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Prepared for

CP Development Company L.P.
One Sansome Street, Suite 3200
San Francisco, California 94104

RISK MANAGEMENT PLAN HUNTERS POINT NAVAL SHIPYARD PARCELS B-1, G, UC-1, AND UC-2 AND IR SITE 7/18 - LOTS 1 AND 3

SAN FRANCISCO, CALIFORNIA

Prepared by

Geosyntec consultants
engineers | scientists | innovators
1111 Broadway, 6th Floor
Oakland, California 94607

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occurring metals above RGs are not subject to the special soil handling and management protocols described in Section 5.4.3.

2.1.5 Petroleum NFA Areas with No Restrictions

Areas where petroleum releases were remediated but residual petroleum COCs remain in place were granted a No Further Action (NFA) designation by the RWQCB. Soil in these areas may be discolored or exhibit a petroleum odor. The specific areas where this may be the case are described in Section 2.~~2~~3 for each Parcel, as applicable. Based on the NFA determination and absent unexpected conditions, any discolored or odiferous soil in petroleum NFA areas may be managed without restriction, subject to the protocols in Section 5.4.4.1 of this RMP. The soil may be moved within the Site in accordance with the general soil handling protocols set forth in Section 3 and Section 5. Unexpected conditions include evidence of free petroleum liquid or petroleum sheen on the soil or groundwater. In the event that these or other unexpected conditions are encountered, the RMP protocols for unexpected conditions provided in Section 5.11 and Appendix H shall apply.

2.1.6 Petroleum NFA Areas with Restrictions

There are a few areas on the Site where petroleum releases were remediated, but petroleum COCs remain in place above the petroleum PSC identified in the New Petroleum Program Strategy (Shaw, 2007). These areas were granted an NFA with Restrictions designation by the RWQCB. The few specific areas where this NFA with Restrictions designation applies are described in Section 2.~~2~~3 for each Parcel, as applicable. The specific Restrictions and protocol that apply to each of these areas are briefly described in Section 5.4.4.2. If unexpected conditions are encountered in these areas, the RMP protocols for unexpected conditions provided in Section 5.11 and Appendix H shall apply. There are no known petroleum NFA areas with Restrictions on the Parcels that currently comprise the Site.

2.1.7 Areas with Residential Use Restrictions

There are areas on the Site where the ROD has specified clean-up to commercial/industrial standards and where a restriction exists for residential land uses. The specific areas where residential land use is restricted are described in Section 2.3 for each Parcel, as applicable. An owner may apply for a modifications of the boundaries of the areas subject to residential land use restrictions as described in Section 2.2.2. The details of the soil handling protocol for these areas are described in Section 5.4.

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2.3.1 Parcel B-1

Parcel B-1 includes 26.86 acres in the northern area of HPS and is bounded by IR sites 7 and 18 to the northwest (see Section 2.2.2), Parcel B-2 and San Francisco Bay (Parcel F) to northeast, and Parcel C and former Parcel A to the south (Figure 1-1) (Navy, 2015a). The land surface at Parcel B-1 is mostly paved or covered by structures with the exception of the steep hillsides on the southwest, which are covered by a vegetated soil cover (Navy, 2015a).

Historically, Parcel B-1 was part of the industrial support area at HPS and used for shipping, ship repair, training, barracks, and offices (Navy, 2015a). As a result of industrial and radiological research activities conducted by the Navy or other tenants in Parcel B-1, the chemicals of concern (COC) released in soil at the Property included metals; VOCs; semivolatile organic compounds (SVOCs), including pesticides, polychlorinated biphenyls (PCBs), and polycyclic aromatic hydrocarbons (PAHs); and total petroleum hydrocarbons (TPH). Radionuclides of concern at the Property included cesium-137, radium-226, and strontium-90. COCs in groundwater were VOCs and Chromium VI.

2.3.1.1 Environmental Condition

The Navy has completed remedial and removal actions in accordance with the Amended Parcel B ROD (Navy, 2009d). The final RACR for Parcel B-1 was submitted in 2015 (ERRG, 2015), and the FFA signatories have concurred with the final RACR (*List referenced letters when complete*). The final RACR for the soil excavation and stockpile removals at Parcels B, D-1, and G was submitted in October 2011 (ERRG, 2011), and EPA has concurred with this RACR (EPA, 2014).

As contemplated in the Amended Parcel B ROD, certain COCs remain in soil, soil vapor, and groundwater at Parcel B-1, at levels and in conditions that the FFA Signatories have determined are consistent with the ROD Remedial Action Objectives. The COCs that remain in soil at Parcel B-1 include metals, VOCs, SVOCs, pesticides, and PCBs (ERRG, 2015). The COCs that remain in soil vapor are VOCs, including benzene, chloroform, tetrachloroethene (PCE), trichloroethene (TCE), and vinyl chloride in designated VOC ARICs (Sealaska, 2013; ERRG, 2015b). The COCs that remain in groundwater include TCE and vinyl chloride (ERRG, 2015). Notable environmental conditions are depicted on Figure 2-1.

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2.3.1.2 CERCLA Remedy

The CERCLA remedy, approved in the Amended Parcel B ROD, included: i) excavation of soil and offsite disposal; ii) a Durable Cover across all of Parcel B as a physical barrier to cut off potential exposure to residual ubiquitous metals soil; iii) shoreline revetment to protect potential ecological receptors in the Bay; iv) in-situ treatment of groundwater to promote biodegradation of VOCs as a source reduction measure; v) groundwater monitoring; vi) installation of a soil vapor extraction (SVE) system at IR Site 10 to remove and treat VOCs in soil gas from soil and groundwater in that area as a source reduction measure; vii) institutional controls (IC); and viii) cleanup of radiologically impacted soil and structures.

The remedial action (RA) in Parcel B-1 was completed in 2012 and the FOST documents that the Parcel B-1 CERCLA remedy is in place. The EPA, DTSC, and the RWQCB have concurred with the Final FOST (*Reference Approval Letters when complete*). Components of the remedy that remain to ensure that human health and environment are protected from potential long-term health risks include:

- Durable Cover over the entire Parcel to prevent contact with residual ubiquitous metals in soil. The Parcel B-1 Durable Cover is defined as hardscape (e.g., asphalt, building foundations, concrete pads, sidewalks, etc.), two feet of clean imported soil fill, or shoreline revetment as defined in the Amended Parcel B ROD (Navy, 2009d), Remedial Design (ChaduxTt, 2011, 2012), Remedial Action Work Plan (RAWP; ERRG, 2012d) and RACR (ERRG, 2015).
- Groundwater monitoring to verify plume stability or that the groundwater remedy continues to meet the RGs defined in the Amended Parcel B ROD.
- Land use and activity restrictions and institutional controls, implemented through a CRUP and federal quitclaim deed, to prevent or minimize exposure to residual COCs in the soil, soil vapor, and groundwater. The entire Parcel includes restrictions related to the Durable Cover.

The requirements for inspection, maintenance, and reporting of these remedy components are provided in the O&M Plan for Parcel B-1 (ERRG, 2016)[1] and the Remedial Action

[1] The O&M Plan for Parcel B-1 (revised draft final, April 2016) covers the inspections, maintenance, and repairs required for the site-wide durable covers and the O&M and monitoring of the IR Site 10 SVE system.

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Monitoring Plan (ChaduxTt, 2011 and 2012)[2] and Final Basewide Groundwater Monitoring Program Sampling and Analysis Plan (CE2-Kleinfelder Joint Venture, 2011a,b, 2012a,b, and 2014)[2], which may be revised from time to time.

The radiological corrective actions in Parcel B-1 are complete and no radiological restrictions remain on Parcel B-1. The California Department of Public Health (CDPH) issued the Radiological Unrestricted Release Recommendation for Parcel B-1 in July 2012 and reinstated the Radiological Unrestricted Release Recommendation for Parcel B in April 2016 stating that Parcel B is suitable for unrestricted use with respect to radiological issues (CDPH, 2012 and 2016).

~~2.2.1.1~~ ***2.3.1.3 Areas Subject to Special Protocols***

The following areas on Parcel B-1 are subject to special protocols as summarized above in Section 2.1. A tabular summary of those areas subject to special protocols is presented in Table 2-1.

2.3.1.3.1 Areas Requiring Location-Specific Construction Worker Health and Safety Protocol

The FFA Signatories have determined that soil beneath certain building foundations at Parcel B-1 may contain unexpected levels of chemicals that have been previously remediated in soil surrounding the buildings. Specific chemicals of potential concern include metals, PCBs, PAHs, SVOCs, and VOCs. Location-specific health and safety protocols are required, as set forth in Section 5.1.2, if and when building foundations are removed in the following locations (refer to Figure 2-1):

- Building 113 and 113A – Soil excavated from beneath the building slab should be monitored during and after demolition for unexpected conditions. Health and safety protocol should consider the potential presence of PCBs, PAHs, and VOCs.
- Building 123 – Soil excavated from beneath the building slab should be monitored during and after demolition for unexpected conditions. Health and safety protocol should consider the potential presence of PAHs, PCBs, and VOCs.
- Building 146 – Soil excavated from beneath the building slab should be monitored during and after demolition for unexpected conditions. Health and safety protocol

[2] Long-term groundwater monitoring is performed in accordance with the Remedial Action Monitoring Plan and the final BGMP Sampling and Analysis Plan and addenda.

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should consider the potential presence of lead, cadmium, PCBs, SVOCs, and VOCs.

~~2.2.1.1.1~~*2.3.1.3.2 ARIC for VOCs in Soil Vapor*

Parcel B-1 includes ARICs for VOCs in soil vapor as identified on Figure 2-1. Construction of utility corridors and inhabited buildings within these areas must comply with standards and protocols as set forth in Sections 5.8.2 and 5.8.3 of the RMP.

2.3.1.3.3 Areas with COCs in Groundwater

In Parcel B-1, the IR-10 groundwater area contains residual concentrations of VOCs (ERRG, 2015) with exceedances of the vinyl chloride RG in wells IR10MW59A, IR10MW61A, and IR10MW71A (CE2-Kleinfelder, 2015b). The location of VOCs in groundwater in IR-10 is identified on Figure 2-1. Work in these areas must comply with standards and protocols as set forth in Section 5.8.1 and 5.8.3 of the RMP.

2.3.1.3.4 Areas with COCs in Soil Above RGs or PSC

There are no known areas with COCs in soil above RGs or PSC on Parcel B-1 subject to special soil handling and management protocols.

