MC252 Deepwater Horizon Oil Spill
ADCP-Measured Currents Monitoring Plan
Amended February 18, 2011

September 2010 Maintenance Mission

Originated as a requirement by:
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Revised to a proposed plan by: Robert Mulcahy (CSA)

Background and Scope of Work

Following the authorization of the initial study plan which included the installation of an ADCP current meter array, it was decided that several changes to the study were required to meet the objectives of the program. These objectives were to improve NRDA water sampling locations and refine data inputs into fate and transport models. The first change was to provide real time Acoustic Doppler Current Profiler (ADCP) data retrieval using a UHF telemetry buoy, and the second was to include an additional ADCP at a minimal cost to the program to collect real time bottom current data. In addition to these changes, a chase boat was added to the deployment methodology for safety considerations during mooring deployment. Due to SIMOPS issues with acoustics during the initial deployment, the site location was changed while at sea which added an additional 2 days of field time to the installation. This location change moved the array further from the MC252 well to avoid acoustic interference from the ADCP array with SIMOPS operations. A discussion of these study plan amendments are presented below.

The initial proposed concept for ADCP data retrieval included the deployment of an ADCP mooring that provided acoustic telemetry from the subsurface ADCP's to a mobile transceiver on a vessel of opportunity. Because the data would be retrieved on an irregular schedule based on the availability of other vessels, it was decided that this would be insufficient to support the objectives of the overall study plan to define in real time where the oil plumes both surface and subsurface were moving. The inclusion of the telemetry buoy will allow for more reliable inputs to the various models being used to map the oil plume. In addition, a bottom scanning ADCP has also been added to cover current measurements for the depth range from 4,000 to 5,000 ft. Other ADCP data from BP assets covering mid and deep water currents are available and have been summarized previously; however, their availability to the program in real time is limited. The additional ADCP greatly benefits the overall program objectives.

In addition, the deployment methodology have been reviewed by SIMOPS, and based on mutual conversations concerning safety during deployment; a chase boat to protect equipment and people will be required. During mooring deployment, the ADCP components (flotation buoys, wire rope and instruments) are laid out behind the vessel, and a chase boat is required to "guard" the area around the deployed array and keep other vessels a safe distance from the operation. The chase boat will be required for ADCP mooring and telemetry buoy installation and subsequent maintenance operations.

This amendment covers the costs to build, integrate and install the new bottom ADCP array, the UHF Telemetry Buoy, 2 months array deployment and data analysis and the vessels required for the maintenance and deployment activities.

Instruments specifications required

- Specialty Devices Inc. (SDI) Ultra High Frequency Telemetry Buoy.
- Teledyne 75kHz Long Ranger ADCP

Vessel

The M/V Rachel Bordelon is planned to deploy the instrumentation. All deployment and lifting equipment required to deploy the array has been previously accounted for in the initial authorization. The vessel can accommodate 12 scientific/technical staff. The M/V Emily Bordelon is proposed as the safety boat for the installation of the ADCP mooring and the telemetry buoy.

Schedule

The cruise for this amendment is planned for September 2 thru the 6th, 2010. The telemetry buoy deployment follows fabrication 5 weeks from authorization.

The following costs are anticipated for the proposed amendment:

Amendment Costs		Total
Buoy and ADCP Telemetry Integration & Preparation (telemetry package purchase and component integration)		$112,309
Telemetry Buoy Installation (Site Mobilization and Vessel day rate plus labor for 6 day effort)		$208,992
Deep Water ADCP (2 month deployment and labor for data reduction and processing)		$21,374
Chase Boat Covers both installations (ADCP & Tele Buoy)		$108,772
Total		**$451,447**

Data Management

All electronic data collected during the maintenance cruise will be saved to an on-board computer and migrated to a dedicated external hard drive of sufficient capacity. The data will be controlled and managed under project protocols, including Chain-of-Custody tracking of the external hard drive and the electronic data it contains. At the end of the maintenance cruise, the external hard drive will be immediately duplicated in full, and a duplicate external hard drive or DVD will be provided to the trustees along with appropriate documentation. The original external hard drive will also be copied by and for Cardno ENTRIX. The original hard drive provided to the trustees shall be kept in a secure facility in trustee custody.

If previously-collected data from the ADCP array has not been provided, Cardno ENTRIX shall provide to the Trustees a copy of the raw data, including all necessary metadata, collected by the ADCP array. Cardno ENTRIX makes no representation as to the accuracy, usability, or validity of the raw data provided to the Trustees because the data has not been subject to QA/QC review.

Additionally, following the cruise activity in which the system will be repaired and serviced, daily transmission of the ADCP-collected data will begin. The telemetered data logger packets are sent hourly as a binary file via iridium satellite link to a CSA email address. These individual binary files for a given 24-hour period will be combined by CSA into a large data file for monthly distribution via DVD to both Trustees and Cardno ENTRIX. Note that telemetered data from each ADCP is received via satellite on an hourly basis; the data is broadcast at 15 minutes past each hour for the 300kHz ADCP and at 45 minutes past the hour for the 75kHz meter. These data transmittals can be interrupted due to sea state and atmospheric conditions and can be limited to a minimum of one hour or longer based on weather conditions on site. Therefore the telemetered data can have data gaps. However, the raw data is not compromised internally and the full data set will be collected and provided when the ADCP meter is downloaded either via acoustic modem or during the quarterly ADCP maintenance cruises. The data collected via telemetry can be viewed and processed with the data gaps but the data will be for draft and visual use only and will be identified as such when presented to specified data managers. The full set of raw data collected via acoustic modem or during the quarterly ADCP maintenance cruises will be provided to Cardno ENTRIX and the Trustees as described above.

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Approvals

Approval of this work plan is for the purposes of obtaining data for the Natural Resource Damage Assessment. Parties each reserve its right to produce its own independent interpretation and analysis of any data collected pursuant to this work plan.

BP Approval:

Printed Name	Signature	Date
Lawrence K. Malnor	[signature]	Aug 30, 2011

Federal Trustee Approval:

Printed Name	Signature	Date
Lisa DiPinto	[signature]	8/17/2011

Louisiana Trustee Approval:

Printed Name	Signature	Date
for KOLAND GUIDRY HAROLDON DEBUSSCHERE	[signature]	4/4/2012