WORK PLAN

GROUNDWATER PROJECT WORK PLAN

PACIFIC COAST PIPELINE (PCPL) SUPERFUND SITE
FILLMORE, CALIFORNIA

Prepared for

Chevron Environmental Management Company
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June 15, 2012

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GROUNDWATER PROJECT WORK PLAN

CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
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This groundwater project work plan describes the remedial design process that will be implemented for a groundwater remedy at the Texaco Pacific Coast Pipeline (PCPL) Superfund Site (Site) located in Fillmore, California.

No express or implied representation or warranty is included or intended in this report except that the work was performed within the limits prescribed by Chevron with the customary thoroughness and competence of professionals working in the same area on similar projects.

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ACRONYMS

ANSR	Accelerated Natural Sulfate Reduction
AS	Air Sparging
ARARs	Applicable or Relevant and Appropriate Requirements
BA	Bachelor of Arts
BS	Bachelor of Science
CGWP	Certified Groundwater Professional
CHG	Certified Hydrogeologist
CIH	Certified Industrial Hygienist
Chevron	Chevron Environmental Management Company
CD	Consent Decree
COC	Constituent of Concern
DTSC	Department of Toxic Substances Control
EPA	Environmental Protection Agency
EO 11988	Executive Order 11988
FSP	Field Sampling Plan
LARWQCB	Los Angeles Regional Water Quality Control Board
LNAPL	Light Non-Aqueous Phase Liquid
MS	Masters of Science
MCL	Maximum Contaminant Level
MNA	Monitored Natural Attenuation
NELAP	National Environmental Laboratory Accreditation Program
NCP	National Contingency Plan
NPL	National Priorities List
PCPL	Pacific Coast Pipeline
PCR	Polymerase Chain Reaction
PLFA	Phospholipid Fatty Acids
PRP	Potentially Responsible Party
PE	Professional Engineer
PG	Professional Geologist
QAPP	Quality Assurance Project Plan
RAOs	Remedial Action Objectives
RPM	Remedial Project Manager
ROD	Record of Decision
RI/FS	Remedial Investigation / Focused Feasibility Study
RBCs	Risk-Based Concentrations
SAP	Sampling and Analysis Plan
Site	Pacific Coast Pipeline
SRB	Sulfate-Reducing Bacteria
SWRCB	State Water Resource Control Board
URS	URS Corporation

1.0 INTRODUCTION

On behalf of Chevron Environmental Management Company (Chevron), working under an environmental services agreement on behalf of Texaco Inc., URS Corporation (URS) has prepared this groundwater project work plan to specifically address impacted groundwater at the Pacific Coast Pipeline (PCPL) Superfund Site (Site) located in Fillmore, California (Figure 1). Chevron is the sole Potentially Responsible Party (PRP). The lead regulatory oversight agency is the U.S. Environmental Protection Agency (agency or EPA).

The groundwater project work plan was prepared in general accordance with a document entitled *EPA Oversight of Remedial Designs and Remedial Actions Performed by Potentially Responsible Parties (Quick Reference Fact Sheet)* dated February 1990 (EPA, 1990a), *Guidance on EPA Oversight of Remedial Designs and Remedial Actions Performed by Potentially Responsible Parties (Interim Final)* dated April 1990 (EPA, 1990b), *Scoping the Remedial Design (Quick Reference Fact Sheet)* (EPA, 1995a), and the *Remedial Design / Remedial Action Handbook* (EPA, 1995b).

In September 2011, the EPA issued an amended Record of Decision (ROD) for the Site (EPA, 2011). The EPA selected a specific remedy to address impacts within two separate groundwater plumes (northern and southern) located beneath the Site. The selected remedy for the northern groundwater plume due to lower overall constituent concentrations was Monitored Natural Attenuation (MNA). A multiple technology remedy was selected by the agency to actively address impacts present in the southern groundwater plume. A detailed analysis of each technology was provided in the final Remedial Investigation / Focused Feasibility Study (RI/FS) dated January 14, 2011 (URS, 2011). The groundwater monitoring network for each groundwater plume (including the plume configuration) is shown on Figure 2. The amended ROD is provided as a reference in Appendix A.

In both plumes, benzene is the primary constituent of concern (COC). Toluene (a less toxic compound) is also being addressed since constituent concentrations are slightly above the regulated Maximum Contaminant Level (MCL). The progress of each selected remedy will be evaluated based solely on these two COCs. The remaining historically detected constituents no longer pose a risk to human health and the environment as stated in the amended ROD (Page 35, Section 7.1.2.1).

This groundwater project work plan is focused exclusively on the groundwater remedy defined in the amended ROD. A separate work plan will be prepared for the shallow soil remedy at the Site.

The EPA also issued a decision regarding compliance with Applicable or Relevant and Appropriate Requirements (ARARs). The following were specified as being applicable to groundwater in the amended ROD (Page 76, Section 13.2).

- **Chemical-Specific ARARs:** MCLs will apply as prescribed in a basin plan prepared by the Los Angeles Regional Water Quality Control Board (LARWQCB).

- **Location-Specific ARARs:** Minimize potential harm within an identified floodplain with respect to Executive Order 11988, Floodplain Management (05/24/1977) ("EO 11988"). No impacts were identified with the groundwater remedy selected for the Site.
- **Action-Specific ARARs:** Cleanup to either background water quality or the best water quality that is reasonable if background water quality cannot be restored per State Water Resource Control Board (SWRCB) Resolution 92-49. Anti-degradation policy, which requires that high quality surface and groundwater be maintained to the maximum extent possible per SWRCB Resolution 68-16.

The ARARs that are specifically applicable to the groundwater remedy are listed in Table 1.

2.0 PROJECT ORGANIZATION

The project team is comprised of specialty subcontractors, environmental consultants, EPA, and Chevron. The lead regulatory agency is the EPA. A project organization chart is provided in Figure 3.

2.1 PROJECT TEAM

The EPA Remedial Project Manager (RPM) is Ms. Holly Hadlock. She is the key agency representative responsible for managing work performed by the PRP (Chevron). The EPA will also seek input from other local agency representatives including the City of Fillmore, County of Ventura, and Department of Toxic Substances Control (DTSC).

Ms. Leslie Klinchuch is the key contact managing environmental remediation activity for Chevron. She will be the main point-of-contact regarding any regulatory communications.

URS will provide engineering consulting services to Chevron. Mr. David Brod is responsible for managing project work. URS has at least two registered professionals responsible for overseeing work conducted at the Site. The geologic/hydrogeologic investigations will be conducted at the direction of Mr. Brian Partington. The engineering related tasks will be overseen by Mr. Allen Blodgett. The fieldwork will be conducted in accordance with safety plans generated by Ms. Susan Gulbrandsen. The quality assurance program will be implemented by Ms. Lily Bayati.

Key contacts for this project are summarized as follows:

Title	Organization	Name	Education	Registration / License	Experience (years)	Phone Number
Project Manager	EPA	Holly Hadlock	---	---	---	(415) 972-3171
Project Manager	Chevron	Leslie Klinchuch	Geology, BS	PG, CHG, CGWP	21	(661) 654-7269
Project Manager	URS	David Brod	Anthropology, BA	---	21	(310) 343-6970
Technical Lead (Geology)	URS	Brian Partington	Geology, BS	PG, CHG	16	(714) 648-2803
Technical Lead (Engineer)	URS	Allen Blodgett	Civil Engineer, BS, MS	PE	34	(714) 648-2795
Health and Safety	URS	Susan Gulbrandsen	Health Science, BS, MS	CIH	25	(805) 964-6010
Quality Assurance	URS	Lily Bayati	Chemistry, BS	---	22	(909) 980-4000
Field Personnel	URS	Jon Sanks	Geology, BS	PG	7	(714) 648-2849
Subcontractor	Drilling	WDC BC2	---	C-57	---	(800) 974 2769 (714) 449-2990
Analytical Testing	Laboratory	Test America	---	NELAP	---	(949) 261-1022

Chevron will select licensed contractors qualified to install system components associated with each groundwater remedy planned for the Site. A general contractor will maintain an active license to operate

in California. A driller will maintain an active license to install/destroy wells within Ventura County. The groundwater remedial systems will be operated by qualified contractors reporting directly to Chevron. The EPA will be presented with a list of contractors (along with qualifications) prior to commencing construction activity at the Site.

2.2 COMMUNITY RELATIONS

The EPA coordinates community involvement activities for the Site with support from Chevron. The community outreach program may include communications to local representatives and community stakeholders with progress at the Site. All community involvement activities conducted by Chevron may be subject to EPA oversight.

In addition, nearby residents and the school district will be informed when fieldwork activity is planned via bilingual notification postcards or flyers approved by EPA and distributed by Chevron a minimum of one week in advance of scheduled activities. Inquiry from the public is highly variable and as such may be addressed directly by Chevron, and/or the EPA.

3.0 PROJECT DESCRIPTION

This section provides a brief description of the site background, remedial action objectives (RAOs), and groundwater remedy selected for each plume located beneath the Site. A majority of the critical decision documents referenced in this work plan are provided in electronic format in Appendix A. An annotated chronology of the regulatory history as well as previous investigations is provided in Appendix B.

3.1 SITE BACKGROUND

A brief site background is provided in this section, while a more detailed description was included in the final RI/FS (URS, 2011). The site background will be expanded as appropriate when submitting decision documents required for the actual RD.

3.1.1 Site Name and Location

The site is referred to as the PCPL Superfund Site. The EPA identification number for this site is CAD980636781. The Site is located along the eastern border of Fillmore, California (Figure 1).

3.1.2 Regulatory Authority

The EPA (Region 9) is the regulatory authority and lead agency administering the amended Consent Decree and Statement of Work (CD/SOW). The State of California is involved through the Department of Toxic Substances Control (DTSC). DTSC reviews and comments on deliverables submitted to the EPA.

The groundwater remedy will focus on the two remaining chemical constituents of concern (benzene / toluene) as identified in the amended ROD (Page 35, Section 7.1.2.1).

3.1.3 Current Operations

The remaining infrastructure currently includes limited subsurface conveyance piping, several concrete pads, former tank dike berms (fire walls), a deep water supply well, numerous groundwater monitoring wells, and a remedial contractor field office trailer. A chain linked fence is used to control access and currently encompasses the entire Site (as required by the amended ROD).

3.2 REMEDIAL ACTION OBJECTIVES

The RAOs for this project are defined by medium-specific criteria to be protective of human health and the environment at the Site. In accordance with the National Contingency Plan (NCP), the site-specific RAOs were developed to address (1) contaminants of concern, (2) media of concern, (3) potential exposure pathways, and (4) preliminary remediation levels. The basis for the RAOs is risk-based concentrations (RBCs) and ecological screening criteria, and ARARs selected for the Site

The RAOs specifically related to groundwater are listed below as stated in the amended ROD (Page 49, Section 8.1):

- Prevent use of contaminated groundwater and restore the aquifer to the most beneficial use, i.e., drinking water, within a reasonable time frame.

  Basis: This objective was established in order to prevent potential exposure to groundwater with contamination above regulatory limits and to restore the aquifer to its most beneficial use.

  Addressing Risk: Preventing use of contaminated groundwater will reduce to acceptable levels the risk associated with exposure to water with chemicals above drinking water standards.

The protection standards for groundwater will be met in part using institutional controls as described in the amended ROD (Page 52, Section 9.1). The institutional controls will be submitted as a separate document to the EPA in accordance with the CD/SOW.

