



# ANALYSIS OF BROWNFIELDS CLEANUP ALTERNATIVES – PRELIMINARY EVALUATION

**India Basin Shoreline Park Redevelopment  
401 Hunters Point Boulevard  
San Francisco, California 94124**

January 9, 2026  
Rev. 3

*prepared for:*

**San Francisco Recreation and Park Department**  
49 South Van Ness Avenue, #1220  
San Francisco, California 94103

**San Francisco Public Works**  
Site Assessment and Remediation, Project Controls and Services  
San Francisco, California 94103

*prepared by:*

**CDIM Engineering, Inc.**  
601 Montgomery Street, Suite 780  
San Francisco, California 94111

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# 1 INTRODUCTION AND BACKGROUND

CDIM Engineering, Inc. (CDIM) has prepared this Preliminary Evaluation Analysis of Brownfields Cleanup Alternatives (ABCA) on behalf of San Francisco Public Works (SFPW) and San Francisco Recreation and Park Department (RPD) for the India Basin Redevelopment Project (Project) at India Basin Shoreline Park (IBSP; Site) located at 401 Hunters Point Boulevard, San Francisco, California 94124. SFPW and RPD are collectively referred to herein as the “City”. Figure 1 shows the Site location and layout.

This ABCA was prepared to support RPD in their application to the United States Environmental Protection Agency (EPA) for a Brownfields Cleanup Grant. An earlier version of this ABCA was prepared to support a 2025 Brownfield Cleanup Grant for Project work within Assessor’s Parcel Numbers (APN): Block 4629A, Lots 003, 004, 005, 006, 009, 011, 013. This ABCA is to address the Project work within the following additional APNs not included in the 2025 Brownfield Cleanup Grant: Block 4605 (Lots 010, 011, 012, 013, 014, 015, 016, 017, 018, 019) and Block 4622 (Lots 007, 008, 012, 013, 016, 017, 018, 019). Figure 2 shows APNs and differentiates the parcels in the 2025 Brownfield Cleanup Grant and the parcels in a forthcoming 2026 application.

## 1.1 Site Location

The Site is located in the Bayview – Hunters Point Neighborhood of San Francisco and is an approximately 5.6-acre waterfront park consisting of an electric tower and gravel yard, the paved Hawes Street roadway, paved parking areas, paved walking paths, picnic facilities, basketball courts, playgrounds with paved surfacing, grassy and landscaped areas, and a shoreline reinforced with riprap. The Site is bordered by Hunters Point Boulevard and a vacant property to the west, Hudson Avenue and the India Basin Waterfront Park to the south, the San Francisco Bay to the east, and a Pacific Gas and Electric Company (PG&E) substation to the north.

## 1.2 Previous Site Use

Prior to 1938, most of the Site was a tidal mudflat. Between 1875 and 1936 it was the location of the Hunters Point Ship Graveyard, where, during the 1920s and continuing into the 1930s, it was used as a ship scavenging area where “obsolete vessels were towed to the east end of the basin, stripped of parts, and left to deteriorate in the mud” (San Francisco Planning Department [SF Planning], 2017). Large areas of the Site were filled in the 1960s using material excavated during the construction of Candlestick Park and portions of Interstate 280. The current shape of India Basin Shoreline Park was in place by 1969, after which filling activities were curtailed. The area became India Basin Shoreline Park in the 1990s and has been improved for recreation and habitat restoration since that time.

The Site is owned by the City and County of San Francisco and is used by the RPD as a recreational shoreline park. No previous cleanups or remediation efforts have been conducted at the Site.

### 1.3 India Basin Shoreline Park Reconstruction

RPD plans to update IBSP through demolition of the existing structures and development of a revitalized park. The project will incorporate wetland restoration and connecting the San Francisco Bay Trail to the adjoining properties. New recreational features will consist of driveways and parking, various types of paths (e.g., paved, wood decking, grate), a cookout terrace, a basketball court, two playgrounds, fitness equipment, restrooms, a pergola, a boathouse and boat launch, and a ferry landing. Proposed shoreline and nearshore improvements include regrading of the existing hardened shoreline edge to a softer (wetlands/beach) edge, construction of a fixed pier, a floating pier with dock and gangway, and creating the lower portion of the Marine Way and gravel beach (Moffatt & Nichol, 2021).

### 1.4 Site Assessment Findings

In June 2015, Langan Treadwell Rollo (Langan) prepared a Phase I Environmental Site Assessment (ESA; Langan, 2015), and in October 2016, AECOM prepared a Technical Memorandum describing data gaps at the Site (AECOM, 2016). Northgate Environmental Management, Inc. (Northgate) performed sampling to characterize soil, sediment, groundwater, and surface water in 2017 and prepared the Site Characterization Report (SCR) to address data gaps identified by AECOM (Northgate, 2017). The SCR aimed to characterize existing historical fill, evaluate soil reuse, and assess soil quality underlying key future Site features that may require maintenance (e.g., walkways, play area); assess quality for recreational users at the shoreline and for tidal marsh creation; determine baseline groundwater concentrations; and assess surface water quality for recreational users and fish ingestion.

Sample results were compared to San Francisco Bay Regional Water Quality Control Board (Regional Water Board) Environmental Screening Levels (ESLs), published action goals for nearby San Francisco Bay restoration sites<sup>1,2</sup>, EPA Regional Screening Levels (RSLs), background and ambient regional values<sup>3,4,5</sup>, and ecological comparative screening values<sup>6</sup> (sediment only).

