

# 18<sup>th</sup> Technical Training Series

December 3-6, 2018 | Hyatt Regency Monterey





SOUTH CHOLLAS LANDFILL – WATER ADMIN BUILDINGS POST CLOSURE LAND-USE DEVELOPMENT  
LEA TECHNICAL TRAINING CONFERENCE – MONTEREY, CA – DECEMBER 2018

# SOUTH CHOLLAS LF – WATER ADMIN BLDG POST CLOSURE LAND-USE DEVELOPMENT PROJECT

- Introduction/Background – Bill Prinz
- Waste Excavation and Management Plans – Glenn Young
- Phase I Office Investigation – Beth Abramson-Beck
- Phase II Field Investigation – Beth Abramson-Beck
- Post Closure Land-Use Plans - Design of building foundations/LFG migration protection system (Beth and Glenn)
- Lessons Learned – Bill, Beth & Glenn

Development Services Department

Solid Waste Local Enforcement Agency (LEA)

Bill Prinz, Environmental Health – City of San Diego

# **CHOLLAS DISPOSAL SITE POSTCLOSURE LAND USE ISSUES**

18th Technical Training Series

Monterey, CA

December 4, 2018

# North & South Chollas

## Chollas WDS

**1946 -1950 North Chollas Burn site operated by the City**

**1951 – South Chollas opened as an MSW landfill**

**1964 (circa) – South Chollas: City operations yard constructed**

**1967-68 – North Chollas – City operated an experimental bale-fill operation**

**1970s – North Chollas - Plans to develop a MSW landfill – ash deposits were reconsolidated into berms**

**1980 – North Chollas – plans for MSW landfill scuttled**

**1981 – South Chollas landfill ceased operation**

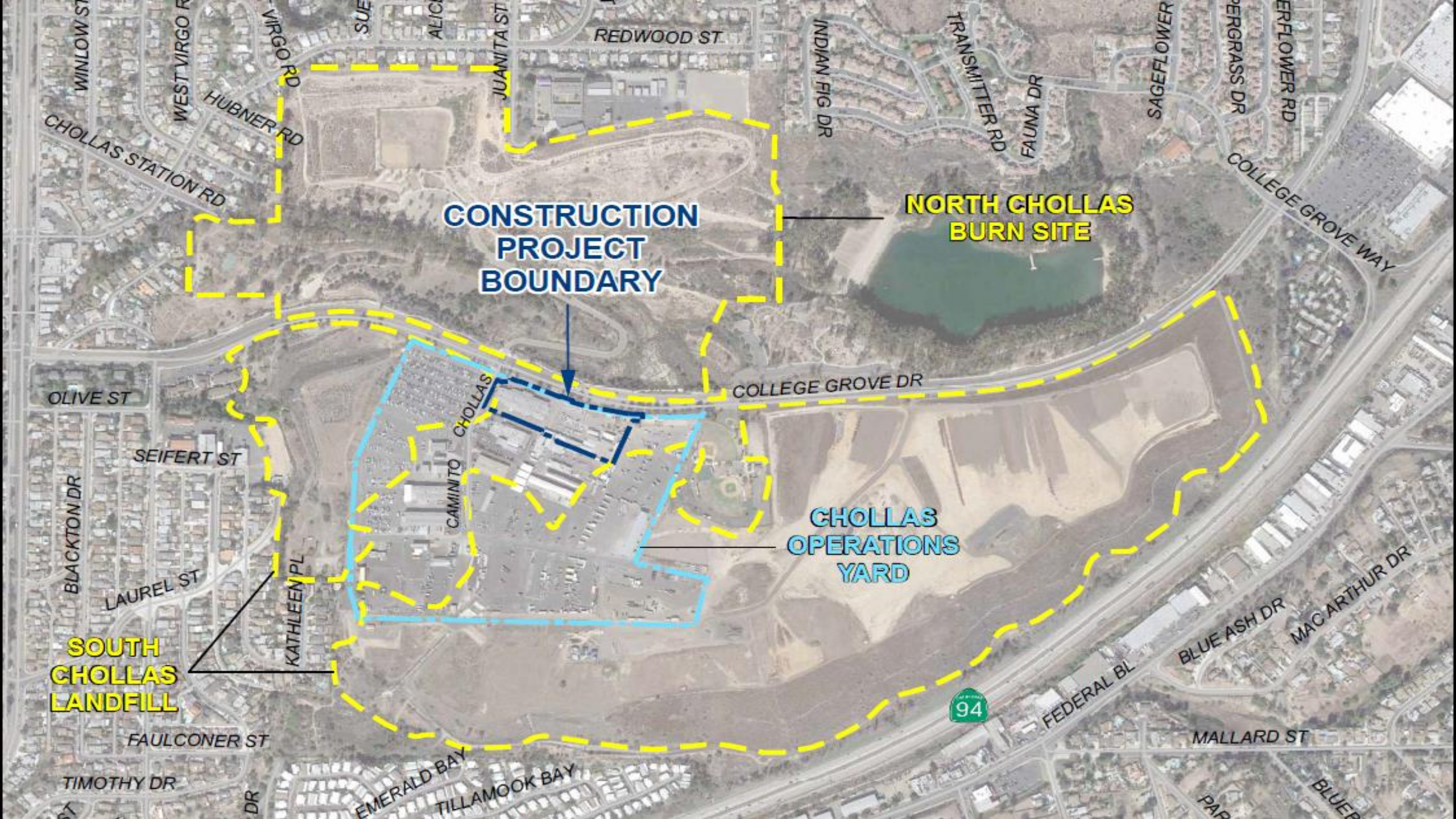
**1996 – “Clean closure” of North Chollas burn ash site was achieved;**

**2009- Proposal to build new Water Operations facility at South Chollas**

**2017 – Construction of Water Operations facility commences**

**2018 – Notice and Order No. 18-04 - Cease and Desist**





**CONSTRUCTION  
PROJECT  
BOUNDARY**

**NORTH CHOLLAS  
BURN SITE**

**CHOLLAS  
OPERATIONS  
YARD**

**SOUTH  
CHOLLAS  
LANDFILL**

# WASTE EXCAVATION AND MANAGEMENT PLANS – GLENN YOUNG

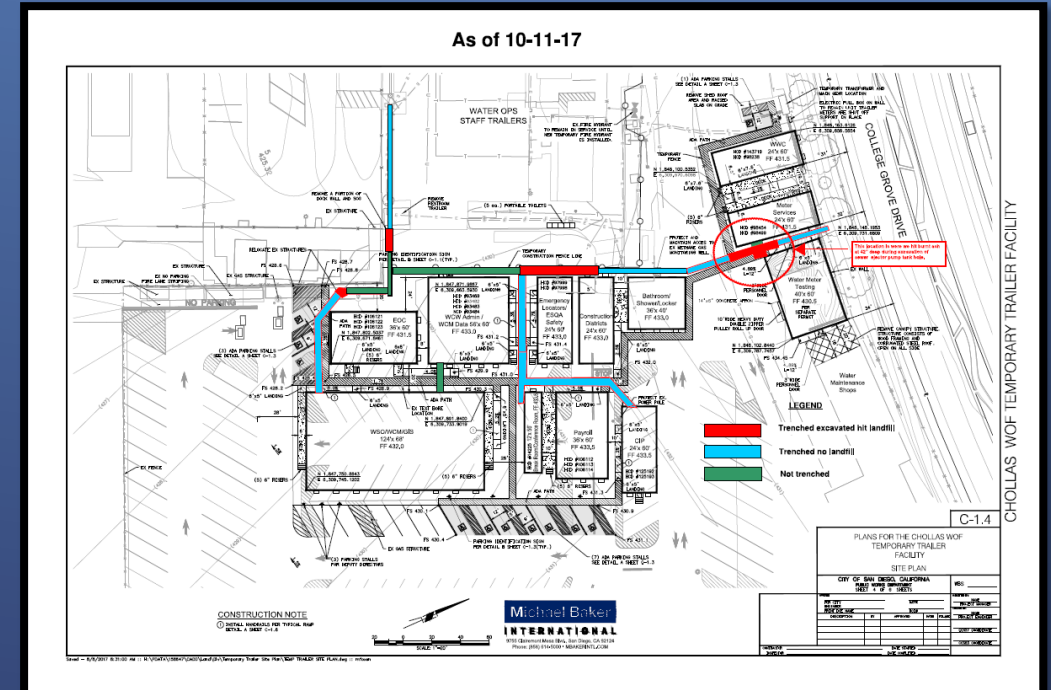
- ▶ City Requested approval from LEA to reconsolidate non-hazardous solid waste from utility trench spoils back in the South Chollas Landfill
- ▶ LEA requested that the City prepare a waste excavation and management plan to determine waste testing and procedures for disposal or reconsolidation on-site
- ▶ CalRecycle Supported LEA with analytical laboratory testing of waste samples to determine presence of hazardous contaminants
- ▶ LEA requested CalRecycle technical assistance in reviewing proposed facility construction projects planned for the South Chollas Landfill City Operations Compound.
- ▶ CalRecycle recommended to the LEA to have City conduct a Phase I Office and Phase II Field investigation of the North and South Chollas Landfill to determine the conditions beneath the proposed building structures (Water Administration Buildings A & B and the Meter Shop).





# WASTE EXCAVATION AND MANAGEMENT PLANS – GLENN YOUNG

- Excavations into old disposal sites can occur from different geotechnical and construction activities to include trenching for utilities, drilling for piling foundations or water wells, excavations for building foundations, grading projects, geotechnical investigations, etc.
- If these activities occur at "known" or historic waste disposal sites, the responsible party (or building department issuing building permits) should provide notification to the LEA and submit a plan, generally known as a "waste management plan" or "excavation and soil/waste management plan" which will ensure that wastes are managed to ensure protection of public health and safety and proper disposal of waste.
- Excavation into former landfills and disposal sites can pose chemical and physical hazards to workers and nearby communities which should be managed by the Local Enforcement Agency (LEA) or Environmental Health Department.
- The excavation and waste management plan should address worker and community health and safety (and protection), management of waste spoils, testing and proper disposal of waste.



# WASTE EXCAVATION AND MANAGEMENT PLANS – GLENN YOUNG

- Some potential issues that may arise with excavation of old disposal sites includes: exposure of stockpiled wastes to wind and storm water may cause odor, dust and other nuisance issues; storm water may cause the formation of leachate and run-off contamination.
- Measures should be taken to protect stockpiles from wind and rain pending testing and disposal (versus for staging and immediate removal to an appropriate disposal facility).
  - Dust and odor control measures should be included in the waste management plan.
  - Piles should be tested using a protocol approved in the waste management plan (sampling guidance from USEPA and DTSC are available for testing stockpiled wastes and contaminated soils).
  - Transportation of waste should include covering or tarping and manifesting procedures.
  - Proper disposal of wastes to a permitted facility should be included in the waste management plan.
  - Testing and analytical data should be provided to ensure that wastes are taken to the proper class facility, e.g. hazardous contaminated soils and wastes taken to a Class I or II facility.

**Table 1 – Waste Management Matrix**

Material Type(s)	Waste Classification	Disposal Method	Transporter(s)	Receiving Facility
Burned Waste and Tar-like Waste with Odor	CA Hazardous, or RCRA Hazardous	Reconsolidation	None	None
		Class I or II Landfill	1, 2, 3	Copper Mountain Landfill (Az) South Yuma County Landfill (Az) US Ecology Nevada
Municipal Solid Waste	Non-hazardous solid waste	Reconsolidation	None	None
		Class III Landfill	RABC-ECC subcontractor	Miramar Landfill
Non-hazardous Debris/Recyclable Waste	Construction and demolition debris	Recycling facility or Class III Landfill	RABC-ECC subcontractor	Miramar Landfill or Recycling Facility
Potentially Contaminated Materials	Regulated Waste or CA Hazardous	Reconsolidation	None	None
		Class II or III Landfill	1, 2, 3	Copper Mountain Landfill (Az) South Yuma County Landfill (Az) Otay Landfill

**Transporters:**

- Belshire Environmental Services
- EFR Environmental Services, Inc.
- Rust & Sons Trucking



# WASTE EXCAVATION AND MANAGEMENT PLANS – GLENN YOUNG

- Trenching into old landfills may require additional safety requirements not covered in under OSHA trenching standards landfill gas may enter trenches and create confined space hazards (explosive or oxygen-deficient) which may require mitigation measures such as venting, or instrument screening using handheld explosive gas/oxygen detection instruments.
  - Landfilled wastes may create unstable conditions for trench walls and may require shoring.
  - Generally – workers should not be allowed to enter trenches within a disposal fill.



