



DEPARTMENT OF
ECOLOGY
State of Washington

Draft Revisions

**Sediment Management Standards
(SMS)**

(Part V and Definitions)

Discussion Materials

**Prepared for the Sediment Cleanup Advisory
Committee**

October 2011 original draft

**November 2011 updated draft includes
freshwater standards**

Prepared by
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Summary

This document is designed to support discussions on revisions to the Part II Definitions and Part V of the Sediment Management Standards (SMS) rule. The document includes the following draft revisions:

Section 200 Definitions: Definitions have been added to reflect changes in the rule to clarify existing terms or existing definitions in the rule and define new terms added to the rule. The following definitions have been added or revised:

Definitions added to clarify existing terms:

Active cleanup action
Anthropogenic
Applicable state and federal laws
Biologically active zone
Chronic bioassays
Cleanup action
Cleanup screening level
Contaminated sediment
Department
Enhanced natural recovery
Include
Natural recovery
Non-anthropogenically affected
Sediment
Sediment cleanup standard
Sediment quality standard
Site

Existing definitions clarified:

Acute
Best management practices
Chronic
Sediment cleanup units

New definitions to define new terms:

Maximum allowable level
Regional background

Section 500 - Sediment Cleanup Decision Process and Policies:

- This section has been revised to clarify the cleanup decision process and the department's thinking on how to conduct cleanup under the paradigm of widespread contamination of ubiquitous, bioaccumulative chemicals from numerous sources. This includes:
- Clarification on establishing site units and approving partial settlements.
- Process for settling cleanup liability and options for addressing recontamination of a cleaned up site.
- Clarification on cleanup timeframes.
- Emphasis on source control measures.

Section 520 - Cleanup screening levels criteria:

- Re-titled: "Sediment cleanup standards based on benthic toxicity in marine sediment".
- Moved to new Section -572 to be incorporated into the Maximum allowable level/Sediment cleanup objective two tier framework.

- Limited application of the “cleanup screening level” term to marine benthic toxicity and other toxic, deleterious, radioactive substances narrative.
- Removed the human health narrative and added human health criteria to new section - 571.

Section -550 Types of cleanup authority:

- “Voluntary cleanup” changed to “Other party initiated cleanup” to reflect the reality that sediment cleanups cannot be done without an agency permit (and thus oversight) and thus by definition under MTCA, are not independent or voluntary cleanups.
- “Partial cleanup” sub section removed and replaced with text in -500(2)(b) “Partial settlements”.

Section -560 Cleanup Study:

- Re-titled “Remedial Investigation and Feasibility Study”
- This section was revised to focus on the content required to develop a remedial investigation and feasibility.
- The requirements for remedy selection were moved to section -580.
- The requirements for sediment impact zones moved to Section -590.
- Terminology was revised to harmonize with MTCA.
- Added MTCA requirements to the SMS requirements to develop a remedial investigation/feasibility study work plan and report.

Section -570 Sediment Cleanup Standards:

- The existing two tier framework of an upper and lower tier of allowable concentrations used to determine a cleanup standard was maintained but revised to include new a term “maximum allowable level” that replaces the previous terms “cleanup screening level” and “minimum cleanup level”.
- This change was necessary to incorporate the process to determine cleanup standards based on risks to human and ecological health from bioaccumulative chemicals, risks to the benthic community for freshwater and marine sediment, and how to incorporate background chemical concentrations.

New sections added to -570:

- **-571: “Sediment cleanup standards based on risks to human health”.**
 - This replaces the narrative standard for protection of human health.
 - Additions include:
 - Risk levels.

- How to incorporate background concentrations.
 - Some specifics on determining risk.
- **-572: “Sediment cleanup standards based on benthic toxicity in marine sediment”.**
 - This language is from section -520.
 - It has been moved into this section for clarity.
 - The “cleanup screening level” terminology has been clarified to apply only to benthic criteria.
 - The human health narrative standard has been removed.
 - The numeric and chemical benthic criteria have not been changed.
- **-573: “Sediment cleanup standards based on benthic toxicity in freshwater sediment”.**
 - This section replaces the freshwater narrative standard.
 - November 2011: Language has been added to include numeric biological and chemical cleanup criteria consistent with the current marine benthic criteria framework in new section -572. This criteria was developed to be protective of the benthic community and does not include bioaccumulative effects to human or ecological health.
- **-574: “Sediment cleanup standards based on ecological risks from bioaccumulative chemicals”.** This language is new to address ecological risks from bioaccumulative chemicals.

Section -580 Selection of cleanup action:

- Re-titled “Selection of cleanup actions”.
- This section was revised to focus on the requirements that must be met to evaluate alternatives and select a preferred remedy.
- Cleanup action decisions language was moved to new section -585.
- Remedial investigation/feasibility study content language was moved to section -560.
- Terminology has been revised to harmonize with MTCA.
- MTCA remedy selection requirements were added to the current SMS requirements.
- The MTCA “disproportionate cost” and SMS “cost effectiveness” terms and concepts have been integrated.
- The SMS “cost, technical feasibility, and net environmental effects” provision for determining sediment cleanup standards and remedy selection were integrated with the MTCA remedy selection provisions.

Section -585 Cleanup action decision:

- New section added to separate the cleanup action decision from development of the remedial investigation and feasibility and the remedy selection process.
- Terminology was revised to harmonize with MTCA.
- Added MTCA requirements to the SMS requirements for cleanup action decisions.

Section -590 Sediment recovery zones:

- New language added to clarify requirements for establishing, approving, and maintaining a sediment recovery zone.
- Requirements were added to be more consistent with section -415, Sediment Impact Zones.

NOTE: The following rule language proposed to be deleted is shown in ~~blue with a strikeout~~, proposed new language is shown in underlined purple, and unrevised language is shown in black.

Chapter 173-204 WAC
SEDIMENT MANAGEMENT STANDARDS

PART I -- GENERAL INFORMATION

- 173-204-100 Authority and purpose.
- 173-204-110 Applicability.
- 173-204-120 Antidegradation and designated use policies.
- 173-204-130 Administrative policies.

PART II -- DEFINITIONS

- 173-204-200 Definitions.¹

PART III -- SEDIMENT QUALITY STANDARDS

- 173-204-300 Purpose.
- 173-204-310 Sediment quality standards designation procedures.
- 173-204-315 Confirmatory marine sediment biological tests.
- 173-204-320 Marine sediment quality standards.
- 173-204-330 Low salinity sediment quality standards.
- 173-204-340 Freshwater sediment quality standards.
- 173-204-350 Sediment quality standards inventory.

PART IV -- SEDIMENT SOURCE CONTROL

- 173-204-400 General considerations.
- 173-204-410 Sediment quality goal and sediment impact zone applicability.
- 173-204-412 Marine finfish rearing facilities.
- 173-204-415 Sediment impact zones.
- 173-204-420 Sediment impact zone maximum criteria.

PART V -- SEDIMENT CLEANUP STANDARDS

¹ Highlighted sections in the table of contents have been revised or added.

| | |
|-------------|-----------------------------------------------------------------------------------------------------------|
| 173-204-500 | Overview of sediment cleanup decision process and policies. |
| 173-204-510 | Screening sediment station clusters of potential concern. |
| 173-204-520 | Cleanup screening levels criteria. |
| 173-204-530 | Hazard assessment and site identification. |
| 173-204-540 | Evaluating and list of sites. |
| 173-204-550 | Types of cleanup and authority. |
| 173-204-560 | Remedial investigation and feasibility study. |
| 173-204-570 | Sediment cleanup standards - General considerations. |
| 173-204-571 | Sediment cleanup standards based on risks to human health. |
| 173-204-572 | Cleanup screening levels based on benthic toxicity in marine sediment. |
| 173-204-573 | Cleanup screening levels and sediment quality standards based on benthic toxicity in freshwater sediment. |
| 173-204-574 | Sediment cleanup standards based on ecological risks from bioaccumulative chemicals. |
| 173-204-580 | Selection of cleanup actions. |
| 173-204-585 | Cleanup action decisions. |
| 173-204-590 | Sediment recovery zones. |

PART VI -- SAMPLING AND TESTING PLANS/RECORDKEEPING

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|-------------|--------------------------------------|
| 173-204-600 | Sampling and testing plan standards. |
| 173-204-610 | Records management. |
| 173-204-620 | Severability. |

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PART II--DEFINITIONS

WAC 173-204-200 Definitions. In cases where a definition does not exist in this chapter, the definitions in WAC 173-340 will apply. For the purpose of this chapter, the following definitions shall apply:

(1) "Active cleanup action"² means those engineered controls as defined in WAC 173-340-200 requiring physical construction to meet the sediment cleanup standard. Active cleanup actions include dredging, capping, and enhanced natural recovery. Passive actions such as natural recovery and institutional controls are not active cleanup actions.

(2) "Acute" means measurements of biological effects using sediment bioassays conducted for time periods that are relatively short in comparison to the life cycle of the test organism. Acute effects may include mortality, larval abnormality, or other endpoints determined appropriate by the department.

(3) "Amphipod" means crustacean of the Class Amphipoda, e.g., Rhepoxynius abronius, Ampelisca abdita, or Eohaustorius estuarius.

(4) "Anthropogenic"³ means created by humans or caused by human activity.

(5) "Applicable state and federal laws"⁴ means all legally applicable requirements and those requirements that the department determines, based on the criteria in WAC 173-340-710(3), are relevant and appropriate requirements.

(6) "Appropriate biological tests" means only tests designed to measure directly, or through established predictive capability, biologically significant adverse effects to the established or potential benthic or aquatic resources at a given location, as determined by rule by the department.

(7) "Beneficial uses" means uses of waters of the state which include but are not limited to use for domestic, stock watering, industrial, commercial, agricultural, irrigation, mining, fish and wildlife maintenance and enhancement, recreation, generation of electric power, and preservation of environmental and aesthetic values, and all other uses compatible with the enjoyment of the public waters of the state.

(8) "Best management practices" or "BMPs" means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution in sediments of the state. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or water disposal, or drainage from raw material storage.

(9) "Bioassay" means a test procedure or biological assessment that measures the response of living plants, animals, or tissues to a sediment sample.

² Added to clarify existing SMS rule language.

³ Added to clarify existing SMS rule language.

⁴ Added to clarify existing SMS rule language.

36 (10) "Biologically active zone"⁵ means the area within the sediment in which a majority
37 of benthic macroinvertebrates are generally found. By default this is the uppermost 10
38 centimeters in marine sediment. Where the department determines the default criteria are not
39 applicable, a site specific biologically active zone shall be determined. Information such as the
40 vertical distribution of benthic macroinvertebrates can be gathered to delimit the site specific
41 biologically active zone.

42 (11) "Chronic" means measurements of biological effects using sediment bioassays
43 conducted for, or simulating, prolonged exposure periods of not less than one complete life
44 cycle, evaluations of indigenous field organisms for long-term effects, assessment of biological
45 effects resulting from bioaccumulation and biomagnification, and/or extrapolated values or
46 methods for simulating effects from prolonged exposure periods. Chronic effects may include
47 mortality, reduced growth, impaired reproduction, histopathological abnormalities, adverse
48 effects to birds and mammals, or other endpoints determined appropriate by the department.

49 (12) "Cleanup action" means any actions taken at a sediment site or sediment cleanup
50 unit to eliminate, render less toxic, stabilize, contain, immobilize, isolate, treat, destroy, or
51 remove contaminated sediment to achieve the sediment cleanup standards throughout the site or
52 sediment cleanup unit.

53 (13) "Cleanup Screening Level"⁶ means chemical concentration criteria, biological
54 effects criteria or other toxic, radioactive, biological, or deleterious substances criteria, and non-
55 anthropogenically affected sediment quality criteria which are used to identify sediments that
56 have minor adverse effects on biological resources per procedures in WAC 173-204-572 through
57 173-204-573.

58 (14) "Contaminated sediment"⁷ means ~~surface sediment designated under the procedures~~
59 ~~of WAC 173-204-310 as exceeding the applicable sediment quality standards of WAC 173-204-~~
60 ~~320 through 173-204-340 exceeding natural background as defined in 173-340.~~⁸

61 (15) "Control sediment sample" means a sediment sample which is relatively free of
62 contamination and is physically and chemically characteristic of the area from which bioassay
63 test animals are collected. Control sediment sample bioassays provide information concerning a
64 test animal's tolerance for stress due to transportation, laboratory handling, and bioassay
65 procedures. Control sediment samples cannot exceed the applicable sediment quality standards
66 of WAC 173-204-320 through 173-204-340.

67 (16) "Department" means the department of ecology.

⁵ Added to clarify existing SMS rule language and current policy for determining the biologically active zone.

⁶ Added an existing SMS rule term from section -520 to the definitions section. Removed the reference to human health criteria as that is included in a new "Maximum allowable level" term and definition. This term now refers to benthic toxicity chemical and biological criteria only.

⁷ Revised to be consistent with MTCA for the definition of contaminated media, clarify existing terminology, and incorporate the human health and background framework.

⁸ This change was made to be consistent with MTCA WAC 173-340.

68 (17) "Enhanced natural recovery"⁹ means, but may not be limited to, thin layer capping
69 of a clean layer of sediment over an area of contaminated sediment to reduce the toxicity or
70 concentration of contaminated sediment.

71 (18) "Freshwater sediments" means sediments in which the sediment pore water contains
72 less than or equal to 0.5 parts per thousand salinity.

73 (19) "Include"¹⁰ means included but not limited to.

74 (20) "Low salinity sediments" means sediments in which the sediment pore water
75 contains greater than 0.5 parts per thousand salinity and less than 25 parts per thousand salinity.

76 (21) "Marine finfish rearing facilities" shall mean those private and public facilities
77 located within state waters where finfish are fed, nurtured, held, maintained, or reared to reach
78 the size of release or for market sale.

79 (22) "Marine sediments" means sediments in which the sediment pore water contains 25
80 parts per thousand salinity or greater.

81 (23) "Maximum Allowable Level"¹¹ means the maximum allowed concentration of any
82 hazardous substance and level of biological effects permissible at the site per procedures in
83 WAC 173-204-570(4) after completion of the cleanup action. This is the upper level of the range
84 for establishing cleanup standards.

85 (24) "Minor adverse effects" means a level of effects that:

86 (a) Has been determined by rule by the department, except in cases subject to WAC 173-
87 204-110(6); and

88 (b) Meets the following criteria:

89 (i) An acute or chronic adverse effect to biological resources as measured by a
90 statistically and biologically significant response relative to reference in no more than one
91 appropriate biological test as defined in WAC 173-204-200~~(3)~~(9); or

92 (ii) A statistically and biologically significant response that is significantly elevated
93 relative to reference in any appropriate biological test as defined in WAC 173-204-200~~(3)~~(9); or

94 (iii) Biological effects per (b)(i) or (ii) of this subsection as predicted by exceedance of an
95 appropriate chemical or other deleterious substance standard, except where the prediction is
96 overridden by direct biological testing evidence pursuant to (b)(i) and (ii) of this subsection; and

97 (c) Does not result in significant human health risk as predicted by exceedance of an
98 appropriate chemical, biological, or other deleterious substance standard.

⁹ Added to clarify existing concepts in SMS rule language and distinguish differences with "natural recovery".

¹⁰ Clarification term, consistent with MTCA.

¹¹ New term added to reflect the framework that includes human health risk and background to determine cleanup standards.

99 (25) "Natural recovery"¹² means physical, chemical or biological processes that act,
100 without human intervention, to reduce the toxicity or concentration of contaminated sediment.
101 The most common form of natural recovery is the natural deposition of a layer of clean sediment
102 over an area of contaminated sediment resulting in burial of contaminated sediment below the
103 biologically active zone.

104 (26) "No adverse effects" means a level of effects that:

105 (a) Has been determined by rule by the department, except in cases subject to WAC 173-
106 204-110(6); and

107 (b) Meets the following biological criteria:

108 (i) No acute or chronic adverse effects to biological resources as measured by a
109 statistically and biologically significant response relative to reference in any appropriate
110 biological test as defined in WAC 173-204-200~~(3)~~(9); and

111 (ii) No acute or chronic adverse biological effect per (b)(i) of this subsection as predicted
112 by exceedance of an appropriate chemical or other deleterious substance standard, except where
113 the prediction is overridden by direct biological testing evidence pursuant to (b)(i) of this
114 subsection; and

115 (iii) Does not result in significant human health risk as predicted by exceedance of an
116 appropriate chemical, biological, or other deleterious substance standard.

117 (27) "Non-anthropogenically affected"¹³ means not created by humans or caused by
118 human activities.

119 (28) "Other toxic, radioactive, biological, or deleterious substances" means contaminants
120 which are not specifically identified in the sediment quality standards chemical criteria of WAC
121 173-204-320 through 173-204-340 (e.g., organic debris, tributyltin, DDT, etc.).

122 (29) "Person" means an individual, firm, corporation, association, partnership,
123 consortium, joint venture, commercial entity, industry, private corporation, port district, special
124 purpose district, irrigation district, unit of local government, state government agency, federal
125 government agency, Indian tribe, or any other entity whatsoever.

126 (30) "Practicable" means able to be completed or achieved in consideration of net
127 environmental effects, technical feasibility, and cost.

128 (31) "Puget Sound basin" or "Puget Sound" means:

129 (a) Puget Sound south of Admiralty Inlet, including Hood Canal and Saratoga Passage;

130 (b) The waters north to the Canadian border, including portions of the Strait of Georgia;

131 (c) The Strait of Juan de Fuca south of the Canadian border; and

132 (d) All the lands draining into these waters as mapped in water resources inventory areas

¹² Added to clarify an existing term in the SMS rule and distinguish from "enhanced natural recovery".

¹³ Added to clarify an existing term in the SMS rule and distinguish from "anthropogenic".

