This Groundwater Technical Review and the included analysis help inform the Water Rights Section's review of whether the proposed groundwater use will ensure the preservation of the public welfare, safety and health as described in ORS 537.525 and ORS 537.621. The Water Rights Section also considers other information sources when making its public interest determination, including watermaster input, any comments received, input from other agencies, other Commission rules not evaluated as part of the Groundwater Review, and other information.

PUBLIC INTEREST TECHNICAL REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date: 5/1/2026

FROM: Groundwater Section Joe Kemper
Reviewer's Name

SUBJECT: Application LL- _ 2023 _ Supersedes review of NA

Date Reviewed by GW Lead and Returned to WRSD: Travis Brown, 6/11/2026

PUBLIC INTEREST PRESUMPTION: GROUNDWATER

OAR 690-310-0130 (1): The Department shall presume that a proposed groundwater use will ensure the preservation of the public welfare, safety and health as described in ORS 537.525 if
(a) The proposed use is allowed in the applicable basin program established pursuant to ORS 536.300 and 536.340 or given a preference under ORS 536.310(12);
(b) Water is available;
(c) The proposed use will not injure other water rights; and
(d) The proposed use complies with the rules of the Commission.

Department staff review groundwater applications under OAR 690-310-0140 to determine whether the presumption is established and may modify or condition the proposed use to meet the presumption criteria.

This review is based upon available information and agency policies in place at the time of evaluation.

A. GENERAL INFORMATION:

A1. Application

Applicant's Name: Knife River Corporation Northwest County: Crook

Applicant(s) seek(s) 1.11 cfs from 1 well(s) in the Deschutes Basin, Lower Crooked subbasin

Proposed use Industrial & Commercial (Dust Control + General Clean Up (239 AF/yr) Seasonality: Year Round

Application _LL_–___2023 __ Date: 5/1/2026

A2. Well and aquifer data:

A2 a: Well identifiers, aquifer, rate, and location

POA Well	Well Log ID	Applicant's Well #	Proposed Aquifer	Proposed Rate (cfs)	Location (T/R-S QQ-Q)	Latitude	Longitude
1	CROO 55470	1 (L149465)	Quaternary-Late Tertiary sediment Aq	1.114	14S/15E-14 SE-SW	44.35212	-120.90014
2							
3							
4							

A2 b: Well construction information by depth below land surface. All units in feet.

POA Well	Seal		Casing		Filter Pack		Open / Perforation / Screen		Well Bottom
	Min	Max	Min	Max	Min	Max	Min	Max	
1	0	112	0	257	0	294	257	287	294
2									
3									
4									

A2 c: Well construction information by elevation above mean sea level. All units in feet.

POA Well	Land Surface Elevation	Seal		Casing		Filter Pack		Open / Perforation / Screen		Well Bottom
		Min	Max	Min	Max	Min	Max	Min	Max	
1	2907.15	2907.15	2795.15	2907.15	2650.15	2907.15	2613.15	2650.15	2620.15	2613.15
2										
3										
4										

A2 d: Information relevant to water levels, including land surface elevation, depth of first water, recent annual high level, and reference levels for permit conditions

POA Well	Depth of First Water from Well Log (ft bls)	Shallowest Static Water Level (ft bls)	Most Recent Annual High WL		Reference Levels for:				Well Tests			
					RSGL	Permit Conditions			(max yield on well log)			
			Depth (ft bls)	WL Date	Depth (ft bls)	Depth (ft bls)	Date	Pro-visional?	Yield (gpm)	Draw-down (ft)	Test Type	Duration (hours)
1	30	7	NA	NA	NA	NA	NA	NA	150	NA	Air	1
2												
3												
4												

Use data from application for proposed wells.
"SWL" = static water level (most recent or representative SWL). "amsl" = above mean sea level. "bls" = below land surface

Comments: There is insufficient data to set a reference level at this time.

A3. Description of hydrogeologic setting / conceptual model: The applicant's well is located northwest of Prineville, on terrace deposits on the north side of the Crooked River. At this location, there is an unconfined aquifer hosted within 10-50 feet of younger Quaternary-aged sands and gravels, 150-250 feet of fine-grained fluviolacustrine sediments, then a confined aquifer within 10-30 feet of coarse-grained sediments, which is likely underlain by weathered volcanics (typically referred to as claystone by drillers) of the John Day Formation (Robinson and Price, 1963). Most domestic wells in the area access the shallow, unconfined aquifer. Many other wells, including several City of Prineville wells, are constructed to produce water from the confined alluvial aquifer at 150-250 feet BLS. Most of the logs for these wells (e.g. CROO 3177, CROO 50140, CROO 53661) report little to no additional water produced from the underlying claystone. Low yields from this claystone are noted in Robinson and Price (1963) as well.

