DRAFT FINAL

PERFLUORINATED COMPOUNDS PRELIMINARY ASSESSMENT SITE VISIT REPORT

NEW YORK AIR NATIONAL GUARD
STEWART AIR NATIONAL GUARD BASE
NEWBURGH, NEW YORK

Prepared For:

Headquarters Air National Guard
Joint Base Andrews, Maryland

February 2016

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BB&E, Inc.
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LIST OF ACRONYMS

AFFF	Aqueous Film Forming Foam
amsl	above mean sea level
ANGB	Air National Guard Base
AOC	Area of Concern
BB&E	BB&E, Inc.
bgs	below ground surface
FD	fire department
ft	feet
FSS	fire suppression system
FTA	Fire Training Area
gal	gallons
HEF	high expansion foam
NYANG	New York Air National Guard
OWS	oil/water separator
PA	Preliminary Assessment
PFCs	Perfluorinated Compounds
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonate
PHAL	Provisional Health Advisory Levels
SI	Site Investigation
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey

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1.0 INTRODUCTION

A preliminary assessment (PA) site visit was conducted by BB&E, Inc. (BB&E) on December 8, 2015 for the New York Air National Guard (NYANG) at the Stewart Air National Guard Base (ANGB) in Newburgh, New York (Base). The site location is shown on Figure 1. The purpose of the visit was to identify potential sites of historic environmental releases of perfluorinated compounds (PFCs), specifically from Aqueous Film Forming Foam (AFFF) usage and storage, as shown on Figure 2. Prior to the site visit, BB&E conducted research of any documented Fire Training Areas (FTAs) in operation since 1970, or any other use or release of AFFF in accordance with the Final PFC Preliminary Assessment Work Plan (BB&E, 2015).

Individuals contributing to this PA effort included the following:

- Capt. Nicolas Caputo – NYANG, Environmental Manager
- Chief Bell – NYANG, Fire Department
- NYANG Base Civil Engineering

Sections 2.0 and 3.0 outline the potential PFC sources identified on the Base property during the records review and site visit and Section 4.0 provides conclusions and recommendations; references are listed in Section 5.0. Representative photos of the subject sites taken during the site visit are attached as Appendix A, records of communication are included in Appendix B, and other supporting documentation is provided in Appendix C.

1.1 Hydrogeologic Setting

Hydrogeologic information was obtained from the 2015 Final Preliminary Assessment/Site Investigation (PA/SI) report prepared by AECOM (AECOM, 2015).

The surficial aquifer at Stewart ANGB consists of a uniform glacial till deposit over the shale bedrock. The shallow portion of the bedrock aquifer that lies beneath the installation is confined by the glacial till. The Normanskill Formation and underlying bedrock have very low permeability and yield low volumes of groundwater. Groundwater at the site is approximately

30 feet (ft) below ground surface (bgs) and flows to the southeast. Three possible modes of groundwater transport through two hydrogeologic units have been identified onsite:

- Perched water moving horizontally along the top of the bedrock, primarily through a weathered rock zone at a rate of about 1.6 ft/year.
- Vertical and horizontal movement through pores in the sandier zones of a glacial till unit overlying the bedrock, at a rate of approximately 13 ft/year.
- Vertical and horizontal movement along fractures in the till unit.

There are currently no known drinking water supply wells at the Base. The Town of New Windsor provides water service to the Stewart ANGB and vicinity and obtains water from Lake Washington (AECOM, 2014).

Further discussion of water wells is included in Section 3.2.1.1 of this report. Surface water drainage is discussed in Section 3.2.4 of this report.

2.0 FIRE TRAINING AREAS

FTA Areas of Concern (AOCs) are sites where AFFF has been released during fire training activities. Based on this PA investigation, there is no evidence that a FTA has been used by ANG within property boundaries. According to Base personnel, all fire training activities have been conducted at off-Base facilities.

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3.0 NON-FIRE TRAINING AREAS

Non-FTA AOCs are sites where AFFF has been released and may include crash sites, hangars, fuel spill areas, hazardous waste storage facilities, firefighting equipment testing areas, etc. The following section includes a description of any non-fire training AOCs, operational history, waste characteristics, and pathway evaluations.

3.1 AOC Description, Operational History, and Waste Characteristics

The following are the Non-FTA AOCs that were identified during this PA Investigation. Appendix A contains photos of these areas. The types of AFFF used and stored in the areas specified below included the following: Ansulite Mil-spec (3%) and Ansul Class A (1%).

3.1.1 Building 104 (Current Fire Station)

Building 104 was built in 2007. Bulk AFFF is stored in totes and drums and is also present in the fire department (FD) vehicles. Current FD vehicle AFFF inventory amounts are included as Appendix C-1. Additionally, the foam trailer currently carries 1,000 gallons (gal) of AFFF. AFFF is transferred to vehicles within the Fire Station via a pony pump on the foam trailer. If AFFF is removed from the trucks for maintenance, it is transferred to empty 55-gal drums within the Fire Station. Any AFFF releases are typically captured by the trench drains which discharge into the storm sewer system, ultimately flowing through an oil/water separator (OWS) at Building 111. Discharges from the OWS (Building 111) are typically routed to Recreation Pond (off-site) through Outfall 002, but can be diverted to the Retention Basin through the Diversion Chamber (see further discussion in Section 3.1.15). A project is currently being investigated by the Base to re-route the Building 104 trench drains from the storm sewer system (ANG, 2015).

3.1.2 Nozzle Testing Area

According to Base personnel, the concrete area west of Building 104 has been used for annual FD vehicle nozzle testing since 2007 and is the only known location of nozzle testing. No records of nozzle testing were available. Cracks in the concrete were observed during the site visit.

