Interim Remediation Waste Management Policy for Petroleum Contaminated Soils #WSC-94-400

Attached is a copy of the Department of Environmental Protection's Interim Remediation Waste Management Policy for Petroleum Contaminated Soils (#WSC-94-400). Please note that this interim policy supersedes policy #WSC-400-89 titled "Management Procedures for Excavated Soils Contaminated with Virgin Petroleum Oils". This new policy outlines changes in the management practices for reuse, recycling, disposal, storage, and transport of petroleum contaminated soils, and presents related guidance. These changes are the result of new regulations for remediation waste management in the Massachusetts Contingency Plan (310 CMR 40.0030), changes in the Massachusetts Hazardous Waste Regulations (310 CMR 30.252(2)), and several other related Departmental initiatives.

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Thomas B. Powers
Acting Commissioner

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1.0 Introduction

On October 1, 1993 amendments to the "Massachusetts Contingency Plan" (MCP, cited collectively as 310 CMR 40.0000) became effective. These regulations govern the reporting, assessment, and cleanup of releases of oil and/or hazardous materials to the environment. The new MCP contains provisions for the management of contaminated soils generated as a result of performing response actions at disposal sites under M.G.L. c. 21E (310 CMR 40.0030). This policy provides guidance on how to implement the management requirements for petroleum contaminated soil. This policy will remain in effect until a more comprehensive policy, which is currently being developed, is issued by the Department.

For the purposes of this policy unless noted otherwise, the term **"petroleum contaminated soils"** means both used and unused waste oil contaminated soils, including petroleum distillates such as gasoline, diesel, kerosene, jet fuel, lubricating oils, and No. 2, 4, 5, 6 heating oils.

The information contained in this document is intended solely for guidance. This document does not create any substantive or procedural rights, and is not enforceable by any party in any administrative proceeding with the Commonwealth. The regulations related to the management of petroleum contaminated soils contain both specific and general requirements. In addition to summarizing specific requirements, this document also provides guidance on what measures the Department considers acceptable for meeting the general requirements set forth in the regulations. Parties using this guidance should be aware that there may be other acceptable alternatives to this guidance for achieving compliance with such general regulatory requirements.

The regulatory citations provided throughout this document are not meant to be, and should not be relied upon, to be a complete list of all the regulatory requirements for managing petroleum contaminated soils. Parties undertaking response actions which involve the management of contaminated soils should consult 310 CMR 40.0000 (MCP), and 310 CMR 30.000 (the Massachusetts Hazardous Waste regulations), and 310 CMR 19.000 (the Massachusetts Solid Waste Management Regulations) for applicable requirements.

Additional copies of this policy, and other policies and forms referenced throughout this policy may be obtained by calling the DEP InfoLine at (617) 338-2255 or 1-800-462-0444. In addition, the 21E Bill of Lading and Material Shipment Record forms and instructions also may be obtained through the Regional Service Centers located in each DEP regional office.

2.0 Background

This policy represents the Department's interim approach for managing petroleum contaminated soil, and soils from urban and industrialized settings. Several important public policy goals directly influenced the development of this policy, policy #BWP-94-037 titled "Reuse and Disposal of Contaminated Soils at Landfills", and recent permit modifications for each Massachusetts soil recycling facility. Outlined below are the principal policy goals which were considered:

The first goal is to discourage the land disposal of petroleum contaminated soils. The MCP specifies that the landfill disposal of petroleum contaminated soils shall only occur when a demonstration can be made that other alternatives such as asphalt batching, thermal processing or reuse as daily cover at a landfill are not feasible (310 CMR 40.0032(5)).

A second goal is to encourage the use of soil management options which provide for the destruction of volatile organic compounds (VOCs), or minimize the potential for release of VOCs in petroleum contaminated soils to the environment. To that end, specific VOC limits have been established for each Massachusetts soil recycling facility and lined landfill based on each facility's potential to release VOCs to the environment. Therefore, soil recycling facilities and landfills which do not destroy or control VOC emissions are permitted to accept lower levels of VOCs in petroleum contaminated soils than facilities that destroy or control VOC emissions.

A third goal is to facilitate the removal of petroleum contaminated soil and soils from urban and industrialized settings which contain elevated lead concentrations from areas where such soils may pose a health hazard to children. While unrestricted access to lead contaminated soils may pose a serious health hazard to children, cost effective management options for lead contaminated soils have not been widely available. For this reason, DEP seeks to encourage the reuse of lead contaminated soils, which are not a hazardous waste, as daily cover at lined landfills. For more information on the reuse of lead contaminated soils at lined landfills please consult section 8.0 of this policy and policy #BWP-94-037.

A fourth goal is to direct petroleum contaminated soils which are appropriate for recycling at all permitted soil recycling facilities (i.e., soils containing higher levels of TPH, low to moderate levels of VOCs and metals) are directed to these facilities.