Slightly elevated concentrations of copper, lead, nickel, total polycyclic aromatic hydrocarbons (PAHs), benzo(a)pyrene equivalent (BaP-eq)<sup>7</sup>, total polychlorinated biphenyls (PCBs), total petroleum hydrocarbons as motor oil (TPH-mo), and naturally-occurring asbestos (NOA) were found in soil and/or sediment samples between 0.5 and 17 feet below ground surface (bgs) across the Site (Northgate, 2017). Where investigated, Site soil is heterogenous and consists of fill material, including fragments of concrete, wood and brick to depths of up to 27.5

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<sup>1</sup> PG&E Hunters Point Site, Shoreline Area Soil Remediation Goals (Jacobson James, 2016).

<sup>2</sup> Yosemite Slough Restoration Project Action Goals for Recreational/Direct Exposure (Northgate, 2009).

<sup>3</sup> Lawrence Berkeley National Laboratory Bay Area Background Metals in Soil, Upper Estimate (Lawrence Berkeley National Laboratory, 2009).

<sup>4</sup> PG&E Hunters Point Site Background for Metals in Soil (TRC, 2009).

<sup>5</sup> California Department of Toxic Substances Control (DTSC) benzo(a)pyrene (BaP) Ambient Conditions for Northern California (DTSC, 2009).

<sup>6</sup> San Francisco Estuary Institute and National Oceanic and Atmospheric Association (NOAA) values.

<sup>7</sup> BaP-eq concentrations are calculated to assess risk by converting carcinogenic PAH concentrations using Potency Equivalency Factors.

feet bgs. Serpentinite fragments were observed throughout the fill, and serpentinite bedrock was observed at approximately 30 to 35 feet bgs. The contaminant distribution in Site soil is heterogeneous, and no clear lateral or vertical pattern was identified. Rather, the contaminants identified are typical of Sites underlain by historic fill and ultramafic bedrock.

Groundwater quality was found to be typical of shallow, near-Bay conditions in an urban setting; surface water quality did not meet applicable objectives but is likely reflective of ambient conditions at India Basin, and no mitigation of surface water was recommended (Northgate, 2017).

Northgate concluded that Site conditions are suitable for recreational uses but that environmental conditions existed, primarily in subsurface soil and offshore sediment, that will require mitigation during the redevelopment of IBSP (Northgate, 2017). To describe mitigation measures for protecting construction workers and the surrounding community from potential exposure to constituents of concern (COCs) during park redevelopment and future park use, the SCR recommended a Site Mitigation Plan (SMP) be developed. CDIM prepared the SMP in August 2024 (CDIM, 2024), which was approved by San Francisco Department of Public Health (SFDPH) on October 17, 2024 (SFDPH, 2024).

## 1.5 Project Goal

The Project Goal is to enhance the existing park with increased protection for the environment and health and safety of park users by excavating and disposing of soils offsite, regrading and placing a soil barrier.

## 2 APPLICABLE REGULATIONS AND CLEANUP STANDARDS

### 2.1 Cleanup Oversight Responsibility

The Site cleanup is overseen by the San Francisco Department of Public Health (SFDPH) pursuant to is subject to protocols outlined in Article 22A of the San Francisco Health Code (Analyzing Soils for Hazardous Waste).

### 2.2 Cleanup Standards for Major Contaminants

The screening levels applied to the Site as cleanup standards are:

- Regional Water Board Direct Exposure Human Health Risk Levels (Table S-1; Regional Water Board, 2019a) Commercial and Construction Worker ESLs, which were determined to be appropriate based on the Site’s future recreational use and the potential for maintenance workers to encounter subsurface contaminants;
- National Oceanographic and Atmospheric Administration Screening Quick Reference Tables (Effects Range-Medium values) for sediments at an existing elevation below the mean high water level;
- California Total Threshold Limit Concentrations (TTLC); and
- Bay Area Air Quality Management District (BAAQMD) requirements for compliance with California Air Resources Board (CARB) asbestos Airborne Toxic Control Measure (ATCM) for Construction, Grading, Quarrying, and Surface Mining Operations.

For some constituents, specifically arsenic, cobalt, and nickel, the Regional Water Board ESLs are lower than regional background concentrations, and generally accepted values for background concentrations were used rather than ESLs. Figures 2 and 3 show sample results exceeding cleanup standards.

### 2.3 Laws & Regulations Applicable to the Cleanup

Article 22A of the San Francisco Health Code (Analyzing Soils for Hazardous Waste), commonly referred to as the Maher Ordinance. The City and County of San Francisco developed Article 22A of the San Francisco Health Code to assess pollutant impacts associated with fill and industrial activities as part of the building permit process. It outlines a process for identifying, investigating, analyzing and, when necessary, remediating or mitigating hazardous substances in soils. RPD developed a Site Mitigation Plan (CDIM, 2024) per the Maher Ordinance requirements, which was then approved by SFDPH (SFDPH, 2024). The SMP established environmental mitigation measures to be implemented during Site redevelopment activities:

- Soil management practices for construction-related excavation, waste disposal, and addressing unknown conditions;
- Durable cover specifications for areas of the Site where existing shallow soils will remain beneath the sidewalk, landscaping, or other non-building areas;

- Nearshore cover specifications for areas of the site below the mean high-water line;
- Groundwater management practices for dewatering and discharge; and,
- Other measures necessary to protect the environment and health and safety of construction workers and future Site users.

Site construction activities are subject to the requirements of California Code of Regulations (CCR) Title 8, Section 5192 and Occupational Safety and Health Administration (OSHA) requirements outlined in the Code of Federal Regulations (CFR) Title 29, Parts 1910 (general industry) and 1926 (construction). Due to the presence of hazardous substances in the Site subsurface, CFR Title 29, Part 1910.120 hazardous materials standards will be applied to the IBSP project, which describes requirements for a Site-specific health and safety plan (HSP), safety personnel, required Hazardous Waste Operations and Emergency Response (HAZWOPER) training, and safety procedures. If handling of contaminated soil is required, the City and its contractor shall establish Work Zones and implement appropriate decontamination procedures per the health and safety requirements.

