CONSTRUCTION QUALITY ASSURANCE PLAN

TGRS Construction
Montrose Superfund Site
20201 S. Normandie Avenue
Los Angeles, California

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ACRONYMS AND ABBREVIATIONS

Abbreviation	Term
AECOM	AECOM Technical Services, Inc
BHC	Benzene Hexachloride
CM	Construction Manager
COC	Chain of Custody
CQA	Construction Quality Assurance
DFW	Definable features of work
DTSC	Department of Toxic Substances Control
DDT	Dichlorodiphenyltrichloroethane
EDD	Electronic Data Deliverable
GAC	Granular activated carbon
gpm	Gallons per minute
HASP	Health and Safety Plan
HDPE	High Density Polyethylene
LADWP	Los Angeles Department of Water and Power
LIMS	Laboratory Information Management System
Montrose	Montrose Chemical Corporation of California
NPL	National Priority List
PLC	Programmable Logic Controller
PM	Project Manager
PVC	Polyvinyl chloride
QA	Quality Assurance
RFI	Request for Information
ROD	Record of decision
ROW	Right-of-way
Site	Montrose Superfund Site
SMP	Site Management Plan
SOW	Statement of Work
TGRS	Torrance Groundwater Remediation System
UPRR	Union Pacific Railroad
USEPA	U.S. Environmental Protection Agency
VOC	Volatile Organic Compound

1.0 INTRODUCTION

1.1 GENERAL PURPOSE

This Construction Quality Assurance (CQA) Plan introduces personnel, defines responsibilities, and describes the quality assurance (QA) program, such as inspections, testing, record keeping, and corrective action for construction of the Torrance Groundwater Remediation System (TGRS) at the Montrose Superfund Site (Site) in Los Angeles, California. A Partial Consent Decree for construction of the Dual Site Groundwater Operable Unit treatment system was finalized in August 2012 (USEPA, 2012a). On behalf of Montrose Chemical Corporation of California (Montrose), this CQA Plan was prepared as required under Item 3.1(a) of the Statement of Work included as Appendix B of the Partial Consent Decree. The CQA Plan was additionally prepared in accordance with the quality assurance elements of the Construction Quality Assurance for Hazardous Waste Land Disposal Facilities (EPA/530-(S)SW-86-301, 1987) and Quality Assurance and Quality Control for Waste Contaminated Facilities (EPA/600/R-93/182, 1993), although these guidance documents primarily address landfills and related waste containment facilities.

The objective in developing and implementing the CQA Plan is to define the management system that will control and document:

- The quality assurance procedures to be used during the project to assure that the techniques, materials, and equipment meet design specifications;
- The integration of quality assurance inspections and corrective measures into the project documentation; and
- The framework for communicating the quality assurance procedures and requirements to the construction project personnel.

1.2 DISTRIBUTION

This CQA Plan, as well as other construction documents, is required reading for all construction personnel participating in the work effort. A copy of the CQA Plan will be provided to all field personnel constructing the TGRS and will be retained at the construction trailer. Construction subcontractors will be required to comply with the procedures documented in this CQA Plan in order to ensure the quality and effectiveness of the construction work.

AECOM Technical Services, Inc. (AECOM) will maintain a distribution list for copies of the CQA Plan. If revisions are made or addenda added to the CQA Plan, such changes will be distributed by AECOM to ensure that all parties holding a controlled copy of the CQA Plan will receive the revisions/addenda. Holders of the controlled copies are responsible for distributing additional material to update any copies within their organizations.

1.3 CQA PLAN FORMAT

The remainder of this CQA Plan has been organized to outline the personnel and procedures that will be utilized to maintain work quality during the project. This information has been organized as follows:

- Section 2 – Background and Scope
- Section 3 – Quality Management Organizational Structure
- Section 4 – Definable Features of Work
- Section 5 – Inspections and Verification Activities
- Section 6 – Non-Conformance and Construction Deficiencies
- Section 7 – Sampling Requirements
- Section 8 – Waste Disposal
- Section 9 – Documentation

Additional plans pertinent to construction quality are summarized below:

- Health and Safety Plan (HASP)
- Site Management Plan (SMP)
- Construction Schedule
- Remedial Wellfield and Treatment System Performance Evaluation Test Plan

2.0 BACKGROUND AND SCOPE

2.1 PROJECT SITE DESCRIPTION

The Montrose Property is located at 20201 South Normandie Avenue in the City of Los Angeles, California (**Figure 1**). The Site is located within a portion of the City of Los Angeles identified as the Harbor Gateway, which extends from Western Avenue to Normandie Avenue. The City of Torrance is located west of the Harbor Gateway, and unincorporated Los Angeles County is located east of the Harbor Gateway.

The Montrose Property occupies approximately 13 acres and is bounded by the Union Pacific Railroad (UPRR) right-of-way and Normandie Avenue to the east, the Jones Chemical Inc. property and a right-of-way owned by the Los Angeles Department of Water and Power (LADWP) to the south, the GLJ Holdings property to the north, and Frito-Lay, Inc. to the west. The Montrose Property and other surrounding properties are shown in **Figure 2**. The area east of the Property is occupied by manufacturing and commercial facilities. The area to the west is occupied by manufacturing and an oil refinery. Land uses south and southeast of the Property are mixed manufacturing, commercial, and residential zoning.

Currently, the Site is unoccupied, fenced, and covered with asphalt. Entrance to the Property is from Normandie Avenue through a locking gate located in the northeast corner of the Property. The on-Property features include three large, raised, asphalt building pads (constructed in 1985) and six temporary soil cells containing soil excavated from along the historical stormwater pathway in a portion of the residential neighborhood (i.e., Kenwood Avenue). Additionally, there is a storage container on-Site for storage of field equipment and supplies. Water service is available through a metered line located at the northeast corner of the Property at this time. Electrical and telephone services are not yet available at the Property. Surface water drainage is toward the southeast corner of the Montrose Property and the Normandie Avenue Ditch.

2.2 SITE BACKGROUND

Montrose manufactured technical grade dichlorodiphenyltrichloroethane (DDT) at the Property from 1947 until 1982. Montrose manufactured DDT by combining chlorobenzene and chloral in the presence of a powerful sulfuric acid catalyst (oleum). The Montrose plant produced as much as eighty million pounds of technical grade DDT annually. Montrose supplied technical grade DDT to, among others, the Department of Defense, United Nations, and the World Health Organization. In addition to the Montrose operations, Stauffer Chemical Company operated a small benzene hexachloride (BHC) plant on the

southeast corner of the Property from approximately 1954 until 1963 when the plant was dismantled and removed from the Site.

Montrose terminated its production process and completely ceased operating the plant in 1982. The plant was fully dismantled and demolished by early 1983. During 1984 and 1985, Montrose graded and covered the property with asphalt. The United States Environmental Protection Agency (USEPA) proposed the Site for the Superfund National Priorities List (NPL) in 1984, and the proposal was finalized in 1989.

Remedial investigations conducted at the Montrose Site have documented chemical impacts including chorobenzene to the three upper water-bearing zones at the Site which are the upper Bellflower Aquitard, the Bellflower Sand, and the Gage Aquifer (USEPA, 1998). A Record of Decision (ROD) for remediation of dissolved-phase chlorobenzene in groundwater was issued by USEPA in 1999 (USEPA, 1999). A number of groundwater pilot tests and studies were conducted over the last decade. Remedial design of the TGRS was completed in June 2012 (Geosyntec, 2012) and was subsequently approved by USEPA on September 19, 2012 (USEPA, 2012b).

2.3 PROJECT PURPOSE AND SCOPE

The ROD specifies a remedial action that provides both contaminant containment and volume reduction of the chlorobenzene plume exceeding the In-Situ Groundwater Standards. The ROD also requires the prevention of adverse migration of contaminants laterally and vertically.

Containment of dissolved-phase volatile organic compounds (VOCs), including chlorobenzene, will be achieved by utilizing hydraulic extraction of groundwater from extraction wells to mitigate contaminant migration. The extracted groundwater will be treated and injected into the aquifers through injection wells. The wellfield and relative pumping rates of the wells will be optimized to limit the lateral and vertical migration of contaminants and to maximize containment during remedial action. This optimization will be conducted in accordance with the requirements and provisions of the ROD.

Groundwater will be extracted from a series of wells, located primarily down the center of the dissolved-phase plumes, and conveyed to the Montrose Property for aboveground treatment using a combination of advanced oxidation, air stripping, and carbon adsorption. Treated groundwater will be conveyed from the Montrose Property to a series of wells, located primarily along the perimeter of the dissolved-phase VOC plumes, for reinjection. Some of the extraction and injection wells were previously installed as part of field pilot testing activities. The remaining wells, underground conveyance pipelines, and groundwater

treatment plant will be constructed under this CQA Plan. The layout of the extraction and injection wells and pipelines is shown in **Figure 3**.

AECOM will construct the TGRS in accordance with the Partial Consent Decree Statement of Work (SOW) and Remedial Design drawings and specifications for the Dual Site Groundwater Operable Unit. The TGRS construction SOW was provided in Appendix B of the Partial Consent Decree.

