**Liquid Robotics, Inc.**

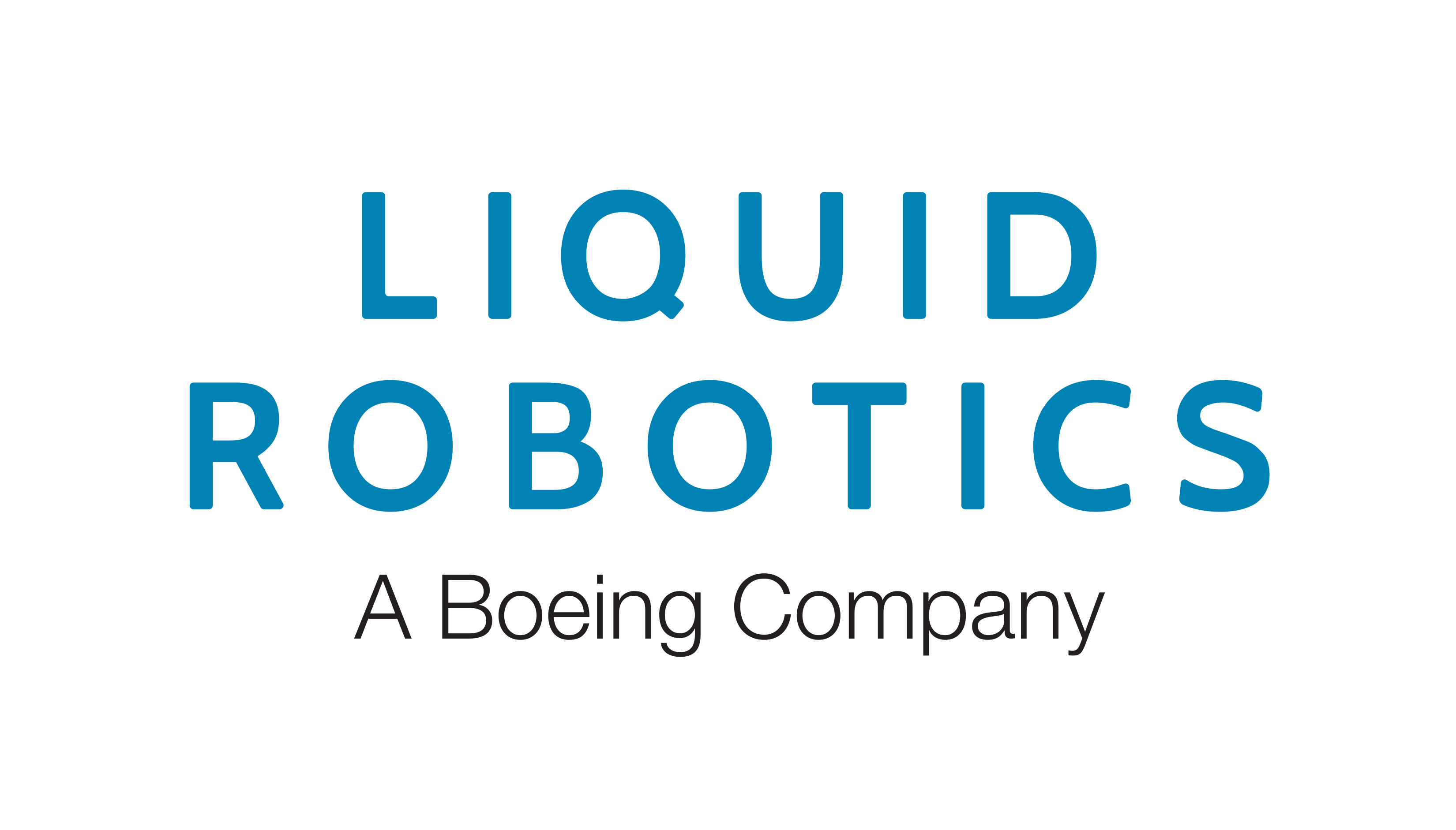
**Field Operations**

**Dalhousie University, Ocean Tracking Network**

**Mission Plan**

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460 Herndon Parkway

Herndon, VA 20170

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# Executive Summary

**Client:** Dalhousie University, Ocean Tracking Network **Mission Date Range:** 250604 - 251104 (153 days)

**Mission Point-of-Contact:** Jimmy Board **Wave Glider Info:** 1ea SV3v300 (SN1121)

**Theater of Operations (ADT, UTC-3):** Scotian Shelf**,** E.Newfoundland, W. Labrador Sea

**Mission Description and Objectives:** SV3-1121 will offload data from several arrays of bottom-mounted Vemco VR4-UWM acoustic receivers: two stuck stations near the Gully MPA, two short lines of receivers (13 receivers total) on the Grand Banks of Newfoundland, and a larger, expansive array of 75 receivers off Eastern Newfoundland and Labrador (NCAT). After completing the offloads, the glider will transit back towards Banquereau Bank to perform surveys in a potential area for offshore wind energy development.

* Task 1: Deploy outside Halifax Harbour and perform platform/sensor functionality checks (1 day);
* Task 2: Transit to Gully MPA to attempt offload of two “stuck” receivers ~192nm (8 days);
