Restoration Advisory Committee for Stewart Air National Guard Base

Meeting 4
October 28, 2020

Final
Air National Guard Team

- **National Guard Bureau**
  - Robert Subasavage, Chief, Environmental Quality Branch
  - Keith Freihofler, Senior Restoration Program Manager
  - Nicole Wireman, Restoration Program Manager

- **Stewart Air National Guard Base**
  - Colonel Marc Kelly, Maintenance Group Commander, and Co-Chair
  - Colonel Edward Cook, Commander, 105th Mission Support Group
  - Mike Oettinger, Environmental Manager
  - MSgt Sara Pastorello, Public Affairs

- **U.S. Army Corps of Engineers**
  - Michelle Lordemann
  - Kinjal Shah
  - Stephen Kitt

- **Contractors**
  - BERS Weston Services
  - Wood
# RAC Members

## Community Representatives

<table>
<thead>
<tr>
<th>Name</th>
<th>Name</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anthony Fern</td>
<td>Aura Lopez Zarate</td>
<td>Carla Johnson</td>
</tr>
<tr>
<td>Cassie Sklarz</td>
<td>Cynthia Mack</td>
<td>Edward Lawson</td>
</tr>
<tr>
<td>John Clarke</td>
<td>Laura Patricia Garcia Balbuen</td>
<td></td>
</tr>
<tr>
<td>Ramona Burton</td>
<td>Robert Sanchez-Potter</td>
<td></td>
</tr>
</tbody>
</table>

## Community Group Representatives

<table>
<thead>
<tr>
<th>Name</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chuck Thomas</td>
<td>Newburgh Conservation Advisory Council</td>
</tr>
<tr>
<td>Jack Caldwell</td>
<td>Quassaick Creek Watershed Alliance</td>
</tr>
<tr>
<td>Manna Jo Greene</td>
<td>Hudson River Sloop Clearwater, Inc</td>
</tr>
<tr>
<td>Mary Wagner</td>
<td>Newburgh Clean Water Project</td>
</tr>
<tr>
<td>Victoria Leung</td>
<td>Riverkeeper</td>
</tr>
</tbody>
</table>

## Government Representatives

<table>
<thead>
<tr>
<th>Name</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anthony Grice</td>
<td>City of Newburgh</td>
</tr>
<tr>
<td>Keith Miller</td>
<td>Orange County</td>
</tr>
<tr>
<td>Patrick Hines</td>
<td>on behalf of the Town of New Windsor</td>
</tr>
</tbody>
</table>
6:00 PM  Welcome – Col. Marc Kelly and Mr. Chuck Thomas

6:05 PM  RAC Business
- Upcoming Meetings
- Vote on Operating Procedures
- Election for RAC Co-Chair
- Election for RAC Open Positions
- Other Business

6:40 PM  Update on Environmental Projects at Stewart ANGB
- Site 3 Former Base Landfill – Annual Long-Term Monitoring
- PFOS/PFOA
  - Interim Storm Water Treatment System

7:20 PM  RAC Open Discussion

7:40 PM  RAC Public Questions

8:00 PM  Adjourn
Meeting Notes / Guidelines

- Tonight’s presentation is being transcribed.
- Please introduce yourself before speaking.
- All phones are muted and will need to be unmuted prior to speaking.
- Five minutes allotted for Questions and A by RAC members after each topic.
- During the RAC Open Discussion, the RAC members may raise their hand to make a comment or ask a question – 3-minute limit.
- Public questions should be submitted through the question module and will be read and addressed in the order they are received. Questions that cannot be answered before the meeting ends will be recorded and written responses will be provided.
RAC Business
Upcoming Meetings

• RAC Meeting 5 – February 3, 2021
  Virtual unless significant changes allow for the Newburgh Armory

• RAC Meeting 6 – April 28, 2021
  Newburgh Armory*

• RAC Meeting 7 – Proposed for July 28, 2021
  Newburgh Armory*

*If local and national COVID-19 travel, meeting, and social distancing restrictions are lifted.
Air National Guard (ANG) met with Chuck Thomas, Mary Wagner, and Victoria Leung on July 31 and September 10 to discuss final comments on Operating Procedures.

