



## Oregon DEQ Division 33 Review Summary Sheet

### Application Information

<b>Applicant Name:</b>	David J. Bielenberg RLT	<b>Application Number:</b>	R-88765
<b>Basin &amp; Sub-basin:</b>	Molalla-Pudding River Basin; Pudding River Sub-basin	<b>Requested Water Amount:</b>	174 acre-feet
<b>Nearest Surface Water:</b>	Pudding River	<b>Nearest Receiving Waterbody:</b>	Pudding River
<b>Proposed Use:</b>	Irrigation and Aesthetics	<b>Requested Period of Use:</b>	Storage November 1 through June 30 for year-round use

### Division 33 Geographic Area

<input checked="" type="checkbox"/> Lower Columbia <input type="checkbox"/> Upper Columbia <input type="checkbox"/> Statewide	
<b>Upper and Lower Columbia Basins only:</b> Based upon the review completed below, does the proposed use comply with existing state and federal water quality standards or may conditions be applied to bring the use into compliance?	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> Insufficient data
<b>Statewide:</b> 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&E) fish species? (Note: the presence of ST&E fish species is determined by Oregon Department of Fish and Wildlife.)	<input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> Insufficient data

### Recommended Pre-Proposed Final Order Actions

<p><b>1. Riparian:</b> If the riparian area is disturbed in the process of developing, modifying or repairing a point of diversion under this water use permit, the permittee 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 permittee 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 permittee shall maintain the riparian area for the life of the permit and subsequent certificate per the approved Riparian Mitigation Plan. The permittee is hereby directed to contact the local Oregon Department of Fish and Wildlife Fish Biologist prior to development of the point of diversion.</p>
<p><b>2.</b></p>
<p><b>3.</b></p>
<p><b>Mitigation Obligation</b>            <input checked="" type="checkbox"/> No    <input type="checkbox"/> Yes</p>
<p>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 permitted 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.</p>

### Recommended Permit Conditions

<b>1. Water Quality:</b> All water use under this permit shall comply with state and federal water quality laws. The permittee 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.	
<b>2. Agricultural Water Quality Management Area Rules:</b> The permittee shall comply with basin-specific Agricultural Water Quality Management Area Rules described in Oregon Administrative Rule Chapter 603-095. The permittee 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.	
<b>3. 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.	
<b>4.</b>	
<b>Additional Reviewer comments</b> <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	
[Use this space to describe any of the following: reasoning to substantiate permit 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.]	
<b>Interagency consultation:</b> [Describe any substantial interagency consultation. Who was contacted and what was discussed?]	
<b>DEQ review prepared by:</b> Brian Creutzburg	<b>Date complete:</b> 7/29/19

**ODA Review Request**

<b>ODA review requested:</b> <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes	<b>Date review sent to ODA:</b> 7/29/2019
<b>ODA reviewer:</b> Paul Measeles	<b>ODA review date:</b> 7/30/2019
<b>ODA comments</b> <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Yes	
[ODA: enter the results of your review here. Designate conditions related to Division 310 with an asterisk.]	

**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**

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 permit issuance, the applicant must provide suitable flow mitigation. You may skip to question 7.