Soil management at the Site will be performed in compliance with applicable laws and regulations. To the extent feasible, soil disturbance will be minimized, and soil will remain onsite beneath a durable cover. For offsite disposal, soil will be tested, and based on test results, if it becomes waste, it will be managed as Class II nonhazardous waste or Class I hazardous waste in accordance with Title 22 of the California Health and Safety Code and CFR Title 40. The project specifications detail requirements for waste profiling, transportation, manifest, temporary stockpiling, import materials, and securing areas with exposed soil.

Per the Maher Ordinance, the City shall submit a Dust Control Plan (DCP) to SFDPH for approval per Article 22B of the San Francisco Health Code at least 3 weeks prior to the start of work and implement associated controls during the project construction. The presence of NOA in soils requires earth-moving construction activities to be subject to the CARB asbestos ATCM in 17 CCR 93105 and California Occupational Safety and Health Administration (Cal-OSHA) asbestos regulations for construction (8 CCR 1529). An Asbestos Dust Mitigation Plan (ADMP) will be prepared for submittal to the BAAQMD for approval.

The IBSP project will disturb more than one acre of soil and drains to the San Francisco Bay. It will thus be subject to the requirements of the California State Water Resources Control Board Construction Stormwater General Permit, Order 2022-0057-DWQ, which requires submitting a notice of intent of coverage under the permit, preparation a storm water pollution prevention plan that outlines best management practices (BMPs) implemented to prevent or reduce pollutant discharge, and implementation of a monitoring and reporting program.

## 3 EVALUATION OF CLEANUP ALTERNATIVES

### 3.1 Cleanup Alternatives Considered

Three potentially feasible cleanup alternatives were developed based on CDIM's experience with similar sites where substantial Bay fill was placed to create usable land surface:

- **Alternative #1. No Action**—Under the No Action Alternative, impacted soil would remain in place without mitigation.
- **Alternative #2. One-Foot Excavation, Disposal, and Durable Cover**—This alternative includes required excavation and disposal of soil to set Site grades, plus the excavation of one foot of native soil to be disposed of offsite followed by regrading and the installation of a hardscape (concrete, asphalt, etc.) or minimum one-foot-thick softscape cap (clean soil cover with demarcation layer in areas accessible by recreation users or clean soil cover in densely vegetated areas) across the entire Site. This alternative complies with Article 22A of the San Francisco Health Code (Maher Ordinance). Physical barriers are frequently implemented at Brownfield redevelopment sites where contaminant removal is either unfeasible or excessively costly. These engineered barriers prevent future recreational Site users from contacting soils. However, these barriers do not reduce or eliminate contaminant concentrations in subsurface soils deeper than one foot bgs. Alternative #2 includes the implementation of long-term operation and maintenance (O&M) to maintain the integrity and effectiveness of the durable cover.
- **Alternative #3. Two-Foot Excavation, Disposal, and Durable Cover**—This alternative is the same as Alternative #2 except that two feet of native soil will be excavated replaced with hardscape or a two-foot-thick softscape cap.

### 3.2 Evaluation of Cleanup Alternatives

#### 3.2.1 Effectiveness

The effectiveness of each alternative is considered below.

- **Alternative #1. No Action**— No Action would not reduce toxicity, mobility, or quantity of COCs in Site soils or sediment. This alternative does not control or prevent exposure of receptors to soil concentrations above Cleanup Standards and does not meet the Project Goal.
- **Alternative #2. One-Foot Excavation, Disposal, and Durable Cover**—The durable cover would reduce the mobility of COCs in Site soils and prohibit potential exposure pathways for recreators. Alternative #2 is not protective to construction workers excavating trenches for utilities or deep foundations, and subsurface work during Site construction would have to be closely monitored with protective measures implemented per the SMP (CDIM, 2024). The durable cover would meet the Project Goal and be protective of human health and the environment in the long term provided that the cap is inspected and maintained properly with O&M. Excavation would be completed

during the dry-weather months to minimize groundwater infiltration into the excavation area and reduce dewatering needs.

- Potential short-term impacts related to Alternative #2 implementation could include exposure of onsite workers and the public to dust or particulate matter. Implementing appropriate engineering controls, including dust control practices per an ADMP, and personal protective equipment for workers would result in low short-term risks.
- Alternative #3. Two-Foot Excavation, Disposal, and Durable Cover—The effectiveness of Alternative #3 is the same as Alternative #2 above except for the addition of one extra foot of softscape cover to protect future Site recreators. Therefore, Alternative #3 is insignificantly more effective than Alternative #2.

### 3.2.2 Implementability

The implementability of each alternative is considered below.

- Alternative #1. No Action— This alternative is easily implemented.
- Alternative #2. One-Foot Excavation, Disposal, and Durable Cover—This alternative is readily implemented using commonly available technology given the proposed Site design. Offsite disposal facilities for excavated soil are also readily available. Ongoing monitoring and maintenance of the cap will require periodic coordination and reporting. Because the Site is located on the San Francisco Bay shoreline, increased monitoring and additional maintenance would likely be required after flooding events.
- Alternative #3. Two-Foot Excavation, Disposal, and Durable Cover—In addition to all items noted for the implementability of Alternative #2, Alternative #3 would require revising Site design plans and would double the volume of soil to be excavated and disposed offsite. Additionally, the Site covers a large area, and installing an additional foot of clean soil over the entirety of the park would add cost and attendant environmental impacts (additional truck trips, grading, etc.) with little added protectiveness.

### 3.2.3 Cost

The cost of each alternative is considered below.

