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### STANDpoint Special Edition

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# STANDpoint

*a Special Edition*  
*January 2006*

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During 2005, STAND conducted several projects funded by a monitoring and technical assistance grant.

One project was a small sampling project with which to gain a better understanding of soils contamination off-site and near Pantex. Twelve soil samples were analyzed for a suite of High Explosives. With a reporting limit ranging between 480 and 500  $\mu\text{g}/\text{kg}$ , none of the soils were reported to have high explosives contaminants. An additional 15 soil samples were analyzed for a suite of radionuclides, using gamma spectroscopy. At this time, results reported for the 17 radionuclides raise more questions than they resolved about the Pratt Lake watershed, which is located above the Amarillo well-field and receives stormwater from Pantex. To date, Pratt Lake has not been investigated by Pantex, nor have the regulators required it.

These results will be provided to STAND's technical assistants that are reviewing the Pantex human health and ecological risk assessments and the Pantex Radiological Information Report. In this way, data gaps that may have gone unnoticed might be identified and a better cleanup may be required by the regulators.

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Since September 1995, the Pantex Plant has relied upon its Pump and Treat system to clean up the contaminated perched aquifer that extends beyond the Pantex surface boundary, beneath neighbor's land to the south and southeast. At the December 5, 2005, quarterly groundwater meeting, a Pantex representative reported that – through October 2005 – the system had treated 404,489,692 gallons of contaminated water. Through this treatment, 132 pounds of Chromium and 4,367 pounds of High Explosives have been removed.

To understand the effectiveness of a decade of Pump and Treat cleanup operations, another project conducted by STAND was an independent review by groundwater hydrologist, George Rice, part of which follows:

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## Effectiveness of the Perched Aquifer Pump and Treat System

December 2005

The Department of Energy's (DOE) report: *Annual Report in Support of Compliance Plan No. CP-50284-000*<sup>1</sup> briefly summarizes information contained in other DOE reports regarding clean-up activities at Pantex. However, it does not present a thorough analysis of the effectiveness of DOE's clean-up activities. Because of this, DOE's quarterly reports of analytical results<sup>2</sup> were examined to evaluate the effectiveness of one of the major clean-up systems at Pantex – the perched aquifer pump and treat system.

The high explosive RDX is one indicator of clean-up effectiveness because it is one of the most widespread contaminants in the perched aquifer.

Table 1 presents RDX data for selected monitor wells in the perched aquifer. Graphs depicting the changes in RDX concentrations are presented in figures 1-7.

The RDX data lead to the preliminary conclusion that DOE's perched aquifer pump and treat system has been marginally effective.

To date, cleanup appears to have been effective in only one of the selected wells: PIX06-1005 (figure 1). Between 1999 and 2005, RDX concentrations dropped from approximately 1000  $\mu\text{g}/\text{L}$  to 20  $\mu\text{g}/\text{L}$ . This is less than the TCEQ Industrial Risk Reduction Standard 2 level of 26  $\mu\text{g}/\text{L}$ <sup>3</sup>. However it is higher than the EPA lifetime health advisory of 2  $\mu\text{g}/\text{L}$ <sup>4</sup>.

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Well PTX06-1005 is near a clean-up system injection well<sup>5</sup>. This may be the reason RDX concentrations have decreased as much as they have.

RDX concentrations have declined in some wells (e.g., PTX06-1042, figure 4) and increased in others (e.g., PTX06-1046, figure 5). Still, except for well PTX06-1005, RDX concentrations remain high in all the wells (figures 2 – 7), far above any standards established to protect human health.

A complete evaluation of the effectiveness of the pump and treat system would require an assessment of the temporal distribution of additional contaminants (e.g., chromium, TCE, TNT), as well as the assessment of additional monitor wells.

<sup>1</sup> DOE, 2005a.

<sup>2</sup> DOE, 1998 – 2005.

