



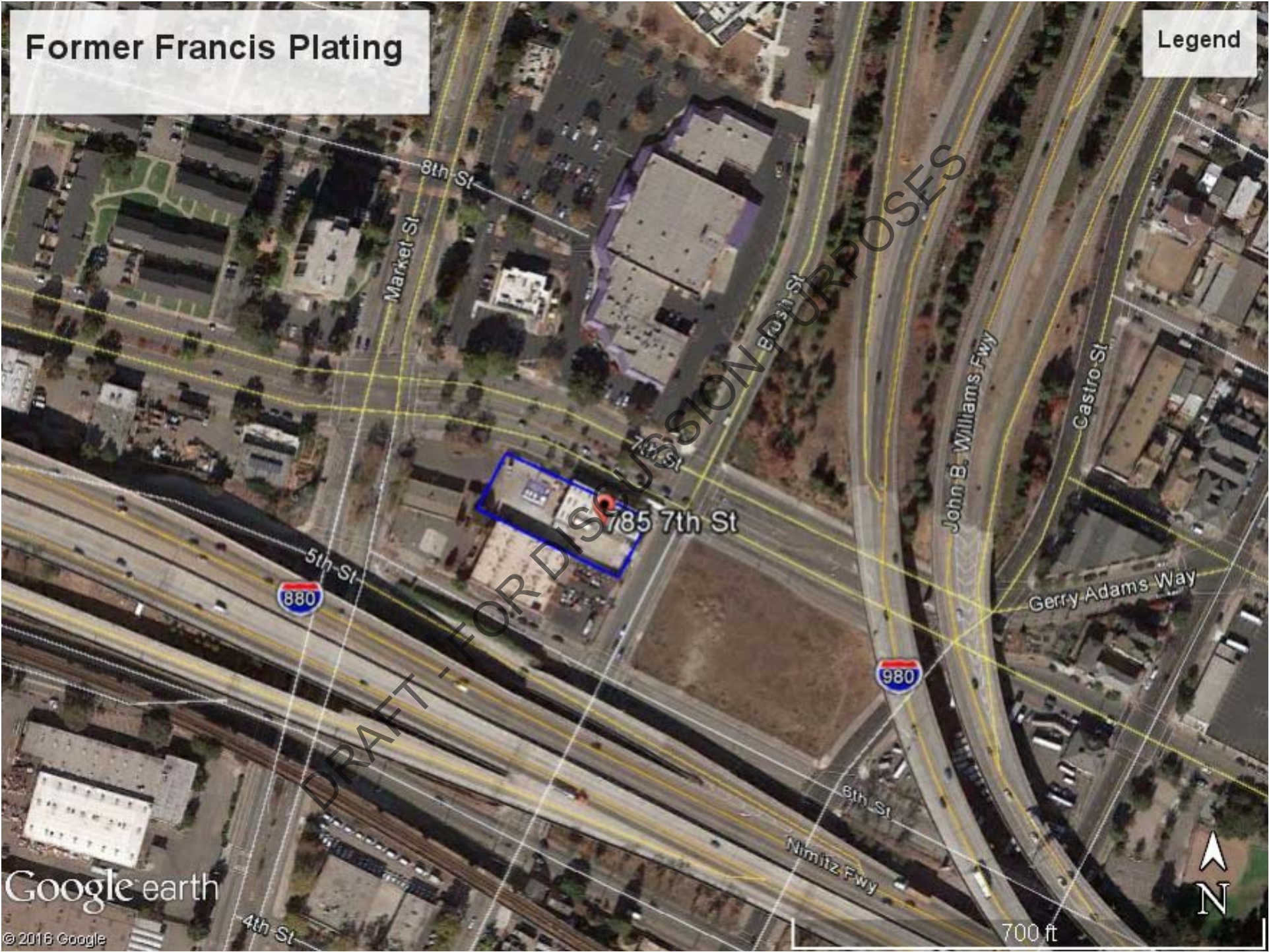
Former Francis Plating 785 7th Street Oakland, California

Presented By:
The Source Group, Inc.
A Division of Apex Companies, LLC
256 Buena Vista Street, Suite 200
Grass Valley, California 95945

February 28, 2017

Former Francis Plating

Legend



Google earth

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700 ft

Meeting Objective



Former Francis Plating – Two Sites

- Former Francis Plating – Building Site
Site Management Plan - Closure
Seventh Street Group
- Former Francis Plating – Frog Pond Site
Site Assessment
Feasibility Documents
Brush Street Group

Development of Remedial Approach for Application into Site Cleanup Subaccount Program (SCAP)

- Limited Responsible Party Funding
- Severely Disadvantaged Community
- Impacted Groundwater
- Proximity to San Francisco Bay

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Site Background



Property Developed: 1945

- Automotive dealership.

