



2020 SOLICITATION

FEASIBILITY STUDY GRANTS

GRANT APPLICATION

APPLICATION DEADLINE: BY 5:00PM ON OCTOBER 15, 2020

Application must be received by this date and time

Send application electronically to: WRD_DL_feasibilitystudygrants@oregon.gov

Mail application to:

OREGON WATER RESOURCES DEPARTMENT
Attention: Grant Program Coordinator
725 Summer Street NE, Suite A
Salem, OR 97301

APPLICATION SUBMISSION INSTRUCTIONS

1. **When completing your application, use the** Application Instructions available at the OWRD Funding Opportunities, Applications, Forms, and Guidance webpage:
<https://www.oregon.gov/OWRD/programs/FundingOpportunities/Pages/default.aspx>
2. Complete all sections in the spaces provided. An application must be submitted on the attached form provided by the Department. An explanation must accompany the application if any of the information required cannot be provided [OAR 690-600-0020(6)].
3. Please ensure that the Certification portion of Section II is signed with a live signature by the Applicant and, if applicable, the Co-Applicant.
4. Taking part in a Pre-Application Conference prior to applying is **highly** recommended. The pre-application conference request form is available on the OWRD Funding Opportunities Forms webpage. To learn more contact the Department.
5. Complete and sign the application checklist.
6. Electronic submission of application is the preferred method. You may scan a copy of the signed signature page and submit with your application if both documents are included in the same email.
7. If application is submitted in hard copy - use 8 ½" x 11" single sided, unstapled pages. Provide any attachments to the application on 8 ½" x 11" single-sided, unstapled pages.
8. Contact the Department at 503.986.0869 or WRD_DL_feasibilitystudygrants@oregon.gov if you have any questions.

FEASIBILITY STUDY GRANT APPLICATION CHECKLIST

Instructions: Use this checklist to ensure that your application is complete. An incomplete application will not be eligible for further review and consideration. This checklist must be completed and signed in order for your application to be considered complete.

SECTION A - Application

I. Study Information

- ☒ Study name and type(s) is complete and correct.
- ☒ The requested grant amount and previous Feasibility Study Grants for the study do not exceed \$500,000.
- ☒ The requested grant amount does not exceed 50% of the Total Cost of the Study.

II. Applicant Information

- ☒ All applicant and co-applicant name(s) and contact information is complete and correct.
- ☒ Application is signed by Applicant/Authorized Person.
- ☒ Application is signed by Co-Applicant/Authorized Person *OR* there is no co-applicant.

Note: *If the project is awarded funding the co-applicant will be required to sign and be party to the grant agreement.*

III. Study Location

- ☒ All questions have been addressed.
- ☒ Site plan map is attached.

IV. Feasibility Study Summary

- ☒ A brief (4-5 sentence) summary of the feasibility study and goal is included.

V. Feasibility Study Grant Specifics

- ☒ All questions have been addressed.
- ☒ Study key tasks are identified.

VI. Feasibility Study Budget

- ☒ All key tasks and budget items follow the Department's Budget Procedures and Allowable Costs guidance available on the OWRD Funding Opportunities Forms webpage.
- ☒ All budget information is accurate and complete.
- ☒ Administrative costs do not exceed 10% of total Grant Request.
- ☒ Key tasks listed in budget match those identified in Questions 13 and 14.

VII. Match Funding Information

- ☒ Matching Funds total, at a minimum, 50% of the Total Cost of the Feasibility Study.
- ☒ Match fund letters, indicating pending or secured match, are attached and equal the amounts listed in VI. Feasibility Study Budget.

VIII. Storage-Specific Questions

- ☒ All questions have been addressed *OR* the application is not for a storage project.
- ☒ Minimum Storage Specific Study Requirements are met and are incorporated into the study and key tasks.

SECTION B - Application Attachments

Instructions: Use this checklist to ensure required attachments are included with your application. All attachments to the application must be numbered as well as included in this list. For all attachments ensure documentation meets any criteria identified in the application instructions, Storage-Specific Guidance, and Guidance on Budget Procedures and Allowable Costs. For “other” optional attachments in excess of the three spaces provided, include a supplemental list.

Required Attachments:

- ☒ Attachment 1 – Site map (Question 3)
- ☒ Attachment 2 – Signed Landowner Agreement Forms (Question 5) to verify that you have authorized access to the lands on which the study would occur. **(N/A)**
- ☒ Attachment 3 – Documentation of matching funds (Question 22) includes the following:
 - a) Match documentation for all match fund sources listed in the match fund table.
 - b) Match fund documentation that clearly identifies the dollar amount and describes the work to be accomplished with the match.
- ☒ Attachment 4 (*Select Storage Projects Only: if you answered “yes” to any part of Question 23*) – Description of approach to address storage-specific requirements; see the Storage-Specific Study Requirements: Application Guidance for the minimum requirements. **(N/A – included in application body).**

Optional Attachments:

- ☐ ☒ Letters of support (Question 13): Attachment # 5
- ☐ List and description of key tasks (Question 14): Attachment #
- ☐ Secured permits and regulatory approvals needed to implement the project (Question 15): Attachment #
- ☐ ☒ Other: Exhibit 1 Attachment # 6
- ☐ Other: Attachment #
- ☐ Other: Attachment #

All required items within Section A and B of the application checklist are completed and all identified criteria are addressed to the best of my knowledge.

Signature of Applicant/Authorized Person: Shelley Burgess Date: 10/15/20

Print Name: Shelley Burgess Title: Union County Administrative Officer



FEASIBILITY STUDY GRANTS 2020 GRANT APPLICATION

I. Study Information

Study Name: Upper Grande Ronde River Watershed Storage Feasibility Study

Type of Feasibility Study: ☐ Water Conservation ☐ Reuse
☒ Storage (Above-Ground) ☐ Storage (Below-Ground)
☐ Storage (Other)

Requested Grant Amount (must be no more than 50% of Total Study Cost): \$114,000

Total Cost of Feasibility Study: \$ 228,000

Note: Request(s) may not exceed \$500,000 per project.

II. Applicant Information

Applicant Name: Union County	Co-Applicant Name: N/A
Address: 1106 K Avenue La Grande, Oregon 97850	Address:
Phone: (541) 963-1001	Phone:
Fax: (541) 963-1079	Fax:
Email: sburgess@union-county.org	Email:

Principle Contact: Dana Kurtz	Fiscal Officer: Shelley Burgess
Address: 1901 N. Fir Street La Grande, Oregon	Address: 1106 K Avenue La Grande, Oregon 97850
Phone: (541) 963-8309	Phone: (541) 963-1001
Fax: (541) 963-5456	Fax: (541) 963-1079
Email: dkurtz@andersonperry.com	Email: sburgess@union-county.org

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 and Co-Applicant (if applicable) 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 Feasibility Study Grant Agreement and are prepared to conduct the study if awarded.

Signature of Applicant/Authorized Person: Shelley Burgess Date: 10/15/20

Print Name: Shelley Burgess Title: Union County Administrative Officer

Signature of Co-Applicant/Authorized Person: _____ Date: _____

Print Name: _____ Title: _____

III. Feasibility Study Summary

1. Please provide a brief, 4-5 sentence summary of the feasibility study. This summary should include a brief description of the goal of the water conservation, reuse, or storage project being studied and the purpose of the study. Please refer to the Feasibility Study Grant Application Instructions for additional information on what to include in your study summary.

The Upper Grande Ronde River Watershed (UGRRW) Partnership has been participating in OWRD's integrated water resources Place-Based Pilot Project for over four years - the results of our assessments of water quality and quantity in the UGRRW indicate that water storage is vitally needed to achieve our goals to reduce late season surface water deficit (for in-stream and out-of-stream needs), improve surface water quality, improve groundwater sustainability, and buffer for natural hazards and climate change risks.

The Partnership proposes to conduct a UGRRW-wide assessment of aboveground storage options - the Feasibility Study would include two components: (1) A review of the entire watershed to determine suitable locations for aboveground storage of winter runoff; and (2) an evaluation of the in-stream flow needs in the reaches most likely to be impacted by a storage project.

The goal of the study would be to identify storage locations and assess site suitability through a variety of social, legal, environmental, economic, and technical factors, while simultaneously conducting large-scale In-stream Flow Incremental Methodology/Physical Habitat Simulation System (IFIM/PHABSIM) studies to determine in-stream flow needs for fisheries.

In its Step 3 Report on the water needs, the UGRRW Partnership identified in-stream demand as a data gap; these proposed IFIM/PHABSIM studies would ensure that winter storage does not compromise the ecological integrity of stream systems. These studies also will help inform how stored water could best be used to benefit both in-stream and out-of-stream needs as the basin prepares to implement any storage projects identified as a result of this feasibility study.

IV. Study Location

Instructions: Please answer the following questions about the location of the feasibility study and project being evaluated.

2. **Location.** Please provide the following information about the study and project location.
 - a. Latitude/Longitude (in decimal degrees): 45°14'6.15"N/ -118° 2'28.84"W
 - b. County: Union
 - c. Watershed/Basin (HUC 10 number): 17060104
3. **Site Plan Map.** Please attach a site plan map showing the following and label as Attachment #1:
 - a. Feasibility study area boundaries
 - b. Project area (if implemented)
 - c. True north arrow
 - d. Map title and legend
 - e. Latitude and longitude
 - f. Property boundaries
 - g. Surface water bodies
 - h. Sampling locations (if proposed)

- i. Points of Diversion and Place of Use, labeled for each water right (if applicable)

4. Properties Impacted or Accessed During Study. Check the box which best describes the properties involved in the proposed Feasibility Study.

- a. ☒ This Feasibility Study will not impact or access lands.
- b. ☐ This Feasibility Study will impact or access lands. Complete the table below to identify any properties where access is required for the feasibility study or on which the study would occur. *Add rows as needed.*

Tax Map Number	Tax Lot Number	Ownership Type (☒ One)	Property Owner of Record
		☐ Public ☐ Private	
		☐ Public ☐ Private	
		☐ Public ☐ Private	
		☐ Public ☐ Private	

5. Landowner Agreement. Attach a signed Landowner Agreement form for each property listed in Question #4 where access to the property is required or on which the Feasibility Study would occur. Attach Landowner Agreement form(s) only for those properties involved in the Feasibility Study and label Attachment #2. (Landowner Agreement forms may be found on the [Applications, Forms and Guidance](#) webpage.)

- a. Where a single landowner entity is the owner of record for multiple properties, one form may list the multiple properties owned by that entity.
- b. For *public* lands attach the landowner form or other documented authorization from the federal or state government property owner allowing the feasibility study activities or documentation that demonstrates such authorization is being pursued.

6. Properties Impacted or Accessed During Implementation. Check the box which best describes the properties involved in future project Implementation. Identify any lands that would be impacted or accessed during future project implementation. Check all that apply and provide the requested information.

- a. ☐ The proposed project, if implemented, will only impact or access lands already identified in Question 4 (must have selected box b under question 4).
- b. ☒ The proposed project, if implemented, will likely impact or access lands during implementation, but those lands likely to be accessed or impacted have not been identified, OR this question is not applicable. If this box (6b) is checked, do not complete the table below.
- c. ☐ The proposed project, if implemented, is highly likely to impact or access additional lands during implementation. If this box (6c) is checked, complete the table below to identify any additional properties (those not already identified under question (4)) where access is required for future project implementation. *Add rows as needed. No Landowner Agreement forms are required for lands listed only under this question.*

Tax Map Number	Tax Lot Number	Ownership Type (✓ One)	Property Owner of Record
		☐ Public ☐ Private	
		☐ Public ☐ Private	
		☐ Public ☐ Private	
		☐ Public ☐ Private	
		☐ Public ☐ Private	

V. Feasibility Study Specifics

Instructions: Please answer all questions in this section. As applications are expected to result in additional pages to complete this section, you may attach your responses on a separate document as long as you indicate the question numbers in your response.

- 7. Water Need.** Describe the identified water need (local, regional, or statewide). Please provide data or a narrative substantiating the need.

Water in the UGRRW is essential for agricultural productivity, municipal viability, and the sustainability of Endangered Species Act (ESA)-listed species and fisheries of great cultural significance to local tribes.

Water storage is needed in the UGRRW for multiple reasons: surface water supply is limited during the summer through late fall when demand is highest for in-stream and agricultural needs; there is currently significant uncertainty with groundwater supply, as water volume in alluvial and volcanic aquifers are under stress; and water quality issues have been identified throughout the watershed related to high water temperatures, low dissolved oxygen, and insufficient flows. These concerns are all exacerbated by the shifting hydrograph resulting from climate change. There is potential to improve these concerns and meet existing and future needs through the managed release of stored water.

The UGRRW Partnership has completed four reports in our planning process. The Step 2 Report focuses on water availability and the Step 3 Report focuses on water need/demand. These reports and supporting documents are available directly (<https://andersonperry-my.sharepoint.com/:f:/p/dkurtz/Ep9GcSb7mj9FqN0aZ8I8g6oBq22Ix7iGysPi4cy9VYIUAA?e=MLbdal>) or on our website if there are additional questions related to water needs (summarized below) <https://union-county.org/planning/place-based-integrated-water-resources-planning/>. These reports have been adopted by the Partnership and represent our best understanding of local demand.

The UGRRW Partnership completed a quantitative analysis of the total volume of water available in the UGRRW (divided into eight subwatersheds) and compared this to calculated needs for ecological, agricultural, and municipal needs. This analysis indicated that overall, on an annual basis, there is enough water to supply all current demands (and future [defined as the next 50 years] demands if on-farm conservation measures are also implemented). However, the analysis indicated that on a bi-weekly basis there are substantial deficits in many of the eight subwatersheds from July to September. These deficits are currently occurring and are projected to worsen in the next 50 years because of climate change (as projected by the Representative Climate Pathways (RCP) 8.5 climate model). Exhibit 1 Table 7-1, 7-2, and 7-3 summarize these volumes as identified in the Step 3 Report.

