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**REVISED ADDENDUM NUMBER 1  
TO THE FINAL  
RISK MANAGEMENT PLAN FOR  
THE 64<sup>TH</sup> STREET PROPERTIES  
EMERYVILLE, CALIFORNIA**

13 April 2001  
(EKI 990016.00, 990016.03)

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13 April 2001

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Subject: Addendum Number 1 to the Risk Management Plan  
64<sup>th</sup> Street Properties, Emeryville, California  
(EKI 990016.00/990016.03)

Dear Dr. Arulanantham and Ms. Hugo:

On behalf of SIMEON Commercial Properties ("SIMEON"), Erler & Kalinowski, Inc. ("EKI") is pleased to submit the *Revised Addendum Number 1 to the Final Risk Management Plan for the 64<sup>th</sup> Street Properties, Emeryville, California*, dated 13 April 2001 ("Addendum"), for your approval. The Addendum was prepared for the properties on the north side of 64<sup>th</sup> Street, between Bay and Hollis Streets ("64<sup>th</sup> Street properties").

The Addendum (1) addresses hydrogen sulfide concentrations found during construction on the 64<sup>th</sup> Street properties and (2) modifies the cap requirements for one portion of the landscaped areas on the 64<sup>th</sup> Street properties.

If this Addendum meets with your approval, we request that you send us a letter indicating such approval. We are available to meet with you to discuss this Addendum, if needed.

Letter to Dr. Arulanantham (RWQCB) and Ms. Hugo (ACDEH)  
13 April 2001  
Page 2 of 2

**Erlar &  
Kalinowski, Inc.**

Thank you for your continuing assistance on this project.

Very truly yours,

ERLER & KALINOWSKI, INC.



Michelle Kriegman King, Ph.D.  
Project Manager



Derby Davidson, P.E.  
Project Engineer

enclosure

cc: Pierson Forbes (SIMEON Commercial Properties)  
Meg Rosegay (Pillsbury Winthrop, LLP)

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## **1. INTRODUCTION**

On behalf of SIMEON Commercial Properties ("SIMEON"), Erler & Kalinowski, Inc. ("EKI") has prepared this Addendum No. 1 to the *Final Risk Management Plan for the 64<sup>th</sup> Street Properties, Emeryville, California*, dated 30 August 1999 ("RMP"). The RMP provides a decision framework to manage residual chemicals of concern ("COCs") in soil and groundwater on the 64<sup>th</sup> Street properties in a manner consistent with planned land use and protective of human health and the environment. The RMP was approved by the California Regional Water Quality Control Board, San Francisco Bay Region ("RWQCB"), and the Alameda County Department of Environmental Health ("ACDEH") in a letter dated 15 October 1999.

The "64<sup>th</sup> Street properties" are bounded to the north by the Ryerson Steel facility, to the west by railroad tracks, to the south by 64<sup>th</sup> Street, and to the east by Hollis Street (Figure 1). SIMEON has recently finished redevelopment of the 64<sup>th</sup> Street properties for commercial/office uses. As discussed in the RMP, the redevelopment involved (a) partial demolition and renovation of the existing building, (b) construction of a new office building, and (c) construction of a new parking structure.

This Addendum to the RMP has the following two objectives:

- address hydrogen sulfide concentrations found during construction on the 64<sup>th</sup> Street properties; and
- modify the cap requirements for one portion of the landscaped areas on the 64<sup>th</sup> Street properties.

Once approved by the ACDEH (with RWQCB concurrence), this Addendum will become part of the RMP.

## **2. HYDROGEN SULFIDE**

Based on the results of previous investigations, hydrogen sulfide was not expected to be present on the 64<sup>th</sup> Street properties. Consequently, the RMP did not include hydrogen sulfide as a COC. However, during excavation for footings for the new office building, hydrogen sulfide odors were noted. Worker health and safety issues regarding hydrogen sulfide were addressed by South Bay Construction ("SBC"), the construction contractor, by monitoring for hydrogen sulfide and requiring appropriate personal protective equipment.

This section (a) presents results of hydrogen sulfide monitoring performed during construction activities, (b) discusses potential exposure of future workers on the 64<sup>th</sup> Street properties to hydrogen sulfide, and (c) discusses appropriate risk management protocols for hydrogen sulfide.

