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Oregon DEQ Division 33 Limited License Review  
Summary Sheet

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Application Information

Applicant Name:	Knife River Corporation	Application Number:	LL-2023
Basin & Sub-basin:	Deschutes / Crooked	Requested Water Amount:	500 gpm further limited to 239 AF/year
Nearest Surface Water:	McKay Creek and Crooked River	Nearest Receiving Waterbody:	Crooked River
Proposed Use:	Industrial: Dust Control and General Cleanup	Requested Period of Use:	June 16 2026 – June 15 2031

Division 33 Geographic Area

<input checked="" type="checkbox"/> Statewide	
<p>Statewide: Will the proposed use result in water quality impacts that will cause either "loss" or "net loss" of essential habitat of sensitive threatened or endangered (ST&amp;E) fish species? (Note: the presence of ST&amp;E fish species is determined by Oregon Department of Fish and Wildlife.)</p>	<p><input type="checkbox"/> No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> Insufficient data</p>

Recommended License Conditions

<p>1. <b>Water Quality:</b> All water use under this license shall comply with state and federal water quality laws. The licensee shall not violate any state and federal water quality standards, shall not cause pollution of any waters of the state, and shall not place or cause to be placed any wastes in a location where such wastes are likely to escape or be carried into the waters of the state by any means. The use may be restricted if the quality of source stream or downstream waters decrease to the point that those waters no longer meet existing state or federal water quality standards. Licensee is responsible for obtaining any necessary state and federal licenses.</p>
<p>2. <b>Flow Restrictor:</b> The licensee shall install a flow control valve on the diversion system to limit use to the licensed rate. The valve shall be in place, functional, and verified by the Certified Water Rights Examiner before a certificate is issued. The valve or a suitable replacement shall remain in place for the life of the water right.</p>
<p>3. <b>Limit Period of Use:</b> Water use shall be limited to the period: <b>Use not allowable</b></p>
<p>4. <b>Construction Activities:</b> 1200-C NPDES Stormwater Construction license coverage is required from DEQ or Agent for construction activities (clearing, grading, excavation, grubbing, stumping, demolition, staging, stockpiling and other land disturbing activities) that will disturb one or more acres, or that will disturb less than one acre of land but is part of a common plan of development or sale that will ultimately disturb one or more acres of land and have the potential to discharge to surface waters or to a conveyance system that leads to surface waters of the state.</p>
<p>5. <b>Off-Channel Stored Water Releases:</b> The permittee shall not release polluted water from this off-channel reservoir into waters of the state except when the release is directed by the State Engineer to prevent dam failure.</p>
<p>6. <b>Water Storage Construction:</b> The applicant shall locate the reservoir outside of the stream's natural channel. Reservoir Name will be constructed and located outside of the natural channel of Waterway Name, with a setback of at least 50 feet. The outlet pipe will be located so that any flow passed through the pond will come from the bottom strata of water, reducing potential thermal loading from releases. The storage reservoir will be located outside of the mapped 100-year floodway.</p>
<p>Mitigation Obligation <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes</p>
<p>As proposed, this use would be detrimental to STE species, impair water quality, and not comply with State and Federal water quality rules. However, if ODFW has recommended mitigation for the proposed use, DEQ would consider mitigation as well. Otherwise, DEQ recommends the proposed use not be allowed. The applicant should</p>

contact their OWRD caseworker to discuss the Mitigation Obligation, flow mitigation options, and development of a Mitigation Proposal if they choose to proceed. Because flow mitigation is site-specific, written approval of the Mitigation Proposal by DEQ is required prior to issuance of a Proposed Final Order.

**Seasonal Limitations**

Reason for limitation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
WAB: 20% flow threshold exceeded	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Other: Statewide Critical Warm Period	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Additional Reviewer comments**  No  Yes

[Use this space to describe any of the following: reasoning to substantiate license conditions; examples of additional information that may allow or disallow the use; and why any variations to the standard Division 33 review process were necessary. Designate conditions related to Division 310 with an asterisk.]

