



## INTRODUCTION

**Naval Base Point Loma (NBPL)** is located in San Diego, California, and consists of three main noncontiguous regions (NBPL Peninsula, NBPL Harbor Drive, and NBPL Old Town), as well as numerous separate smaller areas located throughout San Diego County. The total footprint of NBPL is approximately 1,901 acres. The NBPL Peninsula region has been used for military operations since the U.S. Army established Fort Rosecrans at Ballast Point in 1898 and built a coastal artillery battery, which remained active through World Wars I and II. In 1959, Fort Rosecrans was turned over to the Department of the Navy (Navy). Currently, NBPL is home to 65 tenant commands that provide a complement of 18,000 military and civilian personnel. The major tenants include Naval Information Warfare Systems Command Headquarters, Naval Information Warfare Center Pacific, Submarine Squadron 11, Commander U.S. 3rd Fleet, four homeported Submersible Ship Nuclear fast attack submarines, Explosive Ordnance Disposal Mobile Unit One and Training and Evaluation Unit One, Portsmouth Naval Shipyard Detachment San Diego, Military Sealift Command, Tactical Training Group Pacific, Naval Health Research Center, Surface Combat Systems Training Command, and others.

NBPL's mission is to support the U.S. Pacific Fleet and other operating forces by delivering great shore support, leading with innovation, satisfying customers, spending smart, driving mission accomplishment, and making a difference. NBPL meets this mission along three lines of effort: (1) Serve the Fleet, our tenant commands and organizations, and their families, (2) Build a base for tomorrow's war fighter with strong ties to our civic community, and (3) Protect our people, our resources, and the environment from all threats.

One of the unique features of NBPL is the management of the Point Loma Ecological Conservation Area (PLECA). Since 1994, approximately 633 acres of land on the Point Loma peninsula has been designated a reserve sanctuary (the PLECA) to be managed by the Navy, the National Park Service, the U.S. Coast Guard, the Department of Veterans Affairs (Fort Rosecrans National Cemetery), and the City of San Diego. More than 177 native and 53 exotic plant species are present in the PLECA, with flora and fauna characteristic of those once found throughout the coastal region of southern California. Species found include the endangered California gnatcatcher, which is a bird that prefers to nest in the resident coastal sage habitat and can be affected by noise at high decibels during nesting season. NBPL Installation Restoration (IR) Program fieldwork that requires the use of heavy equipment on or adjacent to the PLECA is only conducted between September and February to avoid the nesting season.



*California gnatcatcher*

## BACKGROUND

### Installation Environmental Organization

The NBPL Commanding Officer's (CO's) leadership is vital to the success of the installation's environmental programs. The CO provides guidance and oversight to ensure environmental integration with the military mission, and management direction to the Public Works Officer (PWO) and the Installation Environmental Program Director (IEPD). The IEPD reports to the PWO and the CO and manages the NBPL Public Works Office's Environmental Division (EV). NBPL EV's mission is to provide the NBPL CO and tenant commands with the environmental subject matter expertise necessary to ensure compliance with local, state, and federal environmental requirements while also meeting the NBPL mission. NBPL EV is committed to supporting operating forces and believes that national defense and environmental protection and restoration are not mutually exclusive goals.





### Environmental Restoration Program

Naval Facilities Engineering Systems Command (NAVFAC) manages the Navy’s Environmental Restoration Program (ERN), which is funded annually through appropriations bills. IR, Munitions Response Program (MRP), and Underground Storage Tank (UST) sites are established and funded when past releases of hazardous substances, petroleum, or munitions and munitions constituents are identified that potentially pose a potential threat to human health and the environment, and a response is required. The NBPL IR Program currently consists of 22 active IR, MRP, and UST sites.

The Navy is the lead federal agency at NBPL. The Navy engages with two California regulatory agencies (the Department of Toxic Substances Control [DTSC] and the Regional Water Quality Control Board [Water Board]) through the Defense and State Memorandum of Agreement (DSMOA) for oversight of the NBPL IR Program. DSMOA is a cooperative agreement that was established for expediting cleanup programs at installations and as reimbursement for the state’s efforts.

