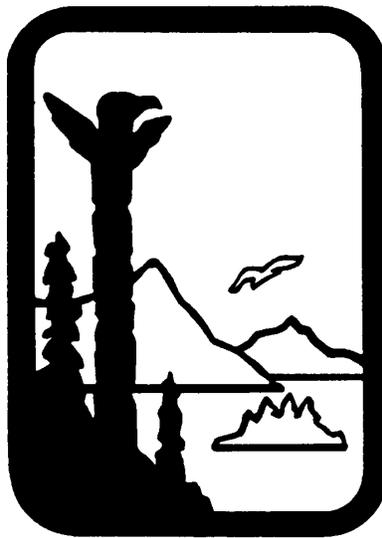


**DEPARTMENT OF  
ENVIRONMENTAL CONSERVATION**



**18 AAC 75**

**Oil and Other Hazardous Substances  
Pollution Control**

**Revised as of October 1, 2014**

**ARTICLE THREE ONLY**

This document is provided as a customer service.  
For the official version, please refer to the entire chapter of  
18 AAC 75 found in the Alaska Administrative Code.

**Sean Parnell  
Governor**

**Larry Hartig  
Commissioner**

## **IMPORTANT NOTE TO READER**

THE REGULATIONS REPRODUCED HERE HAVE BEEN PROVIDED BY THE DEPARTMENT OF ENVIRONMENTAL CONSERVATION AS A PUBLIC COURTESY. WHILE EVERY EFFORT HAS BEEN MADE TO ASSURE THE ACCURACY OF THE REPRODUCED VERSION, THE DEPARTMENT OF ENVIRONMENTAL CONSERVATION CANNOT GUARANTEE ITS ABSOLUTE ACCURACY. PAPER COPIES OF THE REGULATIONS AS ORIGINALLY FILED BY THE LIEUTENANT GOVERNOR ARE AVAILABLE FROM THE DEPARTMENT OF ENVIRONMENTAL CONSERVATION.

THE REGULATIONS HAVE AN EFFECTIVE DATE OF OCTOBER 1, 2014, ARE IN REGISTER 211, AND WILL APPEAR IN OFFICIAL PUBLISHED FORM IN THE OCTOBER 2014 SUPPLEMENT TO THE ALASKA ADMINISTRATIVE CODE.

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## Chapter 75. Oil and Other Hazardous Substances Pollution Control.

### Article

1. Oil Pollution Prevention Requirements (18 AAC 75.005 - 18 AAC 75.090)
2. Financial Responsibility for Oil Discharges (18 AAC 75.205 - 18 AAC 75.290)
3. Discharge Reporting, Cleanup, and Disposal of Oil and Other Hazardous Substances (18 AAC 75.300 - 18 AAC 75.396)
4. Oil Discharge Prevention and Contingency Plans and Nontank Vessel Plans (18 AAC 75.400 - 18 AAC 75.496)
5. Oil Spill Primary Response Action Contractors and Nontank Vessel Cleanup Contractors, Incident Management Teams, and Response Planning Facilitators (18 AAC 75.500 - 18 AAC 75.580)
6. Civil Penalties for Discharge of Petroleum and Petroleum Products and Byproducts (18 AAC 75.605 - 18 AAC 75.670)
7. Surface Oiling (18 AAC 75.700 - 18 AAC 75.730)
8. Oil Discharge for Scientific Purposes (18 AAC 75.800 - 18 AAC 75.830)
9. General Provisions (18 AAC 75.905 - 18 AAC 75.990)

**Editor's notes:** Effective 5/14/92, Register 122, the regulations in 18 AAC 75 were comprehensively reorganized and revised. They replace all previous regulations in this chapter and in 18 AAC 20 (Financial Responsibility), which were repealed simultaneously with the adoption of these regulations. The history line at the end of each section does not reflect the history of that provision before the 5/14/92 effective date of this chapter, nor is the section numbering related to the numbering before that date.

Previous amendments to 18 AAC 20 and to this chapter are on file in the Office of the Lieutenant Governor as follows:

Previous amendments to regulations dealing with financial responsibility, which now appear at 18 AAC 75.205 - 18 AAC 75.275, are found at Register 79, 9/9/81; and at Register 103, 8/6/87.

Previous amendments to regulations dealing with oil and hazardous substances pollution control are found at Register 45, 4/15/73; Register 62, 4/23/77; Register 63, 9/16/77; Register 66, 4/19/78; Register 79, 9/9/81; Register 94, 5/2/85; Register 103, 8/6/87; Register 110, 7/89; and at Register 115, 8/17/90.

The regulations in 18 AAC 75.300 - 18 AAC 75.396, grouped under Article 3, effective January 22, 1999 and distributed in Register 149, constitute a comprehensive reorganization and revision of material formerly set out at 18 AAC 75.300 - 18 AAC 75.370, which also had been grouped at Article 3. The regulations at 18 AAC 75.300 - 18 AAC 75.396 replace former 18 AAC 75.300 - 18 AAC 75.370, which were repealed simultaneously with the adoption of these regulations. The history line at the end of each section does not reflect the history of the replaced provisions before January 22, 1999. Some section numbers in this revision were used for previous regulations, but current sections are not necessarily related to previous sections with the same section number. The earlier version of 18 AAC 75.300 - 18 AAC 75.370 may be reviewed at the Office of the Lieutenant Governor, and may be found at Register 122, effective May 14, 1992.

### **Article 3. Discharge Reporting, Cleanup, and Disposal of Oil and Other Hazardous Substances**

#### **Section**

- 300. Discharge or release notification; reporting requirements
- 305. Posting of information required
- 310. Scope and duration of initial response actions
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**Editor's note:** The regulations in 18 AAC 75.300 – 18 AAC 75.396, grouped under Article 3, effective January 22, 1999 and distributed in Register 149, constitute a comprehensive reorganization and revision of material formerly set out at 18 AAC 75.300 - 18 AAC 75.370, which also had been grouped at Article 3. The regulations at 18 AAC 75.300 - 18 AAC 75.396 replace former 18 AAC 75.300 - 18 AAC 75.370, which were repealed simultaneously with the adoption of these regulations. The history line at the end of each section does not reflect the history of the replaced provisions before January 22, 1999. Some section numbers in this revision were used for previous regulations, but current sections are not necessarily related to previous sections with the same section number. The earlier version of 18 AAC 75.300 - 18 AAC 75.370 may be reviewed at the Office of the Lieutenant Governor, and may be found at Register 122, effective May 14, 1992.

**18 AAC 75.300. Discharge or release notification; reporting requirements.** (a)

Subject to (b), (c), and (g) of this section, a person in charge of a facility or operation shall notify the department by telephone, and immediately afterwards send the department a written notice by facsimile, electronic mail, hand delivery, or first class mail, informing the department about a discharge or release of a hazardous substance at or from the facility or operation as follows:

(1) as soon as the person has knowledge of a

(A) discharge or release of a hazardous substance other than oil;

(B) discharge or release of oil to water; or

(C) discharge or release, including a cumulative discharge or release, of oil in excess of 55 gallons solely to land outside an impermeable secondary containment area or structure; and

(2) within 48 hours after the person has knowledge of a discharge or release, including a cumulative discharge, of oil solely to land

(A) in excess of 10 gallons, but 55 gallons or less; or

(B) in excess of 55 gallons, if the discharge or release is the result of the escape or release of oil from its original storage tank, pipeline, or other immediate container into an impermeable secondary containment area or structure.

(b) A person in charge of a facility or operation shall maintain, and provide to the department monthly, a written record of each discharge or release, including a cumulative discharge or release, of one gallon to 10 gallons of oil solely to land.

(c) If a person in charge of a facility or operation has entered into an agreement with the department, as provided under AS 46.03.755(b) or AS 46.09.010(b), for the periodic reporting of a discharge or release of a hazardous substance, the terms of the agreement replace the applicable requirements of this section for the hazardous substance.

(d) After receiving notice of a discharge or release under (a) of this section, and until containment and cleanup are completed, the department will require interim reports as the department considers necessary to ascertain any threat to human health, safety, or welfare, or to the environment.

(e) Unless the department determines that a written report is not needed for the department to ascertain any threat to human health, safety, or welfare, or to the environment, a written report must be submitted to the department within 15 days after containment and cleanup are completed or, if no cleanup occurs, within 15 days after the discharge or release. The report must be submitted to the department's Anchorage, Fairbanks, or Juneau office, whichever is nearest to the location of the discharge, unless the department specifies otherwise. The report must contain the information specified in (f) of this section.

- (f) A report, record, or notification required by this section must contain, as applicable,
- (1) the date and time of the discharge or release;
  - (2) the location of the discharge or release;
  - (3) the name of the facility or operation;
  - (4) the name, mailing address, and telephone number of
    - (A) each responsible person; and
    - (B) the owner and the operator of the facility or operation;
  - (5) the type and amount of each hazardous substance discharged or released;
  - (6) factors that caused or contributed to the discharge or release;
  - (7) a description of any environmental effects of the discharge or release, or the containment and cleanup, to the extent those effects can be identified;
  - (8) a description of the containment or cleanup action taken;
  - (9) the estimated amount of
    - (A) hazardous substance cleaned up; and
    - (B) hazardous waste generated;
  - (10) the date and method of disposal or treatment of the hazardous substance, contaminated equipment, contaminated materials, contaminated soil, and contaminated water;
  - (11) a description of actions being taken to prevent another discharge or release;
- and
- (12) other information that the department requires to fully assess the cause and impact of the discharge or release, including any sampling reports and a description and estimate of any remaining contamination.
- (g) Reporting under this section is not required for a discharge or release
- (1) that is authorized by a valid permit issued by the department; or
  - (2) that is excluded from the definition of “release” under AS 46.03.826(9). (Eff. 1/22/99, Register 149; am 1/30/2003, Register 165; am 9/4/2014, Register 211)

**Authority:** AS 46.03.020 AS 46.03.745 AS 46.04.070  
AS 46.03.050 AS 46.03.755 AS 46.09.010  
AS 46.03.710 AS 46.04.020 AS 46.09.020  
AS 46.03.740

**18 AAC 75.305. Posting of information required.** (a) The owner or operator shall display a discharge or release notification placard, provided by the department, that includes telephone numbers of department offices in conspicuous locations on a

(1) tank truck containing more than 500 gallons of a hazardous substance, in addition to that required to operate the vehicle;

(2) tugboat, tank vessel, oil barge, tow boat, or other vessel transporting a hazardous substance as cargo in state waters;

(3) vehicle carrying or towing a hazardous substance other than oil, or more than 500 gallons of oil, as cargo off-road over frozen or unfrozen ground; and

(4) facility that has a total above-ground or underground storage capacity in excess of 1,000 gallons of a hazardous substance.

(b) A person who wants to post a substitute for a placard provided by the department shall submit the proposed placard to the department for approval. The department will approve the substitute if the department determines that the substitute meets the requirements of (a) of this section. A placard approved under this subsection must contain the words: "Form approved by the Alaska Department of Environmental Conservation." (Eff. 1/22/99, Register 149)

**Authority:** AS 46.03.020 AS 46.04.020 AS 46.09.020  
AS 46.03.050 AS 46.09.010 AS 46.09.070  
AS 46.03.755

**18 AAC 75.310. Scope and duration of initial response actions.** (a) Immediately after receiving notice from a person or after otherwise becoming aware of a discharge or release of a hazardous substance to land or waters of the state, a responsible person shall, as required by 18 AAC 75.315, immediately contain and control the discharge or release and seek approval of cleanup and disposal plans to be used for that release. After obtaining approval of cleanup and disposal plans, the responsible person shall perform a cleanup of the discharge or release and dispose of the contaminated material in accordance with those plans.

(b) The department under AS 46.04.020(a), or the commissioner under AS 46.09.020(a), will waive the requirements of (a) of this section if the department or commissioner as appropriate

(1) determines, in consultation with appropriate agencies as provided in AS 46.04.020(a)(1) or AS 46.09.020(a)(1), that containment or cleanup of the discharge or release is technically not feasible; or

(2) determines that the containment or cleanup effort would result in a greater threat to human health, safety, or welfare, or in greater damage to the environment than the discharge or release itself.

(c) Unless relieved under (b) of this section, a responsible person shall immediately begin the initial response actions required by 18 AAC 75.315 and continue until

(1) the department, using the factors set out in 18 AAC 75.315, determines that

(A) the lowest practicable level of contamination has been achieved;

(B) any imminent and substantial threat to human health, safety, or welfare, or to the environment is abated; and

(C) additional action, including site cleanup under 18 AAC 75.325 - 18 AAC 75.390, is not required; or

(2) the department determines, on its own or at the request of a responsible person, that the source of the contamination has abated and that cleanup of residual soil and groundwater contamination should proceed under 18 AAC 75.325 - 18 AAC 75.396. (Eff. 1/22/99, Register 149; am 8/27/2000, Register 155; am 1/30/2003, Register 165)

|                   |              |              |              |
|-------------------|--------------|--------------|--------------|
| <b>Authority:</b> | AS 46.03.020 | AS 46.03.740 | AS 46.04.070 |
|                   | AS 46.03.050 | AS 46.03.745 | AS 46.09.020 |
|                   | AS 46.03.710 | AS 46.04.020 |              |

**18 AAC 75.315. Initial response actions.** (a) A responsible person shall investigate, contain, and perform a cleanup of a sudden or recent discharge or release of a hazardous substance

(1) in consultation with the department, or upon notification of a discharge or release under 18 AAC 75.300;

(2) in a manner that does not result in a significantly greater overall threat or damage to human health, safety, or welfare, or to the environment than another alternative, including taking no action; and

(3) until the lowest practicable level of contamination is achieved under (c) of this section.

(b) A person who is not a responsible person and who undertakes an initial response action at a site subject to this section shall comply with this section and 18 AAC 75.320.

(c) For containment and cleanup under this section, the department will determine the lowest practicable level of contamination based on

(1) protection of human health, safety, and welfare, and of the environment;

(2) the nature and toxicity of the hazardous substance, including amount and concentration;

(3) hydrogeological and climatological factors;

(4) the extent to which the hazardous substance has migrated, or is likely to migrate, from the area of original contamination if the hazardous substance remains onsite;

(5) the natural dispersion, attenuation, or degradation of the contamination;

(6) the extent to which residual soil contamination exceeds the cleanup levels in 18 AAC 75.340 and 18 AAC 75.341;

(7) the extent to which groundwater contamination exceeds the groundwater cleanup levels in 18 AAC 75.345;

(8) the current and future use of the groundwater under 18 AAC 75.350; and

(9) the need for an interim removal action under 18 AAC 75.330.

(d) If the department determines that the lowest practicable level of contamination has been achieved under this section, a responsible person is not required to perform additional containment or cleanup. The department will base a determination under this section on the most current and complete information available to the department. The department will require a responsible person to perform additional containment or cleanup if subsequent information indicates that

(1) the level of contamination that remains does not protect human health, safety, or welfare, or the environment; or

(2) the information the department relied upon was invalid, incomplete, or fraudulent. (Eff. 1/22/99, Register 149)

|                   |              |              |              |
|-------------------|--------------|--------------|--------------|
| <b>Authority:</b> | AS 46.03.020 | AS 46.03.740 | AS 46.04.070 |
|                   | AS 46.03.050 | AS 46.03.745 | AS 46.09.020 |
|                   | AS 46.03.710 | AS 46.04.020 |              |

**18 AAC 75.320. Department oversight of containment and cleanup.** (a) The department will determine that a responsible person's containment and cleanup efforts are inadequate under 18 AAC 75.315 or 18 AAC 75.325 - 18 AAC 75.396 if the department determines that

(1) the responsible person has not used, or has not adequately used, containment equipment to intercept, concentrate, and collect the hazardous substance in its pattern of movement, unless environmental conditions exceed the operational limitations of the equipment;

(2) the responsible person has not used, or has not adequately used, exclusion equipment to protect a sensitive environmental zone, unless environmental conditions exceed the operational limitations of the equipment;

(3) the area affected by the hazardous substance is increasing at an avoidable rate despite containment and removal activities, unless environmental conditions exceed the operational limitations of the equipment, or unless immediate containment would pose a greater threat to human health, safety, or welfare, or to the environment, than to allow the discharge or release to temporarily spread;

(4) the containment and exclusion equipment is not functioning effectively because of weather or oceanographic conditions, and other equipment is reasonably available that can function effectively in those conditions;

(5) containment, exclusion, and lightering equipment is not deployed and operational as specified in an applicable oil discharge prevention and contingency plan approved under AS 46.04.030 or a nontank vessel plan approved under AS 46.04.055;

(6) major items of cleanup equipment and materials, including booms, skimmers, lightering pumps, sorbent, and storage containers, are not fully operational;

(7) available personnel, equipment, sorbent, or supplies are inappropriate, being mismanaged, or not being used, or additional personnel, equipment, sorbent, or supplies are required but not being provided; or

(8) containment and cleanup have not proceeded in a timely manner that is protective of human health, safety, and welfare, and of the environment.

(b) If the department determines that a responsible person's containment and cleanup efforts do not adequately protect human health, safety, or welfare, or the environment, the department will

(1) direct that responsible person or another responsible person to use additional measures or to cease cleanup activities;

(2) begin cleanup activities, or authorize an agent of the department to begin cleanup activities; or

(3) take a combination of these actions. (Eff. 1/22/99, Register 149; am 11/27/2002, Register 164)

|                   |              |              |              |
|-------------------|--------------|--------------|--------------|
| <b>Authority:</b> | AS 46.03.020 | AS 46.03.745 | AS 46.04.070 |
|                   | AS 46.03.050 | AS 46.03.822 | AS 46.08.140 |
|                   | AS 46.03.710 | AS 46.04.020 | AS 46.09.020 |
|                   | AS 46.03.740 | AS 46.04.055 |              |

**18 AAC 75.325. Site cleanup rules: purpose, applicability, and general provisions.**

(a) The requirements of 18 AAC 75.325 - 18 AAC 75.390 are referred to in this chapter as the "site cleanup rules". The site cleanup rules establish administrative processes and standards to determine the necessity for and degree of cleanup required to protect human health, safety, and welfare, and the environment at a site where a hazardous substance is located.