2.3.1.3.5 Petroleum NFA Areas With No Restrictions

Cleanup and closure of petroleum areas of concern (AOC) or borings of concern within Parcel B-1 has been completed. RWQCB staff issued NFA letters closing the Parcel B-1 petroleum AOCs (RWQCB, 2012a, c-g; 2013b-j). The RWQCB concurred with the Navy's recommendations of NFA with no restrictions and designated the sites as suitable for residential use. Soil in these areas, however, may exhibit visual and/or olfactory evidence of petroleum. The areas where soil may exhibit visual and olfactory evidence of petroleum impacts are: AOCs 7-E and 46-D, which overlap with IR-7/18; 10-A; 10-B; 10-C; 23-A; 23-B; 24-B; 24-D; 24-E; 26-A; 46-C; 46-E1; 46-E2; 60-A; 60-B; 61-A; and 61-B (depicted on Figure 2-1).

Abandoned conveyance pipes coated with a corrosion-resistant material containing PAHs may be present below ground surface at Parcel B-1[3], and must be handled in accordance with all applicable federal, state, and local laws and regulations. The pipes and their

[3] It has been confirmed that petroleum AOC 24-E contains pipes coated with a corrosion-resistant material containing PAHs (RWQCB, 2015b).

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associated coating material in the subsurface do not present a threat to human health or the environment and will not present a threat to human health or the environment if handled in accordance with applicable laws (Navy, 2015a).

2.3.1.3.6 Petroleum NFA Areas With Restrictions

There are no known Petroleum Corrective Action Areas that have been closed with Restrictions on Parcel B-1.

2.3.1.3.7 Areas with Residential Use Restrictions

There are no areas with residential use restrictions on Parcel B-1.

2.3.2 Installation Restoration Sites 7 and 18 (IR-7/18)

The area referred to as Installation Restoration Sites 7 and 18 (IR-7/18) consists of approximately 14.2 acres comprised of two adjacent IR sites, IR Site 7, and IR Site 18, located in the northwest corner of Parcel B-1 (See Figure 2-1.) IR-7/18 is bounded to the northeast by the San Francisco Bay, non-Navy property to the northwest and southwest, and the remainder of Parcel B-1 to the southeast. Historically, IR-7/18 was created by depositing fill into the Bay, and later expanded with engineered fill materials consisting of local quarried bedrock and some construction debris during the 1950s and 1960s (ERRG, 2012a). Past activities at IR Site 7 include sandblasting and disposal of sandblasting grit and debris and debris associated with decontamination of radiologically contaminated ships involved in atomic weapons testing in the South Pacific. Past activities at IR Site 18 include ground surface releases of waste oil and use of fill materials contaminated with petroleum hydrocarbons. The land surface at IR-7/18 slopes from southeast to northeast toward the Bay. There are no structures present and vegetation consists of plants introduced to stabilize the constructed soil cover. (Navy, 2013a)

To aid in the transfer of non-restricted portions of IR-7/18, IR-7/18 has been delineated into three lots. Lot 1 is located along the southern boundary of IR-7/18, Lot 2 is located in the central and northern portion of IR-7/18, and Lot 3 is located along the eastern boundary of IR-7/18. The COCs at Lots 1 and 3 include metals, VOCs, SVOCs, including pesticides, PCBs, PAH, and TPH. The COCs released in sediment along the shoreline at Lot 3 include metals, pesticides, PCBs, and PAHs.

The RMP, which sets forth certain requirements or protocols that, if followed, will allow certain activities that are otherwise restricted to be performed without additional approval by FFA Signatories, applies to future development work that is conducted in Lots 1 and 3.

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The RMP does not apply to any future development work that is conducted in Lot 2. Lot 2 is comprised of the portion of IR-7/18 that is restricted because of the potential presence of ROCs[4]. Any future development work that is conducted in Lot 2 must be conducted in accordance with restrictions set out in the CRUP and deed restrictions for Lot 2 and will require the owner to obtain approval of a Restricted Activities Work Plan for Lot 2 by the FFA Signatories (see Section 4.2).

2.3.2.1 Environmental Condition in Lots 1 and 3

For CERCLA purposes, the Navy has historically included IR-7/18 as part of Parcel B. The Navy has completed remedial and removal actions in accordance with the Amended Parcel B ROD (Navy, 2009d). The final RACR for IR-7/18 was submitted in 2012 (ERRG, 2012a) and the FFA Signatories have concurred with the final RACR in their comments to the RACR (EPA, 2012).

As contemplated in the Amended Parcel B ROD, certain COCs remain in soil and soil vaopr at Lots 1 and 3, at levels and in conditions that the FFA Signatories have determined are consistent with the ROD Remedial Action Objectives. The COCs that remain in the soil at IR-7/18 Lots 1 and 3 include metals, VOCs, SVOCs, PCBs, PAHs and TPH (Navy, 2013a). The COC that potentially remain in soil vapor at IR-7/18 Lots 1 and 3 are VOCs. No COCs remain in groundwater. Notable environmental conditions are depicted on Figure 2-2.

2.3.2.2 CERCLA Remedy for Lots 1 and 3

The CERCLA remedy for Lots 1 and 3, approved in the Amended Parcel B ROD, included: i) excavation of soil and offsite disposal; ii) a Durable Cover as a physical barrier to cut off potential exposure to residual ubiquitous metals in soil; iii) shoreline revetment to protect potential ecological receptors in the Bay; iv) installation of soil gas probes to allow for monitoring under the base-wide soil gas monitoring program; and v) ICs.

The RA in IR-7/18 was completed in 2011 and the FOST documents that the IR-7/18 CERCLA remedy is in place. Components of the remedy in Lots 1 and 3 that remain to

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[4] ROCs that might be present in Lot 2 at depths greater than four feet below the Navy installed surface include cesium-137, radium-226, and strontium-90. The Navy has implemented the CERCLA remedy for radionuclides in structures and soil at Lot 2, which consists of survey, decontamination, excavation, disposal, groundwater monitoring, and institutional controls.

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ensure that human health and environment are protected from potential long-term health risks include:

- A Durable Cover to prevent contact with residual ubiquitous metals throughout IR-7/18 in soil. The IR-7/18 Durable Cover includes a small area of revetment in Lot 3 and soil covers as defined in the Amended Parcel B ROD (Navy, 2009d), Remedial Design (ChaduxTt, 2010), RAWP (ERRG, 2010) and RACR (ERRG, 2012a).
- Land use and activity restrictions and institutional controls, implemented through a CRUP and federal quitclaim deed, to prevent or minimize exposure to residual COCs in the soil, soil vapor, and groundwater. Lots 1 and 3 include restrictions related to the Durable Cover.

The radiological corrective actions in Lots 1 and 3, which included a few small sections of sewer and storm drain removals, are complete and no radiological restrictions remain. CDPH issued a Radiological Unrestricted Release Recommendation for Parcel B, which included the small sections of sewer and storm drain removals in these lots, in July 2012 (CDPH, 2012).

2.3.2.3 Areas Subject to Special Protocols

The following areas on IR-7/18 Lots 1 and 3 are subject to special protocols as summarized above in Section 2.1. A tabular summary of those areas subject to special protocols is presented in Table 2-1.

2.3.2.3.1 Areas Requiring Location-Specific Construction Worker Health and Safety Protocol

There are no known areas requiring location-specific construction worker health and safety protocol within Lots 1 and 3 of IR-7/18.

2.3.2.3.2 ARIC for VOCs in Soil Vapor

The entirety of Lots 1 and 3 in IR-7/18 are included in an ARIC for VOCs in soil vapor as identified on Figure 2-2. Construction of utility corridors and inhabited buildings within these areas must comply with standards and protocols as set forth in Sections 5.8.2 and 5.8.3 of the RMP.

2.3.2.3.3 Areas with COCs in Groundwater

There are no known areas with COCs in groundwater in Lots 1 and 3.

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2.3.2.3.4 Areas with COCs in Soil Above RGs or PSC

There are no known areas with COCs in soil above RGs or PSC on Lots 1 and 3 of IR-7/18 subject to special soil handling and management protocols.

2.3.2.3.5 Petroleum NFA Areas With No Restrictions

Cleanup and closure of petroleum AOCs within IR-7/18 Lots 1 and 3 have been completed. AOCs located in or partially in Parcel B IR-7/18 Lots 1 and 3 include 7-B, 7-E, 18-B, and 46-D. RWQCB staff issued NFA letters closing the IR-7/18 petroleum areas of concern in 2012 (RWQCB, 2012a,b,f), concurring with the Navy's individual site closeout reports' recommendation for NFA with no restrictions. The Durable Cover and institutional controls designed to be protective of exposure to the other COCs at IR-7/18 (metals and organic chemicals) also provides protection from exposure to any residual petroleum materials in the subsurface (Navy, 2013a). Soil in these areas, however, may exhibit visual and/or olfactory evidence of petroleum. The areas where soil may exhibit visual and olfactory evidence of petroleum impacts in Lots 1 and 3 are AOCs 7-B, 7-E, 18-B and 46-D (RWQCB, 2012a,b).

2.3.2.3.6 Petroleum NFA Areas With Restrictions

There are no known Petroleum Corrective Action Areas with Restrictions on Lots 1 and 3 of IR-7/18.

2.3.2.3.7 Areas with Residential Use Restrictions

There are no areas with residential use restrictions on IR-7/18, Lots 1 and 3.

2.3.3 Parcel G

Parcel G includes about 40 acres in the central area of HPS and is bounded by Parcels UC-1 to the north, Parcels C and D-1 to the east, Parcels D-1 and E to the south, and Parcels E and UC-1 to the west (Figure 1-1) (Navy, 2015c). The land surface at Parcel G is entirely covered with hardscape that consists of asphalt, concrete, or building foundations and slopes gently from northwest to southeast toward the bay (Navy, 2015c).

Historically, Parcel G was part of the industrial support area at HPS and used for shipping, ship repair, laboratory, office and commercial activities (Navy, 2007). As a result of past industrial activities in Parcel G, the COCs released in soil include metals; VOCs; SVOCs, including pesticides; PCBs; PAHs; and TPHs. ROCs at the Property include cesium-137,

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radium-226, and strontium-90. COCs in groundwater are primarily VOCs and selected metals.

2.3.3.1 Environmental Condition

The Navy has completed remedial and removal actions in accordance with the Parcel G ROD (Navy, 2009c). The final RACR for the soil excavation and stockpile removals at Parcels B, D-1, and G was submitted in October 2011 (ERRG, 2011). The final RACR for Parcel G was submitted in 2014 (Arcadis, 2014) and the FFA Signatories have concurred with the final RACR (EPA, 2014a,b).