The Navy conducts restoration in accordance with the Defense Environmental Restoration Program and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLA is a linear

process from investigation to remediation with two outcomes: Response Complete, where cleanup goals have been achieved with long-term management to ensure protectiveness, or Site Closure, where no further action is required and the site is fit for unlimited use/unrestricted exposure.

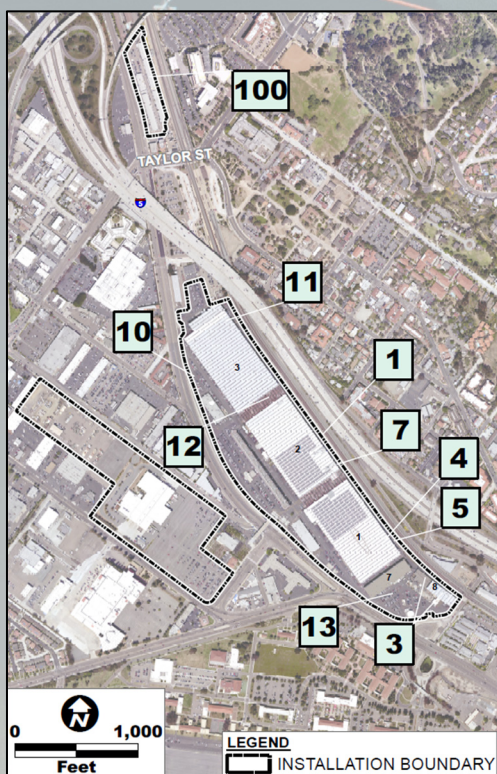
The NBPL IR Program manages projects to achieve response complete or site closure by the milestone dates established in NAVFAC’s Normalization of Environmental Data System (NORM). NORM is a web-based computer system that integrates and centrally maintains the information necessary to manage the program and generate reporting functions for the Navy and Department of Defense budgeting, reporting, and auditing requirements. Currently, NAVFAC’s goal is to achieve response complete on 95% of all ERN sites by 2029.

The NBPL IR Program Team consists of two NAVFAC Southwest Remedial Project Managers (RPMs), Nicholas Shih and Carly Parana, who receive support from the NBPL IEPD, Robert Chichester.

The management approach for the NBPL IR Program prioritizes frequent communication, transparency, and collaboration. The RPMs and IEPD provide monthly briefs to the PWO and



*NBPL Peninsula sites and PLECA*



*NBPL Old Town and Taylor Street sites*





quarterly briefs to the CO to discuss project status, solicit input for decision-making, and manage coordination with Base departments (such as Facilities, Planning, Environmental Compliance, Security, Public Affairs Office, and tenant commands). These command briefings allow for successful project execution while ensuring compliance with the NBPL mission and minimizing the impact to other mission critical entities. In addition, the NBPL IR Program conducts outreach by issuing fact sheets to tenant commands. Fact sheets are distributed as needed to communicate site status and upcoming fieldwork schedule, as well as provide education materials for technical restoration topics and risk communication. In fiscal year (FY) 2021 (FY21) and FY22, ERN issued three fact sheets to one of the NBPL tenants at an IR site to communicate site investigation and vapor intrusion mitigation efforts.

*Over the past 2 years, the NBPL Environmental Restoration Program has built a collaborative working relationship with the Water Board that has resulted in significant progress on site investigation and cleanup. The Water Board and Navy project managers frequently discuss technical approach, findings, and lessons learned to identify obstacles and brainstorm solutions that benefit project phases and the entire life cycle of cleanup sites. The working relationship benefits from transparency and has facilitated efficient document review, work implementation on schedule, and accelerated work when needed to make effective progress toward accomplishing the common goal of protection of human health and water resources within Region 9.*

Sean McClain, P.G.  
 Senior Engineering Geologist  
 San Diego Water Board

The RPMs conduct monthly conference calls with the regulatory agency project managers and use a document tracking spreadsheet as a management tool to track progress of site documents from draft to final. These meetings are used to ensure efficiency by discussing document priority and status and identifying obstacles, delays, and solutions. To further expedite document reviews, the RPMs conduct in-person site walks and briefings, as necessary, to discuss project details and convey the Navy’s technical approach before issuing draft work plans or reports for agency review. In FY21 and FY22, a total of 44 NBPL IR Program documents were finalized with regulatory agency concurrence, demonstrating the effectiveness of the NBPL IR Program.

