Norwalk Tank Farm Update

Presented to the Norwalk Tank Farm Restoration Advisory Board

On behalf of KMEP

February 10, 2011

Presentation Overview

- KMEP Update
  - Remediation Operations Update
  - Generator Fuel Spill Update
  - Selenium Management
  - Additional Assessment Update
  - NPDES Permit Update
  - Five -Year Action Plan Progress Report

Remediation Operations Update

- Objectives
  - Contaminant Mass Containment
  - Contaminant Mass Removal
- South-Central and Southeast Areas
  - Soil Vapor Extraction (SVE) System
  - Groundwater Extraction (GWE) System
  - Total Fluids Extraction (TFE) System
    - Free product
    - Groundwater
- West Site Barrier
  - Groundwater Extraction
    - Discontinued August 2008
    - Shut-down based on low concentrations of MTBE and 1,2-DCA
    - Currently monitoring TBA for possible restart

Remediation Systems

- South-Central Area
  - 18 TFE wells (product and groundwater)
  - 24 onsite and 6 off-site SVE wells (most collocated with TFE wells)
  - 2 GWE Wells
- Southeastern Area (24-inch Block Valve Area)
  - 3 TFE wells (GMW-O-15, GMW-O-18, GMW-36)
  - 2 offsite SVE wells (both collocated with TFE wells)
  - 2 GWE Wells
- Treatment and Discharge
  - SVE Vapors
    - Treatment – Thermal catalytic oxidizer (catox)
    - Discharge – Atmosphere under SCAQMD Permit
  - TVE Liquids – Oil/Water Separator
    - Oil/Water Separator – Free product recycled offsite
    - Groundwater Treatment – Liquid-phase GAC
    - Groundwater Discharge – Coyote Creek under NPDES permit

