

# NJWEA Atlantic City, NJ

Ed Enright, Passaic Valley Sewerage Commission  
Rob Montenegro, Synagro

SYNAGRO

People + Planet → Synchronization



# Passaic Valley Sewerage Commission Service Area

- The Passaic Valley Sewerage Commission (PVSC) Newark Bay Wastewater Treatment Plant
  - Design Capacity 330 MGD
  - Average Daily Flow 220 MGD
- PVSC serves 1.4 million people in parts of Bergen, Hudson, Passaic, Essex and Union Counties
- PVSC serves approximately an additional 2 million people throughout New Jersey and New York through its Liquid Waste Acceptance Program



# PVSC Plant Site



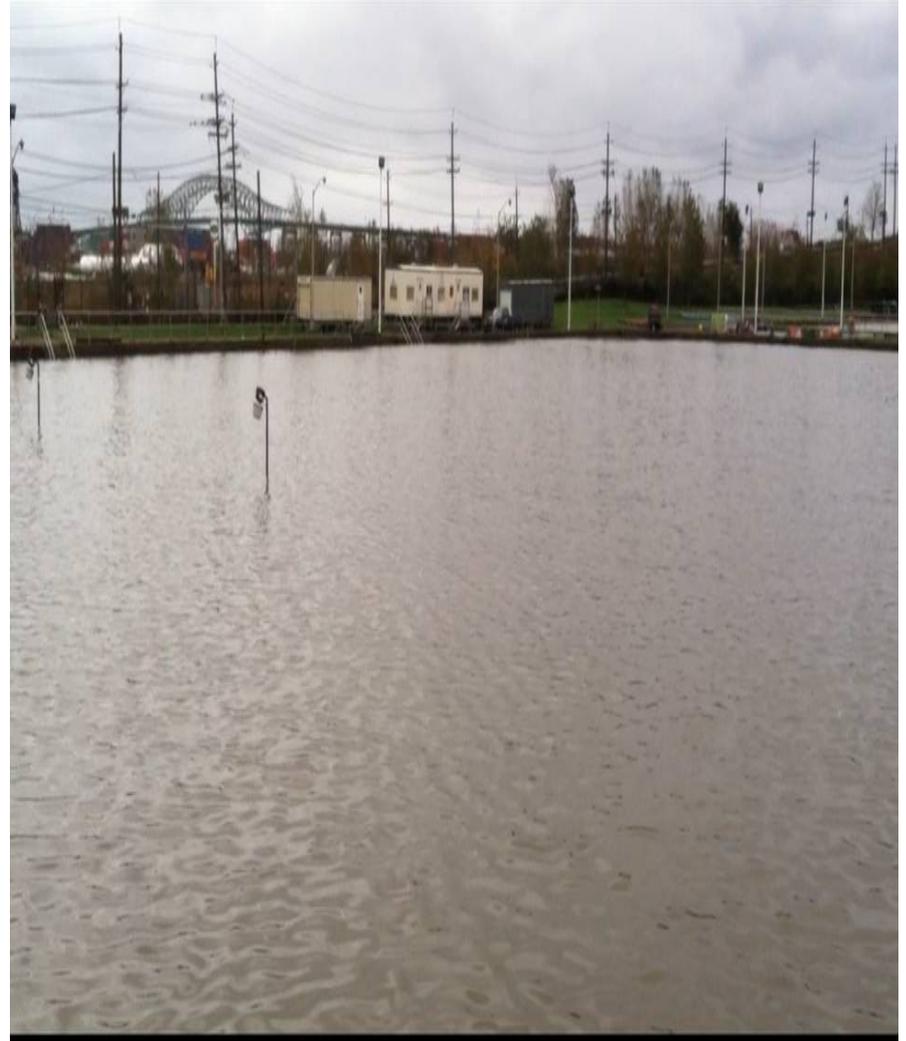
# Storm Sandy Progression

- Storm Sandy hit the Newark area on Monday, October 29, with impacts increasing throughout the course of the day.
- The storm surge inundated the PVSC plant site with approximately four feet of water.
- Due to the impacts of the storm, PVSC's plant was taken out of service at approximately 9:00 pm on October 29.
- The plant was completely out of service until November 3.



# Storm Sandy Impacts on PVSC

- The storm surge caused flooding of all underground facilities including the network of utility tunnels and equipment galleries for the primary and secondary clarifiers, the effluent pumping facilities, the sludge thickening facility, the Sludge Heat Treatment facility and the Sludge dewatering facility.
- Flooding of the underground galleries resulted in water as deep as 18 feet remaining in the galleries after the storm surge receded.
- Extensive damage was caused to electrical systems and pumping equipment in the tunnels and galleries.
- Over 500 electric motors were impacted and were removed and sent to outside facilities for repair.



# Storm Recovery Efforts

- Mobile pumping systems were brought in with assistance from the US Army Corps of Engineers to remove water from subsurface facilities.
- PVSC personnel and outside contractors worked around the clock to restore critical systems.
- Power was restored to the effluent pumping station and partial treatment commenced on November 3.
- Full Secondary Treatment was restored on November 23.