3.3 SELECTED REMEDIAL ALTERNATIVE

This section presents a brief discussion of the selected groundwater remedy for the Site.

3.3.1 Southern Groundwater Plume

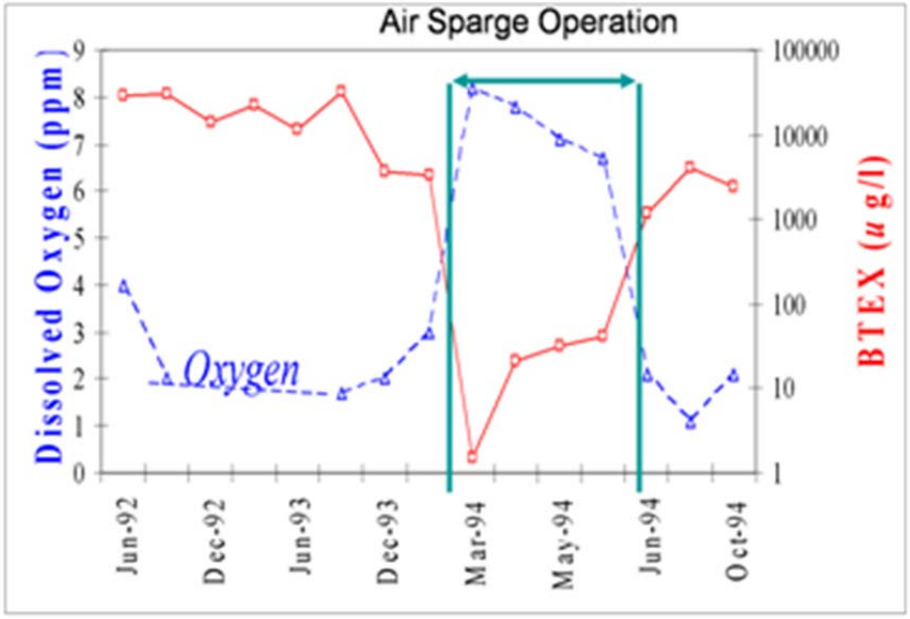
As described in the amended ROD (Page 67, Section 12.0), a multiple technology option was selected for the southern groundwater plume, which includes air sparging (AS) for up to 6 years, circulation of naturally occurring sulfate-rich groundwater for up to 9 years, and then MNA.

The years of operation are estimated based on the strengths of each selected technology. The AS estimate assumes benzene will be preferentially stripped (i.e., volatilized) from the LNAPL smear zone, thus, reducing the source concentration to a point where the remaining constituents are primarily present in the dissolved phase. The subsequent technology (i.e., groundwater circulation) will enhance biodegradation of the dissolved phase by mixing naturally occurring sulfate-rich groundwater from the deeper portion of aquifer with the shallower dissolved plume. The success of the second process will be driven primarily by sulfate/constituent "contact time."'. This process is referred to as Accelerated Natural Sulfate Reduction (ANSR). As discussed in the RI/FS (Section 5.2), sulfate is significantly more soluble in water and has a much higher biodegradation capacity as an electronic acceptor than oxygen (URS, 2011).

Groundwater remedy components will be implemented in phases to verify each technology will work at the Site. If successful, the sequential application of these two options in combination (followed by MNA) should achieve the remedial goals in less time than a single technology application as evaluated in the RI/FS and the multiple technology alternatives has fewer environmental impacts in terms of green and sustainable remediation than the single technology engineered remedies.

One additional important consideration for conducting the sequential application of these two technologies relates to the transition from an aerobic environment generated during AS to anaerobic conditions that are required for the sulfate-reducing environment when implementing the ANSR technology. The AS process is not likely to deliver sufficient oxygen to create strongly (or even mildly) long-term aerobic conditions, especially considering the depressed dissolved oxygen concentrations within the southern groundwater plume. It is expected that currently anaerobic conditions will rebound shortly after completing air sparging, which was the case during a field demonstration project conducted

by Sublette et al. (2006). In this case, dissolved oxygen returned to pre-sparge conditions within days as shown below:



Sublette et al. (2006) also used molecular biological tools (MBTs) to evaluate the changes in the subsurface microbial community following introduction of sulfate. The MBT results showed an increase in phospholipid fatty acids that are commonly found in anaerobic bacteria and are major components of sulfate-reducing bacteria (SRB). In addition, real-time polymerase chain reaction (PCR) results supported the phospholipid fatty acids (PLFA) analysis. For example, the PCR results showed a five-order of magnitude increase in concentrations of an anaerobic gene (bssA) in a monitoring well where dissolved oxygen was 3 mg/L prior to sulfate injection. These results taken together indicate that sulfate introduction shifted the subsurface microbial community structure to increased anaerobic character and increased proportions of SRB within a fairly short period of time.

LNAPL trapped in the source zone is already near the calculated residual saturation, thus recovery via hydraulic methods provides limited (if any) net environmental benefit at this Site. As such, the LNAPL recovery program will be terminated within the southern groundwater plume upon approval of the Performance Groundwater Monitoring Plan (URS, 2012b) submitted concurrently with this document. The only true net environmental benefit for free product reduction can be accomplished by changing the composition (i.e. benzene content) of the LNAPL via AS. Once the remaining volatile constituents have been preferentially stripped by air sparging, there will be no net environmental benefit to actively managing any remaining free product as a natural source zone depletion process will adequately address residual LNAPL (EPA, 2005; ITRC, 2009).

3.3.2 Northern Groundwater Plume

As described in the amended ROD (Page 68, Section 12.0), MNA was selected as the preferred remedy since the groundwater plume geometry is well characterized with multiple lines of evidence for natural attenuation as discussed in the RI/FS (URS, 2011), and the lack of LNAPL.

The potential for petroleum constituent vapor migration is very low due to natural degradation in the extensive vadose zone with groundwater at approximately 85 ft bgs, supported by data collected during the vapor study (URS, 2007). The cost of implementation was also a consideration since remediation funds would be better focused on the southern groundwater plume, which currently has LNAPL and elevated benzene concentrations extending beyond the property limits of the Site. In addition, the proposed technologies for the southern plume need to be proven successful before considering whether engineered remediation of the northern plume may reduce the timeframe to achieve RAOs.

4.0 PROJECT SCHEDULE

Based on discussions with the EPA, it is anticipated that select remedial design documents will be submitted while the agency prepares the CD/SOW.

A Gantt chart was prepared to track progress (including an estimated timeline for the CD/SOW). A process flow diagram for the groundwater remedial design is also shown on Figure 4. The Gantt chart for the groundwater remedy is provided in Appendix C.

The RD deliverables for the southern groundwater plume remedy include the following:

Task	**Schedule**
Preliminary Groundwater Remedial Design (AS and ANSR)	Thirty (30) days after receiving EPA approval of Groundwater Project Work Plan.
Pre-Final Groundwater Remedial Design	Forty-five (45) days after receiving EPA comments on Preliminary Groundwater Remedial Design.
Final Groundwater Remedial Design	Forty-five (45) days after receiving EPA comments on Pre-Final Groundwater Remedial Design.
Groundwater Remedial Action Work Plan including a Groundwater Contingency Plan	Thirty (30) days after receiving EPA approval of Final Groundwater Remedial Design.
Groundwater Construction Quality Assurance Plan	Thirty (30) days after receiving EPA approval of Final Groundwater Remedial Design.
Groundwater Plan for O&M	Draft submitted with Pre-Final Design. Final due thirty (30) days after Final Construction Inspection.
Groundwater Manual for O&M	Draft submitted with Pre-Final Design. Final due thirty (30) days after Final Construction Inspection.
Notification of Groundwater Construction Completion	Ten (10) days after construction completion.
Pre-Final Groundwater Construction Inspection	Thirty (30) days after submitting Notification of Groundwater Construction Completion.
Pre-Final Groundwater Construction Inspection Report	Fourteen (14) days after Pre-Final Groundwater Construction Inspection.
Final Groundwater Construction Inspection (if required)	Thirty (3) days after EPA approves Pre-Final Groundwater Construction Inspection Report.
AS Remedial Action Report	Draft due forty-five (45) days after EPA determines remedy is operational and functional. Final due twenty-one (21) days after receipt of EPA comments on draft.

Task	Schedule
ANSR Remedial Action Report	Draft due forty-five (45) days after EPA determines remedy is operational and functional. Final due twenty-one (21) days after receipt of EPA comments on draft.
Groundwater Progress Report	Quarterly until ANSR remedy completed, then semi-annually.

Assumptions:
1) Gantt chart assumes agency approval will be received within 90 days.
2) Agency approves the groundwater project work plan.
3) Intermediate design document not needed between Phases 1 and 2 of each technology since remedy is fairly straight forward for the Site.

The AS groundwater remedy will be implemented in a phased approach as there are logistical constraints to accessing the entire LNAPL area of the southern groundwater plume due to the location of Pole Creek channel (i.e., the creek bisects the plume North-South). Chevron will evaluate the remedy response for a six month operating period utilizing all sparge wells proposed east of Pole Creek (Phase I). If successful, additional wells may be installed to address potential LNAPL located west of Pole Creek (Phase II). The ANSR groundwater remedy may be installed across the entire plume (i.e., not a phased approach) pending results obtained during AS. The program details will be described further in the RD.

In addition, the southern plume components of the groundwater remedy will commence after completing the soil remedy (including rough grading to make the site ready for reuse) to avoid interference with infrastructure that will be installed as part of the groundwater RD. The soil remedy (including rough grading) fieldwork is currently anticipated in 2013. A proposed schedule for the groundwater remedy is listed in the Gantt chart (Appendix C).

MNA will be implemented in the northern groundwater plume as described in the *Performance Groundwater Monitoring Plan* (URS, 2012b) submitted concurrently with this document. Chevron will continue to monitor constituent degradation by reviewing analytical results obtained during routine groundwater monitoring events associated with the optimized groundwater monitoring network selected for the Site.

The EPA is currently reviewing a site-specific Sampling and Analysis Plan (SAP), which will include media specific requirements for a field sampling plan (FSP) and a Quality Assurance Project Plan (QAPP).

5.0 REFERENCES

Chevron, 2011. *Technical Meeting with EPA. Attended by Holly Hadlock (EPA), Leslie Klinchuch (Chevron), and Tom Sweet (URS). Presented an outline for the proposed Scope of Work (SOW).* October 2011.

EPA, 1990a. *EPA Oversight of Remedial Designs and Remedial Actions Performed by Potentially Responsible Parties (Quick Reference Fact Sheet).* February 1990.

EPA, 1990b. *Guidance on EPA Oversight of Remedial Designs and Remedial Actions Performed by Potentially Responsible Parties (Interim Final).* April 1990.

EPA, 1995a. *Scoping the Remedial Design (Quick Reference Fact Sheet).* March 1995.

EPA, 1995b. *Remedial Design / Remedial Action Handbook.* June 1995.

EPA, 1996. *Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures - EPA\540\S-95\504* April 1996.

EPA, 2005. *A Decision-Making Framework for Cleanup of Sites Impacted with Light Non-Aqueous Phase Liquids (LNAPL).* EPA/542-R-04-011, U.S. EPA OSWER, March 2005.

EPA, 2011. *Amended Record of Decision (ROD).* September 2011.

Interstate Technology & Regulatory Council (ITRC), 2009. *Evaluating Natural Source Zone Depletion at Sites with LNAPL*. ITRC, Washington, DC. April 2009.

URS, 2007. *Report of Natural Attenuation Characteristics and Soil Vapor Characteristics Above Dissolved-Phase Benzene Plumes - PCPL Superfund Site Fillmore, California.* November 13, 2007.

