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New York State Department of Environmental Conservation, Region 5

Division of Environmental Remediation, Michael J. O□Toole, Jr., Director

NYSDEC
Region 5

Atlas Missile Silo Site S-6 Additional Groundwater Monitoring Well Installations, Sampling Results, And Recommendations Report

February 2000

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

GEORGE PATAKI, Governor

JOHN CAHILL, Commissioner

STUART BUCHANAN, Regional Director

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Contract, Atlas Missile Sites: S-4, S-6, S-8, and S-12, Plattsburgh Area, New York, September 1999 that apply to S-6

1987 - on site low level cont.
1995 - residences - not contaminated
1999 - on site contaminated at about std. levels.

Section 1 - Executive Summary

1.1 Summary of Results

The Atlas Missile Silo Site S-6 located in the Town of Black Brook, Clinton County, New York State is the subject of this site investigation. The owner of record is Miroslawa Pavelka, 480 Cook Street, Jackson NJ 08527. This facility was investigated by a consultant working for the Department of Defense (DOD) in 1987. The 1987 report was based on the initial investigation and sampling associated with the site.

The 1987 report documented low levels of contamination found at this site (table 1). Contamination was mainly caused by the cleaning solvent trichloroethene (TCE). In the fall of 1995 the New York State Department of Health (NYSDOH) sampled nearby residences of the atlas missile silo sites. The results of this sampling indicate that nothing was detected in the residential wells sampled. The recommendations from the NYSDOH May 1996 residential well sampling summary report are that continued monitoring of on site wells be continued. The old monitoring wells on site were destroyed by vandalism. To answer the question of whether this site should be listed on the registry, the site had four monitoring wells installed on it, each 200 feet deep, in the summer of 1999 (figure 2). These wells were sampled and analyzed for Volatile Organic Analysis (VOA), EPA method 8260 - GC/MS. The results of this November 9, 1999 sampling indicated TCE contamination on the order of 5 parts per billion (ppb). The results of this sampling are summarized on table 2.

1.2 Presence of Significant Threat

There is not a significant threat posed by the contaminated groundwater at this site. The contamination seen in the on site monitoring wells is on the order of 5 ppb, the drinking water standard for TCE. The estimated amount of TCE on site is one tenth of a pound (0.11 lbs.). This estimated amount is based on some very conservative assumptions, and indicates that there is no source of TCE present on site contributing to the groundwater contamination. The down gradient residential drinking water wells that have been sampled in the past have not had any TCE contamination detected in them. The site is currently not used. These pieces of information indicate that there is not a significant threat associated with the site in terms contaminated groundwater due to the old missile silo operations. The TCE contamination present is at the level of the drinking water standard.

1.3 Recommended Action

This site has been investigated sufficiently to make a determination of no significant threat. This site should therefore not be included in the Registry of Inactive Hazardous Waste Disposal Sites for New York State. The work remaining at this site is the proper abandonment of the four 200 foot monitoring wells recently installed. These wells are open hole bedrock wells, and can act as a conduit for contamination to move from one strata to another within the bedrock unit, if left in place as is. These wells should be either properly abandoned, or screened and sealed to limit cross contamination among the various water bearing zones within the bedrock unit.

Section 2 -Introduction

2.1 Current Site Description

The site is currently unused. The launch control center and living quarters have been removed. The silo doors are closed, however the man way that used to connect the launch control center to the silo is open and is regularly accessed by local youth who trespass and use the site for recreational purposes.

2.2 Previous Investigations

2.2.1 1987 DOD Report

The Atlas Missile Silos are former Department of Defense (DOD) sites that have been initially investigated and reported by a contractor working for the DOD in 1987. The 1987 report recommended that the site not be pursued further. The additional work was done however due to other considerations form the NYSDOH, and the NYSDEC.