A fifth goal is to recognize and affirm that petroleum contaminated soils that exhibit lower levels of TPH and VOCs, with or without elevated metal concentrations, are appropriate and suitable for reuse as daily cover at lined landfills.

3.0 Applicability

The guidance contained in this policy applies to petroleum contaminated soils generated as a result of any response action under 310 CMR 40.0000 (the 1993 MCP). Such response actions include: Limited Removal Actions (LRA), Immediate Response Actions (IRA), Release Abatement Measures (RAM), Utility Related Abatement Measures (URAM), and Comprehensive Response Actions. This policy also applies to petroleum contaminated soils generated by all response actions conducted at disposal sites with approved waivers under 310 CMR 40.000 (the 1988 MCP), and remedial response actions approved by the Department prior to October 1, 1993 pursuant to 310 CMR 40.000.

4.0 The Regulatory Classification of Petroleum Contaminated Soil

Recent amendments to the Massachusetts Hazardous Waste regulations (310 CMR 30.252(2)), now authorize soil contaminated with used or unused waste oil, that is not otherwise a hazardous waste, to be managed in conformance with M.G.L. c. 21E and 310 CMR 40.0000 and the receiving facility's permit issued pursuant to 310 CMR 30.000 or 310 CMR 19.000. This change eliminates the need for PRPs, RPs, or Other Persons to discriminate between "virgin" and "non-virgin" petroleum contamination for determining the regulatory classification and subsequent management procedures for petroleum contaminated soils. However, this distinction should not be lost when identifying the appropriate contaminants of concern and/or making determinations to increase or limit the analytical requirements necessary to characterize petroleum contaminated soil.

Prior to the amendment of 310 CMR 30.252(2), the Department issued a policy on 1/20/93 titled "Interim Policy Regarding the Regulatory Status of Soils Contaminated with Waste Oil of Unknown Origin and/or Hazardous Constituents". The promulgation of the amendment to 310 CMR 30.252(2) supersedes those sections of that policy that concern waste oil contamination of unknown origin. However, section 4 of that policy titled "Soils Contaminated by Hazardous Constituents", is still applicable and should be used as guidance when making decisions concerning the regulatory classification of contaminated media.

Mineral sorbents contaminated with petroleum oils (including used and unused waste oil) generated as part of a response action under M.G.L.c. 21E may be managed in the same way as petroleum contaminated soils. Examples of such material would be sand or mineral sorbents which were applied at the location of a petroleum release. Mixtures of petroleum oils (including used and unused waste oil) and combustible sorptive materials (e.g., absorbent pads, hay, or vegetation) generated as the result of a response action under M.G.L. c. 21E may be transported off-site for combustion at a municipal solid waste incinerator and/or resource recovery facility using the Bill of Lading procedures defined in 310 CMR 40.0030 provided the combustion of such materials is in compliance with the facility permit(s).

Petroleum oil contaminated mineral sorbents or combustible sorbents which are generated not as the result of a M.G.L. c. 21E, but through leakage or releases incidental to the normal operation or maintenance of mechanical equipment such as construction vehicles or pumps should be managed in accordance with Department Policy #HW 92-02 titled "Waste Management Guidance for Industrial Wipers and Sorptive Minerals Contaminated with Waste Oil".

5.0 Authorization

Under the former soils policy (#WSC-400-89), all petroleum contaminated soils transported off-site using a 21E Bill of Lading needed the prior approval of the appropriate DEP regional office. This provision has been changed in the new MCP, to allow the off-site transport of petroleum contaminated soils without prior DEP approval, by using a 21E Bill of Lading with a Licensed Site Professional (LSP) Opinion rendered in accordance with 310 CMR 40.0030. The Licensed Site Professional Opinion must state that all necessary testing and assessment actions have been performed to adequately characterize the soil being transported and, as characterized, the soil can be accepted at the receiving facility or temporary storage location. The MCP allows the Department to impose additional requirements on the management of Remediation Waste under the Bill of Lading process if the Department determines that such materials represent a hazard to health, safety, public welfare or the environment (310 CMR 40.0034(7)).

6.0 Sampling and Analysis

6.1 Release, Source and Site Specific Considerations

Sampling of contaminated soil should be done at sufficient and adequately distributed locations so that the concentrations of the chemical constituents attributable to the petroleum release and any other contaminants of concern which may be present at the disposal site are adequately characterized. The factors listed below should be considered when developing and implementing a soil sampling plan to characterize contaminated soils. Evaluation of these release, source, and site

specific conditions provides the basis for selection of field screening techniques, sampling methodologies, sampling frequencies, and analytical parameters used to adequately characterize contaminated soils:

- o the type(s) and likely constituents of the petroleum oil (i.e., unused waste oil or used waste oil, or mixtures of both);
- o the presence or likelihood of any other oil or hazardous materials which may be present at the disposal site (e.g., chlorinated solvents, metals, Polychlorinated Biphenyls (PCBs), Polycyclic Aromatic Hydrocarbons (PAHs), Halogenated Volatile Organic Compounds (HVOCs));
- o current and former site uses, past incidents involving the release of oil or hazardous materials, and past and present management practices of oil and/or hazardous materials at the disposal site;
- o the presence of listed or characteristic hazardous wastes in the environment at the disposal site and/or in the vicinity of the excavation;
- o visual and olfactory observations, field screening, analytical data, and/or in-situ pre-characterization data;
- o soil matrix type - naturally occurring soils, or fill and soil mixtures (i.e., homogenous or heterogenous soil conditions);
- o soil volume; and
- o facility permit requirements for acceptance of petroleum contaminated soils (including sampling, chemical, physical and structural requirements).

