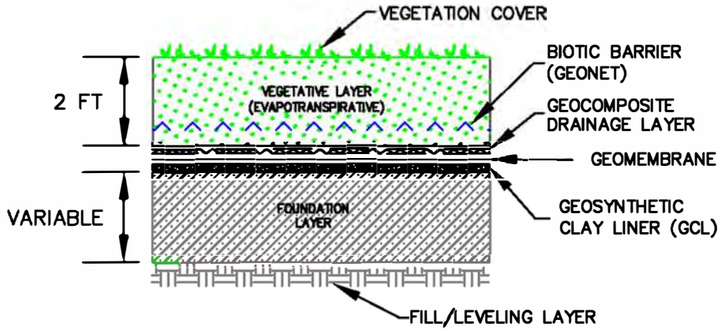
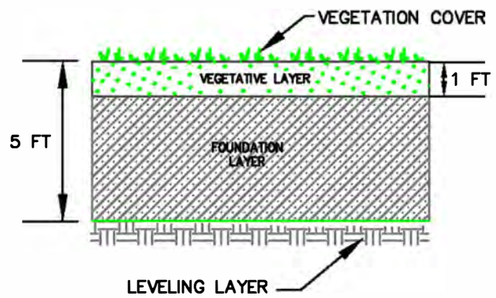
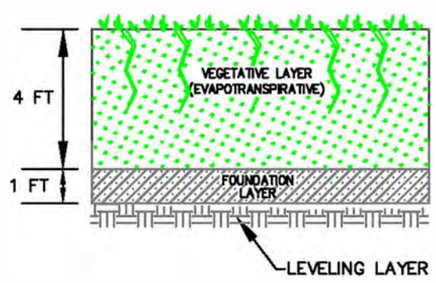


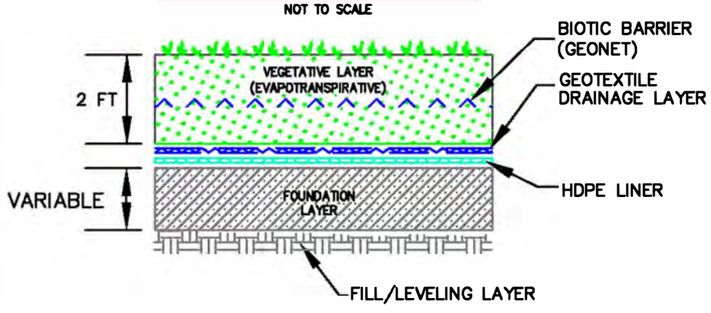
DETAIL A - TYPICAL RCRA CAP SECTION
NOT TO SCALE



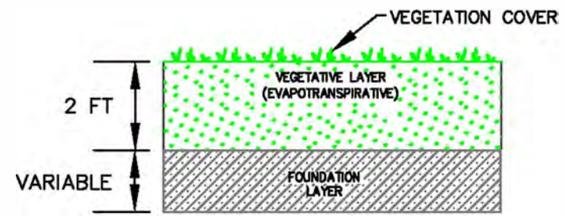
DETAIL B - TYPICAL 5' RCRA-EQUIVALENT MONO SOIL CAP SECTION
NOT TO SCALE



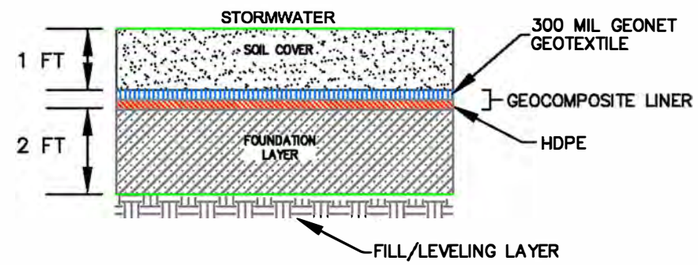
DETAIL C - TYPICAL EVAPOTRANSPIRATIVE CAP SECTION
NOT TO SCALE



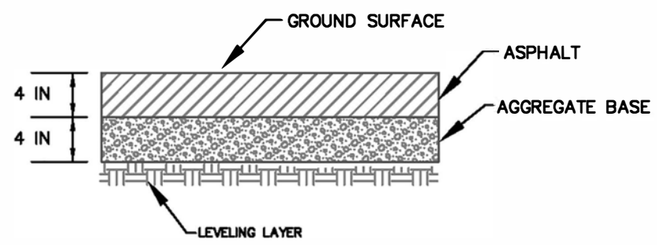
DETAIL D - TYPICAL RCRA-EQUIVALENT HYBRID CAP SECTION
NOT TO SCALE



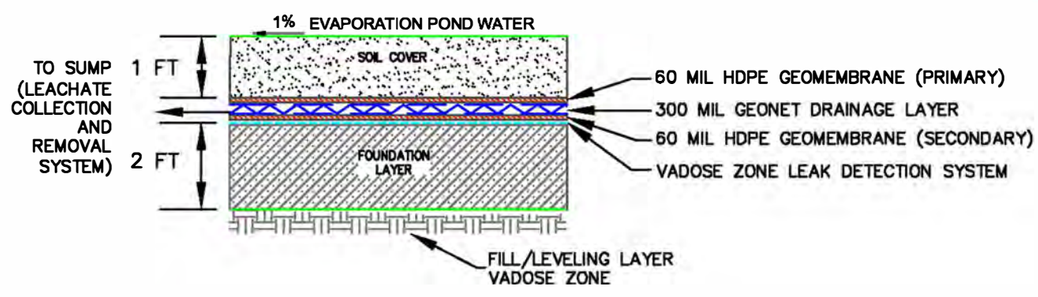
DETAIL E - TYPICAL ECO-CAP - SOIL CAP
NOT TO SCALE



DETAIL F - LINED CAP RETENTION BASIN
NOT TO SCALE



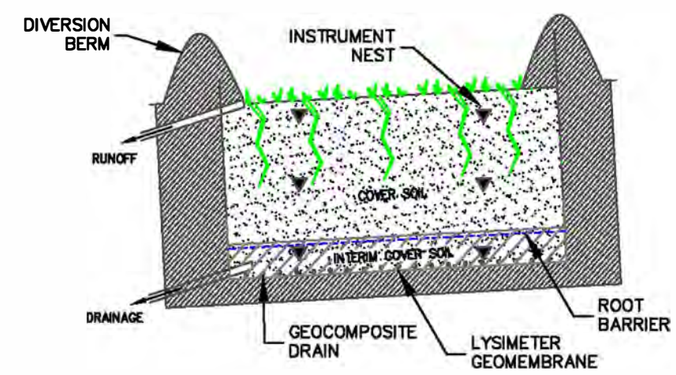
DETAIL G - TYPICAL ASPHALT CAP CROSS SECTION
NOT TO SCALE



DETAIL H - TYPICAL RCRA EVAPORATION POND SECTION
NOT TO SCALE

NOTES:

1. CAPS A, B, C, AND D ARE USED IN APPLICATIONS THAT PREVENT OR MINIMIZE RAINWATER INFILTRATION.
2. CAP E IS USED TO PREVENT POTENTIAL EXPOSURE TO ECOLOGICAL RECEPTORS.
3. CAP F IS USED TO LINE THE STORMWATER RETENTION BASINS.
4. CAP G IS ONLY CONSIDERED IN THE LIQUID TREATMENT AREA.
5. CAP H IS USED TO LINE THE EVAPORATION POND AND INCLUDES A LEACHATE COLLECTION AND RECOVERY SYSTEM (LCRS) COMPOSED OF A 300 MIL GEONET DRAINAGE LAYER THAT DRAINS TO A SUMP. THE POND BOTTOM IS SLOPED AT 1% TO COLLECT ANY LEACHATE THAT PENETRATES THE PRIMARY LINER.
6. USE OF OFFSITE BORROW SOIL IS PROPOSED FOR THE VEGETATIVE AND FOUNDATION LAYERS (SEE FIGURE 10-2) BORROW SOIL IS A CLAYSTONE MATERIAL AND WILL NEED SOME PRE-PROCESSING SUCH AS SCREENING AND PULVERIZING TO REDUCE PARTICLE SIZE.
7. FOUNDATION LAYERS WILL BE COMPACTED TO 90% RELATIVE COMPACTION WHILE VEGETATIVE LAYERS WILL BE TREATED WITH SOIL AMENDMENTS (E.G. BIOSOLIDS) AND LIGHTLY COMPACTED (85% RELATIVE COMPACTION).