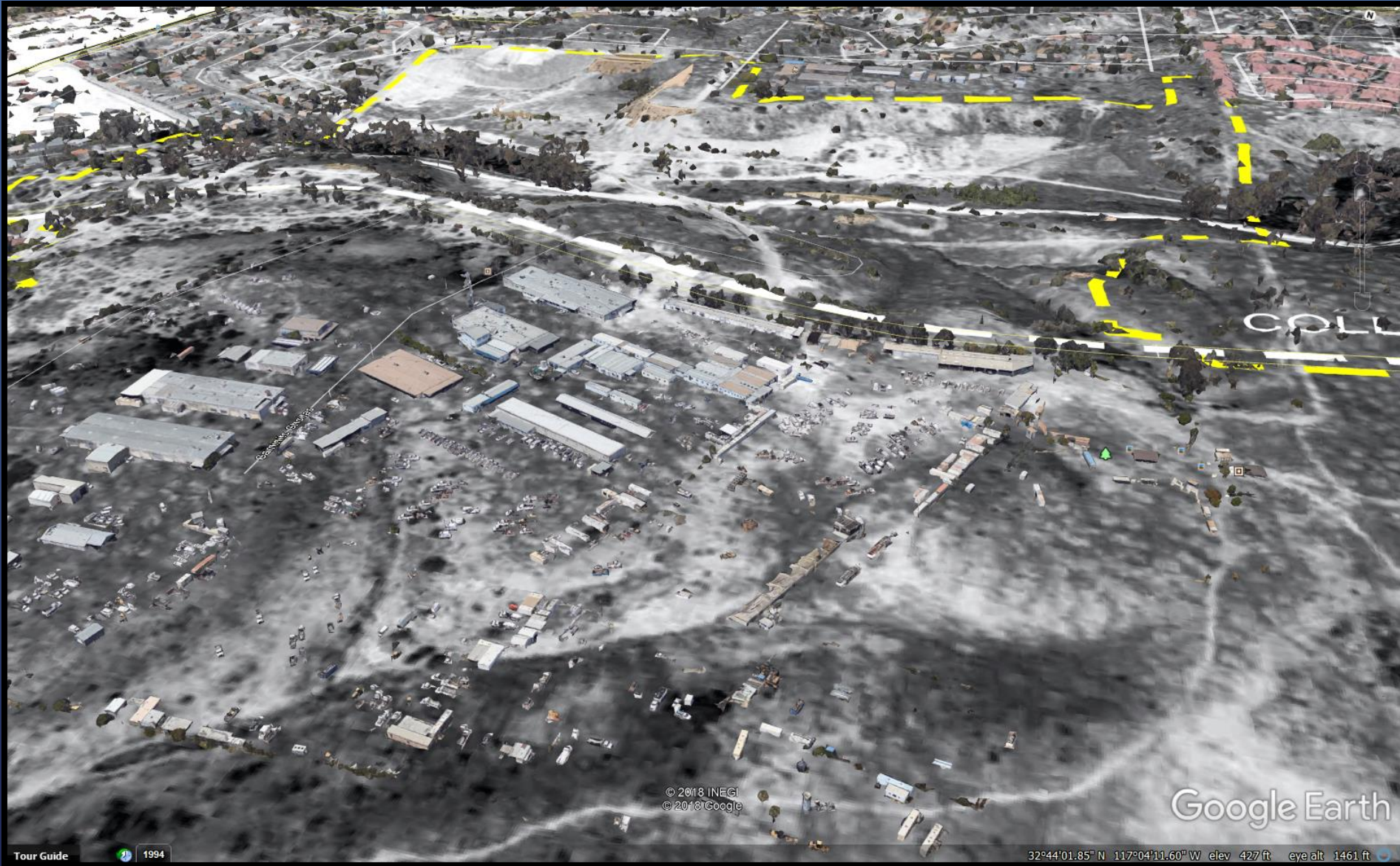
# WASTE EXCAVATION AND MANAGEMENT PLANS – GLENN YOUNG

- CalRecycle's CIA program is a statewide program that provides technical assistance to solid waste local enforcements agencies (LEAs) in California.
  - CIA Website will provide a web page on "Waste Excavation and Management Plans" to support LEAs
  - In providing technical support across multiple jurisdictions and numerous excavation projects into former landfills and disposal sites, the CIA program is compiling example "excavation and waste/soil management plans" that have been used to manage waste excavations, waste stockpile management and testing and disposal of wastes.
  - Also included is technical guidance from regulating agencies responsible for hazardous and solid waste disposal and storm water run-off management and facilities in California that are permitted to receive the wastes and their rates.

Recommended Fill Material Sampling Schedule	
Area of Individual Borrow Area	Sampling Requirements
2 acres or less	Minimum of 4 samples
2 to 4 acres	Minimum of 1 sample every 1/2 acre
4 to 10 acres	Minimum of 8 samples
Greater than 10 acres	Minimum of 8 locations with 4 subsamples per location
Volume of Borrow Area Stockpile	Samples per Volume
Up to 1,000 cubic yards	1 sample per 250 cubic yards
1,000 to 5,000 cubic yards	4 samples for first 1000 cubic yards + 1 sample per each additional 500 cubic yards
Greater than 5,000 cubic yards	12 samples for first 5,000 cubic yards + 1 sample per each additional 1,000 cubic yards

- Regulating agencies which have specific guidance for managing hazardous and solid wastes include:
  - CalRecycle
  - State Water Resources Control Board (27 CCR)
  - Department of Toxic Substances Control (22 CCR) - DTSC has specific guidance on testing and disposition of clean and contaminated soils.
  - Air Resources Board (and local Air Quality Management Districts) - South Coast Air Quality Management District created a rule (SCAQMD Rule 1150.2) which requires a permit for any landfill excavations within their jurisdiction.
  - CalRecycle and SWRCB have specific regulations regarding the classification, handling and transportation of hazardous and solid wastes.

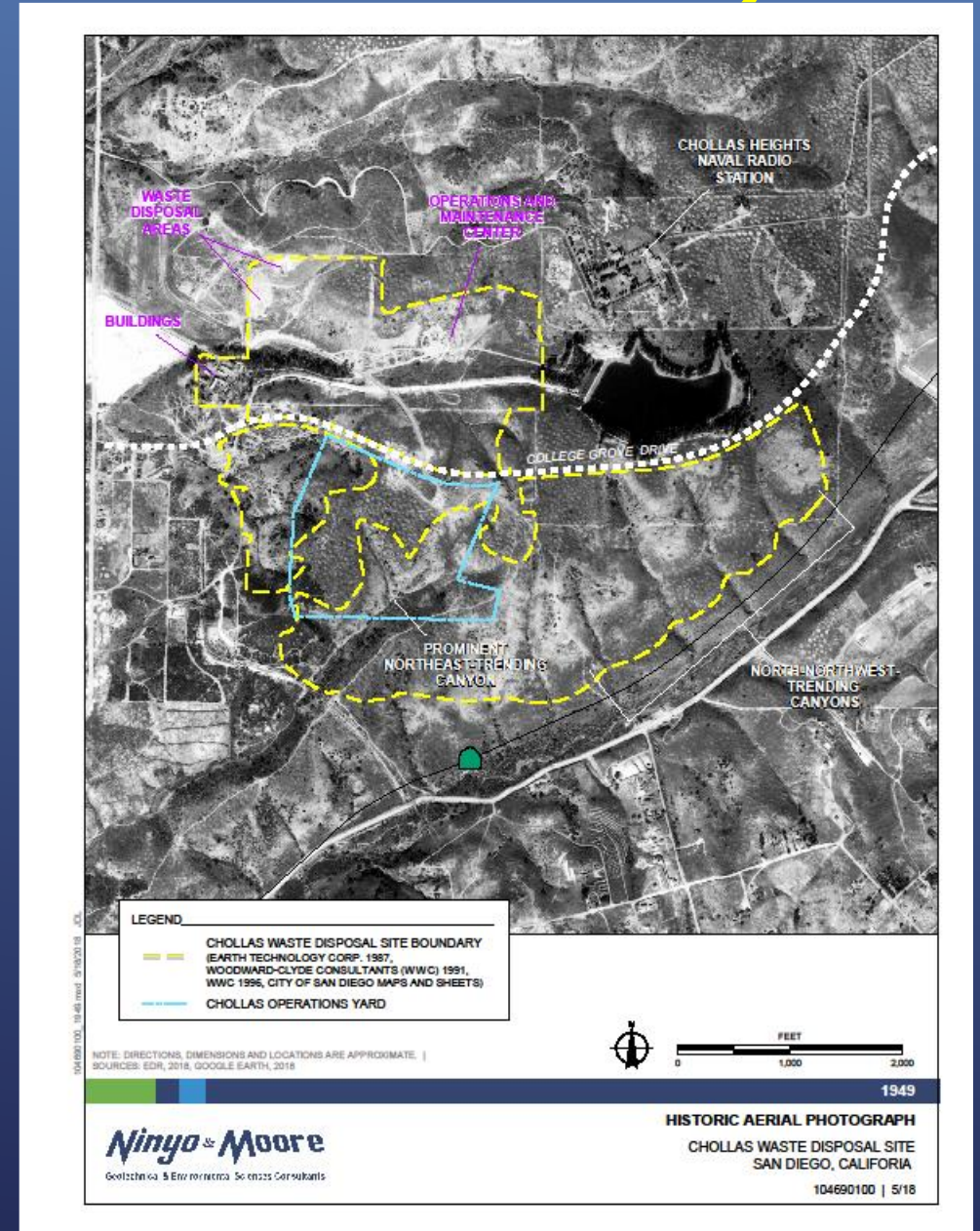
(Adopted October 15, 1982)	Rule 1150 (Cont.) (Adopted October 15, 1982)
<p><b>RULE 1150. EXCAVATION OF LANDFILL SITES</b></p> <p>(a) Definitions</p> <p>For the purpose of this rule:</p> <ol style="list-style-type: none"> <li>(1) A Landfill is a place, location, tract of land, area, or premises in use, or which has been used for the disposal of waste.</li> <li>(2) An Active Landfill is a landfill that has received and/or processed waste within the preceding two years.</li> <li>(3) An Inactive Landfill is a landfill that has not received and/or processed waste within the preceding two years.</li> <li>(4) Operator is the legal owner of a landfill or a person authorized by the legal owner to operate the landfill or to perform excavation activities at the landfill.</li> <li>(5) Excavation means any activity which exposes buried waste to the atmosphere except for activities which are a normal part of the daily operation of an active landfill.</li> </ol> <p>(b) Requirements</p> <ol style="list-style-type: none"> <li>(1) The operator of a landfill is subject to the provisions of this rule.</li> <li>(2) No person shall initiate excavation of an active or inactive landfill without Excavation Management Plan approved by the Executive Officer. The Plan shall, as a minimum, provide information regarding the quantity and characteristics of the material to be excavated and transported, and shall identify mitigation measures to be activated as necessary during excavation to ensure that public nuisance condition does not occur. Mitigation measures shall be selected after consideration of the physical characteristics of the landfill. Such mitigation measures may include gas collection and disposal, baking, encapsulation, covering of the material, chemical neutralizing, or other measures approved by the Executive Officer.</li> <li>(3) The Executive Officer shall not approve any Excavation Management Plan unless such a Plan includes a provision for immediate cessation of excavation activities when the operator is notified by the Executive Officer that a public nuisance has occurred. Upon determination by the Executive Officer that a public nuisance has occurred, those mitigation</li> </ol>	<p>measures identified in the Plan shall be implemented immediately, as well as any additional mitigation measures which the Executive Officer deems appropriate.</p> <ol style="list-style-type: none"> <li>(4) As part of his evaluation of an Excavation Management Plan, the Executive Officer may consult with public health agencies in evaluating potential health effects. When the results of such consultations so warrant, ambient air monitoring equipment requirements may be specified as a condition of Plan approval.</li> <li>(5) Compliance with the provisions of this rule does not exempt a person from complying with the requirements of Rule 402, Nuisance, California Health and Safety Code section 41700, or other applicable codes, rules, and regulations.</li> <li>(6) The District shall respond within 30 days to the applicant as to whether a submitted Plan is complete or incomplete. If additional review time is needed by the District, the applicant will be so informed within the same 30-day period.</li> </ol> <p>(c) Exemptions</p> <ol style="list-style-type: none"> <li>(1) The drilling of holes up to 24 inches in diameter for geological evaluation or for telephone or power transmission poles or their footings.</li> <li>(2) The drilling of oil wells, gas wells, or landfill gas collection wells or the maintenance of gas or leachate collection systems shall not require submittal of an Excavation Management Plan. Permit requirements to construct/operate equipment at a landfill remain, and are not affected by requirements for an Excavation Management Plan.</li> <li>(3) Emergency excavation performed by, under the jurisdiction of, or pursuant to the requirements of, an authorized Health Officer, Agricultural Commissioner, or Fire Protection Officer. Whenever possible, the Executive Officer shall be notified prior to commencing such excavation.</li> <li>(4) The Executive Officer may exempt from the requirements of this rule any excavation activities which he determines pose an insignificant risk of violating Health and Safety Code Section 41700.</li> </ol> <p>(d) Fees</p> <p>For the purpose of determining the appropriate processing fees only, the filing of an Excavation Management Plan shall be considered the equivalent of filing an</p>
1150 - 1	1150 - 2