Table 1
Summary of 1987 DOD Report

Contaminant	Well Numbers	Level (ppb)	DW Std	GA Std
chloroform	trip blank, rinsate from MW sampling**	120, 5.5	50	7
trichloroethene	601, 603, 604	8.1, 3.7 (3.2 dup.), 5.6	5	5
chlorodibromomethane	rinsate from MW sampling**	1.3	50	N/A
toluene	rinsate from MW sampling**	0.47	5	5
total arsenic	603	12 (11 dup.)	50	25
total chromium	602, 603, 604	31, 39 (37 dup.), 22	100	50
total lead	602, 603, 604	15, 19 (15 dup.), 8	15 *	25
total barium	601, 602, 603, 604	15, 231, 265 (219 dup.), 200	2,000	1,000

Notes:

* The lead action levels is exceeded if the concentration of lead in more than 10 % of one liter first draw tap samples collected during any monitoring period exceeds 0.015 milligrams per liter. (NYSDOH Subpart 5-1; section 5-1.41)

** These chemicals were detected in the trip blanks and sample blanks and are most likely lab artifacts, and not indicative of the groundwater quality from the monitoring well.

2.2.2 NYSDOH Summary Report, May 1996

The section of this residential well sampling report that applies to S-6 is included in Appendix B. In the fall of 1995 the DOH sampled residences nearby the atlas missile silo sites. The results of this sampling indicate that nothing was detected in the residential wells that were sampled. The report also recommends that the existing monitoring wells on site continued to be sampled due to the proximity of residential drinking water wells. It should be noted that this report was issued prior to the NYSDEC and the NYSDOH knowing about the destruction of the old monitoring wells,

and the newly installed monitoring well data being available. The nearest residential drinking water well was sampled in the summer of 1999 by NYSDOH. The results are non-detect. This well is up gradient of the site, the sampling was done at the request of the homeowner.

2.3 Standards Criteria and Guidance

The site has various applicable SCGs. The applicability of these SCGs requires that they be considered in the investigation of the site. The SCGs are:

- Technical and Administrative Guidance Memorandum (TAGM) 4046.
- Technical Operations and Guidance Series (TOGS) 1.1.1.
- Part V of 10NYCRR - NYSDOH Drinking Water Standards
- 6NYCRR Parts 371 & 375, 376, 700-705.
- Fish And Wildlife Impact Analysis for Inactive Hazardous Waste Sites (FWIA)

Section 3 - Scope Of Work - 1999 Field Investigation

3.1 Investigation Objective

The objective of the investigation was to determine if there is a need for continued action at this site in terms of contamination resulting from operations of the missile silo. Specifically, the objective was to determine if the Atlas Missile Silo Sites should be added to the Registry of Inactive Hazardous Waste Sites for New York State. Currently only S-11 is listed on the registry (# 510009). This 1999 phase of the investigation included installation of four monitoring wells, 200' deep, sampling and analysis of these four wells, and the preparation of this report documenting the findings from the sampling and analysis and presenting a conclusion regarding the site status.

3.2 Sample Collection

Samples were collected from the four newly installed monitoring wells using dedicated tubing, and a pump. The NYSDOH also sampled a residential well up gradient near the site entrance. The results of this NYSDOH sampling were non detect.

3.3 Sample Analysis

The samples, including trip blanks, were sent to Roy F. Weston Inc. Laboratory in Lionville Pennsylvania and analyzed in accordance with USEPA method 8260 - GC/MS. The NYSDOH sample was analyzed by their own lab.

Section 4 - Investigation Results - 1999 200' Monitoring Wells; Installation and Sampling

The sample results for the four new monitoring wells are shown below in table 2. The sample summary sheets are attached in Appendix A. Monitoring well locations are shown on figure 2. The section of the Field Data Summary, New York State Superfund Standby Contract, Atlas Missile Sites: S-4, S-6, S-8, and S-12, Plattsburgh Area, New York describing the monitoring well installation, that applies to S-6, is included as Appendix C.

Table 2: Sample Results Summary from November 9 1999 Sampling

Well Number	Open Hole Depth Interval (in feet)	Result in ppb	DW / GA Standard in ppb
61	69 - 200	TCE - 2 J	5
62	66 - 200	TCE - 6	5
63	120 - 200	toluene - 1 J	5
64	82 -200	TCE - 5	5

Section 5 - Presence of Significant Threat & Calculations of Quantity Estimate

5.1 Presence of Significant Threat

The on site TCE groundwater contamination does not represent a significant threat to human health and the environment. The groundwater contamination at the site is at the drinking water standard of 5 ppb. Well number 62 had a detection of 6 ppb, and the drinking water standard is 5 ppb. This difference in values is within the limits of differences regularly seen during laboratory analysis, and this value is essentially representing the same thing as 5 ppb is in well 64. The estimated quantity of TCE present on site in the groundwater is one tenth of a pound (0.11 lbs.). The monitoring well sample results and the residential well sample results indicate that there is not a significant threat posed by the contamination present in the groundwater at the site.