133 numbers 1 through 19, set forth in water resources management program established pursuant to
134 the Water Resources Act of 1971, chapter 173-500 WAC.

135 (32) "Puget Sound protocols" means *Puget Sound Estuary Program. 1986. As amended.*
136 *Recommended Protocols for Measuring Selected Environmental Variables in Puget Sound, U.S.*
137 *Environmental Protection Agency, Region 10, Seattle, WA* (loose leaf).

138 (33) "Regional Background"¹⁴ means: Within a department defined geographic area,
139 widespread concentrations of any hazardous substances or toxic, radioactive, biological or
140 deleterious substances in sediment, not primarily attributable to identifiable contaminants from
141 specific sources or releases.

142 Regional background is intended to include low level ubiquitous concentrations of
143 hazardous substances;

144 Regional background concentrations are generally expected to be greater than or equal to
145 natural background and less than area background as defined in WAC 173-340-200.

146 Calculation of regional background must exclude areas with an elevated level of
147 contamination due to the direct influence of known or suspected contaminant sources including,
148 but not limited to, areas within a sediment cleanup unit.

149 Examples of a geographic area to determine regional background could include, but are
150 not limited to, that portion of an embayment or watershed outside the areas with contamination
151 attributable to one or more specific sources;

152 If a waterbody is not beyond the direct influence of a significant source, the department
153 shall approve alternative geographic approaches to determine regional background. Several
154 factors must be evaluated when determining an alternate geographic approach including:

155 (a) Proximity to the site;

156 (b) Similar geologic origins;

157 (c) Similar fate and transport and biological activities; and

158 (d) Chemical similarity.

159 (34) "Reference sediment sample" means a sediment sample which serves as a laboratory
160 indicator of a test animal's tolerance to important natural physical and chemical characteristics of
161 the sediment, e.g., grain size, organic content. Reference sediment samples represent the
162 nonanthropogenically affected background sediment quality of the sediment sample. Reference
163 sediment samples cannot exceed the applicable sediment quality standards of WAC 173-204-320
164 through 173-204-340.

165 (35) "Sediment"¹⁵ means particulate matter settled or present as particles on the bed or
166 bottom of a body of water to which biota or humans may potentially be exposed and:

¹⁴ Added to reflect the new framework that incorporates anthropogenic background concentrations.

¹⁵ Added to clarify the existing term in the SMS rule. Definition was developed from definitions in ASTM standards and the WPCA 173-201A.

167 (a) The surface water is present in the water body for a minimum of six contiguous weeks
168 on an annual basis; or

169 (b) The sediment is located at or below the ordinary high water mark.

170 (c) Sediment can include particulate matter located in the biologically active zone or
171 exposed to the water column by human activity (e.g. dredging), pore water flux, or other
172 hydrological or natural action.

173 (36) "Sediment cleanup objective"¹⁶ means the concentration of any hazardous substance
174 or other toxic, radioactive, biological or deleterious substance in sediment at or below adverse
175 effects levels to biota or humans as per procedures in 173-204-570(3). This is the lower level of
176 the range for establishing cleanup standards and evaluating remedial alternatives and the goal of
177 reducing and ultimately eliminating adverse effects on biological resources and significant health
178 threats to humans.

179 (36) "Sediment cleanup standard"¹⁷ means a department approved concentration in
180 sediment that must be met within a site or sediment cleanup unit. The standard shall be
181 established within an allowable range of contamination. The lower end of the range is the
182 sediment cleanup objective per WAC 173-204-570(3). The upper end of the range is the
183 maximum allowable level per WAC 173-204-570(4). The cleanup standard is established
184 considering technical feasibility, net environmental effects, and cost. The cleanup standard shall
185 be applied within the biologically active zone as determined by the department.

186 (38) "Sediment impact zone" means an area where the applicable sediment quality
187 standards of WAC 173-204-320 through 173-204-340 are exceeded due to ongoing permitted or
188 otherwise authorized wastewater, storm water, or nonpoint source discharges and authorized by
189 the department within a federal or state wastewater or storm water discharge permit, or other
190 formal department authorization.

191 (39) "Sediment quality standard"¹⁸ means chemical concentration criteria, biological
192 effects criteria or other toxic, radioactive, biological, or deleterious substances criteria, and non-
193 anthropogenically affected sediment quality criteria which are used to identify sediments that
194 have no adverse effects on biological resources per procedures in WAC 173-204-320¹⁹ and 173-
195 204-573.²⁰

196 (40) "Sediment recovery zone" means an area where the applicable sediment ~~quality~~
197 ~~standards of WAC 173-204-320 through 173-204-340~~ cleanup objective identified in 173-204-
198 ~~570²¹~~ are exceeded as a result of historical ~~discharge activities, releases and ongoing releases,~~²²

¹⁶ Added to clarify an existing concept and term in the SMS rule. Incorporated when the term applies.

¹⁷ Added to clarify an existing concept and term in the SMS rule. Incorporated how the term applies.

¹⁸ Added an existing SMS rule term from section -520 to the definitions section. Removed the reference to human health criteria as that is included in the "Sediment cleanup objective" term and definition. This term now refers to benthic toxicity chemical and biological criteria only.

¹⁹ References the marine benthic sediment quality standards.

²⁰ References the freshwater benthic sediment quality standards.

²¹ Replaced with the proper term that incorporates human health and background criteria.

199 and authorized by the department as a result of a cleanup decision made pursuant to WAC 173-
200 204-~~580~~585, Cleanup action decision.

201 (41) "Site Sediment cleanup unit" means a discrete subdivision(s) of ~~an individual-~~
202 ~~contaminated~~²³ sediment site ~~designated by the department that are being evaluated~~ for the
203 purpose of establishing a sediment cleanup standards. ~~Site units are based on consideration of A~~
204 sediment cleanup unit may be established based on unique chemical concentrations or
205 parameters, locational, environmental, spatial, contaminant source characteristics, or other
206 conditions methods determined appropriate by the department, e.g., development related
207 cleanups, cleanup under piers, cleanup in eelgrass beds, and cleanup in navigational lanes.

208 (42) "Site"²⁴ means the same as "facility" as defined in WAC 173-340-200.

209 (43) "Surface sediment" means sediment located in the biologically active zone or
210 exposed to the water column. Surface sediment(s) can also include settled particulate matter
211 exposed by human activity (e.g., dredging) to the biologically active aquatic zone or to the water
212 column by human activity (e.g., dredging), pore water flux, or other hydrological or natural
213 action.

214 (44) "Test sediment" means a sediment sample that is evaluated for compliance with the
215 sediment quality standards of WAC 173-204-320 through 173-204-340 and/or the sediment
216 impact zone maximum criteria of WAC 173-240-420 and/or the cleanup screening levels cleanup
217 criteria of WAC 173-204-~~520~~ 570 through 173-204-574.

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²² Revised to reflect sources other than discharges.

²³ Redundant language.

²⁴ Added to be consistent with MTCA WAC 173-340 and harmonize terminology.

29 (h) Documenting the cleanup action decision and soliciting public review of that decision
30 (WAC173-204-585); and

31 (i) Where necessary, authorizing a ~~cleanup-site~~ sediment recovery zone (WAC 173-204-
32 590).

33 ~~(2) Under this chapter, the department may require or take those actions necessary to~~
34 ~~implement the standards of WAC 173-204-500 through 173-204-580 for all contaminated~~
35 ~~sediment stations on the inventory identified in WAC 173-204-350.~~

36 **(3) Coordination with other laws.** The cleanup process and procedures under this
37 chapter and under other laws may be combined. ~~The department may initiate a cleanup action~~
38 ~~under this chapter and may upon further analysis determine that another law is more appropriate,~~
39 ~~or vice versa.~~²⁶ Sediment investigations and cleanups conducted in compliance with this chapter
40 shall be presumed to also meet the substantive requirements in Chapter 173-340 WAC. For
41 example, a remedy selected under WAC 173-204-580 meets the requirements in 173-340-360.

42 **(4) Cleanup process expectations.** The department has the following expectations
43 regarding the cleanup process at sediment sites. These expectations are non-binding and there
44 may be sites where cleanup actions conforming to these expectations are not appropriate:

45 (a) Scale of cleanups. Sediment contamination is often widespread, caused by multiple
46 sources that have intermingled and dispersed over a wide area by natural currents and human
47 activity. It is the department's intent to address this widespread contamination using multiple
48 approaches that lead to cleanup as effectively and efficiently as possible. This may involve, for
49 example:

50 (i) The use of partial cleanups or "sediment cleanup units" (see definition in WAC 173-
51 204-200) that serve to provide more expeditious cleanup in portions of larger sites in a manner
52 that is consistent with broader scale cleanup strategies;

53 (ii) Cleanup of multiple sources and wide-spread contamination coordinated on a bay-
54 wide, area-wide, or watershed-wide scale; and

55 (iii) Use of aggressive source control measures to minimize future contamination.

56 (b) Recontamination. Recontamination of sediment at remediated sites or sediment
57 cleanup units may occur from ongoing discharges or through the dispersal of contaminants from
58 other contaminated sediments in the bay or watershed. It is the department's expectation that
59 further cleanup of this recontamination will not be required by the person(s) conducting the
60 initial cleanup when the recontamination is not under the authority or responsibility of the
61 person(s) conducting the initial cleanup.

62 (c) Cleanup time frame. WAC 173-204-580(3)(e) establishes the timeframe requirements
63 for the restoration of sediment sites. The department expects that sediment sites and cleanup
64 units with limited contamination will be restored within a single construction season using active
65 cleanup methods such as dredging or capping. The department recognizes other sediment

²⁶ Moved to section -550.

66 cleanups may have to occur over a longer time frame due to the nature and extent of
67 contamination and the cleanup technology used. In these latter cases, it is the department's
68 expectation that most of these sites will use active cleanup technologies, in combination with
69 more passive technologies, to achieve restoration within a timeframe of 10 years from the start of
70 a cleanup. The department recognizes that longer restoration time frames may be necessary in
71 cases such as urban areas with widespread contamination and numerous point and nonpoint
72 source discharges.

73 (d) Sediment recovery zones. WAC 173-204-590 establishes requirements for sediment
74 recovery zones. The department expects that sediment recovery zones will be used where it is
75 clear that a short restoration timeframe is not possible. At these sites the department expects that
76 the sediment cleanup standards will be established as close as practicable to the sediment cleanup
77 objective and the sediment recovery zone will be managed in accordance with WAC 173-204-
78 590.

79 (e) Compliance monitoring. The department expects that post-cleanup monitoring will be
80 conducted at cleanup sites and sediment cleanup units to verify compliance with approved
81 cleanup standards. Monitoring will typically include sediment chemistry and bioassays at a
82 minimum but may also include pore water and surface water testing, tissue analyses, and more
83 intense discharge monitoring than would normally occur under a discharge permit where
84 circumstances warrant.

85 (f) Scope of information. The scope of information needed to adequately characterize
86 different sites will vary depending on site conditions and complexity. The department
87 recognizes it may not always be financially feasible to completely characterize very complex
88 sites. In these situations it is the department's expectation that sufficient information will be
89 gathered to enable appropriate decisions and cleanups to proceed expeditiously. Steps in the
90 cleanup process may be combined to facilitate faster cleanups where appropriate.

91 ~~(5)~~ (g) Timely decisions. The department shall endeavor to make sediment cleanup
92 decisions in an expeditious manner, as soon as all needed information is available, consistent
93 with the availability of department resources and the priority of the cleanup site.

94 ~~(4)~~ **(5) Relationship between the sediment cleanup objective, sediment cleanup**
95 **standards, and cleanup actions.** It is the policy of the department to ~~manage~~ select sediment
96 cleanup standards and cleanup actions towards that support the goal of reducing and ultimately
97 eliminating adverse effects on biological resources and significant health threats to humans from
98 sediment contamination.

99 (a) Sediment cleanup objective. The sediment cleanup objective defines the chemical
100 concentrations or biological effect levels that protect human health and environment. WAC 173-
101 204-570 establishes methods and policies for sediment cleanup objectives based on protecting
102 human health and the environment. In some cases, the sediment cleanup objective calculated
103 using the methods and policies in this chapter may be below natural background levels or levels
104 that can be reliably measured. In these situations, the sediment cleanup objective is established
105 at a concentration equal to the practical quantitation limit or natural background, whichever is

106 higher.

107 (b) Sediment cleanup standards. WAC 173-204-570 establishes requirements for
108 sediment cleanup standards. Sediment cleanup standards define the chemical concentrations or
109 biological effects levels that that must be achieved through active cleanup measures. Sediment
110 cleanup standards shall be established as close as practicable to the sediment cleanup objective
111 based on consideration of net environmental effects, technical feasibility, and cost.

112 (c) Cleanup actions. WAC 173-204-580 establishes requirements for cleanup actions.
113 Most cleanup actions consist of a combination of technologies to achieve sediment cleanup
114 standards within the biologically active zone. Cleanup technologies include:

115 (i) Active cleanup actions. Sediment contamination may be addressed by active cleanup
116 actions such as removal, treatment, capping, or enhanced natural recovery. Active cleanup
117 actions are preferred over more passive actions.

118 (ii) Source control. Sediment contamination may also be addressed by controlling
119 ongoing sources including wastewater discharges or stormwater discharges. Source control
120 measures are considered a necessary component of effective cleanup to reduce the risk of
121 recontamination.

122 (iii) Passive cleanup actions. Cleanup actions such as natural recovery and long term
123 monitoring may be used in combination with source control measures to supplement active
124 cleanup actions for the site or sediment cleanup unit.

125 **(6) Applicability of new cleanup standards.**²⁷

126 (a) The department shall determine the standards that apply to a site or sediment cleanup
127 unit based on the rules in effect under this chapter at the time the department issues a final
128 cleanup action plan or similar decision document as described in WAC 173-204-585.

129 (b) Cleanup standards determined in (a) of this subsection shall not be subject to further
130 cleanup action due solely to subsequent amendments to the provisions in this chapter on cleanup
131 standards, unless the department determines that the previous cleanup action is no longer
132 sufficiently protective of human health and the environment.

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²⁷ Added to reflect the concern Ecology has heard about imposing new standards upon cleanup that have been approved by Ecology and are awaiting cleanup or have been cleaned up.

WAC 173-204-510 Screening sediment stations clusters of potential concern

(1) Sediment quality standards inventory.

(2) Station clusters.

(3) Notification.

(4) No further cleanup action.

(5) Re-evaluation.

(1) **Sediment quality standards inventory.** Using the sediment quality standards inventory of WAC 173-204-350, the department shall analyze the sediment sampling data to identify station clusters of potential concern and station clusters of low concern. ~~per the standards of this section.~~ Station clusters of potential concern shall be further evaluated using the hazard assessment standards of WAC 173-204-530. Station clusters of low concern shall remain on the inventory and no further cleanup action determinations shall be taken by the department until the stations are reexamined per subsection (5) of this section.

(2) **Station clusters.** A station cluster is defined as any number of stations from the inventory of WAC 173-204-350 that are determined to be spatially and chemically similar. For the purpose of identifying a station cluster of potential concern ~~per the procedures of this subsection,~~ three stations with the highest contaminant concentration for any particular contaminant or the highest degree of biological effects as identified in WAC 173-204-520~~72~~ ²⁸ through 173-204-573 are selected from a station cluster. This procedure may be repeated for multiple chemicals ~~identified in WAC 173-204-520,~~ ²⁹ recognizing that the three stations with the highest concentration for each particular contaminant may be different and the respective areas for all chemicals may overlap. The department shall review the inventory of WAC 173-204-350 to identify station clusters of potential concern via the following process:

(a) Identify if available, the three stations within a station cluster with the highest concentration of each chemical contaminant identified in WAC 173-204-520 ~~72~~ through 173-204-573, Cleanup screening levels criteria; and

~~(b)~~ (i) For each contaminant identified in (a) of this subsection, determine the average concentration for the contaminant at the three stations identified ~~in (a) of this subsection;~~ and

~~(d)~~ (ii) If the average chemical contaminant concentration for any three stations identified in (a) of this subsection, exceeds the applicable cleanup screening level in WAC 173-204-520 ~~572~~ through 173-204-573, then the station cluster is defined as a station cluster of potential concern; and

²⁸ Changed to reflect the move of section -520 to new section -572 and the future addition of proposed freshwater chemical and biological numeric criteria in section -573.

²⁹ Changed to reflect the move of section -520 to new section -572.

35 ~~(e)~~ (b) Identify if available, three stations within the station cluster with the highest level
36 of biological effects for the biological tests identified in WAC 173-204-315(1) and 173-204-573;
37 and

38 ~~(e)~~ (i) If the biological effects at each of the three stations from ~~(e)~~ (b) of this subsection
39 exceeds the cleanup screening level in WAC 173-204-520 572 through 173-204-573, then the
40 station cluster is defined as a station cluster of potential concern; and

41 ~~(f)~~ (ii) If neither of the conditions of ~~(d)~~ (a)(ii) or ~~(e)~~ (b)(i) of this subsection apply, then
42 the station cluster is defined as a station cluster of low concern; and

43 ~~(g)~~ (c) If the department determines that any three stations within a station cluster exceed
44 the sediment ~~cleanup screening levels~~ maximum allowable level human health criteria in WAC
45 173-204-571³⁰ or the other toxic, radioactive, biological, or deleterious substances criteria or the
46 nonanthropogenically affected criteria of WAC 173-204-520 572 through 173-204-573, then the
47 station cluster is defined as a station cluster of potential concern.

48 **(3) Notification.** When a station cluster of potential concern has been identified, the
49 department shall issue notification to the landowners, lessees, onsite dischargers, adjacent
50 dischargers, and other persons determined appropriate by the department prior to the
51 department's conducting a hazard assessment as defined in WAC 173-204-530.

