



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101**

Reply To
Attn Of: ETPA-083

CLEAN WATER ACT § 401 WATER QUALITY CERTIFICATION

**REMOVAL ACTION
NORTHWEST (NW) NATURAL GASCO SITE**

I INTRODUCTION

This Clean Water Act §401 Water Quality Certification (WQC) is prepared in support of removal activities being conducted under the Administrative Order on Consent (Order) with the U.S. Environmental Protection Agency (EPA) on April 28, 2004 to perform a time-critical removal action at the "Gasco" Site (Site) (USEPA 2004a), under the authority of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended. A copy of this WQC and any future amendments will be placed in the Site File. In addition, copies of this original and any future amendments shall be kept on the job site and made readily available for reference by EPA, the contractor, and any other appropriate federal, tribal, state, and local inspectors.

The Order requires that NW Natural perform a number of actions associated with removing a tar body at the surface of the nearshore sediment adjacent to the Site. The tar body, which is the subject of this Removal Action, is present in and on the river sediments because of oil-gasification waste discharges early in the 20th century. The direct discharge of waste material to the river ceased in the 1940s. The objectives of the Removal Action include the elimination of exposure to the river from tar, creating a surface of lesser total polycyclic aromatic hydrocarbons (TPAH) concentrations, placing a thin-layer barrier pilot cap, allowing monitoring for any project seepage, preventing migration of chemicals from tar downstream, complying with relevant regulations to the extent practicable, and contributing to the performance of a long-term remedial action for the Site. The scope of the Removal Action is described in the Action Memorandum dated June 17, 2005. The Removal Action is described in detail in the Removal Action Project Plan (RAPP, Anchor Environmental, July 2005).

Sediment characterization information obtained in July 2004 defined the lateral and vertical extent of the tar body that would be removed. The study resulted in a total proposed removal volume of approximately 15,000 cubic yards (cy) of combined

materials. Contaminated sediments contain high levels of TPAHs as well as some other chemicals, most notably benzene.

The U.S. Environmental Protection Agency (EPA) is responsible for review of this project to ensure compliance with the substantive requirements of the Clean Water Act §401. Monitoring methods (including parameters, locations/depths, frequency/schedule, background surveys, visual monitoring, and equipment) are consistent with the substantive requirements of the applicable and appropriate Water Quality Standards: Beneficial Uses, Policies and Criteria for Oregon (OAR, Chapter 340, Division 041). Oregon's antidegradation policy (OAR 340-041-0026(1)(a)) is a major factor in the EPA's compliance analysis. Guidance is provided in the Antidegradation Policy Implementation Internal Management Directive for NPDES Permits and Section 401 Water Quality Certifications (ODEQ 2001).

This WQC describes water quality protections for components of the Removal Action that could potentially impact water quality. This primarily includes the Gasco Site work, but potentially includes transfer operations at the Port of Morrow, Oregon. Dredged material will be barged and unloaded at the Port of Morrow transfer facility onto trucks for disposal at the Chemical Waste Management of the Northwest (CWMNW) Subtitle C landfill in Arlington, Oregon. A temporary transfer facility permit will be issued by the Oregon Department of Environmental Quality (DEQ) and all provisions of the Permit for best management practices and monitoring will be followed. EPA has the authority to require additional provisions as necessary to protect water quality.

II REMOVAL ACTIONS

NW Natural will implement the removal action, as detailed in the final design, to achieve the objectives of the Order. The major components of the removal action and the required notifications and reports are described in the Removal Action Project Plan (RAPP) (Anchor Environmental, July 2005). The activities within the Gasco Site associated with the removal action covered by this WQC include the following:

- Removal of the tar body
- Transportation and disposal of removed material
- Cover/cap placement.

The following is a brief summary of removal actions:

- Dredging/Piling Removal or Placement. This construction element includes the removal of the tar body within the dredge prism as described in the project final design. It also includes removal of pilings in the removal action area prior to dredging. The piles will be removed using water-based equipment. The construction contractor will perform the dredging operations from a floating platform using one or more of the mechanical bucket dredges noted in the RAPP. The dredging will be conducted within a non-rigid containment system (i.e., silt curtain).

