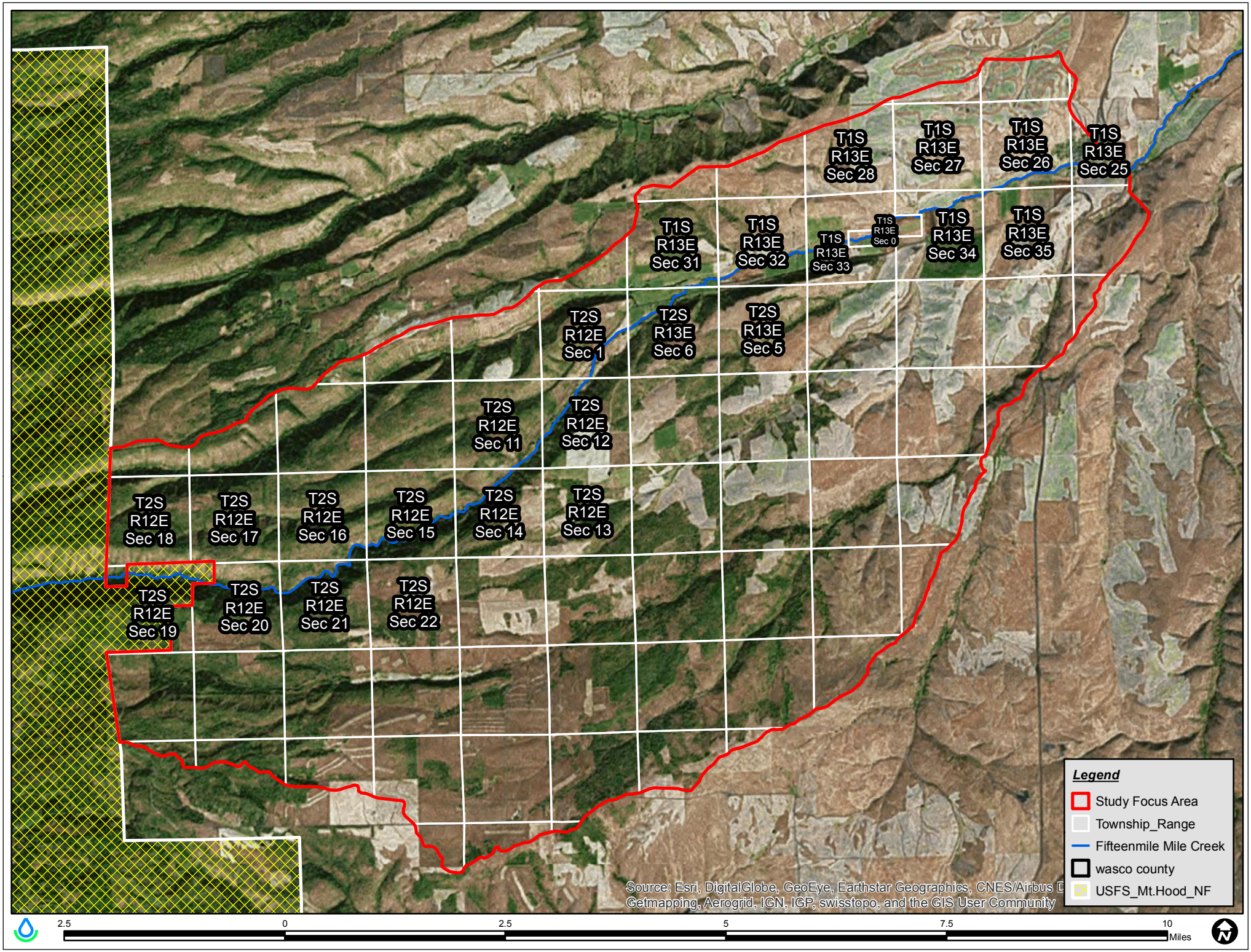
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Fifteenmile Mile Creek
wasco county
USFS_Mt.Hood_NF
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus D
Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
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Wasco County Soil & Water Conservation District

2325 River Road. Suite 3
The Dalles, OR 97058-3551
Tel: (541) 296-6178 ext. 3, Fax: (541) 296-7868, E-mail: wasco.swcd@oacd.org

February 1, 2016

Oregon Water Resources Department
Water Resources Department
725 Summer Street NE, Suite A
Salem, OR 97301

Subject: Fifteenmile Watershed Managed Underground Storage Facilities Feasibility Study – OWRD Water Conservation, Reuse, and Storage Feasibility Study Grant Program

Dear Review Committee,

The Wasco County Soil and Water Conservation District is fully committed to supporting this project. We will have staff time available and anticipate approaching OWEB for a grant for matching funds during the April 2016 cycle. We intend to work with our board of directors and budget committee to include match funding in our upcoming budget cycle, in order to have adequate match funding available beginning in July 2016.