52 **(4) No further cleanup action.** No further cleanup action determinations shall be taken
53 with station clusters of low concern until the inventory of WAC 173-204-350 is updated and the
54 stations reexamined per subsection (5) of this section. Station clusters of low concern shall
55 receive no further consideration for active cleanup, unless new information indicates an increase
56 of chemical contamination at the stations in question. Station clusters of low concern shall be
57 evaluated by the department for improved source control and/or monitoring requirements of this
58 chapter.

59 **(5) Re-evaluation.** The department may at any time reexamine a station or group of
60 stations to reevaluate and identify station clusters of potential concern following the procedures
61 of subsection (2) of this section when new information demonstrates to the department's
62 satisfaction that reexamination actions are necessary to fulfill the purposes of WAC 173-204-500
63 through 173-204-590.

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³⁰ Changed to reflect the proposed human health cleanup criteria.

~~WAC 173-204-520 Cleanup screening levels criteria~~³¹

³¹ Moved to new section WAC 173-204-572. Content has not been substantively changed for the numeric marine chemical and biological criteria.

1 **WAC 173-204-530 Hazard assessment and site identification.**

2
3 (1) Purpose.

4 (2) Hazard assessment requirements.

5 (3) Identification of cleanup sites for potential further investigation.³²

6
7 (1) **Purpose.** A hazard assessment shall be performed to gather existing and available
8 information to further characterize each station cluster of potential concern identified per WAC
9 173-204-510.

10 (2) **Hazard assessment requirements.** Onsite dischargers, lessees, landowners, and
11 adjacent dischargers shall submit, upon the department's request, all existing and available
12 information that would enable the department to:

13 (a) Determine the concentration and/or areal extent and depth of sediment contamination
14 at the station cluster of potential concern by:

15 (i) Identifying the contaminants exceeding the applicable sediment quality standards of
16 WAC 173-204-320 through ~~173-204-340~~ and 173-204-573;³³

17 (ii) Identifying individual stations within the station cluster of potential concern which
18 exceed the sediment cleanup screening levels criteria of WAC 173-204-~~520~~ 572 through 173-
19 204-573;

20 (iii) Identifying the level of toxicity to the applicable biological test organisms of WAC
21 173-204-320 through 173-204-340 and 173-204-573;

22 (iv) Determining where the applicable sediment quality standards of WAC 173-204-320
23 through 173-204-340 and 173-204-573, for any given contaminant, is met;

24 (v) Determining if concentrations of chemicals exist that potentially present a significant
25 threat to human health;

26 (vi) Defining the location where the ~~minimum cleanup level~~ maximum allowable level³⁴
27 as defined in WAC 173-204-570 is met.

28 (b) Identify and characterize the present and historic source or sources of the
29 contamination.

30 (c) Identify the location of sediment impact zones authorized under WAC 173-204-415.

³² Added to mitigate the conflict with the MTCA definition of “site” - where hazardous substances have come to be located WAC 173-340-200.

³³ Added to accommodate future addition of proposed freshwater chemical and biological criteria for benthic toxicity.

³⁴ Changed to reflect terminology changes and the proposed human health, background, and ecological criteria.

31 (d) Identify sensitive resources in the vicinity of the station cluster of potential concern.

32 (e) Provide other information as determined necessary by the department for evaluating
33 sites under WAC 173-204-540.

34 ~~(3) (f) The department shall also~~ Compile existing and available information from other
35 federal, state, and local governments.

36 **(3) Identification of cleanup sites.** To identify cleanup sites, the department shall use all
37 available information of acceptable quality gathered from the hazard assessment to evaluate
38 station clusters of potential concern identified pursuant to WAC 173-204-510(2). For the
39 purpose of identifying a cleanup site per the procedures of this subsection, three stations with the
40 highest contaminant concentration for any particular contaminant or the highest degree of
41 biological effects as identified in WAC 173-204-~~520~~ 572 through 173-204-573 are selected from
42 a station cluster of potential concern. This procedure may be repeated for multiple chemicals
43 ~~identified in WAC 173-204-520~~, recognizing that the three stations with the highest
44 concentration for each particular contaminant may be different and the respective areas for all
45 chemicals may overlap. The department shall review the list of station clusters of potential
46 concern to identify cleanup sites for potential further investigation via the following process:

47 ~~(a) Identify if available, three stations within the station cluster of potential concern with~~
48 ~~the highest level of biological effects for the biological tests identified in WAC 173-204-315(1).~~

49 (b) Station clusters of potential concern ~~where the level of biological effects for any three~~
50 ~~stations within the station cluster of potential concern exceeds the cleanup screening levels of~~
51 ~~WAC 173-204-520(3)~~³⁵ that meet the criteria in WAC 173-204-510(2) shall be defined as
52 cleanup sites for potential further investigation.

53 ~~(c) Identify if available, the three stations within a station cluster of potential concern~~
54 ~~with the highest concentration of each chemical contaminant identified in WAC 173-204-520,~~
55 ~~Cleanup screening levels criteria.~~ For the purpose of identifying a cleanup site per the
56 procedures of this subsection, stations that meet the biological standards of WAC 173-204-
57 ~~520(3)~~572(3) through 173-204-573(3) shall not be included in the evaluation of chemical
58 contaminant concentrations for benthic toxicity.

59 ~~(d) For each contaminant identified in (c) of this subsection, determine the average~~
60 ~~concentration for the contaminant at the three stations identified in (c) of this subsection.~~³⁶

61 ~~(e) (d)~~ Station clusters of potential concern for which any average chemical concentration
62 identified in WAC 173-204-510(2)(a)(i) ~~(d) of this subsection~~ exceeds the cleanup screening
63 level chemical criteria of Table III WAC 173-204-572 through 173-204-573 ~~shall~~ may be
64 defined as cleanup sites for potential further investigation.

65 (f) After completion of the hazard assessment, if neither of the conditions of (b) or ~~(e)~~ (d)
66 of this subsection apply, then the station cluster is defined as a station cluster of low concern.

³⁵ This is a repeat of section 173-204-510(2)(e)

³⁶ Editorial change. Subsection (3)(e) establishes the need to average chemical concentrations.

67 (g) Station clusters of potential concern where the department determines that any three
68 stations within the station cluster of potential concern exceed the ~~sediment cleanup screening~~
69 maximum allowable levels human health criteria of WAC 173-204-571 or the other toxic,
70 radioactive, biological, or deleterious substances criteria or the nonanthropogenically affected
71 criteria of WAC 173-204-520-~~572~~ through 173-204-573, shall be defined as cleanup sites for
72 potential further investigation.

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1 **WAC 173-204-540 Ranking Evaluating³⁷ and list of sites.**

- 2
- 3 (1) Purpose.
- 4 (2) Site evaluation.
- 5 (3) Considerations in site evaluation.
- 6 (4) Site re-evaluations.
- 7 (5) List of sites.
- 8 (6) Site delisting.
- 9 (7) Site re-listing Relisting of sites.³⁸
- 10 (8) Relationship to hazardous sites list.
- 11

12 **(1) Purpose.** The department shall prepare and maintain a list of contaminated sediment
 13 sites in the order of their relative hazard ranking³⁹ risk to human health and the environment.
 14 From this list, the department shall select sites where action shall be taken.

15 **(2) Site ranking evaluation.** The department shall evaluate each cleanup site identified
 16 by the procedures in WAC 173-204-530 on a consistent basis using the procedure described in
 17 Sediment Ranking System (“SEDRANK”), January 1990, and all additions and revisions thereto
 18 or other procedures approved by the department. The purpose of ranking the evaluation is to
 19 estimate, based on technical information compiled during the hazard assessment procedures in
 20 WAC 173-204-530, the relative potential risk posed by the site to human health and the
 21 environment. Information obtained during the hazard assessment, plus any additional data
 22 specified in “SEDRANK,” shall be included in the site hazard ranking evaluation.

23 **(3) Considerations in ranking site evaluation.** In conducting sediment site ranking
 24 evaluations, the department shall assess both human health hazard and ecological hazard, and
 25 consider chemical toxicity, affected resources, and site characteristics for both types of hazards.
 26 The department shall also use best professional judgment and other information as necessary on
 27 a case-by-case basis to conduct site ranking evaluations.

28 **(4) Site reranking re-evaluations.** The department may, at its discretion, rerank re-
 29 evaluate a site. To rerank re-evaluate a site, the department shall use any additional information
 30 within the scope of the evaluation criteria and best professional judgment to establish that a
 31 significant change should result.

32 **(5) List of ranked sites.**

³⁷ Terminology change was made to be consistent with Ecology’s current practice .

³⁸ Editorial change for consistency with subsection -540(6)

³⁹ Deleted due to the outdated term and to conform to Ecology policy of determining cleanup priority based on other factors.

33 (a) Contaminated sediment sites ~~that are ranked via “SEDRANK”~~ shall be placed on a list
34 ~~in the order of their relative hazard ranking~~. The list shall describe the current status of cleanup
35 action at each site ~~and be updated on an annual basis~~.⁴⁰ The department may change a site's
36 status to reflect current conditions on a more frequent basis. The status for each site shall be
37 identified as one or more of the following:

38 (i) Sites awaiting cleanup action;

39 (ii) Sites where ~~department or other party initiated, incidental, or partial~~⁴¹ cleanup
40 actions, ~~as defined in WAC 173-204-550~~, are in progress;

41 (iii) Sites where a cleanup action has been completed and confirmational monitoring is
42 underway;

43 (iv) Sites with sediment recovery zones authorized under WAC 173-204-590; and/or

44 (v) Other categories established by the department.

45 (b) The department shall routinely publish and make the list available to be used in
46 conjunction with a review of ongoing and proposed regulatory actions to determine where and
47 when a cleanup action should be taken. The department shall also make the list available to
48 landowners and dischargers at or near listed sites, and to the public.

49 **(6) Site delisting.**

50 (a) The department may remove a site from the list only after it has determined that:

51 (i) All cleanup actions ~~except confirmational monitoring (including confirmational~~
52 ~~monitoring if required)~~⁴² have been completed and compliance with the site remedial
53 investigation and feasibility study, cleanup action plan (or equivalent document under WAC
54 173-204-585)⁴³ and sediment cleanup standard(s) ~~has~~ have been achieved; or

55 (ii) The listing of the site was erroneous.

56 (b) A site owner or operator may request that a site be removed from the list by
57 submitting a petition to the department. The petition shall state the reason for the site delisting
58 request, and as determined appropriate by the department, shall include thorough documentation
59 of all investigations performed, all cleanup actions taken, and all compliance monitoring data
60 and results to demonstrate to the department's satisfaction that ~~the site sediment~~⁴⁴ cleanup
61 standards have been achieved. The department may require payment of costs incurred, ~~including~~
62 ~~an advance deposit~~,⁴⁵ for review and verification of the work performed. The department shall
63 review such petitions, however the timing of the review shall be at its discretion and as resources

⁴⁰ Deleted to reflect the potential increase or decrease of Ecology staff workload.

⁴¹ Editorial change.

⁴² Added because Ecology cannot delist a site until confirmational monitoring has shown requirements have been met.

⁴³ Terminology changes made to harmonize with the MTCA rule.

⁴⁴ Edited to eliminate redundancy.

⁴⁵ Deleted to reflect that Ecology does not currently require advance deposits.

64 may allow.

65 (c) The department shall maintain a record of sites that have been removed from the list
66 under (a) of this subsection. This record shall be made available to the public on request.

67 (d) The department shall provide public notice and an opportunity to comment when the
68 department proposes to remove a site from the list.⁴⁶

69 **(7) Site re-listing.** The department may relist a site which has previously been removed
70 if it determines that the site requires further cleanup action.

71 **(8) Relationship to hazardous sites list.** The department may additionally evaluate
72 sediment cleanup sites on the site list developed under subsection (5) of this section for possible
73 inclusion on the hazardous sites list published under WAC 173-340-330.

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⁴⁶ Moved from subsection -540(8).

1 **WAC 173-204-550 Types of cleanup and authority.**

2
3 (1) Purpose.

4 (2) Administrative authority.

5 (3) Types of cleanup.

6
7 **(1) Purpose.** The department acknowledges that cleanups of contaminated sediment sites
8 can occur under the authority of chapter 90.48 or 70.105D RCW. Sediment cleanups may also
9 be initiated by the federal government pursuant to the Comprehensive Environmental Response,
10 Compensation and Liability Act (CERCLA). This section describes the department's role in
11 department initiated and other cleanup actions.

12 **(2) Administrative authority.** The department shall use best professional judgment and
13 other information as necessary on a case-by-case basis to determine the appropriate
14 administrative authority for conducting, or requiring ~~contaminated sediment~~⁴⁷ cleanup actions.
15 The department may initiate a cleanup action under this chapter and may upon further analysis
16 determine that another law is more appropriate, or vice versa. When determining the appropriate
17 administrative authority at a site, the decision shall⁴⁸ be based on, but not limited to, the
18 following considerations:

19 (a) Source of contaminants requiring cleanup including spills, dredging actions, and
20 wastewater and/or storm water discharges;

21 (b) Significance of contamination threat to human health and the environment including
22 the degree of contamination and types and number of contaminants;

23 (c) Public perception concerning the contaminant threat to human health and the
24 environment;

25 (d) Personal or corporate financial status of the landowner(s) and/or discharger(s);

26 (e) Enforcement compliance history of the landowner(s) and/or discharger(s);

27 (f) Status of existing or pending federal, state, or local legal orders or administrative
28 actions; and

29 (g) Size of cleanup action proposed or determined necessary.

30 **(3) Types of cleanups.** The types of cleanup actions below establish scenarios
31 recognized by the department which may occur to effect cleanup ~~of contaminated sediment sites~~.
32 All of these types of cleanup actions shall be subject to administrative review and approval of the
33 department under chapters 90.48 and/or 70.105D RCW:

⁴⁷ Editorial change to eliminate redundancy.

⁴⁸ Moved from section -500(3).

34 (a) Department initiated cleanup. Department initiated cleanup actions occur when the
35 department uses its authority under chapter 90.48 and/or 70.105D RCW to conduct or require
36 and/or otherwise effect cleanup to meet the requirements in this chapter;

37 (b) ~~Voluntary~~⁴⁹ Other party initiated cleanup. ~~Voluntary e~~Cleanup actions ~~are~~ may be
38 initiated by parties other than the department. The department shall encourage voluntary these
39 cleanup actions whenever possible, and as early as possible ~~to meet the intent of this chapter.~~
40 These cleanup actions must be approved by the department and must meet the requirements in
41 this chapter;

42 (c) Incidental cleanup. Incidental cleanup actions are conducted when other state or
43 federally permitted activities are ongoing in and/or around the ~~contaminated sediment~~ site. Early
44 coordination of incidental cleanup actions with the department is encouraged to meet the ~~intent~~
45 requirements in this chapter, chapter 70.105D RCW, and chapter 90.48 RCW, as appropriate;
46 and

47 ~~(d) Partial cleanup. Partial cleanup actions may be conducted when completion of~~
48 ~~cleanup requirements under WAC 173-204-560 has identified and proposed discrete site units~~
49 ~~and sediment cleanup standards, the department has approved the selection of the partial cleanup~~
50 ~~alternative per the standards of WAC 173-204-580, and the department has determined that~~
51 ~~awaiting action or decision on conducting a complete site cleanup would have a net detrimental~~
52 ~~effect on the environment or human health.~~⁵⁰

53 ~~(e)~~ (d) CERCLA cleanup. Pursuant to the federal Comprehensive Environmental
54 Response, Compensation and Liability Act, the department may identify this chapter ~~173-204~~ as
55 an applicable state requirement for cleanup actions conducted by the federal government.

56

⁴⁹ Changed to reflect Ecology's long standing policy to not approve voluntary cleanups as defined in WAC 173-340.

⁵⁰ References to partial cleanup have been moved to section -500(4)(a)(i) and integrated with the concept of sediment cleanup units.

1 **WAC 173-204-560 ~~Cleanup Study~~ Remedial investigation and feasibility study.**

- 2
- 3 (1) Purpose.
- 4 (2) Scope of remedial investigation and feasibility study work plan.
- 5 (3) Public participation plan requirements.
- 6 (4) Contents of remedial investigation report.
- 7 (5) Contents of feasibility study report.
- 8 (6) Sampling access.
- 9

10 (1) **Purpose.** This section ~~describes cleanup study plan and report standards which meet~~
 11 ~~the intent of cleanup actions required under authority of chapter 90.48 and/or 70.105D RCW, or~~
 12 ~~other authorities under this chapter. Cleanup actions required under authority of chapter~~
 13 ~~70.105D RCW shall also meet all standards of this chapter and chapter 173-340 WAC, the~~
 14 ~~Model Toxics Control Act cleanup regulation.~~⁵¹ ~~The cleanup study plan and report standards in~~
 15 ~~this chapter include activities to collect, develop, and evaluate sufficient information to enable~~
 16 ~~consideration of cleanup alternatives and selection of a site-specific sediment cleanup standard~~
 17 ~~prior to making a cleanup decision. Each person performing a cleanup action to meet the intent~~
 18 ~~of this chapter shall submit a cleanup study plan and cleanup study report to the department for~~
 19 ~~review and written approval prior to implementation of the cleanup action.~~⁵² ~~The department~~
 20 ~~may approve the cleanup study plan as submitted, may approve the cleanup study plan with~~
 21 ~~appropriate changes or additions, or may require preparation of a new cleanup study plan.~~
 22 establishes the remedial investigation/feasibility study (RI/FS) work plan and report
 23 requirements for investigation of contaminated sediment sites to select a site specific cleanup
 24 standard and evaluate cleanup action alternatives to inform a cleanup action decision under
 25 WAC 173-204-580 through 173-204-585.