Remediation Systems

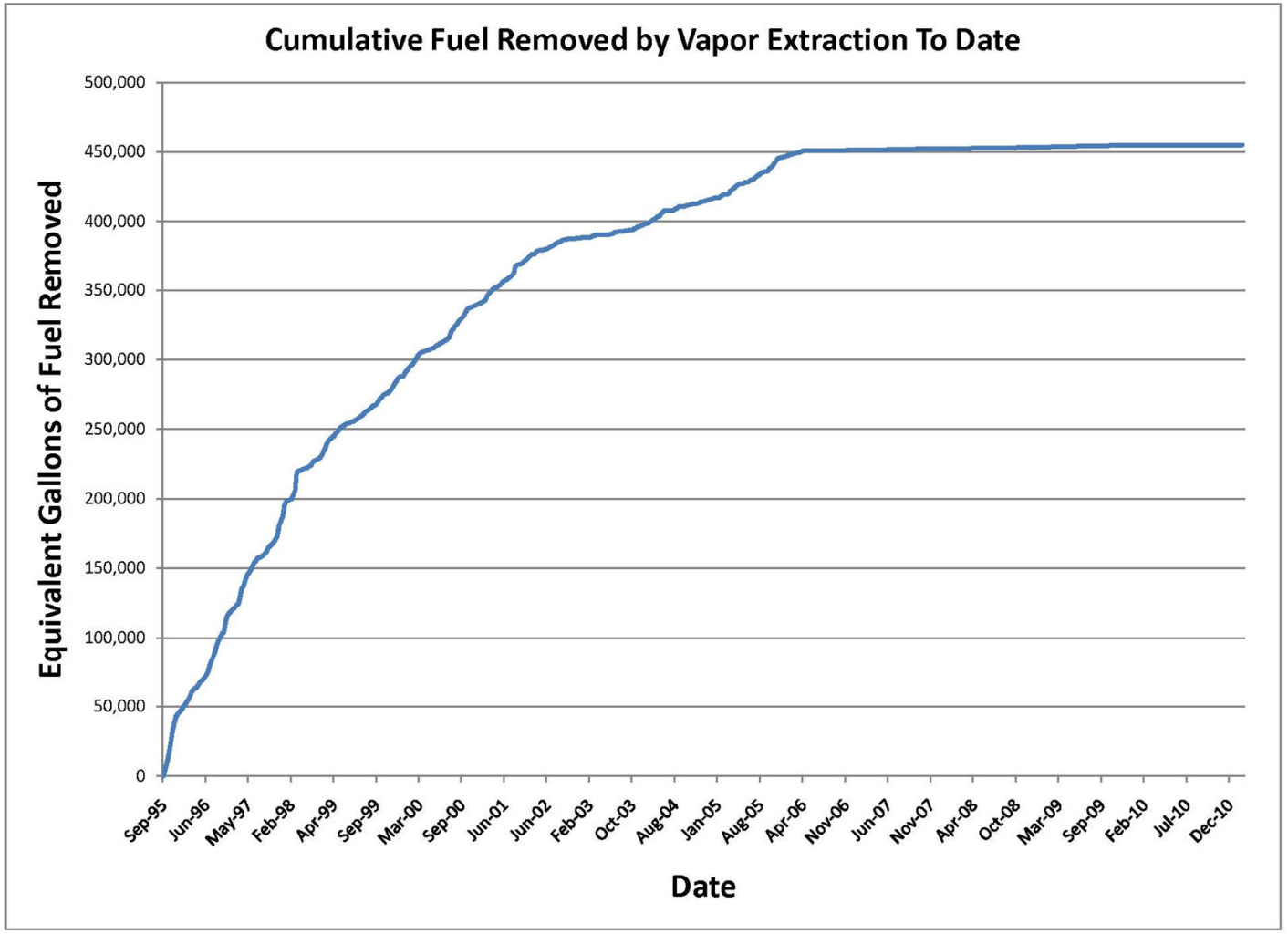
- Operations & Maintenance Activities
  - Weekly Inspection and Maintenance
  - Weekly Data Collection
    - Vapor flow rate, vacuum, groundwater extraction rates, hours of operations, and other system parameters
  - Monthly Pump Inspections
  - Measurement of Individual Well Vapor Concentrations
  - Collection and Analysis of System Influent and Effluent Vapor and Groundwater Samples
  - Gauging of Select Remediation Wells

SVE System Operations Summary

- Equivalent Fuel Treated
  - Based on weekly monitoring of influent vapor concentration, vapor extraction flow rate, and hours of operation.
  - Pounds / 6.6 lbs/gal = gallons

- 3rd Quarter 2010 – 16 gallons (104 pounds)
- 4th Quarter 2010 – 117 gallons (773 pounds)
- Since Second Addendum – 3,107 gallons (20,508 pounds)
- Since 1995 – Approx. 454,885 gallons (3 million pounds)

SVE System Operations Summary



TFE/GWE System Operations Summary

- Groundwater Extracted
  - 3rd Quarter 2010
    - South-Central Area – 736,007 gallons
    - Southeast Area – 807,267 gallons
    - West Site Barrier – none (shutdown in third quarter 2008)
  - 4th Quarter 2010
    - South-Central Area – 1,432,144 gallons
    - Southeast Area – 739,501 gallons
    - West Site Barrier – none (shutdown in third quarter 2008)
  - Since 1995
    - South-Central Area – 43,557,246 gallons
    - Southeast Area – 11,802,577 gallons
    - West Site Barrier – 26,902,604 gallons