- Transfer and Disposal of Dredged Material.** The dredged material will be placed into water-tight staging barges using a mechanical clamshell bucket. Water will be decanted from the bucket prior to placement of the remaining dredged slurry into the barge. This decant water will be returned to surface water within the dredge area, enclosed within a silt curtain. In addition, accumulated water within the transfer barge (prior to being placed in the haul barge) will also be returned to the surface water within the dredge area, enclosed within a silt curtain. No water will be released from the barge outside the silt curtain or on the way to the transfer site. The dredged material will be transferred to a water-tight drying barge where quicklime (approximately 5 percent of dredged sediment weight) will be added to and mixed with the dredged material. The dried material will be transferred to the water-tight haul barge, which will be used to transport the dredged materials to the offloading facility at the Port of Morrow. The barge ports will be sealed when the barge is in transit between the removal site and the offloading facility. No decant or return water will be created or discharged as a part of the transfer and disposal process as described in Appendix E (Removal Action Environmental Protection Plan) of the RAPP.
- Placement of cover/cap.** After the dredging is complete, cap material will be installed as described in the RAPP. The RAPP also presents the required gradation for the fringe cover material, the filter layer material, and the erosion protection material. The volume of fringe cover material is estimated to be 600 to 900 cy. The volume of pilot cap filter layer material is estimated to be 700 cy. The volume of pilot cap erosion protection material is estimated to be 300 cy. The cover/cap material will be transported to the site by barge and off-loaded and placed immediately by the barge-mounted clamshell bucket. All cover/cap material will be evaluated prior to its placement to ensure compliance with the final design requirements.

Remedial actions will be implemented during the summer 2005 fish window according to the construction schedule summarized in the following table. For a more detailed description of remedial actions, please refer to the RAPP and other referenced documents.

Construction Sequencing and Schedule

Remedial Activity	Start	Finish
Silt Curtain Fabrication/Mob	July 12, 2005	August 25, 2005
Deploy Silt Curtain	August 26, 2005	September 2, 2005
Dredging/Disposal	September 5, 2005	October 14, 2005
Cap Placement	October 19, 2005	October 31, 2005

The RAPP and Appendices discuss design and operational best management practices. The Construction Quality Assurance Plan (CQAP – Appendix C of the RAPP) defines inspection, verification, monitoring and corrective actions and contingencies associated

with each element of the project. These are incorporated by reference here. The Contractor's Quality Control Plan will detail the inspection, testing and documentation procedures that will be implemented to ensure that construction conforms to the requirements of the Contract Documents (including the FDSR and technical specifications). The EPA retains the right to further inspect anything concerning the construction. Additionally, the Contractors Quality Control Plan should address whether BMPs or potential contingencies and corrective actions are being revised because of equipment specifics. Contingencies, as defined in the CQAP, are options that can be implemented should water quality monitoring indicate the need for operational changes. These might include alterations to dredging (e.g., equipment, cycle time, pausing in the water column, targeting tidal cycles, etc.), and dewatering (e.g., changes in filter fabric and its deployment, etc.) that could be implemented, if necessary.

The CQAP and Construction Documents describe requirements for the management of dredge material that will prevent suspended sediments in return flows. No return flow may occur from any barge during barge loading or material transfer. The Contractor's Quality Control Plan should define inspection, testing and documentation procedures that will be implemented to ensure these requirements are met.

The Contractor's Quality Control Plan should also define inspection, testing and documentation procedures that will be implemented to ensure that operation will result in no spillage of contaminated sediments or debris during offloading and/or transfer to the uplands immediately adjacent to the Gasco site. The contractor must describe sediment rehandling and transport, as well as the offloading area and offloading process. In addition, the plan must describe how the contractor will handle any unexpected large debris encountered during the project.

Finally, the Contractor's Quality Control Plan should also define inspection, testing and documentation procedures that will be implemented to ensure that placement of capping material is performed in conformance with the Contract Documents. Specified construction methods and BMPs have been defined to minimize resuspension of in situ bottom sediments and minimize mixing of bottom sediments into capping materials. The Contract Documents and CQAP define methods and contingencies to be used that will ensure accurate and low impact/velocity placement.