Currently, on a bi-weekly basis, there is not enough water to meet total demand (municipal, agricultural, and in-stream) from July 1 to November 30 (with the worst period being September 1 to November 20). The total deficits range from -712 acre-feet (AF) to -2,059 AF per two weeks in subwatershed 1, which is the most downstream point of the UGRRW and represents the sum of the area. These deficits are projected to worsen in 2068 if no action is taken (Exhibit 1, Table 7-3). Each AF of deficit strongly impacts tribal fisheries and sensitive ESA-listed fish species that rely on cool, flowing streams in the late season to avoid premature mortality, as well as the agricultural community that relies on multiple crop cuttings to allow for enough profit to help the farms stay in business.

A summary of how these supply and needs were calculated is presented below:

Surface water supply was calculated in the Step 2 Report as described below:

Surface water flow is measured in select locations in the UGRRW by multiple agencies, including OWRD, which has eight active gaging stations in the UGRRW. Flow was analyzed in each subwatershed. Water volume was shown as an exceedance probability (chance that volume will be greater than a certain value) for each two-week period in the 1958 to 1987 base period of record. Exceedance probabilities were calculated for the base period to represent three different flow conditions: high water (10 percent exceedance), low water (90 percent exceedance), and median water (50 percent exceedance). Each subwatershed had the same general patterns of peak flows during springtime. Subwatershed 1 (which includes all flow in the UGRRW) showed a maximum median flow in a two-week period of approximately 80,000 AF. The total annual amount of natural stream flow in the UGRRW is estimated to be 644,600 AF per year. Much of the flow in the UGRRW occurs during a brief period in the spring (April-May, generally). According to OWRD, locations where streamflow is available at 80 percent exceedance for live flows are limited to the central and northern portions of the UGRRW (and only for three to six months per year). An important source of uncertainty in planning for future water availability is the increasing frequency of differences in magnitude and timing of actual streamflow availability in the UGRRW compared to availability during the 1958 to 1987 base period.

Current (2018) and future (2068) demands were calculated as follows for each user group (in-stream, agricultural, and municipal [which includes industry]):

1. In-stream Needs: In-stream demand was estimated at roughly 173,750 AF per year based on existing in-stream water rights. However, many of the waterways in the UGRRW do not have in-stream water rights. In streams where they do occur, the methodologies used in

establishing them are quite dated and do not reflect the current state of the science. As a result, the quantification of in-stream demand remains a significant data gap that the UGRRW Planning Group seeks to address through this feasibility study. This will build upon the information compiled in our Step 3 Report, which suggested that water flows and temperatures are the primary components of in-stream demand for aquatic species and other water uses. In-stream flow deficits are greatest in late summer/early fall. Water quality issues associated with low flows, elevated water temperatures, and high bacteria and nutrients are a significant concern (Step 3 Report; Figures 5-3, 5-4, and 5-5; Tables 5-8 and 5-9). In-stream demand is complex, and numerous processes contribute to the amount of water available for in-stream use. In-stream demand for aquatic life is driven by several factors: species, water needs, stream variables, and future changes. In-stream demand is also important for other uses that are important to tribal culture. For in-stream demand, the group was able to quantify species and water needs and qualify stream and future demands. This was accomplished using calculations based on in-stream water rights (ISWR) and qualitative analysis, which were largely based on ODFW's 1975 Grande Ronde Basin Investigation.

To determine how often existing needs (as described by ISWR only) are met, data from the OWRD Water Availability Reporting System were used to evaluate how much water was left for in-stream uses when consumptive uses (municipal and agricultural) were removed. Water availability for an ISWR at the 80 percent and 50 percent exceedances was calculated. Determining whether future demands can be met is dependent on many issues such as the severity of climate change impacts and whether conservation measures are implemented. For this planning effort, temperatures from the climate model RCP 8.5 were considered for future planning efforts.

2. **Agricultural Needs:** Agricultural water demand was characterized using an evapotranspiration model, which has the advantage of providing temporal information about how crops use water throughout the growing season. The model also facilitates estimates for future climate and increased irrigation efficiency scenarios. Current (2018) agricultural water use was estimated to be 193,725 AF per year (surface water) and 77,973 AF per year (groundwater). Future (2068) estimated gross irrigation water requirement is 284,532 AF per year (surface water) and 114,522 AF per year (groundwater) with existing irrigation efficiency and 214,169 AF per year (surface water) and 87,396 AF per year (groundwater) under the increased efficiency scenario (Step 3 Report, page 4-31; Figure 4-1, Figure 4-5, Figure 4-15, Figure 4-17, and Appendix B Agriculture Water Demand Summary Table [page 246]). The increase in future demand is due to increased temperatures and decreased precipitation estimates as projected by the RCP 8.5 climate model. Water rights were used to delineate irrigated lands and as a reference point for comparisons to modeled crop water use. Irrigation water rights represent an upper limit to current legal water use. Current (2018) estimated irrigation water rights total 211,134 AF per year (surface water) and 86,832 AF per year (groundwater). It is unknown what portion of groundwater is obtained from alluvial versus basalt aquifers.
3. **Municipal Needs:** Total municipal demand (including cities, self-supplied industrial users (SSIU), and unincorporated users) was estimated to be 2,060 AF per year (surface water) and 8,190 AF per year (groundwater). This water is primarily obtained from deep basalt aquifers. Total municipal demand is projected to increase from 10.3 to 22.3 thousand AF (TAF) per year from 2018 through 2068, with SSIU demand projected to increase by up to a factor of 4 (3.7 TAF in 2018 to 15.0 TAF in 2068).

8. Study Goal. Describe the feasibility study goal.

This Feasibility Study includes two components: 1) Determine if suitable locations in the UGRRW exist for aboveground water storage to be used for ecological and agricultural needs; and 2) complete in-stream Flow Incremental Methodology/Physical Habitat Simulation System (IFIM/PHABSIM) studies on portions of Catherine Creek and the Upper Grande Ronde River that are likely to be identified as storage sites and have been identified by ODFW biologists as priority habitats to complete these in-stream flow studies.

9. Study Scope. Describe how the proposed study would achieve the goal.

This feasibility would achieve these goals through our interdisciplinary and multiple user-benefit approach, while utilizing the best available technical expertise.

First, a technical feasibility assessment will occur in which all potential storage sites will be identified. This process will include obtaining the highest quality LiDAR data, contour maps, and aerial photos of the UGRRW and pairing this information with soil maps, geology data, hazards maps, wetlands/waterbodies maps, and other resource maps. This watershed map will be annotated with existing literature reviewed related to previous aboveground storage studies. Next, existing water storage locations will be identified (both natural and built) to determine if expansion is possible. New built and natural storage locations will be identified. Volumes at each location will be identified.

Second, a social/legal feasibility assessment will be conducted whereby all sites will be placed in a spreadsheet and scoring criteria will rule out those that are not feasible based on key social/legal components such as landownership issues, availability of water in that location, cost/benefit, safety, fundability, and permitting.

Third, feasible locations will be reviewed and up to four target sites will be selected for further analysis. Target sites will be selected based on a criteria to be developed in the feasibility study, but is generally anticipated be those that score most highly in the social/legal feasibility assessment and will focus on a cost/benefit analysis of project cost, project ability to meet water needs, and project impacts to the environment. All decisions will be documented in project reports.

Fourth, IFIM/PHABSIM studies will be conducted on Catherine Creek and/or the Upper Grande Ronde River, which are the most likely to include viable storage sites, to address in-stream demand data gaps and identify peak, flushing, and bypass flows. These IFIM/PHABSIM studies are generally anticipated to cover Catherine Creek from Davis Dams upstream to the confluence of the North and South Forks and the Upper Grande Ronde River from the confluence of Fivepoints Creek upstream to the East Fork. These locations are both likely storage option locations and priority areas identified by ODFW biologists to further refine in-stream flow understanding. The two studies are proposed, however the area of coverage and level of detail of these studies may shift depending on storage locations identified. The studies will meet the minimum requirements for OWRD Storage Feasibility Studies.

Fifth, a comprehensive environmental feasibility assessment will occur to determine whether the top four locations are feasible based on alternative means of water supply being available, ecological flows being supported (task four data to be used), analysis of environmental impacts, and evaluation of the need and ability to augment in-stream flows.

Sixth, these steps will be documented in the Feasibility Study report and Oregon Watershed Enhancement Board (OWEB) Strategic Action Plan with details on whether to pursue funding for implementation and design on any of the sites. These results would be reviewed by the UGRRW Partnership and adopted.

Please see key tasks for additional detail.

10. Water Availability. Please provide evidence that water is available to meet the above described need. Evidence can include regulatory and physical information regarding water availability.

There are currently, two storage reservations in the study area as described in OAR 690-508-0110 Upper Grande Ronde Subbasin Storage Reservation. These include 14,900 acre-feet of Meadow Creek and tributaries and 12,000 acre-feet of the Grande Ronde River and tributaries, including Fly Creek and tributaries upstream of river mile 184.

Also, based on Place-based planning Step 2 and Step 3 analysis, water is available on an annual basis to meet the need described in Question 7 above. There are significant seasonal deficits (on a bi-weekly basis on a subwatershed level), but overall, there is enough surface water available. As shown on Table 7-1 of the Step 3 Report, the water balance (total for all eight subwatersheds) when subtracting agricultural, ecological, and municipal demand, indicates a surplus of 277,130 AF per year of surface water. A large caveat to this number is that groundwater is excluded due to lack of information about the total volume of water in the aquifers and what a sustainable rate of use would look like. Additionally, all calculations of water demand and availability are based on best available information.

Surface water supply was calculated in the Step 2 Report as described below:

Surface water flow is measured in select locations in the UGRRW by multiple agencies, including OWRD, which has eight active gaging stations in the UGRRW. Flow was analyzed in each subwatershed. Water volume was shown as an exceedance probability (chance that volume will be greater than a certain value) for each two-week period in the 1958 to 1987 base period of record. Exceedance probabilities were calculated for the base period to represent three different flow conditions: high water (10 percent exceedance), low water (90 percent exceedance), and median water (50 percent exceedance). Each subwatershed had the same general patterns of peak flows during springtime. Subwatershed 1 (which includes all flow in the UGRRW) showed a maximum median flow in a two-week period is approximately 80,000 AF. The total annual amount of natural stream flow in the UGRRW is estimated to be 644,600 AF per year. Much of the flow in the UGRRW occurs during a brief period in the spring (April-May, generally). According to OWRD, locations where streamflow is available at 80 percent exceedance for live flows are limited to the central and northern portions of the UGRRW (and only for three to six months per year).

More detailed calculations will be completed as part of the Feasibility Study.

11. Community Benefit. Describe how implementation of the project could benefit and/or impact the community.

Implementation of small scale or larger scale storage would improve in-stream flows and water quality, reduce supply uncertainty, address natural hazards and climate change and will have a positive impact on many groups who depend on this water. The agricultural community could have access to additional water for irrigation even into late summer and fall. Improved water quality and flows (supplied from late season releases of stored water) would be beneficial to fish and other aquatic species. Other uses, including recreational, fire suppression, and others could see benefits as well.

Additional late season flow (through release of stored water) will could substantially benefit the survival of ESA-listed species and local farms. A testament to how much the community will benefit from a storage project is the very existence of our UGRRW Partnership, which has been working together for more than four years to secure our water future.

12. Community Support. Describe the level of community support and commitment associated with the study. This may include any collaborative water planning efforts undertaken to identify the project or study.

The Upper Grande Ronde River Watershed (UGRRW) Partnership has been participating in OWRD's integrated water resources Place-Based Pilot Project for over four years, with more than 75 meetings, and more than 2,250 hours of work volunteered by more than 25 members of our diverse Partnership. The results of our assessments of water quality and quantity in the UGRRW indicate that water storage is vitally needed to achieve our goals to reduce late season surface water deficit (for in-stream and out-of-stream needs), improve surface water quality, improve groundwater sustainability, and buffer for natural hazards and climate change risks.

The UGRRW Partnership supports this Feasibility Study. Storage was ranked the highest priority action to be taken by the group during implementation in the Step 4 Report.

The UGRRW Partnership brings together a variety of stakeholders to help plan for future water needs in the UGRRW. The Partnership includes a variety of stakeholders representing diverse water interests who are working collaboratively to develop a place-based integrated water resource plan for a better water future. The following Partners (organizations and individuals) have signed the UGRRW Memorandum of Understanding and support this Feasibility Study:

The Freshwater Trust, Confederated Tribes of the Umatilla Indian Reservation, Union County Seed Growers (Brett Rudd), U.S. Fish and Wildlife Service, Union County Cattleman's Association (Rodger Huffman), private citizen (Larry Larson), Fescue Commission/M&M Farming, LLC (Matt Insko), farmer (Curtis Ricker), farmer (Cheryl Murchison), City of La Grande, Department of Environmental Quality,

City of Imbler, City of Union, City of Cove, Union County Farm Bureau, City of Island City, Oregon Department of Fish and Wildlife, Oregon Water Resources Department, Oregon State University Extension Office, Grande Ronde Model Watershed, U.S. Forest Service (Wallowa-Whitman National Forest), Union County Soil Water Conservation District, Union County, farmer (Tim Wallender), farmer (Ann Hulden), Natural Resources Conservation Service, Oregon Department of Agriculture, and Trout Unlimited.

The collaborative and consensus-based decisions of our Partnership have allowed us to continue working together through tough circumstances. The need of our watershed for this collaborative effort was acknowledged by OWRD in granting our Partnership the pilot funding to pursue this collaborative water planning, by OWEB in granting our Partnership the capacity funding to implement our water plan, and by many others who have supported our efforts along the way.

13. Letters of Support. List letters of support (name and/or affiliation of sender). Attach copies of the letters to your application.