DETAIL I - TYPICAL ACAP TYPE LYSIMETER SECTION
NOT TO SCALE

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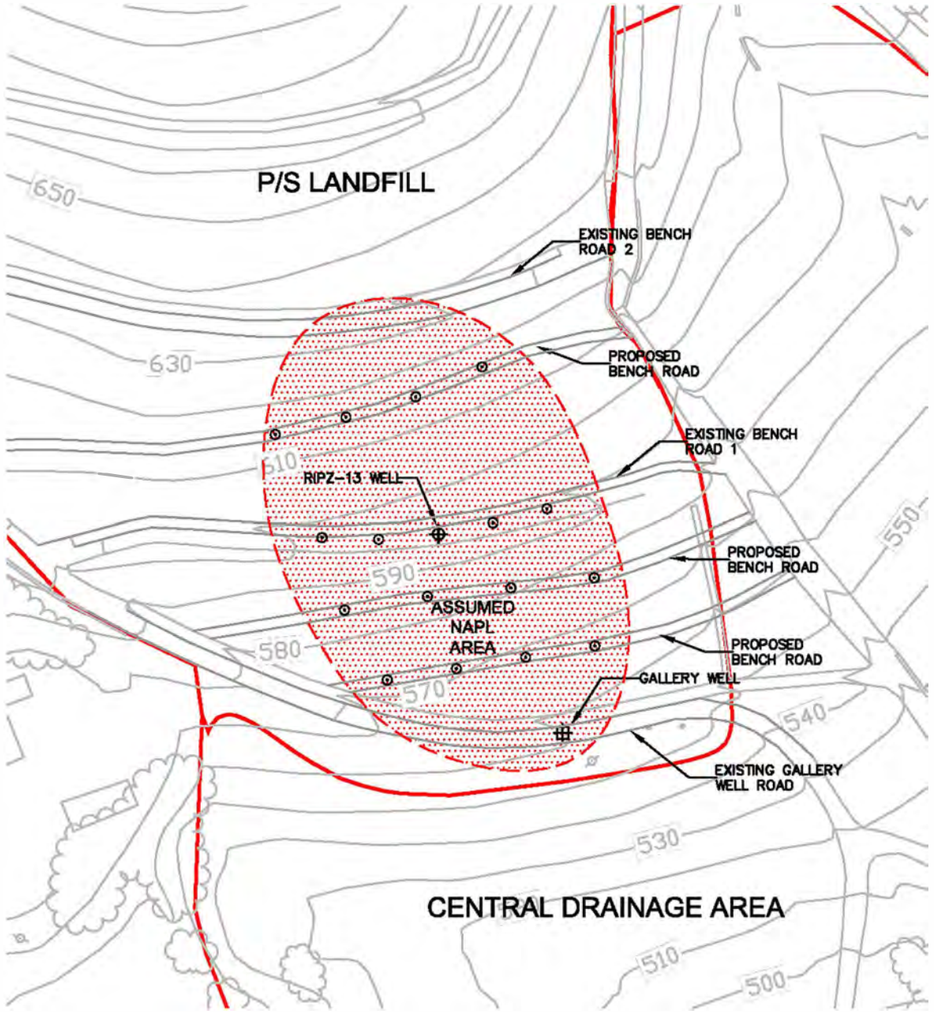
PROJECT: CASMALIA RESOURCES SUPERFUND SITE
FEASIBILITY STUDY

CAPS CONSIDERED IN FS EVALUATION

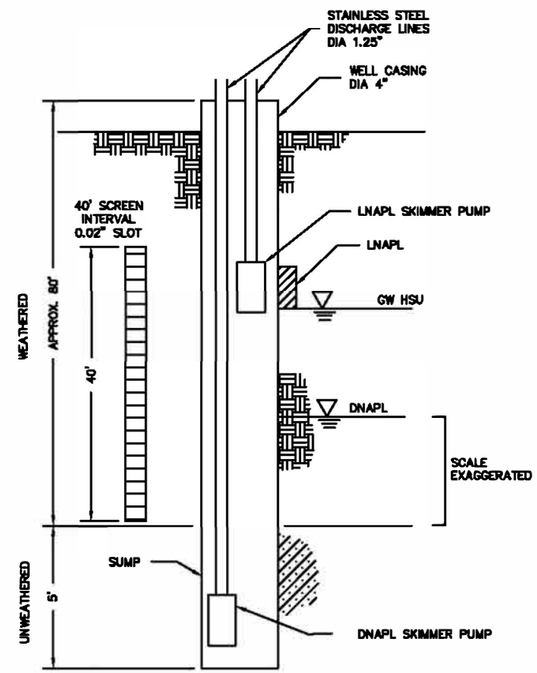
FIGURE 10-1A

LEGEND:

- NAPL EXTRACTION AREA
- EXISTING EXTRACTION WELL
- NAPL-ONLY EXTRACTION WELL (16 WELLS)
- BENCH ROAD

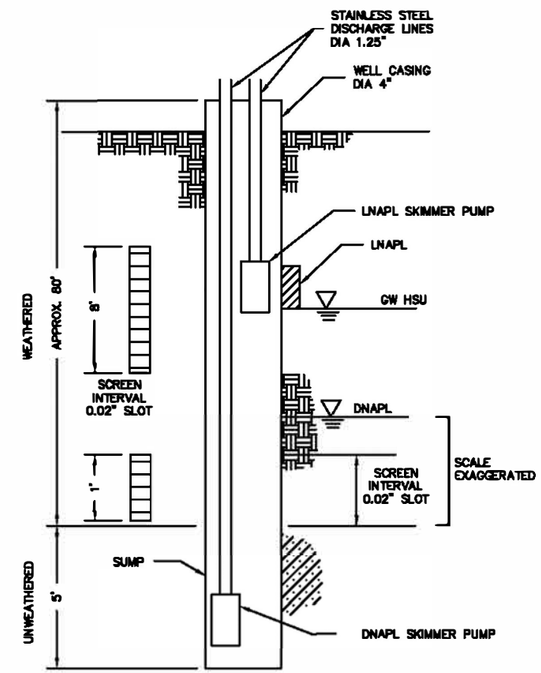


SOUTHERN PORTION OF P/S LANDFILL



APPROACH B - OPTION 1A
NAPL-ONLY EXTRACTION WELL
IN UPPER HSU - CONTINUOUS SCREEN

NOT TO SCALE



APPROACH B - OPTION 1B
NAPL-ONLY EXTRACTION WELL
IN UPPER HSU - TWO DISCRETE SCREENS

NOT TO SCALE

N

0 100'

GRAPHIC SCALE

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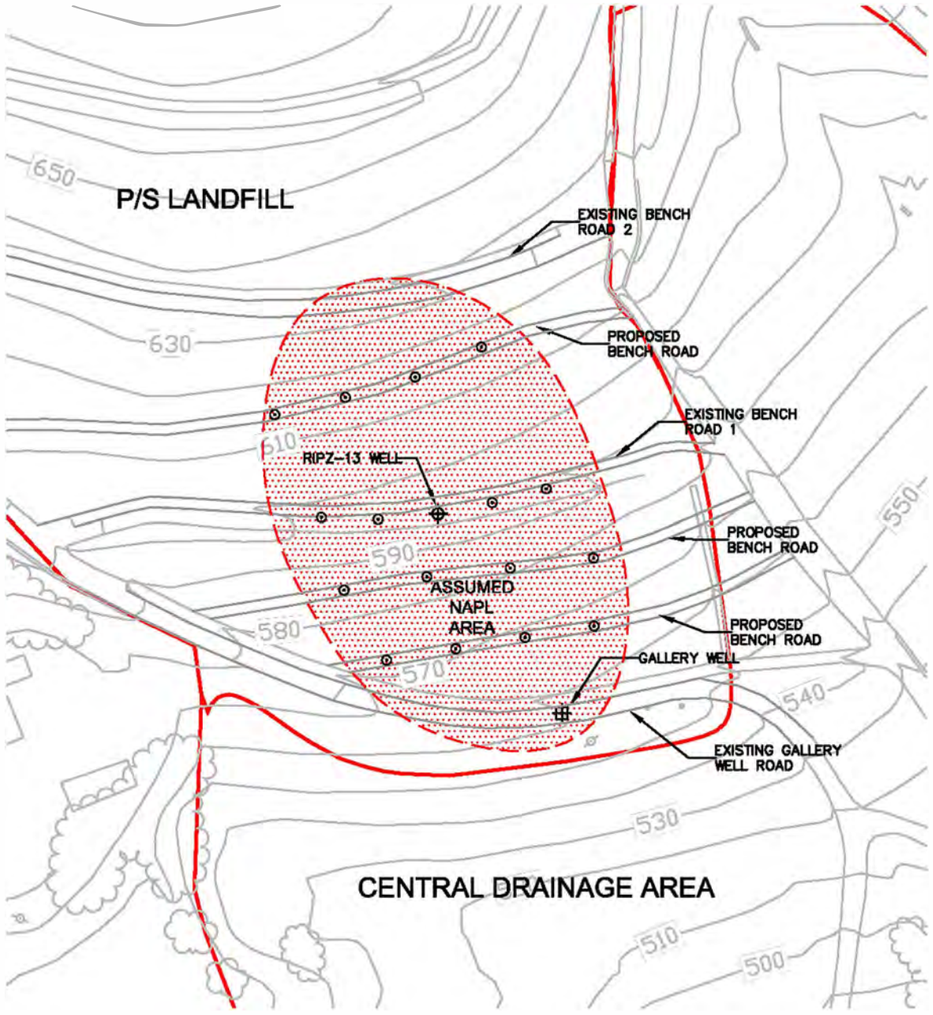
FEASIBILITY STUDY

AREA 5 NORTH - P/S LANDFILL
GALLERY WELL + NAPL-ONLY VERTICAL
EXTRACTION WELLS

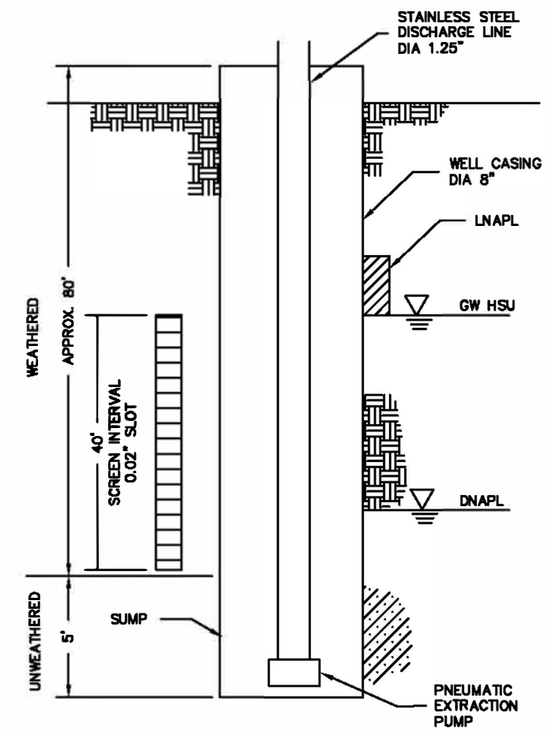
FIGURE 10-1B



SOUTHERN PORTION OF P/S LANDFILL

LEGEND:

- NAPL EXTRACTION AREA
- EXISTING EXTRACTION WELL
- AGGRESSIVE NAPL-ONLY EXTRACTION WELL (16 WELLS)
- BENCH ROAD



APPROACH B - OPTION 2
AGGRESSIVE NAPL EXTRACTION WELL IN UPPER HSU

NOT TO SCALE

N

0 100'

GRAPHIC SCALE

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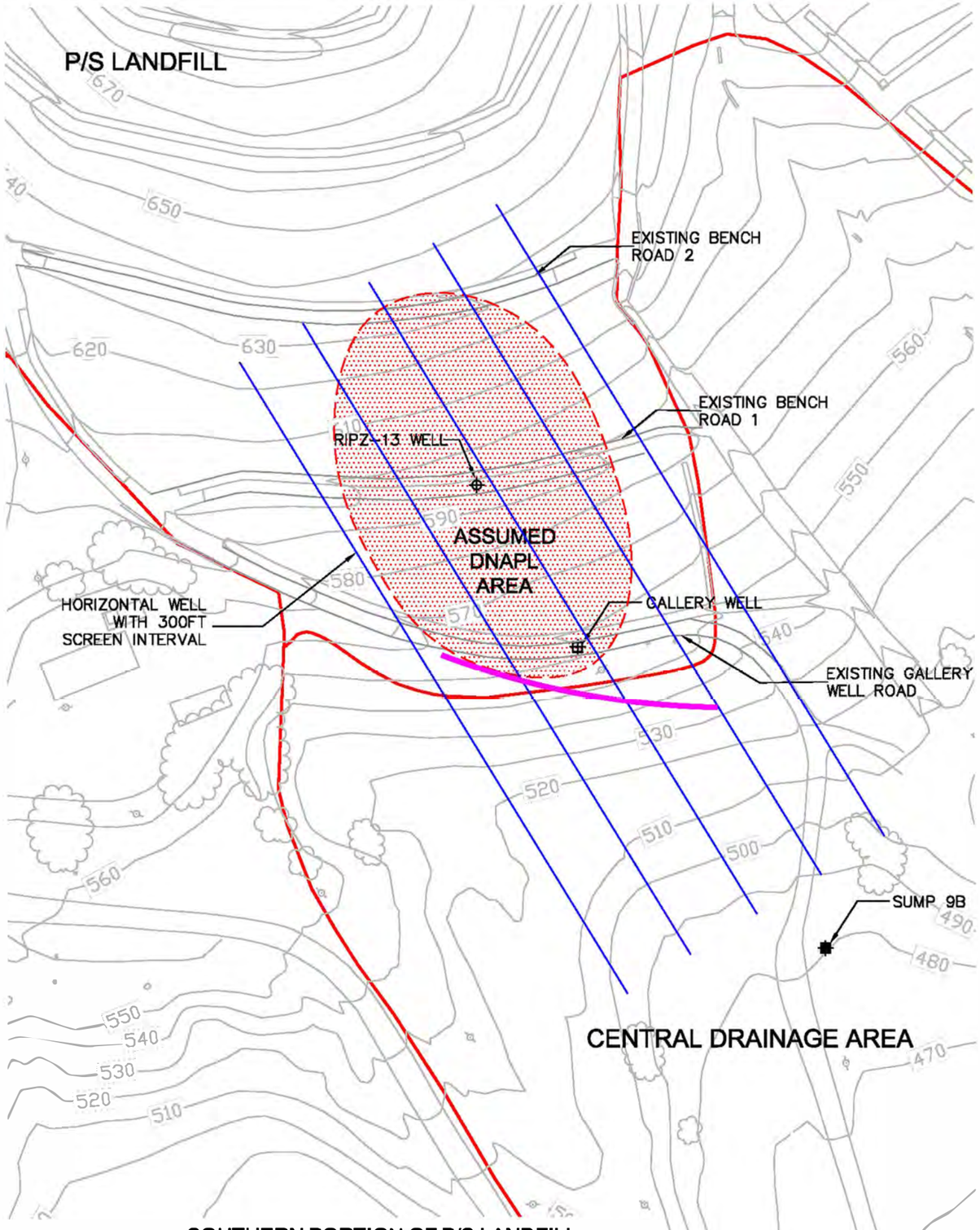
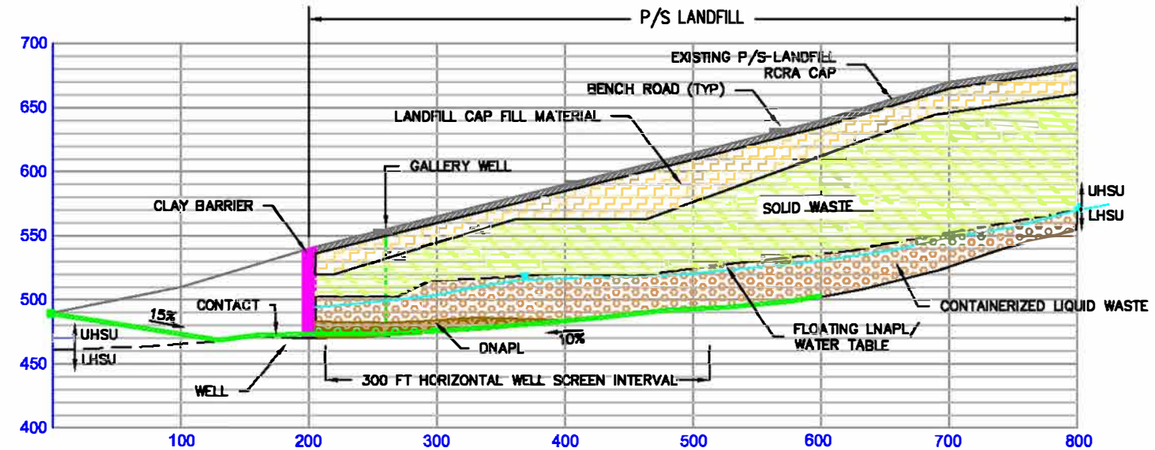
PROJECT: CASMALIA RESOURCES SUPERFUND SITE
FEASIBILITY STUDY

AREA 5 NORTH - P/S LANDFILL
GALLERY WELL + AGGRESSIVE NAPL
EXTRACTION WELLS

FIGURE 10-1C

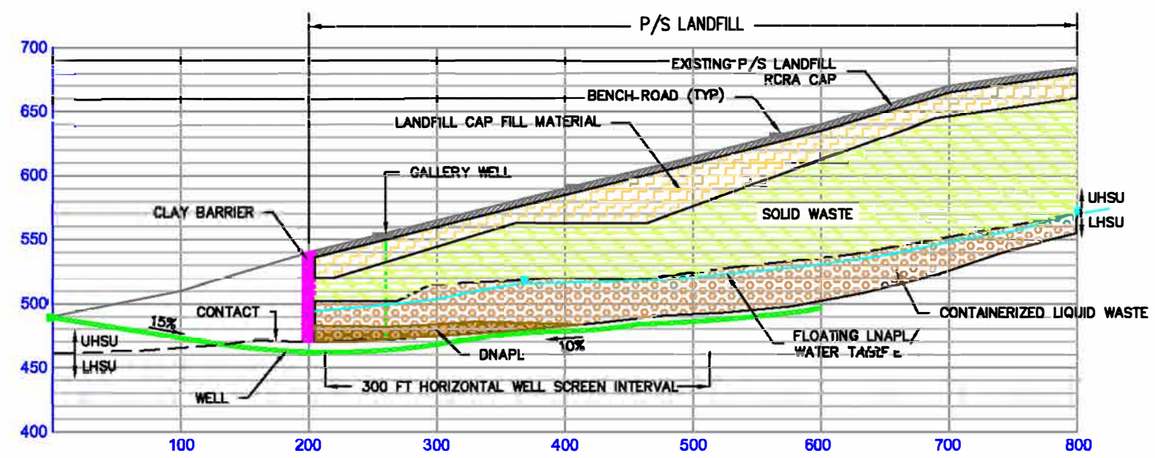


SOUTHERN PORTION OF P/S LANDFILL



APPROACH C - OPTION1
HORIZONTAL WELL CROSS SECTION (TYP)

NOT TO SCALE



APPROACH C - OPTION 2
HORIZONTAL WELL CROSS SECTION (TYP)

NOT TO SCALE

LEGEND:

- NAPL EXTRACTION AREA
- EXISTING EXTRACTION WELL
- EXISTING CLAY BARRIER
- HORIZONTAL WELL
- BENCH ROAD

N

0 100'