Plating Operations: 1957 – 1998

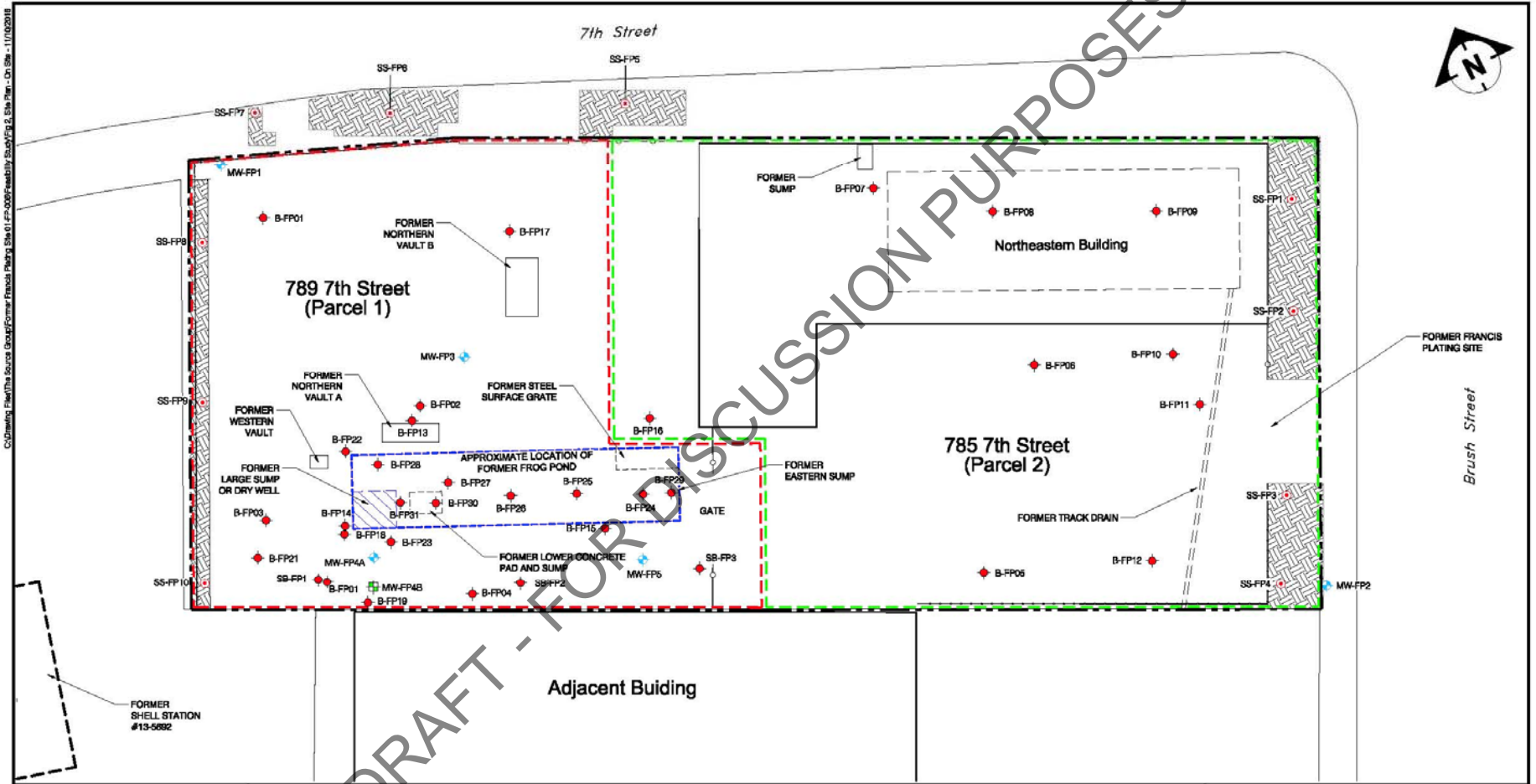
- Nickel, cadmium, aluminum anodizing and chromic acid passivation.

Site Abandoned and Emergency Action

- Spent waste abandoned on-Site was classified. Immediate threats to human health or the environment were disposed and/or managed to reduce impact – January 1999; and
- Removal of select surface soil (6-inches) – October 1999.

Assessment/Frog Pond Removal: 2003-Current

- 34 – Soil Borings;
- 7 – Shallow Monitoring Wells;
- 2 – Deep Monitoring Wells; and
- Frog Pond, concrete vaults and concrete column removed – June through December 2007.