3.0 QUALITY MANAGEMENT ORGANIZATIONAL STRUCTURE

3.1 ROLES AND RESPONSIBILITIES

3.1.1 UNITED STATES ENVIRONMENTAL PROTECTION AGENCY AND STATE OF CALIFORNIA

The USEPA and State of California are the regulatory oversight agencies for TGRS construction. USEPA Region 9 is the lead agency for the Montrose Superfund Site and will additionally direct public participation activities and communication. The Department of Toxic Substances Control (DTSC) is the lead State agency.

3.1.2 CH2M HILL

It is anticipated that CH2M Hill will serve as construction oversight consultant to USEPA. CH2M Hill will periodically review construction documentation and periodically visit the site to observe field construction activities to ensure compliance with the Partial Consent Decree, construction workplans, and Remedial Design drawings and specifications. The frequency of CH2M Hill construction oversight will be determined prior to the start of construction.

3.1.3 CITY AND COUNTY OF LOS ANGELES

Components of the TGRS will be installed off-Property belowground in either City of Los Angeles or County of Los Angeles public Right-of-Ways (ROWs). City and County of Los Angeles personnel will conduct Special Inspections of TGRS components in ROWs to ensure that installation complies with City standards and ordinances.

3.1.4 MONTROSE CHEMICAL CORPORATION OF CALIFORNIA

Montrose is the responsible party for the Montrose Superfund Site and is responsible for implementation of TGRS construction in accordance with the Partial Consent Decree. Montrose will oversee and supervise construction activities conducted by the Project Coordinator and Construction General Contractor.

3.1.5 DE MAXIMIS, INC.

de maximis, inc. (de maximis) is the Project Coordinator for Montrose during TGRS construction. As the client representative, *de maximis* will coordinate TGRS construction activities and facilitate communication on behalf of Montrose between the Construction General Contractor and regulatory agencies. *de maximis* will additionally coordinate and communicate with other construction-related

parties including Geosyntec and CH2M Hill. As Trustee of the Dual Site Trust, *de maximis* will also process claim certificates and payments to the Construction General Contractor following completion of work in accordance with the Trust Agreement.

3.1.6 GEOSYNTEC CONSULTANTS

Geosyntec is the Remedial Design contractor and Engineer of Record. Geosyntec will be responsible for answering Requests for Information (RFIs) and approving design changes during TGRS construction. All questions, clarifications, or uncertain interpretations pertaining to the design will be submitted to Geosyntec in the form of an RFI. Geosyntec will review the RFI and make necessary changes to the design, if required. An example RFI is included in Appendix A. Geosyntec will also be responsible for reviewing Fabricator Shop Drawings and conducting special inspections.

3.1.7 AECOM

AECOM has been selected by Montrose Chemical Corporation as the Construction General Contractor, and it will also be responsible for planning, executing, documenting, and facilitating the CQA program. AECOM will be responsible for construction of the TGRS in accordance with the workplans, Partial Consent Decree SOW, and Remedial Design drawings and specifications. The roles and responsibilities of individual AECOM project personnel are described in Section 3.3. AECOM will hire construction subcontractors and CQA inspection firms as needed to complete TGRS construction. AECOM will directly procure all required TGRS equipment, materials, and supplies.

3.1.8 CONSTRUCTION SUBCONTRACTORS

AECOM will select and hire construction subcontractors to construct individual components of the TGRS. The collective efforts of all construction subcontractors will result in complete construction of the TGRS. Construction subcontractors will be selected to provide the following specialty services:

- Well Driller and Developer;
- Earthwork Contractor;
- Mechanical Contractor;
- Electrical Contractor;
- Programmable Logic Controller (PLC) Contractor;
- Pipe Jacking Contractor (for railroad crossings);
- Concrete/Masonry Contractor;
- Masonry Contractor; and
- Fencing Contractor.

Construction subcontractors will be responsible for performing TGRS construction activities in the field in accordance with their individual contracts with AECOM. Construction subcontractors will have their own internal QA procedures to ensure construction quality, but additional CQA inspections will be performed by a third party under contract to AECOM. In addition, AECOM will provide independent CQA inspection with CQA being performed by the other entities at the Site.

3.1.9 THIRD PARTY INSPECTORS

AECOM will select and hire third party inspectors to perform CQA activities for two components of TGRS construction. Smith Emery Laboratories will be contracted to verify the compressive strength of the concrete foundation for the equipment compound. Additionally, a geotechnical firm (to be determined) will be contracted to verify material compaction associated with backfilling operations and installation of underground TGRS components. The third party inspectors will be part of the CQA team for the TGRS construction project. Information on the geotechnical firm, once selected, will be provided to EPA under separate cover.

3.2 STRUCTURE OF QA/QC ORGANIZATION

An organizational chart is provided in **Figure 4** that illustrates the organizational relationship between the above-referenced parties and TGRS construction personnel.

3.3 RESPONSIBILITIES AND QUALIFICATIONS OF KEY AECOM PERSONNEL

3.3.1 GENERAL CONSTRUCTION CONTRACTOR (AECOM)

The following provides information on the responsibilities and qualifications of key personnel.

Project Manager, Mr. Brian Dean

The Project Manager (PM) is the single point of contact for the TGRS construction general contractor. Mr. Brian Dean of AECOM will serve as the PM for TGRS construction. Mr. Dean has 24 years of experience in managing environmental construction and remediation projects including large-scale groundwater systems. Mr. Dean has also served as a technical consultant to Montrose since 1998 and peer reviewed the groundwater Remedial Design. The PM is responsible for managing all aspects of TGRS field construction including the following duties:

- The management and execution of construction activities in accordance with the workplans as required by the Partial Consent Decree and approved Remedial Design drawings and specifications;

- Coordination and communication with *de maximis*, Geosyntec, CH2M Hill, and the City and County of Los Angeles;
- Ensuring the use of safe work practices and compliance with the HASP during construction activities;
- Managing the construction budget in accordance with the Qualified Settlement Fund and associated Payment Schedule; and
- Preparation of construction inspection and progress reports in accordance with the Partial Consent Decree and associated SOW.

Safety Professional, Ms. Shelley Brown

The Safety Professional is the member of the AECOM Safety, Health and Environmental Department assigned to oversee health and safety requirements for the project and provide any needed technical support. The Safety Professional will be the first point-of-contact for all of the project's health and safety matters. Ms. Shelley Brown of AECOM will serve as the Safety Professional for construction of the TGRS. Ms. Brown is a degreed professional with 11 years of experience in environmental safety program management, hazardous waste operations and emergency response. Duties include the following:

- Approving the HASP and any required changes or addenda;
- Approving additional Task Hazard Analyses, if any;
- Conducting health and safety inspections and audits; and
- Reviewing all personal exposure monitoring results or updating exposure action levels.

AECOM Quality Assurance Team

Construction Manager/CQA Officer, Mr. Kevin Thomas

The Construction Manager (CM) has the overall responsibility and authority to direct work operations at the job site in constructing the TGRS. Mr. Kevin Thomas of AECOM will serve as the CM for construction of the TGRS. Additionally, Mr. Thomas will serve as the CQA Officer. Mr. Thomas is a degreed professional with 22 years of experience in environmental remediation system construction, operations, and maintenance. He has supervised construction and operation of more than 30 large-scale soil and groundwater remediation systems in the western United States. Mr. Thomas' experience as construction supervisor includes coordinating subcontractors, preparing and managing construction

documents, and ensuring construction is performed in accordance with contract plans and approved changes. As CM and CQA Officer, Mr. Thomas is responsible for the following:

- Technical, health, and safety oversight of all field tasks;
- Coordination of construction subcontractors for the construction of the TGRS in accordance with the Partial Consent Decree Workplans and Remedial Design drawings and specifications;
- Oversight and recording of daily construction activities;
- Maintaining close communication with the AECOM PM and communicating, in a timely manner, any activity causing deviation from the approved design, plans, or impacting health and safety, schedule, or cost;
- Conducting inspections of work performed by construction subcontractors;
- Obtaining and reviewing submittals provided by construction subcontractors for the purpose of verifying construction quality;
- Preparing RFIs as needed for review by the AECOM PM and subsequent submittal to the Engineer of Record (Geosyntec);
- Maintaining red-line drawings to reflect actual conditions as constructed in the field;
- Maintaining on-Site documentation in the field office located at the Montrose property;
- Interfacing with CH2M Hill, Geosyntec, and City and County of Los Angeles inspectors in the field to facilitate Special Inspections performed by these organizations; and
- Maintaining close communication, and coordination, with all members of the QA Team for the purpose of obtaining support, as needed, in completing all items above.

Professional Engineering Oversight, Mr. Mark Riley

Mr. Mark Riley of AECOM will provide professional engineering oversight for TGRS construction and will be a member of the QA Team. Professional engineering oversight will be provided during TGRS construction activities to assure the quality of technical work in accordance with State requirements. Mr. Riley is a California-licensed professional civil engineer with 23 years of experience in the environmental engineering field specializing in planning, design, construction, operations, and maintenance of environmental remediation systems. Mr. Riley has served as process design engineer or engineering manager for numerous soil and groundwater remediation system design and construction projects, including several groundwater treatment systems each with a capacity of 1,200 gpm or greater. Mr. Riley's responsibilities include the following:

- Conduct periodic job site visits to "spot" verify daily observations made by the CQA Officer;
- Oversee engineering support during TGRS construction activities;
- Oversee well installation, development, and testing activities;
- Review select daily construction records, containing key items, where professional engineering input is required to assure technical work quality;
- Assist in preparation of RFIs for review by the AECOM PM and subsequent submittal to the Engineer of Record (Geosyntec); and
- Maintain close communication with the AECOM PM and all members of the QA Team.