GRAPHIC SCALE

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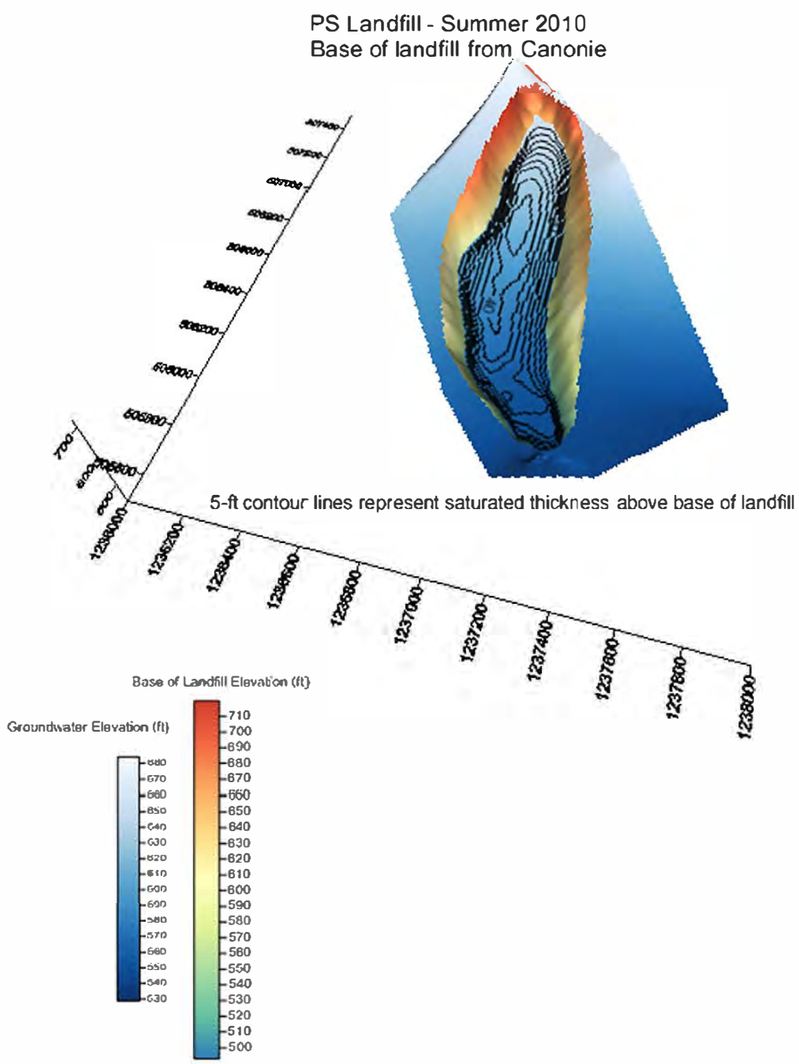
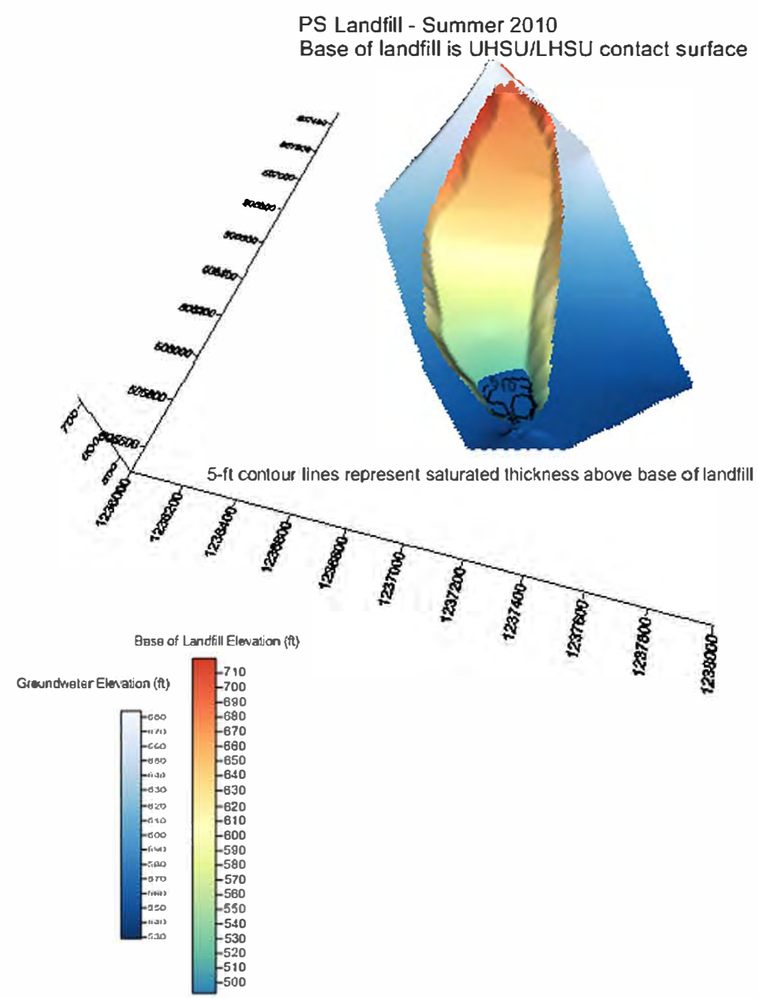
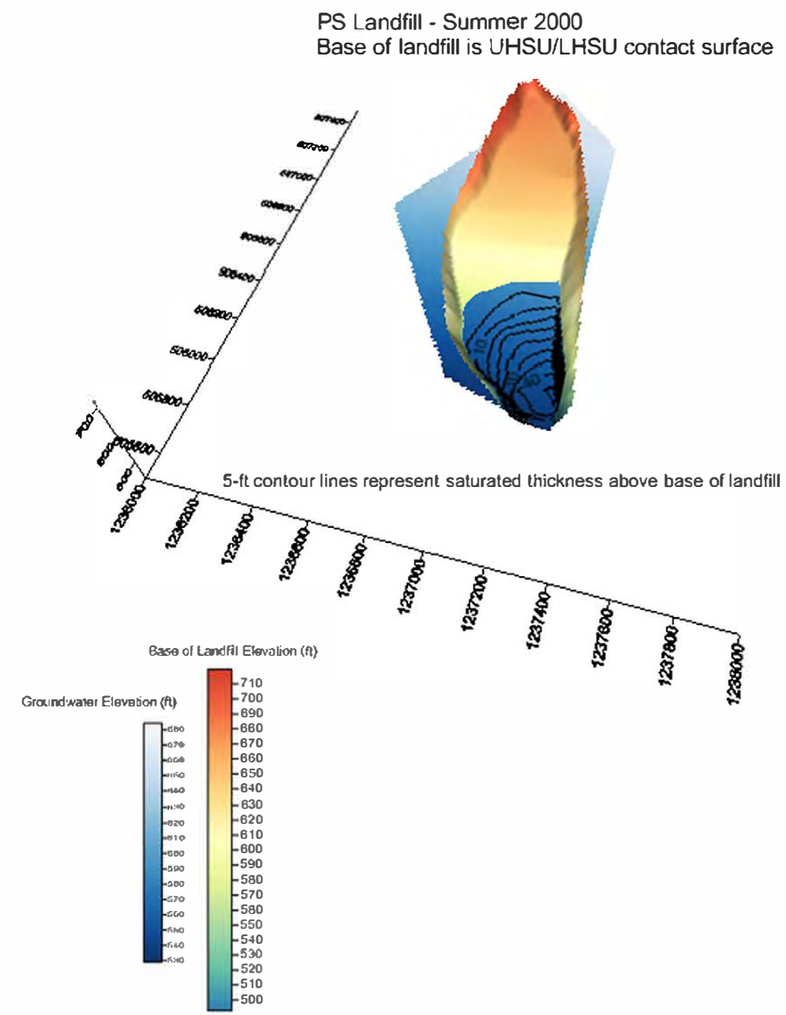
PROJECT: CASMALIA RESOURCES SUPERFUND SITE
FEASIBILITY STUDY