Project is proposing to pump water from a well and stored in a reservoir and later used for reuse.

The Applicant should not allow any polluted water from general cleanup to return to surface waters of the Crooked River Basin. These waters shall be reused and left to evaporate or recharge as applicable. (690-505-0030(2))

The WAB 20% flow threshold is exceeded year-round. DEQ recommends limiting period of use as: **use not allowable** to limit negative impacts to water quality and to protect instream flow requirements.

The Department has determined that ground water appropriations within the Deschutes Ground Water Study Area have the potential for substantial interference with surface water rights as described in OAR 690, division 9, and will measurably reduce scenic waterway flows as defined in ORS 390.835 unless mitigation is provided pursuant to the rules in this division. (690-505-0600(1))

**Interagency consultation: [Describe any substantial interagency consultation. Who was contacted and what was discussed?]**

DEQ review prepared by: Matthew Bearden

Date complete: 05/21/2026

**Antidegradation Policy:**

The purpose of DEQ’s Antidegradation Policy (OAR 340-041-0004(1)) is to guide decisions that affect water quality to prevent unnecessary further degradation from new or increased point and nonpoint sources of pollution, and to protect, maintain, and enhance existing surface water quality to ensure the full protection of all existing beneficial uses. Oregon’s Antidegradation Policy allows exemptions and conditions for new or increased water use.

**1. Temporary Use or Net Benefit**

Does the applicant propose a temporary use in response to an emergency, a restoration activity that the DEQ has determined provides a net ecological benefit, or a temporary (lasting less than six months) use to protect human health and welfare, for which the applicant has demonstrated that they will minimize adverse effects to threatened and endangered species?  No  Yes

If yes, recommend approval of the application and identify conditions necessary to protect water quality for the habitat of ST&E fish species. You may skip to Question 7.

**2. Outstanding Resource Water**

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Does the applicant propose withdrawing directly from an **Outstanding Resource Water** with critical habitat for ST&E fish species?  No  Yes

If yes, then prior to license issuance, the applicant must provide suitable flow mitigation. You may skip to question 7.

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**3. Water Quality Limited**

Is this source **Water Quality Limited** or a tributary to a water quality limited water body? Note: limit downstream review to 6<sup>th</sup> field HUC for parameters that diminished flow can affect (temperature, dissolved oxygen, pH, etc.).  No  Yes

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**Integrated Report 303(d) List Summary Table**

Assessment Unit Name	Assessment Unit Description	Parameter	Status*	Beneficial Uses
McKay Creek	Lofton Creek to confluence with Crooked River	Temperature – Numeric (year-round)	Category 5	Fish and Aquatic Life
Crooked River	Dry Creek to Lone Pine Creek	Temperature – Numeric (year-round)	Category 5	Fish and Aquatic Life
		Total Dissolved Gas	Category 5	Fish and Aquatic Life
		Phosphorus	Category 5	Fish and Aquatic Life
		pH	Category 5	Fish and Aquatic Life
		BioCriteria	Category 5	Fish and Aquatic Life
		Flow Modification	Category 4C	Fish and Aquatic Life

\*Integrated Report Category

**Category 4** - Data indicate that at least one designated use is not supported, but a TMDL is not needed to address the pollutant

**Category 4A** - Clean-up plans (also called TMDLs) that will result in the waterbody meeting water quality standards and supporting its beneficial uses have been approved

**Category 4B** - Other pollution control requirements are expected to address pollutant of concern and will result in attainment of water quality standards

**Category 4C** - The impairment is caused by pollution, not a pollutant. For example, flow, or lack of flow, are not considered pollutants, but may be affecting the waterbody's beneficial uses

**Category 5** - Data indicate a designated use is not supported or a water quality standard is not attained and a TMDL is needed. This category constitutes the Section 303(d) list that EPA will approve or disapprove under the Clean Water Act

Analysis: [If the answer to question 3 is yes, then describe how the use does or does not comply with existing state and federal water quality standards, and how the use may affect ST&E fish species habitat.]