- Alternative #1. No Action—No added costs would be incurred during the implementation of this alternative.
- Alternative #2. One-Foot Excavation, Disposal, and Durable Cover—It is estimated that the incremental increase to the project cost for this alternative is \$9,737,000 when compared to no action (Alternative #1), largely due to the disposal costs associated with the removed soil.
- Alternative #3. Two-Foot Excavation, Disposal, and Durable Cover—It is estimated that the incremental increase to the project cost for this alternative is \$11,948,000 when compared to no action (Alternative #1), largely due to the disposal costs associated with the removed soil and placing import soil.

### 3.3 Recommended Cleanup Alternative

The recommended alternative is Alternative #2 (One-Foot Excavation, Offsite Disposal, and Durable Cover). This alternative was selected because it is readily implementable and allows the park redevelopment to take place while minimizing impact to the public and protecting future Site visitors. A one-foot layer is justified because:

- Most of the Site is used for habitat restoration, and park visitor use will be discouraged by steep slopes, dense vegetation and protective fencing and signage;
- In areas where park visitor use is encouraged, either hardscape (walkways, basketball courts, etc.) or grass over a foot clean soil over (Central Marine Way Lawn) with demarcation layer will be present;
- Periodic inspection of all visited areas will be performed by RPD or consultant staff to ensure continued integrity of the durable cover;
- Maintenance activities will only be conducted by RPD staff that will be familiar with site conditions and required protective measures in accordance with the Cap O&M Plan for the adjacent 900 Innes Site (Anchor QEA, 2024); and
- Soil concentrations showed exceedances of Cleanup Standards were generally the same order of magnitude of the screening levels, and the soil concentrations 95% Upper Confidence Limit were less than the Cleanup Standards for all COCs, except NOA which exhibited a 95% Upper Confidence Limit below hazardous waste thresholds and which will be mitigated by soil cover and vegetation.

### 3.4 Resilience to Extreme Weather Events

The project design evaluated resilience against extreme weather events. A sea level rise vulnerability assessment (Moffatt & Nichol, 2024) and coastal engineering analysis (Moffatt & Nichol, 2021) were completed for the project. The reports describe the project's environmental conditions, coastal processes, and vulnerability to future sea level rise, and summarize the basis of analysis for shoreline engineering and design for the project. The analysis relies on the best-available science summarized in the 2018 State of California Sea-Level Rise Guidance prepared by the California Ocean Protection Council and includes evaluation of Site conditions under anticipated inundation from 2050, 2070, or 2100 sea level rise scenarios.

Based on the Moffatt and Nichol report, all building elevations have been set above king tide levels as projected for the year 2100 (projected elevation of +14.7). All the main park features, including the San Francisco Bay Trail have been set above king tide levels as projected for the year 2070. The shoreline was designed to provide a natural edge that would be adaptive to sea level rise, provide relief during larger storm events minimizing impacts to park features, and provide transitions to promote diverse habitat that would transition as sea level rise.

It is expected that the majority of the Site will not be impacted by future inundation before 2100 since most Site elevations are above 14.7 ft NAVD88. Gravel cover on the shoreline will be increasingly exposed to San Francisco Bay water as sea level rises; however, the erosion control in the tidal zone is designed for this

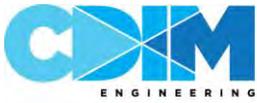
occurrence. Consequently, it is not expected that the Site alternatives describe herein will be detrimentally affected under the 2050, 2070, or 2100 inundation scenarios.

Stormwater management at the Site will be based on the San Francisco Stormwater Management Requirements and Design Guidelines (SMR), which include conservative storm design criteria and performance standards. Large projects are required to manage runoff from upper-percentile design storms, rather than average rainfall events, reflecting an intent to accommodate larger and more intense storms.. The SMR mandates prioritizing specific stormwater management practices (such as infiltration-based BMPs, rainwater harvesting, and green roofs, followed by lined bioretention or flow-through planters) to the extent possible before exploring other BMP options.

Wetland restoration at the Site will conserve and strengthen natural resources, and increase biodiversity and interconnectivity on City parkland, through the expansion of shoreline wetlands and redevelopment of natural upland landscaping. The restoration is expected to enhance resilience to potential adverse impacts from extreme weather events by attenuating floodwaters, dissipating wave and tidal energy, reducing erosion, and providing adaptive stormwater storage that protects adjacent infrastructure and upland areas during intense precipitation, storm surge, and rising sea levels.

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## FIGURES

**LEGEND**

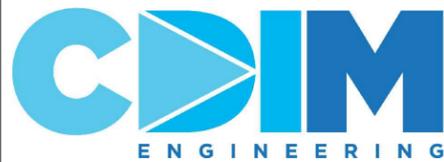
- - - - - SITE BOUNDARY
- EXISTING MHW LINE (5.9 FT)

**ABBREVIATIONS**

MHW = MEAN HIGH WATER

**NOTES**

1. FEATURES SHOWN ARE APPROXIMATE AND BASED ON INDIA BASIN SHORELINE PARK PERMIT SET DESIGN DRAWINGS DATED JULY 17, 2023 BY GGN, INC.



