

Huntington Beach Fire Department

Soil Quality Standard

INTRODUCTION

In an attempt to restore hydrocarbon contaminated soil to a clean condition meeting the environmental requirements listed within this City Specification, and to protect the health and safety of the community, the City of Huntington Beach maintains standards for soil quality. The Huntington Beach Fire Department (HBFD) has the responsibility under the California Fire Code (CFC) and the Huntington Beach Municipal Code (HBMC), Chapter 17.56, to require the implementation of the procedures necessary to evaluate the condition of soil and to confirm the soil conforms to the conditions identified in this City Specification.

This City Specification does not supersede or replace other regulatory agency requirements that may be enforceable for site-specific conditions. For the purposes of this soil quality standard, “soil” is defined as geologic (i.e., earthen) material at the site from ground surface to 5 feet above mean depth to first encountered groundwater, or geologic (i.e., earthen) materials imported to the site as part of the planned site activities.

The purpose of this City Specification (soil quality standard) is to provide guidance to project proponents in assessing site soils for the presence of chemical contaminants and to inform decision-making with regard to required actions in the event that contamination is identified.

APPLICABILITY OF THIS CITY SPECIFICATION

- This City Specification **is applicable to** all types of petroleum contaminated sites and soil media.
- This City Specification **may be applicable to** sites with mixtures of petroleum and other hazardous substances (e.g., petroleum and chlorinated solvents or metals). The procedures described here do not take into account the added complexity of establishing clean-up standards and remediating these mixtures. For such sites, the user should contact HBFD staff to discuss the applicability of this guidance and what other additional factors may need to be considered as part of the remediation of these sites.
- This City Specification is **generally not applicable to** sites contaminated only with hazardous substances other than petroleum related chemicals associated with crude oil production, processing, and handling. Depending on the substances involved, other agencies may be appropriate to manage these substances (e.g., DTSC, RWQCB, OCHCA, CalRecycle, AQMD). See glossary on page (10) for agency definitions.

Site assessment and remediation (e.g., removal alternatives, natural and accelerated attenuation, vapor intrusion mitigation) are not discussed in detail in this City Specification.