**Temperature**

Increases in temperature adversely impact sensitive, threatened, and endangered fish. Fish require different temperature based on species and life history stage. Oregon's temperature limits are based on the most sensitive species and the life history stage of those species at the location and season of concern. **McKay Creek and Crooked River** do not meet Oregon's year-round stream temperature standards. Generally, water temperatures increase as flow decreases. Therefore, reducing flow in waterbodies that are connected to downstream temperature-impaired waterbodies, such as **McKay Creek and Crooked River**, could result in higher stream temperatures and stressed conditions for aquatic life, particularly during the summer months when stream flow is lowest. **The critical warm period when stream conditions are most likely to exceed the year-round temperature standards is July 1 – September 30.**

**Total Dissolved Gas**

When water is released from a dam it drags air bubbles into the water below. The air bubbles dissolve and increase the concentration of atmospheric gases in the water. When a waterbody is 100% saturated, the concentration of dissolved gases in the waterbody is in equilibrium with atmospheric pressure. When the

concentration of dissolved gases increases to above 100% the waterbody is supersaturated. At saturation levels exceeding 110%, fish and aquatic life become susceptible to gas bubble disease. Gas bubble disease occurs when the dissolved gases come out of solution inside an organism's blood stream, damaging tissues or causing death. The **Crooked River** is already known to be impaired for total dissolved gas. An increase in the rate or volume of release will increase the total dissolved gas concentration in this waterbody and result in the diminution of water quality for the habitat of sensitive, threatened, or endangered fish species.

#### **Phosphorus/Phosphate**

Phosphorus is an essential plant nutrient, but an excess of phosphorus can be detrimental to aquatic life. High phosphorus concentrations can lead to eutrophication, a situation where aquatic plants grow so rapidly that dissolved oxygen concentrations drop below the levels needed to sustain fish and other aquatic life.

Phosphate (also referred to as orthophosphate) is a chemical form of phosphorus that is very soluble and readily available for plant uptake, leading to rapid growth and, in the case of algae, rapid expansion of algal blooms. **Crooked River** is already known to have an excess of phosphorus. A reduction in streamflow will increase phosphorus concentrations. This would cause longer or more severe instances of oxygen depletion, resulting in a diminution of water quality for the habitat of sensitive, threatened, or endangered fish species.

#### **pH**

pH is a measure of how acidic or basic (alkaline) the water is. Water with a pH greater than 7 is alkaline, water with a pH of less than 7 is acidic. Every species of fish has adapted to a specific range of pH. Fish exposed to changes in pH outside their normal range can be stressed or even die. Stress leaves fish vulnerable to disease, degrading their health. Additionally, alkaline conditions can transform nitrogen in the water column into a more toxic form of ammonia that can poison fish. Withdrawals from the stream will reduce the stream's heat capacity and cause greater fluctuation in daytime and nighttime stream temperatures. When nutrients and sunlight are sufficiently present, higher stream temperatures lead to more algal growth. During the day, algae absorb carbon dioxide from the water for cell growth, raising pH. At night, photosynthesis stops and algae continue to respire, releasing carbon dioxide and lowering pH. This cycle creates diel fluctuations in pH. Additional withdrawals from a stream that is already impaired for pH will lead to larger diel fluctuations in pH. Fish and aquatic insects are sensitive to imbalances in pH. Low pH levels (below 5) may lead to death and high pH levels (9-14) can harm fish by denaturing cellular membranes. These pH imbalances result in the diminution of the habitat of sensitive, threatened, or endangered fish species.

#### **Biological Criteria**

Waters of the State must be of sufficient quality to support aquatic species without detrimental changes in the resident biological communities. Oregon's biological criteria narrative standard is based on EPA guidance recommending using biological community assessments as an indicator for aquatic life beneficial use support. Resident biological communities are the local food webs that support fish and other aquatic life. Reduced flows, habitat loss, and increases in pollutant loads or concentrations may degrade the biological community onsite or downstream, and therefore result in the diminution of habitat for ST&E species.