# Impacts on Sludge Processing Facilities

- Impacts on Sludge Train facilities were severe and included the following critical units and their support facilities (power and control) being inoperable:
- Thickened Sludge Pumping
- Thickening Centrifuge Feed Pumping
- Heat treatment low pressure feed pumping
- Heat treatment process air compressors
- Filter press feed pumping
- Sludge cake conveying systems
- Typical daily sludge flow to the sludge train is an average of 10 MGD. Average thickened sludge flow is 2000 GPM. Typical dewatered sludge produced is 150 tons per day.



## WHEN SANDY HIT...

---

- Coastal region directly impacted with storm surge, power outages, fuel shortages, etc.
- 49 Water/WW Treatment (including industrial) plants and consultants were active with Synagro.
- Synagro provided active support to multiple authorities in the region.
- Most (all?) did not have viable back up plans or solutions.
- Communications issues prevalent.
- Emergency program for sludge management in NJ required – and fast!
- FEMA, EPA, USACE, NJDEP, many others consulted for options.
  
- Synagro provided an emergency dewatering program at PVSC consisting of:
  - 10 mobile centrifuges
  - 3.0 MW of diesel generators
  - Polymer feed systems
  - Lime feed systems
  - Personnel
  - Pumps and related accessories

# ISSUE – NO POWER!

- 3.0 MW of portable power (diesel generators) was secured and delivered to site.
- Some delivered from as far away as California.
- Miles of electrical cables utilized to connect the mobile power to the centrifuges, pumps, conveyors, etc.
- Diesel was secured and delivered nearly daily – no small feat due to the fuel shortages in the region!



# MOBILIZATION

- Giant mobile cranes used on site to position equipment and assist with the installation of all equipment.
- A classic ballet of movement – giant pieces of equipment maneuvered in extremely tight quarters!



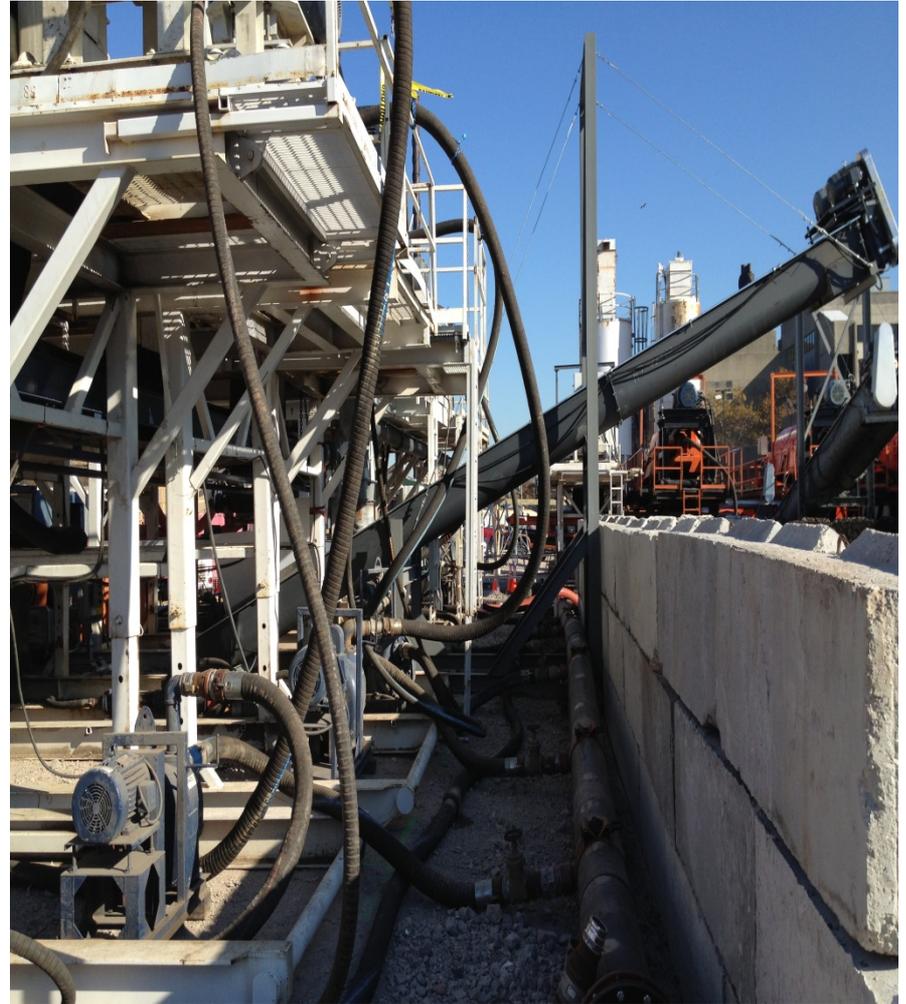
# LAYOUT

- One bank of four centrifuges.
- Two screw conveyors pull cake from centrifuges to storage pad.
- Frac tanks, pumps, piping, hoses, controls, polymer feed, lime feed, etc. connected – a COMPLETE operating system.



