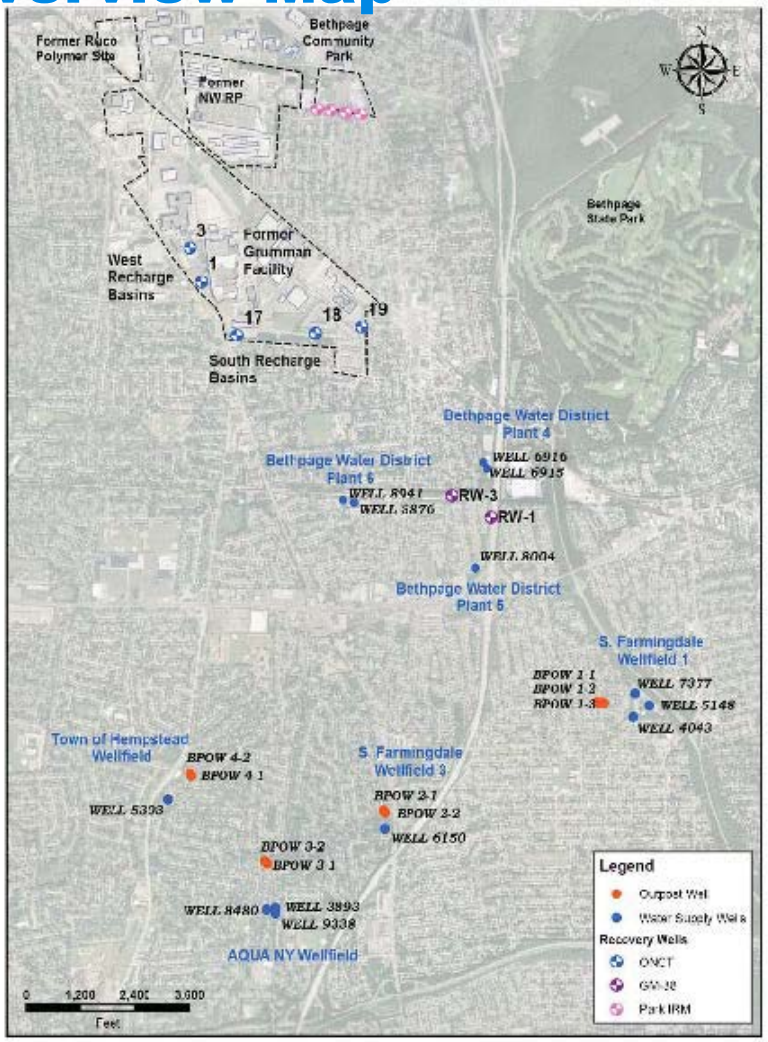
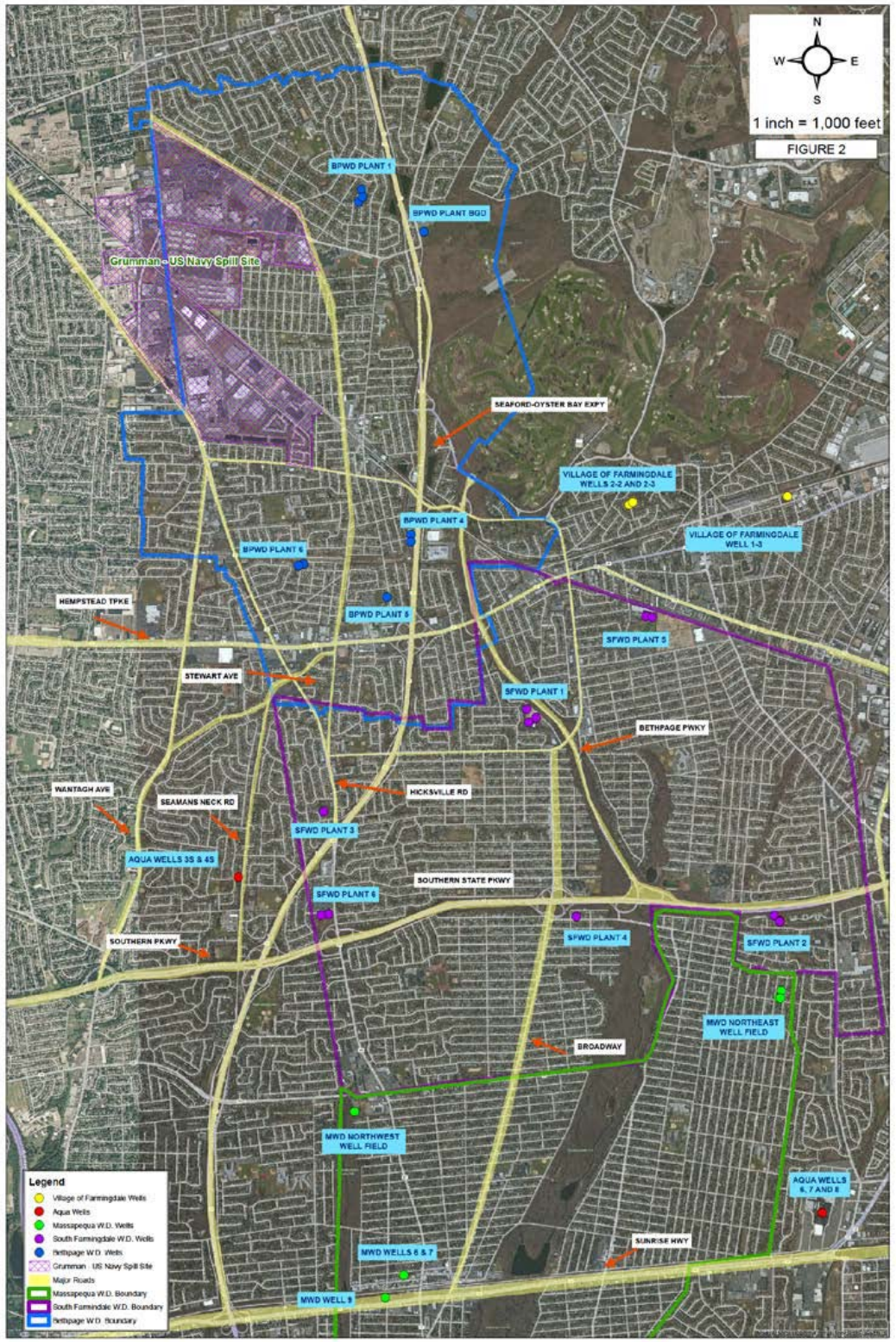
Navy-Grumman Plume – Roundtable Meeting