#### **Flow Modification**

Fish and aquatic life need variable stream flows to trigger life stages and migration events. Some triggers are dependent on a change in flow, some triggers are dependent on a change in temperature. Dams and diversions alter the volume, timing, and temperature of flows. This prevents fish and aquatic life from accessing habitat or changing life stages at the appropriate time. Dams can also increase water clarity which promotes algal growth. Dams and diversions can prevent fish passage, which fragments river systems, isolates previously continuous populations, and prevents the migrations of sensitive, threatened, or endangered fish species.

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Recommended Conditions: [Consider if water quality can be protected by limiting the rate and quantity of water used, period of use, or by including other license conditions.]

Limit Period of Use, Flow Restrictor, Water Storage Construction

4. Total Maximum Daily Load Summary

Are there TMDLs established for parameters identified as being affected by flow modification?  No  Yes

Analysis: [List TMDL, identify the load allocation, and if flow modification is a contributing factor. Describe how the use does or does not comply with existing state and federal water quality standards and how the use may affect ST&E fish species habitat.]

TMDL not yet established for the Deschutes Basin

Recommended Conditions: [Consider if water quality can be protected by limiting the rate and quantity of water used, period of use, or by including other license conditions.]

5. Cumulative Withdrawals Effects

Is it likely that the proposed activity, together with existing withdrawals in the OWRD's Water Availability Basin (WAB), will lower water quality and impair aquatic life?  No  Yes

Water Availability and Cumulative Impacts Summary Table

Percent of natural flow = (consumptive use/natural stream flow)\*100. See Appendix for additional instructions.

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Watershed ID	Exceedance Level	Month	Natural Stream Flow	Consumptive Use	Expected Stream Flow	Reserved Stream Flows	Instream Requirement	Net Water Available	Percent of Flow
30530507	50	JAN	287	121	166	0	75	91.4	42.16028
30530507	50	FEB	607	291	316	0	150	166	47.94069
30530507	50	MAR	1060	568	492	0	255	237	53.58491
30530507	50	APR	1280	565	715	0	255	460	44.14063
30530507	50	MAY	792	284	508	0	255	253	35.85859
30530507	50	JUN	389	328	61.3	0	150	-88.7	84.31877
30530507	50	JUL	112	323	-211	0	75	-286	288.3929
30530507	50	AUG	55.6	321	-266	0	55.8	-321	577.3381
30530507	50	SEP	63.8	281	-217	0	64	-281	440.4389
30530507	50	OCT	75.3	118	-43	0	75	-118	156.7065
30530507	50	NOV	95.5	34.6	60.9	0	75	-14.1	36.23037
30530507	50	DEC	185	79	106	0	75	31	42.7027
30530507	50	ANN	301000	200000	146000	0	94000	74300	66.44518

Monthly flow in Cubic Feet per Second (CFS). Annual flow in Acre Feet (AF). Highlight months that exceed 20% of percent of flow.

6. Flow Modification Compliance with State and Federal Water Quality Standards

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Based on responses to questions 3, 4, and 5, is the use in compliance with state and federal water quality standards or can compliance with state and federal water quality standards be assured, and ST&E habitat loss prevented through flow mitigation and/or by imposing license condition(s)?

No       Yes

Recommended Conditions: [If water quality can be protected by modifying or limiting the amount diverted, period of use, or other license conditions, then select appropriate condition from the conditions list.]

**Limit Period of Use**

**7. Compliance with other State and Federal Water Quality Standards**

ORS 468B.025 prohibits pollution of waters of the state. Are there additional water quality impairments that would result from this proposed use by degrading surface water or groundwater quality?

No       Yes

If water quality can be protected by applying license conditions, then select all appropriate conditions from the standardized menu of conditions.

Recommended conditions: [List conditions]

**Construction Activities, Off-Channel Stored Water Releases**

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DEQ recommends that the applicant provide suitable replacement water as mitigation for anticipated impacts to water quality and more specifically the habitat of sensitive, threatened, and endangered fish species. Additional mitigation may be required from other Interagency Review Team members (for example: OWRD may require mitigation for periods when water is not available). Surface water flow mitigation is unlikely to provide the same benefit that groundwater can provide to gaining stream reaches. However, if groundwater mitigation is unavailable within the same aquifer, surface water mitigation may provide suitable mitigation.

