

**FLOOD RECOVERY (WITHOUT an ARK)  
DERRY TOWNSHIP MUNICIPAL AUTHORITY  
CLEARWATER ROAD WWTP, Hershey, PA**

**PRESENTED TO THE 98<sup>th</sup> ANNUAL NJWEA  
CONFERENCE – AAES WORKSHOP**

**Wayne A. Schutz  
Derry Township Municipal Authority  
May 13, 2013**



# PRESENTATION OVERVIEW

- ❖ INTRODUCTION
- ❖ PLANNING FOR THE “FLOOD”
- ❖ THE FLOOD
- ❖ CLEAN-UP & DEWATERING
- ❖ RESTORATION [SHORT TERM]
  - ❖ ADMIN
  - ❖ PROCESS
- ❖ RECOVERY [LONG TERM]
  - ❖ EQUIPMENT
  - ❖ BUILDINGS & MISC
- ❖ PAYING THE BILL & FUN WITH FEMA

# CLEARWATER ROAD WWTP

## Aerial View Pre-Flood





# FLOOD PLANNING

## “Dry” Run

# 2006



Slow moving thunderstorm storm tracks the Swatara Creek from the Susquehanna River thru the watershed to the headwaters.

- Predicted crest ~ 12-13'
- Actual Crest ~16.1' (Should've been a "NOTE TO SELF" moment!)
- Set Flood Preparedness Planning in Motion



# FLOOD RECOVERY Preparedness Planning

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## Flood Preparedness Plan

For

Derry Township Municipal Authority

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October 21, 2010



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### FLOOD PREPAREDNESS PLAN

FOR

DERRY TOWNSHIP MUNICIPAL AUTHORITY

670 CLEARWATER ROAD  
HERSHEY, PA 17033

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The purpose of the Flood Preparedness Plan is to provide guidelines that support an orderly and effective response to flood conditions at Derry Township Municipal Authority Wastewater Treatment Facility located at 670 Clearwater Road, Hershey, Pa. The Plan provides direction for responding to and mitigating flooding hazards that may occur at various stages of the Swatara Creek. The Plan includes:

- Notification of personnel of potential flooding,
- [Action Items](#) designed to secure structures at given water elevations,
- Historic and other information helpful to the situation,
- A list of supplies and equipment to ensure adequate response time,
- A list of service providers that may be called upon for assistance during mitigation efforts, and
- [Maps](#) which show areas affected by flooding based on topography and river level.

DTMA has enrolled in the USGS Real-Time Hydrologic Notification System subscription program to receive email and telephone notifications of potential flooding of the Swatara Creek. The Operations & Maintenance Supervisor is responsible to activate the Flood Preparedness Plan upon notification and will monitor response and mitigation efforts utilizing Operation and Maintenance staff to carry out the action items. The degree of response will be determined by the forecast flow level of the Swatara Creek near Hershey as predicted by the National Weather Service.