(b) The site cleanup rules apply to

(1) a sudden or recent discharge or release of a hazardous substance, if the department determines under 18 AAC 75.310 that application of the site cleanup rules is necessary; or

(2) a release of a hazardous substance caused by past activities.

(c) The site cleanup rules do not apply to

(1) a release from an underground storage tank (UST) subject to AS 46.03.360 - 46.03.450 and 18 AAC 78, except as made applicable expressly by 18 AAC 78; or

(2) an oil and gas reserve pit closure and permitted solid waste storage or disposal facility regulated under 18 AAC 60, 18 AAC 62, or 42 U.S.C. 6901 - 6992k (Solid Waste Disposal Act, as amended by the Resource Conservation Recovery Act).

(d) A responsible person shall investigate, contain, and perform a cleanup of a discharge or release of a hazardous substance unless

(1) the department makes a written determination that a discharge or release does not pose a threat to human health, safety, or welfare, or to the environment and requires no cleanup action according to the information available at the time of the determination; or

(2) the department issues an order under AS 46.04.020(c), or the commissioner issues an order under AS 46.09.020(c) that the responsible person cease cleanup activities.

(e) A person who is not a responsible person and who undertakes a cleanup activity at a site that is subject to the site cleanup rules shall comply with those provisions of the site cleanup rules that are applicable to the particular cleanup activity undertaken.

(f) A responsible person shall

(1) to the maximum extent practicable,

(A) use permanent remedies;

(B) recover free product in a manner that

(i) minimizes the spread of contamination into an uncontaminated area by using containment, recovery, and disposal techniques appropriate to site conditions;

(ii) avoids additional discharge; and

(iii) disposes of the recovered free product in compliance with applicable local, state, and federal requirements;

(C) complete cleanup in a period of time that the department determines to be protective of human health, safety, and welfare, and of the environment;

(D) prevent, eliminate, or minimize potential adverse impacts to human health, safety, and welfare, and to the environment, onsite and offsite, from any hazardous substance remaining at the site; and

(E) evaluate and perform a cleanup of surface soil staining attributable to a hazardous substance;

(2) meet the applicable cleanup levels determined under 18 AAC 75.340 - 18 AAC 75.350; and

(3) provide for long-term care and management of a site as required under the site cleanup rules, including proper operation and maintenance of

(A) cleanup techniques and equipment;

(B) monitoring wells and equipment, if required; and

(C) institutional controls, if required under 18 AAC 75.375

(g) If using method two or method three for determining the applicable soil cleanup levels as described in 18 AAC 75.340 - 18 AAC 75.341, or if applying the groundwater cleanup levels at Table C in 18 AAC 75.345, a responsible person shall ensure that, after completing site cleanup, the risk from hazardous substances does not exceed a cumulative carcinogenic risk standard of 1 in 100,000 across all exposure pathways and does not exceed a cumulative noncarcinogenic risk standard at a hazard index of one across all exposure pathways. Guidance on cumulative risk determinations is provided in the department's *Cumulative Risk Guidance*, dated June 9, 2008. The department's *Cumulative Risk Guidance*, dated June 9, 2008, is adopted by reference.

(h) If proposing an alternative cleanup level for soil or groundwater, based on a site-specific risk assessment under method four in 18 AAC 75.340(f) or under the provisions of 18 AAC 75.345(b)(2), a responsible person shall ensure that the risk from hazardous substances does not exceed the cumulative carcinogenic risk standard of 1 in 100,000 across all exposure pathways and does not exceed the cumulative noncarcinogenic risk standard at a hazard index of one across all exposure pathways. Guidance on cumulative risk determinations is provided in the department's *Cumulative Risk Guidance*, adopted by reference in (g) of this section. Instead of the risk standards required by this subsection, the department may consider a risk standard consistent with the range acceptable under 40 C.F.R. 300.430, revised as of July 1, 2004, adopted by reference, based on

- (1) site-specific conditions;
- (2) land use;
- (3) hazardous substance characteristics;
- (4) statutory compliance;
- (5) protection of human health, safety, and welfare, and the environment;
- (6) ability of cleanup to be implemented;
- (7) long-term and short-term effectiveness;
- (8) use of treatment technologies;
- (9) public comment; and
- (10) cost.

(i) A responsible person shall obtain approval before disposing of soil or groundwater from a site

(1) that is subject to the site cleanup rules; or

(2) for which the responsible person has received a written determination from the department under 18 AAC 75.380(d)(1);

(j) The department will seek public participation regarding activities conducted under the site cleanup rules, using methods that the department determines to be appropriate for seeking public participation.

(k) If a discharge, release, or planned cleanup affects an anadromous fish-bearing stream or lake or an area designated under AS 16.20, activities under the site cleanup rules are subject to coordination with appropriate resource agencies, including the Department of Fish and Game under AS 16.05.871(a) or AS 16.20. (Eff. 1/22/99, Register 149; am 8/27/2000, Register 155; am 1/30/2003, Register 165; am 10/9/2008, Register 188)

|                   |              |              |              |
|-------------------|--------------|--------------|--------------|
| <b>Authority:</b> | AS 46.03.020 | AS 46.03.740 | AS 46.04.020 |
|                   | AS 46.03.050 | AS 46.03.745 | AS 46.04.070 |
|                   | AS 46.03.710 | AS 46.03.822 | AS 46.09.020 |

**Editor's note:** The document adopted by reference in 18 AAC 75.325 may be reviewed at, or requested from, the department's offices in Anchorage, Fairbanks, Juneau, and Soldotna.

As of Register 166 (July 2003), and acting under AS 44.62.125(b)(6), the regulations attorney made technical changes to 18 AAC 75.325(k), to reflect Executive Order 107 (2003). Executive

Order 107 transferred functions related to protection of fish habitat in rivers, lakes, and streams from the Department of Fish and Game to the Department of Natural Resources.

As of Register 179 (October 2006), and acting under AS 44.62.125(b)(6), the regulations attorney made a technical revision to 18 AAC 75.325(c)(1). This change reflects the enactment of sec. 2, ch. 102, SLA 2006, effective August 5, 2006, which repealed AS 46.03.360 and 46.03.363.

As of Register 186 (July 2008), and acting under AS 44.62.125(b)(6), the regulations attorney made technical changes to 18 AAC 75.325(k), to reflect Executive Order 114 (2008). Executive Order 114 transferred functions related to protection of fish habitat in rivers, lakes, and streams from the Department of Natural Resources to the Department of Fish and Game.

**18 AAC 75.330. Interim removal actions.** (a) The department, or a responsible person as provided in (c) of this section, will perform an interim removal action if the department determines that an interim removal action is necessary under the site cleanup rules to prevent

- (1) human or environmental exposure to a hazardous substance at the site; or
- (2) migration of a hazardous substance at or from the site.

(b) An interim removal action must, to the maximum extent practicable, contribute to the overall performance of any long-term cleanup action at the site. An interim removal action may

- (1) achieve cleanup levels for a portion of the site;
- (2) provide for a partial cleanup for all or part of the site, but not achieve cleanup levels; or
- (3) provide for a partial cleanup at the site and not achieve cleanup levels, but provide information on how to achieve cleanup levels for the final cleanup action.

(c) An interim removal action may occur at any time during the cleanup process and may be performed by the department or by a responsible person with prior approval of the proposed action. An interim removal action may not be used to delay or supplant the cleanup process.

(d) An interim removal action must be followed by additional cleanup actions at the site unless the department determines that the interim removal action has met the requirements of the site cleanup rules.

(e) An interim removal action taken by the department does not

- (1) require the department to take an additional response or cleanup action; or
- (2) relieve a person from liability associated with the discharge or release. (Eff. 1/22/99, Register 149)

**Authority:** AS 46.03.020 AS 46.03.745 AS 46.04.070  
AS 46.03.050 AS 46.03.822 AS 46.08.140  
AS 46.03.710 AS 46.04.020 AS 46.09.020  
AS 46.03.740

**18 AAC 75.335. Site characterization.** (a) Before proceeding with site cleanup under the site cleanup rules, a responsible person shall characterize the extent of hazardous substance contamination at the site.

(b) A responsible person shall submit a site characterization workplan to the department for approval before beginning site characterization work. The department will approve the site characterization workplan if the workplan is

- (1) prepared by a qualified person; and
- (2) designed, to the maximum extent practicable, to
  - (A) determine if a discharge or release of a hazardous substance has occurred;
  - (B) identify each hazardous substance at the site, including the concentration and extent of contamination; this information must be sufficient to determine cleanup options;
  - (C) identify site characteristics or conditions that could result in ongoing site contamination, including the potential for leaching of in-situ contamination and the presence of leaking barrels, drums, tanks, or other containers;
  - (D) evaluate the potential threat to human health, safety, and welfare, and to the environment from site contamination;
  - (E) identify any interim removal action necessary under 18 AAC 75.330;
  - (F) locate sources of known site contamination, including a description of potential releases into soil, sediment, groundwater, or surface water;
  - (G) evaluate the size of the contaminated area, including the concentrations and extent of any soil, sediment, groundwater, or surface water contamination;
  - (H) identify the vertical depth to groundwater and the horizontal distance to nearby wells, surface water, and water supply intakes;
  - (I) evaluate the potential for surface water run-off from the site and the potential for surface water or sediment contamination; and

(J) identify the soil type and determine if the soil is a continuing source for groundwater contamination.

(c) After completing site characterization work, the responsible person shall submit to the department for approval a site characterization report that

(1) is prepared by a qualified person;

(2) sets out the information obtained from activities performed in accordance with a site characterization workplan;

(3) sets out the results of sampling and analysis;

(4) demonstrates that the inspections, sampling, and analysis performed adequately characterize the extent of hazardous substance contamination; and

(5) proposes cleanup techniques for the site.

(d) The department will approve the report submitted under (c) of this section if the department determines that the work described in the report and the cleanup techniques proposed are protective of human health, safety, and welfare, and of the environment. The department will, as part of its approval, modify proposed cleanup techniques or require additional cleanup techniques for the site as the department determines to be necessary to protect human health, safety, and welfare, and the environment. (Eff. 1/22/99, Register 149; am 8/27/2000, Register 155)

|                   |              |              |              |
|-------------------|--------------|--------------|--------------|
| <b>Authority:</b> | AS 46.03.020 | AS 46.03.745 | AS 46.04.070 |
|                   | AS 46.03.050 | AS 46.03.755 | AS 46.09.010 |
|                   | AS 46.03.710 | AS 46.04.020 | AS 46.09.020 |
|                   | AS 46.03.740 |              |              |

**18 AAC 75.340. Soil cleanup levels; general requirements.** (a) This section provides the requirements for cleanup levels for hazardous substances in soil. For each site, except as provided in (b) of this section, a responsible person shall propose soil cleanup levels for approval, shall base those cleanup levels upon an estimate of the reasonable maximum exposure expected to occur under current and future site conditions, and shall develop those cleanup levels using one or more of the following methods:

(1) method one for petroleum hydrocarbon-contaminated soil in

(A) a non-Arctic zone as set out in Table A1 of 18 AAC 75.341(a); or

(B) an Arctic zone as set out in Table A2 of 18 AAC 75.341(b);

(2) method two for soil contaminated with

(A) chemicals other than petroleum hydrocarbons as set out in Table B1 of 18 AAC 75.341(c); or

(B) petroleum hydrocarbons as set out in Table B2 of 18 AAC 75.341(d);

(3) method three, as described in (e) of this section, for developing site-specific alternative cleanup levels; or

(4) method four, as described in (f) of this section, for developing site-specific alternative cleanup levels.

(b) Alternative soil cleanup levels developed under method three or method four may not be used at another site without prior approval. If alternative cleanup levels are developed for one site within a facility with multiple similarly contaminated sites, and if the department determines that the use of those cleanup levels at another site within that facility will be protective of human health, safety, and welfare, and of the environment, the department will approve the use of those cleanup levels at the other site.

(c) For methods two, three, and four, a responsible person shall demonstrate that the Arctic zone soil cleanup level, if applicable, is protective of migration to surface water.

(d) The soil cleanup levels provided under method one and method two apply at a contaminated site unless the department approves an alternative cleanup level that the responsible person has proposed under method three or method four. To obtain approval for an alternative cleanup level, a responsible person must demonstrate that an alternative cleanup level proposed under method three or method four is protective of human health, safety, and welfare, and of the environment, and must demonstrate compliance with the applicable institutional control requirements under 18 AAC 75.375.

(e) Under method three, a responsible person may propose a site-specific alternative cleanup level that modifies

(1) the migration to groundwater or inhalation levels in Table B1 of 18 AAC 75.341(c) or Table B2 of 18 AAC 75.341(d), based on the use of approved site-specific soil data, and the equations set out in the department's *Cleanup Levels Guidance*, dated June 9, 2008, adopted by reference; the alternative cleanup level that then applies at the site for a hazardous substance is the most stringent of the Table B1 direct contact or Table B2 ingestion level and the site-specific calculated levels for inhalation or migration to groundwater;

(2) the migration to groundwater levels in Table B1 or Table B2 based on approved site-specific soil data and an approved fate and transport model that demonstrates that alternative soil cleanup levels are protective of the applicable groundwater cleanup levels under 18 AAC 75.345 if the alternative migration to groundwater cleanup level does not exceed

(A) the direct contact level in Table B1 or the ingestion level in Table B2;

(B) the inhalation level in Table B1 or Table B2; or

(C) a site-specific inhalation level calculated under (1) of this subsection; the level that applies at the site is the most stringent level; or

(3) the direct contact level or the inhalation level in Table B1 or the ingestion level or the inhalation level in Table B2 based on use of commercial or industrial exposure parameters listed in Appendix B of the *Cleanup Levels Guidance*, adopted by reference in (1) of this subsection, if the department determines that the site serves a commercial or industrial land use, and if the alternative direct contact level or inhalation level does not exceed the migration to groundwater cleanup level in Table B1, the alternative ingestion level or inhalation level does not exceed the migration to groundwater cleanup level in Table B2 or the alternative level does not exceed a site-specific migration to groundwater level calculated under (2) of this subsection; the department will base a land use determination under this paragraph upon

(A) consultation with the public, including the local zoning authority, if any;

(B) a determination that the site does not serve a residential land use;

(C) a determination that the site will not serve a future residential land use based on consideration of the factors in EPA's *Land Use in the CERCLA Remedy Selection Process*, OSWER Dir. No. 9355.7-04, dated May 25, 1995, adopted by reference; land in an undeveloped area for which it would be difficult to determine a future use pattern is capable of being a residential area, unless demonstrated otherwise; and

(D) consent of each landowner who is affected by the contamination at the site that a cleanup level less stringent than a cleanup level appropriate to residential land use is appropriate for the site.

(f) Under method four, the department will approve a site-specific alternative cleanup level if a responsible person

(1) performs a site-specific risk assessment and submits a risk assessment report to the department for approval, and if the department determines that the alternative cleanup level is protective of human health, safety, and welfare, and of the environment based on the site-specific risk assessment; in performing the risk assessment, a responsible person shall follow the department's *Risk Assessment Procedures Manual*, dated June 8, 2000, adopted by reference; and

(2) obtains the consent of each landowner who is affected by the contamination at the site that a cleanup level less stringent than a cleanup level appropriate to residential land use is appropriate for the site.

(g) The department will develop a site-specific cleanup level for a hazardous substance not listed under 18 AAC 75.341(c) using the equations set out in the department's *Cleanup Levels Guidance*, adopted by reference in (e)(1) of this section, unless the responsible person demonstrates that a site-specific cleanup level is not necessary to ensure protection of human health, safety, and welfare, and of the environment.

(h) The department will approve less stringent soil cleanup levels subject to any institutional controls required under 18 AAC 75.375, if a responsible person demonstrates that

(1) background concentrations of a hazardous substance in the site area exceed the applicable cleanup level set out in 18 AAC 75.341 for the hazardous substance; or

(2) the practical quantitation limit for the hazardous substance exceeds the applicable cleanup level set out in 18 AAC 75.341 for that substance.

(i) The department will require a responsible person to modify a cleanup level under this section or to perform a site-specific analysis of additional site risks if the department determines that

(1) as a result of site conditions or new data, a modification is necessary to protect human health, safety, or welfare, or the environment; or

(2) a site-specific analysis is necessary due to

(A) exposure pathways such as

(i) accumulation of vapors in buildings or other structures at levels that threaten human health; and

(ii) human inhalation of fugitive dust if the proposed remedy includes leaving a hazardous substance in place within the upper one foot of the surface soil at the site;

(B) sediment contamination;

(C) impacts to ecological receptors; or

(D) other site uses such as recreational, agricultural, or subsistence use.

(j) Soil cleanup levels based on

(1) migration of a hazardous substance to groundwater must be attained in the surface soil and the subsurface soil;

(2) human exposure from ingestion, direct contact or inhalation of a volatile hazardous substance must be attained in the surface soil and the subsurface soil to a depth of at least 15 feet, unless an institutional control or site conditions prevent human exposure to the subsurface soil; and

(3) the maximum allowable concentrations for petroleum hydrocarbons described in Table B2 of 18 AAC 75.341(d) must be attained in the surface soil and the subsurface soil.

(k) For a cleanup conducted under methods two and three, a chemical that is detected at one-tenth or more of the Table B1 direct contact and inhalation cleanup levels set out in

18 AAC 75.341(c) must be included when calculating cumulative risk under 18 AAC 75.325(g). (Eff. 1/22/99, Register 149; am 8/27/2000, Register 155; am 1/30/2003, Register 165; am 10/9/2008, Register 188)

|                   |              |              |              |
|-------------------|--------------|--------------|--------------|
| <b>Authority:</b> | AS 46.03.020 | AS 46.03.740 | AS 46.04.070 |
|                   | AS 46.03.050 | AS 46.03.745 | AS 46.09.020 |
|                   | AS 46.03.710 | AS 46.04.020 |              |

**Editor's note:** The documents adopted by reference in 18 AAC 75.340 may be reviewed at, or requested from, the department's offices in Anchorage, Fairbanks, Juneau, and Soldotna.

**18 AAC 75.341. Soil cleanup levels; tables.** (a) If a responsible person uses method one for a non-Arctic zone under 18 AAC 75.340, the soil cleanup levels must be based on Table A1 in this subsection.

