

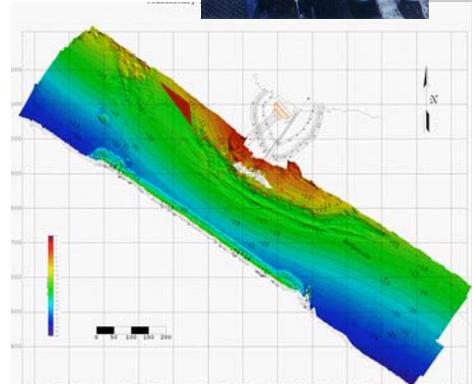
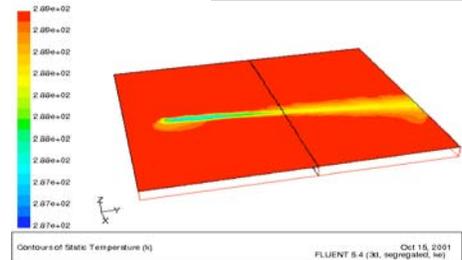
Summary of Qualifications Marine Investigations / Water Related Services

Located in San Diego, California, Q&S Engineering, Inc. (Q&S) is a multidisciplinary consulting firm dedicated to providing *Quality* and *Service (Q&S)* in the environmental, geotechnical, and oceanographic fields. Our definition of *Quality* is deliverables that meet or exceed expectations. Our definition of *Service* are deliverables that are provided on schedule, safely, and within the agreed upon budget.

As a San Diego based company, Q&S understand the importance of the ocean and need for special consideration in the marine environment. Q&S marine ecologists / biologist have advanced degrees and are considered experts in their field. Q&S oceanographers have collected data worldwide and helped developed innovative methods which in some cases are now standard of care. Many of our marine related projects have been completed in challenging near shore and high surf environments. Q&S maritime expertise and marine safety background provide added value. Q&S has a 100% marine safety record.

Q&S experience in marine investigations / water related services includes international projects and tasks orders for the US Navy. A representative list of services includes:

- Multi beam bathymetric surveys
- Side scan sonar
- High resolution seismic surveys
- Pre and post dredge surveys
- Sediment transport studies
- Dredge volume calculation
- Underwater blasting impact assessments
- Contaminated sediment studies
- Water quality studies
- Marine biology
- Interaction with Fisheries
- Outfall / diffuser modeling
- Vibro-core sampling
- Marine CPT
- Client representatives for large scale projects
- ROV operations
- Scientific Diving



4445 Eastgate Mall
Suite 200
San Diego, CA 92121

Tel: 858.812.2055
Cel: 858.232.7169

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Select Project List



Hydrographic Survey along and Under Wharfs, NBVC US Navy

Q&S used profiling sonar to survey elevations adjacent and underneath wharfs. The profiling sonar system utilized a narrow beam high frequency sonar with a rotating transducer head, coupled with a DGPS, compass and 2-axis tilt sensor, to collect a profile of the existing seabed at specific points. Upon completion, Q&S developed dredge volume estimates. Having accurate information underneath the wharfs was of particular importance since sediments

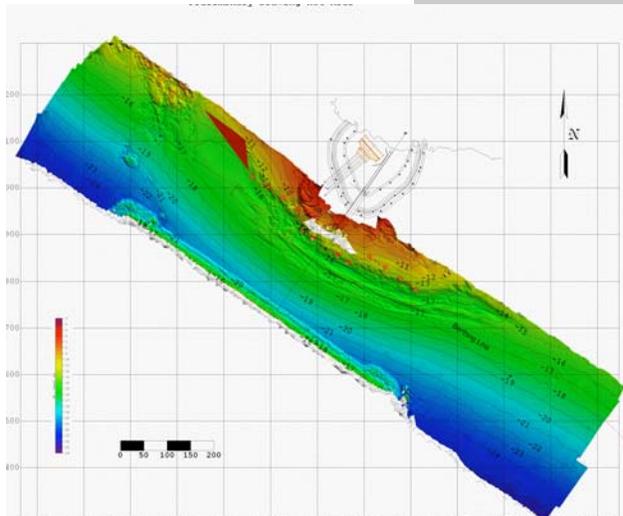
underneath the wharf were thought to be contaminated and their volume had the potential to significantly affect the cost of dredging and disposal.