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944 McCOURTNEY ROAD, SUITE H
GRASS VALLEY, CALIFORNIA 95949

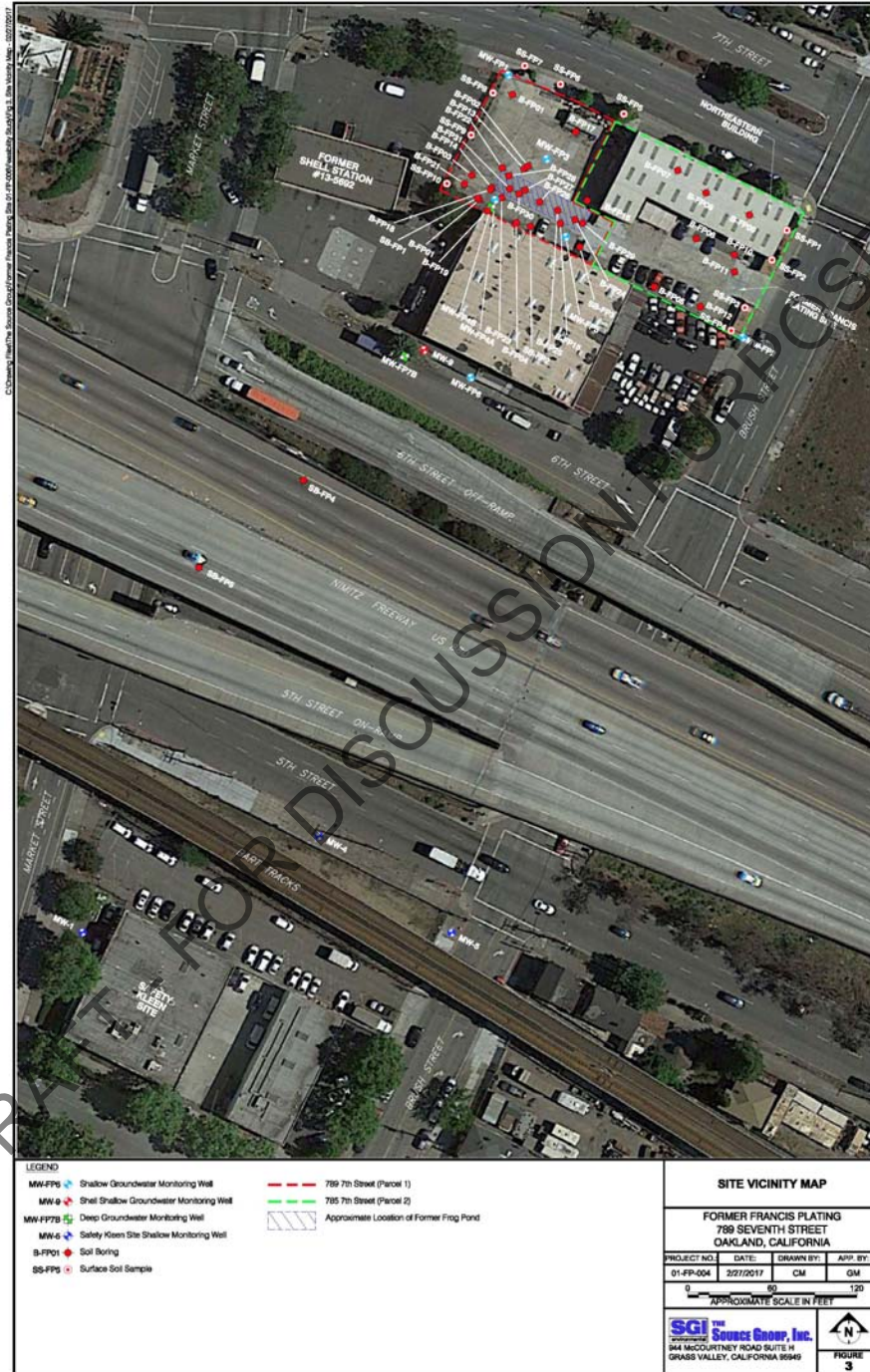
0 20 40
APPROXIMATE SCALE IN FEET

LEGEND

- MW-FP6 Shallow Groundwater Monitoring Well
- MW-FP7B Deep Groundwater Monitoring Well
- B-FP01 Soil Boring
- SS-FP5 Surface Soil Sample
- Fence
- 789 7th Street (Parcel 1)
- 785 7th Street (Parcel 2)
- Site Boundary
- Approximate Area Removed During Large Sump Removal 12/2007
- Exposed Soil Area

Notes:
Former Frog Pond and Vaults extended to approximately four feet bgs. Former large sump extended to approximately 20 feet bgs.

SITE PLAN (On-Site)				
FORMER FRANCIS PLATING 789 7TH STREET OAKLAND, CALIFORNIA				
PROJECT NO.:	DATE:	DRAWN BY:	APP. BY:	FIGURE
01-FP-004	11/10/2018	CM	GM	2