The NBPL lead RPM is the Navy co-chair for the NBPL Restoration Advisory Board (RAB), which meets in person on a quarterly basis and hosts an

annual bus tour. The function of the meetings is for public outreach to the neighboring community to openly discuss the Navy’s activities on restoration sites and to solicit input. The first half of each RAB meeting is dedicated to presenting the status of IR Program sites. The second half focuses on a technical topic selected by the RAB. The annual bus tour gives RAB members the opportunity to see sites and fieldwork in person on the installation. Throughout FY21 and most of FY22, the Navy conducted RAB meetings virtually to comply with local COVID-19 guidelines. In FY21, the annual bus tour was canceled; the Navy pivoted and prepared a virtual tour instead and shared video, photos, and narration of site activity and fieldwork. The virtual tour was attended by 100% of the RAB members and was well received. The Navy resumed in-person meetings in FY22 while maintaining the remote attendance option to expand outreach, and resumed the annual in-person bus tour in FY23.



*April 2022 Navy and Regulatory Agency site walk  
 Left to right: Kristin Schwall (Water Board), Nicholas Shih (NAVFAC SW), Derral Van Winkle (NAVFAC SW), Ed Morelan (DTSC), Eileen Mananian (DTSC).  
 Not pictured: Carly Parana (NAVFAC SW)*





