

Oregon DEQ Division 33 Review
July 16, 2024, Superseding Review Summary Sheet



Application Information

Applicant Name:	Michael Townsend	Application Number:	R-88642
Basin & Sub-basin:	Willamette Basin, Clackamas Subbasin	Requested Water Amount:	77.23 AF of storage in 7 reservoirs
Nearest Surface Water:	North Fork Deep Creek	Nearest Receiving Waterbody:	North Fork Deep Creek
Proposed Use:	Storage for irrigation	Requested Period of Use:	November 1- May 31

Division 33 Geographic Area

☒ Lower Columbia ☐ Upper Columbia ☐ Statewide	
Upper and Lower Columbia Basins only: 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?	☐ No ☒ Yes ☐ Insufficient data
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&E) fish species? (Note: the presence of ST&E fish species is determined by Oregon Department of Fish and Wildlife.)	☐ No ☐ Yes ☐ Insufficient data

Recommended Pre-Proposed Final Order Actions

1. Pond construction: Permittee must construct ponds off-channel, any in-stream or on-channel ponds should be disconnected from the intermittent and perennial channels and must be set back at least 50 feet from North Fork Deep Creek.
2. 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
Mitigation Obligation ☐ No ☒ Yes
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 transferred instream for the <u>May 1- November 30</u> time period and of similar water quality. The applicant should contact their OWRD caseworker to discuss flow mitigation options.

Recommended Permit Conditions

1. 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. Permittee is responsible for obtaining any necessary state and federal permits.
2. Off-Channel Stored Water Releases: The permittee shall not release polluted water from the off-channel reservoirs into waters of the state except when the release is directed by the State Engineer to prevent dam failure.
3. 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.
4. 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.
5. 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.
Additional Reviewer comments ☐ No ☒ 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.] 1. Note: North Fork Deep Creek has an in-stream water right for 20 CFS that is currently not met during the months of July and August. 2. The 2006 Willamette Basin Temperature TMDL applies to North Fork Deep Creek also has water quality impairments for biological criteria and dissolved oxygen across the length of the requested storage season. Aquatic life beneficial uses are impacted by these impairments. Streamflow during the period December 1 through April 30 is near-natural conditions greater than 40 cubic feet per second, and stream temperatures are typically cool during winter/spring months, so DEQ requests mitigation from May 1 through November 30. 3. If condition #1 of the Pre-Proposed Final Order Conditions is not included in the Proposed Final Order or water right permit, DEQ recommends the following condition: 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.

Interagency consultation: [Describe any substantial interagency consultation. Who was contacted and what was discussed?] 09/28/2018: DEQ contacted DSL about potential impacts to waters of the state. DSL conducted an initial review of the National Wetlands Index and did not think the ponds were built in wetlands prior to construction or that 50 cubic yards were removed from the channels. 10/28/2018: DEQ contacted USACE about potential impacts to jurisdictional waters. In a response from 11/05/2018 the USACE stated via email, "We are interested in this site because publicly available aerial imagery (Google Earth) strongly suggest presence of a small defined channels (perhaps even incised) extending up into the area of at least the first two reservoirs and possibly farther. These aeriels also have faint signatures of potential wetland vegetation/conditions all the way up to the dirt farm road." 06/24/2019: WRD notified DEQ that based on the recommended condition, "disconnect from the intermittent and perennial channels" and set the ponds back at least 50 feet from North Fork Deep Creek", the application would be denied because the applicant would not be able to comply with the condition. 12/22/2020: WRD requested DEQ to revise Division 33 review because the condition, "disconnect from the intermittent and perennial channels" and set the ponds back at least 50 feet from North Fork Deep Creek" is not a condition that is used in the water right permits, and that the applicant should have been reviewed in its current state. DEQ is providing this superseding review in response. With the new format of the form, this recommendation has been included as a "Pre-Proposed Final Order" condition. 01/06/2021: After reviewing this application again, and realizing that the applicant is requesting 77.23 acre-feet of water, it was likely that 50 cubic yards of material would have been necessary to excavate all of the reservoirs to the size needed to hold that much water. In light of this information, DEQ contacted DSL staff again, requesting that they take another look at the impacts of this project. 01/07/2021: DSL responded, confirming that there were no mapped wetlands or hydric soils on this site, however the National Hydrology Dataset (NHD) confirmed that there were at least intermitted streams present.	
DEQ review prepared by: Steven W. Parrett	Date complete: 7/16/2024

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 6th 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
North Fork Deep Creek	0 to 9	Biological Criteria	Year Around	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
North Fork Deep Creek	0 to 6.58	Dissolved Oxygen	October 15 - June 15	Spawning: Not less than 11.0 mg/L or 95% of saturation		Cat 5: Water quality limited, 303(d) list, TMDL needed
North Fork Deep Creek	0 to 9	E. Coli	Summer	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

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.]

