Turbidity Monitoring During Construction

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What is turbidity?

Turbidity is a calibrated measurement of the degree to which a material suspended in water scatters and absorbs light.
**Why does turbidity matter?**

- Warms water
- Reduces oxygen
- Impedes photosynthesis
- Clogs fish gills
- Affects fish reproduction and growth
- Interferes with predation
- Affects recreation & drinking

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**The contractor is required to monitor turbidity:**

**As part of Erosion & Sediment Control**

- Standard 280.62(c)
- (NPDES 1200-CA)

**During in-water work**

- Special 290.30(a)(8)
- (Section 401 WQC)
### Turbidity Monitoring Contract Specifications

<table>
<thead>
<tr>
<th>As part of Erosion &amp; Sediment Control</th>
<th>In-water work</th>
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<tbody>
<tr>
<td>(NPDES 1200-CA)</td>
<td>(Section 401 Water Quality Certification)</td>
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**00280.62 Inspection and Monitoring**

(c) Monitor Receiving Stream

Observe and record color and turbidity or clarity within 30 feet upstream and downstream of locations where surface waters from the construction site enter the receiving stream….

**00290.30(a)(8) Turbidity Monitoring**

In addition to any turbidity monitoring required by 00280.62(c) to comply with NPDES 1200 series requirements, monitor turbidity during in-water work….
Turbidity Monitoring Handouts

Section 290 Special Provisions................................................................. 2

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SECTION 00290 - ENVIRONMENTAL PROTECTION

Comply with Section 00290 of the Standard Specifications modified as follows:

00290.30(a) Pollution Control Measures - Add the following subsections and bullets:

**Subsection (7) is used when there is work in, adjacent to, or over a regulated waterway, even if there is no direct in-water work:**

(7) **Water Quality:**

- Do not discharge contaminated or sediment-laden water, including drilling fluids and waste, or water contained within a work area isolation, directly into any waters of the State or U.S. until it has been satisfactorily treated (using a best management practice such as a filter, settlement pond, bio-bag, dirt-bag, or pumping to a vegetated upland location).
- Do not use permanent stormwater quality treatment facilities to treat construction runoff unless prescribed by an ESCP approved under Section 00280.
- If construction discharge water is released using an outfall or diffuser port, do not exceed velocities more than 4 feet per second, and do not exceed an aperture size of 1 inch.
- Do not use explosives under water.
- Implement containment measures adequate to prevent pollutants or construction and demolition materials, such as waste spoils, fuel or petroleum products, concrete cure water, silt, welding slag and grindings, concrete saw cutting by-products and sandblasting abrasives, from entering waters of the State or U.S.
- Implement containment measures adequate to prevent flowing stream water from coming into contact with concrete or grout within the first 24 hours after placement.
- Do not end-dump riprap into the waters of the State or U.S. Place riprap from above the ordinary high water line.
- Cease project operations under high flow conditions that may result in inundation of the project area, except for efforts to avoid or minimize resource damage.
- The Engineer retains the authority to temporarily halt or modify the Work in case of excessive turbidity or damage to natural resources.
- If Work activities violate permit conditions or any requirement of this subsection, stop all in-water work activities and notify the Engineer.
- Do not cause a visible sediment plume in waters of the State or U.S. [This bullet should appear only if the contract does not contain Subsection (8) below.]
Subsection (8) is used when there is in-water work. The contract will have one of three variations:

If a turbidity meter is required:

(8) Meter Turbidity Monitoring - In addition to any turbidity monitoring required by 00280.62(c) to comply with NPDES 1200 series requirements, monitor turbidity using a turbidity meter every two hours during in-water work according to the following:

• Use a turbidity meter that has been maintained and calibrated according to the manufacturer’s specifications.
• Measure stream turbidity before beginning each day’s in-water work to establish pre-construction turbidity levels.
• Measure upcurrent and downcurrent turbidity at two-hour intervals during in-water work and perform work based on turbidity measurements according to the following:
• Take upcurrent samples at a location representative of background turbidity approximately 100 feet from the in-water work area.
• Take downcurrent samples at a location approximately 100 feet from the in-water work area at approximately mid-depth of the water body and within any visible turbidity plume.
• If the downcurrent reading is less than 5 nephelometric turbidity units (NTU) higher than the upcurrent reading, continue to work and take readings every two hours.
• If the downcurrent reading is greater than or equal to 5 and less than 30 NTU higher than the upcurrent reading, modify work procedures and repair or implement best management practices (BMP), continue work, and continue to take readings every two hours. If after four hours the downcurrent reading is still greater than or equal to 5 NTU higher than the upcurrent reading, stop all in-water work and repair or implement additional BMP. Resume in-water work activities only after the downcurrent reading is less than 5 NTU above the upcurrent reading.
• If the downcurrent reading is greater than or equal to 30 and less than 50 NTU higher than the upcurrent reading, modify work procedures, repair or implement BMP and continue work. If, at the subsequent two-hour reading, the downcurrent reading is still more than 30 NTU higher than the upcurrent reading, stop all in-water work and repair or implement additional BMP. Resume in-water work activities only after the downcurrent reading is less than 5 NTU above the upcurrent NTU reading.
• If the downcurrent reading is 50 NTU or more higher than the upcurrent reading, stop all in-water work, repair or implement additional BMP, and inform the Agency. Resume in-water work activities only after the downcurrent reading is less than 5 NTU above the upcurrent NTU, as determined by continued readings made at least every two hours, or the next day's initial turbidity reading.
• Document all turbidity monitoring observations on form 734-2755, “Turbidity Monitoring Report”, or another form approved by the Agency. Submit reports to the Engineer weekly during in-water work and keep copies of the reports at the Project Site.
If visual monitoring is required:

(8) Visual Turbidity Monitoring - In addition to any turbidity monitoring required by 00280.62(c) to comply with NPDES 1200 series requirements, monitor turbidity visually during in-water work according to the following:

• Before beginning work, make upcurrent and downcurrent in stream turbidity observations.
• Every four hours, make observations at an upcurrent location outside the influence of the project, and at a downcurrent location that indicates any turbidity caused by the project.
• Document all turbidity monitoring observations including date, time, and location on form 734-2755, “Turbidity Monitoring Form” or another form approved by the Agency. Submit reports to the Engineer weekly during in-water work and keep copies of the reports at the Project Site.
• If a downcurrent turbidity plume is observed, modify work procedures and repair or implement in-water best management practices (BMP). If a turbidity plume is still observed at the next four-hour observation, stop all in-water work and repair or implement additional BMP. Resume in-water work when there is no longer a visible turbidity plume.

If customized turbidity monitoring requirements are needed (this is rare):

(8) Turbidity Monitoring - In addition to any turbidity monitoring required by 00280.62(c) to comply with the NPDES 1200 series permit requirements, perform turbidity monitoring during in-water work according to the following:

• _______
• _______
SCHEDULE A, Condition 5b: Turbidity (Nephelometric Turbidity Units, NTU) Water Quality Standard:

No more than a ten percent cumulative increase in natural stream turbidities shall be allowed, as measured relative to a control point immediately upstream of the turbidity causing activity. However, limited duration activities necessary to address an emergency or to accommodate essential dredging, construction or other legitimate activities and which cause the standard to be exceeded may be authorized provided all practicable turbidity control techniques have been applied and one of the following has been granted:

(A) Emergency activities: Approval coordinated by DEQ with the Department of Fish and Wildlife under conditions they may prescribe to accommodate response to emergencies or to protect public health and welfare;

(B) Dredging, Construction or other Legitimate Activities: Permit or certification authorized under terms of Section 401 or 404 (Permits and Licenses, Federal Water Pollution Control Act) or OAR 141-085-0100 et seq. (Removal and Fill Permits, Division of State Lands), with limitations and conditions governing the activity set forth in the permit or certificate.

SCHEDULE B, Condition 7 c, d, & e:

c. At representative discharge location(s) from the construction site conduct observation and document the quality of the discharge for any turbidity, color, sheen, or floating materials. If possible, in the receiving stream, observe and record color and turbidity or clarity upstream and downstream within 30 feet of the discharge from the site. For example, a sheen or floating material could be noted as present/absent, if observation is yes, it could indicate concern about a possible spill and/or leakage from vehicles or materials storage. For turbidity and color an observation would describe any apparent color and the clarity of the discharge, and any apparent difference in comparison with the receiving stream.

d. If significant amounts of sediment are leaving the property, briefly explain the corrective measures taken to reduce the discharge and/or clean it up and describe efforts to prevent future releases. The ESCP shall be amended accordingly.

e. If a site is inaccessible due to inclement weather the inspection shall include observations at a relevant discharge point or downstream location, if practical.
TEMPLATE FOR CERTIFICATION TO BE ISSUED DIRECTLY TO APPLICANT
UPON APPLICATION TO USACE AND PAYMENT TO DEQ

DATE

APPLICANT NAME
APPLICANT ADDRESS

RE: Nationwide 401 Water Quality Certification Approval for Project Number, Project Name

The US Army Corps of Engineers (USACE) has determined that your project will be authorized under Nationwide Permit (NWP) category #XX. As described in the application package received and reviewed by the Oregon Department of Environmental Quality (DEQ), the project qualifies for the Nationwide Section 401 Water Quality Certification (WQC), subject to the conditions outlined below. If you cannot meet all conditions of this 401 WQC, you may apply for a standard individual certification. A standard individual certification will require additional information and higher fees will apply.