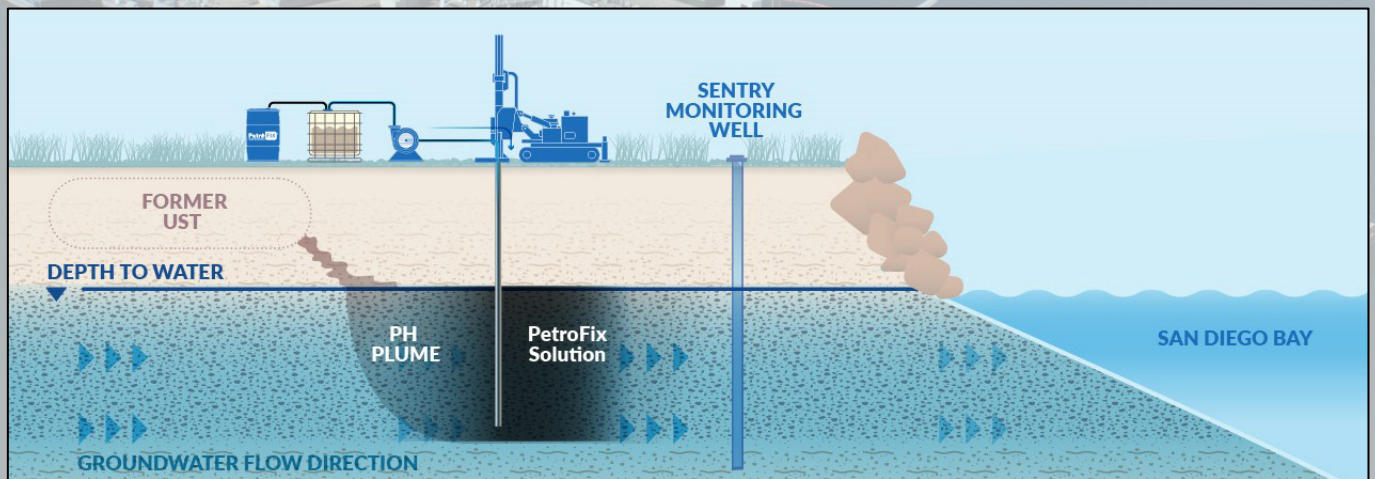
## ACCOMPLISHMENTS

### UST 105 Corrective Action Completion

The Navy completed corrective action at UST 105 in September 2022, and received regulatory agency concurrence on site closure, ending investigations that have been ongoing since 1995. UST 105 is a 1-acre site at the NBPL Magnetic Silencing Facility (MSF) where a release from a former 7,500-gallon marine diesel fuel UST occurred. The UST supported the MSF and was located approximately 100 feet from San Diego Bay and the Deperming Pier before being removed in 1995. The corrective action was designed to protect potential ecological receptors in San Diego Bay from the remaining petroleum hydrocarbons migrating in groundwater toward the bay. The corrective action consisted of injecting micron-scale activated carbon (Petrofix) into the saturated soil between the site and the bay to serve as a permeable reactive barrier zone. Petrofix is a water-based suspension solution that coats the soil and sediment grains to adsorb petroleum hydrocarbons as they migrate across the reactive zone. To enhance biodegradation of petroleum hydrocarbons once they are adsorbed, the Petrofix was combined with electron acceptors (nitrate and sulfate oxides) to help stimulate growth of microbes that degrade hydrocarbons. Because this was the first time applying this technology at NBPL, the Navy and Water Board researched the injection mixture and case studies to ensure it was inert and would not have a negative impact on San Diego Bay.



*UST 105 corrective action implementation*



*UST 105 corrective action cross section diagram*

The NBPL IR Program injected approximately 13,000 gallons of treatment solution at 46 locations within the site in January 2021. Following injection, the Navy conducted five monitoring events from March 2021 to February 2022. In all five events, the Navy demonstrated achievement of the corrective action criteria and compliance with Water Board permit requirements in the sentry groundwater monitoring wells upgradient from San Diego Bay. The NBPL IR Program issued the Final Corrective Action Completion Report on September 19, 2022. The Water Board concurred with the NBPL IR Program’s recommendation for completion of corrective action and site closure ahead of the IR Program’s site closure milestone date of September 2024.

### IR 7 TCRA Completion

The NBPL IR Program completed a successful Time Critical Removal Action (TCRA) at IR 7 between September 2021 and January 2022. IR 7 is a 5.5-acre vacant site where municipal and industrial wastes and





construction debris from the mid-1900s were buried at the bottom of a ravine. The NBPL IR Program implemented the TCRA protocol to accelerate removal on a 0.5-acre portion of IR 7 where contaminants of concern with elevated concentrations posed a potential threat to ecological receptors onsite and on the adjacent PLECA. Stormwater flow through the TCRA area eroded site soil and exposed buried waste, potentially resulting in the migration of contaminants. Contaminants of concern in soil included lead, polychlorinated biphenyls, and hexavalent chromium.



*IR 7 TCRA excavation*

The NBPL IR Program excavated approximately 5,700 cubic yard (330 truckloads) of debris and contaminated soil and disposed of the waste offsite. To completely excavate all of the debris and contaminated soil, the areal extent of the excavation increased 25% and up to 13 feet deeper than planned. Once post-excitation confirmation soil sampling results demonstrated the remedial goals were achieved, the excavation was backfilled, and the stormwater channel was sloped and stabilized with geotextile and riprap.



*IR 7 post-TCRA site restoration*

Site restoration was conducted by installing stormwater erosion controls, hydroseeding with native plant species, and installing a temporary irrigation system for revegetation. The NBPL IR Program issued the Removal Action Completion Report (RACR) to the regulatory agencies in May 2022, documenting the TCRA’s achievement of the remedial action objectives and goals. The completion of the TCRA also resulted in the reduction of the IR 7 site area, where remedial action for the remainder of the site is still required.

**MRP 1 TCRA Completion**

The NBPL IR Program completed a successful TCRA at MRP 1 between October and November 2020 and received regulatory agency concurrence on site closure in December 2021, ending investigations ongoing since 2007. MRP 1 is a 3.5-acre site that was a former small arms range used from the 1940s to the early 1970s. The TCRA was designed to remove lead and soil contaminated with lead from target berm areas to achieve levels protective of both human and ecological receptors.