**Flow Mitigation Obligation:**

Prior to issuance of a Proposed Final Order, the applicant shall submit a mitigation proposal that is, of no less volume and rate than the licensed use. The proposal shall include water that is sourced upstream of the point of diversion or appropriation, or the uppermost point on the stream at which the potential for surface water interference occurs. If a surface water right is used for mitigation, it shall be instream for the *month - month time period* and of similar water quality. The applicant should contact their OWRD caseworker to discuss flow mitigation options.

**Riparian:** If the riparian area is disturbed in the process of developing, modifying or repairing a point of diversion under this water use license, the licensee shall be responsible for restoration and enhancement of such riparian area in accordance with the Oregon Department of Fish and Wildlife's Habitat Mitigation Policy described in Oregon Administrative Rule OAR Chapter 635-415. Prior to development, modification or repairs at the point of diversion, the licensee shall submit, to the Oregon Water Resources Department, either a Riparian Mitigation Plan approved in writing by Oregon Department of Fish and Wildlife (ODFW) or a written declaration from ODFW that riparian mitigation is not necessary. The licensee shall maintain the riparian area for the life of the license and subsequent certificate per the approved Riparian Mitigation Plan. The licensee is hereby directed to contact the local Oregon Department of Fish and Wildlife Fish Biologist prior to development of the point of diversion.

**Water Storage Construction:** The applicant shall locate the reservoir outside of the stream's natural channel. *Identify waterbody and set back to prevent stream capture and justification for distance selected.*

(Note to reviewer: The 1200C license requires a 50-foot setback, which is cited from the National General Construction License OAR-660-023-0090(5). Requiring the storage reservoir to be outside of the mapped 100 year floodway may also be a protective buffer. )

**Construction Activities:** 1200-C NPDES Stormwater Construction license coverage is required from DEQ or Agent for construction activities (clearing, grading, excavation, grubbing, stumping, demolition, staging, stockpiling and other land disturbing activities) that will disturb one or more acres, or that will disturb less than one acre of land but is part of a common plan of development or sale that will ultimately disturb one or more acres of land and have the potential to discharge to surface waters or to a conveyance system that leads to surface waters of the state.

**In-Water or Riparian Construction:** For in-water or riparian construction, licensee may be required to obtain additional licenses from the Oregon Department of State Lands, the U.S. Army Corps of Engineers, and the DEQ Section 401 certification program prior to construction. The applicant must contact these agencies to confirm requirements.

**Herbicide Applications:** When herbicide application is within three feet of water, the licensee is responsible for ensuring that herbicide application laws are met, and that they obtain from DEQ any necessary pesticide application licenses, including the 2300-A Pesticide General License or the 2000-J NPDES General License. Polluted return flows are not allowed to enter waters of the state per ORS 468B.025(1).

## STANDARIZED MENU OF CONDITIONS

**Water Quality:** All water use under this license shall comply with state and federal water quality laws. The licensee shall not violate any state and federal water quality standards, shall not cause pollution of any waters of the state, and shall not place or cause to be placed any wastes in a location where such wastes are likely to escape or be carried into the waters of the state by any means. The use may be restricted if the quality of source stream or downstream waters decrease to the point that those waters no longer meet existing state or federal water quality standards. Licensee is responsible for obtaining any necessary state and federal licenses.

**Agricultural Water Quality Management Area Rules:** The licensee shall comply with basin-specific Agricultural Water Quality Management Area Rules described in Oregon Administrative Rule Chapter 603-095. The licensee shall protect riparian areas, including through irrigation practices and the management of any livestock, allowing site capable vegetation to establish and grow along streams, while providing the following functions: shade (on perennial and some intermittent streams), bank stability, and infiltration or filtration of overland runoff.