III WILLAMETTE RIVER 303(d) LISTING

The project site is located on the Lower Willamette River, a water body currently listed under the Clean Water Act §303(d) as water quality limited due in part to man-made chemicals that have been discharged to the river and reside in bottom sediments, including polynuclear aromatic hydrocarbons (PAH). The removal of contaminated sediments as a part of this project is a clean-up action that will improve sediment quality, prevent migration of chemicals from the existing tar body, and create a sediment surface of lesser PAH concentrations. Best management practices are to be implemented during all phases of the project to minimize the potential redistribution of contaminated sediment back into the Willamette River.

IV CERTIFICATION

The EPA hereby certifies that the proposed work associated with the Removal Action at the Gasco Site in Portland, Oregon complies with the applicable provisions of Sections 301, 302, 303, 306, and 307 of the Clean Water Act, as amended. Compliance with state human health water quality standards established for certain of the contaminants present in the tar body which are applicable to the lower Willamette River are based on long-term averages and likely will be achieved. However, documenting compliance for such a short-term action may be difficult or impossible. Thus, it may be impracticable to meet such standards given the exigencies of the situation. This WQC is valid for a period of one (1) construction season, effective the date it is signed, expiring January 31, 2006, and subject to the following terms and conditions.

A. Expiration and Amendment

This WQC shall become effective on the date it is signed and shall remain valid for one (1) construction season, expiring January 31, 2006, unless specifically extended by EPA through amendment.

Prior to expiration, this WQC may be amended if there are significant additions, changes, modification, and revisions to the RAPP and Appendices.

B. Display of Certification

A copy of this original and any future amendments shall be kept prominently on the job site and readily available for reference by EPA, the contractor, and any other appropriate federal, tribal, state, and local inspectors.

C. Notification and Reporting

The EPA must be notified upon exceedance or failure to comply with conditions of this WQC as soon as possible. Reporting frequencies are detailed below. Typically, the EPA Remedial Project Manager (RPM) will be notified first and the RPM will then immediately notify the EPA Water Quality Specialist (WQS); however, the reverse may occur.

Remedial Project Manager (RPM): The EPA contact person for amendments, modifications, approvals, or any other changes to the RAPP and Appendices is Sean Sheldrake, at (206) 553-1220, fax: (206) 553-0124, email: sheldrake.sean@epa.gov. Correspondence should be addressed by surface mail to:

Mr. Sean Sheldrake
USEPA
Environmental Cleanup Office
1200 Sixth Avenue

Mailstop: ECL-110
Seattle, WA 98101-1128

Water Quality Specialist (WQS): The EPA contact person for amendments, modifications, approvals, or any other changes to this certification is John Malek, at telephone (206) 553-1286, fax: (206) 553-1775, email: malek.john@epa.gov. Correspondence should be addressed by surface mail to:

Mr. John Malek
USEPA
Aquatic Resources Unit
1200 Sixth Avenue
Mailstop: ETPA-083
Seattle, WA 98101-1128

The EPA WQS for this certification shall be notified of and provided with any significant additions, changes, modification, and revisions to the RAPP and Appendices by the RPM.

1. Daily reporting – Any water quality or velocity exceedances of triggers specified in the RAPP will be reported verbally or by e-mail to EPA (Sean Sheldrake and John Malek) on a daily basis.
2. Weekly Reporting – Results from each week’s Water Quality Monitoring Forms will be compiled into a summary table with a comparison to RAPP triggers and provided to EPA with the Weekly Progress Report described in the RAPP. The exception to weekly reporting is the exceedance of a water quality certification condition, which must follow the reporting sequence outlined in Section IV.E.
3. Final Project Report – Once all construction is complete, results for the entire construction period will be compiled and reported to EPA along with supporting documentation in the Removal Action Completion Report (RACR). At a minimum, the report must include the following information:
 - A description of field sampling activities and a plan view of monitoring locations relative to the location of remedial actions
 - Any deviations from the Monitoring Plan and reasons for the deviations
 - Tabular summaries of all water quality and river velocity monitoring data with comparisons to RAPP triggers
 - A summary of field observations, including sampling times, weather conditions, water conditions, silt plumes, distressed/dying fish, and any relevant anecdotal or unusual observations
 - Tabular summaries of all post-removal sediment characterization results
 - Narrative text on results of water quality monitoring related to each operation (e.g., dredging, dredging-related activities such as pile pulling or placement, upland transfer, and cover/cap placement)