Engineering Support, Mr. Jacob Barnes

Mr. Jacob Barnes will provide engineering support for TGRS construction and will be a member of the QA Team. Engineering support will be provided for the general purpose of assisting the CQA Officer in assuring construction quality. Mr. Barnes has more than 10 years of experience in environmental remediation system planning, design, construction, operations, and maintenance. Mr. Barnes has served as project engineer on numerous large soil and groundwater remediation system projects and his responsibilities have included design document and drawing preparation, coordination and on-site supervision of construction subcontractors, construction, operations, and maintenance report preparation, and construction document management. Mr. Barnes' responsibilities include the following:

- Conduct frequent job site visits to assist the CQA Officer in conducting inspections of work performed by construction subcontractors;
- Assist in preparation of construction records and weekly summary reports;
- Assist in obtaining and reviewing construction subcontractor submittals;
- Assist in preparing RFIs for review by the AECOM PM and subsequent submittal to the Engineer of Record (Geosyntec);
- Maintain hardcopy and electronic CQA files at the AECOM office in Long Beach, California;
- Assist in coordination of Special Inspections conducted by CH2M Hill, Geosyntec, and City and County of Los Angeles inspectors; and
- Maintain close communication with the AECOM PM and all members of the QA Team.

Geology Support, Ms. Alycia McCord

Ms. Alycia McCord will provide geology support for TGRS construction and will be a member of the QA Team. Geology support will be provided for the purpose of assuring quality of the well installation and testing portion of TGRS construction and for assisting the CQA Officer in assuring the quality of earthwork construction activities. Ms. Alycia McCord has more than 10 years experience installing various types of wells utilizing rotary-mud and hollow-stem auger drilling technologies. The majority of Ms. McCord's experience has been installing wells with telescoped conductor casings through chemically impacted zones of the Bellflower, Gage, and Lynwood aquifers. Ms. McCord has additionally served as field manager for many large-scale excavations and earth moving projects. Ms. McCord's responsibilities include the following:

- Coordinate the well drilling, installation, and testing portion of the TGRS construction and provide direct field oversight of the drilling subcontractor;
- Prepare and submit a lithologic boring log and well construction diagram for each well installed for the TGRS;
- Obtain and review submittals provided by the drilling subcontractor for the purpose of verifying construction quality;
- Assist the CQA Officer in coordinating and inspector the earthwork subcontractor;
- Maintain hardcopy and electronic CQA files at the AECOM office in Long Beach, California; and
- Maintain close communication with the AECOM PM and all members of the QA Team.

3.3.2 CONSTRUCTION SUBCONTRACTORS

Construction subcontractors have not yet been selected for the TGRS construction project. After construction subcontractors have been selected and key personnel have been identified, this information will be provided to USEPA and the DTSC under separate cover.

4.0 DEFINABLE FEATURES OF WORK

The definable features of work (DFWs) consist of individual TGRS construction tasks that are separate and distinct from each other. Together, completion of all DFWs will comprise completion of TGRS construction, and each DFW is subject to separate inspections and/or testing to ensure construction quality. The list of DFWs is provided below:

- Well Installation - Drilling and installation of 11 groundwater extraction and injection wells (8 extraction and 3 injection);
- Well Component Installation - Installation of well vault, equipment, and wellhead piping at 22 groundwater extraction and injection wells (14 extraction and 8 injection);
- Extraction Pipeline Installation - Installation of approximately 13,000 linear feet of belowground groundwater extraction pipeline consisting of dual-containment high density polyethylene (HDPE) pipe, polyvinyl chloride (PVC) conduit, electrical pull-boxes, valve-vaults, and air-release/blow-off assembly boxes on private property and Los Angeles City and County public ROWs;
- Injection Pipeline Installation - Installation of approximately 24,000 linear feet of belowground groundwater injection pipeline consisting of single-walled HDPE pipe (includes redevelopment piping), PVC conduit, electrical pull-boxes, valve-vaults, and air-release/blow-off assembly boxes on private property and Los Angeles City and County public ROWs;
- Pipe Jacking - Belowground pipe jacking over approximately 300 linear feet under two Union Pacific Rail Road (UPRR) crossings;
- Treatment Facility Grading – Re-grading of soils and resurfacing the area surrounding the planned groundwater treatment facility at the Montrose property;
- Equipment Pad Construction - Concrete equipment pad construction for installation of groundwater treatment equipment;
- Control Building Construction - Construction of a treatment system control building including an electrical control room;
- Mechanical Installation - Installation of groundwater treatment equipment including five aboveground steel tanks (20,000 to 40,000 gallons each), six 20,000-pound granular activated carbon (GAC) vessels, one HiPOx™ advanced oxidation system, three 500 gallons per minute

(gpm) low profile air strippers, chemical feed systems, filter bag housings, transfer and sump pumps, interconnecting pipe, valves, and controls;

- Electrical Installation - Installation of electric wiring and control panels throughout the equipment compound, extraction and injection pipelines, and extraction and injection wells for power distribution and communication with electrical controls; and
- PLC Integration - Installation of PLC panels at the system control room and remote power locations, programming of the main and remote PLCs, integration of all TGRS electrical controls, and testing of system controls.

5.0 INSPECTIONS AND VERIFICATION ACTIVITIES

5.1 GENERAL CONSTRUCTION INSPECTION AND VERIFICATION

The CQA Officer or his designee will conduct inspections of work in progress to confirm construction quality and maintain compliance with Remedial Design drawings and specifications. The QA procedures for fieldwork are based on a three-phase protocol. In general, the CQA Officer will perform the field inspections and will carry out the following phased inspections and surveillance for each DFW:

1. Initial
2. Progress
3. Completion

5.1.1 INITIAL INSPECTIONS

An initial inspection will be performed at the beginning of a DFW and documented in the daily construction records. The initial inspection will focus on the work area, equipment and materials, and field construction personnel. The CQA Officer will verify that the equipment and materials are free from defects and comply with the Remedial Design drawings and specifications. The CQA Officer will additionally verify that the work area has been delineated and is free of obstructions. The CQA Officer will verify that a reliable benchmark is established for surveying TGRS infrastructure elevations and positions. Finally, the CQA Officer will verify that the construction personnel have a good understanding of the work tasks, construction quality requirements, and will comply with the construction workplans, including the HASP.

5.1.2 PROGRESS INSPECTIONS

The CQA Officer will conduct daily progress inspections during performance of the construction work. The progress inspections will focus on the quality of the construction work and continued compliance with construction workplans, HASP, and Remedial Design drawings and specifications. Any defects or errors in the work quality will be recorded, photographed, and immediately resolved. The CQA Officer will identify the defect and communicate the issue to the construction subcontractor and AECOM PM. Once an appropriate corrective measure has been determined, the defect will be corrected, photographed, and reported to *de maximis* as part of the weekly summary reports. If there are any outstanding defects that have not been corrected those will also be reported to *de maximis* as part of the weekly summary reports.

5.1.3 WORK COMPLETION INSPECTIONS

Upon completion of a DFW, the CQA Officer will inspect the work for quality, completeness, and compliance with Remedial Design drawings and specifications. The results of the work completion inspections will be documented in the daily construction records and reported to the AECOM PM. If a defect is identified during a completion inspection, it will be corrected and inspected a second time by the CQA Officer prior to determining the DFW as complete.

5.2 SPECIAL INSPECTIONS

In addition to general construction inspections conducted by the CQA Officer or his designee, special inspections will be conducted by other parties including:

Health and Safety Inspections

The AECOM PM (Brian Dean) and/or Health and Safety Professional (Shelley Brown) will conduct periodic inspections of the construction work to verify compliance with the project HASP. The results of the health and safety inspection will be documented in an inspection report, communicated to *de maximis*, and kept on file at the AECOM Long Beach office.

Equipment Inspections

The CQA Officer and/or engineering support personnel will inspect all equipment items upon delivery to the Site to verify that it is free from defects prior to formal receipt from the manufacturer or shipping courier. Defective equipment will be rejected and returned to the manufacturer at its own cost. For some major equipment items, such as the HiPOx™ equipment skid and large groundwater feed tanks, CQA personnel will review and approve shop drawings prior to fabrication. It may also be necessary to conduct limited factory inspection of the equipment during fabrication and/or work with the manufacturer during fabrication to assure the quality of the custom equipment prior to shipping.

Air Quality and Emissions Monitoring Inspection

The AECOM PM (Brian Dean) and/or Health and Safety Professional (Shelley Brown) will conduct periodic inspections of the construction work to verify compliance with air quality and emission monitoring requirements. Air monitoring requirements for the TGRS construction are specified in the HASP and SMP. The results of the air monitoring inspection will be documented in an inspection report, communicated to *de maximis*, and kept on file at the AECOM Long Beach office.