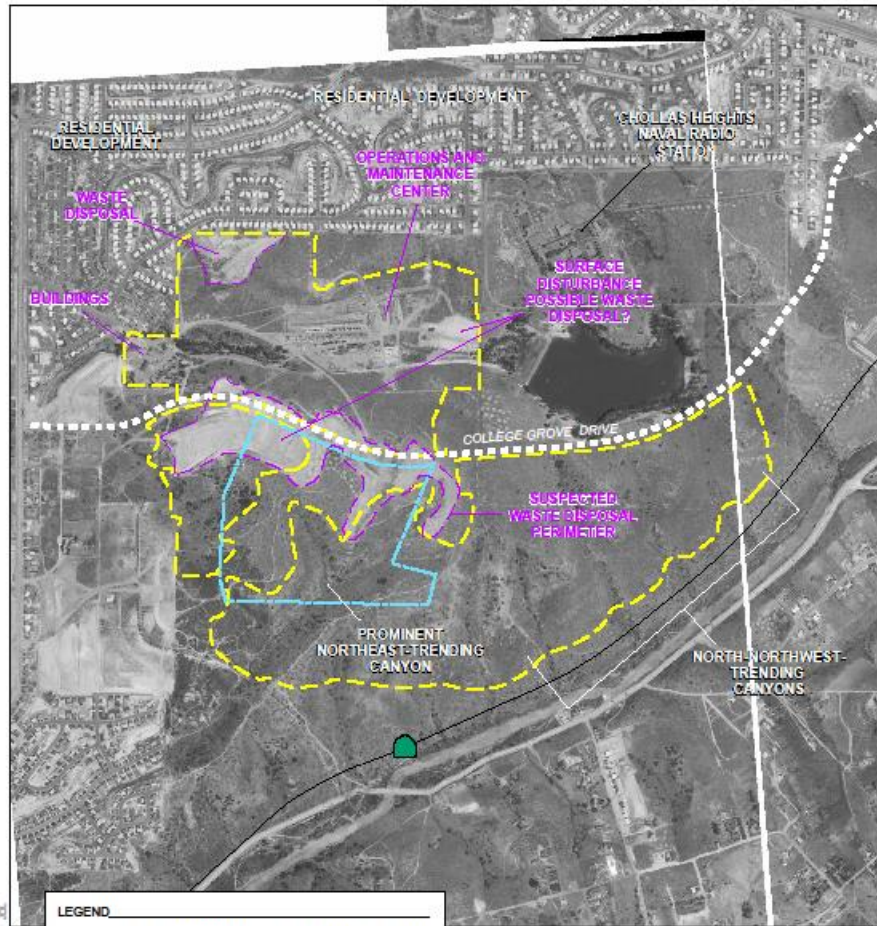
# PHASE I OFFICE INVESTIGATION – BETH ABRAMSON-BECK

# PHASE I HISTORICAL STUDY (MODIFIED PHASE I ESA)

- ▶ Expedited Historical Study
- ▶ Historical aerial photographs/topo maps
- ▶ City of San Diego, CalRecycle and LEA files
- ▶ City of San Diego, records library
- ▶ Obtained/summarized numerous geotechnical and environmental reports
- ▶ Interviewed City of SD staff
- ▶ Compiled locations of geotechnical and environmental borings and LFG wells, delineate wastes
- ▶ North Chollas BS Clean Closure Report
- ▶ Archeological report, College Grove Drive



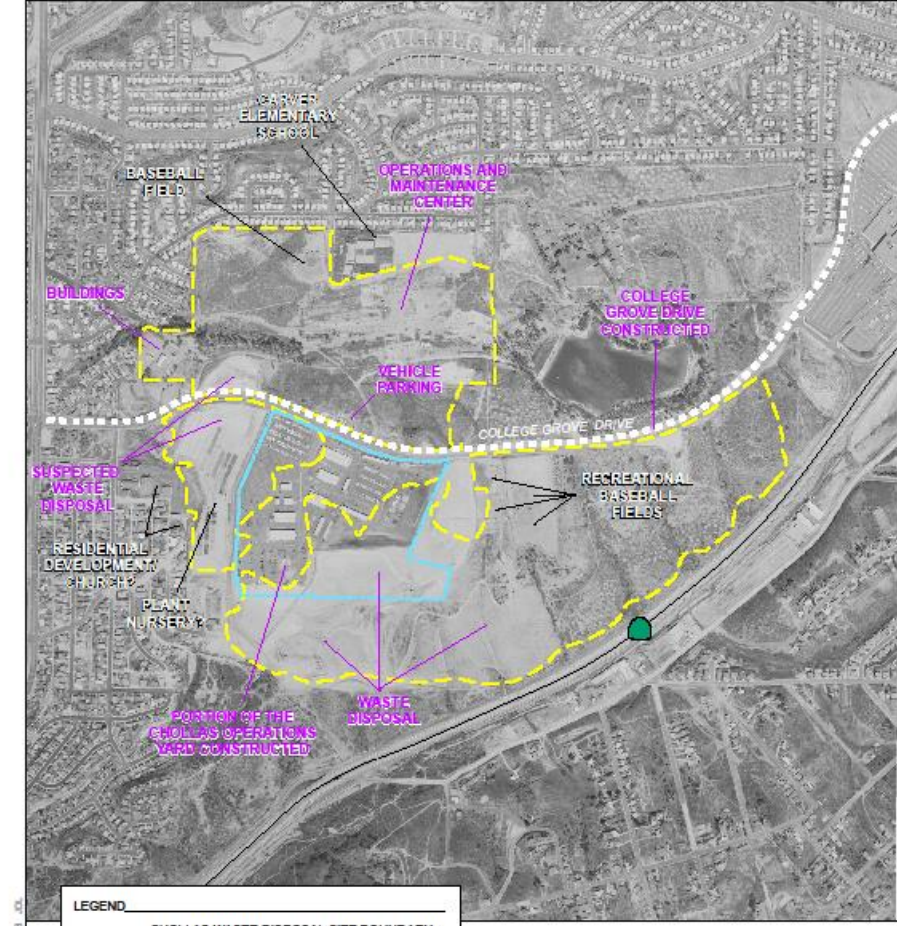
# PHASE I ESA – HISTORICAL AERIAL PHOTOGRAPHS



**LEGEND**

- CHOLLAS WASTE DISPOSAL SITE BOUNDARY (EARTH TECHNOLOGY CORP. 1987, WOODWARD-CLYDE CONSULTANTS (W/C) 1991, WWC 1996, CITY OF SAN DIEGO MAPS AND SHEETS)
- CHOLLAS OPERATIONS YARD

NOTE: DIRECTIONS, DIMENSIONS AND LOCATIONS ARE APPROXIMATE. | SOURCES: EDR, 2018, GOOGLE EARTH, 2018



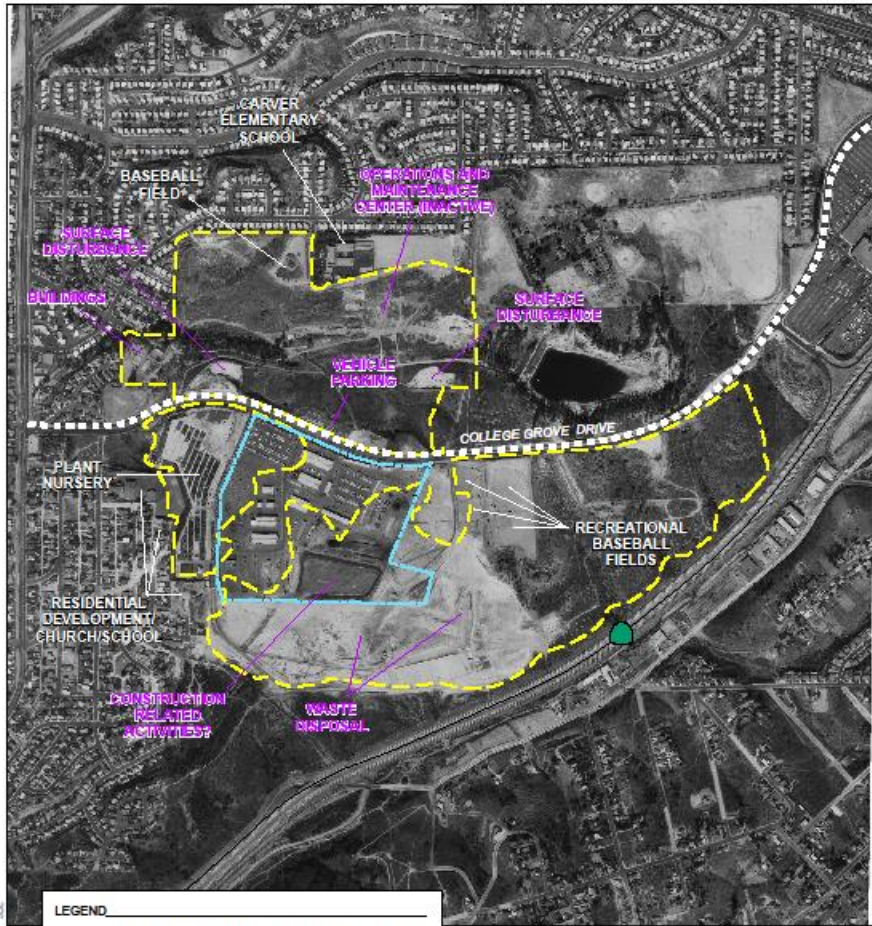
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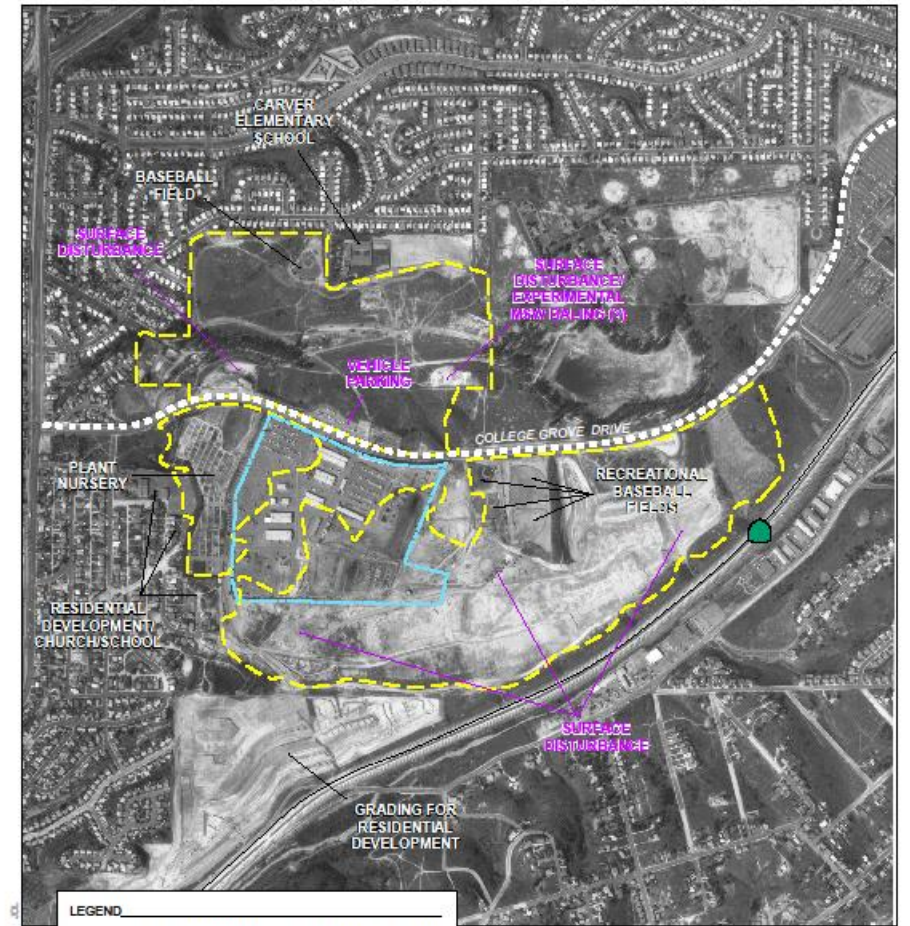


1966

**Ninyo & Moore**  
Geotechnical & Environmental Sciences Consultants

**HISTORIC AERIAL PHOTOGRAPH**  
CHOLLAS WASTE DISPOSAL SITE  
SAN DIEGO, CALIFORNIA

104690100 | 5/18



**LEGEND**

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1970

**Ninyo & Moore**  
Geotechnical & Environmental Sciences Consultants

**HISTORIC AERIAL PHOTOGRAPH**  
CHOLLAS WASTE DISPOSAL SITE  
SAN DIEGO, CALIFORNIA

104690100 | 5/18



# PHASE I ESA – HISTORICAL AERIAL PHOTOGRAPHS



LEGEND  
 CHOLLAS OPERATIONS YARD

NOTE: DIRECTIONS, DIMENSIONS AND LOCATIONS ARE APPROXIMATE. |  
 SOURCES: EDI, 2018; GOOGLE EARTH, 2018



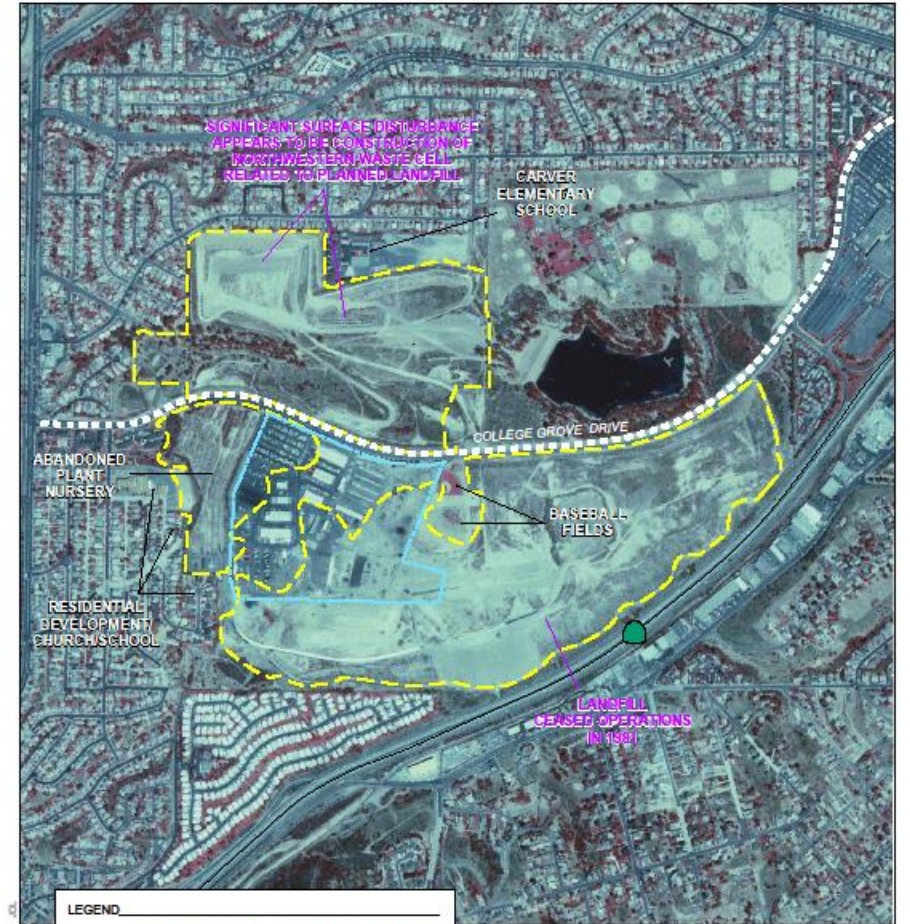
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DECEMBER 1, 1980