Received letter of commendation

Multi Beam Bathymetric Survey and Dredge Volume Calculations for Entrance Channel. LNG Terminal

Q&S used an EM 3002 multi beam echo sounder equipped with electronic pitch, heave and roll compensation to survey the site. The line spacing between survey lines was approximately 20 meters. Depth below surface was calibrated using an Odom Digibar pressure sound velocity profiler. Data was displayed in real-time using HYPACK software. Volume calculations were compared to previous survey conducted in 2006. The scope of work also included the collection of six bulk sediment samples from the dredge area in order to help identify the type of sediments that may have been deposited since the 2006 dredging event.

The quality of the survey was such that discarded anchor blocks were visible in the data Received letter of commendation



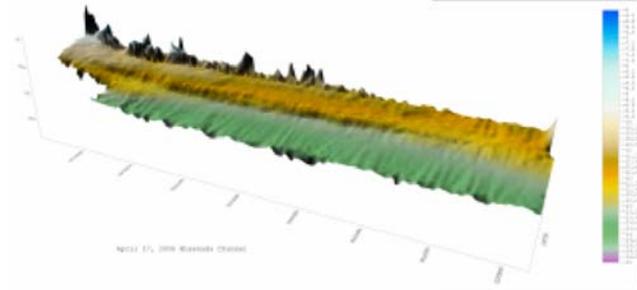
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3D Multi Beam Survey, Port of Ensenada, Mexico

Q&S performed a multi beam survey of the port of Ensenada in support of the deepening of the entrance channel adjacent to a breakwater. The client was concerned that the dredging would affect the stability of the breakwater foundation. Q&S used state of the art system equipped with a heave compensator. In order to help visualize the conditions, Q&S provided the client with data in 3D. *Sole source contract.*

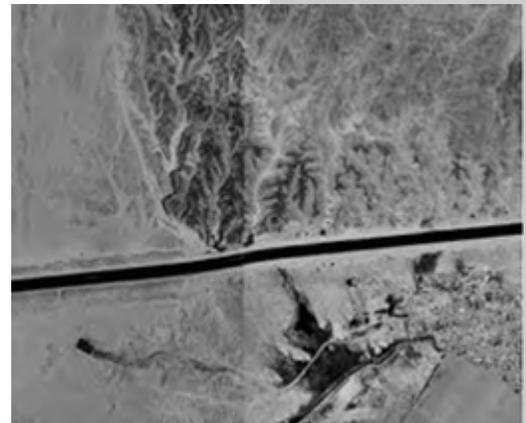


All American Canal, Bathymetric Data Acquisition, CA



Q&S performed a bathymetric survey at four survey sites located along the All American Canal. Prior to mobilizing to the site, Q&S personnel tested the equipment to assure that it was in good working order.

While in the field, the echo sounder was calibrated using a bar check. A second calibration was performed at the end of each shift to verify accuracy. Q&S used a Trimble MS132 D-GPS with Omnistar™ correction service for navigation. Q&S used a 200Khz survey grade ODEC Bathy 500MF echo sounder (echo sounder) with 3 degrees single beam transducer for depth and slope verification along route. Depth data was collected at approximately 2 points a second with X, Y, Z information, time, and date. This was a challenging project due to the limited boat access to the canal and relatively high current velocity.