## 2.1 Hydrogen Sulfide Encountered During Redevelopment

After a rotten-egg odor was noted when performing footing excavations for the new office building in November 1999, measurements of hydrogen sulfide in the breathing zone were made during these excavation activities. Measurements of hydrogen sulfide concentrations were performed by EKI and/or Enviro Group Inc., SBC's industrial hygiene consultant, using direct-reading instruments. Measurements were only performed while excavating for footings for the new office building. According to SBC, hydrogen sulfide odors were not noted while excavating footings for the new parking structure. The approximate locations of footing excavations are shown on Figure 2.

According to SBC, some hydrogen sulfide odors were also noted while performing footing excavations in the central portion and the southeastern corner of the renovated building (see Figure 2). Work was halted when the odors were noted and later resumed while measuring for hydrogen sulfide. However, the odor was no longer present after the resumption of work, and no hydrogen sulfide was detected.

SBC indicated that hydrogen sulfide odors were not noted when excavating trenches for installation of below-grade utilities. The approximate locations of these trenches are shown on Figure 2. In fact, SBC did not note hydrogen sulfide odors after construction of building footings was complete.

The maximum breathing zone concentrations of hydrogen sulfide measured at each foundation excavation for the new office building are shown on Figure 3. The highest concentrations were detected at footing excavations A1 (9 parts per million by volume ("ppmv")), D4-5 (10 ppmv), D7 (10 ppmv), and D11 (7 ppmv). As shown on Figure 3, the distribution of hydrogen sulfide is not contiguous; rather, it appears to be concentrated in specific areas.

The concentrations shown on Figure 3 are peak concentrations; sustained concentrations were lower. Hydrogen sulfide concentrations generally decreased to non-detectable levels within 30 minutes of the cessation of excavation activities. Hydrogen sulfide was only detected in the areas shown on Figure 3, and only when soil excavation was being or had recently been performed.

The origin of the hydrogen sulfide detected on the 64th Street properties is not known. Given that sustained concentrations of hydrogen sulfide were only encountered in the southwestern portion of the 64<sup>th</sup> Street properties (i.e., in the vicinity of the former refinery, see Figure 2), natural degradation of petroleum residuals from the former refinery is the likely source of the hydrogen sulfide. The southeastern corner of the renovated building, where hydrogen sulfide odors were noted, is in the vicinity of a former underground fuel storage tank. Given that bay mud underlies the fill on the property, sulfate bacteria capable of producing hydrogen sulfide are likely present amongst residual hydrocarbons remaining from this closed tank. Thus, hydrogen sulfide odors in this vicinity may also be the result of natural degradation of petroleum hydrocarbons. It is also possible that natural degradation of organic material within the bay muds underlying the 64th Street properties contributes hydrogen sulfide to the soil gas.

## 2.2 Potential Exposure of Future Site Occupants to Hydrogen Sulfide

Future site occupants will be industrial or commercial office workers and building maintenance personnel. Migration of hydrogen sulfide in soil gas and potential exposure of future occupants to hydrogen sulfide in soil gas at the 64<sup>th</sup> Street properties are not considered significant for the following reasons:

- Hydrogen sulfide concentrations observed during construction were at or below the permissible exposure limit (“PEL”) established by the California Occupational Safety and Health Administration (“Cal-OSHA”); however, elevated concentrations observed at the 64<sup>th</sup> Street properties were transient, while the PEL is based on an 8-hour exposure.
- Hydrogen sulfide was not observed unless soil was being or had recently been disturbed, which is likely to be rare after construction is complete.
- Hydrogen sulfide has a very low odor threshold and was not noted previously at the 64<sup>th</sup> Street properties, indicating that significant airborne concentrations of hydrogen sulfide are not present in the absence of excavation activities.
- The soil under the new office building was lime-treated, which reduces the concentration of hydrogen sulfide in soil gas by raising the pH.
- Under the new office building, a waterproofing membrane was placed between the building slab and the subgrade, which will likely inhibit migration of soil gas through the slab.
- Below-grade utility trenches are unlikely to act as conduits for migration of hydrogen sulfide from soil into buildings because (1) hydrogen sulfide odors were not noted during excavation of the trenches and (2) concrete slabs were poured around utility pipes, leaving no annulus around the pipes.