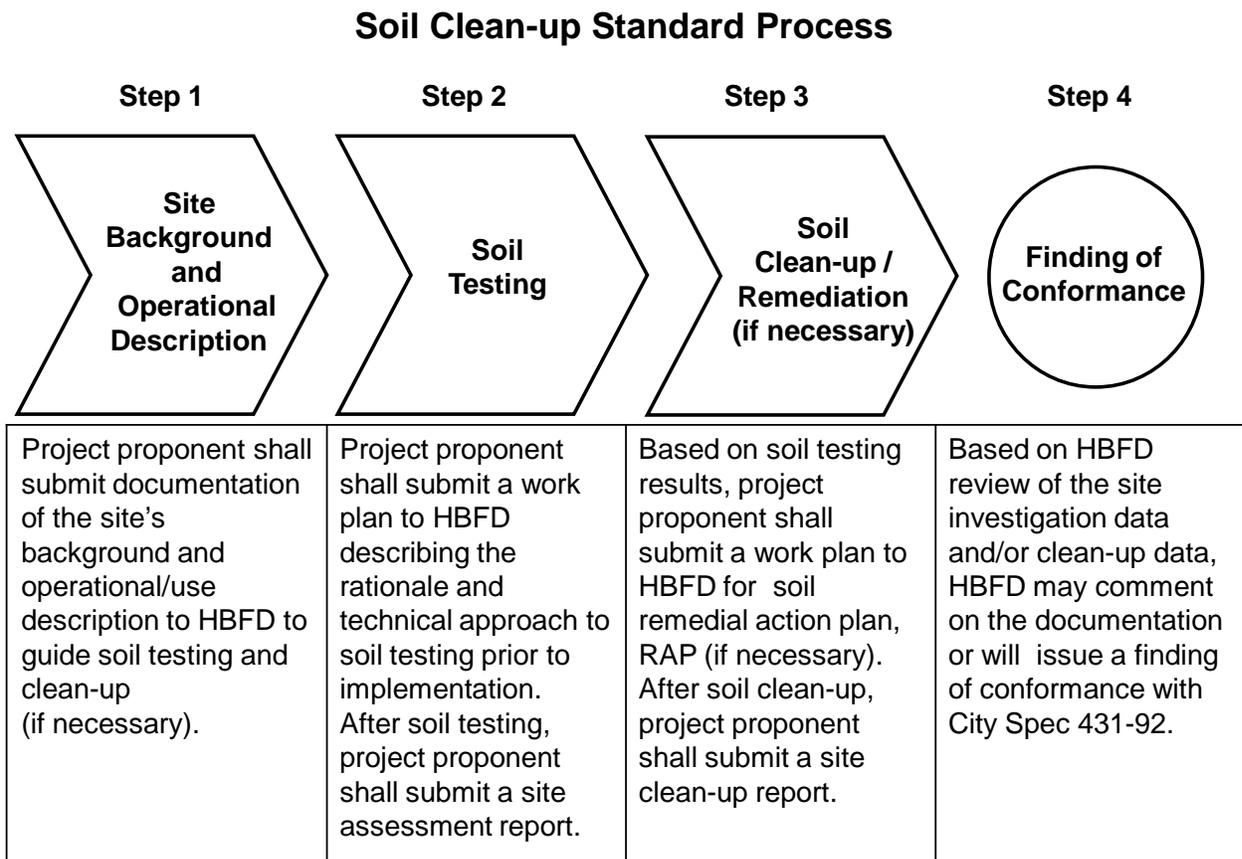
Soil Quality Standard

SOIL CLEAN-UP STANDARD PROCESS

The standard procedures required as part of this City Specification may be summarized in the following primary steps:

- Step 1 – Site Background and Operational Description
- Step 2 – Soil Testing: Work Plans, Implementation and Reporting
- Step 3 – Soil Clean-Up/Remediation (if necessary): Work Plans, Implementation and Reporting
- Step 4 – Finding of Conformance

The activities required in each of the steps are summarized in the figure below.



While reference is made to select State regulations, this City Specification is not intended to provide an all-inclusive listing of potentially applicable statutes and/or regulations, and/or technical guidance (e.g., LUFT Manual). The project proponent is expected to follow the appropriate professional standard-of-care in effect at the time that the documentation is submitted to the HBFD.

Soil Quality Standard

Project proponents are encouraged (and may be required by HBFD) to involve an Environmental Professional (see Glossary and Explanation of Select Terms). The requirement for a site Environmental Professional shall be at the discretion of the HBFD. Environmental sampling (which may include soil and soil vapor sampling) shall be carried out using all appropriate and/or relevant protocols in accordance with the environmental professional standard-of-care.

Copies of final letters and additional documentation demonstrating compliance with this specification as required by HBFD shall be included as part of the architectural plans submitted for building permit issuance.

1. STEP 1 – SITE BACKGROUND AND OPERATIONAL DESCRIPTION

- 1.1 The project proponent shall provide documentation of the site background conditions and describe the operational (i.e., use) history, to achieve the intent of this City Specification to assess and restore contaminated soil to a clean condition. The project proponent shall search for, review, and summarize information pertaining to the site's current and historical uses, and review and summarize any and all existing environmental site documentation. The documentation shall, at a minimum, include:
 - A narrative description of the site background and operational use;
 - Supporting documentation of the background and operational uses (e.g., aerial photographic history, key individual interview summaries); and
 - A description or tabulation of potential or recognized environmental conditions (historical and/or current).
- 1.2 This documentation may be in the form of 'Phase I' environmental site assessment. The documentation shall include all appropriate information needed to determine the potential or recognized environmental conditions at the site.
- 1.3 In the event that the documentation described above does not indicate any potential or recognized environmental conditions, the HBFD may require the project proponent to proceed with Step 2 – Soil Testing to confirm this conclusion. Depending on the project proponent's timeline for development and/or alternate use of the site, this documentation may be submitted as part of, or along with, documentation required as part of Step 2 – Soil Testing, described below.

