2024

Army National Guard

Impact Area Groundwater Study Program

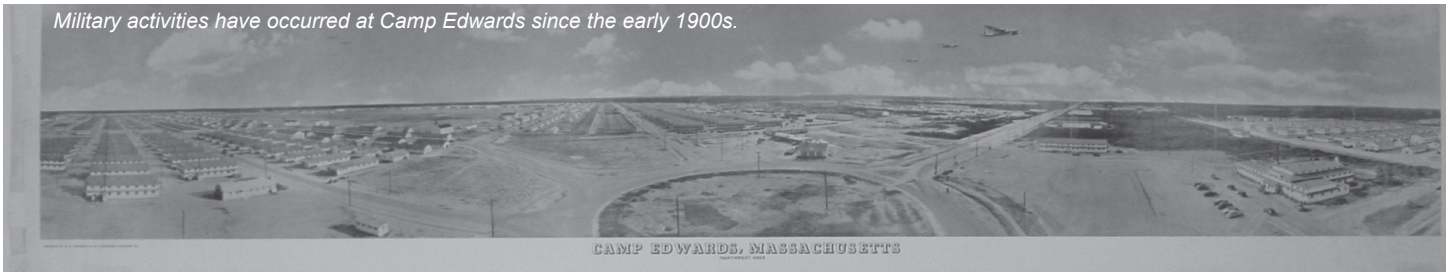
Camp Edwards at Joint Base Cape Cod, Massachusetts

Introduction

The U.S. Army National Guard's Impact Area Groundwater Study Program (IAGWSP) at Camp Edwards on Joint Base Cape Cod (JBCC, formerly the Massachusetts Military Reservation), working in cooperation with the U.S. Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (MassDEP), is committed to the cleanup of groundwater contamination and its sources. These efforts are designed to protect public health and safety, and to restore the Cape Cod aquifer, which is the sole source of drinking water on the upper portion of Cape Cod, in Massachusetts.

Camp Edwards History

Camp Edwards is located on the 22,000-acre Joint Base Cape Cod on the upper portion of Cape Cod and is the largest training area in the Northeast. The training area is 15,000-acres of undeveloped land in the northern portion of the base. The history of Massachusetts National Guard training on Upper Cape Cod extends back to 1908, when soldiers conducted weekend and annual training in the woods to the south and west of the present-day JBCC.



Military activities have occurred at Camp Edwards since the early 1900s.

Today, Camp Edwards hosts units from Massachusetts and throughout the region. Camp Edwards' primary mission is to prepare soldiers for combat missions overseas, and to serve and protect the homeland stateside. The facility supports a wide range of training for homeland defense and security mission needs for the various commands, as well as large-scale joint training exercises with both military and civilian first responder participation.

Contamination Investigation/ Cleanup Process

Potentially contaminated sites are identified through historical reviews, interviews and site inspections.

Sampling Investigations are conducted to identify the presence and extent of soil or groundwater contamination.

Rapid Response Actions are implemented to accelerate cleanup and prevent migration of contamination while investigations and remedy selection were ongoing.

Impact Area Groundwater Study Program History

Investigations into possible contamination at Camp Edwards began in response to community concerns that historic activities might have impacted the groundwater underlying the military installation. The approximately 15,000 acres that comprise Camp Edwards lie over an important recharge area for a portion of the Cape Cod aquifer, known as the Sagamore Lens, which is the principal source of drinking water for the four towns of the Upper Cape: Sandwich, Bourne, Mashpee, and Falmouth. In 1997, EPA began issuing Administrative Orders under the Safe Drinking Water Act, requiring the investigation and cleanup of contamination from military activities. MassDEP also has been actively involved to ensure that the substantive requirements of state statutes are met throughout the investigation and cleanup.

The Air Force Civil Engineer Center's (AFCEC) Installation Restoration Program (IRP) under the Comprehensive Environmental Response, Compensation, and Liability Act is addressing contamination caused by Air Force related activities and found primarily in the southern portion of JBCC and off-base. Much progress has been made since the program's beginning in 1982. Most source areas have been cleaned up and four groundwater plumes are undergoing pump-and-treat cleanup action both on and off-base; seven remedial systems have ceased operation with four successfully cleaned up their respective plumes. Six IRP plumes are currently in a long-term monitoring program with land use controls. PFAS groundwater contamination has been identified by the IRP on the southern portion of JBCC and off-base. Plumes can be seen on the map on pages 8-9. More information on the IRP can be found at: **https://jbcc-iagwsp.org/community/public/irp/**

IAGWSP investigations looked at the impacts from military and defense contractor activities conducted on Camp Edwards. These activities included: firing of artillery, mortars, and other projectiles; demolition training; and the detonation of munitions and explosives. Additionally, burning and burial of munitions and explosives occurred on some of the defense contractor ranges. **Activities that caused past contamination no longer occur on Camp Edwards.**

The IAGWSP investigations are divided into 14 operable units, or sites, which are areas where a hazardous substance has been deposited, stored, disposed of, or otherwise come to be located. The program installed over 14,000 groundwater monitoring wells in over 700 locations and collected over 100,000 groundwater and soil samples. The IAGWSP is treating 3.8 million gallons of groundwater per day and over 18 billion gallons have been as of October, 2024. Decision Documents have been signed for all of the IAGWSP sites. These documents record the selected response action for each site, explain why it was chosen and describe how it will be implemented. Five sites have active groundwater treatment and long-term monitoring. Four sites have a requirement for long-term monitoring with monitored natural attenuation and land-use controls as their selected remedy. Three sites required no further action and two sites have met the cleanup requirements set forth in their decision documents and have been completed.