These reasons are discussed further below.

Future site occupants will be industrial or commercial office workers and building maintenance personnel. Published toxicity data, such as chronic reference doses, are not available for hydrogen sulfide. Thus, EKI compared the hydrogen sulfide concentrations measured while performing building footing excavations with occupational exposure limits. The PEL, an 8-hour time-weighted average, set by Cal-OSHA for hydrogen sulfide is 10 ppmv (8 CCR 5155). Cal-OSHA has set the short-term exposure limit (“STEL”), a 15-minute time-weighted average, for hydrogen sulfide at 15 ppmv (8 CCR 5155).

The maximum hydrogen sulfide concentration detected at the site is 10 ppmv. As noted above, the PEL is also 10 ppmv; however, the PEL is an 8-hour time-weighted average, while the maximum hydrogen sulfide concentrations shown on Figure 3 were not

sustained. In general, hydrogen sulfide concentrations decreased to non-detectable levels within 30 minutes of the cessation of excavation activities. Thus, it is extremely unlikely that future site occupants will be exposed to hydrogen sulfide concentrations on the order of the PEL (i.e., an 8-hour average of 10 ppmv).

Further, hydrogen sulfide odors were noted, and elevated hydrogen sulfide concentrations were measured, only during excavation activities. Hydrogen sulfide odors were not noted in undisturbed areas. Thus, hydrogen sulfide is not expected to be present in the breathing zone unless native soil is disturbed.

The mean odor threshold concentration of hydrogen sulfide is 0.008 ppmv (Cal-EPA, 2000), which is several orders of magnitude below the PEL. Given this low odor threshold, if hydrogen sulfide was migrating from the soil into the breathing zone, it would very likely have been noticed by previous occupants of the 64<sup>th</sup> Street properties. However, prior to the November 1999 excavations, hydrogen sulfide odors had not been noted on the 64<sup>th</sup> Street properties; in particular, hydrogen sulfide odors were not noted inside the existing building, a portion of which was originally located over excavations where some of the higher hydrogen sulfide concentrations were measured. Further, hydrogen sulfide odors were not noted in the buildings during construction.

In addition, as part of the foundation construction, the top 12 inches of native soil underneath the new office building was lime-treated. One effect of lime treatment is elevated soil pH, which decreases hydrogen sulfide gas ( $H_2S$ ) concentrations and increases its ionic, non-gaseous form ( $HS^-$ ). At pH greater than 7, most of the hydrogen sulfide is in its ionic form. Thus, due to the lime treatment, soil gas in the top foot of soil under the new office building will be even less likely to contain hydrogen sulfide than it was during foundation excavation. Further, a composite waterproofing membrane was placed between the building slab and the subgrade under the new office building. This membrane will also likely inhibit migration of chemicals in soil gas, such as hydrogen sulfide, through the slab of the new office building.

Due to their relatively greater permeability, utility trenches have the potential to act as conduits for migration of soil gases, including hydrogen sulfide. However, as discussed in Section 2.1, hydrogen sulfide odors were not noted in utility trench excavations. Further, SBC indicated that the building slabs were poured around utility pipes that penetrate the slab, without leaving an annulus around the pipes. For these reasons, the utility trenches are considered unlikely to act as conduits for hydrogen sulfide to enter the buildings.

Therefore, accounting for the conditions under which hydrogen sulfide has been detected at the 64<sup>th</sup> Street properties and the mitigative measures put in place as part of the new construction, significant migration of hydrogen sulfide and subsequent exposure of future occupants to detectable levels of hydrogen sulfide is not likely to occur.

### 2.3 Post-Construction Risk Management of Hydrogen Sulfide

As discussed above, exposure to hydrogen sulfide from soil on the 64<sup>th</sup> Street properties is very unlikely unless native soil is disturbed during activities such as excavation. Section



4.3 of the RMP requires preparation of a health and safety plan (“H&SP”) for future subsurface excavation activities on the 64<sup>th</sup> Street properties in which the cap is removed. The RMP requires that each H&SP include a description of health and safety training requirements for onsite personnel, the level of personal protective equipment to be used, and any other applicable precautions to be undertaken. Because hydrogen sulfide is now an identified COC on the 64<sup>th</sup> Street properties, health and safety concerns related to hydrogen sulfide during excavations on the 64<sup>th</sup> Street properties will be addressed in the relevant H&SPs.