Certification Decision: Based on information provided by USACE and the Applicant, DEQ is reasonably assured that implementation-eligible activities under the proposed NWP will be consistent with applicable provisions of Sections 301, 302, 303, 306, and 307 of the federal Clean Water Act, state water-quality standards set forth in Oregon Administrative Rules Chapter 340 Division 41, and other appropriate requirements of state law, provided the following conditions are incorporated into the federal permit and strictly adhered to by the Applicant.

In addition to all USACE national and regional permit conditions, the following 401 WQC conditions apply to all NWP categories that qualify for the Nationwide 401 WQC.

**401 GENERAL CERTIFICATION CONDITIONS**

1) **Responsible parties:** This 401 WQC applies to the Applicant. The Applicant is responsible for the work of its contractors and sub-contractors, as well as any other entity that performs work related to this WQC.

2) **Work Authorized:** Work authorized by this 401 WQC is limited to the work described in the Application or Pre-Construction Notification submitted to the USACE and additional application materials (hereafter “the permit application materials”), unless otherwise authorized by DEQ. If the project is operated in a manner not consistent with the project description contained in the permit application materials, the Applicant is not in compliance with this 401 WQC and may be subject to enforcement.

3) A copy of this 401 WQC must be kept on the job site and readily available for reference by Applicant and its contractors, as well as by DEQ, USACE, National Marine Fisheries Service (NMFS), Oregon Department of Fish and Wildlife (ODFW), and other appropriate state and local government officials.
4) In accordance with OAR 340-048-0050, DEQ may modify or revoke this 401 WQC if project activities are having an adverse impact on state water quality or beneficial uses, or if the Applicant is otherwise in violation of the conditions of this certification.

5) The Applicant and its contractors must allow DEQ access to the project site, staging areas, and mitigation sites to monitor compliance with these 401 WQC conditions, including:
   a. Access to any records, logs, and reports that must be kept under the conditions of this 401 WQC;
   b. To inspect best management practices (BMPs), monitoring or operational equipment or methods; and
   c. To collect samples or monitor any discharge of pollutants.

6) Failure of any person or entity to comply with this Order may result in the issuance of civil penalties or other actions, whether administrative or judicial, to enforce its terms.

7) **Land Use Compatibility Statement**: In accordance with OAR 340-048-0020(2) (i), each Applicant must submit findings prepared by the local land use jurisdiction that demonstrates the activity’s compliance with the local comprehensive plan. Such findings can be submitted using the appropriate section of the USACE & DSL Joint Permit Application, signed by the appropriate local official and indicating:
   a. “This project is consistent with the comprehensive plan and land use regulations;” or
   b. “This project will be consistent with the comprehensive plan and land use regulations when the following local approvals are obtained,” accompanied by the obtained local approvals.
   c. Rarely, such as for federal projects on federal land, “this project is not regulated by the comprehensive plan” will be acceptable.

In lieu of submitting the appropriate section of the USACE & DSL Joint Permit Application, the Applicant may use DEQ’s Land Use Compatibility Statement form found at: [http://www.deq.state.or.us/pubs/permithandbook/lucs.pdf](http://www.deq.state.or.us/pubs/permithandbook/lucs.pdf)

**FOR PROJECTS THAT PROPOSE CONSTRUCTION, THE FOLLOWING GENERAL CONDITIONS APPLY**

8) **Erosion and Sediment Control**: During construction, erosion and sediment control measures must be implemented to prevent or control movement of sediment, soil or pollutants into waters of the state. The applicant is required to develop and implement an effective erosion and sediment control plan. **Any project that disturbs more than one acre is required to obtain an NPDES 1200-C construction stormwater permit from DEQ.** In addition, the applicant (or responsible party) must:
   a. Where practicable, use removable pads or mats to prevent soil compaction at all construction access points through, and staging areas in, riparian or wetland areas to prevent soil compaction.
   b. Demarcate wetlands not specifically authorized to be impacted to protect from disturbance and/or erosion.
c. Place dredged or other excavated material on upland areas with stable slopes to prevent materials from eroding back into waterways or wetlands. Place BMPs as necessary to stabilize and prevent erosion.

9) **Spill Prevention:** Applicant must fuel, operate, maintain and store vehicles, and must store construction materials, in areas that will not impact water quality either directly or due to potential discharges.

10) **Spill & Incident Reporting:**
   a. In the event that petroleum products, chemicals, or any other deleterious materials are discharged into state waters, the discharge must be promptly reported to the Oregon Emergency Response Service (OERS, 1-800-452-0311). Containment and cleanup must begin immediately and be completed as soon as practicable.
   b. If the project operations result in distressed or dying fish, the operator must immediately cease operations; take appropriate corrective measures to prevent further environmental damage; and immediately notify DEQ and ODFW.

11) **Vegetation Protection and Site Restoration:**
   a. Applicant must protect riparian, wetland, and shoreline vegetation in the authorized project area from disturbance through one or more of the following:
      i. Minimization of project and impact footprint;
      ii. Designation of staging areas and access points in open, upland areas;
      iii. Fencing and other barriers demarking construction areas; and
      iv. Use of alternative equipment (e.g., spider hoe or crane).
   b. If authorized work results in any vegetative disturbance and the disturbance has not been accounted for in planned mitigation actions, the Applicant must successfully reestablish vegetation to a degree of function equivalent or better than before the disturbance.