September 15, 2011

Overview Map



General site layout at Bethpage such as locations of the Navy's and Northrop Grumman Corporation's former facilities as well as current remedy locations (Source: Northrop Grumman Optimization Presentation, February 8, 2010).


N
W
E
S
1 inch = 1,000 feet
FIGURE 2
BPWD PLANT 1
BPWD PLANT BGD
Grumman - US Navy Spill Site
SEAFORD-OYSTER BAY EXPY
VILLAGE OF FARMINGDALE WELLS 2-2 AND 2-3
BPWD PLANT 4
VILLAGE OF FARMINGDALE WELL 1-3
BPWD PLANT 6
HEMPSTEAD TPKE
BPWD PLANT 5
SFWD PLANT 5
STEWART AVE
SFWD PLANT 1
BETHPAGE PKWY
WANTAGH AVE
SEAMANS NECK RD
HICKSVILLE RD
SFWD PLANT 3
AQUA WELLS 3S & 4S
SOUTHERN STATE PKWY
SFWD PLANT 6
SFWD PLANT 4
SFWD PLANT 2
SOUTHERN PKWY
MWD NORTHEAST WELL FIELD
BROADWAY
MWD NORTHWEST WELL FIELD
AQUA WELLS 6, 7 AND 8
SUNRISE HWY
MWD WELLS 6 & 7
MWD WELL 9
Legend
Village of Farmingdale Wells
Aqua Wells
Massapequa W.D. Wells
South Farmingdale W.D. Wells
Bethpage W.D. Wells
Grumman - US Navy Spill Site
Major Roads
Massapequa W.D. Boundary
South Farmingdale W.D. Boundary
Bethpage W.D. Boundary

