Brownfield Case Study for a New Jersey Petroleum Terminal

Stephen M. Pause, PE, LSP
BP Group Environmental Management

RevTech Conference
Pittsburgh, Pennsylvania
24 July 2003
Overview

• Site Setting and History
• Environmental Studies and Remediation
• Reuse and Redevelopment Planning
• First Reuse Opportunity
• Path Forward
• Key Learnings
Setting
Setting
Terminal - 1950's
Terminal - Late 1990's
Site History

- Site began operations in late 1920’s by Patterson Oil
- BP purchased in 1969 from ARCO
- BP closed facility in May 1996
- Site operated as refined petroleum and specialty chemical bulk storage and distribution facility
- Site and abutting properties total 130 acres; formerly 100 aboveground storage tanks and storage capacity of 3-million barrels (126-million gallons)
Site Setting

- Marine terminal, pipelines, truck loading, rail access, highway access
- 95% site unpaved; soil conditions are sandy
- Depth to groundwater is 10 to 20 feet bls
- Clay confining layer at 90 feet bls
- Local drinking water supplies draw from below clay at depths greater than 200 feet bls
- Local effects due to groundwater pumping
Environmental History

- Environmental corrective action initiated in 1981
- LNAPL recovery initiated in 1984
- Groundwater recovery initiated in 1989
- Groundwater treatment plant on line in 1991
- Off-site impacts to neighborhood identified in 1994; five homes purchased; VPP initiated
- Residential indoor air studies completed in 1995
Environmental History

- Facility closed in 1996
- Off-site SVE system on line in 1997
- Pumping system upgraded in 1999
- Source area SVE systems on line in 2001
- Deep groundwater studies started in 2001
- Potential impacts to municipal water supply identified in 2002
Over 600 soil borings completed to date

Over 250 groundwater monitoring wells installed to date (including 28 off site); depths to 130 feet bls

350-gpm groundwater treatment plant

4,000-cfm soil vapor extraction systems

Documented impacts to soil and groundwater with petroleum and chlorinated-petroleum hydrocarbons

No documented health effects to community
Regulatory History

- Administrative Consent Order (ACO) in 1984
- Second ACO in 1989 for Groundwater Treatment
- Memorandum of Agreement in 1994 for investigation of 14 AOC's
- ISRA Remediation Agreement signed by BP and New Jersey DEP in 1996, amended in 2001
Regulatory Requirements

• Follow NJ Technical Regulations and comply with ISRA Remediation Agreement
• Set Priorities with Case Manager
  1. Delineate extent of on-site and off-site impacts to soil and groundwater
  2. Manage migration of groundwater and soil vapor
  3. Implement source area reduction
  4. Improve communication with Community
On-Site Investigations
Site Geology
LNAPL Delineation
Groundwater Capture
Remediation Systems
Groundwater Treatment
Soil Vapor Extraction
Remediation Summary

- >500,000 gallons petroleum have been removed as LNAPL since 1989 (25,000 gallons in 2002)
- GWTP treated 180 million gallons of groundwater in 2002 (1.4 billion gallons since 1995)
- GWTP has removed 172,000 lbs petroleum since 1995 (28,000 gallons)
- SVE has removed 527,000 lbs petroleum since 1997 (88,000 gallons); mostly in 2001-2002
Improved Communication

- Use of Data Visualization Tools
- Hot Line: 856-423-3648
- Newsletter
- Website: www.paulsboroterminal.com
- Public Forums
Geographic Information Systems
Environmental Database

Geographic Environmental Management System

GEMS

- Data Entry
- Data Review
- Administrative

Managing Data to Achieve Results
Newsletter

Pipeline

Paulsboro Environmental Satellite Web Site Goes Live!

CONTACTS:

BP Amoco

Hammonton Hq:

1351 Tilton Rd

Hammonton, NJ 08037-1069

Webmaster:

Karen Allen

(609) 561-3424

Paulsboro Refinery:

Karen Allen

(609) 561-3424

Office of the Environment:

Karen Allen

(609) 561-3424

BP Amoco

Hammonton, NJ 08037-1069

Webmaster:

Karen Allen

(609) 561-3424

Paulsboro Refinery:

Karen Allen

(609) 561-3424

Office of the Environment:

Karen Allen

(609) 561-3424

Upcoming in Next Pipeline:

- Update on the future of the facility
- Environmental testing and treatment
- Weekly update
- Meet BP Amoco's top 10

Don't have a Computer Yet? Use the Library!