12) The Applicant shall avoid and protect from harm, all wetlands and riparian areas located within 50 feet of USACE jurisdictional waters, unless proposed, necessary, and approved as part of the project. If a local jurisdiction has a more stringent buffer requirement, that requirement will override this certification requirement.

**FOR PROJECTS THAT PROPOSE IN-STREAM WORK IN JURISDICTIONAL WATERS**

13) **Fish protection/Oregon Department of Fish and Wildlife timing:** The Applicant must perform in-water work only within the Oregon Department of Fish and Wildlife preferred time window as specified in the Oregon Guidelines for Timing of In-Water Work to Protect Fish and Wildlife Resources, or as authorized otherwise under a USACE permit and/or Department of State Lands removal/fill permit. Exceptions to the timing window must be recommended by Oregon Department of Fish and Wildlife, the National Marine Fisheries Services and/or the US Fish and Wildlife as appropriate.

14) **Aquatic life movements:** Any activity that may disrupt the movement of aquatic life living in the water body, including those species that normally migrate through the area, is prohibited. The Applicant must provide unobstructed fish passage at all times during any authorized activity, unless otherwise approved in the approved application.
15) **Turbidity**: The Applicant must implement appropriate Best Management Practices (BMPs) to minimize turbidity during in-water work. Any activity that causes turbidity to exceed 10% above natural stream turbidity is prohibited except as specifically provided below:

a. **Monitoring**: Turbidity monitoring must be conducted and recorded as described below. Monitoring must occur at two hour intervals each day during daylight hours when in-water work is being conducted. A properly calibrated turbidimeter is required **unless another monitoring method is proposed and authorized by DEQ**.

i. **Representative Background Point**: Applicant must take and record a turbidity measurement every two hours during in-water work at an undisturbed area. A background location shall be established at a representative location approximately 100 feet upcurrent of the in water activity unless otherwise authorized by DEQ. The background turbidity, location, date, tidal stage (if applicable) and time must be recorded immediately prior to monitoring downcurrent at the compliance point described below.

ii. **Compliance Point**: The Applicant must monitor every two hours. A compliance location shall be established at a representative location approximately 100 feet downcurrent from the disturbance at approximately mid-depth of the waterbody and within any visible plume. The turbidity, location, date, tidal stage (if applicable) and time must be recorded for each measurement.

b. **Compliance**: The Applicant must compare turbidity monitoring results from the compliance points to the representative background levels taken during each two-hour monitoring interval. Pursuant to OAR 340-041-0036, short term exceedances of the turbidity water quality standard are allowed as follows:

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<thead>
<tr>
<th>TURBIDITY LEVEL</th>
<th>Restrictions to Duration of Activity</th>
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<tbody>
<tr>
<td>0 to 4 NTU above background</td>
<td>No Restrictions</td>
</tr>
<tr>
<td>5 to 29 NTU above background</td>
<td>Work may continue maximum of 4 hours. If turbidity remains 5-29 NTU above background, stop work and modify BMPs. Work may resume when NTU is 0-5 above background.</td>
</tr>
<tr>
<td>30 to 49 NTU above background</td>
<td>Work may continue maximum of 2 hours. If turbidity remains 30-49 NTU above background, stop work and modify BMPs. Work may resume when NTU is 0-5 above background.</td>
</tr>
<tr>
<td>50 NTU or more above background</td>
<td>Stop work immediately and inform DEQ</td>
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c. **Reporting**: The Applicant must record all turbidity monitoring required by subsections (a) and (b) above in daily logs. The daily logs must include calibration documentation; background NTUs; compliance point NTUs; comparison of the points in NTUs; location; date; time; and tidal stage (if applicable) for each reading. Additionally, a narrative must be prepared discussing all exceedances with subsequent monitoring, actions taken, and the effectiveness of the actions. Applicant must make available copies of daily logs for turbidity monitoring to DEQ, USACE, NMFS, USFWS, and ODFW upon request.
d. **BMPs to Minimize In-stream Turbidity:** The Applicants must implement the following BMPs, unless otherwise accepted by DEQ:

i. **Sequence/Phasing of Work** – The Applicant must schedule work activities so as to minimize in-water disturbance and duration of in-water disturbances;

ii. **Bucket control** - All in-stream digging passes by excavation machinery and placement of fill in-stream using a bucket must be completed so as to minimize turbidity. All practicable techniques such as employing an experienced equipment operator, not dumping partial or full buckets of material back into the wetted stream, adjusting the volume, speed, or both of the load, or using a closed-lipped environmental bucket must be implemented;

iii. **The Applicant must limit the number and location of stream-crossing events.** Establish temporary crossing sites as necessary in the least sensitive areas and amend these crossing sites with clean gravel or other temporary methods as appropriate;

iv. **Machinery may not be driven into the flowing channel,** unless authorized by DEQ; and

v. **Excavated material must be placed so that it is isolated from the water edge or wetlands,** and not placed where it could re-enter waters of the state uncontrolled.

