

MOTOR YACHT *PASADA MANANA*  
(Research Vessel *Polaris*)  
Guest Dock, Port of Redwood City  
Redwood City  
San Mateo County  
California

HAER CA-2326  
*HAER CA-2326*

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD  
PACIFIC WEST REGIONAL OFFICE  
National Park Service  
U.S. Department of the Interior  
333 Bush Street  
San Francisco, CA 94104

# HISTORIC AMERICAN ENGINEERING RECORD

MOTOR YACHT *PASADA MANANA*  
(Research Vessel *Polaris*)

HAER No. CA-2326

## **Part 1. Identification**

Name of the Vessel: Research Vessel (R/V) *Polaris*

Vessel Official Number: 226457

Report Prepared by: Steven A. Nagel, Federal Preservation Officer, U.S. Geological Survey (USGS)

Present Location: Guest Dock, Port of Redwood City, Redwood City, San Mateo County, California

Present Owner: US Geological Survey / National Research Program  
345 Middlefield Road  
Menlo Park, California

Present Use: Retired research vessel, afloat

## **Part 2. Historical Information**

Historic Significance: The *Pasada Manana* (R/V *Polaris*) has been found significant at the state level under National Register Criteria A and C in the areas of Maritime History, Agriculture, Recreation/Entertainment, Science, and Maritime Architecture. The R/V *Polaris*, originally christened the *Pasada Manana*, was built by Wilmington Boat Works in 1927 for influential businessman and land reclamation advocate Lee Allen Phillips. His efforts in support of land reclamation converting marshlands in the California Delta area to arable land was significantly aided by his prized yacht which was used as a business instrument transporting investors to view his land developments. These repurposed lands contributed to the commerce and viability of the California Delta and it became one of the most productive farming regions in California and

eventually the United States.

The yacht's physical features illustrate the R/V *Polaris* evolution from pleasure craft to a functioning research vessel, incorporating materials and design elements from several periods from original construction in 1927 to its final major overhaul in 1972 which brackets a 45-year period of significance under Criterion C. The ship's vintage design as a yacht is still visible by its unaltered structural line, arrangement of spaces, and material composition. Original wood, metals, glazing, and paint scheme capture the essence of yacht's design from the 1920s juxtaposed alongside modern necessities which enabled the yacht to operate as a modern science vessel for the Federal government. In 2014, the R/V *Polaris* was one of the oldest working vessels operated in federal service at 88 years old.

Principle Dimensions:                      Length: 96'  
                                                             Beam: 20'  
                                                             Draft: 8'  
                                                             Displacement: 114 tons

Physical History:

- a. Designer:                                      A.E. Hudson<sup>1</sup>
- b. Builder/Location:                          H.C. Carlson of Wilmington Boat Works/ Wilmington, California<sup>2</sup>
- c. Date of Construction:                      "Undetermined. "Motor yacht was under construction for six (6) months/Launched May 12, 1927<sup>3</sup>
- d. Original Price:                                \$150,000.00<sup>4</sup>
- e. Project Information:                          As the R/V *Polaris* is listed on the National Register of Historic Places and the USGS is planning to surplus the vessel, this

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<sup>1</sup> "A brief history of the Research Vessel *Polaris*," *Water Quality of San Francisco Bay*, last accessed February 14, 2017. <http://sfbay.wr.usgs.gov/access/wqdata/overview/measure/polaris.html>.

<sup>2</sup> Ibid

<sup>3</sup> Ibid

<sup>4</sup> Ibid

constitutes an adverse effect on a historic property. This recording project is being compiled as part of USGS's mitigation for its adverse effect on the vessel.

The HAER program is administered by the National Park Service, U.S. Department of the Interior. The R/V *Polaris* Recording Project was sponsored during 2016 by Deborah Stoliker, Assistant Chief of National Research Program – Western Branch of the USGS. The measured drawings and color photographs of R/V *Polaris* were compiled by JMS Naval Architects/ Salvage Engineers. Black and white photographs taken by Stephen Shafer. HAER document advice provided by National Park Service through Christine Avery, Historian, and Todd Croteau, Maritime Program Manager. Field information, history of Lee Phillips, and R/V *Polaris* research collected and developed by Jayne Aaron, Architectural Historian of EA Engineering, Science, and Technology, Inc., PBC. HAER report prepared by Steven Nagel, Federal Preservation Officer, USGS.

- f. Original Construction: The hull of the *Pasada Manana* is supported by a solid oak keel running the entire length of the yacht. Bisecting the keel at regular intervals, solid oak ribs are attached. Each oak rib was softened by an application of steam during her construction to make the oak bendable to the cross sectional “U” shape profile of the hull. The yacht's stern post, stem, and horn timber are similarly shaped through the same bending process. The hull is sheathed with 2/1/2” thick Douglas-fir planking attached horizontally across the oak ribs and other structural members of the hull. The thickness of the hull's planking increases to 8” thick at the garboard stake near the keel. The yacht's hull is covered by a main deck made of 2/1/2” teak planking with much of the deck recently covered by marine grade plywood overlain with a layer of fiberglass matting and a topcoat of watertight membrane. Inside the hull, the accommodation deck is located beneath the main deck with bilge space located beneath the accommodation deck.

Above the yacht's water line, the bow section of the hull is symmetrically pierced by a row of six round brass port lights on both the starboard and port sides of the yacht. The anchor is stored off the starboard bow. The forward and mid main decks

are rimmed by deck railing composed of metal posts supports, cable center rail, and capped with a teak grip rail. There was originally only one spar of the *Pasada Manana* which was the main mast. It supported navigation lighting and radio antenna wire. In addition to ship to shore radio, the vessel had one of the first telephone land line hook-ups whenever it docked. Two spars have been added to the vessel. A forward mast located closest to the bow was added to support navigation aid equipment with rotating radar antenna for improved safety of the ship and crew.

The *Pasada Manana* originally was designed with two manually operated radial davits near the stern on the port side of the yacht. They were used to launch the yacht's lifeboat and lower it past the deck side rails to the surface of the water. The manual davits were replaced with a single pivot davit located on the ship's centerline near the stern. The single pivot davit is powered by a hydraulic winch which is used to stow and launch a 17-foot Guardian Boston Whaler. The small boat is stored in the same location amidships on the port side as the original lifeboat. Today, the Boston Whaler has a dual purpose of transporting scientists to shallow waters for science research and in emergency as a lifeboat. The vessel's large exhaust stack is in the same location behind the main mast and has always been part of the ship's superstructure.

The yacht's original exterior color scheme featured the hull painted white to the waterline. Below the waterline to the keel of the yacht, the hull was painted red. The exterior walls and wood trim of the deck cabins on the foredeck and waist deck were natural teak. The wood was sealed with varnish. Today, the ship's hull exhibits the same color scheme of yesteryear. However, the exterior surfaces of the ship's deckhouses have been painted white.

The main deck of the vessel supports a wide variety of spaces with different functions from leisure to ship control. The yacht's pilothouse is forward situated on the elevated forecastle section of the main deck. The pilothouse is approximately 13'-0" wide and has the longest dimension of 16'-0" measured from the center of the back wall to the furthest arc of the semicircular bow wall enclosing the front of the pilothouse. There are six large fixed windows positioned on top of the semicircular wall which provides a commanding

view of the yacht's bow from the pilothouse. The window sashes are made of solid mahogany wood. Each window opening is arched at the upper corners. Two of the windows at opposite sides of the pilothouse are original Pullman designed windows which lower into wall cavities below. Next to the operable windows, the pilothouse has generous crew access through two mahogany doors located at opposite sides of the pilothouse. The doors have a single glass pane and are built of solid mahogany. The interior walls of the pilothouse are sheathed with tabasco mahogany paneling. The paneling is accented by a 1/2" wide wood inlay which is checkered in dark and light colored woods. This inlay is a common motif used in other parts of the yacht where mahogany paneling is applied to the interior wall surfaces of the yacht. The ceiling of the pilothouse is accentuated by overhead deck carlines which are the structural support members of the pilothouse roof. The bottom of each carline is faced with solid mahogany. The vertical sides of the carlines and ceiling areas between each carline are painted white. Mahogany quarter-round trim visually softens the meeting of the carlines and the horizontal surface of the ceiling above. The contrasting hue of the mahogany trim against the white ceiling creates a stunning coffered effect arching over the pilothouse.