# LAYOUT CONTINUED

- Two banks of three centrifuges.
- Each bank with its own screw conveyor to transport cake to storage pad.
- Centrate collected and returned to head of plant.
- Frac tanks, pumps, piping, hoses, controls, polymer feed, lime feed, etc. connected – a COMPLETE operating system.



# PORTABLE LIME FEED SYSTEM

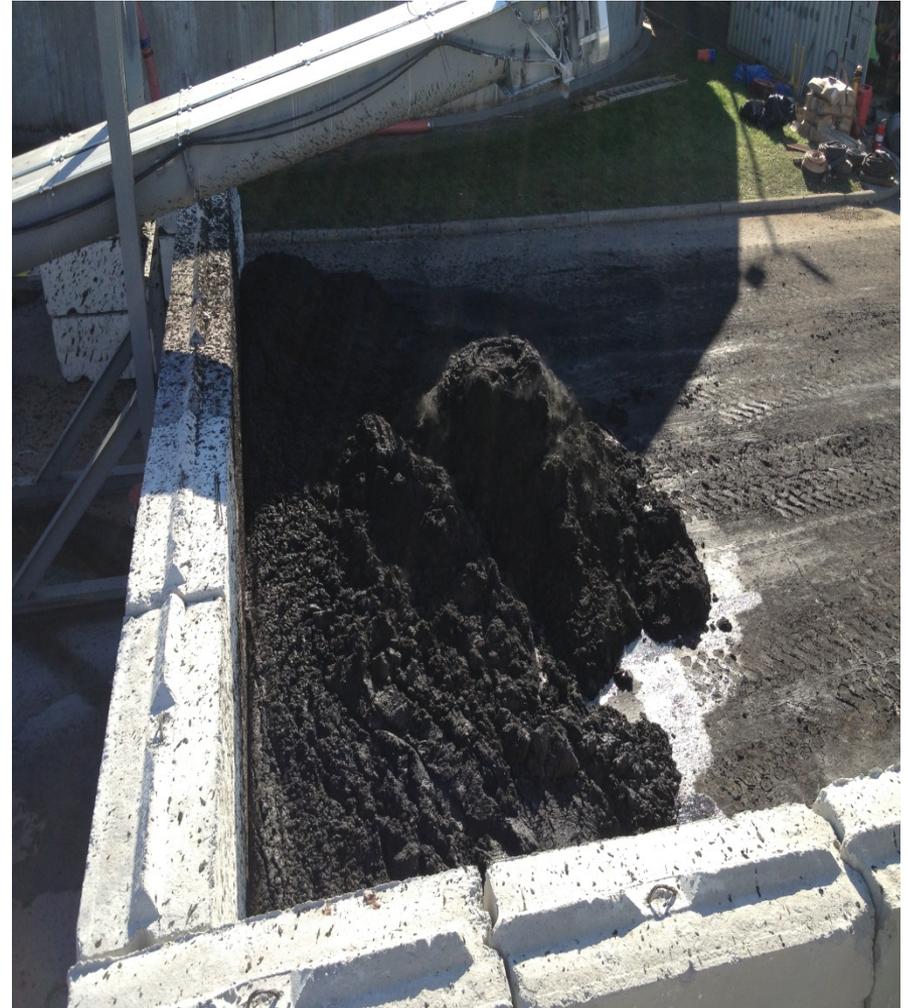
- Portable lime silos utilized for odor control (required to get undigested sludge into PA landfills).
- Lime feed conveyance system designed, procured, constructed, and operational in days!
- Waivers received from PADEP.



# CAKE PAD

---

- Large, concrete lined storage pad created
- Sludge from each bank of centrifuges dumped to common storage pad.
- Front end loaders used to load containers for removal from site.



# DISPOSAL

---

- Sludge cake removed:
  - Via dump trailers to PA landfills.
  - Via intermodal containers and hauled by rail to VA and GA landfills.
- Approximately 15,000 wet tons dewatered and disposed.



# POST SANDY ANONYMOUS CONVERSATIONS

---

- One authority said “do whatever you have to do – I’ ll ask for forgiveness later...”
- We contemplated numerous options at PVSC, including dumping in the ocean – this was immediately shut down by EPA.
- NJ DEP was great – but we had struggles connecting NJ, CT, NY, PA authorities.
- One “high ranking” NJ state official said, when asked about the biosolids management in the state in situations like Sandy – “what are the chances that this will happen again...?”
- After the dust settled – one authority said “I don’ t have to worry anymore – PVSC is back up and running...”

## LESSONS LEARNED

---

- Biosolids management became a huge issue for regional generators.
  - Cooperation from all related agencies (NJ, PA, NY, CT DEP, FEMA, EPA, etc.) was great – but more must be done!
  - Emergency preparedness critical to secure continued operations.
  - Primary and back-up solutions for key functions should be required!
- 
- We need coordinated efforts to ensure that NJ and regional generators are prepared for the “next” event!

# THANK YOU

Ed Enright  
[eenright@pvsc.nj.gov](mailto:eenright@pvsc.nj.gov)  
Phone: (973) 817-5977

Rob Montenegro  
[rmontenegro@synagro.com](mailto:rmontenegro@synagro.com)  
Phone: (203) 689-5349  
Booth 602

People + Planet → Synchronization