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### Information Sources

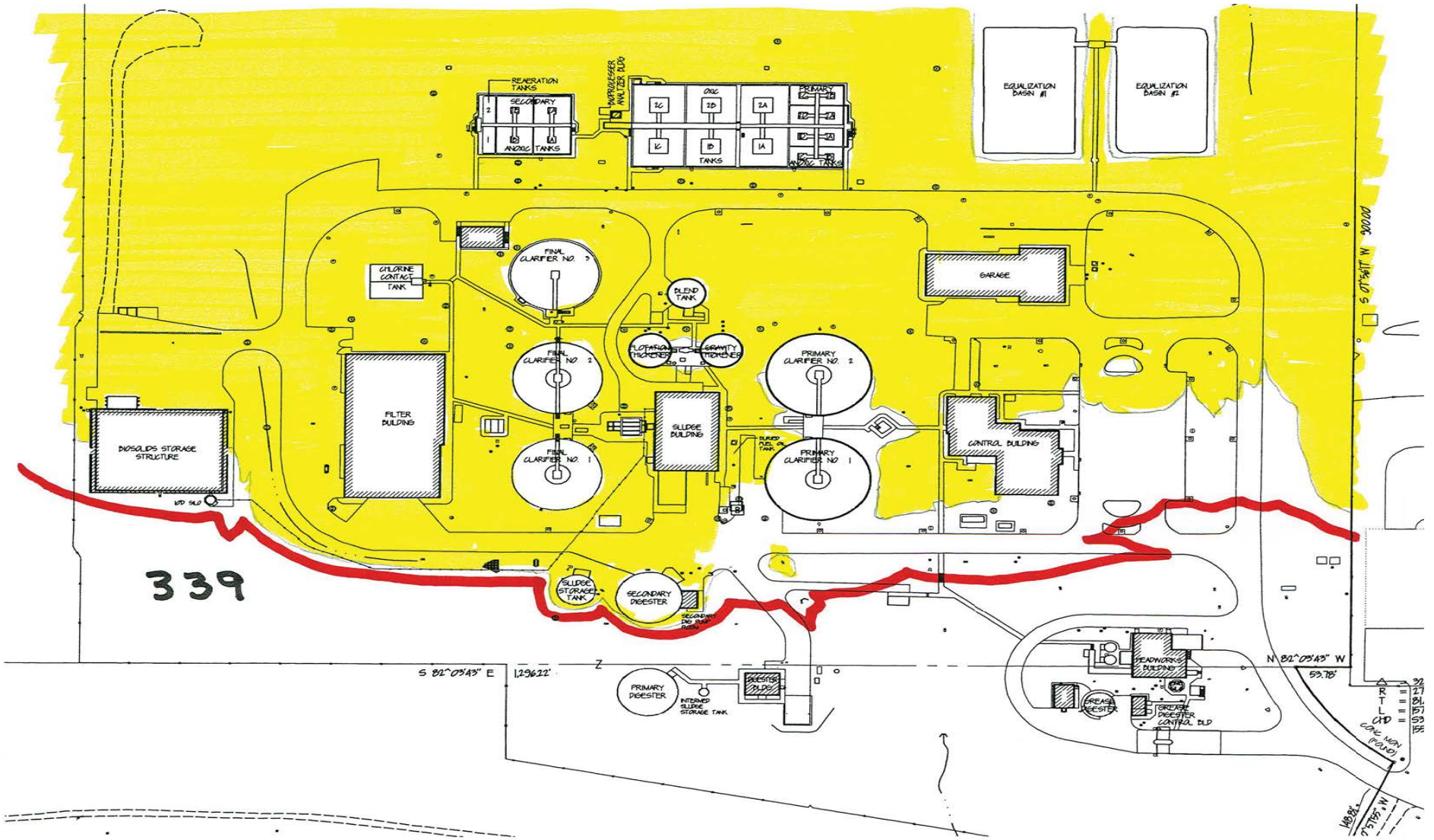
#### U.S. Geological Survey

Sign up for email and/or mobile phone notifications: <http://water.usgs.gov/wateralert>  
Swatara Creek water level: [http://waterdata.usgs.gov/nwis/uv/?site\\_no=01573560](http://waterdata.usgs.gov/nwis/uv/?site_no=01573560)  
Rain gage: [http://waterdata.usgs.gov/nwis/uv/?site\\_no=401701076410001](http://waterdata.usgs.gov/nwis/uv/?site_no=401701076410001)