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**FOR PROJECTS THAT INCLUDE NEW IMPERVIOUS SURFACES OR REDEVELOPMENT OF EXISTING SURFACES, THE FOLLOWING CONDITIONS APPLY**

16) **Post-Construction Stormwater Management:** For projects which propose new impervious surfaces or the redevelopment of existing surfaces, the Applicant must submit a post-construction stormwater management plan to DEQ for review and approval prior to construction, in order to ensure compliance with water quality standards. The Applicant must implement BMPs as proposed in the stormwater management plan, including operation and maintenance. If proposed stormwater facilities change due to site conditions, the Applicant must notify DEQ.

In lieu of a complete stormwater management plan, the applicant may submit documentation of acceptance of the stormwater into a DEQ permitted National Pollutant Discharge Elimination System (NPDES) Phase I Municipal Separate Storm Sewer System (MS4).

17) **Stormwater Management & System Maintenance:** The Applicant is required to implement effective operation and maintenance practices for the lifetime of the proposed facility.

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**CATEGORY-SPECIFIC CONDITIONS**

In addition to all national and regional conditions of the USACE permit and the 401 Water Quality Certification general conditions above, the following conditions apply to the noted specific categories of authorized activities.

**NWP 7 – Outfall Structures and Associated Intake Structures:**

7.1) The following actions are denied certification:

a. Discharge outfalls that are not subject to an NPDES permit, and
b. Outfalls that discharge stormwater without pollutant removal demonstrated to meet water-quality standards prior to discharge to waters of the state.

7.2) If an Applicant cannot obtain an NPDES permit or submit an approveable stormwater management plan per DEQ’s Guidelines found at: http://www.deq.state.or.us/wq/sec401cert/docs/stormwaterGuidelines.pdf, the Applicant must submit complete project information and water quality impacts analysis directly to DEQ in order to undergo individual 401 WQC evaluation and fulfill public participation requirements.

NWP 12 – Utility Lines:

12.1) For proposals that include directionally-bored stream or wetland crossings:

   a. All drilling equipment, drill recovery and recycling pits, and any waste or spoil produced, must be completely isolated, recovered, then recycled or disposed of to prevent entry into waters of the state.

   b. In the event that drilling fluids enter a water of the state, the equipment operator must stop work, immediately initiate containment measures and report the spill to the Oregon Emergency Response System (OERS) at 800-452-0311.

   c. An adequate supply of materials needed to control erosion and to contain drilling fluids must be maintained at the project construction site and deployed as necessary.

   d. The Applicant must have a contingency plan in place prior to construction for the inadvertent return of drilling lubricant.

12.2) For proposals that include utility lines through wetlands, include anti-seep collars or equivalent technology to prevent draining the wetlands.

NWP 13 – Bank Stabilization:

13.1) Projects that do not include bioengineering are denied certification, unless a registered professional engineer provides a written statement that non-bioengineered solutions are the only means of protection.

13.2) To apply for certification for a project without bioengineering, the permittee must submit complete project information and water quality impacts analysis directly to DEQ in order to undergo individual 401 WQC evaluation and fulfill public participation requirements.

NWP 14 – Linear Transportation:

14.1) For projects that include bank stabilization, bioengineering must be a component of the project, unless a registered professional engineer provides a written statement that non-bioengineered solutions are the only means to protect an existing structure.

14.2) To apply for certification for a project without bioengineering, the permittee must submit complete project information and water quality impacts analysis directly to DEQ in order to undergo individual 401 WQC evaluation and fulfill public participation requirements.
NWP 16 - Return Water from Contained Upland Disposal Areas: Water-quality criteria and guidance values for toxics, per OAR 340-041-0033, are available in Tables 20, 33A, 33B, and 33C at: http://www.deq.state.or.us/wq/standards/toxics.htm#Cur.

16.1) Discharge of return water from contaminated dredged material that exceeds a chronic or acute toxicity water quality standard is prohibited.

16.2) Water removed with contaminated dredged material that could or does exceed chronic water-quality criteria must be contained and disposed of at an appropriately sized and sealed upland facility by evaporation or infiltration.

16.3) If a Modified Elutriate Test (MET) is performed for the known contaminants of concern (CoCs) and CoC concentrations are below DEQ chronic water-quality criteria, return water discharge is not limited:
   a. The MET must be performed before dredging.
   b. DEQ must approve the list of CoCs and analytical method prior to the permittee performing the MET.
   c. DEQ must review the results and provide approval of discharge from return water, in writing, prior to dredging.

