



August 27, 2015

MEMORANDUM

TO: Bill Morhoffer, Incident Management District 14, USCG

FROM: James P. Delgado, PhD, Director of Maritime Heritage, and
Lisa Symons, Damage Assessment and Resource Protection Coordinator

SUBJECT: Site Characterization USNS *Mission San Miguel*

REF: USCG-NOAA MOA-2009-20/7848

General Background

A recent survey of opportunity in August 2015 has allowed for a more detailed assessment of the wreck of USNS *Mission San Miguel*, a Remediation of Underwater Legacy Environmental Threats (RULET) target classified as a High/Medium Risk, and the highest ranked potentially polluting wreck in U.S. Coast Guard District 14. The RULET assessment was conservative and reflected the lack of information on both location and structural integrity. The vessel was located on August 3, 2015 and a preliminary archaeological assessment was undertaken.

The original RULET assessment notes:

For the Worst Case Discharge, USNS *Mission San Miguel* scores High with 15 points; for the Most Probable Discharge (10% of the Worst Case volume), USNS *Mission San Miguel* scores Medium with 13 points. Given these scores, NOAA would typically recommend that this site be considered for further assessment to determine the vessel condition, amount of oil onboard and feasibility of oil removal action. However, given the moderate/low level of data certainty and that the location of this vessel is unknown, NOAA recommends that surveys of opportunity be used to attempt to locate this vessel and that general notations are made in the Area Contingency Plans so that if a mystery spill is reported in the general area, this vessel could be investigated as a source. (See Table 1.)

The wreck of USNS *Mission San Miguel* was rediscovered during an annual Rapid Ecological Assessment and Monitoring (RAMP) cruise that had an additional annual maritime heritage component in the waters of Papahānaumokuākea Marine National Monument aboard the NOAA vessel *Hi'ialakai*. This work follows on previous work in September of 2002 on a previous RAMP expedition. (Van Tilburg 2002, 2003) The vessel lies close to the reported area of its loss, in 80 feet of water off Maro Reef. An archaeological team of Jason T. Raupp, Melissa Price, Rebecca Weible, Andy Collins, and Kelly Gleason Keogh documented the site and prepared a site drawing and a site report (Raupp et.al. 2015).



Table 1. *Original* summary matrix for the vessel risk factors for USNS *Mission San Miguel*.

Vessel Risk Factors		Data Quality Score	Comments	Risk Score	
Pollution Potential Factors	A1: Oil Volume (total bbl)	Medium	Maximum of 14,500 bbl, not reported to be leaking	Med	
	A2: Oil Type	High	Bunker oil is diesel, a Group II oil type		
	B: Wreck Clearance	High	Vessel not reported as cleared		
	C1: Burning of the Ship	High	No fire was reported		
	C2: Oil on Water	High	Oil was reported on the water; amount is not known		
	D1: Nature of Casualty	High	Ran aground on coral reef		
	D2: Structural Breakup	Low	Unknown structural breakup		
Archaeological Assessment	Archaeological Assessment	Low	Limited sinking records were located and no site reports exist so an accurate assessment could not be generated	Not Scored	
Operational Factors	Wreck Orientation	Low	Unknown	Not Scored	
	Depth	Low	Unknown		
	Visual or Remote Sensing Confirmation of Site Condition	Low	Location unknown		
	Other Hazardous Materials Onboard	Medium	No		
	Munitions Onboard	High	No		
	Gravesite (Civilian/Military)	High	No		
	Historical Protection Eligibility (NHPA/SMCA)	High	NHPA and SMCA		
			WCD	Most Probable	
Ecological Resources	3A: Water Column Resources	High	Trade winds and current spread oil into deep water; under some conditions the highly sensitive Maro Reef communities could be at significant risk	Med	Med
	3B: Water Surface Resources	High	Very high seasonal densities of birds, sea turtles, and marine mammals present	High	Med
	3C: Shore Resources	High	Very high seasonal densities of birds, sea turtles, and marine mammals on and around Laysan and Lisianski Islands	High	Low
Socio-Economic Resources	4A: Water Column Resources	High	Recreational diving activities, as well as the Northwest Hawaiian Marine National Monument could be at risk	Med	Med
	4B: Water Surface Resources	High	Recreational diving activities, as well as the Northwest Hawaiian Marine National Monument could be at risk	Med	Med
	4C: Shore Resources	High	Could be a major impact on the wildlife study areas Laysan and Lisianski Islands	Med	Med
Summary Risk Scores			15	13	