AREA 5 NORTH - P/S LANDFILL
GALLERY WELL +
HORIZONTAL EXTRACTION WELLS

FIGURE 10-1D







P/S LANDFILL BOTTOM ELEVATION AND SATURATION THICKNESS CONTOURS

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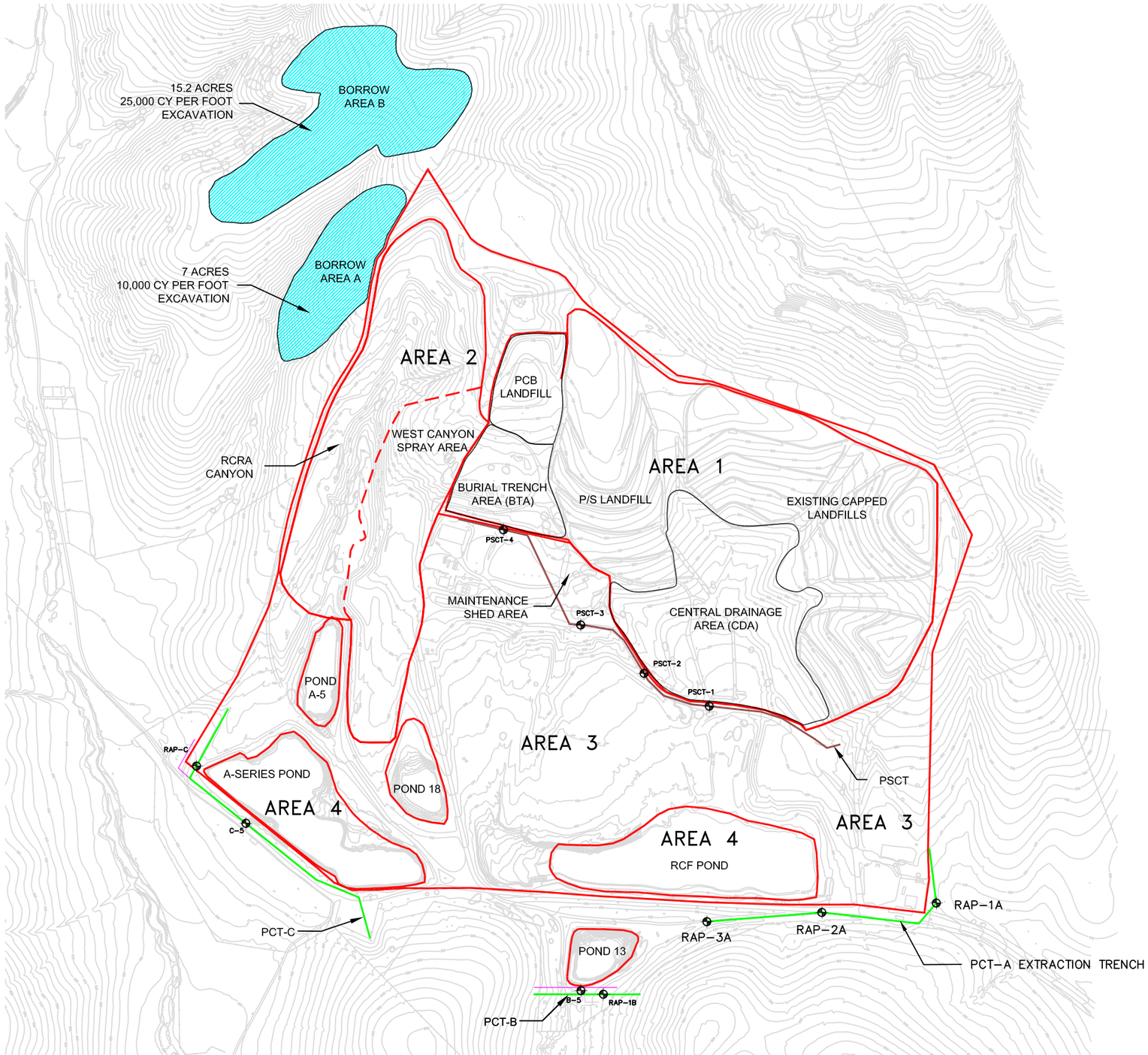
PROJECT: CASMALIA RESOURCES SUPERFUND SITE
FEASIBILITY STUDY

AREA 5 NORTH - P/S LANDFILL
BOTTOM ELEVATION AND
SATURATION THICKNESS CONTOURS

FIGURE 10-1E



NOTES:

1. USE OF OFFSITE BORROW SOIL IS PROPOSED FOR THE VEGETATIVE AND FOUNDATION LAYERS (SEE FIGURE 10-1A) BORROW SOIL IS A CLAYSTONE MATERIAL AND WILL NEED SOME PRE-PROCESSING SUCH AS SCREENING AND PULVERIZING TO REDUCE PARTICLE SIZE.

2. FOUNDATION LAYERS WILL BE COMPACTED TO 90% RELATIVE COMPACTION WHILE VEGETATIVE LAYERS WILL BE TREATED WITH SOIL AMENDMENTS (E.G. BIOSOLIDS) AND LIGHTLY COMPACTED (85% RELATIVE COMPACTION).

LEGEND:

- LIMITS OF STUDY AREA (AREAS 1-4)
- PCT EXTRACTION TRENCH
- PSCT TRENCH
- CLAY BARRIER
- OFFSITE BORROW AREA

N

0 600'

GRAPHIC SCALE

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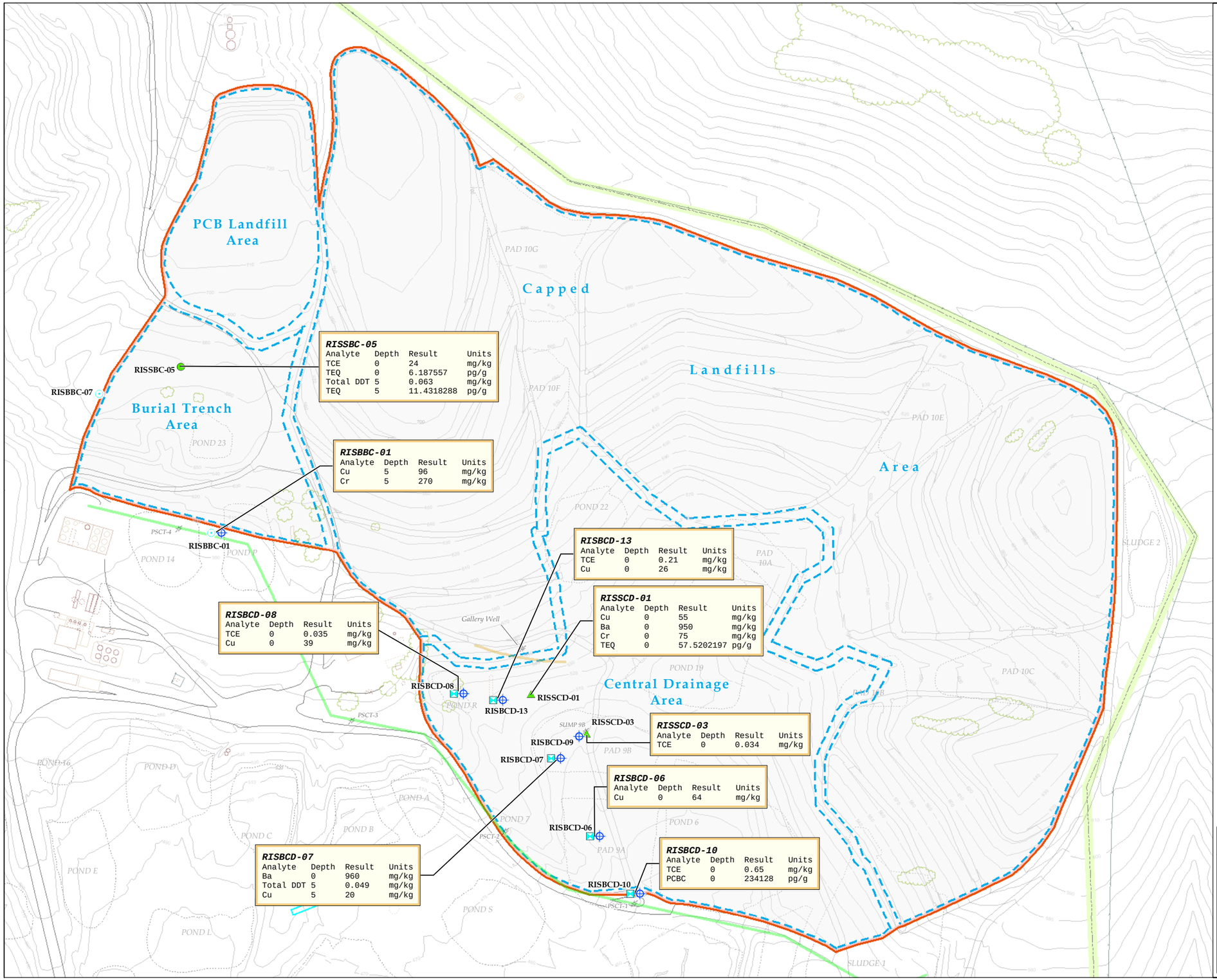
FEASIBILITY STUDY

SOIL BORROW AREAS

FIGURE 10-2



Explanation

Soil Sample Locations

- Surface Soil (Type 2)
- Surface to Shallow Soil (Type 3)
- Surface to Medium Soil (Type 4)
- Surface to Deep Soil (Type 5)
- Surface to Deep Soil - Groundwater and/or Contact if Encountered (Type 6)
- NAPL (Type 7)

Other Site Features

- Casmalia Site Boundary
- FS Study Area Boundary
- RI Study Area Limits
- Liquids Extraction Well
- P/S Landfill Clay Barrier (1981 Photograph)
- Perimeter Source Control Trench (Brierly & Lyman, 1989)
- Perimeter Control Trench (Brierly & Lyman, 1989)
- Historical Feature
- Former Waste Burial Area
- Fence
- Stormwater Pond
- Treated Liquid Impoundment

Source: Topographic base map provided by Pacific Engineering, Inc. from aerial survey dated March 4, 2004.

