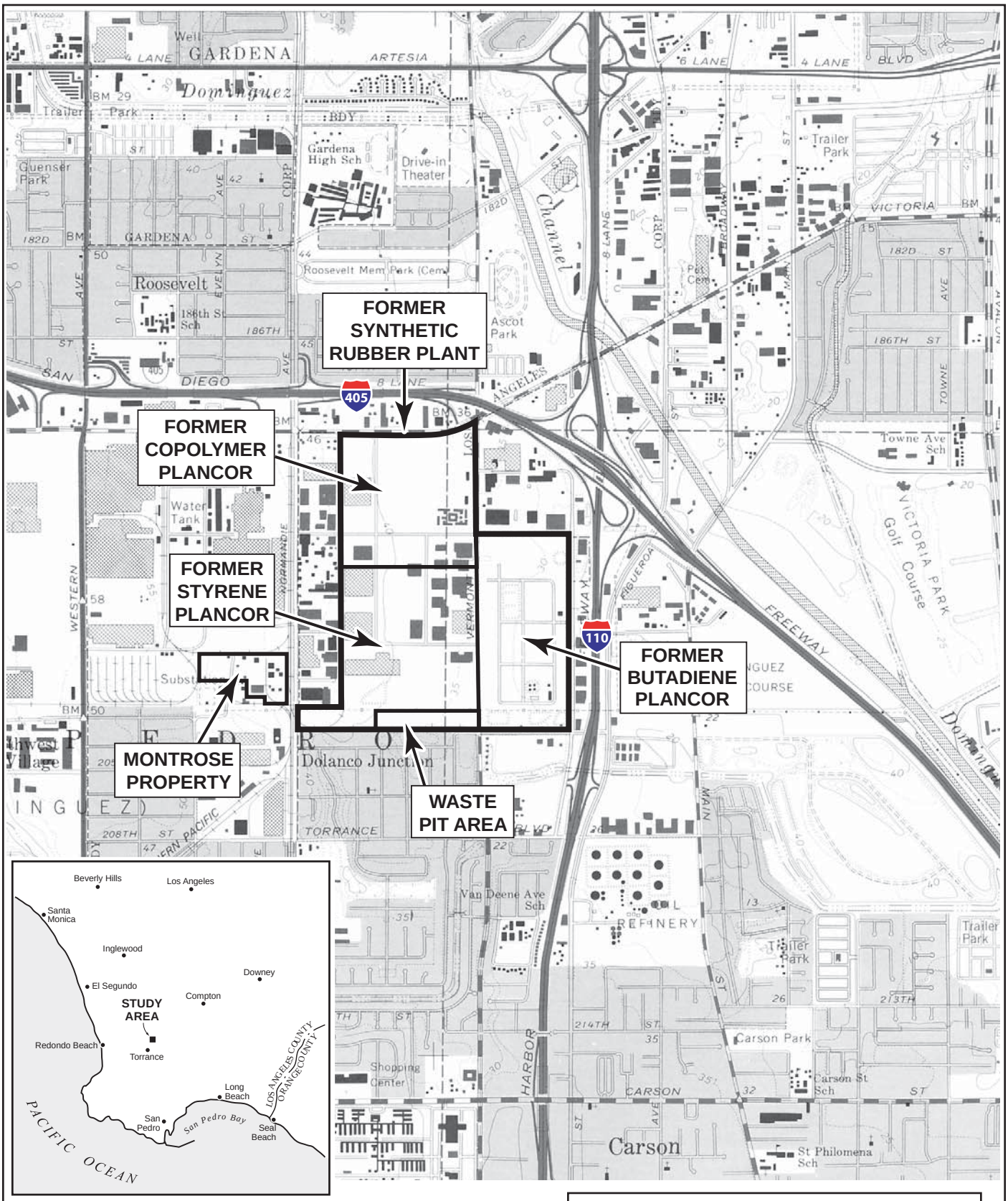
T/Ladd/DelAmo/Francis/Soil&NAPL FS/401-142D



0 1/2 1

Scale in Miles

BASEMAP: USGS 7.5 Minute Topographic Quadrangle: *Torrance, CA* 1964 (Photorevised 1981)

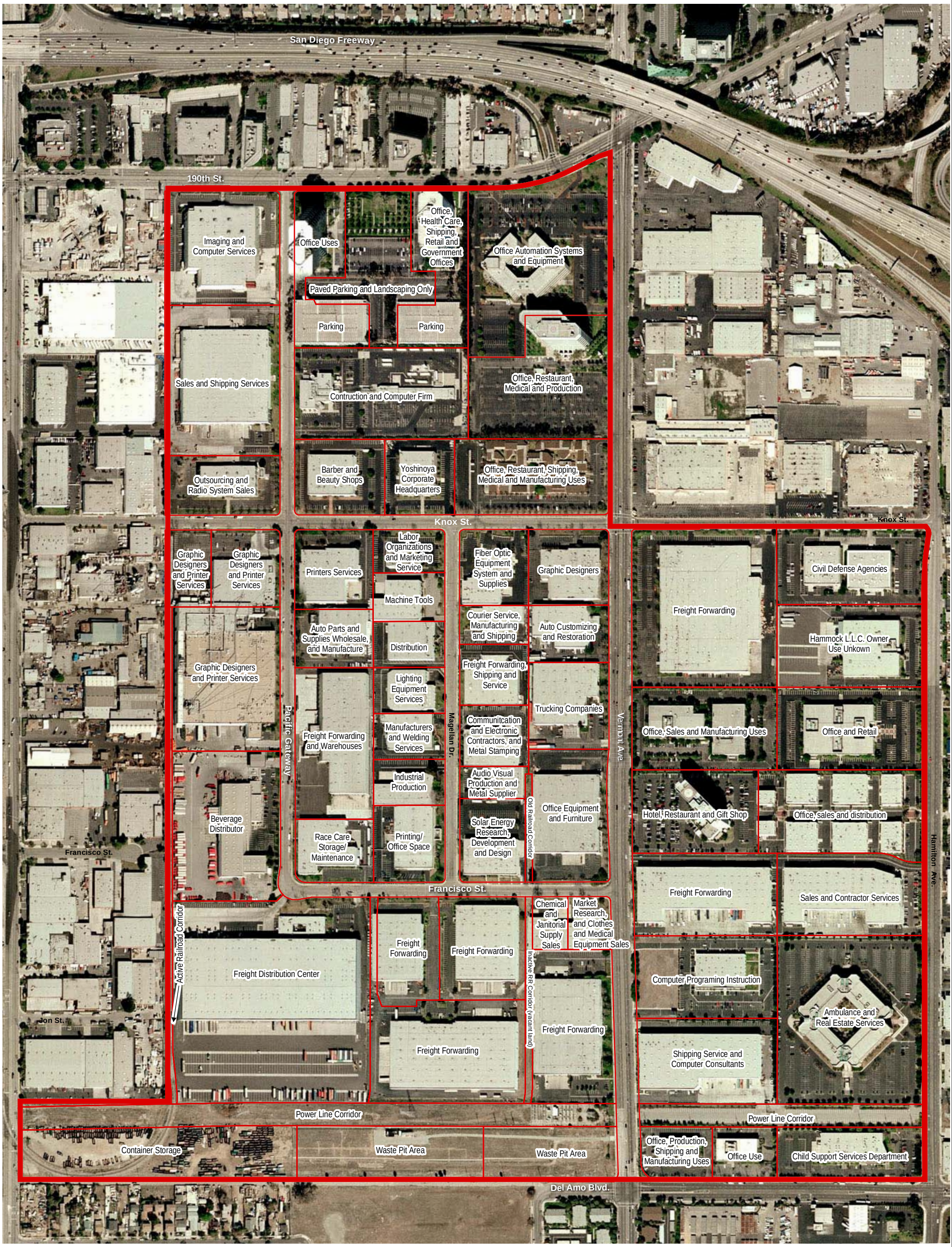
FIGURE 1-1

FORMER PLANT SITE LOCATION MAP

Soil and NAPL FS
Del Amo Superfund Site

URS

T/Ladd/DelAmo/Francis/Soil&NAPL FS/707-148



N

0 400 800

Scale: 1" - 400 feet (1:4,800)

Note: Land use as of 2004.

Legend

Parcel Boundary

Site Boundary

FIGURE 1-2

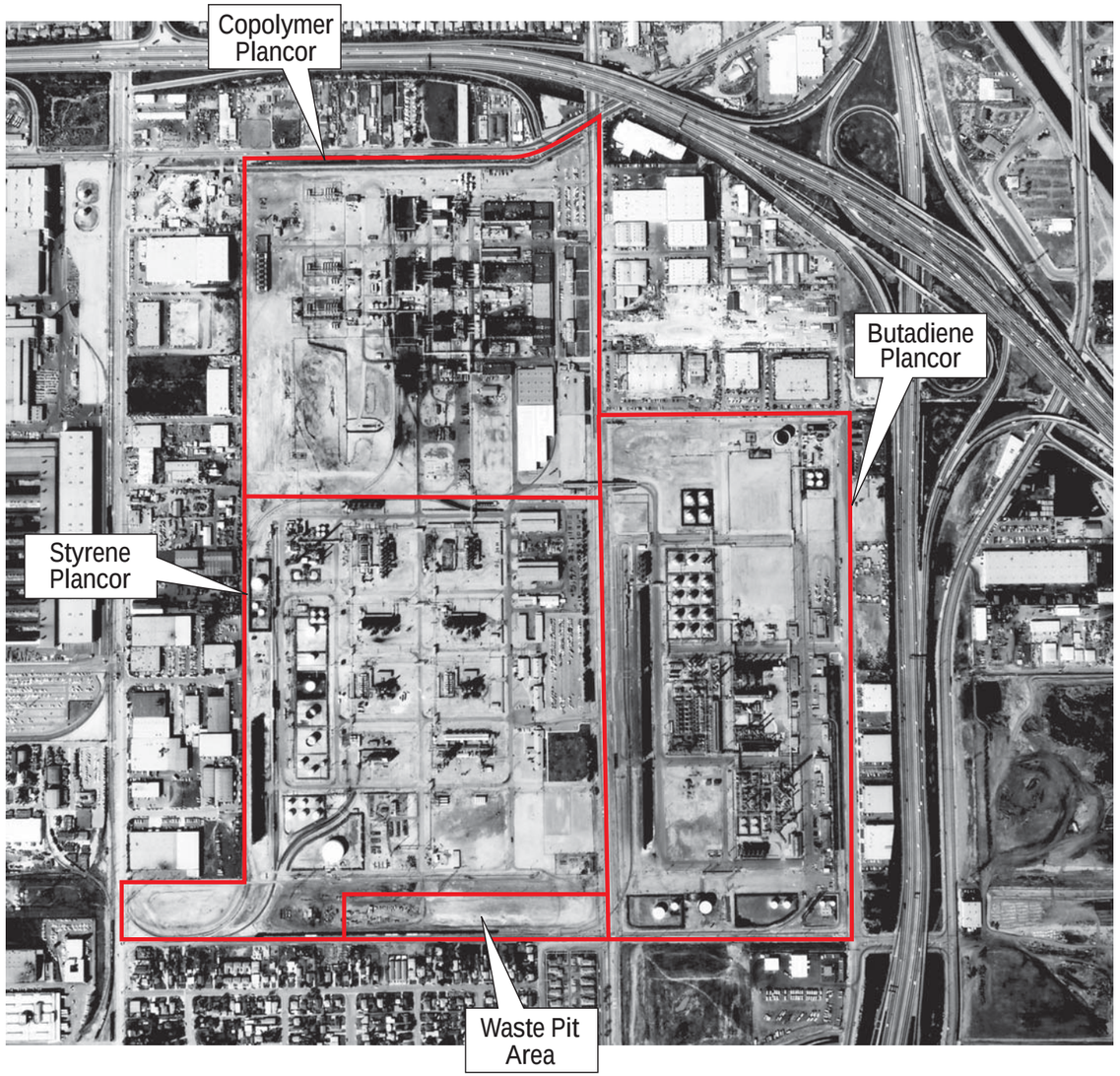
CURRENT LAND USE AT THE FORMER PLANT SITE

Soil and NAPL FS

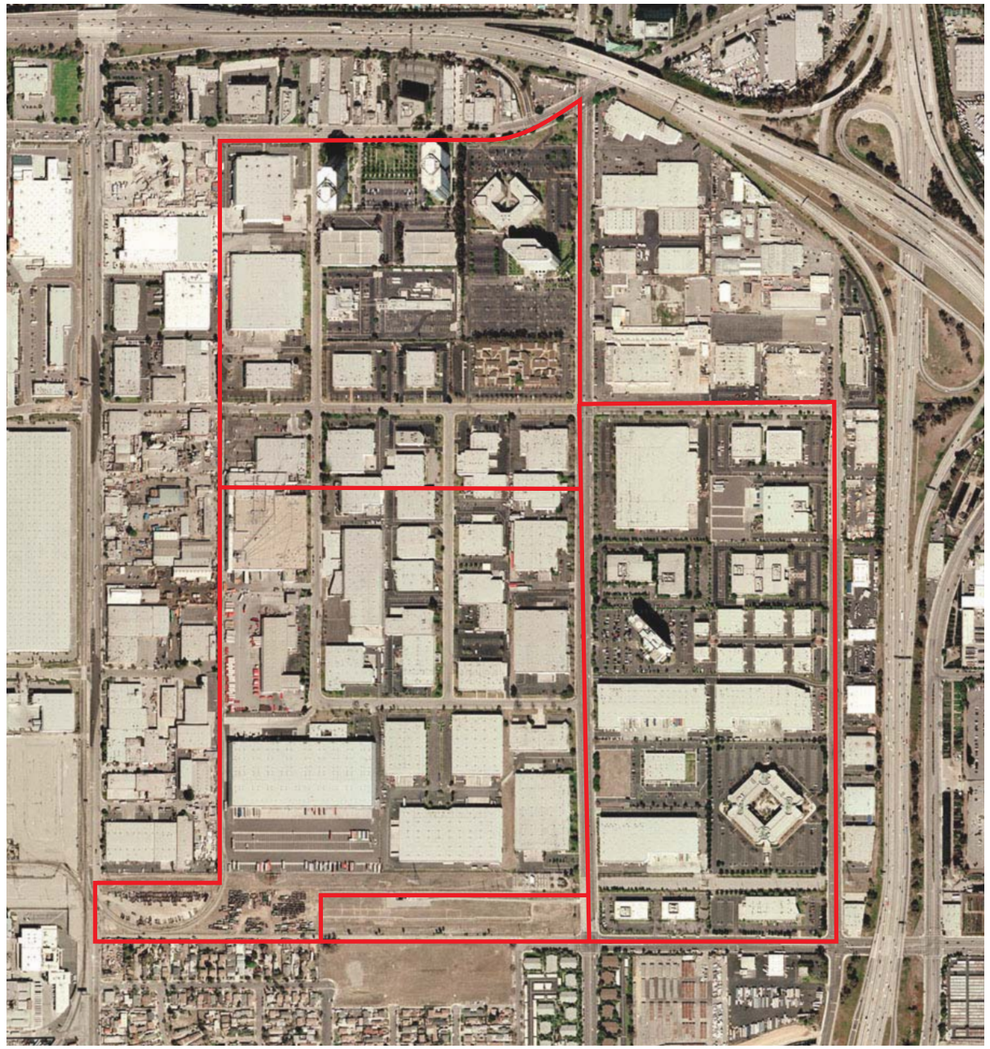
Del Amo Superfund Site

URS

T/Ladd/DelAmo/Francis/Soil&NAPL FS/603-148A



1971 photograph showing synthetic rubber plant shortly before it was decommissioned.



2007 photograph showing business park development of site.