Long-term compliance is discussed in Section 4 below.

### **3. MODIFIED CAP REQUIREMENTS IN LANDSCAPE AREAS**

Due to sloping requirements to prevent undermining building foundations and sidewalks, a portion of the landscape areas south of the new building did not achieve the three feet of clean soil cover specified in the RMP. The landscape area of concern is shown on Figure 4. Within this landscape area, the clean soil cover near the edge (i.e., adjacent to the sidewalk and the building) ranges from 1 to 3 feet in thickness. The width of the soil cover less than 3 feet thick is approximately 2 feet. The clean soil cover thickness varies in a roughly linear fashion, with the thinnest portion being closest to the building and sidewalk. To provide a visual warning of the clean fill boundary, the bottom of the clean fill is marked with plastic, orange fence material in the areas where the clean soil cover is less than 3 feet thick.

As required in Section 4.3 of the RMP, a H&SP will be prepared for future subsurface excavation activities in which the cap is removed. The RMP requires that the H&SPs include a description of health and safety training requirements for onsite personnel, the level of personal protective equipment to be used, and any other applicable precautions to be undertaken. These requirements apply to the cap in the landscape area of concern.

Long-term compliance is discussed in Section 4 below.

### **4. LONG-TERM COMPLIANCE**

A deed restriction for the 64th Street properties was recorded in the Alameda County Recorder’s office on 6 October 1999. Among other things, the deed restriction requires the property owner to comply with the RMP. Once approved by the ACDEH (with RWQCB concurrence), this Addendum will become part of the RMP, and SIMEON will record this Addendum in the Alameda County Recorder’s office for the 64<sup>th</sup> Street properties. In this way, the amended RMP will inform future land owners about (1) the possible presence of hydrogen sulfide, (2) the required appropriate risk management measures if hydrogen sulfide is encountered, and (3) the thinner cap thickness present in the landscape area discussed in Section 3.