0 240 480

Scale in Feet (1 inch = 240 feet)

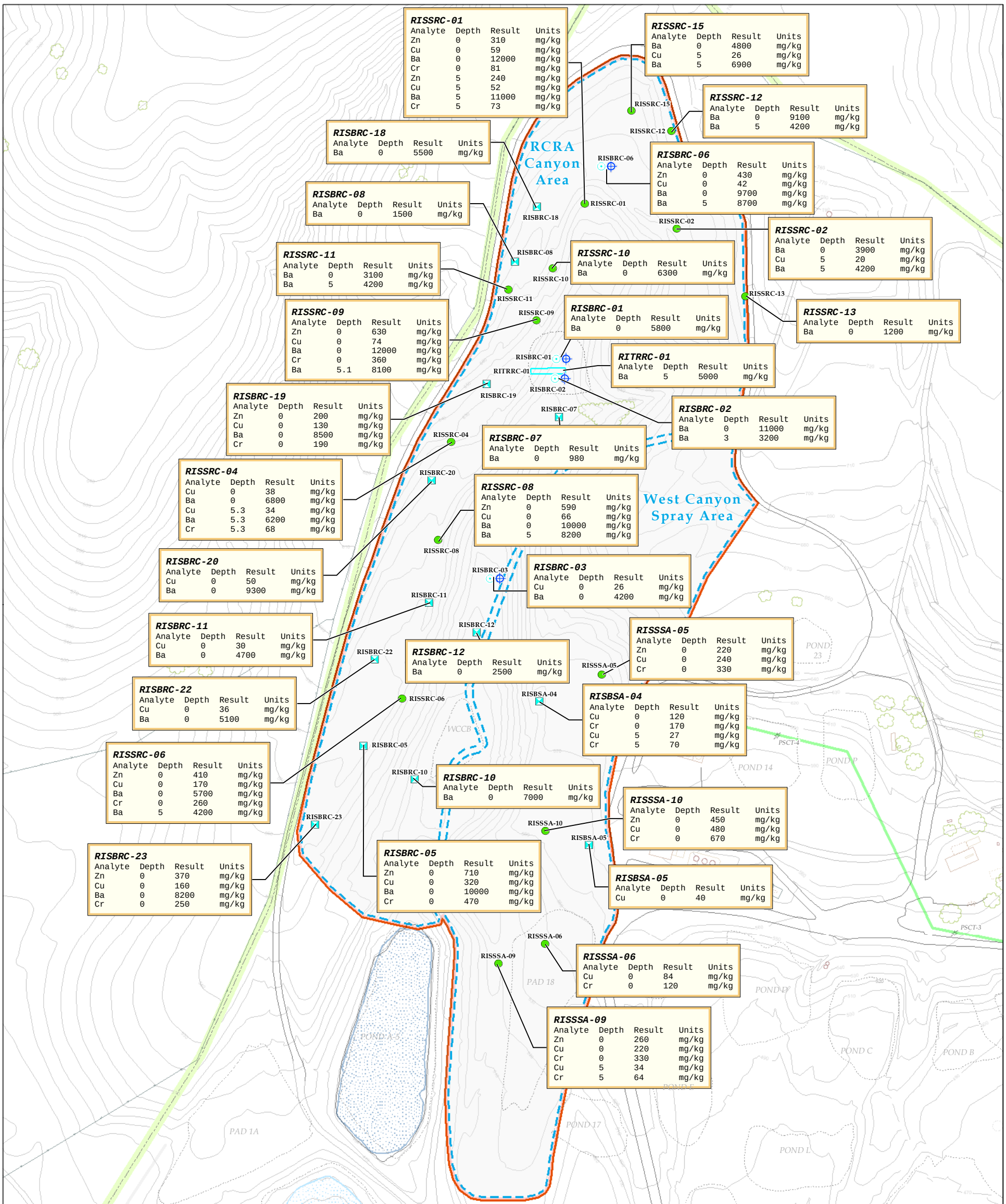
Figure 10-3

Summary Analytical Results Exceedances for Soil Area 1

Feasibility Study

Casmalia Resources Superfund Site

October 2011



Explanation

Soil Sample Locations

- Surface Soil (Type 2)
- Surface to Shallow Soil (Type 3)
- Surface to Medium Soil (Type 4)
- Surface to Deep Soil (Type 5)
- Surface to Deep Soil - Groundwater and/or Contact if Encountered (Type 6)
- NAPL (Type 7)

Other Site Features

- Casmalia Site Boundary
- FS Study Area Boundary
- RI Study Area Limits
- Liquids Extraction Well
- P/S Landfill Clay Barrier (1981 Photograph)
- Perimeter Source Control Trench (Brierly & Lyman, 1989)
- Perimeter Control Trench (Brierly & Lyman, 1989)
- Historical Feature
- Former Waste Burial Area
- Fence
- Stormwater Pond
- Treated Liquid Impoundment

Source: Topographic base map provided by Pacific Engineering, Inc. from aerial survey dated March 4, 2004.

0 240 480

Scale in Feet (1 inch = 240 feet)

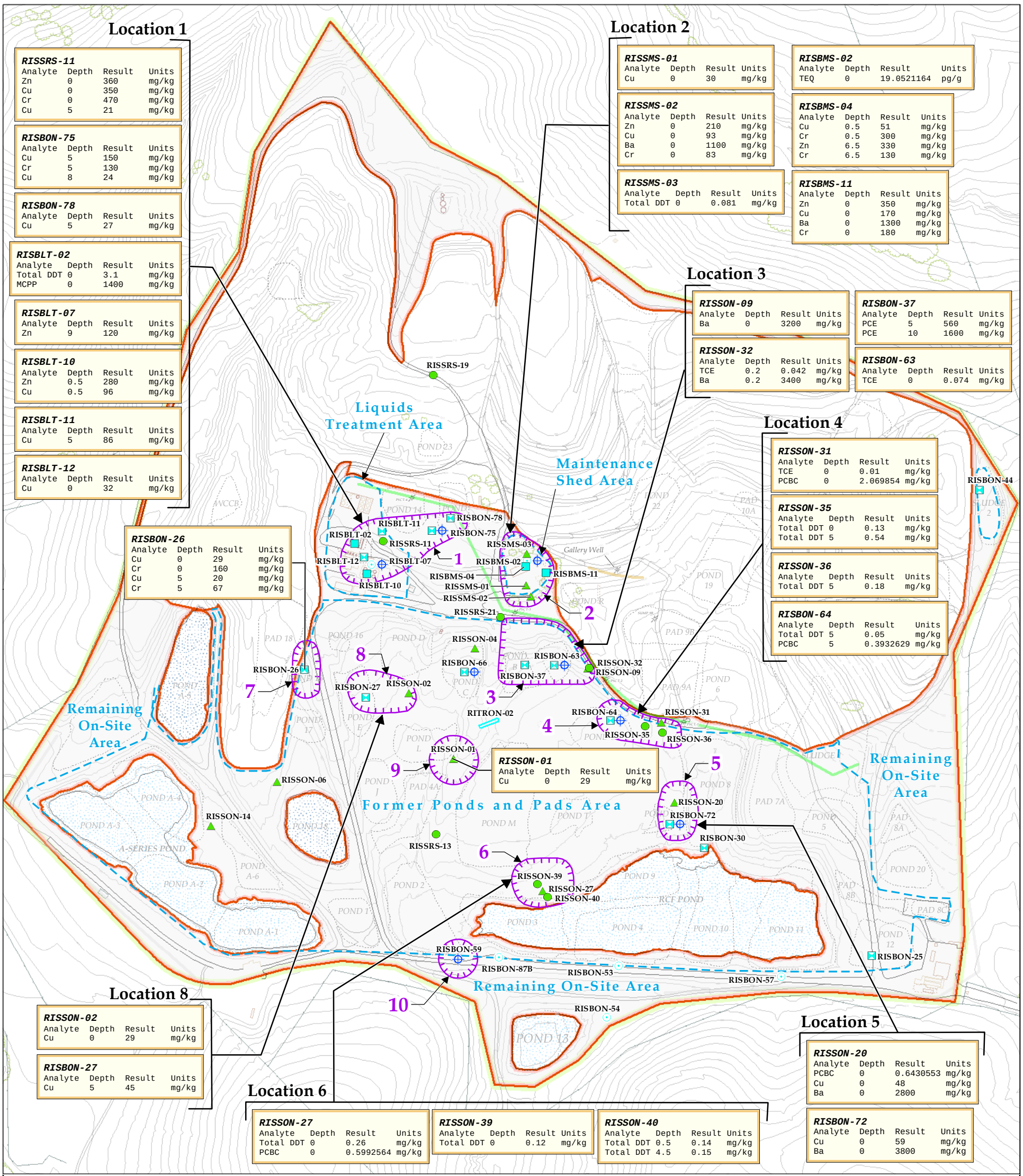
Figure 10-4

Summary Analytical Results Exceedances for Soil Area 2

Feasibility Study

Casmalia Resources Superfund Site

October 2011



Explanation

Soil Sample Locations

- Surface Soil (Type 2)
- Surface to Shallow Soil (Type 3)
- Surface to Medium Soil (Type 4)
- Surface to Deep Soil (Type 5)
- Surface to Deep Soil - Groundwater and/or Contact if Encountered (Type 6)
- NAPL (Type 7)

Other Site Features

- Approximate Hot Spot Location[1]
- Casmalia Site Boundary
- FS Study Area Boundary
- RI Study Area Limits
- Liquids Extraction Well
- P/S Landfill Clay Barrier (1981 Photograph)
- Perimeter Source Control Trench (Brierly & Lyman, 1989)
- Perimeter Control Trench (Brierly & Lyman, 1989)
- Historical Feature
- Former Waste Burial Area
- Fence
- Stormwater Pond
- Treated Liquid Impoundment

Source: Topographic base map provided by Pacific Engineering, Inc. from aerial survey dated March 4, 2004.