The Fifteenmile watershed is actively working towards a solution that can help meet vital agricultural water needs while increasing flows for threatened steelhead and other aquatic species and their habitat. I strongly encourage the Oregon Water Resources Department to consider funding the Fifteenmile Watershed Managed Underground Storage Facilities Feasibility Study.

Sincerely,

Shilah Olson

Shilah Olson
SWCD District Manager

January 25, 2016

Oregon Water Resources Department
Water Resources Department
725 Summer Street NE, Suite A
Salem, OR 97301

Subject: Fifteenmile Watershed Managed Underground Storage Facilities Feasibility Study - OWRD Water Conservation, Reuse and Storage Feasibility Study Grant Program

Dear Review Committee,

On behalf of the City of Dufur I'd like to express our support for this opportunity with the Fifteenmile Watershed Council. The City of Dufur has growing concerns about the certainty of our wells and water sources. We are working with our engineers and evaluating our wells to ensure the city does not run out of water during the summer months. This is a very serious situation because we are competing for ground water with the local Agriculture Producers.

The Fifteenmile watershed is home to federally-listed threatened steelhead and other native fish species, and a vibrant farm community. The Fifteenmile Watershed Council and their partners have been actively working towards options to restore stream flows during critical times of the year, while still meeting the needs of irrigators. This underground storage feasibility study is the next step in meeting the dual goal of benefitting farms, fish and residents.

With an engaged community of water users and partners, the Fifteenmile watershed is working towards a solution that can help meet vital agricultural water needs while increasing flows for steelhead, lamprey and other aquatic species and their habitat.

I strongly encourage the Oregon Water Resources Department to consider funding the Fifteenmile Watershed Managed Underground Storage Facilities Feasibility Study as their next step in a potential solution to examine the fit of managed underground storage facilities with the basin's hydrogeology, ecology, and community values.

Sincerely,

Robert Wallace,
City of Dufur, Mayor

The Freshwater Trust™
Changing the course of conservation.

65 SW Yamhill Street, Suite 200
Portland, Oregon 97204
503.222.9091 MAIN OFFICE
www.thefreshwatertrust.org

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Anthony L. Trunzo
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emeritus
Tim Boyle
Randy Labbe

January 27, 2016

Jon Unger, Program Coordinator
Water Conservation, Reuse, and Storage Grant Program
Oregon Water Resources Department
725 Summer Street NE, Suite A
Salem, OR 97301

RE: Letter of Support for Managed Underground Storage Feasibility Study Proposal in the Upper Fifteenmile Creek Watershed

Dear Mr. Unger,

The Freshwater Trust supports the feasibility study proposal submitted by the Fifteenmile Watershed Council c/o Wasco County SWCD to evaluate the potential application of managed underground storage facilities in the upper Fifteenmile Creek watershed. We understand that the proposed below-ground storage facilities would capture and recharge a portion of peak flows, which would then be used to augment late-season streamflow for the benefit of agricultural water users in the watershed and for the benefit of federally-listed threatened steelhead and other aquatic species.

Together with our restoration partners in the basin, The Freshwater Trust is working toward a goal of maintaining at least 7 CFS of streamflow at the mouth of Fifteenmile Creek throughout the irrigation season. For the past decade, we have worked with irrigators in the Fifteenmile Creek watershed to complete voluntary flow transactions designed to increase instream flow during summer months when low flow and critically high water temperatures negatively impact fish survival. We hope that this feasibility study may identify additional alternatives for increasing late-summer water availability for various beneficial uses including environmental instream flow, and we look forward to participating in the technical review process.

The Freshwater Trust supports funding of this proposal to inform better management of the limited water supply in Fifteenmile Creek, with the goal of increasing resilience both for fish and farms.

Sincerely,

Caylin Barter
Flow Restoration Director

The Freshwater Trust is a 501(c)(3) non-profit organization and its tax ID is 93-0843521.

United States Department of Agriculture

Natural Resources
Conservation Service

The Dalles Field
Office

2325 River Road #3
The Dalles
OR 97058
Voice 541.296.6178
Fax 855.651.8899

January 20, 2016

Oregon Water Resources Department
Attn: Jon Unger
725 Summer St NE, Ste A
Salem, OR 97301

Dear Jon,

Wasco County Natural Resources Conservation Service (NRCS) provides technical support to the Fifteenmile Creek Watershed Council. NRCS has included this resource concerns of low flows and high temperatures in Fifteenmile Creek in our long range plan as a significant concern, which was brought back to us through our local work group process.
NRCS has invested previously in the watershed for irrigation efficiency and monitoring to help alleviate these resource concerns. At this time, NRCS does not offer any financial assistance to the project area; however, we continue to seek practice specifications and scenarios in which we could build a Conservation Implementation Strategy to assist agricultural producers and collaborate with other partners in addressing the issues faced.