As contemplated in the Parcel G ROD, certain COCs remain in soil, soil vapor, and groundwater at Parcel G at levels and in conditions that the FFA Signatories have determined are consistent with the ROD Remedial Action Objectives. The COCs that remain in soil above the RGs and ALs include metals, including arsenic, chromium VI, cobalt, lead, and manganese, and PAHs benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene (Navy, 2009d; *Navy, pending*). COCs in soil vapor that remain at Parcel G include the VOCs benzene, carbon tetrachloride, chloroform, tetrachloroethene (PCE), and TCE and their degradation products (Sealaska, 2013). COCs that remain in A-aquifer groundwater include VOCs benzene, carbon tetrachloride, chloroform, PCE, TCE, their degradation products, and total xylenes (Navy, 2010c; Arcadis, 2014). COCs are not present in B-aquifer groundwater at levels that may pose a health risk (Navy, 2009c). COCs are not present in groundwater in the A or B aquifers at levels that may pose potential environmental impacts to the Bay. However, the Navy continues to conduct groundwater monitoring for chromium VI to confirm that concentrations remain below the RG (ERRG, 2014b). Notable environmental conditions at Parcel G are depicted on Figure 2-3 and further described in the following Sections.

2.3.3.2 CERCLA Remedy

The CERCLA remedy, approved in the Parcel G ROD, included: i) excavation and offsite disposal of soil in selected areas; ii) installation of durable covers across all of Parcel G as physical barriers to cut off potential exposure to soil; iii) removal of two soil stockpiles and offsite disposal; iv) active groundwater treatment by injection of zero-valent iron (ZVI) or a biological substrate to destroy VOCs and treat hexavalent chromium in groundwater; v) long-term groundwater monitoring; vi) a soil vapor survey; vii) ICs; and vii) cleanup of radiologically impacted soil and structures.

The RA in Parcel G was completed in 2014 and the FOST documents that the Parcel G CERCLA remedy is in place. The USEPA, DTSC, and RWQCB have concurred with the

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FOST (USEPA, *pending*; RWQCB, *pending*; *DTSC, pending*). Components of the remedy that remain to ensure that human health and environment are protected from potential long-term health risks include:

- A Durable Cover over the entire Parcel to prevent contact with residual ubiquitous metals in soil. The Parcel G Durable Cover is defined as hardscape (e.g., asphalt, building foundations, concrete pads, sidewalks, etc.) in the ROD (Navy, 2009c), Remedial Design (RD; Navy, 2010b), RAWP (Arcadis, 2012) and RACR (Arcadis, 2014 and ERRG, 2014a).
- Groundwater monitoring to verify plume stability or that the remedy continues to meet the RGs defined in the Parcel G ROD.
- Land use and activity restrictions and ICs, implemented through a CRUP and federal quitclaim deed, to prevent or minimize exposure to residual COCs in the soil, soil vapor, and groundwater. The entire Parcel includes restrictions related to the Durable Cover.

The radiological corrective actions in Parcel G are complete and no radiological restrictions remain on Parcel G. CDPH issued the Radiological Unrestricted Release Recommendation for Parcel G in 2012 and reinstated the Radiological Unrestricted Release Recommendation for Parcel G in April 2016 stating that Parcel G is suitable for unrestricted use with respect to radiological issues (CDPH, 2012 and 2016).

2.3.3.3 Areas Subject to Special Protocols

The following areas on Parcel G are subject to special protocols as summarized above in Section 2.1. A tabular summary of those areas subject to special protocols is presented in Table 2-1.

2.3.3.3.1 Areas Requiring Location-Specific Construction Worker Health and Safety Protocol

The FFA Signatories have determined that soil beneath certain building foundations at Parcel G may contain unexpected levels of chemicals that have been previously remediated in soil surrounding the buildings. Specific chemicals of potential concern include PCBs, PAHs, metals, petroleum hydrocarbons and VOCs. Location-specific health and safety protocols are required, as set forth in Section 5.1.2, if and when building foundations are removed in the following locations (refer to Figure 2-3):

- Building 366 – Soil excavated from beneath the building slab should be monitored during and after demolition for unexpected conditions. Health and safety protocol

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should consider the potential presence of chlorinated VOCs, PAHs, TPH, and metals (lead and antimony).

- Building 408 – Soil excavated from beneath the former building slab should be monitored during and after demolition for unexpected conditions. Health and safety protocol should consider the potential presence of PCBs, PAHs, chlorinated VOCs, TPH, and metals (lead and cadmium).
- Building 411 – Soil excavated from beneath the building slab should be monitored during and after demolition for unexpected conditions. Health and safety protocol should consider the potential presence of PCBs, PAHs, chlorinated VOCs, TPH, and metals (lead, cadmium, chromium, hexavalent chromium, nickel and mercury).
- Building 418 – Soil excavated from beneath the building slab should be monitored during and after demolition for unexpected conditions. Health and safety protocol should consider the potential presence of PCBs, PAHs, chlorinated VOCs, TPH, and metals (lead, cadmium, chromium, hexavalent chromium, copper and zinc).
- Building 436 – Soil excavated from beneath a portion of the building slab should be monitored during and after demolition for unexpected conditions. Health and safety protocol should consider the potential presence of PCBs, chlorinated VOCs, benzene, toluene, ethylbenzene, xylenes, and metals (lead, cadmium and mercury).
- Building 439 – Soil excavated from beneath the building slab should be monitored during and after demolition for unexpected conditions. Health and safety protocol should consider the potential presence of PCBs chlorinated VOCs, benzene, toluene, ethylbenzene, xylenes, and metals (lead, cadmium and mercury).

2.3.3.3.2 ARIC for VOCs in Soil Vapor

Parcel G includes ARICs for VOCs in soil vapor as identified on Figure 2-3. Construction of utility corridors and inhabited buildings within these areas must comply with standards and protocols as set forth in Sections 5.8.2 and 5.8.3 of the RMP.

2.3.3.3.3 Areas with COCs in Groundwater

The COCs in groundwater at Parcel G are a limited number of VOCs.

COCs at the former IR-09 plume included chloroform, methylene chloride, and TCE and degradation products. Groundwater remediation performance monitoring continues at the former impacted area in IR-09 North for chloroform, TCE and vinyl chloride at well

IR09MW07A. The former IR-09 plume is not expected to pose a vapor intrusion risk to future residents based on COC concentrations less than RGs. Soil vapor sampling results collected in the general areas corresponding to the former IR-71 East and former IR-09 North areas in 2010 did not indicate concentrations that would pose an unacceptable risk to potential future residential receptors via vapor intrusion under documented site conditions.

COCs at the former IR-33 plume included benzene, carbon tetrachloride, chloroform, naphthalene, TCE and degradation products, and total xylenes. Groundwater remediation performance monitoring continues at the former impacted area in IR-33 for carbon tetrachloride and chloroform at well IR33MW64A. Groundwater remediation performance monitoring at the former impacted area in IR-33 has been discontinued for benzene, naphthalene, TCE, and total xylenes. Well IR33MW64A is located in a designated ARIC for VOCs in soil vapor. Soil vapor sampling results in the general area located outside the ARIC for VOCs in soil vapor in 2010 did not indicate concentrations that would pose an unacceptable risk to potential future residential receptors via vapor intrusion under documented site conditions.

COCs at the former IR-71 plume included carbon tetrachloride, chloroform, and PCE, TCE, and degradation products. Groundwater remediation performance monitoring continues at the former impacted area in IR-71 East for PCE, TCE and vinyl chloride at wells IR71MW03A and IR71MW04A. At the IR-71 plume, PCE and TCE are present in groundwater at concentrations that slightly exceed their respective RGs, but concentrations of these COCs have demonstrated an overall decreasing trend since groundwater treatment in 2008. While concentrations of PCE and TCE in groundwater at the IR-71 plume (well IR71MW03A) indicate a potential VI risk to future residents, soil vapor concentrations in the vicinity of well IR71MW03A do not present a significant VI risk to residential receptors (Sealaska, 2013).

Chloroform was identified as a COC at non-plume wells IR44MW08A and IR09MW44A. Groundwater remediation performance monitoring was discontinued at wells IR44MW08A and IR09MW44A in 2012 and 2008, respectively.

Work in these areas must comply with standards and protocols as set forth in Section 5.8.1 and 5.8.3 of the RMP.

2.3.3.3.4 Areas with COCs in Soil Above RGs or PSC

There are no known areas with COCs in soil above RGs or PSC on Parcel G subject to special soil handling and management protocols.

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2.3.3.3.5 Petroleum NFA Areas With No Restrictions

RWQCB staff issued NFA letters closing the Parcel G petroleum corrective action areas in 2011 (RWQCB, 2011a-h), determining that residual contamination left-in-place is below PSCs and pose no significant risk to human health or the environment. Soil in these areas, however, may exhibit visual and/or olfactory evidence of petroleum. The areas where soil may exhibit visual and olfactory evidence of petroleum impacts are: AOCs 33-A, 33-B, 33-C, 37-A, 45D-A, and 65-A, and borings IR34B018, IR34B023, IR71B008, and PA45TA00. These areas are depicted on Figure 2-3. This soil may be managed without restriction, subject to the protocol in Section 5.4.4.1 of this RMP unless an unexpected condition is encountered, such as evidence of free petroleum liquid or petroleum sheen on the soil, in which case, soil management will follow the protocol in Section 5.11.

2.3.3.3.6 Petroleum NFA Areas With Restrictions

There are no known Petroleum Corrective Action Areas with Restrictions on Parcel G.

2.3.3.3.7 Areas With Residential Use Restrictions

There are areas of Parcel G where residential use is restricted because there are COCs in soil above residential Action Levels include the metals arsenic, chromium VI, cobalt, lead, and manganese, and the PAHs benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene, as depicted on Figure 2-3. These areas are subject to special soil handling and management protocols described in Section 5.4.

~~2.3.3~~2.3.4 Parcels UC-1 and UC-2

Parcel UC-1 includes a portion of Spear Avenue and is bounded on the north by Parcels A and D-2, on the east by Parcel UC-2, on the south by Parcels E and G, and on the west by Parcel UC-3 (Figure 1-1). Historically, most of the area associated with Parcels UC-1 and UC-2 has been a paved roadway or parking area. Parcel UC-1 is nearly completely paved and includes two buildings, associated asphalt parking areas, and a small unpaved hillside area. Parcel UC-2 includes portions of Fisher Avenue and Robinson Street and is bounded on the north, east, and south by Parcel C and on the west by Parcel UC-1 and former Parcel A. Historical use of the southern portion of Parcel UC-2 is as a roadway (Fisher Avenue), and the northern portion is as a triangularly shaped parking lot. The property is mostly paved, except for the steep unpaved hillside bordering Fisher Avenue, which is covered by vegetation (Navy, ~~2015~~2015b).