- Discussion of water quality trigger exceedances and any additional monitoring that may have resulted
- Data quality review results based on calibration and precision/accuracy information, including any data qualifiers and reasons for those qualifiers
- An appendix containing all completed water quality monitoring and surface sediment sample forms
- An appendix containing all calibration information
- A list of all of the best management practices (BMPs) employed during the project implementation, when and why those were used, and an assessment of the effectiveness of those BMPs

D General Conditions

1. Final project plans as described in the final removal design documents (Removal Action Project Plan and Appendices including Construction Quality Assurance Plan and Construction Water and Sediment Monitoring Plan) have been reviewed and approved by EPA. Contractor quality control plans will be provided to EPA for review and comment. EPA will review these plans to ensure that they are adequate and consistent with the RAPP. If necessary, EPA will provide comments to NW Natural. These plans should be consistent with and implemented in accordance with the terms and conditions of this WQC. Any significant additions, changes, modifications, and revisions to the Plans by the contractor selected to do the work shall require prior notification to and approval by EPA. If necessary, an amended WQC will be prepared by the EPA.

2. Containment system.

As described in the RAPP, containment of the dredge area for the protection of water quality will be accomplished primarily by installation of a silt curtain system. The silt curtain system will be installed prior to any in-water dredging at the site and will be consistent with the EPA-approved RAPP. The silt curtain system includes a series of both permeable and impermeable silt curtains (inner and outer containment areas), a bedload baffle system, floating booms and skirt, and a bubble curtain. The containment system will remain in-place throughout the construction period.

3. Fish timing window.

In order to minimize potential chemical and physical impacts from construction activities and suspended sediments to out-migrating juvenile salmonids utilizing the nearshore environment for migration and feeding, project in-water construction activities in Portland Harbor are limited to the periods from July 1 to October 31 and December 1 to January 31, unless timing extensions are specifically coordinated and approved by the appropriate resource agency.

4. Water Quality Standards.

Water quality standards (OAR, Chapter 340, Division 041) pertaining to the Lower Willamette River, except those human health criteria that may be impracticable, shall apply to this project as measured at a distance of 100 meters (328 feet) from the point of dredging (or 150 feet from the outer containment structure) (see Section IV.D.5; also see attached Table 1 for analytes and criteria). EPA expects that any short-term exceedances of any water quality standards will be outweighed by the long-term benefit of completing the Removal Action, but anticipates that all water quality standards will ~~to~~ be met at the compliance distances indicated below. The point of compliance with standards will be those stations described in Section IV.D.5. Within the compliance zone, the standard for turbidity and temperature are waived, as are the acute criteria applicable to any identified chemicals-of-concern. The standard for dissolved oxygen may be exceeded but shall not be caused to drop below 6.0 mg/l. The compliance distances outlined below are not an authorization to exceed those criteria concentrations for the entire duration of construction, but to allow the project to be implemented while using appropriate measures (BMPs) to reduce any potential exceedances of water quality criteria and/or negative impacts to beneficial uses. In no case does this WQC authorize degradation of water quality that significantly interferes with or becomes injurious to characteristic water uses, causes long-term harm, or impair beneficial uses.

Dissolved Oxygen. At the point of compliance, 100 meters (328 feet) from the point of dredging (or 150 feet from the outer containment structure), DO shall exceed 6.5 mg/L. At no time should dissolved oxygen drop below 6.0 mg/L at any station. Should this occur, then all in-water activities shall cease immediately, and EPA shall be notified. Work shall not resume until dissolved oxygen levels have returned to compliant levels and approval has been given by EPA.

pH. At the point of compliance, 100 meters (328 feet) from the point of dredging (or 150 feet from the outer containment structure), pH will remain between 6.5 and 8.5.

Temperature. The lower mainstem Willamette River has been designated as a salmonid migration corridor. At the point of compliance, 100 meters (328 feet) from the point of dredging (or 150 feet from the outer containment structure), seven-day average temperature shall not exceed 18.0°C. When ambient conditions exceed 18.0°C, no temperature increases will be allowed which will raise the receiving water temperature greater than 0.3°C. Should this occur, then all in-water activities shall cease immediately, and EPA shall be notified. Work shall not resume until temperature levels have returned to compliant levels and approval has been given by EPA.