See Attachment 5 – Letters of Support for copies of the following:

- See CTUIR Letter of Support and Match Documentation in Attachment 3
- See ODFW Email of Support and Match Documentation in Attachment 3
- UGRRW Partnership Letter of Support
- UGRRW Partnership Meeting Minutes with Partnership support for this storage Feasibility Study application identified.
- Union County Cattleman Letter of Support
- Union County Farm Bureau Letter of Support
- Grande Ronde Model Watershed Letter of Support

14. Study Key Tasks. Identify the study key tasks necessary to conduct the feasibility study using the following format and including as many tasks as necessary to complete the study. In the event that your study receives grant funding, the key tasks identified will be incorporated into your grant agreement as the “Statement of Work.” Please note: Project management and administration are common functions within a specified key task and not separate key tasks themselves.

Task number. Key Task Title

- Task schedule: The approximate dates during which the key task will be completed.
- Description of key task activities: Include specific details of the task such as task purpose, planned approach, appropriate technical information, proposed methods, and rationale for the approach.

- Qualified personnel that will complete task: Include a description of the professional experience, professional qualifications and licensure of personnel necessary for task work.

Qualifications are described below and referenced in each Key Task:

UGRRW Partnership Work Group – This group will be composed of technical experts with extensive familiarity with the UGRRW. A list of Partners is identified in question 12 above. Our expected technical experts include NRCS for GIS mapping and identification of on farm conservation areas, Oregon Department of Agriculture for water reservation assistance, local farmers and ranchers for site assessment assistance, Oregon Department of Environmental Quality for water quality impact assessments, Oregon Department of Water Resources for legal evaluations, and the Grande Ronde Model Watershed, Oregon Department of Fish and Wildlife, Confederated Tribes of the Umatilla Indian Reservation, US Fish and Wildlife, and National Marine Fisheries Service for habitat and in-stream needs assessment and review.

Anderson Perry & Associates, Inc. (AP) – AP was founded in 1975 and is a full-service civil engineering and environmental consulting firm with nearly 100 employees and extensive experience with water storage feasibility studies, both above and below ground. AP, led by Brett Moore, P.E. has recently completed two aquifer storage and recovery projects in the area as well as the physical siting review for aboveground water storage feasibility studies in the Klamath Basin and Wasco County. Staff includes licensed engineers, and experienced environmental compliance staff. AP, led by Dana Kurtz, Senior Environmental Scientist, has been working with the UGRRW Partnership for over four years in the water planning process.

Stillwater Sciences, Inc. – Stillwater Sciences specializes in science-based, technical approaches to natural and water resource management. Using a collaborative and targeted approach, they integrate habitat and species information to understand critical ecosystem processes and identify effective measures for restoring and managing rivers and their floodplains as functioning ecosystems within the context of current conditions and future climate change. Stillwater Sciences, led by Kim Gould, Senior Aquatic Scientist, will work closely with the team to provide the technical information needed to make scientifically sound management decisions. The staff includes fish biologists who have completed numerous IFIM/PHABSIM studies throughout the region.

CTUIR – The CTUIR Water Resources Department works to ensure that ground and surface waters are available to satisfy CTUIR treaty rights, the needs of CTUIR members, and the citizens of the Umatilla Indian Reservation. Through both engaging in collaborative partnerships such as the UGRRW Partnership and utilizing CTUIR Water Code procedures and regulations, they advocate for sustainable water use and management. Lead by Anton Chiono, Water Rights Transaction Specialist, CTUIR will ensure that in-stream needs are considered in the process.

ODFW – ODFW manages water and aquatic resources for Oregon. Their team of in-stream flow experts are developing a rapid flow assessment tool and statewide prioritization process that should be available in early 2021. They will apply these tools to evaluate potential storage locations.

Task 1. Technical Feasibility Assessment (Identify all potential sites – utilize GIS mapping)

- Task schedule: 3 months (June 2021-August 2021)
- Description of key task activities:
 - Obtain highest quality mapping (LiDAR/topographic mapping) available of the area. Overlay U.S. Geological Survey soil map/geology information/hazards map and other relevant resource maps.
 - Review literature of potential aboveground storage sites previously reviewed (by USBR, etc.) and identify them on the map (include notes related to volumes and why rejected/determined infeasible).
 - Identify existing water storage sites (reservoirs, ponds, wetlands, oxbows) and develop notes on whether expansion/deepening is possible and volumes.
 - Identify new potential built aboveground storage sites (natural depressions, existing canals, historic sloughs, oxbows).
 - Identify new potential natural aboveground storage sites (former wetlands/floodplains) that could be enhanced or restored).
 - Identify amount of water available for storage at each location (indicate on map).
 - The UGRRW Partnership will review and provide feedback on the map for at least 20 hours total (assuming 1 hour per Stakeholder Committee Member for discussion during meetings).
- Qualified personnel that will complete task: UGRRW Partnership Work Group, AP (see details above Task 1).

Task 2. Social/Legal Feasibility Assessment (develop spreadsheet to document the following components and scoring criteria to rule out those that are not feasible)

- Task schedule: 3 months (September 2021-November 2021)
- Description of key task activities:
 - A spreadsheet will be developed to document the following components and associated scoring criteria:
 - Description of concept (location, size, relevant information from Task 1)
 - Availability of water
 - Estimated earthwork
 - Desirability of site for users (identify intended users and their preference for this location; identify potential controversiality of sites).
 - Landownership issues (identify any landowner or adjacent landowner concerns).
 - Cost/benefit (volume) analysis (estimate rough costs and values for water use).
 - Safety (identify any safety issues).
 - Permits (identify water right/environmental permitting pathway for potential locations/location types).
 - Reasons eliminated – document reasons for not moving forward with project and date
 - The UGRRW Partnership will review and provide feedback on the social/legal assessment for at least 20 hours total (assuming 1 hour per Stakeholder Committee Member for discussion during meetings).
- Qualified personnel that will complete task: UGRRW Partnership Work Group, AP (see details

above Task 1).

Task 3. Select up to Four Target Sites

- Task schedule: 3 months (December 2021-February 2022)
- Description of key task activities:
 - Utilize the spreadsheet from Task 2 to select up to four target sites from locations not eliminated through the social/legal analysis of Task 2. Target sites will be selected based on a criteria to be developed in the feasibility study, but is generally anticipated to include a cost/benefit analysis of project cost, project ability to meet water needs, and project impacts to the environment.
 - Receive feedback and approval from UGRRW Partnership. The UGRRW Partnership will review and provide feedback on the sites for at least 20 hours total (assuming 1 hour per Stakeholder Committee Member for discussion during meetings).
- Qualified personnel that will complete task: UGRRW Partnership Work Group, AP (see details above Task 1).

Task 4. Complete IFIM/PHABSIM studies on Catherine Creek and the Upper Grande Ronde River

- Task schedule: 8 months (July 2021-February 2022)
- Description of key task activities:
 - Analyze bypass, optimum, and flushing flows. It is anticipated that the IFIM/PHABSIM studies will be required for both the Catherine Creek and Upper Grande Ronde River general areas, as that is where storage options are likely to be sited. The two studies are proposed, however the area of coverage and level of detail of these studies may shift depending on storage locations identified. Description of the proposed steps in these studies is located in Question 23.
 - CTUIR and ODFW, utilizing Bonneville Power Administration (BPA) funding, will complete the study on Catherine Creek from Davis Dams upstream to the confluence of the North and South Forks.
 - Stillwater Sciences will complete the study on the Upper Grande Ronde River from the confluence of Fivepoints Creek upstream to the East Fork.
- Qualified personnel that will complete task: Stillwater Sciences, ODFW, and CTUIR (see details above Task 1).

Task 5. Environmental Feasibility Assessment (review remaining sites for environmental feasibility and eliminate locations that are not feasible)

- Task schedule: 6 months (February 2022-July 2022)
- Description of key task activities:
 - Comparative analysis of alternative means of supplying water (See details in Question 23 below)
 - Analysis of ecological flows (Utilizing Task 4 data; See details in Question 23 below).
 - Analysis of environmental impacts (including ESA, groundwater volume, surface water/groundwater quality, climate change, limiting ecological factors; See details in Question 23 below).
 - Evaluation of need and ability to augment in-stream flows (Utilizing Task 4 data; See details in Question 23 below).
 - The UGRRW Partnership will review and provide feedback on the map for at least 20 hours total (assuming 1 hour per average Stakeholder Committee Member for discussion during meetings).
- Qualified personnel that will complete task: Stillwater Sciences, ODFW, and CTUIR to lead; UGRRW Partnership Work Group and AP to support (see details above Task 1).

Task 6. Next Steps for selected site(s)

- Task schedule: 5 months (August 2022-December 2022)
- Description of key task activities:
 - Prepare report documenting Feasibility Study methods and results.
 - Update OWRD Step 5 Plan as needed and OWEB Strategic Action Plan with details to obtain funding for permitting and designing selected site(s).
 - The UGRRW Partnership will review and provide feedback on the map for at least 20 hours total (assuming 1 hour per average Stakeholder Committee Member for discussion during meetings).
- Qualified personnel that will complete task: UGRRW Partnership Work Group, AP (see details above Task 1).

15. Study Task Scheduling. Estimated duration of feasibility study: June 2021 to December 2022

Place an “X” in the appropriate column to indicate when each task of the project would take place. Study tasks should match those listed as part of your response to the previous question.

Feasibility Study Key Tasks (Add additional rows as needed)	Grant year				Grant year				Grant year			
	2021				2022							
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Technical Feasibility Assessment	☐	☒	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐
Social/Legal Feasibility Assessment	☐	☐	☒	☒	☐	☐	☐	☐	☐	☐	☐	☐
Select Target Sites	☐	☐	☐	☒	☒	☐	☐	☐	☐	☐	☐	☐
IFIM/PHABSIM Studies	☐	☐	☒	☒	☒	☐	☐	☐	☐	☐	☐	☐
Environmental Feasibility Assessment	☐	☐	☐	☐	☒	☒	☒	☐	☐	☐	☐	☐
Next Steps for Selected Site(s)	☐	☐	☐	☐	☐	☐	☒	☒	☐	☐	☐	☐

16. Feasibility Study Water Rights. Identify any water rights required to **conduct** the proposed Feasibility Study below. Check all of the following that apply and provide the information requested:

- ☒ No water rights are required to complete the proposed study.
- ☐ The proposed study requires a new water right or other water right transactions to **conduct** the study. If checked, list the transaction(s) required (e.g., new right, transfer, etc.):
- ☐ The applicant has legal access to a water right that will be used to **conduct** the study. The proposed study requires a water right, and the applicant holds or has been given permission to utilize the water right(s) for the proposed study. If checked, list all water rights required for the study in the table below, adding rows as needed. See the Application Instructions for further guidance, including how to find water right information.

Water Right Number (Include prefixes, if applicable, e.g., CW 12345)	Is this an application, permit, certificate, limited license, special or final order, transfer, decree, lease, or claim? Enter “New right Needed” below if a new water right is needed to do this work.	Tax Lot IDs within the Place of Use where water will be used to complete the study

17. Project Implementation Water Rights. Identify any water rights needed to implement the proposed Project below. Check all of the following that apply and provide the information requested:

- a. ☒ The applicant does not know what water rights or water right transactions are required for the project. That will be determined through this study or other effort at a future date.
- b. ☐ ☒ The proposed project requires a new water right or other water right transactions. If checked, list transaction(s) required (e.g., new right, transfer, etc.): Boxes 17a and 17b are checked because it is unknown what may be required, however it is anticipated that the Upper Grande Ronde Subbasin Reservations may be used. There are currently, two storage reservations in the study area as described in OAR 690-508-0110 Upper Grande Ronde Subbasin Storage Reservation. These include 14,900 acre-feet of Meadow Creek and tributaries and 12,000 acre-feet of the Grande Ronde River and tributaries, including Fly Creek and tributaries upstream of river mile 184.
- c. ☐ The applicants holds the water right(s) required for the project. If checked, include list of rights in the table below, adding rows as needed. See the Application Instructions for further instruction, including how to find water right information.

Water Right Number (Include prefixes, if applicable, e.g., G 00010)	Is this an application, permit, certificate, limited license, special or final order, transfer, decree, lease, or claim?	Water Right Amount			Tax Lot IDs within the Place of Use where water will be used to implement the proposed project
		Max Volume (ac-ft)	Max Rate (cfs)	Duty (ac-ft/ac)	
WRD 6-2016, f. & cert. ef 10-18-16 WRD 2-1887, f. & cert. ef. 2-25-97	reservation	14,900			Multiple potential locations (exact areas unknown at this time); Meadow Creek and Tributaries
WRD 6-2016, f. & cert. ef 10-18-16 WRD 2-1887, f. & cert. ef. 2-25-97	reservation	12,000			Multiple potential locations (exact areas unknown at this time); Grande Ronde River and Tributaries

18. Feasibility Study Permits. Provide a list of any other permits and regulatory approvals needed to conduct the Feasibility Study and indicate the status of each in the table below. If permits/approvals are required, please submit copies of secured permits/approvals **or** describe efforts to secure permits/approvals including status. If no permits or authorizations are required for the study, provide an explanation: No permits or authorizations are required to conduct the water storage feasibility study.

Permit/ Regulatory Approval	Permitting Entity	Status and Efforts To Date

19. Project Implementation Permits. Provide a list of the permits and regulatory approvals that you anticipate would be needed to implement the proposed project being studied. If permits/approvals

are not required, please explain why and provide information regarding any agencies contacted to verify this determination:

Project Permit/Regulatory Approval <i>(add rows as needed)</i>	Permitting Entity
Storage permit	OWRD
Water right transfer	OWRD
Fish Passage Approval	ODFW
Removal Fill Permit	DSL
Section 401 CWA Permit	DEQ
Section 404 CWA Permit	USACE

VI. Feasibility Study Budget

Instructions: Please answer the following questions about the study budget using the tables provided.

20. Budget By Line Item or Category. Please provide an estimated line item budget for the proposed feasibility study. Examples include: Direct project specific costs, such as in-house staff salary, contractual services, and administrative costs. See the Department's Budget Procedures and Allowable Costs for further guidance.