CDIM ENGINEERING, INC.  
601 MONTGOMERY STREET, SUITE 780  
SAN FRANCISCO, CA 94111  
WWW.CDIMENGINEERING.COM  
PH:(415)498-0535

SITE LOCATION AND LAYOUT  
INDIA BASIN SHORELINE PARK REDEVELOPMENT  
401 HUNTERS POINT BOULEVARD  
SAN FRANCISCO, CALIFORNIA

FIGURE  
1

**LEGEND**

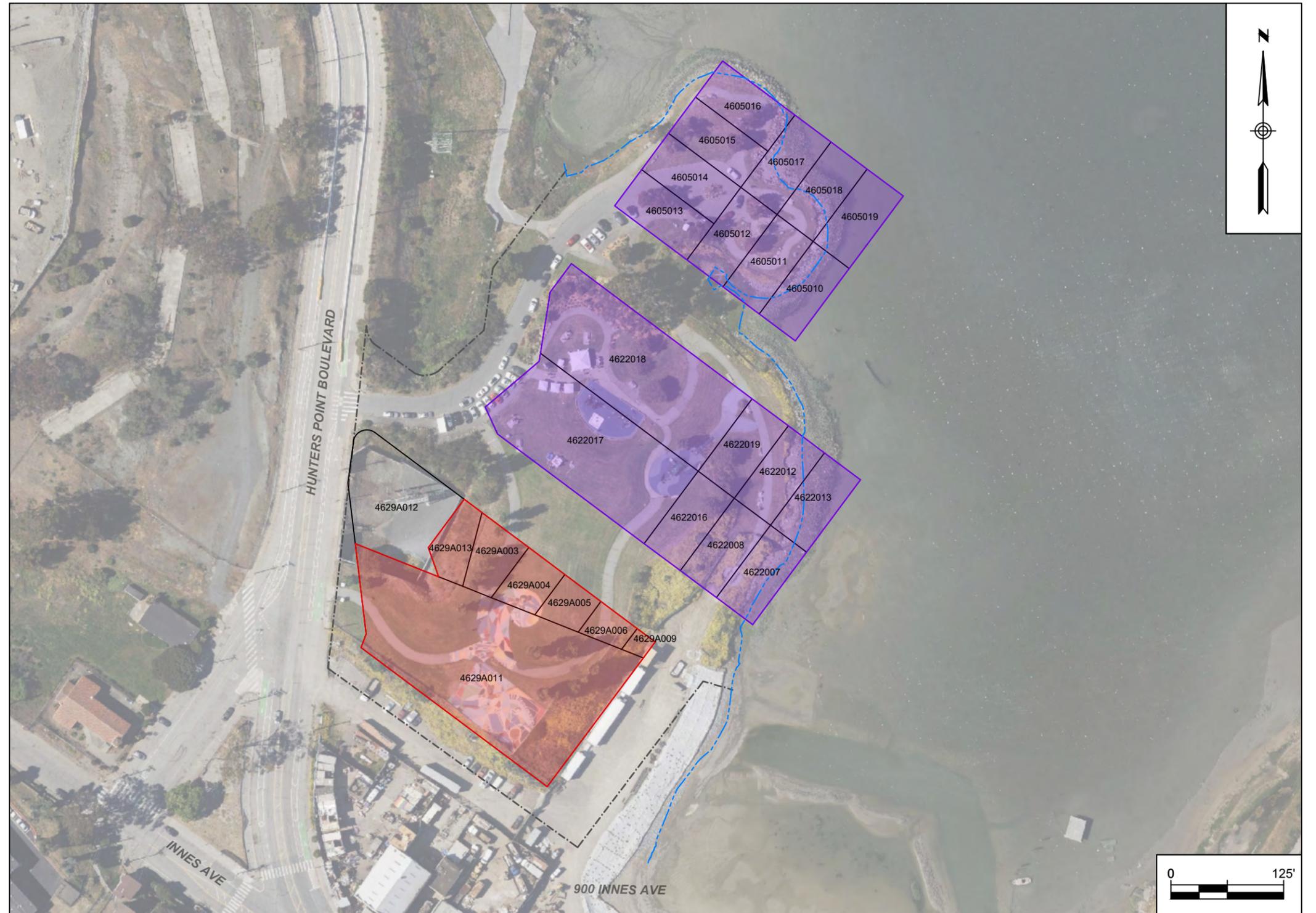
- SITE BOUNDARY
- EXISTING MHW LINE (5.9 FT)
- 4622019 CITY AND COUNTY OF SAN FRANCISCO ASSESSOR PARCEL NUMBER
- PARCEL IN 2025 BROWNFIELD GRANT
- PARCEL IN 2026 BROWNFIELD GRANT

**ABBREVIATIONS**

MHW = MEAN HIGH WATER

**NOTES**

1. FEATURES SHOWN ARE APPROXIMATE AND BASED ON INDIA BASIN SHORELINE PARK PERMIT SET DESIGN DRAWINGS DATED JULY 17, 2023 BY GGN, INC.
2. CITY AND COUNTY OF SAN FRANCISCO ASSESSOR PARCEL NUMBERS FROM THE SAN FRANCISCO PROPERTY INFORMATION MAP ([HTTPS://SFPLANNINGGIS.ORG/PIM/](https://sfplanninggis.org/pim/))



CDIM ENGINEERING, INC.  
601 MONTGOMERY STREET, SUITE 780  
SAN FRANCISCO, CA 94111  
WWW.CDIMENGINEERING.COM  
PH:(415)498-0535

ASSESSOR PARCEL NUMBERS  
INDIA BASIN SHORELINE PARK REDEVELOPMENT  
401 HUNTERS POINT BOULEVARD  
SAN FRANCISCO, CALIFORNIA

FIGURE  
2

**LEGEND**

- SITE BOUNDARY
- PROPOSED MHW LINE (5.9 FT)
- IBSP-SB-22 SOIL SAMPLE LOCATION (NORTHGATE, 2016-2017)
- IBSP-SE-3 SEDIMENT SAMPLE LOCATION (NORTHGATE, 2016-2017)