When the yacht was completed in 1927, a settee was centered along the back wall of the pilothouse behind the ship's wheel. Above the seat, the ship's clock and barometer were attached to the back wall. Today, the settee has been replaced with a multi-drawer chart cabinet. The ship's clock and barometer still hang prominently on the back wall of the pilothouse. The captain's cabin once occupied an area behind the pilothouse on the port side. This room has been converted in part to a hallway reaching aft to the upper laboratory (formerly the smoking room). The other portion of the captain's cabin has been converted into vertical circulation space for a spiral stair case leading to the accommodation deck below the main deck. There is a double stateroom on the starboard quarter behind the pilothouse which provided living quarters for seaman and the cook during the yacht's early years. The vessel's engineer was quartered in the pilothouse.

The aft spaces on the main deck were designed for leisure activity. The smoking room just aft of the pilothouse is 12'-0" deep by 13'-0" feet wide. The walls of the smoking room are

paneled in tabasco mahogany and accented with the same checkered 1/2" wide inlay found in the pilothouse. The room is gracefully spanned overhead by roof carlines possessing the same mahogany trim and color scheme of the pilothouse. The smoking room has eight Pullman designed windows on the port and starboard sides of the space. With all the windows open, cross air ventilation can purge cigar and pipe smoke from the room. The windows also allow abundant natural light to flood the space.

Aft of the smoking room and amidships of the main deck an elevated area above the main deck forms the forecandle deck. An early photograph shows two crewmembers accessing a canvas structure spanning over the forecandle deck with lifeboat sheltered inside. Subsequent photos of the *Pasada Manana* show the forecandle deck with its lifeboat completely exposed to the outdoors without canvas cover. The forecandle deck supports the ceiling spanning across the spaces of the accommodation deck. The low walls supporting the forecandle deck are penetrated by alternating round and oblong brass framed windows which bring natural light and ventilation to the accommodation deck rooms below.

Directly aft of amidships located on the stern of the yacht sits the cockpit. The deck of the cockpit is at the lowest elevation above the vessel's water-line. The space has always been designed for the outdoors like the porch of a house serving its living spaces. For the *Pasada Manana*, the cockpit is accessible directly aft of the accommodation deck with its staterooms, galley and dining space. The cockpit measures 10'-0" wide by 12'-0" deep. The stern end of the cockpit is bounded by a curved low taffrail which continues port and starboard to the bulkhead separating the cockpit from the accommodation deck. The cockpit has been always been sheltered under a flat wooden canopy stiffened with carlines and supported by a minimal number of steel and wood uprights. Today, the sides of the cockpit have been enclosed with permanent and removable walls with a designed adaptability to the inherited mission needs of the R/V *Polaris*. Fixed windows and two doors enclose the forward sides the cockpit. The doors and window frames have been constructed of mahogany to match the wood's use at other parts of the ship. The stern end the cockpit is enclosed with a removable system

of roll-up canvas and vinyl windows stitched into the material to allow delivery of science samples to the laboratories of the R/V *Polaris*. The teak decking of the cockpit is original and has weathered well. A round storm drain, known as a scupper allows rain and storm water to drain off the cockpit's deck. A bronze grill covering the drain measures approximately 18" in diameter. The grill is round and convex in profile with the metal forged into the form of a star in its center. The five points of the star radiate to the outer edge of the grill thereby giving the grill improved strength under foot. It is interesting to note, as this grill is original to the *Pasada Manana* the star may have been used to represent the North Star which stays true for all ship navigation throughout time. When the name of the yacht was changed to *Polaris*, the star pattern on the grill retained is original meaning since the North Star and *Polaris* are one in the same.

The accommodation deck located below the main deck predominantly provides living space for the yacht's owner and guests and serves today for scientists who cruise with the R/V *Polaris*. This deck also supports the yacht's engine room and galley. Both the engine room and galley are in the middle of the accommodation deck creating two separated living areas, one aft and the other forward toward the bow of the yacht. The owner's stateroom is located adjacent and forward of the engine room. The owner's sleeping quarters is complemented with a sitting area and head with shower. For the purposes to conduct science from the R/V *Polaris*, the owner's stateroom had been converted to the lower laboratory space with all the room's furnishings removed for scientific equipment and support needs. Forward of the owner's stateroom when the ship served as a yacht, there was a forward stateroom served by a head and shower. This forward stateroom was divided into two berths for sleeping two scientists in each berth. A ladder and scuttle were added in one berth area on the starboard side of the yacht to provide emergency egress to the main deck above. A new head and shower were installed on the port side across from the lower laboratory for the R/V *Polaris* crew members.

To the aft of the engine and galley, the main saloon is located with its adjacency further aft via a few steps up to the open



aired cockpit at the stern of the vessel. The main saloon measures 16'-0" wide by 21'-0" long. The saloon remains furnished today with the original built-in china cabinet. The cabinet is mounted to the forward wall which separates the saloon from the engine room. The cabinet is also conveniently located next to the adjacent aisle way extending through the galley where dishes were cleaned and returned to the china cabinet. The cabinet's upper and lower cabinets are built with solid stock mahogany wood. The stile and rails of the upper cabinet doors frame the original textured glass at three of the four upper cabinets. A mahogany countertop finishes the top of the base cabinet. The edge of the countertop is thoughtfully designed with a brass galley rail which prevents breakable dishware and glass from falling to the deck below. Directly beneath the china cabinet countertop is a layer of wood drawers which served for storing silverware and other tabletop accessories. The base of the china cabinet is framed and paneled in mahogany with its interior accessible via four hinged cabinet doors. The cabinet door faces are decorated with the 1/2" wood inlay typically used throughout the ship. The main saloon also houses more utilitarian type of storage with built-in cabinets attached along the starboard wall. This part of the saloon has been converted into space for a modern full-size refrigerator. Natural daylighting enters the main saloon through brass-rimmed port lights which are located high on the walls just above the main deck outside. The brass openings alternate between round and oblong geometric shapes.

There are two staterooms aft of the main saloon each measuring approximately 12'-0" by 8'-0". The staterooms still provide sleeping accommodations for four people and used to be served by a dedicated closet for each stateroom. A common head and shower was originally available to the occupants of the staterooms and was located at the forward starboard section of the main saloon. The community head and shower was removed in favor of converting the stateroom closets into private heads serving each stateroom. All the accommodation deck living areas are spanned above by the gracefully cambered carlines supporting the main deck above. The carlines typically run port to starboard and perpendicular

to the keel of the vessel. The formal spaces like the owner's stateroom and main saloon had their carlines embellished with mahogany trim. Carlines carrying the main deck above the forward and aft staterooms were painted white without mahogany accents.

The yacht's galley is a long space located to port of the engine room. The galley is equipped with all food preparation equipment typically found in a kitchen. It was fitted with an Oxo-gas kerosene stove manufactured by Shipmate. The kerosene stove was replaced with an electric powered stove. The original icebox is still built into the port side of the vessel and adjacent to the galley for efficiency in food preparation. Today a full sized electric refrigerator replaces the function of the icebox. To the aft end of the galley, a dinette was designed in 1927 with built-in table and bench seats. The eating area remains in use today mainly for its adjacency to the galley.

The engine room is in the center of the vessel. The room is approximately 20'-0" long by 14'-0" wide. The walls of the engine room are sheathed with riveted metal panels which protects the hull of the yacht from heat generated by the main engine and its accessory systems. The original main engine was a 200 horsepower (hp) Atlas-Imperial diesel with pilothouse control positioned exactly amidships. It drove a 54" diameter, three-bladed, single propeller designed especially for the ship by William Lambie. This engine gave the vessel a cruising speed of 11 knots at 300 rounds per minute (RPM). There were two generators in the engine room, a 7.5 kilowatt (kW) generator driven by the main engine and a 12.5 kW Universal generating plant supplying electrical service to all parts of the yacht. The engine room and adjacent galley was fire protected by a carbon dioxide fire suppression system. Today and likewise in its yesteryear, natural light and air circulation is brought into the engine room through brass framed round port lights located at eye-level along the starboard side of the space.