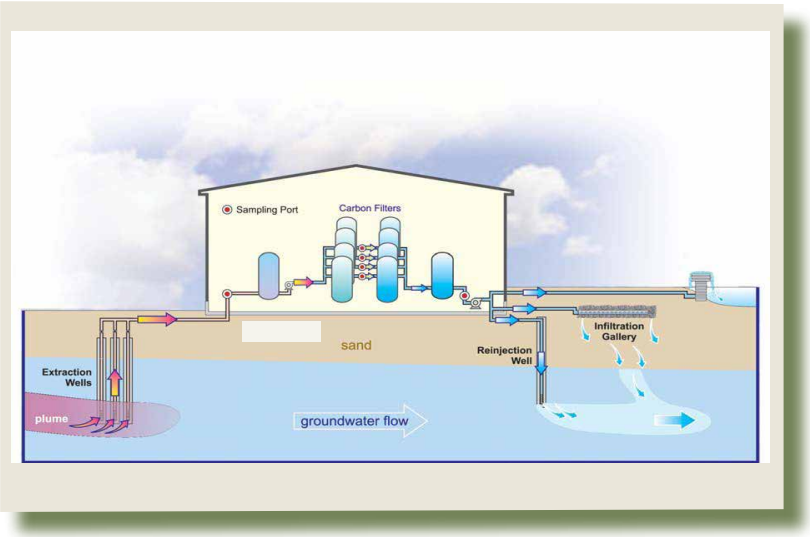
Remedy Selection Plans present an evaluation of alternatives and detail the preferred final Response Action. Public comments on Remedy Selection Plans are solicited.

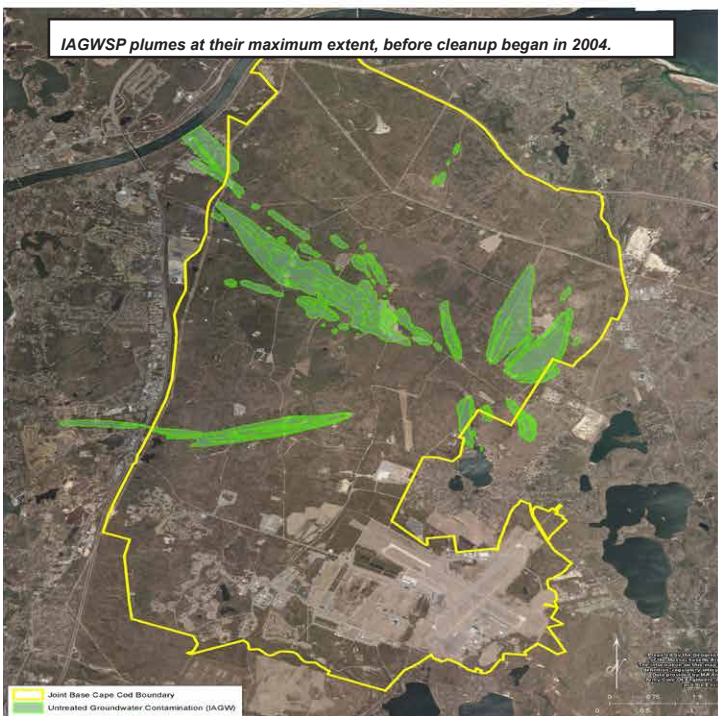
Decision Documents record the selected Response Action, explain why it was selected, and tell how it will be implemented. It also provides responses to public comments.

Long-term monitoring, optimization of treatment systems, operations and maintenance, and land-use controls verify the effectiveness of the action, confirm that modeled predictions are accurate, ensure that there is no exposure to contamination that could cause a risk to human health, and maintain the treatment systems to ensure the effectiveness of the response action.

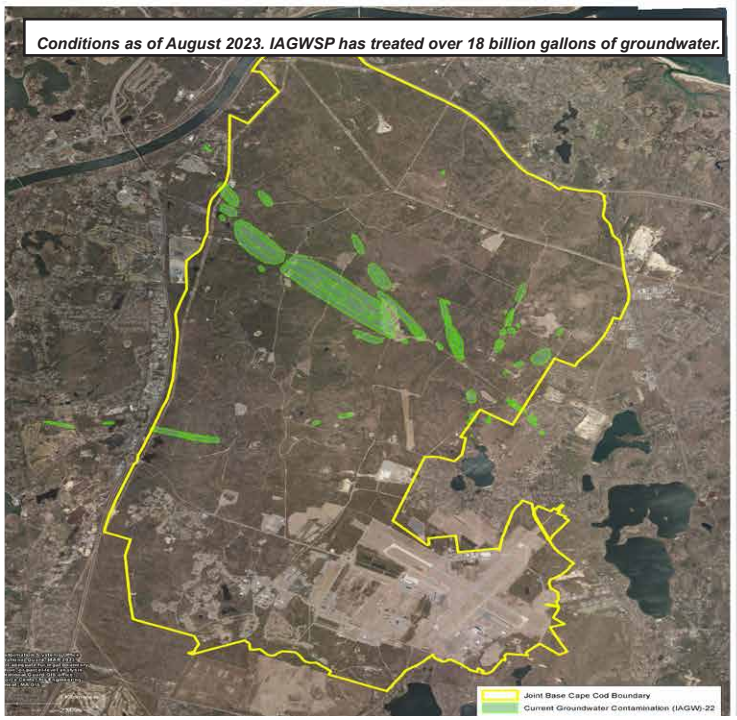
Groundwater Cleanup Process

A plume is a body of groundwater containing contaminants that exceed federal and/or state drinking water standards or acceptable risk-based levels. The primary contaminants in groundwater at Camp Edwards are the explosives compound RDX and perchlorate, which were released from munitions during incomplete combustion and/or disposal. The cleanup levels are 0.6 parts per billion (ppb) for RDX (human health risk-based concentration) and 2 ppb for perchlorate (the Massachusetts Drinking Water Maximum Contaminant Level). Groundwater contamination at Camp Edwards is typically addressed by: focused extraction and treatment, land-use controls, and monitored natural attenuation (natural breakdown), or a combination thereof. Monitored natural attenuation and land-use controls allow attenuation of contamination through the natural processes of dilution, degradation, dispersion, and sorption (i.e., binding of contaminants to the soil), and they include groundwater monitoring to verify that the plume is attenuating, or shrinking, as predicted. Land-use controls are regulations, restrictions, and other protective measures (e.g. signage) to prevent the use of contaminated portions of the aquifer for drinking water; monitoring of land-use controls ensures their effectiveness. Annual reporting on monitoring program results include changes in plume extent or concentrations, comparisons of real vs. modeled results, and recommendations for improving performance. Five-year reviews are conducted to ensure the remedy is still protective and performing as anticipated and to assess any new information which impacts the remedy. To treat groundwater contamination, extraction wells are placed within a plume to pump the contaminated groundwater from the aquifer to a treatment plant where the water is filtered through carbon and/or ion-exchange resins held in large vessels. Treated water is returned to the aquifer through re-injection wells or infiltration trenches.