3.1.3 Building 105 (Former Fire Station)

Prior to relocation to Building 104 in 2007, the FD was stationed in Building 105 (built in 1988). No known Base personnel were identified during the site visit that would have a recollection of AFFF handling and usage within Building 105, but practices are presumed to be similar to those of Building 104. Trench drains were located on either end of the truck bays, near the overhead doors. There are no known records or personnel knowledge of AFFF releases at Building 105. Any releases within Building 105 would have been captured by the trench drains, which discharge into the industrial waste line. It is not known if vehicle nozzle testing was conducted outside of Building 105 during FD occupancy.

3.1.4 Hangar 100

Operation of the AFFF fire suppression system (FSS) at Hangar 100 started in 1987 and continued until 2006, when the system was retrofitted for use of high expansion foam (HEF). Prior to removal, three AFFF supply tanks (unknown capacity) for the fire suppression system were located in the boiler room. It is not known if, or how often, fire suppression systems were tested. No records of accidental AFFF releases exist, but according to Base personnel, at least one accidental release occurred at Hangar 100. A 1990 article from The Sentinel (Appendix C-2) describes an AFFF spill from Hangar 100 that discharged directly into New Windsor's sanitary sewer system, generating plans to construct a second lagoon within the Retention Basin system. Any AFFF releases at Hangar 100 typically would enter the trench drain and building OWS through the industrial waste system and discharge to the Retention Basin (ANG, 2015) (see further discussion in Section 3.1.15). Hangar 100 construction drawings of the FSS conversion from AFFF to HEF are included in Appendix C-3.

3.1.5 Hangar 101

Operation of the AFFF fire suppression system at Hangar 101 started in 1987 and continued until 2009, when the system was retrofitted for use of HEF. The AFFF FSS included underwing and overhead foam generators. The existing overhead foam generators were retained for reuse with HEF. Historically, AFFF storage tanks were kept on the floor of the main hangar. It is not known if, or how often, fire suppression systems were tested. No records of accidental AFFF releases exist. According to Base personnel, several accidental AFFF FSS activations occurred at

Hangar 101 but never resulted in a full-system release. Trench drains in this hangar discharge to an OWS through the industrial waste system to the Retention Basin (ANG, 2015) (see further discussion in Section 3.1.15). Hangar 101 construction drawings of the FSS conversion from AFFF to HEF are included in Appendix C-3.

3.1.6 Hangar 102

Operation of the AFFF fire suppression system at Hangar 102 started in 1988 and continued until 2006, when the system was retrofitted for use of HEF. The existing overhead foam generators were retained for reuse with HEF. Two AFFF supply tanks (1,800 gallons [gal] and 700 gal) for the FSS were located in the Electrical and Fire Protection Equipment Room (Room 115). Staining on the floor and walls was observed in Room 115 during the site visit, potentially due to an AFFF or HEF release (Appendix A, Photo 12). There are no floor drains in Room 115, but an overhead door is located near the FSS which may facilitate an outdoor release of foam if opened during FSS activation. No records of accidental AFFF releases exist. According to Base personnel, several accidental AFFF FSS activations occurred at Hangar 102 but never resulted in a full-system release. It is not known if, or how often, fire suppression systems were tested. Trench drains, located in the hangar bay, discharge to an OWS through the industrial waste system to the Retention Basin (ANG, 2015) (see further discussion in Section 3.1.15). Hangar 102 construction drawings of the FSS conversion from AFFF to HEF are included in Appendix C-3.

3.1.7 Hangar 300

Operation of the AFFF fire suppression system at Hangar 300 started in 1989/1990 and continued until 2004, when the system was retrofitted for use of HEF. One 1,800-gal AFFF supply tank was located in the Sprinkler/Mechanical Room. It is not known if, or how often, fire suppression systems were tested. No records of accidental AFFF releases exist. Any AFFF releases during testing or accidental release within the Hangar typically would have been routed to the trench drains, which discharge to an OWS through the industrial waste system, ultimately to the Retention Basin (ANG, 2015) (see further discussion in Section 3.1.15). Hangar 300 construction drawings of the FSS conversion from AFFF to HEF are included in Appendix C-3.

3.1.8 Hangar 301

Operation of the AFFF fire suppression system at Hangar 301 started in 1992 and continued until 2004, when the system was retrofitted for use of HEF. Two 1,300-gal AFFF supply tanks were located in the Mechanical Room. It is not known if, or how often, fire suppression systems were tested. No records of accidental AFFF releases exist, but according to Base personnel, at least one accidental release occurred at Hangar 301. This maintenance facility is on the flight line and is used by the USMC MAG 49, Det B for maintenance of aircraft fuel cells and for the washing and corrosion control of aircraft. Trench drains in this hangar discharge to an OWS through the industrial waste system to the Retention Basin (ANG, 2015) (see further discussion in Section 3.1.15). Hangar 301 construction drawings of the FSS conversion from AFFF to HEF are included in Appendix C-3.

3.1.9 Building 108 (Pump House)

Building 108, built in 1988, was a historical AFFF storage location according to Base personnel. The dates and amounts of AFFF stored are unknown. No records of accidental AFFF releases exist. According to base personnel, there were no known spills. Building 108 floor drains discharge via the storm sewer system to Outfall 006.

3.1.10 Building 200 (AGE Maintenance)

Building 200, built in 1988, consists of vehicle maintenance bays and a washrack. Maintenance bay floor drains lead to an OWS prior to discharge to the sanitary sewer system. During equipment washing at the washrack, a valve-operated trench grate system is opened and discharges flow to the sanitary sewer system via an OWS. Although there are no records or knowledge of known AFFF spills at Building 200, Base personnel indicated that spills may have occurred due to residual foam in the lines of FD vehicles.

3.1.11 Apron

This area is on the west side of the flight line and is used for parking, fueling, deicing, and minor maintenance of C-17 and KC-130 aircraft. This area is completely paved and covers approximately 75 acres. The apron has a complete network of drain inlets that discharge

stormwater through the storm sewer system to Outfall 002. During normal flow conditions, drainage from the aircraft parking apron goes through the Diversion Valve Chamber, an underground vault located at the southwest corner of the Base, which includes a large filtration system and control equipment. If a spill occurs or the storm water system is threatened with contaminants, the drainage from the aircraft parking apron is redirected at the Diversion Valve Chamber and diverted to the Retention Basin. Flow diversion is accomplished by electronically activating a control valve remotely from Bldgs. 207 or 104 or manually at the Diversion Chamber (ANG, 2015).