Significant Groundwater Contamination and Adverse Impact to Drinking Water

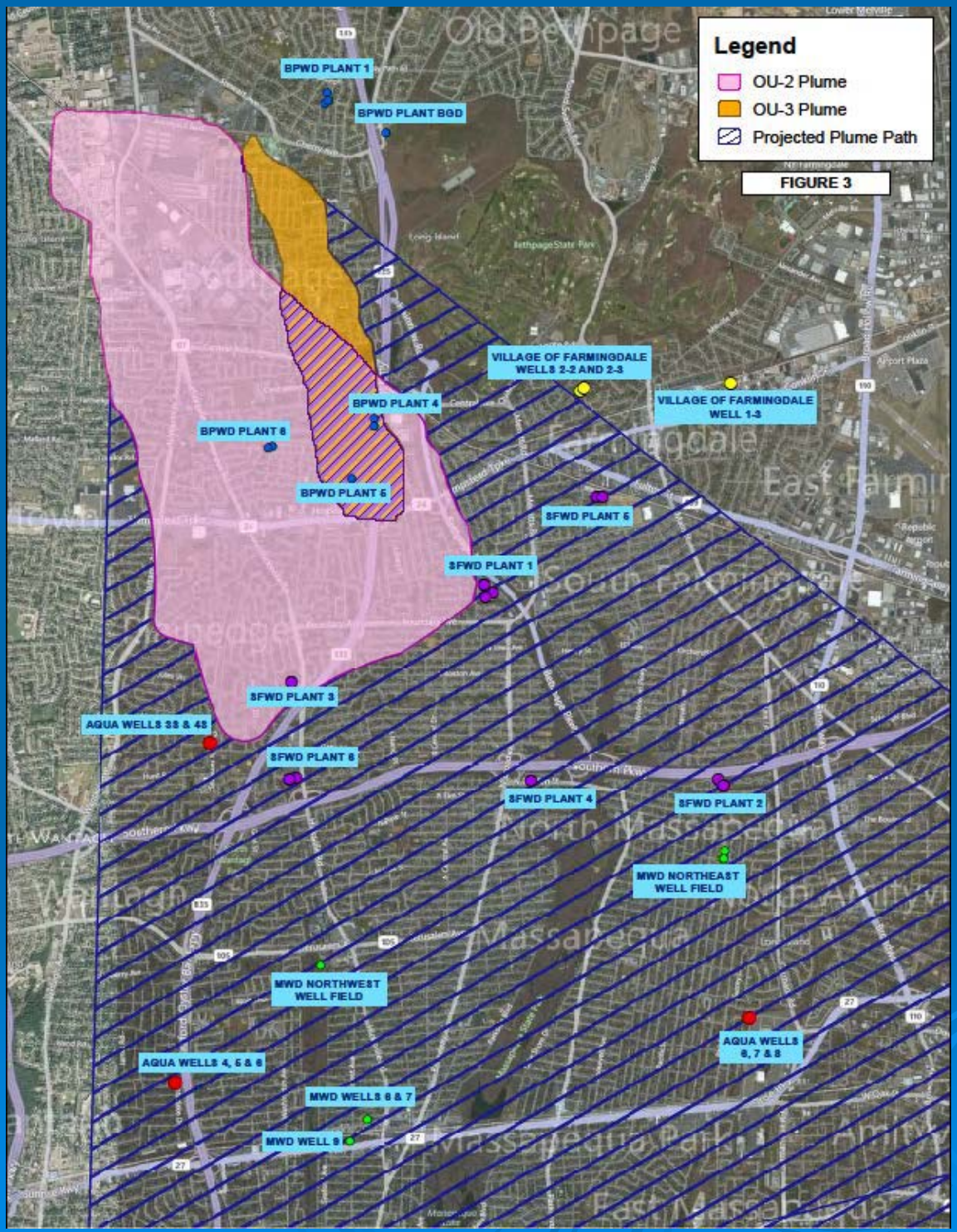
Summary of Wells in Harms Way

- 34 wells total
  - Wellhead Treatment (WHT) – 9 wells
  - WHT Construction – 2 wells
  - Threatened wells – 23 Wells
- A total population of 255,000 are served by wells that are impacted or threatened by the plume
- This population is more than 2.5 times than the City of Albany (95,658 based on 2010 US Census).