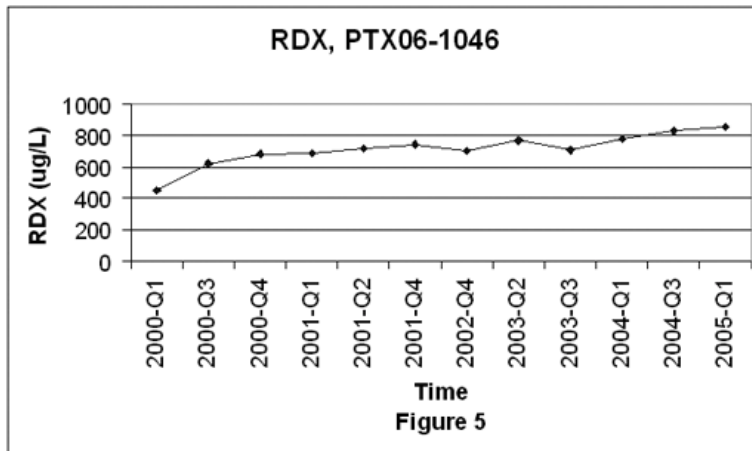
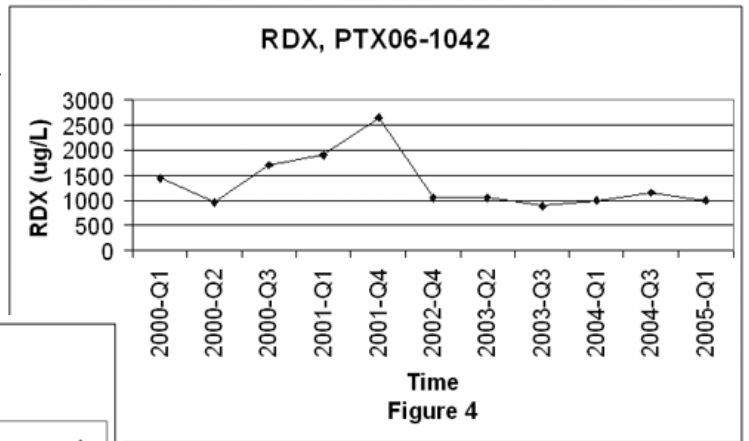
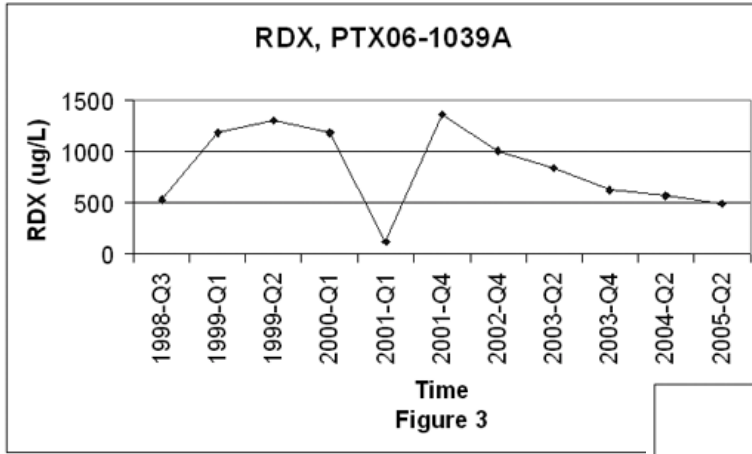
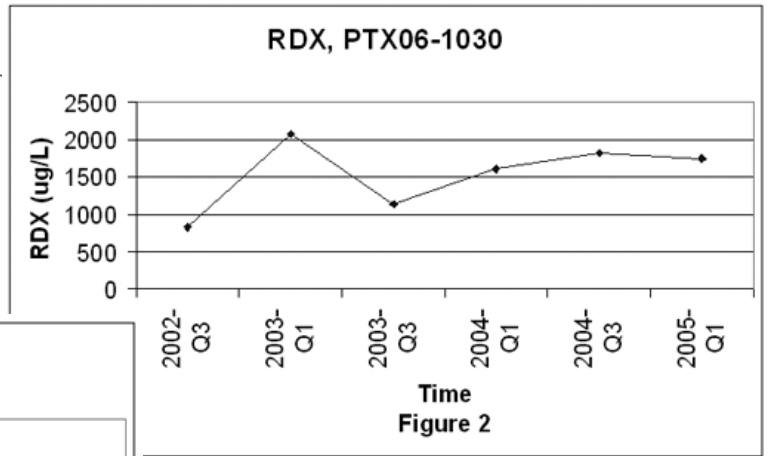
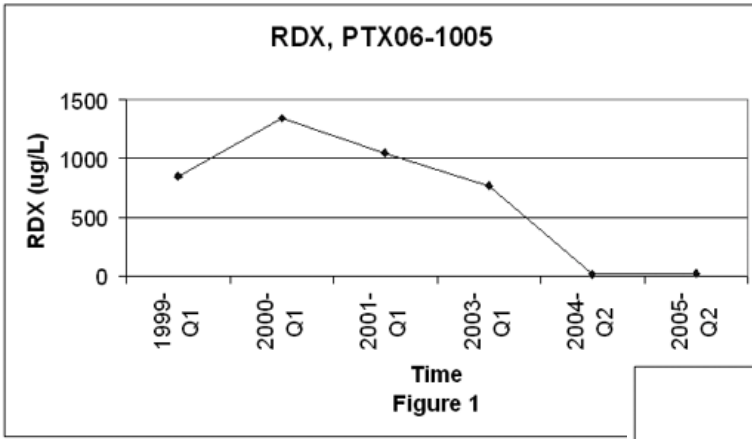
<sup>3</sup> DOE, 2005a, figure 19.1.