Beneath the accommodation deck lays the bilge of the yacht which is the lowest accessible level inside the hull. This area contains the fuel tanks, grey water tank, engine pressurized air cylinders, and propeller shaft. All the tanks and working parts are symmetrically located on the vessel's center line which

helps maintain the balance and stability of the ship as it rests and moves through the water.

In 1959, the vessel's original engine was replaced with a direct reversible six-cylinder Union Diesel engine of 240 hp at the Stone Boatyard in Alameda. The new machine turned out to be the last Union Diesel engine manufactured by the company which was located at the intersection of Union and Diesel streets in Oakland, California. The new direct reversible engine had a unique physical feature most noticeable of its marine predecessors. Its order telegraph was controlled by two handles directly from the engine without an interceding transmission. The short handle regulated fuel delivery to the engine. The long handle controlled the engine's interior mechanics used to execute stop, forward, air forward, astern, and air astern commands. The engine was made to run backwards on a second set of camshaft lobes. From forward, the captain would throttle back the fuel to dead slow and then stop the engine. The camshaft was shifted to the reverse position while compressed air was applied through the air distributor to each of the cylinders in their firing order. When 75 RPM is reached on the tachometer, the captain would pull back the longer handle to astern. To stop, the captain would reduce the RPM and move the longer handle to stop. The same procedure would be used each time to move ahead or astern. The ship could change direction from running full ahead to moving backwards in 40 seconds. The captain could shift the handles 8 to 10 times in maneuvering the ship before running out of compressed air.

By 1990, replacement parts for the Union Diesel were no longer available. Parts had to be custom fabricated for continued use of the engine. USGS managers of the vessel looked to increase power plant reliability and reduce maintenance costs. It was decided the direct reversible Union Diesel engine would be replaced by a Detroit Diesel 12V71 model. The old Union Diesel engine was transferred to the San Francisco Maritime National Historical Park since it was the last engine produced by the manufacturer. The weight of the Detroit engine with its transmission was 15,000 pounds heavier than the Union Diesel. After installation of the new engine, some lead ballast in the R/V *Polaris* was repositioned to

maintain trim and stability of the ship.

The R/V *Polaris* has three electrical generators. Two of the units are rated at 30 kW. The third unit is rated to produce 15 kW. Collectively, all the voltages available to run ship systems and scientific equipment are: 240 volts alternating current (VAC); 120 VAC; 24 volts direct current (VDC); and 12 VDC. The three fuel tanks located in the bilge level of the vessel carry more than 2,500 gallons of diesel. Fuel consumption, with the main engine and two generators operating, used on average 10 gallons an hour at a cruising speed of 10 knots.

The R/V *Polaris* began its federal career in science research after it was acquired by the USGS in 1966 and reclassified as a research vessel. The Branch of Pacific-Arctic Marine Geology became the first science center of the USGS to operate the vessel for coastal operations until a larger vessel was acquired. The vessel with its power generators on-board could power a scientific research device called a “sparker”. It is a towed underwater sled supporting an array of electric terminals pointing upward to an electrically grounded plate. As electricity momentarily powers the terminals and shorts-out on the grounded plate, a spark of light and heat is generated much like a flash bulb of a camera. The spark vaporizes the seawater flowing past the terminals and the grounded plate. The split second when seawater cools from the spark, the collapsing bubbles of the water vapor sends an acoustical pulse of sound outward from the “sparker”. For the scientists operating the towed device, the most important part of the sound pulse strikes the geologic seabed below which is reflected upwards toward a towed hydrophone trailing underwater behind the R/V *Polaris*. Like the workings of a microphone, a hydrophone is made for collecting the reflected sound underwater. The sound captured by the hydrophone is sent to a computer on-board the ship which is programmed to create a graphic profile of the seabed. The process reveals seismic fault lines which can be studied for seismic hazards which generate earthquakes.

In 1966, the R/V *Polaris* was displayed at the American Geophysical Union conference in San Francisco with its “sparker” technology. Two years earlier in 1964, the state of

Alaska had experienced the most powerful earthquake to happen in North American history. It was recorded at 9.2 on the Richter Scale. The science community represented at the conference was interested in surveying Alaska's soil strata in search of subterranean deformation created by the earthquake. In 1967, the R/V *Polaris* was piloted to Prince William Sound in Alaska to survey underwater landscape and document the effects of the historic seismic event.<sup>5</sup>

The R/V *Polaris* was dispatched to one of the worst oil spills in U.S. history off the coast of Santa Barbara, California in 1969. A Unocal drilling rig was rocked by an uncontrollable blow-out at its wellhead on January 8, 1969 which released over 3 million gallons of crude oil into the seas near the central coast community. The ecological catastrophe contributed to the passage of the National Environmental Policy Act of 1969, as amended (NEPA) less than a year later. The R/V *Polaris* assisted with mitigation efforts of the oil spill.

The R/V *Polaris* was transferred to the San Francisco Bay Estuarine Studies Group of the USGS in 1971. The organization is dedicated to monitoring the environmental health of the Bay and its estuaries being affected by pollution and sediments entering the Bay. Estuaries are among the most ecologically disturbed natural environments in the world. Human activities have affected the estuarine ecosystem through water diversion, flow manipulation, and agriculture. To understand the impacts of human activities, scientists have always wanted to understand the natural fluctuations and processes in the ecosystem. Estuaries have complex patterns of water quality variability due to mixing zones between the ocean and the land. Fresh water, sediments, nutrients, toxic contaminants, and other materials are carried into the estuary by river flow. River flows change seasonally and from year to year. Long-term and continuous data sets are necessary to identify natural trends. Phytoplanktons (microscopic algae) occupy the base of the food web and comprise the largest component of the biomass on San Francisco Bay making it

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<sup>5</sup> Bryon Richards, "History of the R/V *Polaris*. USGS Master of the R/V *Polaris* from June 1980 to June 2009," *Water Quality of San Francisco Bay*, last accessed February 14, 2017. <https://sfbay.wr.usgs.gov/access/wqdata/overview/people/byron.html>.

necessary to document how physical and chemical parameters affect their dynamics. The complexity of all these factors with the physical adjacencies of Lee Phillips' (original owner of the R/V *Polaris*) land reclamation projects creates an irony of his yacht being used to study the environmental health of the Bay 80 years later after it was used as a reviewing platform for his clients surveying his land reclamation projects. The mission of USGS in environmental health science is to "contribute scientific information to environmental, agricultural, natural resources, and public-health managers, who use that science to support sound decision making."<sup>6</sup>

To equip the R/V *Polaris* for its new science mission, the vessel was modified with water pumps and water intakes below the waterline of the ship to provide a continuous supply of Bay water sampling while the ship is underway. In addition, a reel with a submersible pump at the end of a long hose was mounted on the stern to take water samples from various depths at over 15 stations, from the southern end of the Bay to Rio Vista on the Sacramento River and the Three Mile Slough entrance on the San Joaquin River. Other stations have been added over the years. Today, there are 36 science stations.<sup>7</sup> It is believed that the upper lab of the R/V *Polaris* was installed in the 1970s to house the science instrumentation of the expanded sample collecting. The lower lab on the accommodation deck was retro-fitted in the 1990s.