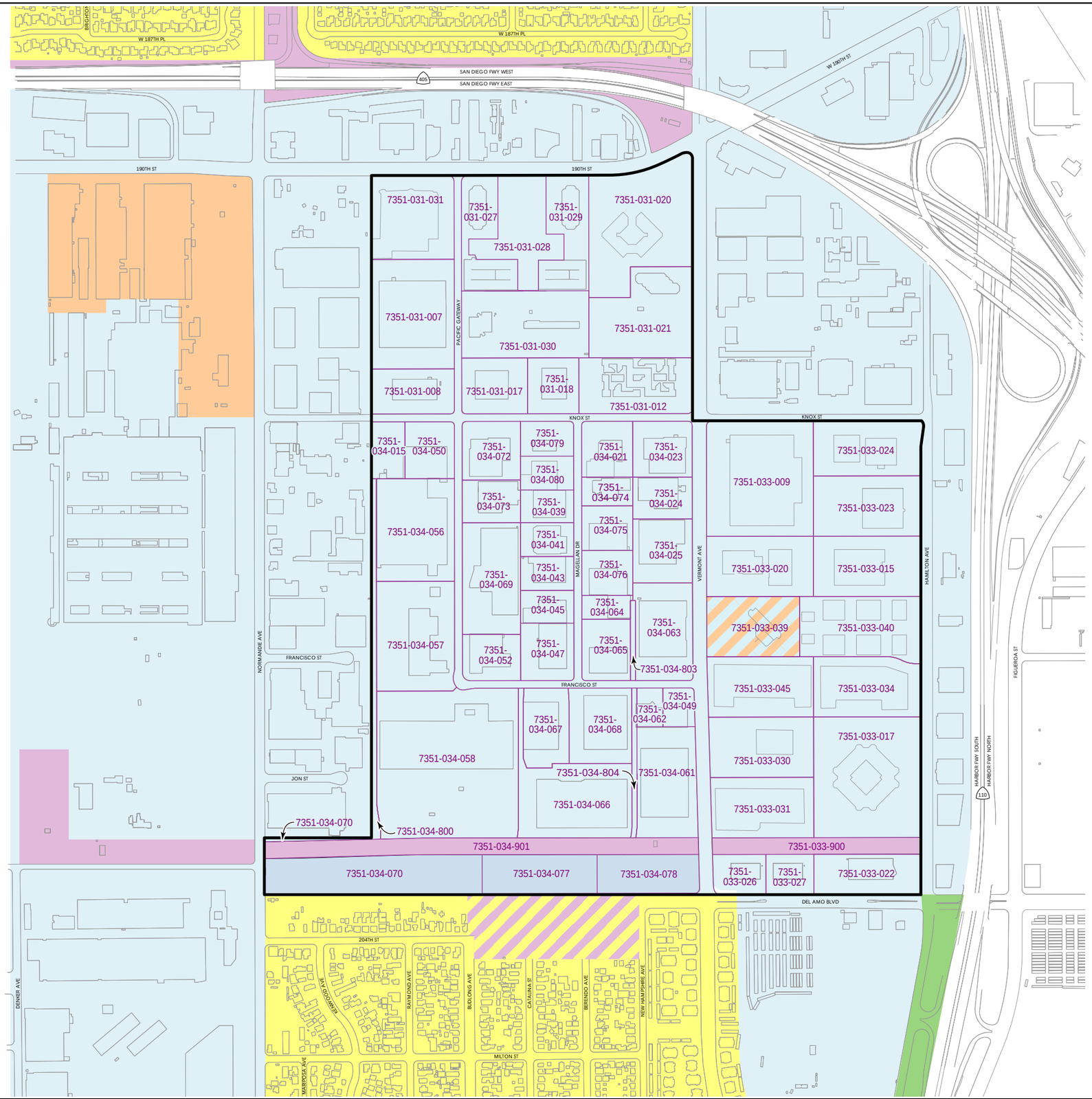
FIGURE 1-3

AERIAL PHOTOGRAPHS-CURRENT AND FORMER DEVELOPMENT

Soil and NAPL FS
Del Amo Superfund Site

URS

T:\Ladd\DelAmo\Francis\Soil&NAPL FS\104-002A



N

0 600 1200

Scale in Feet

Legend

- Manufacturing/industrial
- Commercial
- Dual industrial/commercial
- Public facilities
- Residential
- Former residential area bought out and razed by Shell Oil Company and the US Government. Currently under consideration for development as a public park
- Agricultural
- 7351-034-052 — Parcel boundaries and assessor's parcel number (shown only within former rubber plant site)

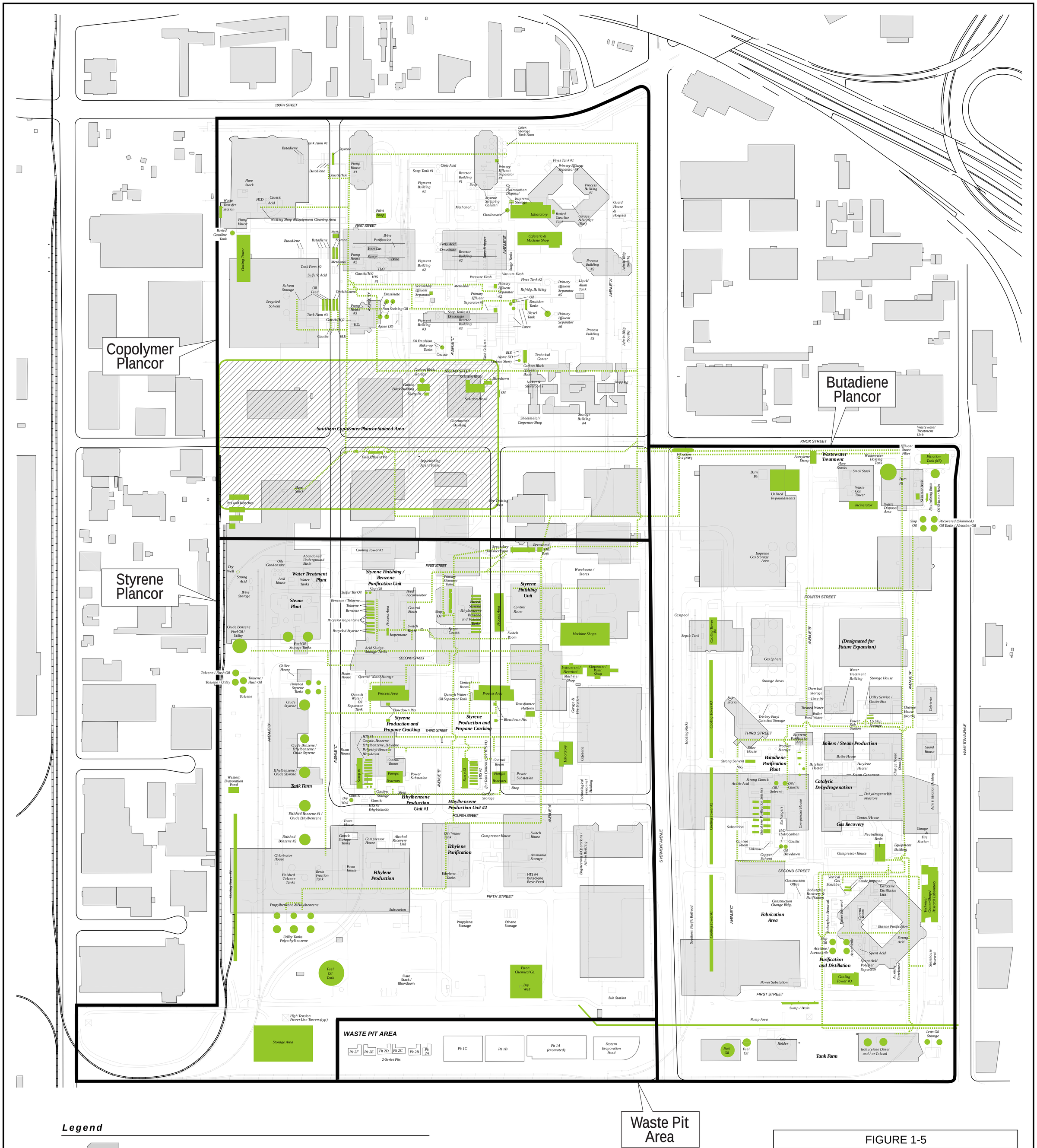
Source:
(1). http://zimas.lacity.org
(2). Los Angeles County Building and Safety Dept. 2005
(3) City of Carson General Plan-Land Use Map 2004

FIGURE 1-4

MAP SHOWING ZONING AND PARCELS

Soil and NAPL FS
Del Amo Superfund Site

URS



Legend

- Current building
- Historical synthetic rubber plant facility and identification
- Historical facilities and features evaluated as part of the Remedial Investigation
- Underground benzene feedstock pipeline
- Underground pipeline or trench that potentially contained dilute VOC solutions

N

0 200 400 600 800

Scale in Feet

Scale: 1 inch = 200 feet

FIGURE 1-5

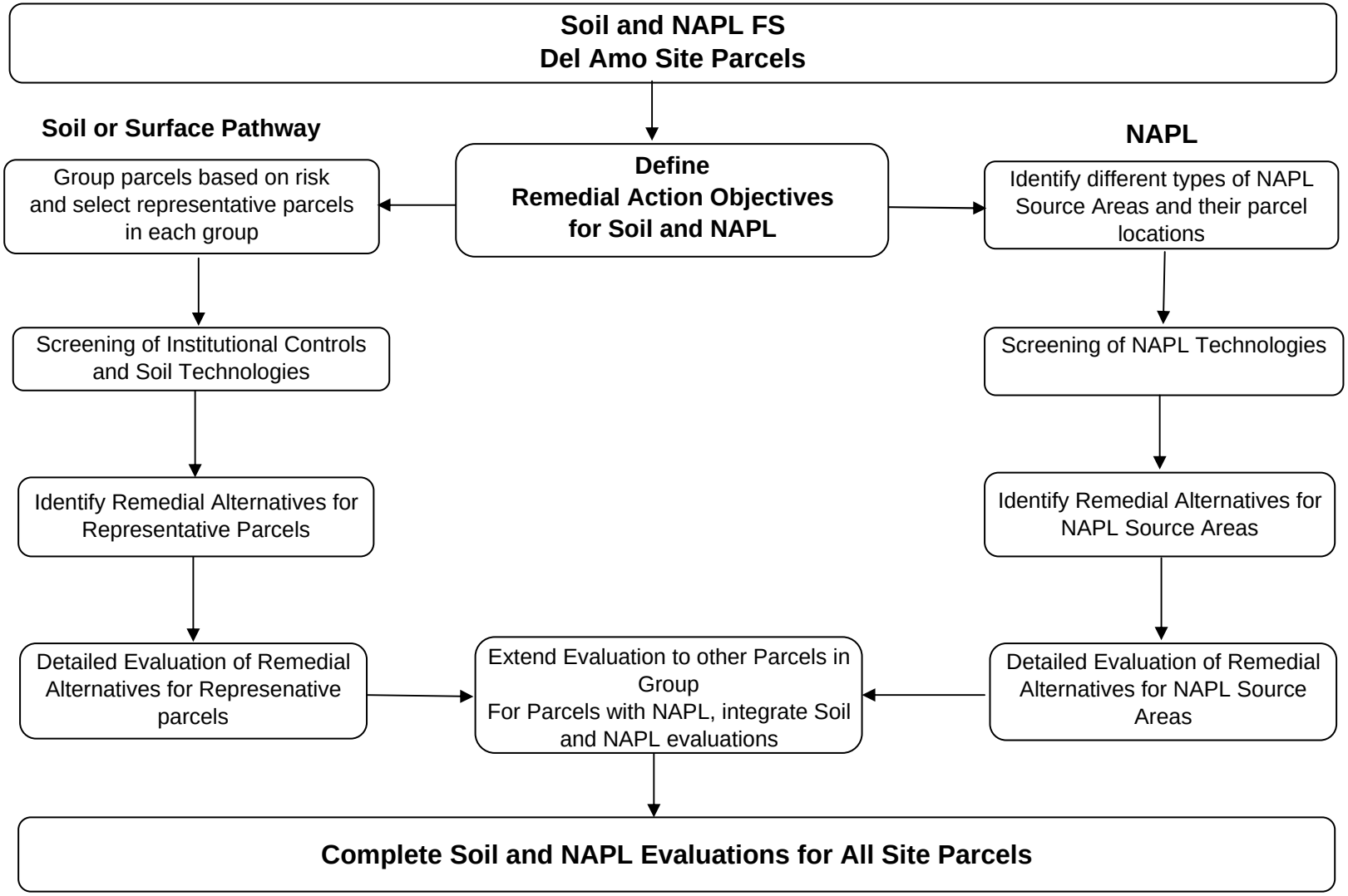
CURRENT AND HISTORICAL RUBBER PLANT FACILITY MAP