### 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

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

Water Body (Stream/Lake)	River Miles	Parameter	Season	Criteria	Beneficial Uses	Status
Pudding River	0 to 61.8	Alkalinity	Year Round	Table 20 Toxic Substances	Aquatic life	Cat 3B: Insufficient data, potential concern
Pudding River	0 to 61.8	Phosphate Phosphorus	Summer	Total phosphates as phosphorus (P): Benchmark 50 ug/L in streams to control excessive aquatic growths	Aquatic life	Cat 3B: Insufficient data, potential concern
Pudding River	0 to 35.4	DDT 4,4	Year Round	Table 20 Toxic Substances	Drinking water; Resident fish and aquatic life; Anadromous fish passage	Cat 4A: Water quality limited, TMDL approved
Pudding River	0 to 35.4	Dieldrin	Year Round	Table 20 Toxic Substances	Drinking water; Resident fish and aquatic life; Anadromous fish passage	Cat 4A: Water quality limited, TMDL approved
Pudding River	0 to 47.5	Dissolved Oxygen	January 1 - May 15	Spawning: Not less than 11.0 mg/L or 95% of saturation	Resident trout spawning	Cat 4A: Water quality limited, TMDL approved
Pudding River	0 to 53.8	Dissolved Oxygen	Year Round (Non-spawning)	Cool water: Not less than 6.5 mg/l	Cool-water aquatic life	Cat 4A: Water quality limited, TMDL approved
Pudding River	0 to 35.4	E. Coli	FallWinterSpring	30-day log mean of 126 E. coli organisms per 100 ml; no single sample > 406 organisms per 100 ml	Water contact recreation	Cat 4A: Water quality limited, TMDL approved
Pudding River	35.4 to 61.7	E. Coli	FallWinterSpring	30-day log mean of 126 E. coli organisms per 100 ml; no single sample > 406 organisms per 100 ml	Water contact recreation	Cat 4A: Water quality limited, TMDL approved
Pudding River	0 to 35.4	Iron	Year Round	Table 20 Toxic Substances	Aquatic life	Cat 4A: Water quality limited, TMDL approved
Pudding River	0 to 61.8	Temperature	Year Round (Non-spawning)	Salmon and trout rearing and migration: 18.0 degrees Celsius 7-day-average maximum	Salmon and trout rearing and migration	Cat 4A: Water quality limited, TMDL approved
Pudding River	0 to 61.8	Biological Criteria	Year Round	Biocriteria: Waters of the state must be of sufficient quality to support aquatic species without detrimental changes in the resident biological communities.	Aquatic life	Cat 5: Water quality limited, 303(d) list, TMDL needed

Water Body (Stream/Lake)	River Miles	Parameter	Season	Criteria	Beneficial Uses	Status
Pudding River	47.5 to 61.8	Dissolved Oxygen	October 15 - May 15	Spawning: Not less than 11.0 mg/L or 95% of saturation		Cat 5: Water quality limited, 303(d) list, TMDL needed
Pudding River	0 to 61.8	Guthion	Year Round	Table 20 Toxic Substances	Aquatic life	Cat 5: Water quality limited, 303(d) list, TMDL needed
Pudding River	0 to 35.4	Lead	Year Round	Table 20 Toxic Substances	Aquatic life	Cat 5: Water quality limited, 303(d) list, TMDL needed

Analysis: Streamflow rates are known to strongly influence temperature and metals concentrations. When stream-flow rates are lowered, the remaining flow will have a lower heat capacity. Oxygen is less readily dissolved in warm water, and cooler water tends to have higher amounts of dissolved oxygen. Species that are adapted to cold water environments tend to require higher levels of dissolved oxygen. High water temperatures combined with low dissolved oxygen concentrations are among the strongest stress-ors to aquatic life. Temperature and dissolved oxygen impairments will be exacerbated by any stream-flow reduction associated with the proposed withdrawal. The capacity of a waterway to assimilate pollution is also flow dependent. In summary, reduced flows can harm or stress stream biota, increase the concentrations of metals, and extirpate cold-adapted species from areas where they have occurred historically.

Recommended Conditions: **Water Quality, Agricultural Water Quality Management Area Rules, Off-Channel Stored Water Releases**

#### 4. Total Maximum Daily Load Summary

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

Analysis: Total Maximum Daily Loads have been established (approved 2008) for temperature, bacteria, pesticides, nitrate, and metals in the Molalla-Pudding Subbasin. The DEQ's 1993 TMDL for the Pudding River addresses dissolved oxygen impairment.

DEQ's water quality standards are set to protect the most sensitive beneficial uses in a waterbody. Numeric criteria in the temperature standard were developed to protect different aspects of the life histories of salmon and trout: spawning, rearing and migration. Peak temperatures typically occur in mid-July through mid-August and often exceed the salmon and trout rearing and migration criterion and core cold water criterion. The critical period in which wasteload allocations (WLAs) apply is June 1 – September 30 for the Pudding River. The load allocations for the temperature TMDL apply year-round and basinwide.

The mainstem Willamette River from its confluence with the Columbia River mouth upstream to approximately the City of Newberg (RM 0 to RM 50) has been designated as a salmon and steelhead migration corridor. The numeric temperature criteria for this use is 20°C (68°F) and applies throughout the year. In addition, narrative criteria for the migration use calls for cold water refugia that are sufficiently distributed so that salmon and steelhead migration can occur without significant adverse effects from higher water temperatures elsewhere in the river.

Riparian vegetation, stream morphology, hydrology (including groundwater interactions), climate, and geographic location influence stream temperature. While climate and geographic location are outside of human control, riparian condition, channel morphology and hydrology are affected by land use activities.

