



Environmental Advisory Board



SWMU 61 Update on Progress

David Fortune, P.E.
Senior Engineer
CAPE

August 1, 2019



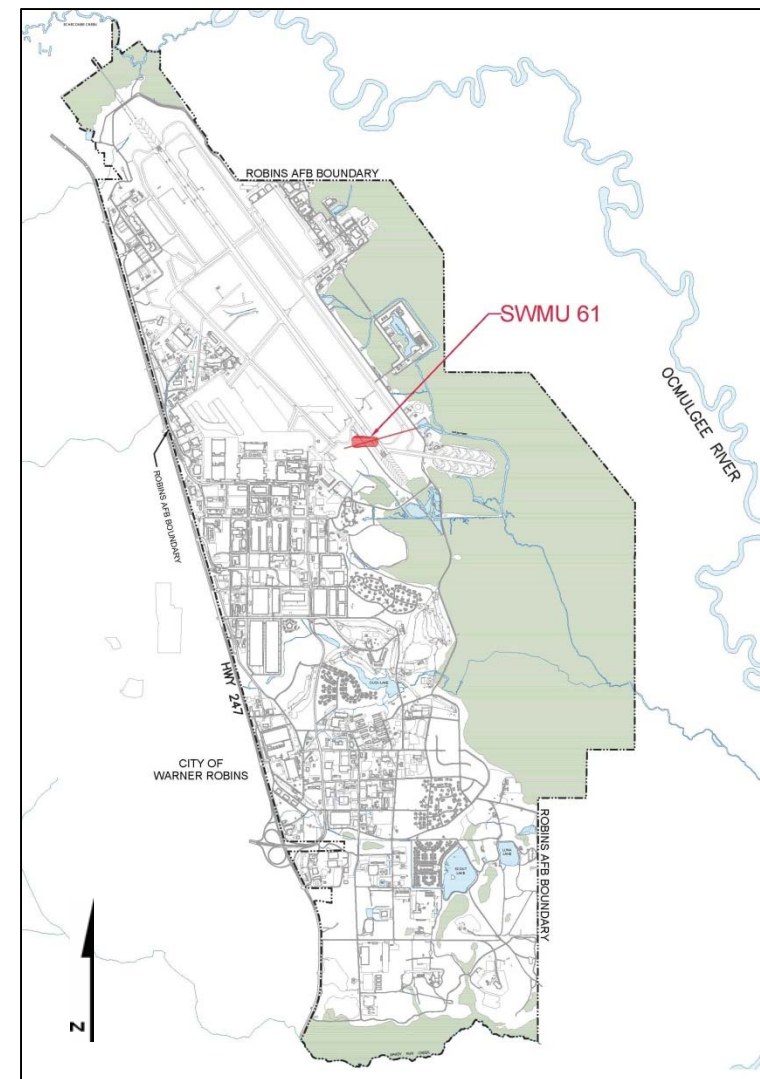
Overview

- **Background**
- **Site layout**
- **Remedial action progress**
- **Path forward**