HISTORIC AERIAL PHOTOGRAPH  
 CHOLLAS WASTE DISPOSAL SITE  
 SAN DIEGO, CALIFORNIA

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 Geotechnical & Environmental Sciences Consultants

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LEGEND  
 CHOLLAS WASTE DISPOSAL SITE BOUNDARY (EARTH TECHNOLOGY CORP. 1987, WOODWARD-CLYDE CONSULTANTS (W/C) 1991, W/C 1996, CITY OF SAN DIEGO MAPS AND SHEETS)  
 CHOLLAS OPERATIONS YARD

NOTE: DIRECTIONS, DIMENSIONS AND LOCATIONS ARE APPROXIMATE. |  
 SOURCES: EDI, 2018; GOOGLE EARTH, 2018



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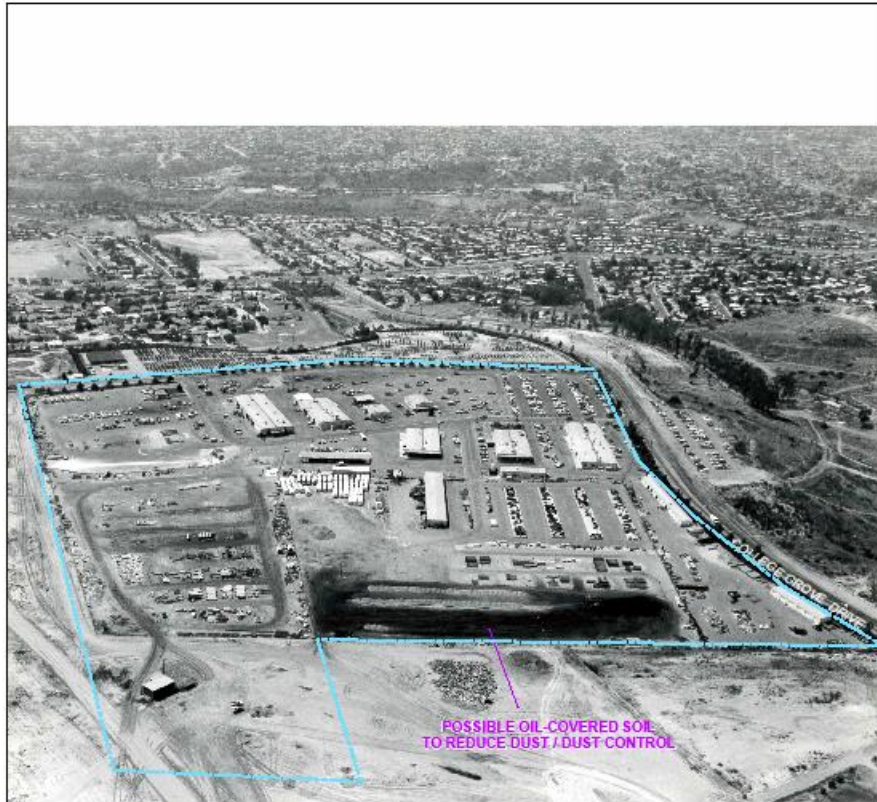
1985

HISTORIC AERIAL PHOTOGRAPH  
 CHOLLAS WASTE DISPOSAL SITE  
 SAN DIEGO, CALIFORNIA

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# PHASE I ESA – HISTORICAL AERIAL PHOTOGRAPHS



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CHOLLAS OPERATIONS YARD



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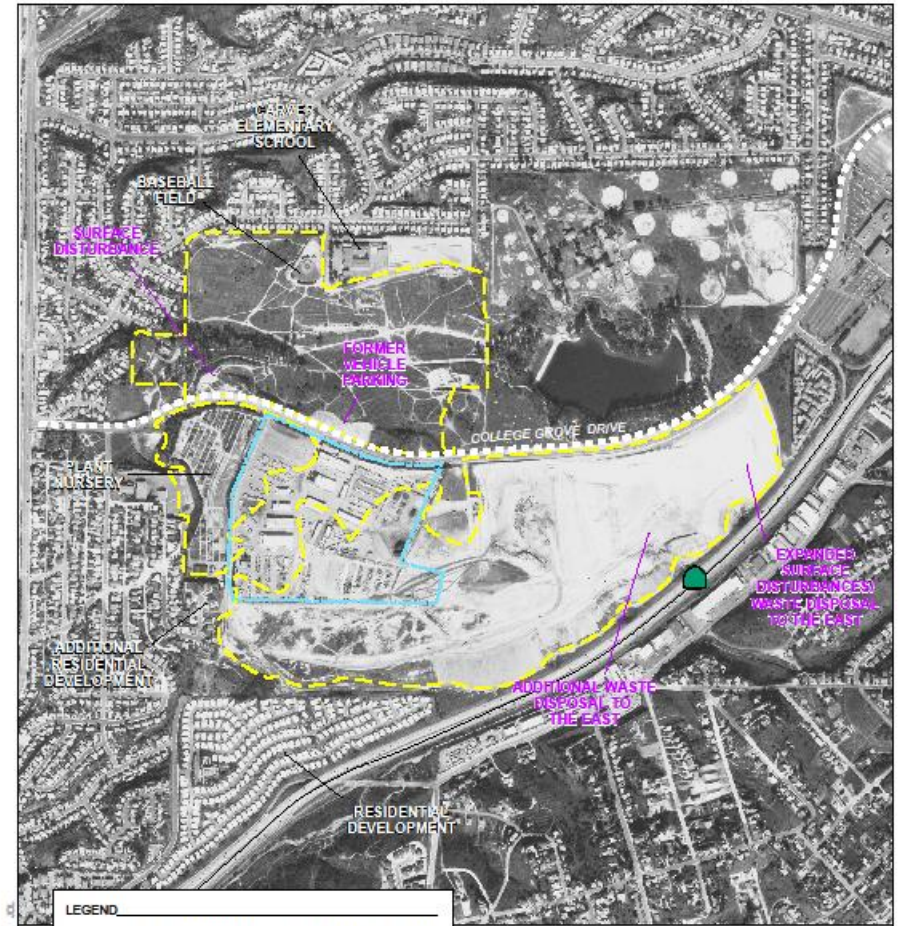
AUGUST 11, 1972

NOTE: DIRECTIONS, DIMENSIONS AND LOCATIONS ARE APPROXIMATE. | SOURCES: EDR, 2018, GOOGLE EARTH, 2018

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Geotechnical & Environmental Services Consultants

HISTORIC AERIAL PHOTOGRAPH  
CHOLLAS WASTE DISPOSAL SITE  
SAN DIEGO, CALIFORNIA

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LEGEND

CHOLLAS WASTE DISPOSAL SITE BOUNDARY (EARTH TECHNOLOGY CORP., 1987, WOODWARD-CLYDE CONSULTANTS (WWC) 1991, WWC 1996, CITY OF SAN DIEGO MAPS AND SHEETS)

CHOLLAS OPERATIONS YARD



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1979

NOTE: DIRECTIONS, DIMENSIONS AND LOCATIONS ARE APPROXIMATE. | SOURCES: EDR, 2018, GOOGLE EARTH, 2018

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Geotechnical & Environmental Services Consultants

HISTORIC AERIAL PHOTOGRAPH  
CHOLLAS WASTE DISPOSAL SITE  
SAN DIEGO, CALIFORNIA

104690100 | 5/18

# PHASE I ESA – HISTORICAL AERIAL PHOTOGRAPHS



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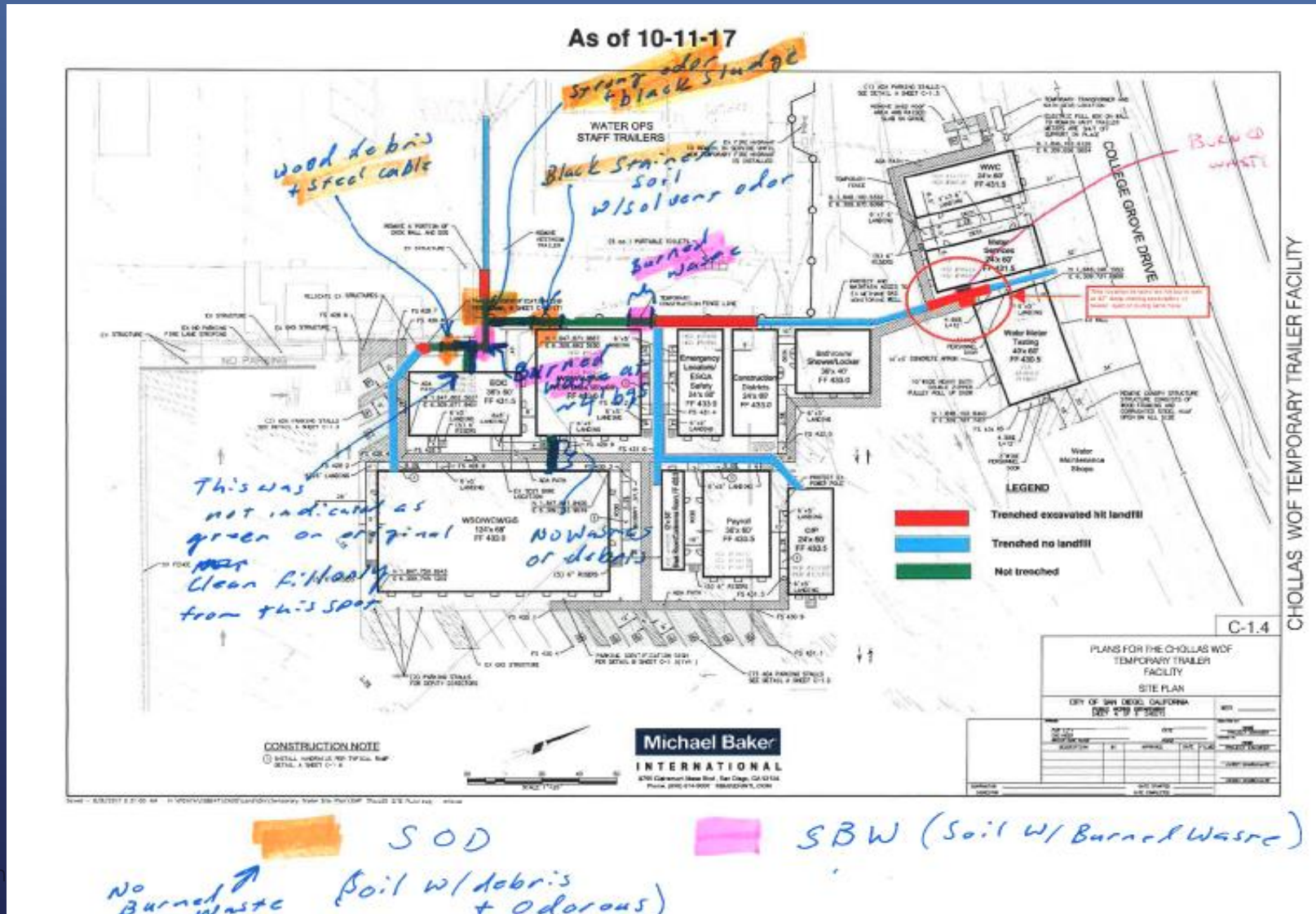
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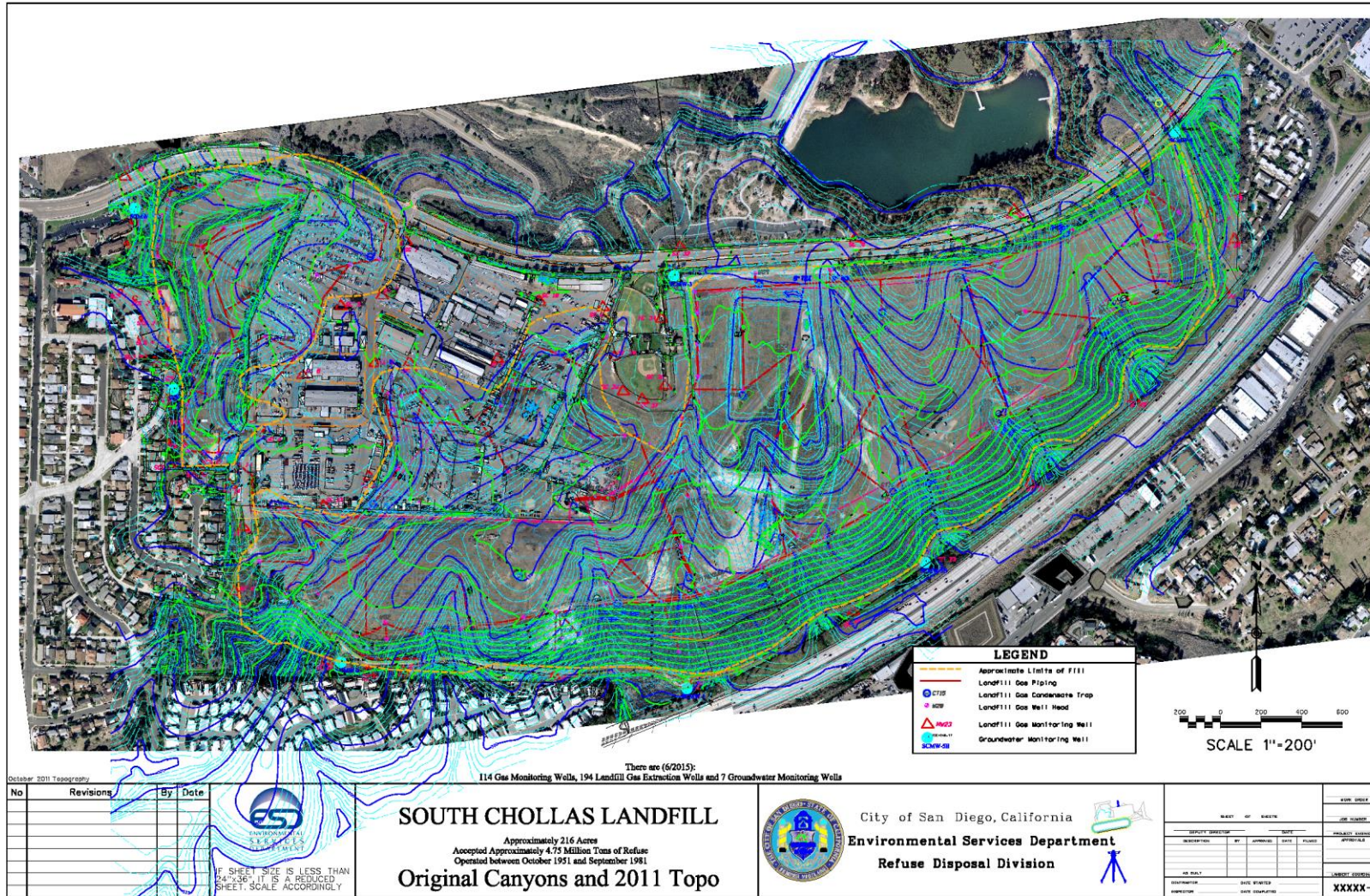
NOTE: DIRECTIONS, DIMENSIONS AND LOCATIONS ARE APPROXIMATE. | SOURCES: EDR, 2018, GOOGLE EARTH, 2018