3.1.12 Outfall 002

The drainage basins of the Base discharge through a network of in-ground conveyances and grass-lined ditches to the Recreation Pond or through several points along the eastern border of the Base. There are ten drainage basins that contain the industrial activities of the Base. These basins generally slope from northwest to southeast and are summarized below (ANG, 2015). Each drainage basin has an associated outfall. Drainage Basin 002 includes a portion of Building 101, Buildings 100,104, 200, 301, 302, 400 and Apron which drain through Outfall 002 (ANG, 2015).

3.1.13 Outfall 003

The drainage basins of the Base discharge through a network of in-ground conveyances and grass-lined ditches to the Recreation Pond or through several points along the eastern border of the Base. There are ten drainage basins that contain the industrial activities of the Base. These basins generally slope from northwest to southeast and are summarized below (ANG, 2015). Each drainage basin has an associated outfall. Drainage Basin 003 includes a portion of Building 101, 102, 105, 106, 107, 1107, 113, 202, 203, 204, 205, 206, 207, 208, 209, 211, 214, 300, 301, and 302 which drain through Outfall 003 (ANG, 2015).

3.1.14 Outfall 006

The drainage basins of the Base discharge through a network of in-ground conveyances and grass-lined ditches to the Recreation Pond or through several points along the eastern border of

the Base. There are ten drainage basins that contain the industrial activities of the Base. These basins generally slope from northwest to southeast and are summarized below (ANG, 2015). Each drainage basin has an associated outfall. Drainage Basin 006 includes Building 108 which drains through Outfall 006 (ANG, 2015).

3.1.15 Retention Basin

The Retention Basin is composed of two lined depressions, known as lagoons to Base personnel. The eastern lagoon was built in 1986 and the western lagoon was built in 1992. Both were relined in 2011. As discussed in Section 3.1.11, if a spill occurs or the storm water system is threatened with contaminants, drainage from the aircraft parking apron is redirected at the Diversion Valve Chamber and diverted to the Retention Basin. Additionally, all releases from Base buildings enter their respective OWSs prior to discharge into the Retention Basin via the industrial waste system. According to Base personnel, AFFF releases on the Apron may have been directed to Recreation Pond or to the Retention Basin; AFFF releases in the hangars were redirected to the Retention Basin and were either disposed off-site or trickled into the sanitary sewer system, as referenced by a 1990 news article (Appendix C-2).

3.2 Pathway and Environmental Hazard Assessment

The following is a preliminary evaluation of the threats and targets associated with each exposure pathway. In their anionic forms, perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) are water soluble and can migrate readily from soil to groundwater. The United States Environmental Protection Agency (USEPA) has established Provisional Health Advisory Levels (PHALs) for PFOS and PFOA in soil (USEPA, 2014). The primary exposure pathway for PFOS and PFOA would be the ingestion of contaminated drinking water.

3.2.1 Groundwater

No documentation was available showing that groundwater at the Base has been tested for PFCs; therefore it is unknown whether PFCs are present in the groundwater. Based on historical practices, they may be present in the groundwater due to known or potential AFFF use at

Building 104 (Current Fire Station), the Nozzle Testing Area, Building 105 (Former Fire Station), Hangar 100, Hangar 101, Hangar 102, Hangar 300, Hangar 301, Building 200 (AGE Maintenance), and the Apron.

3.2.1.1 Water Wells

A review of the EDR Radius Map™ Report with Geocheck® dated December 15, 2015 (EDR, 2015) shows three United States Geological Survey (USGS) well within a one-mile radius of the Base, located to the northwest, south, and south-southwest of the property boundary (Appendix C-4). One public water system wells was identified within a one-mile radius of the Base, located to the south-southwest of the property boundary. Five private wells were identified within a one-mile radius of the Base. According to Base personnel, no drinking water wells are located at the Base.

According to the Work Plan for PA/SI (AECOM, 2014) there are 13 domestic water supply wells within a 1-mile radius of the Base as shown below:

1. 1-Newburgh Country Club, <0.1 mile west-southwest, upgradient, unknown depth
2. 1-Unknown Owner, 0.25 mile northwest, upgradient, 119 ft deep
3. 1-Unknown Owner, <0.1 mile south-southeast, downgradient, 119 ft deep
4. 2-Jones Motor Company, 0.25 mile east-southeast, downgradient, unknown depth
5. 5-Mt Airy Trailer Court, 0.25 mile south-southwest, upgradient, unknown depth
6. 3-Newburgh City, 0.335 mile south-southwest, downgradient, unknown depth

A correlation between the above wells and the EDR Report could not be confirmed with the information available.

3.2.2 Soil

No documentation was available showing that soils at the Base have been tested for PFCs; therefore it is unknown whether PFCs are present in the soil. However, based on historical practices, they may be present in the soil due to known or potential AFFF use at Building 104 (Current Fire Station), the Nozzle Testing Area, Building 105 (Former Fire Station), Hangar 100, Hangar 101, Hangar 102, Hangar 300, Hangar 301, Building 200 (AGE Maintenance), and the Apron.

3.2.3 Sediment

No documentation was available showing that sediments at the Base have been tested for PFCs; therefore it is unknown whether PFCs are present in sediments. Based on historical practices, PFCs could be present in sediment in locations that have received drainage from the Base storm sewer system and industrial waste line system. In general, surface releases at the Base would enter the network of in-ground conveyances and grass-lined ditches and ultimately discharge to the Recreation Pond, Retention Basin, or one of several points along the eastern property line.

3.2.4 Surface Water

The Base is located in the Hudson-Champlain Lowland of the Valley and Ridge Province. The property is relatively flat with significant downward slopes to the south and east. Surface elevations range from 440 to 450 ft above mean seal level (amsl) throughout the majority of the Base to a low 340 ft along the eastern property line and 400 ft along the southern property line (AECOM, 2015).