Licensed Site Professionals should exercise professional judgement consistent with the Best Response Action Management Approach Standard (310 CMR 40.0191) and Environmental Sample Collection and Analyses (310 CMR 40.0017) sections of the MCP, and section 8.0 of the Department's Policy #WSC-401-91 titled "Policy for the Investigation, Assessment, and Remediation of Petroleum Releases: Interim Site Investigation Protocol Document" in rendering Opinions concerning the appropriate testing and assessment actions necessary to adequately characterize contaminated soils.

6.2 Making Decisions to Increase or Limit Analytical Requirements

Conceptually, soil characterization programs should be performed in two stages. The first stage of a sampling program should focus on an evaluation of information obtained during a "due diligence review", including any preliminary in-situ pre-characterization data or field screening data which may be available. The focus of this initial evaluation should be to identify those contaminants of concern associated with the petroleum release and to screen for other known releases or sources of oil or hazardous materials which are likely to be present in the soil at the disposal site. Based upon the results of this investigation, the contaminants of concern should be clearly identified. Contaminants which were the subject of screening but which were not detected could be removed

from consideration entirely or in some instances could be further evaluated albeit at a reduced frequency. With the contaminants of concern identified, a characterization program can be established which specifies sampling frequencies, and appropriate use of field screening techniques commensurate with the concentrations and types of contaminants, and volume of soils which will need to be characterized.

Pending the issuance of more detailed guidance as part of a comprehensive soils policy, the following examples should be used in addition to guidance provided in section 6.1, as a guide when selecting contaminants of concern, and establishing sampling frequencies to adequately characterize contaminated soils.

Example #1: Petroleum contamination resulting from a known release of unused waste oil (virgin petroleum) in a naturally occurring soil matrix in a non-urban, residential setting typically would require evaluation only for those constituents necessary to characterize the concentrations of the unused waste oil in the excavated soil.

Example #2: Petroleum contamination from an unknown source discovered in a fill/soil matrix in an urban or industrialized setting would require a more thorough characterization to be performed than that described in example #1. Uncertainty exists concerning what analytical parameters should be evaluated to characterize the petroleum release. This evaluation is further complicated by the likelihood that other contaminants of concern associated with either the fill material or from the urban or industrialized setting may be present at the disposal site. As a result a more thorough screening and analytical program is necessary to obtain confidence that the contaminants of concern have been adequately identified.

It is assumed in both situations described above that no other releases or sources of oil and/or hazardous materials (in addition to the known release) are known or suspected to have impacted the soils at the disposal site.

6.3 Application of Tables 1 and 2

Table 1 (on page 11) of this policy reflects DEP policy #BWP-94-037, and Table 2 (on page 13) of this policy provides a summary of the current permit levels for all Massachusetts soil recycling facilities. Both tables identify levels of contaminants commonly encountered in petroleum contaminated soils, and in soils located in urban or industrialized settings which may be transported to these respective facilities without prior DEP approval. These levels are meant to be applied as maximum concentrations of contaminants which would be acceptable for reuse at Massachusetts lined landfills, and for recycling at Massachusetts soil recycling facilities.

Contaminated soils transported to a Massachusetts lined landfill should not exceed any of the applicable contaminant levels specified in Table 1. Soils shipped to a lined landfill which exceed the levels and criteria reflected in Table 1 and in #BWP-94-037 require prior approval by the DEP's Division of Solid Waste Management. Soils transported and accepted at a soil recycling facility which exceed the Facility's permit levels would constitute a violation of 310 CMR 40.0035(1)(i) and the facility's recycling permit.

If the soil, as characterized, exceeds any of the applicable contaminant levels in the tables, or if the soil contains concentrations of oil or hazardous materials which would significantly alter the

overall "representativeness" of the soil (e.g., "hot-spots") that portion of the soil should be segregated and evaluated separately. If a hot-spot contained in the soil cannot be physically isolated, then all of the soil, as characterized, would be ineligible for that particular soil management option if the applicable Table or permit levels are exceeded. Hot-spots identified in the soil which do not exceed the applicable contaminant criteria and/or the facility's permit specifications should not be precluded from shipment to the facility.