IAGWSP plumes at their maximum extent, before cleanup began in 2004.

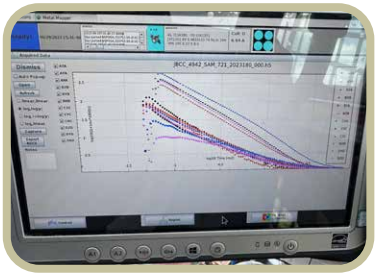


Conditions as of August 2023. IAGWSP has treated over 18 billion gallons of groundwater.

Unexploded Ordnance

In addition to a groundwater treatment system, the Decision Document for the Central Impact Area requires clearance of the unexploded ordnance (UXO) at the source area. UXO may be continuing sources of contaminants in groundwater.

There is an extensive amount of underground metal in the Central Impact Area due to Army training practices and approximately 99% of the metal in the ground is something other than UXO. To minimize needless excavation and improve UXO removal efficiency, the program uses specialized state-of-the-art electromagnetic induction instruments specifically designed for the characterization and discrimination of UXO, called MetalMapper. MetalMapper is a geophysical tool which classifies buried metallic items as either scrap metal or those that have the distinctive shape of UXOs (munitions classification) to determine need for removal. Instead of having to clear and sift through every inch of every acre, the MetalMapper is able to identify targets of interest, (potential UXO), which reduces the number of items that need to be excavated. Initial estimates indicated it would cost $1 million/acre to clear the Camp Edwards Impact Area of UXO using conventional techniques, but with the use of MetalMapper, costs are reduced by up to 70%. Altogether, this technology will be used to clear approximately 330 acres on Camp Edwards; of which nearly 150 acres have been cleared since the removal program began in 2013.



The Upper Cape Water Supply Reserve/Environmental Management

The Upper Cape Water Supply Reserve was established by Massachusetts state law Chapter 47 of the Acts of 2002, as public conservation land dedicated to three primary purposes: water supply and wildlife habitat protection; the development and construction of public water supply systems, and the use and training of the military forces of the commonwealth; provided that, such military use and training is compatible with the natural resource purposes of water supply and wildlife habitat protection. The Reserve comprises Camp Edwards' approximately 15,000-acre northern training area.

Chapter 47 of the Acts of 2002 also established the Environmental Management Commission (EMC), consisting of the Commissioner of the Department of Fish and Game (DFG), the Commissioner of the MassDEP, and the Commissioner of the Department of Conservation and Recreation (DCR). The EMC oversees compliance with and enforcement of the Environmental Performance Standards (EPSs) in the Training Area/Reserve. EPSs are a set of standards specifically created through the Massachusetts Environmental Policy Act process to protect the resources in the Reserve. The EMC also coordinates the actions of environmental agencies of the Commonwealth in the enforcement of environmental laws and regulations in the Training Area/Reserve, as appropriate, and facilitates an open and public review of all activities in the Training Area/Reserve. The legislation also states that the environmental agencies on the EMC retain all their respective, independent enforcement authority.

The EMC is assisted by two advisory councils, appointed by the Governor of Massachusetts. The Community Advisory Council (CAC), consisting of 15 members, assists the EMC by providing advice on issues related to the protection of the water supply and wildlife habitat within the Training Area/Reserve. The Science Advisory Council (SAC), consisting of up to nine members, assists the EMC by providing scientific and technical advice relating to the protection of the drinking water supply and wildlife habitat within the Training Area/Reserve.

OPERABLE UNITS
Status and Quick Facts

- **Final Remedy in Place**
- **Closed Site**
- **Sites with No Related Groundwater Contamination**

CENTRAL IMPACT AREA

- Located within the 2,200-acre impact area, this 330-acre area was the primary target for artillery, mortar and other firing activities from the early 1990s until firing ceased in 1997.
- Source removal: Removal of ongoing sources of potential contamination from UXO continues. Approximately 150 acres have been completed since 2013. Over 7,500 pounds of explosives have been removed from the site.
- Groundwater remedy: Three mobile treatment units with three extraction wells operating at a combined rate of 750 gpm have treated more than 3.7 billion gallons of groundwater.

DEMOLITION AREA 1

- A naturally formed 7.4 acre kettle hole used from the mid-1970s to late 1990s for training and disposal of items, including munitions, fireworks, small arms ammunition, and explosives.
- Source removal: In 2004, 28,000 tons of contaminated soil was excavated, treated by thermal desorption, and returned to the site.
- Groundwater remedy: Three separate treatment facilities consisting of four extraction wells operating at a combined 340 gallons per minute (gpm) have treated over 4.6 billion gallons of groundwater.