#### National Weather Service Advanced Hydrologic Prediction Service:

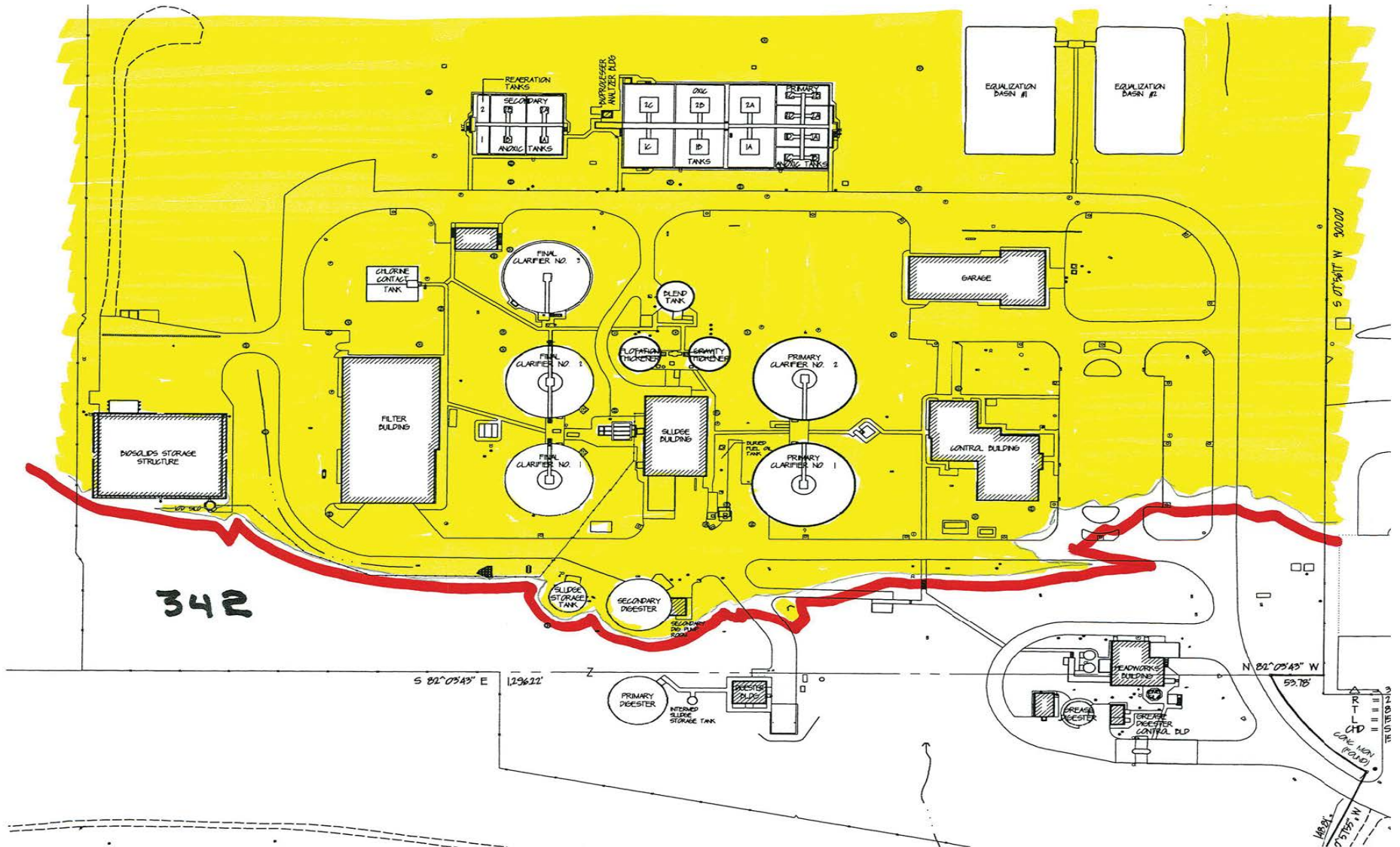
<http://water.weather.gov/ahps2/hydrograph.php?wfo=ctp&gage=herp1&view=1,1,1,1,1,1,1,1&toggles=10,7,8,2,9,15,6>

# FLOOD RECOVERY Preparedness Planning





# FLOOD RECOVERY Preparedness Planning





# FLOOD RECOVERY Preparedness Planning

## DTMA - FLOOD PREPAREDNESS ACTION ITEMS

ELEV, FT	√	IMPACTS & PREPARATORY ACTIONS	CREEK LEVEL, FT
332		Notify Management, Operation, Maintenance and Collection personnel of potential flooding	9
		Plug lower trench drain at Storage Pad	
333		Storage Pad trench is flooded	10
334		Plug RAS Building drain	11
		Plug Blending Tank driveway drain	
		Close Chlorine Contact Tank mud valve and fill the tanks	
		Move boards, totes, equipment, floatables, etc, from potential flood areas	
		Remove chemicals from Alka Pro Building and turn Alka Pro off	
	Remove equipment from Filter Building		
335		Check for proper operation of backflow flap gate in the Filter Building Distribution Chamber	12
		Remove Filter Building Sump Pump cover	
		Close manual gate valve at Equalization Basins	
336		Ivan flood level was 336.76 on 9/18/2004 (See mark on Chlorine Tank wall.)	13
		RAS Building and Blending Tank driveway drains are flooded	
		Average water level in Chlorine Contact Tank is 336.95	
		Install curb barrier in Filter Building to keep water out of lower level	
		Install curb barrier at UV Influent Sump	
		Plug Secondary Digester drain and both Mix Pump containment drains	
	Board stairwell to Blending Tank room		