Surface water runoff flows in an east and southeast direction. Runoff is moderately high due to the large amount of impermeable surfaces (e.g., aircraft parking apron) and predominantly glacial till soil types. Two stormwater lagoons (Retention Basin) collect runoff from the installation and discharge to the Recreation Pond, which discharges to Sliver Stream and Modna Creek that both lie in the Hudson River drainage basin. Additional runoff flows eastward to wetlands in the vicinity of Murphy's Gulch, which is a tributary of the Hudson River (AECOM, 2015).

The drainage basins of the Base discharge through a network of in-ground conveyances and grass-lined ditches to the Recreation Pond or through several points along the eastern border of the Base. There are ten drainage basins that contain the industrial activities of the Base. These basins generally slope from northwest to southeast and are summarized below (ANG, 2015). Each drainage basin has an outfall associated with it.

- Drainage Basin 001: Buildings 401, 402, and 403
- Drainage Basin 002: Buildings 100, 101, 104, 200, 301, 302, 400 and Apron

- Drainage Basin 003: Buildings 101, 102, 105, 106, 107, 1107, 113, 202, 203, 204, 205, 206, 207, 208, 209, 211, 214, 300, 301, and 302
- Drainage Basin 004: Buildings 208 and 209
- Drainage Basin 005: Buildings 211 and 213
- Drainage Basin 006: Building 108
- Drainage Basin 007: Building 415
- Drainage Basin 008: Building 213, Roads, and Parking Lots
- Drainage Basin 009A/B: Landfill
- Drainage Basin 010: Recreation Pond

Based on historical practices, PFCs could be present in surface water in locations that have received drainage from Building 104 (Current Fire Station), the Nozzle Testing Area, Building 105 (Former Fire Station), Hangar 100, Hangar 101, Hangar 102, Hangar 300, Hangar 301, Building 200 (AGE Maintenance), and the Apron.

A map showing the Base storm drainage system is included in Appendix C-5.

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4.0 FINDINGS AND CONCLUSIONS

Fifteen potential release sites have been identified at the Base during this PA. Of those fifteen sites, thirteen are recommended for further investigation.

Further investigation is recommended at the Base to monitor and characterize any groundwater, soil, sediment, and/or surface water PFC contamination onsite. Sampling of soil, groundwater, sediment, and surface within the Base is recommended at a minimum to evaluate the potential of migration of PFCs. In addition, verification of the structural integrity of the Base sanitary sewer is advised.

Table 1 summarizes the recommendation and rationale for each AOC identified at the Base.

Table 1: Preliminary Assessment Report Summary and Recommendations

No.	Potential AFFF PFC AOCs	GPS Coordinates		Rationale	Recommendation
		Latitude	Longitude		
1	Building 104 (Current Fire Station)	41.504103°	-74.092099°	Fire Station since 2007. AFFF stored in FD vehicles and 55-gal drums. Building floor drains are connected to an OWS (Building 111) then to the Apron storm sewer system.	Proceed to SI; focus on soil and groundwater.
2	Nozzle Testing Area	41.503516°	-74.092848°	Only known FD equipment nozzle testing area, located west of Building 104. Testing has occurred annually since 2007.	Proceed to SI; focus on soil and groundwater.
3	Building 105 (Former Fire Station)	41.497738°	-74.087107°	Fire Station from 1988 to 2007. No documented AFFF releases. Trench drains discharge to the industrial waste line.	Proceed to SI; focus on soil and groundwater.
4	Hangar 100	41.500072°	-74.087481°	AFFF FSS from 1987 to 2006. At least one accidental AFFF release occurred during FSS activation. Trench drains discharge to the industrial waste system and ultimately the Retention Basin.	Proceed to SI; focus on soil and groundwater.
5	Hangar 101	41.499191°	-74.085677°	AFFF FSS from 1987 to 2009. Several accidental AFFF releases occurred during FSS activation. Trench drains discharge to the industrial waste system and ultimately the Retention Basin.	Proceed to SI; focus on soil and groundwater.
6	Hangar 102	41.498436°	-74.087234°	AFFF FSS from 1988 to 2006. Several accidental AFFF releases occurred during FSS activation. Trench drains discharge to the industrial waste system and ultimately the Retention Basin.	Proceed to SI; focus on soil and groundwater.

No.	Potential AFFF PFC AOCs	GPS Coordinates		Rationale	Recommendation
		Latitude	Longitude		
7	Hangar 300	41.502354°	-74.084695°	AFFF FSS from 1989/90 to 2004. No known AFFF releases. Trench drains discharge to the industrial waste system and ultimately the Retention Basin.	Proceed to SI; focus on soil and groundwater.
8	Hangar 301	41.497361°	-74.083770°	AFFF FSS from 1992 to 2004. At least one accidental AFFF release occurred during FSS activation. Trench drains discharge to the industrial waste system and ultimately the Retention Basin.	Proceed to SI; focus on soil and groundwater.
9	Building 108 (Pump House)	41.497339°	-74.083764°	Historical AFFF storage location (unknown quantities). No known AFFF releases. Floor drains discharge via the storm sewer system to Outfall 006.	NFA.
10	Building 200 (Vehicle Maintenance)	41.501656°	-74.085736°	May have been impacted by potential AFFF discharges from FD vehicles during maintenance. Floor drains discharge to the sanitary sewer system.	Proceed to SI; focus on soil and groundwater.
11	Apron	41.502869°	-74.087836°	Aircraft loading/parking area that may have been impacted by AFFF.	Proceed to SI; focus on soil and groundwater on the downgradient edge of the apron.
12	Outfall 002	41.496152°	-74.086922°	May have been impacted by AFFF discharges from Hangar 100, a portion of Hangar 101, Building 200, Hangar 301, and the Apron.	Proceed to SI; focus on soil, groundwater, sediment, and surface water at this outfall.
13	Outfall 003	41.496506°	-74.086356°	May have been impacted by AFFF discharges from a portion of Hangar 101, Hangar 102, Hangar 300, and Hangar 301.	Proceed to SI; focus on soil, groundwater, sediment, and surface water at this outfall.