Waste Management Inspections

The AECOM PM (Brian Dean) will conduct periodic inspections of the construction work to verify compliance with waste management requirements specified in the SMP, including compliance with Federal and State regulations. The results of the waste management inspection will be documented in an inspection report, communicated to *de maximis*, and kept on file at the AECOM Long Beach office.

Concrete Equipment Pad Inspections

Smith-Emery Laboratories will be contracted by AECOM to inspect the concrete equipment pad during construction by a concrete/masonry subcontractor. Smith-Emery will collect poured concrete samples for laboratory compressive strength testing to verify compliance with project specification requirements and provide testing reports. Additionally, the Concrete Pour Log and Concrete Reinforcement Field Inspection Checklist provided in Appendix A will be completed.

Grading, Backfilling, and Compaction Inspections

A geotechnical firm will be contracted by AECOM to inspect grading, backfilling, and compaction activities completed by the earthwork subcontractor. The geotechnical firm will conduct field inspection and testing of compacted soils prior to and/or following installation of TGRS infrastructure. Inspection results will be documented in a geotechnical report stamped by a California registered Professional Engineer.

Owners Representative Inspections

de maximis, as the Project Coordinator and owners representative, will conduct periodic inspections of the TGRS construction to verify compliance with the Remedial Design drawings and specifications and to monitor progress of the construction. *de maximis* will be available in the field to interact with the community as need be. *de maximis* will monitor and independently confirm that the elements of a DFW is complete in order to process claim certificates. *de maximis* will be on Site for all shipment of waste. *de maximis* will also be at the Site whenever there is a unexpected Site condition that would result in a change in project scope of cost. The frequency of inspections will vary with the progress of DFW construction activities but will likely be at least weekly. The results of the Owners Representative inspections will be documented in a short email to AECOM and copied to Geosyntec.

Remedial Design Compliance Inspections

Geosyntec will be contracted by Montrose to conduct independent inspections of certain TGRS construction elements to verify compliance with the Remedial Design drawings and specifications. The frequency of inspections will vary with the progress of DFW construction activities but will likely be at

least once every two weeks on average. The results of the Remedial Design compliance inspections will be documented in a short email to *de maximis* and copied to AECOM.

Public Rights-of-Way Inspections

The City and County of Los Angeles will conduct Special Inspections on DFWs in associated public ROWs, specifically well installation and extraction/injection pipeline construction. The City of Los Angeles Design Standards group will conduct both factory and field inspections of the reinforced concrete boxes to be installed in the public streets. The Design Standards group will be evaluating the concrete boxes for structural defects in order to ensure that they will be safe for use in direct traffic applications. The City of Los Angeles Special Inspectors will additionally be inspecting pipe welds, sand bedding, backfilling and compaction, base aggregate, and resurfacing with the City streets and public ROW. The County of Los Angeles is expected to conduct similar inspections within the public ROW.

Construction Oversight Periodic, Pre-Final, and Final Inspections

CH2M Hill, USEPA, and/or the State of California are expected to conduct periodic inspections of the TGRS construction activities in accordance with the requirements of the Partial Consent Decree. The frequency of periodic inspections will be at the discretion of USEPA and the State of California. Upon completion of the work, a pre-final inspection will be scheduled with the oversight regulatory agencies. Upon satisfying any deficiencies identified during the pre-final inspection, a final construction inspection will be scheduled with the oversight regulatory agencies. The results of the regulatory agency oversight inspections will be documented in reports due within 14 days following the inspection.

5.3 INSPECTION ACTIVITIES

With the exception of the Special Inspections described in Section 5.2 above, the CQA Officer or his designee will be responsible for inspecting the construction quality for each DFW. Inspections may occur as part of the initial, progress, or completion work phases and will be documented in daily construction records and weekly summary reports. A list of specific construction inspection activities for each of the DFWs defined in Section 4.0 is provided below. Construction inspections will include the following activities, at a minimum.

Well Installation

- Inspection of well casing and screen for defects prior to installation;
- Inspection of conductor casing welds during installation;
- Verify concrete volume used in cementing the conductor casing (i.e., no bridging);
- Verify that concrete had adequately set prior to drilling ahead;

- Verify bond between conductor casing, concrete, and formation (i.e., bond log);
- Verify sand pack and annular bentonite seal (materials, volume, and depth);
- Verify concrete/bentonite grouting to surface (i.e., no bridging);
- Verify lithology for purposes of installing conductor casings to target depths (in low permeability layers) and fully penetrating wells across the target water-bearing zones; and
- Document lithology and well construction details in a boring log and well construction diagram.

Well Component Installation

- Inspection of reinforced concrete boxes upon delivery to the Site (manufacturer, model, size, and integrity) – damaged or defective boxes or covers will not be accepted and will be returned to the manufacturer;
- Inspection of well equipment, piping, and controls upon delivery to the Site (manufacturer, model, size, and quantity) – damaged or defective equipment will not be accepted and will be returned to the manufacturer;
- Inspection of crane safety, dust control, air monitoring, and confined space procedures;
- Inspection of wellhead component assembly and anchoring;
- Inspect data submittal for aggregate base backfill associated with burial of belowground well vaults;
- Geotechnical firm to provide documentation of field tests performed which verify that excavation floors, bedding, and backfill associated with burial of belowground well vaults meet compaction requirements per Remedial Design drawings and specifications;
- Inspect placement and leveling of concrete well vaults; and
- Complete the Earthwork Field Inspection Checklist provided in Appendix A;

Extraction and Injection Pipeline Installation and Pipe Jacking

- Inspect pipe and conduit materials and associated concrete boxes upon delivery to the Site - damaged or defective equipment will not be accepted and will be returned to the manufacturer;
- Inspect traffic control procedures;
- Inspect trench and excavation pit depths and dimensions;
- Inspect underground utility crossings;
- Inspect dust control, air monitoring, trenching, and confined space procedures;
- Inspect shoring for pipe jacking excavation pits prior to entry;
- Inspect large diameter steel pipe and welds during installation;

- Inspect data submittal for aggregate base backfill and sand bedding associated with burial of conveyance piping and concrete pull boxes, valve vaults, and air release/blowoff assemblies;
- Conduct environmental testing of sand bedding and/or base aggregate materials prior to delivery, as needed;
- Geotechnical firm to provide documentation of field tests verifying that excavation floors, bedding, and backfill associated with burial of pipeline components meet compaction requirements per Remedial Design drawings and specifications;
- Inspect pipe welding, placement, and leak testing. Complete the Leak Test Report Form provided in Appendix A;
- Inspect pipe placement and sand bedding depth;
- Inspect elevations for conformance with Remedial Design drawings;
- Obtain material data submittals for replacement asphalt and concrete for areas where pavement resurfacing is required; and
- Complete the Earthwork Field Inspection Checklist provided in Appendix A.

Treatment Facility Grading

- Inspect material data submittal for new asphalt to be used for resurfacing after grading of underlying native material;
- Inspect dust control, air monitoring, and decontamination procedures;
- Inspect elevations for conformance with grading plans;
- Inspect aggregate base and asphalt resurfacing thickness;
- Geotechnical firm to provide documentation of field tests verifying that graded material meets compaction requirements per project drawings and specifications; and
- Complete the Earthwork Field Inspection Checklist provided in Appendix A.

Equipment Pad and Control Building Construction

- Inspect material data submittals for rebar and concrete prior to installation;
- Geotechnical firm to provide documentation of field tests performed which verify that equipment pad and control building subgrades meet compaction requirements per project drawings and specifications;
- Inspect forms (length, width, height) and placement of equipment and tank pads;
- Inspect rebar size, spacing, and connections;
- Complete the Concrete and Concrete Reinforcement Field Inspection Checklist (Appendix A);

- Complete the Concrete Pour Log (Appendix A); and
- Smith-Emery Laboratories to collect poured concrete samples for laboratory compressive strength testing to verify compliance with project specification requirements.

Mechanical Installation

- Inspection of treatment system equipment upon delivery to the Site (manufacturer, model, size, and rating) – damaged or defective equipment will not be accepted and will be returned to the manufacturer;
- Inspection of sump grate construction and anchoring;
- Inspection of equipment placement and anchoring;
- Inspection of crane lifting and fall protection procedures;
- Inspection of pipe rack construction, welds, and anchoring;
- Inspection of interconnecting pipe welding and assembly;
- Inspection of pipe leak testing and documentation on the Leak Test Report Form provided in Appendix A; and
- Inspection of controls installation.

Electrical Installation

- Inspection of the electrical hardware (cabinets, panels, and disconnects) upon delivery to the Site (verify proper manufacturer, size, and current/voltage rating);
- Inspection of electrical hardware location and mounting;
- Inspection of equipment grounding (panels and tanks);
- Inspection of conduit installation and sealing within the treatment compound;
- Inspection of wire pulling, landing, and labeling;
- Inspection of lock-out/tag-out procedures;
- Inspection of motor rotation and power up testing.

PLC Integration

- Inspection of the PLC hardware upon delivery to the Site (verify proper manufacturer and model);
- Inspection and engineering review of the PLC controls during screen development;
- Verification of pump controls during system performance testing; and
- Verification of alarm relays, notifications, and automated equipment shutdown during system performance testing.