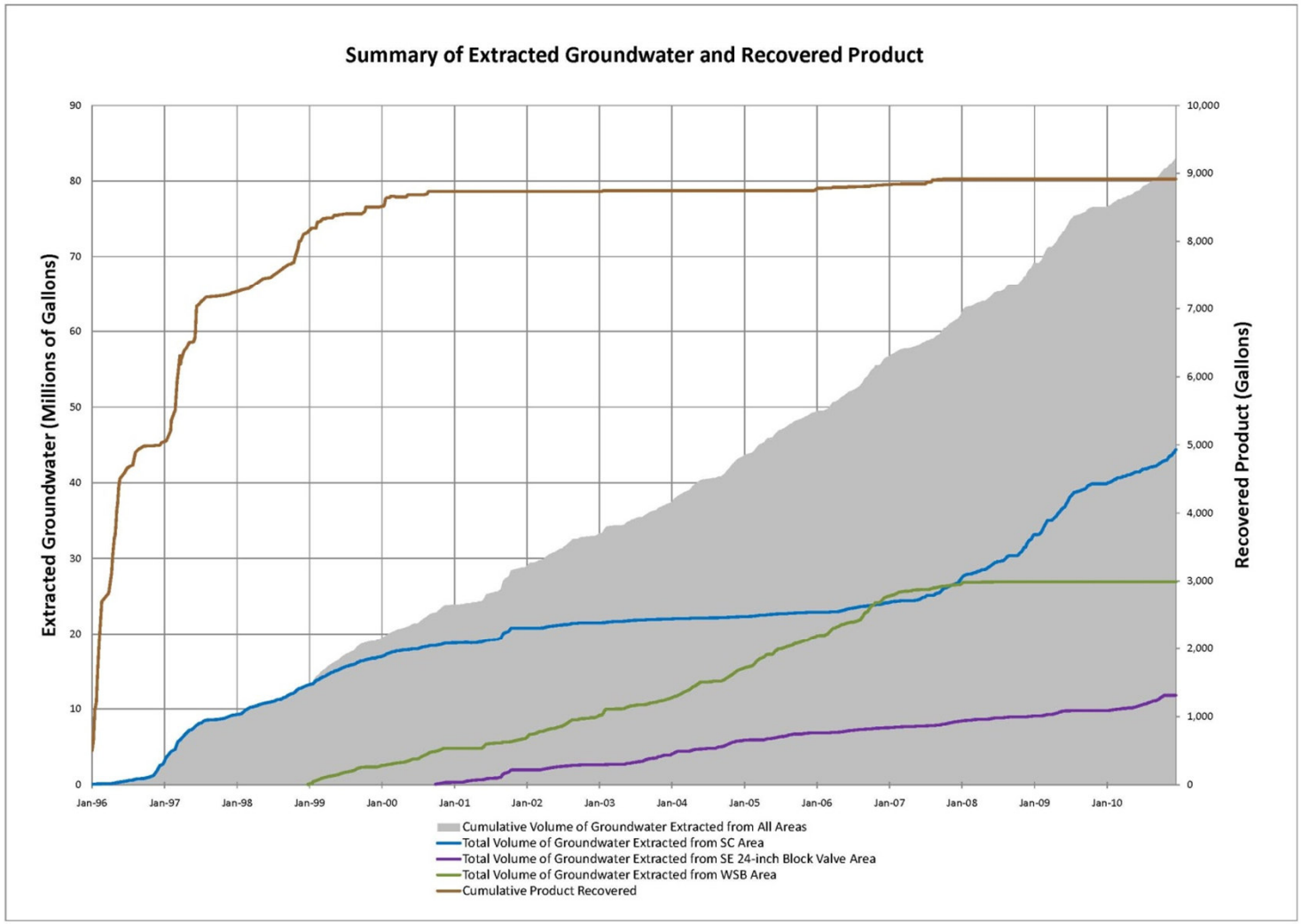
TFE/GWE System Operations Summary

- Mass of TPH removed in Groundwater Extracted
  - 3rd Quarter 2010 – 18 gallons (119 pounds)
  - 4th Quarter 2010 – 13 gallons (84 pounds)
  - Since implementing Second Addendum
    - 182 gallons (1,201 pounds)