6.4 Use of the Jar Headspace Analytical Screening Procedure

The jar headspace analytical screening procedure concentration for volatile organic compounds (VOCs) referenced in the former "virgin soils" policy #WSC-400-89 was used for determining whether or not virgin petroleum contaminated soils may be approved for landfill application. No distinction was made in the former policy between landfill disposal and landfill reuse of petroleum contaminated soils. However, as part of the Department's effort to develop a coordinated approach to contaminated soil management, generic and facility-specific thresholds for the reuse and recycling of soils contaminated with VOCs and other contaminants have been established for all Massachusetts lined landfills and each permitted soil recycling facility. The new performance standards for these facilities are presented in Tables 1 and 2 of this policy.

The jar headspace screening method may be used for estimating the VOC concentration of petroleum contaminated soils proposed for reuse or recycling at Massachusetts facilities.

The new performance standard for volatile organic compounds (VOCs) in petroleum contaminated soils which are proposed for reuse (not disposal) at lined landfills is 10 mg/kg total VOCs (see Table 1). Soils contaminated with gasoline, No. 2, 4, 5, and 6 fuel oils, diesel, kerosene, lubricating oils, and jet fuel that exhibit jar headspace readings less than 100 ppmv generally indicate compliance with the 10 mg/kg total VOC performance standard. All other applications of petroleum contaminated soils at the landfill which utilize the jar headspace screening procedure as part of characterizing the soil should be correlated with laboratory analytical data or studies to demonstrate compliance with the applicable total VOC performance standard.

Each soil recycling facility has in its permit a specific VOC level based in part on the facility's ability to destroy or control VOCs. Soils contaminated with gasoline and No. 2, 4, 5, and 6 fuel oils, diesel, kerosene, lubricating oils, and jet fuel which exhibit a jar headspace reading less than 150 ppmv generally indicate compliance with a total VOC threshold of 15 mg/kg. Petroleum contaminated soils proposed for recycling at Massachusetts soil recycling facilities which exceed a 150 ppmv jar headspace concentration should be correlated with laboratory analytical data or studies to demonstrate compliance with the facility's VOC permit requirement.

Pending the issuance of a comprehensive soils policy, Licensed Site Professionals should exercise professional judgement consistent with the Best Response Action Management Approach Standard (310 CMR 40.0191) and Environmental Sample Collection and Analyses (310 CMR 40.0017) sections of the MCP in selecting field screening techniques to support Opinions concerning appropriate testing and assessment actions necessary to adequately characterize contaminated soils.

7.0 Storage

The new MCP (310 CMR 40.0034(4)) allows parties undertaking response actions to temporarily store petroleum contaminated soils at another location owned or operated by the same PRP, RP, or Other Person conducting the response action. Excavated petroleum contaminated soils stored at the site of generation or at a temporary storage location must be managed to protect health, safety, public welfare and the environment (310 CMR 40.0031)(1)). The owner/operator of the site of generation and/or temporary storage area is responsible for ensuring that the requirements contained in 310 CMR 40.0030 concerning temporary storage are met for the duration of the storage period. The following storage procedures are recommended to meet these requirements:

- All soil stored at the site of generation or temporary storage location should be on a base lined with 6 mil polyethylene and be completely and securely covered with the same material for the duration of the storage period.

- The selection of any on-site or off-site location to stockpile or temporarily store petroleum contaminated soils near sensitive human health and environmental areas such as private and public water supplies, within 100 feet of wetlands and surface water bodies, or near densely populated residential areas should be avoided.

- Appropriate steps must be taken to minimize public access to the contaminated soils located at the storage area and/or site of generation.

Petroleum contaminated soils must be transported to a licensed and/or permitted treatment, recycling, reuse or disposal facility within 120 days of excavation or recovery from a disposal site (310 CMR 40.0034(3)(c) or 310 CMR 40.0034(4)(c). Transportation and storage of the petroleum contaminated soils must be supervised, managed, or overseen by a Licensed Site Professional 310 CMR 40.0034(4)(a) or 310 CMR 40.0035(1)(i). The Department may require immediate removal of stored petroleum contaminated soils if such soils are not stored properly and in accordance with 310 CMR 40.0030, or if the Department determines that storage represents a hazard to health, safety, public welfare or the environment.

Please consult 310 CMR 40.0034(4) for more detailed information on the requirements for the temporary storage of petroleum contaminated soils.

8.0 Reuse and Disposal of Contaminated Soils at Massachusetts Landfill Facilities

8.1 Approvals for Reuse at Lined Landfills

Concurrent with the issuance of this Policy, the Department has also issued an interim policy #BWP-94-037 titled "Reuse and Disposal of Contaminated Soils at Landfills", which establishes allowable contaminant concentrations and physical requirements for contaminated soil which may be reused at DEP-permitted lined landfills without prior DEP approval. Table 1 presents these allowable contaminant concentrations from policy #BWP-94-037. Contaminated soils that exhibit concentrations equal to or below the chemical levels in Table 1 and which satisfy the physical requirements for landfill reuse may be transported to a lined landfill using the Bill of Lading procedures contained in 310 CMR 40.0030, and do not need specific DEP approval for each shipment.