OVERALL STUDY BUDGET 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	140	100	14,000			14,000
Contractual/Consulting	2,090	100	60,000	35,000	114,000	209,000
Equipment (must be approved)						
Supplies						
Travel						
Other:						
Administrative Costs**	50	100		5,000		5,000
Total			74,000	40,000	114,000	228,000

* The "Unit" should be per "hour" or "day" – not per "project" or "contract." $Units \times Unit\ Costs = Total\ Cost$
** Administrative Costs may not exceed 10% of the total funding requested from the Department

21. Budget by Key Task. Identify the budget for each key task below. Key tasks identified below should be the same as the key tasks identified in Questions 14 and 15.

Feasibility Study Key Tasks (Add additional rows as needed)	In-Kind Match	Cash Match Funds	OWRD Grant Funds	Total Cost
Technical Feasibility Assessment	2000	10,000	20,000	32,000
Social/Legal Feasibility Assessment	2000	10,000	10,000	22,000
Select Target Sites	2000	10,000		12,000
IFIM/PHABSIM Studies	64,000		64,000	128,000
Environmental Feasibility Assessment	2000		10,000	12,000
Next Steps for Selected Site(s)	2000	10,000	10,000	22,000
Total	74,000	40,000	114,000	228,000

VII. Match Funding

Instructions: Please answer the following question regarding matching funds.

22. Match Funding Table and Documentation. Please fill out the table below and attach the appropriate documentation for both the secured and pending match (add rows as needed). Keep in mind that applicants must demonstrate a minimum **dollar-for-dollar match**. Please note that a failure to meet this requirement or to attach documentation will result in an incomplete application that will not be considered for funding.

For secured funding, you must attach a letter of support or award from the match funding source that specifically mentions the dollar amount identified for this study and as shown in the “Amount/Dollar Value” column in the table below.

For pending resources, other written documentation showing a request for the matching funds must accompany the application or documentation must identify the date on which a future funding application will be submitted, identify the funding program, and provide evidence that the project is eligible for the funding program identified.

Match Funding Source (if in-kind, briefly describe the nature of the contribution)	Type (✓ Only One)	Status (✓ Only One)	Amount/ Dollar Value	Date Match Funds Available (Month/Year)
OWEB Partnership Funds	☒ cash ☐ in-kind	☒ secured ☐ pending	40,000	January 2020
CTUIR In-stream Flow Study (BPA Funds)	☐ cash ☒ in-kind	☒ secured ☐ pending	60,000	January 2021
Partnership Review	☐ cash ☒ in-kind	☒ secured ☐ pending	10,000	October 2020
ODFW In-stream flow Support	☐ cash ☒ in-kind	☒ secured ☐ pending	4,000	January 2020
	☐ cash ☐ in-kind	☐ secured ☐ pending		
Total of Match Funds			= \$114,000	

VIII. Storage-Specific Questions

Instructions: If you indicated that your study is for a storage project, answer question 23 in this section. If your study is for above-ground storage, also answer question 24. Please refer to the document on Storage-Specific Study Requirements for guidance and information on completing this section, available on the OWRD Funding Opportunities, Applications, Forms, and Guidance webpage. If your study is for a water conservation or reuse project, skip this section.

23. All Storage Projects. Answer the following “Yes/No” questions about the storage project to be evaluated in the proposed study. The study will evaluate all options.

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

If you answered “yes” to any of the questions above, you are required to address the following analyses in your feasibility study. By signing this application, you are committing to include these required elements in your feasibility study.

If you answered “Yes” to (A), (B), or (C) above, attach a description of how you intend to address the following required elements in your feasibility study (please refer to the document on Storage-Specific Study Requirements for guidance and a description of the minimum acceptable standards regarding these study requirements):

- i. 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. **The UGRRW Partnership identified the lack of in-stream flow studies as a data gap in our watershed. Therefore, this opportunity allows us to meet Feasibility Study compliance requirements as well as perform an expanded study to fill this broader data gap related to the actual in-stream needs of fisheries in the UGRRW (as opposed to just the amount specified by in-stream water rights which may be based on outdated methodologies, and do not cover all stream reaches in the basin). To address this need, the CTUIR will utilize BPA funding to contract with ODFW to complete the IFIM/PHABSIM study on Catherine Creek in 2021. Stillwater Sciences will complete the IFIM/PHABSIM study on the Upper Grande Ronde River as a part of this Feasibility Study grant.**

These IFIM/PHABSIM studies are anticipated to cover Catherine Creek from Davis Dams, just below Union Oregon, upstream to the confluence of the North and South Forks of Catherine Creek. On the Upper Grande Ronde River, this analysis will be undertaken from the confluence of Fivepoints Creek, just above La Grande, Oregon, upstream to the confluence of the East Fork and mainstem Grande Ronde River. These reaches are both likely locations for potential storage options as well as priority areas identified by ODFW biologists to further refine our understanding of in-stream flow needs to sustain fisheries. While the area of coverage and level of detail of these studies may shift depending on the storage locations identified, our goal is to better understand instream demand in these

reaches and ensure that any potential storage project would not undermine the overall ecological integrity of these systems. The studies will meet the minimum requirements for OWRD Storage Feasibility Studies, and the elements associated with each study are anticipated to generally include:

- Data compilation (compile and review existing habitat typing and channel type datasets: e.g., ODFW Aquatic Inventories habitat typing, Chinook and Steelhead Intrinsic Potential mapping, bankfull widths, channel confinement, and HabRate ratings for limiting factors geodatabases provided by the GRMW);
- Channel type stratification and transect selection for an up to 32-mile study length;
- Field data collection;
- Depth and velocities at one flow level;
- Water Surface Elevation Levels (WSEL) at two other flow levels, up to a high diversion flow;
- Modeling (using existing suitability curves and criteria, target species: Chinook, steelhead, and bull trout);
- Reporting and project management and coordination

ODFW will also assist by utilizing their new stream assessment tool, which is currently under development and is anticipated to be available in early 2021. Through this process, hydrologic data will be coupled with the habitat data to determine peak and flushing flows. The studies will be designed to meet the OWRD minimum requirements for storage feasibility studies and additional coordination with OWRD and relevant agencies will occur once sites are selected to ensure studies meet these requirements.

- ii. 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. **A comprehensive alternative analysis will be completed utilizing information from the Step 3 Report as a base. A list of alternative means of supplying water will be prepared including reviewing methods to reduce demand (agricultural demand is the highest in the UGRRW so that will be the focus). The degree to which conservation can meet demand, costs and benefits, and regulatory requirements will be evaluated for locations/project areas derived from the Step 3 Report. In the Step 3 Report, future agricultural demand was calculated using estimated future ET based on precipitation and temperatures projected by the Representative Concentration Pathways (RCP) 8.5 climate scenario. Future demand was calculated in two ways: the first assumed no changes in water use, and the second assumed irrigation efficiencies. The Natural Resources Conservation Service water savings estimator was used to estimate water savings for irrigation system planning. Current and potential consumption estimates were calculated based on changes to agricultural irrigation practices. Each subwatershed had different benefits to implementing irrigation improvements.**

Total agricultural water use per year was estimated to be 211,130 AF per year (surface water) and 86,830 AF per year (groundwater) using water rights, and 193,730 AF per year (surface water) and 77,970 AF per year (groundwater) using estimated ET. Future demand with irrigation efficiency implemented to the level suited to field conditions and with projected increases in future temperature was estimated to be 211,130 AF per year

(surface water) and 86,830 AF per year (groundwater) using water rights, and 284,530 AF per year (surface water) and 114,520 AF per year (groundwater) using estimated ET. Estimates assume that no additional water rights are issued, and that no expansion of irrigated acres occur.

This information indicates that water conservation and efficiency are necessary parts of the solution; however, these techniques will not solve the deficit alone, and water storage is needed. In the Feasibility Study, this existing information will be used to focus on what if any potential locations would be viable for additional water conservation projects.

- iii. Analyses of environmental harm or impacts from the proposed storage project. **Environmental impacts are a component of feasibility that will be included in the evaluation. A preliminary analysis of environmental harm will be completed by identifying the possible impacts to the required National Environmental Policy Act environmental elements. These include ESA species, groundwater levels, climate change impacts, land use, floodplains, wetlands, historic properties, biological resources, water quality, air quality, noise, transportation, visual aesthetics, hazardous materials, and limiting ecological factors. An analysis of possible impacts to these areas based on readily available information will be conducted; a complete Environmental Assessment will not be provided at this phase of project development.**
- iv. 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. **This part of the study will build on both the Step 3 Report and ODFW in-stream flow models that are currently being created. An evaluation of the need for and feasibility of using stored water to augment in-stream flows will be completed by comparing the available water in the basin with the associated water rights and the peak and ecological flow analysis. This analysis will provide an indication of the amount of water required to meet the identified needs. This study will include a summary of water available in the UGRRW (See Step 2 Report), summary of streamflow that is legally protected (See Step 2 Report), reference the ecological flows analysis and impact of the proposed project on by-pass, optimum peak, and flushing flows that will be conducted as described in 23i. This analysis will include the potential for and feasibility of in-stream flow augmentation including hydraulic analysis of rainfall-runoff volumes (preliminarily discussed in the Step 2 Report and to be enhanced in this study), the extent to which the project can store water throughout the year, and the feasibility of if/how the project could operate to augment in-stream flows.**
- v. *For proposed storage projects for municipal use only* – 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. **This storage project is not anticipated to be needed for municipal use.**

24. For Above-Ground Storage Only. Describe whether or not the storage project would include provisions for using stored water to augment instream flows to conserve, maintain and enhance aquatic life, fish life or other ecological values. As per statute and rule, above-ground storage projects that include these provisions receive preference for funding over other storage projects.

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Yes, a framework for use would be created to allow for stored water to augment in-stream flows. This framework for use would be developed conceptually at the feasibility level, but then, as the project was implemented, would be codified as required by law. The UGRRW Partnership contains diverse stakeholders and it is a priority for us to ensure that any benefits of water storage are used to meet both out-of-stream and in-stream water needs.

Attachment 0 Cover Sheet for Attachments

The following attachments are included in this Application:

Attachment 1 – Site Plan Map

Attachment 2 – Not included; no landowner agreements at this phase

Attachment 3 – Documentation of Matching Funds

- CTUIR Letter of Support and Match Documentation - Letter from CTUIR Water Resources Department documenting the \$60,000 of BPA funds that will be used to conduct IFIM/PHABSIM studies on Catherine Creek via a contract with ODFW.
- OWEB Partnership Executed Grant Agreement (\$100,000 total funds available)
- Email from Courtney Shaff, OWEB Business Operations Manager indicating that this feasibility study is an acceptable use of OWEB Partnership Capacity/Development Grant Match Funds. Of the total \$100,000 in OWEB Funds, \$40,000 will be used to support this feasibility study. These funds will be used to cover consultant time and administrative costs to conduct the needed to identify, evaluate, and select locations. This will be allocated as \$10,000 for each of task 1, 2, 3, and 6.
- Partnership Match Time Certification Letter – Letter from UGRRW Partnership indicating match of approximately 100 hours (20 for each of task 1, 2, 3, 5, and 6) valued at \$100 per hour for a total of \$10,000 in match time contribution. This represents a minimum match, actual time is anticipated to be greater.
- ODFW Email of Support and Match Documentation of \$4,000 for Task 4.

Attachment 4 – Storage Specific Study Requirements – Not included; our answers are contained in the feasibility study application on Question 23.

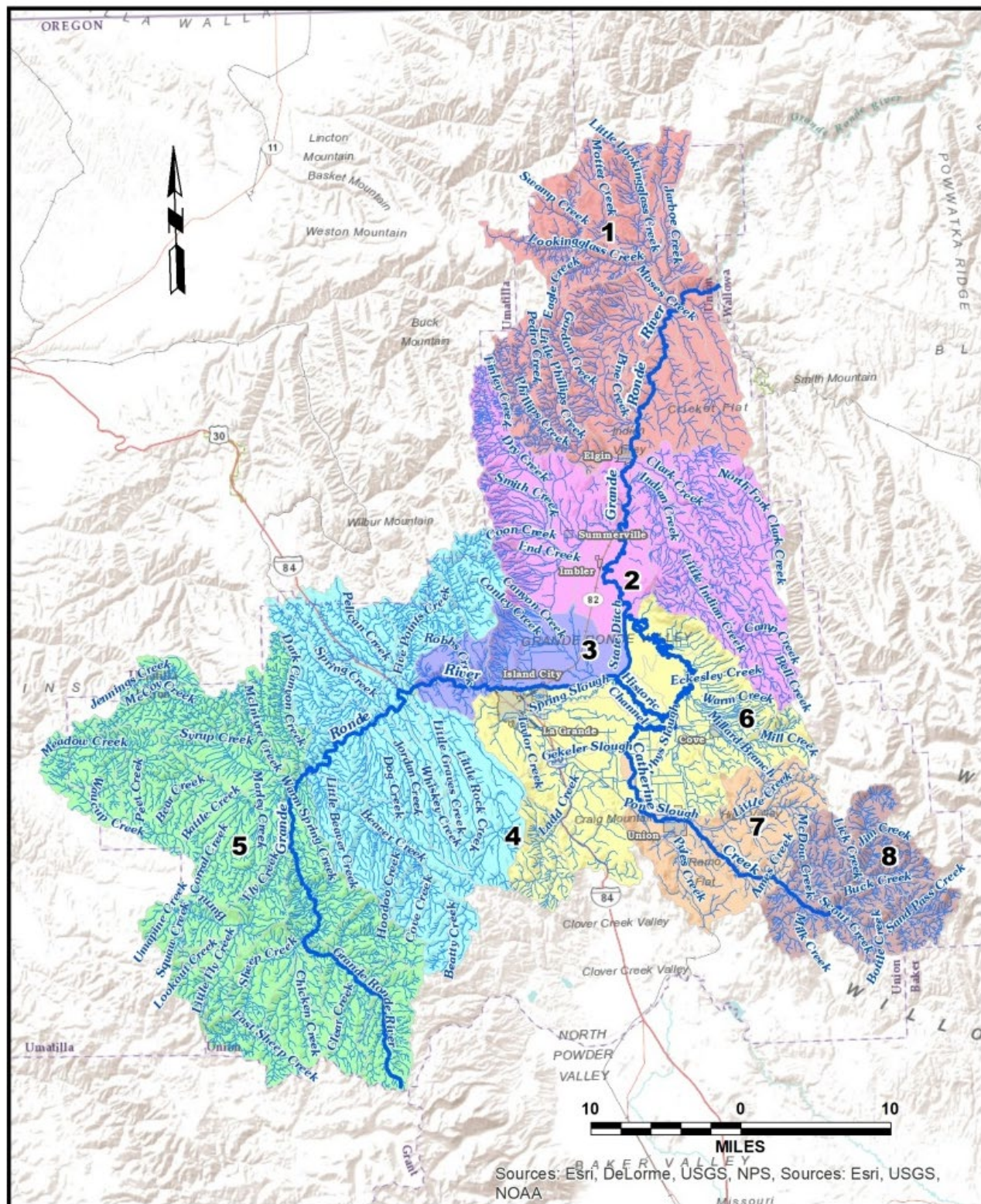
Attachment 5 – Letters of Support

- See CTUIR Letter of Support and Match Documentation in Attachment 3 above
- See ODFW Email of Support and Match Documentation in Attachment 3 above
- UGRRW Partnership Letter of Support
- UGRRW Partnership Meeting Minutes with Partnership support for this storage Feasibility Study application identified.
- Union County Cattleman Letter of Support
- Union County Farm Bureau Letter of Support
- Grande Ronde Model Watershed Letter of Support