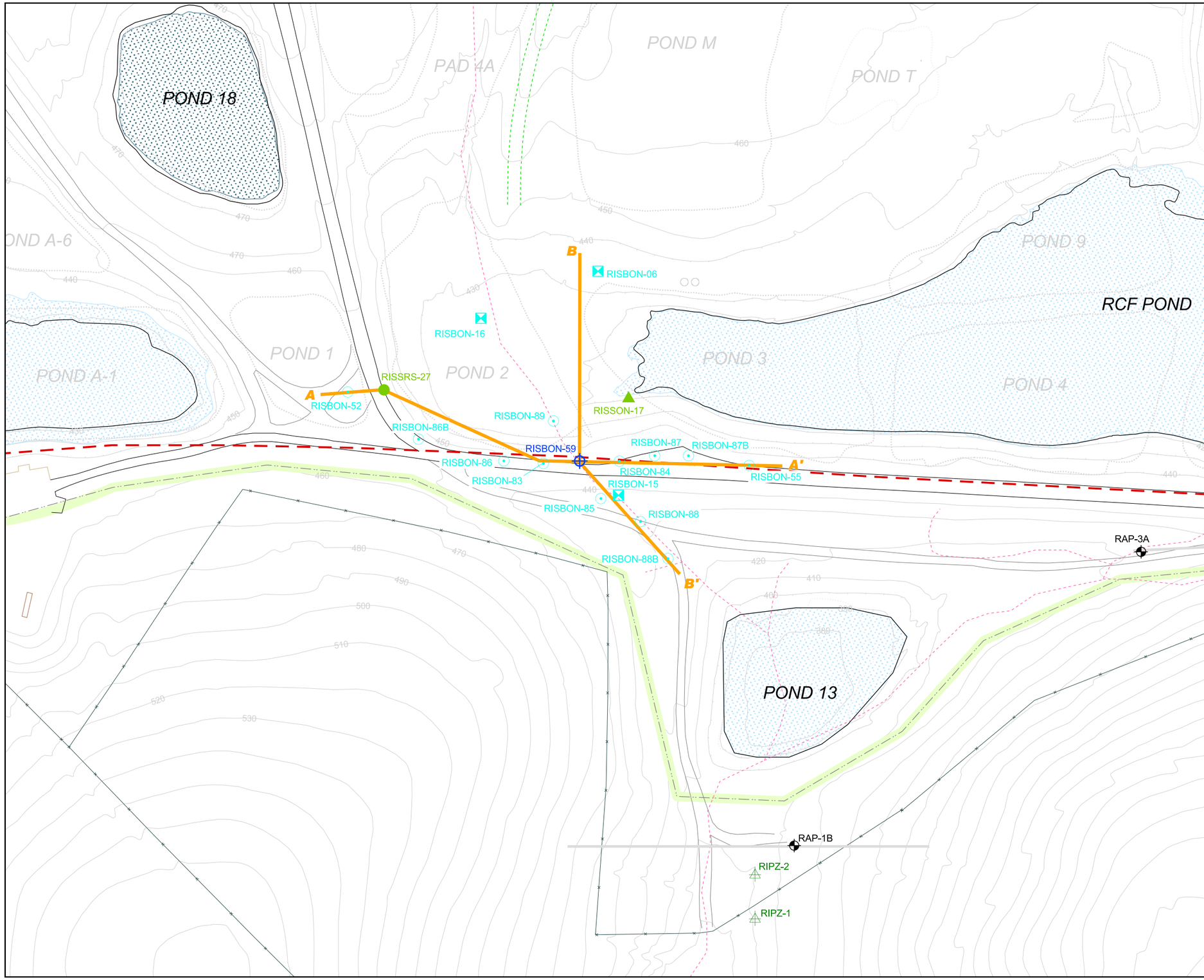
Note:
[1]Posted data grouped and labeled by Hot Spot Location.

0 420
Scale in Feet (1 inch = 420 feet)

Figure 10-5

Summary Analytical Results Exceedances for Soil Area 3

Feasibility Study
Casmalia Resources Superfund Site
October 2011



Explanation

Soil Sample Locations

- Surface Soil (Type 2)
- Surface to Shallow Soil (Type 3)
- Surface to Medium Soil (Type 4)
- Surface to Deep Soil - Groundwater and/or Contact if Encountered (Type 6)
- NAPL (Type 7)

Other Site Features

- Casmalia Site Boundary
- Study Area Boundary
- Cross Section Line
- Piezometer
- Monitoring Well
- Perimeter Control Trench (Brierly & Lyman, 1989)
- Fence
- Road Remnants
- Historical Natural Drainage (Based on 1956 Photo, 1974 Topographic Maps, and Figures 21-2 and 21-3 Woodward-Clyde, 1988)
- Historical Features
- Stormwater Pond
- Treated Liquid Impoundment

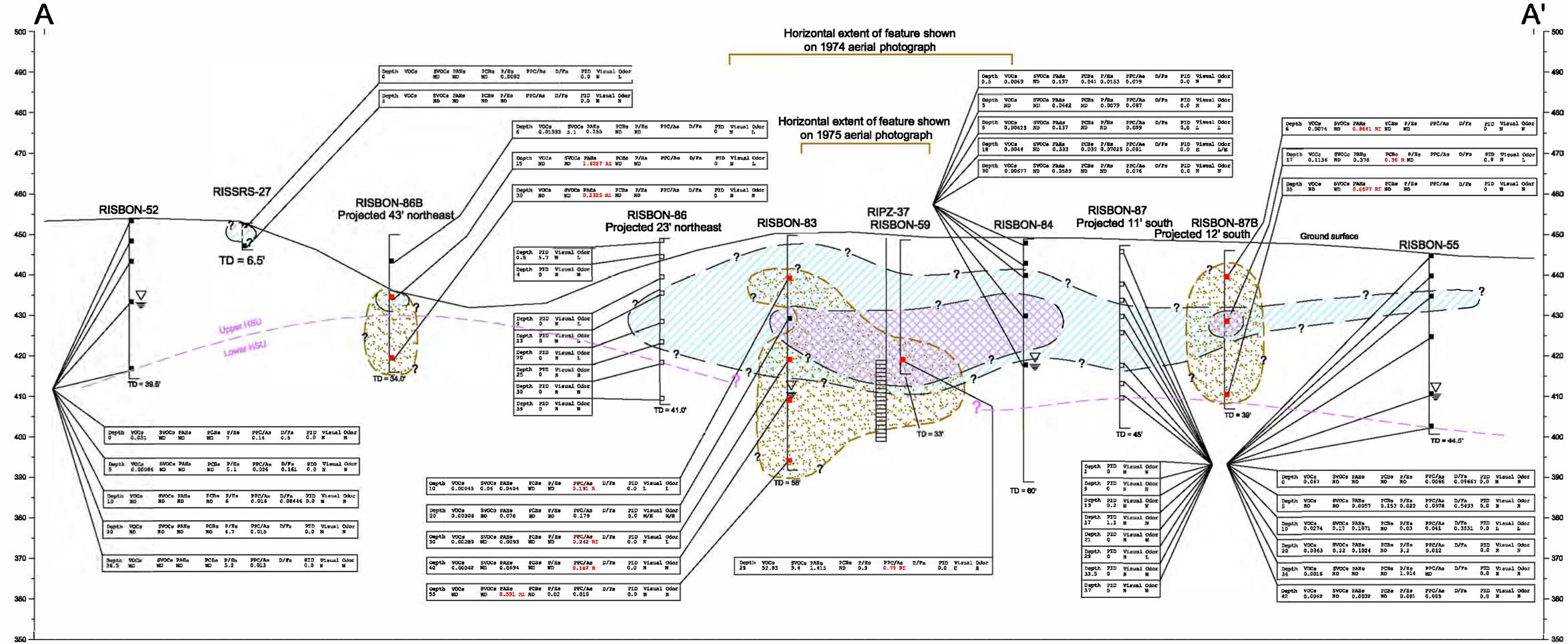
Source: Topographic base map provided by Pacific Engineering, Inc. from aerial survey dated March 4, 2004.

0 150 300
Scale in Feet

Figure 10-5a

SOIL SAMPLING LOCATIONS
RISBON-59 AREA

Feasibility Study
Casmalia Resources Superfund Site
June 2012



Legend

RISSRS-27 Boring location and ID

Sample location

Field observation location (no sample)

TD = 6.5' Total boring depth (feet below ground surface)

Estimated extent of soil impact in exceedance of one or more soil screening level criteria

Contact between upper and lower HSUs (Source: Casmalia Interim Progress Report, Appendix E, Figure E-2. February 2005) as modified by field observations from borings.

Piezometer screened interval

Estimated groundwater elevation (as encountered during piezometer installation)

Laboratory Analytical Results

ND = None detected
x.xx = Reported concentration
- D/F in ng/kg
- all others in mg/kg

Blank space = no test conducted at particular depth

Screening Level Exceedance
R = EPA Region 9 Residential PRG
r = Cal-Modified Residential PRG
I = EPA Region 9 Industrial PRG
i = Cal-Modified Industrial PRG
E = Lowest Ecological Screening Level

PID Field Observation
x.xx = Headspace reading (ppmv)

Visual and Odor Field Observations
N = none
L = light
M = moderate
H = heavy

Slight to moderate odors and/or staining observed

Moderate to high odors and/or staining observed

Analytical Categories
VOCs = Summed volatile organic compounds
SVOCs = Summed semi-volatile organic compounds
PAHs = Summed polycyclic aromatic hydrocarbons
PCBs = Summed polychlorinated biphenyls
P/Hs = Summed pesticides and herbicides
PPC/As = Summed poor-purging compounds and alcohols
D/Fs = Toxicity equivalent quotient (TEQ)

Note: Samples and analytical categories with one or more compounds exceeding screening levels are indicated in RED.