Soils which exceed the chemical criteria presented in Table 1, or contain concentrations of oil or hazardous materials for which no threshold is specified in Table 1, may be reused at a lined landfill if the DEP Division of Solid Waste Management approves an application for Landfill - Minor Modification (BWP SW 22) or other DSWM approval.

For more detailed information on the requirements and procedures on the reuse and disposal of contaminated soils at Massachusetts landfills please consult 310 CMR 19.000, and policy #BWP-94-037.

TABLE 1

ALLOWABLE CONTAMINANT LEVELS FOR SOIL REUSE AT LINED LANDFILLS[a]

CONTAMINANT[b]	Reuse Levels[c] (mg/kg)
Total Arsenic	40
Total Cadmium	80
Total Chromium	1,000
Total Lead	2,000
Total Mercury	10
Total Petroleum Hydrocarbons	5,000
Total PCBs[d]	< 2
Total PAHs[e]	100
Total VOCs[f]	10
Conductivity[g] (μmhos/cm)	4,000
Listed or Characteristic Hazardous Waste (TCLP[h])	none

Notes:

a **Table 1 is a reproduction of the table contained in policy #BWP-94-037.**

b **Contaminant concentrations are in mg/kg, dry weight. Other contaminants are as noted.**

c **Lined landfills have a DEP approved, functioning liner with leachate collection and are operated in compliance with Massachusetts DEP regulations and policies. The criteria apply to reuse of soils at lined landfills as daily cover, intermediate cover, and pre-cap contouring material.**

Please note that the methods specified in footnotes d, e, and f indicate the universe of chemicals to be added up in calculating the total concentrations for these classes of contaminants. This Policy does not specify what method should be used to quantify these contaminants. For example, EPA Method 8100 defines the list of chemicals to be considered in calculating total PAHs. However, EPA Methods 8270 or 8250 may be used to quantify PAH levels.

d **Total concentrations of polychlorinated biphenyls listed in EPA Method 8080.**

e **Total concentrations of polynuclear aromatic hydrocarbons listed in EPA Method 8100.**

f **Total concentration of volatile organic compounds listed in EPA Method 8240 or equivalent.**

g **For soils or sediments which may be expected to contain elevated NaCl concentrations (e.g., sediments from marine environments or road-salt stockpile affected soils).**

h **TCLP testing should be performed for metals or organic compounds when the total concentrations in the soil are above the theoretical levels at which the TCLP criteria may be met or exceeded. For guidance parties should consult United States Environmental Protection Agency, Memorandum #36, "Notes on RCRA Methods and QA Activities", pp. 19-21, Gail Hanson, January 12, 1993.**

8.2 Feasibility Determinations and Landfill Disposal of Contaminated Soils

The MCP specifies that contaminated soils generated in Massachusetts shall not be disposed of at an in-state or out-of-state landfill if a feasible alternative exists that involves the reuse, recycling, destruction, and/or detoxification of such materials (see 310 CMR 40.0032(5)). In making a determination as to whether the above management options are feasible, Licensed Site Professionals and generators of contaminated soil shall consider the following:

a) the volume and physical characteristics of the contaminated soil;

b) the concentrations and types of oil or hazardous materials contained in the soil; and

c) the relative costs of these management options.

8.3 Approvals for Disposal at Lined Landfills

A Special Waste Determination (BWP SW 14 or BWP SW 31) or other approval by the Division of Solid Waste Management will be required for disposal of contaminated soils at all lined landfills.

8.4 Approvals for Reuse and Disposal at Unlined Landfills

A Landfill - Minor Modification (BWP SW 22) or other approval by the Division of Solid Waste Management will be required for reuse of contaminated soils at all unlined landfills. A Special Waste Determination (BWP SW 14 or BWP SW 31) or approval by the Division of Solid Waste Management will be required for disposal of contaminated soils at all unlined landfills.

9.0 Recycling of Petroleum Contaminated Soils at Massachusetts Permitted Soil Recycling Facilities

9.1 Massachusetts Permitted Soil Recycling Facility Summary Levels

All Massachusetts soil recycling facilities are authorized by permit to accept both unused and used waste oil contaminated soils.

Table 2 presents a summary of process-specific levels for contaminants which are commonly detected with petroleum hydrocarbons in petroleum contaminated soils. These process-specific levels have been incorporated into the permits for each type of recycling facility: hot mix and cold mix asphalt batching plants, and thermal processing plants. Below these concentrations, the handling and processing of such soils and reuse of the bituminous concrete/bituminous pavement or thermally processed soil would not be expected to result in a significant risk to human health, safety, public welfare, or the environment.

To determine if a permitted soil recycling facility is eligible to accept a shipment of contaminated soil, generators and Licensed Site Professionals should compare the concentrations in the contaminated soil with the levels in the facility's permit. No threshold presented in Table 2 of this Policy supersedes any requirement specified in the facility permits.