URS, 2011. *Remedial Investigation / Focused Feasibility Study (RI/FS) - PCPL Superfund Site Fillmore, California.* January 14, 2011.

URS, 2012a. *Draft Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan) – PCPL Superfund Site (Fillmore, California.* April 4, 2012.

URS, 2012b. *Performance Groundwater Monitoring Plan – PCPL Superfund Site (Fillmore, California.* June 15, 2012.

Sublette, K., A. Peacock, D. White, G. Davis, D. Ogles, D. Cook, R. Kolhatkar, D. Beckmann, and X. Yang. 2006. *Monitoring Subsurface Microbial Ecology in a Sulfate-Amended, Gasoline-Contaminated Aquifer.* Ground Water Monitoring & Remediation 26(2), 70-78.

Tables

Table 1
Applicable or Relevant and Appropriate Requirements
Texaco PCPL Superfund Site
Fillmore, California

Requirement	Jurisdiction	Citation	Description	Applicable or Relevant and Appropriate
Potential Chemical-Specific ARARs				
Primary Drinking Water Standards	State	22 CCR Section 64431 and Section 64444	California has promulgated drinking water standards for public drinking water sources under the California Safety Drinking Water Act (California Health and Safety Code [H&S Code] Section 4010 et. seq.). California primary MCLs are established to protect public health from contaminants that may be found in drinking water sources.	Relevant and Appropriate
Safe Drinking Water Act	Federal	40 CFR Section 141.11 - 141.16 Section 141.50 - 141.51	Establishes treatment standards for current potential drinking water sources by setting MCLs and on-zero MCLGs, which may be used for cleanup standards at the Site.	Relevant and Appropriate
Required Monitoring	State	23 CCR Chapter 15 Section 2550.7 Section 2550.10	Requires monitoring for the investigation and cleanup and abatement of discharges.	Relevant and Appropriate
California Water Code	State	California Law Division 7 Chapter 4 Section 13240 *et seq.*	The Water Quality Control Plan for the Los Angeles Region (Basin Plan, adopted November 19, 1992) contains numerical and narrative water quality objectives for waters of the state that ensure protection of beneficial uses and prevention of nuisances affecting beneficial use. These objectives are not merely restricted to surface water but also apply to groundwater (SWRCB, 1992).	Applicable
Potential Action-Specific ARARs				
SWRCB	State	Resolution No. 92-49	The *Policy and Procedures for Investigation and Cleanup and Abatement of Discharges under Water Code* Section 13304 derives its authority to maintain the highest quality of water (SWRCB Resolution No. 68-16) through waste discharge requirements as implemented through the federal National Pollutant Discharge Elimination System (NPDES) or RWQCB waste management and discharge requirements (27 CCR Section 20200 et seq.).	Applicable
SWRCB	State	Resolution No. 68-16	The *Statement of Policy With Respect to Maintaining High Quality of Waters in California* is the state's anti-degradation policy that provides a narrative standard which requires that high quality surface water and groundwater be maintained to the maximum extent possible.	Applicable
Required Standards for Management of Hazardous Waste	State	22 CCR Chapter 11 Chapter 12	Division 4.5, Chapter 12. Standards Applicable to Generators of Hazardous Waste (22 CCR §66262.10 - §66262.89): Determine the relevance by applying the "affirmative determination" that contamination is a RCRA waste. Also, in Chapter 11, §66261.3. Definition of Hazardous Waste. Identifies wastes subject to regulation. Contains requirements for off-site shipment of Hazardous Waste.	Applicable
Sources of Drinking Water (SWRCB)	State	Resolution No. 88-63	This policy specifies that ground and surface waters of the state are either existing or potential sources of municipal and domestic supply except water supplies with: a. Total dissolved solids exceeding 3,000 milligrams per liter, or b. Natural or anthropogenic contamination (unrelated to a specific pollution incident) that cannot reasonably be treated for domestic use using either best management practices (BMPs) or best economically achievable treatment practices, or c. The water source does not provide a sustained yield of 200 gallons per day.	Applicable
California Safe Drinking Water & Toxic Enforcement Act (Proposition 65)	State	Cal. HS&C Sections 25495.5-25495.13	Establishes that no person shall discharge a chemical known to the state to cause cancer or reproductive toxicity into water or onto or into land where chemical passes into any source of drinking water; requires warning before exposure to chemicals known to cause cancer or reproductive toxicity.	Relevant and Appropriate

Table 1
Applicable or Relevant and Appropriate Requirements
Texaco PCPL Superfund Site
Fillmore, California

Requirement	Jurisdiction	Citation	Description	Applicable or Relevant and Appropriate
Potential Action-Specific ARARs (continued)				
Ventura County Air Pollution Control District (VCAPCD)	State	VCAPCD Rules and Regulations	The VCAPCD regulations are established to achieve and maintain state and federal ambient air quality standards through the federal-approved state implementation plan (SIP).	Applicable
Regulation IV for Fugitive Dust	State	Rule 55	Emissions of fugitive dust shall not remain visible in the atmosphere beyond the property line of the emission source. Activities conducted in the South Coast Air Basin shall use best available control measures to minimize fugitive dust emissions and take necessary steps to prevent the track-out of bulk material onto public paved roadways as a result of their operations.	Applicable
Regulation IV for Particulate Matter - Concentration	State	Rule 52	Particulate matter in excess of the concentration standard conditions shall not be discharged from any source. Particulate matter in excess of 450 milligrams per cubic meter (0.196 grain per cubic foot) in discharged gas, calculated as dry gas at standard conditions, shall not be discharged to the atmosphere from any source.	Applicable
Regulation IV for Solid Particulate Matter - Weight	State	Rule 53	Solid particulate matter including lead and lead compounds discharged into the atmosphere from any source shall not exceed the rates Table 450(a) of Rule 405. Nor shall solid particulate matter including lead and lead compounds in excess of 0.23 kilogram (0.5 pound) per 907 kilograms (2,000 pounds) of process weight be discharged to the atmosphere. Emissions shall be averaged over one complete cycle of operation or one hour, whichever is the lesser time period.	Applicable
Potential Location-Specific ARARs				
Location-specific ARARs were not identified for the Site. This is consistent with past assessments conducted by the EPA.				
Potential Guidance and Advisories To Be Considered				
California Water Well Standards	State	DWR Bulletin 74-90	Standard well construction/destruction for water wells within California. The previous guidance was established in Bulletin 74-81.	---
Preliminary Remediation Goals	Federal	EPA Website	A risk-based screening tool established for multiple media (soil, water, and air) by EPA.	---

Notes:
- SWRCB = State Water Resource Control Board
- CCR = California Code of Regulations
- MCLs = Maximum Contaminant Levels
- MCLGs = Maximum Contaminant Level Goals
- DWR = Department of Water Resources
- ARARs = Applicable or Relevant and Appropriate Requirements
- DTSC = Department of Toxic Substances Control
- The DTSC provided an initial listing of ARARs in a letter dated August 11, 2009

Figures

N

0 500 1000

Scale in Feet

SITE LOCATION MAP

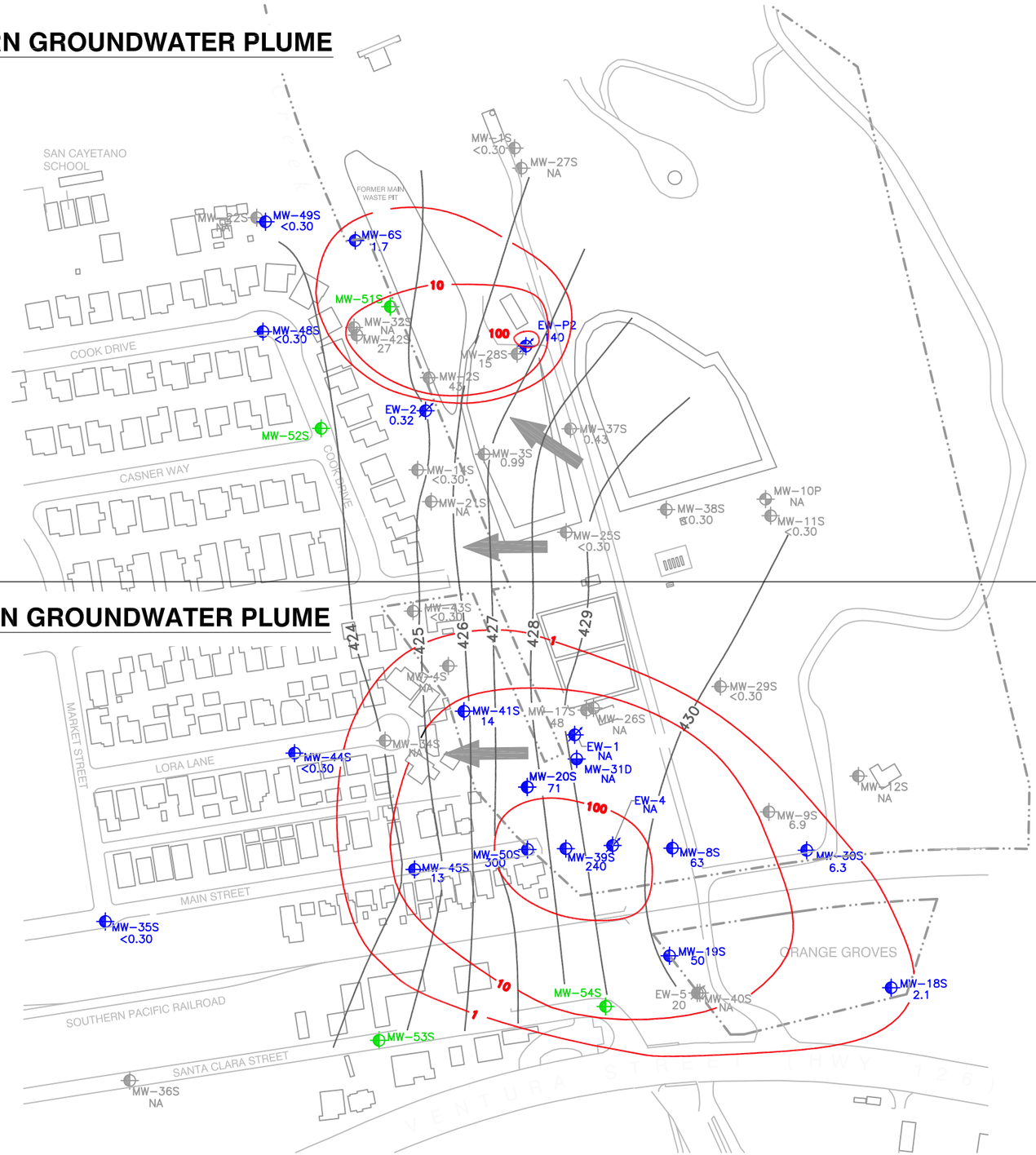
Project No.: 29875030	Date: March 2012	Project: Texaco PCPL (Fillmore Refinery)	Figure 1