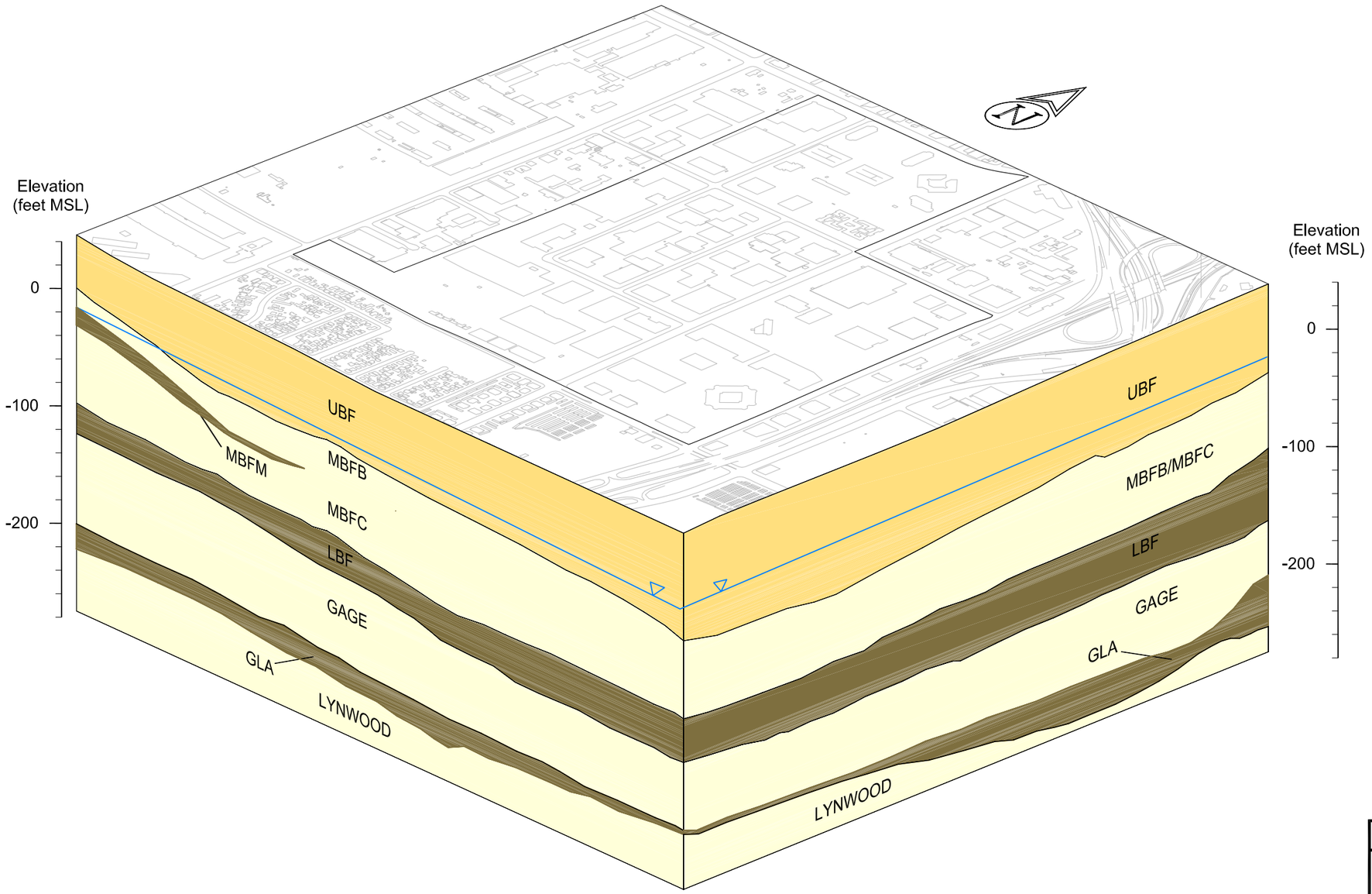
Soil and NAPL FS
Del Amo Superfund Site

URS

T/Ladd/DelAmo/Francis/Soil&NAPL FS/994-318 11-2-95 Rev7-07

Figure 1-6
Feasibility Study Process Flow Chart





EXPLANATION

UBF: Upper Bellflower Aquitard

MBFB: Middle Bellflower B Sand

MBFM: Middle Bellflower Mud

MBFC: Middle Bellflower C Sand

LBF: Lower Bellflower Aquitard

Gage: Gage Aquifer

GLA: Gage-Lynwood Aquitard

Lynwood: Lynwood Aquifer

FIGURE 2-1

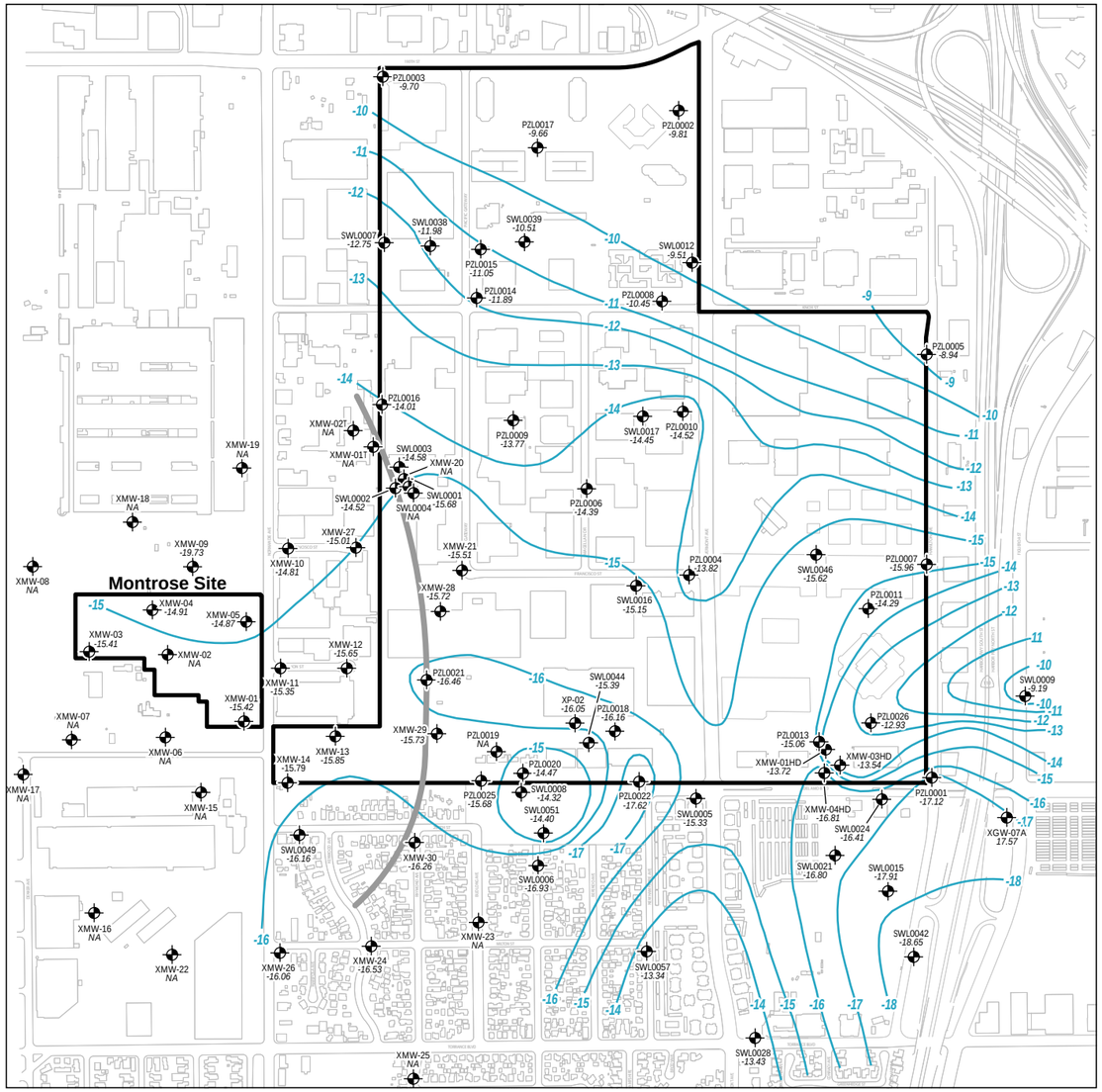
Hydrostratigraphic Block Diagram

URS

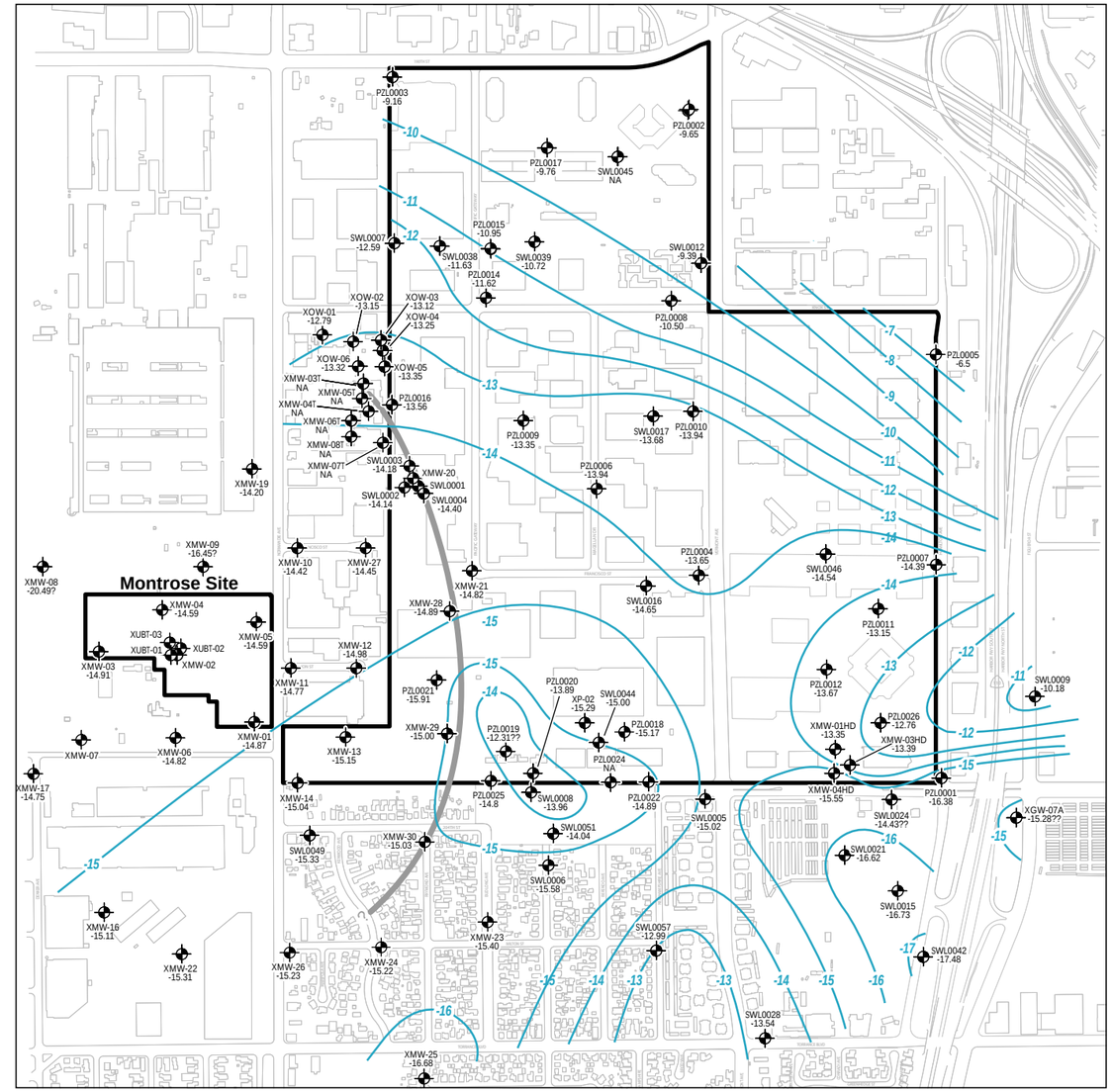
Soil and NAPL FS
Del Amo Superfund Site

t:\del_amo\2004\021603-01.dwg 6/20/07

T/Ladd/DelAmo/Francis/Soil&NAPL FS/1003-204-I



2000



2004

Legend

PZL0007 -14.39	Water table monitoring location and groundwater elevation in feet MSL
-10	Groundwater elevation contour (feet MSL)
	Inferred intersection of water table with top of middle Bellflower B sand. The overlying upper Bellflower aquitard is unsaturated west of the inferred intersection.
NA	Not available

N

0 900 1800

Scale in Feet

FIGURE 2-2

GROUNDWATER CONTOUR MAP WATER TABLE ZONE

Soil and NAPL FS

Del Amo Superfund Site

URS

TLadd\DelAmo\Francis\Soil&NAPL FS\803-182A

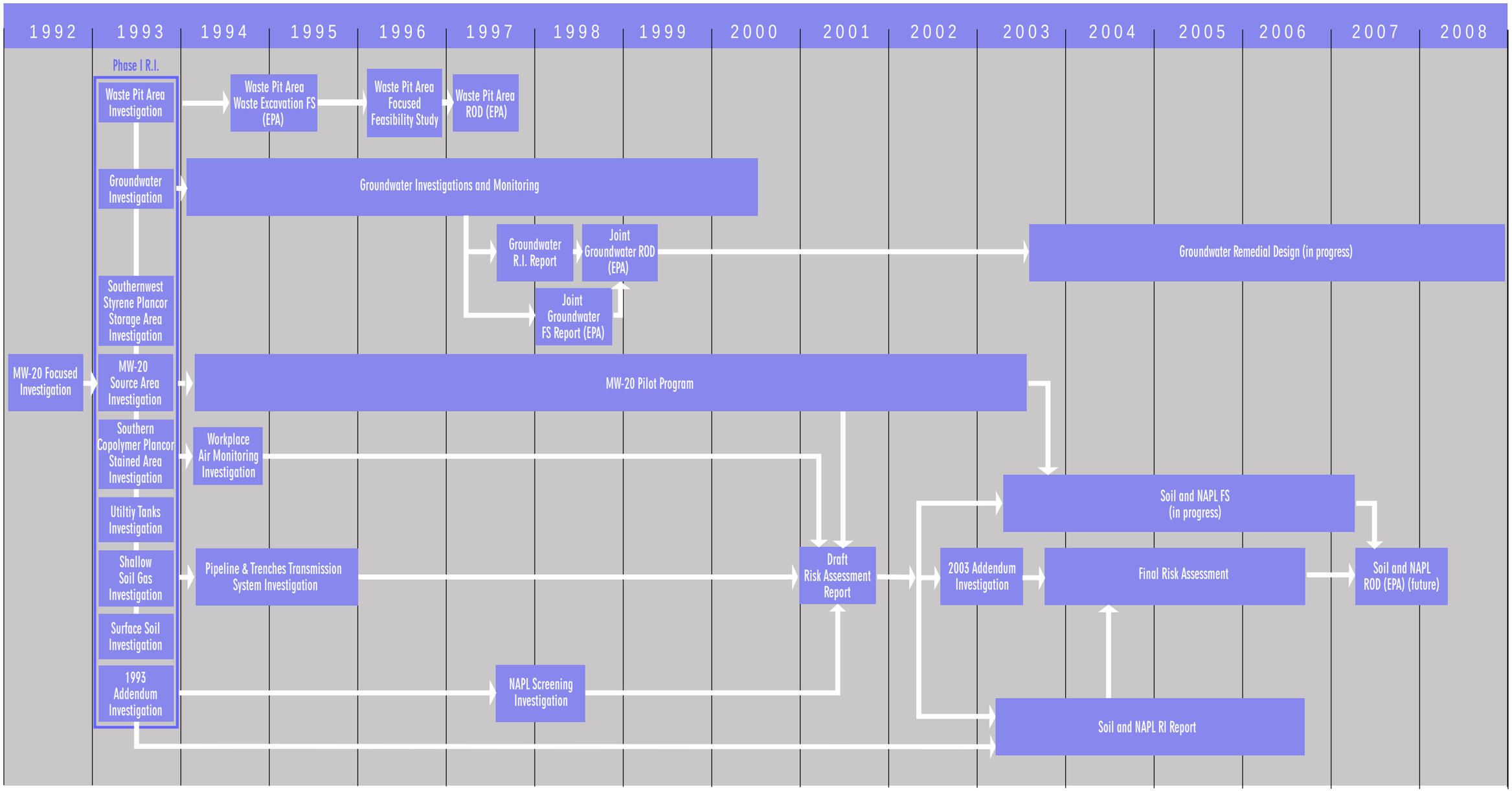


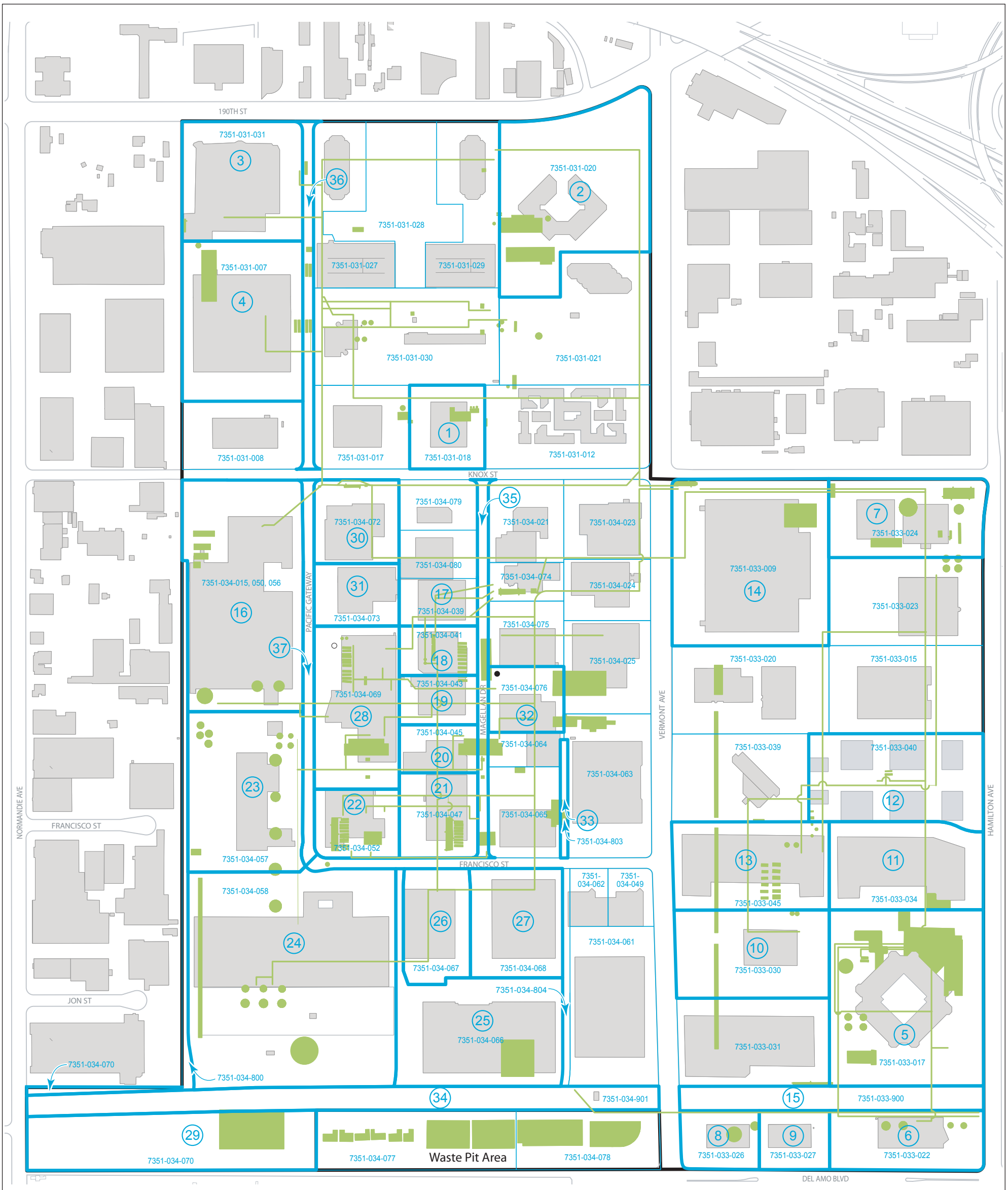
FIGURE 2-3

SITE INVESTIGATION CHRONOLOGY

Soil and NAPL FS
Del Amo Superfund Site

URS

T/Ladd/DelAmo/Francis/Soil&NAPL FS/1204-275



Legend

- ● RI surface soil sampling location where VOCs were analyzed
- ○ Non-RI surface soil sampling location where VOCs were analyzed
- Current building footprint
- Former rubber plant facilities and features evaluated as part of the RI
- (29) Exposure area of potential concern with exposure area number
- 7351-034-070 Assessor parcel number