Conceptual Site Model

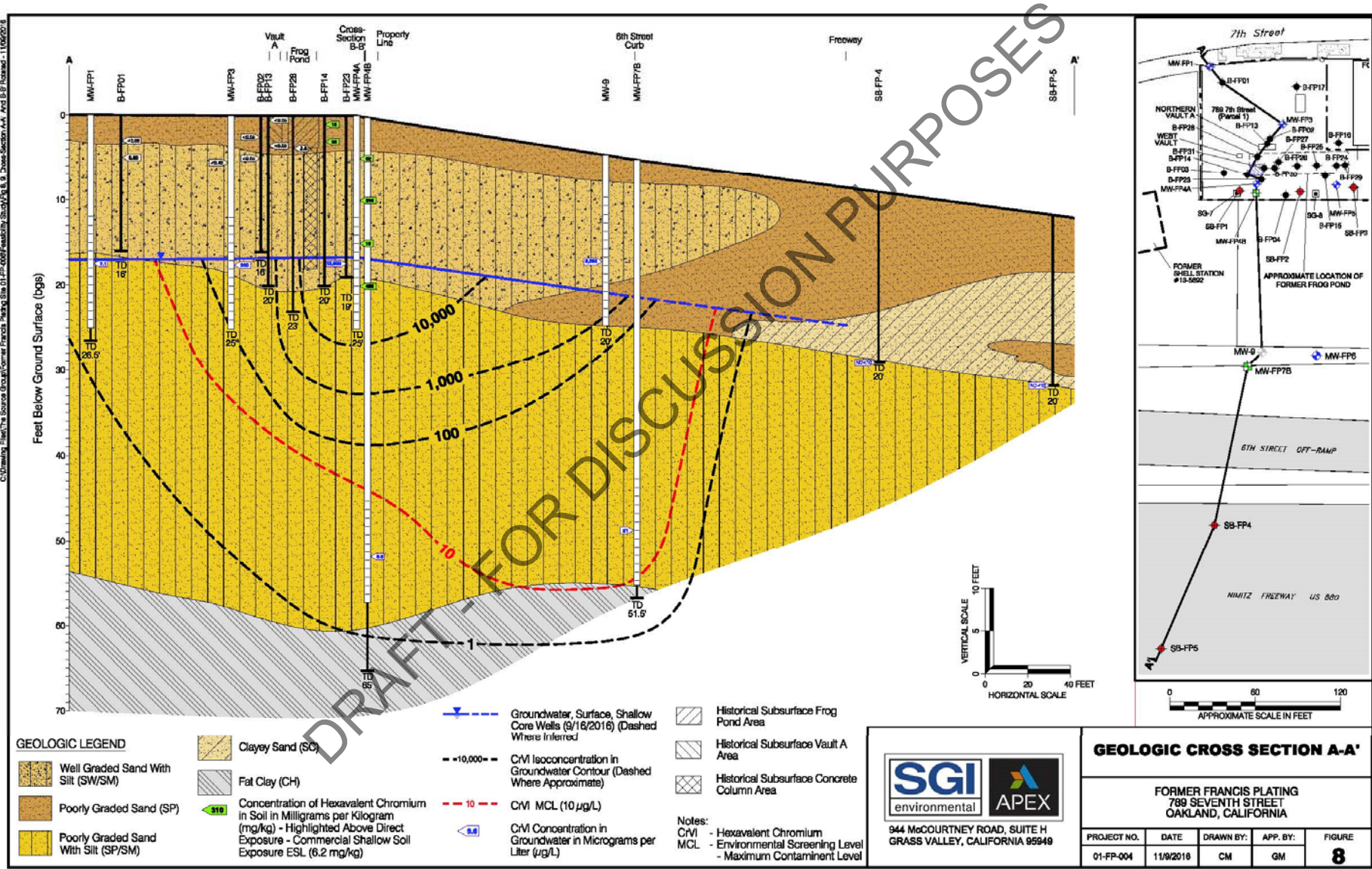


Geology/Hydrogeology:

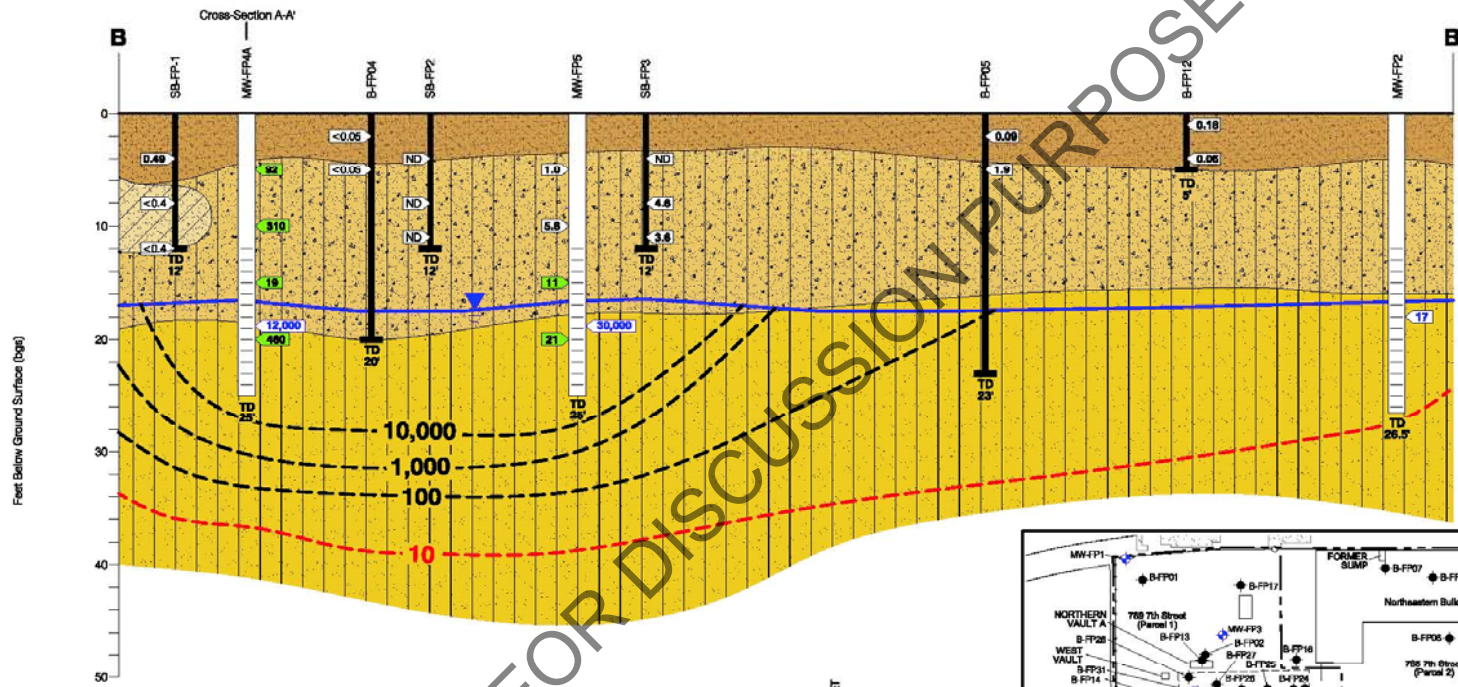
- Low hydraulic conductivity shallow soil (0 – 15 feet bgs)
- Merritt Sand (Poorly Graded Sand) extends approximately to 60 feet bgs
- Old Bay Mud >60 feet bgs
- Static groundwater level in 2016 – 18 feet bgs
- Gradient – Southwest

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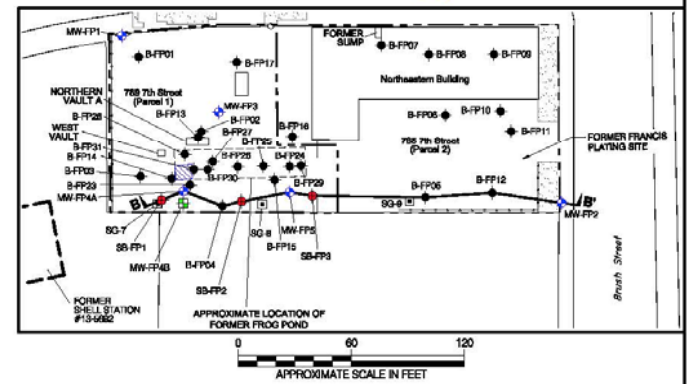
C:\Drawing - Files\The Source Group\Former Francis Plating Site 01-FP-004\Final\Study\2016.9.9_Cross-Section A-A And B-B Revised - 11/09/2016