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TABLE 2-1
AREAS SUBJECT TO SPECIAL PROTOCOLS
Phase II Development Area
Former Hunters Point Shipyard, San Francisco, California

SPECIAL PROTOCOL	PARCEL CONDITION														
	Parcel B-1			IR-7/18 Lots 1 and 3			Parcel G			Parcel UC-1			Parcel UC-2		
	Soil	Soil Vapor	Groundwater	Soil	Soil Vapor	Groundwater	Soil	Soil Vapor	Groundwater	Soil	Soil Vapor	Groundwater	Soil	Soil Vapor	Groundwater
Areas requiring location-specific construction worker health and safety protocol (RMP Section 2.1.1)	✓	-	-		-	-	✓	-	-			-	-		-
ARIC for VOC in soil vapor (RMP Section 2.1.2)	-	✓(1)	-	-	✓(1)	-	-	✓(1)	-	-	✓(1)		-	✓(1)	-
Areas with COCs in Groundwater (RMP Section 2.1.3)	-	-	✓(2)	-	-		-	-	✓(2)	-	-	-	-	-	✓(2)
Areas with COCs in soil above RGs or PSC (RMP Section 2.1.4)								-	-	-	-	-	-	-	-
Petroleum NFA areas with no restrictions (RMP Section 2.1.5)	✓	-	-	✓	-	-	✓	-	-	-	-	-	-	-	-
Petroleum NFA areas with restrictions (RMP Section 2.1.6)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Areas with Residential Use Restrictions (RMP Section 2.1.7)							✓								
Groundwater Management Plan required (RMP Section 5.8.1, 5.8.3)	-	-	✓	-	-	✓	-	-	✓	-	-	-	-	-	✓
Utility trench conduit migration controls (RMP Section 5.8.3)	-	✓	✓	-	✓	✓	-	✓	✓	-	-	-	-	✓	✓

Notes

(1) Note location of ARICs for VOCs in soil vapor on Figures 2-1~~. See RMP Section~~ through 2~~.2~~-4. Owner must submit ~~a Sub-Phase Work Plan or~~ an Activity Specific Work Plan that addresses a soil vapor survey or planned vapor intrusion mitigation.

(2) COCs remain in groundwater in remediation performance monitoring wells ~~IR-06MW54F and IR06MW55F~~ as documented in Section 2~~.1~~-3. Development work within a certain radial distance from ~~the~~a well with COCs in groundwater as specified in the most current EPA Vapor Intrusion Guidance must review the current Navy Basewide Groundwater Monitoring data and follow the protocol specified in the RMP as appropriate to address vapor intrusion risk for the current conditions.

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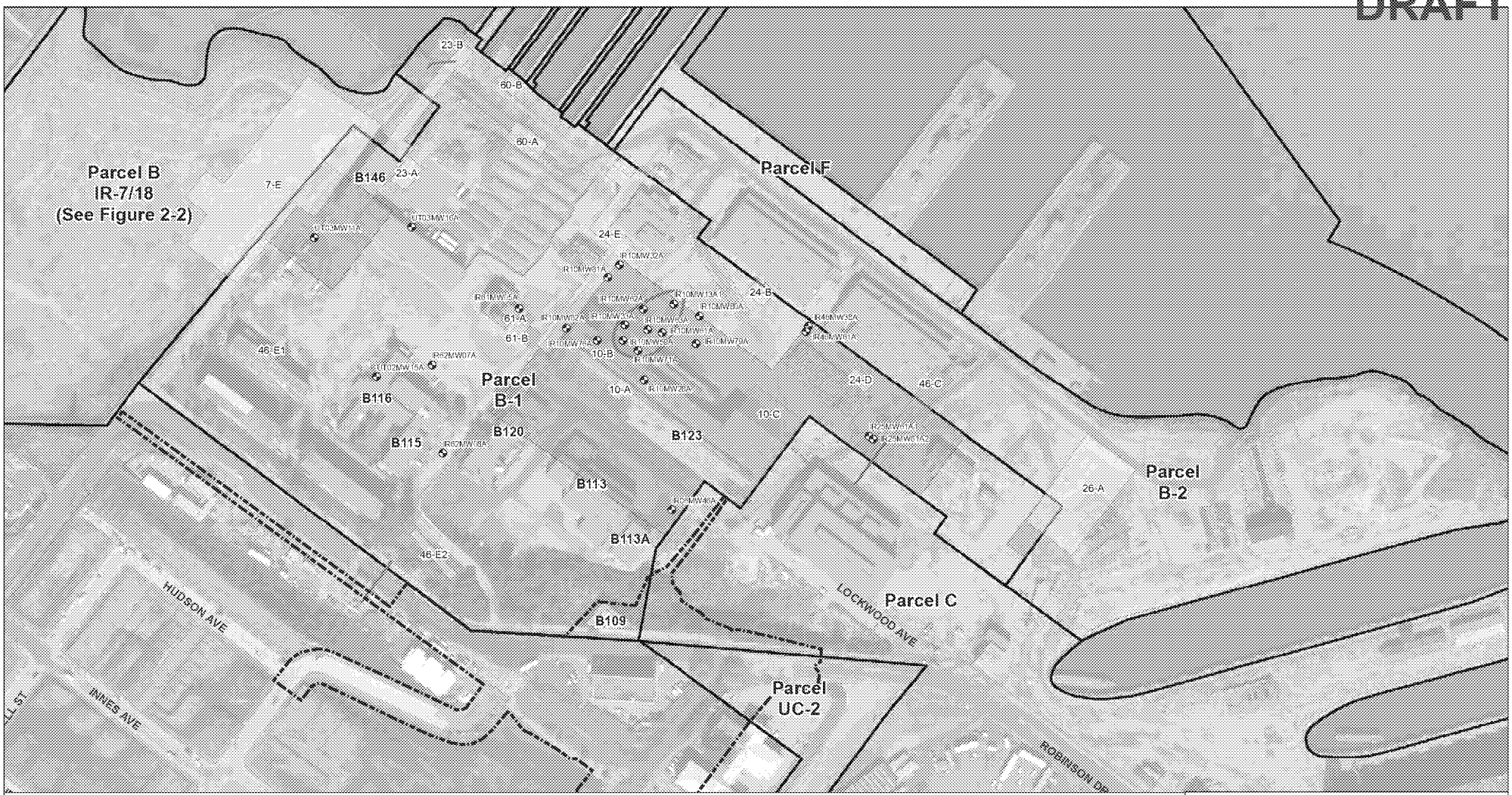

Legend

- Groundwater Monitoring Well

Tar-Wrapped Fuel Lines
- In Place

Asbestos-Wrapped Steam Lines
- In Place

Areas Requiring Institutional Controls (ARICs)
- VOCs

Groundwater Areas
- VOCs

NFA Sites
- NFA, Commingled
- NFA, TPH
- Navy Parcel Boundary
- Impact Area/Limit of Work

Notes:
VOC = volatile organic compound
NFA = no further action

Source
Draft FOST for Parcel B-1, March 2015
Draft RACR for Parcel B-1, February 2015
Aerial provided by ESRI, 2015.

N

0 200 Feet

Parcel B-1 Environmental Conditions
Hunters Point Artist Project
San Francisco, CA

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Figure 2-1

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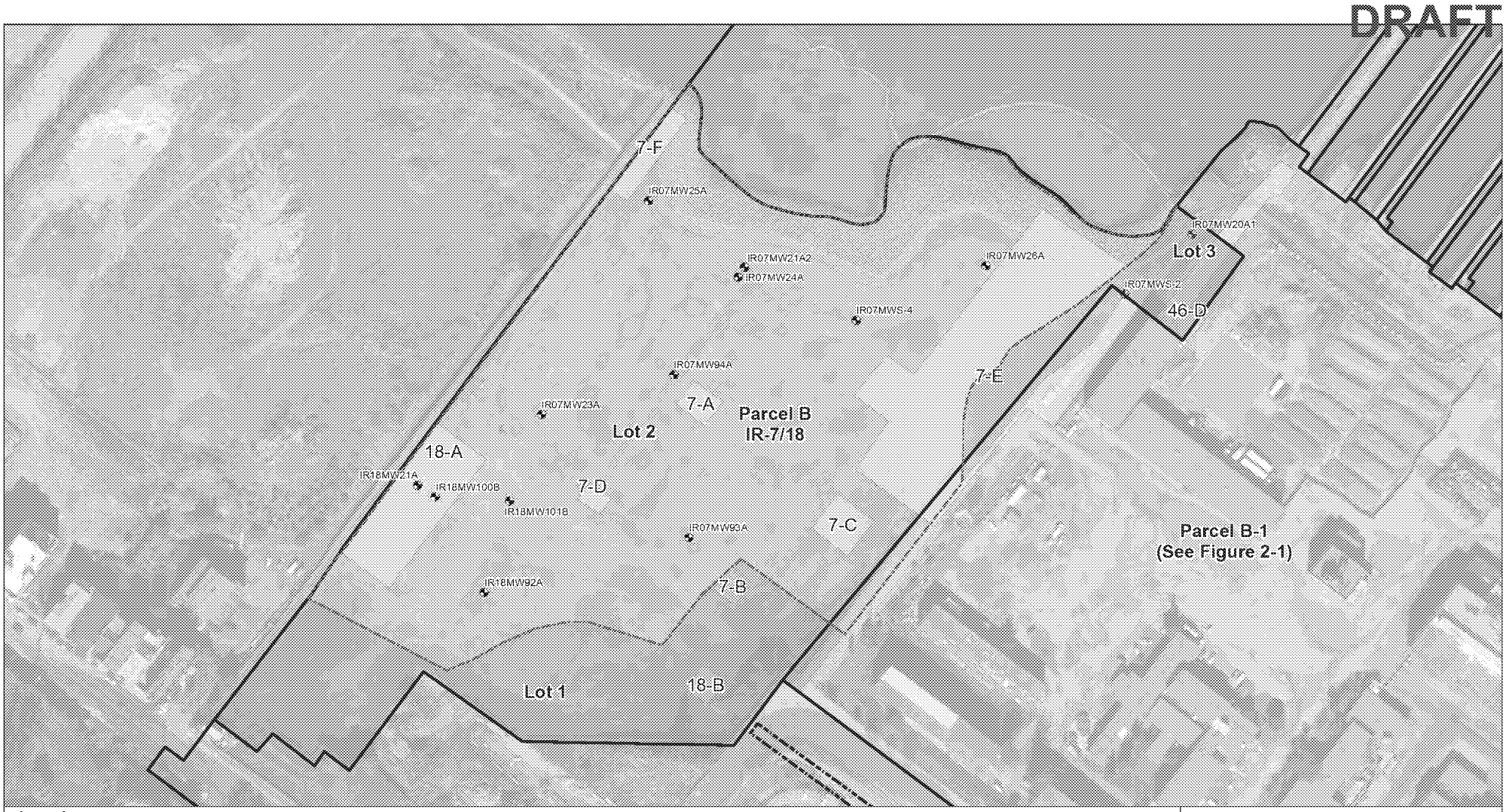

Legend

- Groundwater Monitoring Well

Areas Requiring Institutional Controls (ARICs)

- Radionuclides
- Shoreline Revetment
- VOCs
- Lot 2

NFA Sites

- NFA, TPH
- Navy Parcel Boundary
- Impact Area/Limit of Work

Notes:
VOC = volatile organic compound
NFA = no further action

Source
Final FOST for Parcel B – IR Sites 7 and 18, February, 2013.
Aerial provided by ESRI, 2015.

