



FORMER MCAS TUSTIN

Per- and Polyfluoroalkyl Substances Update

Former Marine Corps Air Station Tustin, Tustin, California

112th Restoration Advisory Board Meeting

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Base Realignment and Closure (BRAC) Program Management Office West

San Diego, California

14 April 2022

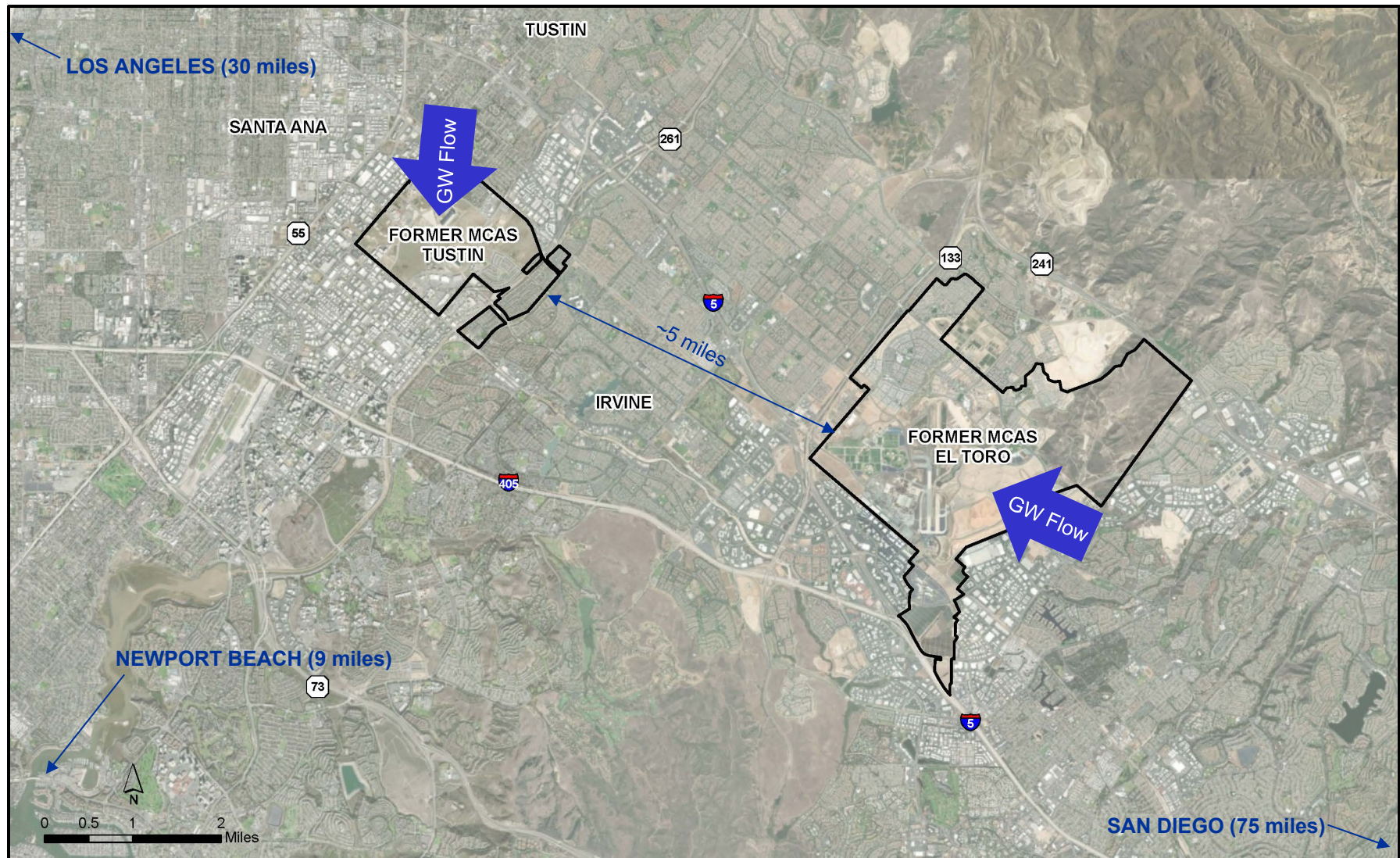
Presentation Overview



- **Background**
- **Program Status**
- **Remedial Investigation (RI) Work Plan**
- **Future Work/Approximate Schedule**
- **Questions?**
- **Acronyms**
- **Navy Contact Information**