2. STEP 2 – SOIL TESTING: WORK PLANS, IMPLEMENTATION AND REPORTING

- 2.1 A site-specific soil testing plan shall be developed by the project proponent and submitted to the HBFD for review and approval. The project proponent shall perform environmental soil testing, to evaluate the environmental soil condition, for all appropriate chemicals or parameters identified in the following criteria:
 - 1st Criteria – Soil testing shall be performed to verify that soils are below Federal and State regulations governing hazardous waste.
 - 2nd Criteria – Soil testing shall be performed to verify that soils are below applicable Federal, State, or County thresholds, as well as the petroleum

Soil Quality Standard

hydrocarbon thresholds defined in this City Specification. These thresholds will depend on the anticipated end use of the site.

- 2.2 The site-specific soil testing plan shall be developed by the project proponent based on historical and/or potential recognized environmental conditions; this City Specification provides the above general criteria to guide soil testing. Prior to commencing soil testing intended to support a determination that the soil meets this City Specification, a work plan shall be submitted to the Hbfd that defines the rationale and technical approach to collecting the environmental data. If soil testing has been performed for another State or County agency, then reports containing the resulting data should be submitted in support of the evaluation required as part of this City Specification.
- 2.3 This City Specification also applies to soil planned for import to the site for fill. The soil sampling plan(s) and site history information may be required to be submitted to Hbfd for review and approval. The Environmental Professional for the project shall review the soil data (to the degree they deem necessary) and concur with the conclusions and assertions made by the exporting licensed consultant. Once the Environmental Professional has reviewed and concurred with the analysis of the exporting consultant (clean and compliant with this specification, 431-92), they shall submit a letter to the Hbfd for review. The letter shall include the amount of soil imported in cubic yards and project address. It will become part of the permanent record for soil at that site.
- 2.4 Soil Testing – 1st Soil Quality Standard Criteria
- Soil testing data shall be submitted that confirms site soils are below thresholds defined in Title 22 of the California Code of Regulations (CCR Title 22, Div. 4.5, Chapter 11 – Identification and Listing of Hazardous Wastes).
 - Laboratory tests used in this determination are pH (EPA-9045D), Title 22 Metals (total using EPA-6010B/7471A), and Volatile Organic Compounds, VOCs (EPA-8260B) as described in Section 2.6 Soil Testing - Site Assessment and Laboratory Specifications. Please note that laboratory methods may be updated periodically; it is the responsibility of the project proponent to analyze for the above constituents according to the appropriate analytical methods. When analyzing for VOCs, samples should be collected to limit volatilization of compounds from the samples (EPA-5035).
 - Soils sampled during site assessments that fail CCR Title 22 criteria for hazardous waste will need to be managed by the appropriate party according to an approved remedial action plan (RAP), as described in Step 3 – Soil Remediation.

Soil Quality Standard

2.5 Soil Testing – 2nd Soil Quality Standard Criteria

- Soil testing data shall also be submitted that evaluates chemicals often associated with petroleum production, storage, refining, retail fuel dispensing and handling operations. Comparison of the Total Petroleum Hydrocarbon (TPH) concentration (EPA-8015B modified) in soils sampled during this Step 2 – Soil Testing shall be made with the screening criteria in Table 1. If the sample results are below or equal to the Table 1 criteria, no further testing or remediation work shall be required.
- If the TPH exceeds the screening criteria, the laboratory will perform the additional analyses specified (EPA-8021B, EPA-8270C).
- Further delineation of the contaminated soil through use of additional borings, additional trenches or by excavation and stockpiling must be performed to determine the lateral and vertical extent of soil exceeding Table 1 criteria.
 - Samples obtained during this delineation will be analyzed for screening criteria listed in Table 1 (EPA-8015B Modified).
 - If sample results exceed the screening criteria in Table 1, the laboratory shall be instructed to run the analyses specified in Table 2 (EPA-8021B, EPA-8270C) unless the applicant chooses to excavate the contaminated soil to meet criteria in Table 1 without proceeding to further analyses specified in Table 2.
 - Soils which contain less than the screening levels specified in Table 2 shall not be required to undergo soil remediation provided that EPA 8015B Modified Total Petroleum Hydrocarbon concentrations are less than 100% excess of Table 1 screening criteria levels (See Step 3).