C:\Drawing\Files\The Source Group\Francis Plating Site B1-FP-005\Final\Sub\Fig 8 & 9, Cross-Section A-A, Act B1-FP-005 - 11/28/2016



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GEOLOGIC LEGEND

- Well Graded Sand With Silt (SW/SM)
- Poorly Graded Sand (SP)
- Poorly Graded Sand With Silt (SP/SM)
- Clayey Sand (SC)
- Concentration of Hexavalent Chromium in Soil in Milligrams per Kilogram (mg/kg) - Highlighted Above Direct Exposure - Commercial Shallow Soil Exposure ESL (6.2 mg/kg)
- Groundwater, Surface, Shallow Core Wells (9/16/2016) (Dashed Where Inferred)

- CrVI Isoconcentration in Groundwater Contour (Dashed Where Approximate)
- CrVI MCL (10 µg/L)
- CrVI Concentration in Groundwater in Micrograms per Liter (µg/L)

Notes:
 CrVI - Hexavalent Chromium
 MCL - Environmental Screening Level
 - Maximum Contaminant Level



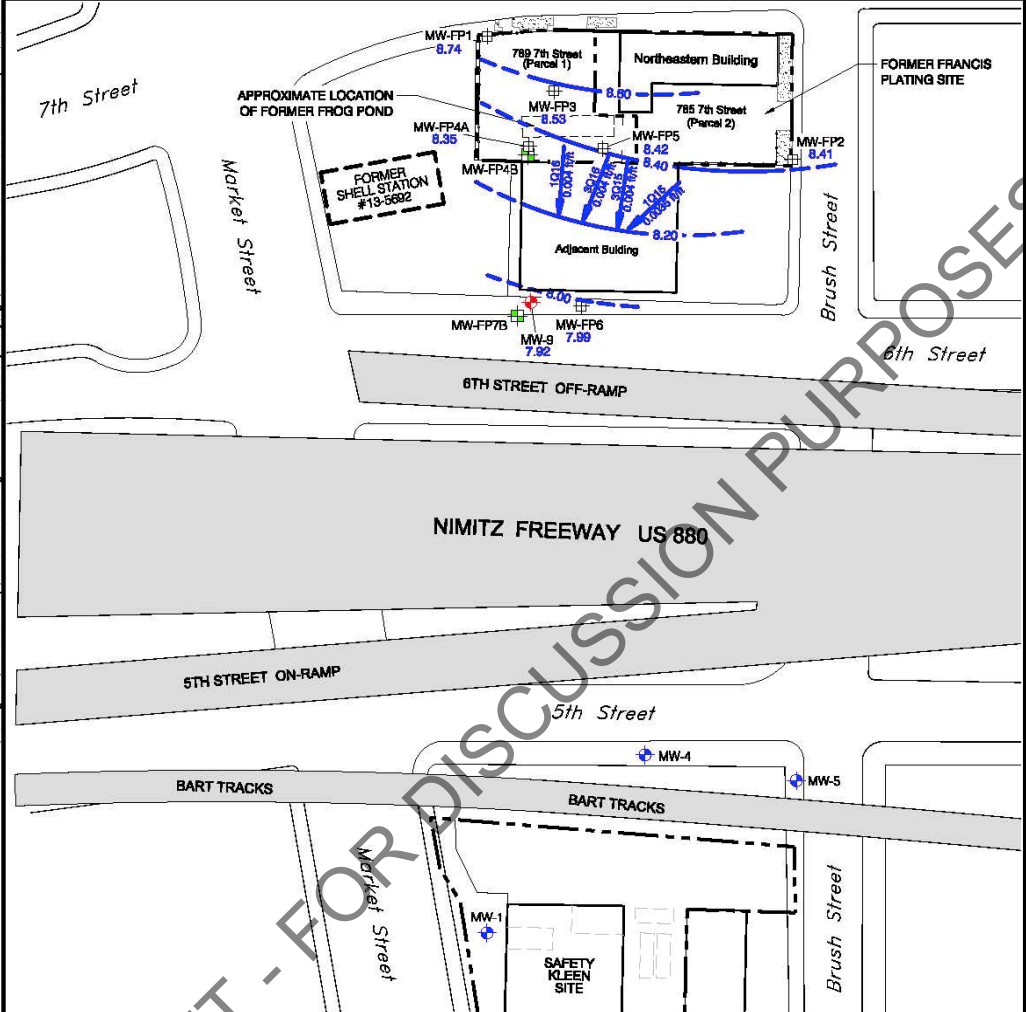
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GEOLOGIC CROSS SECTION B-B'

FORMER FRANCIS PLATING
 789 SEVENTH STREET
 OAKLAND, CALIFORNIA

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C:\Drawing Files\The Source Group\Former Francis Plating Site 01-FP-004\Final\Final Map 4, GW Elev & Potentiometric Surface & Grad Map - 11/10/2016