The applicant's well was originally drilled in January 2024 to a depth of 272 ft BLS and constructed to produce water specifically from the confined aquifer hosted within the confined alluvium at depth. In June 2024, the well was deepened to 291 feet BLS, amended with a cement plug from 247-250 feet BLS, and screened from 257-287 feet BLS. The drillers logs identify gravels and sand from 209-248 feet BLS, fractured claystone from 248-272 feet BLS, and water-bearing claystone from 272-291 feet BLS. The amended construction of the deepening log appears to focus groundwater production on the 40 feet of fractured or water-bearing claystone that immediately underlies the sand and gravel aquifer. However, if the fractured or water-bearing claystone is sufficiently permeable to provide water to a well and is immediately adjacent to a laterally extensive, permeable aquifer, those distinct lithologies would function as a single water-bearing unit. The 3 feet of concrete placed within the annular space from 247-250 feet is not likely sufficient to hydraulically isolate the applicant's well from the sand and gravel aquifer. The deepening log did not document a change in water level from pre- to post-alteration. From a longer-distance perspective, the laterally extensive sand and gravel aquifer is more likely to host long flowpaths from its recharge source than the lower-yielding fractured claystone. In summary, the applicant's well appears to produce water directly from the fractured upper extent of the John Day Fm but the ultimate source of groundwater is likely the immediately adjacent sand and gravel aquifer. A cross section below illustrates this finding.

B. BASIN PROGRAM:

OAR 690-310-0130 (1)(a)

B1. ☒ **Provisions of the** Deschutes (OAR 690-505) Basin rules relative to the development, classification and/or management of groundwater hydraulically connected to surface water ☒ **are**, *or* ☐ **are not**, activated by this application. (Not all basin rules contain such provisions.)
Comments: Impacts to surface water are addressed by Deschutes Basin rules as defined in OAR 690-505.

B2. ☐ **Well(s) #** _____ , ____ , _____ , _____ , _____ , are limited by an administrative restriction under the applicable basin program.
Comments: _____

C. WATER AVAILABILITY:

OAR 690-310-0130 (1)(b)

OAR 690-300-0010(57): "Water is Available" […] means: […]
(d) The proposed groundwater source exhibits Reasonably Stable Groundwater Levels, as defined in OAR 690-008-0001; and
(e) The total requested rate of groundwater allocation is obtainable by the expected yield of the well(s) proposed in the application given best available information; and
(f) The proposed groundwater use does not have the Potential for Substantial Interference (OAR 690-009-0020(5)) with a surface water source [that does not have water available]

C1. Reasonably Stable Groundwater Levels

OAR 690-008-0001 (9): "Reasonably Stable Groundwater Levels" means that Annual High Water Levels, based on observed trends over time, remain within a range consistent with sustaining the function and character of a groundwater reservoir indefinitely, and:
(a) The Annual High Water Levels as measured at one or more representative wells in a groundwater reservoir or part thereof:
(A) indicate no decline or an average rate of decline of less than 0.6 feet per year over any immediately preceding averaging period with duration between 5 and 20 years. Four Annual High Water Levels are required to calculate the rate of change; one must have been measured in the year to which the evaluation of reasonably stable applies, and at least one must have been measured between 5 and 20 years prior; and
(B) have not declined by more than 25 feet from a reference level to the level in the year to which the evaluation of reasonably stable applies. The reference level shall be the highest known water level unless Annual High Water Levels have been measurably increased by human activity, in which case the Department may set a different reference level using best available information.
(b) If water level data are insufficient to perform either test in (a) for a given year, then the Department will presume that groundwater levels are not reasonably stable unless:
(A) the most recent evaluation of reasonably stable applies to a year within 5 years of the given year, in which case the Department may presume that the recent evaluation still applies; or
(B) groundwater has not yet been extracted or authorized for extraction from the groundwater reservoir, in which case the Department may presume that groundwater levels are reasonably stable.
(c) The Department may evaluate Reasonably Stable Groundwater Levels for the year of the priority date of a groundwater right application or for a later year if more recent data are available.