The R/V *Polaris* was upgraded for the purposes of navigation and safety by the large vessel requirements established by the US Coast Guard. The pilothouse of the vessel was equipped with raster-scan radar and an autopilot, both connected to a Sperry Mark 37 gyrocompass, Differential GPS, Loran C, video sounder, and VHF radios to meet the regulatory requirements. A fathometer was installed in the pilothouse to assist the scientist's on-board in accurately collecting samples of water and sediments. The fathometer ensures sampling is consistently collected at assigned depths and therefore

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<sup>6</sup> "About Environmental Health Science," *US Geological Survey- Environmental Health*, last accessed February 15, 2017. <https://www2.usgs.gov/envirohealth/about/>

<sup>7</sup> Bryon Richards, "History of the R/V *Polaris*. USGS Master of the R/V *Polaris* from June 1980 to June 2009," *Water Quality of San Francisco Bay*, last accessed February 14, 2017. <https://sfbay.wr.usgs.gov/access/wqdata/overview/people/byron.html>.

preserves the quality of the controlled science record used to chart natural trends.

The R/V *Polaris* was also fitted with two small hydraulic winches on the aft deck for lowering science devices used for capturing biologic organisms living near the bottom of the Bay. This activity is known as “benthos sampling”. The invasive Amur River Clam (*Corbula amurensis*) was and still is today a major organism being studied by scientists working from the R/V *Polaris* for decades. In 18 months spanning between 1986 and 1987, the Amur River Clam occupied the northern and southern parts of the Bay. The clam passively feeds on phytoplankton which is the most basic nourishment source of the food web in the Bay for all aquatic life. It is not certain how the explosive population growth of the clams will influence the biomass of the San Francisco Bay and what it will mean in the future.

Other deck mounted apparatus helps with the R/V *Polaris* science sampling operations. The vessel’s boom can be operated in conjunction with a deck winch for extraction of heavy bottom sediment sampling. The large size of the R/V *Polaris* allows the use of a box core. The corer is box shaped and is made of stainless steel to resist corrosion. The corer can measure up to 19/5/8” x 19/5/8” x 29/1/2”. Once the box corer is lowered underwater to the bottom, it sinks into the sediment. Two opposing clam-shell cups pivot downward closing the bottom of the box which captures a sample of sediment inside the box. The sediment sample is raised to the ship for examination in its laboratory. The large boom and winch is also used to lower and retrieve a Guardian Boston Whaler to the waters by the vessel. The small boat is used for shallow water benthos sampling especially in South Bay and in Suisun Bay. The Guardian Boston Whaler is capable platform for small scale grab-sampling of water and organisms living in the bottoms of the shallow estuaries.

Scientific instruments onboard the R/V *Polaris* have experienced an evolution in data recording. Much of the data was originally displayed on paper strip charts. The strip charts have been replaced by a computer running the Multiple Interface Data Acquisition System (MIDAS). MIDAS also

records data from other onboard systems, which measure air temperature, atmospheric pressure, wind speed, and direction thereby creating a multi-year synergistic picture of the environment surrounding the benthos and sediment sampling occurring on the ship.

Other modern instruments have enhanced operability of the vessel to include a Differential GPS (DGPS) and the video depth sounder in the pilothouse that provides course, speed, latitude and longitude, as well as water depth.<sup>8</sup>

#### Historical Context:

- a. Source of the Original Name: The yacht *Pasada Manana* is said to have received its name from the words “pasado manana”. The saying is loosely translated as “day after tomorrow” or “get around to it tomorrow”. It is reportedly a retort to Lee Phillips from his wife after he tried to reassure her that he would get around to some necessary task “tomorrow.”
- b. Original and Subsequent Owners: Lee Phillips was the original owner of the *Pasada Manana*. After his death in 1938, the vessel was first sold to John Grant who was an oil executive from Los Angeles. Mr. Grant was the registered owner until 1944 when the U.S. Army acquired the vessel. Under the U.S. Army, the boat became a personnel boat designated as Q109. Its primary use was to shuttle soldiers and their equipment between garrisons where the Army maintained harbor installations in and around the Puget Sound. After the war, the vessel was sold to Mr. Einar Haugen who was a professor teaching linguistics at the University of Washington in Seattle. The *Pasada Manana* was registered as a yacht complete with a master and crew of five. Haugen kept the vessel until 1950 when it was sold to Mr. Robert Fleming of Los Angeles. Haugen, who was rising to prominence in the field of linguistics probably, sold the vessel before he transitioned into his new faculty position at Harvard University. Fleming kept the boat for two years and then sold it to Mr. Robert Paysee of Chicago, Illinois. He kept the yacht through 1956 when the vessel was transferred to the Prothero Boat Company in Seattle, Washington. Shortly thereafter, the *Pasada Manana* was purchased by Alaska Charters, Incorporated. The company

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<sup>8</sup> Ibid



renamed the vessel (*Polaris*) and kept it for two years. In 1959, Ken K. Bechtel purchased the vessel. He was the son of the founder of Bechtel Corporation Ken at the time, was an executive with the international engineering company. Bechtel and his friends piloted the (*Polaris*) up and down the western coast of Canada via the Inside Passage to Alaska. He kept the (*Polaris*) for four years before putting it up for sale at a price of \$163,000. This time however, the (*Polaris*) failed to attract a new owner. Mr. Bechtel donated the yacht to the University of California at Berkeley. The vessel was once again cruising in its home waters of the San Francisco Bay. The university tried to use the vessel for a variety of purposes, but the vessel proved to be problematic. Apparently, each time it left the Richmond berth “something broke” and the expenses for upkeep, repairs, and the berth were mounting in costs for the university.<sup>9</sup> Within three years, the university decided to sell the (*Polaris*). Meantime, the U.S. Geological Survey was looking for a large vessel to operate for marine geology studies. The USGS petitioned for and received a special appropriation of \$4,000 from the U.S. Congress to purchase the (*Polaris*).

- c. History of the Vessel Type The *Pasada Manana* has the classic line and profile which was characteristic of the Pacific Northwest cruiser. They were commonly known as “Dreamboats.” This class of yacht shared a typical arrangement including the raised foredeck with sleeping accommodation, pilothouse with large windows all around over the engine space, and the covered aft cockpit. Dreamboats were rather narrow and round-bottomed, with a maximum speed of 8 knots using the low powered engines of their day.<sup>10</sup>
- d. Relationship to History The motor yacht *Pasada Manana* was christened in May of 1927. It was built for Mr. Lee Allen Phillips, then, the executive vice president of Pacific Mutual Life Insurance Company and president and director of California Delta Farms.
- Mr. Phillips was born in Ashton, Illinois on August 24, 1871.

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<sup>9</sup> Ibid

<sup>10</sup> Marty Loken, “Elegance for Everybody in the 1920’s,” *Pacific Motor Boat Design Rick Etsell, naval architect*, last assessed March 7, 2017, <http://www.pacificmotorboat.com/dreamboats/>.

He was the son of Milton Eaves and Magdelina Phillips. Milton Eaves Phillips became well known in Los Angeles, where for four years he was dean of the University of Southern California. Lee A. Phillips received his law degree at DePauw University, Greencastle, Indiana, in 1894. He moved to Los Angeles and in October 1894 he began practicing law for Cochran & Williams, a job he held until 1907.

Phillips was a man with two careers. He was initially a lawyer and insurance executive. In a later developing career, he was active in the business of draining and reclamation of land in California. Reclamation was a cornerstone movement of the Progressive era when men such as George Maxwell and William Edward Smythe argued forcefully that western lands should be reclaimed for small-scale agriculture (either by providing water through modern irrigation systems, or draining waterlogged lands). They saw this as the most appropriate way to save U.S. democracy from the labor and social crises of the Gilded Age. Their activism ensured the passage of the National Reclamation Act in 1902, which provided a federal role for development of irrigation in the West.