K:\2012\Site Maps\Chevron PCPL\Fig 1 - Site Loc Map.ai

URS

NORTHERN GROUNDWATER PLUME

SOUTHERN GROUNDWATER PLUME



EXPLANATION

MW-6S	RETAIN EXISTING AQUIFIER I MONITORING WELL
EW-P2	RETAIN EXISTING AQUIFIER I EXTRACTION / MONITORING WELL
MW-31D	RETAIN EXISTING AQUIFIER II MONITORING WELL
MW-6S	DESTROY EXISTING AQUIFIER I MONITORING WELL
EW-5	DESTROY EXISTING AQUIFIER I EXTRACTION/MONITORING WELL
MW-10P	DESTROY EXISTING PERCHED MONITORING WELL
MW-56S	ADD AQUIFER I MONITORING WELL
31	BENZENE CONCENTRATION (MICROGRAMS PER LITER) (Q4 2011)
< 0.30	ANALYTE NOT DETECTED ABOVE LABORATORY REPORTING LIMIT (Q4 2011)
100 ?	BENZENE ISOCONCENTRATION CONTOUR, DASHED WHERE INFERRED, QUERIED WHERE UNCERTAIN (Q4 2011)
427	GROUNDWATER ELEVATION CONTOUR, DASHED WHERE INFERRED, QUERIED WHERE UNCERTAIN (Q4 2011)
	GROUNDWATER FLOW DIRECTION (APPROXIMATE)
NA	GROUNDWATER MONITORING WELL NOT PART OF SAMPLING PROGRAM

N

0 125 250 500

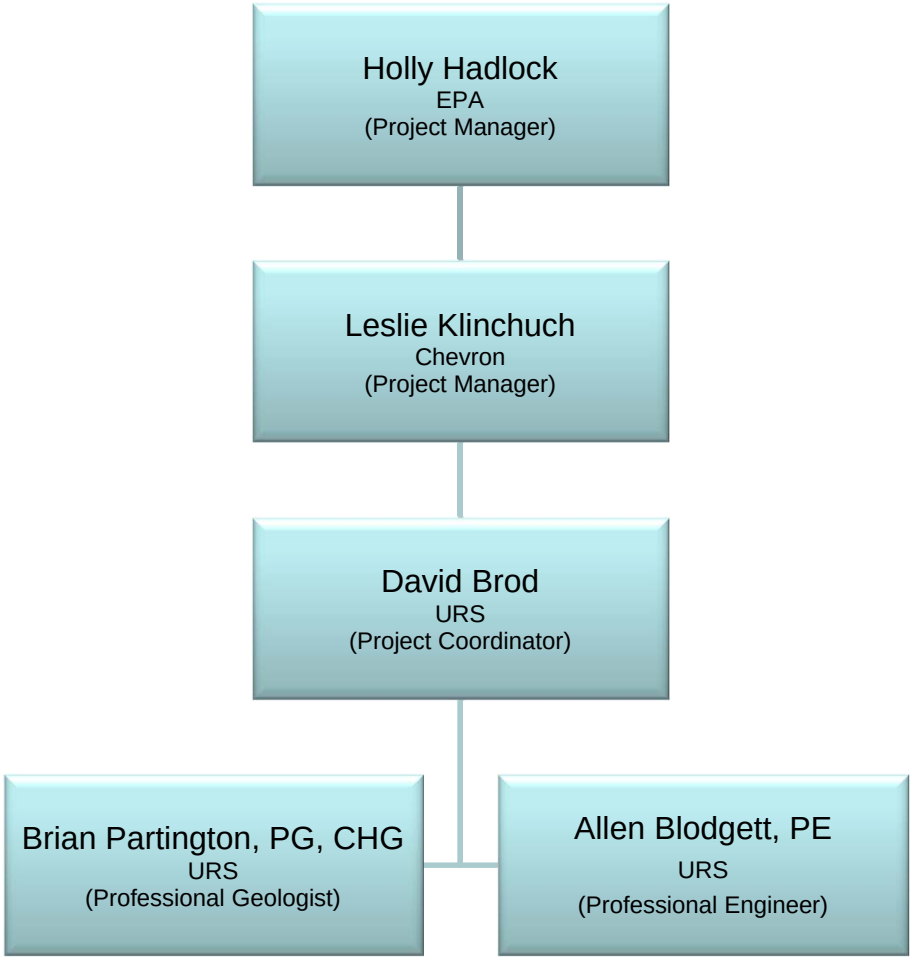
SCALE: IN FEET

URS

Groundwater Monitoring Network

Proj. No.:	29875030	Date:	May 2012
Project:	Texaco PCPL Superfund Site Fillmore, California	Figure:	2

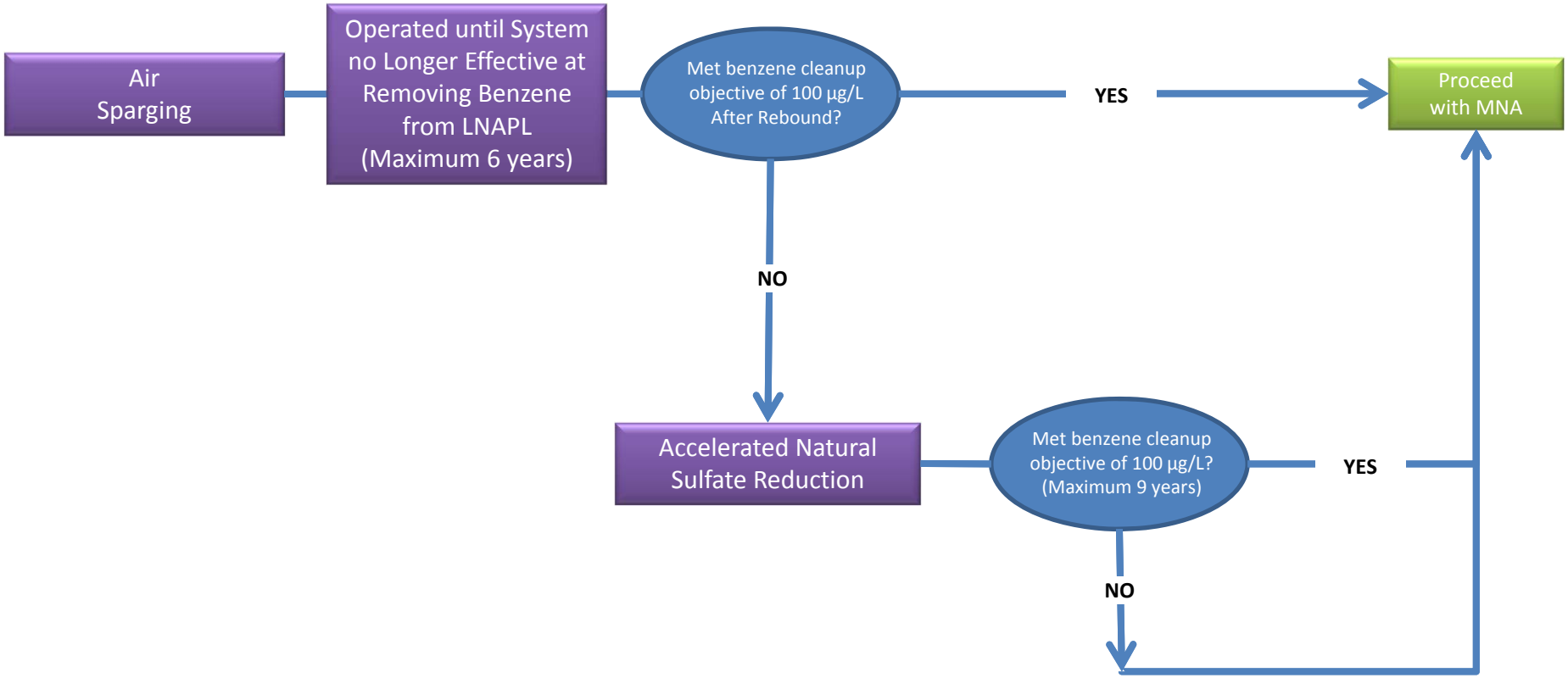
T:\2004\Chevron PCPL (Fillmore Refinery)\Deliverables (Finals In El Seg)\Work Plans\15. 120531--Prelim RD&RAWP For GW\Figures\Fig 02-Groundwater Network.dwg , File date: 5/25/2012 3:43 PM, Print date: 5/25/2012 3:43 PM by: Brian Partington



URS

PROJECT ORGANIZATION CHART

Proj. No.:	29875030	Date:	May 2012
Project:	TEXACO PCPL FILMORE, CALIFORNIA	Figure:	3



LNAPL = Light Non-Aqueous Phase Liquid

URS

PROCESS FLOW CHART FOR GROUNDWATER REMEDIAL DESIGN

Proj. No.:	29875030	Date:	MAY 2012
Project:	TEXACO PCPL FILMORE, CALIFORNIA	Figure:	4

T:\2004\Chevron PCPL (Fillmore Refinery)\Deliverables (Finals In El Seg)\Work Plans\15. 120615–GW Proj WP\Figures \Fig 04–RD flow chart CVX PCPL.pptx, Print date: 6/11/2012 2:49 PM by: Brian Partington

Appendix B

Site Regulatory History / Previous Investigations

FACILITY BACKGROUND

A chronology of the site regulatory history follows:

- **1980** – Investigation requested by Regional Water Quality Control Board (RWQCB).

- **1983 to 1989** – Voluntary ground water and soil assessment conducted under the Department of Health Services (DOHS) and RWQCB.

- **1986 -** Removed 38,000 tons of waste and contaminated soil from the former main waste pit and other small waste disposal areas.

- **1989 -** Site added to NPL by EPA.

- **1990** to **1992 -** *Remedial Investigation/Feasibility Study* (RI/FS) was completed (ENSR, 1991/1992). The RI/FS concluded that there were significant levels of total petroleum hydrocarbons (TPH) and benzene, toluene, ethylbenzene, and total xylene (BTEX) in ground water and significant concentrations of TPH in the vadose zone, but very little evidence of BTEX in the **vadose** zone. The RI/FS concluded that ground water pump-and-treat coupled with limited soil vapor extraction (SVE) in the vadose zone were the appropriate remediation technologies for the site.

- **1992 -** The *Record of Decision* (ROD) was issued in March 1992 (USEPA, 1992). The selected remedy included ground water pump-and-treat and SVE for those areas that threaten to contaminate ground water at levels above site cleanup standards. The ROD listed ground water cleanup levels for benzene, toluene, ethyl benzene, methylene chloride, and 1,2-DCA. Benzene and toluene are the only compounds that currently exceed the ground water cleanup standards. Because there was little evidence of BTEX in the vadose zone, no soil cleanup standards were mandated.

- **1992** – A *Preliminary Design Work Plan* (ESI, 1992) was submitted and approved by EPA in December 1992.

- **1993 –** The *Consent Decree* was entered in August 1993. The *Phase 1 Design Report* (ESI, 1993) was completed in September 1993. The Phase 1 remedial program included pilot testing for SVE treatment and ground water extraction and treatment with GAC and discharge to Pole Creek under a National Pollutant Discharge Elimination System (NPDES) permit. Phase 1 ground water extraction and treatment began in December 1993.

- **1994 –** Phase 1 vapor extraction began and the *Final Phase 2 Design Report* (England & Associates, 1994) was submitted and approved.

- **1995 –** The *Final Phase 2 Remedial Action Work Plan* (England & Associates, 1995a) was submitted and approved. Phase 2 vapor extraction began using thermal oxidation for soil vapor treatment, and the ground water treatment system (GWTS) operations were upgraded in capacity. The *Operation and Maintenance Plan* and the *Monitoring and Confirmation Sampling Plan* (England & Associates, 1995b and 1995c) were also submitted and approved.

- **1996** – An *Interim Remedial Action Plan Report* (England & Associates, 1996a) was submitted to fulfill the requirements for Construction Complete and Closeout Reporting required by the Consent Decree. System optimization measures were discussed with EPA and documented in a letter (England & Associates, 1996b).