Attachment 6 – Exhibit 1 Step 3 Area Map and Water Balance Table – Excerpts from the Step 3 Report

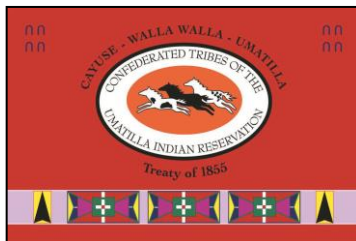
- Figure 2-1 Subwatersheds of the UGRRW
- Table 7-1 Annual Water Balance (Current Demand)
- Table 7-2 Annual Water Balance (Future Demand)
- Table 7-3 Shaded Bi-weekly Water Balance

Attachment 1 Site Map Plan – Upper Grande Ronde River Watershed, Union County, Oregon



**Confederated Tribes of the
Umatilla Indian Reservation**

Department of Natural Resources
Water Resources Program



46411 Timine Way
Pendleton, OR 97801

www.ctuir.org davidhaire@ctuir.org
Phone 541-429-7288

Oregon Water Resources Department
Grant Program Coordinator
725 Summer St. NE, Suite A
Salem, OR 97301

October 15, 2020

Dear Feasibility Grant Review Team,

As the Water Resources Program Manager for the Confederated Tribes of the Umatilla Indian Reservation, and as a member of the Upper Grande Ronde River Watershed Place-Based Planning Partnership (Partnership), I am pleased to submit this letter in support of the Partnership's application for a Feasibility Study Grant from the Oregon Water Resources Department.

Planning for the sustainable use of water resources is essential to addressing current issues and preparing communities and ecosystems for a changing climate. The generous support the Partnership has received through Oregon's Place-Based Planning Program has enabled our basin to begin undertaking these efforts in a proactive, collaborative fashion. It is our hope that this work will help inform a path to avoiding future resource use conflict, and better prepare our communities for adaptation to a changing climate.

However, while planning is a critical first step, the ultimate effectiveness of this effort will be contingent upon the implementation of the strategies our Partnership has developed in its vision for a sustainable future. Foremost among these is the identification of storage opportunities that will enhance, not undermine, the ecological integrity of our river systems. Achieving this will require a better understanding of instream needs, which was identified as a data gap during our planning effort.

With this application, our Partnership embarks upon the implementation of its collective vision for the Upper Grande Ronde. This vision includes both a thriving economy and a thriving environment, and the Umatilla Tribes are pleased to allocate up to \$60,000 in BPA funding as match to help invest in the analyses necessary to better understand instream demand.

The potential support presented by this Feasibility Study Grant would allow our Partnership to continue moving forward in its work, and will be critical to helping Oregon make the most of its investment in Place-Based Water Resources Planning in the Upper Grande Ronde.

Sincerely,

David Haire

Program Manager
Water Resources Program, Department of Natural Resources
Confederated Tribes of the Umatilla Indian Reservation

**OREGON WATERSHED ENHANCEMENT BOARD
GRANT AGREEMENT
for
TECHNICAL ASSISTANCE**

Grantee: Union County Admin Services

Grant Number: 220-8313-17327

Grant Name: Upper Grande Ronde River Watershed Partnership - Place-Based Integrated Water Resources P

Award Amount: \$100,000.00

Project Completion Date: 3/30/2023

Award Date: 1/22/2020

Progress Report Due:

12/30/2020, 12/30/2021, and 12/30/2022

Grantee

Union County Admin Services

1106 K Avenue

La Grande, OR 97850

Phone: 541-963-1001

Email: sburgess@union-county.org

Contact: Shelley Burgess

Project Manager for the Grantee

Dana Kurtz

N/A

1901 N. Fir Street/P.O. Box 1107

La Grande, OR 97850

Phone: 541-963-8309

Email: dkurtz@andersonperry.com

Payee

Union County Admin Services

Shelley Burgess

1106 K Avenue

La Grande, OR 97850

Phone: 541-963-1001

Email: sburgess@union-county.org

Project Manager for the Board

Oregon Watershed Enhancement Board

Leah Tai

775 Summer St NE Suite 360

Salem, OR 97301-1290

Phone: (503) 986-0177

Email: leah.tai@oregon.gov

Fund Source:

This grant is funded by Oregon Lottery funds or another state fund source and must comply with the requirements defined in Article XV, section 4b(2) of the Oregon Constitution.

This Grant Agreement is between the Oregon Watershed Enhancement Board, hereafter called "Board," and the Grantee as identified above, in consideration of the mutual covenants contained herein. This Agreement consists of the following, in descending order of precedence: modifications to this Agreement contained in Exhibit B, if applicable, this Agreement less all exhibits attached, Exhibits G (Grant Application selected for funding by the Board), B (Conditions of Agreement), A (Schedule for Release of Funds), C (Project Completion Report Requirements), D (Required Evidence of Permits, Licenses and Other Agreements), E (Insurance Requirements), and F (Oregon Prevailing Wage Rate Law).

A. Authorization

This grant is authorized by ORS 541.890 to 541.958, as amended by Oregon Laws 2011, chapter 643, and is subject to Oregon Administrative Rules 695-001-0000 to 695-050-0050, as such rules may periodically be amended by the Board.

B. Grant Award

The Grantee agrees to perform the Project described in the grant application (Exhibit F) and as specified in this Agreement. The Board will disburse Grant Funds in accordance with Exhibit A (Schedule for Release of Funds).

The Grantee agrees that funds provided by the Board will be used only for the Project.

"Payee" designated on page one (1) of this Agreement means the person or entity designated by Grantee to administer grant payments under this Agreement.

C. Term of Agreement

Unless otherwise specified in Exhibit B, upon signature by all parties and approval as required by law, this Agreement is effective as of the Award Date specified on page one (1) of this Agreement, and expires on the Project Completion Date specified on page one (1) of this Agreement.

D. Funding Conditions

The Board's obligation to disburse funds to the Grantee under this Agreement is subject to the Board having received, on the date of each disbursement, sufficient funding, appropriations, limitations, allotments, or other expenditure authority to allow the Board, in the exercise of its reasonable administrative discretion, to make each disbursement. Nothing in this Agreement entitles the Grantee to receive payment under this Agreement from any part of Oregon state government other than the Board, and nothing in this Agreement is to be construed as permitting any violation of Article IX, section 7 of the Oregon Constitution or any other law regulating liabilities or monetary obligations of the State of Oregon.

As a condition for the disbursement of any Board funds, the Grantee agrees to do the following:

1. Obtain Necessary Permits and Licenses

Submit to the Board's Project Manager, before release of any Board funds for the Project components requiring permits or licenses, or for activities dependent on portions of the Project for which a permit or license has yet to be issued, copies of all permits and licenses from local, state or federal agencies or governing bodies that have been obtained, or written evidence acceptable to the Board that permits and licenses are not needed (see Exhibit D, Required Evidence of Permits and Licenses and Other Agreements) as required by ORS 541.932(10).

This statute gives OWEB discretion in releasing funds for portions of projects that do not require a permit or license. In considering whether to release funds for portions of on-the-ground restoration activities that do not require permits or licenses, OWEB will consider whether the activities provide ecological benefit consistent with the project objectives, and are not dependent on the portion of the project for which a permit or license has yet to be issued. OWEB also has the discretion to condition its release of funds based on specific circumstances of a project. Grantee should review Exhibit B Conditions of Agreement for any related conditions with respect to permitting, licensing and fund release.

2. Obtain Signed Landowner Agreements

Unless otherwise specified in Exhibit B, the Board will not release any payments under this Agreement until Grantee has submitted to the Board's Project Manager copies of signed Cooperative/Landowner Agreements for each Project site. Such Cooperative/Landowner Agreements shall at a minimum contain the agreements and certification outlined in Exhibit D.

3. Comply With Implementation Conditions

- (a) Submit to the Board's Project Manager, before release of any Board funds, documentation that non-Board match of at least 25% of the total amount of funding from the Board has been secured as required by OAR 695-005-0060(2), unless otherwise specified in Exhibit B, Conditions of Agreement, or;
For Focused Investment Partnership Projects, in accordance with OAR 695-047-0110(7), the matching funds requirement is reduced to a minimum of at least \$1.00. However, any cash or in-kind match funding utilized in the course of completing this grant must be documented in the Project Completion Report (Exhibit C). Submit to the Board's Project Manager, before release of any Board funds, documentation that \$1.00 minimum match requirement will be met for the match.
- (b) Provide written notice to the Board's Project Manager of any Grantee address changes, Grantee Project Manager changes or Payee changes.

4. Document and Report Project Completion; Board Approval

- (a) Submit to the Board's Project Manager all expenditure tracking sheets and other accounting records through the Project Completion Date, to document expenditure of grant fund installments, and to account for all other funding, in-kind contributions and donations in the Project Completion Report.
- (b) Submit to the Board's Project Manager within 60 days after the Project Completion Date, a Project Completion Report and the final Request for release of Funds that complies with Exhibit C, and includes any special reporting required in Exhibit B. Reports received after 60 days will be marked as "outstanding" until approved by the Board's designee. New grant agreements will not be released if Grantee has any outstanding reports.
- (c) Upon receipt of a Project Completion Report and the final Request for Release of Funds, the Board's designee has 90 days to either approve the report and release final funds, or notify Grantee of any concerns or missing information that must be submitted before the report is considered complete. If there are any unresolved issues 90 days after receipt of the Project Completion Report and the final Request for Release of Funds, then the grant will be marked "outstanding." New grant agreements will not be released if Grantee has any outstanding reports.

E. Records Maintenance and Access

- 1. **Access to Records and Facilities.** The Board, the Secretary of State's Office of the State of Oregon and their duly authorized representatives will have access to the books, documents, papers and records of Grantee that are directly related to this Agreement, the grant moneys provided hereunder, or the Project for the purpose of making audits and examinations. In addition, the Board, the Secretary of State's Office of the State of Oregon and their duly authorized representatives may make and retain excerpts, copies and transcriptions of the foregoing books, documents, papers and records. Grantee will permit authorized representatives of the Board and the Secretary of State's Office of the State of Oregon to perform site reviews of all services delivered as part of the Project.
- 2. **Retention of Records.** Grantee will retain and keep accessible all books, documents, papers, and records that are directly related to this Agreement, the grant moneys or the Project for a minimum of six (6) years, or such longer period as may be required by other provisions of this Agreement or applicable law, following termination or expiration of this Agreement. If there are unresolved audit questions or litigation at the end of the six-year period, Grantee will retain the records until the questions or litigation is resolved.
- 3. **Expenditure Records.** Grantee will document the expenditure of all grant moneys disbursed by the Board under this Agreement. Grantee will create and maintain all expenditure records in accordance with generally accepted accounting principles and in sufficient detail to permit the Board to verify how the grant moneys were expended, including without limitation accounting for all other funds expended, as well as in-kind services and donated materials.

F. Amendments; Changes in Project Approved by Board

1. Except as provided in Section F(3), any modifications of this Agreement must be mutually agreed to in writing by all parties.
2. All amendments, such as award amendments, time extensions and reinstatements may proceed regardless of reporting obligation status.
3. Grantee agrees to complete the Project as approved by the Board unless proposed modifications to the Project are submitted in writing to, and approved in writing by, the Board's Project Manager or, if required by this Agreement, the Board's Program Manager, prior to the beginning of any work proposed in the modification. Modifications to the budget categories shown in Exhibit A may be approved for change upon signature of the Board's Project Manager.

G. Assignment

The Grantee will not assign or transfer its interest in this Agreement without prior written approval from the Board.

H. Permission Required to Access Private Property; Access to Project Sites

In carrying out this Agreement, Grantee will not access any private property without first obtaining written consent from the landowner of the private property. Grantee will direct its contractors not to access private property without first obtaining written consent from the landowner of the private property.

Upon Board request and consistent with the Cooperative/Landowner Agreement(s) meeting the requirements as specified in Exhibit D, Grantee will seek the landowner's permission for mutually convenient access to the project site by Board members and their representatives for the purposes of evaluating Project implementation, completion, post-implementation status or effectiveness.

I. Public Domain Information

Projects funded by this grant may be used in the collection of monitoring information on private lands about the effects of the Project on aquatic or terrestrial conditions. Grantee acknowledges that all monitoring information obtained from private lands may become public information subject to the requirements of ORS 192.311 to 192.478.