DEMOLITION AREA 2

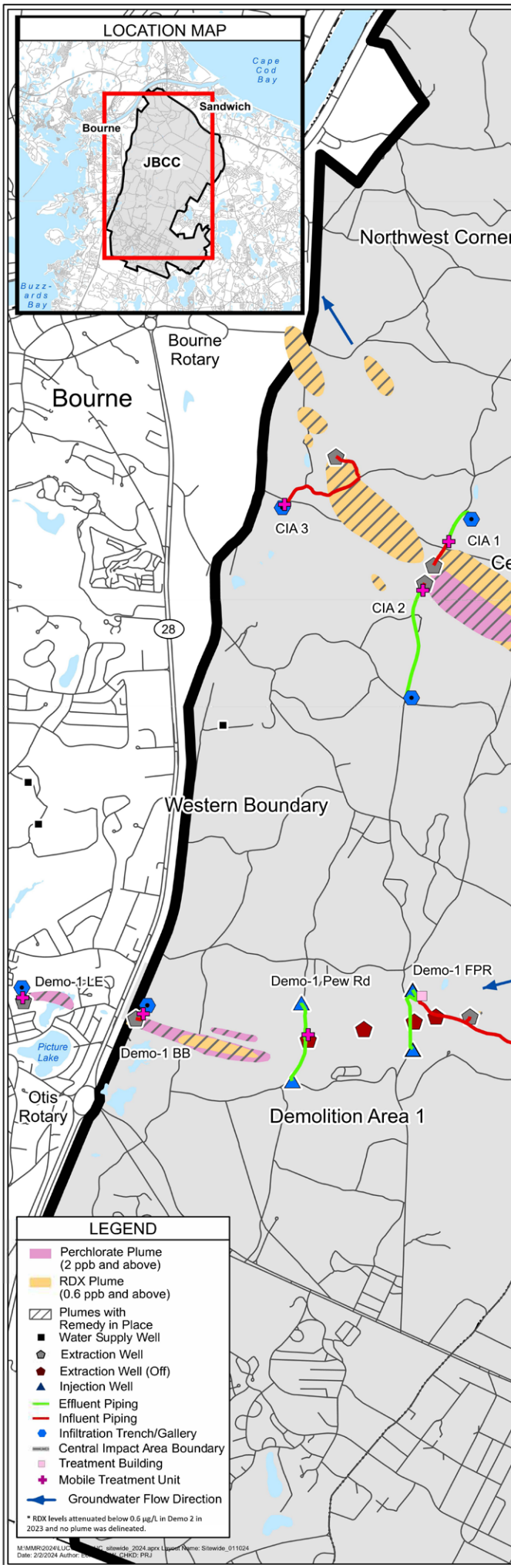
- Located in the north-central portion of Camp Edwards, Demolition Area 2 was used from the late-1970s to the late-1980s for light demolition training activities involving explosive charges of less than ten pounds.
- Source removal: 1,200 tons of soil was excavated and treated using thermal desorption. Metallic debris, including unexploded munition items, was also removed.
- Groundwater remedy: Monitored Natural Attenuation and Land-Use Controls.

NORTHWEST CORNER

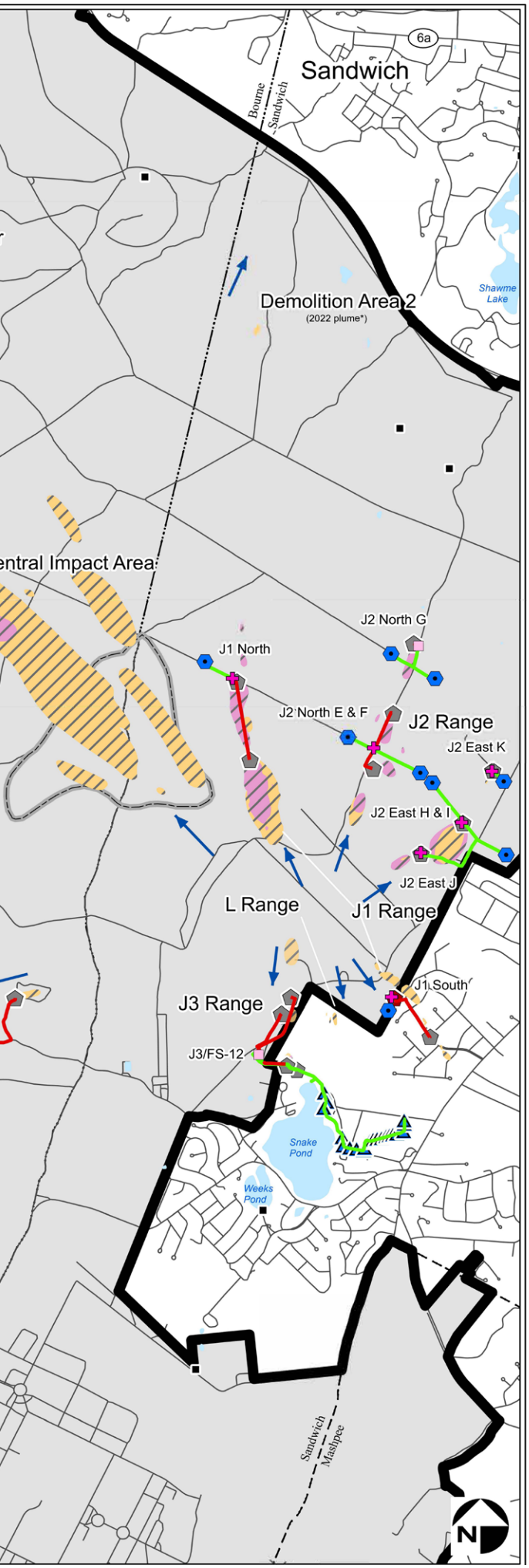
- Site is located near the Cape Cod Canal and includes areas where pyrotechnics and artillery were used. It also includes a portion of the town of Bourne that was used for annual fireworks displays from 1996 to 2003.
- Source removal: No source removals were conducted. Perchlorate was depleted in Northwest Corner soils and there were no existing sources of contamination.
- Groundwater remedy: Monitored Natural Attenuation and Land-Use Controls. The site reached cleanup goals in 2018 and site closeout processes are underway.

WESTERN BOUNDARY

- The site includes an area on the western boundary of Camp Edwards and downgradient in the Bourne Water District's Monument Beach well field.
- Source removal: No source removals were conducted as the pre-existing source area was likely depleted.
- Groundwater remedy: Monitored Natural Attenuation and Land-Use Controls. The site reached cleanup goals in 2016 and the site was closed.