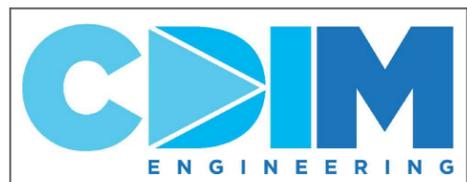
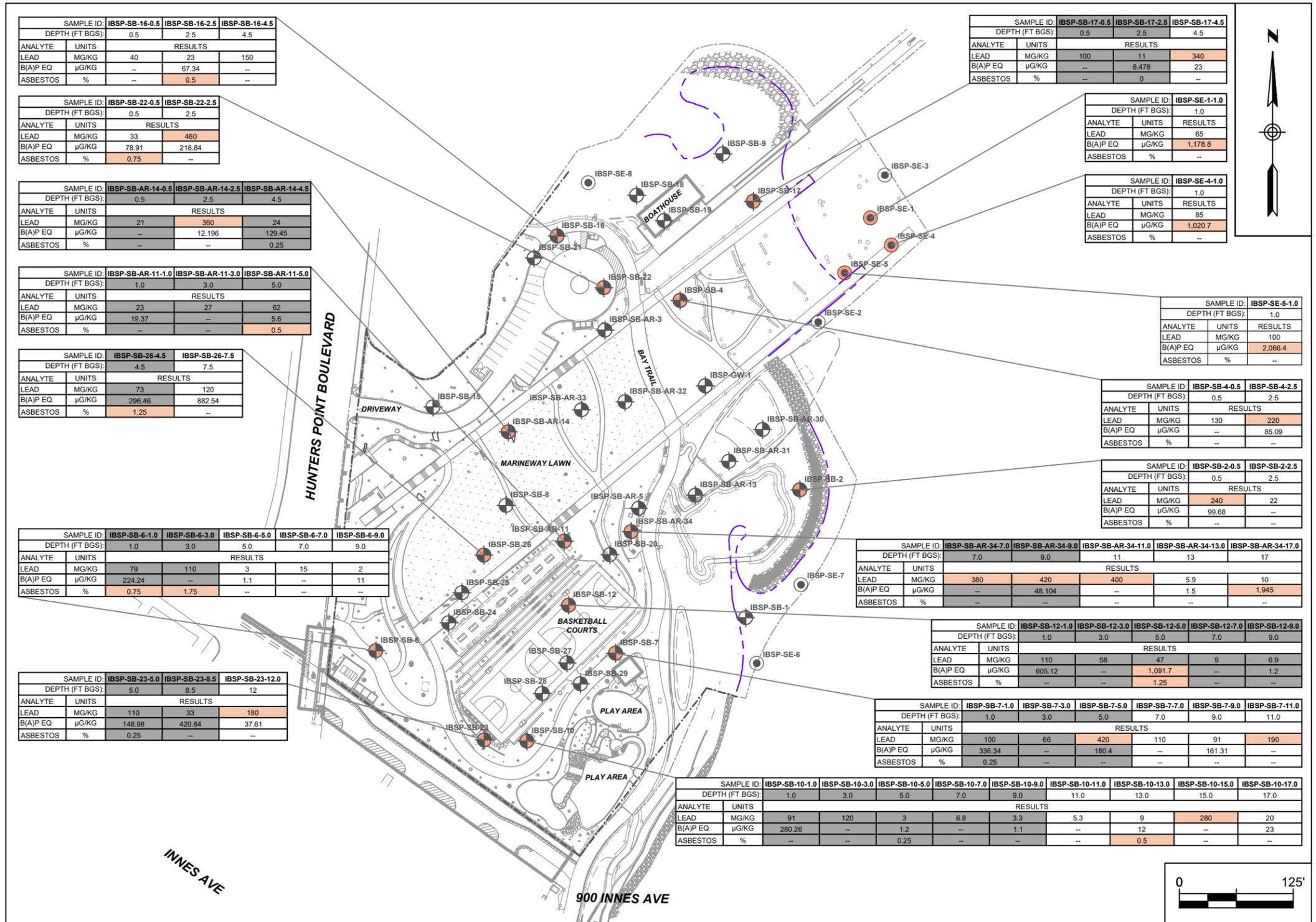
HUMAN HEALTH CLEANUP STANDARDS		
ANALYTE	UNITS	VALUE
LEAD	MG/KG	160 <sup>1</sup>
B(A)P EQ	µG/KG	900 <sup>2</sup>
ASBESTOS	%	0.25 <sup>3</sup>

**ABBREVIATIONS**

B(A)P EQ = BENZO(A)PYRENE EQUIVALENTS  
 MG/KG = MILLIGRAMS PER KILOGRAM.  
 MHW = MEAN HIGH WATER  
 µG/KG = MICROGRAM PER KILOGRAM.

**NOTES**

- LEAD HUMAN HEALTH CLEANUP STANDARD IS BASED ON THE SAN FRANCISCO REGIONAL WATER QUALITY CONTROL BOARD ENVIRONMENTAL SCREENING LEVEL (ESL) FOR CONSTRUCTION WORKER EXPOSURE.
- B(A)P EQ HUMAN HEALTH CLEANUP STANDARD IS BASED ON THE CALIFORNIA TOTAL THRESHOLD LIMIT CONCENTRATION (TTLIC).
- ASBESTOS HUMAN HEALTH CLEANUP STANDARD IS BASED ON THE CALIFORNIA AIR RESOURCES BOARD (CARB) ASBESTOS AIRBORNE TOXIC CONTROL MEASURE (ATCM).
- FEATURES SHOWN ARE APPROXIMATE AND BASED ON INDIA BASIN SHORELINE PARK PERMIT SET DESIGN DRAWINGS DATED JULY 17, 2023 BY GGN, INC. BASEMAP FROM PERMIT SET SOILS PLAN, SHEET L160.2 REVISED APRIL 26, 2024.
- SAMPLE LOCATIONS FROM NORTHGATE'S SITE CHARACTERIZATION REPORT FOR INDIA BASIN SHORELINE PARK DATED MAY 2017.
- GREY SHADING INDICATES SAMPLE DEPTH MAY BE REMOVED OR RELOCATED DURING EARTHWORK BASED ON THE PERMIT SET SHEET C003.2 FOR EARTHWORK ABOVE MHW DATED JULY 17, 2023.
- ORANGE SHADING INDICATES CLEANUP STANDARD EXCEEDANCE.