Wells Impact and Threatened

Supplier	Plant Site	Well No.	Number of Wells	Capacity (MGD) (1)	Status
AQUA of NY	Seaman Neck	3 & 4	2	6.04	Impacted
	Demot	4, 5 & 6	3	7.82	Threatened
	Sunrise Mall	6, 7 & 8	3	9.06	Threatened
Bethpage	Plant 4	4-1 & 4-2	2	3.98	Impacted
	Plant 5	5-1	1	1.99	Impacted
	Plant 6	6-1 & 6-2	2	3.98	Impacted
Levittown (Town of Hempstead)	Wantagh Ave	?	1	1.78	Threatened
Massapequa	Northwest	4 & 5	2	3.98	Threatened
	New York Ave.	6 & 7	2	3.98	Threatened
	Sunrise Hwy	9	1	1.99	Threatened
	Northeast	1, 2R, 3 & 8	4	8.85	Threatened
South Farmingdale	Plant 1	1-2 & 1-3	2	3.98	Impacted
	Plant 1	1-4	1	1.99	Imminent threat
	Plant 2	2-2 & 2-3	2	3.56	Threatened
	Plant 3	3-1	1	1.99	Imminent threat
	Plant 4	4-1	1	1.78	Threatened
	Plant 5	5-1 & 5-2	2	3.98	Threatened
	Plant 6	6-1 & 6-2	2	3.98	Threatened
Total Wells Threatened or Impacted:			**34**	**74.71**	MGD
Total Wells with Wellhead Treatment (WHT):			**9**	**19.97**	MGD
Totals Wells with WHT planned or under construction:			**2**	**3.98**	MGD
Total Threatened Wells:			**23**	**50.76**	MGD

Notes: (1) - Authorized Capacity MGD - Million Gallons per Day


Legend
OU-2 Plume
OU-3 Plume
Projected Plume Path
FIGURE 3
BPWD PLANT 1
BPWD PLANT BGD
BPWD PLANT 4
BPWD PLANT 6
BPWD PLANT 5
VILLAGE OF FARMINGDALE WELLS 2-2 AND 2-3
VILLAGE OF FARMINGDALE WELL 1-3
SFWD PLANT 6
SFWD PLANT 1
SFWD PLANT 3
AQUA WELLS 3S & 4S
SFWD PLANT 8
SFWD PLANT 4
SFWD PLANT 2
MWD NORTHEAST WELL FIELD
MWD NORTHWEST WELL FIELD
AQUA WELLS 4, 5 & 6
AQUA WELLS 6, 7 & 8
MWD WELLS 6 & 7
MWD WELL 9

Public Health Protection Concerns

- Wellhead treatment is not desirable based on health risk concerns.
- Over the past 25 years the EPA has continued to set forth more stringent requirements for public drinking water.
- These more stringent measures primarily have initiated more stringent wellhead treatment facilities.

Drinking Water Exposure Concerns

(1) Prior to 1970 the primary plume contaminants were not regulated

(2) From the late 1970s to December 31, 1988 the regulatory limit for the primary plume contaminants were 50 ppb

(3) From Jan. 1, 1989 to present the regulatory limit for the primary plume contaminants is 5 ppb

(4) - EPA is presently evaluating lowering the regulatory limit for PCE and TCE to 2 ppb or less.

Drinking Water Exposure Concerns

- In theory a person could drink water over a 20 year period at 50 ppb drinking water MCL and ingest over 10 pounds of contaminants (PCE / TCE).
- Therefore the plume clean-up must be in accordance with the EPA MCL Goal (MCLG) of zero

Other Wellhead Treatment Concerns

- Air emissions
- Adverse community impact. Many facilities are located in residential neighborhoods.
- Adverse impact on property values.

Air Stripping for VOC Removal

Air Stripping for VOC Removal

MWD Northeast Well Field

Air Stripping for VOC Removal

MWD Northeast Well Field

Attenuation is not the Answer!