- **1997** – Permitting with local agencies was completed and system optimization measures were implemented, including the installation of a new well in an area of higher concentration. The ground water sampling program was modified as described in an approved technical memorandum (England & Associates, 1997).

- **1998** – Monitoring well network upgrades, including abandonment of damaged wells and wells that were no longer useful and installation of new wells, were completed (England & Associates, 1998a and 1998b).

- **2000 through 2002** – Texaco applied for renewal of the NPDES permit in March 2000. RWQCB indicated that processing for new permits was on hold pending finalization of the California Toxics Rule (CTR) and that the existing permit requirements would remain in effect in the interim. The CTR was finalized in May 2000 in Code of Federal Regulation (CFR) 40, Part 131. The CTR promulgate numeric criteria for priority pollutants and require the state to issue compliance for new or revised NPDES permit limits. In response, the State Water Resources Control Board (SWRCB) adopted the State Implementation Plan (SIP). As a result of the CTR and the SIP, more stringent limits were required for a new permit. Many of the CTR limits were below naturally occurring background levels. Following negotiations with RWQCB, Chevron was given permission to continue operating under the old NPDES permit limits but was required to discontinue discharge under the permit prior to May 2003 (England Geosystem, 2002b).

- **2001** – USEPA completed the *First Five-Year Review Report for Pacific Coast Pipeline Superfund Site* (USEPA, 2001). The report indicated that the treatment systems were operating as designed and the remedial action continues to be protective of human health and the environment.

- **2001 and 2002** – An early request for authorization to shut off the SVE system was submitted, as shutoff criteria were nearly met (England Geosystem, 2001b). In January 2002, the shutoff criteria were met and a technical memorandum detailing the SVE shutoff and monitoring plans was submitted (England Geosystem, 2002a and 2002c). The shut off was approved on April 11, 2002 and the SVE system operations were discontinued on April 14, 2002. Soil gas concentrations were monitored monthly for eight months following SVE system shut-off. No rebound above the shutoff criteria was observed and soil vapor monitoring was discontinued in November 2002.

- **2002 - 2004 –** A technical memorandum for GWTS operational modifications and pilot study for enhanced bioremediation at the PCPL Superfund Site in Fillmore, California was submitted to EPA on October 16, 2002 (England Geosystem, 2002d). On-site conventional ground water pump-and-treat technology had reached its effective limit at the PCPL site. Chevron's proposal for modifying the operation of that system and investigating the implementation of enhanced monitored natural attenuation as a replacement or supplement to that system allows additional focused remediation while ensuring protection of public health and safety. EPA approved the modification to the

operations of the GWTS at Fillmore and the pilot testing as proposed in January 2003. The oxygen release compound (ORC®) pilot-test performed in 2003-2004 at the Site demonstrated that ORC® injection was not effective in reducing dissolved-phase benzene concentrations at the site. The results from the ORC® pilot study are described in *Evaluation of the Enhanced Bioattenuation Pilot Study* (England Geosystem, 2005b). Although the pilot study for enhanced bioattenuation was not effective, calculations have shown that natural attenuation accounts for a significant amount of destruction of dissolved hydrocarbons in groundwater. Therefore, Chevron continues to evaluate monitored natural attenuation enhancement as a ground water remedial alternative at the site.

- **2004 –** Regulatory and corporate meetings to discuss forward plans including monitored natural attenuation.

- **2005 –** A work plan for Phase 1 Soil Sampling within the former tank areas was submitted (England Geosystem, 20005a) to the EPA, and comments were received from both the EPA and DTSC. Another work plan was also submitted to EPA and DTSC for review: *Sampling and Analysis Plan for Natural Attenuation Characteristics and Soil Vapor Characteristics Above Dissolved Phase Benzene Plumes*.

- **2006** – A response to agency comments regarding Phase 1 Soil Sampling was sent by Chevron (Chevron, 2006b), and the work plan was subsequently approved by EPA and DTSC in 2006. Phase 1 Soil Sampling was conducted by URS and a report was submitted to the EPA and DTSC (URS, 2006b). The work plan, *Sampling and Analysis Plan for Natural Attenuation Characteristics and Soil Vapor Characteristics Above Dissolved Phase Benzene Plumes*, was revised based on comments received from the agencies and subsequently approved by EPA and DTSC (URS, 2006a). Fieldwork for this investigation began in September 2006 with the collection of soil and preliminary vapor samples.

  During the third quarter of the year, the second Five-Year Review report was completed (EPA, 2006). The review of documents, applicable or relevant and appropriate requirements (ARARs), risk assumptions, and the results of the site inspection indicate that the remedy is functioning as intended by the ROD to control further migration of the contaminated groundwater.

- **2007** – A vapor monitoring well installation report, *Continuous Multichannel Tubing Well Installation Report* (URS, 2007a), was submitted to EPA and DTSC. A work plan for Phase 2 Soil Sampling was submitted to EPA and DTSC for review. The work plan, *Soil Sampling Phase 2 – Historical Operations*, was revised based on comments received from the agencies and subsequently approved by EPA and DTSC (URS, 2007b). Field work for this investigation was conducted in September and October 2007.

- **2008** – The *Soil Sampling Report for Phase 2 – Historical Operations* (URS, 2008a) and *Work Plan Phase 3 – Data Gaps for Risk Assessment* (URS, 2008b) were submitted to EPA and DTSC. The five Continuous Multichannel Tubing (CMT) wells west of Pole Creek were destroyed (URS, 2008c). Agency comments on the Phase 3 Work Plan were received and addressed. Agency approval to proceed with the Phase 3 Work Plan was

received on September 18, 2008. Phase 3 soil sampling occurred in October. Rainfall delayed collection of Phase 3 soil vapor samples until January 2009.

- **2009** – Phase 3 soil vapor samples were collected in mid-January. Chevron submitted to EPA a memorandum titled *Evidence for Monitored Natural Attenuation with Institutional Controls for Final Groundwater Remedy* (Chevron, January 30, 2009). The *Phase 3 – Shallow Soil Investigation Data Gap Sampling and Human Health Risk Assessment* (URS, 2009) was submitted on May 11, 2009. EPA transmitted to Chevron a draft statement of work (SOW) for a friendly Unilateral Administrative Order (UAO), which outlines the schedule for completion of the RI/FS. Chevron responded with comments on the SOW that were generally acceptable to the Agency. EPA transmitted comments on the *Phase 3 – Shallow Soil Investigation Data Gap Sampling and Human Health Risk Assessment* (URS, 2009) on September 15, 2009. Chevron submitted to EPA the *Remedial Action Objectives* (*RAO) Technical Memorandum* and the *Reuse Assessment* on September 15, 2009. EPA issued the UAO, effective September 28, 2009. On November 24, 2009, Chevron submitted a *Draft Remedial Investigation/Focused Feasibility Study (RI/FS)* to EPA. On December 16, 2009, EPA transmitted comments on the RAO memorandum.

- **2010** – Chevron submitted a revised HHRA along with additional soil characterization in *Soil Lead Speciation and Bioavailability at the Pacific Coast Piplelines Site, Fillmore, California* (Geomega, Inc., April 14, 2010). The documents demonstrated that lead samples did not contain alkylated lead and concluded that organic lead was not a chemical of concern for the Site. At a meeting in EPA's San Francisco office on April 22, 2010, EPA concurred and agreed that development of remediation alternatives for lead in shallow soil would focus on inorganic lead impacts. In a letter dated April 27, 2010, EPA conveyed comments on the Draft RI/FS. On June 11, Chevron submitted the *Final Remedial Investigation/Focused Feasibility Study (RI/FS)* to EPA. Chevron submitted a response to comments letter to EPA and DTSC (dated August 27, 2010) indicating how and where agency comments were addressed in the Final RI/FS. Additional soil sampling was performed (June 2010 to October 2010) to further define removal volumes reported in the RI/FS. On December 16, 2010, Chevron submitted the *Work Plan to Remove Remaining Infrastructure*.

- **2011** – Chevron incorporated additional Agency comments and submitted a Final RI/FS dated January 14, 2011. Chevron incorporated EPA comments into the *Work Plan to Remove Remaining Infrastructure* (URS, March 7, 2011), which was approved by EPA in a letter dated March 24, 2011. Infrastructure removal began on June 1, 2011. On June 2, 2011, EPA released its Proposed Plan for remediation of the Site. EPA held a public meeting in Fillmore on June 16, 2011, to explain the Proposed Plan to members of the community and gather comments. In September 2011, EPA completed the ROD Amendment, which describes the remediation selection process and presents the alternative selected to clean up impacts in the shallow soil and groundwater. In September, the pipeline removal activities were completed for the year. A *Soil Delineation Sampling and Infrastructure Removal Report* documenting additional activity at the Site was submitted to EPA on December 16, 2011.

REFERENCES

California Department of Public Health (CDPH), 2007. *Drinking Water Notification Levels and Response Levels: An Overview*.

England & Associates, 1994. *Final Phase 2 Design Report, Pacific Coast Pipeline (PCPL) Superfund Site, Fillmore, California*, December 16, 1994.

_____, 1995a. *Final Phase 2 Remedial Action Work Plan*, (This report includes the *Health and Safety Plan* in Appendix A) May 2, 1995.

_____, 1995b. *Operations and Maintenance Plan*, July 31, 1995.

_____, 1995c. *Monitoring and Confirmation Sampling Plan*, September 18, 1995.

_____, 1996a. *Interim Remedial Action Report*, August 30, 1996.

_____, 1996b. *Documentation of Optimization Measures Discussed in the Conference Call of November 13, 1996*, November 22, 1996.

_____, 1997. *Technical Memorandum - Recommended Modifications to the Ground Water Sampling Program*, May 13, 1997.

_____, 1998a. *Revised Technical Memorandum – Well Abandonment and Installation Request*, August 6, 1998.

_____, 1998b. *Monitoring Well Upgrade Completion Notification*, October 1, 1998.

England Geosystem, Inc., 2001. *Technical Memorandum Request for Authorization to Discontinue Soil Vapor Extraction Operation*, May 21, 2001.

_____, 2002a. *Technical Memorandum SVE Shutoff and Monitoring Plans*, March 28, 2002.

_____, 2002b. *Notice of Intent to Discontinue Use of NPDES Permit*, May 15, 2002.

_____, 2002c. *Response to EPA Letter and Call Associated with SVE Shutoff and Monitoring Plans*, May 24, 2002.

_____, 2002d. T*echnical Memorandum Proposal for Ground Water Treatment System Operational Modifications and Pilot Study for Enhanced Bioremediation*, October 16, 2002.

_____, 2002e. *Addendum to Work Plan for Implementation of Enhanced Bioattenuation Pilot Study PCPL Superfund Site Fillmore, California*. Submitted December 4, 2002.

_____, 2005a. *Work Plan for Soil Sampling PCPL Superfund Site Phase I – Former Tank Areas*, March 31, 2005.

_____, 2005b. *Evaluation of the Enhanced Bioattenuation Pilot Study*, May 26, 2005.

_____, 2005c. *Evaluation of the Enhanced Bioattenuation Pilot Study*, May 26, 2005.

ENSR, 1991. *Final Remedial Investigation Report.* June 1991.

_____, 1992 *Final Texaco Fillmore Site Feasibility Study Report*. February 1992.

Environmental Solutions, Inc. (ESI), 1992. *Preliminary Design Work Plan*, December 1992.