The 2015 assessment focused on documenting the characteristics of the site and comparing this data with plans for USNS *Mission San Miguel* as part of an archaeological exercise to identify the wreck and to assess its archaeological integrity as a site potentially eligible for listing in the National Register of Historic Places.

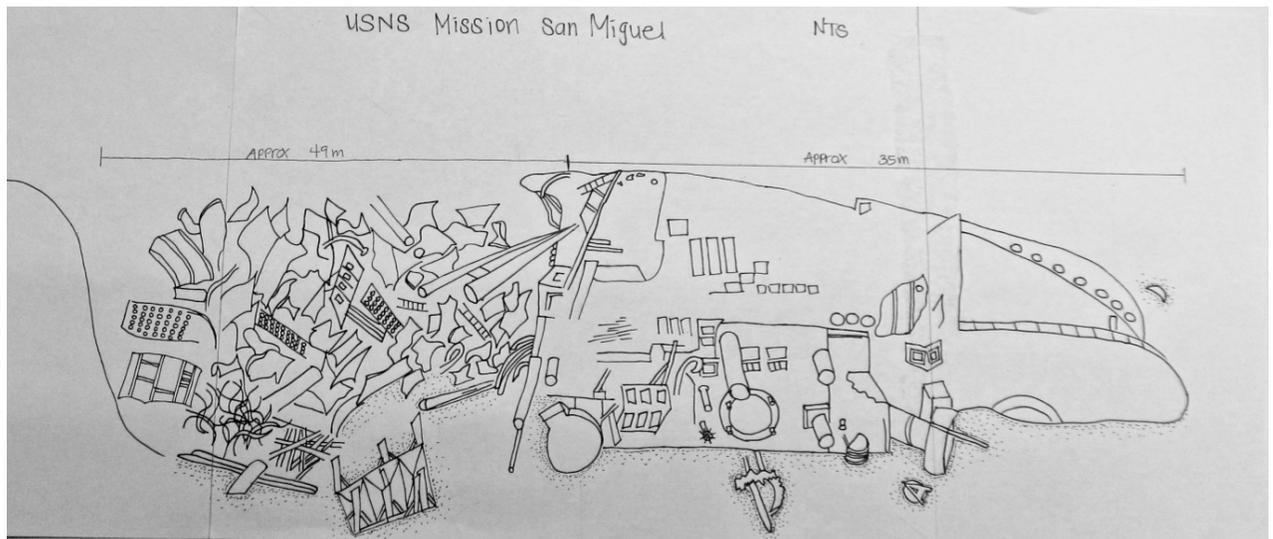


Figure 1: Mud Map of USNS *Mission San Miguel* (Rebecca Weible)

General Observations/Archaeological Assessment for RULET Purposes

The shipwreck of USNS *Mission San Miguel* as observed by the archaeological team and documented in their report (based on assessment dives made on August 3 and 4) note:

The wreck lies at a bearing of 080° and consists of three main sections. These include the largely intact stern section of the ship, which rests on its port side and rises from approximately 24 m (80 feet) at the seabed to a depth of 8.8 m (29 feet) below the water surface; the aft cargo tank section, which is located directly forward of the stern and is mostly collapsed; and an area thought to represent the tanker's bow located approximately 165 m (540 feet) east and northeast of the stern section and includes two anchors and chain, numerous components of deck machinery, and scattered sections of hull plate and piping in depths ranging from 1.5 to 10.5 m (5 to 35 feet). Each of these aspects of the vessel's deposition closely matches historical data pertaining to the USNS *Mission San Miguel*. According to the US Navy reports, when salvage operations were terminated the 160m (524 foot) long tanker was aground with a bearing of 075° and drew four feet in the forward part and 83 feet in the after portion (Raupp et. al. 2015).