LEGEND

- MW-FP6 Shallow Groundwater Monitoring Well
- MW-FP7B Deep Groundwater Monitoring Well
- MW-9 Shell Shallow Groundwater Monitoring Well
- MW-5 Safety Kleen Site Shallow Monitoring Well
- 8.25 Groundwater Elevation Contour in Feet Above Mean Sea Level (Dashed Where Inferred - September 14, 2016)
- 0.004 ft/ft Approximate Groundwater Flow Direction and Calculated Hydraulic Gradient
- Fence
- Site Boundary

Note:

- * - Not Included in Contour (MW-FP4B and MW-FP7B are screened in a different zone)
- ft/ft - feet per foot

GROUNDWATER ELEVATION, POTENTIOMETRIC SURFACE AND GRADIENT MAP

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789 7TH STREET
OAKLAND, CALIFORNIA

PROJECT NO.:	DATE:	DRAWN BY:	APP. BY:
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0 100 200
APPROXIMATE SCALE IN FEET

944 McCOURTNEY ROAD SUITE H
GRASS VALLEY, CALIFORNIA 95949

FIGURE 4





Conceptual Site Model

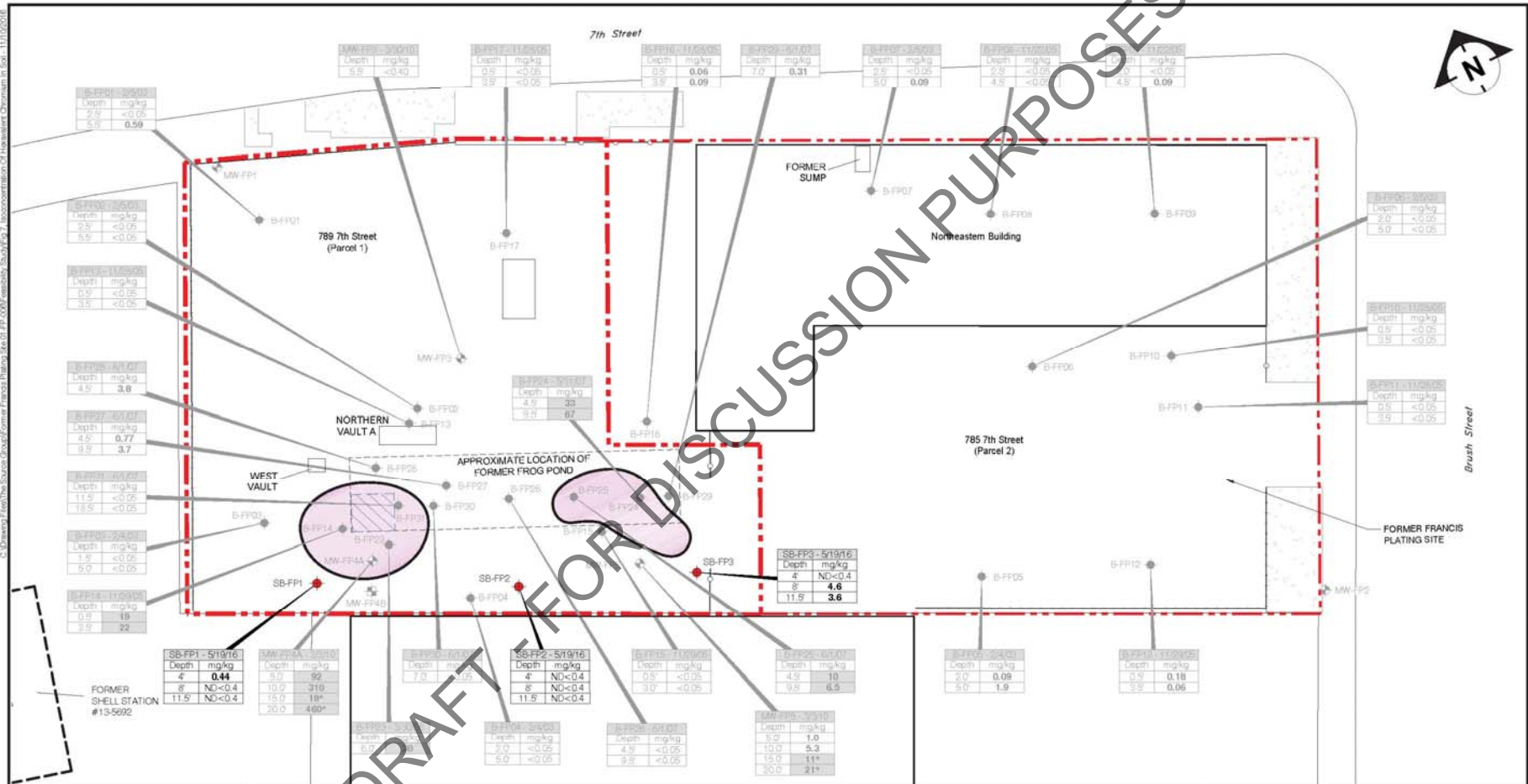
Chemicals of Concern

- Primary – Hexavalent Chromium (CrVI) in soil and groundwater
- Secondary – Trichloroethene (TCE) in groundwater

Impact and Extent

- Soil – CrVI within and south of the Former Frog Pond, Maximum 310 mg/kg MW-FP4A
- Soil Vapor – TCE present in soil gas and sub-slab
- Groundwater
 - CrVI – South (6th Street off-ramp), East (Brush Street), West (Former Shell Station)
 - TCE – South (Interstate 880)

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GRASS VALLEY, CALIFORNIA 95949

0 20 40
APPROXIMATE SCALE IN FEET

LEGEND

- SB-FP5 • Soil Borings (5/19/2016)
- B-FP01 • Soil Boring Location
- MW-FP6 • Shallow Groundwater Monitoring Well
- MW-FP4B • Deep Groundwater Monitoring Well
- Fence
- - - Site Boundary
- ▨ Approximate Area of Excavation 12/2007
- Approximate Area of Soil Above Environmental Screening Level (6.2 mg/kg)