Sincerely,

Carly Heron
Acting District Conservationist

An Equal Opportunity Provider and Employer

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
1201 NE Lloyd Boulevard, Suite 1100
PORTLAND, OREGON 97232-1274

February 1, 2016

Nate Woodard
Fifteenmile Flow Restoration Coordinator
c/o Wasco County
Soil and Water Conservation District
2325 River Road, Suite 3
The Dalles, Oregon 97058

Dear Mr. Woodard:

I am writing to support the Fifteenmile Watershed Council's request to the Oregon Water Resource Department for a grant to fund a managed underground storage feasibility study in the Fifteenmile Watershed. This grant will enable the Watershed Council to learn more about alternative ways of increasing water availability within the watershed.

Please let me know if you have any questions and thank you for your consideration of this proposal.

Regards,

Rosemary Furfey
Salmon Recovery Coordinator
Interior Columbia Basin Office
NOAA Fisheries, West Coast Region

THE CONFEDERATED TRIBES OF THE WARM SPRINGS RESERVATION OF OREGON

NATURAL RESOURCES

P.0. Box C, Warm Springs, Oregon 97761
Phone (541) 553-3466
Fax (541) 553-1994

Oregon Water Resources Department
Attn: Jon Unger
725 Summer St NE, Suite A
Salem, OR 97301

Dear Jon,

I am writing in support of the Wasco County SWCD's grant application to OWRD to fund a managed underground water storage feasibility study. If successful this project will help create balance between ecological demand and irrigator need in the Fifteenmile Watershed. High flow seasonal water storage will significantly decrease surface water demands in the Fifteenmile Watershed during low flow high demand periods.

Restoration of surface water flow will have positive impacts on water quality including decreased water temperatures and increased dissolved oxygen levels. Increased surface water flows during summer months will greatly benefit riparian ecosystems. Specifically this project will support increased habitat for sensitive species of interest like steelhead and pacific lamprey.

It is important to address the surface water issues in the Fifiteemile Watershed. This feasibility study will help answer questions and create water resource options for partners. The Confederated Tribes of Warm Springs is enthusiastic in supporting this project, and feel that the protection and responsible management of water resources in the Fifiteemile Watershed is paramount to achieving the Tribes goal of providing harvestable numbers of fish for the membership in perpetuity.

Sincerely,

Scott Turo
Fish Habitat Program Manager
The Confederated Tribes

United States Department of the Interior

U.S. GEOLOGICAL SURVEY

Oregon Water Science Center
2130 SW 5th Avenue
Portland, OR 97201
(503) 251-3220 • Fax: (503) 251-3470
http://or.water.usgs.gov/

February 1, 2016

Oregon Water Resources Department
Attention: John Unger
725 Summer Street NE, Suite A
Salem, Oregon 97301

This letter is to express support for the Water Conservation, Reuse and Storage Feasibility Study Grant Application submitted by the Wasco County Soil and Water Conservation District (Wasco SWCD) for exploring the feasibility of aquifer storage and recovery to augment late season flow in the Fifteenmile Creek watershed.

We reviewed a draft of the application and found it to be technically sound. The work plan calls for a phased approach beginning with a “desktop” analysis that will evaluate existing data to identify any fatal flaws with the concept. Should none exist, some basic geological exploration drilling and aquifer testing are proposed in order to test basic concepts and feasibility. The approach is prudent and methodical, and the funding requested is in line with the proposed work.

Aquifer storage and recovery has proven to be a workable technology in Columbia River Basalt terrains elsewhere in Oregon and should be included in the menu of options explored by the Wasco SWCD in the Fifteenmile Creek watershed. We support the proposed study and encourage you to strongly consider it for funding.

Sincerely,

James D. Crammond
Center Director

WY'EAST

January 25, 2016

Oregon Water Resources Department
Water Resources Department
725 Summer Street NE, Suite A
Salem, OR 97301

Subject: Fifteenmile Watershed Managed Underground Storage Facilities Feasibility Study - OWRD Water Conservation, Reuse and Storage Feasibility Study Grant Program

Dear Review Committee,

On behalf of Wy'East Resource Conservation and Development, I'd like to express our support for this opportunity for the Fifteenmile Watershed Council. We have a history of working with the Fifteenmile Watershed Council, Local Agriculture Producers, and Local Agencies with on-farm Energy and Water Conservation Projects.

There are many benefits that will result if we can help restore the declining ground water situation. WyEast works with most all the Irrigators in the Fifteenmile Watershed with irrigation efficiency projects. Looking at the feasibility of underground storage could become a great solution for our community while reducing irrigation demands on the Fifteenmile Creek.