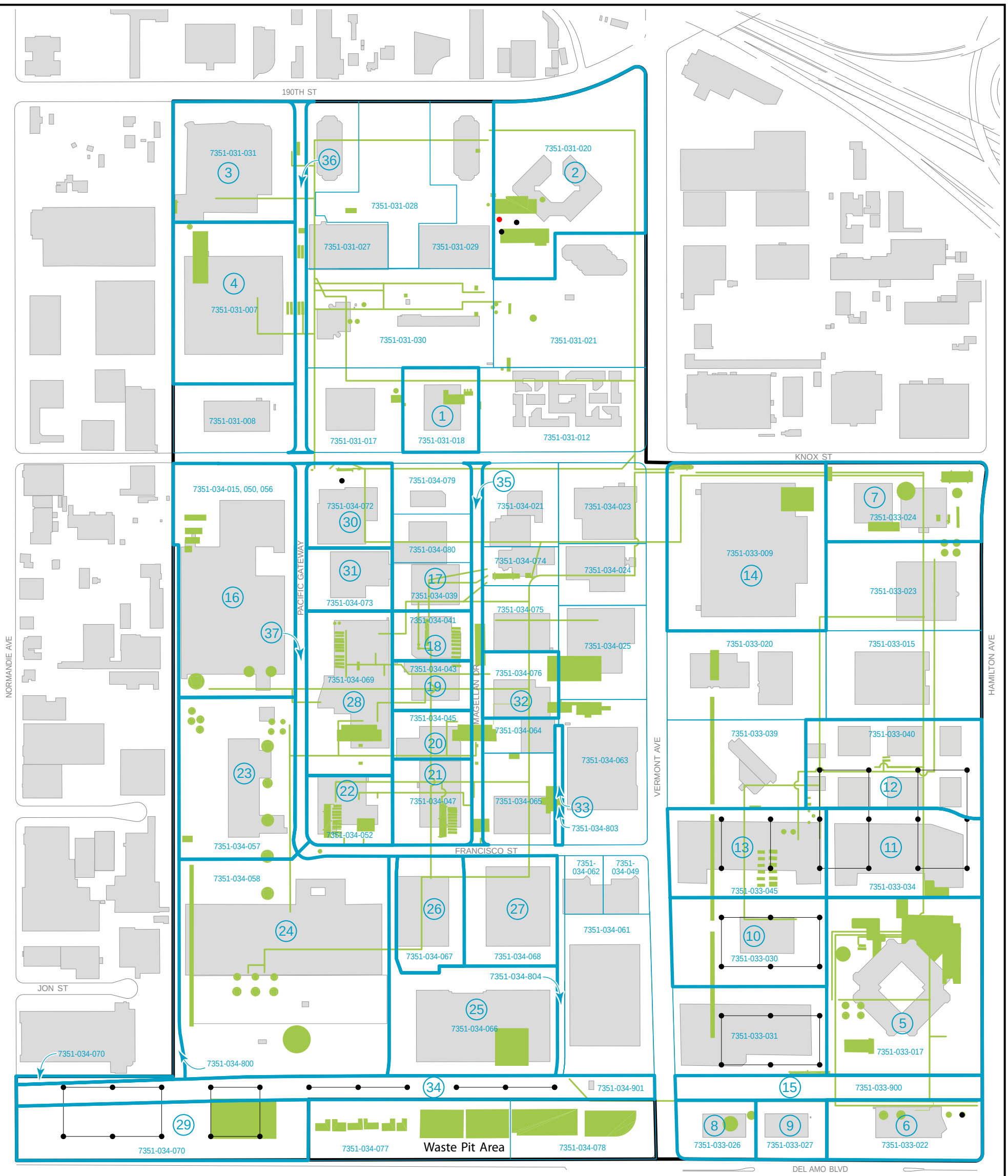
FIGURE 2-4

VOC SAMPLING LOCATIONS IN SURFACE SOIL

Soil and NAPL FS
Del Amo Superfund Site

URS

T/Ladd/DelAmo/Francis/Soil&NAPL FS/904-166A



Legend

- RI surface soil sampling location where SVOCs/PAHs were analyzed
- Composite RI surface soil sampling location where SVOCs/PAHs were analyzed
- Surface soil sampling locations where one or more SVOCs/PAHs were detected at concentrations in excess of industrial PRGs
- Current building footprint
- Former rubber plant facilities and features evaluated as part of the RI
- 29 — Exposure area of potential concern with exposure area number
- 7351-034-070 — Assessor parcel number

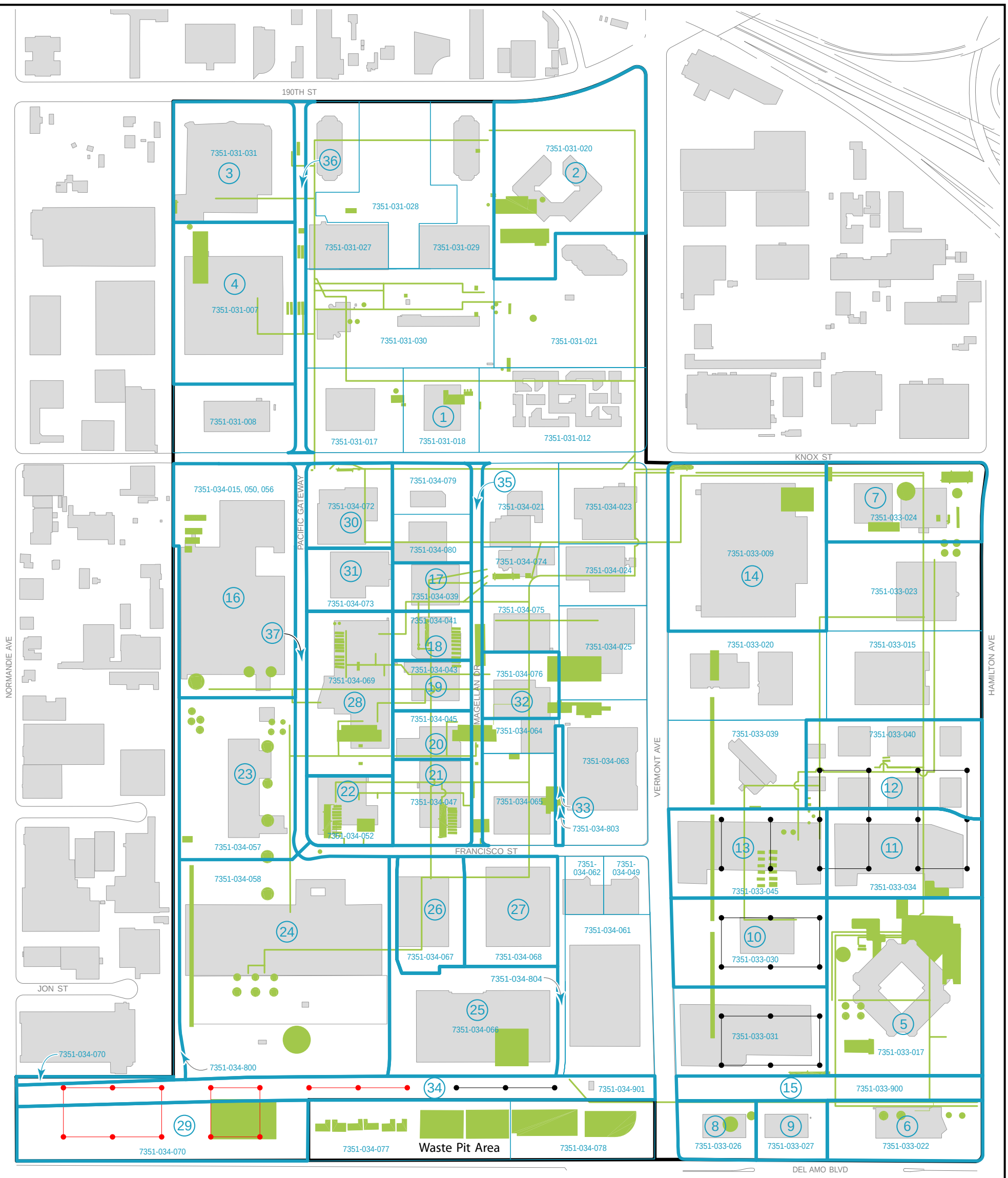
FIGURE 2-5

SVOC/PAH SAMPLING LOCATIONS IN SURFACE SOIL

Soil and NAPL FS
Del Amo Superfund Site

URS

T/Ladd/DelAmo/Francis/Soil&NAPL FS/904-167A



Legend

- RI surface soil sampling location where Pesticides/PCBs were analyzed
- Non-RI surface soil sampling location where Pesticides/PCBs were analyzed
- Composite RI surface soil sampling location where Pesticides/PCBs were analyzed
- Surface soil sampling locations where one or more pesticides/PCBs were detected at concentrations in excess of residential PRGs
- Current building footprint
- Former rubber plant facilities and features evaluated as part of the RI
- 29 — Exposure area of potential concern with exposure area number
- 7351-034-070 — Assessor parcel number

N

0 400 800

Scale in Feet

FIGURE 2-6

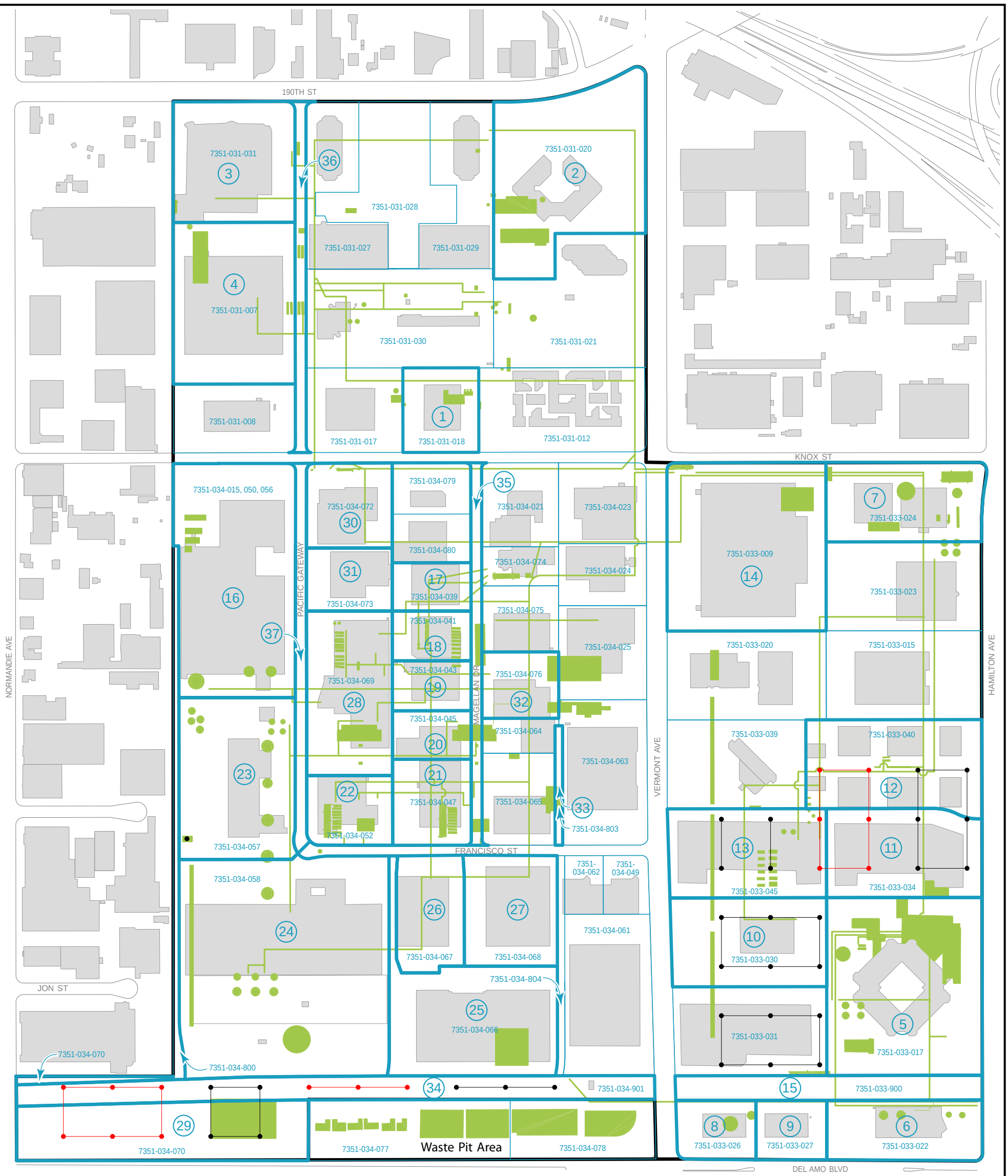
PESTICIDE/PCB SAMPLING LOCATIONS IN SURFACE SOIL

Soil & NAPL FS

Del Amo Superfund Site

URS

T/Ladd/DelAmo/Francis/Soil&NAPL FS/904-162A



Legend

- RI surface soil sampling location where metals were analyzed
- Composite RI surface soil sampling location where metals were analyzed
- Surface soil sampling locations where one or more metals were detected at concentrations in excess of residential background concentrations and/or residential PRGs
- Current building footprint
- Former rubber plant facilities and features evaluated as part of the RI
- 29 — Exposure area of potential concern with exposure area number
- 7351-034-070 — Assessor parcel number