TFE System Operations Summary

- Free Product Extracted
  - 3rd and 4th Quarters 2010
    - Free product has generally decreased since implementing the Second Addendum
    - Volume of free product recovered is small and emulsified
    - Free product not observed to accumulate in the product holding tank.
  - Free product not estimated for 3rd and 4th Quarters 2010
  - Since 1995 – 8,917 gallons

TFE System Operations Summary



Remediation System Operations Summary

- SVE System
  - 3rd Quarter 2010
    - Operated 20% of time
  - 4th Quarter 2010
    - Operated 30% of time
    - Operated 34% of time (excluding planned shutdowns for groundwater monitoring)
- TFE/GWE System
  - 3rd Quarter 2010
    - Operated 96% of time
  - 4th Quarter 2010
    - Operated 82% of time
    - Operated 92% of time (excluding planned shutdowns for groundwater monitoring)

Remediation System Downtime

- SVE System
  - High temp alarms – July to December 2010
    - Replace dilution and process valves
    - Clean catalytic oxidizer beds
    - Replace pilot light assembly
    - Replace and rewire thermocouples
    - SVE fully operational since mid-December 2010
- TFE/GWE System
  - Maintenance activities
  - Groundwater monitoring activities
  - High level alarms for transfer tanks
    - Changed bag filters, cleaned bag filter housing, replace high level switch
  - Pump repairs at TFE/GWE wells
  - Southeastern area groundwater extraction currently down due to possible leak in conveyance piping

Remediation System Downtime

- Southeastern Area Downtime
  - Issue
    - Extracted groundwater not being conveyed from extraction wells to remediation treatment system in south-central area
  - Trouble-shooting
    - Wells GMW-36, GMW-O-15, and GMW-O-18 were removed for service and confirmed to be operational
    - Solenoid valve for air compressor replaced
    - Conveyance piping cleared of muddy water and silt on January 28, 2011
    - Having ruled out mechanical issues with the pumps and obstructions in the conveyance piping, it is now believed that there is a leak in the conveyance piping
    - Utility survey conducted on February 4, 2011 to confirm approximate location of underground conveyance piping between wells GMW-36 and GMW-O-15 (area thought to have a leak)
  - Path Forward
    - Excavate soil in the area thought to have the leak to expose the conveyance piping and attempt to identify and repair the leak
    - Excavation work will commence this week

Remediation System Maintenance

- Implementing several maintenance and upgrade activities to improve operation of the TFE/GWE system
  - Install new flow meters, pressure gauges
  - Inspect wellheads, replace fittings and well boxes
  - Pulled, cleaned, refurbished or replaced, and reinstalled extraction pumps
- These maintenance activities increased treatment system downtime, but will decrease future downtime and increase performance

Preventative Maintenance

- Check pump operation – monthly
- Pump inspection/cleaning/maintenance - ongoing
- Bag filter replacements – weekly
  - Transfer high level switch also replaced on August 19, 2010
- Pre-catalyst back pressure monitoring – Weekly
  - Monitor for particulate buildup on catalyst cells
- Sampling between GAC vessels – bi-weekly
  - Monitor for breakthrough prior to last vessel
  - Carbon change out for lead vessel performed on July 9 and October 1, 2010

Preventative Maintenance

- System-specific preventative maintenance schedule for each of the other components of the remediation system
  - South-Central System
  - Southeast System
  - West Side Barrier System
- Example system-specific preventative maintenance activities
  - Check/inspect valves, blowers, chemical pumps, level switches, hoses, and catox flame arrestor
  - Clean filters (various types), flow sensors, valves, transfer pumps, and catox catalyist
  - Change oil and air filters in various equipment
  - Check/replace belts and hoses on various equipment
  - Maintain pneumatic pumps
  - Clean oil/water separator and sumps
  - Drain and/or pressure wash holding tanks

Planned Remediation Activities

- Continue focusing remedial efforts on south-central and southeastern areas
  - Continue trouble shooting SVE system (system has been fully operational since mid-December 2010)
  - Continue operating TFE, GWE, and SVE systems
  - Continue system maintenance, inspections, and data collection on weekly basis
  - TBA Treatment
- Monitor concentrations of 1,2-DCA, MTBE, and TBA in western area and restart WSB if necessary