**TABLE A1. METHOD ONE – PETROLEUM HYDROCARBON SOIL  
CLEANUP LEVELS IN NONARCTIC ZONES**  
(See notes to table for further requirements)

**Part A: Determine score for each item\***

|   |  |
|---|--|
| <p><b>1. Depth to Groundwater</b></p> <p>Less than 5 feet (10)</p> <p>5 feet to 15 feet (8)</p> <p>More than 15 feet to 25 feet (6)</p> <p>More than 25 feet to 50 feet (4)</p> <p>More than 50 feet (1)</p>  |  |
| <p><b>2. Mean Annual Precipitation</b></p> <p>More than 40 inches (10)</p> <p>More than 25 inches to 40 inches (5)</p> <p>15 inches to 25 inches (3)</p> <p>Less than 15 inches (1)</p>   |  |
| <p><b>3. Soil Type (Unified Soil Classification)</b></p> <p>Clean, coarse-grained soils (10)</p> <p>Coarse-grained soils with fines (8)</p> <p>Fine-grained soils (low organic carbon) (3)</p> <p>Fine-grained soils (high organic carbon) (1)</p>  |  |
| <p><b>4. Potential Receptors</b><br/>(Select the most applicable category)</p> <p>a. Public water system within 1000 feet, or private water system within 500 feet (15)</p> <p>b. Public/private water system within 1/2 mile (12)</p> <p>c. Public/private water system within one mile (8)</p> <p>d. No water system within one mile (4)</p> <p>e. Nonpotable groundwater (1)</p> |  |
| <p><b>5. Volume of Contaminated Soil</b></p> <p>More than 500 cubic yards (10)</p> <p>More than 100 cubic yards to 500 cubic yards (8)</p> <p>More than 25 cubic yards to 100 cubic yards (5)</p> <p>10 cubic yards to 25 cubic yards (2)</p> <p>Less than 10 cubic yards (0)</p>   |  |

\*The items to be scored are defined in note 1 to this table.

**Part B: Add scores from Part A to determine matrix score and cleanup level**

| Matrix Score<br>for Each Category | Cleanup Level in mg/kg     |                          |                            |
|-----------------------------------|----------------------------|--------------------------|----------------------------|
|                                   | Gasoline Range<br>Organics | Diesel Range<br>Organics | Residual Range<br>Organics |
| Category A: More than 40          | 50                         | 100                      | 2000                       |
| Category B: More than 26 to 40    | 100                        | 200                      | 2000                       |
| Category C: 21-26                 | 500                        | 1000                     | 2000                       |
| Category D: Less than 21          | 1000                       | 2000                     | 2000                       |

**Notes to Table A1:**

1. The following definitions for items 1 - 5 in Part A apply for purposes of using method one:

a. "depth to groundwater" means the measurement from the lowest point of the zone of soil contamination to the seasonal high groundwater table; a responsible person may not claim a lower matrix score for soil by moving contaminated soil to a higher elevation relative to the groundwater table;

b. "mean annual precipitation" is defined at 18 AAC 75.990;

c. "soil type" means the predominant Unified Soil Classification (USC) soil type between the deepest point of contamination and the seasonal high groundwater table; a responsible person may seek to demonstrate that otherwise coarse-grained soil has an organic carbon content that might enable a lower point classification. Soil types using the USC system are further defined as shown in Figure 1:

**Figure 1**

| SOIL TYPE                             | UNIFIED SOIL CLASSIFICATIONS                      |
|---------------------------------------|---|
| Clean coarse-grained                  | GW, GP, SW, SP                                    |
| Coarse-grained with fines             | GM, GC, SM, SC, GP-GC, SP-SM, GW-GM, SW-SM, SW-SC |
| Fine-grained with low organic carbon  | ML, CL, HM, CH                                    |
| Fine-grained with high organic carbon | OL, OH, Pt  |

d. for the "potential receptors" categories,

(i) "public water system" and "private water system" have the meaning given those terms in 18 AAC 80.1990;

(ii) "nonpotable" means unusable for drinking water due to a water quality condition, such as salinity, that was not caused by or that does not arise from contamination at the site;

e. "volume of contaminated soil" means the total estimated volume of soil that is contaminated above the applicable cleanup level before a responsible person begins a removal or cleanup action.

2. For the "potential receptors" categories, a responsible person shall submit a demonstration supporting the score assigned, including the results of an approved water well survey; the most conservative score must be used to determine the proximity of potential receptors; for example, if a water system is within one-quarter mile, the category "public/private water system within one mile" that would score 8 would be superseded by the category "public/private water system within 1/2 mile" that would score 12.

3. The identity of a released refined petroleum product must be assumed to be unknown unless a responsible person demonstrates that the product is only gasoline, or only a refined nongasoline product; the department will waive the requirement that a product be identified by analysis if a responsible person demonstrates that only one type of product was stored or distributed at the site; the soil cleanup levels in Part B are based on gas chromatographic analytical measurements corresponding to a specific measured range of petroleum hydrocarbons as follows:

a. gasoline range organics: light-range petroleum products such as gasoline, with petroleum hydrocarbon compounds corresponding to an alkane range from the beginning of C<sub>6</sub> to the beginning of C<sub>10</sub> and a boiling point range between approximately 60° Centigrade and 170° Centigrade;

b. diesel range organics: mid-range petroleum products such as diesel fuel, with petroleum hydrocarbon compounds corresponding to an alkane range from the beginning of C<sub>10</sub>

to the beginning of C<sub>25</sub> and a boiling point range between approximately 170° Centigrade and 400° Centigrade;

c. residual range organics: heavy-range petroleum products such as lubricating oils, with petroleum hydrocarbon compounds corresponding to an alkane range from the beginning of C<sub>25</sub> to the beginning of C<sub>36</sub> and a boiling point range between approximately 400° Centigrade and 500° Centigrade.

4. In addition to meeting the soil cleanup levels in Part B, a responsible person shall ensure that the site meets the most stringent standards for benzene, toluene, ethylbenzene, and total xylenes for the applicable exposure pathway in Table B1 in (c) of this section.

(b) If a responsible person uses method one for an Arctic zone under 18 AAC 75.340, the soil cleanup levels must be based on Table A2 in this subsection.

| <b>TABLE A2. METHOD ONE - PETROLEUM HYDROCARBON SOIL CLEANUP LEVELS IN THE ARCTIC ZONE</b> |  |  |  |
|--|--|--|--|
| <b>PRODUCT</b>   | <b>Cleanup Level in mg/kg</b>              |  |  |
|  | <b>Diesel Range Petroleum Hydrocarbons</b> | <b>Gasoline Range Petroleum Hydrocarbons</b> | <b>Residual Range Petroleum Hydrocarbons</b> |
| Gasoline   | N/A  | 100  | N/A  |
| Diesel   | 200*                                       | N/A  | N/A  |
| Unknown/Crude  | 200  | 100  | N/A  |
| Residual   | N/A  | N/A  | 2000   |

In this table, "N/A" means "not applicable."

\* If a responsible party demonstrates that contamination is due to a diesel spill, that levels of benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are less than 15 mg/kg, that benzene levels are less than 0.5 mg/kg, and that other site conditions are favorable, and if the department determines that a less stringent level is protective of human health, safety, and welfare, and of the environment, the department will allow a cleanup level of 500 mg/kg for diesel range petroleum hydrocarbons.

The Arctic Zone numeric cleanup levels in this table cover only contamination related to manmade pads and roads. The department will determine the cleanup levels for undisturbed tundra or other undisturbed native vegetation on a site-specific basis, depending upon whether a cleanup action would cause more severe or long-term damage than would the discharge or release alone.

(c) If a responsible person uses method two for chemicals other than petroleum hydrocarbons under 18 AAC 75.340, the soil cleanup levels must be based on Table B1 in this subsection.

| TABLE B1. METHOD TWO – SOIL CLEANUP LEVELS TABLE (See notes for additional requirements) |                                    |                     |                                     |   |                                     |   |                                     |   |   |
|--|------------------------------------|---------------------|-------------------------------------|---|-------------------------------------|---|-------------------------------------|---|---|
| CAS Number <sup>4</sup>  | Hazardous Substance                | Carcinogenic (c/nc) | Arctic Zone <sup>1</sup>            |   | Under 40 inch Zone <sup>2</sup>     |   | Over 40 inch Zone <sup>3</sup>      |   | Migration to Groundwater <sup>7</sup> (mg/kg) |
|  |                                    |                     | Direct Contact (mg/kg) <sup>5</sup> | Outdoor Inhalation <sup>6</sup> (mg/kg) | Direct Contact (mg/kg) <sup>5</sup> | Outdoor Inhalation <sup>6</sup> (mg/kg) | Direct Contact (mg/kg) <sup>5</sup> | Outdoor Inhalation <sup>6</sup> (mg/kg) |   |
| <b>ORGANICS</b>  |                                    |                     |                                     |   |                                     |   |                                     |   |   |
| 355-72-782   | 2-Amino-4,6-dinitrotoluene         | nc                  | 26                                  |   | 20                                  |   | 16                                  |   | 0.029   |
| 194-06-510   | 4-Amino-2,6-dinitrotoluene         | nc                  | 26                                  |   | 19                                  |   | 16                                  |   | 0.029   |
| 83-32-9  | Acenaphthene <sup>14</sup>         | nc                  | 3800                                |   | 2800                                |   | 2300                                |   | 180   |
| 208-96-8   | Acenaphthylene <sup>14</sup>       | nc                  | 3800                                |   | 2800                                |   | 2300                                |   | 180   |
| 67-64-1  | Acetone                            | nc                  | 123000                              | 102000                                  | 91300                               | 68600                                   | 74700                               | 51100                                   | 88  |
| 309-00-2   | Aldrin                             | c                   | 0.40                                |   | 0.30                                |   | 0.24                                |   | 0.070   |
| 120-12-7   | Anthracene <sup>14</sup>           | nc                  | 27800                               |   | 20600                               |   | 16800                               |   | 3000  |
| 71-43-2  | Benzene <sup>14</sup>              | c                   | 200                                 | 17                                      | 150                                 | 11                                      | 120                                 | 8.5                                     | 0.025   |
| 56-55-3  | Benzo(a)anthracene <sup>14</sup>   | c                   | 6.6                                 |   | 4.9                                 |   | 4.0                                 |   | 3.6   |
| 205-99-2   | Benzo(b)fluoranthene <sup>14</sup> | c                   | 6.6                                 |   | 4.9                                 |   | 4.0                                 |   | 12  |
| 207-08-9   | Benzo(k)fluoranthene <sup>14</sup> | c                   | 66                                  |   | 49                                  |   | 40                                  |   | 120   |
| 65-85-0  | Benzoic acid                       | nc                  | 428000                              |   | 317000                              |   | 259000                              |   | 410   |
| 191-24-2   | Benzo(g,h,i)perylene <sup>14</sup> | nc                  | 1900                                |   | 1400                                |   | 1100                                |   | 38700   |
| 50-32-8  | Benzo(a)pyrene <sup>14</sup>       | c                   | 0.66                                |   | 0.49                                |   | 0.40                                |   | 2.1   |
| 111-44-4   | Bis(2-chloroethyl)ether            | c                   | 10                                  | 4.9                                     | 7.5                                 | 3.3                                     | 6.2                                 | 2.5                                     | 0.0022  |
| 117-81-7   | Bis(2-ethylhexyl)phthalate         | c                   | 300                                 |   | 220                                 |   | 180                                 |   | 13  |
| 75-27-4  | Bromodichloromethane               | c                   | 180                                 | 15                                      | 130                                 | 10                                      | 110                                 | 7.3                                     | 0.044   |
| 75-25-2  | Bromoform                          | c                   | 1400                                | 430 <sup>12</sup>                       | 1100                                | 420                                     | 860                                 | 320                                     | 0.34  |
| 71-36-3  | Butanol                            | nc                  | 8800                                |   | 6500                                |   | 5300                                |   | 9.8   |
| 104-51-8   | n-Butylbenzene                     | nc                  | 1400                                | 42 <sup>12</sup>                        | 1000                                | 42 <sup>12</sup>                        | 830                                 | 42 <sup>12</sup>                        | 15  |
| 135-98-8   | sec-Butylbenzene                   | nc                  | 1400                                | 41 <sup>12</sup>                        | 1000                                | 41 <sup>12</sup>                        | 830                                 | 41 <sup>12</sup>                        | 12  |
| 98-06-6  | tert-Butylbenzene                  | nc                  | 1400                                | 70 <sup>12</sup>                        | 1000                                | 70 <sup>12</sup>                        | 830                                 | 70 <sup>12</sup>                        | 12  |
| 85-68-7  | Butyl benzyl phthalate             | c                   | 3900                                |   | 2900                                |   | 2400                                |   | 920   |

| TABLE B1. METHOD TWO – SOIL CLEANUP LEVELS TABLE (See notes for additional requirements) |   |                     |                                     |   |                                     |   |                                     |   |   |
|--|---|---------------------|-------------------------------------|---|-------------------------------------|---|-------------------------------------|---|---|
| CAS Number <sup>4</sup>  | Hazardous Substance                         | Carcinogenic (c/nc) | Arctic Zone <sup>1</sup>            |   | Under 40 inch Zone <sup>2</sup>     |   | Over 40 inch Zone <sup>3</sup>      |   | Migration to Groundwater <sup>7</sup> (mg/kg) |
|  |   |                     | Direct Contact (mg/kg) <sup>5</sup> | Outdoor Inhalation <sup>6</sup> (mg/kg) | Direct Contact (mg/kg) <sup>5</sup> | Outdoor Inhalation <sup>6</sup> (mg/kg) | Direct Contact (mg/kg) <sup>5</sup> | Outdoor Inhalation <sup>6</sup> (mg/kg) |   |
| 86-74-8  | Carbazole                                   | c                   | 390                                 |   | 290                                 |   | 230                                 |   | 6.5   |
| 75-15-0  | Carbon disulfide                            | nc                  | 6500                                | 250 <sup>12</sup>                       | 4800                                | 250 <sup>12</sup>                       | 3900                                | 250 <sup>12</sup>                       | 12  |
| 56-23-5  | Carbon tetrachloride                        | c                   | 86                                  | 4.5                                     | 64                                  | 3.1                                     | 52                                  | 2.3                                     | 0.023   |
| 57-74-9  | Chlordane                                   | c                   | 26                                  |   | 19                                  |   | 15                                  |   | 2.3   |
| 106-47-8   | p-Chloroaniline                             | c                   | 130                                 |   | 90                                  |   | 80                                  |   | 0.057   |
| 108-90-7   | Chlorobenzene                               | nc                  | 2700                                | 200 <sup>12</sup>                       | 2000                                | 200 <sup>12</sup>                       | 1700                                | 200 <sup>12</sup>                       | 0.63  |
| 124-48-1   | Chlorodibromomethane (Dibromochloromethane) | c                   | 130                                 | 21                                      | 99                                  | 14                                      | 81                                  | 11                                      | 0.032   |
| 75-00-3  | Chloroethane                                | c                   | 3900                                | 34                                      | 2900                                | 23                                      | 2300                                | 17                                      | 580   |
| 67-66-3  | Chloroform                                  | c                   | 1400                                | 4.7                                     | 1000                                | 3.2                                     | 830                                 | 2.4                                     | 0.46  |
| 91-58-7  | 2-Chloronaphthalene                         | nc                  | 6300                                |   | 4700                                |   | 3800                                |   | 120   |
| 95-57-8  | 2-Chlorophenol                              | nc                  | 680                                 | 3800                                    | 510                                 | 2500                                    | 410                                 | 1900                                    | 1.5   |
| 218-01-9   | Chrysene <sup>14</sup>                      | c                   | 660                                 |   | 490                                 |   | 400                                 |   | 360   |
| 72-54-8  | DDD   | c                   | 41                                  |   | 30                                  |   | 25                                  |   | 7.2   |
| 72-55-9  | DDE   | c                   | 29                                  |   | 21                                  |   | 18                                  |   | 5.1   |
| 50-29-3  | DDT   | c                   | 29                                  |   | 21                                  |   | 18                                  |   | 7.3   |
| 53-70-3  | Dibenzo(a,h)anthracene <sup>14</sup>        | c                   | 0.66                                |   | 0.49                                |   | 0.40                                |   | 4.0   |
| 132-64-9   | Dibenzofuran                                | nc                  | 270                                 |   | 200                                 |   | 170                                 |   | 11  |
| 84-74-2  | Di-n-butyl phthalate                        | nc                  | 10700                               |   | 7900                                |   | 6500                                |   | 80  |
| 117-84-0   | Di-n-octyl phthalate                        | nc                  | 4200                                |   | 3100                                |   | 2500                                |   | 3800  |
| 94-75-7  | 2,4-Dichlororophenoxy acetic acid (2,4-D)   | nc                  | 1200                                |   | 860                                 |   | 710                                 |   | 0.21  |
| 95-50-1  | 1,2-Dichlorobenzene                         | nc                  | 12300                               | 45 <sup>12</sup>                        | 9100                                | 45 <sup>12</sup>                        | 7500                                | 45 <sup>12</sup>                        | 5.1   |
| 541-73-1   | 1,3-Dichlorobenzene                         | nc                  | 12300                               | 69 <sup>12</sup>                        | 9100                                | 69 <sup>12</sup>                        | 7500                                | 69 <sup>12</sup>                        | 28  |
| 106-46-7   | 1,4-Dichlorobenzene                         | c                   | 470                                 | 44                                      | 350                                 | 30                                      | 280                                 | 22                                      | 0.64  |
| 91-94-1  | 3,3-Dichlorobenzidine                       | c                   | 15                                  |   | 11                                  |   | 9.2                                 |   | 0.19  |