Comments were received from RAC members on September 16.

ANG submitted a final version to the sub-group on September 29 for review.

Comments?

Vote.
2021 Co-Chair & Secretary

• Chuck’s 1-year term ends this year – Thank you Chuck!
  – Nomination for Ed Lawson to be the 2021 Co-Chair
  – Discussion
  – Vote
    • RAC Members please use the raise your hand function to show your approval

• Nomination for the 2021 Secretary
  – Discussion
  – Vote
RAC Open Positions

• Thank you, Cynthia Mack and Anthony Fern for your service on the RAC.

• There are 2 open seats for the 2021 RAC.
• Nominations for the open positions.
  – Discussion
  – Vote
Other RAC Business

- RAC members please raise your hand if you have other business to discuss.
Update on Environmental Projects at Stewart Air National Guard Base

Nicole Wireman
Restoration Program Manager
NGB/A4VR
**AR Quick Navigation Aids**

[https://ar.afceccloud.af.mil/](https://ar.afceccloud.af.mil/)

<table>
<thead>
<tr>
<th>Report Name</th>
<th>AR # Main Report</th>
<th>AR # for Additional Parts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final Expanded SI Report for PFOS/PFOA (2020)</td>
<td>602198 (Part 1 of 33)</td>
<td>Appendices A-F: 602199 &amp; 602200&lt;br&gt;Appendix G: 602203&lt;br&gt;Appendix H: 28 parts various #s&lt;br&gt;Appendices I-P: 602265</td>
</tr>
<tr>
<td><strong>July 2020 RAC Meeting Materials</strong></td>
<td>601741</td>
<td></td>
</tr>
<tr>
<td>Final SI Report for PFOS/PFOA (2018)</td>
<td>598617 (Part 1 of 3)</td>
<td>598619 and 598621 (Parts 2 – 3)&lt;br&gt;598642 (explains change in AR #s)</td>
</tr>
<tr>
<td>Final SI Report Addendum for PFOS/PFOA (2019)</td>
<td>584628</td>
<td></td>
</tr>
<tr>
<td>Final LTM Work Plan for Site 3 – Former Base Landfill (2020)</td>
<td>595733</td>
<td></td>
</tr>
<tr>
<td>Final 2019 Annual LTM Report for Site 3 (SS003, aka Site 1)</td>
<td>590042 (Part 1 of 5)</td>
<td>590058 - 590061 (Parts 2 – 5)</td>
</tr>
<tr>
<td>Final RI Report for Pesticides in Monitoring Well-01 (SS005, Site 5) (2017)</td>
<td>556572 (Part 1 of 3)</td>
<td>556573 - 556574 (Parts 2 – 3)</td>
</tr>
</tbody>
</table>

**Bold Green** text indicates new document since last meeting

<table>
<thead>
<tr>
<th>AR = Administrative Record</th>
<th>PFOS = Perfluorooctane Sulfonate</th>
</tr>
</thead>
<tbody>
<tr>
<td>LTM = Long Term Monitoring</td>
<td>SI = Site Inspection</td>
</tr>
<tr>
<td>PFOA = Perfluorooctanoic Acid</td>
<td>RI = Remedial Investigation</td>
</tr>
</tbody>
</table>
Recent News Article on Stewart’s PFAS RI

• Next step in CERCLA = Remedial Investigation (RI)
  – ANG sequences installations for RIs using a data- and risk-based process – essentially worst first

• News article indicated community would be penalized because of switch to an alternative drinking water source

• This is contrary to official position of the ANG
  – Relative Risk Site Evaluation (RRSE) considers impacts to original drinking water source in the migration pathway and receptor analysis
  – Sequencing of Stewart PFAS RI will not be impacted by alternate drinking water source currently being used
Site 3 (aka Site 1) Former Base Landfill – Annual Long-Term Monitoring

Kerry Tull
Senior Principal/Project Manager
Wood PLC
Site 3 – Former Base Landfill (LF003)

- **Background**
  - Landfill received municipal domestic waste from former onsite Air Force residents during the 1960s and 1970s.
  - Landfill cover installed with an engineered cap in 1999.
  - Annual long term monitoring since 2000 (2020 represents the 21st year that LTM has been performed).
Site 3 – Former Base Landfill (LF003)