# FLOOD RECOVERY Preparedness Planning

## DTMA - FLOOD PREPAREDNESS ACTION ITEMS

ELEV, FT	v	IMPACTS & PREPARATORY ACTIONS	CREEK LEVEL, FT
337		Average water level of Filter Building Distribution Chamber is 337.33	14
		Chlorine Contact Tank sidewall height is 337.84 on June 2006	
		Remove Sludge Building and Pump Station (3) sump pump covers	
		Plug Sludge building trench drain and Loading Area drains	
		Board stairwell to Sludge Building Heating Boiler Room , tape door, seal louvers	
		Board Waste Sludge stairwell, tape door	
		Board tunnel to Primary Pump Station	
		Seal Sludge Building doors	
		Open Filter Building doors and remove grating from UV Effluent Pit. Rope for safety barrier	
		Move Control Building, Administration, and Maintenance assets to higher elevation	
		Seal Secondary Digester Room doors	
		Seal Control Building and Atrium Doors	
		Consider removing pump motors and panel control modules	
	Notify DEP of potential process failure		
338		Water enters Garage	15
		Water enters Atrium	
		Water backs up through effluent line causing effluent flow to surcharge out of UV Effluent Pit	
		Water enters Sludge Building stairwell and Secondary Digester drains	
		Top of Power Center No. 2 concrete pad is 338.5	
		Storm event level was at 338.84 or 3' up on Power Center No. 2 on 06/29/2006	
		Shut down power to Power Station No. 2	
		Notify DEP of process failure	
	Seal Control Building doors		

# FLOOD RECOVERY Preparedness Planning

## DTMA - FLOOD PREPAREDNESS ACTION ITEMS

ELEV, FT	√	IMPACTS & PREPARATORY ACTIONS	CREEK LEVEL, FT
339		Secondary Clarifier 1 & 2 average water level is 339.20	16
		Waste Sludge Pump Station Stairwell top is 339.25	
		Control Building Ground is 339.25	
		Maintenance Garage Floor is 339.25	
		Sludge Building Ground Floor is 339.25	
		Filter Building Ground Floor is 339.25	
		Filter Building Distribution Chamber Wall top is 339.75	
		Monitor Sludge Building Basement for flooding level	
		Shut down power to Transfer Pump and Primary Pump Stations and rest of the buildings	
		Monitor Control Building for Dry Well flooding and need to shut down power	
		Seal Dry Well door	
	Prepare for having PPL shutdown power to both power sources		
340		Diluent Water Pit top is 340.33	17
		Secondary 1 & 2 Tank Wall tops are 340.70	
		Transfer Pump Station Stairwell top is 340.75	
		Monitor flood water levels at Switch Gear Power Station	
		Lift Rotomats from channel	
		Fill Equalization Basins	
341		Primary Sludge Pump Station Stairwell top is 341.37	18
		PPL power shut down	
342		Influent flow may overcome the four Raw Pumps' capacity and the Wet Well will flood	19
		Monitor the Emergency Generator as they continue to power the Raw Pumps	
343		Administration Floor is 343.25	20
		Thickener and DAF Tanks Walls tops are 343.50	
344		<b>The 100-year flood elevation</b>	21



# FLOOD RECOVERY

## Preparedness Planning

### DTMA - FLOOD PREPAREDNESS ACTION ITEMS

#### SUPPLIES & EQUIPMENT

Item	Location
Pipe plugs, rags, duct tape, plastic sheeting, sandbags	Filter Building - Janitorial Supply Area
Wood	Filter Building - Janitorial Supply Area
Pusher Trailers (Qty 2)	Filter Building
Pumps (4" / 1 ½ - 2")	Filter Building / Garage - Collection Bay

#### SERVICE CONTACTS

Service	Contacts
Cleaning Services	Belfor USA Group, Inc. (939-9090)
	Mark 1 Restoration (561-1255)
	Mellon Certified Restoration (232-1551)
Electrical Utility	PP&L (888-220-9991) (Acct. No. 64950-78009)
Electrical Service	Bitner Electric (564-5070)
	Garden Spot Electric (626-2360)
Movers	Penn Hershey Transfer (533-2000)
	United Van Lines (232-2100)
Moving Truck Rentals	Budget Truck Rental (561-8925)
	U - Haul (545-8124)
Pumps	Godwin Pumps (724-266-6936)
	Keystone Pump & Power (502-8500)
Vactor	Kline's Services (1-866-455-4637)

# FLOOD RECOVERY

## The “BIG” One

# 2011



Fully saturated, “brim” full Swatara Creek receives 16” – 18” of rainfall from TS Lee from the Susquehanna River thru the watershed to the headwaters.