**Flow Restrictor:** The licensee shall install a flow control valve on the diversion system to limit use to the licensed rate. The valve shall be in place, functional, and verified by the Certified Water Rights Examiner before a certificate is issued. The valve or a suitable replacement shall remain in place for the life of the water right.

**Limit Rate:** Water withdrawal shall be limited to *Enter CFS or AF for the defined period, or a month by month rate or volume.*

**Limit Period of Use:** Water use shall be limited to the period: *start date through end date.*

(Note to reviewer: Do not split the irrigation season. Require mitigation if water is not available during the requested time period.)

**Limit Diversion:** The licensee shall not divert water under this water use license unless streamflow in the *waterbody name* is at or above *CFS* cubic foot per second, as determined at Gaging Station ID .

**Off-Channel Stored Water Releases:** The licensee shall not release polluted water from this off-channel reservoir into waters of the state except when the release is directed by the State Engineer to prevent dam failure.

**On-Channel Reservoir:** The licensee shall design and operate the water storage facility such that all waters within and below the reservoir meet water quality criteria. The licensee shall develop a reservoir operations plan that details how water quality criteria and standards will be met. A Certified Water Rights Examiner shall verify that the reservoir operations are consistent with the plan before a certificate is issued. The reservoir operator shall maintain a copy of the plan and make it available for review upon request.

**Restrict Reservoir Release:** To prevent pollution downstream, the licensee shall not release water from the reservoir when the flow at Gaging Station ID *(gage name)* is below the Mean Daily Discharge of *CFS* (discharge which was equaled or exceeded for 90% percent of the time) except when the release is directed by the State Engineer to prevent dam failure.

**Live Flow:** Once the allocated volume has been stored, licensee shall pass all live flow downstream at a rate equal to inflow, using methods that protect instream water quality.

**Lining:** The licensee shall line the reservoir with *include material or allowable infiltration rate* to minimize seepage and protect groundwater quality per Oregon Administrative Rule 340-040. The liner is to be in place, inspected,

and approved by the Certified Water Rights examiner prior to storage of water.\* If the liner fails, the water user shall replace it within one calendar year.

**Site-Specific Condition:** The licensee shall

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\* OAR 690-410-0010(2)(a), OAR 690-310-0120, OAR 690-310-0140

## Appendix: General Overview, Instructions for Water Availability Analysis, and Process Flow Chart

### General Overview

The purpose of OAR Chapter 690, Division 33 is to aid the Oregon Water Resources Department (OWRD) in determining whether a proposed use will impair or be detrimental to the public interest with regard to listed sensitive, threatened, or endangered (ST&E) fish species. Oregon's stream temperature, dissolved oxygen (DO), pH and several other water quality standards are based on the life cycle needs of salmonids and other resident fish and aquatic life. Exceeding the standards can disrupt the life cycle of a ST&E fish species and may cause death. In addition, OWRD must consider water quality impacts as part of a public interest review, OAR 690-310-0120. Water quality impacts and conditions unrelated to ST&E species should be noted as "Division 310" in the recommendations to OWRD. The DEQ's Water Right Application Review Procedures document contains a full description of the review process.

The two main categories of Division 33 reviews are based on the geographic distribution of ST&E fish species:

- **For Proposed Uses in the Columbia River Basin**, reviews must determine whether a proposed use complies with existing state and federal water quality standards. Upper Columbia applications specifically require applicants to provide evidence that the proposed use complies with existing state and federal water quality standards. Geographic scope: Columbia River Basin (includes all waters that ultimately drain into the Columbia River).
- **For Proposed Uses Statewide**, review is conducted under the "Statewide review" procedure. Statewide reviews must determine whether a proposed use may affect ST&E fish species habitat. The statewide review procedure is intended to identify license conditions that can prevent the "loss" or "net loss" of essential habitat of ST&E fish species. When license conditions cannot be identified that meet this standard, then the DEQ recommends denial of the license. Geographic scope: all areas outside the Columbia River Basin where OWRD determines ST&E fish species are present.