* Task 3: Transit to HaliBT east receiver line, offload six receivers, 333nm (14 days);
* Task 4: Transit to HaliBT west receiver line, offload seven receivers, 158nm (6 days);
* Task 5: Return transit to HaliBT east receiver line, 155nm (5 days);
  + Check ice in NCAT array - if clear continue to Task 6 or repeat Task 4/5.
* Task 6: Transit to start of NCAT receiver array 300nm (14 days);
* Task 7: Offload 75 VR4 receivers, split into 18 “gates” ~880nm circuit (50 days);
* Task 8: Transit to Banquereau Bank, 540nm (17 days);
* Task 9: Survey Banquereau Bank as area of interest for offshore wind energy, TBD (30 days);
* Task 10: Transit to Halifax Harbour for recovery 215nm (8 day).

**Special Operational Considerations:** Dalhousie to pilot M-F ~14:00-02:00 UTC, WGOC to pilot evenings and weekends. There will be times when Dalhousie will do 24H piloting operations for data offloads. This will be communicated to the Mission POC and WGOC in advance.

* As per Canadian small MASS regulations, Dalhousie will always have a Master on Standby (MOS) available for emergency contact. The MOS contact information will be shared each shift via WGMS.

**Operational Risk Assessment Summary:** Mission involves risk factors that can only be partially mitigated. Client is aware of the following risks and is instructing LRI to proceed with Piloting Services:

* **Currents/Eddies:**
  + **Scotian Shelf:** The Scotian Current is a dynamic feature in the area, usually seen 25-75nm from shore, running parallel to the coast. Currents can range from 0.25-1.5knots.
  + **E Newfoundland/W Labrador Sea**: May experience strong surface currents from the inshore branch of the Labrador Current measuring approximately 100km wide and 150m deep. This inshore branch flows southward following underwater topography through the Avalon Channel and continues to follow bathymetry around the Avalon Peninsula and southern Newfoundland, branching into western and southern flows. Will attempt to keep glider offshore of the current when transiting towards the receivers.
* **Waves:** Predominantly wind dependent. Typically, 1-2m with 8 second periods in the morning and can grow over 3m with 10s period in the afternoon.
  + **E Newfoundland/W Labrador Sea:** In September and October, the mean direction of significant waves is from the SW or W, as a result of southwesterly or westerly wind waves and swell. Tropical storms may occur during summer and early winter, but most often occur from late August through October. Hurricanes are generally reduced to tropical or post-tropical storms by the time they reach this area but may still produce gale force winds and high waves.
* **Solar**:
  + **October:** Approx. 10-12 hours of daylight expected. Often extended periods of sea fog and/or cloud cover. Power management and duty cycling protocols should be in place and referenced at each change of shift to avoid oversight.
* **Bathymetry**: Online depth charts were used to estimate bathymetry.
  + **Task 6**: Transit to NCAT array off east coast of Newfoundland. The glider will remain east of Virgin Rocks/Eastern Shoals off Newfoundland, but otherwise no known bathymetry concerns. An exclusion zone has been created.
* **Ice:** Icebergs off eastern Newfoundland and Labrador.
  + **Task 7:** Will monitor daily iceberg charts provided by the NAIS and will be required to avoid areas with known icebergs.
* **Hazards to Navigation**: There will be fisheries operating at this time. Difficult to know specific locations of fishing activity. Reviewing potential fisheries and will update if I get more information.
  + **Task 1/2 (deployment, transit):** NAFO Div 4WVs
    - Inshore lobster LFA 31b/32 open until June 19th. Glider to move offshore once clear of Halifax shipping lanes.
    - Groundfish fisheries open – halibut, flounder, cod, skate.
    - Snow crab CFA 23 and 24E open to August 31. Glider will transit here but will avoid historical landing areas.
  + **Task 3/4/5 (transit/offload, Grand Banks):** NAFO Div 3O (brief time in 3Ps). Transit between receiver lines has potential for increased fishing activity. May need to adjust waypoints once we’re in the area.
    - Lobster fishery LFA 9/10 open Apr 20-Jul 30.
    - Snow crab 3Ps closes July 7 and 3LNO closes July 31.
    - Groundfish – redfish mainly May-Oct otter bottom trawl, Atlantic halibut, cod open July 25-Oct 30, white hake, monkfish, skate.
  + **Task 6/7 (transit/NCAT offloads):** NAFO Div3KL
    - Lobster closes July 15th, glider likely in the area after closing date.
    - Snow crab 3LNO closes July 31st. Mostly clear when glider in area.
    - Groundfish typically late July through fall: Greenland halibut primarily June-August northern boundary between 3K/3L, cod 3KL open July 25 to Oct 30th with use of gillnets, longline, handline and cod pots authorized,
    - Northern shrimp northern boundary between 3K/3L.
    - Potentially other fisheries – capelin June-August, herring.
  + **Task 8/9 (transit/Banquereau)**: Need to do more research for Banquereau. Known scallop fishery SFA 25, Arctic surf clam year-round.
* **Vessel traffic:** There will be increased large vessel traffic in shipping lanes outside Halifax Harbor and along southern Newfoundland, as well as typical shipping traffic across the Scotian Shelf. We expect some increased fishing vessels during our survey on the Grand Banks, as well as, intermittent traffic from fishing vessels in the NCAT offload/study area.

Diagram

Description automatically generated with low confidence

Figure Inbound commercial shipping traffic - Scotian Shelf and Cabot Strait

A picture containing text, post, laser

Description automatically generated

Figure Inbound commercial shipping traffic - Grand Banks of NL

* **Political Interests:** During our transit to/from Newfoundland, we will remain south of the French territory of St Pierre Bank.

Awaiting data from ORA, but based on past missions:

Green = Nominal risk Yellow = Moderate risk Red = High risk

*Risk type Risk Level Risk Mitigation*

Bathymetry = Exclusion zones around all shallow banks

Navigational Authority = Where possible, steer glider out of peak current flow

Power Margin = Duty cycle payloads, two APUs

Severe Weather = Monitor wave height, use ESS courses when >5m

Vessel Traffic = File LNM, light bar, and auto-avoid

Hazards to Navigation = Monitor nearshore traffic when close to shore

Political Interests = Transit south of French Territory

**Local Authorities & Permitting:** Request for publication in Regional Navigational Warnings (NAVWARNs) to be submitted 24-48 hours ahead of deployment.