6.0 NON-CONFORMANCE AND CONSTRUCTION DEFICIENCIES

6.1 NON-CONFORMANCE REPORTS

Non-Conformance Reports (Appendix A) will be used to alert responsible personnel of problem areas and/or nonconforming items. Such occurrences will be recorded separately on the individual Non-Conformance Reports. The CQA Officer will inform the PM of materials and/or workmanship that do not meet specified design. Upon correction, the Non-Conformance Report will be updated with actions taken and test data that prove the problem was corrected.

6.2 CONSTRUCTION DEFICIENCY IDENTIFICATION AND CONTROL

The CQA Officer will assess the nature and extent of any defects in the work performed or materials installed. The CQA Officer will estimate the extent of the deficiency by testing, observations, or other appropriate means. Any defects resulting in a compromise of worker safety will result in work stoppage until the defect is corrected.

The CQA Officer will notify the PM after the extent and nature of the defect has been identified. A work deficiency meeting may be held as needed between the CQA Officer, the PM, CQA Team members, construction subcontractors, CH2M Hill, and Geosyntec to address the problem.

The CQA Officer will correct all deficiencies to meet the Remedial Design drawings and specification. If weather conditions affect work, or project specifications cannot be met, the CQA Team and AECOM PM will develop suggested solutions and present them to *de maximis* for approval. The CQA Officer will verify whether the defect has been corrected prior to performing additional work in the deficiency area. Corrections will be documented in daily construction records, weekly summary reports, and in Non-Conformance Reports if applicable. Non-conforming construction and the associated corrective measure will be documented in the construction files.

7.0 SAMPLING REQUIREMENTS

Sampling activities during TGRS construction will be limited to waste characterization and initial system performance testing. Groundwater monitoring was conducted at the Site in early 2012 and will not be conducted as part of the construction activities (except for newly constructed wells). It is anticipated that a baseline sampling round will be conducted prior to system startup, which is anticipated in 2014. Additional groundwater monitoring requirements associated with the TGRS will be considered separately as part of the Monitoring and Compliance Program for the Site.

Characterization and system performance testing samples to be collected during the project include:

- Drilling mud and soil cuttings from well installation;
- Groundwater from well development activities;
- Groundwater samples from newly constructed wells;
- Decontaminated asphalt debris from on-Property grading activities;
- Decontamination rinse water;
- Excess soil from trenches for belowground pipeline installation;
- Screened rocks and debris from both on- and off-Property native backfill material; and
- Influent, intermediate, and effluent treatment plant samples, once the system is installed.

Sampling procedures including: collection, containerization, preservation, custody transfer, laboratory analysis, data quality, and documentation are discussed in this section.

7.1 SAMPLE CONTAINERIZATION AND PRESERVATION

Sample containers will be furnished by the analytical laboratory and will be pre-preserved by the laboratory where appropriate. The analytical laboratory will additionally supply coolers and trip blanks where appropriate.

7.2 SAMPLE CUSTODY

Sample custody procedures are designed so that field custody of samples will be fully and continuously maintained and documented. These procedures provide complete identification and documentation of the sampling event and the sample chain-of-custody (COC) from shipment of sample bottleware through sample collection to receipt of the samples by the laboratory. When used in conjunction with the laboratory's custody procedures, these procedures will establish full legal custody and allow complete

traceability of a sample from preparation and receipt of sample bottleware to sample collection, preservation, shipping and laboratory receipt, sample analysis, and data validation.

7.3 SAMPLE COLLECTION

Representative samples will be collected of each waste stream or groundwater source. Where there are multiple containers from the same source, a composite sample will be collected to ensure the representativeness of the sample. Upon collection, the sample will be labeled with a unique identification name, date, and time. The sample information, number and type of containers, preservation method, requested analytical methods, and laboratory turnaround time will be recorded on a laboratory supplied COC form. The same information will additionally be entered into a field sample log retained at the construction trailer. If required, disposable sampling equipment will be used to eliminate the potential for cross-contamination.

The CQA Officer or his designee will verify the accuracy of all sample information recorded on the COC prior to transfer of custody to the laboratory courier. Samples will be placed in a cooler with ice and maintained in the sampler's presence or in a secure location for the remainder of the daily sampling activities or until custody is transferred to another party.

7.4 SAMPLE SHIPPING

All waste and groundwater samples collected during TGRS construction will be picked up directly from the construction trailer by the laboratory courier. No samples will be shipped overnight by commercial couriers. At the time of sample pickup, the sampler will relinquish the samples to the courier, who will also sign the COC. A copy of the signed COC will be kept on file at the construction trailer. All samples will be delivered to the laboratory for analysis within 24 hours.

7.5 LABORATORY CUSTODY PROCEDURES

Upon receipt, the analytical laboratory will accept custody of the samples and sign the COC. Samples received by the laboratory will be carefully checked for label identification and complete, accurate COC records. The sample temperature will be measured upon arrival by measuring a temperature blank that will be shipped with the samples. Each sample will then be assigned a unique laboratory identification number through a computerized Laboratory Information Management System (LIMS) that stores identifications and essential information. The LIMS system will track the sample from storage through the laboratory system until the analytical process is completed and the sample is properly disposed.

An analytical laboratory has not yet been selected for the TGRS construction project. However, one of the analytical laboratories previously used for environmental investigation activities at the Montrose Site will be selected (e.g., Calscience Environmental Laboratories or Test America, Inc.). Personnel and the laboratories performing the tests are qualified and the equipment and procedures to be used comply with applicable standards.

7.6 DATA QUALITY ASSESSMENT AND VALIDATION

Only data collected that will support the implementation of the ROD will undergo data validation. Data validation will not be done for waste characterization samples. Full raw data packages will be requested for 100% of the groundwater analytical data generated during TGRS construction activities. At least 10% of the analytical results will be validated in accordance with USEPA Tier 3 or State Level IV validation requirements (highest level of validation review). The remaining 90% of the analytical results will be validated using Tier 2 or Level III requirements. The results of data validation review will be documented in a data validation report and data quality assessment.

Any laboratory results classified as “R” by the validator will be rejected and not used as groundwater data. If the rejected data affects the groundwater data interpretation, then the results will be discarded and new samples will be collected for laboratory analysis. Rejected data will also be brought to the attention of the Project Coordinator and subsequently reported to USEPA and the State of California.

7.7 DATA PRESENTATION

Laboratory data will be provided to USEPA and DTSC as electronic data deliverables (EDDs) or electronic database (i.e., MS Access file). Electronic data deliverables will be provided to USEPA and the DTSC in accordance with the methods previously used during soil and groundwater investigation activities at the Site and in accordance with the data management plan prepared by Hargis + Associates, Inc in 2004 (H+A, 2004). The TGRS construction project is not expected to generate a significant amount of laboratory data, limited primarily to waste characterization and initial system performance testing. The database will also include relevant data for monitoring wells including groundwater and wellhead elevations.

8.0 WASTE DISPOSAL

Waste generated during TGRS construction activities will be classified in accordance with State and Federal regulations. After reviewing the results of the waste characterization sampling analyses, *de maximis* will conduct a waste determination. Once completed, a waste profile sheet will be prepared for each characterized waste stream for submittal to the appropriate disposal facility. The waste profile will be signed by *de maximis* on behalf of Montrose and submitted to the waste disposal facility for approval. Once a profile is approved, a uniform hazardous or non-hazardous waste manifest will be completed and reviewed *by de maximis* for completeness and accuracy prior to signature by the *de maximis*.

In accordance with the Partial Consent Decree and prior to transporting any waste materials for off-Site disposal, a determination will be obtained from USEPA that the receiving facility is operating in compliance with 42 USC § 9621(d)(3) and 40 CFR §300.440. For receiving facilities located outside of California, the appropriate state environmental official and USEPA Project Coordinator will be notified in writing in advance of shipment. The aforementioned written notification applies to waste volumes exceeding 10 cubic yards and will include at a minimum: (1) the name and location of the receiving facility, (2) the type and quantity of waste material, and (3) the shipping schedule, and (4) the method of transportation. The above notification will be made for each disposal facility located outside of California.

The transporter will sign the manifest at the time of waste pickup. The CM, in conjunction with a *de maximis* representative, will verify that the correct waste container is picked up by the transporter and that the waste containers are in good condition, properly labeled, and otherwise packaged correctly prior to off-Site transportation. A copy of the waste manifest will be retained at the construction trailer, and the CM will also retain a waste log documenting all loads transported for off-Site disposal. A copy of the waste manifest will also be retained by *de maximis* whenever waste is sent off-Site for disposal.

Once a waste load has reached the disposal facility, a facility representative will sign the manifest and distribute copies as required, completing the procedure for cradle-to-grave documentation of the waste disposal process. Completed final copies of waste manifests, and associated weigh tickets where applicable, will be provided to *de maximis*, USEPA, and the State. Waste management is additionally discussed in the TGRS construction SMP and HASP.