No.	Potential AFFF PFC AOCs	GPS Coordinates		Rationale	Recommendation
		Latitude	Longitude		
14	Outfall 006	41.496841°	-74.083776°	Receives discharges from Building 108, which has had no known AFFF releases.	NFA.
15	Retention Basin	41.496952°	-74.085313°	May have been impacted by AFFF discharges from any of the above buildings or Apron.	Proceed to SI; focus on soil, groundwater, sediment, and surface water (if present).

AFFF – Aqueous Film Forming Foam
ANG – Air National Guard
AOC – Area of Concern
GPS – Global Positioning System
NFA – No Further Action
PFC – Perfluorinated Compound
SI – Site Investigation

5.0 REFERENCES

AECOM, 2014. Work Plan for Preliminary Assessment/Site Investigation Report for Regional Compliance Restoration Program, Stewart Air National Guard Base, Newburgh, New York. April.

AECOM, 2015. Preliminary Assessment/Site Investigation Report for Regional Compliance Restoration Program, Stewart Air National Guard Base, Newburgh, New York. July.

ANG, 2015. Storm Water Pollution Prevention Plan. January

BB&E Inc (BB&E), 2015. Final Perfluorinated Compound (PFC) Preliminary Assessment Work Plan, Prepared for Headquarters Air National Guard Andrews AFB, Maryland. July.

USEPA, 2014. Peer Review of Health Effects Documents for PFOA and PFOS. February.

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FIGURES

NORTH

0 2 4

Miles

Figure 1
Site Location Map

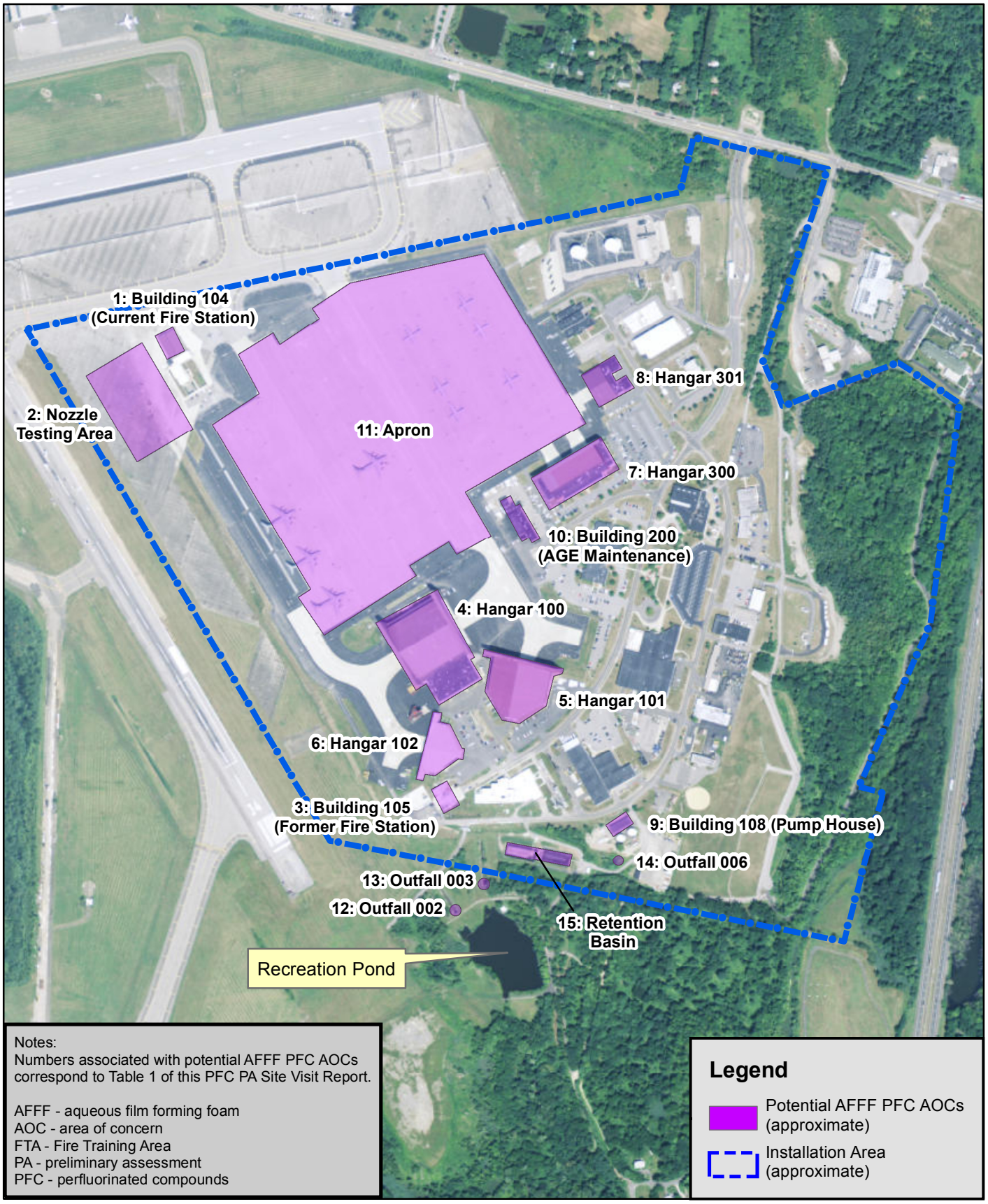
New York Air National Guard
Newburgh, New York

BB&E

Document Path: H:\IT\GIS\ANG\AFFF PFC\Stewart\Site Location Map Stewart.mxd

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

KMA 10/02/2015



Notes:
Numbers associated with potential AFFF PFC AOCs correspond to Table 1 of this PFC PA Site Visit Report.