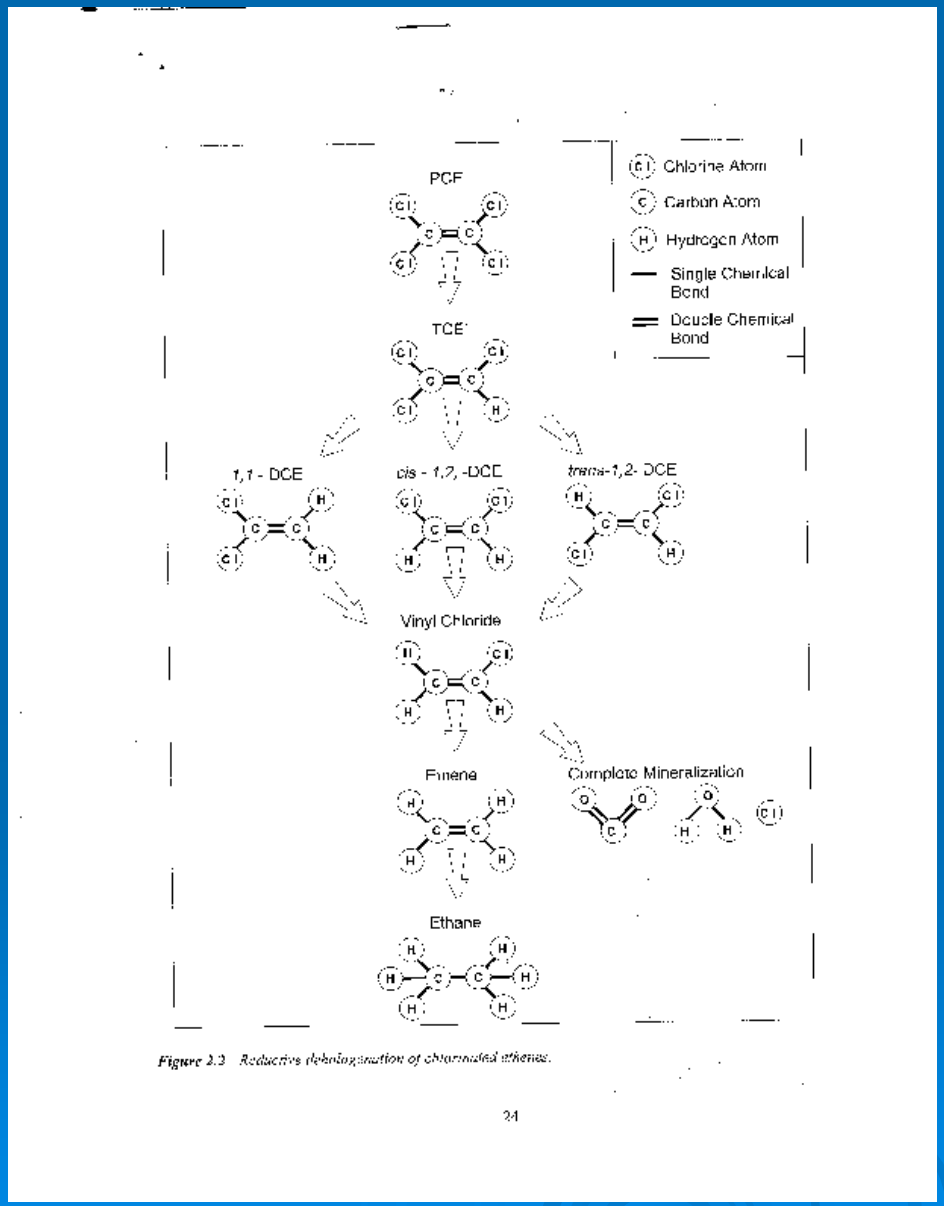


Figure 2.3 Reductive dehalogenation of chlorinated ethenes.

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Source: EPA Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater

September 1998

EPA/600/R-98/128

The Law……

- Allowing the groundwater contamination to remain and not be subject to cleanup is not in compliance with the law.

2001 NYSDEC OU-2 ROD

- Erroneously Alternative 3 was the selected remedy
- It was grossly misleading since it is based on providing wellhead treatment for five (5) wells rather than the full thirty six (36) that are in the projected path of the plume.