9.0 DOCUMENTATION

9.1 RECORD KEEPING

Construction records will be kept daily and will be prepared by the CQA Officer or his designee. The records will include a summary of daily construction activities and supporting inspection data sheets, where appropriate. A daily construction record form is provided in Appendix A. At a minimum, the daily record will include the following information:

- Date, project name, location, and other identification
- Description of weather conditions, including temperature, cloud cover, and precipitation
- Reports on any meetings held and their results
- Record of visitors to the Site
- Locations of construction underway during that day
- Equipment and personnel working in each activity
- Descriptions of work being inspected/tested and inspection/test results
- Materials and system equipment delivered to the Site
- Descriptions of problems or delays and resolution
- Communications with contractor staff
- Construction activities completed and/or in progress
- Progress photos, where applicable

Daily construction records will be kept on file at the construction trailer and copies will be submitted to the AECOM Project Manager.

9.2 CONSTRUCTION PROGRESS REPORTS

In accordance with the Partial Consent Decree, monthly construction progress reports will be submitted to USEPA and the State of California. The reports will document the progress of TGRS construction and will include associated CQA data, testing results, inspection reports, and photographs, where appropriate. Any problems that arise during construction, and the associated corrective measure, will be identified in the progress reports. *de maximis* will submit the monthly progress reports on behalf of Montrose, and AECOM will provide routine weekly updates and documentation to *de maximis* for use in preparing the report. A weekly summary construction report form is provided in Appendix A.

9.3 INSPECTION AND TESTING REPORT FORM

Report forms will be completed for inspections and tests conducted. The forms vary depending on inspection and test type. Representative forms for several types of inspection and testing reports are included in Appendix A. These forms include:

- Description or title of the inspection activity
- Location of the inspection activity or location from which the sample was obtained
- Recorded observation or test data
- Results of the inspection activity
- Personnel involved in the inspection activity
- Signature of the inspector

9.4 RECORD DRAWINGS/AS-BUILT DRAWINGS

Modifications to the TGRS Remedial Design drawings or specifications that occur during construction will be documented as red-line revisions in the field. A master set of red-line field revisions will be kept on file at the construction trailer and made available for review by the Project Coordinator, Geosyntec, CH2M Hill, and other inspectors. The CM and CQA Officer will be responsible for updating the red-line drawings and specifications as changes are made during TGRS construction. These red-line record drawings will be used to update the design drawings to as-built status at the completion of the work. The as-built drawings will record approved actual field conditions upon completion of the work. Where there was a change to a specified material, dimension, location, or other feature, the as-built drawing will indicate the work performed.

A number of EPA comments on the Remedial Design drawings and specifications (USEPA, 2012) were identified as being resolved during construction (*de maximis*, 2012). The resolution of these comments will be documented as red-line revisions to the drawings and specifications and subsequently documented in the as-built drawings submitted to USEPA and the State of California as part of the Construction Completion Report.

9.5 CONTROL OF QUALITY RECORDS

The CQA Team verifies QA record accuracy and maintains copies of all quality-related documentation. This includes, but may not be limited to:

- Daily Construction Records
- Weekly Construction Summary Reports

- Inspection Checklists
- Leak Test Report Forms
- Concrete Pour Logs
- Equipment and Material Data Sheets
- Laboratory Analytical Reports and COC Forms
- RFIs
- Geotechnical Reports
- Special Inspections Documentation/Reports
- Non-Conformance Reports
- Waste Manifests

While the project is in progress, these records will be stored at both the AECOM office in Long Beach, California and the temporary field construction trailer at the Montrose property. Originals of records originating from, or originally received at, the Long Beach office, will be stored there. Originals of records originating from, or originally obtained in, the field, will initially be stored in the field office. At the completion of the project, all original records maintained in the field office will be transferred to the Long Beach office, and a copy of all records, either as hard copy or electronic, will be provided to *de maximis*. Both storage locations will have fire-resistant facilities. All records will be available for inspection and audit by *de maximis*, USEPA, DTSC, and other regulatory or oversight personnel.

9.6 FINAL REPORTING

In accordance with the Partial Consent Decree, a Construction Completion Report will be submitted to USEPA and the State of California within 60 days following approval of the final construction inspection. The report will provide a summary of the final construction inspection and report any deviations from the construction workplans. The results of CQA inspections and associated testing will be summarized in the report. The report will also provide a summary of the wellfield evaluation and treatment system testing results. As-built drawings signed and stamped by a California-registered Professional Engineer will be included with the Construction Completion Report. The report will provide documentation demonstrating that construction of the TGRS is complete and ready for operation.

10.0 REFERENCES

AECOM, 2012a — Health and Safety Plan, Montrose Superfund Site, 20201 Normandie Avenue, Los Angeles, California, April 23.

de maximis, 2012 — Letter to Mr. Kevin Mayer, U.S. EPA Region 9, Response to EPA's Final Design Comments dated August 7, 2012 Dual Site Groundwater Operable Unit Unilateral Administrative Order No. 2008-04A, Los Angeles, California, December 11.

Geosyntec, 2012 — Final Design Drawings and Specifications, Dual Site Groundwater Operable Unit, Unilateral Administrative Order No. 2008-04A, Los Angeles, California, June 5.

H+A, 2004 — Data Management Plan, Montrose Superfund Site, 20201 Normandie Avenue, Los Angeles, California, March 4.

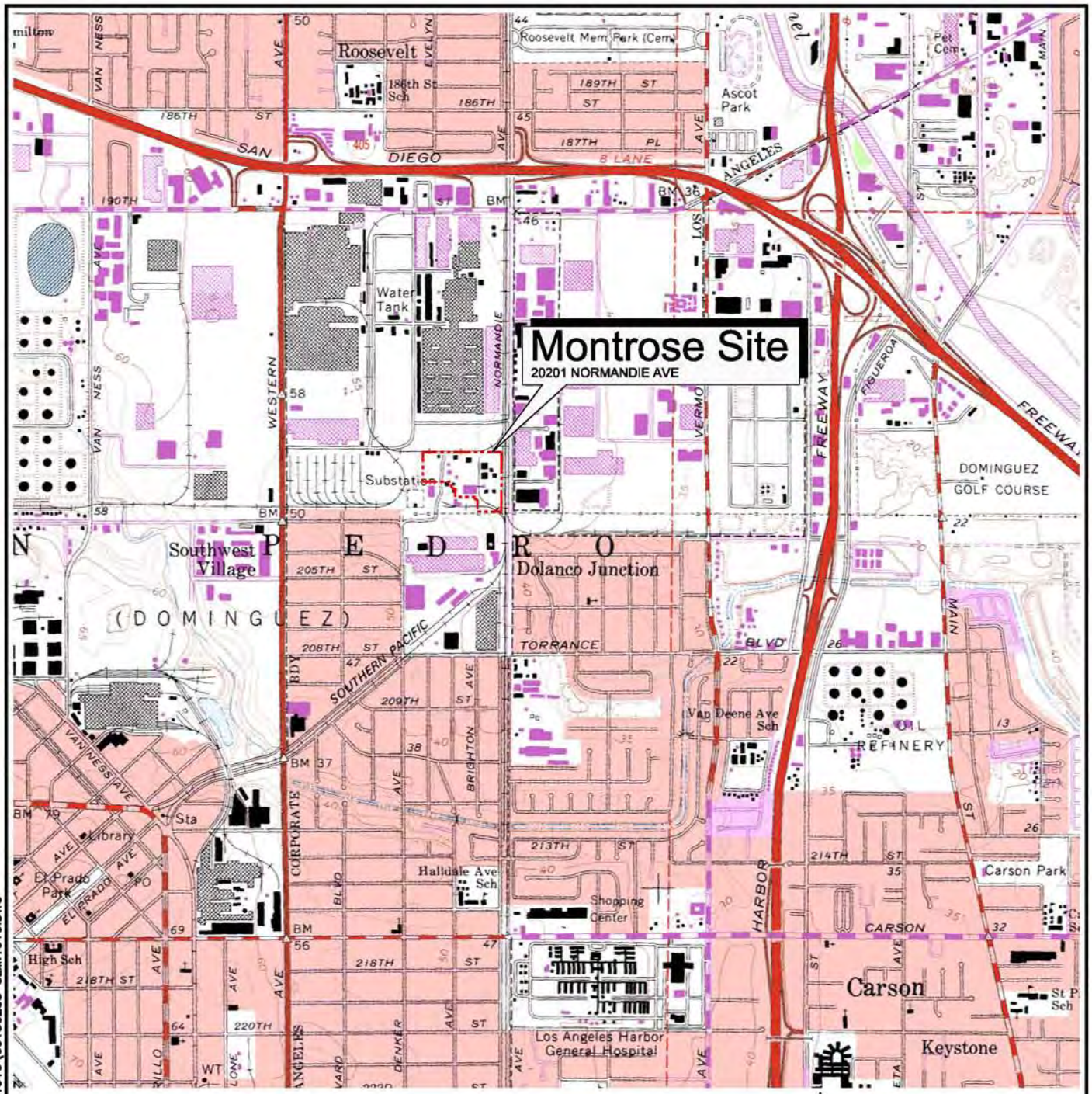
USEPA, 1998 — Final Remedial Investigation Report for the Montrose Superfund Site, Los Angeles, California, May 18.

USEPA, 1999 — Record of Decision for Dual Site Groundwater Operable Unit, Montrose Chemical and Del Amo Superfund Sites, Volume I: Declaration and Decision Summary, March.

USEPA, 2012a — Partial Consent Decree, Construction of the Dual Site Groundwater Operable Unit Treatment System, August 22.