C1a. If part (a) of 690-008-0001(9) has been superseded by a basin program rule as per 690-008-0001(9)(B)(d) proceed to C1c. List one or more representative wells in the proposed groundwater reservoir or part thereof that have sufficient data to evaluate part (a) of 690-008-0001(9). Both the Rate (OAR 690-008-0001(9)(a)(A)) and Magnitude (OAR 690-008-0001(9)(a)(B)) tests for a given well must be passed in order to find that the water levels are Reasonably Stable. It is not necessary to include all POAs proposed on this application into this table, as long as they all access the same part of the groundwater reservoir and have the same reasonable stability status indicated in C1b below. If some POAs are found to be reasonably stable while others are not, then all the POAs on the application should be included in the table below, with their POA number indicated in the second column. In that situation, the reviewer does not need to indicate in this table which wells are considered representative for determining reasonable stability status for different POAs, but they should describe those relationships in the comments below.

Well Log ID	POA Well #	Reference Level for Evaluation of Reasonable Stability (ft bls)	Rate Test	Magnitude Test	Water Levels Reasonably Stable
CROO 51607	N/A	3.94	Fail	Fail	Declined or Declining
CROO 1453	N/A	9	Fail	Fail	Declined or Declining
CROO 1521	N/A	30.9	Pass	Pass	Reasonably Stable
CROO 2133	N/A	6	Pass	Fail	Declined or Declining

Comments: See hydrographs below.

C1b. Summary finding for this application. Check only one primary finding. It is possible that different proposed POAs could access different parts of the GW reservoir, and for some of those parts to be Reasonably Stable while others are not. In that case, summary finding for the application should be "Not Reasonably Stable," and the reviewer should indicate which POAs access part(s) of the groundwater reservoir that are Reasonably Stable. OAR 690-008-0001(9)(a): *Annual High Water Levels as measured at one or more representative wells in a groundwater reservoir or part thereof*:

☐ **Are Reasonably Stable**

☐ Groundwater has not yet been extracted or authorized for extraction from the groundwater reservoir

☒ **Are Not Reasonably Stable**

☐ If some Proposed POAs are Reasonably Stable, list the Reasonably Stable POAs here: _____

☐ **Sufficient data are not available to evaluate reasonable stability**

List representative wells identified during review that could be measured in order to overcome a finding of Insufficient Data: _____

Comments: Wells in the target aquifer near Prineville (e.g., CROO 54871, CROO 1453) and McKay Creek (CROO 51607) are not reasonably stable. The older record from CROO 955 (0.7 miles away) suggests that the target aquifer exhibits a similar pattern to the McKay Creek and Prineville wells. CROO 1521 accesses the target aquifer and shows a stable trend; however, the preponderance of evidence indicates that the target aquifer does not have reasonably stable water levels. Additional time-series water-level data from the applicant's well or nearby wells could modify this finding.

C1c. OAR 690-008-0001(d): Evaluation for reasonably stable water levels per superseding basin program rules OAR 690-_____ for the _____ administrative basin.

Comments: _____

C2. Well Yield

C2a. OAR 690-300-0010(57)(e): Is the total requested rate of groundwater allocation obtainable by the expected yield of the well(s) proposed in the application given best available information?

☒ **Yes** ☐ **No**

Comments: _____

C3. Groundwater Interference with Surface Water

OAR 690-300-0010(57): "Water is Available", when used in OAR 690-310-0080, 690-310-0010 and 690-310-0130, means […]:
(f) The proposed groundwater use does not have the Potential for Substantial Interference (OAR 690-009-0020(5)) with a surface water source [that is not available for further appropriation]

OAR 690-009-0040: (1) When evaluating a Proposed Groundwater Use, Hydraulic Connection and the Potential for Substantial Interference with a surface water source shall be determined by the Department according to these rules. These determinations shall be based upon the application of generally accepted hydrogeologic principles using best available information concerning the hydrologic system of interest and the well(s) under consideration.

(a) Appropriate information that is provided in the application or in the public comment period for the application shall be considered in the process of making these determinations.