J. Termination of Grant Agreement

1. This Agreement may be terminated:
 - (a) At any time by mutual written consent of all parties;
 - (b) Upon written notice by the Board to Grantee for Grantee's failure to perform any provision of this Agreement;
 - (c) Upon 30 days written notice by the Board to Grantee for any other reason specified in writing; or
 - (d) At any time, upon written notice by the Board, if the Board lacks sufficient funding, appropriations, limitations, allotments, or other expenditure authority to allow the Board, in the exercise of its reasonable administrative discretion, to disburse the grant funds.
2. Within 30 days of termination, Grantee will return to the Board any unspent funds provided by the Board under this Agreement in accordance with Section O, Recovery of Grant Funds. The Board will reimburse the Grantee for authorized services performed and expenses incurred before the termination under this Agreement.

K. Compliance With Applicable Law

Grantee shall comply with all federal, state and local laws, regulations, executive orders and ordinances applicable to this Agreement or to the Project. Without limiting the generality of the foregoing, Grantee expressly agrees to comply with the following laws, regulations and executive orders to the extent they are applicable to the Agreement or the Project: (a) all applicable requirements of state civil rights and rehabilitation statutes, rules and regulations, (b) Titles VI and VII of the Civil Rights Act of 1964, as amended, (c) Sections 503 and 504 of the Rehabilitation Act of 1973, as amended, (d) the Americans with Disabilities Act of 1990, as amended, (e) Executive Order 11246, as amended, (f) the Health Insurance Portability and Accountability Act of 1996, (g) the Age Discrimination in Employment Act of 1967, as amended, and the Age Discrimination Act of 1975, as amended, (h) the Vietnam Era Veterans' Readjustment Assistance Act of 1974, as amended, (i) all regulations and administrative rules established pursuant to the foregoing laws, and (j) all other applicable requirements of federal civil rights and rehabilitation statutes, rules and regulations. These laws, regulations and executive orders are incorporated by reference herein to the extent that they are applicable to the Agreement or the Project and required by law to be so incorporated. Grantee shall not discriminate against any individual, who receives or applies for services as part of the Project, on the basis of actual or perceived age, race, creed, religion, color, national origin, gender, disability, marital status, sexual orientation, age or citizenship. All employers, including Grantee, that employ subject workers who provide services in the State of Oregon shall comply with ORS 656.017 and provide the required Workers' Compensation coverage, unless such employers are exempt under state law.

L. Grantee Authority

The individual signing on behalf of the Grantee hereby certifies and swears under penalty of applicable law that s/he is authorized to act on behalf of Grantee, has authority and knowledge regarding Grantee's payment of taxes, and to the best of her/his knowledge, Grantee is not in violation of any Oregon tax laws.

M. Indemnity

Subject to the limitations of the Oregon Tort Claims Act (ORS 30.260 - 30.300), Grantee will defend (subject to any limitation imposed by ORS Chapter 180), save, hold harmless, and indemnify the State of Oregon and the Board and their officers, employees and agents from and against all claims, suits, actions, losses, damages, liabilities, costs and expenses of any nature resulting from or arising out of, or relating to the activities of Grantee or its officers, employees, contractors, or agents under this Agreement or in the implementation of the Project.

N. Designation of Forum

Any party bringing a legal action or proceeding against any other party arising out of or relating to this Agreement shall bring the legal action or proceeding in the Circuit Court of the State of Oregon for Marion County. Each party hereby consents to the exclusive jurisdiction of such court, waives any objection to venue, and waives any claim that such forum is an inconvenient forum.

O. Recovery of Grant Funds

Any funds disbursed to Grantee under this Agreement that are expended in violation or contravention of one or more of the provisions of this Agreement or that remain unexpended on the earlier of termination of this Agreement or the Project Completion Date must be returned to the Board not later than 15 days after the Board's written demand.

P. Counterparts

This Agreement may be executed in several counterparts, including by facsimile or by signature on a portable document format (pdf) delivered by email, all of which when taken together shall constitute one agreement binding on all parties, notwithstanding that all parties are not signatories to the same counterpart. Each copy of this Agreement so executed shall constitute an original.

Q. Insurance

1. In addition to any insurance specified in Exhibit E, Grantee shall carry the insurance types and amounts described below and will continue this coverage through Project completion. In addition, the Grantee shall require that all contractors or consultants hired for construction, restoration, technical design, assessment or monitoring contracts carry the minimum insurance types and amounts described below. The minimum insurance requirements do not apply to contractors not engaged in these types of activities, for example, those engaged in facilitation, data analysis, or web design, etc.. Contractor insurance requirements do not apply to landowners with whom the Grantee is contracting to perform work on the landowner's property.

Insurance Type	Minimum Amount
General liability	\$1,000,000 per occurrence, \$2,000,000 annual aggregate
Auto liability	\$1,000,000 combined single limit

2. If requested by the Board, Grantee shall provide to the Board Certificate(s) of Insurance for all required insurance. As proof of insurance the Board has the right to request copies of insurance policies and endorsements relating to the insurance requirements in this Agreement.
3. Grantee or the insurer must provide at least 30 days' written notice to the Board before cancellation of, material change to, potential exhaustion of aggregate limits of, or non-renewal of the required insurance coverage(s).

THIS AGREEMENT, INCLUDING ALL MATERIALS INCORPORATED BY REFERENCE, CONSTITUTES THE ENTIRE AGREEMENT BETWEEN THE PARTIES ON THIS SUBJECT. THERE ARE NO UNDERSTANDINGS, AGREEMENTS, OR REPRESENTATIONS, ORAL OR WRITTEN, NOT SPECIFIED HERE REGARDING THIS AGREEMENT. NO WAIVER, CONSENT, MODIFICATION OR CHANGE OF TERMS OF THIS AGREEMENT SHALL BIND EITHER PARTY UNLESS IN WRITING AND SIGNED BY BOTH PARTIES. SUCH WAIVER, CONSENT, MODIFICATION OR CHANGE, IF MADE, SHALL BE EFFECTIVE ONLY IN THE SPECIFIC INSTANCE AND FOR THE SPECIFIC PURPOSE GIVEN. THE FAILURE OF THE BOARD TO ENFORCE ANY PROVISION OF THIS AGREEMENT SHALL NOT CONSTITUTE A WAIVER BY THE BOARD OF THAT OR ANY OTHER PROVISION. GRANTEE, BY EXECUTING THIS AGREEMENT, HEREBY ACKNOWLEDGES THAT GRANTEE HAS READ THIS AGREEMENT, UNDERSTANDS IT AND AGREES TO BE BOUND BY ITS TERMS AND CONDITIONS.

CERTIFICATION

GRANTEE CERTIFIES THAT GRANTEE WILL NOT BEGIN WORK ON PROJECTS INVOLVING PRIVATE LANDS UNTIL GRANTEE HAS SECURED COOPERATIVE LANDOWNER AGREEMENTS (EXHIBIT D) WITH ALL PARTICIPATING PRIVATE LANDOWNERS THAT, AT A MINIMUM, COMPLY WITH SECTION H AND INCLUDE THE FOLLOWING:

- (a) Acknowledgement that the landowner is aware of the application to OWEB and that information relating to the work, including effectiveness monitoring data, is a public record.

AGREED:

FOR THE GRANTEE:

Paul Anderes

Grantee Signature

Paul Anderes

Print Name

March 18, 2020

Date

FOR THE BOARD:

Meta J. Gaarden

OWEB Program Manager

4/6/2020

Date

EXHIBIT A

SCHEDULE FOR RELEASE OF FUNDS

All fund requests shall comply with the Board's Billing Instructions and Budget Categories Definitions and Policies, (see OWEB's website <https://www.oregon.gov/OWEB/> "manage your grant" and choose "payments & budget") and be submitted using the most current Request for Release of Funds form signed by the Grantee, Payee, or other agent authorized by Grantee. Disbursement of funds is subject to the Board having sufficient funding on the date of each disbursement. The Board will not reimburse the Grantee for any expenditure incurred prior to the award date of the grant agreement except for fees charged by an affected city or county for processing the required Land Use Information Sheet. Payment requests will be processed after approval by the Board's Project and Fiscal Managers or delegates.

Funds are released upon Board approval of receipts or invoices for amounts \$250 or more (excluding indirect cost grant administration) for purchases or work accomplished along with an expense tracking spreadsheet for all Board expenses.

Funds may also be released in advance on the basis of a detailed estimate of expenses. Copies of receipts, invoices or supporting documentation, for amounts \$250 or more (excluding indirect cost grant administration) must be submitted to document OWEB funds previously advanced for this grant within 120 days of the date of the payment. Also, an expense tracking spreadsheet for all OWEB expenses shall be submitted. Failure to comply may delay new grants from being issued, and other grant payment requests and amendments.

The grant budget consists of the elements listed below.

Budget Category	Amount
OWEB Funds	
Contracted Services	\$95,000.00
Materials and Supplies	\$5,000.00
Categories Subtotal	\$100,000.00
Grant Total	\$100,000.00

Up to the final 10% of the grant (\$10,000.00) will not be released for payment until the Board's approval of the Project Completion Report including all grant expense documentation.
OAR 695-005-0060(7).

If Federally Negotiated Indirect Cost Rate (FNICR) is selected as the indirect cost method, then an approved plan as of grant application due date or later must be on file at OWEB before funds for indirect costs will be released.

Submittal and Board approval of a Project Completion Report and final Request for Release of Funds will authorize the Board to retain any remaining unspent funds.

EXHIBIT B
CONDITIONS OF AGREEMENT

1. Reporting: Progress Report

Grantee will submit to the Board's Project Manager progress report(s) that may be a brief paragraph, sent by email, using the heading "Progress Report" with the project number. The progress report should describe Project implementation status towards achieving the scope of work described in the Grant Application, detailing actions completed to date and providing an anticipated timeline for remaining Project components. See page one for reporting schedules.

2. Project Specific: Other

The Project Completion Report must include the strategic action plan and implementation communication plan.

EXHIBIT C
PROJECT COMPLETION REPORT REQUIREMENTS

Oregon Administrative Rule 695-010-0100(1) states that "Grantee must submit a report at completion of the project describing the work done and placing it in its larger watershed context." Therefore, **Grantee must submit a Project Completion Report within 60 days following project completion** that includes, but is not limited to, (1) through (6) below.

The Project Completion Report must be submitted electronically on OWEB's Grant Management System (OGMS). Electronic submission requires an OGMS User Identification and password. To request a User Identification and password, call (503) 986-0183.

1. **A final Project summary** that in 200 words or less, describes **what the Project accomplished and what problem(s) it addressed**. The information you provide will be used for accountability and reporting purposes, and displayed for the general public. Please make a clear and concise statement; avoid jargon and acronyms. For guidance see: <https://www.oregon.gov/OWEB/> "manage your grant" and choose "reporting requirements".
2. **A brief, narrative description of the Project including:**
 - (a) Background on the problem that generated the Project;
 - (b) A description of the work done, placing it in its larger watershed context;
 - (c) A description and explanation of any changes to the original proposal;
 - (d) A summary of any outreach activities related to the Project, including identification of any tours or presentations and copies of newspaper or other media coverage about the Project;
 - (e) Lessons learned, if any, from the Project; and
 - (f) Recommendations, if any, for more effective implementation of similar projects.
 - (g) **For Monitoring grants**, attach a technical report that describes the monitoring questions being asked and/or monitoring objectives being addressed; monitoring protocols used; a description of the sampling design; a map of all monitoring sites; all analyses completed; results of the monitoring, including tables, graphs and photos that visualize results; a description of where the data are stored for future access and/or use; discussion of the results, including a thorough explanation stating if and how monitoring questions/objectives were addressed; and an explanation of how the results will be used to inform future actions.
 - i. If effectiveness monitoring of a project was completed, provide an interpretation of the monitoring results that describes the effects of restoration actions being evaluated.
 - ii. As applicable, submit all water quality data to the Oregon Department of Environmental Quality's Laboratory and Environmental Assessment Section in an approved format for inclusion in the state's public database. The Project Completion Report shall include confirmation that your data were successfully transmitted to DEQ. Contact DEQ staff for information and instructions for submitting your data at:
<https://www.oregon.gov/deq/wq/Pages/WQ-Monitoring-Resources.aspx>.
 - iii. As applicable, submit all Habitat Inventory data, juvenile survey data and final reports to ODFW's Natural Resource Information Management Program (NRIMP) at:
<https://nrimp.dfw.state.or.us/DataClearinghouse/>. The Project Completion Report shall include confirmation that your data were successfully transmitted to ODFW.
3. **See Exhibit B for any additional reporting requirements for the Project Completion Report.**
4. **Attachments:**
 - (a) For Technical Assistance grants, attach final Project designs, the action plan prepared by the Project contractor or staff person, or a list of the landowners contacted and identify those successfully recruited, with discussion of the reasons that landowners agreed or declined to participate, and the resulting list of sites secured for Project implementation (include township, range, and section for each).
 - (b) For CREP Technical Assistance grants, attach the Quarter 8 Progress Report, and a list of landowners provided with technical assistance under the project who did not enroll in the CREP Program, with discussion of the reasons that the landowners declined to participate.
 - (c) For Watershed Assessment grants, attach two (2) paper copies and an electronic version of the completed assessment.
 - (d) For Stakeholder Engagement grants, attach copies of any outreach or informational materials developed as part of this Project.

5. Final Report Metrics Form:

Complete the Final Report Metrics form as provided for Technical Assistance, Monitoring and Stakeholder Engagement grants on the OWEB website at <https://www.oregon.gov/OWEB/> "manage your grant" and choose "forms". The information you provide in the Final Report Metrics Form is used by OWEB for federal and state reporting purposes.

