Oregon DEQ Division 33 Review
Summary Sheet

Application Information

Applicant Name:	US Horticulture Farmland, LLC	**Application Number:**	S-89387
Basin & Sub-basin:	Willamette and Upper Willamette	**Requested Water Amount:**	1.62 cfs
Nearest Surface Water:	Calapooia River	**Nearest Receiving Waterbody:**	Calapooia River
Proposed Use:	Agricultural Use	**Requested Period of Use:**	October 1 through April 30

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.

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 **[month-month]** time period and of similar water quality. The applicant should contact their OWRD caseworker to discuss flow mitigation options. Flow mitigation is site-specific, therefore DEQ recommends written approval of the mitigation proposal by DEQ prior to issuance of a proposed final order.

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. **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.
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. 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.

Seasonal Limitations

Reason for limitation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
TMDL: Critical period	☐	☐	☐	☐	☐	☐	☒	☒	☒	☐	☐	☐
WAB: 20% flow threshold exceeded	☐	☐	☐	☐	☐	☐	☒	☒	☒	☐	☐	☐
IR or 303(d) listings: **Temperature (year-round)**	☐	☐	☐	☐	☐	☐	☐	☒	☒	☐	☐	☐
Other: Instream Right 20 cfs	☐	☐	☐	☐	☐	☐	☐	☒	☐	☐	☐	☐

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.]	
Interagency consultation: [Describe any substantial interagency consultation. Who was contacted and what was discussed?]	
DEQ review prepared by: Steve Parrett	**Date complete**: 12/26/2023

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

2022 Integrated Report & 303(d) List Summary Table

Assessment Unit Name	AUID	Assessment Unit Description	Impaired Beneficial Uses	Parameter	Period	Status*
Calapooia River	OR_SR_1709000304_02_103821	Shedd Slough to confluence with Willamette River	Fish and Aquatic Life	Alkalinity		3B
				Aluminum		3B
Willamette River	OR_SR_1709000306_05_103854	confluence of Middle Fork Willamette River and Coast Fork Willamette River to Luckiamute River	Aesthetic, boating, fish and aquatic life, fishing, private domestic water supply, public domestic water supply	Alkalinity		3B
				Aluminum		3B
Calapooia River	OR_WS_170900030403_02_103821	Watershed Unit (1st through 4th order streams)	Fish and Aquatic Life	Dissolved Oxygen	spawn	5
					Year-round	5
				Temperature	year_round	5
Willamette River	OR_SR_1709000306_05_103854	confluence of Middle Fork Willamette River and Coast Fork Willamette River to Luckiamute River	Aesthetic, boating, fish and aquatic life, fishing, private domestic water supply, public domestic water supply	Iron (total)		5
				Phosphorus		5
				Dissolved Oxygen	spawn	5
				BioCriteria		5
				Temperature	year_round	5
				Temperature	spawn	5
				Iron (total)		5
				Chlordane		5
				Dioxin (2,3,7,8-TCDD)		4A
HUC12 Name: Calapooia River	OR_SR_1709000306_05_104247	Watershed Unit (1st through 4th order streams)	Fish and Aquatic Life	Methylmercury		4A
				Aquatic Weeds		5
				Aluminum		5
				Iron (total)		5

*Integrated Report Category

Category 3B - There is insufficient data to determine use support, but some data indicate possible impairment

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

https://www.oregon.gov/deq/wq/Pages/epaApprovedIR.aspx

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.]

The following parameters can be negatively affected by water diversions:

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. The Calapooia River and Willamette River downstream do not meet Oregon's year-round and/or spawning 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 the Calapooia 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.

Dissolved Oxygen
Decreased dissolved oxygen levels adversely impact sensitive, threatened, and endangered fish. Oregon's 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. The Calapooia River does not meet Oregon's year-round and/or spawning dissolved oxygen standards. Reduced flows may increase water temperature and reduce surface area and turbulence, which can decrease dissolved oxygen. Therefore, reducing flow in waterbodies that are connected to downstream dissolved oxygen-impaired waterbodies, such as the Calapooia River could result in lower stream dissolved oxygen levels 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 dissolved oxygen standards is July 1 – September 30.