Oregon's biological criteria narrative standards is based on the assemblage of species needed to maintain a healthy resident biological community. Resident biological communities are the local food webs that support fish and other aquatic life. Reduced flows and increased pollutant loads or concentrations may degrade the biological community and therefore, result in the diminution of habitat for ST&E fish species.

Dissolved Oxygen is a water quality parameter of concern for North Fork Deep Creek. Fish and other aquatic organisms require minimum concentrations of dissolved oxygen based on their species and life history stage to grow and remain healthy. Oregon's dissolved oxygen standards are based on the most sensitive species and life history stage within a waterbody and season of concern. Dissolved oxygen levels are affected by a combination of physical, chemical and biotic factors, including: temperature, flow, turbulence, nutrient and organic compound loading, algae and plant growth, respiration, and decomposition.

In waterbodies where dissolved oxygen concentrations are known to be insufficient for aquatic life habitat and habitat of ST&E fish species, any actions or conditions that cause additional reduction in dissolved oxygen concentrations would result in a diminution of habitat.

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 permit conditions.]

Water Quality, Flow Restrictor, Off-Channel Releases, Mitigation

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.]

The Clackamas Basin is a subbasin of the Willamette River Basin. The 2006 Willamette River Basin TMDL has approved bacteria and temperature TMDLs in this subbasin.

The Willamette Basin Temperature TMDL (2006) notes that stream temperature is influenced by natural factors such as climate, geomorphology, hydrology, and vegetation. Human influenced or anthropogenic heat sources may include discharges of heated water to surface waters, the loss of streamside vegetation and reductions in stream shading, changes to stream channel form, and reductions in natural streamflows.

The purpose of Oregon's temperature standard is to protect designated beneficial uses that are sensitive to temperature. Salmon, trout and other cold water species that inhabit most streams in the Willamette Basin are considered to be the beneficial uses most sensitive to stream temperature. Furthermore, each stage of the salmon or trout life cycle has separate water temperature preferences and tolerances. Biologically-based numeric criteria are specific to salmonid life stages such as spawning and rearing. There are also numeric criteria for critical habitat areas that serve as the core for salmonid protection and restoration efforts.

These pollutants are affected by flow modification and impact ST&E species habitat. Water quality data, modeling and research has shown that withdrawals decrease the capacity of streams to assimilate pollutant loads. Therefore, withdrawals potentially result in increased pollutant concentrations and warmer stream temperatures. Pollutants and parameters of concern associated with the health of ST&E fish species include: temperature, dissolved oxygen, turbidity, fine sediment, toxics, algae, pH and nutrient loading.

As discussed in the analysis for #3, in waterbodies where dissolved oxygen drop to low enough levels, habitat can be rendered unsuitable and can harm or kill fish. Any actions or conditions that cause additional reduction in dissolved oxygen concentrations would result in the diminution of habitat.

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 permit conditions.]

Water Quality, Mitigation

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.

[Water Availability Basin]: NF DEEP CRK > DEEP CRK- AT MOUTH WILLAMETTE BASIN

Watershed ID	Exceedance Level	Month	Natural Stream Flow	Consumptive Use	Expected Stream Flow	Instream Requirement	Net Water Available	Percent of Flow
137	50	JAN	71.9	1.25	70.6	20	50.6	2
137	50	FEB	60.2	1.07	59.1	20	39.1	2
137	50	MAR	42.8	0.496	42.3	20	22.3	1
137	50	APR	40.6	0.517	40.1	20	20.1	1
137	50	MAY	26.2	0.824	25.4	20	5.38	3
137	50	JUN	13.4	1.15	12.3	3	9.25	9
137	50	JUL	4.49	1.77	2.72	3	-0.28	39
137	50	AUG	2.03	1.47	0.56	1	-0.44	72
137	50	SEP	1.72	0.7	1.02	1	0.02	41
137	50	OCT	2.3	0.35	1.95	1	0.95	15
137	50	NOV	22.1	0.474	21.6	20	1.63	2
137	50	DEC	80.3	1.38	78.9	20	58.9	2
	50	ANN	22100	692	21500	8970	12500	3

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 through flow mitigation and/or by imposing permit condition(s)?

☐ No ☒ Yes

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

Water Quality, Mitigation, Flow Restrictor

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 permit conditions, then select all appropriate conditions from the standardized menu of conditions.

Recommended conditions: [List conditions]

Water Quality, Mitigation, Live Flow, Off-Channel Stored Water Releases

PRE-PROPOSED FINAL ORDER ACTIONS

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.)