_____, 1993. *Final (100%) Phase 1 Design Report, Pacific Coast Pipeline Site*, June 1993.

URS Corporation, 2006a. *Sampling and Analysis Plan for Natural Attenuation Characteristics and Soil Vapor Characteristics Above Dissolved Phase Benzene Plumes*, August 4, 2006.

_____, 2006b. *Soil Sampling Report Phase 1 – Former Tank Areas Pacific Coast Pipeline (PCPL) Superfund Site Fillmore, California*, Revised September 8, 2006

_____, 2007a. *Continuous Multichannel Tubing Well Installation Report*, Pacific Coast Pipeline (PCPL) Superfund Site, Fillmore, California. May 11, 2007.

_____, 2007b. *Work Plan for Soil Sampling Phase 2 – Historical Operations Pacific Coast Pipeline (PCPL) Superfund Site Fillmore, California*, Revised July 30, 2007.

_____, 2008a. *Soil Sampling Report for Phase 2 – Historical Operations Pacific Coast Pipeline (PCPL) Superfund Site Fillmore, California*, April 15, 2008.

_____, 2008b. *Work Plan Phase 3 Soil Sampling – Data Gaps for Risk Assessment Pacific Coast Pipeline (PCPL) Superfund Site Fillmore, California*, April 15, 2008.

_____, 2008c. Continuous Multichannel Tubing (*CMT) Well Destruction Report*, July 24, 2008.

_____, 2009. *Phase 3 – Shallow Soil Investigation Data Gap Sampling and Human Health Risk Assessment*, May 11, 2009.

_____, 2011a. *Final Remedial Investigation/Focused Feasibility Study (RI/FS) PCPL Superfund Site, Fillmore, California*, January 14, 2011.

_____, 2011b. *Soil Delineation Sampling and Infrastructure Removal Report PCPL Superfund Site, Fillmore, California*, December 16, 2011.

U.S. Environmental Protection Agency (USEPA) 1992. *Record of Decision (ROD) - Pacific Coast Pipeline, Texaco Fillmore Facility*, April 2, 1992.

_____, 1993. *Consent Decree - Pacific Coast Pipeline Site*. February 1993, entered August 1993.

_____, 2001. *First Five-Year Review Report for Pacific Coast Pipeline Superfund Site*, September 2001.

_____, 2006. *Second Five-Year Review Report for Pacific Coast Pipeline Superfund Site*, September 2006.

_____, 2011. *Proposed Plan*, June 2011.

_____, 2011. *Record of Decision Amendment, Pacific Coast Pipeline EPA ID: CAD980636781; Fillmore, CA.* September 2011.

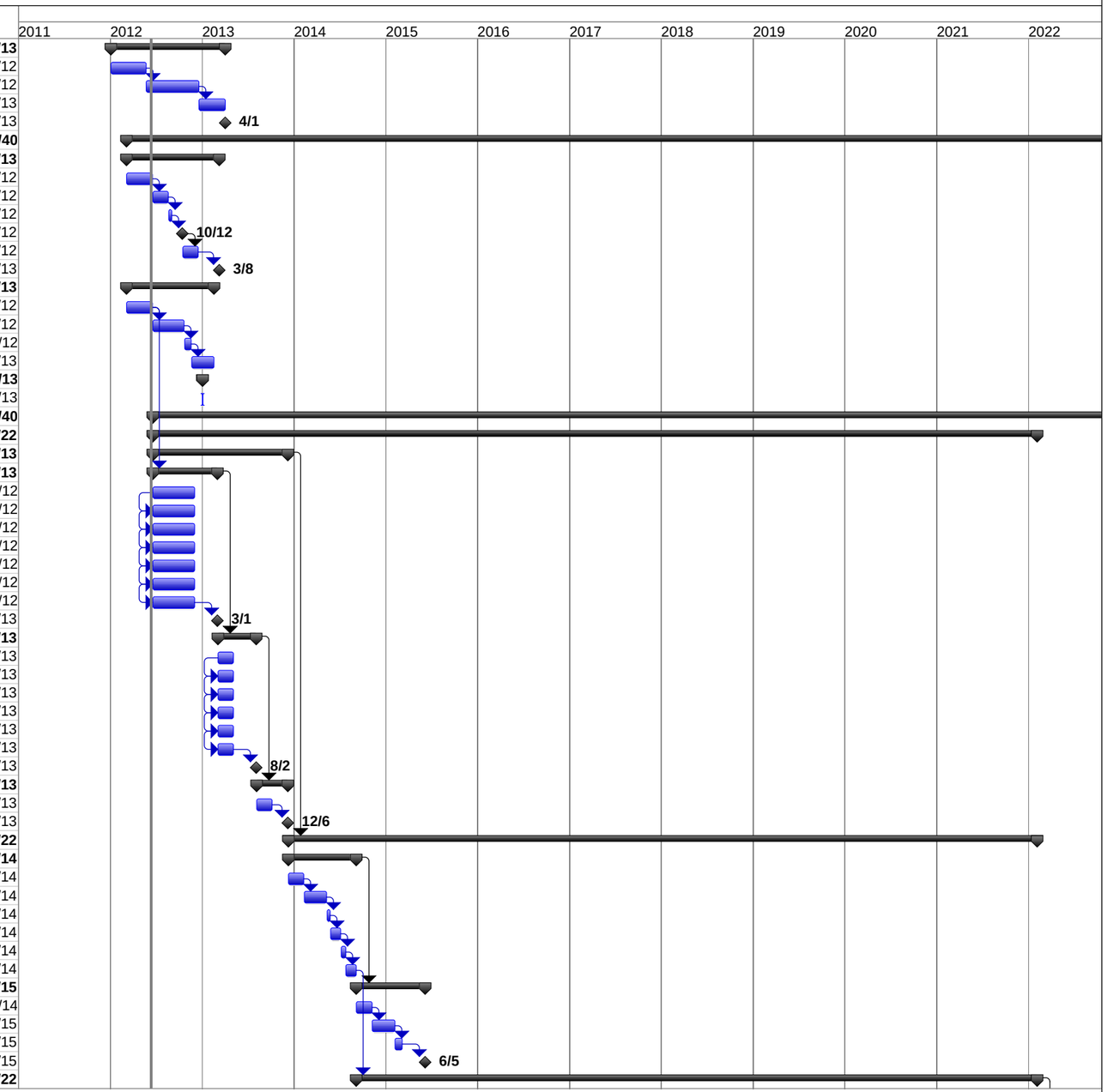
Appendix C

Gantt Chart for the Groundwater Remedy

Project Schedule for Groundwater Remedy

Texaco PCPL Superfund Site - Fillmore, California

ID	Task Name	Duration	Start	Finish
1	**Administrative Documents by EPA**	**325 days**	**Tue 1/3/12**	**Mon 4/1/13**
2	EPA Prepares Consent Decree (CD) Scope of Work (SOW)	100 days	Tue 1/3/12	Mon 5/21/12
3	EPA Negotiates Consent Decree	150 days	Tue 5/22/12	Mon 12/17/12
4	EPA Enters CD with the District Court	75 days	Tue 12/18/12	Mon 4/1/13
5	Final Consent Decree	1 day	Mon 4/1/13	Mon 4/1/13
6	**Remedial Design / Remedial Action for Groundwater**	**7498 days**	**Mon 3/5/12**	**Wed 11/28/40**
7	**Performance Groundwater Monitoring Plan**	**265 days**	**Mon 3/5/12**	**Fri 3/8/13**
8	Prepare Document	75 days	Mon 3/5/12	Fri 6/15/12
9	Agency Review	45 days	Mon 6/18/12	Fri 8/17/12
10	Incorporate Comments from EPA	10 days	Mon 8/20/12	Fri 8/31/12
11	Final Approval from EPA	30 days	Mon 9/3/12	Fri 10/12/12
12	Implement Optimized Groundwater Monintoring Network	45 days	Mon 10/15/12	Fri 12/14/12
13	Submit Report - Optimized Groundwater Monitoring Network	60 days	Mon 12/17/12	Fri 3/8/13
14	**Groundwater Project Work Plan**	**250 days**	**Mon 3/5/12**	**Fri 2/15/13**
15	Prepare Document	75 days	Mon 3/5/12	Fri 6/15/12
16	Agency Review	90 days	Mon 6/18/12	Fri 10/19/12
17	Incorporate Comments from EPA	20 days	Mon 10/22/12	Fri 11/16/12
18	Agency Approval	65 days	Mon 11/19/12	Fri 2/15/13
19	**Northern Groundwater Plume**	**1 day**	**Tue 1/1/13**	**Tue 1/1/13**
20	Implement Selected Remedy - MNA (per PGMP)	1 day	Tue 1/1/13	Tue 1/1/13
21	**Southern Groundwater Plume**	**7423 days**	**Mon 6/18/12**	**Wed 11/28/40**
22	**Air Sparging**	**2514 days**	**Mon 6/18/12**	**Thu 2/3/22**
23	**Remedial Design & Remedial Action Planning**	**385 days**	**Mon 6/18/12**	**Fri 12/6/13**
24	**Preliminary Remedial Design & Remedial Action Work Plan**	**185 days**	**Mon 6/18/12**	**Fri 3/1/13**
25	Design Criteria	120 days	Mon 6/18/12	Fri 11/30/12
26	Plans / Specifications	120 days	Mon 6/18/12	Fri 11/30/12
27	Permit Requirements	120 days	Mon 6/18/12	Fri 11/30/12
28	Update Sampling & Analysis Plan (if needed)	120 days	Mon 6/18/12	Fri 11/30/12
29	Update HASP (if needed)	120 days	Mon 6/18/12	Fri 11/30/12
30	Groundwater Contingency Plan	120 days	Mon 6/18/12	Fri 11/30/12
31	Draft Construction Quality Assurance Plan	120 days	Mon 6/18/12	Fri 11/30/12
32	Agency Approval	65 days	Mon 12/3/12	Fri 3/1/13
33	**Pre-Final Remedial Design & Remedial Action Work Plan**	**110 days**	**Mon 3/4/13**	**Fri 8/2/13**
34	Incorporate agency comments from Prelim	45 days	Mon 3/4/13	Fri 5/3/13
35	Complete Data Analysis	45 days	Mon 3/4/13	Fri 5/3/13
36	Final Plans / Specifications	45 days	Mon 3/4/13	Fri 5/3/13
37	Draft O&M Plan / Draft O&M Manual	45 days	Mon 3/4/13	Fri 5/3/13
38	Construction Schedule	45 days	Mon 3/4/13	Fri 5/3/13
39	Construction Cost Estimate	45 days	Mon 3/4/13	Fri 5/3/13
40	Agency Approval	65 days	Mon 5/6/13	Fri 8/2/13
41	**Final Remedial Design & Remedial Action Work Plan**	**90 days**	**Mon 8/5/13**	**Fri 12/6/13**
42	Incorporate agency comments from Pre-Final	45 days	Mon 8/5/13	Fri 10/4/13
43	Agency Approval	45 days	Mon 10/7/13	Fri 12/6/13
44	**Remedial Action Planning**	**2129 days**	**Mon 12/9/13**	**Thu 2/3/22**
45	**Groundwater Treatment Operations**	**194 days**	**Mon 12/9/13**	**Thu 9/4/14**
46	Logistics / Coordination (Contractors, Materials, etc.)	45 days	Mon 12/9/13	Fri 2/7/14
47	System Construction	65 days	Mon 2/10/14	Fri 5/9/14
48	Notification of Construction Completion	10 days	Mon 5/12/14	Fri 5/23/14
49	Pre-final Construction Inspection	30 days	Mon 5/26/14	Fri 7/4/14
50	Pre-final Construction Completion Report	14 days	Mon 7/7/14	Thu 7/24/14
51	Final Construction Inspection	30 days	Fri 7/25/14	Thu 9/4/14
52	**Remedial Action Report**	**196 days**	**Fri 9/5/14**	**Fri 6/5/15**
53	Prepare Document	45 days	Fri 9/5/14	Thu 11/6/14
54	Agency Review	65 days	Fri 11/7/14	Thu 2/5/15
55	Incorporate Comments from EPA	21 days	Fri 2/6/15	Fri 3/6/15
56	Agency Approval	65 days	Mon 3/9/15	Fri 6/5/15
57	**System Operations**	**1935 days**	**Fri 9/5/14**	**Thu 2/3/22**