(b) Best available information may include, but is not limited to, pertinent water well reports, aquifer test analyses, hydrologic and geologic studies and reports, groundwater and surface water elevation data, available numerical and analytical groundwater flow models, and any other information that is used in applying generally accepted hydrogeologic principals and methodologies.

(2) A determination of Hydraulic Connection is a prerequisite for a determination of the Potential for Substantial Interference.
(3) A determination of the Potential for Substantial Interference with a surface water source shall at a minimum include application of the generally accepted hydrogeological principles described in "Streamflow Depletion by Wells – Understanding and Managing the Effects of Groundwater Pumping on Streamflow" by P. M. Barlow and S. A. Leake, 2012.
(4) The Potential for Substantial Interference with a surface water source exists if the well(s) under consideration will, over the full term of the proposed or authorized groundwater use, obtain water from Streamflow Depletion.

OAR 690-009-0020(4): "Hydraulic Connection" means saturated conditions exist allowing water to move between two or more sources of water, either between groundwater and surface water or between groundwater sources.

OAR 690-009-0020 (7) "Streamflow Depletion" means a reduction in the flow of a surface water source due to pumping a hydraulically connected groundwater source. Streamflow Depletion encompasses:

(a) captured groundwater that would otherwise discharge to a surface water source; or
(b) induced infiltration from a surface water source to the hydraulically connected groundwater source.

C3a. OAR 690-009-0020(5): *Potential for Substantial Interference", or "PSI", means that a groundwater use will cause streamflow depletion based on the assessments described in OAR 690-009-0040, and therefore may cause or has caused substantial interference with or undue interference with a surface water source, based on the definitions in OAR 690-008-0001.*

Summary of surface water sources evaluated for hydraulic connection and Potential for Substantial Interference. For hydraulic connection and potential for substantial interference, a value of 1 means yes, and blank means no.

POA Well	WRD Streamcode	Streamcode Surface Water Name	Water Availability Basin (WAB)	WAB Watershed ID	Hydraulically Connected	Potential for Substantial Interference
1	0519801170	Crooked River	CROOKED R > DESCHUTES R - AB DRY R	30530507	1	1

Comments: _____

List all surface water sources identified to have PSI and their associated Water Availability Basin:

WRD Streamcode	Streamcode Surface Water Name	Water Availability Basin (WAB)	WAB Watershed ID
0519801170	Crooked River	CROOKED R > DESCHUTES R - AB DRY R	30530507

Comments: Impacts to surface water are addressed by the Deschutes Mitigation Program as defined in basin program rules (OAR 690-505). The proposed use will have a localized impact in the Crooked River ZOI.

D. INJURY:

OAR 690-310-0130 (1): The Department shall presume that a proposed groundwater use will ensure the preservation of the public welfare, safety and health as described in ORS 537.525 if…(c) The proposed use will not injure other water rights.

To make a finding of injury to an existing water right, the Department must make a finding of "Substantial Interference" as defined in OAR 690-008-0001(10). The finding of "Substantial Interference" with a surface water right is made by the Water Rights Services Division based on the evaluation in section C3. Sections D1 and D2, below, address the finding of "Substantial Interference" with a groundwater right.

OAR 690-008-0001(10): "Substantial or Undue interference", means the spreading of the cone of depression of a well to intersect a surface water source or another well, or the reduction of the groundwater levels as a result of pumping or otherwise extracting groundwater from an aquifer, which contributes to:

(b)The groundwater level being drawn down to the Economic Pumping Level of the senior appropriator(s); or

(c) One or more of the senior groundwater appropriators being unable to obtain either the permitted or customary quantity of groundwater, whichever is less, from a reasonably efficient well that fully penetrates the aquifer where the aquifer is relatively uniformly permeable. However, in aquifers where flow is predominantly through fractures, full penetration may not be required as a condition of substantial or undue interference.

D1a. OAR 690-008-0001(10): Will the proposed groundwater use result in substantial or undue interference with an existing groundwater user?

☐ **Yes** ☐ **No** ☒ **No, as long as the permit is conditioned as indicated in item F below.**

Comments: Seasonal groundwater fluctuations caused by pumping observed in adjacent observation wells indicate that the aquifer maintains sufficient saturated thickness to provide adequate water to adjacent groundwater users.

E. OTHER RULES OF THE COMMISSION:

OAR 690-310-0130 (1): The Department shall presume that a proposed groundwater use will ensure the preservation of the public welfare, safety and health as described in ORS 537.525 if…(d) The proposed use complies with the rules of the Commission.