There are other plumes in the southern area of JBCC not depicted on this map.



See pages 8-9 for a comprehensive JBCC plume map.

J-1 RANGE

- The J-1 Range was used for military training from 1935 to the mid-1970s. The range was used by defense contractors through the late 1980s to test various caliber munitions.
- Source removal: 5,700 tons of soil were removed and treated and/or disposed of off site. Over 3,300 munitions items were removed.
- Groundwater remedy: The treatment systems addressing the northern plume have two extraction wells operating at a combined 250 gpm. They have treated over 1.4 billion gallons of groundwater. The southern plume treatment system located at the JBCC boundary has one off-base extraction well operating at a flow rate of 125 gpm It has treated over 800 million gallons of groundwater.

J-2 RANGE

- The J-2 Range was used for military training in the 1940s and by defense contractors for munitions testing from 1953 until the late-1980s.
- Source removal: More than 10,000 tons of soil were excavated and treated by either thermal desorption or alkaline hydrolysis. More than 42,000 munitions items were removed. Additional source area investigations were conducted to identify and remove any pits used for burning and burying explosives and munitions.
- Groundwater remedy: The treatment systems addressing the northern plume have three extraction wells operating at a combined 475 gpm. They have treated over 3.9 billion gallons of groundwater. The eastern plume treatment systems also have three extraction wells operating at a flow rate of 495 gpm, the systems have treated over 3.7 billion gallons of groundwater.

J-3 RANGE

- The J-3 Range is located adjacent to the impact area and is the southernmost of the former military training and defense contractor ranges.

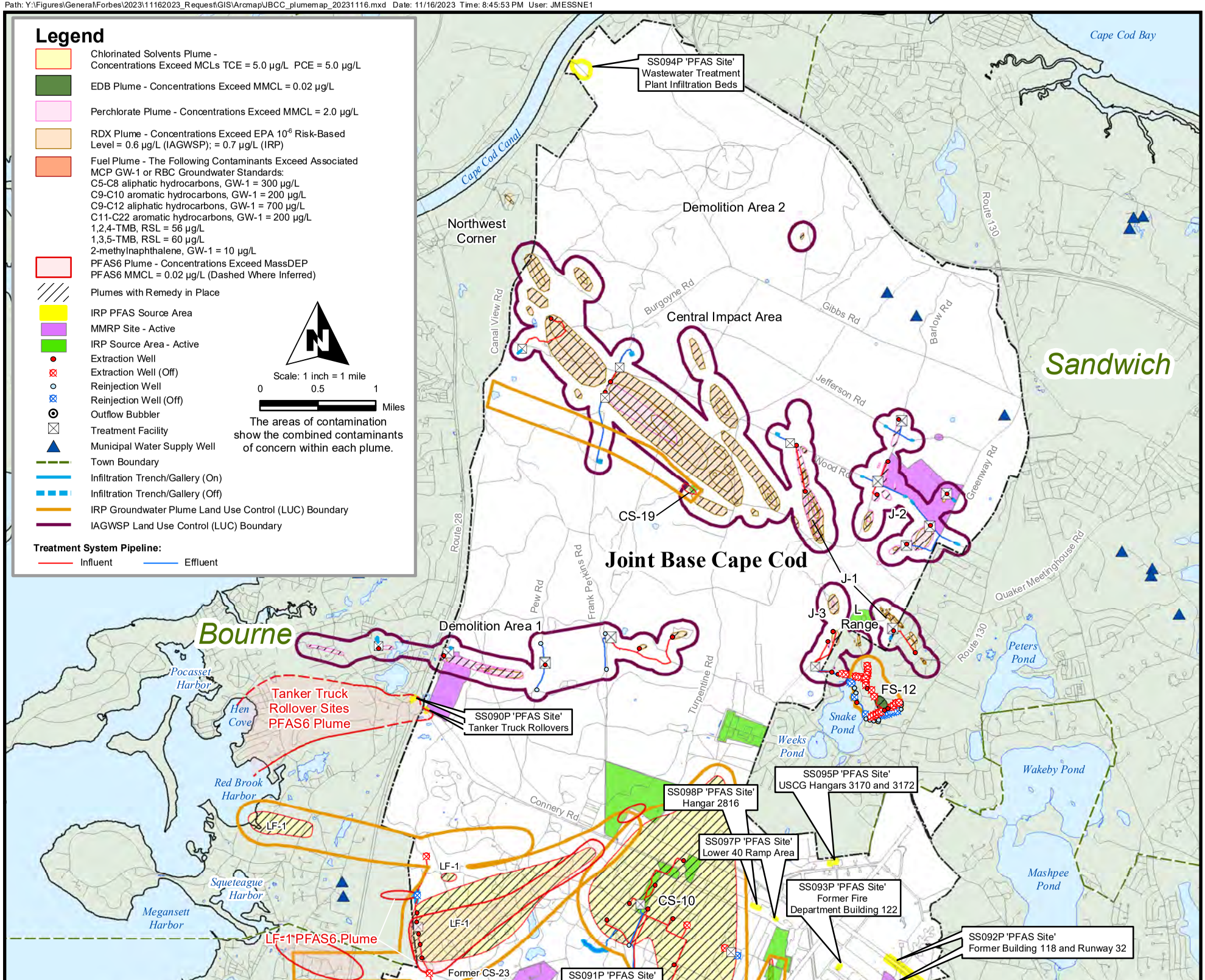
  Source removal: More than 3,500 tons of soil were removed and treated on-site using thermal desorption.
- Groundwater remedy: A treatment system consisting of four extraction wells pumping at a combined 255 gpm has treated over 1.8 billion gallons of groundwater.