Biological Criteria
Oregon's biological criteria standards are 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. Reduced flows and increased temperatures may degrade the biological community and therefore result in the diminution of habitat of sensitive, threatened, or endangered fish species.

Aquatic weeds and/or algae
Both rooted aquatic plants and algae are a natural part of stream systems. They grow by taking in nutrients from the water column and sunlight. When water temperatures are warm enough and sufficient nutrients are present, excessive growth can occur; this can be a problem for both aquatic life and recreational beneficial uses. Excessive growth can affect aquatic life in several ways. During sunlight hours, plants and algae remove carbon dioxide from the water column as part of photosynthesis. With excessive growth, this can result in increased pH (alkaline conditions). During the night, plant growth removes oxygen from water and releases carbon dioxide, resulting in both low pH (acidic conditions) and low dissolved oxygen. In addition, when algae die and decompose, they remove oxygen from the surrounding water. Low dissolved oxygen can lead to decreased fish habitat and even fish kills. Additionally, low dissolved oxygen levels can lead to changes in water chemistry that allow mercury to be more able to enter the food chain. Algal blooms also often create odors and coloration that are objectionable to recreational users. A reduction in stream flow would result in increased water temperature and increased nutrient concentrations, both of which would contribute to a greater risk of excessive plant growth and algal blooms. Reduced stream flow would also result in reduced flushing capacity (to remove decomposing plant and algal materials) which would exacerbate conditions in following years. Additionally, decreased stream flow would increase the occurrence of low dissolved oxygen from plant growth and decomposition and increase the opportunity for mercury to enter the food chain.

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, Agricultural Water Quality Management Area Rules, Flow Restrictor, Riparian**

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 Calapooia River is a tributary to the Willamette River in the Upper Willamette Sub-basin. The Willamette Basin has approved TMDLs for mercury, bacteria, and stream temperature. DEQ is currently under court order to replace the temperature TMDL. The current Willamette TMDL is in effect until the new one is approved.
The Upper Willamette Subbasin temperature TMDL applies to all perennial and/or fish bearing streams in the Upper Willamette Subbasin – including the Calapooia River. The temperature TMDL identifies salmonid fish spawning and rearing, anadromous fish passage, resident fish and aquatic life as the most sensitive beneficial uses. Land use activities including riparian vegetation, stream morphology, hydrology, climate, and geographic location influence stream temperature in the Upper Willamette Subbasin.

The critical condition for stream temperature and heat loading is the seasonal period of maximum stream temperatures and lowest stream flows. Maximum stream temperatures are a function of combining the effects of atmospheric inputs (solar radiation) and low stream flows that usually occur during the summer period. In the Upper Willamette sub-basin, peak temperatures typically occur in mid-July through mid-August and often exceed the salmon and trout rearing and migration criterion. Temperatures are much cooler late summer through late spring but occasionally exceed the spawning criterion.

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.] **Flow Restrictor, Water Quality, Agricultural Water Quality Management Area Rules, Riparian**

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.

CALAPOOIA R > WILLAMETTE R - AB MOUTH

Watershed ID	Exceedance Level	Month	Natural Stream Flow	Consumptive Use	Expected Stream Flow	Reserved Stream Flows	Instream Requirement	Net Water Available	Percent of Flow
76	50	JAN	1300	4.75	1300	0	20	1280	0.37
76	50	FEB	1260	4.68	1260	0	20	1240	0.37
76	50	MAR	996	3.5	992	0	20	972	0.35
76	50	APR	664	3.18	661	0	20	641	0.48
76	50	MAY	404	19.6	384	0	20	364	4.85
76	50	JUN	178	15.4	163	0	20	143	8.65
76	50	JUL	73.9	23.9	50	0	20	30	32.34
76	50	AUG	35.9	17.2	18.7	0	20	-1.33	47.91
76	50	SEP	34.9	8.89	26	0	20	6.01	25.47
76	50	OCT	58.1	2.83	55.3	0	20	35.3	4.87
76	50	NOV	449	3.34	446	0	20	426	0.74
76	50	DEC	1270	4.7	1270	0	20	1250	0.37

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, Agricultural Water Quality Management Area Rules, 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 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: [List conditions]

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: 1200-C NPDES Stormwater Construction permit 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, 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.