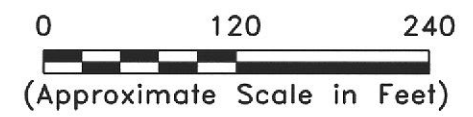
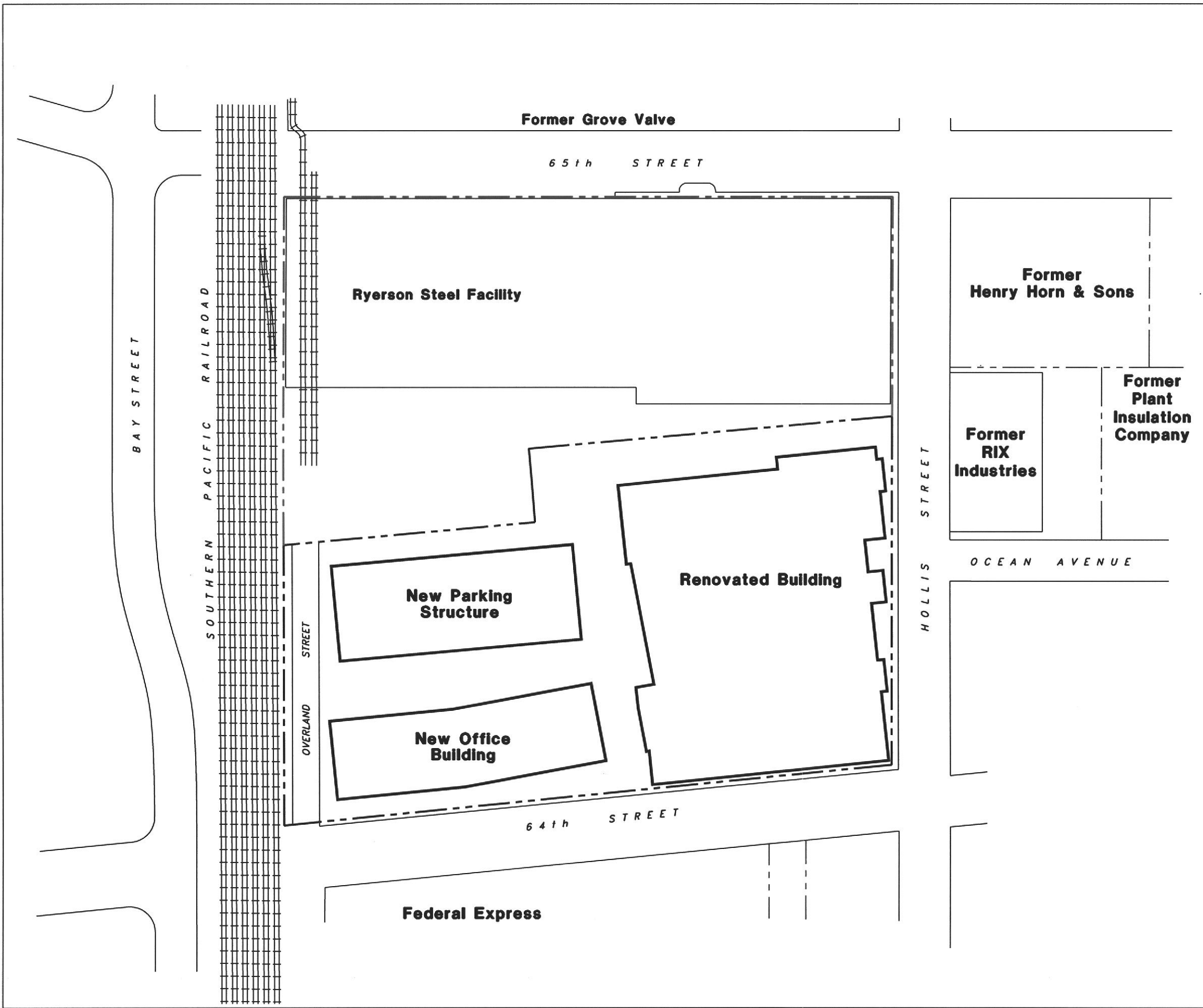
In addition, the City of Emeryville is developing a tracking system (“one-stop shop”) for hazardous materials sites within its jurisdiction. Once in place, this tracking system will allow the building and planning departments of the City of Emeryville to access requirements for and restrictions on work performed at these sites (e.g., when an excavation permit application is received). The RMP and this Addendum will be provided to the City of Emeryville for their inclusion in the tracking system.

## **5. REFERENCES**

8 CCR 5155. California Code of Regulations, Title 8, Section 4155.

Cal-EPA, 2000. California Environmental Protection Agency, Office of Environmental Health Hazard Assessment, *Technical Support Document for the Determination of Noncancer Chronic Reference Exposure Levels*, Batch 1B, April 2000.

EKI, 1999. Erler & Kalinowski, Inc., *Final Risk Management Plan for the 64<sup>th</sup> Street Properties, Emeryville, California*, 30 August 1999.



**LEGEND**

- Railroad Tracks
- Approximate Property Boundary
- Boundary of 64th Street Properties
- Boundary of Ryerson Steel Facility Property