- Predicted crest ~ 20'
- Actual Crest ~26.1' (*Note to Self*)



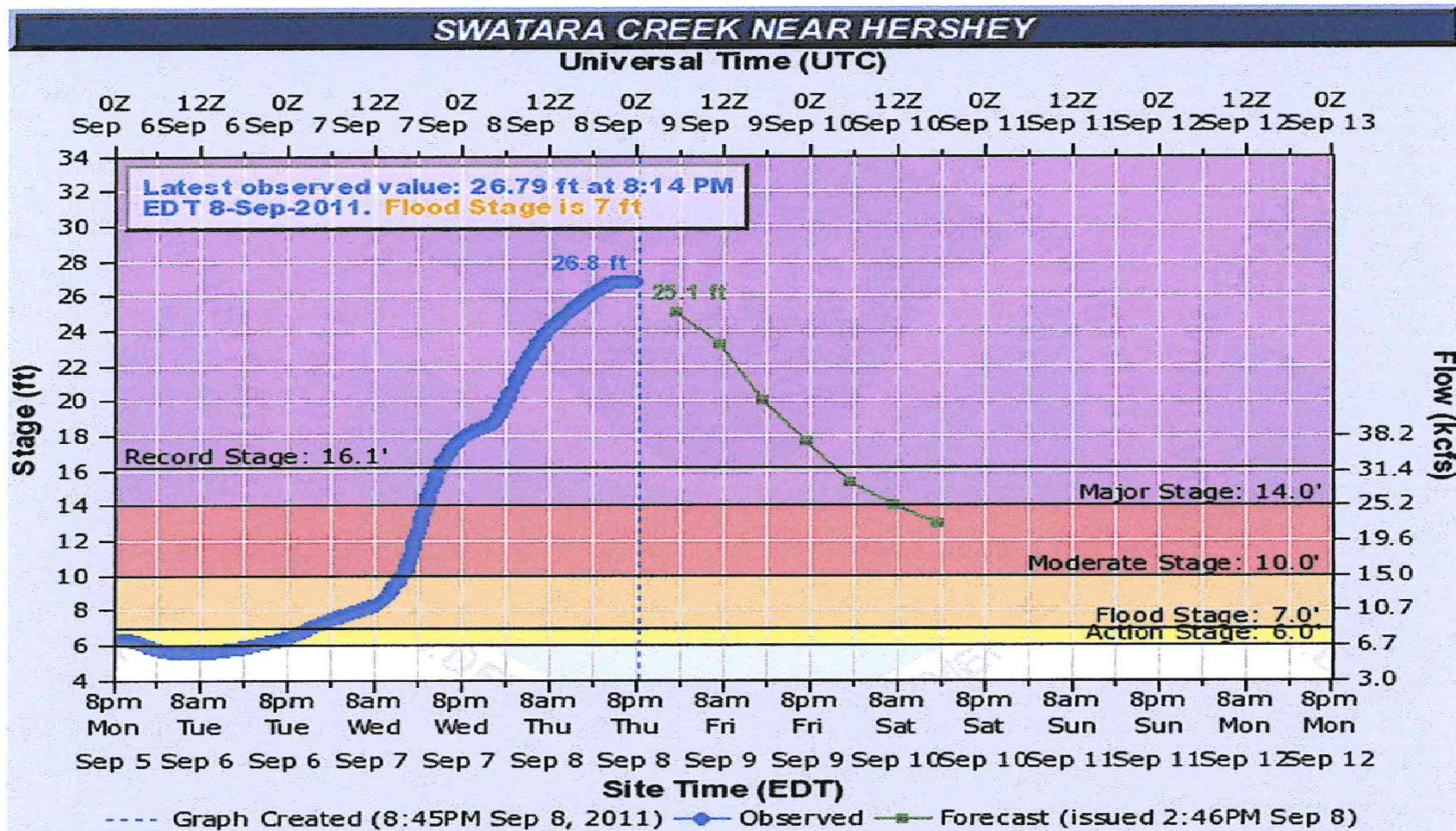


# FLOOD RECOVERY

## "Revised" Predicted Crest

09/08 0815