While it is not clear if Phillips had the reformist zeal of Smythe and Maxwell (not all advocates of reclamation were so ideologically predisposed), it does appear that he understood the value of reclamation for the development of California (and perhaps his own pocketbook). His first foray into reclamation began in 1900 when he embarked on a plan to drain the Cienega swamps west of downtown Los Angeles. Artesian wells were developed on the land after the swamps were drained. Water from the wells was conveyed to dry land between the towns of Palms and Santa Monica, thereby reclaiming more land for agriculture. The reclaimed lands were sold as small parcels to farm families. These lands were, by 1921, providing the bulk of fresh vegetables available for purchase in the Los Angeles area.<sup>11</sup>

Phillips began a more ambitious reclamation project two years after the Los Angeles project. In 1902, he acquired the Jones

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<sup>11</sup> John Steven McGroarty, *Los Angeles from the Mountains to the Sea* (New York: The American Historical Society, 1921), 235, 265, 394.

tract in the San Joaquin-Sacramento River delta. The Jones tract, one of over 70 islands and reclaimed tracts of land in the delta, is a 12,000-acre island less than 10 miles from Stockton, California. When Phillips acquired the island, the San Joaquin-Sacramento River delta had been subjected to limited development. A few settlers began building dams and levees to drain the marshy land as early as the 1860s. The state had classified the delta lands as “barren wastes,” but by the late 1860s investors began seeing the potential productivity of the marsh lands if they could be reclaimed. This awareness led to large-scale reclamation efforts in the central delta at Sherman Island and Twitchell Island beginning in 1869. Almost 18,000 acres were enclosed with levees, flumes, and tide gates through the cooperative labor of small-scale farmers. Over 40,000 acres were subsequently reclaimed in the southern third of the delta in the 1870s. The reclamation work in this region was done by large crews of Chinese laborers and a hydraulic dredge. The reclamation efforts in the California Delta had spread south by 1900, with efforts centering on the area south and east of the San Joaquin River, including the Jones tract.<sup>12</sup>

Phillips’s acquisition of the Jones tract was the beginning of a vast accumulation of land in the California Delta. He moved to Stockton in 1902 and, over the next four years organized a number of corporations (land companies and holdings companies) for the purpose of reclaiming over 100,000 acres of land in the California Delta. In 1906, the companies were consolidated under one business venture named California Delta Farms, Incorporated. Phillips served as the corporation’s president for over 20 years. California Delta Farms holdings included King Island, Bacon Island, Bouldin Island, the Rindge Tract, and islands in Contra Costa County. Land was initially leased to Japanese and Chinese framers who operated the farms on a share basis. Some land was eventually sold to individual farm families. The California Delta quickly became one of the most productive agricultural regions in California.<sup>1314</sup>

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<sup>12</sup> John Thompson, “Early Reclamation and Abandonment of the Central Sacramento-San Joaquin Delta.” *SACRAMENTO HISTORY JOURNAL*, Vol. I, (2006): 41-72.

<sup>13</sup> “Many Men Make Great Success at Raising Succulent Spud,” *San Jose Evening News*, January 22, 1907.

<sup>14</sup> John Steven McGroarty, *Los Angeles from the Mountains to the Sea* (New York: The American Historical Society, 1921), 235, 265,394.

Phillips's interest in reclamation extended beyond California, both in terms of edification and implementation. He traveled to Holland to study that nation's dike system in 1905. As president of the Pecos Valley Investment Company (not the much larger Pecos Valley Irrigation and Investment Company), he oversaw the reclamation of over 3,000 acres of desert land near Roswell, New Mexico, through development of irrigation via artesian wells. The land, by 1921, contained 700 acres of apple orchards and alfalfa fields.<sup>1516</sup>

Phillips returned to Los Angeles in 1907 to become associate counsel for the Pacific Mutual Life Insurance Company; in 1912 was chosen third vice president in charge of company investments. Six years later, he became the vice president and treasurer of the company, which held \$250 million worth of insurance policies and \$45 million of investments. A contemporary journalist describes the Pacific Mutual Life Insurance Company as "one of the most progressive insurance companies in America."<sup>17</sup> The company, formed by Leland Stanford in 1868, was, for example, the first insurance company to offer accident insurance (in 1885). Later in 1906, the company began offering no cancelable disability insurance policies and became one of the largest insurance companies on the west coast.

After returning to Los Angeles, Phillips became active in the development of the downtown business district. He financed and provided construction oversight of the Pacific Mutual Building located on West Sixth Street near Pershing Square. The building, designed by noted Los Angeles architects John Parkinson and Edwin Bergstrom, was completed in 1908. It quickly became a commercial centerpiece in Los Angeles. As a developer, Phillips also played a prominent role in the construction of the Biltmore Hotel less than a block away from the Pacific Mutual Building. The Biltmore was designed by Leonard Schultz and S. Fullerton Weaver who were two iconic architects who previously designed the Waldorf Astoria and

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<sup>15</sup> Ibid

<sup>16</sup> "Turning Barren Prairies into Orchards," *The Bessemer Monthly*, February 1914, 2.

<sup>17</sup> John Steven McGroarty, *Los Angeles from the Mountains to the Sea* (New York: The American Historical Society, 1921), 235, 265, 394.

Sherry-Netherland hotels in New York City and the Breakers hotel at Palm Springs, Florida. The Biltmore was constructed and furnished at a cost of \$10 million dollars. The hotel was opened to the public in 1923. At the time, the hotel was the largest hotel west of the Mississippi River. The Biltmore became an instant attraction. Thousands of people attended its grand opening. The hotel hosted the Academy Awards from 1931 to 1942. Phillips, thus, was responsible for the construction of two architectural landmarks in Los Angeles.

Phillips played another indirect role in developing southern California. In 1929, he created the Consolidated Rock Products Company through an \$11 million merger of smaller companies. Consolidated Rock Products, which was owned by Phillips, operated 23 producing plants and other rock product facilities and served a wide region from Santa Barbara to San Diego.<sup>18</sup>

Lee Allen Phillips's business success allowed him certain luxuries. Phillips purchased three lots in the exclusive West Los Angeles subdivision of Berkeley Square in 1905. The subdivision was conceived and constructed between 1903 and 1905 and Phillips was one of the first property owners. Envisioned as a showcase of prominent architecture among a picturesque Southern California palm-studded landscape, Berkeley Square was the model of exclusivity. The entire subdivision, including the streets, was privately owned. The neighborhood was also gated and effectively segregated.

Phillips built two homes in Berkeley Park. His first home was constructed in 1907 to coincide with his return to Los Angeles. A year later, he added a garage and servant's quarters to the rear of the property. Phillips sold his first Berkeley Park home to Willis Gustavus Hunt in 1913. Phillips purchased three additional lots to build his second Berkeley Park home in 1912—a large estate with at least 22 rooms (sources list as many as 85 rooms), in which he lived until his death in 1938.<sup>19</sup>

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<sup>18</sup>“\$11,000,000 Merger Joins Rock Plants,” *San Diego Union*, February 16, 1929.

<sup>19</sup> Duncan Maginnis, “Berkeley Square, Resurrecting a West Adams Street Lost to the Freeway,” *Historic Los Angeles*, last modified 2015, <http://www.berkeleysquarelosangeles.com/2011/05/4-second-lee-allen-phillips-house.html>.

Phillips also had a home built in the rural Beverly Hills of 1911. The house was intended to be a country retreat for his wife Catherine. Phillips owned the house until he sold it to Hollywood stars Douglas Fairbanks and Mary Pickford sometime around 1920. The new owners renovated Phillips's Beverly Hills retreat into a 22-room estate house known as Pickford.

In 1920, Phillips and Arthur C. Parsons of San Francisco, had a pleasure craft built. Parsons was a friend and business associate of Phillips, president of the Venice Island Land Company, and sales manager for California Delta Farms, Inc. The vessel was constructed by William Cyer in Oakland, was christened *Pasado Manana*.

The 1920 vessel was 65'-0" long and had a beam measuring 16'-0" and had a draft of 5'-0". The vessel had a forward cabin with private lavatory, large galley, aft main cabin, rear cockpit, and a pilothouse over the engine room near the center of the vessel. Phillips and Parsons used the *Pasado Manana* in the winter months to cruise their extensive land reclamation interests in the California delta. During summer months; however, the vessel was put to more pleasurable use. The businessmen, avid anglers, used the yacht to cruise and fish for tuna and swordfish around the Catalina Islands and surrounding waters.<sup>20</sup> In 1927, the *Pasado Manana* was sold to Willis Gustavus Hunt, president of Pioneer Paper Company. On the same year, Lee Phillips was having a new yacht constructed. Like its successor, the newly christened *Pasada Manana* was also featured in Pacific Motor Boat magazine. Mr. Phillips used the vessel much like the original *Pasado Manana*, as a business instrument transporting land reclamation speculators to view his work and proposals. This new yacht, *Pasada Manana*, eventually became known as the R/V *Polaris*.