*MRP 1 mechanical screening and small arms munitions debris (inset)*

The NBPL IR Program excavated approximately 600 cubic yards of soil from MRP 1. A mechanical screener equipped with multiple sieve sizes was used to screen soils a minimum of three times to separate lead fragments. Screened soil was stockpiled and sampled in accordance with regulatory guidelines to determine whether soil could be reused as backfill. Approximately 150 cubic yards of waste was disposed of offsite, and approximately 450 cubic yards of screened soil was determined to be suitable for reuse as backfill. The screening and reuse approach allowed the NBPL IR Program to save approximately \$50,000 by reducing waste disposal and backfill material costs. Once post-excitation confirmation soil sampling results demonstrated the TCRA remedial goals were achieved, the excavation was backfilled and graded to match existing contours. Site restoration was conducted by installing erosion controls, hydroseeding and planting native species, and installing a temporary irrigation system for revegetation. The NBPL IR





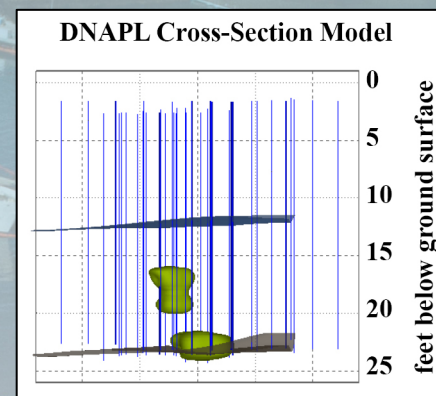
Program issued the Final RACR recommending site closure in November 2021, and received concurrence from the regulatory agencies ahead of the NBPL IR Program’s site closure milestone date in May 2022.

### **IR Sites 10, 11, 12, and 13 Site Closure and Fieldwork Completion**

The NBPL IR Program accomplished an extensive amount of work at multiple IR sites at the NBPL Old Town region. Chlorinated volatile organic compounds were released to soil and groundwater at these sites from large-scale industrial activity associated with World War II–era operations. A summary of the major accomplishments in 2021 and 2022 is provided as follows:

**IR 10** – In April 2021, the NBPL IR Program issued the Data Collection Summary Report and Site Closure Request for IR Site 10, a small 0.25-acre site. The site closure request received regulatory agency concurrence in June 2021.

**IR 11** – Between October 2021 and March 2022, the NBPL IR Program implemented dye-enhanced laser-induced fluorescence technology for the first time at NBPL, in 38 borings, to model and quantify the trichloroethylene (TCE) contaminant source, present as dense nonaqueous phase liquid (DNAPL), in groundwater. During this same period, the NBPL IR Program also injected approximately 20,000 gallons of enhanced anaerobic bioremediation fluid downgradient of the TCE source. The DNAPL model will help the NBPL IR Program identify and implement an appropriate remedy for the TCE source and, in the interim, bioremediation will prevent migration of contaminants dissolved in groundwater.



*IR 11 DNAPL cross section model*

**IR 12 and IR 13** – Between February and April 2022, the NBPL IR Program managed investigation fieldwork at two sites. The fieldwork included a total of 30 direct-push drilling and cone penetrometer testing points, installation and sampling of 20 subslab vapor test probes and 30 soil vapor monitoring probes, groundwater sampling at 30 locations, and indoor air sampling at 85 locations. Approximately 40% of the fieldwork was subsurface drilling conducted after routine business hours because many of the locations were inside occupied buildings. The preliminary data from IR 12 showed that vapor intrusion of volatile organic contaminants from the subsurface into an occupied building was a potential concern at the site. Within 2 weeks, the NBPL IR Program expedited a response by conducting several indoor air sampling events followed by the installation and operation of a subslab ventilation system that successfully mitigated vapor intrusion and reduced TCE concentrations in indoor air to ensure protection of human health.