Containment of the Plume for Threatened Wells

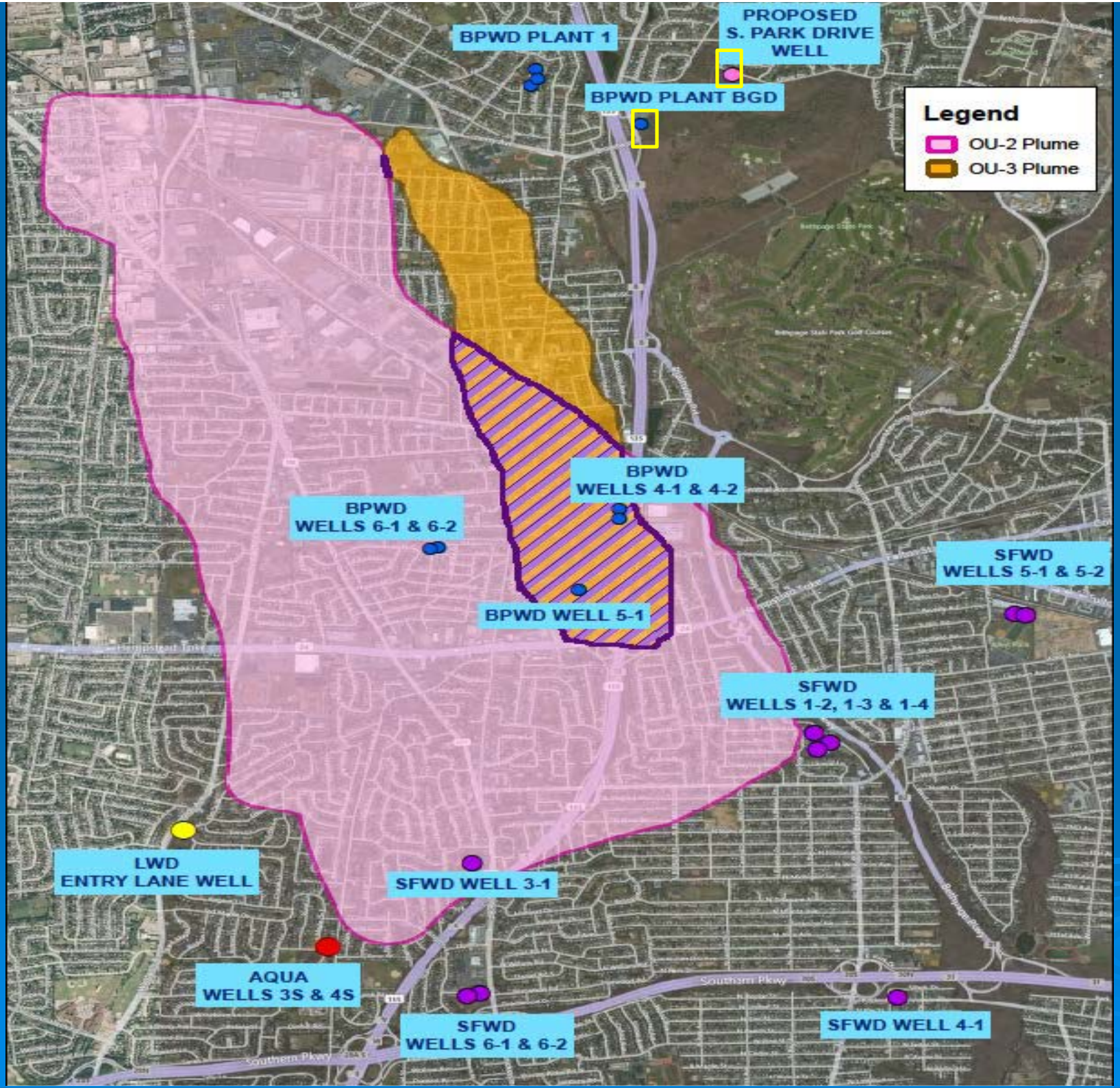
- The Navy Optimization Report calls for effective containment of the OU-3 plume. Further DEC's regulations, 6 NYCRR 375-1.8(c), as described previously, specifically require containment.