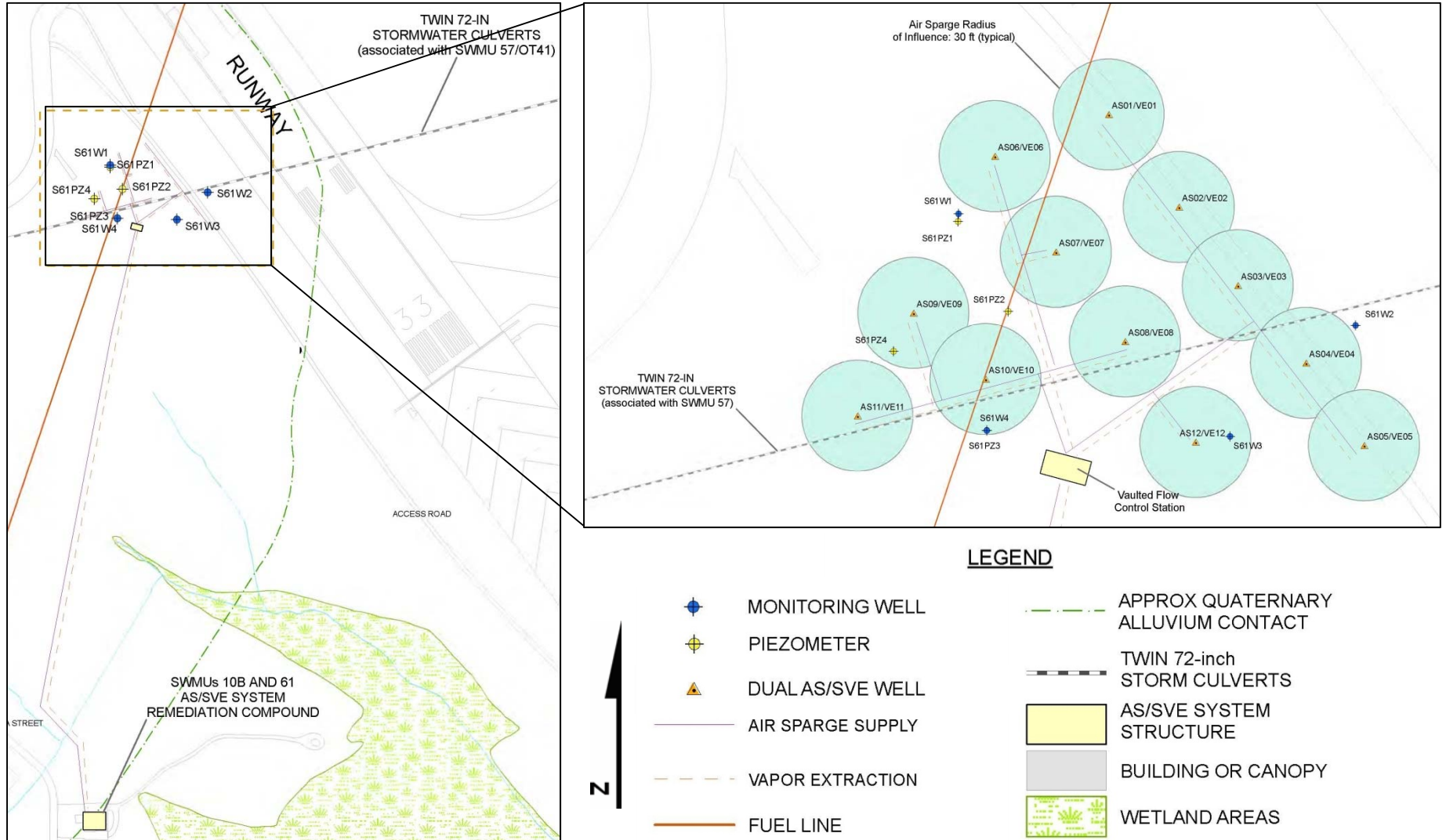
Background

- **Jet Propellant (JP) fuel release from leaking valve on the JP Fuel No. 8 supply line**
- **Contaminants include:**
 - **VOCs**
 - Benzene
 - 1,3,5-Trimethylbenzene (TMB)
 - Ethylbenzene
 - **One Semi-volatile Organic Compound (SVOC)**
 - Naphthalene
- **Georgia Environmental Protection Division (GA EPD) approved the CAP in 2002**
 - AS and SVE
 - Monitored natural attenuation (MNA)





Site Layout





Remedial Action Progress

- **Operated AS/SVE system from 2003 through 2009**
 - **Contaminant concentrations reduced to near Remedial Levels (RLs)**
 - **January 2009 - Ceased system operation and initiated MNA**
 - **By permit - Three-year monitoring period required for site closure to assess rebound**
- **Closure monitoring sampling events**
 - **April 2009 - Annual sampling initiated**
 - **June 2011 - GA EPD approved monitoring in only S61W4**



Remedial Action Progress

Annual monitoring results 2008 through 2013 at S61W4

Remedial Level	Date Sampled	4/23/2008	4/29/2009	4/29/2010	4/28/2011	4/16/2012	4/10/2013
µg/L	COCs	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
5	Benzene	6.44	6.41	6.35J	3.76J	5.6	5.7
700	Ethylbenzene	1.99J	4.96J	22.6J	10.7J	16.7	8.6
12	1.3.5-Trimethylbenzene	1.53J	5U	2.2J	4.22J	5.2	15.8
6.5	Naphthalene	0.581U	0.505U	0.515U	3.59	0.086U	0.052U

Notes:

Remedial levels taken from Table 4-1, State-approved Draft Corrective Action Plan for SWMUs 57 and 61 dated June 2002.

µg/L = micrograms per liter

COC = Contaminant of Concern

Results in **BOLD** indicate detections

Highlighted results indicate a detection exceeding its respective remedial level

U = Result not detected. Numerical value preceding the "U" qualifier is the reporting limit.

J = Analyte is detected. The reported result is an estimated value.