The Fifteenmile watershed is home to federally-listed threatened steelhead and other native fish species, and a vibrant farm community. The Fifteenmile Watershed Council and their partners have been actively working towards options to restore stream flows during critical times of the year, while still meeting the needs of irrigators. This underground storage feasibility study is the next step in meeting the dual goal of benefitting both farms and fish.

I strongly encourage you to support the Fifteenmile Watershed Council with this important study. We feel this project will positively impact the Fifteenmile Watershed creating current day solutions for future generations.

Sincerely,

Robert Wallace

Robert Wallace,

Executive Director/Certified Energy Manager

Wy'East Resource Conservation and Development

Wy'East employs strategies that protect, restore, enhance and sustain both communities and natural resources.

Olson, Shilah - NRCS-CD, The Dalles, OR

From: UNGER Jon J <jonathan.j.unger@state.or.us>
Sent: Monday, February 01, 2016 9:54 AM
To: Olson, Shilah - NRCS-CD, The Dalles, OR
Subject: RE: Statewide water assessment and inventory

Thank you Shilah. Please add this email correspondence to your application.

Jon Unger | Grant Program Coordinator

Oregon Water Resources Department
Desk: 503.986.0869

From: Olson, Shilah - NRCS-CD, The Dalles, OR [mailto:shilah.olson@or.nacdnet.net]
Sent: Monday, February 01, 2016 9:48 AM
To: UNGER Jon J
Cc: Nate Woodard; Forrest, Abigail - NRCS-CD, The Dalles, OR
Subject: Statewide water assessment and inventory

Hi Jon,
Thank you for taking the time to discuss our project with us on Friday. Your input was very helpful!

We would like to request that our project, "Fifteenmile Watershed Managed Underground Storage Facilities," be added to the Oregon Water Resources Department's statewide water assessment and inventory. I believe Nate Woodard emailed you a request to this effect sometime in January, but that request may have been lost in translation.

Please let me know if you have any questions or would like more information.

Thank you,

Shilah Olson
District Manager
Wasco County SWCD
(541) 296-6178 x105

Wasco County Soil & Water Conservation District

2325 River Road. Suite 3
The Dalles, OR 97058-3551
Tel: (541) 296-6178 ext. 3, Fax: (541) 296-7868, E-mail: wasco.swcd@oacd.org

February 8, 2016

Oregon Water Resources Department
Water Resources Department
725 Summer Street NE, Suite A
Salem, OR 97301

Subject: Fifteenmile Watershed Managed Underground Storage Facilities Feasibility Study – OWRD Water Conservation, Reuse, and Storage Feasibility Study Grant Program

Dear Review Committee,

The Fifteenmile Watershed Council is fully committed to supporting this project. Members of the Fifteenmile Watershed Council intend to organize a steering committee which will contribute $8,400 of in-kind match. We anticipate this steering committee will include members of the Fifteenmile Watershed Council, partner agencies, and affected community members, and will be convened as needed to provide direction and oversight to the staff and qualified contractors.

We also have discussed the project with The Freshwater Trust, and they have verbally committed to $1,100 of in-kind match.

The Fifteenmile Watershed Council is actively working towards a solution that can help meet vital agricultural water needs while increasing flows for threatened steelhead and other aquatic species and their habitat. This project has wide support from a number of stakeholders and partner agencies. I strongly encourage the Oregon Water Resources Department to consider funding the Fifteenmile Watershed Managed Underground Storage Facilities Feasibility Study.

Sincerely,

Abbie Forrest
Watershed Council Coordinator

Wasco County Soil & Water Conservation District

2325 River Road. Suite 3
The Dalles, OR 97058-3551
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February 8, 2016

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Subject: Fifteenmile Watershed Managed Underground Storage Facilities Feasibility Study – OWRD Water Conservation, Reuse, and Storage Feasibility Study Grant Program

Dear Review Committee,

The Wasco County Soil and Water Conservation District is fully committed to supporting this project. We will have staff time available to provide $38,000 of in-kind match and $14,385 in administration. We are currently in the budget process and will work with our board of directors and budget committee to include cash match funding of $101,400 in our upcoming budget cycle. We intend to approach OWEB for a grant for matching funds during the April 2016 application period. If successful, the OWEB funding will help offset the SWCD cash match and administration.

In addition to funding and staff time provided directly from Wasco County SWCD, we are working with the Fifteenmile Watershed Council to organize a steering committee, which will contribute $8,400 of in-kind match. We also have discussed the project with The Freshwater Trust, and they have verbally committed to $1,100 of in-kind match.

The Fifteenmile Watershed Council is actively working towards a solution that can help meet vital agricultural water needs while increasing flows for threatened steelhead and other aquatic species and their habitat. This project has wide support from a number of stakeholders and partner agencies. I strongly encourage the Oregon Water Resources Department to consider funding the Fifteenmile Watershed Managed Underground Storage Facilities Feasibility Study.

Sincerely,

Shilah Olson
SWCD District Manager