USEPA, 2012b — Letter to Mr. Joe Kelly, President, Montrose Chemical Corporation of California, Approval of Final Dual Site Groundwater Operable Unit Remedial Design Report, Unilateral Order No. 2008-04A, Dual Site Groundwater Operable Unit, Montrose Chemical and Del Amo Superfund Sites, Los Angeles, California, September 19.

FIGURES



Reference:

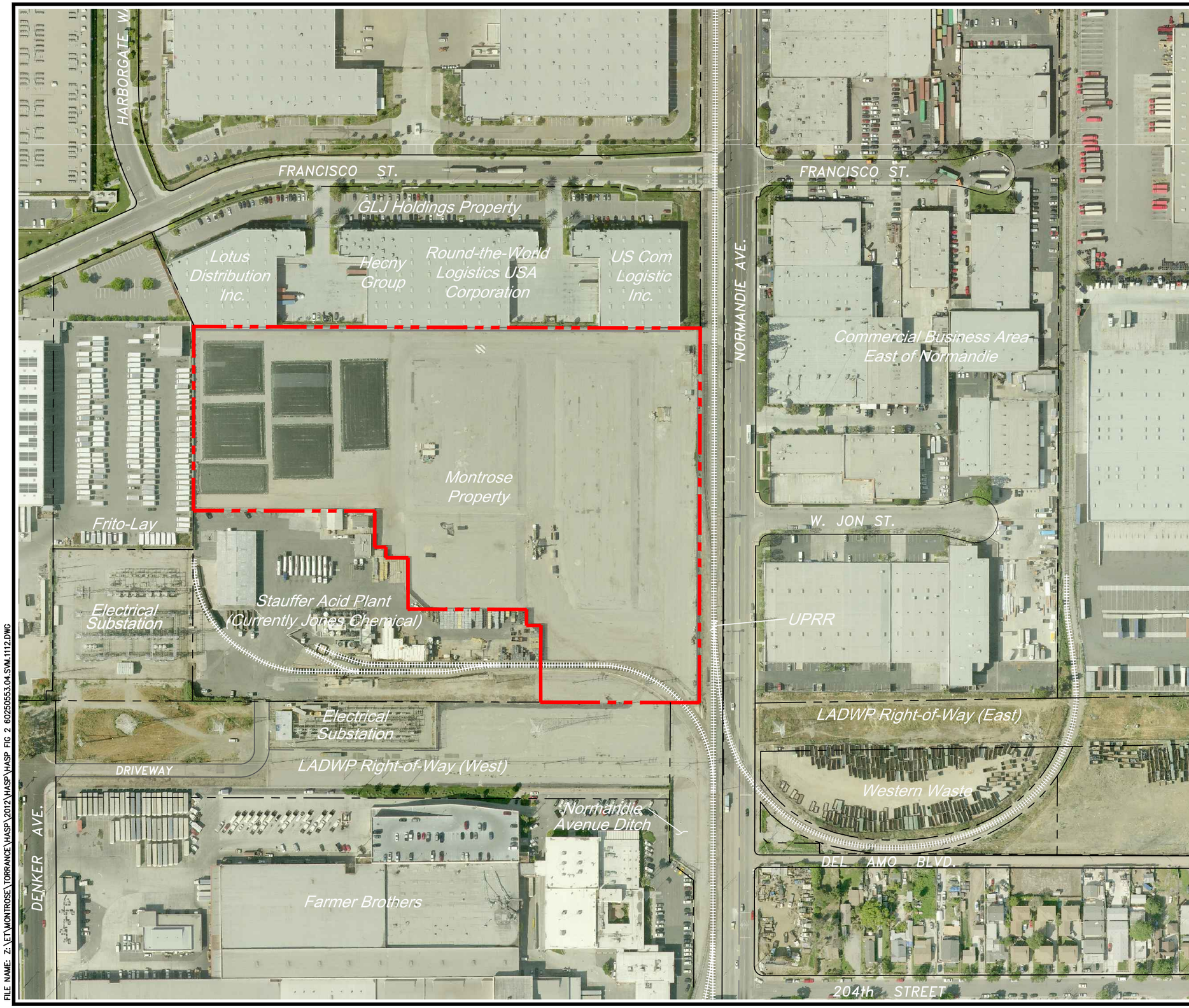
1. U.S.G.S. Topographic Map, Torrance, California 7.5 Minute Quadrangle. Georeferenced using the State of California's CASIL On-line GIS Database, Copyright 2010.

Montrose Chemical Corporation

Site Location Map

Date: 10-10	Montrose Superfund Site	Figure
Project No. 60150255	AECOM	1

FILE NAME: Z:\ET\MONTROSE\TORRANCE\SLM\2010\SLM.1010\60150255 SLM.1010.DWG



Legend:

- Location of Current Montrose Property Boundary
- Parcel Boundary / Right-of-Way
- LADWP — Los Angeles Department of Water and Power
- Existing Railroad Tracks

References:

1. Parcel Boundary Information from Los Angeles, CA, Department of Public Works, Online GIS data set, ©2009. Montrose Chemical Corporation Boundary Survey conducted August 13, 2001 by Dulin & Boynton Land Surveyors.
2. Satellite/Aerial Photos Reference: U.S.G.S Orthorectified Image, Dated July 29, 2009.

NORTH

0 100 200 FEET

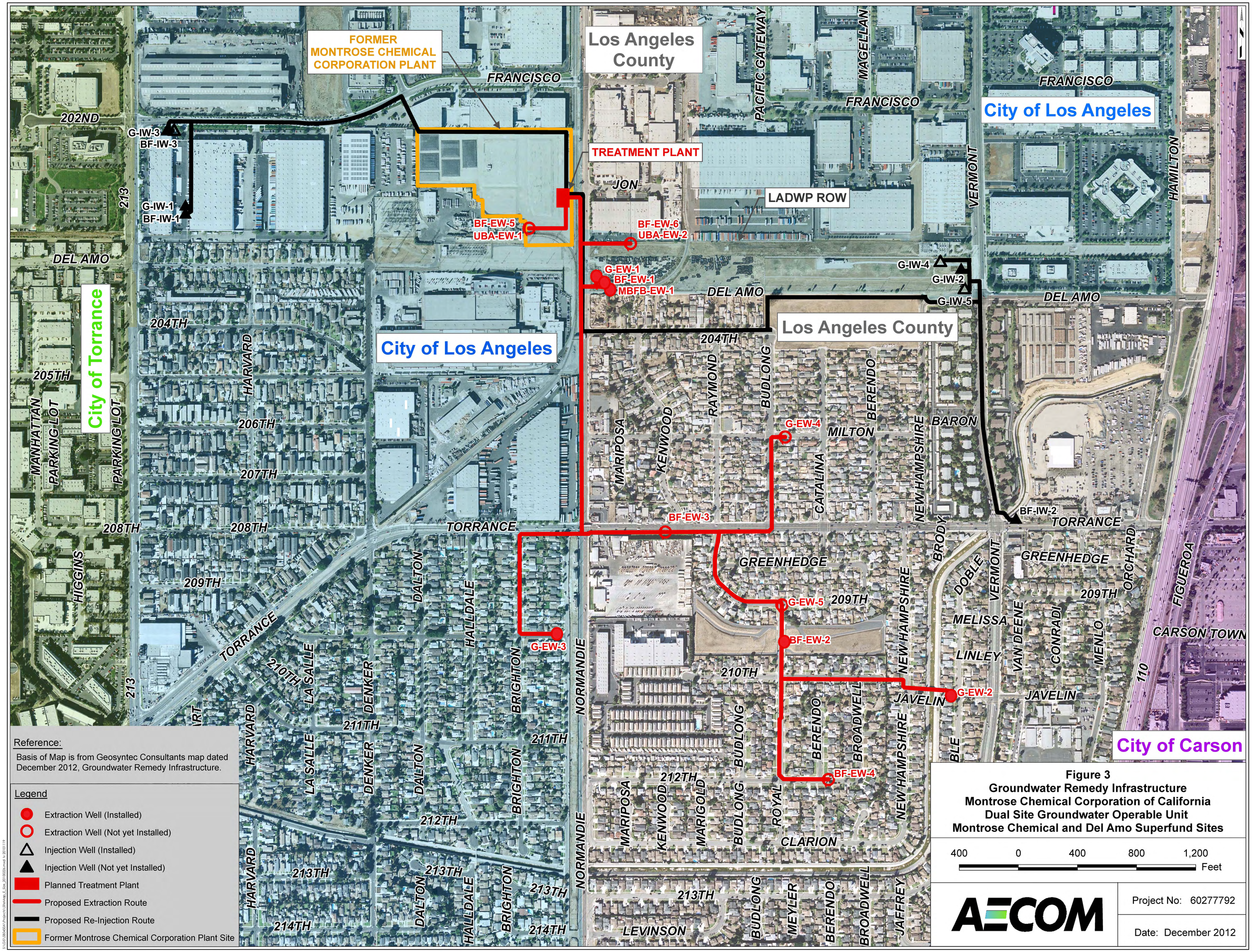
SCALE: 1"= 200'

Montrose Chemical Corporation

Site Vicinity Map

Date: 11-12	Montrose Superfund Site	Figure
Project No. 60250553	AECOM	2

FILE NAME: Z:\ET\MONTROSE\TORRANCE\HASP\2012\HASP\HASP FIG 2 60250553.04.SVM.1112.DWG



Reference:

Basis of Map is from Geosyntec Consultants map dated December 2012, Groundwater Remedy Infrastructure.