# PHASE I ESA - CONSTRUCTION PROJECT - LOCATIONS OF BURNED WASTES



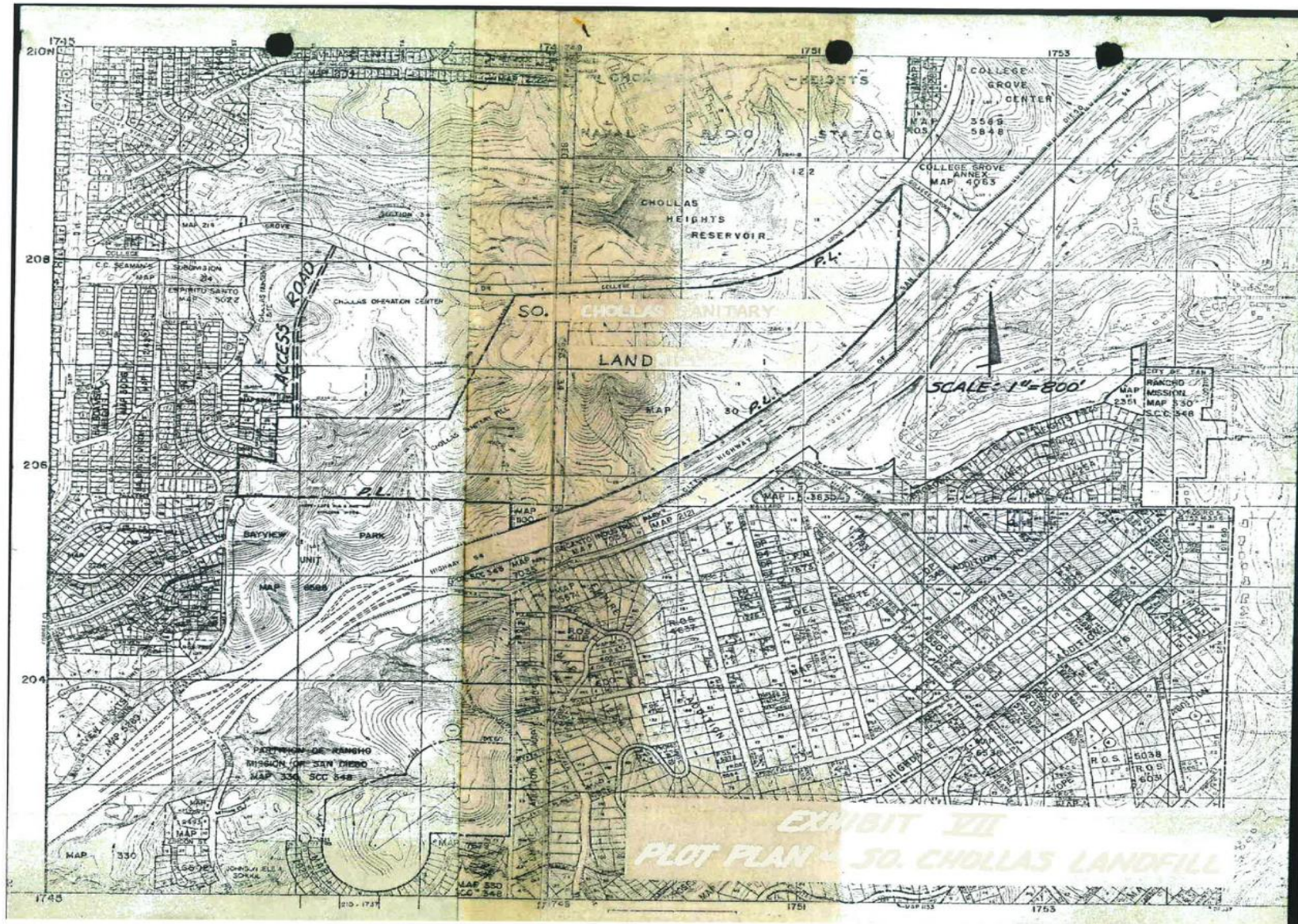
# PHASE I ESA - CITY OF SAN DIEGO SOUTH CHOLLAS LANDFILL

## ORIGINAL CANYONS/TOPOGRAPHY

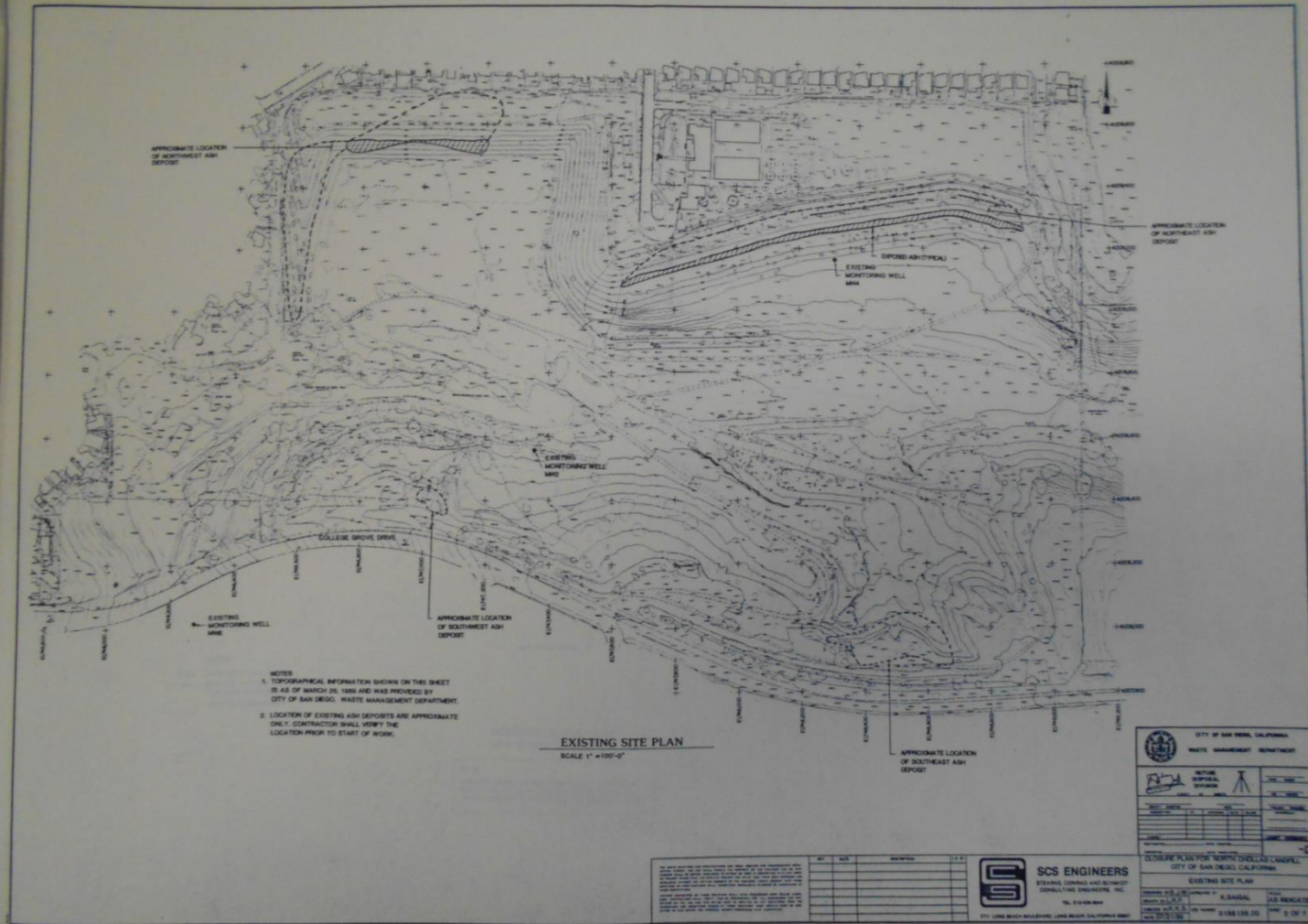


- ▶ City of SD pre-waste disposal canyons/topo
- ▶ Buildings A and B likely on formation with minor fill
- ▶ Meter shop building area appears to correspond to two finger canyons that extend from N Chollas BS, underlie College Grove Drive, onto the northern area of South Chollas LF
- ▶ Historic LFG monitoring wells constructed outlying wastes, provided information on waste extent