Generator Fuel Spill Update

- Diesel powered generator mobilized on June 14, 2010 to provide temporary power to the remediation systems
- Shut down due to fuel leak on June 22, 2010
  - Impacted area in unpaved area east of the power building on the KMEP lease property
  - Soil samples collected to 14 feet below ground surface (bgs); concentrations of TPHd and BTEX decrease with increasing depth and distance from the source area
  - Excavation of 40 cubic yards of soil between June and July 2010; 290 square feet to 7 feet bgs
  - Soil characterized as non-hazardous and transported to TPST in Adelanto, California on September 13, 2010, for treatment and recycling
  - Excavation area was backfilled with clean imported soil on October 22, 2010

Selenium Management

- Selenium is a naturally occurring constituent in groundwater at many sites and is not related to SFPP's or DESC's operations
- SFPP discharge limit under NPDES Permit
  - 4.1 ug/L – Average monthly effluent limitation (AMEL)
  - 8.2 ug/L – Maximum daily effluent limitation (MDEL)
- Selenium was occasionally detected above discharge limits from 2009 through 2010 as described during the July 2010 RAB meeting

Selenium Management

- Resolution
  - Collected groundwater samples to assess selenium treatment options
    - June 30, 2010, 10 samples to Applied Speciation Laboratory
    - Selenium concentrations less than discharge limits
  - Collected groundwater samples to confirm Applied Speciation results
    - July 22, 201, 9 samples to Calscience, 9 samples to Test America, 9 samples to Applied Speciation
    - Selenium concentrations for Test America and Applied Speciation less than discharge limits; selenium concentrations reported by Calscience above discharge limits
    - Switched labs for compliance sampling

Selenium Confirmation Sampling

Selenium Confirmation Sampling Event - July 22, 2010

Defense Fuel Support Point, Norwalk, CA

Analysis	Location	Date	Calscience Laboratory 6020	Applied Speciation Laboratory 6020A (DRC)	Test America Laboratory 6020A
Dissolved	Influent	07/22/10	5.17	0.766	ND (<1.4)
Selenium	Effluent	07/22/10	5.03	0.148	ND (<1.4)
(preserved)	GWR-3	07/22/10	11.7	0.275	ND (<1.4)
Total	Influent	07/22/10	5.55	1.27	ND (<1.4)
Selenium	Effluent	07/22/10	4.88	0.170	ND (<1.4)
(preserved)	GWR-3	07/22/10	12.5	0.450	ND (<1.4)
Total	Influent	07/22/10	5.4	0.572	ND (<1.4)
Selenium	Effluent	07/22/10	4.13	0.209	ND (<1.4)
(unpreserved)	GWR-3	07/22/10	11.3	0.628	ND (<1.4)

Notes:

All units are expressed as micrograms per liter (µg/L).

Samples for dissolved selenium analysis were filtered in the field during sampling.

ND = Not detected at the minimum detection limit.

- **Calscience above AMEL (4.1 ug/L)**
- **Applied Speciation and Test America below AMEL (4.1 ug/L)**

Selenium Management

- Why did previous lab have higher selenium concentrations?
  - Previous lab used standard analytical method (ICP-MS) which is prone to interferences from other compounds
  - Other labs used standard analytical method coupled with integrated dynamic reaction cell (DRC)
    - Upfront chamber with certain gases which react with the sample and reduces certain interferences
    - Reduces interferences, eliminating false-positives and lowering detection limits
  - Current compliance lab uses DRC technology to provide more accurate and defensible data

Additional Assessment

- Southeastern 24-Inch Block Valve Area
- South-Central Residential Area Vapor Study
- Vertical Assessment of LNAPL in Soil
- Schedule
  - Work Plans submitted to RWQCB and approved
  - Southeastern 24-inch Block Valve field investigation complete (results pending)
  - Access agreements being finalized for other two investigations
- Expected to be completed this year
- Scope of work described in July 2010 RAB meeting