AFFF - aqueous film forming foam
AOC - area of concern
FTA - Fire Training Area
PA - preliminary assessment
PFC - perfluorinated compounds

Legend

- Potential AFFF PFC AOCs (approximate)
- Installation Area (approximate)

NORTH

0 750 1,500

Feet

Figure 2
Site Features and Potential AOCs

Stewart Air National Guard Base
Newburgh, New York

BB&E

Document Path: H:\IT\GIS\ANG\AFFF PFC\Stewart\Site Features Map Stewart.mxd

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
KMG 1/28/2016

APPENDIX A

PHOTO DOCUMENTATION

Appendix A
Stewart Air National Guard Base, PFC PA Site Visit, Newburgh, NY – December 8, 2015

Photo 1: Current AFFF tote and drum storage in Building 104 (Current Fire Station).

Photo 2: Current AFFF drum storage in Building 104 (Current Fire Station).

Photo 3: Empty drums in Building 104 (Current Fire Station) used for transfer of AFFF from vehicles.

Photo 4: Trench drains were present in Building 104 (Current Fire Station).

Photo 5: The current AFFF inventory includes a 1,000 gallon trailer, located at Building 104 (Current Fire Station).

Photo 6: Looking west from Building 104 (Current Fire Station) toward the Nozzle Testing Area.

Photo 7: Floor drains are present at Hangar 101.

Photo 8: Boiler Room at Hangar 100, which currently is equipped with a HEF bladder tank (formerly equipped with AFFF bladder tanks).

Photo 9: AFFF generators were formerly installed on the high beams in Hangar 100.

Photo 10: Floor drains were present in Hangar 100.

Photo 11: Floor drains were present at Hangar 102.

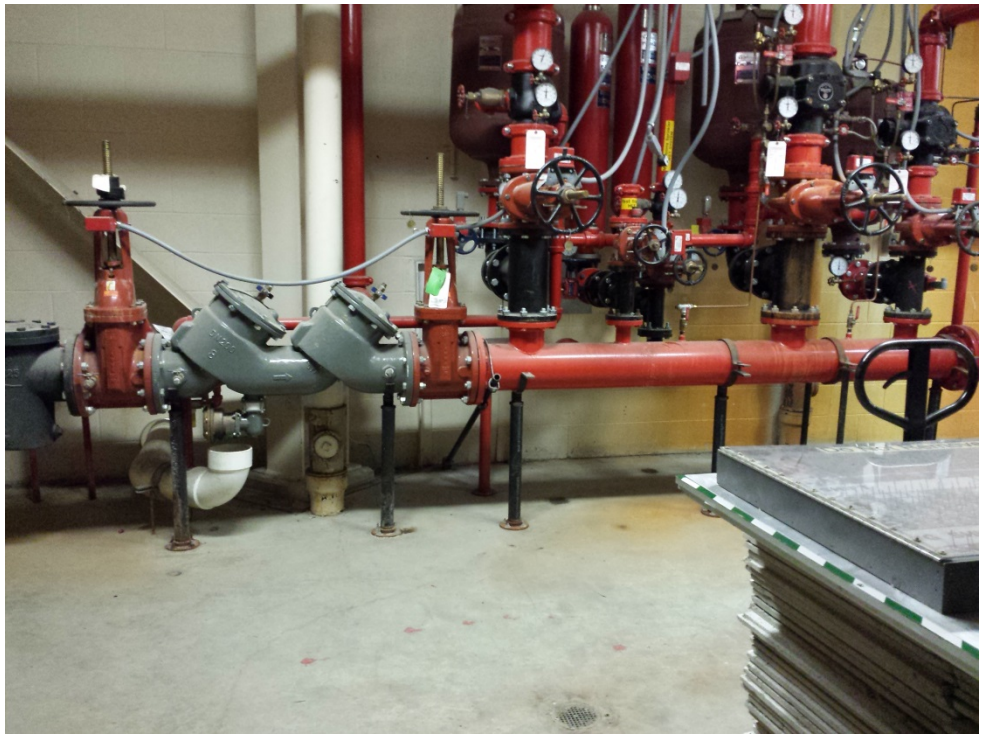


Photo 12: Staining on the walls and floor of the Electrical and Fire Protection Equipment Room in Hangar 102 was observed.

Photo 13: Looking west toward Building 105 (Former Fire Station).

Photo 14: Floor drains were present at Building 105 (Former Fire Station).

Photo 15: Looking east toward the eastern lagoon (Retention Basin).

Photo 16: Looking south toward the western lagoon (Retention Basin).

Photo 17: Looking north toward Outfall 002.

Photo 18: Looking south toward Recreation Pond, located south of the Base property boundary.

Photo 19: Building 108 (Pump House). Floor drains were present.

Photo 20: Floor drains were present in Hangar 301.

Photo 21: Current HEF FSS at Hangar 301.

Photo 22: Fire department vehicle maintenance is conducted in the pit bay within Building 200 (AGE Maintenance).

APPENDIX B

RECORDS OF COMMUNICATION

Interviewees: Base Civil Engineering & Fire Dept (Chief Bell)

12/8/15

Interview Questions regarding AFFF use
(At Present and back to 1970)

1. When did AFFF first start being used on this installation?

Started construction on the first hangar in 1985, brought online 1987

2. What are the years of active use for each Fire Training Area (FTA), Aircraft Hangar, Fire Department, other places AFFF may have been used (collectively Potential Areas of Concern (PAOC)?

No FTA's on this Facility Hangars – 1987 thru 2009 Fire Dept. – only trucks & pump trailer

3. What type of AFFF is used or has been used on this installation (i.e. 3%, 6%, High Expansion Foam)?

3% Ansulite Mil-spec
1% Ansul ClassA

4. What manufacturer's AFFF products are used or were used on this installation (i.e. 3M, Ansul, Chemguard, etc.)?

Ansul

5. Did you ever dispose of old bulk AFFF, if so, when and where?

No, whenever there is bulk AFFF it is distributed to other Guard Units or when acceptable given to Mutual Aid Volunteer Departments

6. Is the AFFF stored as a mixed solution (3% or 6%) or do you formulate the AFFF on the installation?

3% purchased ready to use

7. If AFFF is formulated on base, where is the solution mixed, contained, transferred, etc.?

Purchased ready to use

8. Are your automated fire suppression systems currently charged with AFFF or have they been retrofitted for use of high expansion foam?