Legend

- Extraction Well (Installed)
- Extraction Well (Not yet Installed)
- Injection Well (Installed)
- Injection Well (Not yet Installed)
- Planned Treatment Plant
- Proposed Extraction Route
- Proposed Re-Injection Route
- Former Montrose Chemical Corporation Plant Site

Figure 3
Groundwater Remedy Infrastructure
Montrose Chemical Corporation of California
Dual Site Groundwater Operable Unit
Montrose Chemical and Del Amo Superfund Sites

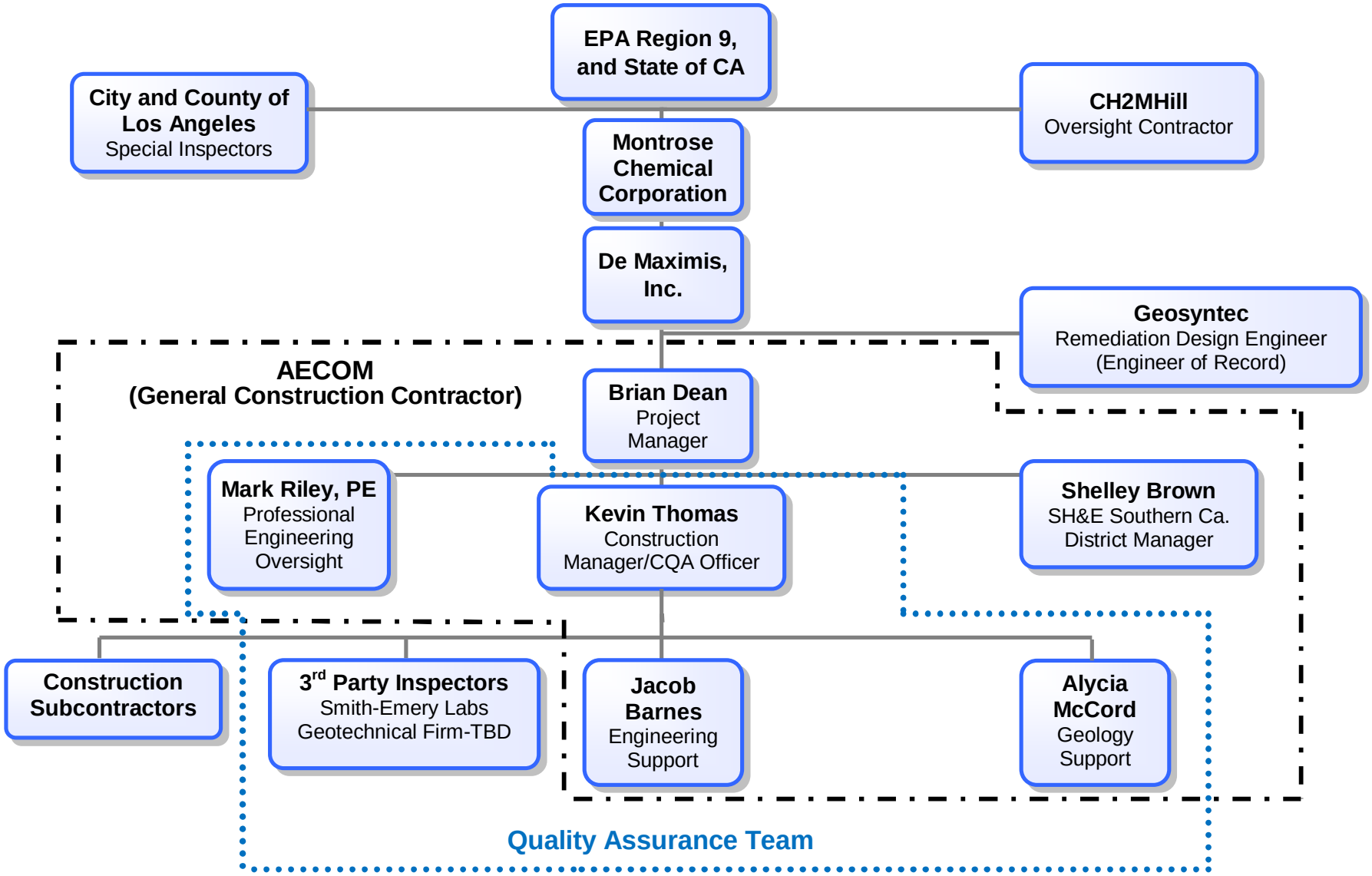
400 0 400 800 1,200 Feet

AECOM

Project No: 60277792

Date: December 2012

TGRS Construction
Montrose Superfund Site
Figure 4 Project Organization Chart



Notes:
CQA = Construction quality assurance

APPENDIX A

PROJECT FORMS

AECOM

Concrete Pour Log

Property Owner: _____

Project: _____

Contractor performing Work: _____ **Page:** _____ of _____

Date	Contractor performing Work	Pour No.	Location	Cubic Yards	Mix

AECOM

Daily Construction Report

Property Owner: _____ Page _____of_____

Daily Report No.: _____ Date: _____

Project: _____

Project No.: _____

Weather: A.M. _____ P.M. _____ Temp. (°F): High _____ Low _____ Rain ____

Contractor(s) _____

Contractor Super(s) _____

Contractor	No. of People

Major Constr Equip Description	Size/Capacity	No. On Site	No. In Use

Visitors	Representing

Planned Activities for Next Working Day:

Materials/System Equipment Delivered:_____

_____

Inspections:_____

_____

AECOM

Daily Construction Report

Property Owner: _____ Page _____of_____

Daily Report No.: _____ Date: _____

Project: _____

Project No.: _____

Daily Notations:_____

Project Representative_____

AECOM

Field Inspection Checklist –Earthwork

(To Be Completed Daily during Earthwork)

Property Owner: _____

Date: _____

Project :_____

Contractor performing Earthwork: _____

	Description	YES	NO	N/A
A	GENERAL			
1.	Is area released for work?			
2.	Is equipment adequate?			
3.	Are existing structures and utilities adequately protected?			
4.	Is removed material properly dispositioned?			
5.	Haul routes maintained for dust control?			
B	EXCAVATING AND TRENCHING			
1.	Does completed depth and configuration comply with drawings and specs?			
2.	Required shoring and bracing in place?			
3.	Existing utilities protected?			
C	PLACING AND COMPACTING BEDDING AND FILL			
1.	Excavation properly compacted and verified by Geotechnical Contractor?			
2.	Approved bedding and backfill material is used?			
3.	Is bedding fully compacted to support pipe, conduit, and/or utility?			
4.	Is pipe, conduit, and/or utility placed belowground in compliance with drawings and specs?			
5.	Approved fill material used?			
6.	Is proper compaction of fill attained and verified by Geotechnical Contractor?			
D	GRADING AND RESURFACING			
1.	Approved grading material used?			
2.	Sufficient slope for positive drainage away from structures to drainage system?			
3.	Is rough grading reasonably even and free of irregularity and allowance made for finish grading?			
4.	Is finished grade cleaned of all loose and foreign material?			
5.	Is finished grade smooth and even in profile?			
6.	Is resurfacing performed in compliance with drawings and specs?			

Project Representative_____

AECOM

Leak Test Report Formt

Property Owner: _____ Page _____of_____

Date: _____

Contractor Performing Leak Test:_____

Leak Test Description: _____ Leak Test Data_____

Type of Pipe	Size	Location	Air	H2O	Start Time	End Time	Beg. psi	End psi

Notes:

Project Representative_____

AECOM

Nonconformance Report

Property Owner: _____ Page _____of_____

Report No.: _____ Date: _____

Project:_____

Observed Nonconformance:_____

_____

_____

_____

_____

_____

See Daily Construction Report No.:_____

Contractor has been notified by:_____

Date:_____ ☐ **Verbally** ☐ **In Writing**

Deficiency has been corrected. See Daily Construction Report No.:_____

Date:_____

By:_____

Corrective measures are acceptable. See Daily Construction Report No.:_____

Date:_____

By:_____

Comments:_____

_____

_____

_____

_____

_____

Attachment Identification:_____

_____

_____

Prepared by:_____

Project Representative

Date:_____

Request for Information

AECOM

Property Owner: _____ Date: _____

Project: _____ RFI No. _____

To:	Drawing No.:
From:	Specification Ref:

Subject:

Clarification Requested:

Submitted By:_____

Signature: _____ Date:_____

Response:

Name:_____ Title:_____

Company:_____

Signature:_____ Date:_____

Property Owner: _____ Page _____of_____

Weekly Report No.: _____ Date: _____

Reporting Period:_____

Project: _____

Construction Progress:_____

Materials and Equipment Delivered:_____

Meetings:_____

AECOM

Weekly Summary Construction Report

Property Owner: _____ Page _____of_____

Weekly Report No.: _____ Date: _____

Reporting Period:_____

Project: _____

Site Visitors:_____

Inspections:_____

Planned Activities:_____

List of Attachments including Photographs (if any):_____

Project Representative_____