### Instructions for Populating the Water Availability Summary Table using data from OWRD's WAB (Section 5)

- Open OWRD's Water Availability Reporting System.
- Search for the water availability basin of interest. Select 50% exceedance. The 50% exceedance stream flow is the stream flow that occurs at least half of the time.
- The water availability analysis will display a nested list of watersheds that contain the POD. Select the highest nesting order WAB that contains the POD.
- Download to an Excel spreadsheet. Percent of flow is calculated using this equation:

$$\text{Percent of Flow} = \frac{\text{Consumptive Use}}{\text{Natural Stream Flow}} * 100$$

You may choose to add the proposed rate (or storage amount) to the consumptive use.

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**Instructions for Water Availability Analysis**

To complete Section 6, review and consider the cumulative impact of consumptive withdrawals using the **OWRD WAB**. All water withdrawals and the following factors should be considered when conducting a water availability analysis.

- **Instream Flow:** Consider the percent of natural flow removed from the stream in each month (see right-most column in Water Availability and Cumulative Impacts Summary Table). Based on best professional judgment, evaluate if the cumulative withdrawal is likely to cause impairment to aquatic life or water quality. Water quality standards are established to protect aquatic life. In scientific literature, researchers have identified ecological harm occurring when flows are reduced by **>6-35% of daily flow**<sup>1</sup>. Consider the seasonality of any listings and season of withdrawal to determine impact for each month of the year.
- **Antidegradation:** Rule 340-041-0004 applies: withdrawals cannot cumulatively increase a waterbody's temperature by more than 0.5 degrees Fahrenheit or cause a 0.1 mg/l decrease in dissolved oxygen from the upstream end of a stream reach to the downstream end of the reach so long as it has no adverse effects on threatened and endangered species. See OAR **340-041-0004(3)-(5)** for a description in rule of activities that do not result in lowering of water quality.
- **Flow modification:** Consider if cumulative withdrawals are contributing to flow modification and a likely limiting factor in the waterbody at certain times of the year. Temperature and dissolved oxygen are flow-related parameters. When streamflow is reduced, assimilative capacity is reduced. As a waterbody heats up, dissolved oxygen concentrations decline. Reduced stream flows (including groundwater inputs to streamflow), exacerbate temperature and/or dissolved oxygen impairments.
- **Temperature:** Increases in temperature or a reduction in dissolved oxygen adversely impacts ST&E fish. Fish require different temperature and concentrations of dissolved oxygen based on species and life history stage. Oregon's temperature and dissolved oxygen limits are based on the most sensitive species and the life history stage of those species at the location and season of concern. Additional heat or reduction in dissolved oxygen concentrations will further impact these species habitat. Reduced flows can also increase the concentrations of phosphorous, bacteria, pesticides and metals.

**Instructions for Calculating "Limit Diversion" Rate**

This condition is selected to limit withdrawals once the cumulative withdrawals in the watershed have exceeded the protective threshold of 20 percent and/or the ISWR is not fully protective of aquatic life. A different value can be selected, but the reviewer should state why a particular percent was selected.

"Natural stream flow" is obtained from OWRD's Water Availability Reporting System. The condition is applied on a monthly timeframe based on OWRD's data.

"Natural stream flow" – (percent of flow \* "natural stream flow") = Expected Stream Flow

The applicant would have to stop using when instream flows drop below the Expected Stream Flow.

Example:

Natural stream flow for a particular month = 1200 CFS

1200 CFS – (.2 \* 1200 CFS) = 960 CFS

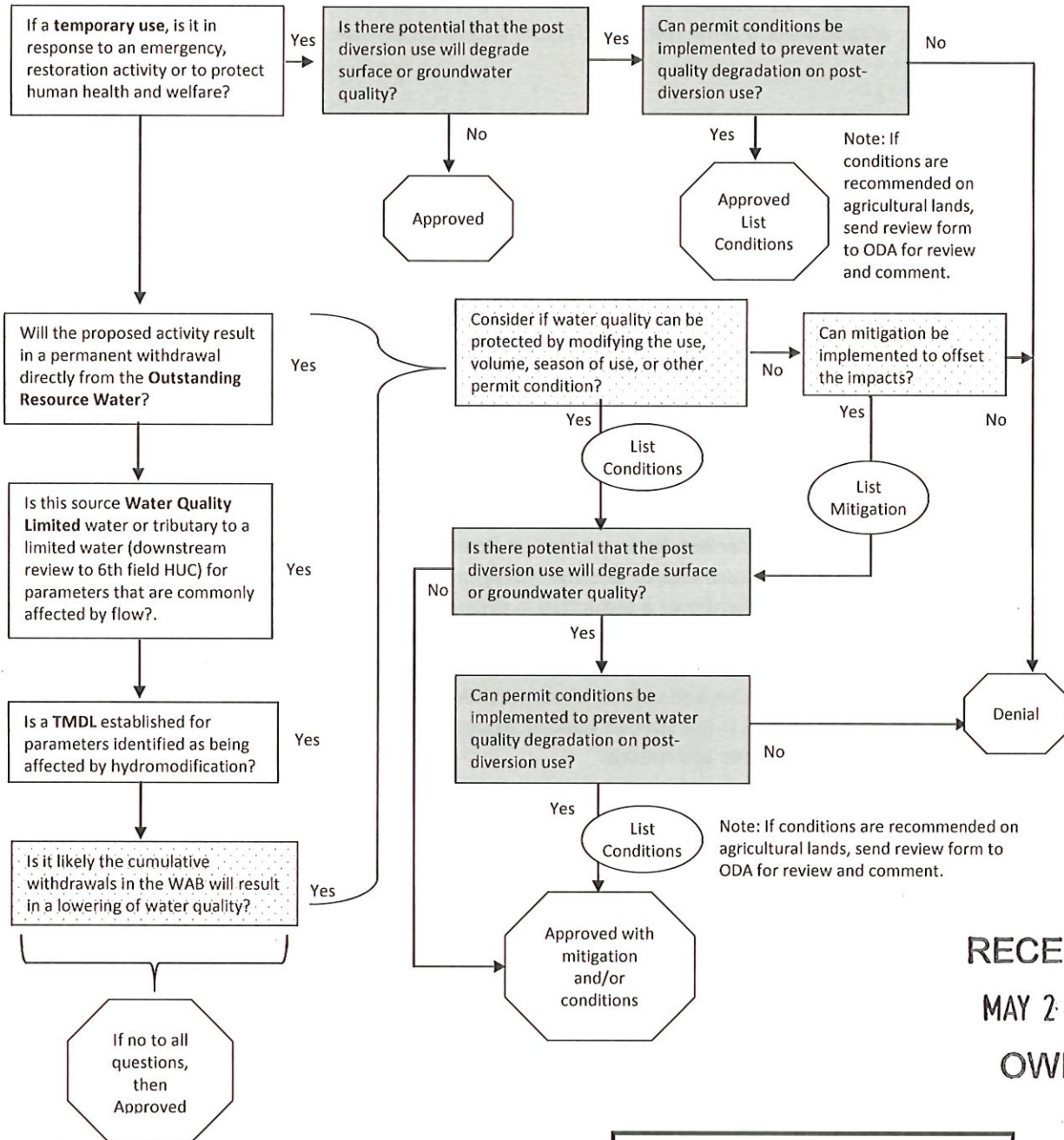
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<sup>1</sup> Richter BD, Davis MM, Apse C, Konrad C. 2011. *Short Communication, A Presumptive Standard For Environmental Flow Protection*. River Research and Applications. Published online in Wiley Online Library (wileyonlinelibrary.com), DOI: 10.002/rra.1551

**DEQ Water Right Review Flow Chart**



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Each yes will need to be explained by how the use does not comply with existing state and federal water quality standards and how the use may affect sensitive, threatened or endangered fish species habitat.

Note: Review based on DEQ's anti-degradation rule (340-041-0004).

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	Best Professional Judgment and Data
	Data