N

0 400 800

Scale in Feet

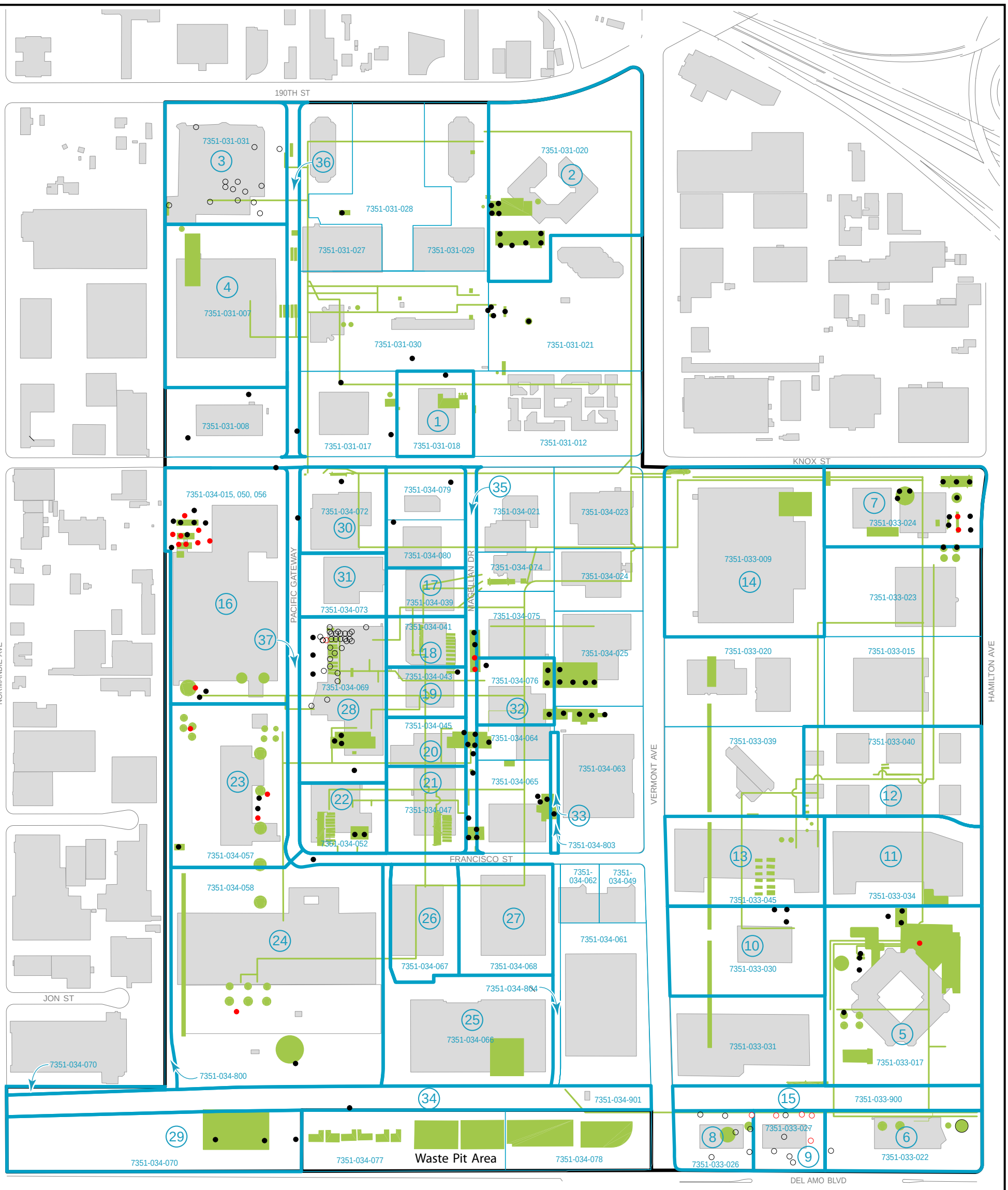
FIGURE 2-7

METALS SAMPLING LOCATIONS IN SURFACE SOIL

Soil and NAPL FS
Del Amo Superfund Site

URS

T/Ladd/DelAmo/Francis/Soil&NAPL FS/904-181A



Legend

- ● RI shallow soil sampling location where VOCs were analyzed
- ○ Non-RI shallow soil sampling location where VOCs were analyzed
- ● ○ Shallow soil sampling locations where one or more VOCs were detected at concentrations in excess of residential PRGs
- Current building footprint
- Former rubber plant facilities and features evaluated as part of the RI
- (29) Exposure area of potential concern with exposure area number
- 7351-034-070 Assessor parcel number

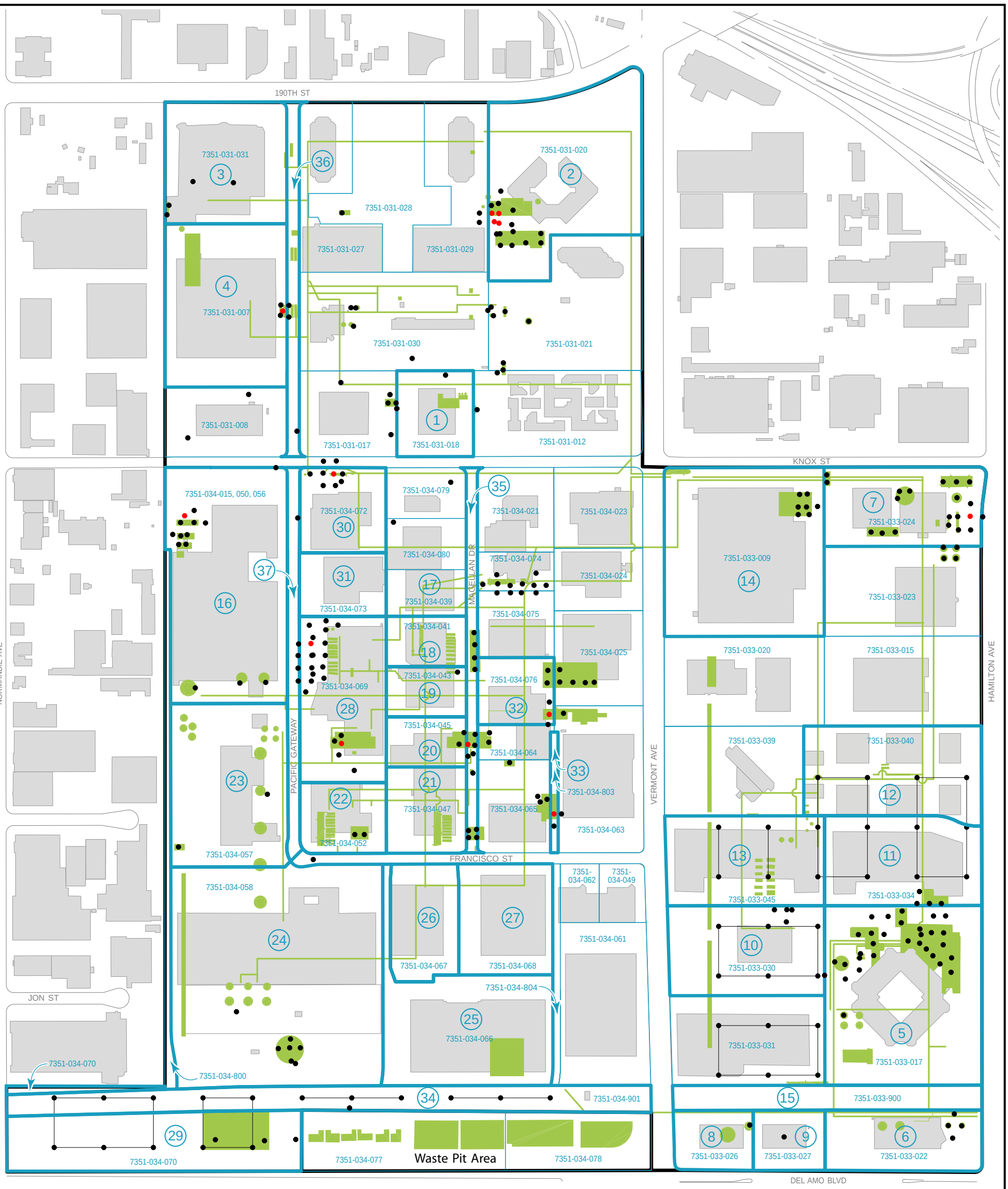
FIGURE 2-8

VOC SAMPLING LOCATIONS IN SHALLOW SOIL

Soil and NAPL FS
Del Amo Superfund Site

URS

T/Ladd/DelAmo/Francis/Soil&NAPL FS/904-180A



Legend

- RI shallow soil sampling location where SVOCs/PAHs were analyzed
- Non-RI shallow soil sampling location where SVOCs/PAHs were analyzed
- Composite RI shallow soil sampling location where SVOCs/PAHs were analyzed
- Shallow soil sampling locations where one or more SVOCs/PAHs were detected at concentrations in excess of industrial PRGs
- Current building footprint
- Former rubber plant facilities and features evaluated as part of the RI
- 29 — Exposure area of potential concern with exposure area number
- 7351-034-070 — Assessor parcel number

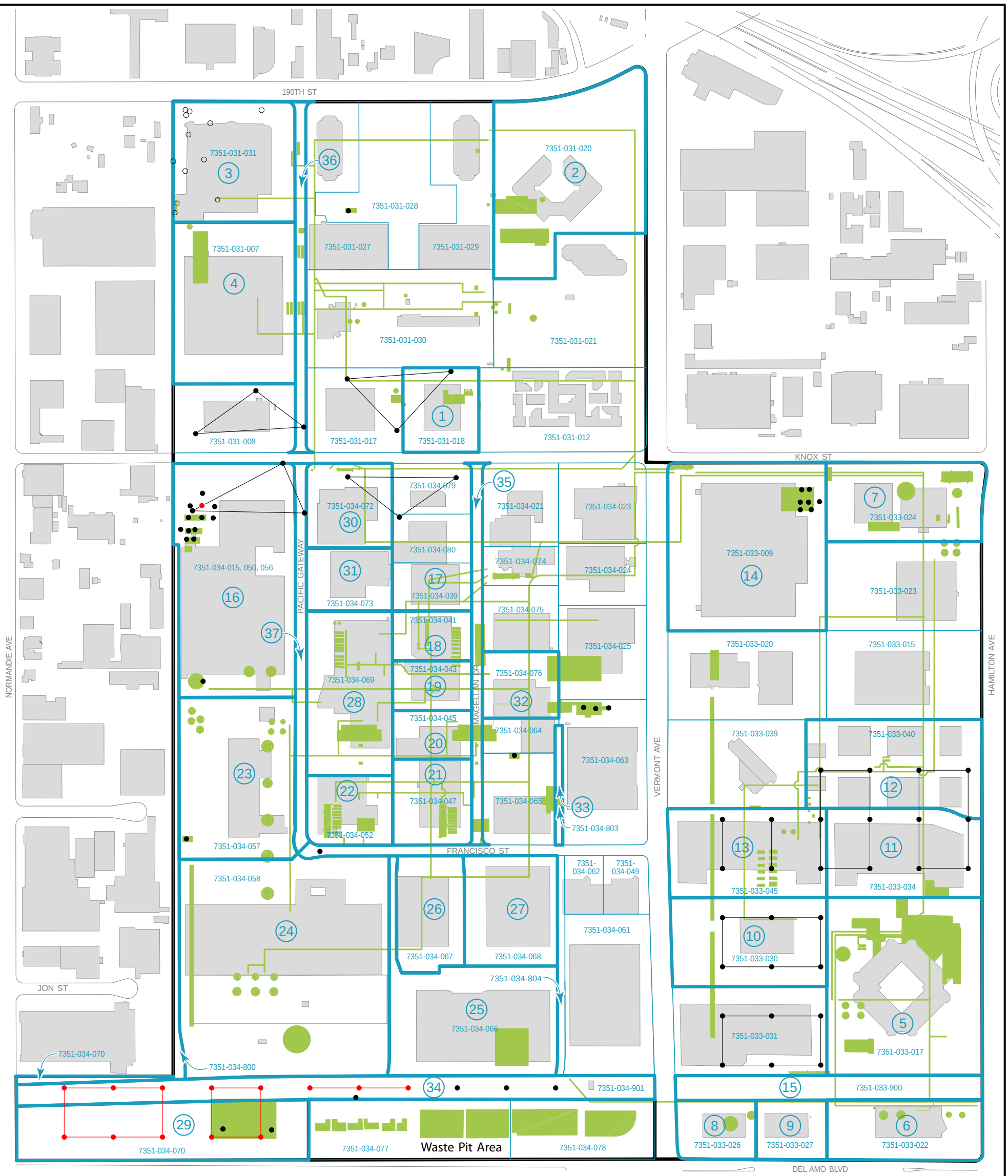
FIGURE 2-9

SVOC/PAH SAMPLING LOCATIONS IN SHALLOW SOIL

Soil and NAPL FS
Del Amo Superfund Site

URS

T/Ladd/DelAmo/Francis/Soil&NAPL FS/904-163A



Legend

- RI deep soil sampling location where Pesticides/PCBs were analyzed
- Non-RI deep soil sampling location where Pesticides/PCBs were analyzed
- Composite RI shallow soil sampling location where Pesticides/PCBs were analyzed
- Shallow soil sampling locations where one or more Pesticide/PCBs were detected at concentrations in excess of residential PRGs
- Current building footprint
- Former rubber plant facilities and features evaluated as part of the RI
- (29) Exposure area of potential concern with exposure area number
- 7351-034-070 Assessor parcel number

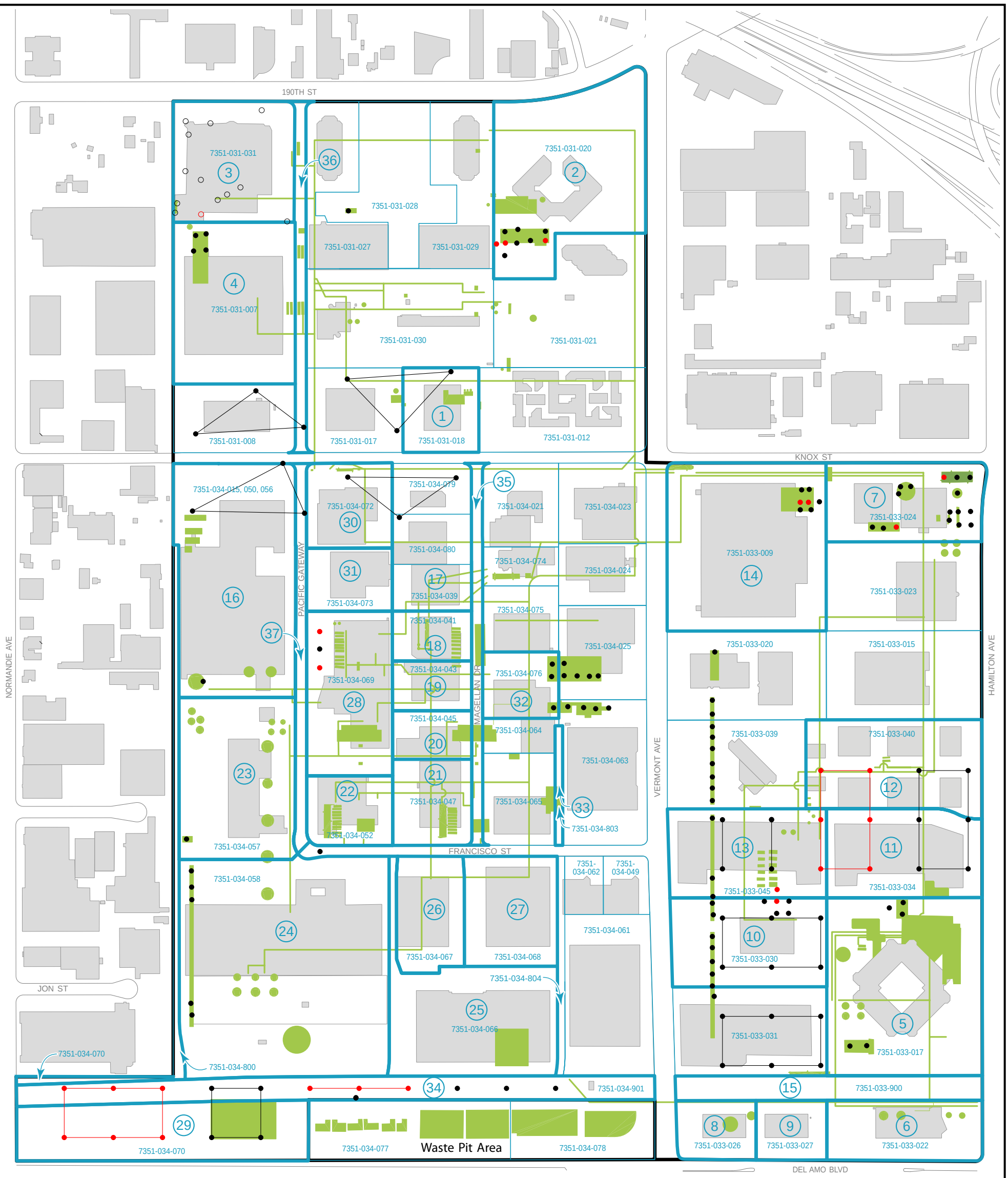
FIGURE 2-10

PESTICIDE/PCB SAMPLING LOCATIONS IN SHALLOW SOIL

Soil and NAPL FS
Del Amo Superfund Site

URS

T/Ladd/DelAmo/Francis/Soil&NAPL FS/904-165A



Legend

- RI shallow soil sampling location where metals were analyzed
- Non-RI shallow soil sampling location where metals were analyzed
- Composite RI shallow soil sampling location where metals were analyzed
- Shallow soil sampling locations where one or more metals were detected at concentrations in excess of background concentrations and/or residential PRGs
- Current building footprint
- Former rubber plant facilities and features evaluated as part of the RI
- 29 — Exposure area of potential concern with exposure area number
- 7351-034-070 — Assessor parcel number