E1. OAR 690-200, 690-210 and 690-215: Well Construction

Identify any notable well construction deficiencies or hydrogeologic considerations to support review by Well Construction & Compliance.

E1a. Well #: _____ Logid: _____

E1b. Well construction deficiency or other comment is described as follows: _____

E2. OAR 690-310-0260: Water Rights Within or Above State Scenic Waterways

E2a. **Scenic Waterway Interference & General/Local Surface Water Evaluation for Deschutes Ground Water Study Area**

The source of appropriation is within or above the Deschutes Scenic Waterway

Use the Scenic Waterway condition (Condition 7J).

PREPONDERANCE OF EVIDENCE FINDING UNDER ORS 390.835:

Department has found that there is a preponderance of evidence that the proposed use of groundwater will measurably reduce the surface water flows necessary to maintain the free-flowing character of the **Deschutes** Scenic Waterway in quantities necessary for recreation, fish and wildlife.

E2b. **Localized Impact Finding**

☒ The proposed use of groundwater will have a localized impact to surface water in the Crooked River/Creek Subbasin.

If the localized impact box above is checked, then the water use under any right issued pursuant to this application is presumed to have a localized impact on surface water within the identified subbasin. Mitigation of the impact, originating from within the Local Zone of Impact identified by the Department, will be required before a permit may be issued for the proposed use.

If the localized impact box above is not checked, then the water use under any right issued pursuant to this application is presumed to have a general (regional) impact on surface water. Mitigation of the impact, originating anywhere within the Deschutes Basin above the Madras gage, will be required before a permit may be issued for the proposed use.

E3. Other Relevant Rules of the Commission:

Comments: _____

F. RECOMMENDED MODIFICATIONS OR CONDITIONS:

OAR 690-310-0140(2): If the Department determines that the presumption is not established, the Department shall determine whether the proposed use will impair or adversely affect the public welfare, safety and health under ORS 537.525 and may either:
(a) Propose denial of the application upon a finding that the use will impair or adversely affect the public welfare, safety and health; or
(b) Make specific findings to demonstrate that even though the presumption is not established, the proposed use will not impair or adversely affect the public welfare, safety and health and propose approval of the application with appropriate modifications or conditions.

Based on the findings in sections A-D above, the following conditions are recommended if the permit is approved:

Large Water-Use Reporting. 7RLN.

REFERENCES:

Gannett, M. W., Lite Jr, K. E., Morgan, D. S., and Collins, C. A., 2001, Ground-Water Hydrology of the Upper Deschutes Basin, Oregon, USGS Water-Resources Investigations Report 00-4162, 74 p., https://pubs.usgs.gov/wri/wri004162/pdf/WRIR004162.pdf

Groundwater Information System (GWIS). Oregon Water Resources Department. https://apps.wrd.state.or.us/apps/gw/gw_info/gw_info_report/gw_search.aspx Accessed 4/30/2026

Lite, K. E. and Gannett, M. W., 2002, Geologic Framework of the Regional Ground-Water Flow System in the Upper Deschutes Basin, Oregon. USGS Water-Resources Investigation Report 02-4015, 44 p., https://pubs.er.usgs.gov/publication/wri024015