The *Pasada Manana* was larger and more luxurious than the first vessel, *Pasado Manana*. The yacht cost more than

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<sup>20</sup> "New Sixty-Five-Foot Cruiser "Pasado Manana,"" *Pacific Motor Boat*, October 1920, 36-37.

\$150,000 (in 1927 dollars), and required six months to construct. The vessel was designed by A. E. Hudson and built by H. C. Carlson of the Wilmington Boat Works of Wilmington, California. He continued to monitor his land reclamation interests from the deck of the new yacht and his love for fishing remained unabated. The vessel was used for sport fishing of swordfish and marlin. Apparently, Phillips took the *Pasada Manana* to Canada during prohibition to purchase whiskey.<sup>21</sup> The contraband was hidden behind some of the vessel's wall panels in metal tanks. Considerably larger than the original yacht, this vessel could sleep 13 guests aft and a crew of 4 and was used as a "floating hotel" for Phillips and his guests which included former U.S. President Herbert Hoover in September of 1933.

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Starboard view of R/V *Polaris* underway. Photograph taken in 2009  
by JMS Naval Architects Salvage Engineers.

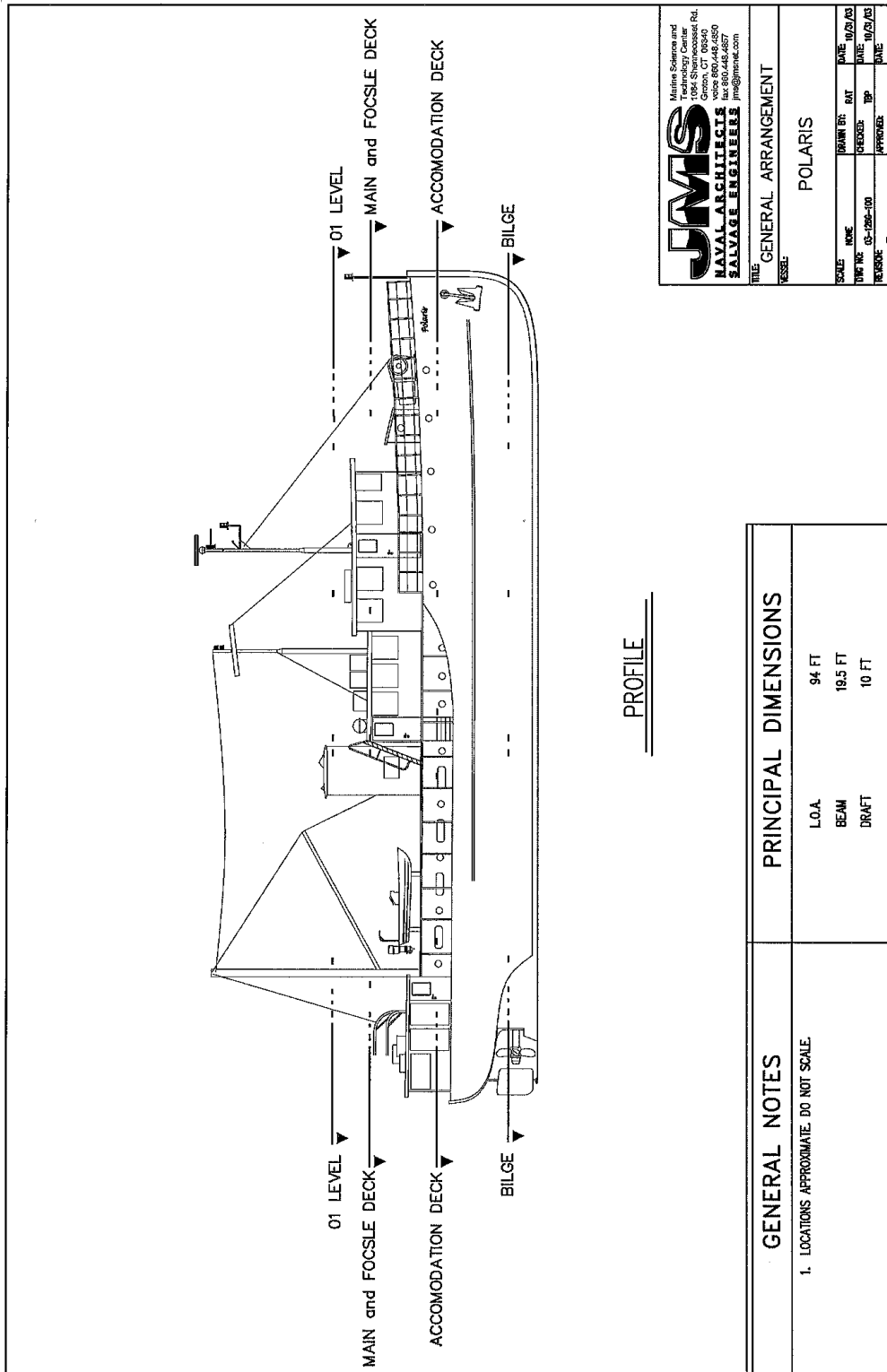


Stern view of the R/V *Polaris* from port side in dry dock.  
Photograph taken in 2009 by JMS Naval Architect Salvage  
Engineers.



Upper laboratory (foreground), Pilothouse (back ground).  
View from starboard side of R/V *Polaris*. Photograph taken by  
Jayne Aaron on October 23, 2012

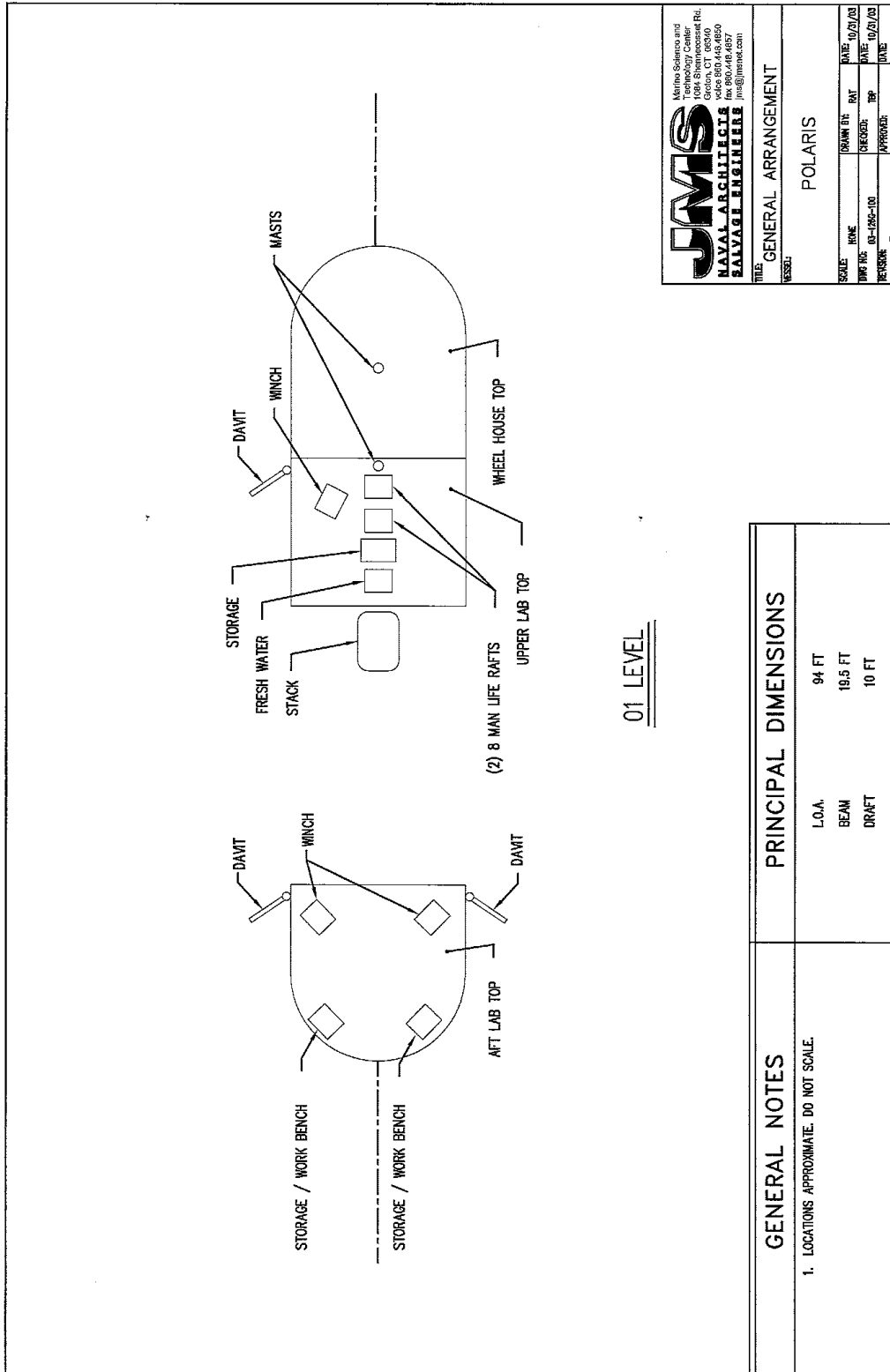
Line Drawings:



**JMS**  
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 Marine Science and Technology Center  
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 jms@jmsmat.com

TITLE		GENERAL ARRANGEMENT	
PROJECT		POLARIS	
SCALE	DATE	DRAWN BY	DATE
1:100	03-1995-100	BT	10/23/03
REVISED	APPROVED	TOP	DATE

Line drawing depicting Profile of R/V *Polaris* with Deck Levels  
 Drawing completed on Oct. 31, 2003 by JMS Naval Architects Salvage Engineers



01 LEVEL

**JMS** Marine Science and Technology Center  
 1046 Shattuck St. Ft. Lauderdale, FL 33304  
 Phone: 800-443-4850 / 954-576-1100  
 Fax: 800-443-4857 / 954-576-1100  
 jms@jmsnet.com

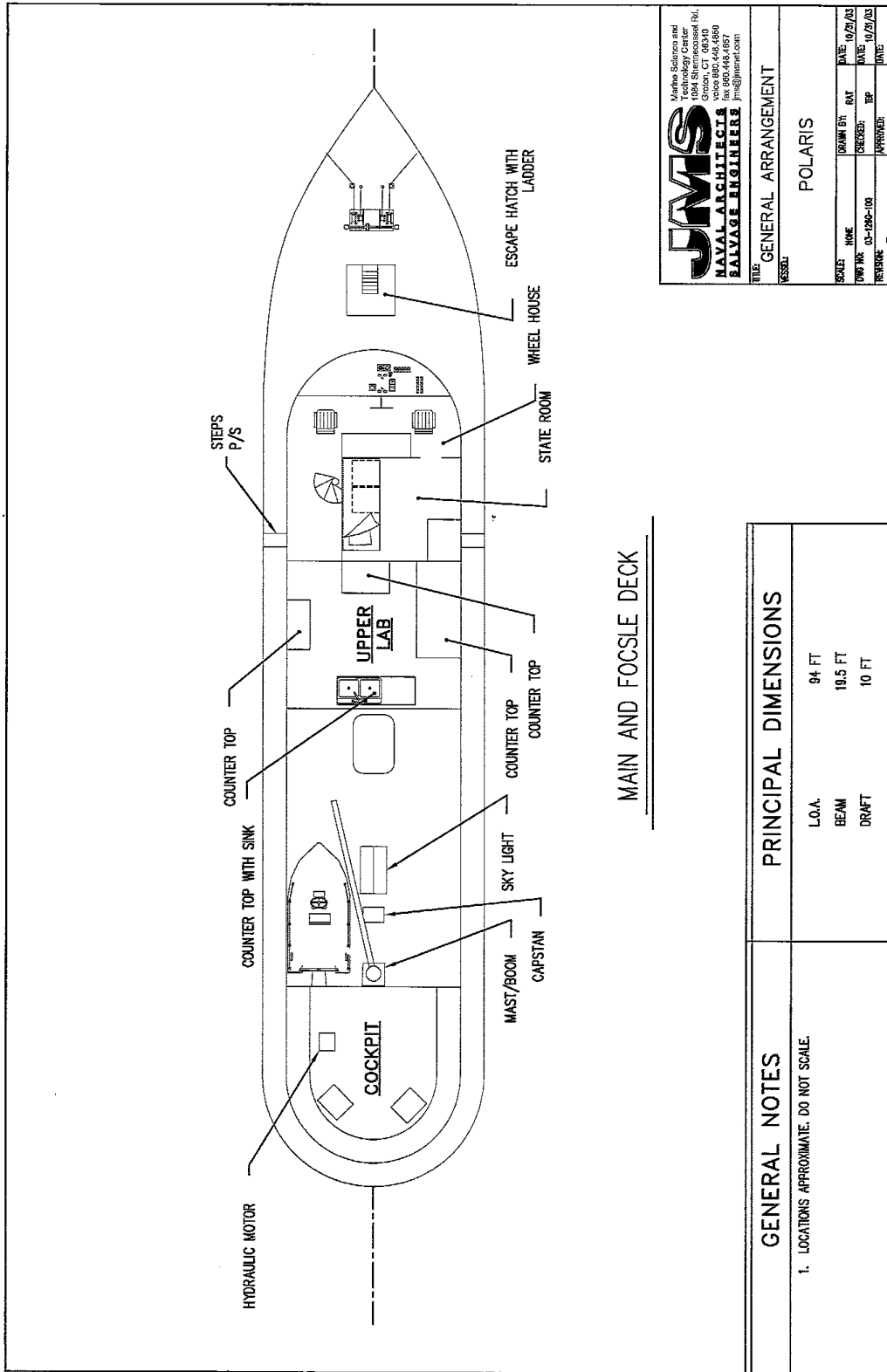
**JMS**  
 NAVAL ARCHITECTS  
 SALVAGE ENGINEERS

TITLE: GENERAL ARRANGEMENT  
 VESSEL: POLARIS

SCALE:	DATE:
REV:	DATE:
DESIGNED BY:	APPROVED BY:
CHECKED BY:	DATE:
DATE:	DATE:

GENERAL NOTES	PRINCIPAL DIMENSIONS
1. LOCATIONS APPROXIMATE. DO NOT SCALE.	L.O.A. 94 FT BEAM 19.5 FT DRAFT 10 FT

Line drawing depicting 01-Level of R/V *Polaris*  
 Drawing completed on Oct. 31, 2003 by JMS Naval Architects Salvage Engineers