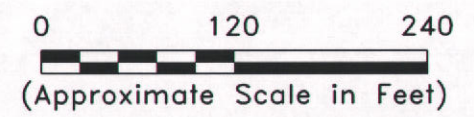
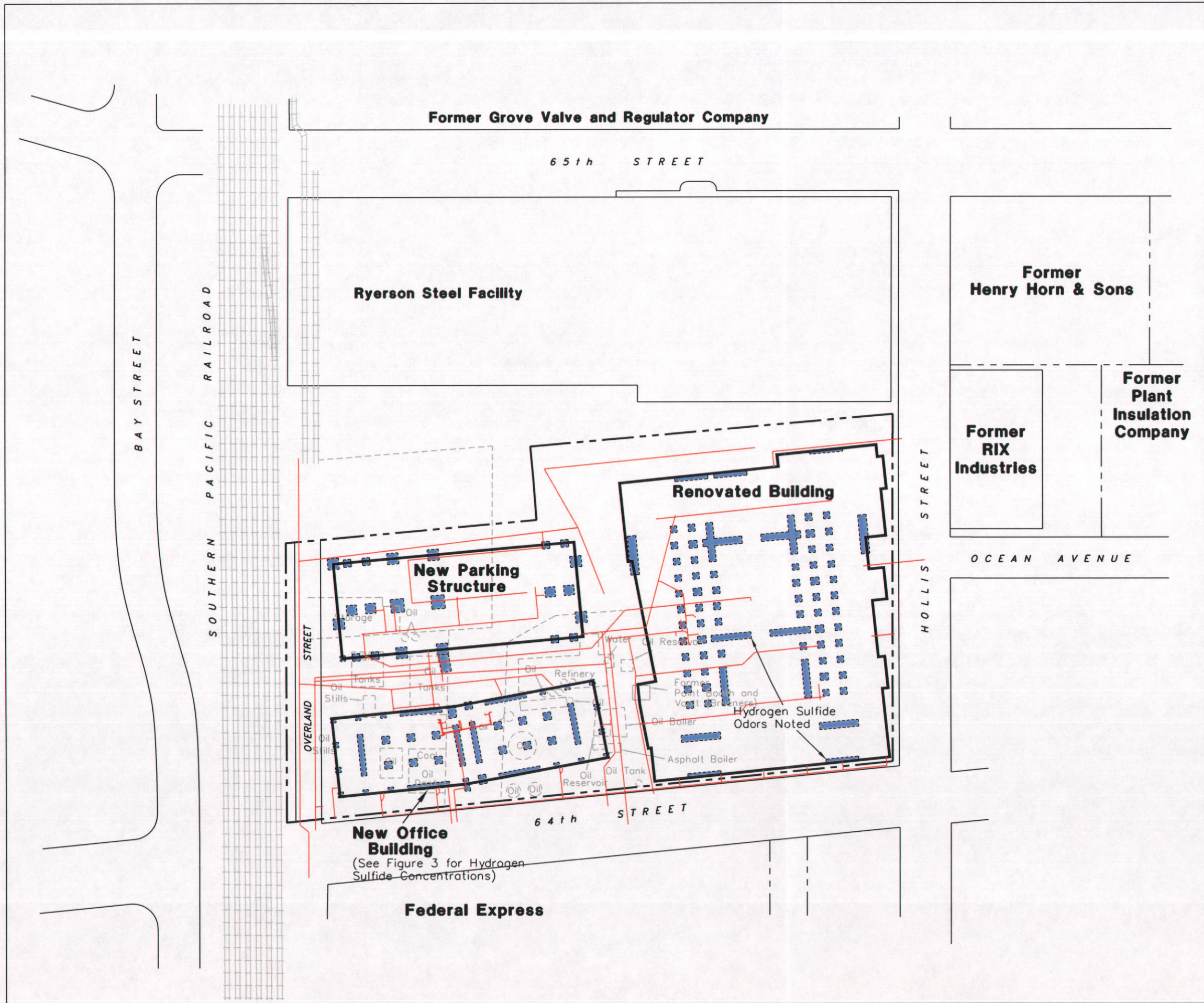
**Notes:**

1. All locations are approximate.

**Erler & Kalinowski, Inc.**

Site Plan

64th Street Properties  
 Emeryville, CA  
 April 2001  
 EKI 990016.03  
 Figure 1