### **IR 100 Site Closure**

The NBPL IR Program received regulatory agency concurrence with IR 100 site closure in January 2022, ending investigations ongoing since 1988. IR 100 was historically used for manufacturing and maintenance of aviation electronic parts at NBPL Taylor Street, just north of the Old Town region. In 2014, DTSC did not concur with the NBPL IR Program’s closure of the site. Since then, the NBPL IR Program had used a teaming approach and conducted site walks and technical briefings with the regulatory agencies to increase lines of evidence and reduce uncertainty with respect to remaining contaminant levels in soil and groundwater. In January 2022, the NPBL IR Program issued the Final Data Gaps Investigation Report for IR 100 recommending site closure. Both the Water Board and DTSC concurred with the report, and the Navy decommissioned the groundwater wells at IR 100 in August 2022.

### **Innovative Techniques**

The unique steep terrain on portions of NBPL makes land surveying efforts challenging using traditional means. In May 2022, the NBPL IR Program conducted its first unmanned aerial system (drone) flights at two IR sites. The drone was equipped with Light Detection and Ranging (LiDAR) technology to generate





digital terrain models to support environmental remediation design. Drone flights on NBPL in the metropolitan San Diego area required significant coordination and endorsements from the Commander, Navy Region Southwest; the NBPL CO; the Naval Air Systems Command Chief Engineer; Naval Air Station North Island Air Traffic Control; and the Federal Aviation Administration.

**Accomplishments Summary**

The NBPL IR Program met or exceeded NAVFAC’s site closure milestone dates for UST 105, MRP 1, IR 10, and IR 100. The results of site closure are: (1) protection of human health and the environment at the sites and adjacent areas, such as the PLECA or San Diego Bay, and (2) reduction of the Navy’s future liability and long-term management costs associated with additional investigation and remediation. The NBPL IR Program currently allocates approximately \$10,000 per year per site for annual inspections and reports and \$50,000 every 5 years per site for Five-Year Reviews for long-term management sites with land use control remedies. Sites that do not obtain closure and are added to the long-term management program increase the cost of inspections and reviews. As a result of closing four sites in FY21 and FY22, approximately 8 acres of NBPL property on the Point Loma peninsula and in the Midway District of San Diego have now been restored by the NBPL IR Program for the Navy’s reuse without restrictions and additional IR Program costs (up to \$40,000/year and \$200,000/every 5 years in perpetuity).

Successful completion of TCRAs and UST corrective actions demonstrate that the NBPL IR Program can work efficiently with regulatory agencies and multiple internal Navy components (Acquisition, Facilities, Environmental, Planning, Security, tenant commands, and the Naval Ordnance Safety and Security Activity ) to obtain approvals, conduct cleanup actions on schedule (even when limited to a 6-month fieldwork window outside of the California gnatcatcher nesting season), and achieve remedial action objectives and goals. The NBPL IR Program intends to use the TCRAs at MRP 1 and IR 7 as models to efficiently achieve success and incorporate lessons learned on other accelerated removal action sites, including another former small arms range MRP site on NBPL. The success of in situ petroleum absorbent technology at UST 105 should also be used as a case study for assessing corrective action feasibility at other Navy petroleum release sites in proximity to surface waters.

Despite challenges created by the COVID-19 pandemic and funding delays on account of continuing resolutions (with 100% program funding not being received until third quarter in both FY21 and FY22), the NBPL IR Program had significant success. The NBPL IR Program completed an extensive amount of work over the 2-year timeframe (which includes approximately 10,000 hours of fieldwork labor with no reportable injuries). The magnitude of accomplishments at NBPL demonstrates the program’s quality, significant contribution to environmental restoration at NBPL, and the commitment to accomplishing NBPL’s mission.



*IR 7 ravine topography captured via LiDAR-equipped drone (inset)*

*The DTSC appreciates the working relationship that has been established between DTSC and the NBPL Environmental Restoration Program Project Managers. Project managers from the Navy and DTSC maintain open lines of communication and have made significant progress at NBPL sites that have historically been stalled (NBPL Taylor Street IR 100, NBPL Old Town IR 1 and 10, NBPL Peninsula IR 5, 10, 20 and 8, 9, 23) in addition to all the other program sites. Three new IR sites have also been identified through the collaborative efforts of NBPL and DTSC project managers. The working relationship has resulted in the completion of 40+ documents during the previous 2 years at NBPL. DTSC looks forward to further achievements in the future.*

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