Turbidity. At the point of compliance, 100 meters (328 feet) from the point of dredging (or 150 feet from the outer containment structure), turbidity shall not exceed 3 NTU over background turbidity when the background turbidity is 50 NTU or less, or have more than a 10 percent increase in turbidity when the background turbidity is more than 50 NTU. At no time should turbidity exceed

50 NTU over background. Should this occur, then all in-water activities shall cease immediately, and EPA shall be notified. Work shall not resume until turbidity levels have returned to compliant levels and approval has been given to EPA.

Chemicals of Concern (COCs). Whole water samples for chemicals of concern will be taken consistent with the Construction Water and Sediment Monitoring Plan (see attached Table 1 for analytes and criteria).

If DO, turbidity, or a COC acute standard is exceeded at a point of compliance, the steps outlined in Section IV.E Operational Response must be followed.

5. Compliance Determination.

For this project the entire water area within 328 feet (100 meters) of the approximate center of the construction operation is authorized as the project area. Observation reports and water quality data collected within and at the edge of the project area for any reason shall be provided to the EPA in a timely manner.

For all operations, ambient field water quality parameters will be monitored in the river 300 feet directly upstream (for background conditions) and 150 feet downstream of the operation. Three downstream stations will be monitored in an arc as depicted in Figure D-2 of the Construction Water and Sediment Monitoring Plan. As the river is tidally influenced at this location, if flow reversal is observed to occur during construction, then the sampling stations will be reversed to continue the down-current arc and up-current (for background conditions) pattern as appropriate.

For dredging operations, containment barriers, or silt curtains, will be deployed around active dredging operations. Where containment barriers are used, the locations for compliance and monitoring will be 150 feet upstream and downstream of the edge of the barrier, notwithstanding the two preceding paragraphs. Containment barriers may be deployed near other operations if initial observations indicate that they may reduce potential water quality impacts.

6. Water Quality Monitoring

Water quality monitoring will be conducted in accordance with the Construction Water and Sediment Monitoring Plan (WSMP) in Appendix D of the RAPP. The WSMP describes the water quality measurements, monitoring methods, and data collected that will be used in the assessment process described in the Removal Action Environmental Protection Plan (Appendix E of the RAPP). Any significant additions, changes, modifications, and revisions to the plan of field operations by the contractor selected to do the work requires prior notification and approval by EPA.

At least two weeks prior to the project start date, NW Natural must identify a Quality Assurance Official (QAO), or the individual that will perform onsite oversight and

coordination functions. The water quality monitoring field team should be prepared to obtain and process temperature, DO, pH, COC, and turbidity samples on any day they are in the field.

Monitoring will take place near each of the following operations:

- Dredging/Piling Removal or Placement
- Barge loading
- Transfer of dredged material to upland transport
- Upland processing
- Placement of cover/cap

Water quality monitoring will be conducted for the following parameters: field parameters turbidity (in nephelometric turbidity units (NTU), temperature (in degrees Celsius), dissolved oxygen (in mg/L), and pH (in standard units); and laboratory parameters PAHs (anthracene, benzo(a)pyrene, benzo(a)anthracene, fluoranthene, fluorene, naphthalene, dibenzofuran) and cyanide.

Sampling depths for both the field and laboratory parameters will be located at the approximate top, middle, and bottom of the water column if the water depth permits collecting samples from three intervals separated by at least 5 feet from each other. Top and bottom samples will be taken 1 foot below the surface of the water and above the mud line, respectively. Thus, for water depths less than 7 feet, two samples will be collected and for water depths less than 2 feet, one sample will be collected (sample approach shown on Figure D-1 of the WSMP)

Whole water samples will be taken for the dissolved PAHs and cyanide at one station immediately downstream of the operation at a distance of 100 meters (328 feet) from the point of dredging (or 150 feet from the edge of the last containment barrier). For the first sampling event, an upstream grab sample will also be taken to establish background conditions. Multiple depth-specific samples will be collected at the compliance point consistent with the description above.

