

# ATK Promontory Solid Rocket Motor Static Tests



A public meeting to discuss the assessment was held on September 17th, 2014 at the Bear River Health Department's Tremonton Office. Click [here](#) to view the presentation from the meeting.

## **Background:**

The Alliant Techsystems, Inc. (ATK) Promontory facility consists of nearly 20,000 acres of land in the southwest foothills of the Blue Spring Hills north of the Great Salt Lake along State Highway 83. In 1974, ATK (then named Thiokol) was awarded the contract to build and test the reusable solid rocket fuel motor (RSRM) boosters for the NASA Space Shuttle program. ATK Promontory also manufactures motors for military missile systems, as well as a number of non-military munitions such as flares and igniter components for passive restraint systems (e.g., air bags).

The first static (i.e., fixed to the ground and not moving) test firing of an RSRM occurred on July 18, 1977. A total of 52 static test firings have taken place, with the last occurring on September 8, 2011. The Development Motor (DM), developed for the Ares launch system, was based on the Space Shuttle RSRM. Each DM contained nearly 1,400,000 pounds of solid propellant, consisting primarily of aluminum oxide and perchlorates, and burned for approximately two minutes. The exhaust from the rocket motor had

sufficient force to scour soil and rock from the test site and carry that material for a substantial distance. Three static test firings of a DM have occurred: DM-1 on September 10, 2009; DM-2 on August 30, 2010; and DM-3 on September 8, 2011. On September 28, 2010, the U.S. Environmental Protection Agency (EPA) received a petition from a concerned citizen living in Thatcher requesting that EPA investigate the environmental and health impacts of the DM-2 test and previous rocket tests on the communities near the ATK Promontory facility. Specifically, the petition complained of the large plume of smoke and debris generated during the test and resultant fallout on those communities. The community's concern was that the plume of smoke and debris exposed residents to hazardous contaminants through air, soil, and groundwater exposure routes.

During November 2010, the Utah Department of Environmental Quality (UDEQ) and EPA conducted preliminary site assessments that included soil and groundwater sampling from properties in Penrose and Thatcher. UDEQ and EPA held a public availability session in February 2011 to gather community concerns. Based on health concerns identified by residents of the area during that meeting, UDEQ asked the Environmental Epidemiology Program (EEP) to conduct this PHA. UDEQ additionally requested that the EEP conduct a statistical review of cancer incidence among residents of Bothwell, Howell, Marble Hills, Penrose, and Thatcher.

## Documents:

### Public Health Assessment (2015)



- The EEP cannot conclude whether the DM-2 and DM-3 rocket motor tests could have harmed people's health.
  - No usable outdoor air data was collected by UDEQ and EPA during the DM-3 test.
  - Perchlorates were not found in soil and ground water samples.
  - Debris samples indicated the presence of short-lived, airborne, alkaline (pH 9.77 - 11) material (likely calcium oxide and calcium hydroxide).
    - Cannot verify that caustic sediments travelled to the surrounding communities because they are so short-lived in the environment.
    - Potential exposure to residents is plausible, but would have been temporary in nature.
- Acidic hydrogen chloride (HCl) gas was likely to be present in the exhaust plume based on the nature of the propellant.
  - HCl is very short-lived in the environment, with a half-life of 3 - 5 minutes.
  - Air modeling of HCl concentrations indicated that potential exposures could result in temporary skin irritation, though not any health hazards beyond this.
- One groundwater sample had a potentially elevated level of arsenic at 9.6 micrograms per liter (µg/L).
  - Exposure dose estimates for children drinking one liter of this water per day, every day, exceeded the Minimal Risk Level.

- o Fallout samples from the DM-3 test contained very little arsenic (6.84 parts per million).
- o Arsenic in groundwater samples from this area is consistent with the natural hydrogeology of the region, and is very unlikely to be the result of site-related activities.
  - Reports from the U.S. Geological Survey indicate that the Cache Valley and Lower Bear River aquifers typically contain levels of arsenic between 1 - 10 µg/L.



### Cancer Incidence Statistical Review (2013)

- A statistical review of cancer incidence among residents of Bothwell, Howell, Marble Hills, Penrose, and Thatcher
- The EEP did not find meaningfully elevated incidence of cancer for any of the 42 site-specific cancer categories.
- There was no trend of increasing incidence of cancer for any cancer category.
- Three cancer categories had elevated incidence for a single analytical time period.
  - o Lung and bronchial cancer among males during the 1985 - 1989 period.
  - o Prostate cancer during the 2000 - 2004 period.
  - o Non-Hodgkin lymphoma among females during the 2005 - 2009 period.
- Risk factors for these three cancer types are not associated with any of the non-occupational industrial or commercial environmental concerns in or near the area.

### **Documents**

- [Public Health Assessment](#)
- [Western Bear River Valley Cancer Study](#)

### **Contaminants**

- [Aluminum](#)
- [Arsenic](#)
- [Calcium Hydroxide](#)
- [Calcium Oxide](#)
- [Hydrogen Chloride](#)
- [Perchlorates](#)

### **Additional Information**

- [Bear River Health Department](#)
- [Utah Department of Environmental Quality](#)
- [Agency for Toxic Substances and Disease Registry](#)