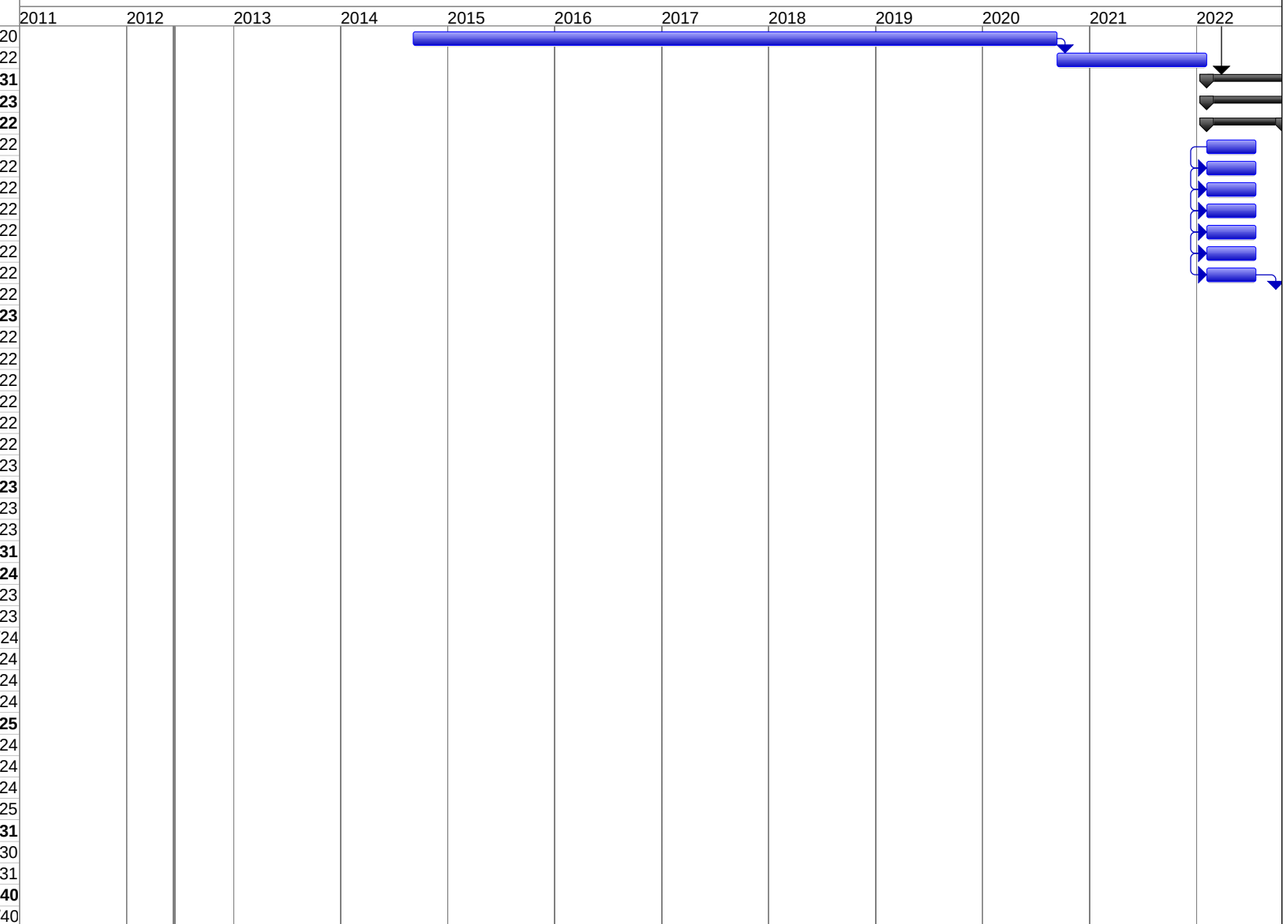
Project: Texaco PCPL
Date: Mon 6/11/12

Task		Project Summary		Inactive Milestone		Manual Summary Rollup		Progress	
Split		External Tasks		Inactive Summary		Manual Summary		Deadline	
Milestone		External Milestone		Manual Task		Start-only			
Summary		Inactive Task		Duration-only		Finish-only			

Project Schedule for Groundwater Remedy

Texaco PCPL Superfund Site - Fillmore, California

ID	Task Name	Duration	Start	Finish
58	Implement Remedy (6 years)	1570 days	Fri 9/5/14	Thu 9/10/20
59	Rebound Monitoring (4 Quarterly Events)	365 days	Fri 9/11/20	Thu 2/3/22
60	**Accelarated Natural Sulfate Reduction**	**2514 days**	**Fri 2/4/22**	**Wed 9/24/31**
61	**Remedial Design & Remedial Action Planning**	**385 days**	**Fri 2/4/22**	**Thu 7/27/23**
62	**Preliminary Remedial Design & Remedial Action Work Plan**	**185 days**	**Fri 2/4/22**	**Thu 10/20/22**
63	Design Criteria	120 days	Fri 2/4/22	Thu 7/21/22
64	Plans / Specifications	120 days	Fri 2/4/22	Thu 7/21/22
65	Permit Requirements	120 days	Fri 2/4/22	Thu 7/21/22
66	Update Sampling & Analysis Plan (if needed)	120 days	Fri 2/4/22	Thu 7/21/22
67	Update HASP (if needed)	120 days	Fri 2/4/22	Thu 7/21/22
68	Groundwater Contingency Plan	120 days	Fri 2/4/22	Thu 7/21/22
69	Draft Construction Quality Assurance Plan	120 days	Fri 2/4/22	Thu 7/21/22
70	Agency Approval	65 days	Fri 7/22/22	Thu 10/20/22
71	**Pre-Final Remedial Design & Remedial Action Work Plan**	**110 days**	**Fri 10/21/22**	**Thu 3/23/23**
72	Incorporate agency comments from Prelim Design	45 days	Fri 10/21/22	Thu 12/22/22
73	Complete Data Analysis	45 days	Fri 10/21/22	Thu 12/22/22
74	Final Plans / Specifications	45 days	Fri 10/21/22	Thu 12/22/22
75	Draft O&M Plan / Draft O&M Manual	45 days	Fri 10/21/22	Thu 12/22/22
76	Construction Schedule	45 days	Fri 10/21/22	Thu 12/22/22
77	Construction Cost Estimate	45 days	Fri 10/21/22	Thu 12/22/22
78	Agency Approval	65 days	Fri 12/23/22	Thu 3/23/23
79	**Final Remedial Design & Remedial Action Work Plan**	**90 days**	**Fri 3/24/23**	**Thu 7/27/23**
80	Incorporate agency comments from Pre-Final	45 days	Fri 3/24/23	Thu 5/25/23
81	Agency Approval	45 days	Fri 5/26/23	Thu 7/27/23
82	**Remedial Action Planning**	**2129 days**	**Fri 7/28/23**	**Wed 9/24/31**
83	**Groundwater Treatment Operations**	**194 days**	**Fri 7/28/23**	**Wed 4/24/24**
84	Logistics / Coordination (Contractors, Materials, etc.)	45 days	Fri 7/28/23	Thu 9/28/23
85	System Construction	65 days	Fri 9/29/23	Thu 12/28/23
86	Notification of Construction Completion	10 days	Fri 12/29/23	Thu 1/11/24
87	Pre-final Construction Inspection	30 days	Fri 1/12/24	Thu 2/22/24
88	Pre-final Construction Completion Report	14 days	Fri 2/23/24	Wed 3/13/24
89	Final Construction Inspection	30 days	Thu 3/14/24	Wed 4/24/24
90	**Remedial Action Report**	**196 days**	**Thu 4/25/24**	**Thu 1/23/25**
91	Prepare Document	45 days	Thu 4/25/24	Wed 6/26/24
92	Agency Review	65 days	Thu 6/27/24	Wed 9/25/24
93	Incorporate Comments from EPA	21 days	Thu 9/26/24	Thu 10/24/24
94	Agency Approval	65 days	Fri 10/25/24	Thu 1/23/25
95	**System Operations**	**1935 days**	**Thu 4/25/24**	**Wed 9/24/31**
96	Implement Remedy (9 years)	1570 days	Thu 4/25/24	Wed 5/1/30
97	Rebound Monitoring (2 Semiannual Events)	365 days	Thu 5/2/30	Wed 9/24/31
98	**MNA until benzene <1 µg/L**	**2395 days**	**Thu 9/25/31**	**Wed 11/28/40**
99	Monitoring, Sampling, Reporting	2395 days	Thu 9/25/31	Wed 11/28/40