Sample Location

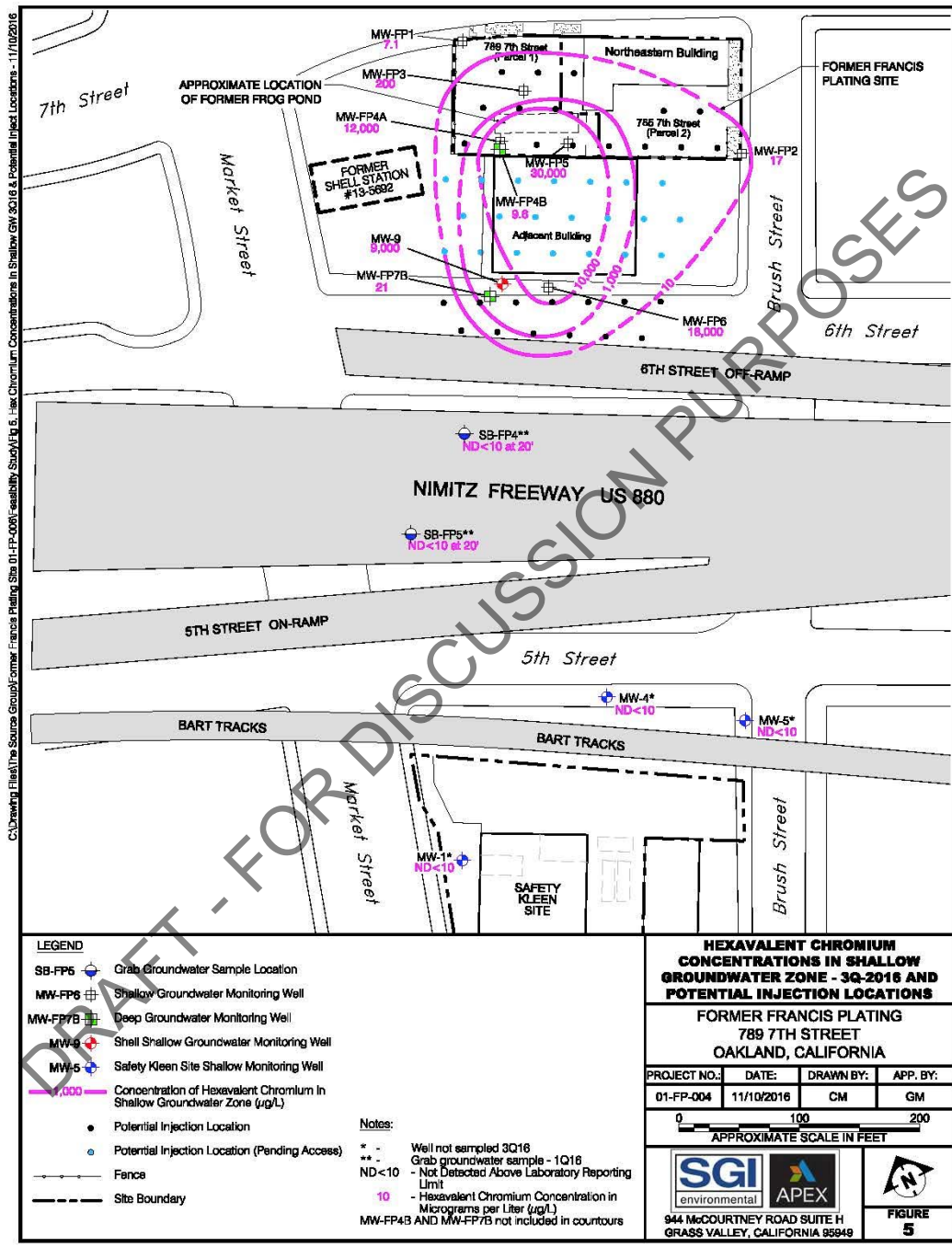
MW-FP4A - 3/3/10	Depth mg/kg	Hexavalent Chromium Concentration in milligrams per kilogram (mg/kg) Deflections are Shown in Bold
5.0'	92	OWI Concentration Above Commercial Environmental Screening Level - Direct Exposure (6.2 mg/kg)
10.0'	310	
15.0'	19	
20.0'	460	

Note:
• Indicates saturated soil sample

ISOCONCENTRATION OF HEXAVALENT CHROMIUM IN SOIL

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789 7TH STREET
OAKLAND, CALIFORNIA