Bacteria problems have been identified (i.e., streams placed on the 303(d) list of water quality impaired waterbodies) in the urbanized and agricultural portions of the Willamette Basin. People can become sick if they ingest water that is contaminated with bacteria when they are swimming, recreating or in contact with the water. Bacteria are typically carried into streams and rivers as part of stormwater runoff in agricultural areas. The Willamette River has fish consumption advisories due to elevated levels of mercury found in some fish species. General sources include air deposition and erosion of soils that contain mercury from natural and anthropogenic sources.

Stream flow in the Willamette Basin is highly modified by dam and reservoir operations. Dam operations have dramatically changed the natural flow patterns of the Willamette River by reducing peak flows in winter and artificially augmenting summer low flows. To the extent practicable, management activities in the basin should maintain and/or re-establish natural hydrology of the watershed by maintaining post-development peak runoff rate and average volume at levels that are similar to predevelopment levels.

**Recommended Conditions: Water Quality, Agricultural Water Quality Management Area Rules, Off-Channel Stored Water Releases**

**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 Summary Table**

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

[Water Availability Basin]: PUDDING R > MOLALLA R - AB HOWELL PRAIRIE

Watershed ID	Exceedance Level	Month	Natural Stream Flow	Consumptive Use	Expected Stream Flow	Instream Requirement	Net Water Available	Percent of Flow
152	50	JAN	1210	69.8	1140	10	1130	5.8
152	50	FEB	1070	60.9	1010	10	999	5.7
152	50	MAR	909	39.9	869	10	859	4.4
152	50	APR	685	21.2	664	10	654	3.1
152	50	MAY	412	14.1	398	10	388	3.4
152	50	JUN	183	28.9	154	10	144	15.8
152	50	JUL	68.7	44.3	24.4	10	14.4	64.5
152	50	AUG	34.6	36.7	-2.09	10	-12.1	106.1
152	50	SEP	35.9	21.9	14	10	4.04	61.0
152	50	OCT	74.6	3.96	70.6	10	60.6	5.3
152	50	NOV	576	18.6	557	10	547	3.2
152	50	DEC	1150	63.8	1090	10	1080	5.5
152	50	ANN	385000	25600	360000	7240	353000	6.6

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**

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 by limiting the amount diverted, period of use, or by imposing permit condition(s)?

No  Yes

- If yes:

Recommended Conditions: **Water Quality, Agricultural Water Quality Management Area Rules, Off-Channel Stored Water Releases**

- If no, can **flow mitigation** ensure compliance with state and federal water quality standards and prevent loss of ST&E habitat?  No  Yes

**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 used by degrading surface water or groundwater quality?

No  Yes

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

Recommended conditions: **Water Quality, Agricultural Water Quality Management Area Rules, Off-Channel Stored Water Releases**

## PRE-PROPOSED FINAL ORDER ACTIONS

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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 permitted 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 permit, the permittee 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 permittee 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 permittee shall maintain the riparian area for the life of the permit and subsequent certificate per the approved Riparian Mitigation Plan. The permittee 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 permit requires a 50-foot setback, which is cited from the National General Construction Permit OAR-660-023-0090(5). Requiring the storage reservoir to be outside of the mapped 100 year floodway may also be a protective buffer. )

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## STANDARIZED MENU OF CONDITIONS

**Water Quality:** All water use under this permit shall comply with state and federal water quality laws. The permittee 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.

**Agricultural Water Quality Management Area Rules:** The permittee shall comply with basin-specific Agricultural Water Quality Management Area Rules described in Oregon Administrative Rule Chapter 603-095. The permittee 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 permittee shall install a flow control valve on the diversion system to limit use to the permitted 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 permittee shall not divert water under this water use permit 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 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.

**On-Channel Reservoir:** The permittee shall design and operate the water storage facility such that all waters within and below the reservoir meet water quality criteria. The permittee 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 permittee 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, permittee shall pass all live flow downstream at a rate equal to inflow, using methods that protect instream water quality.

**Lining:** The permittee 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 permittee 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 permit conditions that can prevent the "loss" or "net loss" of essential habitat of ST&E fish species. When permit conditions cannot be identified that meet this standard, then the DEQ recommends denial of the permit. 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.