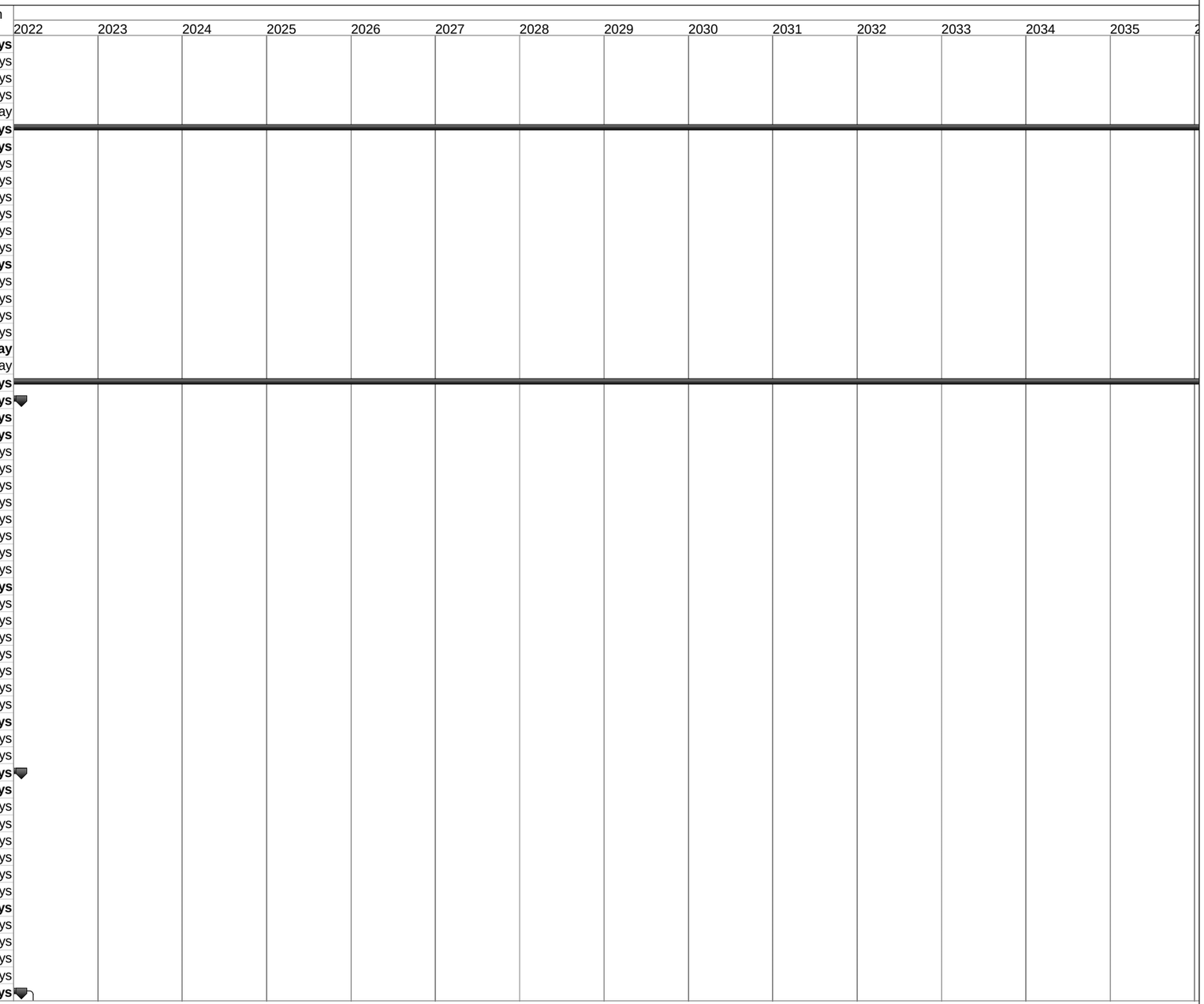
Project: Texaco PCPL
Date: Mon 6/11/12

Task | Split | Milestone | Summary | Project Summary | External Tasks | External Milestone | Inactive Task | Inactive Milestone | Inactive Summary | Manual Task | Duration-only | Manual Summary Rollup | Manual Summary | Start-only | Finish-only | Progress | Deadline

Project Schedule for Groundwater Remedy

Texaco PCPL Superfund Site - Fillmore, California

ID	Task Name	Duration
1	**Administrative Documents by EPA**	**325 days**
2	EPA Prepares Consent Decree (CD) Scope of Work (SOW)	100 days
3	EPA Negotiates Consent Decree	150 days
4	EPA Enters CD with the District Court	75 days
5	Final Consent Decree	1 day
6	**Remedial Design / Remedial Action for Groundwater**	**7498 days**
7	**Performance Groundwater Monitoring Plan**	**265 days**
8	Prepare Document	75 days
9	Agency Review	45 days
10	Incorporate Comments from EPA	10 days
11	Final Approval from EPA	30 days
12	Implement Optimized Groundwater Monintoring Network	45 days
13	Submit Report - Optimized Groundwater Monitoring Network	60 days
14	**Groundwater Project Work Plan**	**250 days**
15	Prepare Document	75 days
16	Agency Review	90 days
17	Incorporate Comments from EPA	20 days
18	Agency Approval	65 days
19	**Northern Groundwater Plume**	**1 day**
20	Implement Selected Remedy - MNA (per PGMP)	1 day
21	**Southern Groundwater Plume**	**7423 days**
22	**Air Sparging**	**2514 days**
23	**Remedial Design & Remedial Action Planning**	**385 days**
24	**Preliminary Remedial Design & Remedial Action Work Plan**	**185 days**
25	Design Criteria	120 days
26	Plans / Specifications	120 days
27	Permit Requirements	120 days
28	Update Sampling & Analysis Plan (if needed)	120 days
29	Update HASP (if needed)	120 days
30	Groundwater Contingency Plan	120 days
31	Draft Construction Quality Assurance Plan	120 days
32	Agency Approval	65 days
33	**Pre-Final Remedial Design & Remedial Action Work Plan**	**110 days**
34	Incorporate agency comments from Prelim	45 days
35	Complete Data Analysis	45 days
36	Final Plans / Specifications	45 days
37	Draft O&M Plan / Draft O&M Manual	45 days
38	Construction Schedule	45 days
39	Construction Cost Estimate	45 days
40	Agency Approval	65 days
41	**Final Remedial Design & Remedial Action Work Plan**	**90 days**
42	Incorporate agency comments from Pre-Final	45 days
43	Agency Approval	45 days
44	**Remedial Action Planning**	**2129 days**
45	**Groundwater Treatment Operations**	**194 days**
46	Logistics / Coordination (Contractors, Materials, etc.)	45 days
47	System Construction	65 days
48	Notification of Construction Completion	10 days
49	Pre-final Construction Inspection	30 days
50	Pre-final Construction Completion Report	14 days
51	Final Construction Inspection	30 days
52	**Remedial Action Report**	**196 days**
53	Prepare Document	45 days
54	Agency Review	65 days
55	Incorporate Comments from EPA	21 days
56	Agency Approval	65 days
57	**System Operations**	**1935 days**



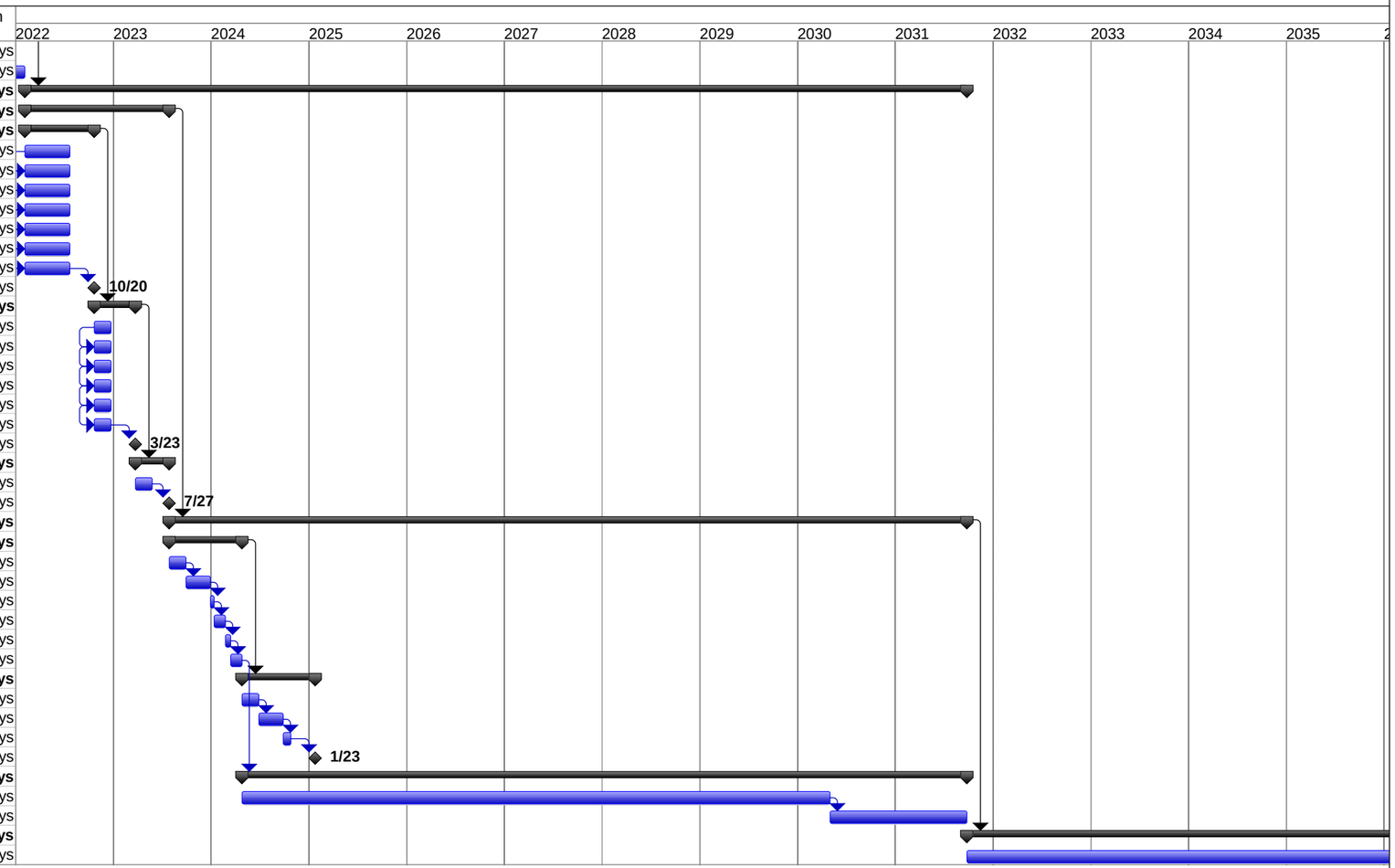
Project: Texaco PCPL
Date: Mon 6/11/12

Task | Split | Milestone | Summary | Project Summary | External Tasks | External Milestone | Inactive Task | Inactive Milestone | Inactive Summary | Manual Task | Duration-only | Manual Summary Rollup | Manual Summary | Start-only | Finish-only | Progress | Deadline

Project Schedule for Groundwater Remedy

Texaco PCPL Superfund Site - Fillmore, California

ID	Task Name	Duration
58	Implement Remedy (6 years)	1570 days
59	Rebound Monitoring (4 Quarterly Events)	365 days
60	**Accelarated Natural Sulfate Reduction**	**2514 days**
61	**Remedial Design & Remedial Action Planning**	**385 days**
62	**Preliminary Remedial Design & Remedial Action Work Plan**	**185 days**
63	Design Criteria	120 days
64	Plans / Specifications	120 days
65	Permit Requirements	120 days
66	Update Sampling & Analysis Plan (if needed)	120 days
67	Update HASP (if needed)	120 days
68	Groundwater Contingency Plan	120 days
69	Draft Construction Quality Assurance Plan	120 days
70	Agency Approval	65 days
71	**Pre-Final Remedial Design & Remedial Action Work Plan**	**110 days**
72	Incorporate agency comments from Prelim Design	45 days
73	Complete Data Analysis	45 days
74	Final Plans / Specifications	45 days
75	Draft O&M Plan / Draft O&M Manual	45 days
76	Construction Schedule	45 days
77	Construction Cost Estimate	45 days
78	Agency Approval	65 days
79	**Final Remedial Design & Remedial Action Work Plan**	**90 days**
80	Incorporate agency comments from Pre-Final	45 days
81	Agency Approval	45 days
82	**Remedial Action Planning**	**2129 days**
83	**Groundwater Treatment Operations**	**194 days**
84	Logistics / Coordination (Contractors, Materials, etc.)	45 days
85	System Construction	65 days
86	Notification of Construction Completion	10 days
87	Pre-final Construction Inspection	30 days
88	Pre-final Construction Completion Report	14 days
89	Final Construction Inspection	30 days
90	**Remedial Action Report**	**196 days**
91	Prepare Document	45 days
92	Agency Review	65 days
93	Incorporate Comments from EPA	21 days
94	Agency Approval	65 days
95	**System Operations**	**1935 days**
96	Implement Remedy (9 years)	1570 days
97	Rebound Monitoring (2 Semiannual Events)	365 days
98	**MNA until benzene <1 µg/L**	**2395 days**
99	Monitoring, Sampling, Reporting	2395 days



Project: Texaco PCPL
Date: Mon 6/11/12

Task		Project Summary		Inactive Milestone		Manual Summary Rollup		Progress	
Split		External Tasks		Inactive Summary		Manual Summary		Deadline	
Milestone		External Milestone		Manual Task		Start-only			
Summary		Inactive Task		Duration-only		Finish-only			