N

65 0 65 Feet

Lots 1 and 3, IR 7/18 Environmental Conditions
Hunters Point Artist Project
San Francisco, CA

Geosyntec consultants

Figure 2-2

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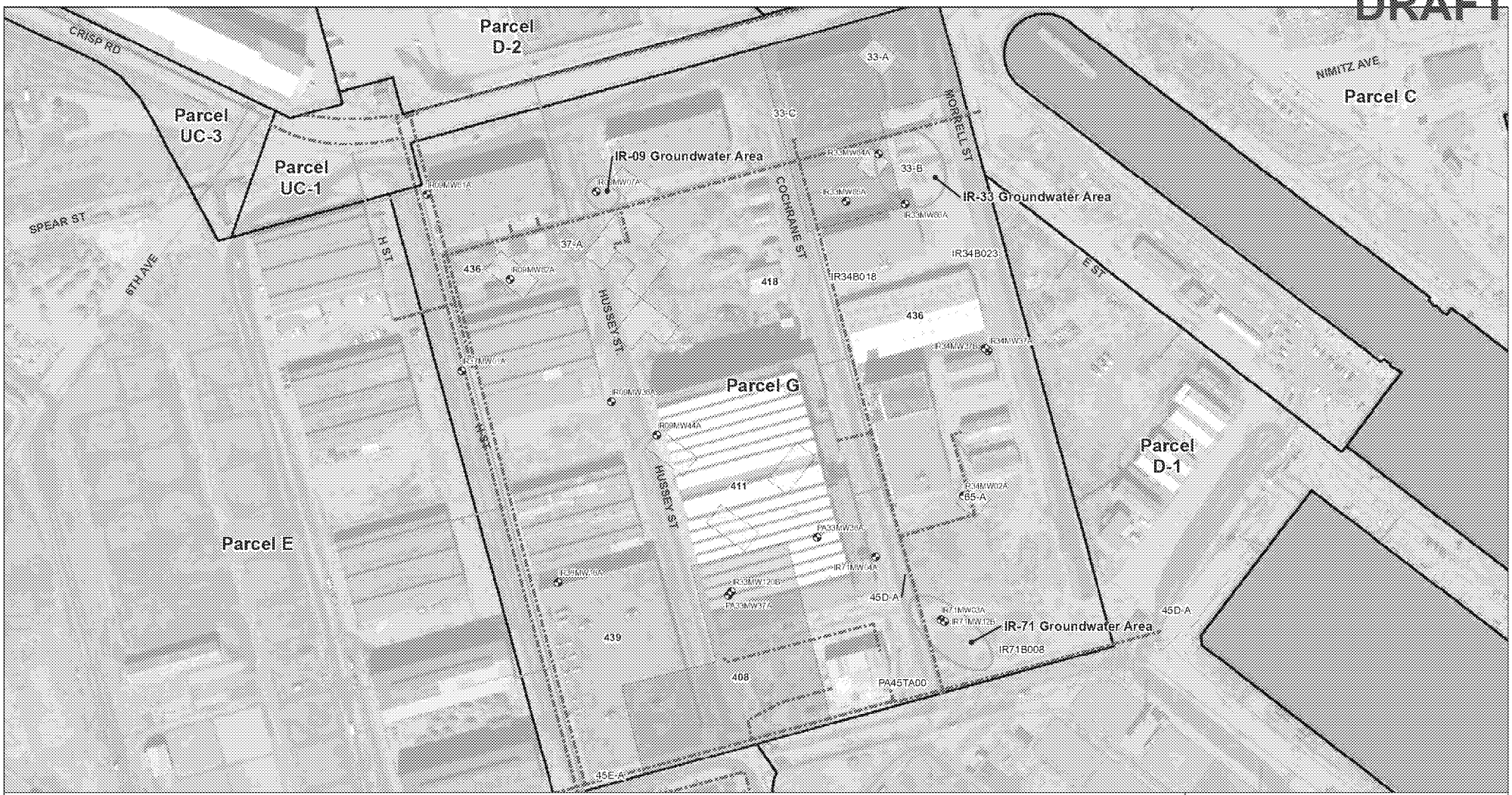

Legend

- Groundwater Monitoring Well
- Tar-Wrapped Lines (status uncertain)

Asbestos-Wrapped Steam Lines

- In Place

Area Requiring Institutional Controls (ARICs)

- Residential
- VOCs

Groundwater Areas

- Naphthalene
- VOCs

NFA Sites

- NFA, Commingled
- NFA, TPH
- Navy Parcel Boundary

Notes:
VOC = volatile organic compound
NFA = no further action

Source
Final FOST for Parcel G, June 2015

Aerial provided by ESRI, 2015.

N

0 200 Feet

Parcel G Environmental Conditions
Hunters Point Artist Project
San Francisco, CA

Geosyntec consultants

WR1247A | August 2016

Figure 2-3

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Cover or the temporary removal and replacement such that the underlying soil becomes exposed, then the protocol presented in this Section must be followed and documented in the Annual Report (Section 4.4). When digging in landscaped areas, workers will segregate any removed soil Durable Cover material from any removed HPS Bay Fill/Native Soil. Any removed HPS Bay Fill/Native Soil will be placed on a plastic barrier to prevent contamination of the underlying material (HPS Bay fill and Native Soil may be combined as the two will probably be indistinguishable).

Disturbance of the soil Durable Cover must follow the RMP requirements including the Dust Control Plan (DCP) and, if applicable, the Soil Import Plan (SIP). The DCP is included in Appendix E and ~~a~~the SIP ~~outline~~ is included in Appendix F. In addition, the construction Storm Water Pollution Prevention Plan (SWPPP) must address potential for run-off from the exposed soil while the durable cover is removed (see Section 5.6). When routine maintenance is complete, workers must document that the soil Durable Cover was replaced with either the clean segregated soil or with two (2) feet of imported clean soil that meets SIP requirements. The Durable Cover is to be replaced within ten (10) business days of the completed routine maintenance work. Annual Report documentation is to include photographs of the work, measured Durable Cover thickness, elevation survey, and a statement signed by the person(s) performing the maintenance activities that the work was completed as per this Durable Cover Protocol; this documentation will be attached to the RMP annual report form (see Appendix C).

It is the responsibility of each Owner to provide anyone working on the Site with a copy of this RMP prior to them performing any Restricted Activities and ensuring compliance with the RMP.

5.4 Soil Management Protocols

Except as otherwise provided below, HPS Bayfill and Native Soil within the boundaries of the Site may be moved within the Site and soil from Parcel A may be moved from Parcel A onto the Site without prior FFA signatory approval or the need for sampling, if and only if such soil will be placed underneath the required Durable Cover. In the event that placement of soil underneath the required Durable Cover is not accomplished immediately upon its removal, such soil is to be stockpiled within the Site, with adequate protection, as further described in Section 5.4.1, below, or removed from the Site for offsite disposal. Soil will be designated for offsite disposal, only when there is a surplus of soil from mass grading or if it constitutes an unexpected condition as described in Section 5.11. RMP guidelines for off-site disposal are provided in Section 5.4.1 below.

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HPS Bay Fill and Native Soil excavated in areas subject to a residential use restriction may be moved within the Site without prior FFA signatory approval or the need for sampling only if such soil will be placed underneath the required Durable Cover in an area of the Site that is also subject to a residential use restriction.

Soil at documented locations with known residual COC concentrations above ROD RGs or PSC must be managed as specified in Sections 5.4.3 and 5.4.4. Section 2.2 identifies such areas for each Parcel, as applicable.

Potential impacts from dust associated with the handling and movement of soil, soil compaction, soil stockpiling, off-haul, etc., will be addressed through the implementation of the DCP, described in Section 5.4.2 and included in Appendix E.

5.4.1 Soil Stockpile Management Protocols

Stockpiling of excavated HPS Bay Fill and/or Native Soil may be necessary on a temporary basis to support the logistical phasing of the redevelopment activities. Whenever possible, soil stockpiles will be located in close proximity to the work area or the ultimate disposition area as practicable within the Site. Stockpiles that contain contaminated soil will be placed on a physical barrier that prevents the contamination of the underlying soil. Examples of a physical barrier are a plastic membrane, concrete surface, or asphalt surface. Stockpiles will be labeled, covered, and monitored as documented in Appendix E (DCP) to prevent the windblown transport of contaminated dust from the stockpile. Occasionally, it may be necessary to place soil stockpiles temporarily outside the Site. When such occasion occurs, the Owner will request permission from the Navy to place soil stockpiles in areas that are still owned by the Navy.

Management of stockpiles containing hazardous substances and/or petroleum substances will include Site access control, storm water runoff control, and dust control requirements identified in this RMP. Access control will be accomplished as outlined in Section 5.10 of this RMP. Storm water runoff requirements will be specified in a project-specific SWPPP as identified in Section 5.6 of this RMP. The project-specific SWPPP will be generated for each project involving earth disturbing activity and is incorporated herein by reference. The DCP that will apply to all work is summarized below, and the detailed plan is included in Appendix E.

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Stockpiles will be under control of the Owner at all times and inspected/monitored as specified in the SWPPP and DCP to ensure access control, dust control, and runoff control measures are functioning adequately. At a minimum, stockpiles will be monitored by the contractor ~~at least~~ weekly to verify that the various controls are in place and functioning as intended.