PROJECT NO.:	DATE:	DRAWN BY:	APP. BY:	FIGURE
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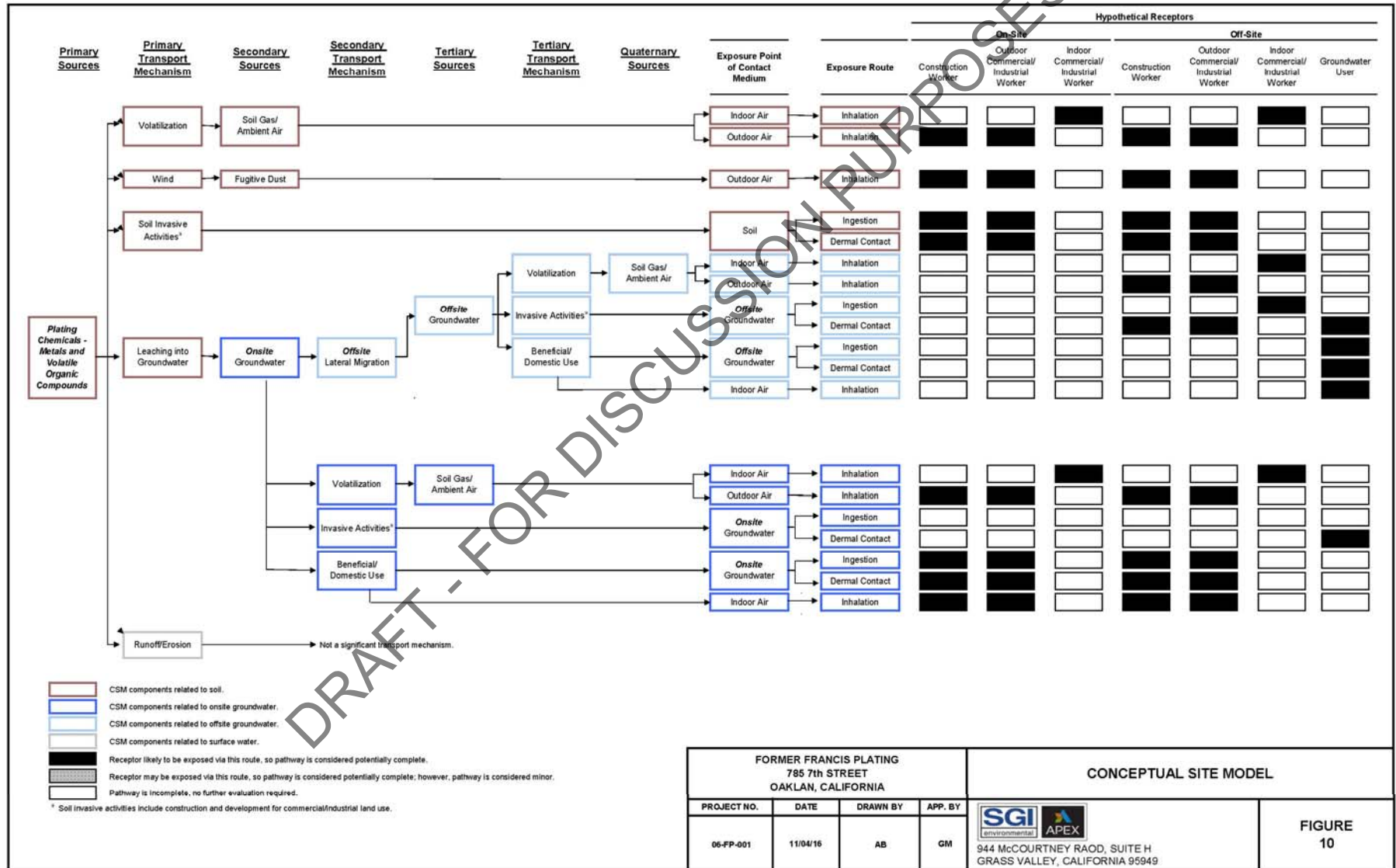
Conceptual Site Model



Potential Receptors

- On-Site – Construction Worker, Outdoor/Indoor Industrial Worker; and
- Off-Site – Construction Worker, Indoor/Outdoor Industrial Worker, Groundwater Use and surface water.

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Remedial Objectives

Remedial Objectives:

- Remediate impacted soil within the source area
- Remediate groundwater impacted with CrVI and TCE

Cleanup Goals

- Groundwater
Environmental Screening Level - Maximum Contaminant Levels
CrVI – 10 µg/L
TCE – 5 µg/L
- Soil
Environmental Screening Levels - Direct Exposure human Health Risk Levels
(Commercial/Industrial)
CrVI – 6.2 mg/kg



Remedial Alternatives – Soil

Technology	Overall Protection of Human Health and Environment	Long-Term Effectiveness and Reduction of Toxicity	Implementation	Cost
Excavation, retrieval, off-Site disposal	Excellent	Excellent	Difficult	High - 750 tons approximately
Calcium Polysulfide	Good	Good	Easier	Moderate – 10 foot radius of influence

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Remedial Alternatives – Groundwater

Technology	Overall Protection of Human Health and Environment	Long-Term Effectiveness and Reduction of Toxicity	Implementation	Cost
Groundwater pumping with activated carbon filtering	Good	Good	Moderate	High
Calcium Polysulfide	Good	Good	Moderate	Low
Biostimulants	Good	Moderate	Moderate	Moderate
Solid Iron Additives (ZVI)	Good	Good	Moderate	Moderate

Selected Remedial Technology and Approach

Proposed Treatment of Impacted Soil and Groundwater – Calcium Polysulfide (CPS)

- Lime sulfur, reliably available
- Remediates CrVI in soil and groundwater
 - Convert soluble CrVI into insoluble Cr(III) as chromium hydroxide
- Remediates VOCs in groundwater
 - Promotes the growth of naturally occurring sulfate-reduction bacteria

Pilot/Bench Scale Study

- Work Plan - Soil/Groundwater Collection and Pilot Test Activities
 - Collection of Site soil and groundwater samples for bench scale test
 - Soil Reduction Demand
 - Groundwater Reduction Demand
 - Column and Treatability Testing (Control, 1x, 2x and 5x)
 - Injection of CPS into vadose and saturated zones

Selected Remedial Technology and Approach

Anticipated pilot/bench scale study outcomes

- Treatability of CrVI in low hydraulic conductivity vadose zone soils
- Treatability of CrVI and TCE in groundwater
- Dosage needed to treat soil and groundwater
- Radius of influence in the vadose and saturated zone

Discussion

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