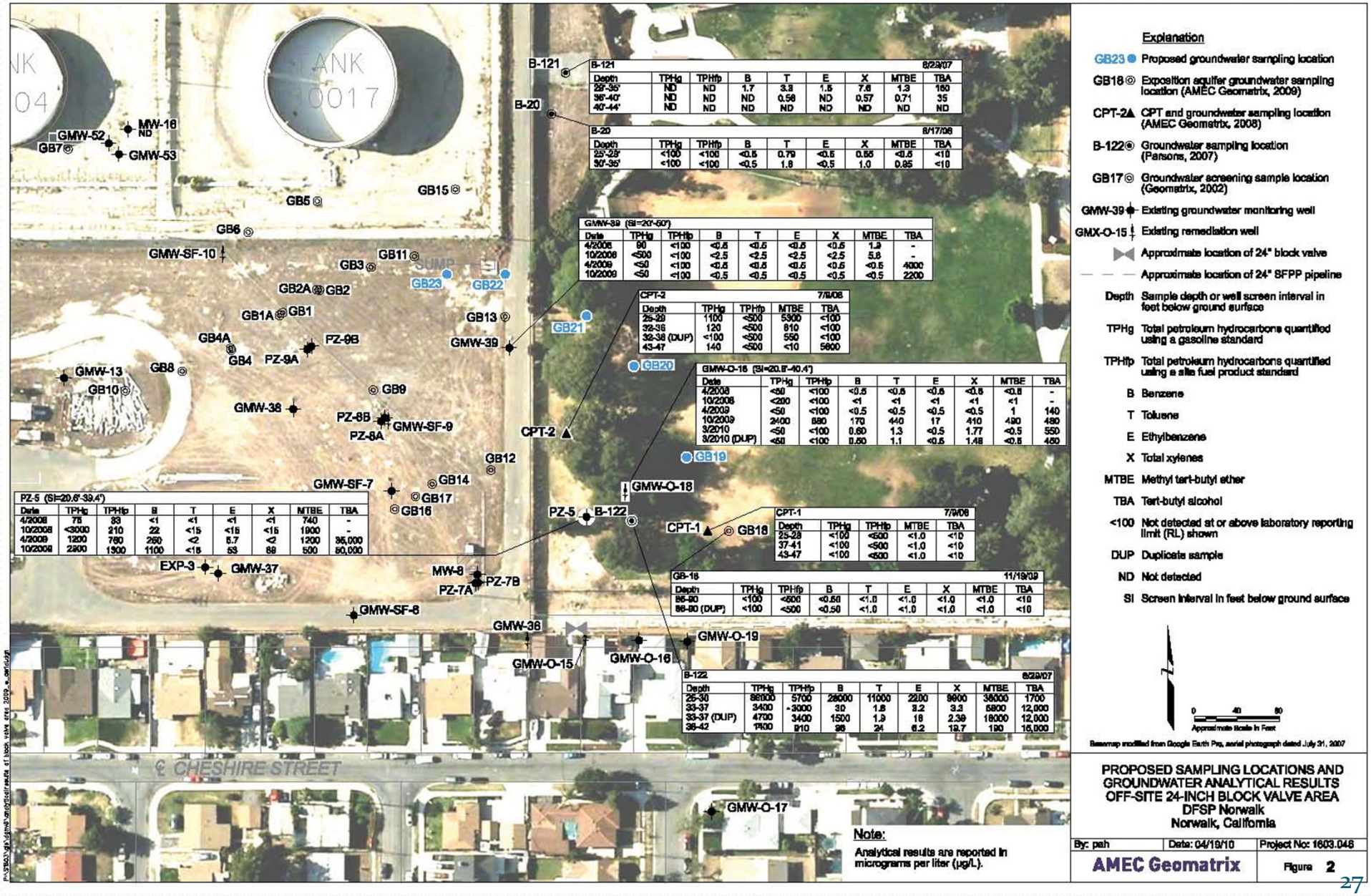
Southeastern 24-Inch Block Valve Area

- Additional Off-site Assessment– Complete
  - Field work conducted in July 2008
    - Soil gas sampling, lithologic profiling through aquitard (CPT), and discrete-depth GW sampling (CPT) in uppermost aquifer
  - Results documented in Report (AMEC, August 28, 2008)
- Supplemental Vertical Delineation – Complete
  - Field work conducted in November 2009
    - Continuous drilling, soil sampling and grab GW sampling in Exp Aquifer
  - Results presented at January 28, 2010 RAB Meeting
  - Results documented in Report (AMEC, April 23, 2010)
- Step-Out Investigation in Vicinity of Well GMW-O-18
  - Field work completed in January 2011
  - Analytical results pending

Southeastern 24-Inch Block Valve Area

- Step-Out Investigation in Vicinity of Well GMW-O-18
  - Objective
    - Delineate impacts in groundwater in southeastern area
  - Approach – investigate 5 x locations (GB-19 – GB-23):
    - Direct push field methods to top of aquitard (50 ft bgs)
    - Drilling, continuous coring, and lithologic logging
    - Discrete-depth soil and groundwater sampling
    - Soil and grab groundwater samples analyzed TPHg, TPHfp, BTEX, and Oxygenates

Southeastern 24-Inch Block Valve Area



NPDES Permit Update

- Treated groundwater discharged to Coyote Creek under NPDES permit
  - Current permit expired in October 2010
    - RWQCB allows SFPP to operate under old permit until new permit is issued
  - Tentative permit issued in December 2010
    - Tertiary butyl alcohol (TBA) added as new discharge parameter
    - SFPP working with RWQCB on schedule for implementation of new permitting requirements
  - SFPP adding new treatment units to existing remediation system; expected to implement in second or third quarter 2011