5.4.2 Dust Control Plan

The DCP identifies the measures that will be taken to reduce particulate emissions during demolition of existing structures, grading, soil handling and stockpiling, vehicle loading, utility work, truck traffic and construction of site infrastructure. The DCP has been prepared in accordance with the requirements in Article 31 of the San Francisco Health Code and certain BAAQMD regulations often applicable to redevelopment activities. Exposure of onsite construction workers to dust containing COCs will be minimized, and generation of nuisance dust will also be minimized to comply with Article 22B of the San Francisco Health Code. The DCP is attached as Appendix E.

NOA has been found in the serpentine bedrock and fill soil throughout the Hunters Point area. Large construction projects occurring within these areas are subject to the California Air Resources Board Airborne Toxic Control Measures (ATCM). For projects where ~~surface~~ soil containing NOA will be disturbed in an area of one acre or larger (as defined in the ATCM), an Asbestos Dust Mitigation Plan (ADMP) will be submitted to and approved by the BAAQMD, as required. For projects less than one acre or for projects greater than one acre but for which no asbestos data exists, an evaluation will be performed to determine whether an ATCM-compliant ADMP is required prior to initiation of potential dust generating activities.

5.4.3 Soil Management Protocols for Location-Specific Areas with COCs Above RGs or PSC

The FFA Signatories agreed to leave soil in place with COC concentrations above ROD RGs or PSC in limited locations where the Navy and/or FFA Signatories have conducted a risk management evaluation and determined that potential health risks can be appropriately managed with the use of a Durable Cover. These locations are identified in Section 2.2 of this RMP for each Parcel, as applicable. If the existing Durable Cover above such soil is removed, the soil from the delineated areas identified in Section 2.2 must be handled in accordance with one or more of the following protocols:

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3. POTENTIAL SOURCES OF EMISSIONS

Planned site activities have the potential to generate particulate emissions in the form of fugitive dust emissions. Possible sources of particulate emissions include:

- Construction Traffic – Movement of construction equipment around unpaved portions of the construction area is capable of creating fugitive dust emissions in excavated or cleared areas. There is also the potential for vehicular traffic on paved or unpaved roads and parking lots to produce fugitive dust emissions.
- Demolition – Demolition of existing above and below grade structures ~~can produce fugitive dust emissions via excavation efforts, vehicular traffic traveling on un-paved portions of the Site and material handling operations~~ will be conducted through a variety of demolition techniques, which may include sawing, breaking, and excavation. Roads, parking lots, and other hardscape surface treatments will be demolished by grinding, sawing, and breaking, as appropriate for the material. Wherever possible, reclaimed material will be recycled and reused.
- ~~Site Preparation and Foundation Work – Grading, excavation of footings and foundations, and backfilling operations can produce both fugitive dust emissions.~~

  ~~Trenching Activities – Excavation~~ Potential sources of fugitive dust during demolition activities include impact hammers, saws and heavy equipment to reduce material size; and vehicular traffic traveling on un-paved portions of the Site to collect and transport the material. Equipment or tools will be fitted with a water spray system which directs water spray at the point where the tool contacts the structural material to reduce dust emissions at the source during the demolition activity. Details of these dust control BMPs are described in more detail in Section 4.
- Concrete Reclamation and Recycling – Due to the amount of concrete debris that may be generated and the amount of general and structural fill that will be required for development construction, CPDC has developed a plan to reclaim and recycle as much concrete as possible. Depending on the volume of debris, this may or may not occur on Site.

  Potential sources of fugitive dust during concrete crushing activity includes vehicle traffic on paved and dirt roads, movement of material from demolition

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areas to stockpiles, from stockpiles to the crusher, and from the crusher to the final processed material stockpiles. Dust control BMPs and protocol are described in Section 4 and generally entail applying spray water as the material is picked up from the stockpile and as the material is loaded into the hopper; crushing the material in an enclosed containment; utilizing water spray bars located at the end of each stage of the conveyor belt system which continuously apply a water mist to the crushed material; and applying water to processed material stockpiles or covering the stockpiles. Details of these dust control BMPs practices are described in more detail in Section 4.

- Site Preparation Prior to Placement of Fill Material – In advance of placement of fill material to raise Site elevations or as surcharge to facilitate compaction, existing surfaces must first be prepared to address geotechnical requirements. This preparation usually entails scarifying the existing ground surface to create an appropriate surface on which new material will be placed. The scarification process can be accomplished by several methods, the most common of which is called "ripping" and entails dragging a set of parallel metal teeth across the surface similar to a plow. Other means include running a sheep's foot roller compactor over the surface to create a series of indentations or breaking up the surface material. Prior to and during active scarification, water will be added to the soil being disturbed in these work areas to minimize the potential for dust generation. Once the scarification process is complete and prior to placement of fill or surcharge material, the disturbed areas will be kept moist throughout the work day. Details of these and other dust control BMPs are described in more detail in Section 4.

- Infrastructure Improvements – Infrastructure improvements include excavation and backfilling of trenches for the installation of underground utilities ~~can cause~~, rough and fine grading in preparation of road construction, forming and pouring concrete road base and sidewalks, and backfilling, grading, and re-vegetating of the disturbed areas.

- Potential sources of fugitive dust emissions:

  ~~Material Stockpiles~~ include vehicle traffic on paved and dirt roads, disturbance and movement of soil, trench backfill, loading of soil into dump trucks, and soil stockpiling. Stockpiles of excavated soil from trenching activities may contribute to windborne dust emissions. Details of the dust control BMPs for earth moving activities are described in more detail in Section 4.

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- ~~Cleanup and Grading – Backfilling, grading, and re-vegetating of the excavated areas may produce both fugitive dust emissions.~~

- Vertical Development – Upon completion of demolition, mass grading, and construction of the major infrastructure, the vertical construction will begin. In general vertical construction is not anticipated to generate significant dust as the majority of the area will be paved with hardscape. However, vertical construction will involve some minor earth moving activities for installation of foundation elements, connection to below-grade utilities already installed within the adjacent public rights-of-way, final grading and paving of parking lots, and landscaping. Potential sources of fugitive dust emissions include vehicle traffic on paved and dirt roads, disturbance and movement of soil, trench backfilling, loading of soil into dump trucks, and soil stockpiling. Details of the dust control BMPs for earth moving activities are described in more detail in Section 4.

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4.3 Construction Traffic

4.3.1 Track-out Prevention

Track-out of loose materials will be controlled using gravel pads along with a tire washing/cleaning station installed at the access point from the unpaved portion of the project Site to a paved road to prevent tracking of soil onto public roadways. The stabilized construction exit (gravel pads) will be installed according to the specifications provided in the Erosion and Sediment Control Plan of the Storm Water Pollution Prevention Plan (SWPPP) for the Site. All vehicle tires will also be inspected and washed as necessary to prevent track-out (at gravel ramps of at least 50 feet long) prior to entering the paved roadways. To the extent possible, heavy equipment will be left on the construction site to minimize the potential for track-out.

4.3.2 Traffic Control

Mitigation measures and BMPs will be followed to control fugitive dust emissions from construction traffic traveling on unpaved portions of the construction site and from construction traffic traveling from unpaved to paved portions of the Project Area as described in the following sub-sections.

4.3.2.1 Travel on Unpaved Surfaces

To the extent practicable, travel on unpaved surfaces within the construction site will be minimized and limited only to necessary construction vehicles. Fugitive dust emissions from construction traffic traveling on unpaved surfaces will be controlled with the following mitigation measures and BMPs:

1. All unpaved roads in the project construction Site will be watered at the start of each work day and prior to the movement of any equipment traveling on the unpaved portions of the active construction Site. All of these same unpaved roads will be watered at the end of the work day. In addition, active unpaved roads will be watered every two hours or frequently enough to maintain moisture conditions adequate to prevent the release of fugitive dust. The frequency of watering can be reduced, as appropriate, during periods of precipitation.
2. Vehicle speeds will be limited to ~~10~~ 5 miles per hour (mph) (~~16~~ 8 kilometers per hour [km/h]) on unpaved surfaces or 15 mph on paved surfaces within the

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construction Site. Speed limit signs will be posted at the construction Site entrances.

3. Vehicle trips will be reduced through efficient truck and equipment usage to reduce the potential for traffic-related dust.

~~3.~~4. Implementation of erosion control measures identified in the Construction SWPPP, will control fugitive dust emissions from pubic roadways and parking areas.

~~4.~~5. Gravel access pads will be constructed in the temporary stockpile locations. It will be the responsibility of the construction contractor to construct and maintain functional gravel access pads.

6. Any graveled areas within and around the stockpile area will be inspected during the daily inspections of the stockpiles (Section 4.4.6) and the gravel surface maintained as necessary to provide adequate dust control. The gravel cover should have a silt content that is less than five (5) percent and asbestos content that is less than 0.25 percent, as determined using an approved asbestos bulk test method, to a depth of three (3) inches on the surface being used from for travel.

~~5.~~7. Personal vehicles will not be parked within unpaved portions of the Site. Personal vehicles may be parked only on temporary graveled or paved parking areas.

~~6.~~8. To the extent possible, construction work vehicles (e.g., pick-up trucks) will park on paved or graveled areas within the site to avoid driving in unpaved areas.

4.3.2.2 Travel on Paved Surfaces

The following mitigation measures will be followed to control fugitive dust emissions from construction traffic traveling on paved surfaces:

1. The main access and egress routes to the construction site, which will be used by construction employees and delivery trucks, will be paved prior to the initiation of construction.
2. No construction vehicles will be allowed to enter or exit the unpaved portions of the construction site except through a treated exit (gravel pad and vehicle brush/wash station). Gravel pads will be installed at all unpaved area access/egress points to prevent tracking of soil on to public roadways. Wheel

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brushing stations will be constructed and used if track-out cannot be prevented by the gravel pad only. The wheel brushing stations will be upgraded to wheel washing stations if necessary to prevent track-out.

3. Construction areas adjacent to and above grade from any paved roadway will be treated with BMPs, as specified in the Construction SWPPP.

4. Any visible track-out on a paved road at any location where vehicles exit the construction site must be removed. If visible track-out is noted, removal must be done using wet sweeping, a high-efficiency particulate air (HEPA) filter-equipped vacuum device or other effective means of removing the track-out. The use of dry rotary brushes is expressly prohibited except where preceded or accompanied by sufficient wetting to limit the visible dust emissions. Use of blower devices is expressly forbidden.