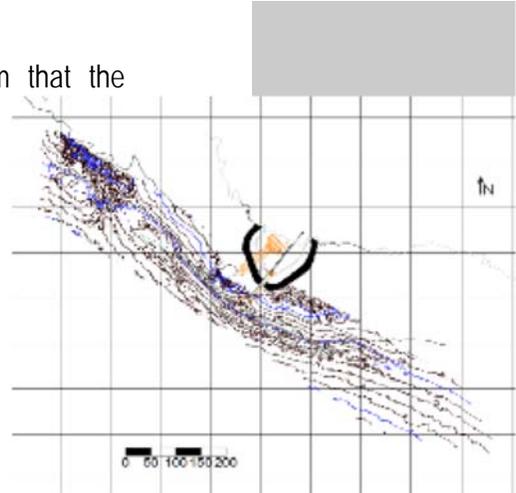
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Post Dredge Survey, LNG facility

Q&S performed a post dredge survey in order to confirm that the recommended volume of sediment was removed as per design engineering specification. This was a fast track project since LNG tanker was in route to the terminal. Received letter of commendation.



All American Canal Blockage Survey, Gordon Wells, CA

Q&S performed a limited bathymetric survey of the AAC realignment area at Gordon Well to confirm or reject the possibility of a submerged obstruction significantly affecting current flow. The survey showed no evidence of a significant obstruction or blockage in the area of the canal. The data also showed no signs of significant sedimentation on the north side specifically but also throughout the survey area. Sedimentation or submerged obstructions were ruled out as the cause of water flow velocity changes.



According to assumptions, the velocity of the current in the canal was estimated at approximately 2 to 6 knots. To keep the rubber raft on location, it was pointed into the current at a speed sufficient to hold it in position. By placing the echo sounder transducer and D-GPS antenna on the stern of the boat, it was possible to maintain approximate position and navigate a reasonably straight line for data collection. While conditions near the narrows were difficult, by utilizing the eddy current it was possible to work in fairly close to the structure

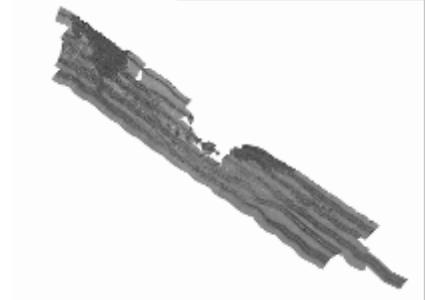
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Back Scatter Analysis of Multi Beam Data

Q&S performed a back scatter analysis of multi beam data in order to help assess if the seafloor material was composed of sand or rock. Q&S evaluated the raw data and returns from the sonar and was able to help differentiate between hard and soft reflectors.



High Resolution Seismic Survey Ground Truth and Sand Thickness Survey

Used divers equipped with a water jet to probe sea floor at 90 locations in order to provide ground truth for a high resolution seismic survey (sub-bottom profiling) previously commissioned by the client. Q&S divers obtained an average penetration of over 20 feet below the seafloor and identified rock outcropping not previously reported. Q&S concluded that the actual sand thickness (based on probing) was significantly greater than what was previously estimated based on a previous survey performed by the client. Q&S estimates were subsequently collaborated during an offshore geotechnical investigation. *Received letter of commendation.*



Sediment Thickness Probing

Q&S staff used a water jet probe to penetrate the seafloor and obtain sand thickness estimates in the general vicinity of 10 LNG ship mooring dolphin locations. The jet probe was constructed from 2" inch (5 cm) schedule 80 PVC pipe and was connected to a water pump via flexible reinforced hose. The divers were able to obtain estimated sand thickness data that was meant to support a subsequent high resolution seismic survey.



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Underwater Blasting Environmental Impact and Mitigation LNG Marine Terminal , Mexico



Impact evaluation and mitigation of underwater impacts associated with underwater blasting leading to high visibility LNG Terminal project approval located within grey whale migration route and aquaculture facilities. Underwater

blasting had been previously expressly prohibited by the regulatory agency at the site due to location and receptors . Q&S suggested appealing the regulatory decision based on a comprehensive / site specific assessment of impacts. The Q&S assessment report included an environmental description of the site, a literature review of blasting effects, a conceptual blasting plan, modeling of biotic impacts, designation of blast safe zones, recommendations for blasting controls, potential impacts on fish and fisheries, and, proposed observation, mitigation, and monitoring programs. The Q&S report helped change the opinion of the regulatory agencies and the client received regulatory approval to perform the blasting. Received letter of commendation