N

0 400 800

Scale in Feet

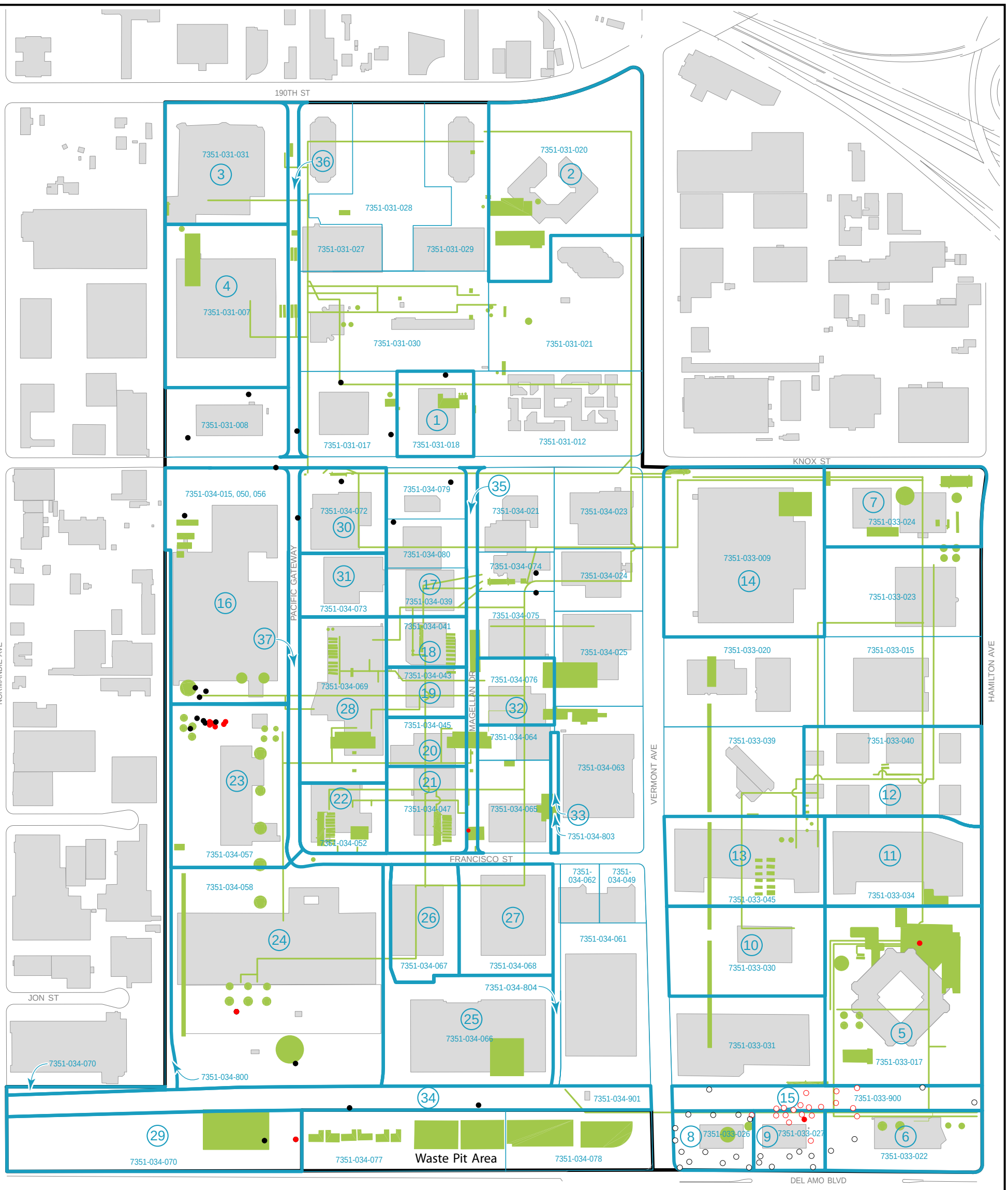
FIGURE 2-11

METALS SAMPLING LOCATIONS IN SHALLOW SOIL

Soil and NAPL FS
Del Amo Superfund Site

URS

T/Ladd/DelAmo/Francis/Soil&NAPL FS/904-182A



Legend

- ● RI deep soil sampling location where VOCs were analyzed
- ○ Non-RI deep soil sampling location where VOCs were analyzed
- ● ○ Deep soil sampling locations where one or more VOCs were detected at concentrations in excess of residential PRGs
- Current building footprint
- Former rubber plant facilities and features evaluated as part of the RI
- (29) Exposure area of potential concern with exposure area number
- 7351-034-070 Assessor parcel number

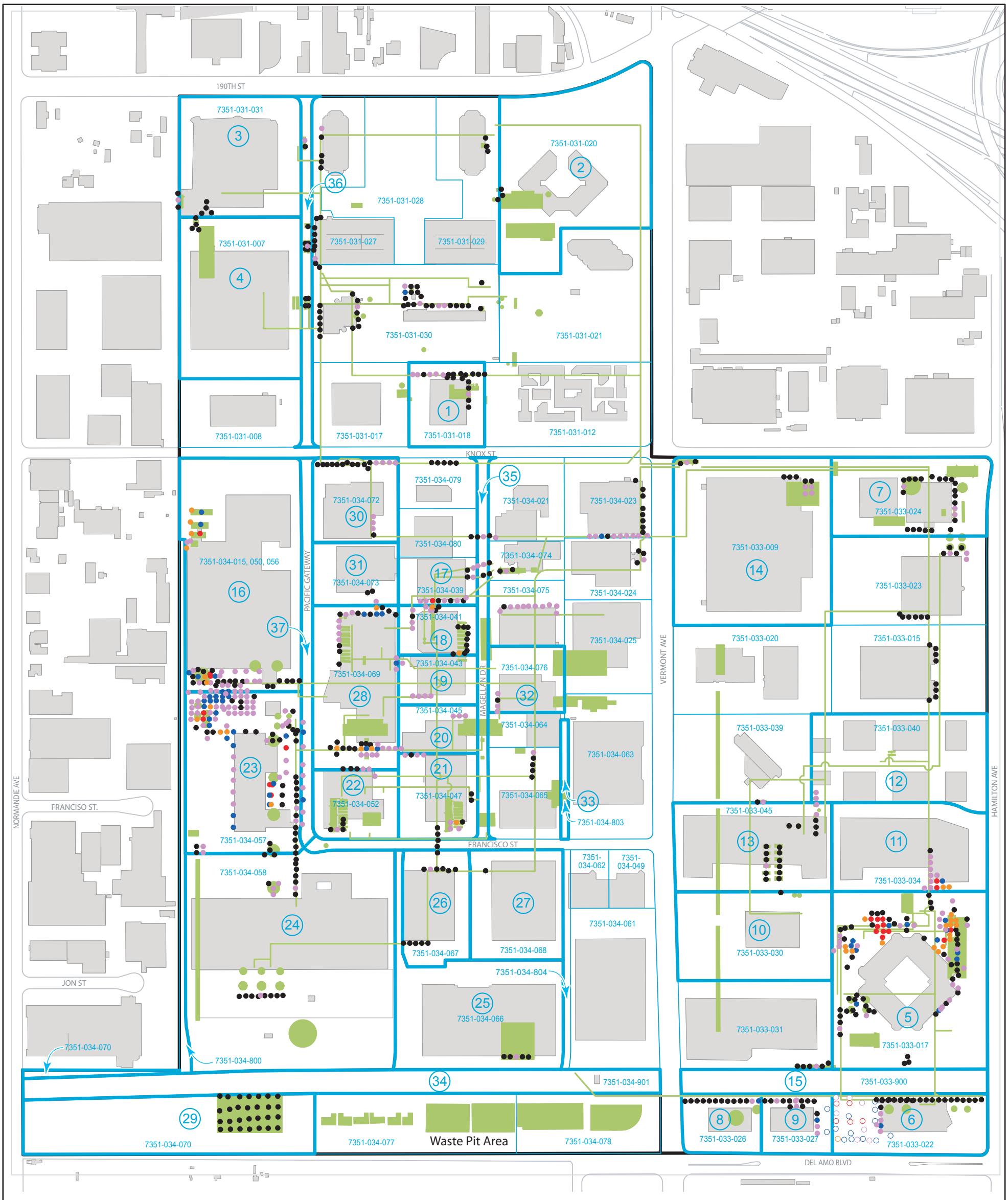
FIGURE 2-12

VOC SAMPLING LOCATIONS IN DEEP SOIL

Soil and NAPL FS
Del Amo Superfund Site

URS

T/Ladd/DelAmo/Francis/Soil&NAPL FS/1204-274



Legend

Filled symbol represents RI/FS location;
Open symbol represents non-RI/FS location

- ● ○ Shallow soil gas sampling location where total VOCs were not detected
- ● ○ Shallow soil gas sampling location where total VOCs were detected at a concentration of <5 ppmv
- ● ○ Shallow soil gas sampling locations where total VOCs were detected at a concentration of ≥5 ppmv but <50 ppmv
- ● ○ Shallow soil gas sampling locations where total VOCs were detected at concentrations of ≥50 ppmv but <500 ppmv
- ● ○ Shallow soil gas sampling locations where total VOCs were detected at a concentration of ≥500 ppmv
- Current building footprint
- Former rubber plant facilities and features evaluated as part of the RI
- (29) Exposure area of potential concern with exposure area number
- 7351-034-070 Assessor parcel number

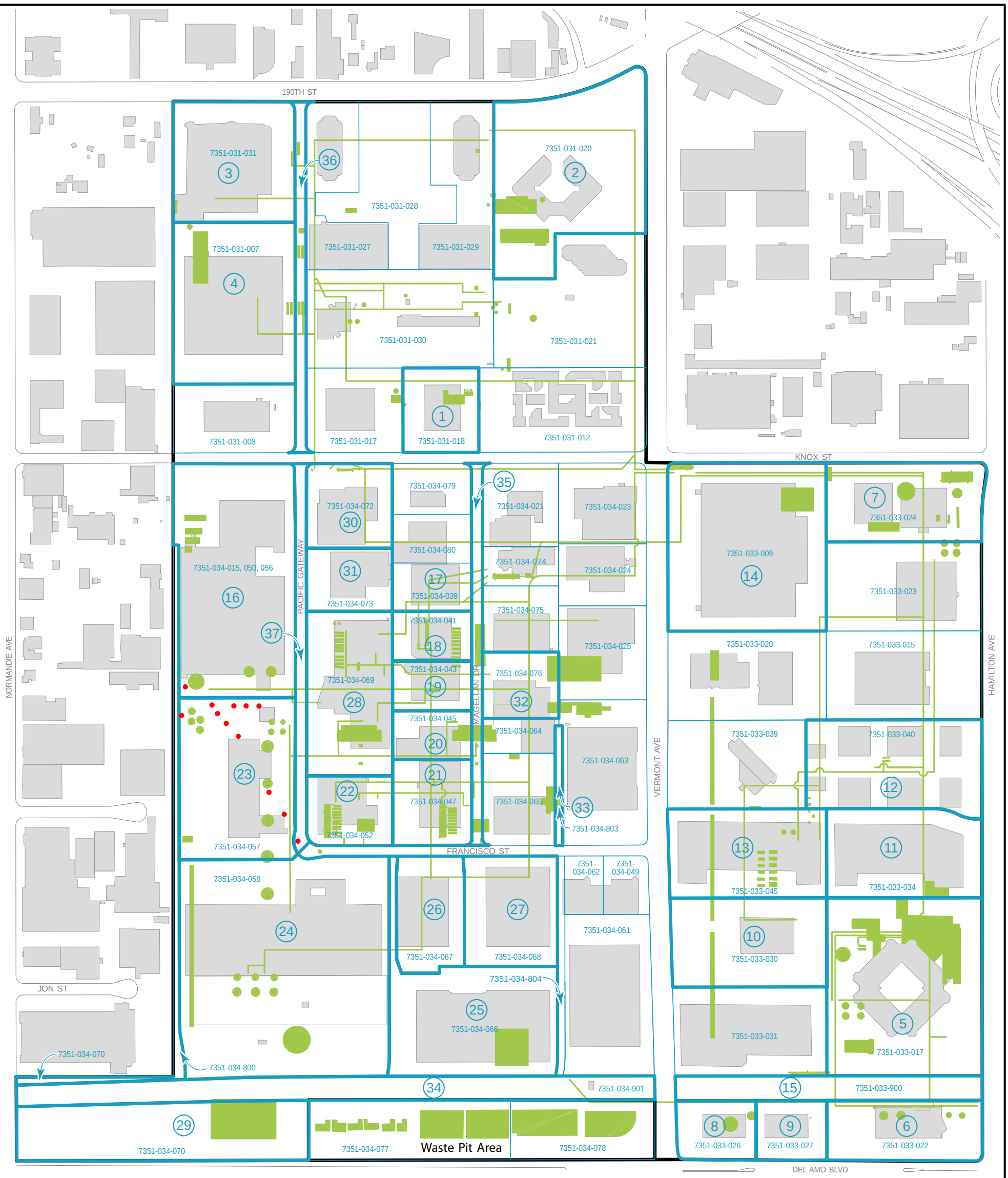
FIGURE 2-13

TOTAL VOC CONCENTRATIONS AT SHALLOW SOIL GAS SAMPLING LOCATIONS

Soil and NAPL FS
Del Amo Superfund Site

URS

T/Ladd/DelAmo/Francis/Soil&NAPL FS/1204-270



Legend

- Deep soil gas sampling location where total VOC concentration is greater than 500 ppmv
- Current building footprint
- Former rubber plant facilities and features evaluated as part of the RI
- (29) Exposure area of potential concern with exposure area number
- 7351-034-070 Assessor parcel number

Note: Total VOC concentrations were greater than 500 ppmv at all deep soil gas sampling locations

N

0 400 800

Scale in Feet

FIGURE 2-14

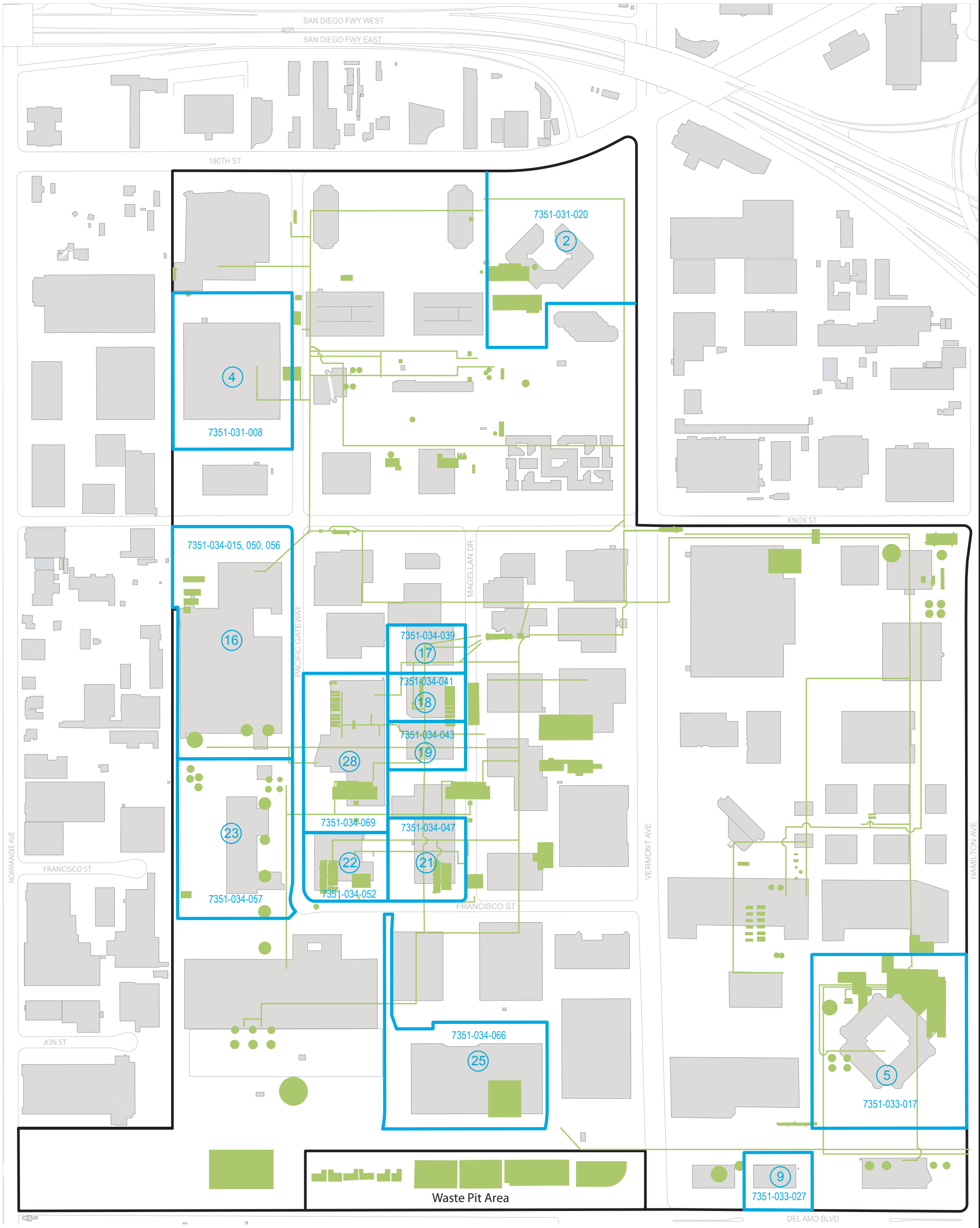
TOTAL VOC CONCENTRATIONS IN DEEP SOIL GAS SAMPLES