### 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 left instream in each month (see right-most column in Table 1). Based on best professional judgment, evaluate if the cumulative withdrawal is likely to cause

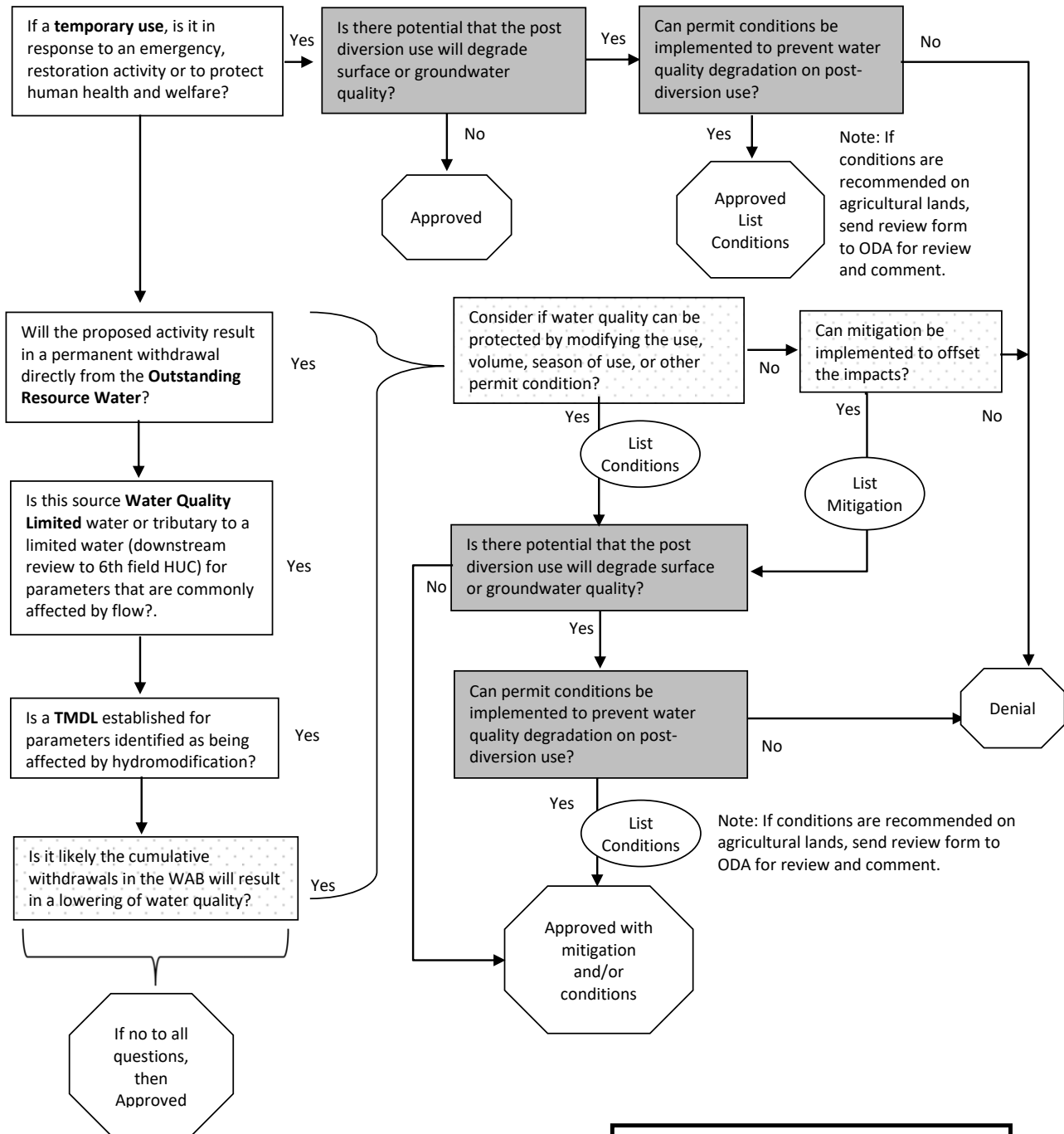
impairment to aquatic life or water quality. Water quality standards are established to protect aquatic life. In scientific literature, researchers have identified ecological harm occurring when flows are reduced by [>6-35% of daily flow](#)<sup>1</sup>. Consider the seasonality of any listings and season 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.

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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](http://wileyonlinelibrary.com)), DOI: 10.002/rra.1551

### DEQ Water Right Review Flow Chart



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).

	Best Professional Judgment and Data
	Data
	Best Professional Judgment