Site-Specific Condition: The permittee shall

[*] 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:

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

  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 flow[1]. 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.

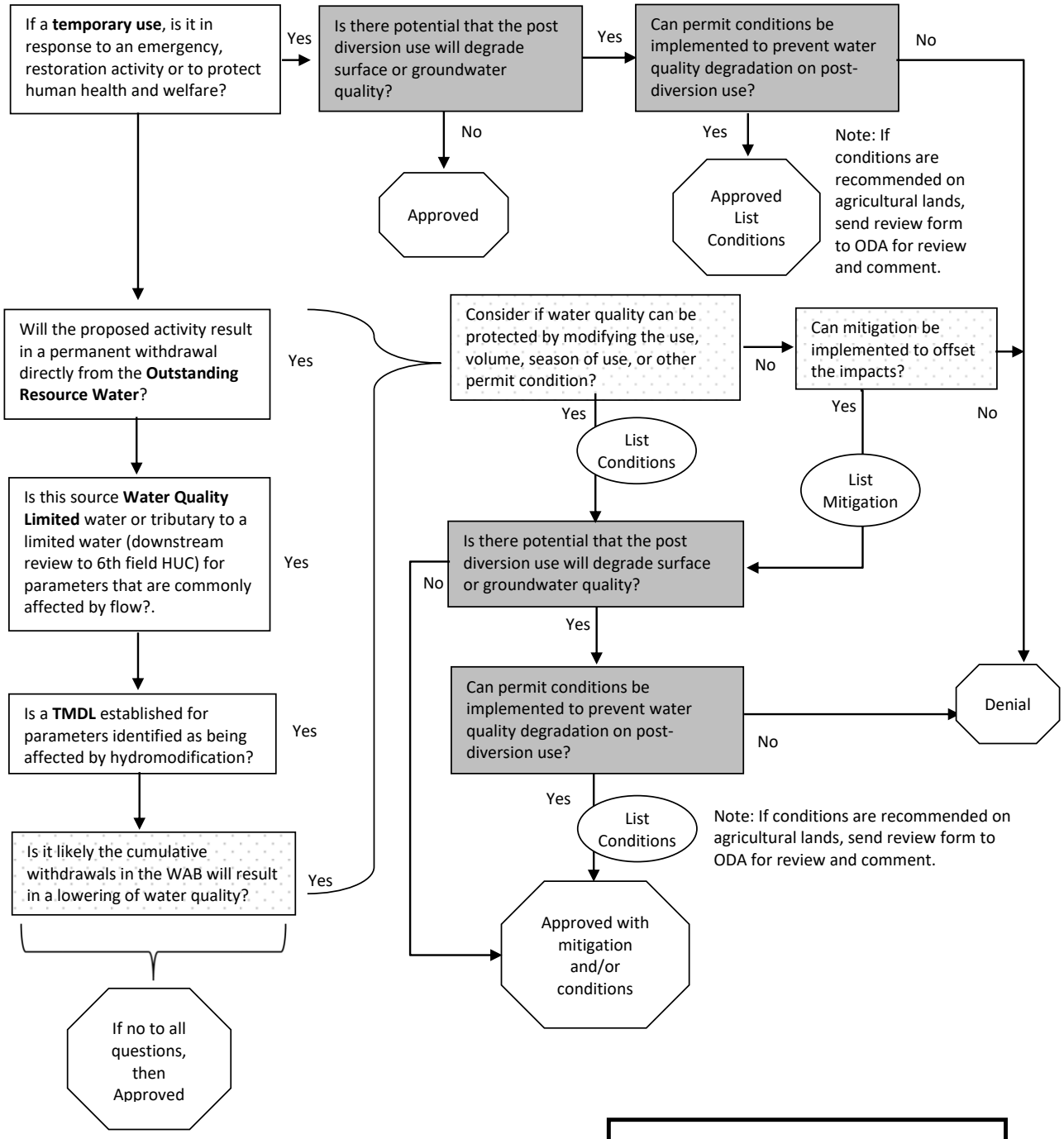
Example:

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).