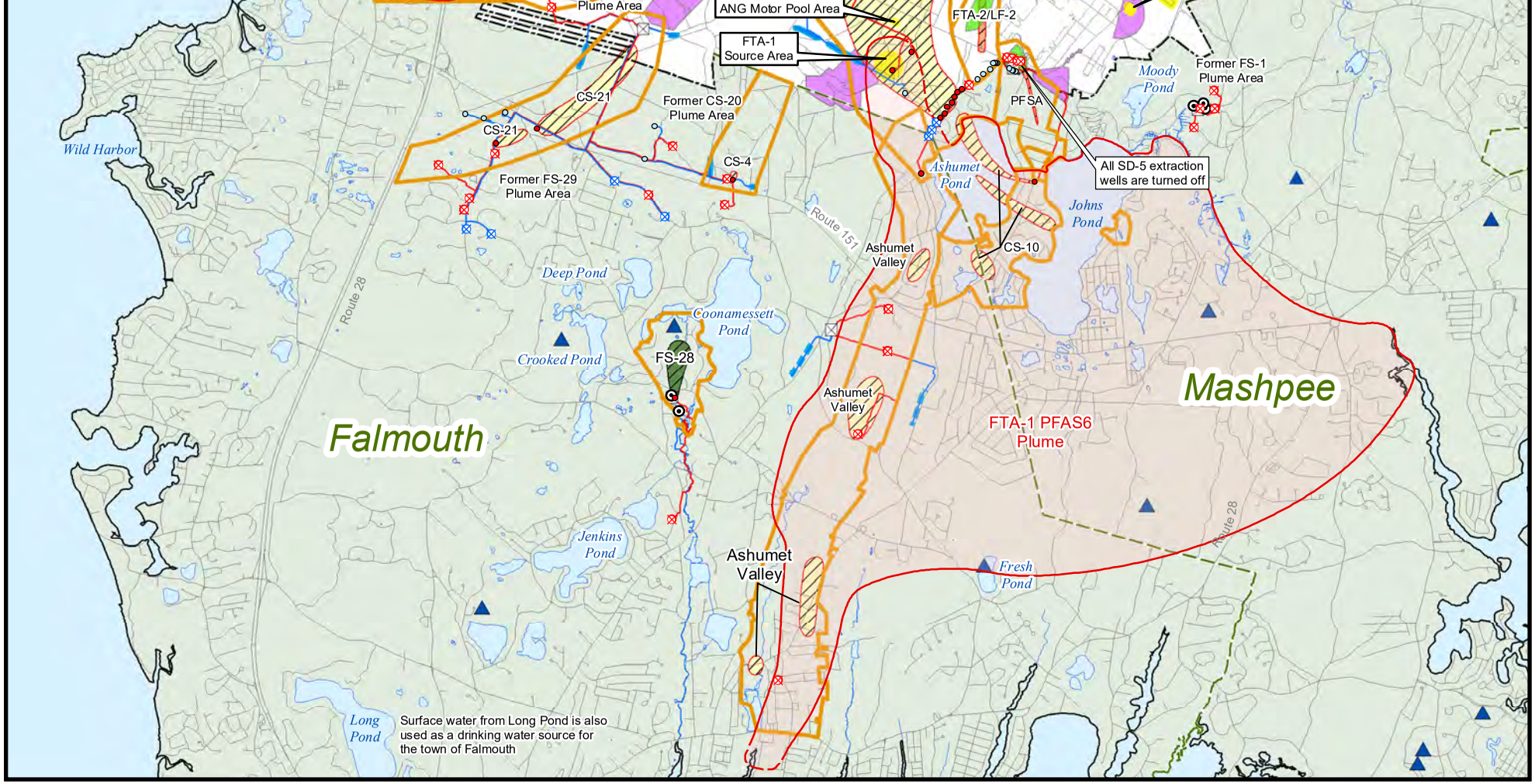
L RANGE

- Primarily used as a 40mm grenade-launcher familiarization range from the 1970s to the mid-1990s, the L Range has been used as a training range since the 1940s.
- Source removal: Remote controlled robotic equipment was used to clear 4,100 tons of contaminated soil. Soil was treated using alkaline hydrolysis.
- Groundwater remedy: A Decision Document that calls for Monitored Natural Attenuation and Land-Use Controls as the remedy was signed in 2010.

OTHER SITES

- **Gun and Mortar Positions:** Soil removals were completed in 2001 and 2004 at two of the 37 former mortar and artillery firing sites. No significant groundwater contamination was found and a no further action Decision Document was issued in 2012.
- **Small Arms Ranges**: A berm maintenance program removed 60 tons of lead and treated 36,000 tons of soil in 1998 at 16 current ranges. More than 7,000 tons of soil was removed from three former ranges in 2009.
- **Former A and Former K Ranges**: In 2009, soil removals were conducted at the former anti-tank range and the former rocket/grenade-launcher range. 188 tons were removed and treated by alkaline hydrolysis. A Decision Document issued in 2011 required no further action for the K Range, and limited groundwater monitoring for the A Range. The Former A Range site was closed in 2018.