| TABLE B1. METHOD TWO – SOIL CLEANUP LEVELS TABLE (See notes for additional requirements) |                                    |                     |                                     |   |                                     |   |                                     |   |   |
|--|------------------------------------|---------------------|-------------------------------------|---|-------------------------------------|---|-------------------------------------|---|---|
| CAS Number <sup>4</sup>  | Hazardous Substance                | Carcinogenic (c/nc) | Arctic Zone <sup>1</sup>            |   | Under 40 inch Zone <sup>2</sup>     |   | Over 40 inch Zone <sup>3</sup>      |   | Migration to Groundwater <sup>7</sup> (mg/kg) |
|  |                                    |                     | Direct Contact (mg/kg) <sup>5</sup> | Outdoor Inhalation <sup>6</sup> (mg/kg) | Direct Contact (mg/kg) <sup>5</sup> | Outdoor Inhalation <sup>6</sup> (mg/kg) | Direct Contact (mg/kg) <sup>5</sup> | Outdoor Inhalation <sup>6</sup> (mg/kg) |   |
| 75-71-8  | Dichlorodifluoromethane            | nc                  | 27400                               | 570                                     | 20300                               | 380                                     | 16600                               | 280                                     | 140   |
| 75-34-3  | 1,1-Dichloroethane                 | c                   | 27400                               | 900 <sup>12</sup>                       | 20300                               | 900 <sup>12</sup>                       | 16600                               | 900 <sup>12</sup>                       | 25  |
| 107-06-2   | 1,2-Dichloroethane                 | c                   | 120                                 | 7.1                                     | 91                                  | 4.8                                     | 75                                  | 3.6                                     | 0.016   |
| 75-35-4  | 1,1-Dichloroethylene               | c                   | 19                                  | 1.3                                     | 14                                  | 0.85                                    | 11                                  | 0.63                                    | 0.030   |
| 156-59-2   | <i>cis</i> -1,2-Dichloroethylene   | nc                  | 1400                                | 190                                     | 1000                                | 130                                     | 830                                 | 95                                      | 0.24  |
| 156-60-5   | <i>trans</i> -1,2-Dichloroethylene | nc                  | 2700                                | 240                                     | 2000                                | 160                                     | 1700                                | 120                                     | 0.37  |
| 120-83-2   | 2,4-Dichlorophenol                 | nc                  | 310                                 |   | 230                                 |   | 190                                 |   | 1.3   |
| 78-87-5  | 1,2-Dichloropropane                | c                   | 160                                 | 7.9                                     | 120                                 | 5.3                                     | 100                                 | 4.0                                     | 0.018   |
| 542-75-6   | 1,3-Dichloropropene                | c                   | 110                                 | 40                                      | 83                                  | 27                                      | 68                                  | 20                                      | 0.033   |
| 60-57-1  | Dieldrin                           | c                   | 0.43                                |   | 0.32                                |   | 0.26                                |   | 0.0076  |
| 84-66-2  | Diethyl phthalate                  | nc                  | 84000                               |   | 61900                               |   | 50600                               |   | 130   |
| 105-67-9   | 2,4-Dimethylphenol                 | nc                  | 1800                                |   | 1300                                |   | 1100                                |   | 8.8   |
| 131-11-3   | Dimethyl phthalate                 | nc                  | >10 <sup>6</sup>                    |   | 773000                              |   | 633000                              |   | 1100  |
| 528-29-0   | 1,2-Dinitrobenzene                 | nc                  | 11                                  |   | 7.8                                 |   | 6.4                                 |   | 0.020   |
| 99-65-0  | 1,3-Dinitrobenzene                 | nc                  | 10                                  |   | 7.1                                 |   | 5.8                                 |   | 0.020   |
| 100-25-4   | 1,4-Dinitrobenzene                 | nc                  | 8.8                                 |   | 6.5                                 |   | 5.3                                 |   | 0.020   |
| 51-28-5  | 2,4-Dinitrophenol                  | nc                  | 210                                 |   | 160                                 |   | 130                                 |   | 0.54  |
| 121-14-2   | 2,4-Dinitrotoluene                 | nc                  | 12                                  |   | 8.8                                 |   | 7.2                                 |   | 0.0093  |
| 606-20-2   | 2,6-Dinitrotoluene                 | c                   | 12                                  |   | 8.9                                 |   | 7.3                                 |   | 0.0094  |
| 123-91-1   | 1,4-Dioxane                        | c                   | 700                                 |   | 540                                 |   | 440                                 |   | 0.21  |
| 1746-01-6  | 2,3,7,8-TCDD (Dioxin) <sup>8</sup> | c                   | 0.000063                            |   | 0.000047                            |   | 0.000038                            |   | 0.000058                                      |
| 122-39-4   | Diphenylamine                      | nc                  | 2200                                |   | 1600                                |   | 1300                                |   | 25  |
| 115-29-7   | Endosulfan                         | nc                  | 820                                 |   | 610                                 |   | 500                                 |   | 64  |
| 72-20-8  | Endrin                             | nc                  | 2.7                                 |   | 2.0                                 |   | 1.7                                 |   | 0.29  |

| TABLE B1. METHOD TWO – SOIL CLEANUP LEVELS TABLE (See notes for additional requirements) |   |                     |                                     |   |                                     |   |                                     |   |   |
|--|---|---------------------|-------------------------------------|---|-------------------------------------|---|-------------------------------------|---|---|
| CAS Number <sup>4</sup>  | Hazardous Substance                           | Carcinogenic (c/nc) | Arctic Zone <sup>1</sup>            |   | Under 40 inch Zone <sup>2</sup>     |   | Over 40 inch Zone <sup>3</sup>      |   | Migration to Groundwater <sup>7</sup> (mg/kg) |
|  |   |                     | Direct Contact (mg/kg) <sup>5</sup> | Outdoor Inhalation <sup>6</sup> (mg/kg) | Direct Contact (mg/kg) <sup>5</sup> | Outdoor Inhalation <sup>6</sup> (mg/kg) | Direct Contact (mg/kg) <sup>5</sup> | Outdoor Inhalation <sup>6</sup> (mg/kg) |   |
| 100-41-4   | Ethylbenzene <sup>14</sup>                    | c                   | 13700                               | 110 <sup>12</sup>                       | 10100                               | 110                                     | 8300                                | 81                                      | 6.9   |
| 106-93-4   | Ethylene dibromide (1,2-Dibromoethane)        | c                   | 5.6                                 | 0.89                                    | 4.2                                 | 0.60                                    | 3.4                                 | 0.44                                    | 0.00016                                       |
| 107-21-1   | Ethylene glycol                               | nc                  | 175000                              |   | 130000                              |   | 106000                              |   | 190   |
| 206-44-0   | Fluoranthene <sup>14</sup>                    | nc                  | 2500                                |   | 1900                                |   | 1500                                |   | 1400  |
| 86-73-7  | Fluorene <sup>14</sup>                        | nc                  | 3200                                |   | 2300                                |   | 1900                                |   | 220   |
| 76-44-8  | Heptachlor                                    | c                   | 1.7                                 |   | 1.3                                 |   | 1.0                                 |   | 0.28  |
| 1024-57-3  | Heptachlor epoxide                            | c                   | 0.86                                |   | 0.63                                |   | 0.52                                |   | 0.014   |
| 118-74-1   | Hexachlorobenzene                             | c                   | 4.3                                 | 2.2                                     | 3.2                                 | 1.5                                     | 2.6                                 | 1.1                                     | 0.047   |
| 87-68-3  | Hexachloro-1,3-butadiene                      | c                   | 18                                  | 3.8 <sup>12</sup>                       | 13                                  | 3.8 <sup>12</sup>                       | 11                                  | 3.8 <sup>12</sup>                       | 0.12  |
| 319-84-6   | alpha-Hexachlorocyclohexane                   | c                   | 1.6                                 |   | 1.2                                 |   | 1.0                                 |   | 0.0064  |
| 319-85-7   | beta-Hexachlorocyclohexane                    | c                   | 5.5                                 |   | 4.0                                 |   | 3.3                                 |   | 0.022   |
| 58-89-9  | gamma-Hexachlorocyclohexane (Lindane)         | c                   | 7.6                                 |   | 5.6                                 |   | 4.6                                 |   | 0.0095  |
| 77-47-4  | Hexachlorocyclopentadiene                     | nc                  | 530                                 | 3.0                                     | 390                                 | 2.0                                     | 320                                 | 1.5                                     | 1.3   |
| 67-72-1  | Hexachloroethane                              | c                   | 88                                  | 250                                     | 65                                  | 170                                     | 53                                  | 130                                     | 0.21  |
| 121-82-4   | Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX) | c                   | 97                                  |   | 72                                  |   | 59                                  |   | 0.040   |
| 302-01-2   | Hydrazine                                     | c                   | 2.3                                 | 1.5                                     | 1.7                                 | 0.98                                    | 1.4                                 | 0.73                                    | 0.00080                                       |
| 193-39-5   | Indeno(1,2,3-c,d)pyrene <sup>14</sup>         | c                   | 6.6                                 |   | 4.9                                 |   | 4.0                                 |   | 41  |
| 78-59-1  | Isophorone                                    | c                   | 7200                                |   | 5300                                |   | 4400                                |   | 3.1   |
| 98-82-8  | Isopropylbenzene (Cumene)                     | nc                  | 13700                               | 62 <sup>12</sup>                        | 10100                               | 62 <sup>12</sup>                        | 8300                                | 62 <sup>12</sup>                        | 51  |
| 72-43-5  | Methoxychlor                                  | nc                  | 440                                 |   | 320                                 |   | 270                                 |   | 23  |
| 74-83-9  | Methyl bromide (Bromomethane)                 | nc                  | 190                                 | 21                                      | 140                                 | 14                                      | 120                                 | 11                                      | 0.16  |
| 74-87-3  | Methyl chloride (Chloromethane)               | c                   | 860                                 | 37                                      | 640                                 | 25                                      | 520                                 | 19                                      | 0.21  |
| 78-93-3  | Methyl ethyl ketone (MEK)                     | nc                  | 82100                               | 23300 <sup>12</sup>                     | 60800                               | 23300 <sup>12</sup>                     | 49800                               | 23300 <sup>12</sup>                     | 59  |
| 108-10-1   | Methyl isobutyl ketone (MIBK)                 | nc                  | 11000                               | 2100 <sup>12</sup>                      | 8100                                | 2100 <sup>12</sup>                      | 6600                                | 2100 <sup>12</sup>                      | 8.1   |

| TABLE B1. METHOD TWO – SOIL CLEANUP LEVELS TABLE (See notes for additional requirements) |  |                     |                                     |   |                                     |   |                                     |   |   |
|--|--|---------------------|-------------------------------------|---|-------------------------------------|---|-------------------------------------|---|---|
| CAS Number <sup>4</sup>  | Hazardous Substance                                    | Carcinogenic (c/nc) | Arctic Zone <sup>1</sup>            |   | Under 40 inch Zone <sup>2</sup>     |   | Over 40 inch Zone <sup>3</sup>      |   | Migration to Groundwater <sup>7</sup> (mg/kg) |
|  |  |                     | Direct Contact (mg/kg) <sup>5</sup> | Outdoor Inhalation <sup>6</sup> (mg/kg) | Direct Contact (mg/kg) <sup>5</sup> | Outdoor Inhalation <sup>6</sup> (mg/kg) | Direct Contact (mg/kg) <sup>5</sup> | Outdoor Inhalation <sup>6</sup> (mg/kg) |   |
| 74-95-3  | Methylene bromide                                      | nc                  | 1400                                | 560                                     | 1000                                | 370                                     | 830                                 | 280                                     | 1.1   |
| 75-09-2  | Methylene chloride                                     | c                   | 1500                                | 240                                     | 1100                                | 160                                     | 910                                 | 120                                     | 0.016   |
| 22967-92-6   | Mercury (Methyl)                                       | nc                  | 10                                  |   | 7.7                                 |   | 6.3                                 |   | 0.012   |
| 90-12-0  | 1-Methylnaphthalene                                    | nc                  | 380                                 | 1100                                    | 280                                 | 760                                     | 230                                 | 560                                     | 6.2   |
| 91-57-6  | 2-Methylnaphthalene                                    | nc                  | 380                                 | 1100                                    | 280                                 | 750                                     | 230                                 | 560                                     | 6.1   |
| 95-48-7  | 2-Methylphenol (o-cresol)                              | c                   | 4400                                |   | 3200                                |   | 2700                                |   | 15  |
| 108-39-4   | 3-Methylphenol (m-cresol)                              | c                   | 4400                                |   | 3200                                |   | 2700                                |   | 15  |
| 106-44-5   | 4-Methylphenol (p-cresol)                              | c                   | 480                                 |   | 350                                 |   | 290                                 |   | 1.5   |
| 1634-04-4  | Methyl <i>tert</i> -butyl ether (MTBE)                 | c                   | 6200                                | 440                                     | 4600                                | 290                                     | 3800                                | 220                                     | 1.3   |
| 91-20-3  | Naphthalene <sup>14</sup>                              | nc                  | 1900                                | 42                                      | 1400                                | 28                                      | 1100                                | 21                                      | 20  |
| 98-95-3  | Nitrobenzene   | nc                  | 68                                  | 180                                     | 51                                  | 120                                     | 41                                  | 90                                      | 0.094   |
| 55-63-0  | Nitroglycerin  | c                   | 400                                 |   | 300                                 |   | 240                                 |   | 0.22  |
| 556-88-7   | Nitroguanidine   | nc                  | 8800                                |   | 6500                                |   | 5300                                |   | 11  |
| 62-75-9  | n-Nitrosodimethylamine                                 | c                   | 0.22                                | 0.28                                    | 0.16                                | 0.19                                    | 0.13                                | 0.14                                    | 0.000053                                      |
| 86-30-6  | n-Nitrosodiphenylamine                                 | c                   | 1000                                |   | 750                                 |   | 610                                 |   | 15  |
| 621-64-7   | n-Nitroso-di-n-propylamine                             | c                   | 0.71                                |   | 0.52                                |   | 0.43                                |   | 0.0011  |
| 88-72-2  | 2-Nitrotoluene   | c                   | 35                                  |   | 26                                  |   | 21                                  |   | 0.025   |
| 99-08-1  | 3-Nitrotoluene   | c                   | 2000                                |   | 1500                                |   | 1200                                |   | 4.9   |
| 99-99-0  | 4-Nitrotoluene   | c                   | 470                                 |   | 350                                 |   | 290                                 |   | 0.34  |
| 103-65-1   | n-Propylbenzene  | nc                  | 1400                                | 42 <sup>12</sup>                        | 1000                                | 42 <sup>12</sup>                        | 830                                 | 42 <sup>12</sup>                        | 15  |
| 2691-41-0  | Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX) | nc                  | 6200                                |   | 4600                                |   | 3700                                |   | 49  |
| 87-86-5  | Pentachlorophenol                                      | c                   | 52                                  |   | 39                                  |   | 32                                  |   | 0.047   |
| 85-01-8  | Phenanthrene <sup>14</sup>                             | nc                  | 27800                               |   | 20600                               |   | 16800                               |   | 3000  |
| 108-95-2   | Phenol   | nc                  | 31300                               |   | 23200                               |   | 19000                               |   | 68  |

| TABLE B1. METHOD TWO – SOIL CLEANUP LEVELS TABLE (See notes for additional requirements) |  |                     |                                     |   |                                     |   |                                     |   |   |
|--|--|---------------------|-------------------------------------|---|-------------------------------------|---|-------------------------------------|---|---|
| CAS Number <sup>4</sup>  | Hazardous Substance                                  | Carcinogenic (c/nc) | Arctic Zone <sup>1</sup>            |   | Under 40 inch Zone <sup>2</sup>     |   | Over 40 inch Zone <sup>3</sup>      |   | Migration to Groundwater <sup>7</sup> (mg/kg) |
|  |  |                     | Direct Contact (mg/kg) <sup>5</sup> | Outdoor Inhalation <sup>6</sup> (mg/kg) | Direct Contact (mg/kg) <sup>5</sup> | Outdoor Inhalation <sup>6</sup> (mg/kg) | Direct Contact (mg/kg) <sup>5</sup> | Outdoor Inhalation <sup>6</sup> (mg/kg) |   |
| 133-63-63  | Polychlorinated biphenyls (PCBs) <sup>9</sup>        | c                   | 1                                   |   | 1                                   |   | 1                                   |   |   |
| 129-00-0   | Pyrene <sup>14</sup>                                 | nc                  | 1900                                |   | 1400                                |   | 1100                                |   | 1000  |
| 100-42-5   | Styrene  | nc                  | 27400                               | 200 <sup>12</sup>                       | 20300                               | 200 <sup>12</sup>                       | 16600                               | 200 <sup>12</sup>                       | 0.96  |
| 79-34-5  | 1,1,2,2-Tetrachloroethane                            | c                   | 56                                  | 8.1                                     | 42                                  | 5.5                                     | 34                                  | 4.1                                     | 0.017   |
| 127-18-4   | Tetrachloroethylene (PCE)                            | c                   | 21                                  | 15                                      | 15                                  | 10                                      | 13                                  | 7.3                                     | 0.024   |
| 108-88-3   | Toluene <sup>14</sup>                                | nc                  | 11000                               | 220 <sup>12</sup>                       | 8100                                | 220 <sup>12</sup>                       | 6600                                | 220 <sup>12</sup>                       | 6.5   |
| 8001-35-2  | Toxaphene  | c                   | 10                                  |   | 7.5                                 |   | 6.2                                 |   | 3.9   |
| 688-73-3   | Tributyltin  | nc                  | 26                                  |   | 19                                  |   | 16                                  |   | 5500  |
| 120-82-1   | 1,2,4-Trichlorobenzene                               | nc                  | 1400                                | 41 <sup>12</sup>                        | 1000                                | 41 <sup>12</sup>                        | 830                                 | 41 <sup>12</sup>                        | 0.85  |
| 71-55-6  | 1,1,1-Trichloroethane                                | nc                  | 27400                               | 360 <sup>12</sup>                       | 20300                               | 360 <sup>12</sup>                       | 16600                               | 360 <sup>12</sup>                       | 0.82  |
| 79-00-5  | 1,1,2-Trichloroethane                                | c                   | 200                                 | 17                                      | 150                                 | 11                                      | 120                                 | 8.6                                     | 0.018   |
| 79-01-6  | Trichloroethylene (TCE)                              | c                   | 28                                  | 0.85                                    | 21                                  | 0.57                                    | 17                                  | 0.42                                    | 0.020   |
| 95-95-4  | 2,4,5-Trichlorophenol                                | nc                  | 8800                                |   | 6500                                |   | 5300                                |   | 67  |
| 88-06-2  | 2,4,6-Trichlorophenol                                | c                   | 620                                 | 6100                                    | 460                                 | 4100                                    | 380                                 | 3000                                    | 1.4   |
| 93-72-1  | 2-(2,4,5-Trichlorophenoxy) propionic acid (2,4,5-TP) | nc                  | 700                                 |   | 520                                 |   | 430                                 |   | 0.19  |
| 96-18-4  | 1,2,3-Trichloropropane                               | c                   | 1.6                                 | 0.26                                    | 1.2                                 | 0.17                                    | 0.97                                | 0.13                                    | 0.00053                                       |
| 76-13-1  | 1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)    | nc                  | >10 <sup>6</sup>                    | 750 <sup>12</sup>                       | >10 <sup>6</sup>                    | 750 <sup>12</sup>                       | >10 <sup>6</sup>                    | 750 <sup>12</sup>                       | 750 <sup>12</sup>                             |
| 75-69-4  | Trichlorofluoromethane (Freon-11)                    | nc                  | 41100                               | 990 <sup>12</sup>                       | 30400                               | 990 <sup>12</sup>                       | 24900                               | 820                                     | 86  |
| 95-63-6  | 1,2,4-Trimethylbenzene                               | nc                  | 6800                                | 49 <sup>12</sup>                        | 5100                                | 49                                      | 4100                                | 37                                      | 23  |
| 108-67-8   | 1,3,5-Trimethylbenzene                               | nc                  | 6800                                | 42 <sup>12</sup>                        | 5100                                | 42 <sup>12</sup>                        | 4100                                | 32                                      | 23  |
| 99-35-4  | 1,3,5-Trinitrobenzene                                | nc                  | 3800                                |   | 2800                                |   | 2300                                |   | 19  |
| 479-45-8   | 2,4,6-Trinitrophenylmethylnitramine (Tetryl)         | nc                  | 550                                 |   | 400                                 |   | 330                                 |   | 4.5   |
| 118-96-7   | 2,4,6-Trinitrotoluene (TNT)                          | c                   | 60                                  |   | 44                                  |   | 36                                  |   | 0.49  |
| 108-05-4   | Vinyl acetate  | nc                  | 137000                              | 2200 <sup>12</sup>                      | 101000                              | 1500                                    | 83000                               | 1100                                    | 100   |