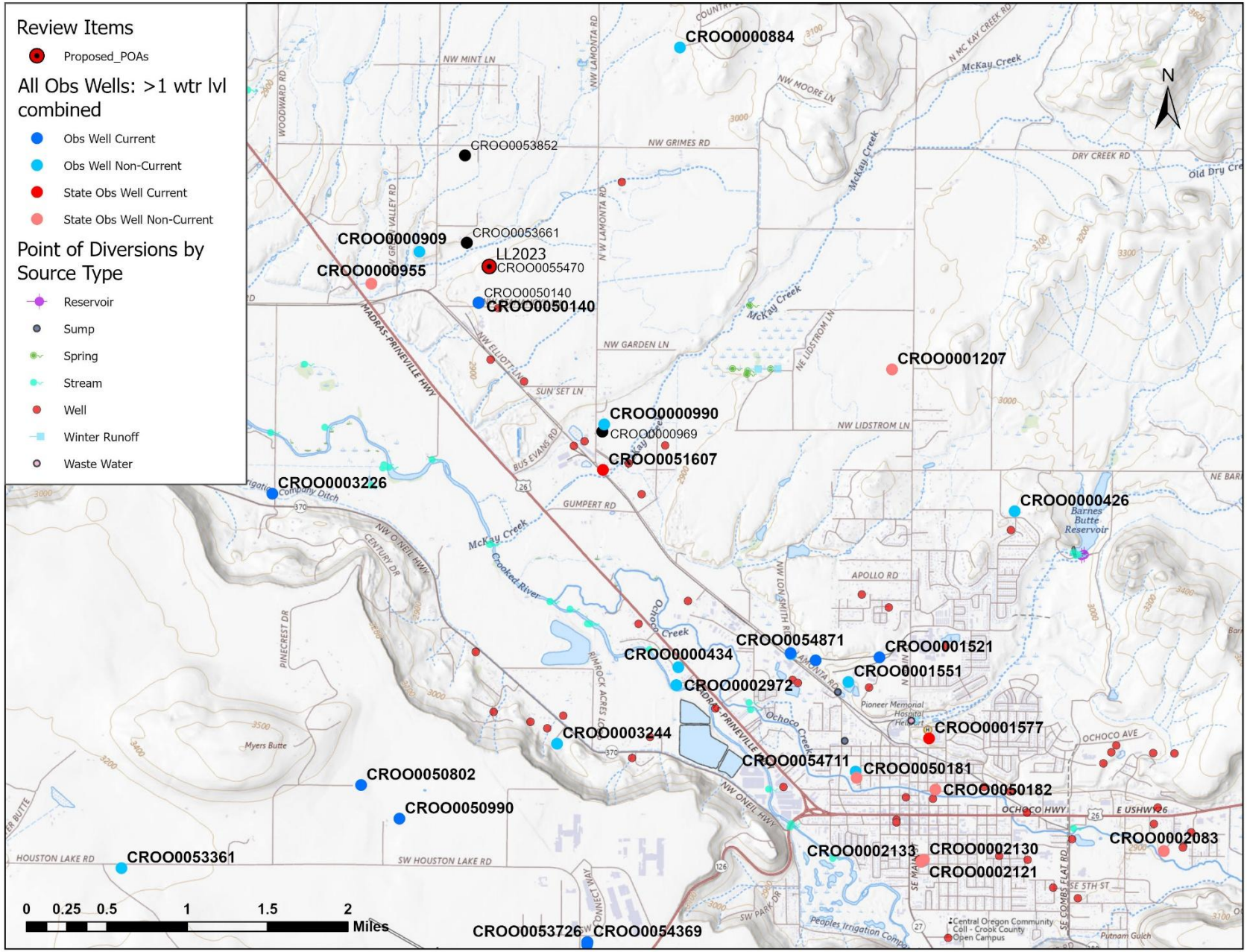
McClaughry, J. D., et al. Geologic Map of the North Half of the Lower Crooked River Basin, Crook, Deschutes, Jefferson, and Wheeler Counties, Oregon, scale 1:63,360, 64" x 60". DOGAMI Bulletin 108

Robinson, J. W., and Don Price. 1964. Ground Water in the Prineville Area, Crook County, Oregon. USGS Water Supply Paper, https://doi.org/10.3133/wsp1619P.

Sherrod, D. R., Taylor, E. M., Ferns, M. L., Scott, W. E., Conrey, R. M. and Smith, G. A., 2004, Geologic Map of the Bend 30-x-60-Minute Quadrangle, Central Oregon. U. S. Geological Survey Geologic Investigations Series Map I-2683. 49p., https://pubs.usgs.gov/imap/i2683/