<sup>4</sup> EPA, 2004.

<sup>5</sup> PTX06-1005 is less than 200 feet from injection well PTX06-INJ-8 (DOE, 2005a, figure 17.3).

**Table 1. Concentrations of RDX in selected Perched Aquifer Wells (DOE, 1998-2005).**

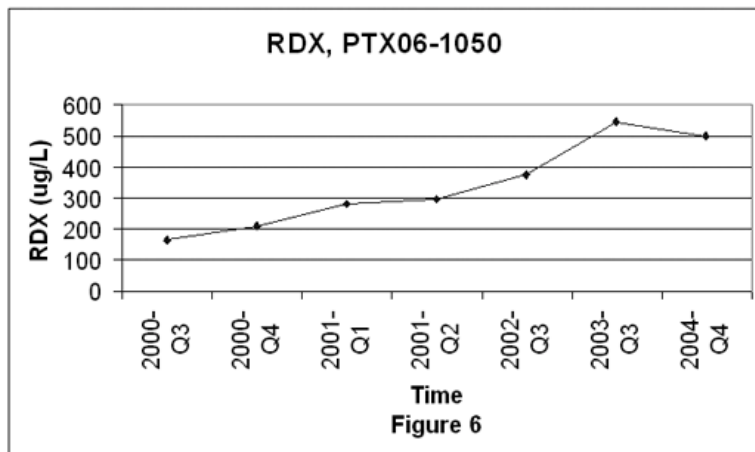
Date	PTX06-1005	PTX06-1030	PTX06-1039A	PTX06-1042	PTX06-1046	PTX06-1050	PTX08-1002
1998-Q3	NA <sup>1</sup>	NA	288/535	NA	NA	NA	21
1998-Q4	NA	NA	NA	NA	NA	NA	NA
1999-Q1	362, 846	NA	1130/1180	NA	NA	NA	158/176
1999-Q2	NA	NA	1300	NA	NA	NA	NA
1999-Q3	NA	NA	NA	NA	NA	NA	NA
1999-Q4	NA	NA	NA	NA	NA	NA	NA
2000-Q1	1340	NA	1180/671	526/1430	450	NA	93/90
2000-Q2	NA	NA	NA	451/959	NA	NA	NA
2000-Q3	NA	NA	NA	1700	624/467	164	NA
2000-Q4	NA	NA	NA	NA	358/685	190/210	NA
2001-Q1	1050/622	NA	120	1500/1900	686	250/280	NA
2001-Q2	NA	NA	NA	NA	366/717	270/296	234/252
2001-Q3	NA	NA	NA	NA	NA	NA	NA
2001-Q4	NA	NA	0/1360	982/2650	540/746	NA	NA
2002-Q1	NA	NA	NA	NA	NA	NA	NA
2002-Q2	NA	NA	NA	NA	NA	NA	NA
2002-Q3	NA	543/832	NA	NA	NA	332/376	NA
2002-Q4	NA	NA	627/1010	636/1050	514/702	NA	NA
2003-Q1	520/768	598/2080	NA	NA	NA	NA	NA
2003-Q2	NA	NA	526/840	1040/146 (?)	507/732, 771/356	NA	238/277
2003-Q3	NA	845/1130	NA	576/891	705/375	474/546, 481/336	NA
2003-Q4	NA	NA	621/336	NA	NA	NA	NA
2004-Q1	NA	1500/1610	NA	998/1000	760/782	NA	NA
2004-Q2	15.6/16.5	NA	557/567	NA	NA	NA	NA
2004-Q3	NA	1520/1830	NA	1110/1150	816/831	NA	NA
2004-Q4	NA	NA	NA	NA	NA	222/499	84.8
2005-Q1	NA	1480/1710 1340/1750	NA	824/87, 970/1000	673/685, 841/855	NA	
2005-Q2	22.2/23.5	NA	498/406	NA	NA	NA	NA





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For additional information about  
STAND  
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## References

DOE, 1998 - 2005, *Environmental Monitoring Quarterly Reports*, posted on the Pantex web site: <http://www.pantex.com/environment/epd/index.shtml>

DOE, 2005a, *Annual Report in Support of Compliance Plan No. CP-50284-000*, April 1, 2005.

EPA, 2004, *2004 Edition of the Drinking Water Standards and Health Advisories*, EPA 822-R-04-005, Winter 2004.