| TABLE B1. METHOD TWO – SOIL CLEANUP LEVELS TABLE (See notes for additional requirements) |                               |                     |                                     |   |                                     |   |                                     |   |   |
|--|-------------------------------|---------------------|-------------------------------------|---|-------------------------------------|---|-------------------------------------|---|---|
| CAS Number <sup>4</sup>  | Hazardous Substance           | Carcinogenic (c/nc) | Arctic Zone <sup>1</sup>            |   | Under 40 inch Zone <sup>2</sup>     |   | Over 40 inch Zone <sup>3</sup>      |   | Migration to Groundwater <sup>7</sup> (mg/kg) |
|  |                               |                     | Direct Contact (mg/kg) <sup>5</sup> | Outdoor Inhalation <sup>6</sup> (mg/kg) | Direct Contact (mg/kg) <sup>5</sup> | Outdoor Inhalation <sup>6</sup> (mg/kg) | Direct Contact (mg/kg) <sup>5</sup> | Outdoor Inhalation <sup>6</sup> (mg/kg) |   |
| 75-01-4  | Vinyl chloride (Chloroethene) | c                   | 7.5                                 | 6.4                                     | 5.5                                 | 4.3                                     | 4.5                                 | 3.2                                     | 0.0085  |
| 1330-20-7  | Xylenes (total) <sup>14</sup> | nc                  | 27400                               | 63 <sup>12</sup>                        | 20300                               | 63 <sup>12</sup>                        | 16600                               | 63 <sup>12</sup>                        | 63 <sup>12</sup>                              |
| <b>INORGANICS</b>  |                               |                     |                                     |   |                                     |   |                                     |   |   |
| 7440-36-0  | Antimony                      | nc                  | 55                                  |   | 41                                  |   | 33                                  |   | 3.6   |
| 7440-38-2  | Arsenic <sup>15</sup>         | c                   | 6.1                                 |   | 4.5                                 |   | 3.7                                 |   | 3.9   |
| 7440-39-3  | Barium                        | nc                  | 27400                               |   | 20300                               |   | 16600                               |   | 1100  |
| 7440-41-7  | Beryllium                     | c                   | 270                                 |   | 200                                 |   | 170                                 |   | 42  |
| 7440-43-9  | Cadmium                       | c                   | 110                                 |   | 79                                  |   | 65                                  |   | 5.0   |
| 7440-47-3  | Chromium (Total)              | nc                  | 410                                 |   | 300                                 |   | 250                                 |   | 25  |
| 16065-83-1   | Chromium +3                   | nc                  | 205000                              |   | 152000                              |   | 124000                              |   | >10 <sup>6</sup>                              |
| 18540-29-9   | Chromium +6                   | nc                  | 410                                 |   | 300                                 |   | 250                                 |   | 25  |
| 7440-50-8  | Copper                        | nc                  | 5500                                |   | 4100                                |   | 3300                                |   | 460   |
| 57-12-5  | Cyanide <sup>10</sup>         | nc                  | 2700                                |   | 2000                                |   | 1700                                |   | 27  |
| 7439-92-1  | Lead <sup>11</sup>            | c                   | 400                                 |   | 400                                 |   | 400                                 |   |   |
| 7439-97-6  | Mercury                       | nc                  | 41                                  | 26                                      | 30                                  | 18                                      | 25                                  | 13                                      | 1.4   |
| 7440-02-0  | Nickel                        | nc                  | 2700                                |   | 2000                                |   | 1700                                |   | 86  |
| 7790-98-9  | Perchlorate                   | nc                  | 96                                  |   | 71                                  |   | 58                                  |   | 0.067   |
| 7782-49-2  | Selenium                      | nc                  | 680                                 |   | 510                                 |   | 410                                 |   | 3.4   |
| 7440-22-4  | Silver                        | nc                  | 680                                 |   | 510                                 |   | 410                                 |   | 11.2  |
| 7440-28-0  | Thallium                      | nc                  | 11                                  |   | 8.1                                 |   | 6.6                                 |   | 1.9   |
| 7440-62-2  | Vanadium                      | nc                  | 960                                 |   | 710                                 |   | 580                                 |   | 3400  |
| 7723-14-0  | White phosphorus              | nc                  | 2.7                                 |   | 2.0                                 |   | 1.7                                 |   | 0.036   |
| 7440-66-6  | Zinc                          | nc                  | 41100                               |   | 30400                               |   | 24900                               |   | 4100  |

**NOTES TO TABLE B1 FOLLOW TABLE B2 IN (d) OF THIS SECTION**

(d) If a responsible person uses method two for petroleum hydrocarbons under 18 AAC 75.340, the soil cleanup levels must be based on Table B2 in this subsection.

**TABLE B2. METHOD TWO - PETROLEUM HYDROCARBON SOIL CLEANUP LEVELS**

| Petroleum Hydrocarbon Range   | Arctic Zone <sup>1</sup><br>mg/kg |                                  |   | Under 40 Inch Zone <sup>2</sup> |                                  |   | Over 40 Inch Zone <sup>3</sup>  |                                  |   | Maximum Allowable Concentrations <sup>13</sup><br>mg/kg |
|---|-----------------------------------|----------------------------------|---|---------------------------------|----------------------------------|---|---------------------------------|----------------------------------|---|---|
|   | Ingestion (mg/kg) <sup>16</sup>   | Inhalation (mg/kg) <sup>17</sup> | Migration to Groundwater (mg/kg) <sup>7</sup> | Ingestion (mg/kg) <sup>16</sup> | Inhalation (mg/kg) <sup>17</sup> | Migration to groundwater (mg/kg) <sup>7</sup> | Ingestion (mg/kg) <sup>16</sup> | Inhalation (mg/kg) <sup>17</sup> | Migration to Groundwater (mg/kg) <sup>7</sup> |   |
| <b>For Laboratory Analysis using AK Methods 101, 102, and 103</b>                                       |                                   |                                  |   |                                 |                                  |   |                                 |                                  |   |   |
| C <sub>6</sub> -C <sub>10</sub> GRO using AK 101  | 1400                              | 1400                             | n/a   | 1400                            | 1400                             | 300   | 1400                            | 1400                             | 260   | 1400  |
| C <sub>10</sub> -C <sub>25</sub> DRO using AK 102   | 12500                             | 12500                            | n/a   | 10250                           | 12500                            | 250   | 8250                            | 12500                            | 230   | 12500   |
| C <sub>25</sub> -C <sub>36</sub> RRO using AK 103   | 13700                             | 22000                            | n/a   | 10000                           | 22000                            | 11000   | 8300                            | 22000                            | 9700  | 22000   |
| <b>For Laboratory Analysis using AK Aliphatic and Aromatic Fraction Methods 101AA, 102AA, and 103AA</b> |                                   |                                  |   |                                 |                                  |   |                                 |                                  |   |   |
| C <sub>6</sub> -C <sub>10</sub> Aliphatics  | 1000                              | 1000                             | n/a   | 1000                            | 1000                             | 270   | 1000                            | 1000                             | 240   | 1000  |
| C <sub>6</sub> -C <sub>10</sub> Aromatics   | 1000                              | 1000                             | n/a   | 1000                            | 1000                             | 150   | 1000                            | 1000                             | 130   | 1000  |
| C <sub>10</sub> -C <sub>25</sub> Aliphatics   | 10000                             | 10000                            | n/a   | 10000                           | 10000                            | 7200  | 8300                            | 10000                            | 6400  | 10000   |
| C <sub>10</sub> -C <sub>25</sub> Aromatics  | 5000                              | 5000                             | n/a   | 4100                            | 5000                             | 100   | 3300                            | 5000                             | 90  | 5000  |
| C <sub>25</sub> -C <sub>36</sub> Aliphatics   | 20000                             | 20000                            | n/a   | 20000                           | 20000                            | 20000   | 20000                           | 20000                            | 20000   | 20000   |
| C <sub>25</sub> -C <sub>36</sub> Aromatics  | 4100                              | 10000                            | n/a   | 3000                            | 10000                            | 3300  | 2500                            | 10000                            | 2900  | 10000   |
| See notes to table for further requirements. "n/a" means not applicable.                                |                                   |                                  |   |                                 |                                  |   |                                 |                                  |   |   |

**Notes to Tables B1 and B2:**

If applicable, site specific cleanup levels must be protective of migration to surface water. Concentrations of hazardous substances in soil must be calculated and presented on a per dry weight basis. For volatile organic hazardous substances for which toxicity data is not currently available or calculated levels exceed the calculated saturation concentration, the cleanup level that applies at a site is the calculated saturation concentration determined using the equations set out in *Cleanup Levels Guidance*, adopted by reference in 18 AAC 75.340. The cleanup level from Table B1 or B2 that applies at a site is the most stringent of the applicable exposure pathway-specific cleanup levels based on direct contact, inhalation, or migration to groundwater.

In Table B1, a blank space means not available or not applicable.

1. "Arctic zone" is defined at 18 AAC 75.990.
2. "under 40 inch zone" means a site that receives mean annual precipitation of less than 40 inches each year.
3. "over 40 inch zone" means a site that receives mean annual precipitation of 40 or more inches each year.
4. "CAS Number" means the Chemical Abstract Service (CAS) registry number uniquely assigned to chemicals by the American Chemical Society and recorded in the CAS Registry System.
5. "Direct contact" means exposure through both incidental ingestion of soil and through dermal absorption of the contaminant from soil.
6. "outdoor inhalation" means a potential pathway of exposure to volatile organic hazardous substances in the soil through volatilization and migration to outdoor air.
7. "migration to groundwater" means the potential for hazardous substances to leach to groundwater where they may result in a completed human exposure pathway through direct ingestion of contaminants at or above levels listed in Table C at 18 AAC 75.345(b)(1); soil cleanup levels protective of migration to surface water must be determined on a site-specific basis.
8. The cleanup level in Table B1 for dioxin is for 2,3,7,8-Tetrachlorodibenzo-*p*-Dioxin (TCDD) only; all cleanup levels for polychlorinated dibenzo-*p*-dioxin (PCDD) and polychlorinated dibenzofuran (PCDF) congeners must be determined on a site-specific basis.
9. For unrestricted land use, polychlorinated biphenyls (PCBs) in soil shall be cleaned up to one mg/kg or less, unless the department determines that a different cleanup level is necessary as provided in 18 AAC 75.340(i); with the prior approval of the department, PCBs in soil may be cleaned up to
  - (A) between 1 and 10 mg/kg if the responsible person
    - (i) caps each area containing PCBs in soil at levels between 1 and 10 mg/kg; for purposes of this Note 9, "caps" means covering an area of PCB contaminated soil with an appropriate material to prevent exposure of humans and the environment to PCBs; to be approved, a cap must be designed and constructed of a material acceptable to the department and of sufficient strength and durability to withstand the use of the surface that is exposed to the environment; within 72 hours after discovery of a breach to the integrity of a cap, the responsible person or the landowner shall initiate repairs to that breach; and
    - (ii) provides the department within 60 days after completing the cleanup, documentation that the responsible person has recorded a deed notation in the appropriate land records, or on another instrument that is normally examined during a title search, documenting

that PCBs remain in the soil, that the contaminated soil has been capped, and that subsequent interest holders may have legal obligations with respect to the cap and the contaminated soil; or

(B) an alternative PCB soil cleanup level developed through an approved site-specific risk assessment, conducted according to the *Risk Assessment Procedures Manual*, adopted by reference at 18 AAC 75.340.

10. Cyanide expressed as free, or physiologically available cyanide.

11. Lead cleanup levels are based on land use; for residential land use, the soil cleanup level is 400 mg/kg. For commercial or industrial land use, as applied in 18 AAC 75.340(e)(3), the soil cleanup level is 800 mg/kg; through an approved site-specific risk assessment, conducted according to the *Risk Assessment Procedures Manual*, adopted by reference at 18 AAC 75.340, approved exposure models may be used to evaluate exposure to a child resident or an adult worker; a responsible person may also propose an alternative cleanup level, through a site-specific risk assessment conducted according to the *Manual*, and based on a chemical speciation of the lead present at the site. For soils contaminated with lead more than 15 feet below ground surface, lead cleanup levels will be determined on a site-specific basis.

12. These levels are based on soil saturation level (C<sub>sat</sub>) using the equations set out in *Cleanup Levels Guidance*, adopted by reference in 18 AAC 75.340. Refer to the Cumulative Risk Guidance, adopted by reference in 18 AAC 75.325(g), for inhalation risk screening levels.

13. This level is the concentration of C<sub>6</sub> - C<sub>10</sub>, C<sub>10</sub> - C<sub>25</sub>, or C<sub>25</sub> - C<sub>36</sub> petroleum hydrocarbon range in surface and subsurface soil that if exceeded, indicates an increased potential for hazardous substance migration or for risk to human health, safety or welfare, or to the environment; the level of a petroleum hydrocarbon may not remain at a concentration above the maximum allowable concentration unless a responsible person demonstrates that the petroleum hydrocarbon will not migrate and will not pose a significant risk to human health, safety, or welfare, or to the environment; free product must be recovered as required by 18 AAC 75.325(f).

14. If using method two or method three, the applicable petroleum hydrocarbon cleanup levels must be met in addition to the applicable chemical-specific cleanup levels for benzene, ethylbenzene, toluene, and total xylenes; the chemical-specific cleanup levels for the polynuclear aromatic hydrocarbons acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)pyrene, chrysene, dibenzo(a,h)anthracene, flouranthene, fluorene, indeno(1,2,3-c,d)pyrene, naphthalene, phenanthrene, and pyrene must also be met unless the department determines that those cleanup levels need not be met to protect human health, safety, and welfare, and the environment.

15. Due to naturally occurring variable concentrations throughout the state, arsenic must be evaluated as a contaminant of potential concern on a site-specific basis.

16. “Ingestion” means a potential pathway of exposure to hazardous substances through direct consumption of the soil.

17. “inhalation” means a potential pathway to volatile organic hazardous substances in the soil through volatilization.

18. “c” means carcinogenic, and “nc” means noncarcinogenic. (Eff. 1/22/99, Register 149; am 8/27/2000, Register 155; am 10/9/2008, Register 188)

|                   |              |              |              |
|-------------------|--------------|--------------|--------------|
| <b>Authority:</b> | AS 46.03.020 | AS 46.03.740 | AS 46.04.070 |
|                   | AS 46.03.050 | AS 46.03.745 | AS 46.09.020 |
|                   | AS 46.03.710 | AS 46.04.020 |              |

**Editor's note:** The applicable EPA rule governing disposal and cleanup of PCB contaminated facilities under 40 C.F.R. Part 761.61 (PCB remediation waste) may apply to PCB cleanup at a contaminated site. The PCB cleanup levels listed in Table B1 are based on cleanup levels referred to in 40 C.F.R. 761.61 for high occupancy areas with no cap.

**18 AAC 75.345. Groundwater and surface water cleanup levels.** (a) Except as otherwise provided in this section, cleanup of a discharge or release of a hazardous substance to groundwater or surface water must meet the requirements of this section.