Background

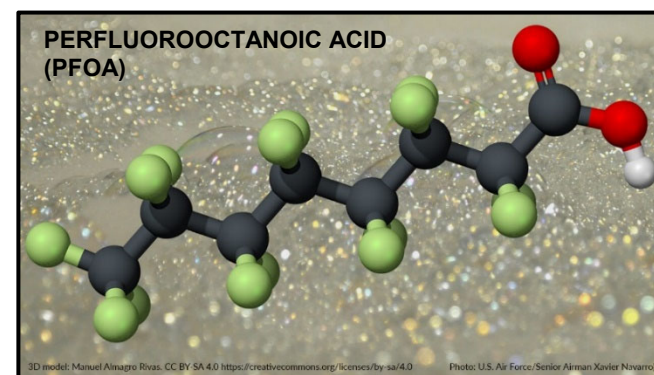
Station Location



Per- and Polyfluoroalkyl Substances (PFAS)



- Synthetic organofluorine compounds
- Thermally stable, hydrophobic, and lipophobic
- Decades of use in industrial and consumer products
 - *Firefighting foams (e.g., aqueous film-forming foam)*
 - *Metal plating operations (mist suppression)*
 - Stain-resistant/waterproof textiles (e.g., GORE-TEX®)
 - Nonstick cookware (e.g., Teflon™)
 - Cleaning products
 - Carpeting
 - Upholstery
 - Food wrappings
- Not currently regulated and no promulgated standards exist
- U.S. Environmental Protection Agency (U.S. EPA) considering designating PFAS as hazardous under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)



Department of Defense Guidance (15 September 2021 Memorandum)