# Key Stakeholders

|  |  |  |  |
| --- | --- | --- | --- |
| Points-Of-Contact | | | |
| Client POC: | Adam Comeau (Dalhousie) [adam.comeau@dal.ca](mailto:adam.comeau@dal.ca) + 1 902 456-1329 (cell) | Mission POC: | Mike Kelley Mission Support Specialist mike.kelley@liquid-robotics.com +1 571 519-3505 |
| Data QC: | Ellis Keener-LaCroix (Dalhousie) [ekeener-lacroix@oceantrack.org](mailto:ekeener-lacroix@oceantrack.org) | Field Ops Mgr: | Lorraine Day Field Support Operations Manager Lorraine.day@liquid-robotics.com |
| Field Ops Eng./Tech: | Sue L’Orsa (Dalhousie) [s.lorsa@dal.ca](mailto:s.lorsa@dal.ca) +1 250 877-8052 (cell) | WGOC Mgr: | Mike Kelley Mission Support Specialist mike.kelley@liquid-robotics.com +1 571 519-3505 |
| Acct Rep.: | Jimmy Board Senior Manager, Business Dev. [jimmy.board@liquid-robotics.com](mailto:jimmy.board@liquid-robotics.com) +1 408 806-8580 | WGOC: | Pilot-in-Charge Mission Support Specialists [opscenter@liquid-robotics.com](mailto:opscenter@liquid-robotics.com) +1 408 636-4205 |

## Roles and Responsibilities

**Client Point-of-Contact:** If deployment is on behalf of an external client, Client POC is the primary liaison to the Mission POC to coordinate mission objectives and communicate deviations should they become required during fulfillment of mission objectives.

**Mission Point-of-Contact:** Primary liaison to client, and governing entity of the mission. Mission POC coordinates communications and personnel required to support the field deployment in conjunction with Field/Customer Support Operations. Mission POC authorization is required to affect mission objectives as well as manage any deviation requests subject to WGOC vetting for operational risk assessment.

**Data QC:** Ensures sensors and Wave Glider are properly integrated and operating consistent with mission objectives (prior to, and during field deployment).

**Field Operations Manager:** Coordinates and plans logistics of people, equipment, and vessels (responsibility may be fulfilled by Mission POC).

**Field Operations Engineer/Technician:** Personnel assigned to perform on-location work.

**Wave Glider Operations Center Manager:** Coordinates mission planning logistics, mission administration, and piloting operations of Wave Glider activities.