Retro-fitted for use of high expansion

9. If retrofitted, when was that done?

2004-2009 last conversion completed in 2009

Hangar 100 = 2006
Hangar 101 = 2009
Hangar 102 = 2006
Hangar 300 = 2004
Hangar 301 = 2004

Will download construction drawings of AFFF → HEF conversion to CD.

10. Do you have an inventory of the amount of AFFF stored on the installation, now and in the past, or present in automated fire suppression systems? Were retention ponds built to store discharged AFFF? Was the AFFF trickled to the sanitary sewer or left in the pond to infiltrate?

Yes we have an inventory of the amount of AFFF-We do not have AFFF automated Fire Suppression systems

Discharged AFFF: 2 Lagoons – sent to Lagoons for treatment

11. Provide a list of vehicles that carried AFFF, now and in the past, and where are/were they located? Any vehicles have a history of leaking AFFF?

Vehicles in USE that carry AFFF – Fire Department 3,5,6,7,8 and the foam trailer
NO history of significant leaks that we are aware

12. How much AFFF (gallons) is/was carried/stored in the specified vehicles?

See Attachment #1

13. Do you ever dispose of unused AFFF? If so, how and where?

No – see question #5

14. Has unused AFFF ever been disposed of in the past? If so, how and where?

No – see question #5

15. Do you/did you test the vehicles spray patterns to make sure equipment is working properly?

Yes, FAA 139 required annual testing and documentation

16. How often are/were these spray tests performed and can you provide the locations of these tests, now and in the past?

Yes, FAA 139 required annual testing and documentation – conducted at Fire Dept bldg. 104

17. Can you describe the procedure on how vehicles and systems are/were supplied with AFFF?

Pony pump on Foam trailer

18. Can you provide the procedures on how these vehicles are/were cleaned/decontaminated and where vehicle cleaning is performed currently as well as performed in the past?

The storage tanks for the AFFF on vehicles are never completely empty – if AFFF is removed for maintenance, it is stored in approved storage barrels – the tanks are not decontaminated.

19. Is/was there a specified area on the installation where vehicles are filled with AFFF and does this area have secondary containment in case of spills?

Yes, The Firehouse Bldg. 104 is equipped with drains that go to secondary containment

20. When a release of AFFF occurs during a fire training exercise, now and in the past, how is the AFFF cleaned and disposed of?

N/A – no fire training exercises
All training is conducted at off base facilities

21. How many FTAs are/were on this installation and where are they?

N/A

22. How many FTAs are active and inactive?

N/A

23. What types of fuels/flammables were used at the FTAs?

N/A

24. For inactive FTAs, when was the last time that fire training using AFFF was conducted at them? Find out ahead of time in Admin Record for former FTAs.

N/A

Per Al Crudale

25. What are/were the non-FTA locations where PFCs or AFFF release systems are installed (i.e. Hangars, Wastewater Treatment Plants, Fire Stations, etc.)? Where are/were these locations (Building numbers)?

1987 1987 1988 1989/90 1992 – Date fire suppression system installed & put into use.

All hangers had AFFF systems. They are 100, 101, 102, 300, 301. - all systems have been demolished
Areas that had AFFF stored in them are 100 Boiler room, 102 Boiler room, 108 pump house, and 105 old FD.

26. Do you have a list (Building names and numbers, current and demolished) where the fire suppression systems either currently contain or have contained AFFF?

Yes, Bldg. 300, 301, 100, 101, 102 – all systems have been demolished

Y Fire suppression systems are under ANG command, but these buildings are under Marine's command. ANG oversaw ~~engineering~~ and engineered conversion to HEF.

27. Do you have records of fuel spill logs and emergency response logs? Knowledge of aircraft mishaps/crashes?

FD has them logged as responses. Environmental has their own log

28. Do you have recollection or records of AFFF being used as a precaution in response to fuel releases to prevent fires?

No occurrence on this Facility

29. Do you have recollection or records of historical emergency response sites (i.e. crash sites and fires) where AFFF was used?

Recollection of 1996 /Fed Ex fire at the Stewart International AirPort
Also a 2015 crash @ IAP airshow

30. Do you have recollection or record of emergency runway landings where foam might have been used as a precaution?

NO, not a practice at SWF

31. If not written records or incomplete written records, do you have anecdotal/verbal information and locations of spills or other emergency response incidents where AFF was used?

See #29

32. What is the typical procedure for removing dispensed AFFF from an area where it has been used?

If AFFF was dispensed on the ramp, it is captured in the safe drain, otherwise it goes to the lake or we divert to the lagoon and we report it and pay for all of the contents in the lagoon. Contents in the safe drain would be removed and disposed by my office with the help of the LFM for cheap.

If AFFF was dispensed in the hangars (using the trucks) the industrial waste would capture it and send it to the lagoons. Environmental office would dispose of it via OSRO contract

33. Can you provide any other locations where AFFF has been stored, released, or used (i.e. hangars, buildings, fire stations, firefighting equipment testing and maintenance areas, emergency response sites, storm water/surface water, waste water treatment plants, and AFFF ponds)?

Stored – 104, 105 and 5 hangar mechanical rooms / Lagoons

also Hangar 301 spill

- Al Crudale: spill at Hangars 100 & 101 due to broken bladder (fire suppression system)
- Civil Engineering: may have been accidental system activation at Hangar 102.

34. Do you have or did you have a chrome plating shop on base? If no, skip to Question #38.

NO

35. What were/are the years of operation of that chrome plating shop?

Skip to #38

36. Do you know whether the shop has/had a foam blanket mist suppression system or used a fume hood for emissions control?