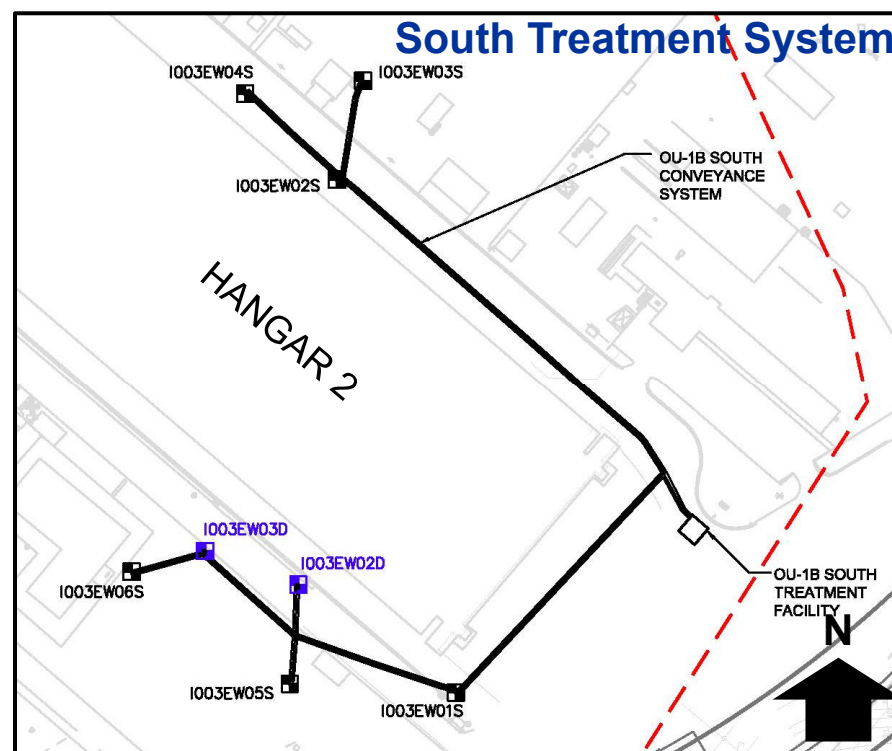
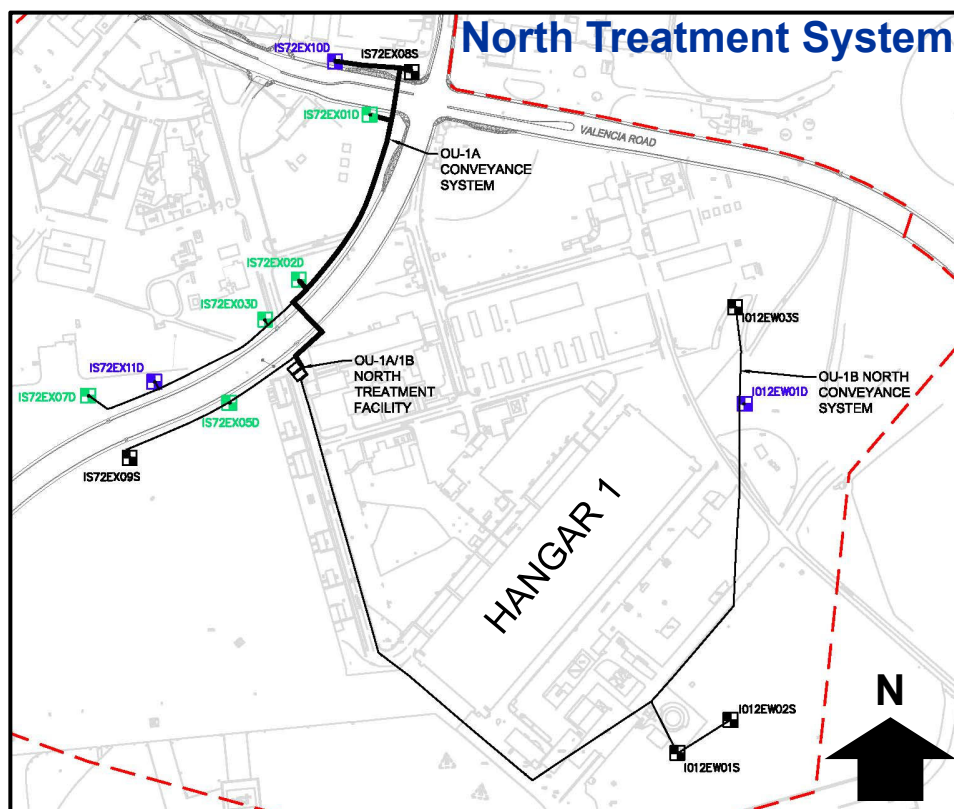
- PFAS cleanup conducted under the CERCLA process, despite current lack of regulation
- Department of Defense screening levels were developed using the U.S. EPA Regional Screening Level calculator; applies factor of 0.1 when more than one PFAS is present
- Used to determine need to move into CERCLA RI phase

PFAS	Tap Water (ng/L)	Residential Soil (ng/kg)	Industrial Soil (ng/kg)
PFOA	40	130,000	1,600,000
PFOS	40	130,000	1,600,000
PFBS	600	1,900,000	25,000,000

Values assume more than one PFAS is present.
ng/kg = nanograms per kilogram (parts per trillion)
ng/L = nanograms per liter (parts per trillion)
PFAS = per- and polyfluoroalkyl substances

PFBS = perfluorobutanesulfonic acid
PFOA = perfluorooctanoic acid
PFOS = perfluorooctane sulfonate