26 (2) **Scope of ~~cleanup study plan~~ remedial investigation and feasibility study work**
 27 **plan.**⁵³ The scope of a ~~cleanup study~~ RI/FS work plan shall depend on the specific site
 28 informational needs, the site hazard, the type of cleanup action proposed, and the authority cited
 29 by the department to require cleanup. ~~To in~~ establishing the necessary scope ~~cleanup study~~, the
 30 department may consider cost mitigation factors, such as the financial resources of the person(s)
 31 responsible for the cleanup action. In all cases sufficient information must be collected,
 32 developed, and evaluated to enable the appropriate selection of a sediment cleanup standard
 33 under WAC 173-204-570 and a cleanup action decision under WAC 173-204-580 through 173-
 34 204-585. The ~~cleanup study~~ RI/FS work plan shall ~~address~~ include:

- 35 (a) Public ~~information/education~~ participation plan;

⁵¹ Moved to section -580, Selection of Cleanup Actions.

⁵² Language reworded in following text.

⁵³ Terminology changed to harmonize with MTCA.

36 ~~(b) Site investigation and cleanup alternatives evaluation;~~

37 (b) Sampling plan and recordkeeping in compliance with WAC 173-204-600 through -
38 610 and department guidance;⁵⁴ and

39 (c) Site safety ~~cleanup study plan shall address proposed activities~~ to meet the
40 requirements of the Occupational Safety and Health Act of 1970 (29 U.S.C. Sec. 651 et seq.) and
41 the Washington Industrial Safety and Health Act (chapter 49.17 RCW), and regulations
42 promulgated pursuant thereto. These requirements are subject to enforcement by the designated
43 federal and state agencies. Actions taken by the department under this chapter do not constitute
44 an exercise of statutory authority within the meaning of section (4)(b)(1) of the Occupational
45 Safety and Health Act.⁵⁵

46 (d) Each person performing a cleanup action to meet the requirements of this chapter
47 shall submit an RI/FS work plan conforming to department guidance for department review and
48 approval prior to implementing the remedial investigation.

49 ~~(3) Cleanup study plan public information/education~~ **Public participation plan**
50 **requirements.** The ~~cleanup study plan~~ public participation plan shall encourage coordinated and
51 effective public involvement commensurate with the nature of the proposed cleanup action, the
52 level of public concern, and the existence of, or potential for adverse effects on biological
53 resources and/or a threat to human health. The plan shall address proposed activities for the
54 following subjects:

55 (a) When public notice will occur, the length of the comment periods, the potentially
56 affected vicinity, and any other areas to be provided notice;

57 (b) Where public information ~~repositories~~ will be located to provide ~~site~~ information
58 about the cleanup;

59 (c) Methods for identifying the public's concerns which may include e.g., interviews,
60 questionnaires, community group meetings, etc.;

61 (d) Methods for providing information to the public, which may include e.g., press
62 releases, public meetings, fact sheets, list serves, etc.;

63 (e) Coordination of public participation requirements mandated by other federal, state, or
64 local laws;

65 (f) Amendments to the planned public involvement activities; and

66 (g) Any other elements that the department determines to be appropriate for inclusion in
67 the plan.

68 ~~(4) Cleanup study plan site investigation and cleanup alternatives evaluation~~

⁵⁴ Moved from original subsection (5) Cleanup study plan.

⁵⁵ Moved from original subsection (6) Cleanup study plan site safety requirements.

69 ~~requirements~~⁵⁶ **Remedial investigation content.** The content of the ~~cleanup study plan for the~~
 70 ~~site investigation and cleanup alternatives evaluation~~ remedial investigation is determined by the
 71 type of cleanup ~~action~~ selected as defined under WAC 173-204-550. As determined by the
 72 department, ~~the cleanup study plan shall address~~ person(s) responsible for the cleanup shall
 73 ~~conduct a remedial investigation that includes~~ the following ~~subjects~~ requirements:

74 (a) General site information. General information, including: Project title; name,
 75 address, and phone number of project coordinator; legal description of the cleanup site; area and
 76 volume dimensions of the site; ~~present and past owners and operators~~; present and past owners
 77 and operators of contaminant source discharges to ~~the~~ site and their respective operational
 78 history; and other pertinent information determined by the department;

79 (b) Site conditions map. An existing site conditions map which illustrates site features as
 80 follows:

81 (i) Property boundaries: ;

82 (ii) The site boundary defined by the individual contaminants exceeding the applicable
 83 sediment ~~quality standards of WAC 173-204-320 through 173-204-340~~ cleanup objective of
 84 ~~WAC 173-204-570.~~⁵⁷ ~~Delineations should be made~~ at the point where the concentration of the
 85 contaminant would meet the:

86 (A) ~~Site specific sediment cleanup standards as defined in WAC 173-204-570(2);~~ and

87 (B) ~~Sediment~~ cleanup objective ~~as defined in WAC 173-204-570(3);~~ and

88 (C) ~~Minimum cleanup level~~⁵⁸ ~~Maximum allowable level as defined in WAC 173-~~
 89 ~~204-570(4);~~

90 (iii) Surface and subsurface structures and topography: ;

91 ~~(iv)~~ (iv) Utility lines: ;

92 ~~(vi)~~ (v) Navigation lanes: ;

93 ~~(vii) Current and ongoing sediment sources.~~⁵⁹

94 ~~(viii)~~ (vi) Other pertinent information determined by the department: ;

95 (c) Site investigation. Sufficient investigation to characterize the distribution of sediment
 96 contamination ~~present at the site~~, and the threat or potential threat to human health and the
 97 environment. Where applicable to the site, these investigations shall address the following:

98 (i) Surface water and sediments. Investigations of ~~sediment~~, surface water
 99 hydrodynamics, and sediment transport mechanisms to characterize significant hydrologic

⁵⁶ Section -560 revised to focus on the content and process of developing an RI/FS. Remedy selection requirements have been moved to section -580 and cleanup action decisions have been moved to new section -585 for clarity.

⁵⁷ Added to include human health, background and ecological criteria.

⁵⁸ Replaced with maximum allowable level to include human health, background and ecological criteria.

⁵⁹ Already addressed in subsection (4)(c)(i) and (4)(d).

100 features such as:

101 (A) Site surface water drainage patterns, quantities and flow rates;

102 (B) Areas of sediment erosion and deposition including estimates of sedimentation rates;

103 (C) ~~and actual or potential~~⁶⁰ Contaminant migration routes to and from the site and

104 within the site;

105 (D) ~~Sufficient water and sediment sampling shall be performed to adequately~~
106 ~~characterize the~~⁶¹ Areal and vertical distribution and concentrations of contaminants in sediment;

107 (E) Recontamination potential of sediments which are likely to influence the type and
108 rate of contaminant migration, or are likely to affect the ability to implement alternative cleanup
109 actions ~~shall be characterized~~.⁶²

110 (ii) Geology and ground water system characteristics. Investigations of site geology and
111 hydrogeology to ~~adequately~~ characterize the physical properties and distribution of sediment
112 types, and the characteristics of ground water flow rate, ground water gradient, ground water
113 discharge areas, and ground water quality data which may affect site cleanup alternatives
114 evaluations;

115 (iii) Climate. Information regarding local and regional climatological characteristics
116 which are likely to affect surface water hydrodynamics, ground water flow characteristics, and
117 migration of sediment contaminants such as: Seasonal patterns of rainfall; the magnitude and
118 frequency of significant storm events; prevailing wind direction and velocity;

119 (iv) Land use. Information characterizing human populations exposed or potentially
120 exposed to sediment contaminants released from the site and present and proposed uses and
121 zoning for shoreline areas contiguous with the site;

122 (v) Natural resources and ~~ecology~~ habitat⁶³. Information to determine the impact or
123 potential impact of sediment contaminants from the site on natural resources and ~~ecology~~ critical
124 habitat of the area such as ~~sensitive environment, local and regional habitat~~⁶⁴; nursery grounds,
125 shellfish or eelgrass beds and other plant and animal species ~~and other environmental receptors~~.
126 ⁶⁵

127 (d) Current and potential Sediment contaminant sources. A description of the location,
128 quantity, areal and vertical extent, concentration and sources of active and inactive waste
129 disposal and other sediment contaminant discharge sources ~~which affect or potentially affect the~~

⁶⁰ “Potential” removed because recontamination is already addressed in this subsection (4)(c)(i)(E) and (4)(d) Site investigation.

⁶¹ Removed because already addressed in this subsection (4)(c) Site investigation.

⁶² Removed because already addressed in this subsection (4)(c) Site investigation

⁶³ Removed “ecology” and added “habitat” for clarity.

⁶⁴ Removed because this term is not well defined. Added more specific examples.

⁶⁵ Removed because already included in “other plant and animal species”.

130 ~~site.~~⁶⁶ Where determined relevant by the department, the following information shall be
 131 obtained by the department from the responsible discharger:

132 (i) The physical and chemical characteristics, and the biological effects of ~~site sediment~~
 133 contaminant sources;

134 (ii) The status of source control actions for permitted and unpermitted ~~site sediment~~
 135 contaminant sources; and

136 (iii) A recommended compliance time frame for known permitted ~~and unpermitted site~~
 137 ~~sediment~~ contaminant sources which affect or potentially affect implementation of the timing
 138 and scope of the ~~site~~ cleanup action alternatives.

139 ~~(b) — Human health risk assessment. The current and potential threats to human health~~
 140 ~~that may be posed by sediment site contamination shall be evaluated using a risk assessment~~
 141 ~~procedure approved by the department.~~⁶⁷

142 (e) The RI/FS shall be submitted to the department for review and written approval prior
 143 to implementation of the cleanup action.

144 **(5) Feasibility Study content.**⁶⁸ The purpose of the feasibility study is to develop and
 145 evaluate cleanup action alternatives to make a cleanup action decision. The feasibility study
 146 shall include the following:

147 (a) Summary of remedial investigation results including:

148 (i) Conceptual site model to provide the basis from which cleanup action alternatives are
 149 developed and evaluated;

150 (ii) The proposed biologically active zone;

151 (iii) The proposed sediment cleanup standards; and

152 (iv) Maps, cross-sections, and calculations illustrating the location, estimated amount and
 153 concentration distribution of hazardous substances above cleanup standards and the sediment
 154 cleanup objective;

155 (b) Results of any additional investigation conducted after completion of the remedial
 156 investigation;

157 ~~(4f)~~ (c) Cleanup action alternatives. Each ~~cleanup study plan~~ feasibility study shall
 158 include an evaluation of alternative cleanup actions that protect human health and the
 159 environment by eliminating, reducing, or otherwise controlling risks posed through each
 160 exposure pathway and migration route. The number and types of alternatives to be evaluated
 161 shall take into account the characteristics and complexity of the site and be evaluated using the
 162 requirements in WAC 173-204-580- ;

163 (d) Identified alternatives;

⁶⁶ Already addressed in the title.

⁶⁷ Removed because already addressed in sections -570, -571, and -580.

⁶⁸ This section has been amended to focus on the process and content requirements to develop an FS. Remedy selection requirements have been moved to section -580 and 580 and cleanup action decisions have been moved to new section -585 for clarity.

164 (e) Alternatives eliminated that do not meet the requirements in WAC 173-204-580;
165 (f) Documentation of the alternatives evaluation process. For each alternative evaluated
166 in detail this shall include:

167 (i) The location and estimated amount of each contaminant to be removed or treated by
168 the alternative and the estimated time frame in which removal or treatment will occur; and

169 (ii) The location, estimated amount and projected concentration distribution of each
170 contaminant remaining on site above proposed cleanup standards after implementation of the
171 alternative;

172 (g) The preferred remedy and the basis for selection;⁶⁹ and

173 ~~(4i) (h) Upon department approval, the proposed site cleanup alternatives may to include~~
174 ~~establishment of site sediment cleanup units with individual sediment cleanup standards within~~
175 ~~the range required in WAC 173-204-570. Based on site physical characteristics and complexity,~~
176 ~~and cleanup standard alternative established on consideration of cost, technical feasibility, and~~
177 ~~net environmental impact.⁷⁰~~

178 (i) Applicable local, state and federal laws specific to the proposed preferred remedy,
179 including a description of permit/approval conditions identified in consultation with the
180 permitting agencies;

181 ~~(4(f)(ii) (j) The proposed site cleanup alternatives preferred remedy⁷¹ may include~~
182 ~~establishment of a sediment recovery zone as authorized under WAC 173-204-590, Sediment~~
183 ~~recovery zones. Establishment or expansion of a sediment recovery zone shall not be used as a~~
184 ~~substitute for active cleanup actions, when such actions are practicable and meet the~~
185 ~~requirements of WAC 173-204-580. The cleanup study plan shall include the following~~
186 ~~information for evaluation of sediment recovery zone alternatives:⁷²~~

187 ~~(4)(ii)(A) The time period during which a sediment recovery zone is projected to be~~
188 ~~necessary based on source loading and net environmental recovery processes determined by~~
189 ~~application of a department approved sediment recovery zone computer model under WAC 173-~~
190 ~~204-130(4) as limited by the standards of this section and the department's best professional~~
191 ~~judgment;~~

192 ~~(4)(ii)(B) The legal location and landowner(s) of property proposed as a sediment~~
193 ~~recovery zone;~~

194 ~~(4)(ii)(C) Operational terms and conditions including, but not limited to proposed~~
195 ~~confirmational monitoring actions for discharge effluent and/or receiving water column and/or~~
196 ~~sediment chemical monitoring studies and/or bioassays to evaluate ongoing water quality,~~
197 ~~sediment quality, and biological conditions within and adjacent to the proposed or authorized~~
198 ~~sediment recovery zone to confirm source loading and recovery rates in the proposed sediment~~

⁶⁹ Subsection (5)(d) through (g) added to incorporate MTCA requirements.

⁷⁰ The definition "sediment cleanup unit" in WAC 173-204-200 incorporates this language. Section -580 addresses cost, technical feasibility, and environmental impact.

⁷¹ Added to harmonize with the MTCA process.

⁷² Subsection (4)(f)(ii)(A) through (G) is addressed in section -590. Removed to eliminate duplicity.

199 ~~recovery zone.~~

200 ~~(4)(ii)(D) Potential risks posed by the proposed sediment recovery zone to human health~~
201 ~~and the environment;~~

202 ~~(4)(ii)(E) The technical practicability of elimination or reduction of the size and/or degree~~
203 ~~of chemical contamination and/or level of biological effects within the proposed sediment~~
204 ~~recovery zone; and~~

205 ~~(4)(ii)(F) Current and potential use of the sediment recovery zone, surrounding areas, and~~
206 ~~associated resources that are, or may be, affected by releases from the zone.~~

207 ~~(4)(ii)(G) The need for institutional controls or other site use restrictions to reduce site~~
208 ~~contamination risks to human health.~~

209 ~~(4)(f)(iii) ⁷³ A phased approach for evaluation of alternatives may be required for certain~~
210 ~~sites, including an initial screening of alternatives to reduce the number of potential remedies for~~
211 ~~the final detailed evaluation. The final evaluation of cleanup action alternatives that pass the~~
212 ~~initial screening shall consider the requirements of subsection (4) and the following factors:~~

213 ~~———(A) Overall protection of human health and the environment, time required to~~
214 ~~attain the sediment cleanup standard(s), and on-site and offsite environmental impacts and risks~~
215 ~~to human health resulting from implementing the cleanup alternatives;~~

216 ~~———(B) Attainment of the sediment cleanup standard(s) and compliance with~~
217 ~~applicable federal, state, and local laws;~~

218 ~~———(C) Short-term effectiveness, including protection of human health and the~~
219 ~~environment during construction and implementation of the alternative; and~~

220 ~~———(D) Long-term effectiveness, including degree of certainty that the alternative will~~
221 ~~be successful, long-term reliability, magnitude of residual, biological and human health risk, and~~
222 ~~effectiveness of controls for ongoing discharges and/or controls required to manage treatment~~
223 ~~residues or remaining wastes cleanup and/or disposal site risks;~~

224 ~~———(4)(g) Ability to be implemented. The ability to be implemented including the~~
225 ~~potential for landowner cooperation, consideration of technical feasibility, availability of needed~~
226 ~~offsite facilities, services and materials, administrative and regulatory requirements, scheduling,~~
227 ~~monitoring requirements, access for construction, operations and monitoring, and integration~~
228 ~~with existing facility operations and other current or potential cleanup actions;~~

229 ~~———(4)(h) Cost, including consideration of present and future direct and indirect~~
230 ~~capital, operation, and maintenance costs and other foreseeable costs;~~

231 ~~———(4)(i) The degree to which community concerns are addressed;~~

232 ~~———(4)(j) The degree to which recycling, reuse, and waste minimization are~~
233 ~~employed; and~~

234 (k) Environmental impact. Sufficient information shall be provided to fulfill the
235 requirements of chapter 43.21C RCW, the State Environmental Policy Act for the proposed
236 preferred remedy. Discussions of significant short-term and long-term environmental impacts,

⁷³ Subsections (4)(f)(iii) through (4)(j) are referencing remedy selection requirements and have been moved to section -580.

237 significant irrevocable commitments of natural resources, significant alternatives including
238 mitigation measures, and significant environmental impacts which cannot be mitigated shall be
239 included.