CDIM ENGINEERING, INC.  
 601 MONTGOMERY STREET, SUITE 780  
 SAN FRANCISCO, CA 94111  
 WWW.CDIMENGINEERING.COM  
 PH:(415)498-0535

SOIL AND SEDIMENT SAMPLES EXCEEDING HUMAN HEALTH  
 CLEANUP STANDARDS AND PROPOSED SITE PLAN  
 INDIA BASIN SHORELINE PARK REDEVELOPMENT  
 401 HUNTERS POINT BOULEVARD  
 SAN FRANCISCO, CALIFORNIA

FIGURE  
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**LEGEND**

- SITE BOUNDARY
- PROPOSED MHW LINE (5.9 FT)
- IBSP-SB-22 SOIL SAMPLE LOCATION (NORTHGATE, 2016-2017)
- IBSP-SE-3 SEDIMENT SAMPLE LOCATION (NORTHGATE, 2016-2017)

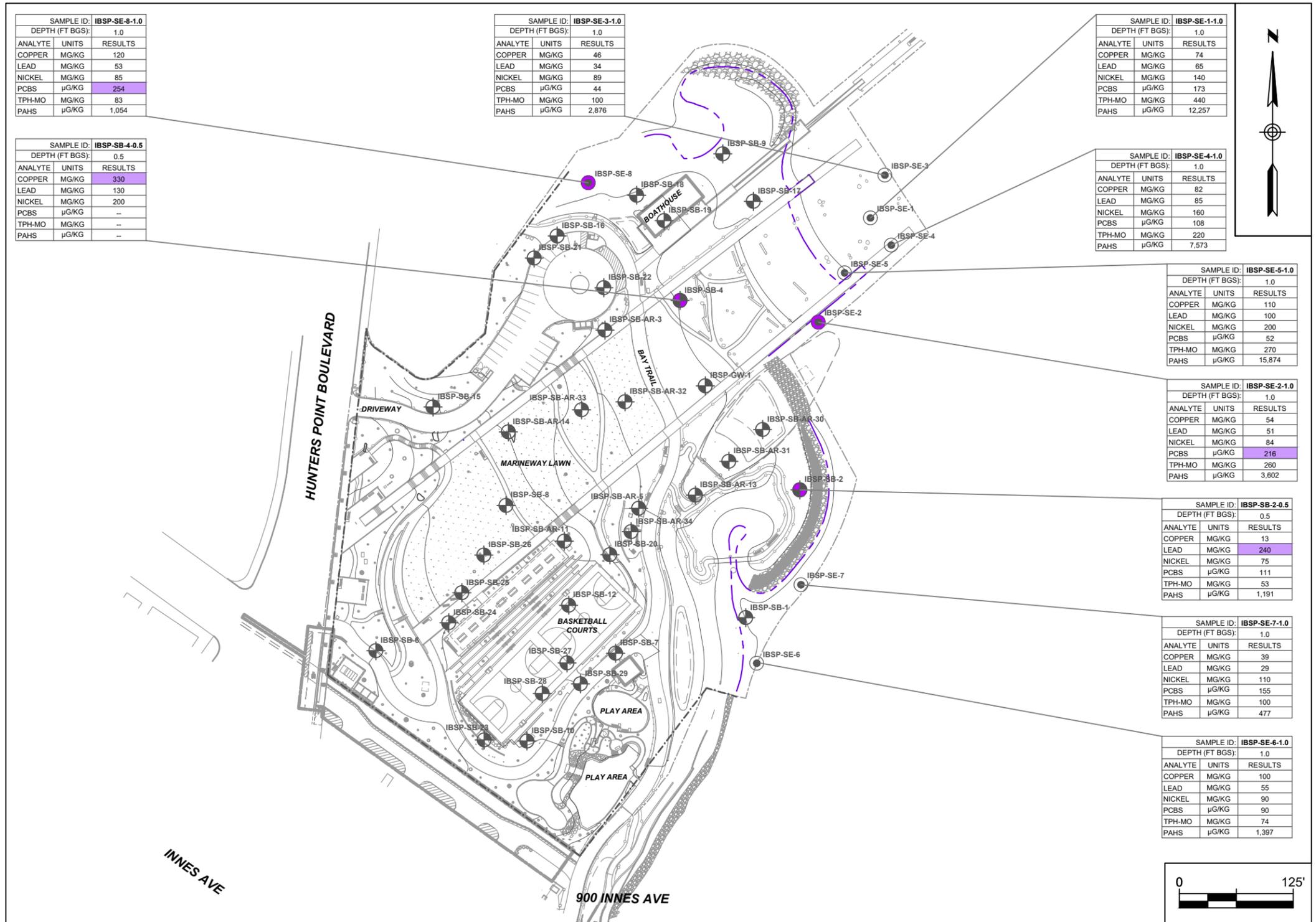
ECOLOGICAL CLEANUP STANDARDS		
ANALYTE <sup>1</sup>	UNITS	NOT TO EXCEED SINGLE VALUE
COPPER	MG/KG	270 <sup>2</sup>
LEAD	MG/KG	218 <sup>2</sup>
PCBS	µG/KG	180 <sup>2</sup>

**ABBREVIATIONS**

- MG/KG = MILLIGRAMS PER KILOGRAM.
- MHW = MEAN HIGH WATER
- PAHS = POLYCYCLIC AROMATIC HYDROCARBONS
- PCBS = POLYCHLORINATED AROMATIC BIPHENYLS
- TPH-MO = TOTAL PETROLEUM HYDROCARBONS AS MOTOR OIL
- UCL = UPPER CONFIDENCE LIMIT
- µG/KG = MICROGRAM PER KILOGRAM.