EXHIBIT E

INSURANCE REQUIREMENTS

Section Q of this Agreement specifies the base insurance requirements. The Board considers some projects and project activities to have an increased risk to the organization, organization's employees, volunteers, and the community and may require additional insurance. If required for the Project under this Agreement, the additional insurance types required, the amount, and who will carry the insurance are set forth below.

- ☒ The work related to this Project **will not** require additional insurance beyond base Agreement requirements.
- ☐ The work related to this Project **will** require additional insurance beyond base Agreement requirements.

If Grantee is completing the technical work, they shall carry the insurance types and amounts described below and will continue this coverage through Project completion. If Grantee is contracting out the technical work, they will only be required to meet the minimum OWEB insurance requirements of **Section Q** of this Agreement. Additionally, the Grantee shall require that all contractors or consultants hired for construction, restoration, technical design, assessment or monitoring activities carry the minimum insurance types and amounts described below.

Insurance Type	Coverage Amount	Organization carrying insurance

EXHIBIT F

OREGON PREVAILING WAGE RATE LAW

Grantees may be required to comply with Oregon's prevailing wage rate law, ORS 279C.800-279C.870. This law requires that entities using public funds for public works must pay not less than the prevailing rate of wage for an hour's work, including fringe benefits, in the same trade in the locality where the work is performed. Contracts not exceeding \$50,000 are exempt from prevailing wage rate laws and nonprofit organizations are exempt for work other than construction. Public works is defined as including "roads, highways, buildings, structures and improvements of all types, the construction, reconstruction, major renovation or painting of which is carried on or contracted for by any public agency to serve the public interest . . ." ORS 279C.800(6)(a). Construction is defined as "the initial construction of buildings and other structures, or additions thereto, and of highways and roads." OAR 839-025-0004(5)

Failure to comply with prevailing wage rate laws could result in a Grantee being liable to the workers affected in the amount of their unpaid minimum wages, including all fringe benefits, and in an additional amount equal to unpaid wages as liquidated damages.

Information regarding prevailing wage rate law can be found on the Bureau of Labor and Industries website at https://www.oregon.gov/BOLI/WHD/PWR/Pages/W_PWR_Pwrbk.aspx.

EXHIBIT G
OWEB GRANT APPLICATION
(In OWEB files)

Dana Kurtz

From: Dana Kurtz
Sent: Monday, October 12, 2020 10:44 AM
To: Dana Kurtz
Subject: FW: OWEB partnership fund use

From: SHAFF Courtney * OWEB <Courtney.Shaff@oregon.gov>
Sent: Tuesday, September 29, 2020 3:46 PM
To: Dana Kurtz <dkurtz@andersonperry.com>
Subject: RE: OWEB partnership fund use

Hi Dana, I hope you are doing well. The answers to both questions is yes. If you have any questions let me know.

Take care,

Courtney

Courtney Shaff

Interim Business Operations Manager
Oregon Watershed Enhancement Board
775 Summer St. NE, Suite 360
Salem, OR 97301
503-986-0046
courtney.shaff@oregon.gov

To keep updated on OWEB's granting processes, please visit our website (<https://www.oregon.gov/oweb/Pages/index.aspx>) which contains a list of frequently asked questions and our most recent responses.



From: Dana Kurtz <dkurtz@andersonperry.com>
Sent: Tuesday, September 29, 2020 12:45 PM

To: SHAFF Courtney * OWEB <Courtney.Shaff@oregon.gov>

Subject: OWEB partnership fund use

Hey Courtney,

The Upper Grande Ronde River Watershed Partnership is applying for an OWRD Feasibility Study Grant. I wanted to check:

1. Is it allowable to use OWEB partnership funds to draft the application, do background research, meet with work groups to work through the study concept etc? **Yes**
2. Is it allowable to use OWEB partnership funds as match funds for the feasibility study grant? **Yes**
3. If the answer to number 2 is no, could you let me know the OWEB TA grant deadline for 2020/2021, and point me to the up to date spot on your website? I remember you mentioning grant changes due to COVID but I don't remember if this one was affected.

Thanks for your help!



Dana Kurtz
Senior Environmental Scientist
Anderson Perry & Associates, Inc
[1901 N Fir Street/PO Box 1107](#)
La Grande, OR 97850
541-963-8309(Office)
509-953-1804(Cell/Text)

[Web](#) [Facebook](#) [LinkedIn](#)



UNION COUNTY BOARD OF COMMISSIONERS

*Donna Beverage, Commissioner
Paul Anderes, Commissioner
R. Matthew Scarfo, Commissioner*

Shelley Burgess, Administrative Officer

1106 K. Avenue

La Grande, Oregon 97850

PHONE: (541) 963-1001

FAX: (541) 963-1079

TTY: 1-800-735-1232

October 14, 2020

Dear OWRD review committee,

I, Donna Beverage, Convener of the Upper Grande Ronde River Watershed Partnership, pledge to utilize partnership time as match time for this OWRD Water Storage Feasibility Grant in the following way:

Task 1 - The UGRRW Partnership will review and provide feedback on the map for at least 20 hours total (assuming 1 hour per Stakeholder Committee Member for discussion during meetings).

Task 2 - The UGRRW Partnership will review and provide feedback on the social/legal assessment for at least 20 hours total (assuming 1 hour per Stakeholder Committee Member for discussion during meetings).

Task 3 - The UGRRW Partnership will review and provide feedback on the sites for at least 20 hours total (assuming 1 hour per Stakeholder Committee Member for discussion during meetings).

Task 5 - The UGRRW Partnership will review and provide feedback on the map for at least 20 hours total (assuming 1 hour per average Stakeholder Committee Member for discussion during meetings).

Task 6 - The UGRRW Partnership will review and provide feedback on the map for at least 20 hours total (assuming 1 hour per average Stakeholder Committee Member for discussion during meetings).

This equates to a total of 100 hours of match time from the entire partnership, valued at \$100 an hour, for a total match of \$10,000.

Thank you,

Donna Beverage
Commissioner

Dana Kurtz

From: Adrienne W Averett <Adrienne.W.Averett@state.or.us>
Sent: Thursday, October 15, 2020 4:08 PM
To: Dana Kurtz
Cc: Anna Pakenham Stevenson
Subject: RE: Draft Application

Hi Dana,

I can provide \$4000.00 of in-kind match to the feasibility project to assist with implementation of the ODFW prioritization and rapid assessment tools, Task 4, and any associated workgroup task for the project period.

Best Regards,
Adrienne

Adrienne W. Averett (she/her/hers) | East Region Implementation Coordinator
Oregon Department of Fish & Wildlife
107 20th Street, La Grande, OR 97850
Phone: 541-962-1839 | adrienne.w.averett@state.or.us

Please note: I am currently teleworking and the best way to contact me is via email. I may be working flexible and/or reduced hours to balance family and child care needs. I will respond to your request as quickly as possible. Thank you for your patience and understanding.

From: Dana Kurtz <dkurtz@andersonperry.com>
Sent: Thursday, October 15, 2020 11:57 AM
To: adrienne.w.averett@state.or.us
Subject: Draft Application

 Dana Kurtz
Senior Environmental Scientist
Anderson Perry & Associates, Inc
[1901 N Fir Street/PO Box 1107](#)
La Grande, OR 97850
541-963-8309(Office)
509-953-1804(Cell/Text)

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UNION COUNTY BOARD OF COMMISSIONERS

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1106 K. Avenue

La Grande, Oregon 97850

PHONE: (541) 963-1001

FAX: (541) 963-1079

TTY: 1-800-735-1232

October 7, 2020

Dear OWRD Feasibility Study Review Team,

Since fall of 2016, Union County has served as the Upper Grande Ronde River Watershed Partnership (UGRRWP) Place-Based Integrated Water Resources Planning effort.

The Upper Grande Ronde River Watershed is a vital ecosystem that supports ranchers, farmers, and municipal residents as well as an array of fish and wildlife species. Union County has convened a place-based integrated water resources planning effort to evaluate all demands on water resources within the watershed compared to available water resources.

This is a collaborative effort among a balanced representation of local organizations that have a vested interest in the area's water resources. We have over 25 organization and individuals participating in our meetings and contributing to analysis and strategic work on a regular basis.

The objective of this 5-step planning process is to have a complete document outlining available water resources in the watershed compared to the demands on each resource that will serve as a "roadmap" to best align the demands with the available resources for an integrated and sustainable system. It is with great excitement that we share with you our intent to complete this 5-step planning process in the near future.

We feel that through our collaborative effort we have created an integrated plan that can guide us in the implementing projects that benefit all water users and the environment. We feel that keeping our partnership together will be integral in allowing this work to be accomplished.

We, the Union County Board of Commissioners, affirm our commitment to continue our participation in this project throughout the proposed grant period.

The UGRRW Partnership have prioritized water storage as the most important strategy to address identified water concerns. This feasibility study would help our Partnership meet water needs now and into the future.

Thank you for the opportunity to apply for this support for our important cause.

Sincerely,

Donna Beverage
Commissioner

Paul Anderes
Commissioner

R. Matthew Scarfo
Commissioner

Upper Grande Ronde River Watershed Partnership
Place-Based Integrated Water Resource Planning
Stakeholder Meeting No. 32

Meeting Minutes
September 16, 2020
Conference Call

ATTENDANCE:

Adrienne Averett, Dave Johnson, Leonard Flint, Larry Larson, Rodger Huffman, Tim Bailey, Jed Hassinger, Bill Gamble, Donna Beverage, Jesse Steele, Tony Malmberg, Matt Insko, Anton Chiono, Kyle Carpenter, Curt Ricker, Steve Parrett, Dana Kurtz, Brett Moore

I. WELCOME

a. Introductions

Donna welcomed the group at 5:05pm. Donna stated the next meeting will hopefully have an in-person option.

b. Meeting Guidelines

Donna discussed guidelines for virtual meetings: state your name, speak up when talking, and use chat function.

c. Recap of June 24, 2020 Stakeholder meeting

Dana provided a recap of the June 2020 meeting. Feedback was sought about meeting time preference; 5:00 p.m. to 7:00 p.m. is the preferred time. Dana stated that the Partnership is applying for an OWRD feasibility study grant due October 15. The Partnership indicated support for this application.

i. Step 4 report schedule, overview, and preliminary comments

Most recent draft was emailed to everyone September 8; it includes incorporation of additional comments since last meeting.

II. Step 4 Report Review (80 minutes)

a. Revised Schedule

Dana presented the revised schedule:

October 14, 2020	VOTE to adopt Step 4 Report
November 11, 2020	Review DRAFT Step 5 Report
December 9, 2020	Revisions to Step 5 Report
January 2021	Revisions to Step 5 Report
February 2021	Adopt DRAFT Step 5 Report
March 1, 2021	Need to Submit plan to allow for 30-60 days agency review (ODA, ODFW, OWRD, DEQ)
April 2021	Wait/work implementation
May 2021	Wait/work implementation (presentation of final plan to the OWRD commission)
June 30, 2021	Grant extension expires

Upper Grande Ronde River Watershed Partnership
Place-Based Integrated Water Resource Planning
Stakeholder Meeting No. 32

- b. Review and discussion of stakeholder comments

Dana led discussion of stakeholder comments. See *attachment*.

III. Conclusion (5 minutes)

- a. Requests for Step 5 working groups forthcoming
- b. Next meeting is October 14, 2020 (5-7) Misener Room/Conference Call
- c. Other Comments

Donna adjourned the meeting at 6:55 p.m.

Union County Cattlemen

61931 Cottonwood Rd.

La Grande, OR. 97850

October 15, 2020

Oregon Water Resources Department
795 Summer St. Suite a
Salem, OR. 97301

RE: Union County Grant Proposal

Dear OWRD:

Union County Cattlemen support the water storage and feasibility study grant proposal being submitted by Union County. The Upper Grande Ronde Partnership was established 4 years ago to study the water supply and needs in this area. The feasibility of a water storage project has been an important topic of discussion.

We urge you to award a study grant.

Sincerely,

Pat Larson for:

Union County Cattlemen
Darren Hansen, President
Brett Beverage, Vice President
Pat Larson, Secretary

Union County Farm Bureau
2106 Cove Ave.
La Grande, OR 97850

10/15/2020

Oregon Water Resources Department
Attention: Grant Program Coordinator
725 Summer Street NE, Suite A
Salem, OR 97301

To Whom It May Concern:

I am writing on behalf of the Union County Farm Bureau to express our full support of the grant application for the Upper Grande Ronde River Watershed Storage Study, being submitted by Union County. Our county farm bureau is proud to have been actively engaged in the local place-based planning effort, which has identified surface water deficits as one of the highest priority water resource issues in our basin. The proposed study addresses an urgent need for information regarding potential options for water storage, a strategy that has risen to the top of the list for addressing the deficits in the Grande Ronde watershed.

While late season surface water deficits have long been felt by local farmers that rely on a consistent supply of irrigation water to sustain our crops, this deficit has been elucidated by the work done through the place-based planning process. The analysis of the water balance, based on the biweekly supply and demands from different user groups, highlights the fact that, while there is a surplus of water on an annual basis, deficits occur in late summer for both instream and consumptive uses. Storage would seem to be an obvious solution to this situation, allowing for the beneficial use of spring runoff water that is otherwise often detrimental to farms and residences in the valley due to flooding. However, such storage infrastructure is conspicuously lacking in our basin.

We are grateful to Union County for taking this step to proactively seek solutions to these water resource issues that are projected to worsen in the future. The climate change scenarios evaluated by the place-based planning group have found that agricultural demand is likely to increase in the future due to temperature increases, while the hydrograph could advance such that water leaves the basin well before crop water use peaks. This situation would not only exacerbate irrigation water deficits, but would also reduce instream flows needed to support aquatic organisms, leading to increased conflict between these user groups. It is heartening that we have come together as collaborators in this effort to seek solutions that benefit all and reduce future conflict.

If funded, Union County Farm Bureau will support the study and continue our participation in place-based planning to help implement strategies identified through the process. We are confident that the proposed study will provide vital information that could be pivotal in shaping a bright water future for our basin. As farmers, we look forward to these collaborative solutions that will allow us to sustainably grow the agricultural products that are the backbone of our local economy. Thank you for considering this application.

