Problems at Piney Point

In 1966, the Piney Point fertilizer plant opened on U. S. 41 in Florida's Manatee County. Being located across from a rail line and next to Port Manatee, was ideal for receiving mined phosphate as well as shipping finished fertilizer. (See map on back of this page.)

Phosphate fertilizer production creates a biproduct called phosphogypsum, which is slightly radioactive due to impurities in the mined rock. Phosphogypsum is stacked on the property – Piney Point has two gypsum stacks that are between 50-70 feet high. Ideally, liners beneath the stacks prevent radiation from leaking into groundwater; Piney Point has no liners, and in 1994 the owners were fined by the Florida Department of Environmental Protection (DEP) for polluting groundwater.

Fertilizer production also requires a lot of water. The hot and corrosive wastewater is first sent to cooling ponds and then pumped into other ponds on top of the gypsum stacks. Some water is reused whereas the rest evaporates. Ideally, evaporation keeps the pond levels low, and federal law requires that owners make sure the ponds do not overflow. But rain adds water to the ponds, and if rainfall exceeds evaporation, pond owners will release some water into local waterways in order to prevent overflow. Before release, the wastewater is treated lime to neutralize the acid.

2001-2004 releases

In 2001, the owners of the Piney Point fertilizer, Mulberry Corp., filed bankruptcy and abandoned the plant, but the gypsum stacks remained. The DEP took responsibility for the abandoned plant, and were responsible for maintaining water levels in the gypsum-stack ponds. Later that year, Tropical Storm Gabrielle hit the region, and the DEP had to release 10 million gallons of lime-treated wastewater into Bishop Harbor, an estuary leading to Tampa Bay, to prevent an even more catastrophic release that would occur if the ponds overflowed.

In 2002, the DEP tried a different approach to treat and get rid of excess water; they ran the water through a reverse-osmosis filter and then dumped the cleaned water into the ocean. This was a slow-going process, as filters clogged repeatedly. Nonetheless, they kept water levels in the ponds low enough by filtering some water and sending other waste water to nearby sewage plants.

But a New Year's Eve storm dumped 16.5 inches of rain on Piney Point. Once again, the DEP had to lower water levels in the ponds, and asked the U. S. EPA for permission to dump water into the ocean. They received permission in April of 2003 and dumped partially-treated wastewater 100 miles offshore, directly into the Gulf of Mexico. This dumping of partially-treated wastewater into Tampa Bay continued through early 2004.

2011 spill

Between 2005 and 2009, DEP drained and lined the four ponds on top of the gypsum stacks with plastic. In all, Florida spent $144 million on the cleanup of Piney Point. The sides of the gypsum stacks are now grass covered.

A company called HRK bought Piney Point in 2006 for $4.3 million, a $3.8 million contribution to state cleanup, and the promise to maintain the gypsum stacks and reservoirs at a cost of $250,000 per year. They planned to turn the phosphate plant into a shipping terminal.

The widening of the Panama Canal meant that larger ships would be coming to Florida, and work was being done to deepen and widen Port Manatee to accommodate the ships. For a price, HRK allowed sediments dredged (to deepen the port) to be dumped in the ponds on the gypsum stacks. The sediments were polluted, which prevented them from being dumped in normal landfills, but since the gypsum stacks and ponds are already polluted, they provide an ideal place to dump the sediments. HRK plans to put permanent caps over the sediment-filled ponds upon completion of harbor work.

In May 2011, the liner on one of the gypsum stacks leaked, probably when punctured by a piece of earth-moving equipment. Some water leaked through the gypsum stack, picking up pollutants as it moved. The DEP ordered that the pond be drained of all water and the liner repaired. 170 millions of contaminated sea water were dumped into Bishop Harbor and lower Tampa Bay. In all, the water leaking into Bishop Harbor contained elevated levels of nitrogen (3.5 tons), phosphorus (7.2 tons), and heavy metals like cadmium.

Increased nutrients can trigger algal blooms in the Gulf, which will alter ecosystems and fisheries. The DEP, however, stated that the spill would have a small impact on Tampa Bay, which normally has a nitrogen load of 210 tons.

The liners are being repaired. Following drinking water tests, the DEP states that water from in wells near the plant is safe to drink.

Hurricane hits Riverview phosphate plant

During Hurricane Frances on September 5, 2004, the high winds created huge waves in the wastewater pond on top of a 100 foot tall gypsum stack at Cargill Crop Nutrition's (now Mosaic's) plant in Riverview, Florida. The waves broke a 6-foot deep hole in a dike, dumping nearly 70 million gallons of wastewater into Archie Creek and then into Hillsborough Bay. The owners of the plant tried mixing lime with the wastewater to neutralize the acid, but ran out of lime; a pump being used in this treatment process failed as well. Later that day owners received a new shipment of lime and were able to again treat the water. The flow from the gypsum stack stopped on Monday, and workers were able to repair the leak.

The wastewater is very acidic, with a pH of 1.8, but is neutralized when diluted with rainwater or with the addition of lime. Nonetheless, water draining from Archie Creek into the bay had a pH of 3.1. The water is also radioactive, 2-3 times the water quality standard. The DEP did not expect the water to harm residential areas or public safety, but did worry that wildlife in the bay might suffer. Dozens of dead stingrays, crabs, snook and mullet were found.

A main concern was high levels of nitrogen in the wastewater. Nitrogen provides nutrients for algae, and algal blooms take oxygen from the water and block sunlight. According to the Tampa Bay Estuary Program, the amount of sea grass in Tampa Bay was cut in half between 1950 and 1982 because algal blooms blocked sunlight needed by the grass. Sea grass is both food and shelter in a sensitive ecosystem that includes redfish, snook, tarpon, manatees, shrimp and crabs, as well as birds. In 1998, members of the local community agreed to efforts to cut nitrogen flux into the bay by 6 tons per year. The two-day Cargill spill added 93 tons of nitrogen to the bay.

Normally, water levels in ponds at the top of the gypsum stacks are kept down by evaporation. An especially wet summer caused water levels to be higher then normal.

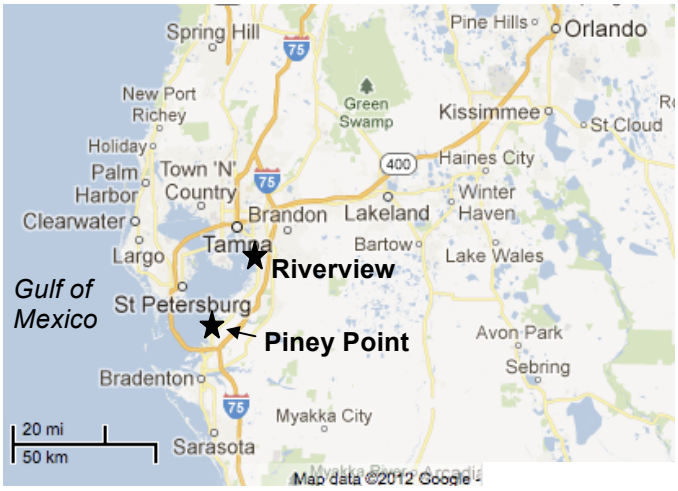

Figure 1. Locations of the Piney Point and Riverview fertilizer plants. Map made using GoogleMaps.

The above document was written by Joy Branlund, using information from the following sources:

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Zink, Janet. September 10, 2004. Fertilizer plant gets set for Ivan. St. Petersburg Times

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