**LEGEND**

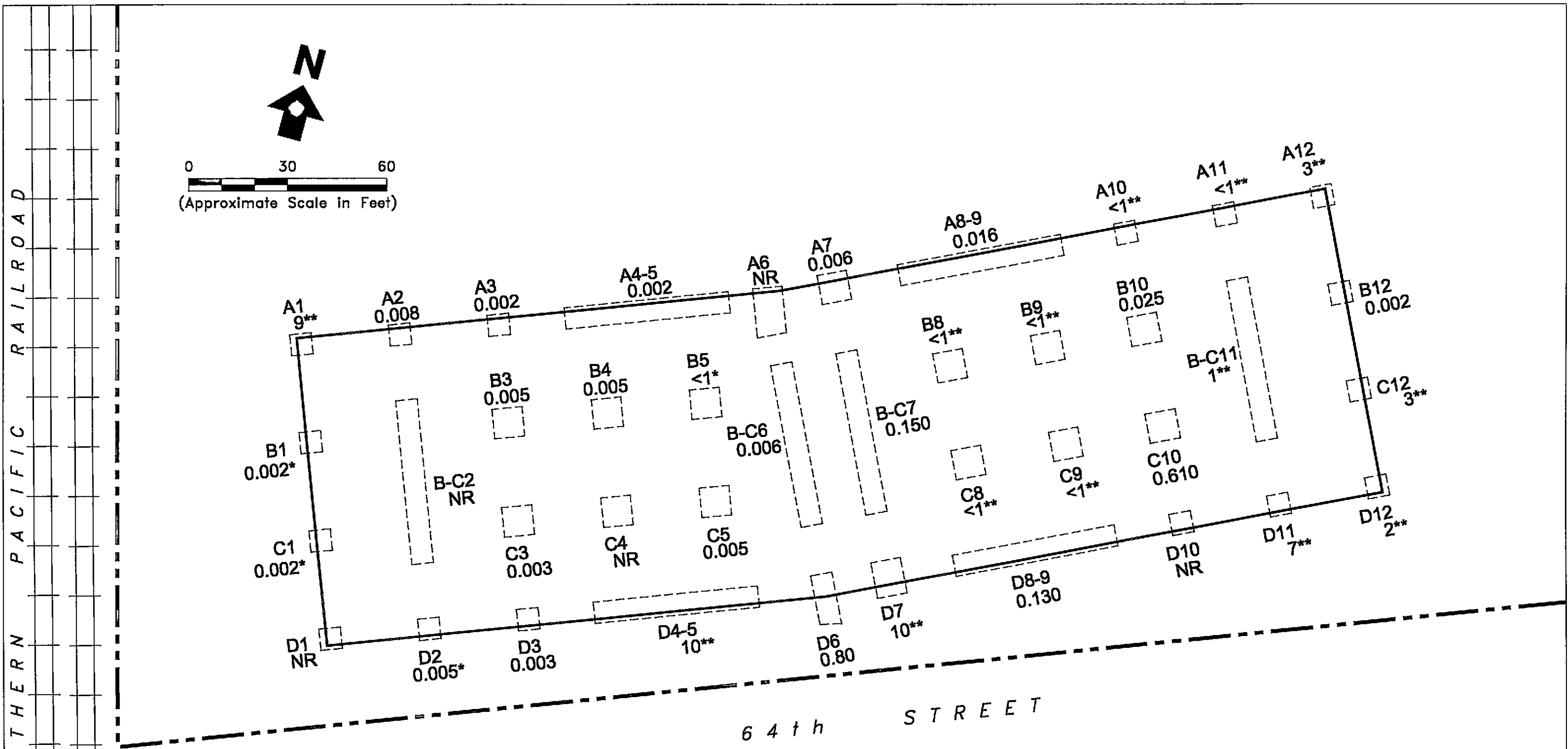
- Railroad Tracks
- Approximate Property Boundary
- Boundary of 64th Street Properties
- Building Outline
- Historical Site Features (1911 Sanborne Map)
- Underground Utilities
- Excavation for Building Footing

**Notes:**  
1. All locations are approximate.

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Building Footing Excavations and Underground Utilities