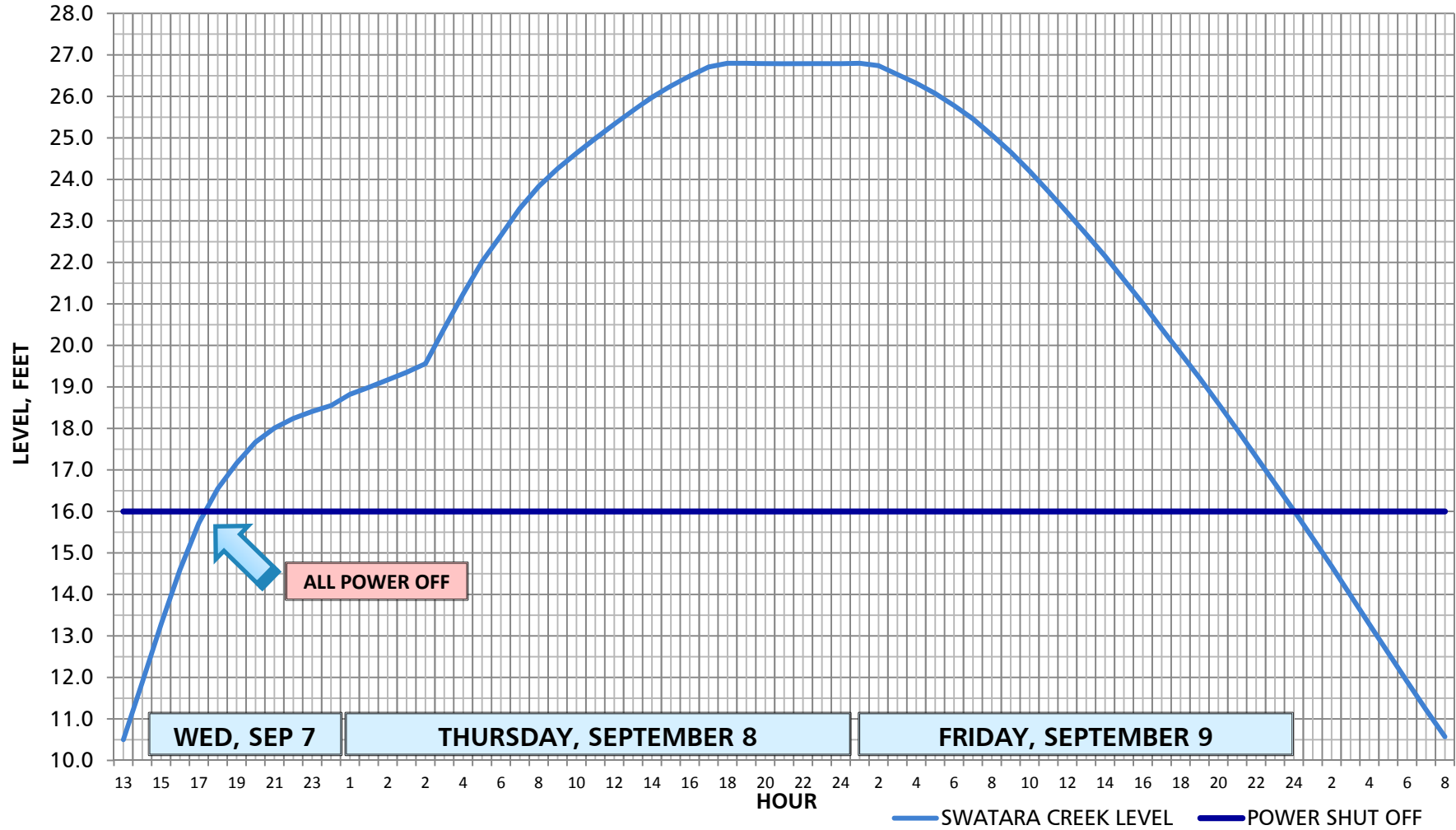
National Weather Service  
 Advanced Hydrologic Prediction Service  
[water.weather.gov/ahps/](http://water.weather.gov/ahps/)