• Background
  – Annual Sampling Event Completed Week of 6 Apr 2020.
    • Groundwater sampling at 7 wells.
    • Surface water and sediment sampling.
    • Landfill gas monitoring along landfill perimeter.
Site 3 – Former Base Landfill (LF003)
Site 3 – Former Base Landfill (LF003)

• Update since last RAC meeting
  – 2020 Annual Long Term Monitoring Report
    • Draft Final Report submitted to NYSDEC and RAC on 29 September 2020.
• Findings
  – Low levels of solid waste-related chemicals detected in groundwater; most chemicals show stable or decreasing concentration trends.
Site 3 – Former Base Landfill (LF003)

• Findings (continued)
  – Several solid waste-related chemicals show variable or increasing trends over time (for example, chloride, sodium, iron, and solvent break-down products).
  – No solid waste-related chemicals are present above NYSDEC criteria in the most downgradient well (MW-19) or in surface water and sediment samples.
Site 3 – Former Base Landfill (LF003)
• Findings (continued)
  – Nominal levels of landfill gas were detected at perimeter sampling stations indicating low or no levels of biological activity.
  • Positive information because high levels of biological activity can result in the need for gas treatment and (or) the generation of elevated chemical concentrations in leachate.
Site 3 Former Base Landfill Questions

RAC Members
Please Raise Your Hand to Ask a Question

5 Minute Timer

Time’s Up!
Interim Storm Water Treatment System at Recreation Pond

Doug Close
BERS Weston Services
Phase 2 – ISWTS SITE PLAN

- Turbidity Barrier
- Untreated Water Influent
- Recycled Water
- Treated Water Effluent
- ISTWS Outfall Structure
- Weir Structure
- Outfall 010
- To Silver Stream
- Sand Filter Skid
  - Sand Filter Effluent
  - Pre-Treatment Skid
  - Treatment Skid No. 1
  - Treatment Skid No. 2
  - Pre-Treatment Effluent
- Interim Storm Water Treatment System
Phase 2 – ISWTS Site Layout

Pre-treatment Container - Control Panel & Bag Filters

Treatment Containers (GAC & Resin)

Electrical Distribution

Influent Pipe

Effluent Pipe

Sand Filter Container
Phase 2 – ISWTS Structure
Timeline Reminders

• Constructed improved pretreatment system in June 2020.
• Commissioned system in early July 2020. Commissioning included pressure testing of new equipment and configuring the controls.
• Changed GAC media and the Primary Ion Exchange Resin (prior to startup).
• Started Phase 2 Pilot (with sand filtration skid) and changed media (GAC and Resin) on 13 July 2020.
Phase 2 – Operations Highlights

Data Summary for the period of 13 July through 15 September 2020 (65 days of operation).

- For 50 of the 65 days [>75%], the pond water level remained below the weir (no bypass flow into Silver Stream).
- More than 21 million gallons of Rec Pond water was treated.
- Levels of PFOS & PFOA in effluent (water outflow from treatment system) remained below 5 parts per trillion (PPT) and predominantly Non Detect (ND).
Phase 2 – Sampling Results

**Influent PFOS/PFOA Levels**
- Average level 405.44 ppt

**Effluent PFOS/PFOA Levels**
- Average level 0.98 ppt

ND = Non Detect, which means PFOS/PFOA was not detected above detection limits

PPT = Parts Per Trillion

UNCLASSIFIED
Phase 2 – Rec Pond Water Level

Four rain events during Phase 2 operations:
A. Aug 4-5, >0.5 in. rain
   Loss of power for 2 days
B. Aug 18 =0.5 in. rain
C. Aug 27-28 >0.5 in rain
D. Sept. 2 >0.5 in rain
Outfall 10 Comparison

View of ISWTS discharge outfall with approx. 1ft. drawdown

View of ISWTS discharge outfall after rain event
Outfall 10 Comparison

ISWTS effluent outfall pipe

Existing Outfall 10 weir structure

ISWTS discharge outfall

ISWTS effluent outfall pipe

View of Outfall 10 weir structure during draw down from the treatment system

View of Outfall 10 weir structure during a storm event with >2ft of bypass over weir
Changing pond conditions such as high turbidity, algae, pond weeds, and microorganisms negatively impact the functionality of the ISWTS.
• Total Organic Carbon (TOC) is a water quality indicator.
• TOC present in surface water is likely impacting media (GAC & Resin) life and contributing to biofouling.
• Guideline from Resin supplier TOC <2 parts per million (ppm).