# PHASE I ESA - CITY OF SAN DIEGO HISTORICAL TOPOGRAPHIC MAPS

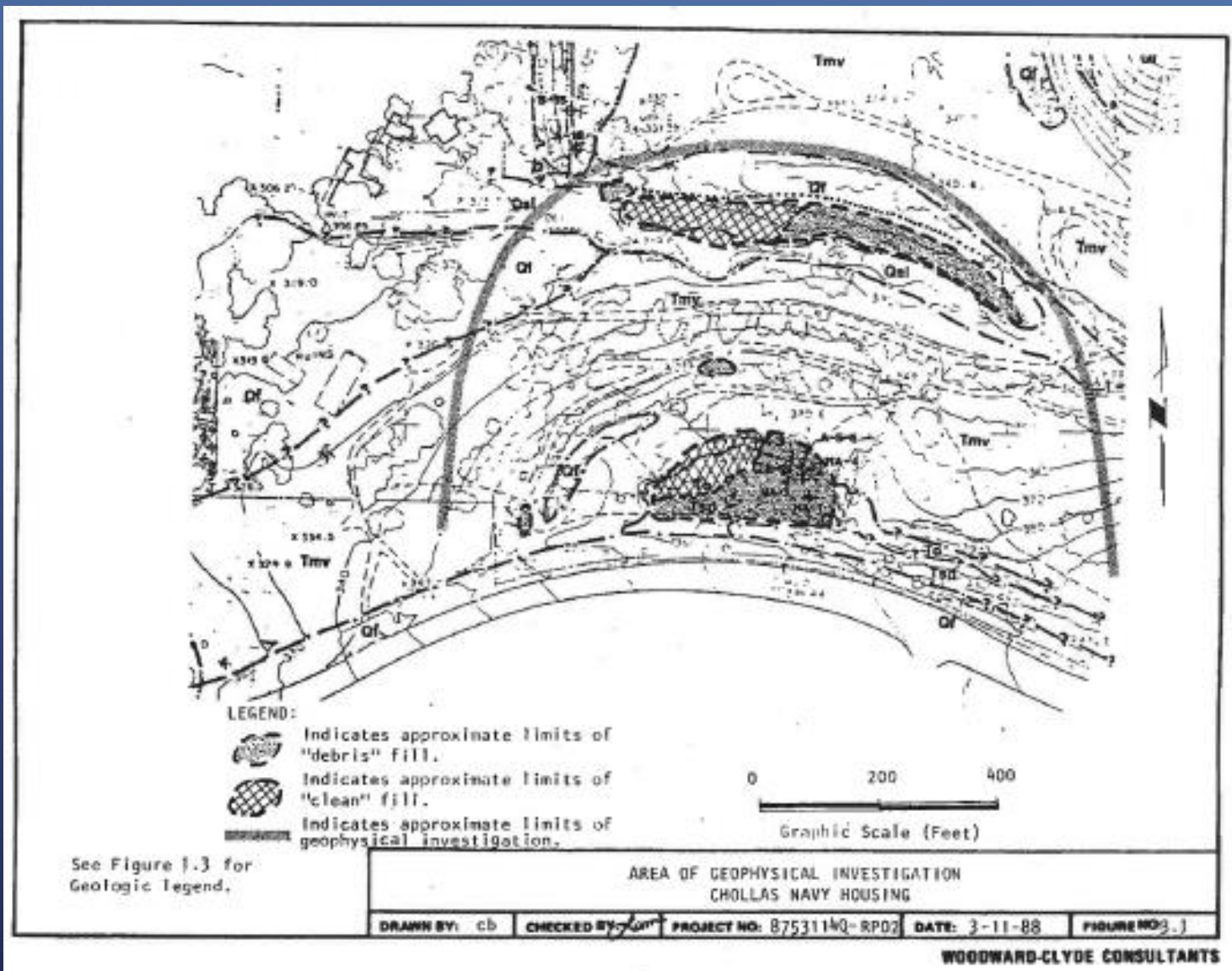


# PHASE I ESA - NORTH CHOLLAS BS – CLEAN CLOSURE AREAS



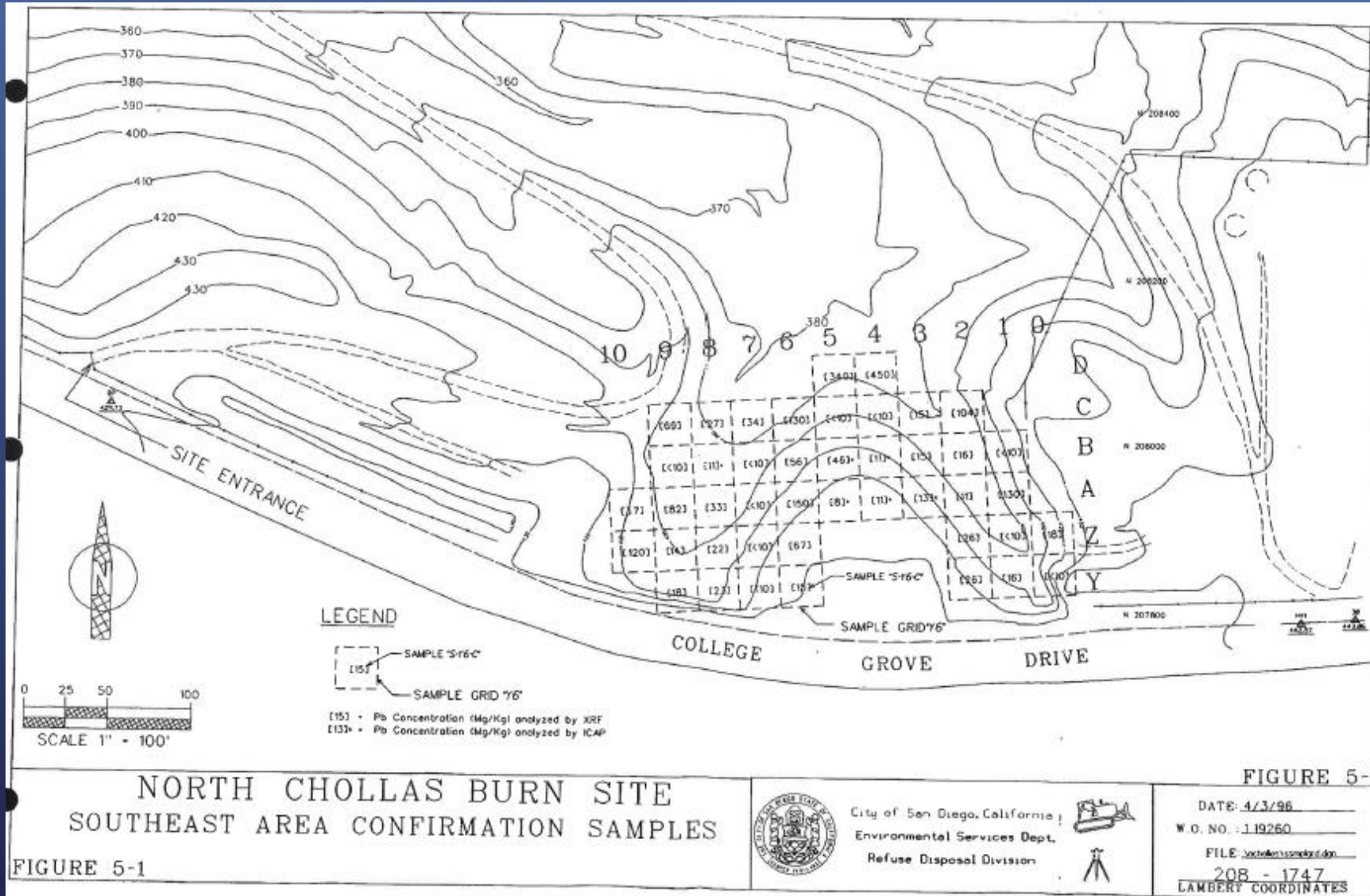
- ▶ ~135,000 cy of burned wastes removed
- ▶ Southeast area - burned wastes extended beyond the burn site boundaries, (aka N Chollas BS), continuing under College Grove Drive
- ▶ Burned wastes 9 to 32 feet bgs, 0-25 feet thick

# PHASE I ESA – N CHOLLAS BS, CLEAN CLOSURE, SOUTHEASTERN EXTENT





# PHASE I ESA - NORTH CHOLLAS BS – CLEAN CLOSURE, SE EXTENT



Stratigraphy Profile



## Loveless & Linton Consulting

1421 West Lewis St. San Diego, CA 92103

### DISCOVERY REPORT

Date:	Project Title:	Client /Contractor:
Sept. 20, 2017	69 <sup>th</sup> & Mohawk	PK Mechanical
Loveless & Linton Project ID:	Artifact Number(s):	Location:
NA	NA	College Grove Drive
Archaeological Monitor(s):	Native American Monitor(s):	Principal Investigator:
Rebekah Loveless	Luke Lofton	Rebekah Loveless

#### Notification of Discovery:

Name	Company	Method of Communication	Date of Communication
Dave Spindler	PK Mechanical	Verbal Notification	9/20/17
Hamid Yaghoubpour	Louis Burger/ City of SD	Verbal Notification	9/20/17
Rudy Bilan	City of SD MMC	Phone call	9/20/17

#### Discovery Description:

*Description: (if multiple finds; list below)	Location: (Lat/Long)	Collected?	Diagnostic?
<b>H/P</b> Historic Glass in burn deposit. Likely part of landfill	Center point: Lat: 32;44;6.39 Long: 117;4;5.02	Sample of 5 glass bottles	Likely. Will be analyzed in lab

#### Additional Information: (possible affiliation, in/out of context etc.)

An ash burn deposit was discovered during trenching on College Grove Drive. Deposit consisted of broken glass and other refuse debris. In large the glass appears to be of historic context with clear, brown, green, and milk glass within the observed deposit. Soils appear to be burned and likely to be part of historic landfill. Deposit was located approximately 6 feet below surfaces and approximately 8.5 feet in length.

#### Additional Action Required:

No Additional action is suggested at this time. The sample that was collected will be used to establish a period context and is not expected to be curated.

*Information contained on this sheet is not for public review. Contents of this sheet are for review of intended recipients only. Please do not share with unauthorized parties.*

*\*H/P indicates Historic or Prehistoric resources*

Milky ceramic (angular in shape)



Spoils Pile (high density of glass fragments; poor condition due to disposal and burning)