# FLOOD RECOVERY

## Creek Level - The Facts

### SWATARA CREEK LEVELS - SEPTEMBER 7<sup>th</sup>, 8<sup>th</sup>, & 9<sup>th</sup>, 2011



# FLOOD RECOVERY

## Views from the Flood

### ❖ VIEWS FROM THE FLOOD



# FLOOD RECOVERY

## Views from the Ark



# FLOOD RECOVERY

## Views from the Ark





# FLOOD RECOVERY

## Views from the Ark





# FLOOD RECOVERY

## Views from the Ark





# FLOOD RECOVERY

## Views from the Park



# 2011 FLOOD Views from the Ark





# FLOOD RECOVERY "HQ"





# FLOOD RECOVERY "HQ Lunchroom"



# FLOOD RECOVERY

## Clean-Up

- Clean-up Challenges
  - Power
  - Water
- Debris
- Stuff



# FLOOD RECOVERY

## Clean-Up – “Stuff”



# FLOOD RECOVERY

## Tanker Recovery



**But the biggest Clean-up  
Challenge...**



# FLOOD RECOVERY

## Clean-Up Mulch

M  
U  
L  
C  
H





# FLOOD RECOVERY

## Fence Clean-Up - Mulch



**MULCH,**



# FLOOD RECOVERY

## Fence Clean-Up - Mulch





# FLOOD RECOVERY

## Fence Damage

# & MORE MULCH





# FLOOD RECOVERY

## Reality Sets In



# FLOOD RECOVERY

## Reality Sets In





# FLOOD RECOVERY Clean-Up





# FLOOD RECOVERY Clean-Up



Clean-up Challenge  
.....**BASEMENT DEWATERING**



# FLOOD RECOVERY

## Dewatering Challenges



# FLOOD RECOVERY

## Dewatering Challenges





# FLOOD RECOVERY

## Dewatering Challenges





# FLOOD RECOVERY

## Dewatering Challenges





# FLOOD RECOVERY

## Building Dewatering





**ADMINISTRATIVE  
FUNCTIONS  
RESTORATION**

# FLOOD RECOVERY

## Admin Restoration – “Temporary” Office Trailers





# TREATMENT PROCESS RESTORATION

# FLOOD RECOVERY

## By-Pass Pumping





# FLOOD RECOVERY

## Process & Equipment Restoration

- **MOTORS**
  - Bake, Dip, & RTS
- **DRIVERS**
  - Pumps & Gearboxes
    - Drain, Flush, Refill (grease/lubricant) & RTS
- **FLYING BLIND**
  - CONTROLS & INSTRUMENTATION
  - SCADA System
- **MAINTENANCE**
  - No Tools

# POWER RESTORATION



# FLOOD RECOVERY

## Power Center #2



# FLOOD RECOVERY

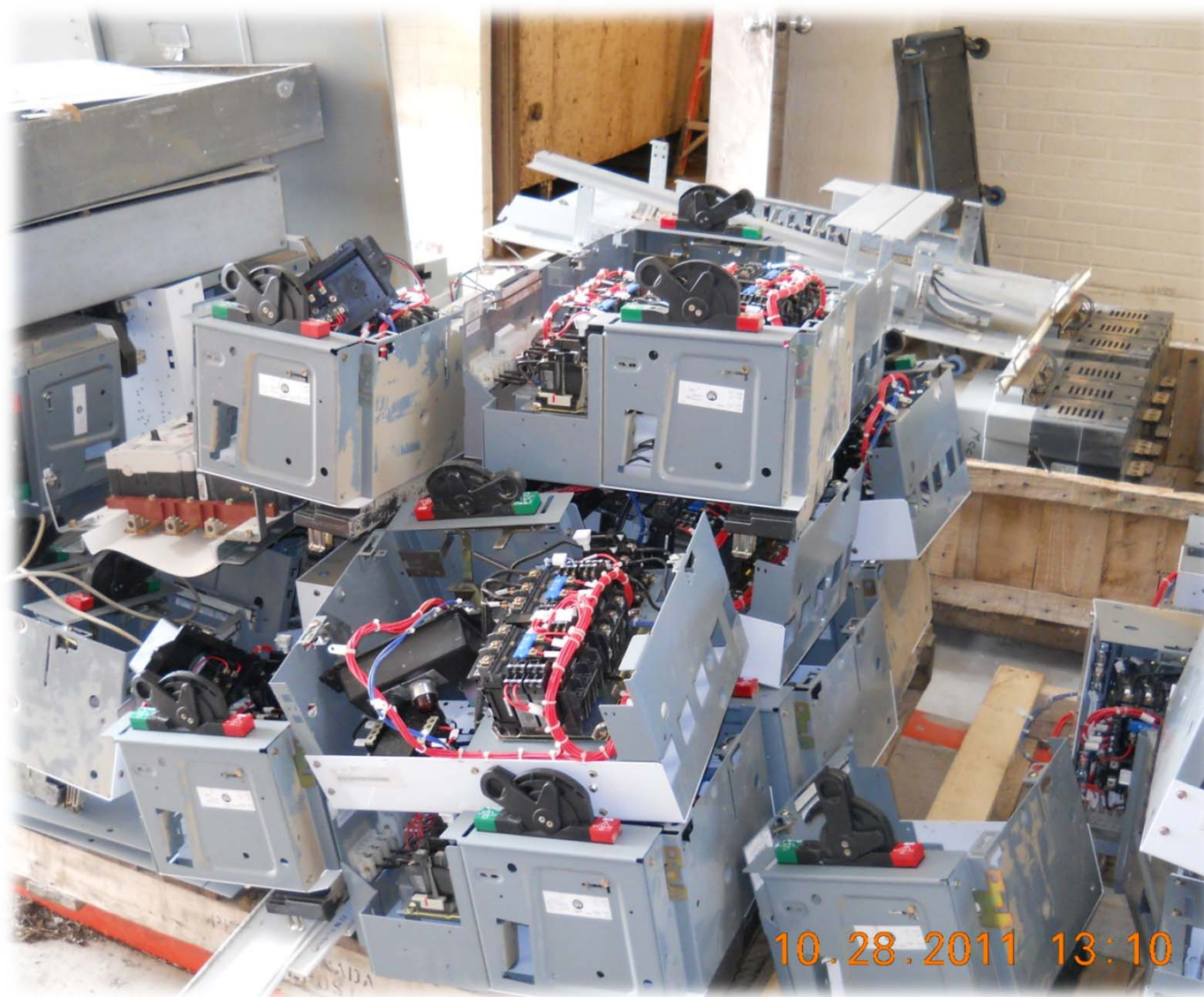
## Primary Switchgear & PPL Meter Cabinet