TABLE 2

Massachusetts Soil Recycling Facility Summary Levels [a]

Contaminant	Hot Mix Asphalt Plants mg/kg[b]	Thermal Processing Plant mg/kg	Cold Mix Emulsion Plant mg/kg
Total Arsenic (As)	30	30	30
Total Cadmium (Cd)	30	11	30
Total Chromium (Cr)	500	500	500
Total Mercury (Hg)	10	3	10
Total Lead (Pb)	1,000	1,000	1,000
Total VOCs[c]	30 to 1,800[d]		
Total Petroleum Hydrocarbons	5,000 to 60,000[e]		
Total PCBs	< 2	< 2	< 2
Total Halogenated Volatile Organic Compounds	5	5	5
Listed or Characteristic Hazardous Waste (TCLP[f])	none	none	none

Notes:

a Contaminant levels presented in Table 2 are a summary of soil recycling permits issued by the DEP's Division of Hazardous Waste as of April 1994. For a complete listing for a specific facility please consult the applicable facility permit.

b Concentrations for all three processes are in mg/kg, dry weight.

c As determined by EPA method 8240 or equivalent, provided that the presence of such constituents does not cause the soil to be either a characteristic or listed hazardous waste pursuant to 310 CMR 30.000.

d The concentrations specified represent the lowest and highest VOC concentration permitted among all soil recycling facilities. However, each permitted VOC level is process-specific and LSPs and generators should consult the facility's individual soil recycling permit to ensure that the VOC concentration in the contaminated soil is consistent with that authorized in the facility permit.

e The concentrations specified represent the lowest and highest TPH concentration permitted among all soil recycling facilities. However, each permitted TPH level is process-specific and LSPs and generators should consult the facility's individual soil recycling permit to ensure that the TPH concentration in the contaminated soil is consistent with that authorized in the facility permit.

f TCLP testing should be performed for metals or organic compounds when the total concentrations in the soil are above the theoretical levels at which the TCLP criteria may be met or exceeded. For guidance parties should consult United States Environmental Protection Agency, Memorandum #36, "Notes on RCRA Methods and QA Activities", pp. 19-21, Gail Hanson, January 12, 1993.

9.2 On-site Asphalt Batching

Petroleum contaminated soils which are generated at a 21E disposal site, incorporated as aggregate in bituminous concrete/bituminous pavement, and are applied within the boundaries of the same disposal site are not subject to the permitting and approval requirements under 310 CMR 30.800, provided that the petroleum contaminated soils are not otherwise a hazardous waste, and that the response action is conducted in conformance with 310 CMR 40.0000. On-site asphalt batching operations are considered by the Department to be an immobilization technology, which like any other remedial technology, may be used to achieve a temporary or permanent solution under the MCP. As with all remedial technologies, LSPs should exercise professional judgement consistent with the Best Response Action Management Approach Standard when selecting, implementing, and evaluating the effectiveness of any remedial technology at a disposal site. The Department anticipates developing specific guidance and procedures for mobile on-site asphalt batching in the future.

Petroleum contaminated soils which are generated at a 21E disposal site, incorporated as aggregate in bituminous concrete/bituminous pavement, and are applied within or outside the boundaries of the disposal site must be managed to protect health, safety, public welfare and the environment (310 CMR 40.0030). Generators and LSPs should ensure that the bituminous concrete/bituminous pavement proposed for application within or outside the boundaries of the 21E disposal site are suitable for application based on the chemical, physical and structural properties of the bituminous concrete/bituminous pavement and its intended use.

Contaminated soils used as aggregate in bituminous concrete/bituminous pavement for off-site application shall be limited to used and unused waste oil contaminated soils (310 CMR 30.252(2)). Material specifications (chemical, physical, and structural) for processed aggregate and bituminous concrete/bituminous pavement should be based on accepted standards such as those of the ASTM Standard, the Massachusetts Highway Department, the Massachusetts Turnpike Authority, the Asphalt Institute or other industry-wide accepted standards. The quality assurance and quality control procedures employed on the aggregate, during the emulsion process, and on the resulting bituminous concrete/bituminous pavement should be documented in the next applicable remedial response action submittal along with the location where the material was applied off-site.

The levels of contaminants for petroleum contaminated soils used as aggregate in making bituminous concrete/bituminous pavement for off-site application should be comparable to those levels established by the Department for an analogous stationary soil recycling facility (i.e., type and process specific). Bituminous concrete/bituminous pavement which incorporates as aggregate soil contaminated with oil and hazardous materials which exceed these concentrations may require specific permit and/or approval by the Department pursuant to 310 CMR 30.800.