240 ~~(5) Cleanup study plan—sampling plan and record keeping requirements. The cleanup~~
241 ~~study plan shall address proposed sampling and recordkeeping activities to meet the standards of~~
242 ~~WAC 173-204-600, Sampling and testing plan standards, and WAC 173-204-610, Records-~~
243 ~~management, and the standards of this section.~~⁷⁴

244 ~~(6) Cleanup study plan site safety requirements.~~⁷⁵ ~~The cleanup study plan shall address~~
245 ~~proposed activities to meet the requirements of the Occupational Safety and Health Act of 1970-~~
246 ~~(29 U.S.C. Sec. 651 et seq.) and the Washington Industrial Safety and Health Act (chapter 49.17~~
247 ~~RCW), and regulations promulgated pursuant thereto. These requirements are subject to~~
248 ~~enforcement by the designated federal and state agencies. Actions taken by the department~~
249 ~~under this chapter do not constitute an exercise of statutory authority within the meaning of~~
250 ~~section (4)(b)(1) of the Occupational Safety and Health Act.~~

251 ~~(7) Cleanup study report.~~⁷⁶ ~~Each person performing a cleanup action to meet the intent of~~
252 ~~this chapter shall submit a cleanup study report to the department for review and written~~
253 ~~approval of a cleanup decision prior to implementation of the cleanup action. The sediment~~
254 ~~cleanup study report shall include the results of cleanup study site investigation conducted~~
255 ~~pursuant to subsection (4) of this section, and preferred and alternative cleanup action proposals~~
256 ~~based on the results of the approved cleanup study plan.~~

257 ~~(8) Sampling access.~~⁷⁷ ~~In cases where the person(s) responsible for cleanup is not able to~~
258 ~~secure access to sample sediments on lands subject to a cleanup study plan approved by the~~
259 ~~department, the department may facilitate negotiations or other proceedings to secure access to~~
260 ~~the lands. Requests for department facilitation of land access for sampling shall be submitted to~~
261 ~~the department in writing by the person(s) responsible for the cleanup action study plan.~~

262
263

⁷⁴ Moved to subsection (2)(c).

⁷⁵ Moved to subsection (2)(c).

⁷⁶ Removed because already addressed in subsection (1), sections -580 through -585.

⁷⁷ Removed. MTCA addresses this issue in WAC 173-340-800 in more detail and applies to sediment cleanup.

1 **WAC 173-204-570 Sediment cleanup standards – General requirements.**⁷⁸

- 2 (1) Applicability and purpose.
 3 (2) Sediment cleanup standard.
 4 (3) Sediment cleanup objective.
 5 (4) Maximum allowable level.
 6

7 **(1) Applicability and purpose.** This section establishes the sediment cleanup standards
 8 requirements for cleanup actions required under the authority of chapter 90.48 RCW or chapter
 9 70.105D RCW. ~~and/or this chapter, and describes the process to determine site specific cleanup~~
 10 ~~standards.~~

11 **(2) Sediment cleanup standard.** The sediment cleanup standard defines the maximum
 12 allowed chemical concentration and level of biological effects permissible at the cleanup site to
 13 be achieved by year ten after start of the cleanup.⁷⁹

14 (a) ~~(4)~~ The sediment cleanup standard ~~are~~ is established ~~on a site specific basis for a site~~
 15 ~~or a sediment cleanup unit~~ within an allowable range of ~~contamination~~ concentration.⁸⁰

16 (i) The lower end of the range is the sediment cleanup objective as defined in subsection
 17 ~~(2)~~ (3) of this section;

18 (ii) The upper end of the range is the maximum allowable level as defined in subsection
 19 (4) of this section.

20 (b) The ~~site specific sediment~~ cleanup standards shall be as close as practicable to the
 21 sediment cleanup objective, but in no case shall exceed the ~~minimum cleanup~~ maximum
 22 allowable⁸¹ level;

23 (c) ~~In all cases, the cleanup standards shall be defined in consideration of Determinations~~
 24 ~~on whether the sediment cleanup standard is as close as practicable to the sediment cleanup~~
 25 ~~objective shall take into account the following per procedures in WAC 173-204-580.~~⁸²

⁷⁸ This section has been modified to lay out the process for defining a cleanup standard that incorporates proposed human health, background, and ecological criteria into the current SMS two tier framework. Section -570 through -574 replace the language from the original -570.

⁷⁹ This clarifies the concept in section -590 Sediment recovery zones, and original section -570(3). This could be interpreted as a substantive change. Original section -570 states the CSL/Minimum cleanup level must be achieved by year ten after completion of the active cleanup action. But section -590(1) and (2)(f) require a sediment recovery zone if the cleanup standard exceeds the SQS with an allowance of a sediment recovery zone for longer than ten years.

⁸⁰ This is consistent with the current SMS framework but incorporates proposed human health, background, and ecological criteria.

⁸¹ Changed to incorporate the proposed human health, background, and ecological criteria.

⁸² Subsection (2)(c)(i) through (iii) are an editorial rewrite from section -570(4).

26 (i) Net environmental effects including the potential for natural recovery of the sediments
27 over time;

28 ~~(ii) Cost and engineering feasibility~~ ⁸³ feasibility of cleanup alternatives;

29 ~~(iii) Cost and engineering feasibility~~ Cost of cleanup alternatives; and

30 (iv) Meeting or maintaining a sediment cleanup standard based on technical limitations
31 by ongoing releases from public or private sources where there is no contractual relationship
32 with the person(s) conducting the cleanup action or where source control actions are not under
33 the authority of person(s) conducting the cleanup action. ⁸⁴

34 ~~(2) (3) Sediment cleanup objective.~~ The sediment cleanup objective shall be to
35 eliminate adverse effects on biological resources and significant health threats to humans from
36 sediment contamination. ~~The sediment cleanup objective for all cleanup actions shall be the~~
37 ~~sediment quality standards as defined in WAC 173-204-320 through 173-204-340, as~~
38 ~~applicable.~~ ⁸⁵ ~~The sediment cleanup objective identifies sediments that have no acute or chronic~~
39 ~~adverse effects on biological resources,~~ ⁸⁶ ~~and which correspond to no significant health risk to~~
40 ~~humans, as defined in this chapter.~~ ⁸⁷ This is the lower end of the range for determining sediment
41 cleanup standards. Unless one or both of the conditions in subsection (e) apply, the sediment
42 cleanup objective shall be at least as stringent as all of the following:

43 (a) Sediment quality standards for benthic toxicity as defined in WAC 173-204-320 and
44 173-204-573, ⁸⁸ as applicable;

45 (b) Sediments that are estimated to result in no significant threat to human health as
46 defined in WAC 173-204-571(2), ⁸⁹

47 (c) Sediments that are estimated to result in no significant ecological risk to higher
48 trophic levels as defined in WAC 173-204-574; ⁹⁰

49 ~~(5) must meet all legally~~ Requirements in other applicable federal, state, and local

⁸³ Term changed to maintain consistency with the rest of the rule “technical” vs. “engineering” are intended to be synonymous.

⁸⁴ Substantive change. This change reflects the need to incorporate the flexibility for Ecology to resolve PLP liability from recontamination of a cleaned up site or unit.

⁸⁵ Deleted to encompass the proposed human health, background, and ecological criteria.

⁸⁶ This is addressed in subsection (a) and sections -572 and -573 for benthic toxicity criteria.

⁸⁷ Deleted, addressed in subsection (b) and section -571.

⁸⁸ Substantive change. This replaces freshwater narrative standard for potential proposed chemical and biological criteria but maintains the marine numeric chemical and biological criteria.

⁸⁹ Substantive change. Added to incorporate proposed human health criteria.

⁹⁰ Substantive change. Added to incorporate proposed narrative standard to address ecological health risks from bioaccumulative chemicals.

50 requirements laws; and

51 (e) Consideration of natural background and analytical limits. Sediment cleanup
52 standards developed under subsection (2) of this section shall not be established at
53 concentrations below natural background concentrations or the practical quantitation limit,
54 whichever is higher.⁹¹

55 (4) ~~Minimum cleanup level~~Maximum allowable level. The ~~minimum cleanup level~~
56 maximum allowable level is the maximum allowed chemical concentration and level of
57 biological effects permissible at the ~~cleanup site or sediment cleanup unit~~ to be achieved ~~by year~~
58 ~~ten~~⁹² after completion of the active cleanup action. This is the upper end of the range for setting
59 sediment cleanup standards. Unless one or both of the conditions in subsection (e) apply, the
60 maximum allowable level shall be at least as stringent as all of the following:

61 (d) Cleanup screening levels for benthic toxicity as defined in WAC 173-204-572
62 through -573,⁹³ as applicable;

63 (e) Sediments that are estimated to result in no significant threat to human health as
64 defined in WAC 173-204-571(3).⁹⁴

65 (f) Sediments that are estimated to result in no significant ecological risk to higher
66 trophic levels as defined in WAC 173-204-574;⁹⁵

67 (g) Requirements in other applicable federal, state and local ~~requirements~~ laws; and

68 (h) Consideration of regional background and analytical limits. Sediment cleanup
69 standards developed under subsection (4) of this section shall not be established at
70 concentrations above regional background concentrations as defined in WAC 173-204-200 or the
71 practical quantitation limit, whichever is higher.⁹⁶

72

⁹¹ Substantive change. This incorporates the MTCA framework of establishing a cleanup standard that is the highest of a human health risk level, background, or practical quantitation limits.

⁹² This could be interpreted as a substantive change. The current phrasing is in conflict with the rest of the SMS rule. Whereas the cleanup standard is not allowed to be above this upper level and a sediment recovery zone is required is the cleanup standard is above the lower level.

⁹³ This replaces freshwater narrative standard for potential chemical and biological criteria but maintains the marine criteria

⁹⁴ Added to incorporate new human health criteria

⁹⁵ Added to incorporate ecological health risks from bioaccumulatives.

⁹⁶ Substantive change. This changes the current two tier framework by establishing a cleanup standard that is the highest of a human health risk level, background, or practical quantitation limits for both lower and upper tiers.

1 **WAC 173-204-571 Sediment cleanup standards based on human health risks.**

2 (1) Purpose.

3 (2) Requirements for sediment cleanup objective based on human health protection.

4 (3) Requirements for maximum allowable level based on human health protection.

5 (4) Human health risk assessment methods and policies.

6
7 **(1) Purpose.** This section defines the human health risk assessment framework that shall
8 be used to comply with the sediment cleanup standard requirements in WAC 173-204-570.

9 **(2) Requirements for the sediment cleanup objective based on human health risks.**
10 Unless one or both of the conditions in subsection (2)(c) of this subsection apply, the sediment
11 cleanup objective shall be at least as stringent as both of the following:

12 (a) Sediment concentrations that correspond to no acute or chronic non-carcinogenic
13 toxic effects. Compliance with this provision⁹⁷ shall be based on a hazard quotient of one (1).
14 The calculated sediment concentration for an individual hazardous substance shall be adjusted
15 downward if the hazard index exceeds one for multiple non-carcinogens and/or multiple
16 exposure pathways per procedures identified in WAC 173-340-708(4) through 173-340-708(6)
17 and methods approved by the department.

18 (b) Sediment concentrations that correspond to no unacceptable cancer risks.
19 Compliance with this provision⁹⁸ shall be based on an individual lifetime excess cancer risk of
20 one-in-one million (1×10^{-6}). The calculated sediment concentration shall be adjusted
21 downward if the total lifetime excess cancer risks exceed one-in-one hundred thousand (1×10^{-5})
22 for multiple carcinogens and/or multiple exposure pathways per procedures identified in WAC
23 173-340-708(4) through 173-340-708(6) or other methods approved by the department.

24 (c) Natural background and analytical considerations. The sediment cleanup standard or
25 sediment cleanup objective shall not be established at concentrations below natural background
26 concentrations as defined in WAC 173-340-200 or the practical quantitation limit, whichever is
27 higher.

28 **(3) Requirements for the maximum allowable level based on human health risks.**
29 Unless one or both of the conditions in subsection (3)(c) of this subsection apply, the maximum
30 allowable shall be at least as stringent as both of the following:

31 (a) Sediment concentrations that correspond to no acute or chronic non-carcinogenic
32 toxic effects. Compliance with this provision shall be based on a hazard quotient of one (1).
33 The calculated sediment concentration for an individual hazardous substance shall be adjusted

⁹⁷ This provision is not intended to be appreciably different than MTCA for non carcinogenic effects.

⁹⁸ This provision is not intended to be appreciably different than MTCA for carcinogenic effects.

34 downward if the hazard index exceeds one for multiple non-carcinogens and/or multiple
35 exposure pathways per procedures identified in WAC 173-340-708(4) through 173-340-708(6)
36 or other methods approved by the department.

37 (b) Sediment concentrations that correspond to no unacceptable cancer risks.
38 Compliance with this provision shall be based on a total site risk of one-in-one hundred thousand
39 (1 X 10⁻⁵)⁹⁹ per procedures identified in WAC 173-340-708(4) through -708(6) or other methods
40 approved by the department.¹⁰⁰

41 (c) Regional background and analytical considerations. The sediment cleanup standard
42 or maximum allowable level shall not be established at concentrations above regional
43 background concentrations as defined in WAC 173-340-200 or the practical quantitation limit,
44 whichever is higher.

45 (4) **Human health risk assessment methods and policies.** The following policies and
46 methods shall be used to establish sediment concentrations that correspond to no significant
47 human health risks:

48 (a) Sediment concentrations that correspond to no significant human health risk shall be
49 based on estimates of the reasonable maximum exposures expected to occur under both current
50 and future site use conditions. For sites located within a tribal usual and accustomed fishing
51 area, the reasonable maximum exposure scenario shall be based on tribal fish consumption rates.
52 The department has developed a statewide default fish consumption rate of XXX g/day. The
53 department may approve a site specific fish consumption rate.¹⁰¹

54 (b) Sediment concentrations that correspond to no significant human health risk shall be
55 based on toxicological parameters established by the USEPA and available through the
56 Integrated Risk Information System data base. If a toxicological parameter for a particular
57 substance is not available through IRIS, other sources may be used. The department will use the
58 hierarchy in the USEPA Office of Solid Waste and Emergency Response Directive 9285.7-53
59 when evaluating the appropriateness of using alternative sources.

60

⁹⁹ The upper human health risk level is still under consideration by Ecology. A policy decision has not been made.

¹⁰⁰ Ecology is in the process of drafting a guidance document for conducting human health risk assessments at sediment sites that will include more detail such as default exposure parameters and risk equations. It is Ecology's expectation this guidance will be complete upon promulgation of this rule.

¹⁰¹ Substantive change. Ecology has not made a policy decision as to a specific default rate, a range of rates, or the criteria necessary to develop a site specific fish consumption rate. A technical report is available for public review at: <http://www.ecy.wa.gov/toxics/fish.html>.

1 WAC 173-204-572 Sediment cleanup standards based on benthic toxicity in marine
 2 sediment.¹⁰²

- 3 (1) Applicability.
 4 (2) Puget Sound marine sediment quality standards and cleanup screening levels
 5 chemical criteria.
 6 (3) Puget Sound marine sediment quality standards and cleanup screening levels
 7 biological criteria.
 8 (4) Other toxic, radioactive, biological, or deleterious substances criteria.

9
 10 **(1) Applicability.** The marine sediment criteria in ~~Table III~~ Tables IV and V establish the
 11 marine chemical and biological sediment quality standards and cleanup screening levels to be
 12 used to be used in the evaluation of cleanup alternatives per the procedures of WAC 173-204-
 13 580560, and selection of a site sediment cleanup standard(s) per the procedures of WAC 173-
 14 204-570. ~~The criteria in and this section establish minor adverse effects as the Puget Sound~~
 15 marine sediment minimum cleanup level

16 ~~(a) The marine sediment cleanup screening levels chemical criteria, and the marine sediment-~~
 17 ~~biological effects criteria, and the marine sediment other toxic, radioactive, biological, or~~
 18 ~~deleterious substance criteria, and the marine sediment nonanthropogenically affected criteria of~~
 19 ~~this section~~

20 **(2) Puget Sound marine sediment quality standards and cleanup screening levels**
 21 **chemical criteria.** The chemical concentration criteria in Table IV establish the sediment quality
 22 standards and cleanup screening levels chemical criteria for marine sediment.¹⁰³ The criteria of
 23 this section shall apply to marine sediments within Puget Sound for toxicity to the benthic
 24 community.

25 (a) The sediment quality standards of this section establish a no adverse effects level,
 26 including no acute or chronic adverse effects, to the benthic community. Chemical
 27 concentrations at or below the sediment quality standards correspond to sediment quality that
 28 results in no adverse effects to the benthic community.

29 (b) The cleanup screening levels of this section establish a minor adverse effects, _
 30 including acute or chronic effects, on the benthic community. Chemical concentrations above the
 31 cleanup screening level correspond to sediment quality that results in minor adverse effects to the
 32 benthic community. The marine chemical and biological cleanup screening levels establish
 33 minor adverse effects as the level above which station clusters of potential concern are defined

¹⁰² This section was moved from section -520. The chemical and biological numeric criteria have not changed.

¹⁰³ Not a substantive change. The sediment quality standards chemical criteria from section -320 are repeated in Table IV for clarity and consistency with section -573, freshwater standards.

34 and may be defined as potential cleanup sites for benthic community toxicity¹⁰⁴ and at or below
 35 which station clusters of low concern are defined, per the procedures identified in WAC 173-
 36 204-510 and WAC 173-204-530.

37 (c) The cleanup screening level chemical criteria is exceeded when the sediment
 38 chemical concentration for an individual chemical is above the cleanup screening level in Table
 39 IV.

40 (d) The sediment quality standard chemical criteria is exceeded when the sediment
 41 chemical concentration for an individual single chemical is above the sediment quality standard
 42 in Table IV.

43 (b) Non-Puget Sound marine sediment cleanup screening levels criteria. Reserved: The
 44 department shall determine on a case-by-case basis the criteria, methods, and procedures
 45 necessary to meet the intent of this chapter.

46 (c) Low salinity sediment cleanup screening levels criteria. Reserved: The department
 47 shall determine on a case-by-case basis the criteria, methods, and procedures necessary to meet
 48 the intent of this chapter.