Underwater Blasting Appraisal for LNG Terminal, 2009

As a result of the successful work in the past in permitting underwater blasting at the site, Q&S received a subsequent contract to perform environmental work in support of the actual blasting. The scope of work included:

- review of prior blasting and its impacts;
- modeling of biotic impacts of the blasting and development of Blast Safe Zones based on final blast plans;
- modifications if necessary to the Observation Program, Mitigation Plan, and Monitoring Program based on new blast plan modeling; and
- preparation of narrative report and conclusions.



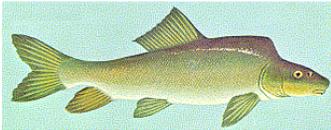
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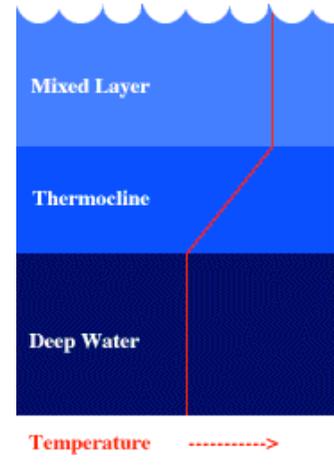
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Underwater Blasting Environmental Assessment Lake Mead Water Intake Structure, Nevada

Q&S performed an underwater blasting environmental assessment in support of the Southern Nevada Water Authority's (SNWA) third water supply intake for the Las Vegas metropolitan area. The intake structure is single level, horizontally-configured intake with an opening at 860 feet approx. 300 feet below the current lake level. This was a high visibility project. An endangered species of fish (razorback sucker) was identified



at Lake Mead and the blasting permit requirements were very stringent. Q&S prepared a report that assessed the effect of the blasting on water quality and biological receptors, a technical appraisal of explosive effects, designation of blast safe zones, and a discussion of mitigation measures to minimize potential effects. The blast modeling and assessment included a consideration of water-borne waves' peak pressure and impulse values, particle velocity, shock energy and radiation, bubble pulsation, and potential damping effects of natural physical phenomena such as the thermal gradient of the water column. Based on the findings of this assessment, blasting for the water intake structure was determined viable from an environmental perspective.



Essential Fish Habitat Assessment, West Coast Navy Tactical Training Theater Assessment and Planning (TAP) Program, SOCAL EIS

Q&S completed the EFH Assessment for the U.S. Navy SOCAL Range Environmental Impact Statement (EIS). The SOCAL Range Complex is a 120,000 square nautical mile area that includes four southern California Channel Islands. This EFH was one of the most wide-ranging and complex assessments prepared under the new fish habitat conservation requirements for Federal Agencies.

The Sustainable Fisheries Act (SFA) established a new habitat conservation tool: the Essential Fish Habitat (EFH) mandate. The SFA requires that EFH be identified and mapped for each species covered under Fishery Management Plans. An Essential Fish Habitat Assessment, required for actions and activities in coastal waters with potential impacts to EFH, includes a description of the proposed action, an analysis of the effects of the action on EFH, fish mortality calculations, and proposed mitigation.



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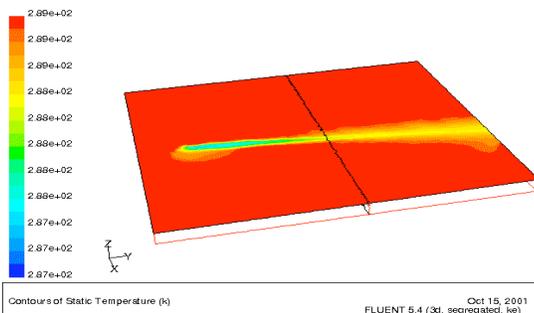
Essential Fish Habitat Assessment, East Coast Navy TAP Program, EIS Support / EFH