NWP 20 – Response Operations for Oil and Hazardous Waste:

20.1) Coordination with DEQ’s Emergency Response program is required. See: http://www.deq.state.or.us/lq/cu/emergency/index.htm.

NWP 22 – Removal of Vessels:

22.1) Coordination with DEQ’s Emergency Response program is required. See: http://www.deq.state.or.us/lq/cu/emergency/index.htm.

NWP 31 – Maintenance of Existing Flood Control Facilities:

31.1) Projects in streams with temperature TMDLs which result in a net reduction of riparian shade are prohibited.

NWP 38 – Cleanup of Hazardous and Toxic Waste:

38.1) For removal of contaminated material from waters, dredging method is limited to diver assisted hydraulic suction, hydraulic suction, closed-lipped environmental bucket, or excavation in the dry, unless otherwise authorized by DEQ.
   a. For in-water isolation measures, the permittee is referred to Appendix D of DEQ’s Oregon Erosion and Sediment Control Manual, April 2005 (or most current version), at: http://www.deq.state.or.us/wq/stormwater/docs/escmanual/appxd.pdf.

38.2) Discharge to waters of the state resulting from dewatering during dredging or release of return water from an upland facility is prohibited except as provided below.
a. All water removed with sediment must be contained and disposed of at an appropriately sized and sealed upland facility by evaporation or infiltration; or,

b. A Modified Elutriate Test (MET) may be performed for the known Contaminants of Concern (CoCs) and if CoC concentrations are below DEQ chronic water-quality criteria; return water discharge is not limited.

   i. The MET must be performed before dredging.
   ii. DEQ must approve the list of CoCs and analytical method prior to the permittee performing the MET.
   iii. DEQ must review the results and provide approval of discharge from dewatering and return water in writing prior to dredging.

38.3) Dredged material must be disposed of in compliance with DEQ Rules governing Hazardous Waste (see: http://www.deq.state.or.us/lq/hw/hwmanagement.htm) or Solid Waste (see: http://www.deq.state.or.us/lq/sw/index.htm).

38.4) The new in-water surface must be managed to prevent exposure or mobilization of contaminants.

NWP 41 - Reshaping Existing Drainage Ditches:

41.1) To the extent practicable, permittees must work from only one bank in order to minimize disturbance to existing vegetation, preferably the bank with the least existing vegetation;

41.2) Following authorized work, permittees must establish in-stream and riparian vegetation on reshaped channels and side-channels using native plant species wherever practicable. Plantings must be targeted to address water-quality improvement (e.g., provide shade to water to reduce temperature or provide bank stability through root systems to limit sediment inputs). Planting options may include clustering or vegetating only one side of a channel, preferably the side which provides maximum shade.

NWP 42 – Recreational Facilities:

42.1) For facilities that include turf maintenance actions, the permittee must develop and implement an Integrated Pest Management Plan (IPM) that describes pest prevention, monitoring and control techniques with a focus on prevention of chemical and nutrient inputs to waters of the state, including maintenance of adequate buffers for pesticide application near salmonid streams, or coverage under an NPDES permit, if required (information is available at: http://www.deq.state.or.us/wq/wqpermit/pesticides.htm).

NWP 43 – Stormwater Management Facilities:

43.1) Projects that propose the following elements are denied certification:
   a. In-stream or wetland stormwater facilities;
   b. Discharge outfalls not subject to an NPDES permit; and,
   c. Proposals that do not demonstrate pollutant removal to meet water-quality standards prior to discharge to waters of the state.

43.2) To apply for certification for a project with in-stream stormwater facilities, without an NPDES permit, or without submittal of an approvable stormwater management plan per DEQ’s Guidelines (at: http://www.deq.state.or.us/wq/sec401cert/docs/stormwaterGuidlines.pdf), the
permittee must submit complete project information and water quality impacts analysis directly to DEQ in order to undergo individual 401 WQC evaluation and fulfill public participation requirements.

NWP 44 – Mining Activities:

44.1) Projects that do not obtain an NPDES 700-PM or Individual permit are denied certification.

44.2) To apply for certification for a project without an NPDES permit, the permittee must submit complete project information and water quality impacts analysis directly to DEQ in order to undergo individual 401 WQC evaluation and fulfill public participation requirements.

NWP 51 – Land-Based Renewable Energy Generation Facilities:

51.1) For associated utility lines with directionally-bored stream or wetland crossings proposed, condition 12.1 must be applied.

NWP 54 – Living Shorelines

B.1) Projects that do not include bioengineering are denied certification, unless a registered professional engineer provides a written statement that non-bioengineered solutions are the only means of protection.

If the Applicant is dissatisfied with the conditions contained in this certification, a hearing may be requested. Such request must be made in writing to DEQ’s Office of Compliance and Enforcement at 700 NE Multnomah St, Suite 600, Portland Oregon 97232, within 20 days of the mailing of this certification.