<table>
<thead>
<tr>
<th>TOC Result Summary (parts per million)</th>
<th>Influent Average</th>
<th>4.4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sand Filter Effluent Avg.</td>
<td>4.0</td>
<td></td>
</tr>
<tr>
<td>Bag Filter Effluent Avg.</td>
<td>4.1</td>
<td></td>
</tr>
<tr>
<td>GAC Effluent Avg.</td>
<td>2.0</td>
<td></td>
</tr>
<tr>
<td>Primary Resin Effluent Avg.</td>
<td>2.0</td>
<td></td>
</tr>
<tr>
<td>Secondary Resin Effluent Avg.</td>
<td>1.6</td>
<td></td>
</tr>
<tr>
<td>Effluent Avg.</td>
<td>1.7</td>
<td></td>
</tr>
</tbody>
</table>
Influent and Effluent Turbidity

SANGB - ISWTS
Influent and Effluent Turbidity

Turbidity (NTU)

0.00 5.00 10.00 15.00 20.00 25.00

Date:
Turbidity/Solids

- Turbidity is a measurement that can quantify the amount of solids present in the water.
- During Phase 1 Pilot (Feb – Mar) influent (water coming into treatment system) turbidity averaged 3.4 NTU.
- During Phase 2 Pilot (July – Sept) influent turbidity averaged 9.5 NTU or approximately 3 times higher.
  - As a result of increased turbidity, we increased maintenance to control system performance.
  - After treatment turbidity averaged 1.6 during this period.

NTU = Nephelometric Turbidity Units
Biofouling Control

• Biofouling is the accumulation of micro-organisms on wetted surfaces.

• Two chemical additions were considered to control biofouling: algicide and chemical dosing with peracetic acid.
  – An algicide, known as Cutrine, application to the pond was not used this season. Will continue to research options for next season.
  – NYSDEC approved the use of 15% Peracetic Acid at low levels with a maximum dosing rate of 7.3 lbs/day (0.75 gallons/day) at 500 gpm avg. flow measured at the outfall.
    • The low dose approved by NYSDEC did not appear to inhibit biofouling; however, monitoring will continue.
Peracetic Dosing System

- Metering pump
- Sand filter vessel
- Backwashing site glass
- Eye wash station
Sand Filters

• Filters were equipped with automated backwashing, which allowed for reduced operations and maintenance labor.

• Filters normally operate in downflow regime (e.g. top to bottom of vessel). Backwashing reverses the flow, so the water is used to remove solids collecting on top of the bed.

• During Phase 2, the backwashing controls were optimized to achieve acceptable backwashing at variable water flows.

• Course and fine sand filters were backwashed approximately 3 to 4 times per day (220 to 280 times).
Biofouling in Sand Filters

Example of biological fouling on sand filter lid by growth of pond algae and organisms, which negatively impact the ISWTS mechanical components and functionality
Bag Filters

• Bag filters were change approximately every other day.
  – Primary bag filters changed 25 times (300 bags).
  – Secondary bag filters changed 34 times (400 bags).
• Alternative bag filters ranging between 25-micron and 5-micron pore sizes were tested. (A micron is 1000\(^{\text{th}}\) of an inch.)
• Based on summer conditions, the most effective configuration is to use 25-micron primary bag filters with 10-micron secondary bag filters.
Regular cleanings of bag filters are required to address buildup of solids and algae in order to keep pretreatment system operational.
Operational Summary (Con’t)

Treatment Trains

- Treatment train pressure is monitored to confirm when maintenance is required. Solids accumulation in the vessel restrict flow, which causes increased pressure.
- Carbon backwashing was standardized to 2 or 3 times/week (16 times).
- Backwashed Primary Resin twice during operations & maintenance period. Did not backwash secondary resin, although pressures were rising.
- Post internal vessel inspections are conducted to ensure no channeling is caused by backwashing.
September Media Changes

Results from primary resin sample taken on 9/1/20 (received 9/10/20) triggered a media change requirement after PFOS and PFOA levels tested above 35 ppt.

