



November 3, 2022

Project No. 2111008

Corum Ketchum, Interim City Manager
City of John Day
450 East Main St
John Day, OR 97845

c/o: Aaron Lieuallen, Senior Project Manager
c/o: Nick Green, Catalyst Public Policy Advisors

RE: WATER REUSE PROJECT CONSUMPTIVE USE ASSESSMENT - SCOPE

Dear Mr. Green:

The City of John Day's (City) Innovation Gateway project includes a major Adaptive Water Reuse element aimed at increasing sustainable water use and improving flow conditions in the John Day River. The Reclaimed Water Distribution Network, or "purple pipe" system, will include more than 2 miles of reuse water distribution to end users along the John Day River valley. End uses will include public reclaimed water filling stations, lumber industry uses, local irrigation, use in the City greenhouses, and various City park applications. The City's stated goals are to convert 100% of all City non-potable water demand to recycled reuse water from the Wastewater Treatment Plant, as well as replacing all lumber mill water use with recycled water.

The environmental benefits of the adaptive water reuse project can be evaluated by determining the percent consumptive use of the proposed water reuse. The current City wastewater facility discharges water to four infiltration ponds along the north banks of the River. Some water is lost from the ponds through evapotranspiration, though most returns to the River after flowing through the alluvial aquifer. Each type of proposed reuse will result in a different degree of consumptive loss. All end uses must be considered together when comparing net return flows to the River to the return flows from the current operation. Some of the proposed end users currently divert water from the John Day River or from shallow wells and sumps in the alluvial aquifer. The transition to reuse water for non-potable applications will reduce summer diversions from the John Day River and pumping from the shallow alluvial aquifer.

In order to assess the net environmental benefits that the Adaptive Water Reuse program may create for the John Day River, CwM proposes a consumptive use assessment. This assessment will focus on comparing the current wastewater infiltration facility to the proposed water reuse system while considering the offsetting effects of the proposed reuse. This assessment consists of three primary tasks:

- Task 1 – Review of Water Reuse Plan
- Task 2 – Assessment of Evaporative Loss from Infiltration Ponds
- Task 3 – Reuse Water Consumptive Use Analysis

Scope of Work

Task 1 – Review of Water Reuse Plan

In Task 1, CwM will review the City’s water reuse plan as presented in the WaterHub Conceptual Design Report (Sustainable Water, 2018). The report outlines the various proposed recycled water end users (lumber industry, irrigation, greenhouses, etc.) and their anticipated current and projected future water demands. The monthly or seasonal breakdown of the types of reuse proposed will factor heavily into the consumptive use assessment.

CwM will meet with City staff to review these water demand values. The report does not include groundwater infiltration as part of the wastewater budget, and CwM understands that the proposed end users may have changed in the four years since the Conceptual Design Report was produced. Using the 2018 water reuse plan as a foundation, CwM will work with the City to update and fine-tune the proposed water reuse breakdown.

Task 2 – Assessment of Evaporative Loss from Infiltration Ponds

Water from the City’s current wastewater treatment plant is discharged into four infiltration ponds constructed in the coarse gravel and sand dredge deposits of the John Day River alluvial aquifer. Infiltrated water flows through the alluvium and discharges as return flow to the River over a diffuse area. The only loss of return flows is through evaporation from the pond surface, and through transpiration of wetland plant communities that have developed in the ponds.

In Task 2, CwM will estimate the percent loss from the ponds through evapotranspiration. CwM will collect past City data on the depth and temperature of the ponds and the discharge rate to the ponds to calculate residence time. Reference values for transpiration from similar wetland types, along with regional climate data, will be used to calculate a loss value for each month of the year.

Based on the monthly evaporative loss values, CwM will calculate a typical return flow curve to use in comparisons with proposed water reuse regimes.

Deliverables: Table and Graphs of Evapotranspiration Loss from Infiltration Ponds

Task 3 – Reuse Water Consumptive Use Analysis

Consumptive loss of various water uses has been measured experimentally in numerous studies. CwM will perform a literature review to determine a range of reliable consumptive use coefficients for each of the proposed water reuse types. These values will then be applied to the monthly or seasonal water use projections determined in Task 1. The result will be an overall consumptive use coefficient for the entire water reuse program for each month or season.

While it is possible that the consumptive loss through the water reuse program may be greater than that of the infiltration ponds, the reuse program will also offset potential diversions from the John Day River system. CwM will assess these replaced diversions and factor them into the consumptive use calculations to determine a net consumptive use.

CwM will summarize the findings of Tasks 2 and 3 in a technical memorandum. The consumptive use estimate data will also be presented graphically in material flow analysis diagrams.

Deliverables: Consumptive Use Assessment Technical Memorandum
Consumptive Use Diagrams

Cost Estimate and Schedule

Please see the attached time and materials cost estimate to provide the above services. CwM estimates that approximately 74 hours of professional time will be required to support the proposed services for an estimated cost of approximately **\$11,660**.

A breakdown of the cost estimate is included as Attachment 1 - Cost Estimate. We anticipate that the proposed tasks can be completed in approximately **6 weeks** of approval of this scope of work and receipt of all necessary water reuse plans and data from the City.

Contract and Work Order Authorization

Accompanying this scope of work, you will find CwM's Work Order Authorization (WOA) for the proposal (Attachment 2). Please sign a copy of the WOA and return it for our records. The work proposed will be completed under our active contract with the City of John Day. Please do not hesitate to call or email me with any questions.

Sincerely,

CwM H2O, L.L.C.



Robert Long, RG, LHG, CWRE
Principal Consultant

Attachments:

- 1) Cost Estimate
- 2) Work Order Authorization

Task	Description	Labor Hours	Labor	Outside Services, Affiliates and Expenses	Total
1	Review of Water Reuse Plan	18	\$3,120	\$0	\$3,120
2	Assessment of Evaporative Loss	18	\$2,720	\$0	\$2,720
3	Consumptive Use Analysis	38	\$5,820	\$0	\$5,820
4					
TOTALS	Project Total	74	\$11,660	\$0	\$11,660

Attachment 2
2111008 – City of John Day Consumptive Use Assessment
John Day, Oregon
Work Order Authorization 001

CwM H2O, LLC

Project Name and Site	Client Reference No.	CwM H2O Project No.
Consumptive Use Assessment	2111	2111008

SCOPE OF SERVICES

The scope of services is outlined in the attached proposal, dated November 3, 2022. This scope includes three tasks intended to review the current Adaptive Water Reuse plan, calculate evaporative losses for the current infiltration ponds, and estimate net return flow based on the proposed water reuse system.

AGREEMENT COST

Time and Materials estimate: \$11,660

SCHEDULE

The project will commence once CwM receives the signed documents.
Estimated time of completion is approximately six weeks, assuming all necessary reports and data are provided by the City.

The work covered by this Work Order Authorization shall be performed under the terms and conditions of our active contract with the City of John Day. Please endorse the signature page of this document and return to CwM-H2O, LLC. Thank you.

Nich Green, City Manager
City of John Day

By:
Authorized Representative

Its:

Date: _____

CwM-H2O, LLC



By:
Authorized Representative
Robert E. Long Jr.

Its: Member Manager

Date: November 3, 2022