(b) Contaminated groundwater must meet

(1) the cleanup levels in Table C if the current use or the reasonably expected potential future use of the groundwater, determined under 18 AAC 75.350, is a drinking water source;

TABLE C. GROUNDWATER CLEANUP LEVELS

| CAS Number <sup>1</sup> | Hazardous Substance                         | Carcinogenic (c/nc) <sup>2</sup> | Groundwater cleanup level (mg/L) |
|-------------------------|---|----------------------------------|----------------------------------|
| <b>ORGANICS</b>         |   |                                  |                                  |
| 355-72-782              | 2-Amino-4,6-dinitrotoluene                  | nc                               | 0.0073                           |
| 194-06-510              | 4-Amino-2,6-dinitrotoluene                  | nc                               | 0.0073                           |
| 83-32-9                 | Acenaphthene                                | nc                               | 2.2                              |
| 208-96-8                | Acenaphthylene                              | nc                               | 2.2                              |
| 67-64-1                 | Acetone                                     | nc                               | 33                               |
| 309-00-2                | Aldrin                                      | c                                | 0.00005                          |
| 120-12-7                | Anthracene                                  | nc                               | 11                               |
| 71-43-2                 | Benzene                                     | c                                | 0.005                            |
| 56-55-3                 | Benzo(a)anthracene                          | c                                | 0.0012                           |
| 205-99-2                | Benzo(b)fluoranthene                        | c                                | 0.0012                           |
| 207-08-9                | Benzo(k)fluoranthene                        | c                                | 0.012                            |
| 65-85-0                 | Benzoic acid                                | nc                               | 150                              |
| 191-24-2                | Benzo(g,h,i)perylene                        | nc                               | 1.1                              |
| 50-32-8                 | Benzo(a)pyrene                              | c                                | 0.0002                           |
| 111-44-4                | Bis(2-chloroethyl)ether                     | c                                | 0.00077                          |
| 117-81-7                | Bis(2-ethylhexyl)phthalate                  | c                                | 0.006                            |
| 75-27-4                 | Bromodichloromethane                        | c                                | 0.014                            |
| 75-25-2                 | Bromoform                                   | c                                | 0.11                             |
| 71-36-3                 | Butanol                                     | nc                               | 3.7                              |
| 104-51-8                | n-Butylbenzene                              | nc                               | 0.37                             |
| 135-98-8                | sec-Butylbenzene                            | nc                               | 0.37                             |
| 98-06-6                 | tert-Butylbenzene                           | nc                               | 0.37                             |
| 85-68-7                 | Butyl benzyl phthalate                      | c                                | 7.3                              |
| 86-74-8                 | Carbazole                                   | c                                | 0.043                            |
| 75-15-0                 | Carbon disulfide                            | nc                               | 3.7                              |
| 56-23-5                 | Carbon tetrachloride                        | c                                | 0.005                            |
| 57-74-9                 | Chlordane                                   | c                                | 0.002                            |
| 106-47-8                | p-Chloroaniline                             | c                                | 0.016                            |
| 108-90-7                | Chlorobenzene                               | nc                               | 0.1                              |
| 124-48-1                | Chlorodibromomethane (Dibromochloromethane) | c                                | 0.010                            |
| 75-00-3                 | Chloroethane                                | c                                | 0.29                             |
| 67-66-3                 | Chloroform                                  | c                                | 0.14                             |
| 91-58-7                 | 2-Chloronaphthalene                         | nc                               | 2.9                              |
| 95-57-8                 | 2-Chlorophenol                              | nc                               | 0.18                             |
| 218-01-9                | Chrysene                                    | c                                | 0.12                             |

TABLE C. GROUNDWATER CLEANUP LEVELS

| CAS Number <sup>1</sup> | Hazardous Substance                     | Carcinogenic (c/nc) <sup>2</sup> | Groundwater cleanup level (mg/L) |
|-------------------------|---|----------------------------------|----------------------------------|
| 72-54-8                 | DDD                                     | c                                | 0.0035                           |
| 72-55-9                 | DDE                                     | c                                | 0.0025                           |
| 50-29-3                 | DDT                                     | c                                | 0.0025                           |
| 53-70-3                 | Dibenzo(a,h)anthracene                  | c                                | 0.00012                          |
| 132-64-9                | Dibenzofuran                            | nc                               | 0.073                            |
| 84-74-2                 | Di-n-butyl phthalate                    | nc                               | 3.7                              |
| 117-84-0                | Di-n-octyl phthalate                    | nc                               | 1.5                              |
| 94-75-7                 | 2,4-Dichlorophenoxy acetic acid (2,4-D) | nc                               | 0.07                             |
| 95-50-1                 | 1,2-Dichlorobenzene                     | nc                               | 0.6                              |
| 541-73-1                | 1,3-Dichlorobenzene                     | nc                               | 3.3                              |
| 106-46-7                | 1,4-Dichlorobenzene                     | c                                | 0.075                            |
| 91-94-1                 | 3,3-Dichlorobenzidine                   | c                                | 0.0019                           |
| 75-71-8                 | Dichlorodifluoromethane                 | nc                               | 7.3                              |
| 75-34-3                 | 1,1-Dichloroethane                      | c                                | 7.3                              |
| 107-06-2                | 1,2-Dichloroethane                      | c                                | 0.005                            |
| 75-35-4                 | 1,1-Dichloroethylene                    | c                                | 0.007                            |
| 156-59-2                | <i>cis</i> -1,2-Dichloroethylene        | nc                               | 0.07                             |
| 156-60-5                | <i>trans</i> -1,2-Dichloroethylene      | nc                               | 0.10                             |
| 120-83-2                | 2,4-Dichlorophenol                      | nc                               | 0.11                             |
| 78-87-5                 | 1,2-Dichloropropane                     | c                                | 0.005                            |
| 542-75-6                | 1,3-Dichloropropene                     | c                                | 0.0085                           |
| 60-57-1                 | Dieldrin                                | c                                | 0.000053                         |
| 84-66-2                 | Diethyl phthalate                       | nc                               | 29                               |
| 105-67-9                | 2,4-Dimethylphenol                      | nc                               | 0.73                             |
| 131-11-3                | Dimethyl phthalate                      | nc                               | 370                              |
| 528-29-0                | 1,2-Dinitrobenzene                      | nc                               | 0.0037                           |
| 99-65-0                 | 1,3-Dinitrobenzene                      | nc                               | 0.0037                           |
| 100-25-4                | 1,4-Dinitrobenzene                      | nc                               | 0.0037                           |
| 51-28-5                 | 2,4-Dinitrophenol                       | nc                               | 0.073                            |
| 121-14-2                | 2,4-Dinitrotoluene                      | nc                               | 0.0013                           |
| 606-20-2                | 2,6-Dinitrotoluene                      | c                                | 0.0013                           |
| 123-91-1                | 1,4-Dioxane                             | c                                | 0.077                            |
| 1746-01-6               | 2,3,7,8-TCDD (Dioxin)                   | c                                | 0.00000030                       |
| 122-39-4                | Diphenylamine                           | nc                               | 0.91                             |
| 115-29-7                | Endosulfan                              | nc                               | 0.22                             |

TABLE C. GROUNDWATER CLEANUP LEVELS

| CAS Number <sup>1</sup> | Hazardous Substance                           | Carcinogenic (c/nc) <sup>2</sup> | Groundwater cleanup level (mg/L) |
|-------------------------|---|----------------------------------|----------------------------------|
| 72-20-8                 | Endrin  | nc                               | 0.002                            |
| 100-41-4                | Ethylbenzene                                  | c                                | 0.7                              |
| 106-93-4                | Ethylene dibromide (1,2-Dibromoethane)        | c                                | 0.00005                          |
| 107-21-1                | Ethylene glycol                               | nc                               | 73                               |
| 206-44-0                | Fluoranthene                                  | nc                               | 1.5                              |
| 86-73-7                 | Fluorene                                      | nc                               | 1.5                              |
| 76-44-8                 | Heptachlor                                    | c                                | 0.0004                           |
| 1024-57-3               | Heptachlor epoxide                            | c                                | 0.0002                           |
| 118-74-1                | Hexachlorobenzene                             | c                                | 0.001                            |
| 87-68-3                 | Hexachloro-1,3-butadiene                      | c                                | 0.0073                           |
| 319-84-6                | alpha-Hexachlorocyclohexane                   | c                                | 0.00014                          |
| 319-85-7                | beta-Hexachlorocyclohexane                    | c                                | 0.00047                          |
| 58-89-9                 | gamma-Hexachlorocyclohexane (Lindane)         | c                                | 0.0002                           |
| 77-47-4                 | Hexachlorocyclopentadiene                     | nc                               | 0.05                             |
| 67-72-1                 | Hexachloroethane                              | c                                | 0.04                             |
| 121-82-4                | Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX) | c                                | 0.0077                           |
| 302-01-2                | Hydrazine                                     | c                                | 0.00028                          |
| 193-39-5                | Indeno(1,2,3-c,d)pyrene                       | c                                | 0.0012                           |
| 78-59-1                 | Isophorone                                    | c                                | 0.90                             |
| 98-82-8                 | Isopropylbenzene (Cumene)                     | nc                               | 3.7                              |
| 72-43-5                 | Methoxychlor                                  | nc                               | 0.04                             |
| 74-83-9                 | Methyl bromide (Bromomethane)                 | nc                               | 0.051                            |
| 74-87-3                 | Methyl chloride (Chloromethane)               | c                                | 0.066                            |
| 78-93-3                 | Methyl ethyl ketone (MEK)                     | nc                               | 22                               |
| 108-10-1                | Methyl isobutyl ketone (MIBK)                 | nc                               | 2.9                              |
| 74-95-3                 | Methylene bromide                             | nc                               | 0.37                             |
| 75-09-2                 | Methylene chloride                            | c                                | 0.005                            |
| 22967-92-6              | Mercury (Methyl)                              | nc                               | 0.0037                           |
| 90-12-0                 | 1-Methylnaphthalene                           | nc                               | 0.15                             |
| 91-57-6                 | 2-Methylnaphthalene                           | nc                               | 0.15                             |
| 95-48-7                 | 2-Methylphenol (o-cresol)                     | c                                | 1.8                              |
| 108-39-4                | 3-Methylphenol (m-cresol)                     | c                                | 1.8                              |
| 106-44-5                | 4-Methylphenol (p-cresol)                     | c                                | 0.18                             |
| 1634-04-4               | Methyl <i>tert</i> -butyl ether (MTBE)        | c                                | 0.47                             |
| 91-20-3                 | Naphthalene                                   | nc                               | 0.73                             |
| 98-95-3                 | Nitrobenzene                                  | nc                               | 0.018                            |

TABLE C. GROUNDWATER CLEANUP LEVELS

| CAS Number <sup>1</sup> | Hazardous Substance                                    | Carcinogenic (c/nc) <sup>2</sup> | Groundwater cleanup level (mg/L) |
|-------------------------|--|----------------------------------|----------------------------------|
| 55-63-0                 | Nitroglycerin  | c                                | 0.050                            |
| 556-88-7                | Nitroguanidine   | nc                               | 3.7                              |
| 62-75-9                 | n-Nitrosodimethylamine                                 | c                                | 0.000017                         |
| 86-30-6                 | n-Nitrosodiphenylamine                                 | c                                | 0.17                             |
| 621-64-7                | n-Nitroso-di-n-propylamine                             | c                                | 0.00012                          |
| 88-72-2                 | 2-Nitrotoluene   | c                                | 0.0037                           |
| 99-08-1                 | 3-Nitrotoluene   | c                                | 0.73                             |
| 99-99-0                 | 4-Nitrotoluene   | c                                | 0.050                            |
| 103-65-1                | n-Propylbenzene  | nc                               | 0.37                             |
| 2691-41-0               | Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX) | nc                               | 1.8                              |
| 87-86-5                 | Pentachlorophenol                                      | c                                | 0.001                            |
| 85-01-8                 | Phenanthrene   | nc                               | 11                               |
| 108-95-2                | Phenol   | nc                               | 11                               |
| 133-63-63               | Polychlorinated biphenyls (PCBs)                       | c                                | 0.0005                           |
| 129-00-0                | Pyrene   | nc                               | 1.1                              |
| 100-42-5                | Styrene  | nc                               | 0.1                              |
| 79-34-5                 | 1,1,2,2-Tetrachloroethane                              | c                                | 0.0043                           |
| 127-18-4                | Tetrachloroethylene (PCE)                              | c                                | 0.005                            |
| 108-88-3                | Toluene  | nc                               | 1.0                              |
| 8001-35-2               | Toxaphene  | c                                | 0.003                            |
| 688-73-3                | Tributyltin  | nc                               | 0.011                            |
| 120-82-1                | 1,2,4-Trichlorobenzene                                 | nc                               | 0.07                             |
| 71-55-6                 | 1,1,1-Trichloroethane                                  | nc                               | 0.2                              |
| 79-00-5                 | 1,1,2-Trichloroethane                                  | c                                | 0.005                            |
| 79-01-6                 | Trichloroethylene (TCE)                                | c                                | 0.005                            |
| 95-95-4                 | 2,4,5-Trichlorophenol                                  | nc                               | 3.7                              |
| 88-06-2                 | 2,4,6-Trichlorophenol                                  | c                                | 0.077                            |
| 93-72-1                 | 2-(2,4,5-Trichlorophenoxy) Propionic Acid (2,4,5-TP)   | nc                               | 0.05                             |
| 96-18-4                 | 1,2,3-Trichloropropane                                 | c                                | 0.00012                          |
| 76-13-1                 | 1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)      | nc                               | 1100                             |
| 75-69-4                 | Trichlorofluoromethane (Freon-11)                      | nc                               | 11                               |
| 95-63-6                 | 1,2,4-Trimethylbenzene                                 | nc                               | 1.8                              |
| 108-67-8                | 1,3,5-Trimethylbenzene                                 | nc                               | 1.8                              |
| 99-35-4                 | 1,3,5-Trinitrobenzene                                  | nc                               | 1.1                              |
| 479-45-8                | 2,4,6-Trinitrophenylmethylnitramine (Tetryl)           | nc                               | 0.15                             |
| 118-96-7                | 2,4,6-Trinitrotoluene (TNT)                            | c                                | 0.018                            |

| <b>TABLE C. GROUNDWATER CLEANUP LEVELS</b> |                                      |  |   |
|--|--------------------------------------|--|---|
| <b>CAS Number<sup>1</sup></b>              | <b>Hazardous Substance</b>           | <b>Carcinogenic (c/nc)<sup>2</sup></b> | <b>Groundwater cleanup level (mg/L)</b> |
| 108-05-4                                   | Vinyl acetate                        | nc                                     | 37                                      |
| 75-01-4                                    | Vinyl chloride (Chloroethene)        | c                                      | 0.002                                   |
| 1330-20-7                                  | Xylenes (total)                      | nc                                     | 10                                      |
| <b>INORGANICS</b>                          |                                      |  |   |
| 7440-36-0                                  | Antimony                             | nc                                     | 0.006                                   |
| 7440-38-2                                  | Arsenic                              | c                                      | 0.010                                   |
| 7440-39-3                                  | Barium                               | nc                                     | 2.0                                     |
| 7440-41-7                                  | Beryllium                            | c                                      | 0.004                                   |
| 7440-43-9                                  | Cadmium                              | c                                      | 0.005                                   |
| 7440-47-3                                  | Chromium (Total)                     | nc                                     | 0.10                                    |
| 16065-83-1                                 | Chromium +3                          | nc                                     | 55                                      |
| 18540-29-9                                 | Chromium +6                          | nc                                     | 0.10                                    |
| 7440-50-8                                  | Copper                               | nc                                     | 1.0                                     |
| 57-12-5                                    | Cyanide                              | nc                                     | 0.20                                    |
| 7439-92-1                                  | Lead                                 | c                                      | 0.015                                   |
| 7439-97-6                                  | Mercury                              | nc                                     | 0.002                                   |
| 7440-02-0                                  | Nickel                               | nc                                     | 0.10                                    |
| 7790-98-9                                  | Perchlorate                          | nc                                     | 0.026                                   |
| 7782-49-2                                  | Selenium                             | nc                                     | 0.05                                    |
| 7440-22-4                                  | Silver                               | nc                                     | 0.10                                    |
| 7440-28-0                                  | Thallium                             | nc                                     | 0.002                                   |
| 7440-62-2                                  | Vanadium                             | nc                                     | 0.26                                    |
| 7723-14-0                                  | White phosphorus                     | nc                                     | 0.00073                                 |
| 7440-66-6                                  | Zinc                                 | nc                                     | 5.0                                     |
| <b>PETROLEUM HYDROCARBONS</b>              |                                      |  |   |
|  | C <sub>6</sub> -C <sub>10</sub> GRO  | nc                                     | 2.2                                     |
|  | C <sub>10</sub> -C <sub>25</sub> DRO | nc                                     | 1.5                                     |
|  | C <sub>25</sub> -C <sub>36</sub> RRO | nc                                     | 1.1                                     |

**Notes to Table C:**

1. "CAS Number" means the Chemical Abstract Service (CAS) registry number uniquely assigned to chemicals by the American Chemical Society and recorded in the CAS Registry System.

2. "c" means carcinogenic, and "nc" means noncarcinogenic.

(2) an approved cleanup level based on an approved site-specific risk assessment

conducted under the *Risk Assessment Procedures Manual* adopted by reference in 18 AAC 75.340.

(c) The department will require a more stringent cleanup level than the applicable level under (b) of this section, if the department determines that a more stringent cleanup level is necessary to ensure protection of human health, safety, or welfare, or of the environment, and based on actual onsite and actual or likely offsite uses of the groundwater that are likely to be affected by the hazardous substance, and

(1) the groundwater use classifications other than for drinking water, as set out under 18 AAC 70.020(a)(1)(A) and 18 AAC 70.050(a)(2);

(2) groundwater hazardous substance concentrations complying with the secondary maximum contaminant levels in 18 AAC 80.300 for actual or likely drinking water supplies; and

(3) the cleanup levels in this section for groundwater contaminated with petroleum, the contamination may not exceed, for each petroleum hydrocarbon range applicable, including the gasoline range, the diesel range, and the residual range,

(A) a threshold odor number (TON) of 1 for odor, as measured by Method 2150B, *Standard Methods for the Examination of Water and Wastewater*, 21<sup>st</sup> edition, American Public Health Association (2005), adopted by reference; or

(B) a flavor threshold number (FTN) of 1 for flavor, as measured by Method 2160B, *Standard Methods for the Examination of Water and Wastewater*, adopted by reference in (A) of this paragraph.

(d) Toxic substances in sediment may not cause, and may not be reasonably be expected to cause, a toxic or other deleterious effect on aquatic life, except as authorized under 18 AAC 70. For purposes of this subsection, "toxic substances" has the meaning given in 18 AAC 70.990.

(e) The point of compliance where groundwater cleanup levels must be attained is throughout the site from each point extending vertically from the uppermost level of the saturated zone to the lowest possible depth that could potentially be affected by the discharge or release of a hazardous substance, unless the department approves an alternative point of compliance as part of the cleanup action under 18 AAC 75.360. For the department to approve an alternative point of compliance under this subsection, the

(1) alternative point of compliance must be within the existing groundwater contamination plume; and

(2) the cleanup levels in Table C at (b)(1) of this section must be met at the property boundary in an area where the current use or reasonably expected potential future use of groundwater in the neighboring property is determined to be a source of drinking water, unless a responsible person

(A) demonstrates that attainment of the applicable groundwater cleanup levels is not practicable; and

(B) provides an alternative source of water for affected persons.