**NOTES**

- 95% UCLs FOR COPPER, LEAD, NICKEL, PCBS, TPH-MO, AND PAHS EXCEEDED THE RECOMMENDED 95% UCL ECOLOGICAL HEALTH SCREENING LEVELS BASED ON PUBLISHED ACTION GOALS FOR SAN FRANCISCO BAY RESTORATION SITES PRESENTED IN THE 2017 SITE CHARACTERIZATION REPORT (NORTHGATE, 2017).
- NATIONAL OCEANOGRAPHIC AND ATMOSPHERIC ADMINISTRATION SCREENING QUICK REFERENCE TABLES (EFFECTS-RANGE-MEDIUM VALUES) FOR SEDIMENTS AT AN EXISTING ELEVATION BELOW THE MEAN HIGH WATER LEVEL.
- FEATURES SHOWN ARE APPROXIMATE AND BASED ON INDIA BASIN SHORELINE PARK PERMIT SET DESIGN DRAWINGS DATED JULY 17, 2023 BY GGN, INC. BASEMAP FROM PERMIT SET SOILS PLAN, SHEET L160.2 REVISED APRIL 26, 2024.
- SAMPLE LOCATIONS FROM NORTHGATE'S SITE CHARACTERIZATION REPORT FOR INDIA BASIN SHORELINE PARK DATED MAY 2017.
- PURPLE SHADING INDICATES AN ECOLOGICAL HEALTH CLEANUP STANDARD EXCEEDANCE.



SAMPLE ID: IBSP-SE-8-1.0		
ANALYTE	UNITS	RESULTS
DEPTH (FT BGS):	1.0	
COPPER	MG/KG	120
LEAD	MG/KG	53
NICKEL	MG/KG	85
PCBS	µG/KG	254
TPH-MO	MG/KG	83
PAHS	µG/KG	1,054

SAMPLE ID: IBSP-SE-3-1.0		
ANALYTE	UNITS	RESULTS
DEPTH (FT BGS):	1.0	
COPPER	MG/KG	46
LEAD	MG/KG	34
NICKEL	MG/KG	89
PCBS	µG/KG	44
TPH-MO	MG/KG	100
PAHS	µG/KG	2,876

SAMPLE ID: IBSP-SE-1-1.0		
ANALYTE	UNITS	RESULTS
DEPTH (FT BGS):	1.0	
COPPER	MG/KG	74
LEAD	MG/KG	65
NICKEL	MG/KG	140
PCBS	µG/KG	173
TPH-MO	MG/KG	440
PAHS	µG/KG	12,257

SAMPLE ID: IBSP-SB-4-0.5		
ANALYTE	UNITS	RESULTS
DEPTH (FT BGS):	0.5	
COPPER	MG/KG	330
LEAD	MG/KG	130
NICKEL	MG/KG	200
PCBS	µG/KG	--
TPH-MO	MG/KG	--
PAHS	µG/KG	--

SAMPLE ID: IBSP-SE-4-1.0		
ANALYTE	UNITS	RESULTS
DEPTH (FT BGS):	1.0	
COPPER	MG/KG	82
LEAD	MG/KG	85
NICKEL	MG/KG	160
PCBS	µG/KG	108
TPH-MO	MG/KG	220
PAHS	µG/KG	7,573

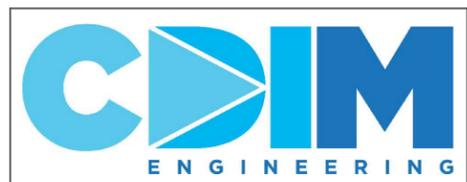
SAMPLE ID: IBSP-SE-5-1.0		
ANALYTE	UNITS	RESULTS
DEPTH (FT BGS):	1.0	
COPPER	MG/KG	110
LEAD	MG/KG	100
NICKEL	MG/KG	200
PCBS	µG/KG	52
TPH-MO	MG/KG	270
PAHS	µG/KG	15,874

SAMPLE ID: IBSP-SE-2-1.0		
ANALYTE	UNITS	RESULTS
DEPTH (FT BGS):	1.0	
COPPER	MG/KG	54
LEAD	MG/KG	51
NICKEL	MG/KG	84
PCBS	µG/KG	216
TPH-MO	MG/KG	260
PAHS	µG/KG	3,602

SAMPLE ID: IBSP-SB-2-0.5		
ANALYTE	UNITS	RESULTS
DEPTH (FT BGS):	0.5	
COPPER	MG/KG	13
LEAD	MG/KG	240
NICKEL	MG/KG	75
PCBS	µG/KG	111
TPH-MO	MG/KG	53
PAHS	µG/KG	1,191

SAMPLE ID: IBSP-SE-7-1.0		
ANALYTE	UNITS	RESULTS
DEPTH (FT BGS):	1.0	
COPPER	MG/KG	39
LEAD	MG/KG	29
NICKEL	MG/KG	110
PCBS	µG/KG	155
TPH-MO	MG/KG	100
PAHS	µG/KG	477

SAMPLE ID: IBSP-SE-6-1.0		
ANALYTE	UNITS	RESULTS
DEPTH (FT BGS):	1.0	
COPPER	MG/KG	100
LEAD	MG/KG	55
NICKEL	MG/KG	90
PCBS	µG/KG	90
TPH-MO	MG/KG	74
PAHS	µG/KG	1,397



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FIGURE  
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