Q&S was contracted to perform EIS support work at 3 east coast range complexes. The assessment of the impact of Navy training on "Essential Fish Habitat" (EFH) covered regulatory issues, fishery management plans and Managed Species, the project area, proposed actions, impacts, and mitigation measures. East coast experience includes:



- Cherry Point Range Complex, North Carolina;
- Jacksonville Range Complex, Florida;
- Virginia Capes Range Complex, Virginia

Marine Baseline Survey and Environmental Impact Assessment, El Paso Gas / Phillips Petroleum, Proposed LNG Terminal, Rosarito, B.C., Mexico



Q&S staff provided fast-track project management and field investigative support as part of an EIS for a proposed LNG Marine Terminal in Rosarito. The project required computer modeling of wastewater effluent (ocean outfall) in order to evaluate the feasibility of



discharging approx. 43,000 m³ /hr at 7 C° below ambient, and with a hypochlorite concentration of 0.05 mg/l; and effects on marine biology. Q&S staff prepared English and Spanish versions of the environmental impact report (MIA) other work included: installation of groundwater MWs, groundwater monitoring, soil sampling, marine and terrestrial biology, air quality sampling, seawater sampling, and noise monitoring. Received letter of commendation.

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Multi Disciplinary Services, SEMPRA LNG, Ensenada, Mexico

Provided multi disciplinary environmental, geotechnical, underwater construction monitoring, marine ecological, and marine geophysical support for the first LNG facility on the west coast of the Americas resulting in approx \$1.1 million dollars worth of work for Q&S Engineering. *Received letter of commendation*



Multi Disciplinary Services, Puerto Libertad LNG Sonora, Mexico

Provided multi disciplinary environmental, marine geophysics, and offshore geotechnical services. Performed water quality base line survey, collected sediment samples prior to offshore drilling, evaluated environmental impacts for offshore drilling, served as client representative during marine geophysical survey and offshore drilling geotechnical investigation.



Prior to geotechnical drilling, collected sediment samples and oceanographic data, evaluated offshore drilling equipment, performed safety audits in vessel prior to departure, evaluated impacts associated with offshore work, obtained permitting to perform offshore drilling, and helped prepared HSE plans for marine operations. As client representative, made shipboard decisions regarding depth and abandonment of borings during adverse conditions. Provided client with regular updates and independent field log.

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Offshore Geotechnical Investigation, SEMPRA LNG

Q&S staff obtained permitting, coordinated /monitored off shore drilling and CPT work on board the drill ship, served as first shift marine coordinator, assisted in anchor handling operations, provided precision navigation with a D-GPS to sampling locations, and prepared Marine Health and Safety Plans. Saved over \$100K dollars during fieldwork by implementing innovative solutions. Q&S received a letter of recommendation for "outstanding work", ability to resolve problems, and innovative approach to technical challenges



Marine CPT Testing, Port of Ensenada and Port of El Sauzal

Q&S provided project management / coordination in support of dredging studies at the ports of Ensenada and El Sauzal, Mexico. In order to receive more competitive bids and reduce costly change orders, the port authority (API) wanted to provide dredging contractors with site specific information regarding sediments properties in the two ports. Unlike, a conventional CPT that requires a drill ship or barge, the Mini-cone used was contained in a self righting seabed deployment frame and lowered directly to the sea floor. It is operated remotely from the surface by an electromechanical umbilical that provides the power and digital control to coiled rod that is pushed into the sea floor. The mini-CPT was deployed from a fishing boat and provided stratigraphic detail and soil strength information based on the tip pressure, sleeve friction and pore pressure sensors of the cone. The Mini-cone is capable of operating in depths up to 10000 feet with a maximum penetration depth of 30 feet below mudline and a maximum tip resistance of approximately 350 tsf. This was the first time that API Ensenada had used this technology to evaluate sediments for dredging. The client was very happy with the results and offered a second sole source contract to perform additional work.