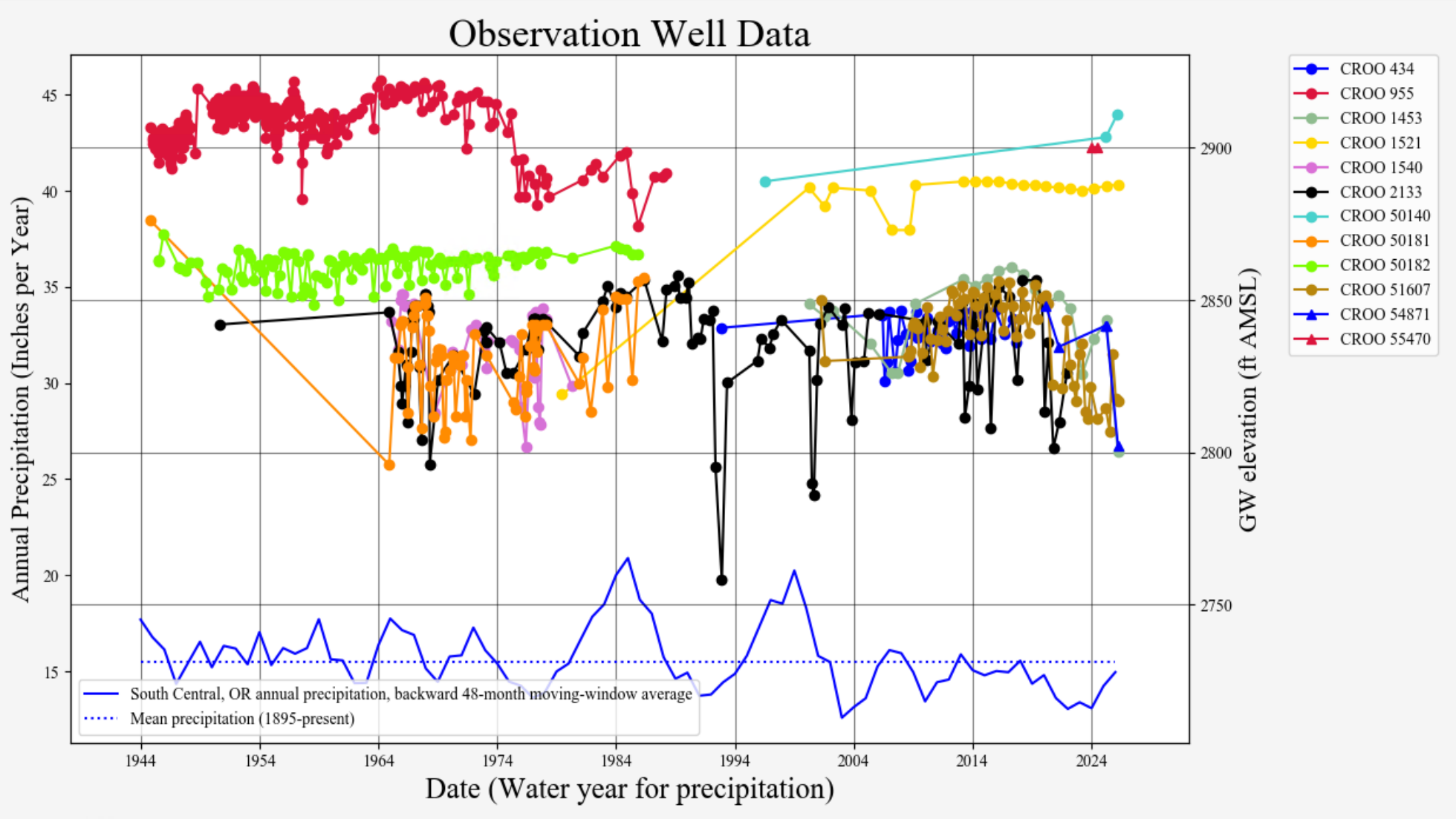
ATTACHMENTS:

Well Location Map

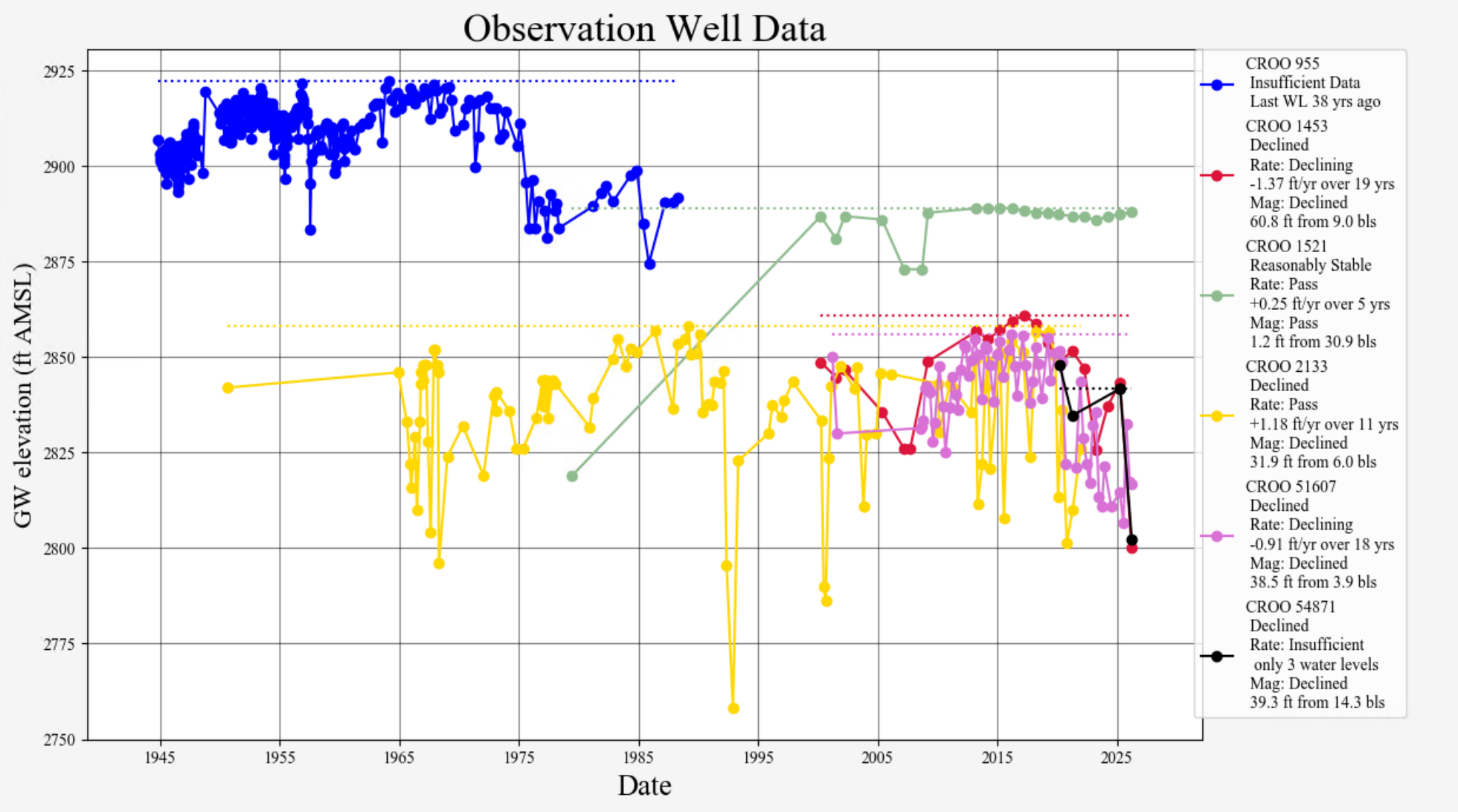


Water-Level Measurements in Nearby Wells

Hydrograph 1. Water Levels in Confined Alluvial Aquifer From 1945 to present. Most long-term observation wells show seasonal fluctuations of 5-20 feet with year-on-year changes that reflect longer-term recharge and pumping. Wells with this pattern near Prineville (3-4 mi away) and McKay Creek (1.2 mi away) water have levels between 2800-2850 ft amsl that are not Reasonably Stable. The applicant's well (CROO 55470) and adjacent wells (CROO 955 and CROO 50140) have higher water levels (~2900 ft amsl), which corresponds to the water level contours from Robinson and Price (1963). CROO 955 has a water level record from 1945 to 1990 with similar seasonal and annual fluctuations to wells near McKay Creek and Prineville.



Hydrograph 2. Reasonably Stable Groundwater Level findings for Representative Wells



Cross Section of Adjacent Wells. Cross section of the applicant's well (CROO 55470) and adjacent wells that access the confined alluvial aquifer. CROO 55470 penetrates 40 feet of fractured claystone (assumed John Day Fm) which is in direct contact with the confined alluvial aquifer. If this 40 feet of fractured claystone is permeable and immediately adjacent to the confined alluvium, then it would act as a single aquifer. The 3-foot bentonite plug inside the applicant's well is unlikely to hydraulically isolate it from the confined alluvium. The confined alluvium is likely the primary recharge pathway for any fractured zone in the underlying claystone. Logs for wells in the area deeper than 400 feet do show WBZs at depth with distinct hydraulic conditions (e.g. CROO 969).