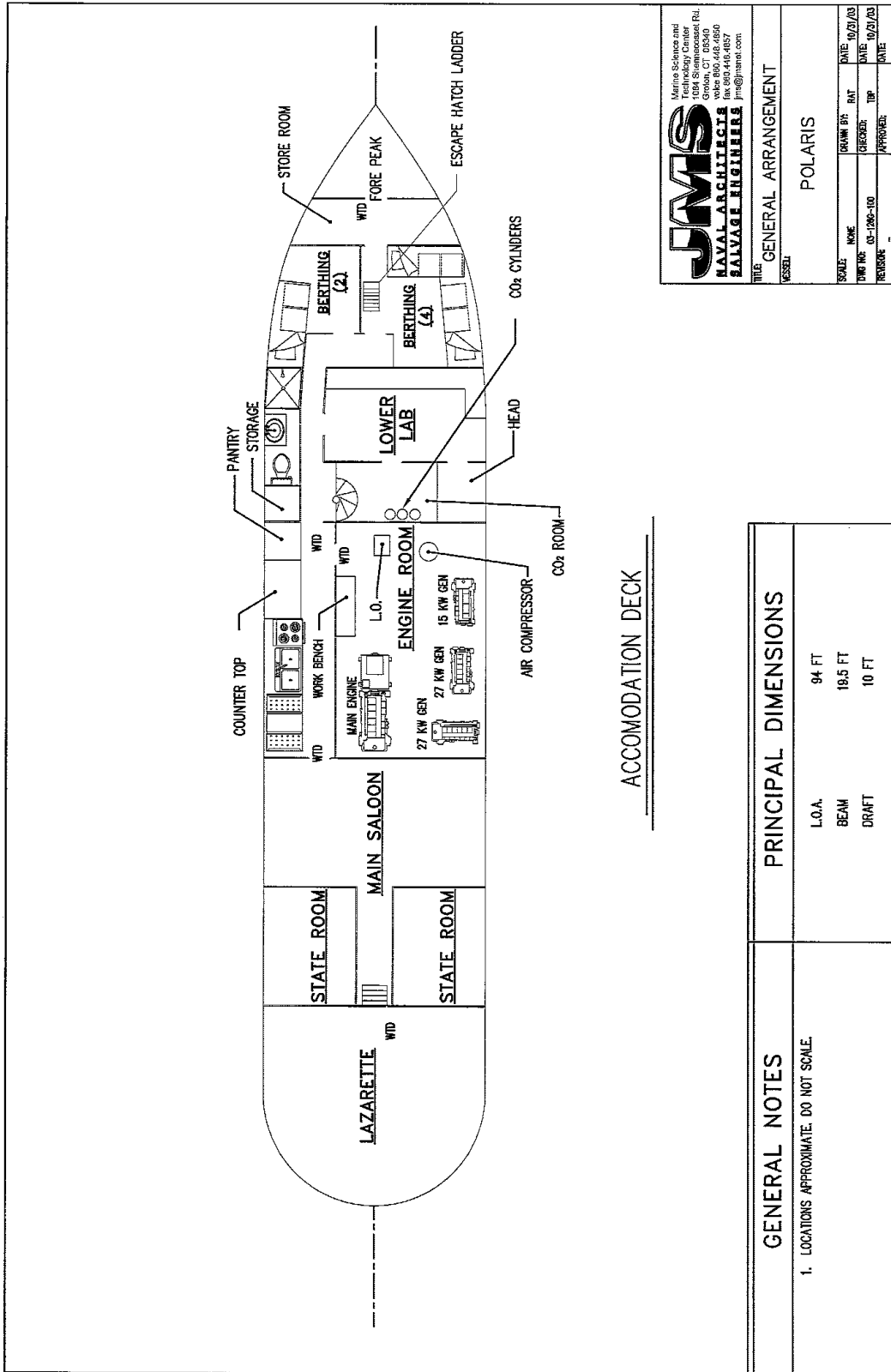
**JMS**  
 Naval Architects  
 Salvage Engineers  
 Jms@jmsnet.com

TITLE: GENERAL ARRANGEMENT	
PROJECT: POLARIS	
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DRAWN BY:	CHECKED: JEP
DATE: 10/29/03	DATE: 10/29/03
DESIGNED BY:	APPROVED:

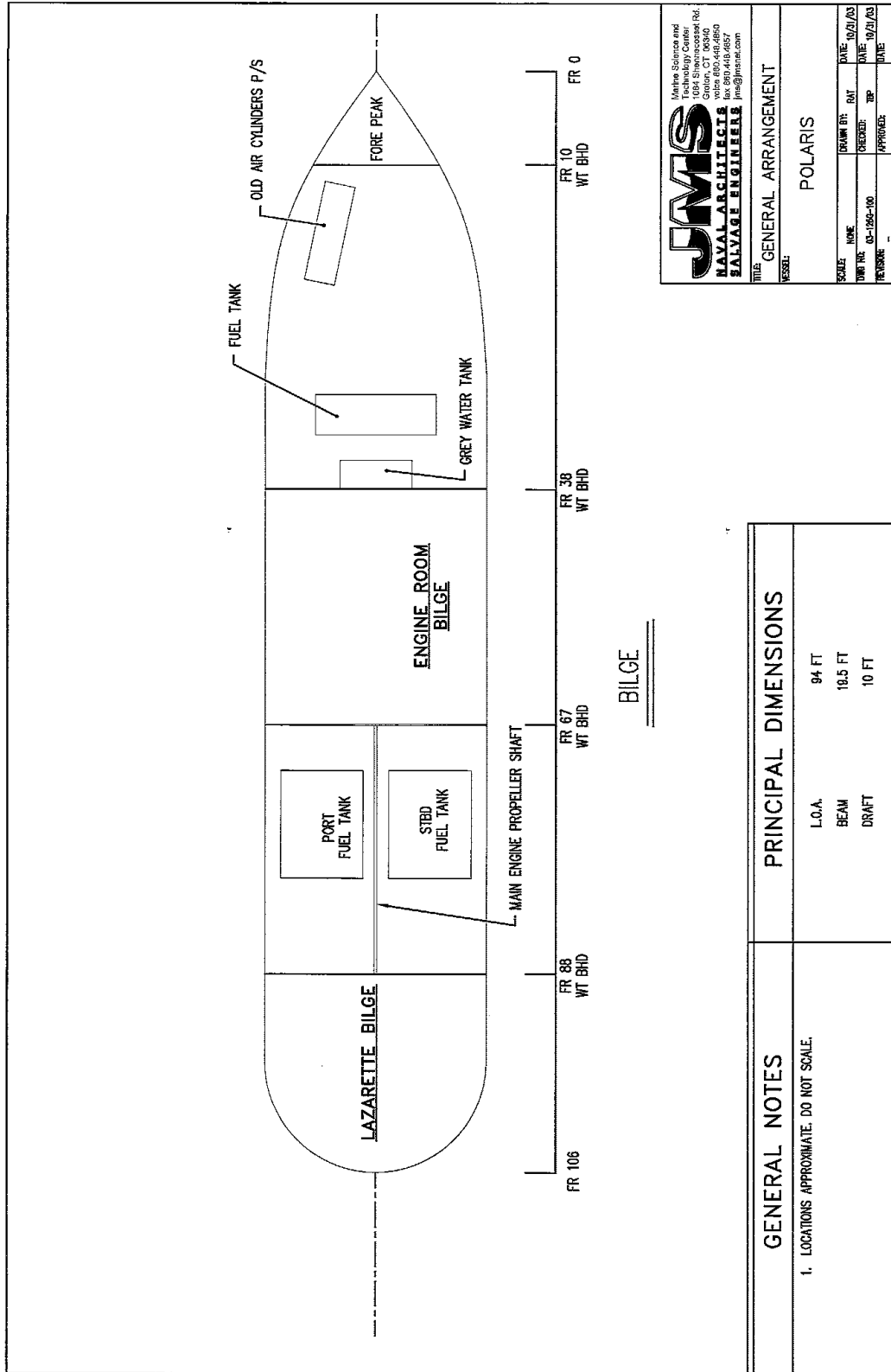
MAIN AND FOCSE DECK

GENERAL NOTES	PRINCIPAL DIMENSIONS		
	L.O.A.	94 FT	
	BEAM	19.5 FT	
	DRAFT	10 FT	
1. LOCATIONS APPROXIMATE. DO NOT SCALE.			

Line drawing depicting Main and Focsle Deck of R/V Polaris  
 Drawing completed on Oct. 31, 2003 by JMS Naval Architects Salvage Engineers



Line drawing depicting Accommodation Deck of R/V *Polaris*  
 Drawing completed on Oct. 31, 2003 by JMS Naval Architects Salvage Engineers



Line drawing depicting Bilge of R/V *Polaris*  
 Drawing completed on Oct. 31, 2003 by JMS Naval Architects Salvage Engineers