Soil and NAPL FS

Del Amo Superfund Site

URS

T/Ladd/DelAmo/Francis/Soil&NAPL FS/1203-240A



Legend

Former rubber plant facilities and features evaluated as part of the RI

4 Parcel with building where workplace air monitoring was conducted and exposure area number

7351-034-070 Assessor parcel number

N

0 400 800

Scale in Feet

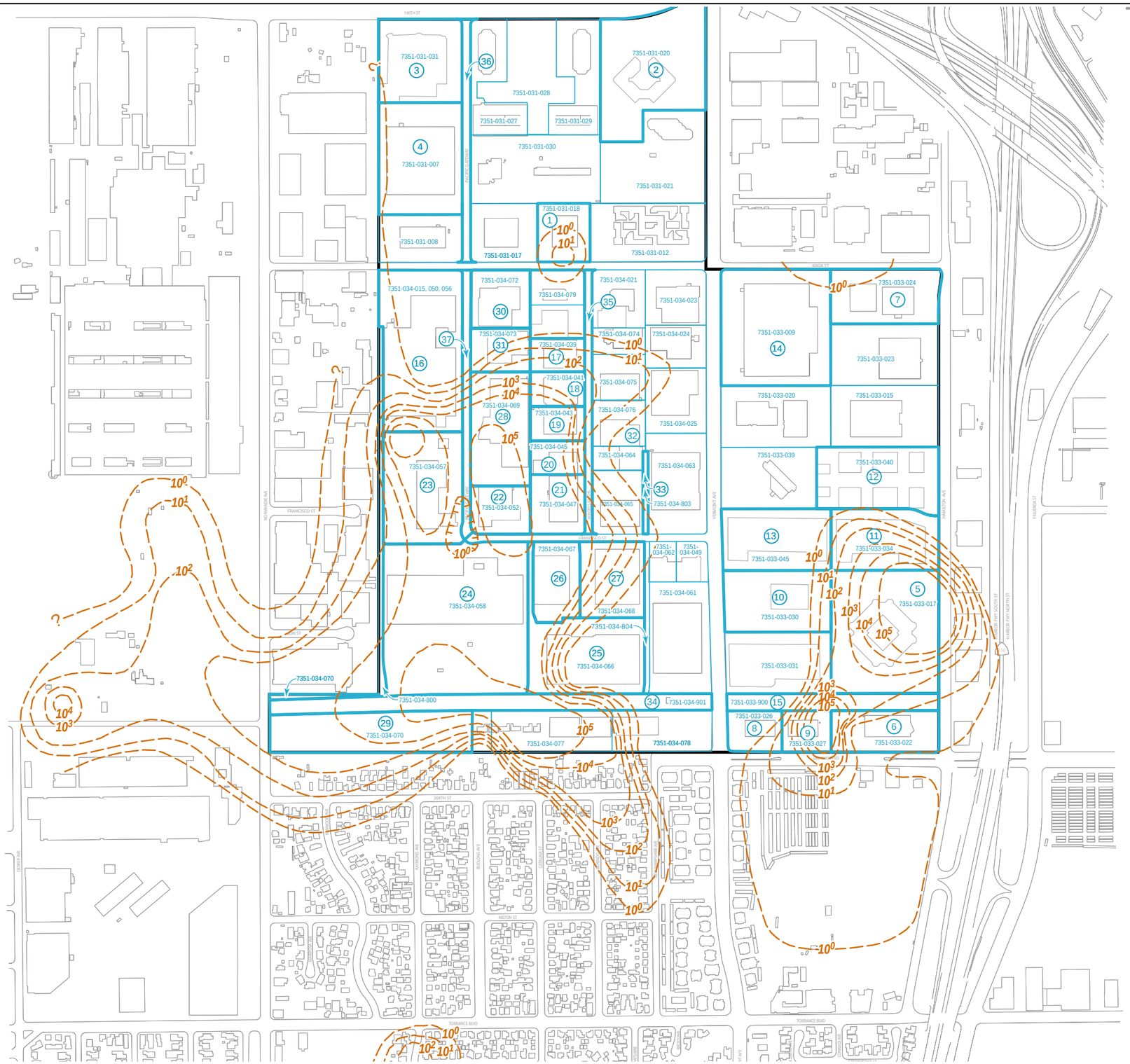
FIGURE 2-15

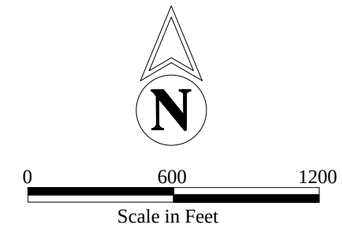
INDOOR AIR MONITORING LOCATIONS

Soil & NAPL FS
Del Amo Superfund Site

URS

T/Ladd/DelAmo/Francis/Soil&NAPL FS/204-030A





Legend

10^3 Benzene concentration isopleth (µg/L)

29 Exposure area of potential concern with exposure area number

7351-034-070 Assessor parcel number

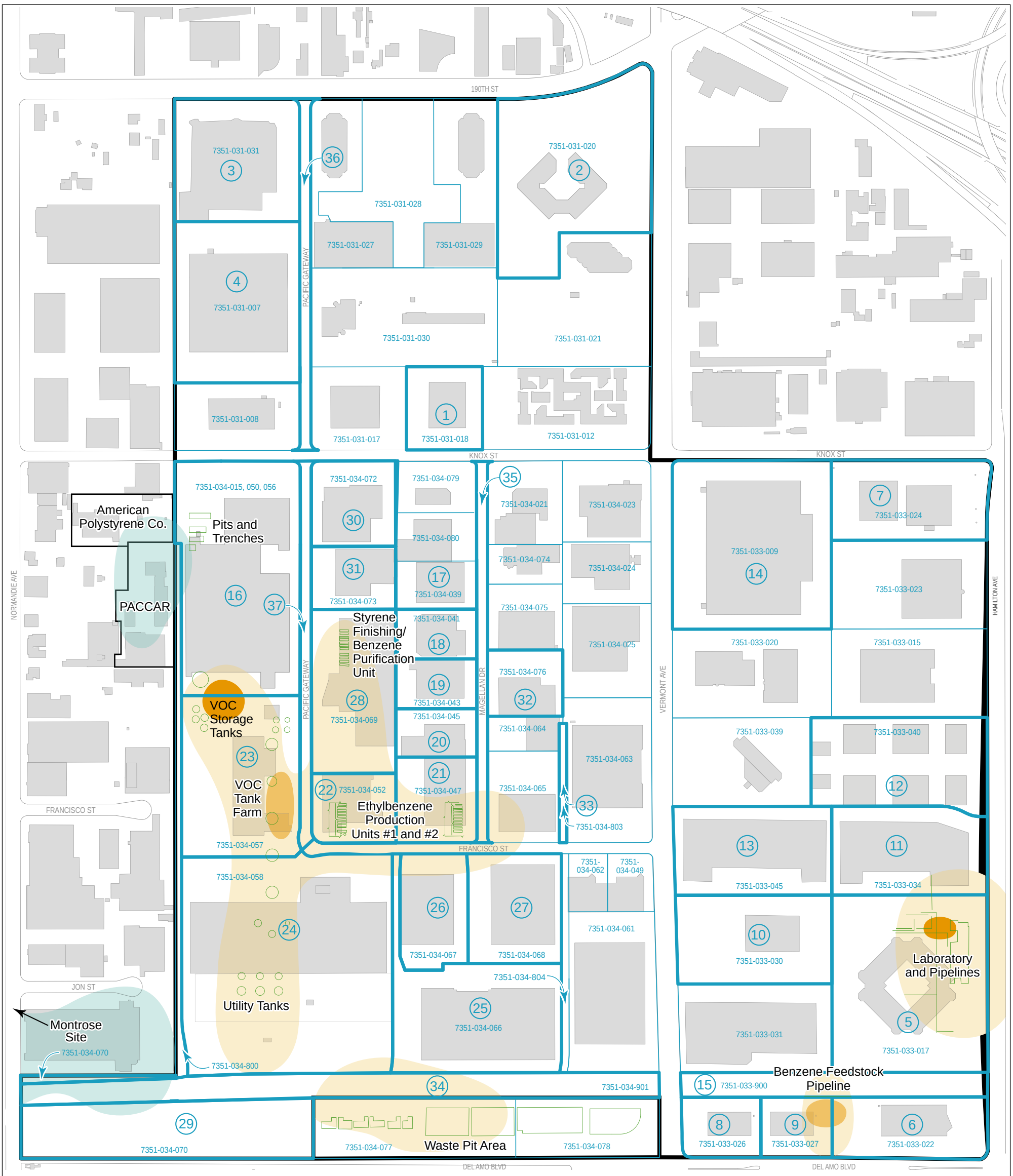
FIGURE 2-16

DISSOLVED BENZENE CONCENTRATIONS WATER TABLE ZONE

Soil & NAPL FS
Del Amo Superfund Site

URS

T/Ladd/DelAmo/Francis/Soil&NAPL FS/703-169A



Legend

- Area where DNAPL is potentially present based on dissolved concentrations of TCE and/or PCE concentrations in excess of 1% of their respective solubilities within the water table zone
- Area where LNAPL has not been observed, but could potentially be present based on dissolved concentrations of benzene and/or ethylbenzene in excess of 5% of their respective solubilities within the water table zone
- Area where LNAPL has been observed at residual saturations, but has not accumulated within a water table monitoring well or temporary well point
- Area where visible LNAPL accumulations occur within one or more water table monitoring wells or temporary well points
- Historical rubber plant VOC facilities that may be associated with NAPL
- (29) Exposure area of potential concern with exposure area number
- 7351-034-070 Assessor parcel number

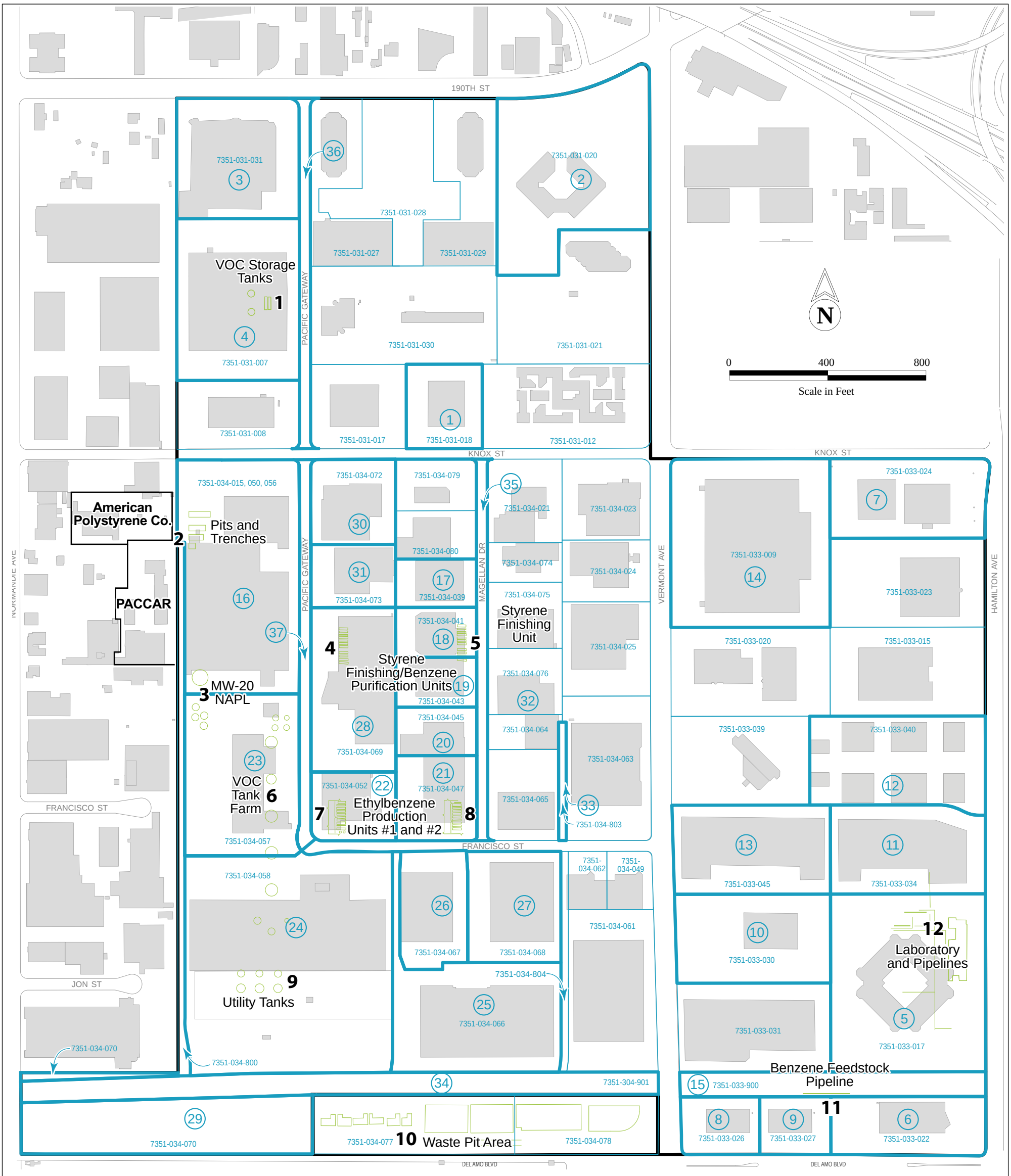
FIGURE 2-17

POTENTIAL AND KNOWN NAPL AREAS

Soil & NAPL FS
Del Amo Superfund Site

URS

T/Ladd/DelAmo/Francis/Soil&NAPL FS/104-028B



Source Area Number	Plancor	Suspected Source Facility	Primary Contaminants	NAPL?
1	Copolymer	Storage tanks	Cyclohexane	Unlikely
2	Copolymer	Offsite properties to west	TCE, PCE	Potential DNAPL
3	Styrene	Benzene tanks	Benzene	LNAPL accumulation
4	Styrene	Styrene finishing/benzene purification unit	Benzene, cyclohexane	Potential LNAPL
5	Styrene	Styrene finishing unit	BTEX, styrene	Unlikely
6	Styrene	VOC tank farm	Benzene, ethylbenzene	Residual LNAPL
7	Styrene	Ethylbenzene production unit	Benzene, ethylbenzene	Potential LNAPL
8	Styrene	Ethylbenzene production unit	Benzene, ethylbenzene	Potential LNAPL
9	Styrene	Utility tanks	Benzene, toluene	Potential LNAPL
10	Styrene	Waste pit area	BTEX	Potential LNAPL
11	Butadiene	Benzene feedstock pipeline	Benzene	Residual LNAPL
12	Butadiene	Laboratory/pipelines	BTEX, styrene	LNAPL accumulation

Legend

Historical rubber plant facilities inferred to be associated with groundwater contamination source area