The DEQ hereby certifies that this project complies with the Clean Water Act and state rules, with the above conditions. If you have any questions, please contact Sara Christensen at 541-633-2007, by email at christensen.sara@deq.state.or.us, or at the address on this letterhead.

Sincerely,

Steve Mrazik,
Water Quality Manager
Northwest Region

cc: ADD CC
Turbidity Monitoring for ESC

WHEN DO WE DO IT?

- When site’s runoff drains to a stream (most sites)
- On sites inactive for 7+ days: at least every two weeks
- On active sites:
  - At least once every 7 days
  - Daily during storm or snowmelt runoff
  - Within 24 hours after period of 0.5” of rain per 24-hour period
  - Or when directed
Visual observations are generally more convenient and may be more permissive.

Metered measurements of water samples are more objective and precise.

Standard Specification 280.62(c) doesn’t limit how we do it.

Upstream
– within 30 feet of construction discharge
– at a location not affected by the project

Downstream within 30 feet of construction discharge
Turbidity Monitoring for ESC

WHAT IS THE COMPLIANCE STANDARD?

- No more than 10% increase over background
- When monitoring visually, any noticeable increase in turbidity above background should be presumed to exceed the standard.

What is a “noticeable increase in turbidity?”

Any difference you can see between upstream and downstream points, or across the stream at the observation point; a plume of water that is less clear than adjacent water.
Several images are not available, but given the context, it appears to be discussing turbidity monitoring during in-water work. The text in the image is as follows:

**Turbidity Monitoring During In-Water Work**

**WHERE ARE OBSERVATIONS RECORDED?**

![Image of turbidity monitoring form](image)

Form 734-2755
IN-WATER WORK TURBIDITY MONITORING REPORT

1. For ODOT use

| DSL permit no. | Army Corps of Engineers permit no. | Instream work start date | Instream work end date | Extension date (if applicable) |

**Sampling/Observation Locations**

Distance of upcurrent and downcurrent sampling or observations from the in-water work:

- □ ≤ 30 feet (typically if there is no 401 Water Quality Certification)
- □ 100 feet (typically if there is a 401 Water Quality Certification)
- □ Other: Text ________ Reason: Text

2. For Contractor/Inspector Use: See SP00290.30(a)(8) for prescribed turbidity monitoring method.

**Meter turbidity monitoring** – First monitoring before work begins, then every two hours.

- □ Check here to affirm that the turbidity meter used has been maintained and calibrated according to the manufacturer's specifications.

<table>
<thead>
<tr>
<th>MONITORED BY</th>
<th>DATE</th>
<th>MONITORING START TIME</th>
<th>TIDAL STAGE (EBB OR FLOW)</th>
<th>UPCURRENT NTU</th>
<th>DOWNCURRENT NTU</th>
<th>STOP TIME</th>
<th>COMMENTS</th>
</tr>
</thead>
</table>

**Visual turbidity monitoring** – First monitoring before work begins, then every four hours.

<table>
<thead>
<tr>
<th>MONITORED BY</th>
<th>DATE</th>
<th>MONITORING START TIME</th>
<th>TIDAL STAGE (EBB OR FLOW)</th>
<th>PLUME OBSERVED? (YES/NO)</th>
<th>STOP TIME</th>
<th>COMMENTS</th>
</tr>
</thead>
</table>

3. Signature and submission

<table>
<thead>
<tr>
<th>PRINTED NAME</th>
<th>SIGNATURE</th>
<th>DATE</th>
<th>TITLE</th>
<th>PHONE</th>
</tr>
</thead>
</table>

Submit according to Section 00290.30(a)(8).

Distribution: Original to Agency Project Manager. Keep a copy on site during on-site work.
Turbidity Monitoring During In-Water Work

WHEN DO WE DO IT?

Per 290.30(a)(8) – Meter: 2-hr / Visual: 4-hr intervals
Turbidity Monitoring During In-Water Work

“In-water work” means:
below the ordinary high water level or high tide line,
whether it’s submerged or not

HOW DO WE DO IT?

- We do it in the manner 290.30(a)(8) directs.
- Metered measurements of water samples are usually required for in-water work.
- Visual observations are occasionally allowed.
Turbidity Monitoring During In-Water Work

WHERE DO WE DO IT?

- Where 290.30(a)(8) directs:
- Visual: Upcurrent outside the influence of the project, and downcurrent within any plume.
- Meter: Upcurrent approximately 100’ from the work; downcurrent approximately 100’ from the work, mid-depth of the stream, and within any plume.

WHAT IS THE VISUAL COMPLIANCE STANDARD?