The historical record, which includes US Navy salvage reports and damage assessment from the unsuccessful attempt to recover the vessel at the time of its wrecking on Maro Reef, along with a detailed assessment of the record by archaeologist Hans Van Tilburg, makes it clear that the tanker was in ballast at the time of loss, with no cargo (fuel oil and gasoline) on board (Van Tilburg 2003, USCG 1958). USNS *Mission San Miguel* was fueled and after running for five days had consumed approximately 1700 barrels of Navy Special Fuel

(No.5) out of a 14,700 barrel capacity. The fuel oil was carried in two tanks, which were located aft of the engineering compartment bulkhead.

In reviewing the data from the August 3-4 survey, it is apparent that the disintegration of the majority of the hull of the vessel extends to the engineering spaces in the stern. As the vessel sank and moved deeper, it is likely that the vessel twisted and broke apart. The bow, being the most shallow portion of the wreck, has collapsed and broken apart. Only the stern is intact. Structural collapse of all but approximately 100 feet of the 558 foot hull includes the fuel oil tank on the starboard side of the stern. About 18 feet of the port side and therefore the port fuel oil tank is buried in the sand bottom. The archaeological team believes that, while this tank may not be collapsed, it may have opened up to some extent due to the pressure of the wreck. They observed no oil or sheening on the site. Divers did not enter the wreck but visible overhead spaces did not contain any obvious oil (Raupp et.al. 2015).

Conclusions and Updated Risk Assessment

The only other archaeological work that could be undertaken would be excavation of the buried port tank area but that is not recommended. The existence of oil residue or trapped oil beneath portions of the intact stern is possible, but we believe the amounts would be minimal.

The survey of the wreck has provided information that allows NOAA to update the Vessel Risk Factors used for determining potential pollution risk. NOAA ran a revised Pollution Risk Factor assessment and the Pollution Potential score for the vessel is now LOW for worst case discharge and LOW for most probable discharge. This downgrade is based on the change in our knowledge of the wreck site, particularly the lack of remaining structural integrity in the areas of the wreck that would have held fuel oil.

Table 2. Revised matrix for the vessel risk factors for USNS *Mission San Miguel*

Vessel Risk Factors		Data Quality Score	Comments	Risk Score
Pollution Potential Factors	A1: Oil Volume (total bbl)	Medium	13,000 bbl, not reported to be leaking	LOW
	A2: Oil Type	High	Navy Special Fuel Oil (#5)	
	B: Wreck Clearance	High	Vessel not cleared	
	C1: Burning of the Ship	High	Vessel did not burn	
	C2: Oil on Water	High	Oil was reported on the water; amount is not known	
	D1: Nature of Casualty	High	Ran aground on coral reef	
	D2: Structural Breakup	Low	Vessel broke into two pieces and bow broke apart, only stern intact	
Archaeological Assessment	Archaeological Assessment	High	Vessel has collapsed and broken apart, leaving only the stern engineering spaces intact. One fuel tank has broken open and collapsed and the other is buried, most likely is breached and collapsed.	Not Scored
Operational Factors	Wreck Orientation	High	Linear, on port side at 80 degrees.	Not Scored
	Depth	High	80 feet	
	Visual or Remote Sensing	High	Visual confirmation.	

	Confirmation of Site Condition			
	Other Hazardous Materials Onboard	High	No	
	Munitions Onboard	High	No	
	Gravesite (Civilian/Military)	High	No	
	Historical Protection Eligibility (NHPA/SMCA)	High	NHPA and SMCA	

References

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