# PHASE I ESA COMPILATION - WORK PLAN

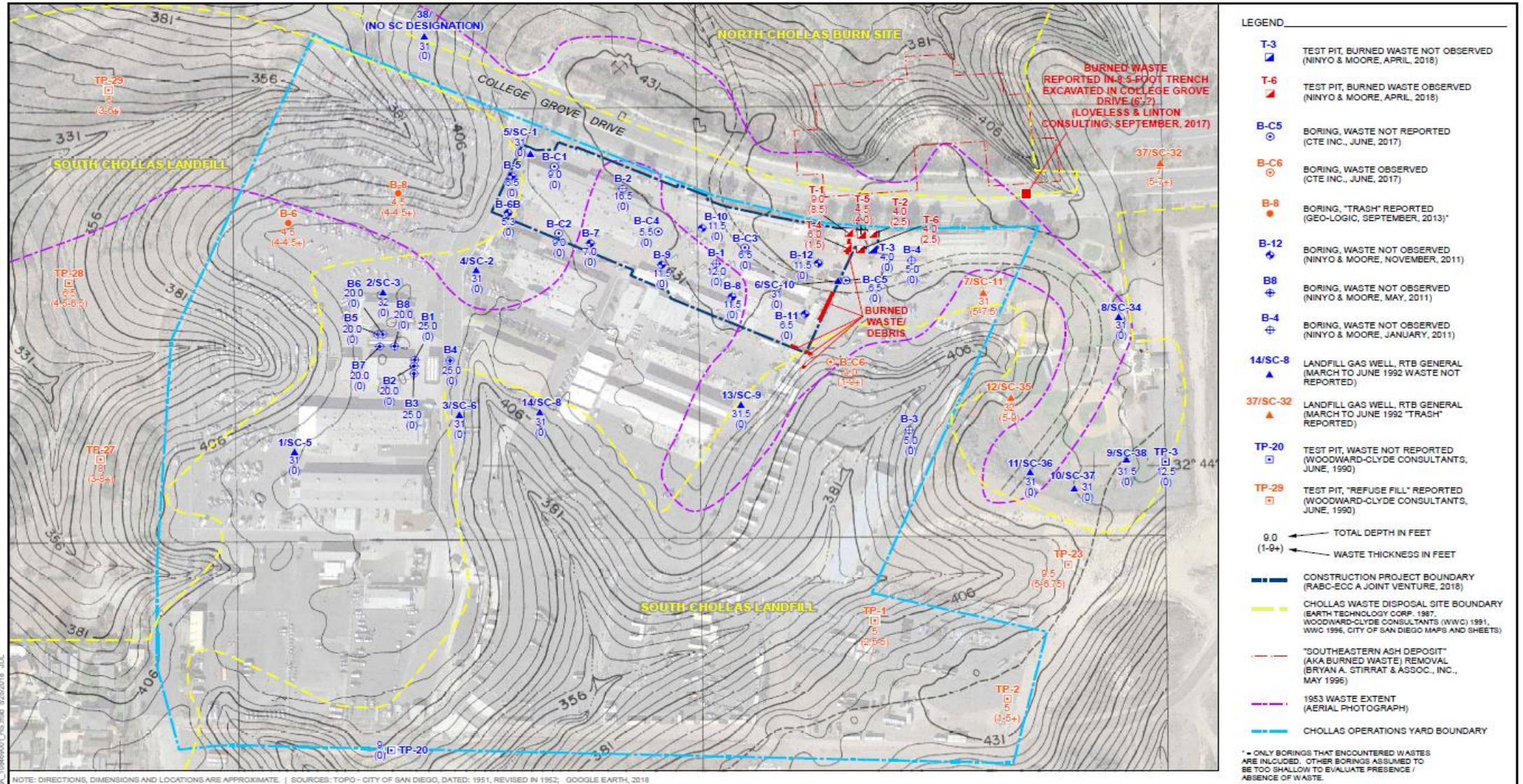


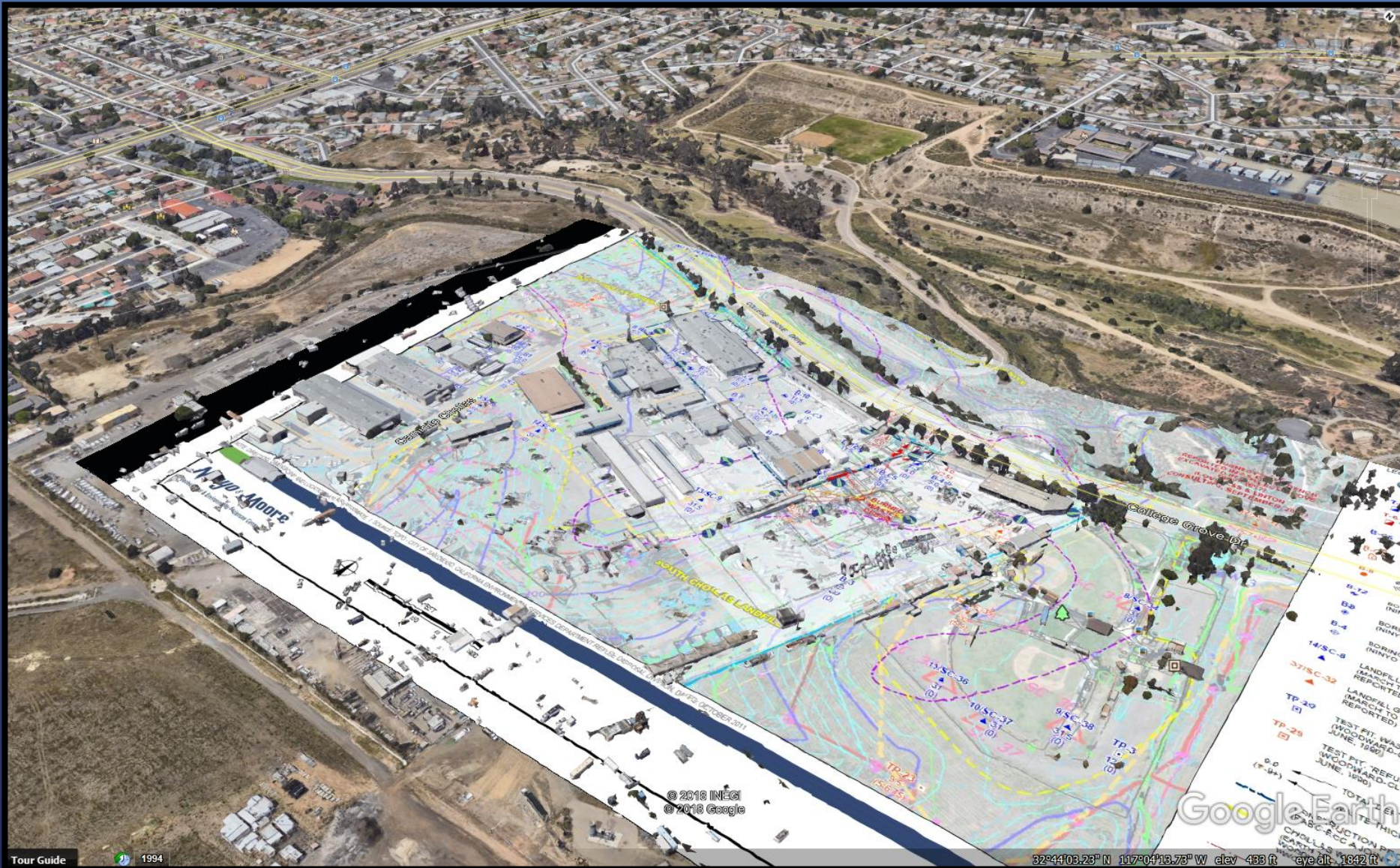
FIGURE 3A

COMPILATION OF MAPS AND FIGURES WITH CITY OF SAN DIEGO TOPOGRAPHY

CHOLLAS WASTE DISPOSAL SITE  
SAN DIEGO, CALIFORNIA

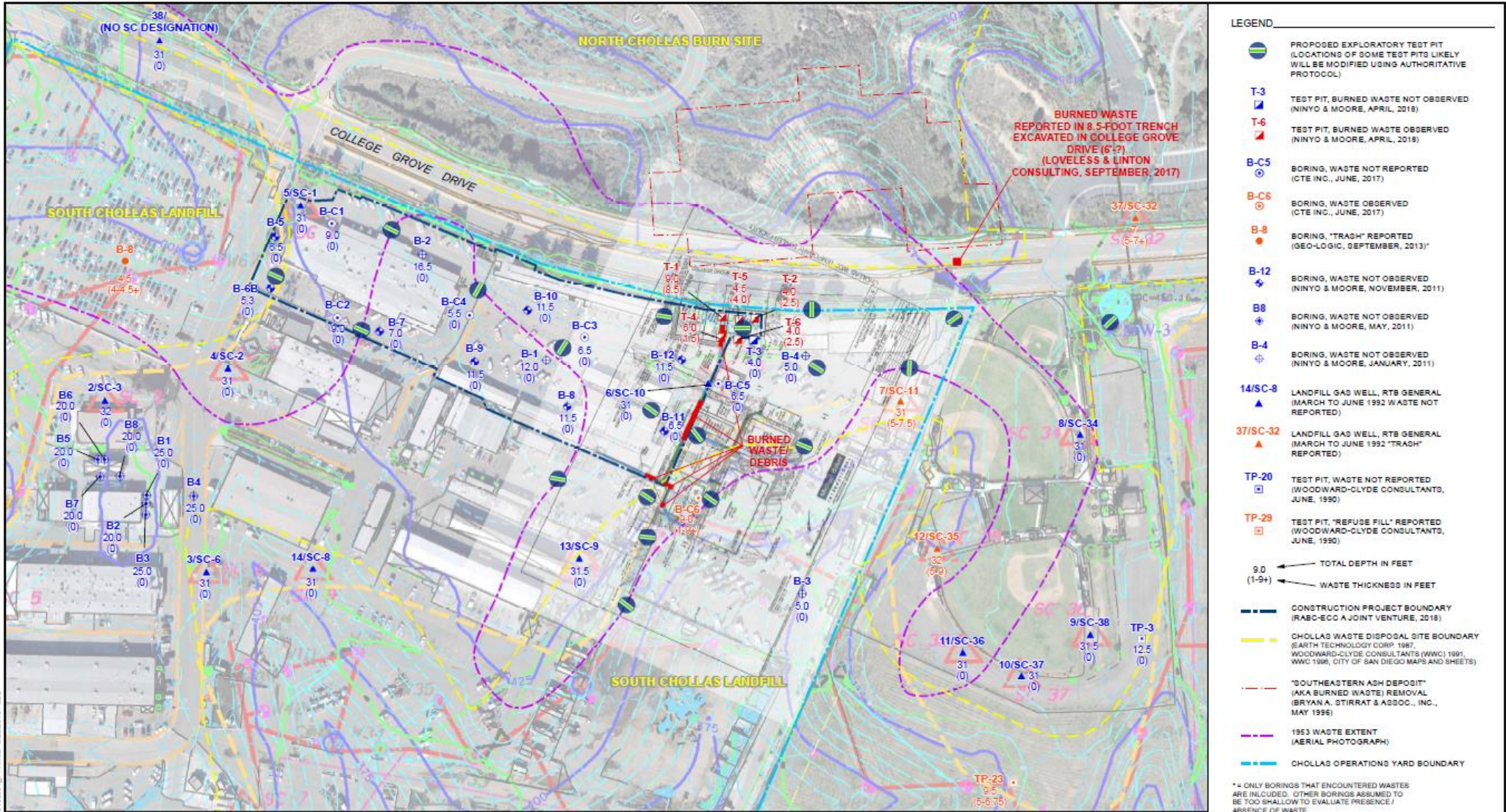


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# PHASE II FIELD INVESTIGATION – BETH ABRAMSON-BECK

# PHASE II ESA - PROPOSED SCOPE OF WORK



NOTE: DIRECTIONS, DIMENSIONS AND LOCATIONS ARE APPROXIMATE. | SOURCE: TOPO - CITY OF SAN DIEGO, CALIFORNIA ENVIRONMENTAL SERVICES DEPARTMENT REFUSE DISPOSAL DIVISION, DATED: OCTOBER 2011

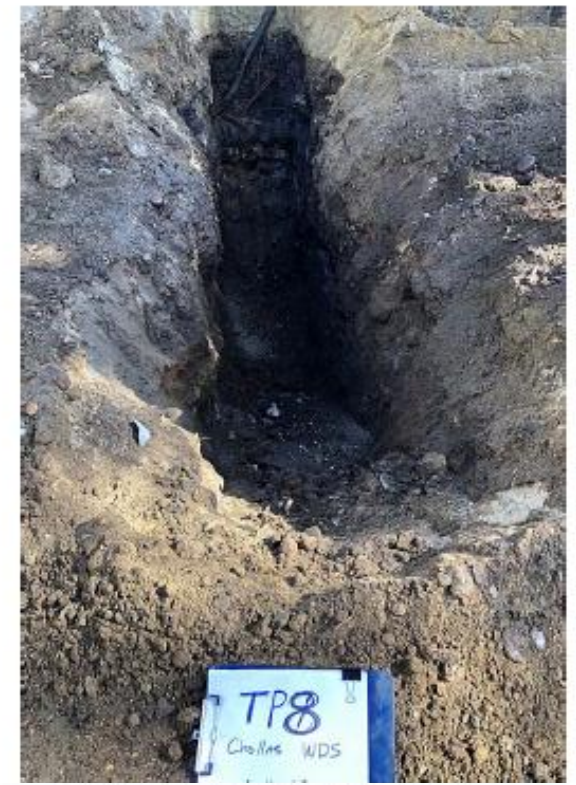
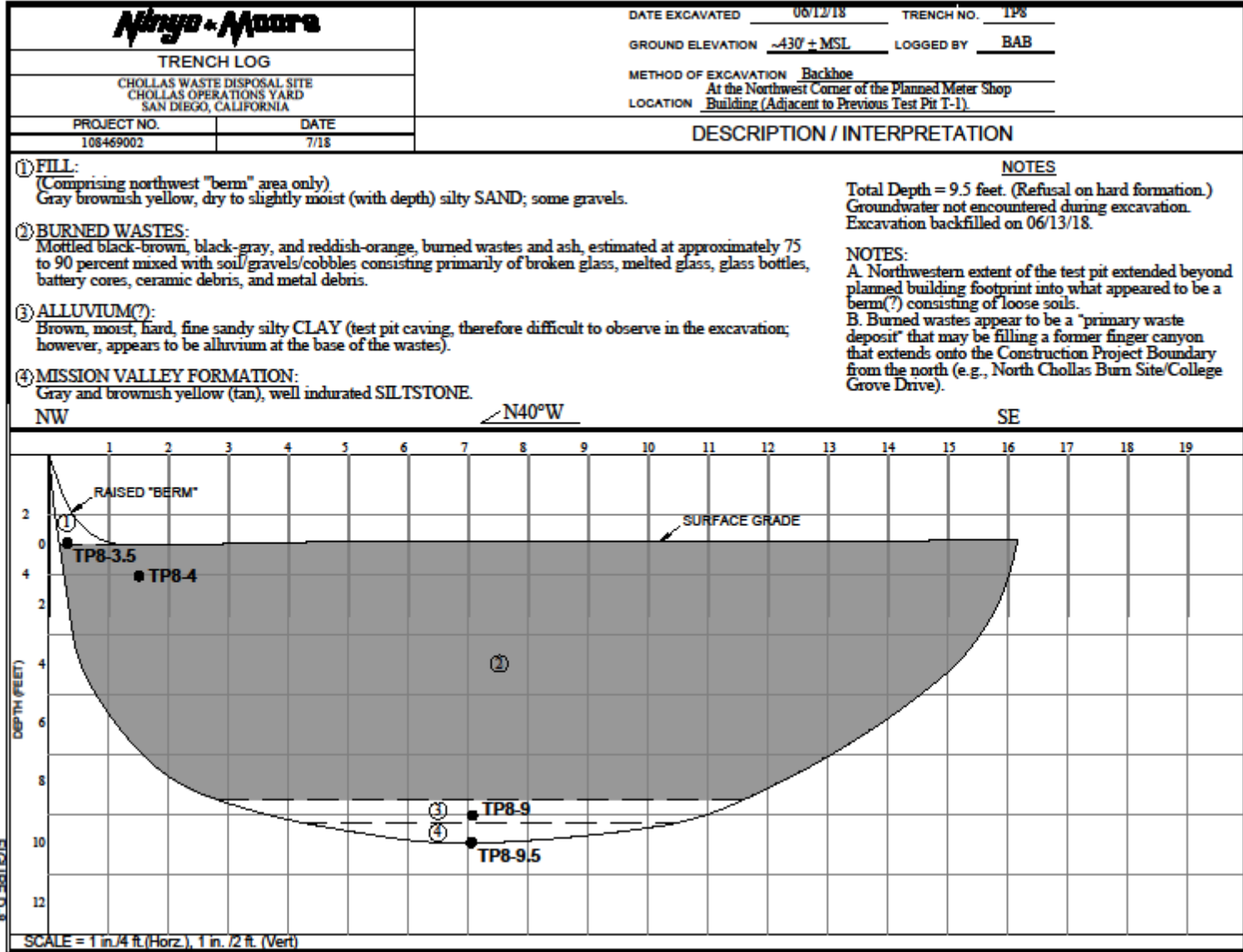
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FIGURE 4

PROPOSED EXPLORATORY TEST PIT LOCATIONS

CHOLLAS WASTE DISPOSAL SITE  
SAN DIEGO, CALIFORNIA

# PHASE II ESA RESULTS

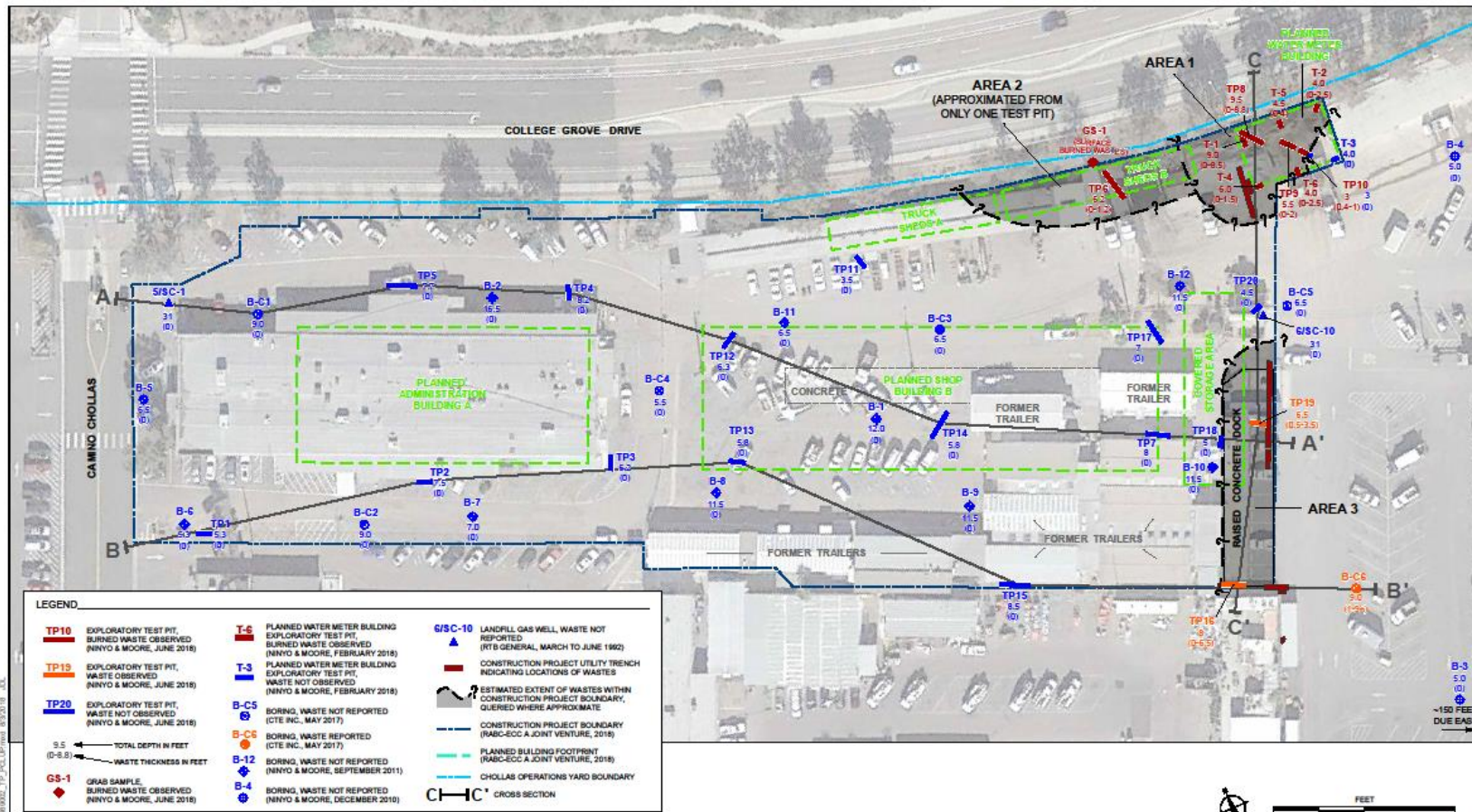


# PHASE II ESA RESULTS

Area 1 - Burned wastes appear to fill a former finger canyon, related to the North Chollas BS