29 Exposure area of potential concern with exposure area number

7351-034-070 Assessor parcel number

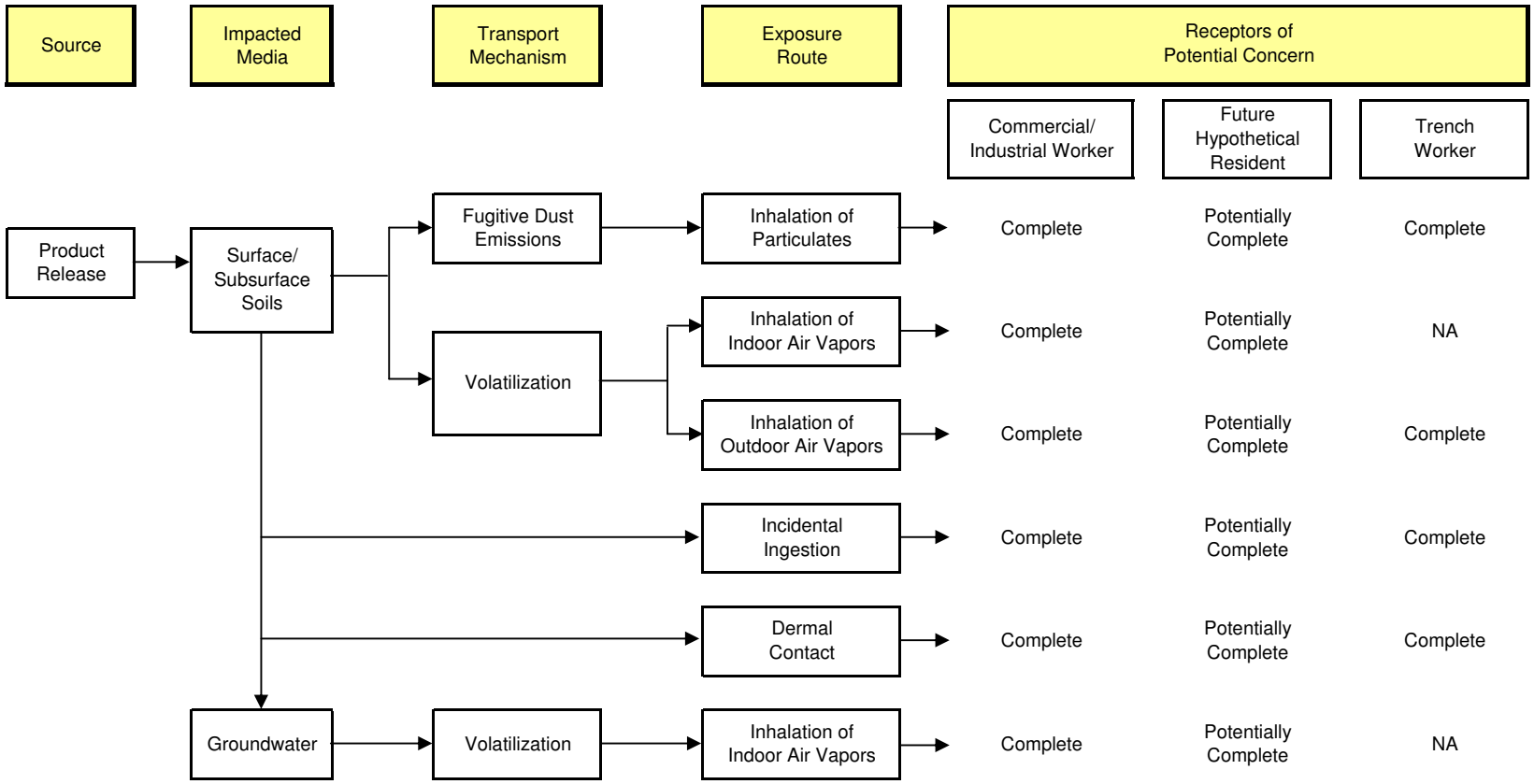
FIGURE 2-18

EAPCS AND GROUNDWATER CONTAMINATION SOURCE AREAS

Soil & NAPL FS
Del Amo Superfund Site

URS

FIGURE 2-19
CONCEPTUAL SITE MODEL
SOIL AND NAPL FS
DEL AMO SUPERFUND SITE

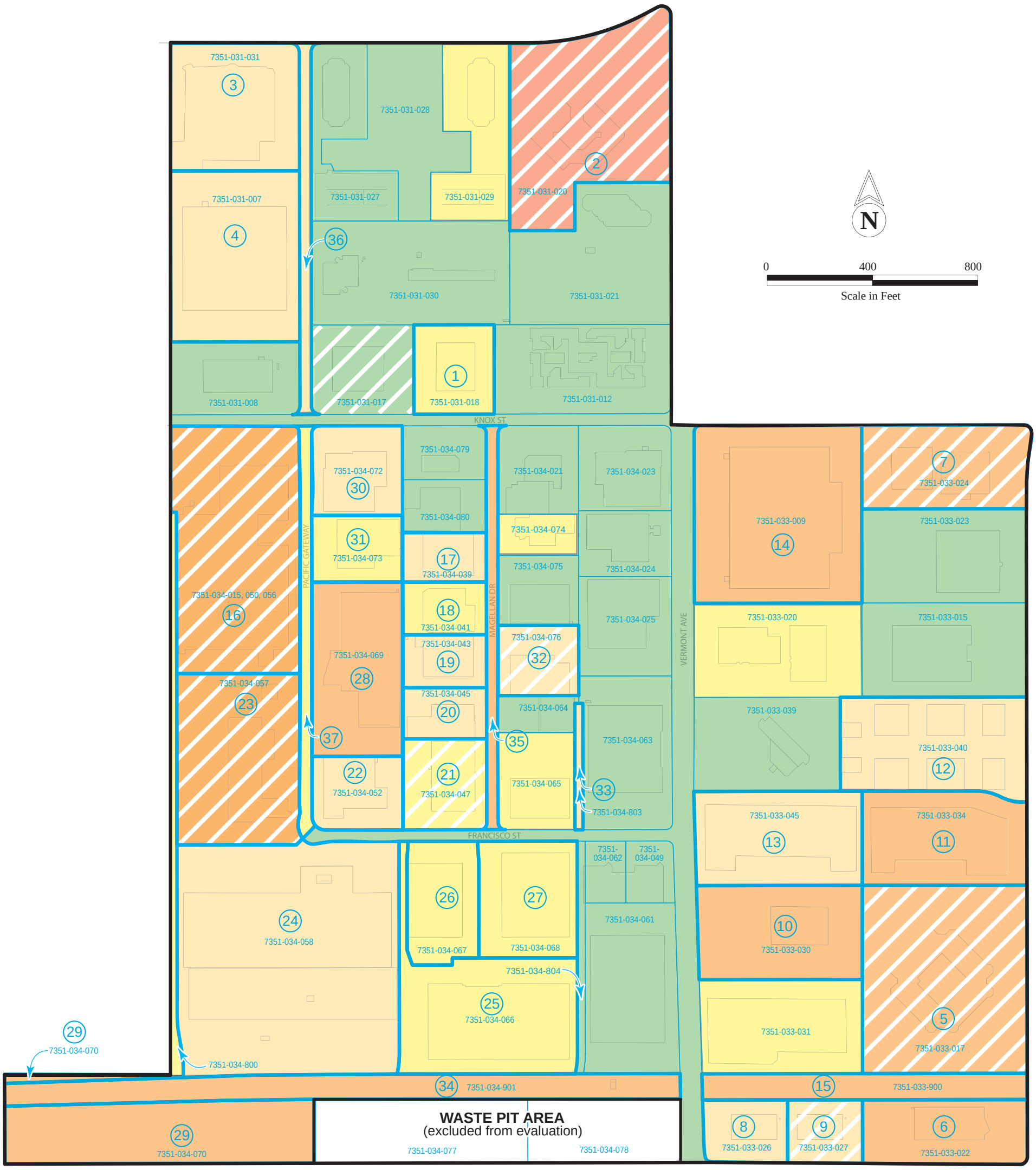


Note:

"NA" Not Applicable

S:\Tennison\REPORTS\FS AOC JudeFr\tech editing\
Figure_2-19_CSM

T/Ladd/DelAmo/Francis/Soil&NAPL FS/607-139



Legend

- Group 1 Parcels (26 parcels)
- Group 2 Parcels (14 parcels)
- Group 3 Parcels (18 parcels)
- Group 4 Parcels (12 parcels)
- Group 5 Parcels (1 parcel)

Representative parcels for each group shown with hatch patterns

7351-034-066 Assessor's Parcel Number

29 EAPC Number

Notes:

1. Streets such as Pacific Gateway, Francisco, Knox, Magellan and Vermont do not have parcel numbers but were evaluated in the risk assessment.

FIGURE 3-1

PARCEL GROUPING AND REPRESENTATIVE PARCELS

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FIGURE 5-1

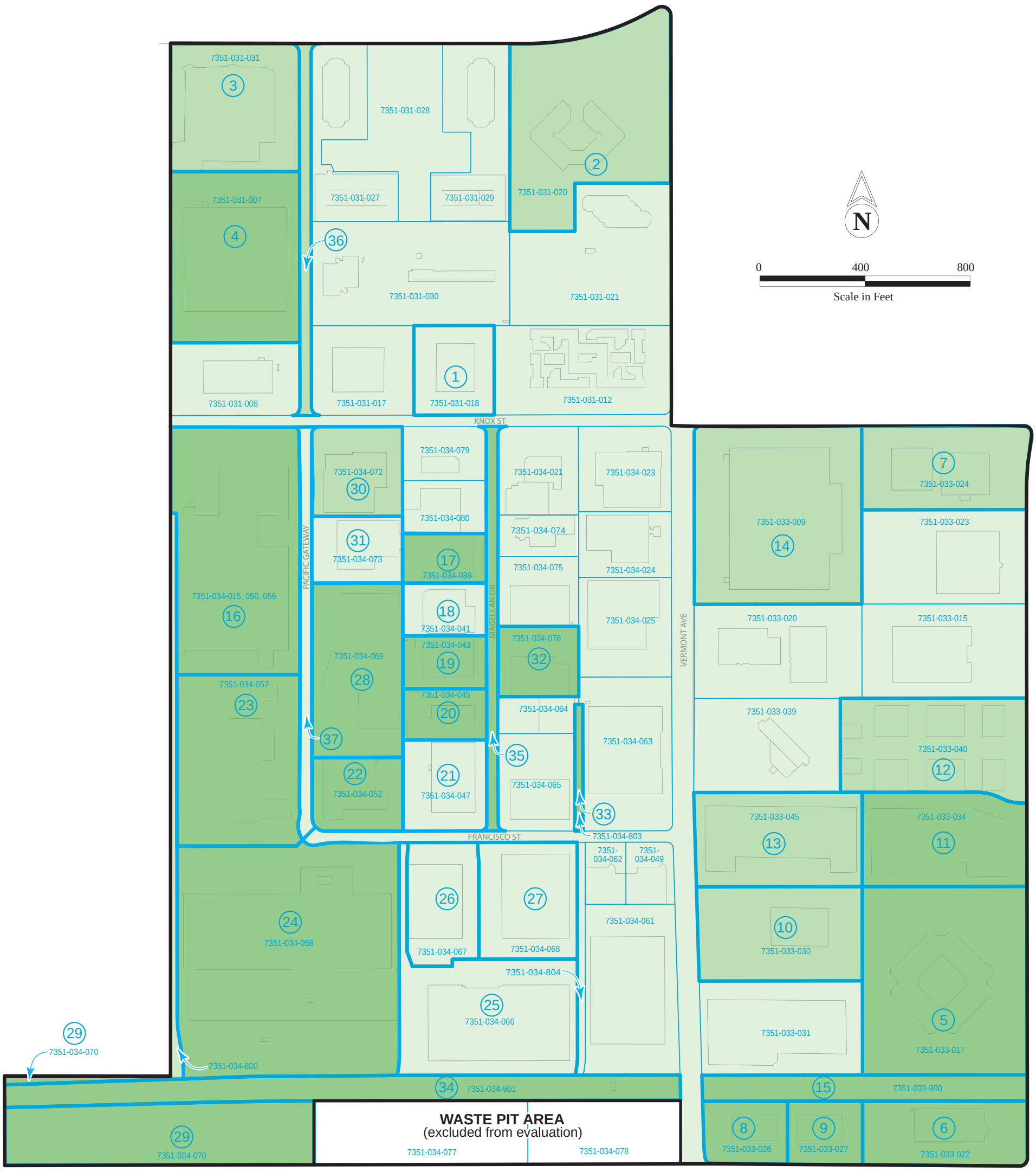
INSTITUTIONAL CONTROLS LAYERING PLAN SUMMARY

Soil and NAPL Feasibility Study
Del Amo Superfund Site
Los Angeles, California

IC Layers		PROPERTY GROUPS											
		GROUP 5	GROUP 4		GROUP 3			GROUP 2		GROUP 1			
		7351-031-020	7351-033-022 7351-033-024 7351-033-009 7351-033-017 7351-033-030 7351-033-034 7351-033-900 7351-034-015	7351-034-050 7351-034-056 7351-034-057 7351-034-069 7351-034-070 7351-034-901 EAPC 35 (2)	7351-031-007 7351-031-031 7351-033-026 7351-033-027 7351-033-040	7351-033-045 7351-034-039 7351-034-043 7351-034-045 7351-034-058	7351-034-052 7351-034-072 7351-034-076 7351-034-803 EAPC 36 (2)	7351-031-018 7351-031-029 7351-033-020 7351-033-031 7351-034-041 7351-034-047 7351-034-065	7351-034-066 7351-034-067 7351-034-068 7351-034-073 7351-034-074 7351034-800 EAPC 37 (2)	7351-031-008 7351-031-012 7351-031-017 7351-031-021 7351-031-027 7351-031-028 7351-031-030	7351-033-015 7351-033-023 7351-033-039 7351-034-021 7351-034-023 7351-034-024 7351-034-025	7351-034-049 7351-034-061 7351-034-062 7351-034-063 7351-034-064 7351-034-075 7351-034-079	7351-034-080 7351-034-804 Francisco St Knox St Vermont Ave
LAYER 1	Information Only	71 parcels											
LAYER 2	Permit Restrictions	71 parcels											
LAYER 3	Zoning to Prohibit Residential Use (1)	31 parcels											
LAYER 4	Restrictive Covenant a) for Land Use or Sampling b) for Engineering control	31 parcels											
LAYER 5	Restrictive Covenant for Groundwater (3)		7351-033-017 7351-033-022 7351-033-034 7351-033-900 7351-034-015 7351-034-050	7351-034-056 7351-034-057 7351-034-069 7351-034-070 7351-034-901 EAPC 35 (2)	7351-031-007 7351-033-026 7351-033-027 7351-034-039	7351-034-043 7351-034-045 7351-034-052	7351-034-076 7351-034-803 7351-034-058						

(1) For Group 3 parcels, the zoning restriction would not prohibit residential use; instead the deed language would require sampling or other actions prior to being considered for residential use.
(2) Properties are defined to include land that are roadway segments that do not have parcel numbers.
EAPC 35 is Magellan Dr; EAPC 36 is Pacific Gateway North; and EAPC 37 is Pacific Gateway South.
(3) Restrictive Covenants for Groundwater are applied to parcels in Groups 3, 4 and 5 that also have impacted groundwater below it.

T/Ladd/DelAmo/Francis/Soil&NAPL FS/607-140A (rev7-09)



Legend

- Parcels proposed for IC Layers 1 and 2 (40 parcels)
- Parcels proposed for IC Layers 1 - 4 (9 parcels)
- Parcels proposed for IC Layers 1 - 5 (22 parcels)
- 7351-034-066 — Assessor's Parcel Number
- (20) — EAPC and Number

IC Layer No.	Description
1	Information Only - e.g. Site Registry listing, Web-based Information, Land Activity Monitoring
2	Permit Restrictions implemented through City of Los Angeles, Dept. of Building & Safety
3	Zoning Restrictions to prohibit residential land use
4	Restrictive Covenants a) for Land Use or Sampling; b) for Engineering Control
5	Restrictive Covenants for Groundwater

Notes:

1. Streets such as Pacific Gateway, Francisco, Knox, Magellan and Vermont do not have parcel numbers but were evaluated in the risk assessment and have proposed institutional controls.
2. For parcels where IC Layer 3 is proposed, the zoning restriction would not prohibit residential use; instead the deed language would require sampling or other actions prior to being considered for residential use.

FIGURE 5-2

ICs LAYERING

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