Soil Quality Standard

Table 1	
Screening Level for Hydrocarbon Remediation	
Land Use	TPH (8015B Modified, full carbon chain)
Residential and Recreational	<500 ppm
Commercial and Industrial	<1,000 ppm
Roadway	
<ul style="list-style-type: none"> • 0' - 4' Below Road Surface 	<1,000 ppm Total; <100 ppm of the <C14 component (carbon chain length 14 and below)
<ul style="list-style-type: none"> • >4' Below Road Surface 	<1,000 ppm

Table 2		
Screening Level for Hydrocarbon Remediation		
Land Use	BTX & E (8021B)	PNA (8270C)¹
Residential and Recreational	B< 1.0 PPM T, X & E < 10.0 ppm individually	Each PAH <0.5 ppm Total PAHs <3.0 ppm
Commercial and Industrial	B< 1.0 PPM T, X & E < 10.0 ppm individually	Each PAH <1.0 ppm Total PAHs <6.0 ppm
Roadway		
<ul style="list-style-type: none"> • 0' - 4' Below Road Surface 	B<1.0 ppm T, X & E <10.0 ppm individually	Each PAH <1.0 ppm Total PAHs <6.0 ppm
<ul style="list-style-type: none"> • >4' Below Road Surface 	B<1.0 ppm T, X & E <10.0 ppm individually	Each PAH <1.0 ppm Total PAHs <6.0 ppm

Table Notes:

¹ Based on PAHs found in Proposition 65 list in addition to benzo(g,h,i)perylene.

B – Benzene, T – Toluene, X – Xylenes, E – Ethylbenzene

Soil Quality Standard

2.6 Soil Testing – Site Assessment and Laboratory Specifications

- Analyses performed during site assessments shall include (for soil): pH (EPA-9045D), Title 22 Metals (total only, soluble if total exceeds 10 times STLC), Volatile Organic Compounds (EPA-8260B), Total Fuel Hydrocarbons (EPA-8015B Modified), Semi-Volatile Organics (EPA-8270C) and Polychlorinated Biphenyls (EPA-8082). The laboratory soil testing contract shall specify use of EPA Method 3630 as a soil sample preparation procedure prior to soil analysis for CAPNA's using EPA-8270C if the EPA Method 8015B Modified results show greater than 1,000 ppm. Other historical industrial or agricultural uses may require additional analyses.
- The sampling frequency will vary depending on potential for on-site contamination. Sampling should be targeted at identified or suspected contaminated locations on the site. Sampling of areas not suspected to be contaminated shall be done on a random basis according to a site-specific soil testing work plan, which shall be approved by the HBFD. Vertical limits of hydrocarbon contamination shall be assessed. Sampling shall extend to a depth sufficient to identify at least five (5) feet of uncontaminated soil or to a depth not greater than five (5) feet above the water table in cases where regional groundwater will be impacted by sampling activities.
- The site-specific soil testing work plan shall define both site-specific targets and/or other random sampling, as appropriate. The burden of demonstrating soil quality to established limits of contamination shall be the responsibility of the project proponent and/or land owner. Analytical results, which may be inconsistent or anomalous when compared to other sample data taken as part of the soil testing (Step 2) shall be made a part of the record. The project proponent and/or land owner shall have the option of providing additional samples to clarify inconsistencies. The number and location of these samples shall be determined by the project proponent and reviewed and approved by the HBFD.

3. STEP 3 – SOIL CLEAN-UP/REMEDIATION: WORK PLANS, IMPLEMENTATION AND REPORTING

- 3.1 Soil not meeting the criteria identified during Steps 1 and 2 shall be remediated. The project proponent shall submit a RAP to the HBFD to address soil non-compliance with this City Specification. Following HBFD review of the RAP and written approval, soil remediation may be implemented. All site remediation activities shall comply with all applicable Federal, State, County, and City regulations.
- 3.2 After soil is remediated and/or reused according to approved procedures, the surface of the designated remediation area shall be tested in accordance with provisions identified herein above (Step 2). Similar to Step 2, a site-specific confirmation soil testing work plan shall be submitted to the HBFD for review and approval as well as a final report, which shall summarize the remediation efforts and post-remediation test results.