Area 2 - Secondary burned wastes, likely related to North Chollas BS and/or street construction

Area 3 - Fill soil mixed with burned wastes and SVOCs, likely related to earlier construction projects



NOTE: DIRECTIONS, DIMENSIONS AND LOCATIONS ARE APPROXIMATE. | SOURCE: GOOGLE EARTH, 2018

FIGURE 4

EXPLORATORY TEST PIT LOCATIONS AND ESTIMATED EXTENT OF WASTES

CHOLLAS WASTE DISPOSAL SITE  
SAN DIEGO, CALIFORNIA

108469002 | 8/18

# POST CLOSURE LAND USE PLAN

## Met requirements of CCR Title 27 Section 21190 - Post Closure Land Use

### ▶ Final Landfill & Burn Site Cover

- ▶ N Chollas BS – burned wastes at South Chollas LF – no cover
- ▶ S Chollas LF - adequately covered average 3 ft, up to 12 ft thick

### ▶ Post Closure Maintenance and Reporting

- ▶ N Chollas BS - due to “clean closed” status, no PCM&M
- ▶ S Chollas LF - GW & LFG monitoring, LFG extraction/collection system

### ▶ Nature and Extent of Wastes

- ▶ N Chollas BS – “clean closed” BW at S Chollas LF within project delineated
- ▶ S Chollas LF – MSW previously delineated

### ▶ Waste Management and Mitigation

- ▶ Implementation of plans - SHSP, CHSP, WMPs
- ▶ Meter shop-excavate wastes to total depth (40x60 ft) + 5 ft outward
- ▶ Used controlled low strength concrete material to stabilize soils/BW

### ▶ Landfill Gas - Prevent Gas Migration into Buildings

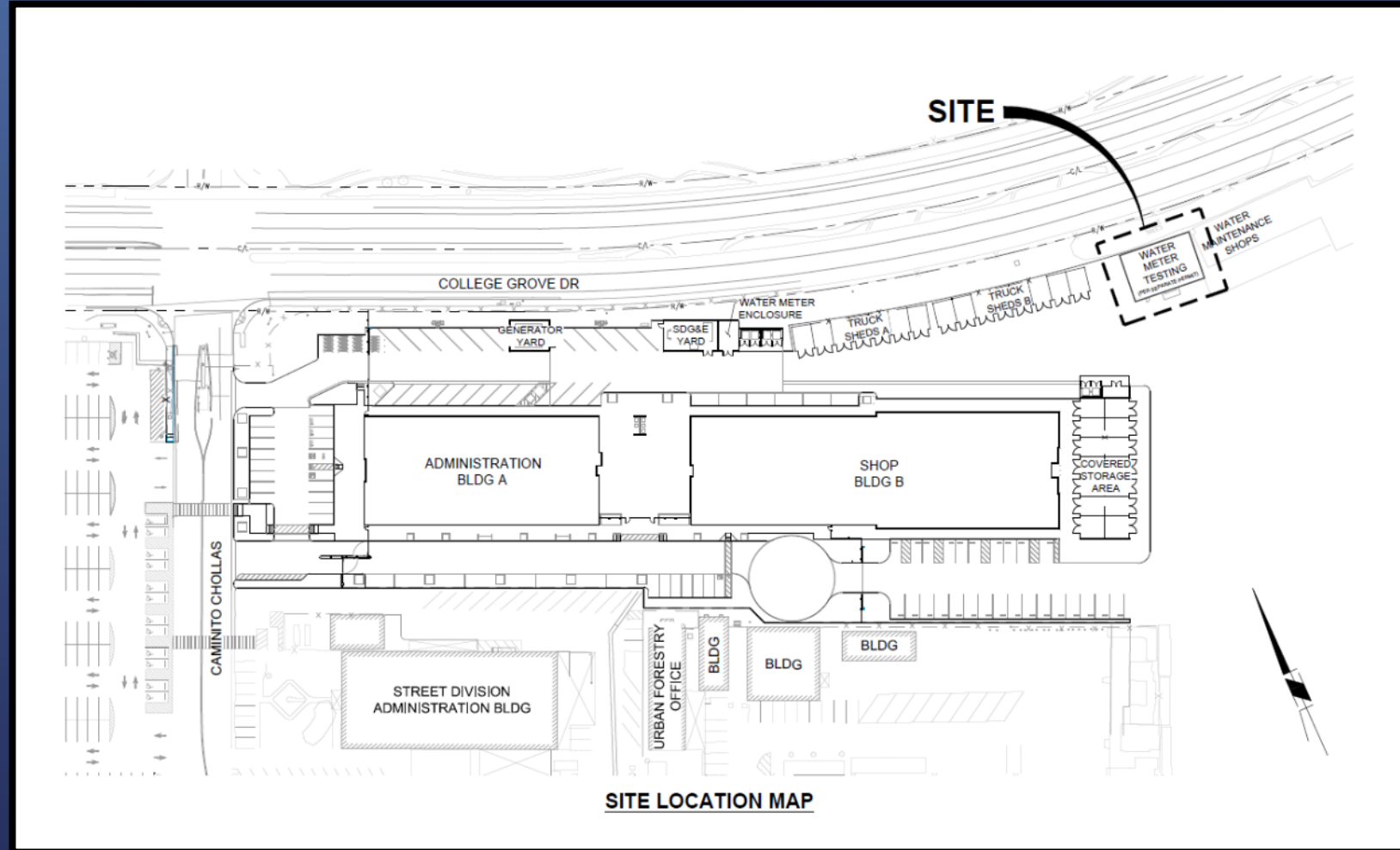
- ▶ Automatic methane gas sensors to detect CH<sub>4</sub> inside buildings
- ▶ Install a CH<sub>4</sub> mitigation membrane with low permeability to LFG
- ▶ Mechanical gas extraction blower to mitigate potential gas accumulation
- ▶ Quarterly inspections - verify workability of continuous CH<sub>4</sub> gas detectors





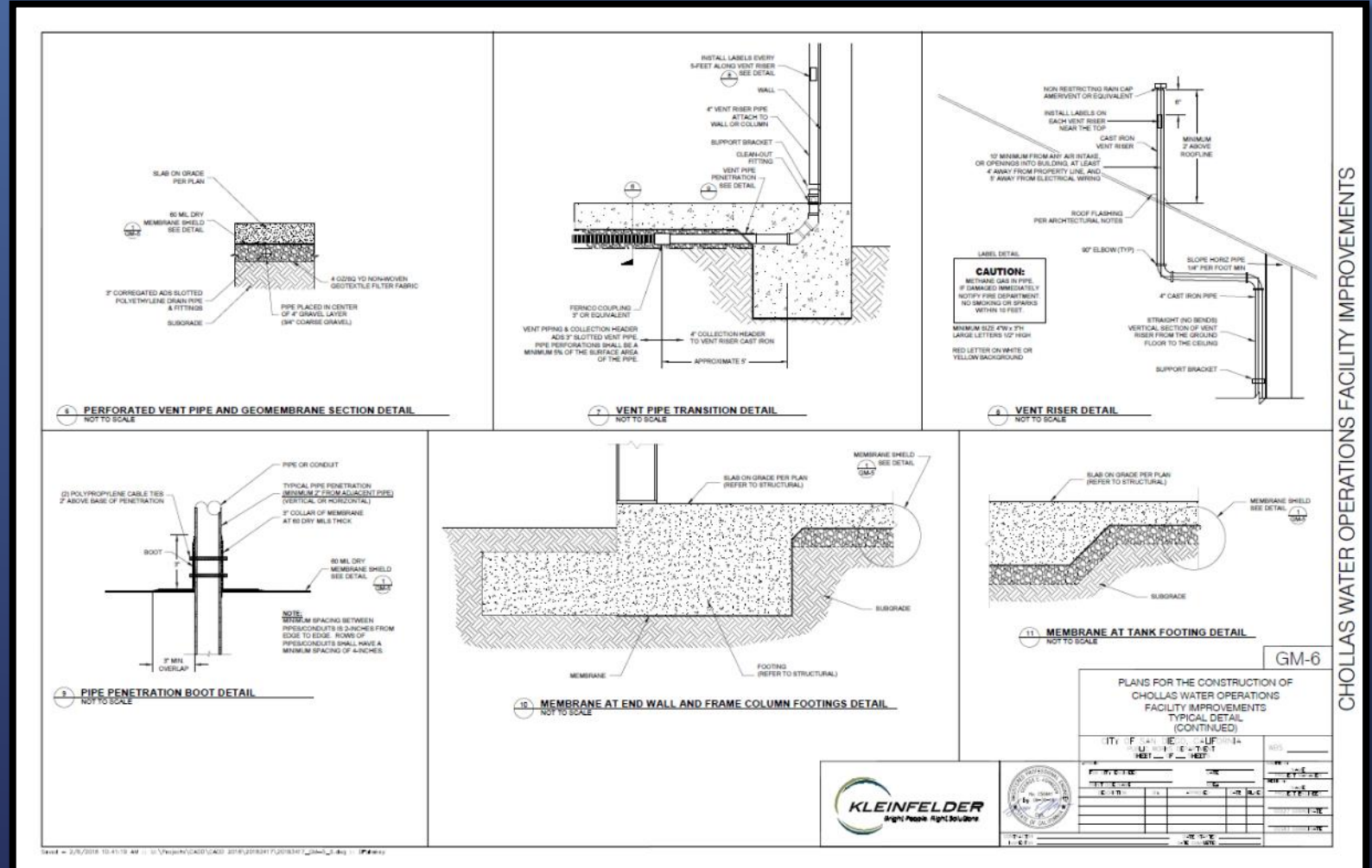
# PCLU DEVELOPMENT PLANS

- ▶ PCLU Project includes Administration Bldg's A & B and Water Meter Testing Shop
- ▶ All building foundations will be constructed as "slab on grade"
- ▶ Geotechnical specifications require removal of disposal fill from foundation and backfilling with engineered fill
- ▶ Waste Excavation Management Plan approved by the LEA will be used to manage excavated wastes



# PCLU DEVELOPMENT PLANS

- ▶ Investigation of existing disposal site conditions – Does the site meet state minimum standards and is there a report that documents this.
- ▶ 27 CCR 21190 Requirements
- ▶ Foundation LFG Barrier (FML)
- ▶ Venting Layer (12-in Gravel)
- ▶ Vent Risers
- ▶ Continuous Monitoring System
- ▶ Cover penetrations
- ▶ LFG Monitoring & Control
- ▶ Waste Excavation Management Plan



CHOLLAS WATER OPERATIONS FACILITY IMPROVEMENTS

# LESSONS LEARNED

- ▶ General PCLU Approval Condition - the landfill should be in compliance with state minimum standard as a condition of development, e.g. to allow public access to a former landfill it should meet state minimum standards, e.g. cover, grading, drainage & erosion control, LFG monitoring and control, etc. to protect public health and safety.
- ▶ Landfill investigation data (extents and characteristics) should provide the basis for the design of the post closure land-use development; Investigation data should include the horizontal and vertical limits of waste (particularly in the area of construction), and a volume estimate and waste characteristics; this data can be used to estimate clean-closure or consolidation and capping options.
- ▶ The use of historical aerial photographs, U.S.G.S. Topographic Maps, historical site topographic maps and imaging overlay capabilities, e.g. ArcGIS, Google Earth (to locate existing site features) are valuable resources in conducting extents investigations at former landfills
- ▶ A waste excavation management plan should be developed and approved by the LEA to coordinate the excavation, testing and disposition of wastes to an approved off-site disposal facility.
- ▶ Long-term maintenance and monitoring responsibilities and costs should be determined and assigned as a condition of development