Containment Systems Operable Units 1A and 1B

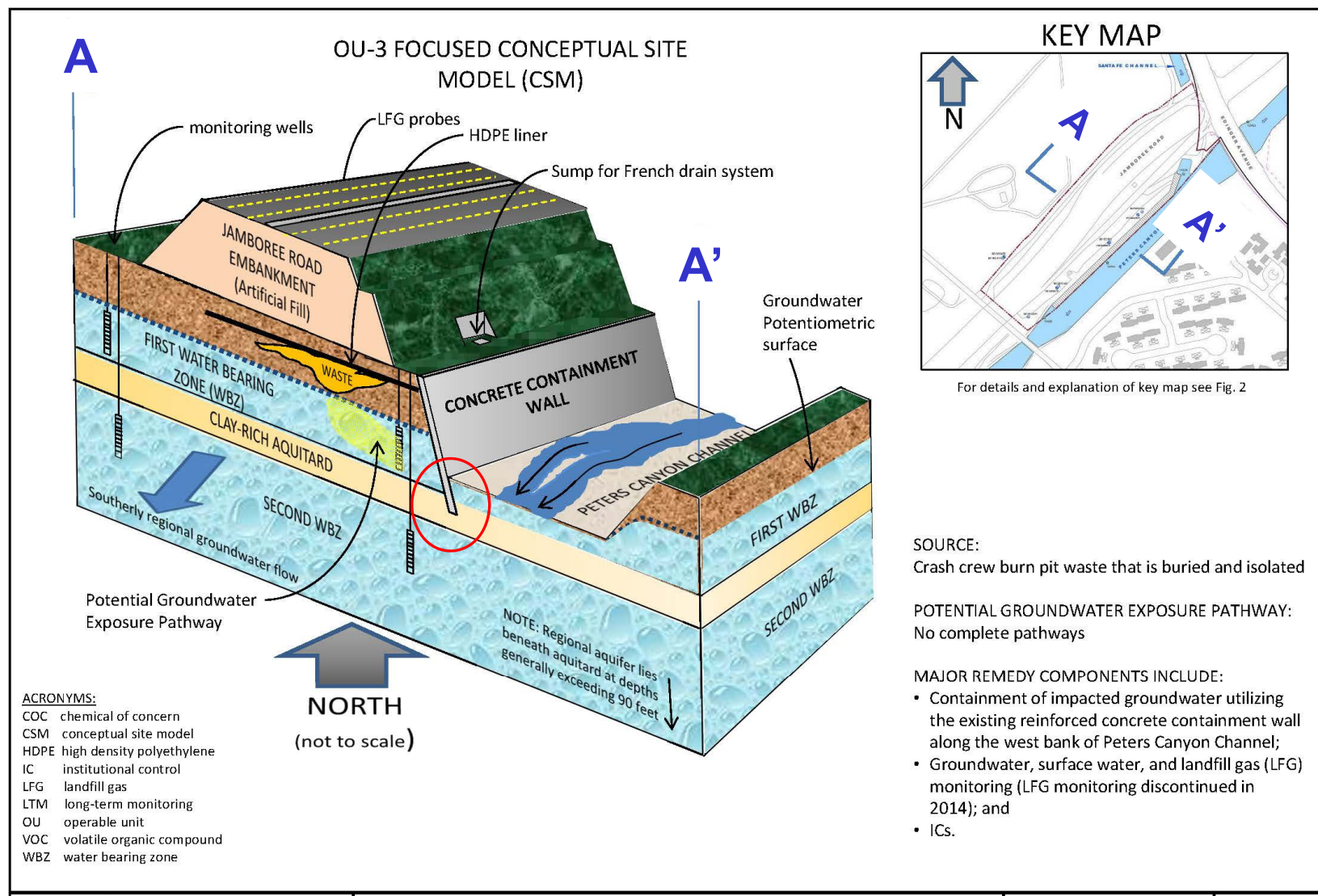


System	Wells	Volume	Treatment	Disposal	Influent PFOA+PFOS	Effluent PFOA+PFOS
North	11	~14 mgal/yr	Liquid-Phase GAC	Sanitary Sewer	806 ng/L (Jan. 2022)	<4 ng/L (Jan. 2022)
South	7	~4 mgal/yr	Liquid-Phase GAC	Sanitary Sewer	11,480 ng/L (Jan. 2022)	<4 ng/L (Jan. 2022)

GAC = granular activated carbon; mgal/yr = million gallons per year

Containment Systems (cont.)

Operable Unit 3 Conceptual Site Model



Program Status

Program Status



- **From 2016 to 2021, the Navy conducted a Preliminary Assessment/Site Inspection (PA/SI) that included research and multiple phases of groundwater sampling to assess the presence of PFAS**
 - 36 Areas of Interest (AOIs) recommended for further investigation
 - All are proceeding to RI
 - Work proposed on former Navy property outside of Carve-Outs 5 and 6 will require coordination with current property owners (notifications already made via letter and PA/SI; also, they will receive the Draft RI Work Plan for review and comment)

PA/SI Report Summary



- **Months of research and >200 groundwater samples collected from >120 locations**
- **36 AOIs identified (types of areas below)**
 - **11 Installation Restoration Program Sites:**
 - 1, 3, 5N, 5S(a), 5S(b), 6, 9a, 9b, 13E, 13S, and 13W
 - **15 Buildings/Hangars**
 - **3 Oil/Water Separators**
 - **3 Miscellaneous Wash Areas**
 - **2 Miscellaneous Disposal Areas**
 - **2 Fire Stations**
 - **1 Firefighting Training Area**
 - **1 Burn Pit**
 - **1 Storm Drain**
 - **1 Landfarming Site**
 - **1 Aircraft Crash Site (suspected location southeast of Mooring Mat-5)**