The following ISWTS changes were made:

1. Primary Resin vessel was replaced with GAC, because
   a. High Total Organic Carbons in water require frequent backwashing maintenance and Resin is not designed to be backwashed.
   b. GAC has been proven to effectively remove PFOS/PFOA.

2. All media was replaced, and a system cleaning occurred during the system shutdown to mitigate any biofouling.
ISWTS September Redesign
Path Forward

• Continue monitoring effectiveness of low Peracetic Acid dose.
• Continue evaluating performance of GAC being substituted for Primary Resin in order to compare each media performance.
• Continue optimizing ISWTS through operations and maintenance.
• Continue sampling for system compliance.
RAC Questions

Interim Storm Water Treatment System Questions

RAC Members Please Raise Your Hand to Ask a Question

5 Minute Timer

Time’s Up!
RAC Open Discussion
RAC Open Discussion

- Opportunity for RAC members to review remediation questions and concerns.
- Propose topics and action items for February’s meeting.
Public Questions

Please submit questions through the Question Module. Questions will be read by the moderator.

If there is not enough time to respond to all questions, the questions will be downloaded and written responses will be provided.
Public questions on this presentation may be submitted to

Mary Wagner at mary@inherentgood.co

Questions will be accepted until Nov 15.
Presentation - Figures
Interstitial Storm Water Treatment System (ISWTS) Location

- Recycled Water
- Treated Water
- Treated Water Effluent
- ISTWS Outfall Structure
- Weir Structure
- Outfall 010
- To Silver Stream
- Untreated Water Influent
- Turbidity Barrier

Interim Storm Water Treatment System

- Sand Filter Skid
- Treatment Skid No. 1
- Treatment Skid No. 2
- Pre-Treatment Skid
- Pre-Treatment Effluent
- NY Route 17K
- Storm Drain
- Outfall 010
- ISTWS Outfall Structure
- Western Interceptor Drain
- Western Airfield Drains
- Eastern Airfield Drains
- To Silver Stream
Slide 27 Graphic

Recreational Pond
Untreated Water

Pump

Turbidity Barrier

Peracetic Acid
Biofouling Control

Sand Filter Structure

Backwash

1A&B 2A&B 3A&B 4A&B 5A&B

Coarse Sand Filter

Pretreatment Structure

Fine Sand Filter

Backwash

1A&B 2A&B 3A&B 4A&B 5A&B

Bag Filters

Pretreatment Structure

Recycle

PBF1 PBF2

Flow Design and Sample Ports

As operated during Phase 2 Pilot
July to September 2020

Stewart Air National Guard Base
New York

LEGEND

● Sample Port/ID

Interim Storm Water Treatment System
Flow Design and Sample Ports
As operated during Phase 2 Pilot
July to September 2020

BERS-Weston Services JVA, LLC
Slide 46 Graphic

Stewart Air National Guard Base
New York

Interim Storm Water Treatment System
Flow Design and Sample Ports
After Modification in September 2020

Recreational Pond
Untreated Water

Pump

Turbidity Barrier

Separator

Peracetic Acid
Biofouling Control

Backwash

Sand Filter Structure

Recover

Turbidity Barrier

Recycle

Effluent

Flow Monitor

To Silver Stream

LEGEND
• Sample Port/ID

Sand Filter Structure

Coarse Sand Filter

Fine Sand Filter

Backwash

1A&B

2A&B

3A&B

4A&B

5A&B

1A

1B

2A

2B

Pre-treatment Structure

Bag Filters

Pretreatment Structure

PBF1

PBF2

1A&B 2A&B 3A&B 4A&B 5A&B

Graphic

GAC 1

Train B

Train A

GAC 2

Resin 1

Resin 1

GAC 1

GAC 2

Resin 1

Resin 1

GAC 1

GAC 2

Resin 1

Resin 1

GAC 1

Pump

Peracetic Acid
Biofouling Control

Sand Filter Structure

Fine Sand Filter

To Silver Stream