# FLOOD RECOVERY

## MCC "Buckets"



10.28.2011 13:10

# FLOOD RECOVERY

## Electrical Components





# COLLECTION SYSTEM RESTORATION

# PROJECT INTERRUPTED

## Mansion Road Pump Station





# FLOOD RECOVERY

## By-Pass Pumping





# FLOOD RECOVERY

## Sewer R/W Damage





# FLOOD RECOVERY

## Sewer R/W Damage



# TREATMENT PROCESS & EQUIPMENT RECOVERY



# FLOOD RECOVERY

## Process & Equipment Recovery

- MOTORS
- DRIVERS
  - Pumps & Gearboxes
  - Remove from Service One at a Time
  - Contract Repair
    - Open, Clean, Rebuild, Repair, RTS
- CONTROLS & INSTRUMENTATION
  - VFDs
  - Flow Meters
  - Actuators (*"Note to Self"*)

# FLOOD RECOVERY

## Process & Equipment Recovery

- SCADA System
  - Rebuild (we can make it better)
- CLARIFIER & THICKENER DRIVES
  - Remove from Service One at a Time
  - Contract Repair
    - Open, Clean, Rebuild, Repair, RTS
- CoGENERATION
  - DTMA gets Lucky
- BIOSOLIDS DRYER
  - Bid Awarded for Repair



# FLOOD RECOVERY

## Process & Equipment Recovery

- MISCELLANEOUS
  - Heating System
    - Boiler
    - Circ Pumps
    - Unit Heaters
  - Pipe Insulation
  - Doors & Windows
- ADMIN BUILDING RENOVATION
  - Slowed by Hurdles

**COSTS & OTHER  
MINOR STUFF**



# FLOOD RECOVERY

## Costs

- No Flood Insurance
- \$500,000 Flood Reserve Fund
- \$1 - \$2 Million in “Other” Reserve Funds
- \$6 Million Line of Credit

- FEMA
  - Reimburse 100% of **“ELIGIBLE”** Costs
  - Project Worksheets (paper & forms)
    - 55, 3” binders submitted
  - Bureaucratic Process, slow reimbursement



# FLOOD RECOVERY

## Summary

- NO SEWER FLOW
  - Approximately 96 Hours
- EXTENDED PRIMARY TREATMENT
  - Approximately 21 days
- NPDES PERMIT Compliance
  - October 1<sup>st</sup>
  - WY 2010 - 2011
    - LOST ~50,000 Lbs "N" Credits

- FLOOD RECOVERY ASSISTANCE
- TECHNICAL, CONTRACT, & ADMINISTRATIVE SUPPORT
  - ENGINEERS
  - CONTRACTORS

**–STAFF!!!!!!!!!!**



# FLOOD RECOVERY

## Summary

- FINAL COSTS:
  - Approximately \$12 - \$13 Million
- COMPLETE RECOVERY:
  - WWTP ~ 18-24 Months
  - Office Building ~36 Months

# QUESTIONS ?