The public will be able to access the Internet through computers at the PPA Memorial Library, located in the center of Braddock and Evergreen Streets. The library staff will be in the media of acting as a resource center to access the Internet. At the end of the summer, they should have added more computers for patrons to use—all with access to the Internet. The library has instructions for key access to the website. Summer hours are Monday through Thursday 12 pm to 7 pm and 10 am to 6 pm. It is closed on Friday through Monday.
Website
Why Look at Reuse and Redevelopment?
The Triple-Bottom Line

- **Economic Responsibility** (Business Approach)
  - Market Portfolio Divestments
  - Auctions

- **Social Responsibility** (Community Approach)
  - Donations
  - Area Restoration

- **Environmental Responsibility** (Regulatory Approach)

LIABILITY EXIT & REPUTATION ENHANCEMENT

BASELINE INFORMATION
BP’s Goal

“To catalyze development of a sustainable economic enterprise while meeting all of our long-term environmental cleanup responsibilities.”
Community Commitment

- Commitment to address site-related environmental issues per NJDEP requirements (over >$40M long term)
- Commitment to help Community stimulate a sustainable economic development
- Commitment to fund “Highest and Best Use” studies to explore site reuse and redevelopment (over $300k investment)
- Commitment to explore early reuse opportunities
Keys to Redevelopment Planning

- Alignment of Corporate Business Units and Functions
- Funding Commitment
- Involvement and Input of Community
- Involvement of Neighboring Property Owners
Redevelopment Setting
The Redevelopment Site
Site Access

DISTANCES TO SITE FROM I-295

1. 1.5 Miles
2. 1.8 Miles
3. 3.0 Miles
4. 3.1 Miles
Redevelopment Planning

• Initiated Phase 1 planning study in 2000 to evaluate whether redevelopment could:
  ▪ Increase asset value
  ▪ Reduce environmental costs by use of engineering controls, deed restrictions, covenants, property control
  ▪ Create positive image in community

• Phase 1 recommended:
  ▪ Commercial/industrial alternative
  ▪ Maritime port alternative
Redevelopment Planning

- Initiated Phase 2 in 2001
- Recommended alternative incorporates:
  - On-going remedial needs
  - A new overpass and access from the east
  - An internal roadway network that allows for phased demolition and development
  - A buffer area for the residential neighborhood to the west
  - Capitalization of river frontage through a 30 to 40 acre flexible out-parcel for some type of river loading/unloading operation
  - A small commercial/recreational district located due north of the adjacent neighborhood
Redevelopment Benefits

- $90M in New Public and Private Investment
- Construction Jobs - 1,500 FTE/year
- Permanent Jobs - 400-500 FTE
- Projected Payroll - $20M/year
- Additional Tax Revenues - $1.4M
- Positive Spin-off Effects Supporting the Borough’s Neighborhood/Business District Revitalization
- Over $5M in potential environmental savings plus goodwill, reputation, tax benefits
Phase 2 Highest & Best Use

- Niche Port Facility
- Solar Power Field
- New Overpass over Mantua Creek
- Waterfront Commercial
- GWTP/SVE Systems
Current Site Plan
Future Site Plan
Project Financing

- BP is not a developer
- Project requires significant public subsidy / total amount yet to be identified
- Project requires equity / source yet to be identified
- Project requires lowest possible debt financing
- Normal rate of returns associated with debt and equity sources
First Reuse Opportunity
A Solar Power Facility
Solar Project Facts

- First Reuse project....
- Plant output is 276 kW
- Design life is 25 years
- Plant to generate 350,000 kWh/year
- 5,880 2’x4’ thin film panels
- Power approximately 30% of demand for Terminal remediation
- Panel arrays occupy area of 5+ acres of 17.3 acres leased from Essex
Funding

• VASE Grant for $408k
• NJ Clean Energy Program for $908k
• BP GEM contribution of $700k (includes extra costs of needed for reuse of landfill)
• Additional $300k will be needed to complete Public Awareness component (visitor/education/park)
Environmental Benefits

- Reduction of CO2 gases by 571,000 lb/year
- Reduction of SO2 emissions by 1,600 lb/year
- Reduction of NOx emissions by 1,100 lb/year
Landfill
Project Design
Project Design
Solar Field
Solar Field
Solar Field
Solar Field
Solar Field
Visitor/Education Park Concept
Redevelopment Learnings

• Involve the local Community stakeholders early and often
• Complete Best Use Studies: What does the Site want to be?
• Look at an Area-Wide Approach: You are not alone.
• Involve the Regulators
• Seek out other available resources
• Keep the Politicians involved
Redevelopment Learnings...
Future Tasks

- Continue with environmental investigations and remediation (5-7 years estimated)
- Continue to work with Community and neighbors
- Continue to pursue outside funding opportunities
- Continue to “market” the Redevelopment Concept
- Tank removal and surface clean up
- Conveyance of land “control” to third party
Questions?