49 ~~(d) Freshwater sediment cleanup screening levels and minimum cleanup levels criteria.~~
 50 ~~Reserved: The department shall determine on a case-by-case basis the criteria, methods, and~~
 51 ~~procedures necessary to meet the intent of this chapter.~~¹⁰⁵

52 ~~The chemical concentration criteria in Table III IV establish the Puget Sound marine~~
 53 ~~sediment cleanup screening levels chemical and minimum cleanup levels criteria.~~

54 ~~(a)~~ (d) Where laboratory analysis indicates a chemical is not detected in a sediment
 55 sample, the detection limit and the practical quantitation limit shall be reported and shall be at or
 56 below the Marine S sediment Qquality Sstandards chemical criteria value set in WAC 173-204-
 57 320(2).

58 ~~(b)~~ (e) Where chemical criteria in ~~this~~ Table ~~III~~ IV represent the sum of individual
 59 compounds or isomers, the following methods shall be applied:

60 ~~(i)~~ (f) Where chemical analyses identify an undetected value for every individual
 61 compound/isomer then the single highest detection limit shall represent the sum of the respective
 62 compounds/isomers; and

63 ~~(ii)~~ (g) Where chemical analyses detect one or more individual compound/isomers, only
 64 the detected concentrations will be added to represent the group sum.

65 ~~(e)~~ (h) The listed chemical parameter criteria represent concentrations in parts per

¹⁰⁴ This change reflects the terminology change to limit the cleanup screening level term to the marine and freshwater numeric chemical and biological criteria for protection of the benthic community. The benthic criteria have not changed.

¹⁰⁵ Substantive change. Removed. Section -573 is reserved for future proposed freshwater chemical and biological criteria intended to replace the current narrative standard for freshwater sediment cleanup standards.

66 million, "normalized," or expressed, on a total organic carbon basis. To normalize to total
67 organic carbon, the dry weight concentration for each parameter is divided by the decimal
68 fraction representing the percent total organic carbon content of the sediment per the equation:
69 ppm OC = [(ppb dry weight) / (% total organic carbon X 1000)].

70 ~~(e)~~ (i) The LPAH criterion represents the sum of the following "low molecular weight
71 polynuclear aromatic hydrocarbon" compounds: Naphthalene, Acenaphthylene, Acenaphthene,
72 Fluorene, Phenanthrene, and Anthracene. The LPAH criterion is not the sum of the criteria
73 values for the individual LPAH compounds as listed.

74 ~~(e)~~ (j) The HPAH criterion represents the sum of the following "high molecular weight
75 polynuclear aromatic hydrocarbon" compounds: Fluoranthene, Pyrene, Benz(a)anthracene,
76 Chrysene, Total Benzo(a)fluoranthenes, Benzo(a)pyrene, Indeno(1,2,3-c,d)pyrene,
77 Dibenzo(a,h)anthracene, and Benzo(g,h,i)perylene. The HPAH criterion is not the sum of the
78 criteria values for the individual HPAH compounds as listed.

79 ~~(e)~~ (k) The ~~TOTAL BENZOFLUORANTHENES~~ Total Benzo(a)fluoranthenes criterion
80 represents the sum of the concentrations of the "B," "J," and "K" isomers.

| Chemical Parameter | mg/kg Dry Weight (Parts per Million (PPM <u>ppm</u>) Dry Weight) | mg/kg Dry Weight (Parts per Million (PPM <u>ppm</u>) Dry Weight) |
|------------------------------|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| | Sediment Quality Standard | Cleanup Screening Level |
| Arsenic | 57 | 93 |
| Cadmium | 5.1 | 6.7 |
| Chromium | 260 | 270 |
| Copper | 390 | 390 |
| Lead | 450 | 530 |
| Mercury | 0.41 | 0.59 |
| Silver | 6.1 | 6.1 |
| Zinc | 410 | 960 |
| | | |
| Chemical Parameter | mg/kg Organic carbon (ppm carbon) Sediment Quality Standard | mg/kg Organic carbon (ppm carbon) Cleanup Screening Level |
| LPAH | 370 | 780 |
| Naphthalene | 99 | 170 |
| Acenaphthylene | 66 | 66 |
| Acenaphthene | 16 | 57 |
| Fluorene | 23 | 79 |
| Phenanthrene | 100 | 480 |
| Anthracene | 220 | 1200 |
| 2-Methyl Naphthalene | 38 | 64 |
| HPAH | 960 | 5300 |
| Fluoranthene | 160 | 1200 |
| Pyrene | 1000 | 1400 |
| Benz(a)anthracene | 110 | 270 |
| Chrysene | 110 | 460 |
| Total Benzo(a)fluoranthenes | 230 | 450 |
| Benzo(a)pyrene | 99 | 210 |
| Indeno(1,2,3 c,d) Pyrene | 34 | 88 |
| Dibenzo (a,h) Anthracene | 12 | 33 |
| Benzo (g,h,i) Perylene | 31 | 78 |
| 1,2 Dichlorobenzene | 2.3 | 2.3 |
| 1,4 Dichlorobenzene | 3.1 | 9 |
| 1,2,4 Trichlorobenzene | 0.81 | 1.8 |
| Hexachlorobenzene | 0.38 | 2.3 |
| | | |
| Dimethyl Phthalate | 53 | 53 |
| Diethyl Phthalate | 61 | 110 |
| Di-n-butyl Phthalate | 220 | 1700 |
| Butyl Benzyl Phthalate | 4.9 | 64 |
| Bis (2-ethylhexyl) Phthalate | 47 | 78 |
| Di-n-octyl Phthalate | 58 | 4500 |
| | | |
| Dibenzofuran | 15 | 58 |
| Hexachlorobutadiene | 3.9 | 6.2 |
| N-Nitrosodiphenylamine | 11 | 11 |
| Total PCBs | 12 | 65 |
| | ug/kg Dry Weight (Parts per billion (PPM <u>ppb</u>) Dry Weight) | ug/kg Dry Weight (Parts per billion (PPB <u>ppb</u>) Dry Weight) |
| Phenol | 420 | 1200 |
| 2-Methylphenol | 63 | 63 |
| 4-Methylphenol | 670 | 670 |
| 2,4 Dimethyl Phenol | 29 | 29 |
| Pentachlorophenol | 360 | 690 |
| Benzyl Alcohol | 57 | 73 |
| Benzoic Acid | 650 | 650 |

81 **(3) Puget Sound marine sediment quality standards and cleanup screening levels**
 82 **and minimum cleanup level biological criteria.** The biological effects criteria in Table V of
 83 this subsection establish the Puget Sound marine sediment quality standards and cleanup
 84 screening levels. ~~and the Puget Sound marine sediment minimum cleanup level criteria~~ The
 85 criteria of this section shall apply to Puget Sound marine sediments for toxicity to the benthic
 86 invertebrate community.

87 (a) The sediment quality standard biological criteria for a sampling station is exceeded
 88 when one of the biological test results is above the sediment quality standard as described in
 89 Table V.¹⁰⁶

90 (b) ~~(d)~~ The cleanup screening level biological criteria for a sampling station is exceeded
 91 when: ~~the criteria of WAC 173-204-320(3):~~

92 (i) Any two of the biological tests results for a sampling station exceed the sediment
 93 quality standard in Table V,¹⁰⁷ or

94 (ii) One of the biological test results for a sampling station exceeds the cleanup screening
 95 level as described in Table V ~~or one of and~~ the following: test determinations is made:¹⁰⁸

96 (i) (A) Amphipod: The test sediment has a higher (statistically significant, t test, $p \leq 0.05$)
 97 mean mortality than the reference sediment and the test sediment mean mortality is greater than a
 98 value represented by the reference sediment mean mortality plus thirty percent.

99 (ii) (B) Larval: The test sediment has a mean survivorship of normal larvae that is less
 100 (statistically significant, t test, $p \leq 0.05$) than the mean normal survivorship in the reference
 101 sediment and the test sediment mean normal survivorship is less than seventy percent of the
 102 mean normal survivorship in the reference sediment (i.e., the test sediment has a mean combined
 103 abnormality and mortality that is greater than thirty percent relative to time-final in the reference
 104 sediment).

105 (iv)(C) Juvenile polychaete: The test sediment has a mean individual growth rate of less
 106 than fifty percent of the reference sediment mean individual growth rate and the test sediment
 107 mean individual growth rate is statistically different (t test, $p \leq 0.05$) from the reference sediment
 108 mean individual growth rate.

109 (iii) (D) Benthic abundance: The test sediment has less than fifty percent of the reference
 110 sediment mean abundance of any two of the following major taxa: Class Crustacea, Phylum
 111 Mollusca or Class Polychaeta and the test sample abundances are statistically different (t test, p
 112 ≤ 0.05) from the reference abundances.

¹⁰⁶ Not a substantive change. A table was added to better communicate how a sediment quality standard exceedance is determined.

¹⁰⁷ Not a substantive change. A table was added to better communicate how a cleanup screening level exceedance is determined.

¹⁰⁸ Not a substantive change. A table was added to better communicate how a cleanup screening level exceedance is determined.

113 (c) The acute and chronic effects biological tests of Table VI shall be used to:¹⁰⁹

114 (i) Confirm designation of marine sediments for benthic toxicity. The department may
 115 require biological testing to confirm the designation of marine sediment which either passes or
 116 fails the chemical criteria established in WAC 173-204-572(2). If required, the sediment shall be
 117 tested using the procedures in subsection (3)(d).

118 (ii) Establish the marine sediment quality standard and cleanup screening level for
 119 identifying sediment station clusters of potential concern for benthic toxicity using the
 120 procedures of WAC 173-204-510(2); and

121 (iii) Establish the marine sediment quality standard or cleanup screening level for
 122 identifying station clusters of low concern using the procedures of WAC 173-204-510(2). (d) To
 123 designate sediment quality using biological criteria, a minimum of the following shall be
 124 included in the suite of biological tests for each sediment sample as described in Table VI:¹¹⁰

125 (i) Two acute effects tests, and

126 (ii) One chronic test.

127 (e) The appropriate control and reference sediment samples shall meet the performance
 128 standards described in Table VI. Selection and use of reference sediment must be approved by
 129 the department and shall meet the performance standards of Table VI. The department may
 130 approve a different performance standard based on best available science.

131 (f) Use of alternate biological tests may be required by the department and shall be
 132 subject to the review and approval of the department using the procedures of WAC 173-204-
 133 130(4).

134 (g) Any person who designates test sediments using the procedures of this section shall
 135 meet the sampling and testing plan requirements of WAC 173-204-600 and records management
 136 requirements of WAC 173-204-610. Test sediments designated using the procedures of this
 137 section shall be sampled and analyzed using methods approved by the department, and shall use
 138 an appropriate quality assurance/quality control program, as determined by the department.

139 ~~(a) The acute and chronic effects biological tests of WAC 173-204-315(1) shall be used~~
 140 ~~to:~~

141 ~~——(i) Identify the Puget Sound marine sediment cleanup screening level for the purpose of~~
 142 ~~screening sediment station clusters of potential concern using the procedures of WAC 173-204-~~
 143 ~~510(2); and~~

144 ~~——(ii) Identify the Puget Sound marine sediment cleanup screening level for the purpose of~~

¹⁰⁹ Not a substantive change. Language from sections -310, -315 was brought into this section for clarity and to avoid the need to refer to a different section and consistency with section -573, freshwater standards.

¹¹⁰ Not a substantive change for subsections (d) through (g). Language from section -310, -315 was brought into this section for clarity and to avoid the need to refer to a different section and consistency with section -573, freshwater standards.

145 ~~identifying station clusters of low concern and/or cleanup sites using the hazard assessment~~
146 ~~procedures of WAC 173-204-510(2).~~

147 ~~——(b) When using biological testing to determine if station clusters exceed the cleanup~~
148 ~~screening level or to identify the cleanup screening level for a contaminated site, test results from~~
149 ~~at least two acute effects tests and one chronic effects test shall be evaluated.~~

150 ~~(c) The biological tests shall not be considered valid unless test results for the appropriate~~
151 ~~control and reference sediment samples meet the performance standards described in WAC 173-~~
152 ~~204-315(2).¹¹¹~~

153 ~~(5) (4) Other toxic, radioactive, biological, or deleterious substances criteria. Puget-~~
154 ~~Sound marine sediment cleanup screening levels and minimum cleanup levels o¹¹² Other toxic,~~
155 ~~radioactive, biological, or deleterious substances criteria in, or on, sediments shall be at or below~~
156 ~~levels which cause minor adverse effects in marine biological resources, or which correspond to~~
157 ~~no significant health risk to humans, as determined by the department.¹¹³ The department shall~~
158 ~~determine on a case-by-case basis the criteria, methods, and procedures necessary to meet the~~
159 ~~intent of this chapter.~~

160

161

162

163

¹¹¹ Moved to subsection (3)(c) through (e).

¹¹² Editorial change.

¹¹³ Removed to reflect the proposed human health criteria in new section -571.

| Biological Test/Endpoint | Performance | Standard | Sediment Quality Standard for each biological test | Cleanup Screening Level for each biological test |
|----------------------------------------------|------------------------------------------------------------------------------------|---------------------------|---------------------------------------------------------------------------|---------------------------------------------------------------------------|
| | Control | Reference | | |
| Amphipod | | | | |
| 10-day Mortality | $M_C < 10\%$ | $M_R < 25\%$ | $M_T > 25\%$ Absolute and M_T vs. M_R SD ($p = 0.05$) | $M_T - M_R > 30\%$ and M_T vs. M_R SD ($p = 0.05$) |
| Larval | | | | |
| Bivalve or Echinoderm Abnormality /Mortality | $N_C / I \geq 0.70$ | | $N_T / N_R < 0.85$ and N_T vs. N_R SD ($p = 0.10$) | $N_T / N_R > 0.70$ and N_T vs. N_R SD ($p = 0.10$) |
| Juvenile Polychaete | | | | |
| <i>Neanthes</i> 20-day Growth | $M_C < 10\%$ and $MIG_C \geq 0.72$ mg/individual/day (or Case By Case) | $MIG_R / MIG_C \geq 0.80$ | $MIG_T / MIG_R < 0.70$ and MIG_T vs. MIG_R SD ($p = 0.05$) | $MIG_T / MIG_R < 0.50$ and MIG_T vs. MIG_R SD ($p = 0.05$) |
| Microtox | | | | |
| Microtox Decreased Luminescence | Case By Case | Case By Case | $ML_T / ML_R < 0.80$ and ML_T vs. ML_R SD ($p = 0.05$) | |

Table V: Marine sediment quality standards, cleanup screening levels, and performance standards for each biological test. C = Control; R = Reference; T = Test; F = Final; M = Mortality; N = Normal Survivorship expressed as actual counts; I = Initial count; MIG = Mean Individual Growth Rate expressed in mg/ind/day AFDW*; ML = Mean Light output; BLD = Blank Corrected Light Decrease; SD = Significantly Different; An exceedance of the criteria requires a statistical significance at $p = 0.05$ for Amphipod, Juvenile Polychaete, Microtox tests; An exceedance of the criteria requires a statistical significance at $p = 0.10$ for the Larval test.

| Species/Class, biological test, and endpoint | Acute effects biological test | Chronic effects biological test |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------|
| Amphipod: <i>Rhepoxynius abronius, Ampelisca abdita, Eohaustorius estuarius</i> | | |
| 10 day Mortality | X | |
| Larval: <i>Crassostrea gigas (Pacific oyster), Mytilus (edulis) galloprovincialis (Blue mussel), Strongylocentrotus purpuratus (Purple sea urchin), Dendraster excentricus (Sand dollar)</i> | | |
| Mortality/Abnormality | X | |
| Juvenile Polychaete: <i>Neanthes arenaceodentata</i> | | |
| 28 day Growth | | X |
| Microtox: <i>Vibrio fisheri</i> | | |
| 15 minute exposure; Decreased luminescence | | X |
| Benthic Infauna: Class Crustacea, Polychaeta, Phylum Mollusca | | |
| | | X |

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166 Table VI. Types of marine sediment biological tests, species, and applicable endpoints.

167

168 ~~(4) Puget Sound marine sediment cleanup screening levels and minimum cleanup levels~~
 169 ~~human health criteria. Reserved: The department may determine on a case-by-case basis the~~
 170 ~~criteria, methods, and procedures necessary to meet the intent of this chapter.~~¹¹⁴

171 ~~(5) Puget Sound marine sediment cleanup screening levels and minimum cleanup levels~~
 172 ~~nonanthropogenically affected sediment criteria. Whenever the nonanthropogenically affected~~
 173 ~~sediment quality is of a lower quality (i.e., higher chemical concentrations, higher levels of~~
 174 ~~adverse biological response, or posing a higher threat to human health) than the applicable~~
 175 ~~cleanup screening levels and minimum cleanup levels criteria established under this section, the~~
 176 ~~existing sediment chemical and biological quality shall be identified on an area-wide basis as~~
 177 ~~determined by the department, and used in place of the standards of WAC 173-204-520.~~¹¹⁵

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¹¹⁴ Removed to reflect the proposed human health criteria in new section -571.

¹¹⁵ Changed to reflect the proposed human health, background, and ecological criteria in section -570 through -574.

1 **WAC 173-204-573 Cleanup screening levels and sediment quality standards based on**
2 **benthic community toxicity in freshwater sediment.**

3 (1) Applicability.

4 (2) Freshwater sediment quality standards and cleanup screening levels chemical criteria.

5 (3) Freshwater sediment quality standards and cleanup screening levels biological
6 criteria.

7 (4) Other toxic, radioactive, biological, or deleterious substances criteria.

8
9 **(1) Applicability.** The freshwater criteria in Tables VII and VIII establish the freshwater
10 chemical and biological sediment quality standards and cleanup screening levels to be used in the
11 evaluation of cleanup alternatives per the procedures of WAC 173-204-580 and the selection of a
12 sediment cleanup standard(s) per the procedures of WAC 173-204-570.

13 **(2) Freshwater sediment quality standards and cleanup screening levels chemical**
14 **criteria.** The chemical concentration criteria in Table VII establish the sediment quality
15 standards and cleanup screening levels chemical criteria for freshwater sediment. The criteria of
16 this section shall apply to freshwater sediments for toxicity to the benthic community.