5. All paved roads within or adjacent to the construction site will be swept twice daily with a wet sweeper if the roads were used by any construction vehicles that day or if there is evidence of visible dust (windblown or otherwise).

~~5.~~6. Additional water trucks will be utilized to aid in wetting paved public roads, and construction area roads as needed, throughout the day.

4.3.2.3 Additional Mitigation Measures for Traffic Control

If any of the above mitigation measures listed in Sections 4.1 through 4.3.2.2 fail to properly control fugitive dust emissions, one or more of the following reasonably available control measures will be applied:

1. Unpaved roads within active portions of the construction site will be watered or treated with dust control solutions to minimize the generation of visible dust due to wind and vehicle traffic. If watering is the chosen method, efforts will be made to maintain a continuously wet surface with water applied at a minimum frequency of every two hours and at the end of the day. If another liquid suppressant is chosen, then the manufacturer's application instructions will be followed so that a continuous dust suppressing layer is present.

2. Paved portions of the construction site will be swept at a frequency of at least every two hours with a wet sweeper and more frequently as necessary to control windblown dust and dust generated by vehicle traffic. Streets adjacent to the Construction Site will be swept as necessary to remove accumulated dust and

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soil. Water may also be applied to the paved roads if necessary to control fugitive dust.

~~2.~~3. Any designated haul roads, whether paved or unpaved, will be watered more frequently as necessary to control windblown dust and dust generated by construction vehicle traffic when in use by the contractor.

~~3.~~4. Physical or chemical stabilization compounds will be applied to control dust on unpaved roads where they were not previously applied.

~~4.~~5. Gravel, re-crushed/recycled asphalt or other material with low fines content (less than 5 percent) will be applied at a thickness of 3 or more inches, if necessary. Serpentine-containing material will not be used for this purpose.

~~5.~~6. Vehicle trips and vehicle speed on unpaved surfaces will be reduced.

4.3.3 Off-Site Transport

All vehicles that are used to transport solid bulk material and that have the potential to cause visible fugitive dust emissions will be covered with a tarp cover, or the materials will be sufficiently wetted and loaded onto the trucks in a manner to provide at least 1 foot of freeboard. This is most applicable for off-Site transport to a waste disposal facility. Trucks carrying loose soil or sand will be covered before they leave the construction Site, and on-Site vehicle speeds will be limited to ~~10~~ 5 mph (~~16~~ 8 km/h) or lower in unpaved construction areas.

Vehicles loads will be checked to ensure that they are appropriately covered and to remove any excess material on the shelf or exterior surfaces of the cargo compartment. No spillage can occur from holes or other openings in cargo compartments. All off-site haul trucks will access the construction sites via paved access roads and established gravel pads. Every off-site haul truck will proceed through the decontamination gravel pad/tire cleaning area prior to departure from the construction site. Site construction personnel will be stationed at the access point to monitor inflow/outflow to and from the Site. They will be responsible for inspecting all vehicles exiting and performing the cleaning of the tires.

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6. Limit the area subject to excavation, grading or other construction activity at any one time. Cover on-site storage piles of loose soil or sand.
7. For inactive disturbed surfaces, the following dust control methods will be used:
    a. A dust palliative will be applied in sufficient quantity to form a crust and create a stabilized surface.
    b. Backfill material will be wetted, covered, or contained when not actively handled.
    c. Inactive stockpiles (stockpiles that have existed for more than 7 days without any soil being added or taken away from the pile) will be covered or contained with a material such as plastic sheeting or more robust dust ~~pallative~~palliative;
    d. Stabilized and inactive stockpiles will be monitored on a routine basis at the beginning and end of each work shift, as well as once per weekend and once per 2 consecutive holidays, and dust suppression measures applied, where necessary, on an as-needed basis. At a minimum, touchup application of soil stabilizers will be applied to inactive stockpiles on a monthly basis or as necessary to maintain a viable cover.
    ~~d.~~e. Excavated materials will be stockpiled, segregated, and managed to facilitate sampling and analysis for NOA content and disposal characterization.

4.4.2 Crushing

In the event that a concrete crusher will be mobilized to the Site to crush and recycle concrete debris resulting from building and roadway demolition, crushing operations will be visually monitored for the appearance of fugitive dust. If dust is being generated, water will be applied to control the dust. Serpentinite materials containing asbestos will not be processed by the crusher. The following additional methods will be utilized to minimize concrete dust:

1. Use of specialized mechanized equipment such as high-reach excavators fitted with concrete pulverizers and shears to keep dust generation to a small localized area. Concrete crushing equipment utilized at the point of demolition will be fitted with water misters or foggers at the breaker head or claw, which will

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continuously spray water on the work surface during demolition to reduce dust generation.

2. During concrete reclamation and recycling operations, material stockpile and handling areas will be kept moist throughout the day and during the loading of concrete debris into the crusher. Water will be directed to the point where concrete enters the crushing jaw. The watering device will provide a continuous stream of water mist which the material must pass before falling into a processed material stockpile. All processed material stockpiles will be moistened throughout the work day and stabilized in accordance with section 4.4.6.

4.4.3 Demolition

Demolition activities will be monitored daily for the generation of fugitive dust. Water will be applied at the point(s) of demolition to minimize visible dust. The following methods will be utilized to minimize visible dust:

1. Prior to the commencement of daily demolition and material handling operations the active demolition area will be pre-wet.
2. Fugitive dust emissions from material handling and/or loading operations will be controlled by ensuring that all demolished material is adequately wetted during the handling and/or loading process.
3. Cover, wet or stabilize on-site piles of demolition debris.
4. Loader buckets will be emptied slowly and drop height from loader bucket minimized.
5. All loading activities will be halted during periods of sustained strong winds, defined as hourly average wind speeds of 25 mph (40 km/h or greater).
6. Prior to completion of demolition, water or other soil stabilizers will be applied to any disturbed areas as needed to prevent visible emissions.

4.4.4 Excavation Activities

Excavation activities will be visually monitored daily for the generation of fugitive dust. Water will be applied at the point of excavation, ~~or~~ drilling or disturbance to minimize visible dust. The following methods will be utilized to minimize visible dust:

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1. Soil will be pre-wetted prior to excavation to minimize visible dust. Additional water will be applied during active excavation, material handling, and loading. Active excavation areas will be wet a minimum of every two hours during dry weather or more frequently as needed. The disturbed area will be watered at the end of the day or a dust palliative can be applied according to manufacturer's instructions to stabilize the loose soil and prevent the release of fugitive dust.
2. The height from which excavated soil is dropped onto either stockpiles, haul trucks, or dewatering pads will be minimized and water sprays will be used to prevent dust generation when soils are dropped onto stockpiles or loaded into trucks.
3. Water will be applied during any rock processing operations, and a trained geologist will be present to observe the rock to be processed during the excavation to check for the presence of serpentinite rock. If present, serpentinite rock will be removed from the pile to be processed and treated separately.
4. A dedicated laborer will be assigned to each point of an excavation to sweep, shovel or otherwise push soil inadvertently dropped on adjacent paved roads within the construction area. If appropriate, an excavator may be used to push soil back into a trench
5. Installation of a misting system can be used up to as much as 24 hours per day as needed to aid in keeping soil moist after construction activity has ceased each day.
6. As an alternative to watering, dust palliatives may be applied in sufficient quantities to inactive disturbed areas so as to form a crust and prevent the release of fugitive dust.

4.4.5 Loading

Loading activities will be visually monitored daily for the generation of fugitive dust. The following methods will be utilized to minimize visible dust:

1. Fugitive dust emissions from loading operations will be controlled by ensuring that all excavated material is adequately wetted during the loading process. Soil will be pre-wetted prior to loading to minimize visible dust.

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2. Loader buckets will be emptied slowly, drop height from loader bucket minimized, and water sprays will be used to prevent dust generation when soils are dropped onto stockpiles or loaded into trucks.
3. All loading activities will be halted during periods of sustained strong winds, defined as hourly average wind speeds of 25 mph (40 km/h or greater).

4.4.6 Material Stockpiles

~~Fugitive~~A soil storage pile is considered active if material is added to, or removed from a soil storage pile within 7 calendar days. In order to control fugitive dust emissions from active soil storage piles one or more of the following control measures will be ~~controlled by using~~used:

1. Adequately wetting the exposed surface with water, at least once daily and at the end of each work day;
2. ~~Use of a~~A temporary cover~~, water, or a chemical~~ (plastic sheeting, tarp, etc.) during non-work hours;
3. Daily inspections of active storage piles during work activities to verify that piles are adequately wetted or covered as necessary to prevent dust ~~control agent. Soil stockpiles~~generation; and,
4. Inspection of storage piles once per weekend and once per 2 consecutive holidays to verify that piles are adequately wetted or covered as necessary to prevent dust generation.

Because increased truck traffic to the soil stockpile area may impact the surface of the asphalt or concrete Durable Cover, the roadways will be inspected weekly, along with the stockpile area, and repairs made to damaged roadways, as needed. ~~will be inspected weekly to verify that dust control measures are intact and effective at controlling dust emissions.~~

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4.6 Additional Requirements for Serpentine Material

SFDPH Article 31 includes specifications on mitigation measures to address post-excavation stabilization for exposed serpentine material. In a memo to SF Planning Department (SFDPH, June 2011) about this mitigation measure, SFDPH Environmental Health Section (EHS) requires that the exposed serpentine material be covered with one of the following cover types:

1. One foot of clean, non-asbestos-containing fill soil;
2. Hardscape; or
3. Vegetative cover that holds soil in place.

The construction schedule will be prioritized to the extent possible to install permanent cap over potentially asbestos containing soil by placement of concrete road base and curb/gutter. Imported clean aggregate base rock may be used for placement of the final 6 to 12 inches of necessary fill to raise the grade to final subgrade elevation and provide a cover over potentially asbestos containing soil.

The June 2011 memo also clarifies that specific "institutional controls" must be implemented "to prevent future exposure to naturally occurring asbestos from excavation activities." The purpose of the institutional control requirement is to assure that the post-excavation stabilization measure(s) will remain in place as long as the serpentine material is present. SFDPH EHS concludes in their June 2011 memo that the institutional control requirement is satisfied by the ongoing obligation to comply with the Building Code's Construction Dust Control and the Health Code's Article 31 requirements.

In addition, the 2010 Amendments to San Francisco Health Code Article 31 and the corresponding Implementing Regulations contain requirements for submittal of a Serpentinite Cover Plan and the requirement to describe the implementation of this Plan in the required Article 31 Closure Report submittal.