Soil Quality Standard

3.3 Soil Remediation - Applicability of Specification to Soil Remediation - Depth

- Soil contamination in excess of the Tables 1 and 2 criteria extending deeper than 20 feet below ultimate finished grade or within five (5) feet of the mean depth to the groundwater table, whichever is shallower, and not exhibiting characteristics of material considered hazardous for disposal purposes, may be considered for non-remediation.
- Soil can be remediated on-site as long as it does not exhibit any characteristics of material considered hazardous for disposal purposes. Remediation activities shall be performed within a designated area as identified within the RAP and consistent with the approved Stockpile Permit, if applicable.
- Any non-remediation request shall be submitted to the HBFD for review and verification of compliance with this specification. The lateral and vertical extent of this contaminated material left in place shall be determined using Table 1 criteria. This extent shall be reported to the HBFD.
- Surface structures within 100 feet of the lateral extent of the contaminated soil shall be built with vapor barriers in accordance with applicable City Specifications.

3.4 Soil Remediation - Specifications for Disposition of Stockpiled Soil / Soil Re-use

- Soil stockpiles in excess of 50 cubic yards require approval by and issuance of a Stockpile Permit from the Public Works Department.
- Soil that is stockpiled on-site as a result of criteria applied above can be evaluated for re-use on-site according to the criteria in this specification.
- Soil that is planned for reuse on-site should be sampled at a frequency sufficient to adequately characterize the degree and composition of the contamination. The site-specific soil testing work plan shall be submitted to the HBFD for review and approval prior to re-use.
- Soils must meet criteria listed in Tables 1 and 2. Placement of re-used soils must meet compaction requirements of the project's plans and specifications (approved by the Departments of Public Works and/or Planning and Building).
- Reused soils shall be placed directly beneath the asphalt cap and underlying aggregate to a maximum depth of four (4) feet below the road surface. Fills deeper than four (4) feet must be approved by the HBFD based on sufficient findings.

Soil Quality Standard

- Potable drinking water lines must be surrounded by clean sand or gravel and approved and inspected by the appropriate City departments (e.g., Public Works and Planning and Building) before burial in the roadway.
- A detailed set of drawings must be submitted to the HBFD showing the plan view of re-used soils, a cross section of the road base, locations of utility lines and thickness of clean sand and gravel pack placed around these lines. Soil analysis data for the road fill must also be submitted which shall verify compliance with the standards listed in Tables 1 and 2.

4. STEP 4 – FINDING OF CONFORMANCE

- 4.1 Depending on the HBFD review of the soil testing report and/or soil remediation report (as appropriate), the HBFD may issue a conditional Finding of Conformance or require additional soil testing or remediation to demonstrate compliance with this City Specification.
- 4.2 Following the issuance of a conditional Finding of Conformance, the project proponent shall observe for the potential presence of contaminated soils during site development activities using an Environmental Professional. The Environmental Professional shall monitor grading activities for indicators of soil contamination and shall be aware of the situations and procedures:
- Soft spongy soil that becomes evident as heavy equipment travels over it.
 - Hydrocarbon odors emanating from the soil.
 - A reading of greater than 20 ppm on a hand-held calibrated organic vapor monitor (OVM) held three (3) inches from suspected contaminated soils. The meter shall be calibrated at least once per day, or per manufacturer specifications.
- 4.3 If any of the indicators above are found, the Environmental Professional shall devise a soil sampling plan capable of ascertaining whether or not the waste is classified as hazardous. The process identified above as part of Steps 2 and 3 shall be followed. Any contamination observed shall be made a part of the site record and the HBFD shall be immediately notified. Sufficient samples shall be analyzed to characterize the vertical and horizontal extent of the potential contaminant.
- 4.4 A report documenting the observations and samples obtained during grading shall be prepared and submitted to the HBFD for review and approval. This report shall document compliance with the appropriate sections of Table 1 and/or Table 2 as applicable, as well as provide information identified above in Steps 1 through 4 of the site assessment and soil clean-up standard process.
- 4.5 Copies of final letters and additional documentation demonstrating compliance with this specification as required by HBFD shall be included as part of the architectural plans submitted for building permit issuance.