17 (a) The sediment quality standards of this section establish a no adverse effects level,
18 including no acute or chronic adverse effects, on the benthic community. Chemical
19 concentrations below the sediment quality standards correspond to sediment quality that results
20 in no adverse effects to the benthic community.

21 (b) The cleanup screening levels of this section establish a minor adverse effects level,
22 including acute or chronic effects, on the benthic community. Chemical concentrations above the
23 cleanup screening level correspond to sediment quality that results in minor adverse effects to the
24 benthic community. The freshwater chemical and biological cleanup screening levels establish
25 minor adverse effects as the level above which station clusters of potential concern are defined
26 and may be defined as potential cleanup sites for benthic community toxicity and at or below
27 which station clusters of low concern are defined, per the procedures identified in WAC 173-
28 204-510.

29 (c) The cleanup screening level chemical criteria is exceeded when the sediment chemical
30 concentration for a single chemical is above the cleanup screening level in Table VII.

31 (d) The sediment quality standard chemical criteria is exceeded when the sediment
32 chemical concentration for a single chemical is above the sediment quality standard in Table VII.

33 (c) Where laboratory analysis indicates a chemical is not detected in a sediment sample,
34 the detection limit and the practical quantitation limit shall be reported and shall be at or below
35 the freshwater sediment quality standards chemical criteria value in Table VII.

36 (d) Where chemical criteria in Table VII represent the sum of individual compounds or
37 isomers, the following methods shall be applied:

38 (i) Where chemical analyses identify an undetected value for every individual
39 compound/isomer then the single highest detection limit shall represent the sum of the respective
40 compounds/isomers; and

41 (ii) Where chemical analyses detect one or more individual compound/isomers, only the
42 detected concentrations will be added to represent the group sum.

43 (e) The listed chemical criteria represent concentrations in parts per million dry-weight
44 normalized.

45 (f) The total PAH criterion represents the sum of the following polycyclic aromatic
46 hydrocarbon compounds: 1-methylnaphthalene, 2-methylnaphthalene, acenaphthene,
47 acenaphthylene, anthracene, benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene,
48 benzo(ghi)perylene, benzo(k)fluoranthene, chrysene, dibenz(ah)anthracene, fluoranthene,
49 fluorene, indeno(123-cd)pyrene, naphthalene, phenanthrene, pyrene, total benzofluoranthenes
50 (b+k+j).

51 (g) The total DDDs criterion represents the sum of the following DDD isomers: o,p'-
52 DDD, p,p'-DDD.

53 (h) The total DDEs criterion represents the sum of the following DDE isomers: o,p'-DDE,
54 p,p'-DDE.

55 (i) The total DDTs criterion represents the sum of the following DDT isomers: o,p'-DDT,
56 p,p'-DDT.

57 (j) The total PCB Aroclors criterion represents the sum of the following Aroclors: 1016,
58 1221, 1242, 1248, 1254, 1260, 1268.

59 (k) When the listed chemical criteria in Table VII have a “>” (greater than) value for the
60 cleanup screening level, the minor adverse affects level is unknown but above the concentration
61 shown. If test results show concentrations above this level, bioassays shall be conducted to
62 evaluate potential benthic toxicity.

63 (l) The department recognizes there are freshwater sediment environments where the
64 chemical criteria in Table VII are not predictive of benthic toxicity. In these situations, the
65 department may require alternative methods for characterizing benthic toxicity. Examples of
66 these types of environments include:

67 (i), Sediment with unique geochemical characteristics such as bogs, alpine wetlands, or
68 metals mining, milling, or smelting sites;

69 (ii) Sites where chemicals not listed in Table VII are suspected of causing benthic
70 toxicity;

71 (iii) Sites with unusual pH, total organic carbon, alkalinity or other characteristics.

72

| Table VII Freshwater Sediment Quality Standards and Cleanup Screening Levels Chemical Criteria | | | 73 |
|---------------------------------------------------------------------------------------------------|----------------------------------------------------|--------------------------------------------------|-----|
| Chemical Parameter | Dry Weight Normalized Sediment Quality Standard | Dry Weight Normalized Cleanup Screening Level | 74 |
| Conventional chemicals (mg/kg) | | | 75 |
| Ammonia | 230 | 300 | 76 |
| Total sulfides | 39 | 61 | 77 |
| Metals (mg/kg) | | | 78 |
| Arsenic | 14 | 120 | 79 |
| Cadmium | 2.1 | 5.4 | 80 |
| Chromium | 72 | 88 | 81 |
| Copper | 400 | 1200 | 82 |
| Lead | 360 | > 1300 | 83 |
| Mercury | 0.66 | 0.8 | 84 |
| Nickel | 26 | 110 | 85 |
| Selenium | 11 | >20 | 86 |
| Silver | 0.57 | 1.7 | 87 |
| Zinc | 3200 | > 4200 | 88 |
| Organic Chemicals (µg/kg) | | | 89 |
| 4-Methylphenol | 260 | 2000 | 90 |
| Benzoic acid | 2900 | 3800 | 91 |
| Beta-Hexachlorocyclohexane | 7.2 | 11 | 92 |
| Bis(2-Ethylhexyl) phthalate | 500 | 22000 | 93 |
| Carbazole | 900 | 1100 | 94 |
| Dibenzofuran | 200 | 680 | 95 |
| Dibutyltin | 910 | 130000 | 96 |
| Dieldrin | 4.9 | 9.3 | 97 |
| Di-n-butyl phthalate | 380 | 1000 | 98 |
| Di-n-octyl phthalate | 39 | > 1100 | 99 |
| Endrin Ketone | 8.5 | * | 100 |
| Monobutyltin | 540 | > 4800 | |
| Pentachlorophenol | 1200 | > 1200 | |
| Phenol | 120 | 210 | |
| Tetrabutyltin | 97 | > 97 | |
| Total PCB Aroclors | 110 | 2500 | |
| Total DDDs | 310 | 860 | |
| Total DDEs | 21 | 33 | |
| Total DDTs | 100 | 8100 | |
| Total PAHs | 17000 | 30000 | |
| Tributyltin | 47 | 320 | |
| Bulk Petroleum Hydrocarbons (mg/kg) | | | |
| TPH-Diesel | 340 | 510 | |
| TPH-Residual | 3600 | 4400 | |

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103 **(3) Freshwater sediment quality standards and cleanup screening levels biological**
104 **criteria.** The biological effects criteria in Table VIII establish the sediment quality standards
105 and cleanup screening levels biological criteria for freshwater sediment. The criteria of this
106 section shall apply to freshwater sediments for toxicity to the benthic invertebrate community.

107 (a) The sediment quality standard biological criteria for a sampling station is exceeded
108 when one of the biological test results is above the sediment quality standard as described in
109 Table VIII.

110 (b) The cleanup screening level biological criteria for a sampling station is exceeded
111 when:

112 (i) Any two of the biological test results for a sampling station are above the sediment
113 quality standard in Table VIII; or

114 (ii) One of the biological test results for a sampling station is above the cleanup
115 screening level as described in Table VIII.

116 (c) The acute and chronic effects biological tests of Table IX shall be used to:

117 (i) Confirm designation of freshwater sediment for benthic toxicity. The department may
118 require biological testing to confirm the designation of freshwater sediment which either passes
119 or fails the chemical criteria in WAC 173-204-573(2). If required, the sediment shall be tested
120 using the procedures in subsection (3)(d);

121 (ii) Evaluate the freshwater sediment quality standard and cleanup screening level for
122 identifying sediment station clusters of potential concern for benthic toxicity using the
123 procedures in WAC 173-204-510(2);

124 (iii) Establish the freshwater sediment quality standard or cleanup screening level for
125 identifying station clusters of low concern for benthic toxicity using the procedures in WAC 173-
126 204-510(2).

127 (d) To designate sediment quality using biological criteria, a minimum of the following
128 shall be included in the suite of biological tests for each sediment sample as described in Table
129 IX:

130 (i) Two different species; and

131 (ii) Three endpoints; and

132 (iv) One chronic test; and

133 (v) One sublethal endpoint.

134 (e) The appropriate control and reference sediment samples shall meet the performance
135 standards described in Table VIII. Selection and use of reference sediment must be approved by
136 the department and shall meet the performance standards of Table VIII. The department may
137 approve a different performance standard based on best available science.

138 (f) Use of alternate biological tests may be required by the department and shall be

139 subject to the review and approval of the department using the procedures of WAC 173-204-
 140 130(4).

141 (g) Any person who designates test sediments using the procedures of this section shall
 142 meet the sampling and testing plan requirements of WAC 173-204-600 and records management
 143 requirements of WAC 173-204-610. Test sediments designated using the procedures of this
 144 section shall be sampled and analyzed using methods approved by the department, and shall use
 145 an appropriate quality assurance/quality control program, as determined by the department.

146 (4) **Other toxic, radioactive, biological, or deleterious substances criteria.** Other
 147 toxic, radioactive, biological, or deleterious substances in, or on, sediments shall be at or below
 148 levels which cause minor adverse effects to biological resources, or which correspond to no
 149 significant health risk to humans, as determined by the department. The department shall
 150 determine on a case-by-case basis the criteria, methods, and procedures necessary to meet this
 151 requirement.

| Biological Test/Endpoint | Performance Standard | | Sediment Quality Standard for each biological test | Cleanup Screening Level for each biological test |
|---------------------------|------------------------------------|------------------------------------|----------------------------------------------------|--------------------------------------------------|
| | Control | Reference | | |
| <i>Hyaella azteca</i> | | | | |
| 10-day mortality | $M_C < 20\%$ | $M_R < 25\%$ | $M_T - M_C > 15\%$ | $M_T - M_C > 25\%$ |
| 28-day mortality | $M_C < 20\%$ | $M_R < 30\%$ | $M_T - M_C > 10\%$ | $M_T - M_C > 25\%$ |
| 28-day growth | $MIG_C \geq 0.15$ mg/individual | $MIG_R \geq 0.15$ mg/individual | $MIG_T/MIG_C < 0.75$ | $MIG_T/MIG_C < 0.6$ |
| <i>Chironomus dilutus</i> | | | | |
| 10-day mortality | $M_C < 30\%$ | $M_R < 30\%$ | $M_T - M_C > 20\%$ | $M_T - M_C > 30\%$ |
| 10-day growth | $MIG_C \geq 0.48$ mg/individual | $RF/CF \geq 0.8$ | $MIG_T/MIG_C < 0.8$ | $MIG_T/MIG_C < 0.7$ |
| 20-day mortality | $M_C < 32\%$ | $M_R < 35\%$ | $M_T - M_C > 15\%$ | $M_T - M_C > 25\%$ |
| 20-day growth | $MIG_C \geq 0.60$ mg/individual | $RF/CF \geq 0.8$ | $MIG_T/MIG_C < 0.75$ | $MIG_T/MIG_C < 0.6$ |

152 Table VIII. Freshwater sediment quality standards, cleanup screening levels, and performance
 153 standards for each biological test. M = Mortality; C = Control; R = Reference; T = Test; F =
 154 Final; MIG = Mean Individual Growth at time final; mg = milligrams. An exceedance of the
 155 sediment quality standard and cleanup screening level requires statistical significance at $p = 0.05$.

156 Reference performance standards are provided for sites where the department has approved a
 157 freshwater reference sediment site(s) and reference results will be substituted for control in
 158 comparing test sediments to criteria.

159

| Species, biological test, and endpoint | Acute effects biological test | Chronic effects biological test | Lethal effects biological test | Sub-lethal effects biological test |
|----------------------------------------|-------------------------------|---------------------------------|--------------------------------|------------------------------------|
| Amphipod | | | | |
| <i>Hyalella azteca</i> | | | | |
| 10 day Mortality | X | | X | |
| 28 day Mortality | | X | X | |
| 28 day Growth | | X | | X |
| Midge | | | | |
| <i>Chironomus dilutus</i> | | | | |
| 10 day Mortality | X | | X | |
| 10 day Growth | X | | | X |
| 20 day Mortality | | X | X | |
| 20 day Growth | | X | | X |

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161 Table IX. Types of freshwater sediment biological tests, species, and applicable endpoints.

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1 WAC 173-204-574 Sediment cleanup standards based on ecological risks from
2 bioaccumulative chemicals.¹¹⁶

3 (1) Applicability and purpose.

4 (2) General considerations.

5 (1) **Applicability and purpose.** Cleanup standards must prevent exposure to
6 contaminant concentrations that may have minor adverse effects on species that currently utilize,
7 may potentially inhabit, or have historically inhabited cleanup sites. Minor adverse effects
8 include impairment of reproduction, growth or survival.

9 (2) **General considerations.** Cleanup standards shall be protective of species based
10 on a number of factors including, but not limited to, the species life history, feeding and
11 reproductive strategy, population numbers, range, and the potential for recruitment/immigration
12 of individuals to the site. For species protected under the Endangered Species Act or other
13 applicable laws that extend protection to individuals of a species, adverse effects also include
14 impacts that significantly disrupt normal behavior patterns that include, but are not limited to,
15 breeding, feeding, or sheltering.

16 (a) The cleanup standards shall be protective of ecological receptors that may be exposed
17 to contaminants from the site through bioaccumulation and biomagnification through the food
18 chain. The determination of a bioaccumulative contaminant's potential to have minor adverse
19 effects on biological resources must be based on the contaminant's potential to be persistent,
20 bioaccumulative, or toxic (PBT) as established in WAC 173-333-320. A bioaccumulative
21 contaminant that is present at the site may be deemed by the department to be reasonably likely
22 to produce minor adverse effects on ecological receptors if either of the following conditions
23 exist:

24 (i) The contaminant is listed as a persistent bioaccumulative toxin on the department's
25 PBT list in WAC 173-333-310; or

26 (ii) The contaminant has chemical properties which indicate a propensity to
27 bioaccumulate. Chemicals with a log $K_{ow} > 3.5$ will be presumed to have a propensity to
28 bioaccumulate. Chemicals that are present at a site and meet either of the conditions specified
29 above will be considered bioaccumulative contaminants of concern (BCoCs).

30 (b) An ecological risk assessment using methods approved by the department may be
31 required when BCoCs are present at the site. An ecological risk assessment may also be
32 required when site contaminants are known or suspected of having minor adverse effects on
33 upper trophic level receptors through direct contact exposure scenarios. Ecological risk
34 assessments will not be required at sites where either a human health risk assessment has
35 determined that the cleanup standard must be established at natural background or where a
36 potentially liable person has agreed to use natural background as a cleanup standard.

37 (c) For determining ecological risk from BCoCs and non-bioaccumulative contaminants,
38 the department shall determine on a case-by-case basis the criteria, methods, and procedures
39 necessary to meet the intent of this chapter.

¹¹⁶ Added to address the lack of a narrative standard for ecological risks from bioaccumulative chemicals.

1 **WAC 173-204-580 ~~Cleanup action decision~~ Selection of cleanup actions.**¹¹⁷

2
3 (1) Purpose.

4 (2) General requirements.

5 (3) Minimum requirements for sediment cleanup actions.

6 (4) Cleanup selection criteria.

7
8 (1) Purpose. This chapter establishes the minimum requirements and selection criteria
9 for sediment cleanup actions under this chapter.

10 (2) General requirements.

11 (a) ~~Receive department review and written approval of the preferred and/or alternate~~
12 ~~cleanup actions and necessary sediment recovery zones proposes in the cleanup study report~~
13 ~~prior to implementing a cleanup action(s)~~ The department shall review and provide written
14 approval of cleanup actions and sediment recovery zones prior to implementation of a cleanup
15 action.

16 (b) Sediment investigations and cleanups conducted in compliance with this chapter shall
17 be presumed to also meet the requirements under Chapter 70.105D RCW. For example, a
18 remedy selected under WAC 173-204-580 does not also have to be justified under WAC 173-
19 340-360.

20 **(3) Minimum requirements for sediment cleanup actions.**¹¹⁸ These requirements and
21 the requirements for consideration of the cleanup standard under WAC 173-204-570 shall be
22 considered concurrently. All cleanup actions conducted under this chapter shall meet the
23 following requirements:

24 (b) (a) ~~Achieve a degree of cleanup that is protective~~ Protect human health and the
25 environment;

26 (d) (b) Comply with the sediment cleanup standards specified in WAC 173-204-570
27 through 574;

28 (c) ~~Achieve compliance~~ Comply with all applicable state, federal, and local laws;

29 (d) Be permanent to the maximum extent practicable;

30 (3) (e) Provide for a reasonable restoration timeframe ~~for completion of the cleanup~~
31 action. Unless otherwise determined by the department, cleanup actions that achieve compliance

¹¹⁷ This section has been revised to focus on the remedy selection requirements. Some of the language from the original section -560 regarding remedy selection requirements have been moved to this section.

¹¹⁸ This section is divided into minimum requirements for selecting a cleanup action and subsequent supplemental criteria the Ecology may consider during remedy selection. Additional requirements have been added to harmonize with the requirements in MTCA, WAC 173-340-360 through 173-340-370.

32 with the sediment cleanup standards as soon as practicable and within 10 years or sooner from
 33 the completion start¹¹⁹ of the active cleanup action shall be presumed to have a reasonable
 34 restoration timeframe;

35 ~~(e) (f) Achieve compliance with~~ If source control requirements is part of the cleanup
 36 action, comply with WAC 173-204-400 through 173-204-420 ~~if necessary~~;

37 (g) If a sediment recovery zone is part of the cleanup action, meet the requirements in
 38 WAC 173-204-590;

39 ~~(h) Provide for landowner review of the cleanup study plan and report, an opportunity for~~
 40 review and comment by affected landowners and the general public, and consider public
 41 concerns raised during review of the draft cleanup report identified in these comments; and

42 ~~(g) (i)~~ (i) Provide adequate monitoring to ensure the effectiveness of the cleanup action.