Legend
Chlorinated Solvents Plume - Concentrations Exceed MCLs TCE = 5.0 µg/L PCE = 5.0 µg/L
EDB Plume - Concentrations Exceed MMCL = 0.02 µg/L
Perchlorate Plume - Concentrations Exceed MMCL = 2.0 µg/L
RDX Plume - Concentrations Exceed EPA 10-6 Risk-Based Level = 0.6 µg/L (IAGWSP); = 0.7 µg/L (IRP)
Fuel Plume - The Following Contaminants Exceed Associated MCP GW-1 or RBC Groundwater Standards:
C5-C8 aliphatic hydrocarbons, GW-1 = 300 µg/L
C9-C10 aromatic hydrocarbons, GW-1 = 200 µg/L
C9-C12 aliphatic hydrocarbons, GW-1 = 700 µg/L
C11-C22 aromatic hydrocarbons, GW-1 = 200 µg/L
1,2,4-TMB, RSL = 56 µg/L
1,3,5-TMB, RSL = 60 µg/L
2-methylnaphthalene, GW-1 = 10 µg/L
PFAS6 Plume - Concentrations Exceed MassDEP PFAS6 MMCL = 0.02 µg/L (Dashed Where Inferred)
Plumes with Remedy in Place
IRP PFAS Source Area
MMRP Site - Active
IRP Source Area - Active
Extraction Well
Extraction Well (Off)
Reinjection Well
Reinjection Well (Off)
Outflow Bubbler
Treatment Facility
Municipal Water Supply Well
Town Boundary
Infiltration Trench/Gallery (On)
Infiltration Trench/Gallery (Off)
IRP Groundwater Plume Land Use Control (LUC) Boundary
IAGWSP Land Use Control (LUC) Boundary
Treatment System Pipeline:
Influent
Effluent
N
Scale: 1 inch = 1 mile
0 0.5 1
Miles
The areas of contamination show the combined contaminants of concern within each plume.
Cape Cod Bay
Cape Cod Canal
SS094P 'PFAS Site' Wastewater Treatment Plant Infiltration Beds
Demolition Area 2
Northwest Corner
Central Impact Area
Sandwich
Route 130
Canal View Rd
Burgoyne Rd
Gibbs Rd
Barlow Rd
Jefferson Rd
Wood Rd
Greenway Rd
Route 28
CS-19
J-2
J-1
J-3
L Range
Joint Base Cape Cod
Pew Rd
Frank Perkins Rd
Turpentine Rd
Quaker Meetinghouse Rd
Bourne
Demolition Area 1
Peters Pond
Pocasset Harbor
Hen Cove
Tanker Truck Rollover Sites PFAS6 Plume
SS090P 'PFAS Site' Tanker Truck Rollovers
FS-12
Snake Pond
Weeks Pond
Red Brook Harbor
LF-1
Connery Rd
SS098P 'PFAS Site' Hangar 2816
SS095P 'PFAS Site' USCG Hangars 3170 and 3172
Wakeby Pond
SS097P 'PFAS Site' Lower 40 Ramp Area
Squeteague Harbor
Megansett Harbor
CS-10
SS093P 'PFAS Site' Former Fire Department Building 122
Mashpee Pond
LF-1 PFAS6 Plume
Former CS-23
SS091P 'PFAS Site'
SS092P 'PFAS Site' Former Building 118 and Runway 32



Contaminant of Concern (COC)	Type of Contaminant	Risk-Based Level
TCE = trichloroethene	solvent	MCL = 5 µg/L
PCE = perchloroethene	solvent	MCL = 5 µg/L
CCl_4 = carbon tetrachloride	solvent	MCL = 5 µg/L
EDB = ethylene dibromide	fuel-related compound	MMCL = 0.02 µg/L
benzene	fuel-related compound	MCL = 5 µg/L
VC = vinyl chloride	solvent	MCL = 2 µg/L
1,1,2,2-TeCa = 1,1,2,2-tetrachloroethane	solvent	GW-1 = 2 µg/L
1,4-DCB = 1,4-dichlorobenzene	solvent	MMCL = 5 µg/L
Mn = manganese	metal	EPA Health Advisory = 300 µg/L
thallium	metal	MCL = 2 µg/L
lead	metal	15 µg/L (treatment technique action level for water distribution systems)
toluene	fuel-related compound	MCL = 1,000 µg/L
RDX - hexahydro-1,3,5-trinitro-1,3,5-triazine	explosive	HA = 2 µg/L GW-1 = 1 µg/L 10^{-6} = 0.6 µg/L (IAGWSP); = 0.7 µg/L (IRP)
perchlorate	oxidizer	HA = 15 µg/L MMCL = 2 µg/L
C5-C8 aliphatic hydrocarbons	fuel-related compound	GW-1 = 300 µg/L
C9-C10 aromatic hydrocarbons	fuel-related compound	GW-1 = 200 µg/L
C9-C12 aliphatic hydrocarbons	fuel-related compound	GW-1 = 700 µg/L
C11-C22 aromatic hydrocarbons	fuel-related compound	GW-1 = 200 µg/L
1,2,4-TMB	fuel-related compound	RSL = 56 µg/L
1,3,5-TMB	fuel-related compound	RSL = 60 µg/L
2-methylnaphthalene	fuel-related compound	GW-1 = 10 µg/L
1,4-dioxane	solvent	RG = 0.46 µg/L

Joint Base Cape Cod Groundwater Plume Map, and IRP and IAGWSP LUC Areas

Issued November 2023

Note: MCL – Maximum Contaminant Level
MMCL – Massachusetts Maximum Contaminant Level
HA – Federal Lifetime Health Advisory
PFAS - Per- and Polyfluoroalkyl substances
GW-1 – State default cleanup value to be used in lieu of site-specific risk-based level
10^{-6}– EPA level resulting in an excess cancer risk of one in a million
RG – Site Specific Risk Based Remediation Goal
RSL – Regional Screening Level

Perfluorinated Compounds

The IAGWSP is investigating per- and polyfluoroalkyl substances (PFAS) at Camp Edwards. The EPA identified PFAS as an “emerging contaminant of concern” and in April 2024 established final maximum contaminant levels for PFAS compounds in drinking water and MassDEP established Massachusetts Maximum Contaminant Levels for six (PFAS6). PFAS are widely used, long-lasting chemicals, which break down very slowly over time. PFAS are found in firefighting foam used in fire training exercises, suppressing aircraft and other vehicle fires, and in aircraft hangar fire suppression systems since 1970. PFAS are also used extensively in household and industrial products, clothing, and food wrappers.

In 2018, anecdotal evidence suggested that firefighting foams containing PFAS could have been possibly present at department of defense Open Burning/Open Detonation (OB/OD) sites; therefore, EPA requested that the IAGWSP collect samples for analysis of PFAS compounds at the OB/OD sites. The administrative record does not indicate that foams were used at these areas, but references to the fire department conducting inspections of government contractors, as well as being present during destruction activities, are mentioned.

The sampling program was built around the concept that, if the firefighting foams were used in conjunction with the other disposal activities at OB/OD sites, it is likely that PFAS contaminants would have been co-released and would be co-located with the RDX contamination and perchlorate contamination already identified in the plumes. PFAS investigations were designed to define the nature and extent of PFAS in groundwater.