Sincerely,

Curt Ricker
President, Union County Farm Bureau



1114 J Ave.
La Grande, Oregon 97850

(541) 663-0570
Fax: (541) 962-1585

<http://www.grmw.org>

Board of Directors

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JD Cant
Bill Gamble

Staff:

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Mary Estes
Ian Wilson
Kayla Morinaga
Jesse Steele
Connar Stone

October 14, 2020

Dear OWRD Feasibility Study Review Team,

The Grande Ronde Model Watershed (GRMW) Board of Directors are writing this letter in support of the Upper Grande Ronde River Watershed Partnership's Place-Based Integrated Water Resource Planning effort.

GRMW staff have participated on both the Stakeholder and Technical Teams since the effort was initiated in 2016. We are committed to continuing our participation in the planning process.

GRMW's mission is to develop and oversee the implementation, maintenance and monitoring of coordinated resource management that will enhance the natural resources of the Grande Ronde and Imnaha River Basins. We support the study of feasibility for various methods of water storage to address municipal, fish & wildlife and agricultural water needs in the Upper Grande Ronde River Subbasin. We are hopeful that solutions exist that can achieve the goals of the wide array of partners invested in this process.

The commitment to this planning effort over the last four years from natural resource managers, private landowners, county commissioners, state and federal employees and citizens of Union County is a testament to the strength of this partnership. Please consider funding this feasibility study for water storage options in the Upper Grande Ronde.

Sincerely,

Jesse Steele
Executive Director

The mission of the Grande Ronde Model Watershed Program is to develop and oversee the implementation, maintenance and monitoring of coordinated resource management that will enhance the natural resources of the Grande Ronde River and Imnaha River Basins.

The UGRRW is divided into eight subwatersheds that are analyzed in this report. For more information on the methodology to develop these subwatersheds, see the State of Water Resources Report (UGRRW Partnership, 2018). See the subwatershed boundaries below (Figure 1-2).

Figure 1-2
Subwatersheds of the Upper Grande Ronde River Watershed

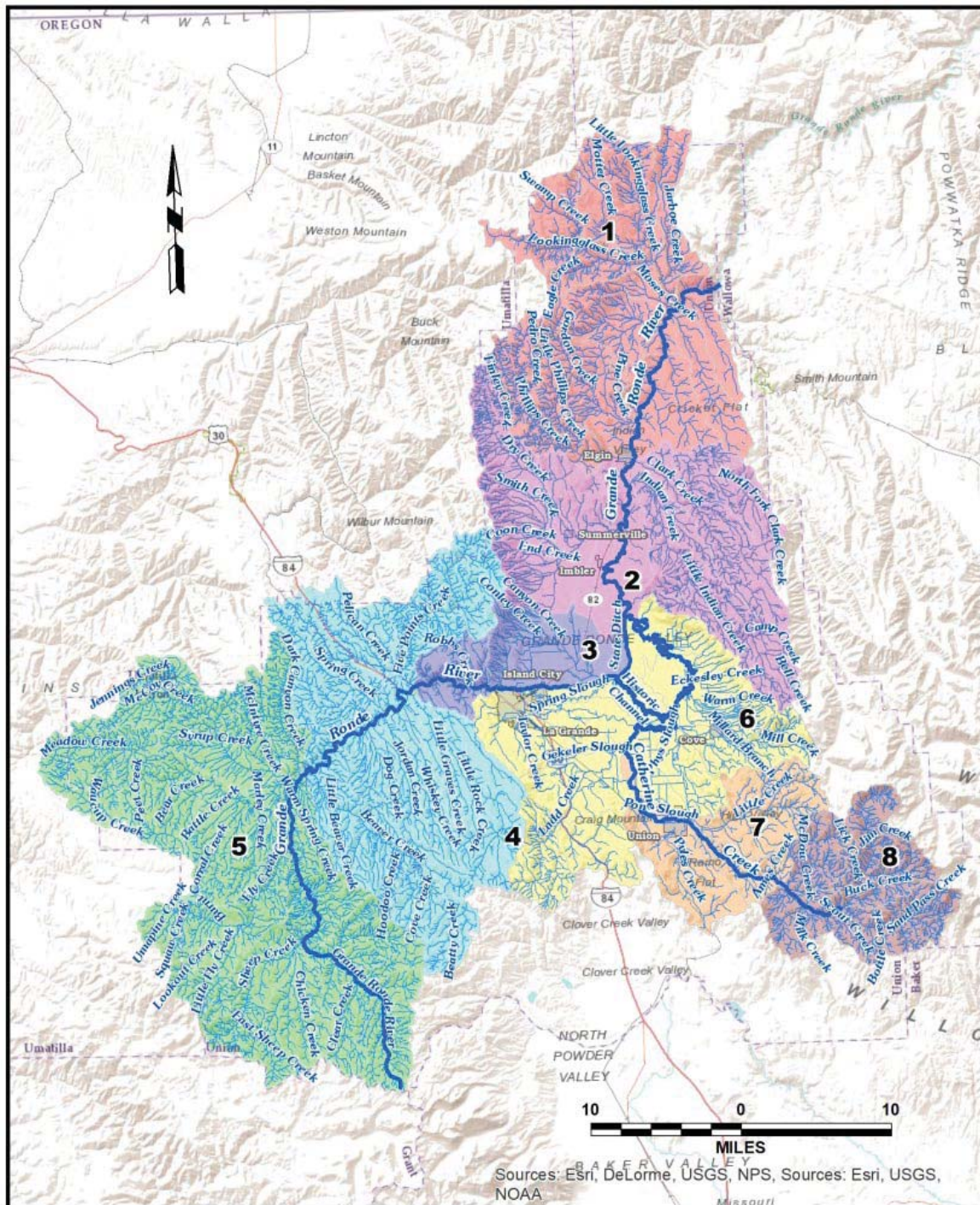


Table 7-1
Annual Water Balance (Current Demand)

Subwatershed	Name	Surface Water Quantity (Natural Stream Flow) (from Step 2 Report) AF per Year (50th Percentile)	Groundwater Used (from Step 2 Report) AF per Year	Agricultural Demand Surface Water (AF per Year) (Water Rights Only)	Agricultural Demand Groundwater (AF per Year) (Water Rights Only)	Agricultural Demand Surface Water (AF per Year) (ET Estimate)	Agricultural Demand Groundwater (AF per Year) (ET Estimate)	Municipal Demand Surface Water (AF per Year)	Municipal Demand Groundwater (AF per Year)	Instream Demand (AF per Year) (Water Rights Only)	Surface Water Balance (ag ET)	Groundwater Balance (ag ET)
1	Lookingglass Creek/Cabin Creek	644,600	-	3,470	230	3,410	220	383	810	173,750	467,440	(1,030)
2	Willow Creek/Indian Creek	523,380	29,400	51,890	14,440	46,630	12,980	-	810	141,820	334,930	15,620
3	Lower Five Points Creek	234,120	25,720	23,780	23,490	20,770	20,520	1,393	500	85,610	127,740	4,700
4	Beaver Creek, Upper Five Points Creek	219,830	1,960	750	2,040	710	1,932	170	160	85,610	133,510	(120)
5	Meadow Creek Upper Grande Ronde River	127,840	190	520	-	510	-	-	50	46,840	80,490	140
6	Ladd Creek Lower Catherine	153,740	71,720	106,330	46,100	96,350	41,774	110	5,500	57,550	(160)	24,450
7	Upper Catherine Creek 1	116,240	9,280	24,030	530	24,870	550	-	370	57,550	33,820	8,360
8	Upper Catherine Creek 2	71,600	-	360	-	470	-	-	10	32,500	38,620	(10)
Total		644,600*	138,270	211,130	86,830	193,730	77,973	2,060	8,190	173,750*	277,130	52,110

*Total natural stream flow and instream demand are expressed as the total from subwatershed 1 (the most upstream section of the watershed) to prevent "double counting."

Table 7-2
Annual Water Balance (Future Demand)

Subwatershed	Name	2068 Temperature Change from Current (°F)	Surface Water Quantity (Natural Stream Flow) (from Step 2 Report) AF per Year	Groundwater Used (from Step 2 Report) AF per Year	Agricultural Demand Surface Water (AF per Year) (Water Rights Only)	Agricultural Demand Ground Water (AF per Year) (Water Rights Only)	Agricultural Demand Surface Water (AF per Year) (ET estimate)	Municipal Demand Surface Water (AF per Year)	Municipal Demand Groundwater (AF per Year)	Instream Demand AF per Year (Water Rights Only)	Surface Water Balance (ag ET)	Groundwater Balance (ag ET)
1	Lookingglass Creek/Cabin Creek	1.6	593,040	-	3,470	230	5,010	60	30	173,750	414,210	(2,090)
2	Willow Creek/Indian Creek	1.6	481,510	29,400	51,890	14,440	68,490	-	860	141,820	271,210	9,490
3	Lower Five Points Creek	1.6	215,390	25,720	23,780	23,490	30,510	5,570	1,240	85,610	93,700	(5,660)
4	Beaver Creek, Upper Five Points Creek	1.6	202,250	1,960	750	2,040	1,050	690	360	85,610	114,910	(1,230)
5	Meadow Creek Upper Grande Ronde River	1.6	117,610	71,720	520	-	750	-	50	46,840	70,020	140
6	Ladd Creek Lower Catherine	1.6	141,440	9,280	106,330	46,100	141,510	460	8,870	57,550	(58,070)	1,490
7	Upper Catherine Creek 1	1.6	106,940	-	24,030	530	36,530	-	390	57,550	12,870	8,080
8	Upper Catherine Creek 2	1.6	65,870	190	360	-	690	-	10	32,500	32,680	(10)
Total		1.6	593,040*	138,270	211,130	86,830	284,530	6,780	11,810	173,570*	126,510	10,200

Table 7-3, below, shows shaded representations of the water balance.

Table 7-3
Shaded Bi-weekly Water Balance

Biweekly surface water balance by subwatershed																								
	Oct		Nov		Dec		Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep	
	1st to 15th	16th to 31st	1st to 15th	16th to 30th	1st to 15th	16th to 31st	1st to 15th	16th to 31st	1st to 15th	16th to 28th	1st to 15th	16th to 31st	1st to 15th	16th to 30th	1st to 15th	16th to 31st	1st to 15th	16th to 30th	1st to 15th	16th to 31st	1st to 15th	16th to 31st	1st to 15th	16th to 30th
Subwater																								
1	-1607	-2059	-1393	-1393	2160	1684	5350	4874	19409	19409	32618	32142	62371	62276	71312	70762	36536	36436	7133	6697	2116	1716	-775	-712
2	-1007	-1029	-528	-528	2357	2010	4948	4601	16323	16323	27087	26740	46949	45651	51850	50243	25695	24336	-215	-19	-2064	-1377	-2134	-1282
3	345	431	-33	-33	1062	923	2504	2365	6960	6960	14425	14226	21029	20475	21306	20260	816	3185	-3345	-3302	-1715	-1314	-772	-392
4	449	395	-111	-111	918	779	2271	2132	6464	6464	13411	13212	19496	19476	20766	20156	2229	5183	-443	-633	262	218	172	185
5	842	-1534	-1110	-1110	658	579	1260	1181	3496	3219	7866	7767	13431	13417	15529	15370	4914	4900	-660	-803	-1547	-2478	-2353	-2343
6	-241	372	478	478	1325	1265	2086	2026	5384	5384	6506	6308	9370	6689	6365	3876	-5498	-6075	-13376	12413	-8240	-6162	-3969	-2208
7	352	466	662	662	855	796	997	938	1320	1320	616	417	1725	1033	8971	8034	5495	7002	-2206	-2076	-1584	-1091	-670	-216
8	-8	-63	-54	-54	184	125	271	212	493	493	1319	308	3138	3125	8103	7954	6516	6502	262	129	-66	-130	-72	-63

2068 biweekly surface water balance by subwatershed

	Oct		Nov		Dec		Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep	
	1st to 15th	16th to 31st	1st to 15th	16th to 30th	1st to 15th	16th to 31st	1st to 15th	16th to 31st	1st to 15th	16th to 28th	1st to 15th	16th to 31st	1st to 15th	16th to 30th	1st to 15th	16th to 31st	1st to 15th	16th to 30th	1st to 15th	16th to 31st	1st to 15th	16th to 31st	1st to 15th	16th to 30th
Subwater																								
1	-1495	-2135	-1557	-1297	4301	1589	299	6076	20796	13882	27399	27911	39997	60417	58938	32329	21715	28686	7883	5032	1389	1906	-1386	39
2	-1322	-1051	-621	-411	4135	1972	886	5617	17489	13872	22889	23264	28016	43262	40190	16280	10655	15326	-1687	-3084	-3937	-2458	-3520	-1298
3	11	250	-249	-154	1641	733	472	2656	7279	4904	11981	12181	10782	19084	15439	3397	-4750	-328	-4340	-4588	-2594	-2046	-1474	-728
4	468	367	-172	-83	1604	743	505	2547	6905	4675	11258	11468	10361	18729	16107	5662	-1550	3207	-327	-948	145	219	53	297
5	867	-1538	-1133	-1082	1092	569	280	1426	3750	2251	6650	6784	8407	13014	12752	6707	2503	3644	-578	-988	-1607	-2467	-2412	-2267
6	-1187	351	436	498	1833	1240	878	2310	5712	4063	5259	5121	2276	4241	-187	-11382	-15670	-13929	-17816	-16628	-11293	-8895	-6141	-3481
7	149	459	631	701	1266	787	241	1127	1438	868	149	-5	-1293	312	5464	-1595	-865	3052	-3153	-3461	-2440	-1751	-1303	-409
8	18	-68	-73	-30	438	120	-194	328	566	214	1032	75	1552	2991	6501	2968	3630	5003	396	1332	-146	-105	-147	43

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