Soil Quality Standard**GLOSSARY AND EXPLANATION OF SELECT TERMS**

Agency References – Department of Toxic Substances Control (DTSC), Environmental Protection Agency (EPA), Regional Water Quality Control Board (RWQCB), OC Health or Orange County Health Care Agency (OCHCA), CalRecycle (formerly the California Integrated Waste Management Board), Air Quality Management District (AQMD).

Aromatic Hydrocarbons – Hydrocarbons that contain one or more Benzene ring. The name comes from the fact that many of them (e.g., Pentane, Hexane, Heptane, Octane, Toluene, Styrene, and Decane, etc.) have strong, pungent aromas. All of these products are part of the Hydrocarbon family.

BTX & E – **B**enzene, **T**oluene, **X**ylene, and **E**thylbenzene. All are members of the hydrocarbon family. The “8021” heading in Table 2 refers to the EPA test number used to determine the screening levels.

Environmental Professional – Professional with experience and training in environmental matters, ideally licensed in the State of California as a Professional Engineer (PE) or Professional Geologist (PG) (aka, environmental consultant or professional-of-record for the site).

Laboratory Tests – The City Specification refers to the types of laboratory tests that are conducted to determine the pH level, Metals (total), and the Volatile Organic Compounds in any given soil sample. The acronyms listed (EPA-9045D and EPA-8260B) are the recognized tests used by the Environmental Protection Agency (EPA) to find the levels of the specified agent (e.g., pH, Metals, and various types of hydrocarbons). Several areas of this City Specification refer to these various types of EPA recognized tests. Each test carries a numerical reference number.

LUFT – **L**eaking **U**nderground **F**uel **T**ank **F**ield **M**anual. This provides guidance on procedures to address environmental concerns for water quality protection from gasoline or diesel leaks. The LUFT Manual was intended to approximate many complex phenomena that occur during the transport of all type of hydrocarbons.

OVM – **O**rganic **V**apor **M**onitor (OVM). This is a hand-held monitor that provides the capability of monitoring hydrocarbon families, as well as organic matter.

PAH - **P**olycyclic **A**romatic **H**ydrocarbons. Polycyclic Aromatic Hydrocarbons are associated with the process of oil production and could potentially be found in the soil or ground water of oil production areas.

pH – Refers to the relative level of acidity or alkalinity of a solution.

ppm – **P**arts **P**er **M**illion. Refers to the relative concentration of a chemical contained within the sample.

Soil Quality Standard

RAP – Remedial Action Plan. Remediation refers to the restoration of site soil quality to conditions in conformance with this specification; also interchangeably referred to as ‘clean-up.’

STLC – Soluble Threshold Limit Concentration. The Waste Extraction Test (WET) and Toxicity Test Characteristic Leaching Procedure (TCLP) describe methods for extracting elements from soil or ground water samples and determining soluble concentrations for comparison to state criteria (CCR Title 22).

Title 22 Metals – Title 22 of the California Administrative Code provides a list of metals that may be hazardous at certain levels. Certain of the heavy metals may be the result of end-stage hydrocarbon production. Title 22 lists 18 different metals:

- | | |
|------------------|--------------------|
| 1. Ag- Silver | 10. Mo- Molybdenum |
| 2. As- Arsenic | 11. Ni- Nickel |
| 3. Ba- Barium | 12. Pb - Lead |
| 4. Be- Beryllium | 13. Pd- Palladium |
| 5. Cd- Cadmium | 14. Sb- Antimony |
| 6. Cr- Chromium | 15. Se- Selenium |
| 7. Co- Cobalt | 16. Tl- Thallium |
| 8. Cu- Copper | 17. V- Vanadium |
| 9. Hg – Mercury | 18. Zn- Zinc |

TPH – Total Petroleum Hydrocarbon. Refers to the full range of total petroleum hydrocarbons including benzene, toluene, ethylbenzene, xylenes, as well as the full suite of volatile organic compounds (i.e., aromatics), and the longer-chain hydrocarbons (i.e., aliphatics).

APPROVED: _____
Original Signed
Patrick McIntosh, Fire Chief

DATE: _____
September 26, 2013