The sites evaluated include Demolition Area 1, and the J Ranges (J-1 Northern, J-2 Northern, J-2 Eastern and J-3 Ranges). Sampling results to date show sporadic, isolated detections and there is no known PFAS plume. The current investigation efforts are focused on the J-2 and J-3 Ranges because of the proximity to an Upper Cape Water Supply Cooperative well and possible site boundary contamination, respectively. A comprehensive report that will present all data collected to date and next steps is planned to be issued in 2025.

Operations and Maintenance Activities

Operations and Maintenance duties and monthly sampling of all groundwater treatment facilities occurs throughout the year. Groundwater cleanup remedies require long-term operation and maintenance of treatment plants and the Program continually reviews the system performance of each plume. In order to find ways to accelerate treatment, improve operations, save resources and reduce environmental impacts, the IAGWSP team looks at adjusting monitoring plans, changing flow rates, adding extraction wells or turning off extraction wells as the plumes shrink, alternating extraction well operation, or other ways to make their treatment efforts more efficient and effective. In addition, five-year reviews are conducted to evaluate the protectiveness of remedies and impacts of any new information on each site’s remedy.

AWARDS

Camp Edwards received first place awards for Environmental Restoration from both the **Secretary of the Army** and the **Secretary of Defense in 2020.**

The program was recognized for adopting cutting edge electromagnetic induction sensor technology and for great progress mitigating past environmental impacts while increasing military training capabilities. The program’s successes are a direct result of the work and dedication of the entire IAGWSP team and their partners at the local, state, and federal level.

Learn More

To learn more about the Impact Area Groundwater Study Program and opportunities for public input, visit the IAGWSP website at: www.jbcc-iagwsp.org. Information also is available through:

JBCC Cleanup Team (JBCCCT) – This citizen advisory team meets with members of the Air Force's Installation Restoration Program, the IAGWSP, EPA, and MassDEP to review program activities and to provide input. Meetings are typically held quarterly and are open to the public.

Tours – From May to October, public tours of Camp Edwards are offered at JBCC. They provide the public an opportunity to see and learn firsthand about Camp Edwards' soldier training venues, natural resources program and habitat conservation work, and the IAGWSP. For more information on tours, please call 339-202-9341.

Neighborhood Meetings – The IAGWSP periodically holds neighborhood meetings and information sessions to update the public about investigations of interest to a particular community.

Public Comment Periods – Plans and Decision Documents are presented for public review and comment.

Town Updates – The IAGWSP provides routine updates to the Boards of Selectmen and Health in each of the four towns surrounding JBCC.

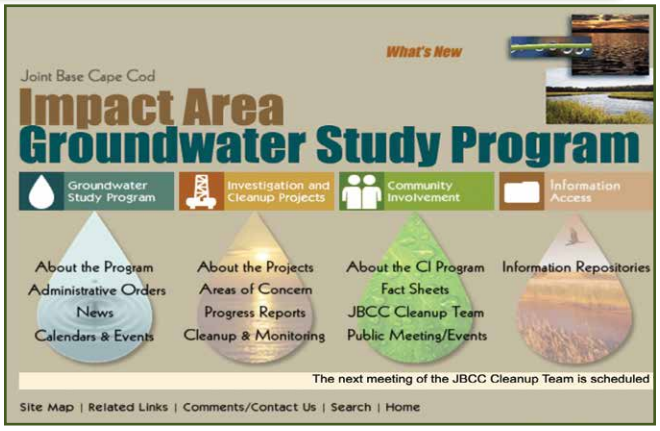
Mailing List – Mailing and e-mail lists are used to send out meeting announcements, updates, fact sheets, and newsletters. Sign up on the IAGWSP website at: https://jbcc-iagwsp.org/community/contacts.html.

Local Media – The IAGWSP routinely updates the local media on program events, advertises meetings and other events in the local newspapers, and responds to requests for information on all aspects of the program.

State of the Reservation Report – This annual report, issued by Camp Edwards, describes the nature and extent of military training and other activities taking place in the Camp Edwards Training Area/Upper Cape Water Supply Reserve. Find at: https://www.massnationalguard.org/ERC/publications.htm.

Documents and Updates

Documents related to the IAGWSP investigation and cleanup are available on the IAGWSP website at: **https://www.jbcc-iagwsp.org** and through the Cape Libraries Automated Materials Sharing (CLAMS) library network at: **https://info.clamsnet.org/**



For Additional Information

Impact Area Groundwater Study Program

Pamela Richardson

Phone: 339.202.9360
E-mail: pamela.j.richardson.nfg@army.mil

Massachusetts Army National Guard
Camp Edwards Training Site

Kathleen Kolva

Phone: 339.202.9307
E-mail: kathleen.a.kolva.civ@army.mil

Installation Restoration Program
Air Force Civil Engineer Center

Doug Karson

Phone: 508.968.4678, ext. 2
E-mail: douglas.karson@us.af.mil

U.S. Environmental Protection Agency

Brenda Murcia

Phone: 617.918.1186
E-mail: murcia.brenda@epa.gov

Massachusetts Department of
Environmental Protection

Deborah Marshall-Hewlitt

Phone: 774.384.3564
E-mail: deborah.marshall-hewlitt@mass.gov

Massachusetts National Guard
Environmental & Readiness Center

Emily Kelly

Phone: 339.202.9341
E-mail: emily.d.kelly2.nfg@army.mil

Impact Area Groundwater Study Program
1807 West Outer Road
Camp Edwards, MA 02542

This fact sheet was developed in coordination with EPA and MassDEP.

Photos on front cover: clockwise, left to right: UXO uncovered in the CIA awaiting destruction; MetalMapper electromagnetic induction sensor working in CIA; the J-2 Range North mobile treatment units; monitoring well installation; team inspecting the J-3 Range system housed in an IRP treatment facility; a drill rig set up to install a monitoring well.