(f) Groundwater that is closely connected hydrologically to nearby surface water may not cause a violation of the water quality standards in 18 AAC 70 for surface water or sediment. The department will, in consultation with local, state, and federal officials and the public, establish points of compliance with this subsection, taking into account the following factors:

(1) groundwater travel time and distance from sources of hazardous substances to surface water;

(2) the contribution of the groundwater to the chemical and physical quantity and quality of the surface water;

(3) organisms living in or dependent upon the groundwater to surface water ecosystems;

(4) climatic, tidal, or seasonal variations;

(5) feasibility of attaining applicable water quality standards to support the designated uses of the surface water;

(6) presence of sediment contamination;

(7) if conducted for the site, the conclusions of a site-specific risk assessment conducted under the *Risk Assessment Procedures Manual*, adopted by reference in 18 AAC 75.340.

(g) If the groundwater point of compliance is established at or near a property boundary or if groundwater is closely connected hydrologically to a surface waterbody, the department will, if the department determines that sentinel monitoring is necessary to ensure protection of human health, safety, or welfare, or the environment, require a responsible person to develop sentinel monitoring wells that monitor for any hazardous substances likely to migrate to the applicable point of compliance at concentrations that exceed the cleanup levels.

(h) The department will require long-term monitoring if the department determines that monitoring is necessary to ensure protection of human health, safety, or welfare, or of the environment and if groundwater, surface water, soil, or sediment contains residual concentrations of a hazardous substance that exceed the applicable cleanup levels. If long-term monitoring is required under this subsection, a responsible person shall submit a plan and schedule for monitoring as part of the requirements for cleanup operations under 18 AAC 75.360. Unless otherwise approved by the department, a responsible person shall conduct monitoring quarterly for at least one year to establish the concentration trend. The department will evaluate the monitoring program yearly. If the monitoring indicates that the concentration trend

(1) is increasing, the department will require additional followup monitoring and assess the need for additional cleanup; or

(2) is stable or decreasing, and that hazardous substance migration is not occurring, the department will decrease or discontinue the monitoring frequency and locations, if the responsible person demonstrates that continued monitoring is not necessary to ensure protection of human health, safety, and welfare, and of the environment.

(i) The department will require groundwater, surface water, soil, or sediment monitoring to estimate contaminant flux rates and to address potential bioaccumulation of each hazardous substance at the site, if the department determines that monitoring is necessary to ensure protection of human health, safety, or welfare, or of the environment. If monitoring is required under this subsection, a responsible person shall submit a plan and schedule for monitoring as part of the cleanup operation requirements under 18 AAC 75.360.

(j) Groundwater monitoring wells must be installed, developed, and decommissioned in accordance with the department's *Recommended Practices for Monitoring Well Design, Installation, and Decommissioning*, April 1992, adopted by reference, or another approved method that is protective of human health, safety, and welfare, and of the environment.

(k) For a cleanup conducted under (b)(1) of this section, a chemical that is detected at one-tenth or more of the Table C value must be included when calculating cumulative risk under 18 AAC 75.325(g). (Eff. 1/22/99, Register 149; am 8/27/2000, Register 155; am 1/30/2003, Register 165; am 10/9/2008, Register 188)

|                   |              |              |              |
|-------------------|--------------|--------------|--------------|
| <b>Authority:</b> | AS 46.03.020 | AS 46.03.745 | AS 46.04.070 |
|                   | AS 46.03.050 | AS 46.03.755 | AS 46.09.010 |
|                   | AS 46.03.710 | AS 46.04.020 | AS 46.09.020 |
|                   | AS 46.03.740 |              |              |

**Editor's note:** *Standard Methods for the Examination of Water and Wastewater*, adopted by reference in this section, may be purchased from the American Water Works Association Bookstore, 6666 West Quincy Avenue, Denver, Colorado 80235, or may be viewed at the department's Anchorage, Fairbanks, Juneau, and Soldotna offices. *Recommended Practices for Monitoring Well Design, Installation, and Decommissioning*, adopted by reference in this section, may be viewed at, or requested from, the department's Anchorage, Fairbanks, Juneau, and Soldotna offices.

**18 AAC 75.350. Groundwater use.** Subject to 18 AAC 75.345(c), groundwater at the site is considered to be a drinking water source unless a responsible person demonstrates or the department determines that

(1) the groundwater is not

(A) used for a private or public drinking water system;

(B) within the zone of contribution of an active private or public drinking water system; or

(C) within a recharge area for a private or public drinking water well, a wellhead protection area, or a sole source aquifer;

(2) the groundwater is not a reasonably expected potential future source of drinking water, based on an evaluation of

(A) the availability of the groundwater as a drinking water source, including depth to groundwater, the storativity and transmissivity of the aquifer, the presence of permafrost, and other relevant information;

(B) actual or potential quality of the groundwater, including organic and inorganic substances, and as affected by background, saltwater intrusion, and known or existing areawide contamination;

(C) the existence and enforceability of institutional controls described in 18 AAC 75.375 or municipal ordinances or comprehensive plans that prohibit or limit access to the groundwater for use as drinking water;

(D) land use of the site and neighboring property, using the factors in EPA's *Land Use in the CERCLA Remedy Selection Process*, adopted by reference in 18 AAC 75.340;

(E) the need for a drinking water source and the availability of an alternative source; and

(F) whether the groundwater is exempt under 40 C.F.R. 146.4, revised as of July 1, 1997, and adopted by reference; and

(3) the groundwater affected by the hazardous substance will not be transported to groundwater that is a source of drinking water, or that is a reasonably expected potential future source of drinking water, in concentrations in the receiving groundwater that exceed the groundwater cleanup levels; in reviewing the demonstration required under this paragraph, the department will consider

(A) the areal extent of the affected groundwater;

(B) the distance to any existing or reasonably anticipated future water supply well;

(C) the likelihood of an aquifer connection due to well construction practices in the area where the site is located;

(D) the physical and chemical characteristics of the hazardous substance;

(E) the hydrogeological characteristics of the site;

(F) the presence of discontinuities in the affected geologic stratum at the site;

(G) the local climate;

(H) the degree of confidence in any predictive modeling performed; and

(I) other relevant information; the department will request additional information if the department determines that the information is necessary to protect human health, safety, or welfare, or the environment. (Eff. 1/22/99, Register 149; am 8/27/2000, Register 155)

|                   |              |              |              |
|-------------------|--------------|--------------|--------------|
| <b>Authority:</b> | AS 46.03.020 | AS 46.03.740 | AS 46.04.070 |
|                   | AS 46.03.050 | AS 46.03.745 | AS 46.09.020 |
|                   | AS 46.03.710 | AS 46.04.020 |              |

**18 AAC 75.355. Sampling and analysis.** (a) Unless the department determines that final confirmation sampling is not needed to meet the requirements of the site cleanup rules, a responsible person shall submit a sampling and analysis plan for approval under 18 AAC 75.360, and after implementing the plan, shall submit the analytical sampling results collected to the department. Based on the results of the analyses, a responsible person shall demonstrate compliance with the site cleanup rules.

(b) A responsible person and the owner or operator of an offsite or portable treatment facility under 18 AAC 75.365 shall ensure that the collection, interpretation, and reporting of data, and the required sampling and analysis is conducted or supervised by a qualified, impartial third party. The department will waive the requirement for use of an impartial third party if a responsible person demonstrates that work performed will be conducted or supervised by a qualified and objective person, and if the department determines that a waiver is protective of human health, safety, and welfare, and of the environment, and that strict compliance with the impartial third party requirement is not practicable. To request a waiver under this subsection, in addition to meeting the requirements of 18 AAC 75.390, a responsible person shall submit

(1) a written request for a waiver;

(2) the resume of the person qualified to conduct or supervise the work to be performed, showing relevant education, vocational training, related work experience, and any special training, license, certificate, or registration held by that person; and

(3) a description of the supervisory and organizational structure related to the person identified in (2) of this subsection.

(c) If a hazardous substance is suspected at the site because of empirical evidence or prior analysis, but is not detected or is detected at a concentration below the practical quantitation limit, and the practical quantitation limit is higher than the cleanup level for that substance,

(1) the department will determine the responsible person to have attained the cleanup level, if additionally the more stringent of the following conditions is met:

(A) the practical quantitation limit is no greater than 10 times the method detection limit for all hazardous substances other than polychlorinated biphenyls where the practical quantitation limit is no greater than five times the method detection limit; or

(B) the practical quantitation limit is no greater than the practical quantitation limit established in EPA's *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (SW-846), Third Edition, including Final Update III (1997), adopted by reference;

(2) and if the department determines that additional action is necessary to ensure protection of human health, safety, or welfare, or of the environment, the department will require one or more of the following:

(A) use of a surrogate measure to estimate the concentration of the hazardous substance;

(B) use of a specialized sample collection or analytical method to improve the accuracy, precision, method detection limit, or practical quantitation limit for the hazardous substances at the site; or

(C) monitoring to ensure that the concentration of the hazardous substance does not exceed quantifiable levels; and

(3) and if the department determines that an improved analytical method or other responsive action is necessary to ensure protection of human health, safety, or welfare, or of the environment, the department will, before site closure and if the site is in a monitoring stage, periodically consider whether improved analytical methods should be used at the site and will require the use of an improved analytical method or other responsive action.

(d) Among the analytical methods set out in EPA's *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (SW-846), as adopted by reference in (c) of this section, if there is more than one analytical method for a hazardous substance, a responsible person may select any of those methods with a practical quantitation limit less than the applicable cleanup level. If only one analytical method has a practical quantitation limit less than the applicable cleanup level, that method must be used. Analysis for petroleum contamination must follow the applicable Alaska methods for petroleum hydrocarbons referred to in Table 1 of Chapter 2 of the *Underground Storage Tanks Procedures Manual*, dated November 7, 2002. Table 1 of Chapter 2 and Appendices D and E of the *Underground Storage Tanks Procedures Manual*, dated November 7, 2002 are adopted by reference.

(e) Laboratory analysis under the site cleanup rules must be performed by a laboratory approved by the department under 18 AAC 78.800 - 18 AAC 78.815. (Eff. 1/22/99, Register 149; am 8/27/2000, Register 155; am 1/30/2003, Register 165)

**Authority:** AS 44.46.025 AS 46.03.710 AS 46.04.020  
AS 46.03.020 AS 46.03.740 AS 46.04.070  
AS 46.03.050 AS 46.03.745 AS 46.09.020

**Editor's note.** EPA's *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (SW-846), adopted by reference in this section, may be purchased from the U.S. Department of Commerce, National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161, (800) 553-6847, Fax: (703) 321-8547. The Underground Storage Tank Procedures Manual, adopted by reference in 18 AAC 75.355, may be requested from the department at any of the offices listed below. Both documents may be viewed at the department's Anchorage, Fairbanks, Juneau, or Soldotna office.

**18 AAC 75.360. Cleanup operation requirements.** A responsible person shall ensure that site cleanup is conducted or supervised by a qualified person. Except as provided in 18 AAC 75.355(b), a responsible person shall submit each of the following elements for approval before work on that element begins, and for additional approval if a modification to an element is anticipated:

- (1) a schedule for conducting field work, monitoring, cleanup, and submittal of interim and final cleanup reports;
- (2) a sampling and analysis plan that meets the requirements of 18 AAC 75.355;
- (3) a waste management plan for handling, transporting and disposing of investigation-derived wastes, including
  - (A) purged water from a boring or monitoring well;
  - (B) cuttings, mud, and other wastes from well or boring installation and development; and
  - (C) contaminated equipment and materials;
- (4) a cleanup plan that includes
  - (A) provisions for the cleanup of soil and groundwater contaminated at levels exceeding the applicable cleanup levels determined under the site cleanup rules;
  - (B) detailed specifications for each cleanup technique that the department has approved under 18 AAC 75.335(c) - (d);
  - (C) provisions for minimizing hazardous substance migration to previously unaffected areas;
  - (D) provisions for transporting contaminated soil as a covered load in compliance with 18 AAC 60.015; and

(E) provisions for the disposal of contaminated soil and groundwater, including the location and method of disposal;

(5) a list of chemical additives proposed for use and their potential effects on

(A) the hazardous substances at the site; and

(B) human health, safety, and welfare, and the environment;

(6) a site control plan, if necessary to protect human health, safety, or welfare, or the environment, including engineering measures, such as the installation of caps and liners, and provisions for restricting access, such as the use of fences, signs, or other barriers;

(7) a demonstration that site work and the cleanup action will comply with the air quality standards and requirements of 18 AAC 50;

(8) a plan for ensuring that contaminated soil does not come in contact with uncontaminated soil during the cleanup process, except under an approved cleanup plan under this subsection or an approved operations plan under 18 AAC 75.365;

(9) a nondomestic wastewater system plan under 18 AAC 72.600, if the cleanup operation requires construction, alteration, installation, modification, or operation of a nondomestic wastewater treatment works or disposal system; and

(10) the additional elements required under 18 AAC 75.365, as applicable;

(11) for ex-situ cleanup techniques,

(A) provisions for containment and handling of leachate, if leachate is produced;

(B) provisions for storing contaminated soil in compliance with the requirements of 18 AAC 75.370;

(C) if using a hot asphalt batch plant, written certification by a registered engineer that processes incorporating contaminated soils meet current industry standards for asphalt paving; and

(D) if combining contaminated soil with asphalt for the purpose of cold asphalt recycling;

(i) a pavement structure design study for incorporating the excavated material; the study must be certified by a registered engineer;

(ii) the leaching assessment or model proposed for use in determining hazardous substance migration; and

(iii) results of the approved hazardous substance leaching assessment or model, referenced under (ii) of this subparagraph; those results must demonstrate that hazardous substance concentrations in the soil will not migrate;

(E) if using bioremediation, a detailed description of

(i) cultured microbes, unless using an indigenous microbe population;

(ii) electron acceptor and nutrient source for microbes;

(iii) the expected rate of biodegradation;

(iv) intermediate and final breakdown products;

(v) type and amount of contamination;

(vi) any potential adverse effect on human health, safety, or welfare, or on the environment; and

(vii) other information requested by the department; the department will request additional information if it determines that the information is necessary to ensure protection of human health, safety, or welfare, or of the environment;

(F) if using solidification, a solidification report that includes

(i) a demonstration that hazardous substance concentrations in the solidified material will not migrate;

(ii) results of structural testing on the solidified material to demonstrate that the solidified material has an unconfined compressive strength of 2,000 psi or more after 28 days;

(iii) results of leachability testing of the solidified material; and

(iv) specifications for the ratio of the mass of contaminated soil to the mass of reagent;

(G) if using soil contaminated with petroleum hydrocarbons or metals as a base for a physical barrier,

(i) a demonstration that the contaminated soil that is used for the base will be blended with uncontaminated soil only if necessary to meet design specifications;

(ii) a physical barrier design study, certified by a registered engineer;

(iii) the leaching assessment or model proposed for use in determining hazardous substance migration;

(iv) results of the approved leaching assessment or model referenced under (iii) of this subparagraph; those results must demonstrate that hazardous substance concentrations in the soil will not migrate;

(v) a demonstration that the base for a physical barrier will use no more than 18 vertical inches of material containing contaminated soil;

(vi) a demonstration that the contaminated zone will be compacted to 95 percent or more of the maximum density as specified in American Society for Testing and Materials (ASTM) D 1557-07, *Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort*, updated November 2007 and adopted by reference or ASTM D 4253-00, *Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table*, updated March 2006 and adopted by reference;

(vii) a demonstration that the material containing contaminated soil will be placed in a zone directly beneath the final base course with at least 18 inches of impervious pavement extending beyond the horizontal limit of the material containing contaminated soil;

(viii) a demonstration that at least six feet will separate the seasonal high groundwater point from the lowest point of material containing contaminated soil; and

(ix) as-built drawings, certified by a registered engineer, that show the final location of material containing contaminated soil; and

(12) for in-situ cleanup techniques,

(A) a site monitoring plan showing proposed locations of monitoring wells;

(B) a hydrogeologic description of the site, including

(i) soil and sediments present;

(ii) stratigraphy;

(iii) aquifer characteristics, including groundwater gradient, confining layers, perched water, permeability, and aquifer transmissivity;

(iv) percolation rates from precipitation; and

(v) other relevant factors;

(C) results of hydrogeologic modeling performed to address capture zones, effects of hydraulic loading, and plume migration; and

(D) if using bioremediation, a demonstration of compliance with (11)(E) of this section. (Eff. 1/22/99, Register 149; am 10/9/2008, Register 188)

|                   |              |              |              |
|-------------------|--------------|--------------|--------------|
| <b>Authority:</b> | AS 46.03.020 | AS 46.03.740 | AS 46.04.020 |
|                   | AS 46.03.050 | AS 46.03.745 | AS 46.04.070 |
|                   | AS 46.03.710 | AS 46.03.822 | AS 46.09.020 |

**Editor's note:** The ASTM methods adopted by reference in 18 AAC 75.360 may be reviewed at the department's Anchorage, Fairbanks, Juneau, and Soldotna offices, and may be obtained from the ASTM International, Publications Department, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, Pennsylvania 19428-2959; telephone (610) 832-9585; fax (610) 832-9555.