OU-3 FS

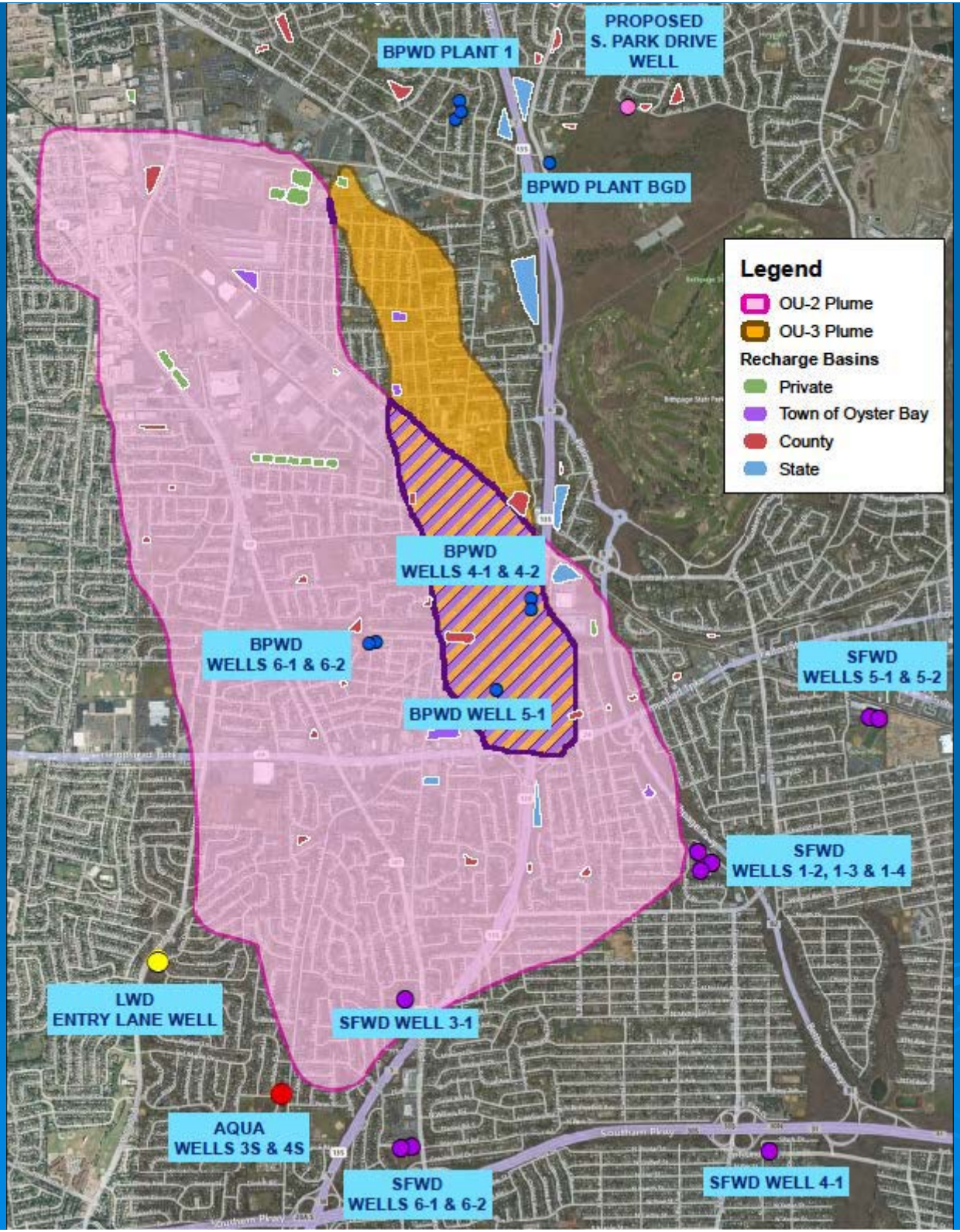
- Cost to implement the remedy that DEC and Arcadis have promoted under the OU-3 FS would be approximately $250 million.
- The cost for containment of the plume in conjunction with the costs associated with the utilization of Bethpage well 4 for cleanup, will be substantially less than $250 million.

Better Approach

- The approach adopted by the water suppliers is substantially less costly than the approach promoted by DEC and Arcadis.



Moving Bethpage WD Supply Capacity to the North of the Plume


PROPOSED
S. PARK DRIVE
WELL
BPWD PLANT 1
BPWD PLANT BGD
Legend
OU-2 Plume
OU-3 Plume
Recharge Basins
Private
Town of Oyster Bay
County
State
BPWD
WELLS 4-1 & 4-2
BPWD
WELLS 6-1 & 6-2
BPWD WELL 5-1
SFWD
WELLS 5-1 & 5-2
SFWD
WELLS 1-2, 1-3 & 1-4
LWD
ENTRY LANE WELL
SFWD WELL 3-1
AQUA
WELLS 3S & 4S
SFWD
WELLS 6-1 & 6-2
SFWD WELL 4-1