RI Work Plan

Remedial Investigation



- **Continues the CERCLA process**
- **Coordinate and disclose findings to owners of other properties**

Area(s) of Interest	CERCLA Status	Property Owner	Next Step
IRP Site 1	Open	Non-Navy	Coordination; RI
IRP Site 3	Open	Navy	RI
IRP Site 5N	Closed	Non-Navy	Coordination; RI
IRP Site 5S(a)	Open	Navy	RI
IRP Site 5S(b)	Closed	Non-Navy	Coordination; RI
IRP Site 6	Open	Navy	RI
IRP Sites 9a & 9b	Closed	Navy/Non-Navy	Coordination; RI
IRP Site 13E	Closed	Non-Navy	Coordination; RI
IRP Site 13S	Open	Navy	RI
IRP Site 13W	Open	Non-Navy	Coordination; RI

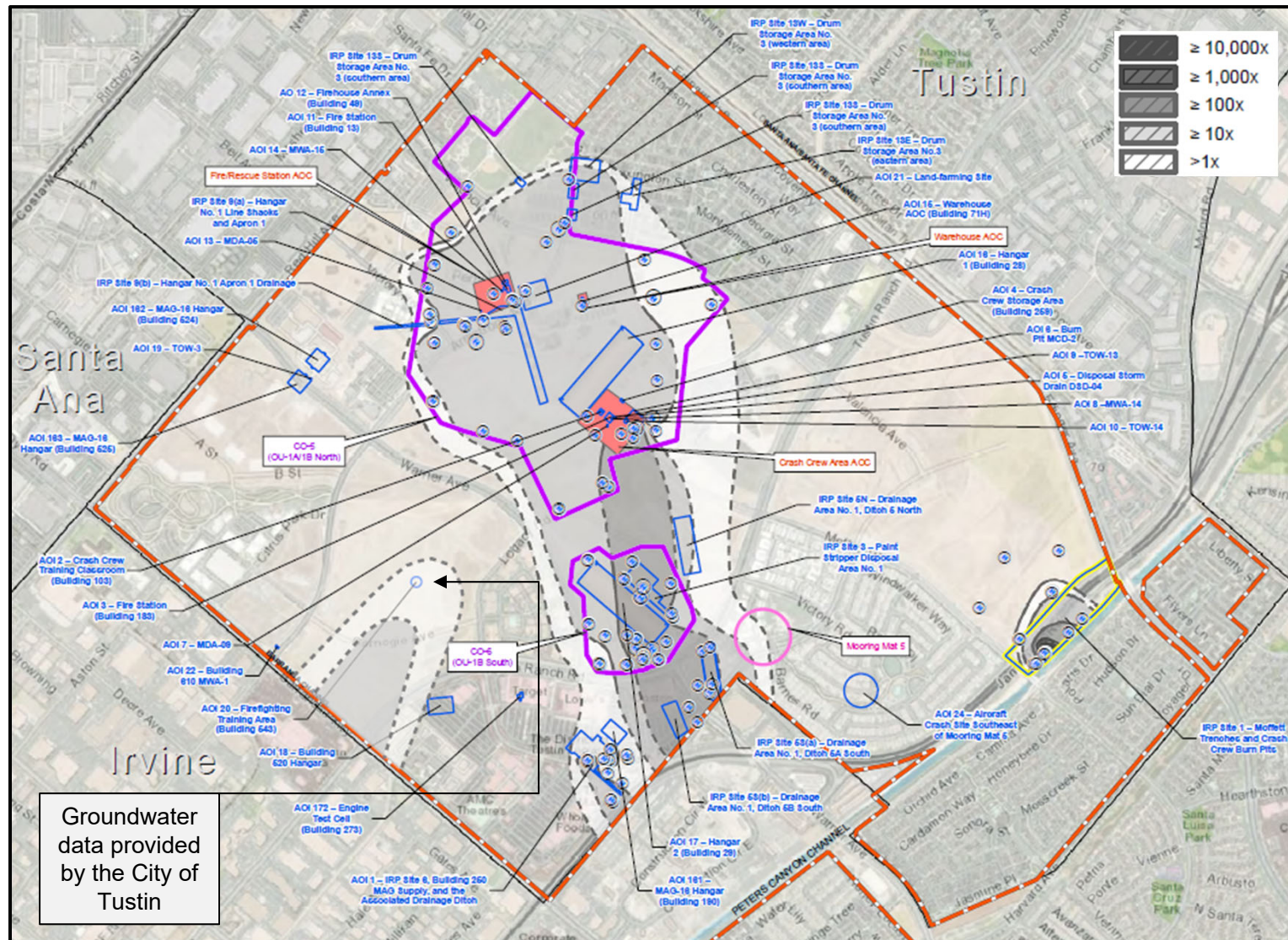
IRP = Installation Restoration Program

Remedial Investigation (cont.)



Area(s) of Interest	Regulatory Status	Property Owner	Next Step
15 Various Buildings/Hangars	Not Applicable	Navy/Non-Navy	Coordination; RI
3 Oil/Water Separators	Closed	Navy/Non-Navy	Coordination; RI
1 Aircraft Crash Site	Not Applicable	Non-Navy	Coordination; RI
3 Miscellaneous Wash Areas	Closed	Navy/Non-Navy	Coordination; RI
2 Miscellaneous Disposal Areas	Closed	Navy	RI
2 Fire Stations	Closed	Navy	RI
1 Storm Drain	Closed	Navy	RI
1 Burn Pit	Closed	Navy	RI
1 Landfarming Site	Not Applicable	Non-Navy	Coordination; RI
1 Firefighting Training Area	Closed	Non-Navy	Coordination; RI

AOIs Requiring Further Investigation



RI Summary



- **The RI will be conducted in two phases**
- **Phase I**
 - Install and sample >25 new permanent groundwater monitoring wells
 - Install and sample >50 temporary groundwater monitoring wells
 - Sample >30 existing groundwater monitoring wells
 - Collect >300 soil samples for PFAS analysis with additional samples for fate and transport parameter analyses only
 - Drill >100 boreholes to support soil sample collection and well installation
 - Conduct a biological survey to support the ecological risk assessment
- **Phase II design supported by Phase I data (Technical Memorandum)**