43 **(4) Cleanup selection criteria.**¹²⁰ When evaluating ~~cleanup action~~ alternatives for
 44 compliance with the minimum requirements in subsection (3) of this section, the department
 45 shall consider the following criteria:

46 (a) Overall protection of human health and the environment,¹²¹ ~~time required to attain the~~
 47 ~~cleanup standard(s), and on-site and off-site environmental impacts and risks to human health~~
 48 ~~resulting from implementing the cleanup alternatives including: the degree to which existing~~
 49 ~~human health risk and environmental effects are reduced by the alternative; human health risk~~
 50 ~~and environmental effects of cleanup construction and disposal activities; human health risk and~~
 51 ~~environmental effects after cleanup; restoration of current and potential future uses of the site;~~
 52 ~~and, improvement of the overall environmental quality;~~

53 ~~(b) Attainment of~~ Whether the alternative will achieve the sediment cleanup standards;¹²²

54 ~~(c) Whether the alternative complies~~ compliance with applicable federal, state, and local
 55 laws;¹²³

56 (d) The degree to which the alternative permanently reduces the toxicity, mobility or
 57 volume of contaminants;

58 ~~(a) (e) The net environmental effects, including consideration of residual effects,~~
 59 ~~recovery rates, and any adverse effects of cleanup construction or disposal activities~~ positive and
 60 adverse impacts on natural resources and habitat resulting from implementation of the cleanup
 61 action;

¹¹⁹ This could be interpreted as a substantive change.

¹²⁰ Requirements added to harmonize with MTCA, WAC 173-340-560. Requirements from original section -560 have been moved to this subsection.

¹²¹ Moved from original section -560(4)(f)(iii)(A) and added language to harmonize with MTCA.

¹²² Moved from original section -560(4)(f)(iii)(B).

¹²³ Moved from original section -560(4)(f)(iii)(B).

62 (f) The relative cost-effectiveness of the alternatives in achieving the approved site
 63 cleanup standards. Costs shall include consideration of present and future direct and indirect
 64 capital, operation, and maintenance costs, agency oversight costs and other foreseeable costs.
 65 The comparison of costs and benefits may be quantitative, but will often be qualitative and
 66 require the use of best professional judgment. In particular, the department has the discretion to
 67 favor or disfavor qualitative benefits and use that information in selecting a cleanup action;

68 (g) The time required to achieve the sediment cleanup standards,¹²⁴ with preference for
 69 alternatives that restore the site sooner;

70 (h) The effectiveness of source control measures to prevent recontamination of the site;

71 (i) The degree to which community concerns are addressed¹²⁵ in implementation of the
 72 alternative;

73 ~~(3(a)(vi))~~ (j) ~~The degree of and~~ ability to ~~control and~~ monitor the effectiveness of the
 74 cleanup and any migration of contamination from the site left behind after cleanup;

75 (k) Short-term effectiveness¹²⁶ of the alternative, including protection of human health
 76 and the environment during construction and implementation of the alternative, and ability to
 77 control the migration of contamination during implementation of the cleanup action¹²⁷ and the
 78 restoration timeframe;

79 (l) Long-term effectiveness¹²⁸ of the alternative, including degree of certainty that the
 80 alternative will be successful, long-term reliability, ~~magnitude of residual, biological and human~~
 81 ~~health risk,~~¹²⁹ and effectiveness of controls for ongoing discharges ~~and/or controls required to~~
 82 ~~manage treatment residues or remaining wastes cleanup and/or disposal site risks.~~ The following
 83 types of cleanup actions shall be used as a guide, in descending order, when assessing the
 84 relative degree of long-term effectiveness:

- 85 • Source controls in combination with other cleanup technologies;
- 86 • Destruction or detoxification of contaminants;
- 87 • Dredging and disposal at an open water disposal site approved by the department.¹³⁰
- 88 • Dredging and disposal in an engineered facility that minimizes subsequent releases
 89 and exposures to contaminants;
- 90 • Containment of contaminated sediments in-place with an engineered cap;
- 91 • Enhance natural recovery;

¹²⁴ Moved from original section -560(4)(f)(iii)(A) and added language to harmonize with MTCA

¹²⁵ Moved from original section -560(4)(i).

¹²⁶ Moved from original section -560(4)(f)(iii)(C).

¹²⁷ Moved from original section -580(3)(a)(vi)

¹²⁸ Moved from original section -560(4)(f)(iii)(D).

¹²⁹ Addressed in subsection (3)(a) and (4)(a).

¹³⁰ We would like to discuss with the advisory group the order of this option.

92 • Natural recovery; and
 93 • Institutional controls and monitoring.
 94 ~~(m) Ability to be implemented.~~ The ability to be implemented the alternative, including:
 95 the potential for landowner cooperation; ~~consideration of~~ technical feasibility; availability of
 96 ~~needed off site facilities~~ a disposal or treatment facility, services and materials; administrative
 97 and regulatory, ~~scheduling~~ requirements; ability to acquire access for construction, operations
 98 and monitoring; and integration with existing facility operations and other current or potential
 99 cleanup actions. ¹³¹

100 ~~(3)(a)(vii)~~ (n) Natural recovery processes which are expected to occur at the site that will
 101 reduce concentrations of contaminants.

102 ~~(3)(a)(v)~~ (o) Likely effectiveness and reliability of institutional controls to minimize
 103 exposures to contaminated sediments left behind after cleanup and consumption of potentially
 104 impacted aquatic resources.

105 ~~(5) Public participation. The department shall provide opportunity for public review~~
 106 ~~and comment on all cleanup action study plans, reports, and decisions reviewed and approved by~~
 107 ~~the department, for cleanup actions conducted under this chapter.~~ ¹³²

108 ~~(6) Land access. In cases where the persons(s) responsible for cleanup is not able to~~
 109 ~~secure access to lands subject to a cleanup action decision made pursuant to his section, the~~
 110 ~~department may facilitate negotiations or other proceedings to secure access to the lands.~~
 111 ~~Required for department facilitation of land access shall be submitted to the department in~~
 112 ~~writing by the persons(s) named in the cleanup action approval.~~ ¹³³
 113
 114

¹³¹ Moved from original section -560(4)(g).

¹³² Removed because addressed in subsection (3)(h).

¹³³ Removed. MTCA addresses this issue in WAC 173-340-800 in more detail and applies to sediment cleanup.

1 **WAC 173-204-585 Cleanup action decisions.**

2 (1) Purpose.

3 (2) Federal clean water act.

4 (3) Model toxics control act and water pollution control act.

5 (4) Federal cleanup sites.

6
7 **(1) Purpose.** The department shall use the remedial investigation and feasibility study,
8 and other appropriate information, to decide the appropriate cleanup standards, extent of cleanup,
9 cleanup methods, and other pertinent issues to be addressed at the site. These decisions must be
10 consistent with this chapter and the underlying administrative authority.

11 **(2) Federal clean water act.** For sites being cleaned up under authority of chapter 90.48
12 RCW, Section 401 of the federal clean water act or other administrative authority, the
13 department's decision shall be incorporated into the permit, administrative order, or other
14 appropriate binding legal document. The basis for the department's decision shall be documented
15 consistent with the requirements and procedures for the underlying legal mechanism.

16 **(3) Model toxics control act and water pollution control act.** For sites being cleaned
17 up under the authority of chapter 90.48 RCW or 70.105D RCW, the department shall prepare a
18 cleanup action plan documenting its cleanup decision. The cleanup action plan shall be prepared
19 consistent with the pertinent requirements and procedures specified in WAC 173-340-380. The
20 decisions in the cleanup action plan shall be incorporated into any permit, administrative order,
21 or other binding legal document issued under chapter 90.48 RCW or chapter 70.105D RCW.

22 **(4) Federal cleanup sites.** For sites being cleaned up under the federal cleanup law
23 (Comprehensive Environmental Response, Compensation and Liability Act; 42. U.S.C. 9601 et
24 seq.), a record of decision or order or consent decree prepared under the federal cleanup law
25 shall be used by the department to meet the requirements of this section provided:

26 (a) The cleanup action meets the requirements under this chapter;

27 (b) The state has concurred with the cleanup action; and

28 (c) An opportunity was provided for the public to comment on the cleanup action.

29 **(5) Other authorities.** For sites being cleaned up under other authorities, the
30 department's decision shall be incorporated into the permit, administrative order, or other
31 appropriate binding legal document. The public review process and basis for the department's
32 decision shall be documented consistent with the requirements and procedures for the underlying
33 legal mechanisms.

34 **(6) Public involvement.** The department shall provide public notice and an opportunity for
35 review and comment on its sediment cleanup decisions under this chapter. A separate public
36 notice is not needed under this chapter if an adequate notice and comment opportunity has been
37 provided through the underlying administrative authority.

1 **WAC 173-204-590 Sediment recovery zones.**

2 (1) Purpose.

3 (2) Applicability.

4 (3) General requirements.

5 (4) Criteria.

6 (5) Sediment recovery zone duration.

7 (6) Operational terms and conditions.

8 (7) Trespass not authorized.

9 (8) Public involvement.

10 (9) Enforcement.

11
12 **(1) Purpose.** The purpose of this section is to set forth the requirements for establishment
13 and monitoring of sediment recovery zones ~~to meet the intent of sediment quality dilution zones~~
14 ~~authorized pursuant to RCW 90.48.520.~~

15 **(2) Applicability.** The standards of this section are applicable to cleanup action decisions
16 made pursuant to WAC 173-204-580 ~~through 173-204-585~~ where selected actions leave in place
17 marine, low salinity, or freshwater sediments that exceed the applicable sediment ~~quality~~
18 ~~standards~~ cleanup objective of WAC 173-204-~~320 through 173-204-340~~570.

19 ~~(2)~~ **(3) General requirements.**¹³⁴ Authorization of a sediment recovery zone by the
20 department shall require compliance with the following general requirements:

21 ~~(a) The sediment recovery zone shall be determined by application of the department's~~
22 ~~sediment recovery zone computer models "CORMIX," "PLUMES," and/or "WASP," or an alternate~~
23 ~~sediment recovery zone model(s) approved by the department under WAC 173-204-130(4) as~~
24 ~~limited by the standards of this section and the department's best professional judgment.~~¹³⁵

25 (a) Establishment or expansion of a sediment recovery zone shall not be used as a
26 substitute for active cleanup actions, when such actions are determined to be practicable ~~and~~
27 ~~meet the standards of~~ under WAC 173-204-580;¹³⁶

28 (b) The area boundaries of the sediment recovery zone shall be the minimum practicable
29 surface area necessary;¹³⁷

30 (c) The chemical concentrations within the sediment recovery zone shall be the minimum

¹³⁴ Subsection (3)(a) through (c) moved from original section -560(f)(ii)

¹³⁵ Moved to original subsection (5)(a).

¹³⁶ Moved from original section -560(f)(ii).

¹³⁷ Language from section -415(1)(e). Added for consistency with Sediment Impact Zones.

31 practicable concentrations necessary;¹³⁸

32 (d) All discharges within the area encompassed by the sediment recovery zone shall be
33 treated with all known, available, and reasonable methods of treatment prior to the discharge.
34 This includes stormwater discharges;

35 (e) Best management practices shall be used for activities resulting in diffuse, nonpoint
36 discharges within the sediment recovery zone;

37 ~~(2)(b)~~ (f) The department shall provide specific authorization for a describe the sediment
38 recovery zone within the written approval of the cleanup study report and cleanup decision
39 required under in the cleanup action plan, or other decision document prepared under WAC 173-
40 204-580585. Specific authorization for the sediment recovery zone must be provided in an
41 enforceable document (permits, orders, settlements, etc.); and

42 ~~(2)(d)~~ (g) The department's written sediment recovery zone Any authorization for a
43 sediment recovery zone shall identify the legal location and landowners of property in the
44 sediment recovery zone.

45 **(4) Criteria.** When considering whether or not to authorize a sediment recovery zone, in
46 addition to the criteria in subsection (3) of this section, the department shall consider the
47 following factors:

48 (a) Limitations of any modeling used to project the aerial extent and time period needed
49 for the sediment recovery zone;

50 (b) Potential risks posed by the sediment recovery zone to human health and the
51 environment;¹³⁹

52 (c) The technical practicability of elimination or reduction of the size and/or degree of
53 chemical contamination and/or level of biological effects within the proposed sediment recovery
54 zone;

55 (d) Current and potential use of the sediment recovery zone, surrounding areas, and
56 associate resources that are, or may be, affected by releases from the zone;¹⁴⁰ and

57 (e) The need for institutional controls or other site use restrictions to reduce site
58 contamination risks to human health.¹⁴¹

59 **(5) Sediment recovery zone duration.** Except as provided in (a) of this subsection,
60 sediment recovery zones longer than 10 years shall not be authorized by the department.

61 ~~(2)(f)~~ (a) Where cleanup is not practicable pursuant to the analysis under WAC 173-204-
62 570(4)580, sediment recovery zones may be authorized for periods in excess of ten years;

63 (b) The aerial extent and time period during which a sediment recovery zone is projected

¹³⁸ Added language to be consistent with the intent of section -415(1)(f).

¹³⁹ Moved from original section -560(f)(ii)(D).

¹⁴⁰ Moved from original section -560(f)(ii)(F).

¹⁴¹ Moved from original section -560(f)(ii)(G).

64 to be necessary will be based on the source loading rate and the net environmental recovery rate
65 determined by the application of sediment recovery computer necessary to meet the sediment
66 cleanup objective. The source loading rate and recovery rate shall be determined by application
67 of the department's models "CORMIX," "PLUMES," and/or "WASP," a department approved
68 sediment recovery zone computer model, or an alternate method approved by the department
69 under WAC 173-204-130(4), as limited by the standards of this section and the department's best
70 professional judgment,¹⁴² and

71 (c) The time period during which a sediment recovery zone is authorized by the
72 department shall be so stated in the department's cleanup action plan, or other decision document
73 prepared under WAC 173-204-570, and implementing documents.

74 (2)(e) (6) Operational terms and conditions.¹⁴³ Operational terms and conditions for the
75 authorized sediment recovery zone pursuant to subsection (5) of this section shall be maintained
76 at all times. These terms and conditions shall include:

77 (5) (a) Chemical monitoring and/or bioassays of discharges, receiving water column, and
78 sediment;

79 (b) Confirmation of sediment source(s) loading rates, chemical quality and biological
80 toxicity;

81 (c) Monitoring contaminant bioaccumulation; and

82 (5) (d) evaluate Ongoing evaluation of the water quality, sediment quality, biological
83 conditions, and human health impacts within and adjacent to the proposed or authorized
84 sediment recovery zone.

85 (3) (7) Trespass not authorized. A sediment recovery zone authorization issued by the
86 department under the authority of chapter 90.48 or 70.105D RCW, or other administrative means
87 available to the department, does not constitute authorization to trespass on lands not owned by
88 the applicant. These requirements do not address, and in no way alter, the legal rights,
89 responsibilities, or liabilities of the permittee or landowner of the sediment recovery zone for any
90 applicable requirements of proprietary, real estate, tort, and/or other laws not directly expressed
91 as a requirement of this chapter.

92 (4) (8) Public involvement. Prior to authorization, the department shall make a
93 reasonable effort to identify and notify all landowners affected by the proposed sediment
94 recovery zone. The department shall issue a sediment recovery zone notification letter to any
95 person it believes to be a potentially affected landowner, the Washington State department of
96 natural resources, the U.S. Army Corps of Engineers, affected Port Districts, local governments
97 with land use planning authority for the area, and other parties determined appropriate by the
98 department. The notification letter shall be sent by certified mail, return receipt requested, or by
99 personal service. The notification letter shall provide:

¹⁴² Moved from original section -560(f)(ii)(A) for consistency and to eliminate duplication.

¹⁴³ These are a combination of language from original subsection (5) and section -560 (2).

- 100 (a) The name of the person the department believes to be the affected landowner; ~~and~~
- 101 (b) The names of other affected landowners to whom the department has sent a proposed
102 sediment recovery zone notification letter; ~~and~~
- 103 (c) The name of the sediment recovery zone applicant; ~~and~~
- 104 (d) A general description of the proposed sediment recovery zone including the
105 chemical(s) of concern by name and concentration, and the area of affected sediment; ~~and~~
- 106 (e) The determination of the department concerning whether the proposed sediment
107 recovery zone application meets the standards of this section; ~~and~~
- 108 (f) The intention of the department whether to authorize the proposed sediment recovery
109 zone; and
- 110 (g) ~~Notification that the affected landowner may comment on the proposed sediment~~
111 ~~recovery zone.~~ Invite comments on the proposed sediment recovery zone. Any landowner
112 comments shall be submitted in writing to the department within thirty days from the date of
113 receipt of the notification letter, unless the department provides an extension.
- 114 **(9) Enforcement.** The department shall review all data or studies conducted ~~in~~
115 ~~accordance with~~ under a sediment recovery zone authorization to ensure compliance with the
116 terms and conditions of the authorization and the standards of this section. Whenever, in the
117 opinion of the department, the operational terms and conditions of a sediment recovery zone or
118 the standards of this section are violated or there is a potential to violate the sediment recovery
119 zone authorization or the standards of this section, or new information or a reexamination of
120 existing information indicates the sediment recovery zone is no longer appropriate, the
121 department may at its discretion:
- 122 (a) Require additional chemical or biological monitoring as necessary;
- 123 (b) Revise the sediment recovery zone authorization as necessary to meet the standards of
124 this section;
- 125 (c) Require active contaminated sediment maintenance actions including additional
126 cleanup in accordance with the requirements of WAC 173-204-500 through 173-204-580; and/or
- 127 (d) Withdraw the department's authorization of the sediment recovery zone.
- 128