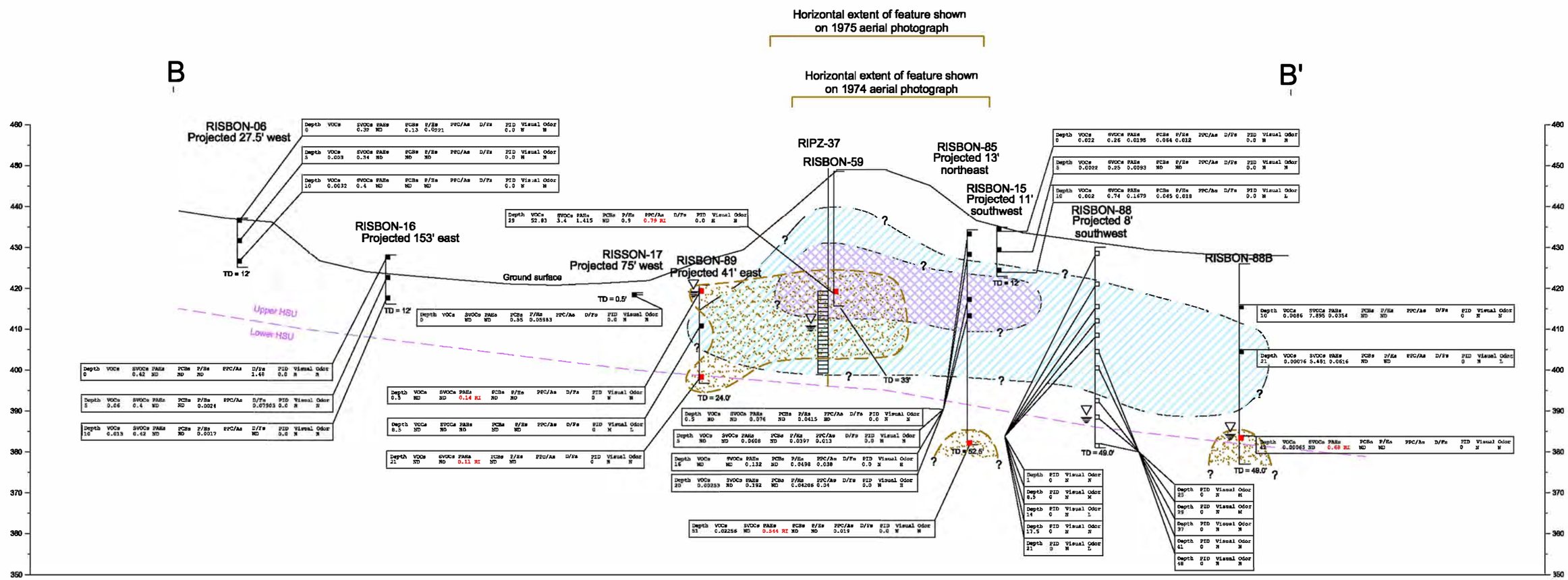
Horizontal scale 1" = 50'
Vertical exaggeration 2x

0 50 100
Horizontal scale in feet

Figure 10-5b

CROSS SECTION A-A'

Feasibility Study
Casmalia Resources Superfund Site
June 2012



Legend

RISSRS-27 Boring location and ID

Sample location

Field observation location (no sample)

TD = 6.5' Total boring depth (feet below ground surface)

Piezometer screened interval

Estimated extent of soil impact in exceedance of one or more soil screening level criteria

Estimated groundwater elevation (as encountered during piezometer installation)

Contact between upper and lower HSUs (Source: Casmalia Interim Progress Report, Appendix E, Figure E-2. February 2005) as modfied by field observations from borings.

Laboratory Analytical Results

ND = None detected
x.xx = Reported concentration
- D/F in ng/kg
- all others in mg/kg

Blank space = no test conducted at particular depth

Screening Level Exceedance

R = EPA Region 9 Residential PRG
r = Cal-Modified Residential PRG
I = EPA Region 9 Industrial PRG
i = Cal-Modified Industrial PRG
E = Lowest Ecological Screening Level

PID Field Observation

x.xx = Headspace reading (ppmv)

Visual and Odor Field Observations

N = none
L = light
M = moderate
H = heavy

Slight to moderate odors and/or staining observed

Moderate to high odors and/or staining observed

Analytical Categories

VOCs = Summed volatile organic compounds
SVOCs = Summed semi-volatile organic compounds
PAHs = Summed polycyclic aromatic hydrocarbons
PCBs = Summed polychlorinated biphenyls
P/Hs = Summed pesticides and herbicides
PPC/As = Summed poor-purging compounds and alcohols
D/Fs = Toxicity equivalent quotient (TEQ)

Note: Samples and analytical categories with one or more compounds exceeding screening levels are indicated in RED.

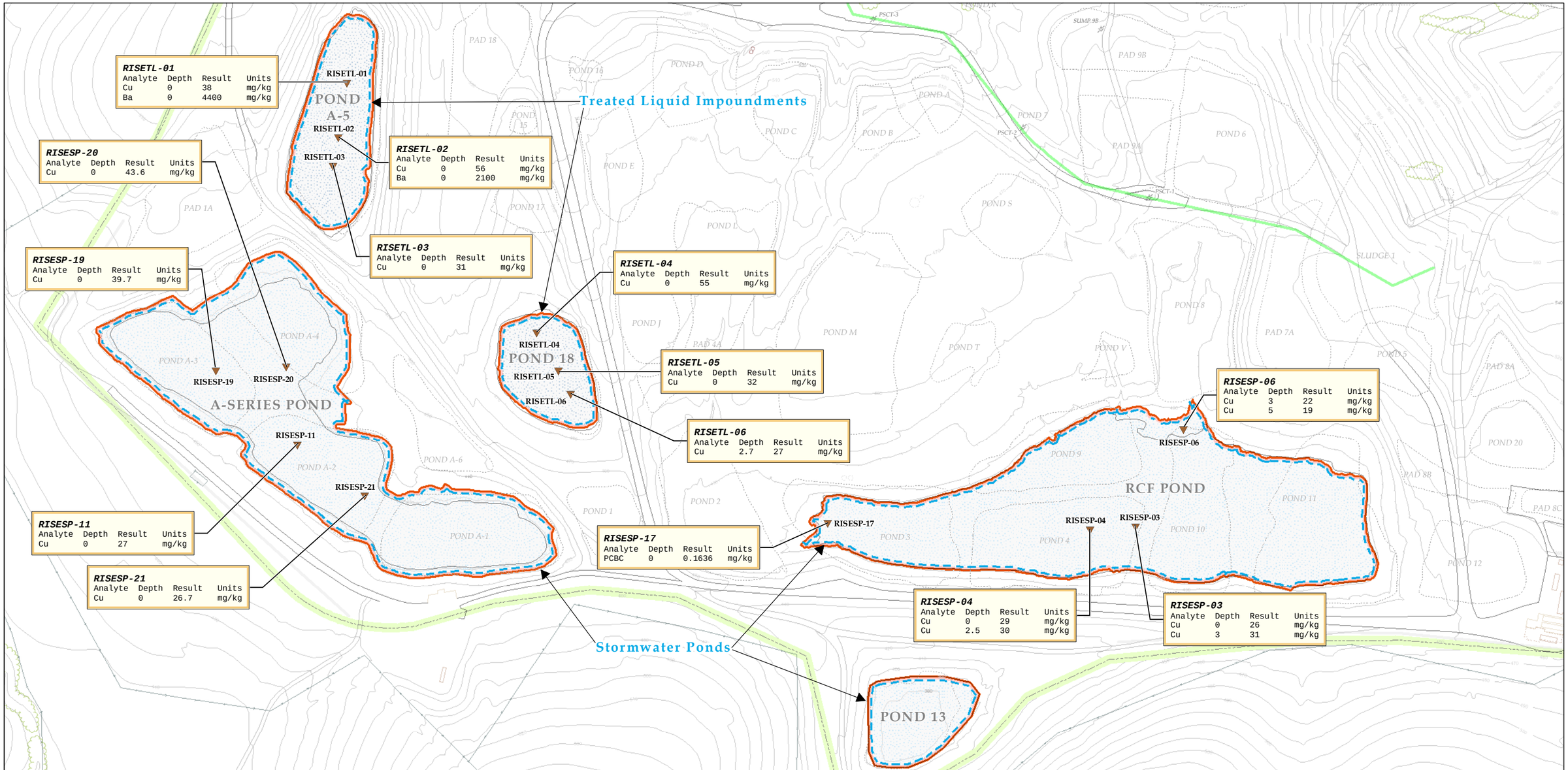
Horizontal scale 1" = 50'
Vertical exaggeration 2x

0 50 100
Horizontal scale in feet

Figure 10-5c

CROSS SECTION B-B'

Feasibility Study
Casmalia Resources Superfund Site
June 2012



Explanation

Soil Sample Locations

- Surface Soil (Type 2)
- Surface to Shallow Soil (Type 3)
- Surface to Medium Soil (Type 4)
- Surface to Deep Soil (Type 5)
- Surface to Deep Soil - Groundwater and/or Contact if Encountered (Type 6)
- NAPL (Type 7)

Other Site Features

- Casmalia Site Boundary
- FS Study Area Boundary
- RI Study Area Limits
- Liquids Extraction Well
- P/S Landfill Clay Barrier (1981 Photograph)
- Perimeter Source Control Trench (Brierly & Lyman, 1989)
- Perimeter Control Trench (Brierly & Lyman, 1989)
- Historical Feature
- Former Waste Burial Area
- Fence
- Stormwater Pond
- Treated Liquid Impoundment

Source: Topographic base map provided by Pacific Engineering, Inc. from aerial survey dated March 4, 2004.

0 250

Scale in Feet (1 inch = 250 feet)

Figure 10-6

Summary Analytical Results Exceedances for Soil Area 4

Feasibility Study

Casmalia Resources Superfund Site