RI Summary (cont.)



- **The RI Report will be prepared following completion of fieldwork and receipt of validated data and will generally consist of the following:**
 - Description of all work performed
 - Discussion of nature and extent of PFAS data collected; including fate and transport (groundwater modeling)
 - Tabulated data
 - Graphic representation of data
 - Human-Health Risk Assessment
 - Ecological Risk Assessment
 - Conclusions and Recommendations (no further action at this time or continue the CERCLA process)
 - Feasibility Studies (this will likely be the point where the Station-wide investigation will turn to being site specific)

Future Work/Approximate Schedule

Future Work/Approximate Schedule



- **RI Work Plan**
 - Draft in April/May 2022
 - Final in September 2022
- **Phase I**
 - Fieldwork (Early 2023)
 - Final Technical Memorandum (Late 2023)
- **Phase II**
 - Field Change Request (Late 2023)
 - Fieldwork (Early 2024)
 - Draft Report (Mid-2024)
 - Draft Final Report (Late 2024)
 - Final Report (Early 2025)
- **Feasibility Study(ies)**
 - To be determined

Questions?



Acronyms



AOI – Area of Interest

BRAC – Base Realignment and Closure

CERCLA – Comprehensive Environmental Response, Compensation, and Liability Act

GAC – granular activated carbon

IRP – Installation Restoration Program

MCAS – Marine Corps Air Station

mgal/yr – million gallons per year

Navy – U.S. Department of the Navy

ng/kg – nanogram(s) per kilogram

ng/L – nanogram(s) per liter

PA – Preliminary Assessment

PFAS – per- and polyfluoroalkyl substances

PFBS – perfluorobutanesulfonic acid

PFOA – perfluorooctanoic acid

PFOS – perfluorooctane sulfonate

RI – Remedial Investigation

SI – Site Inspection

WBZ – water-bearing zone

U.S. EPA – U.S. Environmental Protection Agency

Navy Contact Information



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