Field parameters will be measured at the start of each operation at least once every hour during active in-water work. On any day active in-water work occurs, the first sample will be taken 1 hour after the initiation of the activity, and once at each 1-hour interval thereafter. This frequency of monitoring for field parameters will continue until four consecutive hourly events indicate no exceedance of any trigger levels described in Appendix D of the RAPP. If no exceedance is identified following four consecutive hourly events the sampling frequency will be reduced to every 4 hours. If results exceed the triggers presented in the RAPP, these same parameters will be measured again within 30 minutes of determination of the exceedance. If the exceedance continues, then procedures discussed in Section IV.E will be followed. Hourly frequency will resume if any visible decline in water quality is observed.

Laboratory parameters will be measured once a day for three consecutive days at the start of the project. These parameters will be measured once per week thereafter. If

substantial exceedances occur, additional monitoring events may be conducted as determined in consultation with EPA.

For field parameters only, initial background conditions for the Site will be established prior to the start of any active in-water work. A minimum of seven independent measurements at all applicable water depths will be made 300 feet upstream of the expected location of containment barriers around the work area over the course of a two-day period just prior to construction initiation. For each parameter, the 95th percentile upper confidence limit on the mean will be used to represent initial background conditions.

The background sampling for laboratory parameters will consist of one upstream event (with samples taken at the depths noted above) during the first sampling event.

7. Spills Prevention

Reasonable precautions and controls must be used to prevent incidental and accidental discharges of petroleum products or other deleterious or toxic materials from entering the water as a result of any in-water activities. Materials such as sorbent pads and booms must be available on-site and must be used to contain and clean up petroleum product spilled as a result of the in-water activities. If an oil sheen is observed, immediate corrective actions must be taken to modify the operation to prevent further degradation, or the activity must cease. EPA must be notified of the situation (see Section IV.C).

If such conditions are observed, monitoring for field and laboratory parameters following the above procedures will be conducted and procedures for protective measures as described in the RAEPP will be followed.

8. Silt Plume

Visual monitoring of any silt plumes generated by the construction activities will take place whenever construction is actively underway. It will be conducted by the Water Quality Monitoring Field Leader when present on-site and by the Construction Quality Assurance Officer at all other times. Observations will be made as to the presence of any of the following occurring outside containment barriers (where present):

- High turbidity that might reasonably result in exceedance of compliance triggers
- Sheens or other visible contamination in the water
- Distressed or dying fish

During in-water activities, if a large silt plume is observed in the vicinity of construction operations at any time, then a description of the color, source, and size of the plume must be recorded, and potentially additional water quality measurements collected. EPA must be notified and decisions coordinated (see Section IV.C). Any additional water quality measurements will be taken at the discretion of the Quality Assurance Official and EPA, and are intended to define the area of impact and assess the situation to allow informed decisions.

9. Material for Sand Capping

Clean, sandy material must be used, will be suitable for in-water disposal, and shall be free from fines and suspendable material to the extent practicable, and free from contamination by petroleum products or toxic substances in toxic amounts. Prior to placement of the cap material, the EPA Project Manager must be provided with information regarding the location/source of the material and detailed specifications of this material, including chemistry and grain size information, to determine its suitability as a clean cap material.

10. Debris Control

Floatable debris introduced into the river as a result of any construction activity will be collected and suitably disposed at an upland location.

E. Operational Response.

Construction Best Management Practices (BMPs; e.g., controlling descent and retrieval of bucket, controlled swing of filled bucket, placement of material into barge not dropping the material from height, as identified in the CQAP) are expected to be fully understood and followed during all construction operations. If construction operations are found not to be in compliance with the provisions of this certification (through monitoring results or direct observation by EPA-approved inspectors), or result in conditions causing distressed or dying fish, then the operator shall immediately take the following actions:

- 1) Cease operations at the location of the violation.
- 2) Assess the cause of the water quality problem and take appropriate measures to correct the problem and/or prevent further environmental damage. This may include increasing dredger cycling time, checking the equipment, or adjustment of other construction BMPs by the operator. The EPA expects that when water quality problems with the conventional constituents (e.g., turbidity, dissolved oxygen) are identified during monitoring, new samples will be collected *immediately* using recalibrated instruments or more precise measurement methods to confirm the initial indication. Regardless of whether the second sample confirms the initial measurement, EPA will be notified of the instance via the weekly report. If the second sample does not confirm the initial measurement, then construction may recommence with a third set of samples collected within 45 minutes of restart. Indications of a water quality problem in this third series will immediately trigger construction shut-down and notification to EPA. Construction will not be recommenced until specifically approved by EPA. It is strongly recommended that additional monitoring be initiated to determine the recovery time.