10.0 Transportation

10.1 In-State Generated Soils to In-State Facilities

The transport of petroleum contaminated soils to Massachusetts soil recycling facilities, Massachusetts landfills, or temporary storage locations must be performed in accordance with the Bill of Lading provisions contained in 310 CMR 40.0030. A common carrier may be used, provided this method of transport does not pose a risk to health, safety, public welfare or the environment. All soils transported by common carrier should be covered to minimize windblown dust and volatilization of contaminants during transport along roadways. In those instances where

large volumes of contaminated soils, or numerous trips are required, or where the site/truck staging area is unpaved, appropriate truck decontamination procedures should be employed, such as truck tire and under-carriage washing to minimize excess tracking of contaminated soil on the roadway. All decontamination water must be managed in accordance with all applicable federal, state, and local laws and regulations (310 CMR 40.0031(2)).

10.2 In-State Generated Soils to Out-of-State Facilities

Under the former "virgin soils" policy (#WSC-400-89), virgin petroleum contaminated soils needed to be manifested and transported by a licensed hazardous waste transporter when shipped to an out-of-state facility.

The 1993 MCP does not require that a Massachusetts licensed hazardous waste transporter and manifest be used for petroleum contaminated soils transported to out-of-state recycling, reuse, treatment or disposal facilities. Petroleum contaminated soils shipped to out-of-state facilities may be transported by common carrier under a 21E Bill of Lading in conformance with 310 CMR 40.0030, provided that this method of transport ensures the protection of health, safety, public welfare and the environment, and is consistent with the receiving facility's permit requirements and with any other law in the receiving state(s) which may govern the transport of contaminated soil.

10.3 Out-of-State Generated Soils to In-State Facilities

The transport of petroleum contaminated soils generated outside the boundaries of the Commonwealth are not subject to the management requirements of the MCP. Out-of-state generated soils when shipped to a Massachusetts permitted soil recycling facility or Massachusetts lined landfill must use a BWP Material Shipment Record to document the soil transaction. Parties transporting soils generated outside of the Commonwealth should consult the specific facility permit(s), and policy #BWP-94-037 for applicable requirements.

10.4 Transport of Petroleum Contaminated Soils under a Hazardous Waste Manifest

An alternative to using the 21E Bill of Lading procedures to transport petroleum contaminated soils off-site would be to transport the contaminated soils under a hazardous waste manifest using a licensed hazardous waste transporter in conformance with the Massachusetts Hazardous Waste regulations (310 CMR 30.000). A LSP Opinion is not required for transporting materials using a hazardous waste manifest.

Parties transporting petroleum contaminated soils to out-of-state treatment, recycling, or disposal facilities under a hazardous waste manifest must use the waste code MA01. Shipments transported out-of-state under waste code MA01 will be subject to the Massachusetts Transporter Fee.

11.0 Submission of the 21E Bill of Lading Form to DEP

The 1993 MCP (310 CMR 40.0034 and 40.0035) requires generators of contaminated soil to submit the completed Bill of Lading form and summary sheet with original signatures, Licensed

Site Professional Opinions, and all relevant supporting documentation to the appropriate DEP regional office within 14 days after final shipment has been made to the receiving facility.

Parties conducting Limited Removal Actions (in accordance with 310 CMR 40.0318) using a 21E Bill of Lading are not required to submit the completed Bill of Lading form and supporting documentation to the Department (see 310 CMR 40.0034(5)). However, 310 CMR 40.0034(6) requires that the completed Bill of Lading form and supporting documentation be retained by the RP, PRP, or Other Person for a minimum of 5 years.

Parties conducting Utility Related Abatement Measures (URAMs) in accordance with 310 CMR 40.0462(4) may transport these soils to a temporary storage location owned or operated by the same PRP conducting the URAM. A 21E Bill of Lading and LSP involvement is not required for these types of soil shipments to temporary storage areas. However, the shipment of URAM generated soils to treatment, reuse, recycling, or disposal facilities from a temporary storage location, or from the site of excavation must be transported using a 21E Bill of Lading with a LSP Opinion rendered in accordance with 310 CMR 40.0030 (see 310 CMR 40.0462(5)).

12.0 Managing Contaminated Soils below 21E notification Thresholds

The 1993 MCP (310 CMR 40.0032(3)) allows contaminated soils which exhibit concentrations of oil or hazardous materials below the applicable 120 day notification thresholds specified in 310 CMR 40.0300, and which are not otherwise a hazardous waste, to be transported from a disposal site without prior notice or approval from the Department provided that:

a) the soils are not disposed or reused at locations where oil or hazardous materials in the soil would be in excess of the applicable notification threshold at the receiving location; and

b) the soils are not disposed or reused at locations where existing concentrations of oil or hazardous materials at the receiving site are significantly lower than the levels of oil or hazardous materials present in the soil being reused or disposed.

However, parties proposing to manage soils contaminated at less than the applicable 120 day notification level specified in the MCP at in-state permitted soil recycling or landfill facilities are required under the facility permit(s) to document that the soils have been adequately characterized. Specifically, a Bureau of Waste Prevention Material Shipment Record form shall be used when transporting these contaminated soils to Massachusetts permitted soil recycling facilities and landfills. A "qualified environmental professional" will be required to sign a statement contained in the form which attests to the adequacy of the testing and assessment actions necessary to adequately characterize the contaminated soils.