**18 AAC 75.365. Offsite or portable treatment facilities.** (a) A person who owns or operates an offsite or portable treatment facility shall

(1) obtain approval of an operations plan before that person accepts or treats contaminated soil; the department will approve the plan if the department determines that the operations proposed in the plan are protective of human health, safety, and welfare, and of the environment; a plan submitted under this paragraph must include

(A) a facility diagram that shows the location of

(i) each soil treatment, storage, and transportation area;

(ii) major roads within or bordering the site or facility; and

(iii) monitoring wells, surface water, water supply wells, facility boundaries, and public or private buildings within 500 feet of the facility boundary;

(B) a detailed process description, including a discussion of

(i) air, water, and solid waste process streams;

(ii) startup and shutdown procedures;

(iii) maximum process flow rate;

(iv) air pollution control equipment;

(v) water treatment systems;

(vi) the projected maximum time necessary for the treatment method to achieve soil cleanup levels for contaminated soil; and

(vii) a detailed description of any additive to be used;

(C) a post-treatment sampling and analysis plan prepared by a qualified person in accordance with 18 AAC 75.355(b) to verify that the applicable cleanup levels have been met;

(D) provisions for complete containment of the contaminated soil before, during, and after treatment until the contaminated soil meets the applicable cleanup levels; alternatively, if the treatment process, such as landfarming or landspreading, will not contain the contaminated soil, the person who owns or operates the offsite or portable treatment facility must demonstrate that there will be no uncontrolled leachate from the treatment area;

(E) for an offsite treatment facility classified as a Category C or Category D facility, as described in the department's *Soil Treatment Facility Guidance*, dated November 7, 2002, engineering plans and engineering record drawings for contaminated soil and water containment structures; the *Soil Treatment Facility Guidance*, dated November 7, 2002, is adopted by reference; and

(F) site monitoring procedures that will measure for secondary contamination at the treatment facility;

(2) if the facility is a Category C or Category D facility, as described in the *Soil Treatment Facility Guidance*, submit the following to the department before the owner or operator accepts or treats contaminated soil:

(A) proof of a performance bond or other approved means of fiscal responsibility that will provide the department with a source of funds to clean up contaminated soils that have been received for treatment if the facility operator fails to treat the contaminated soils in accordance with this chapter; a performance bond must be executed by an insurance company licensed in the state and include a bond amount that will cover cleanup of the contaminated soils at the treatment facility; the bond shall be based on

(i) the quantity of contaminated soil allowed at the facility specified in the facility's approved operation plan; and

(ii) the cost per ton for treating contaminated soil at that facility location; and

(B) proof of pollution liability insurance that will provide the department with a source of funds to clean up secondary contamination at the facility property that is caused by the soil treatment facility during soil treatment operations;

(3) perform confirmation sampling of treated soil in accordance with a sampling and analysis plan approved under this subsection to verify that applicable cleanup levels have been met;

(4) submit to the department an assessment of background contamination at the facility before initial startup of the treatment facility; and

(5) submit to the department within 90 days after terminating operation of the treatment facility, a closure assessment demonstrating that secondary contamination did not occur at the facility; if secondary contamination did occur at the facility, the owner or operator of the portable treatment facility shall perform a cleanup of the contamination by in-situ or ex-situ treatment within two years after terminating operation.

(b) If the owner or operator of an offsite or portable treatment facility fails to process soils to the department's satisfaction in accordance with the operations plan approved under (a)(1) of this section, the department will withdraw approval under (a)(1) of this section, and that owner or operator may not process or receive contaminated soil.

(c) For purposes of this section

(1) "engineering plans" means a set of plans approved and sealed by a registered engineer;

(2) "engineering record drawings" means the approved original plans prepared for construction and department approval under (a)(1) of this section, revised to reflect how the containment structure or system was constructed or installed, and sealed by a registered engineer;

(3) "facility" has the meaning given in AS 46.03.900; "facility" includes the land, structures, and equipment associated with treatment of contaminated soil;

(4) "offsite or portable treatment facility" has the meaning given in the *Soil Treatment Facility Guidance*, adopted by reference in (a)(1) of this section;

(5) "owner or operator" has the meaning given to "owner" and "operator" in AS 46.03.826;

(6) "performance bond" means a written agreement between the owner or operator and the department guaranteeing performance of the obligations covered by the agreement;

(7) "registered engineer" means a professional engineer registered to practice in the state under AS 08.48. (Eff. 1/22/99, Register 149; am 8/27/2000, Register 155; am 1/30/2003, Register 165)

**Authority:** AS 46.03.020 AS 46.03.740 AS 46.04.070  
 AS 46.03.050 AS 46.03.745 AS 46.09.020  
 AS 46.03.710 AS 46.04.020

**Editor’s note:** The department’s *Soil Treatment Facility Guidance*, adopted by reference in 18 AAC 75.365(a)(1), may be viewed at or requested from the department’s offices in Anchorage, Fairbanks, Juneau, and Soldotna.

**18 AAC 75.370. Soil storage and disposal.** (a) Unless the department approves the activity in question as protective of human health, safety, and welfare, and of the environment, a responsible person may not blend contaminated soil with uncontaminated soil and shall

(1) segregate contaminated soil based on

(A) the intended cleanup alternatives; and

(B) the specific hazardous substance present;

(2) store contaminated soil

(A) 100 feet or more from surface water, a private water system, a Class C public water system as defined in 18 AAC 80.1990, or a fresh water supply system that uses groundwater for a use designated in 18 AAC 70.020(a)(1)(A) and 18 AAC 70.050(a)(2); and

(B) 200 feet or more from a water source serving a Class A or Class B public water system, as defined in 18 AAC 80.1990;

(3) place contaminated soil on a liner or on or within another impermeable surface that prevents soil and groundwater beneath the liner from becoming contaminated;

(4) place petroleum-contaminated soil on a liner that meets the minimum specifications for the testing methods set out in Table D of this section;

| TABLE D. BOTTOM LINER SPECIFICATIONS  |                |                 |
|---|----------------|-----------------|
| Method  | Coated Fabric  | Extruded Fabric |
| <b>Short-term storage of petroleum-contaminated soil (less than 180 days)</b> |                |                 |
| Cold crack (ASTM D 2136-02, updated July 2007)                                | -60° F         | -60° F          |
| Black carbon content (ASTM D 1603-06, updated March 2006)                     | 2% or greater  | 2% or greater   |
| Tensile strength (ASTM D 751-06, updated May 2006)                            | 125 lbs (warp) | N/A             |
| Mullen burst (ASTM D 751-06, updated May                                      | 250 psi        | N/A             |

|   |  |  |
|---|--|--|
| 2006)   |  |  |
| One inch tensile strength (ASTM D 882-02, updated June 2002)  | N/A  | 25 lbs (warp)  |
| One inch elongation MD (machine direction)  | N/A  | 550%   |
| Nominal thickness   | 10 mil   | 10 mil   |
| Oil resistance (ASTM D 471-06, updated November 2006)   | No signs of deterioration and more than 80% retention of tensile and seam strength after immersion for 30 days at 73° F. | No signs of deterioration and more than 80% retention of tensile and seam strength after immersion for 30 days at 73° F. |
| <b>Long-term storage of petroleum-contaminated soil (180 days to two years)</b>   |  |  |
| Cold crack (ASTM D 2136-02, updated July 2007)  | -60° F   | -60° F   |
| Black carbon content (ASTM D 1603-06, updated March 2006)   | 2% or greater  | 2% or greater  |
| Tensile strength (ASTM D 751-06, updated May 2006)  | 300 lbs (warp)   | N/A  |
| Mullen burst (ASTM D 751-06, updated May 2006)  | 500 psi  | N/A  |
| One inch tensile strength (ASTM D 882-02, updated June 2002)  | N/A  | 45 lbs (warp)  |
| One inch elongation MD (machine direction)  | N/A  | 625%   |
| Nominal thickness   | 20 mil   | 20 mil   |
| Oil resistance (ASTM D 471-06, updated November 2006)   | No signs of deterioration and more than 80% retention of tensile and seam strength after immersion for 30 days at 73° F. | No signs of deterioration and more than 80% retention of tensile and seam strength after immersion for 30 days at 73° F. |
| The American Society for Testing and Materials (ASTM) methods referred to in this table are adopted by reference. "N/A" means not applicable. |  |  |

(5) place nonpetroleum contaminated soil on a liner compatible with the type of hazardous substance, and meet the general strength and thickness requirements of Table D;

(6) cover and protect the contaminated soil stockpile from weather with no less than a six-mil, reinforced polyethylene liner or its equivalent, with the edge of the cover lapped over the bottom liner to prevent water running through the soil; and

(7) inspect and maintain the contaminated soil stockpile regularly to ensure that the cover remains intact and that the soil and any liquid leachate derived from the soil is contained.

(b) A responsible person shall obtain approval before moving or disposing of soil subject to the site cleanup rules. (Eff. 1/22/99, Register 149; am 8/27/2000, Register 155; am 10/9/2008, Register 188)

**Authority:** AS 46.03.020                      AS 46.03.740                      AS 46.04.070  
AS 46.03.050                      AS 46.03.745                      AS 46.09.020  
AS 46.03.710                      AS 46.04.020

**Editor’s note:** The ASTM methods adopted by reference in Table D of 18 AAC 75.370

may be reviewed at the department's Anchorage, Fairbanks, Juneau, and Soldotna offices, or may be obtained from the ASTM International, Publications Department, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, Pennsylvania 19428-2959; telephone (610) 832-9585; fax (610) 832-9555.

**18 AAC 75.375. Institutional controls.** (a) The department will, after consultation with each landowner of the site, determine that the use of an institutional control is necessary, on a site-specific basis, if the department determines that controls are required to ensure

- (1) compliance with an applicable cleanup level;
- (2) protection of human health, safety, or welfare, or the environment; or
- (3) the integrity of site cleanup activities or improvements.

(b) Institutional controls include

(1) the requirement for and maintenance of physical measures, such as fences and signs, to limit an activity that might interfere with cleanup or result in exposure to a hazardous substance at the site;

(2) the requirement for and maintenance of engineering measures, such as liners and caps, to limit exposure to a hazardous substance;

(3) restrictive covenants, easements, deed restrictions, or other measures that would be examined during a routine title search, and that limit site use or site conditions over time or provide notice of any residual contamination; and

(4) a zoning restriction or land use plan by a local government with land use authority.

(c) The use of institutional controls must, to the maximum extent practicable, be

(1) appurtenant to and run with the land so that the control is binding on each future owner of the site; and

(2) maintained by each responsible person or owner of the site.

(d) If the department determines any of the following are necessary to protect human health, safety, or welfare, or the environment, the department will require that institutional controls be designed to accomplish one or more of the following:

(1) prohibit activities on the site that might interfere with the site cleanup, operation and maintenance, monitoring, or other response actions;

(2) prohibit activities that might result in the release of a hazardous substance that

was contained as a part of the site cleanup activities;

(3) require written notice to the department of any proposal to use the site in a manner that is inconsistent with a restrictive covenant or other measure described in (b)(3) of this section; and

(4) grant the department and its designated representatives the right to enter the property at reasonable times to evaluate compliance with the institutional control, including the right to take samples, inspect any cleanup actions taken at the site, and inspect records relating to the operation and maintenance of the institutional control.

(e) If the department determines that financial assurance is necessary to ensure protection of human health, safety, or welfare, or of the environment, the department will require a responsible person to provide financial assurance sufficient to cover costs of operation and maintenance, including compliance monitoring and corrective measures, for any institutional control.

(f) If the concentrations of all residual hazardous substances remaining at the site are subsequently determined to be below the levels that allow for unrestricted use, the department will approve elimination of the institutional control. (Eff. 1/22/99, Register 149; am 10/9/2008, Register 188)

|                   |              |              |              |
|-------------------|--------------|--------------|--------------|
| <b>Authority:</b> | AS 46.03.020 | AS 46.03.745 | AS 46.04.110 |
|                   | AS 46.03.050 | AS 46.04.020 | AS 46.09.060 |
|                   | AS 46.03.710 | AS 46.04.070 | AS 46.09.070 |
|                   | AS 46.03.740 |              |              |

**18 AAC 75.380. Final reporting requirements and site closure.** (a) A responsible person shall submit a written final cleanup report to the department for each site undergoing cleanup under the site cleanup rules. The report must be prepared by a qualified person.

(b) The written report required by (a) of this section must contain, as applicable,

- (1) the date and time of the discharge or release;
- (2) the location of the discharge or release, including latitude and longitude coordinates;
- (3) the name and physical address of the site, facility, or operation;
- (4) the name, mailing address, and telephone number of the owner and of the operator of the site, facility, or operation;
- (5) the type and amount of each hazardous substance discharged or released;
- (6) a description of environmental damage caused by the discharge, release, or containment, to the extent the damage can be identified;

(7) a demonstration that the free product was recovered in compliance with 18 AAC 75.325(f)(1)(B) and that provides, at a minimum, the following information:

(A) the estimated amount, type, and thickness of free product observed or measured in wells, boreholes, and excavations;

(B) the type of free product recovery system used;

(C) whether a discharge or release has occurred or will occur at the site or offsite during the recovery operation and where the discharge or release occurred or will occur;

(D) the type of treatment applied to, and the effluent quality resulting or expected from, any substance that has been discharged or released or will be discharged or released;

(E) whether a discharge or other permit was required under local, state, or federal law and if each required permit was obtained;

(F) the date, location, and method of disposal of the recovered free product, dissolved phase product, or contaminated soil; and

(G) whether free product remains at the site, and, if so, the estimated quantity;

(8) a summary of each applicable soil and groundwater cleanup level approved under the site cleanup rules and a description of the factors used in determining each applicable cleanup level;

(9) a description of cleanup actions taken, including

(A) a demonstration that cleanup was conducted in accordance with the elements, including modifications to the elements, approved under 18 AAC 75.360;

(B) sampling reports and a description of the soil and groundwater sampling protocol and sampling locations;

(C) a summary of the laboratory reports for the final verification samples collected at the site; the laboratory or a responsible person shall keep those reports and make them available to the department upon request for at least 10 years after submission of the summary to the department;

(D) a detailed explanation of what was done if a sample exceeded the applicable required cleanup level;

(E) a demonstration that contaminated soil and groundwater were stored, treated, and disposed of in an approved manner;

(F) an estimate of the extent of any remaining residual contamination,

above and below the applicable cleanup levels;

(G) a demonstration that surface soil staining was evaluated and that a cleanup of that staining was performed;

(H) whether permits were required under local, state, or federal law and if each required permit was obtained;

(I) confirmation that any hazardous waste generated was stored, treated, or disposed of in compliance with 42 U.S.C. 6901 - 6992k (Solid Waste Disposal Act, as amended by Resource Conservation Recovery Act), as amended through January 6, 2003 and adopted by reference; and

(J) other information requested by the department, as the department determines necessary to ensure protection of human health, safety, or welfare, or of the environment;

(10) a demonstration of compliance with applicable institutional control requirements under 18 AAC 75.375.

(11) cumulative risk calculations.

(c) The department will determine final compliance with the

(1) applicable soil cleanup levels, based on sampling results from onsite contaminated soil and from contaminated soil moved offsite for treatment or disposal, and based on the maximum concentrations detected, unless the department approves an appropriate statistical method, in which case compliance will be based on the mean soil concentration at the 95th percent upper confidence limit; approval of a statistical method will be based on

(A) the number and location of samples taken;

(B) whether large variations in hazardous substance concentrations relative to the mean concentration exist; and

(C) whether a large percentage of concentrations are below the method detection limit; and

(2) groundwater cleanup levels, based on an analysis of unfiltered groundwater samples unless a responsible person demonstrates that a filtered sample provides a more representative measure of groundwater quality; the department will determine compliance based on the maximum concentrations of a hazardous substance detected in the final confirmation samples; before closure, the size of the dissolved plume must be steady state or shrinking and concentrations of the hazardous substance must be decreasing.

(d) After reviewing the final cleanup report submitted under this section, if the department determines that

(1) a site has been adequately characterized under 18 AAC 75.335 and has achieved the applicable requirements under the site cleanup rules, the department will issue a written determination that the cleanup is complete, subject to a future department determination that the cleanup is not protective of human health, safety, or welfare, or of the environment; or

(2) the cleanup and applicable institutional controls are not protective of human health, safety, or welfare, or of the environment, the department will, as necessary to ensure protection of human health, safety, or welfare, or of the environment, require a responsible person to conduct additional actions that meet the requirements of the site cleanup rules. (Eff. 1/22/99, Register 149; am 10/9/2008, Register 188)

**Authority:** AS 46.03.020 AS 46.03.745 AS 46.04.070  
 AS 46.03.050 AS 46.03.755 AS 46.09.010  
 AS 46.03.710 AS 46.04.020 AS 46.09.020  
 AS 46.03.740

**18 AAC 75.385. Appeals.** A person aggrieved by a final department decision under the site cleanup rules may request an adjudicatory hearing under 18 AAC 15.195 - 18 AAC 15.340. A request for an adjudicatory hearing must be made within 30 days after the date of the decision being appealed. (Eff. 1/22/99, Register 149; am 7/11/2002, Register 163; am 1/30/2003, Register 165)

**Authority:** AS 46.03.020 AS 46.35.090

**18 AAC 75.390. Waiver or modification.** If the department determines that a waiver of modification will be protective of human health, safety, and welfare, and of the environment, the department will waive or modify the site cleanup rules based on a review of the quantity or concentration of the discharge or release, soil and groundwater conditions, surface water and topography, geology, water and land use, construction methods and materials, and any other human health or environmental factor important to the evaluation. A responsible person seeking a waiver or modification of a provision of the site cleanup rules under this section shall submit a written report to justify the request and to demonstrate that the waiver or modification is protective of human health, safety, and welfare, and of the environment. A qualified person shall prepare and sign the report submitted under this section. (Eff. 1/22/99, Register 149)

**Authority:** AS 46.03.020 AS 46.03.745 AS 46.09.010  
 AS 46.03.050 AS 46.03.755 AS 46.09.020  
 AS 46.03.710 AS 46.04.070

**18 AAC 75.395. Interference with cleanup prohibited.** A person may not interfere with, hinder, or obstruct the containment or cleanup of a hazardous substance conducted under this chapter. This prohibition does not apply to the United States Coast Guard or EPA. (Eff. 1/22/99, Register 149)

**Authority:** AS 46.03.020 AS 46.04.070 AS 46.09.020  
 AS 46.04.020

**18 AAC 75.396. Local control.** Subject to AS 29.35.020, AS 46.04.110, and AS 46.09.060, the requirements of 18 AAC 75.300 - 18 AAC 75.390 do not preempt local control that is as stringent as, or more stringent than, those requirements, and that is consistent with a regional master plan prepared under AS 46.04.210. (Eff. 1/22/99, Register 149)

**Authority:** AS 46.03.020 AS 46.04.210 AS 46.09.060  
AS 46.04.110