Construction Activities: For construction activities (clearing, grading, excavation, staging, and stockpiling) that will disturb one or more acres and may discharge to state waters, the permittee is required to obtain from DEQ a 1200-C NPDES Stormwater Construction Permit prior to project construction.

In-Water or Riparian Construction: For in-water or riparian construction, permittee may be required to obtain additional permits 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 permittee is responsible for ensuring that herbicide application laws are met, and that they obtain from DEQ any necessary pesticide application permits, including the 2300-A Pesticide General Permit or the 2000-J NPDES General Permit. 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 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. Permittee is responsible for obtaining any necessary state and federal permits.

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.

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

Site-Specific Condition: The permittee shall

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 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 flow¹**. 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.

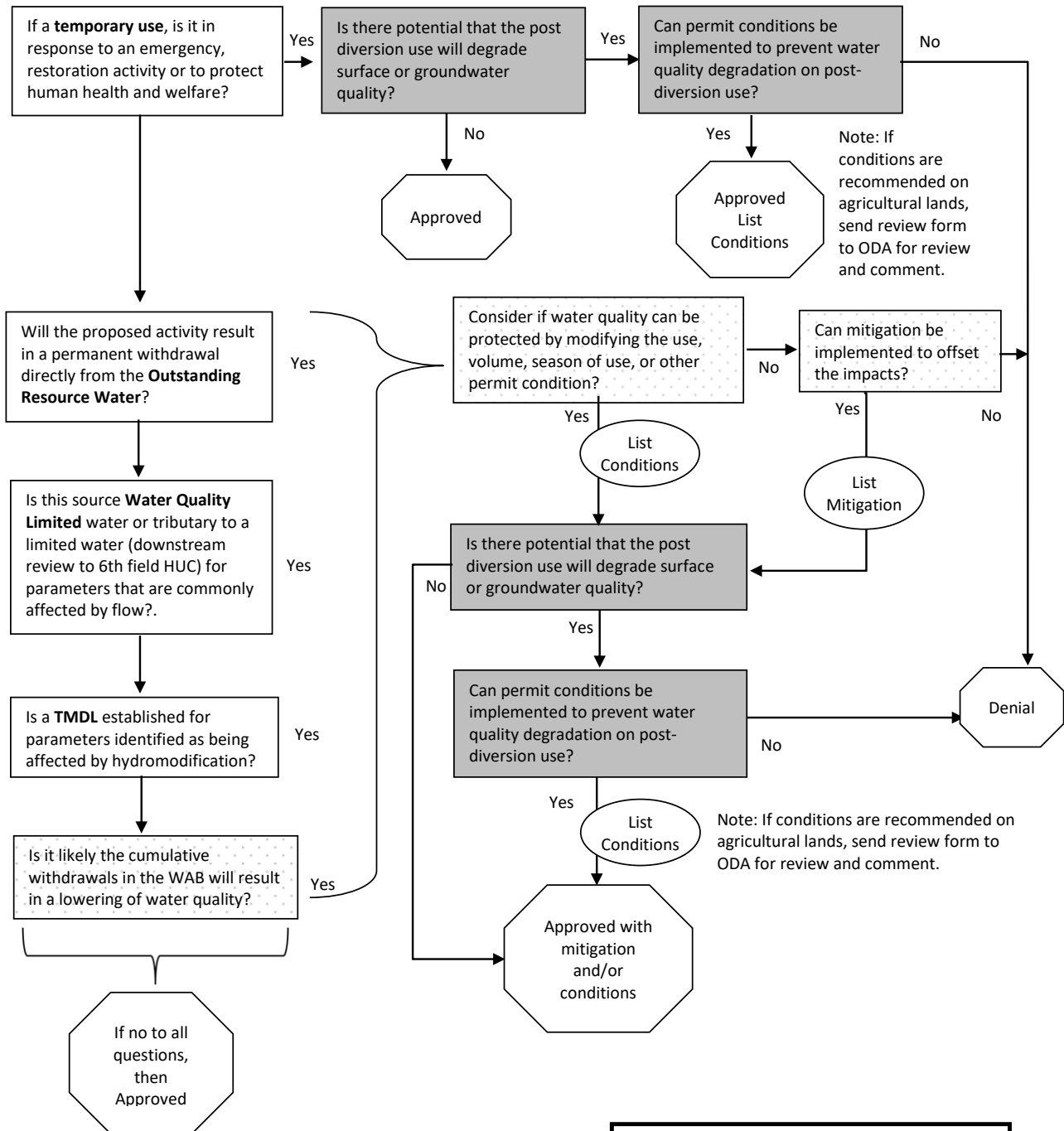
Example:

Natural stream flow for a particular month = 1200 CFS

1200 CFS – (.2 * 1200 CFS) = 960 CFS

¹ 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



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).