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Seafloor Coring and Sampling

Q&S used divers to drive a Ogeeche Sand Corer (core sampler) about 1.8 meters into the seafloor bottom in order to collect core samples from six separate locations along the footprint of a proposed breakwater running parallel to the coast line. Information regarding the upper 1.8 meters of sand was required for the engineering design phase of the breakwater. Due to sand density, Q&S had to use casing and multiple drives to reach the desired depth. The options to use divers to collect the cores in lieu of a vibro-core technology saved the client tens of thousands of dollars in mobilization and equipment fees. *Q&S received letter of commendation*



Water Quality Baseline Survey, Black & Veatch, Energia Costa Azul LNG Facility



The primary objective of the water quality sampling was to establish baseline conditions at the site prior to the construction of the proposed rock filled causeway. Q&S collected approximately 30 water quality measurements at the site and adjacent areas. The water quality measurements were collected at varies depth ranging from 1 meter below the surface to the seafloor. Approximately three to four measurements were collected from each sampling station. The sampling was performed on board a small vessel (approximately 26 feet) with the use of a Horiba U-22 water quality meter. Data collected included : pH, conductivity, turbidity, dissolved oxygen, temperature, salinity, total dissolved solids, and depth. *Received commendation*



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Sea Water and Sediment Sampling, Puerto Libertad LNG, Sonora, Mexico



Q&S collected water quality samples from 6 locations upstream, downstream and in the general area of the intake and discharge outlets, breakwater, and trestle of proposed LNG facility. A total of 12 water samples were collected below the surface and slightly above the sea floor. The samples were sent to a Mexico laboratory for chemical parameters as per applicable Mexican water quality

standard (NOM-001-ECOL-1996) and additional parameters including: : TPH, grease / oils, sedimentary solids, total suspended solids, floating matter, total nitrogen, total phosphorus, nine regulated metals (arsenic, cadmium, cyanide, copper, chromo, mercury, nickel, led, and zinc), Total Organic Carbon, Chemical Oxygen Demand, and Biochemical Oxygen Demand. The water samples were collected by means of a standard discrete sampler (bomb sampler) that allows the extraction of a water sample from a discrete depth. In addition to the laboratory water quality analysis, Q&S staff used a Horiba U-22 Hydrolab (probe unit) to measure physical-chemical parameters in the field and collected bulk sediment samples using a Ponar Benthic Sample sampler for physical analysis.



Underwater Rock Bolting , Energia Costa Azul LNG



Q&S Engineering was contracted by Black & Veatch to install rock anchors into boulders at the toe of the causeway that were too large to be removed with a crane bucket. Q&S divers used air powered rock drills to install 1 ¾ stainless steel Williams Rock



Anchors (all-thread rods) approx 16 –20 inches into selected boulders. Eyebolts were screwed into the all-threads and were subsequently used to lift the boulders out of the water. The large boulders were interfering with the placement of the Core Locs. The site subcontractor initially tasked with the work had claimed that the large boulders could not be removed. Q&S and its teaming partner, Underwater Resources, demonstrated that it could be done. The site subcontractor was subsequently back-charged by our client for Q&S labor. *Q&S received commendation letter.*

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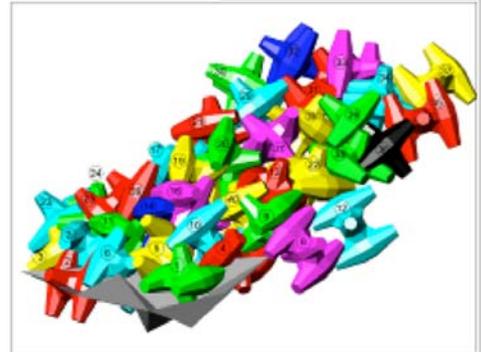
Underwater Rock Outcrop Fracturing Using Hydraulic Splitter

A rock outcrop adjacent to a loading terminal was preventing an LNG tanker from coming along side / discharging. The rock outcrop had been recently identified but the site contractor handling the work had failed to remove it in time. Q&S was called to the scene and recommended an alternative innovative approach. Q&S successfully removed rock outcrops using underwater drills and a hydraulic rock splitter. The hydraulic rock splitter allowed the divers to break free large pieces of rock. Once the rock was removed, the tanker tied up along the terminal and discharged. Q&S received commendations.