3) In the event of finding distressed or dying fish, the operator shall collect fish specimens and water samples in the affected area and, within the first hour of such conditions, have the water samples analyzed for dissolved oxygen and total sulfides. For distressed or dying fish the following, at a minimum, will be noted:

- Condition of fish (dead, dying, decaying, erratic or unusual behavior)
- Number, species, and size of fish in each condition
- Location of fish relative to operations
- Presence of any apparently healthy fish in the area at the same time
- Whether the species is a listed species

EPA may require further sampling and analyses before allowing the work to resume.

In the event the water quality monitoring field staff/coordinator detect a water quality exceedance at any in situ compliance monitoring station, the following sequence must be followed:

- a. Immediately alert the Quality Assurance Official (CAO).
- b. Immediately retake all depths at the station
- c. If passes, retake samples within 45 minutes of construction restart to confirm the pass. If confirmed as a pass, QAO informs the EPA (RMP and WQS) of resolved violation. Work may continue, however, this monitoring location should be evaluated carefully in subsequent monitoring efforts.
- d. If fails again, construction will be shut down and the QAO will inform the EPA (RMP and WQS) of ongoing violation and proposed actions to define and resolve the water quality problem.

In the event water quality monitoring COC results detect a chemistry water quality exceedance of chronic criteria at any compliance monitoring station, BMPs must be reassessed to address the exceedance(s). All BMPs employed in response to an exceedance of the water quality criteria must be recorded and an effectiveness determination must be made after the results from the subsequent monitoring are received.

In the event water quality monitoring COC results detect a chemistry water quality exceedance of acute criteria at any compliance monitoring station, the following sequence must be followed:

- a. Immediately stop construction work and alert the QAO and EPA (RMP and WQS) following receipt of lab results.
- b. Compliance boundary concentrations will be compared with those at the upstream ambient station to evaluate whether concentrations may be elevated as a result of the Removal Action, or may reflect area-wide water quality conditions. Removal Action operations may not continue during this review.
- c. Follow-up water quality samples will be collected within 12 hours at the compliance boundary and the upstream ambient station, and submitted for analysis with a maximum 72 hour turn-around time. Additional water quality in-situ and chemistry grab samples may be taken at the discretion of the QAO and EPA to gain additional information about the size and location of any identifiable plume or

potential source. Depending on the discussions/results of the deliberation in b. above, Removal Action operations may resume, may be altered, or may continue to be suspended pending the results of the additional testing. Pending receipt of the follow-up testing results, NW Natural will assemble a list of recommendations for addressing the exceedance if it is found, during the following testing, to persist.

d. The QAO and EPA will be notified of follow-up testing results. If concentrations in the follow-up monitoring indicate continuing exceedances of water quality criteria caused by the Removal Action, NW Natural and EPA will confer concerning additional sampling, implementation of operational controls, and/or re-evaluation of the compliance boundary for water quality chemical criteria.

In addition to turbidity monitoring, the cause of any observed silt plume generated by construction activities will be assessed and appropriate measures (e.g. change production rates, modify work schedule, perform work on a slower flow, etc.) will be taken to correct an identified problem if project operations are determined to be the source.

River velocity measurements will be conducted concurrently with the water quality monitoring activities as discussed in Appendix D of the RAPP. A water velocity trigger of 1 foot per second (fps) will be used to determine the need for ceasing operations at the removal area due to potential loss of silt curtain effectiveness. Exceedance of the water velocity trigger does not indicate a potential water quality impact. Rather, water velocity of 1 fps is a trigger to ensure that silt curtains are operating effectively while removal actions are taking place and should ensure that water quality impacts are avoided. If currents exceed 1 fps, operations will stop until currents are again below this velocity or the EPA has directed that operations may resume.