5.2 Estimate of Quantity of TCE and Cis-1,2 - Dichloroethene

The calculations to determine the amount of TCE on site are presented here. There were several assumptions made and are listed below. These are conservative assumptions and represent the worst possible case scenario.

1. An average concentration of the 1999 sampling data is sufficient to use for estimate calculations. (5=6=2)/3 = 4.3 ug/l
2. The depth of contamination will be the depth of the wells and silo (200').
3. The total depth of water in the silo is the depth of the silo - the average depth to the top of the water. 200' - 66' = 134'
4. Areal extent is the exterior fence in the direction of flow to the silo. 143' X 125' = 17,875 $ft.^2$
5. Volume of water in bedrock fissures is negligible when compared to the volume of water in the silo, and in the overburden soil.
6. Silo water volume is 134' deep by 60' diameter ($V= PI * r^2 * h$)
   $V= (3.1417etc.)(30')^2(134') = 378,876\ ft^3 * 7.48 = 2,833,993$ gal. * 3.785 = 10,726,663 liters

7. Void space in soil is 20%, average depth of saturate sand is (20.74+0+26.37+7.46)/4 = 13.6'
   V=20% X Area X Depth of saturated soil = (.20)(17,875 ft^2)(13.6ft)=48,620 ft^3
   V=48,620 ft^3 * 7.48 = 363,677.6 gal. * 3.785 = 1,376,520 liters
8. Estimated amount of TCE present: a.) Silo: 10,726,663 l X 4.3 ug/l X 2.205 x 10^{-9} = 0.10 lbs.
   b.) Soil Water: 1,376,520 l X 4.3 ug/l X 2.205 X 10^{-9} = 0.01 lb. ***0.11 lbs. TCE***

Section 6 - Recommendations

6.1 Recommended Site Classification

This site has been investigated sufficiently to make a determination of no significant threat. The recommendation for the Atlas Missile Silo S-6 in Black Brook New York is that it not be pursued further as a "P" site. The groundwater on site has been shown to be slightly contaminated with TCE, at or below the level of the drinking water standard of 5 ppb. The down gradient residential wells did not show any contamination when they were sampled in 1995. The up gradient well that is closest to the site also did not show any contamination when it was sampled in 1999.

6.2 Future Work

The work remaining at this site is the proper abandonment of the three newly installed 200' monitoring wells. These wells are open hole bedrock wells, cased into bedrock anywhere from 66 to 120 feet blow grade. Given the past history f vandalism at this site, and no need to keep the wells for future monitoring, these wells should be properly abandoned to remove the conduit to bedrock water that they represent.

Section 7 - References

Field Data Summary, New York State Superfund Standby Contract, Atlas Missile Sites: S-4, S-6, S-8, and S-12, Plattsburgh Area, New York, September 1999, prepared by Malcolm Pirnie Inc., Buffalo New York.

Sample Data Package: RFW Batch 9911L663, NYSDEC ID: SH599-11899-B08141, B08142, B08143, B08TB, December 1999, Recra Environmental Inc., Lionville Pennsylvania,

Final Report Confirmation Study of Former Atlas Missile Sites For Potential Toxic and Hazardous Waste Contamination Former Atlas Site S-8, Essex, New York, May 1987, for the U.S. Army Corps of Engineers, Kansas City Missouri; prepared by Law Environmental, Atlanta Georgia

Summary Report 1995 NYSDOH Residential Well Sampling of Atlas Missile Silo Sites, May 1996, NYSDOH.

Figure 1 Atlas Missile Site S-6 Site Location Map

Figure 2 Atlas Missile Site S-6 Site Map

Appendix A: Sample Results Summary Sheet for S-6, 1999

Appendix B: Sections of the 1996 NYSDOH Residential Well Sampling of Atlas Missile Silo Sites, May 1996 that apply to S-6; 1999 Residential Well Sample Results Letter

Appendix C: Sections of the Field Data Summary, New York State Superfund Standby Contract, Atlas Missile Sites: S-4, S-6, S-8, and S-12, Plattsburgh Area, New York, September 1999, that apply to S-6