- Visual: A visible plume is an indicator that the standard has been exceeded.
  - Repair or upgrade in-water BMPs
  - If a plume is still present at the next 4-hour observation interval, repair or upgrade in-water BMPs and stop work until there is no longer a visible plume.
### Turbidity Monitoring During In-Water Work

**WHAT IS THE METER COMPLIANCE STANDARD?**

<table>
<thead>
<tr>
<th>Turbidity Level</th>
<th>Restrictions to Duration of Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 5 NTU above background</td>
<td>No restrictions. Continue to monitor every 2 hours.</td>
</tr>
<tr>
<td>≥ 5 &amp; &lt; 30 NTU above background</td>
<td>Modify BMPs &amp; continue for 4 hours. If turbidity is still ≥ 5 above background, stop. Modify BMPs. Resume when NTU is &lt; 5 above background.</td>
</tr>
<tr>
<td>≥ 30 &amp; &lt; 50 NTU above background</td>
<td>Modify BMPs &amp; continue for 2 hours. If turbidity is still ≥ 5 above background, stop. Modify BMPs. Resume when NTU is &lt; 5 above background.</td>
</tr>
<tr>
<td>50 NTU or more above background</td>
<td><strong>Stop work immediately.</strong> Contractor notifies the ODOT inspector, and ODOT notifies DEQ.</td>
</tr>
</tbody>
</table>

### Turbidity Monitoring During In-Water Work

**WHERE ARE OBSERVATIONS RECORDED?**

*Form 734-2755*
General Considerations: **Safety First!**

Move the monitoring site or revert to visual monitoring if conditions are sketchy.

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*Figure showing a construction site near a river with a sign that says 'Avoid Contact with Water'.*
### General Considerations: Non-Project Turbidity

- Place the monitoring point between the non-project source and the project activity or discharge point.
- Record on the monitoring form, and take a photograph.

![Monitoring Point](image)

### General Considerations: Sampling Point

- In a well-mixed stream, take sample away from the shore line
- Mid-depth of the stream
- If there’s a visible plume, take sample from within it
- If in the stream, take sample upstream from your feet (avoid sample contamination by stirring up bed sediment)

![Sampling Point](image)
**General Considerations: Sample Handling**

- Take upstream and downstream samples as close to the same time as possible
- Rinse sample container 3 times with sample water before filling with the sample to be tested
- Invert the container when submerging and turn it upright in the mid-point of the stream
- Minimize pouring from one container to another
- Follow meter’s maintenance and calibration instructions
- Before metering, gently agitate to resuspend sediments
- Average multiple readings for each sample

**General Considerations: Effects of Settling**

- **Clay particles**:
  - At resuspension
  - After 1 hour

- **Sandy silt**:
  - At resuspension
  - After 1 minute
General Considerations: Exceedances

- Immediately inspect the site to identify turbidity sources
- Upgrade/repair erosion and sediment controls
- Repeat monitoring, inspection and upgrade until exceedances stop
- Record each inspection and remedial steps

General Considerations: Uncontrollable Factors & Regulator Reporting

Exceedances due to factors outside ODOT's control
- Must be reported on the monitoring forms
- Erosion/sediment control must be immediately restored

Self-reporting exceedances:
- Things go better with regulators when they trust us.
- Trust is built by transparency.
- Consistently perfect reports are unrealistic and suspicious.
Post-Construction Stormwater Management
Best Management Practices (BMPs)

BMPs are constructed facilities or features of the roadside area used to:
- Clean up storm water
- Maintain site hydrology

Why We Manage Post-Construction Stormwater

- Clean Water Act
  - 401 Certifications
  - NPDES MS4 Permit
- Endangered Species Act
  - Federal Aid Highway Project Biological Opinion
  - Individual Biological Opinions
Stormwater Facilities Specifications (2018)

- 00842 – Drainage Facility Markers
- 01010 – Stormwater Control, Water Quality Structures
- 01011 – Stormwater Control, Ponds (includes detention and bioretention ponds)
- 01012 – Stormwater Control, Water Quality Biofiltration Swale
- 01013 – Stormwater Control, Water Quality Bioslope (aka Media Filter Drain)
- 01014 – Stormwater Control, Water Quality Filter Strip
- 01030.13(f) – Types of Seed Mixes
- 03020 – Compost

Stormwater BMPs include:

- Filter strips
- Media filter drains
- Bioswales
- Detention / retention ponds
- Rain gardens
- Proprietary devices
Things to Watch For:

- Grading, size, slope and elevation
- Correct placement and elevation of inlets, outlets, orifices
- Correct materials and plants: amended soil mixes, seed mixes, etc.
- Erosion control during plant establishment

Avoiding Problems

- Make sure permanent erosion control is installed correctly.
- Do not open a facility for stormwater until construction and erosion control is completed.
- Do not route construction site runoff into a permanent stormwater BMPs, unless specifically called for by the ESCP (SP 290.30(a)(7)).
Modification to BMP Designs

**Always** get approval from the hydraulic engineer for changes to size, location, configuration, materials, etc.

Making Sure It Gets Done Right

- Be familiar with the plans and specs
- Talk to the designer – understand the purpose of the whole and the parts
- Talk to the contractor and construction crew
- Provide feedback to the designer