Five-Year Action Plan Progress Report

- Second Addendum to Remedial Action Plan
  - Submitted – November 2006
  - Approved – April 2007
  - Remediation system enhancements
    - Expanded the SVE and TFE system into onsite areas where residual LNAPL appeared to remain
  - 5-Year Schedule to Submitting Closure Request
  - August 2012
- Update provided in February 19, 2010 Letter to RAB
  - Revised Schedule to Submitting Closure Request
  - September 2013
- Remediation System Effectiveness Evaluation provided in Report by AMEC (May 14, 2010)

Five-Year Action Plan Progress Report

Status	Task	Date Completed or Projected	Second RAP Addendum
Completed	Receive Approval from RWQCB	April 2007	December 2006
	Begin Remediation System Expansion	May 2007	--
	Begin Upgrades to Groundwater Treatment System	August 2007	--
	Complete Remediation System Improvements	December 2007	February 2007
	Full-Scale Remediation Startup	January 2008	--
	Begin SVE Rebound Testing	December 2008	August 2008
	Submit First Annual Remediation Progress Report	January 2009	February 2008
	Submit Second Annual Remediation Progress Report	January 2010	--
	Complete SVE Rebound Testing	As conditions allow	February 2009
	Submit Third Annual Remediation Progress Report	January 2011	--
Future	Begin Bioventing Operation	After free product removal	March 2009
	Submit Fourth Annual Remediation Progress Report	January 2012	--
	Begin Bioventing Rebound Testing	TBD	December 2009
	Begin Verification Groundwater Monitoring	January 2012	June 2010
	Compete Bioventing Testing	TBD	June 2010
	Submit Fifth Annual Remediation Progress Report	January 2013	--
	Complete Verification Groundwater Monitoring	When cleanup objectives are met	June 2010
	Submit Closure Request to RWQCB	When cleanup objectives are met	August 2012