The transport of these soils, as described above, to out-of-state facilities or locations shall be protective of health, safety, public welfare, and the environment. Examples of soil management methods and procedures which would be considered protective and consistent with 310 CMR 40.0030, and 310 CMR 30.000 include the 21E Bill of Lading form and procedures, a Hazardous Waste Manifest, or a Material Shipment Record Form. In addition, all soils transported to out-of-state licensed and/or permitted facilities, or locations shall be consistent with any applicable

federal, state or local law which may govern the transport and management of these soils in the receiving state.

Nothing in this section of the policy is intended to prohibit the voluntary use of the 21E Bill of Lading process to document the transport of soils with contamination below the applicable 120 day notification threshold to appropriate facilities or locations, provided that the soils are not otherwise a hazardous waste.

ATTACHMENT I

PETROLEUM HYDROCARBON ANALYSIS

A number of analytical procedures are commonly used to quantitatively and/or qualitatively evaluate heavier molecular weight (i.e., number 2, 4, and 6 Oils) petroleum contaminants within a soil matrix. Many of these procedures are modifications of methods developed for water or wastewater analyses. For the purpose of this policy, the Department suggests using the following methodologies or their equivalent:

Quantitative Total Petroleum hydrocarbons (TPH) in mg/kg

* Standard Methods Procedure 503B/E, partition-infrared methods;

* EPA Method 418.1, modified for soil extraction/analysis.

Qualitative/Quantitative TPH in mg/kg

Solvent-extraction analysis using capillary GC-FID, including:

* "Methodology for Comparison of Petroleum Oils by Gas Chromatography", ASTM Procedure D 3328;

* "Oil Spill Identification by Gas Chromatograph,", U.S. Coast Guard, Report No. CG-D-52-77; and

* "Gas Chromatography of High Molecular Weight Hydrocarbons with an Inorganic Salt Eutectric Column", Journal of Analytical Chemical, Vol. 50, No. 2 (February 1987).

Soils samples for TPH analysis should, at a minimum be collected and handled in the following manner:

* a representative samples should be collected (representative samples will be determined on a case-by-case basis);

* use of pre-cleaned 16 oz. wide mouth glass jars;

* sample should be iced down or refrigerated to retard biodegradation;

* expedite delivery to lab; and

* analysis should be conducted as soon as possible after sample collection.

For further sampling, storage and handling instructions see the specific TPH analytical method which is to be used.

ATTACHMENT II

JAR HEADSPACE ANALYTICAL SCREENING PROCEDURE

The following are recommended procedures for conducting analytical screening of gasoline-contaminated soils utilizing a portable Photoionization Detector (PID) or Flame Ionization Detector (FID):

(1) Half-fill two clean glass jars with the sample to be analyzed. Quickly cover each open top with one or two sheets of clean aluminum foil and subsequently apply screw caps to tightly seal the jars. Sixteen ounce (16 oz.) (approx. 500 ml) soil or "mason" type jars are preferred; jars less than 8 oz. total capacity (approx. 250 ml), should not be used.

(2) Allow headspace development for at least 10 minutes. Vigorously shake jars for 15 seconds both at the beginning and end of the headspace development period. Where ambient temperatures are below 32 F (0 C), headspace development should be within a heated vehicle or building.

(3) Subsequently to headspace development, remove screw lid/expose foil seal. Quickly puncture foil seal with instrument sampling probe, to a point about one-half of the headspace depth. Exercise care to avoid uptake of water droplets or soil particulates.

As an alternative, syringe withdrawal of a headspace sample with subsequent injection to instrument probe or septum-fitted inlet is acceptable contingent upon verification of methodology accuracy using a test gas standard.

(4) Following probe insertion through foil seal and/or sample injection to the probe, record highest meter response as the jar headspace concentration. Using foil seal/probe insertion method, maximum response should occur between 2 and 5 seconds. Erratic meter response may occur at high organic vapor concentrations or conditions of elevated headspace moisture, in which case headspace data should be discounted.

(5) The headspace screening data from both jar samples should be recorded and compared; generally, replicate values should be consistent to plus or minus 20%.

(6) PID and FID field instruments shall be operated and calibrated to yield "total organic vapors" in ppm (v/v) as benzene. PID instruments must be operated with a 10.0 eV (+/-) lamp source. Operation, maintenance, and calibration shall be performed in accordance with the manufacturer's specifications. For jar headspace analysis, instrument calibration shall be checked/adjusted no less than once every 10 analyses, or daily, whichever is greater.

(7) Instrumentation with digital (LED/LCD) displays may not be able to discern maximum headspace response unless equipped with a "maximum hold" feature or strip-chart recorder. Deviations, departures and/or additions to the above procedures should be consistent with 310 CMR 40.0017. In such cases, compelling technical justification must be presented and documented by the methodology proponent.