As needed, any remaining rock that will be processed will be tested to verify that it contains less than 0.25% asbestos by the CARB 435 Method. In addition, excavated materials, which will be transported off site, will be analyzed for asbestos content. Materials with greater than 1 percent by-weight asbestos will be handled and disposed of off-site in accordance with all requirements for proper disposal of asbestos.

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5.2.2 Perimeter Air Monitoring Instruments

Prevailing wind at Hunters Point is from the west or ~~southwest~~west-northwest and towards the east or ~~northeast~~southeast as shown on Figure 2. From time-to-time, there may be two or more separate work areas and decisions about monitoring can be made independently for each area. In addition, if the potential dust generating activities are contained within even smaller work areas within each parcel then decisions about those areas can be made independently.

Monitoring locations will initially be established based on the prevailing wind directions and will be checked regularly and adjusted if necessary to maintain downwind coverage.

Real-time particulate dust monitors will be used to monitor for particulates. The action level and details of the monitoring instruments, locations, and the monitoring frequency will be submitted by the master developer and approved by SFDPH EHS based on the Particulate Monitoring System and Approval Form attached in Appendix A. The details of the system (layout, number of monitors, etc.) can be changed, as needed, through email submittal and approval by email from SFDPH EHS. The use of this form and the ability to change the parameters of the monitoring are intended to allow flexibility within the overall objectives of the particulate monitoring program while still meeting or exceeding all health standards.

No particulate monitoring is required when the construction site is shut down and no work is being conducted and no vehicles are being driven on unpaved surfaces. This is the presumed condition on weekends and holidays.

National Ambient Air Quality Standards (NAAQS) and the California State Ambient Air Quality Standards (CSAAQS) are designed to protect the general public from airborne particulates generated in the urban, suburban and rural environments. The NAAQS and the CSAAQS are not meant to be applied to site specific actions and related air quality but instead are used in an attempt to attain city or region-wide ambient air quality goals for the benefit of the general public. The current standards are:

1. 24 Hour National Ambient Air Quality Standard
    - PM-10: 150 micrograms per cubic meter average per 24 hour day (Not to be exceeded more than once per year on average over 3 years)

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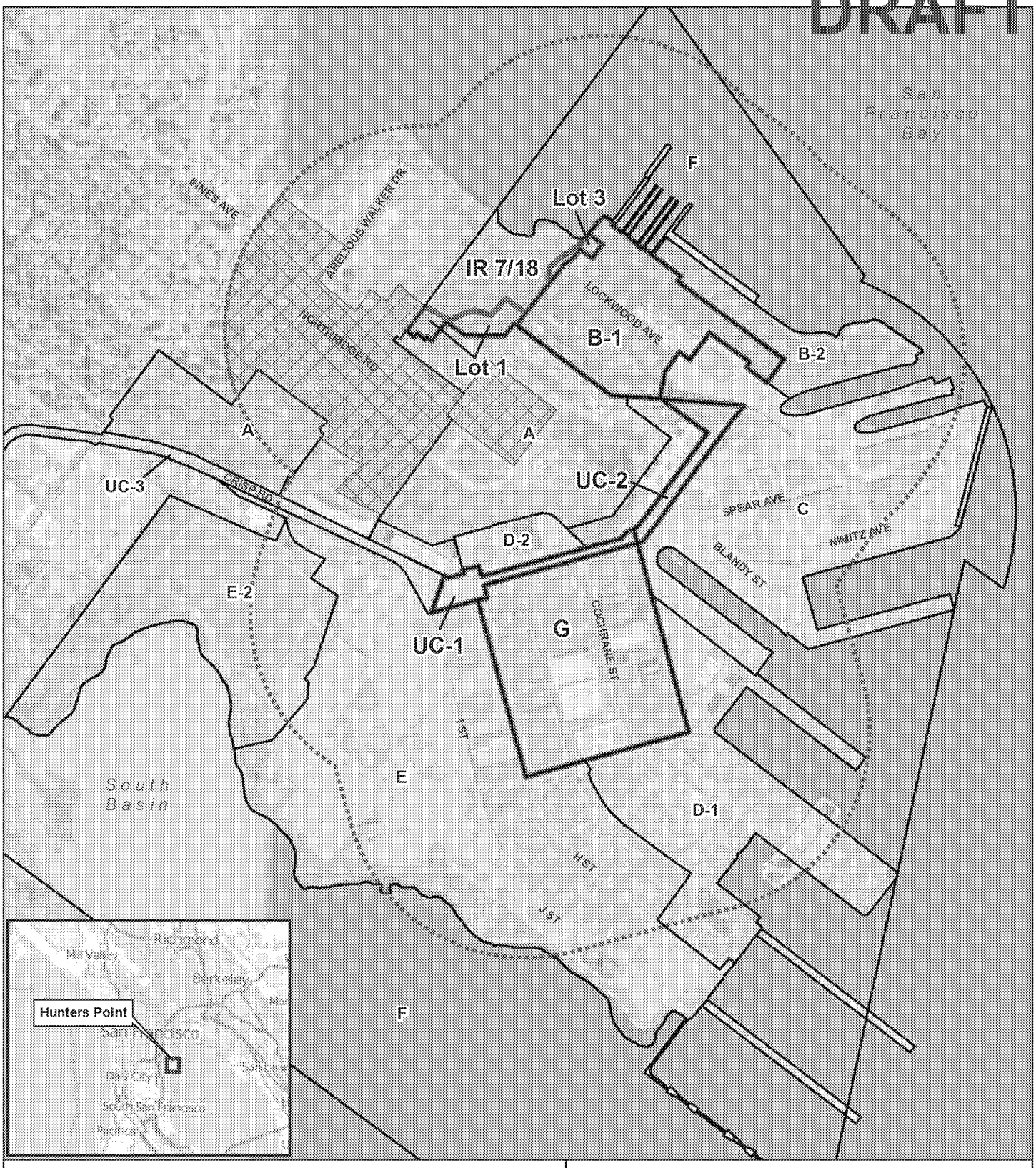

Legend

- 1/4 Mile Parcel Buffer
- Location of Potential Sensitive Receptor
- Navy Parcel Boundary
- Site Boundary

Basemap source: ESRI, 2014

N

0 1,000 Feet

Site Boundary with 1/4 Mile Buffer

Risk Management Plan
Hunters Point Shipyard, San Francisco, CA

Geosyntec consultants

WR1247A	June 2016	Figure 1

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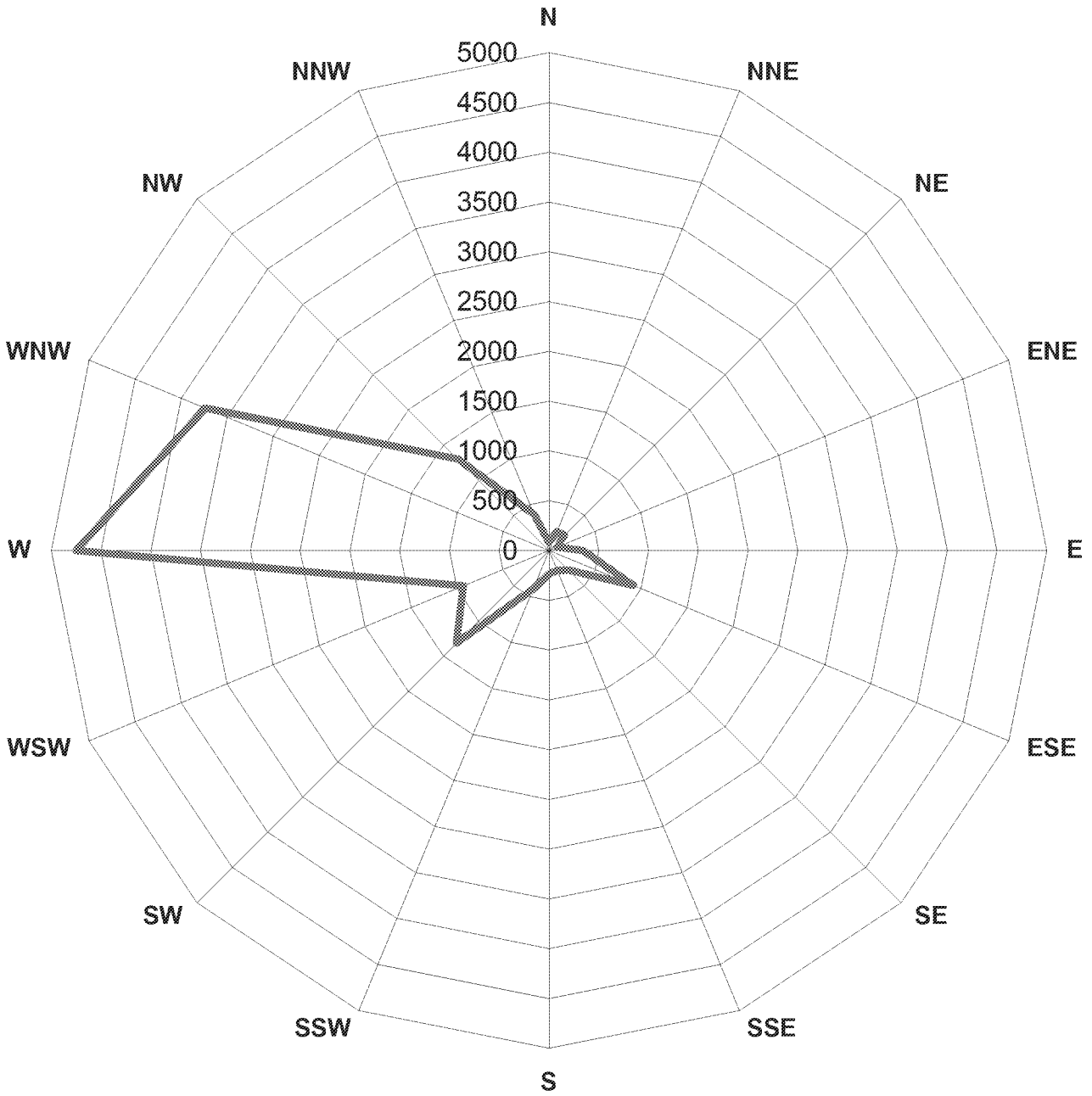

Number of events

Notes:

1. The wind rose represents wind direction data recorded at an onsite meteorological station for 2015. Data have been collected continuously since construction work began at Hunters Point; 15,000 data points were collected in 2015.
2. The predominant wind direction is from the West or West-Northwest.

Wind Rose Diagram

Hunters Point Artist Parcels
San Francisco, California

Geosyntec consultants

WR1247 | February 2016

Figure 2

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