REVIEWED AND APPROVED BY:

John Malek
Sediment Management Program
Office of Ecosystems, Tribal and Public Affairs

Date

**Table 1
Water Quality Triggers for Additional Environmental Controls**

Parameter	Unit	Location	Trigger ^{a,c}		Action Triggered
Turbidity	Nephelometric Turbidity Units (NTU)	100 meters (328 feet) downstream from point of dredging or 150 feet downstream of containment barriers (whichever is greater) ^b	> 3 NTU over background (where background <50 NTU) >10% over background (where background >50 NTU) ^c >50 NTU over background, cease operations		Inspect construction and select an additional control(s) that focus on cause of exceedance
Dissolved Oxygen (DO)	mg/L	100 meters (328 feet) downstream from point of dredging or 150 feet downstream of containment barriers (whichever is greater) ^b	<6.5 modify operations <6.0 cease operations ^d		Inspect construction and select an additional control(s) that focus on cause of exceedance
pH	Standard units	100 meters (328 feet) downstream from point of dredging or 150 feet downstream of containment barriers (whichever is greater) ^b	<6.5 or >8.5		Inspect construction and select an additional control(s) that focus on cause of exceedance
Oil/Sheen	Visual Observation	Outside of outer containment barrier	Any visible oil/sheen present outside the outer containment barrier		Inspect construction and select targeted additional sheen control(s) from Section 3.1
			Aquatic Chronic	Aquatic Acute	
Anthracene	µg/L	100 meters (328 feet) downstream from point of dredging or 150 feet downstream of containment barriers (whichever is greater) ^b	0.73	13	For chronic, confirm standard controls and increase monitoring to once per day (see RAPP for exceedances of more than four consecutive days). For acute, stop operations, inspect construction and select an additional control(s) that focus on cause of exceedance
Benzo(a)anthracene			0.027	0.49	
Benzo(a)pyrene			0.014	0.24	
Dibenzofuran			3.7	66	
Fluoranthene			6.16	3,980	
Fluorene			3.9	70	
Naphthalene			12	190	
Cyanide			5.2	22	
Water Velocity	fps	Upstream and immediately in line with operation	1.0 fps		Stop operations and secure silt curtains and other containment barriers.
Distressed or Dead Fish	Visual Observation	Anywhere in proximity to site.	Any distressed, dying, or dead fish		Stop all operation, collect fish, determine species, notify Services if listed species present, apply controls required by Biological Opinion and/or additional controls for nonlisted species (see Section IV.E.3 for handling of distressed or dead fish.

^a If field parameter monitoring results exceed trigger, then the same field parameter will be measured within 30 minutes of the determination of the exceedance. If the exceedance continues, the additional controls discussed in Section 3 will be implemented.

b Sampling will occur at the specified distance from the edge of the outer containment barrier. Although flow reversals due to tidal fluctuations are rare in winter months on this part of the river, if such reversals are observed, sampling will be conducted up current (background) and down current for field parameters, as appropriate.

c Trigger is exceeded where downstream conditions exceed the specified amounts relative to the event-specific background or the preconstruction background survey.

d If DO levels fall below 6.5 mg/l, additional controls discussed in Section 3 will be implemented. If DO levels fall below 6.0 mg/L, operations will cease until DO levels rise above 6.0 mg/L and additional controls discussed in Section 3 will be implemented before resumption of work.

e If chronic levels are exceeded, see text for description of activities. If acute levels are exceeded, additional controls will be applied where activities are still consistent with activities at the time the sampling occurred.

References

NW Natural Gasco Site, Engineering Evaluation/Cost Analysis, dated May 2005. Prepared by Anchor Environmental for NW Natural for submittal to US Environmental Protection Agency, Region 10.

NW Natural Gasco Site, Final Remedial Action Project Plan, dated July 2005. Prepared by Anchor Environmental for NW Natural for submittal to US Environmental Protection Agency, Region 10. (includes Appendix D: Construction Water and Sediment Monitoring Plan and Quality Assurance Project Plan including the Water Quality Monitoring Plan and Appendix E: Removal Action Environmental Protection Plan)

U.S. Environmental Protection Agency (EPA) 2004a. Administrative Order on Consent for Removal Action between NW Natural and the U.S. Environmental Protection Agency. April 28, 2004.

Anchor Environmental, L.L.C., 2004a. "NW Natural "Gasco Site Removal Action Work Plan." Prepared for NW Natural. August 2004.