

**United States Environmental Protection Agency
Region IV
POLLUTION REPORT**

Date: Thursday, August 13, 2009
From: Alyssa Hughes, On Scene Coordinator

Subject: Initial POLREP
Severn Peanut Company
1333 Severn Rd, Severn, NC
Latitude: 36.5177180
Longitude: -77.1952880

POLREP No.:	1	Site #:	
Reporting Period:	8/12-13/2009	D.O. #:	
Start Date:	8/12/2009	Response Authority:	CERCLA
Mob Date:	8/12/2009	Response Type:	Emergency
Demob Date:		NPL Status:	Non NPL
Completion Date:		Incident Category:	Removal Action
CERCLIS ID #:		Contract #	
RCRIS ID #:			

Site Description

Severn Peanut Company houses the largest dome silo of its kind in the country. The dome is 192' in diameter with a height of 100', for an interior volume of 1,791,000 cubic feet. The walls of the dome are constructed with 22" concrete thickness at the bottom, which tapers to a 10" thickness at the top. Inside of the concrete there is 3" thick R19 insulation, and a membrane roof on the exterior. The silo holds 21 million pounds of peanuts, which occupy an estimated 1,345,000 cubic feet of space. The total volume of space within the dome is 1,791,000 cubic feet, leaving approximately 500,000 cubic feet of head space.

On Monday August 10th, on-site personnel detected the smell of burning peanuts. At approximately 1600 hrs on August 11th, the on-site representative observed smoke emanating from the top of the dome. Once he noticed this smoke, he contacted his supervisor and local fire department. Local fire department, NC RRT, and Northampton County EMA responded to the scene.

Aluminum phosphide tablets, used as a fumigant throughout the grain industry, were applied to the peanut silo on August 4. IFC applied 28.4 grams/1000 cubic feet, for a total of 49,000 grams applied in flasks containing 500 grams each (98 flasks). Standard procedure is to drop the flasks into the dome at the location of a 1' x 3' plate at the top of the dome. Once complete, the plate is replaced and bolts are tightened. Aluminum phosphide reacts with water to produce phosphine gas, which disperses throughout the pile and serves as a rodenticide for the peanuts. Under normal conditions, this reaction takes place within 7 to 10 days, after which the phosphine gas reaches a level suitable for release into the atmosphere (< 0.3 ppm). IFC, the company responsible for application of the fumigant, has taken phosphine readings from a tube which descends 15' into the top of the dome, since application of the fumigant.

Phosphine is a flammable, reactive gas which dissipates quickly in the open environment. Please see the links section for additional information.

The dome, manufactured by DOMETECH International, can reportedly withstand temperatures up to 1000 degrees F. There are 20 thermal cables descending into the dome, which constantly measure the temperature. Currently, these thermocouples are indicating maximum temperatures in the vicinity of 250 degrees F.

It is not possible to isolate the location of the fire within the pile base don the information known at this time.

Current Activities

8/12/2009

OSC Hughes arrived on-site at 1600 hrs and met with ERT Phil Campagna and representatives from the plant. Fire chief, police, County EMA and RRT had all demobilized from the scene awaiting a change in status. EPA and the Severn Peanut Co representatives discussed the situation and several alternative means for extinguishing the fire. Phosphine levels measured via a tube inserted to a depth of 15 feet below

the top of the dome had reduced to 265 ppm from 580 ppm yesterday. There is no phosphine outside of the dome at this time. Due to the stability of the situation, the group will consult technical experts prior to making a decision on how to proceed. IFC, the company responsible for application of the fumigant, is bringing a phosphine specialist on-site tomorrow.

OSC Hughes consulted ATSDR representatives Rich Nickle and Bob Safay to obtain a public health consult regarding phosphine. The PEL (permissible exposure limit) for phosphine is 0.3 ppm, with an IDLH (Immediately Dangerous to Life and Health) value of 50 ppm. Based on the short life of phosphine in an open environment, ATSDR recommends an action level of 0.25 ppm to consider protective measures.

START contractor OTIE, Inc. arrived on-site at 1900 hrs. and met with OSC Hughes to go over the current situational status and identify viable methods for extinguishing the fire.

8/13/2009

Representatives from the insurance companies for both Severn Peanut Co, and IFC arrived on-scene today. The group sat in a briefing at 0900 hrs this morning to discuss each entity's specific goals, ideas as to how to proceed, and any questions/concerns. Several ideas were discussed, of which the most probable consists of pressure feeding carbon dioxide or argon into the bottom of the dome through the fans to force the oxygen up and out the top of the dome, depleting the oxygen source for the fire and extinguishing it.

While the invested parties discussed alternatives and procurement issues, OSC Hughes, ERT Campagna, START and representatives from IFC traveled to the site of the silo in order to take some air monitoring readings. Readings acquired using a multiRAE with phosphine sensor at the tube extended into the dome exceeded the range of the instrument. According to the AreaRAE sensor guides, interference may be caused by several gases, most notably carbon monoxide. The presence of 1000 ppm CO, may elevate a phosphine reading by 1 ppm. Therefore, it would only require 50,000 ppm CO to reach the max detection limit of 50 ppm phosphine. It was decided to utilize the handheld pump with mid-range Draeger tubes to attempt to attain a more accurate reading. Using this technique, 33 ppm of phosphine were detected within the dome. By the end of the day, the level of phosphine had reduced to 20 ppm.

The respective parties and the companies representing them met to discuss an action plan. The insurance company for IFC is mobilizing a mobile lab to the Site in order to analyze air samples collected on-site. Once the phosphine levels are determined with some degree of accuracy, the group will decide on a plan for extinguishing the fire.

Planned Removal Actions

Once the phosphine levels within the dome are known, a plan for extinguishing the fire will be implemented.

Next Steps

Determine with more reliability the concentration of phosphine gas within the dome.

Key Issues

With so many variables unknown at this time, including phosphine levels, temperature, location of the fire, and oxygen levels, it is difficult to develop a concrete plan as to how to move forward. This is why the top priority is to identify more about the environment inside the dome. Although there are people who have experience with peanut fires, and fires caused by the application of aluminum phosphide, the group has been unable to find any reference material regarding a fire in such a large enclosed dome structure. This is presenting significant challenges regarding how to proceed.

response.epa.gov/SevernPeanutCompany