Remedial Action Progress

- Benzene remained near the RL: concentrations fluctuating both above and below RL
- TMB detected above RL in April 2013
 - Prompted initial concern from GA EPD
- Ethylbenzene and naphthalene remained below RL through April 2013



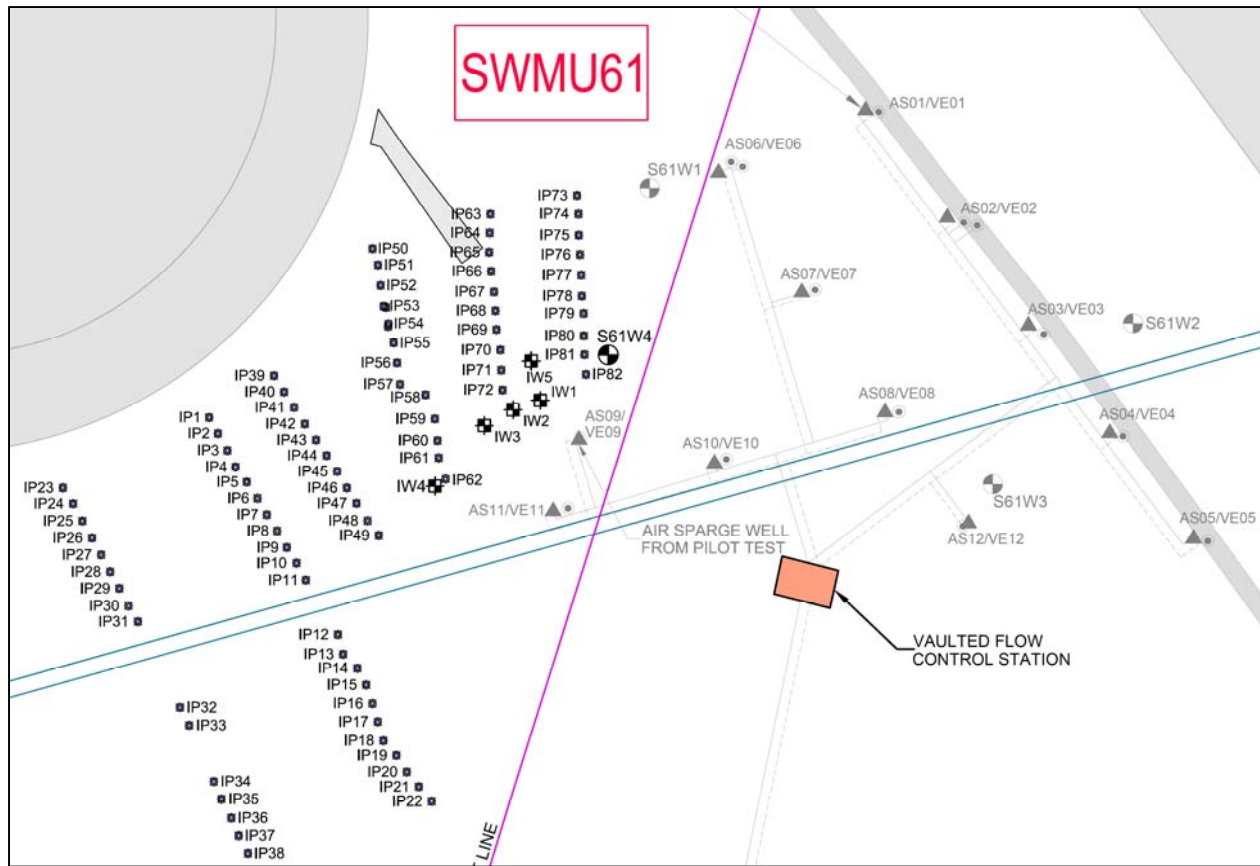
Remedial Action Progress

- **Reviewed recalcitrant benzene and TMB detection with GA EPD in October 2013**
 - **Began quarterly monitoring**
 - **Collaborated on idea to perform polishing using In-Situ Oxygen Curtain (iSOC™) and an oxygen releasing compound injection called TersOX™**
 - **Implemented iSOC™ December 2013**
 - **Installed TersOX™ January 2014**



Remedial Action Progress

iSOC™ and TersOX™ Injection Locations



- IW4 INFUSION WELL (2014)
- IP1 INJECTION POINT (2014)
- EXISTING AS WELL, INACTIVE
- EXISTING SVE WELL, INACTIVE
- EXISTING MONITORING WELL

- TWIN 72-IN STORM CULVERTS
- FUEL LINE

GRAPHIC SCALE





Remedial Action Progress

- After Implementing iSOC and TersOx, saw naphthalene exceed its RL
- Benzene and 1,3,5-TMB were reduced to at or below their RLs

Remedial Level	Date Sampled	10/22/2014	4/22/2015	3/22/2016	10/12/2016	3/9/2017	3/23/2018
µg/L	COCs	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
5	Benzene	4.4	4.8	5M	4.1	5.0	4.0
700	Ethylbenzene	100D	67.8M	42	NA	48M	53
12	1,3,5-Trimethylbenzene	6.6	6.0	3J	2.3	2U	2U
6.5	Naphthalene	27.1	14.6DM	15	23J	18J	14

Notes:

Remedial levels taken from Table 4-1 in the State-approved Draft Corrective Action Plan for SWMUs 57 and 61 dated June 2002.

µg/L = micrograms per liter.