Skip to #38

37. If foam blanket mist suppression was used, where was the foam stored, mixed, applied, etc.?

Skip to #38

38. Is there anyone else or other base organization personnel that you would recommend we interview? Name, organization, position, phone number, e-mail.

Major Caputo – Environmental x2366
IAP – Guillio Minguillo 845-838-8240
Veh MX – CMSgt Ken Anderson x2757
CES – Al Crudale x2700

39. Was it common practice to wash away fuel spills with AFFF?

No – soak up with an absorbent pad

40. Identify drainage patterns around flightline/ramp area. Point source discharge is likely AFFF Area of Concern (AOC).

Please see attachment #2

APPENDIX C

SUPPORTING DOCUMENTATION

APPENDIX C-1

CURRENT FD VEHICLE AFFF INVENTORY

105th ARFF Vehicle Information

Airport: SWF

Call Sign	Model Year	Manufacturer	Model (Type)	Vehicle Status	Water gallons	AFFF gallons	AFFF Concentrate	Dry Chemical Type	Dry Chemical Capacity Lbs.	Maximum Primary Turret Discharge Rate
Crash 3	1996	Oshkosh	P-23	In service	3,000	500	3%	PKP	500	1250 gpm
Crash 8	1996	Oshkosh	P-23	In service	3,000	500	3%	PKP	500	1250 gpm
Crash 7	2006	Oshkosh	P-19	In service	1,500	210	3%	PKP	450	1,250 gpm
Crash 5	2013	KME	P-34 RIV	In service	440	40	3%	N/A	N/A	60 gpm
Crash 6	2013	KME	P-34 RIV	In service	440	40	3%	N/A	N/A	60 gpm
				Total:	**8,980**	**1,290**			**1,450**	

APPENDIX C-2

AFFF SPILL – THE SENTINEL, JULY 26, 1990

New Windsor Officials Meet With NYANG Over Leakage Problem

Lt. Col. William Steene, left, explains the process that the New York Air National Guard uses for diverting de-icing materials into a retention pond, with, from left, New Windsor Town Attorney Tad Seamon, Town Engineer Dick McGoey, Joe Marcogliese of the state DEC, and Mike Tremper, Director of Operations for CAMO Pollution Control, operators of the Town of New Windsor's sewerage treatment plant. Photo by J. Mecca.

Supervisor, DEC Engineer Take "Wait-And-See" Stand On Sollutions

By Joseph Mecca

STEWART AIRPORT - Officials from the Town of New Windsor met with officers from the New York Air National Guard, Monday, concerning an ongoing problem of leakage of large amounts of concentrated foam, used for firefighting, into New Windsor's sanitary sewer system.

The material in question is Ansulite AFFF concentrate, a fire-suppressing foam. New Windsor has had several incidents where the foam leaked, in large amounts into the Town sewer system and eventually to the Town's sewer treatment plant. The foam kills off the bacteria which treats the wastewater at the plant, effectively shutting down a portion of the plant.

According to Lt. Col William Steene, NYANG Base Civil Engineer, the foam is biodegradeable, but when the bacteria tries to consume the large amounts of foam concentrate, the bacteria

NYANG officials believe that all previous problems have been corrected by New Windsor and a state Department of Environmental Conservation engineer are taking a wait-and-see attitude on the situation.

The contingent of New Windsor officials included Supervisor George Green, Town Councilman Ernest Spignardo, Town Attorney Tad Seaman, Town Engineer Dick McGoey, and Mike Tremper of CAMO Pollution Control, the Town Sewer Treatment Plant operators. Also on hand were Assemblyman William J. Larkin, Jr. (R-C-95th District), and Joe Marcogliese, Associate Sanitary Engineer with the State DEC. The group was given an overview of the situation by Lt. Col. Steene, who then, along with several other officers, led a tour of the aircraft hanger where the most recent spill occured.

Two weeks ago, a blown valve in the foam storage area of hanger 100 and uncovered floor

Leakage Problem

(continued from page 1)

drains which lead directly into the Town sewer system resulted in untold gallons of foam released into the Town's sewers. Normally, when the chemicals are used to fight a fire, the waste is diverted through a series of underground pipes to a man-made 486,000 gallon lagoon, which holds the effluent until it can be gradually released into the sanitary sewer system. In small amounts the foam can be easily consumed by the bacteria.

Steene said showed the entourage that the floor drains leading to the Town sewer system had been cemented over. Several smaller drains which led to the holding lagoon were left unplugged. Observing the holding tanks and piping system, some of valves appeared to be corroding. "The (foam) material is corrosive, the pipes are not sufficient," Town Engineer McGoey said, "They should be using stainless steel pipes and welded joints instead of flanges." The preference for flanges makes replacing pipes easier, but McGoey said that stainless steel piping would last considerably longer.

According to Steene, NYANG will spend over $192,000 to correct the problems. Plans include the construction of a pre-treatment system, which has already been designed, and the possibility of a 2nd lagoon to handle any additional runoff from the deicing of planes or excess water

Supervisor George Green said he was satisfied that NYANG was addressing the problems, but wasn't satisfied that the situation has been corrected "As far as the Town of New Windsor is concerned," he said "they (NYANG) must do what is necessary if they want to keep using New Windsor's sanitary sewer system."

DEC Engineer Joe Marcogliese was concerned about the lagoon in particular "What happens if there is an accident (spill) and a storm occured at the same time," he said "To me, the lagoon appeared to be about 3/4 full. If an inch of rain falls on the tarmac, and an accident occurred, I would envision more water than they could contain."

Marcogliese suggested that if NYANG plans to build a 2nd lagoon, it's design should be for a "10-year" storm contingency, that is, the lagoon should be able to handle the worse possible storm during a 10 year period. Ultimately, though, Marcogliese said that everyone will have to wait for the the next accident before "we see how well the problems have been solved. I'm happy that they seem to be responding, but in the past the've responded and things keep happening."

APPENDIX C-3

AFFF TO HEF FSS CONVERSION DRAWINGS

HANGAR 100