64th Street Properties  
Emeryville, CA  
April 2001  
EKI 990016.03  
Figure 2

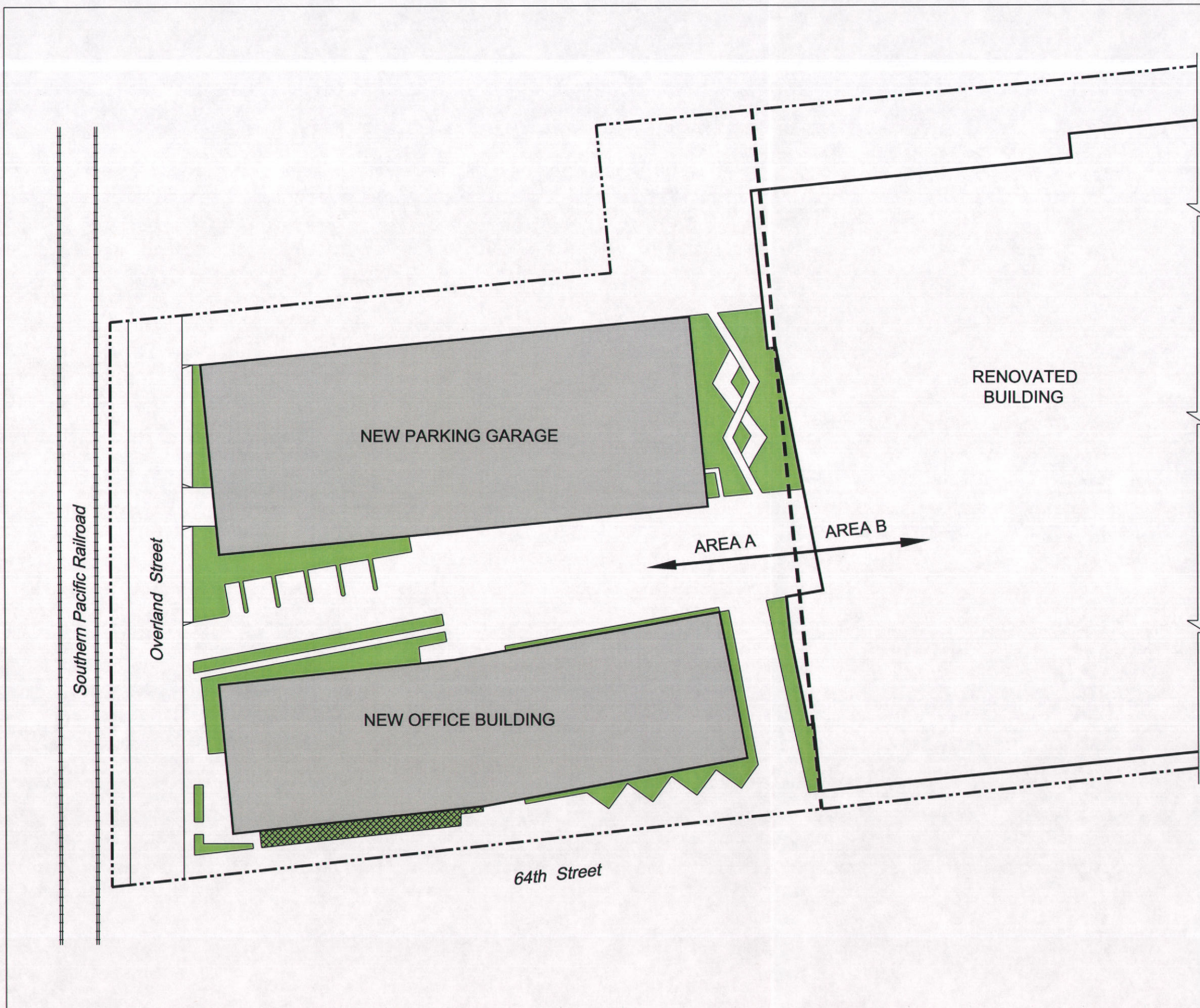


- Legend:**
- New Office Building Outline
  - Boundary of 64th Street Properties
  - Foundation Excavation Designation
  - 0.002** Breathing Zone Hydrogen Sulfide Concentration (PPMV)
  - NR** No Reading Recorded

- Notes:**
1. Unless otherwise noted, concentrations were measured by EKI.
  2. "\*" = EKI reading taken 1/2-2 hours after excavation.
  3. "\*\*\*" = Concentration measured by Enviro Group. Enviro Group instrument measured concentrations greater than or equal to 1 PPMV.
  4. Hydrogen sulfide concentration measurements were taken during foundation excavation for the new office building only.

## Erler & Kalinowski, Inc.

Maximum Breathing Zone Hydrogen Sulfide Concentrations Measured During Construction  
 64th Street Properties  
 Emeryville, CA  
 April 2001  
 EKI 990016.03  
 Figure 3



0 60 120  
 (Approximate Scale in Feet)

**LEGEND**

- Boundary of 64th Street Properties
- - - Area A Boundary
- Building Outline
- ==== Railroad Tracks
- Landscape Area
- ▨ Landscaped Area Which Does Not Have 3 Feet of Clean Cover Everywhere (Note 2)

**Notes:**

1. All locations are approximate.
2. Within 2 feet of the edges, clean fill thickness varies between 1 and 3 feet. Clean fill is thinnest at the edge of this landscape area.

**Erler & Kalinowski, Inc.**

Area A Landscape Areas

64th Street Properties  
 Emeryville, CA  
 April 2001  
 EKI 990016.00  
 Figure 4