Results in **BOLD** indicate detections.

Highlighted results indicate a detection exceeding its respective remedial level.

U = Result not detected. Numerical value preceding the "U" qualifier is the reporting limit.

J = Analyte is detected. The reported result is an estimated value.

M = Analyte is detected and a matrix effect was present. Results should be considered estimated.



Remedial Action Progress

- In April 2018, CAPE proposed to conduct dilute hydrogen peroxide and potable water injections to stimulate biological processes
- Dilute hydrogen peroxide injections were conducted in June and August 2018 using existing injection wells (IWs) (IW-1 through IW-5)



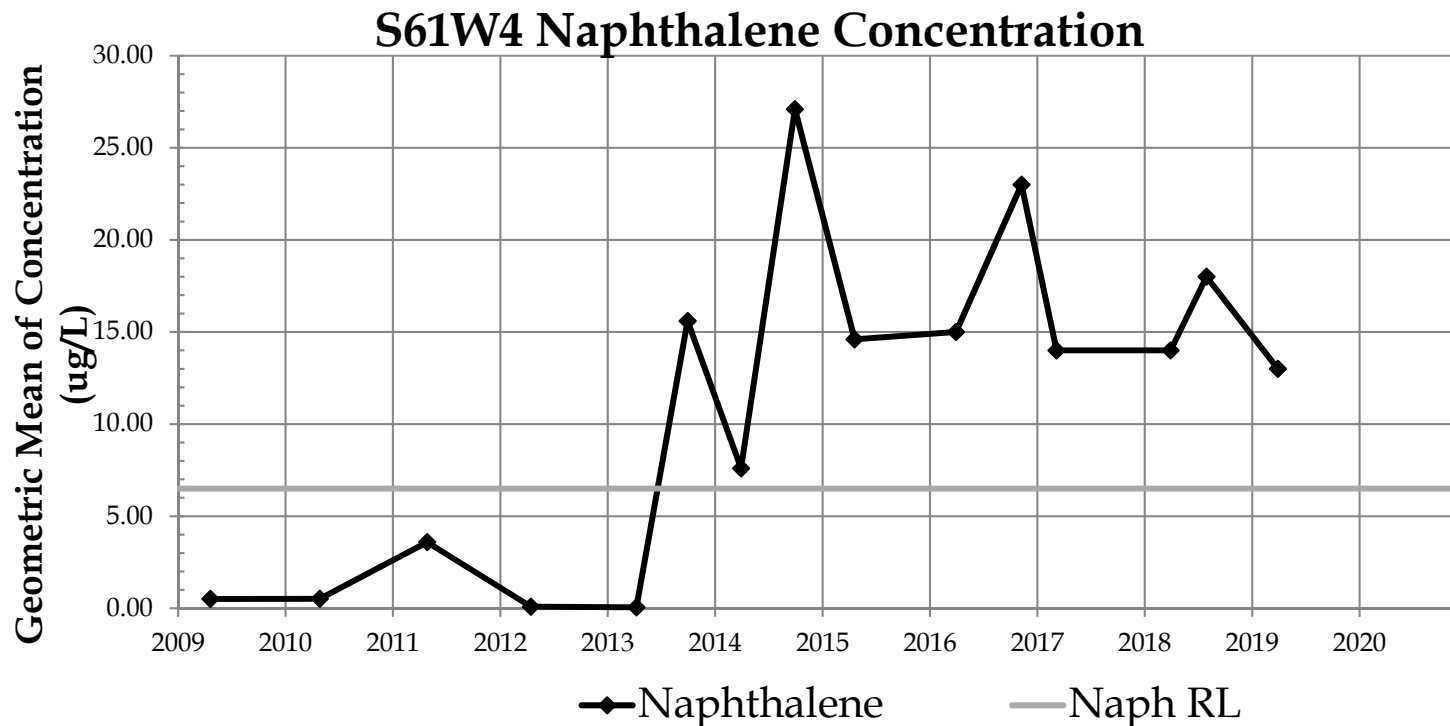
Remedial Action Progress

- **Field measurements for dissolved oxygen indicated increases in oxygen concentrations**
- **August 2018 data indicated that naphthalene concentrations have not yet been impacted by hydrogen peroxide injections**
- **CAPE installed new oxygen diffusers to replace iSOCs™ and started them in December 2018**
- **Oxygen diffusers will allow oxygen to continually diffuse into groundwater for approximately three months prior to annual sampling in March 2019**



Remedial Action Progress

- March 2019 result indicated a slight decrease in naphthalene to 13J $\mu\text{g/L}$ (down from 18 observed in August 2018)





Path Forward

- **Operate oxygen diffusers to address naphthalene concentrations**
- **Once contamination is below RLs, re-initiate closure monitoring**
- **After three years of successful closure monitoring, request SC**