Shallow Water CoreLoc Inspection, SEMPRA LNG Marine Terminal, Black & Veatch 2007

The objective of the underwater reconnaissance was to determine if rock toe material was founded on bedrock, to determine the correctness of the Core-Loc placement behind the toe and to verify that the first row of Core-Locs were properly founded on bedrock as well and properly supported by the toe in front (seaward side) and underlayer behind (shoreward side). Due to the limited depth of the water, Q&S had to carefully monitor and forecast weather, tides, and wave conditions in order to mobilize during optimum conditions and help reduce project costs. Q&S identified multiple concerns and subsequently oversaw remedial work. Q&S received a letter of commendation.



Deep Water Core Loc Inspection, SEMPRA Energy



Q&S performed an underwater inspection of Core Locs located around a breakwater. Due to depth of water in excess of 90 feet, Q&S required the use of a decompression chamber. Q&S purchased specialized low light / high definition color underwater video equipment that allowed the evaluation of conditions in real

time. The diver observation, measurements, and comments were recorded live for permanent record.



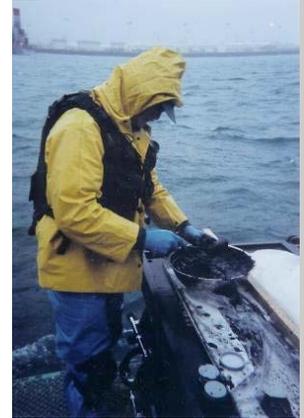
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Sediment Sampling / Contaminated Sediment Disposal Feasibility Study; Naval Base Ventura County; Port Hueneme Facility, Ventura, CA

Collection of approximately 45 sediment core samples for characterizing bottom sediments; and preparation of contaminated sediment disposal feasibility report. The samples were analyzed for aquatic toxicity, physical, and chemical parameters. The chemical samples were screened against various guidelines including: EPA Region 9 PRGs, SOGs, ERLs, ERM, AETs, TELs, PELs, SLs, BTs, MLs, STLCs, TTLCs and TCLP. The disposal options included: upland disposal; confined disposal facility (CDF); confined aquatic disposal (CAD); unconfined ocean disposal, cement stabilization / permanent storage at NBVC; beach sand replenishment, temporary storage at NBVC /subsequent disposal at Port of Long Beach (POLB) as fill; and other beneficial uses. Based on the relatively high silt and clay content; the majority of the dredge sediments were not compatible for beach replenishment. Results from the bioassay were compared with reference sediments to evaluate possibility of unconfined ocean disposal. The disposal option was over \$2 million less than a previous US Army Corps recommendation for disposal at a Class I Landfill. *Q&S received letter of recommendation*



Water and Sediment Sampling, Naval Command Control and Ocean Surveillance Center (NCCOSC) Morris Dam, IR Site 2, Azusa, CA

Perform drilling and collected soils samples at various locations of IR Site 2. Use small vessels to collect water samples from the reservoir at various locations at 5 foot intervals in depth. Used Vibro-core barge to perform sediment coring and sampling at 9 locations. The project required an innovative approach to assembling and launching the barge since there was no suitable boat ramp in the reservoir



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There are many reasons to contract with Q&S Engineering for marine investigations, surveys, and overwater work

But why select Q&S Engineering?

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- Seasoned managers....with extensive marine expertise
- Multidisciplinary services.. environmental, oceanographic, geotechnical
- 100% marine safety record
- Federal contracting experience
- International experience...over 300 Mexico projects completed
- Excellent references...proven track record
- HUB Zone, SDB, and U-DBE certification,
- A commitment to Quality and Service



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