**Account Representative:** Provides project oversight ensuring mission plan aligns with client’s business needs.

**Wave Glider Operations/Customer Support Call Center:** Personnel assigned to perform shore-side piloting operations.

# Mission Plan

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Client Deliverables | | | | | | | | | |
| **Specific to LR SV3-1121**  **Sortie 1:** *See* [*Executive Summary*](#_Executive_Summary) *(Mission Description)*   * Objective: Remote data offloads from 90 bottom-mounted Vemco VR4 acoustic receivers located in the Gully MPA, Grand Banks of Newfoundland and Western Labrador Sea.   **Device configurations:** *see* [*Device Configurations / Duty Cycling Regime*](#_Device_Configurations_/)   * Specify data access required (fetch, server via SSH, WGMS)   + Fetch, WGMS, external data repositories.   + Data offloaded from VR4s to be transmitted to shore via RUDICS as power and time dictates.   **Professional Service:** Piloting services.  **Reports:** Client managed.  **Communications:**   * Mission plan deviations:   + To be submitted and approved by Mission POC after vetting by the WGOC for operational risk assessment (and corresponding mitigating factors if applicable). * Non-emergency:   + Drift or evasive navigation causing breach of and return to a defined survey area to be communicated to Mission POC immediately.   + Device duty-cycling in compliance with power management criteria and or Duty Cycling Regime to be communicated to and authorized by Mission POC. * Emergency:   + Core system and or device malfunctions to be communicated to Mission POC. * Escalation Interfaces:   **Mike Kelley**  **Mission POC**  **Mission Support Specialists**  **Wave Glider Operations Center**  **Management**  **Wave Glider Operations**  **Adam Comeau**  **Client POC**  **Sue L’Orsa, Tyler Byrne**  **Field Ops Tech** | | | | | | | | | |
| Operations Logistics | | | | | | | | | |
| **Project Code:** | TBD | | | | **LR Field Ops Req:** | | **Total days on location:** 0 days  **Total days underway:** 0 days | | |
| **Deployment Type:** | Client Mission | | | | **Schedule (dates):** | | 250604 - Mobilize, Underway, Deploy, Return to Port  251104 - Underway, Recover, Return to Port, Demobilize | | |
| **Vessel:** | Deployment: Dominion Bearcat  Recovery: Dominion Bearcat  **Chartered by:** Client managed | | | | **Client/**  **Vessel**  **Required Certs:** | | **Credentials required:** Client managed  \*In compliance with LRI guidelines (minimum HSSE and operating equipment standards) | | |
| **Port:** | Deployment: Halifax, NS  Recovery: Halifax, NS | | | |
| **Vehicle Preparation:** Client managed  **Freight Forwarding Logistics:** Client managed  **Pre-Launch Validation:** Core systems and subsystem verification (pre-launch checklist) submitted via Regulus Vehicle Webpage. *see* Appendix | | | | | | | | | |
| Vehicle Configuration & Operating System | | | | | | | | | |
| **Wave Glider Info:** | **Vehicle, Tracker**  SV3-1121, Tracker SN-1240 | | | | **WGMS Org:**  **Access:**  **WGMS, Dashboard Ready:** | | | otn.wgms.com  Submit request with user name, email, phone# (LR Acct. Rep. authorization required) to [opscenter@liquid-robotics.com](mailto:opscenter@liquid-robotics.com)  2025-06-02 | |
| **Float Devices:** | AIS, WSS, WX, Light, Xeos, GPS Waves, two (2) APU, 3MPU Payload, RUDICS, SeaBird GPCTD+DO | | | |
| **Sub Devices:** | Vemco VM4, MobileRx and VMT all mounted in/on towbody with L-Drop tow cable | | | |
| Navigational / Operational Tasking | | | | | | | | | |
| **Mission Description, Objectives, and Theater of Operations**:  **Sortie 1:** *See* [*Executive Summary*](#_Executive_Summary) *(Mission Description)*  **Course Architecture:**  **Task 1**: Deploy in vicinity of 44.520 °N, 63.44 °W (40m depth) followed by core system and device validations. (*see* [*Course Architecture*](#_Course_Architecture) *WP 1-5*)   * Specific navigational and operational interests to be conducted by Client POC (or WGOC upon direction from Client POC). * Following completion of task, make best speed to next task.   [yymmdd, hhmmz, lat/lon – task start]  [yymmdd, hhmmz, lat/lon – unplanned events: challenges; special discoveries; etc…]  [yymmdd, hhmmz, lat/lon – task end]    **Task 2**: Transit to Gully MPA and offload two receivers. (*see* [*Course Architecture*](#_Course_Architecture) *WP 5-15*)   * Specific navigational and operational interests to be conducted by Client POC (or WGOC upon direction from Client POC). * Small fishing vessels and large shipping traffic will likely be seen during transit. * Following completion of task, make best speed to next task.   [yymmdd, hhmmz, lat/lon – task start]  [yymmdd, hhmmz, lat/lon – unplanned events: challenges; special discoveries; etc…]  [yymmdd, hhmmz, lat/lon – task end]  **Task 3**: Transit to HaliBT east receiver line, offload six receivers (*see* [*Course Architecture*](#_Course_Architecture) *WP 15-21*)   * Specific navigational and operational interests to be conducted by Client POC (or WGOC upon direction from Client POC). * Small fishing vessels and large shipping traffic will likely be seen during transit. * Following completion of task, make best speed to next task.   [yymmdd, hhmmz, lat/lon – task start]  [yymmdd, hhmmz, lat/lon – unplanned events: challenges; special discoveries; etc…]  [yymmdd, hhmmz, lat/lon – task end]  **Task 4**: Transit to HaliBT west receiver line, offload seven receivers. (*see* [*Course Architecture*](#_Course_Architecture) *WP 21-24*)   * Specific navigational and operational interests to be conducted by Client POC (or WGOC upon direction from Client POC). * Small fishing vessels and large shipping traffic will likely be seen during transit. * Following completion of task, make best speed to next task.   [yymmdd, hhmmz, lat/lon – task start]  [yymmdd, hhmmz, lat/lon – unplanned events: challenges; special discoveries; etc…]  [yymmdd, hhmmz, lat/lon – task end]  **Task 5**: Return transit to HaliBT east receiver line. (*see* [*Course Architecture*](#_Course_Architecture) *WP 24-26*)   * Specific navigational and operational interests to be conducted by Client POC (or WGOC upon direction from Client POC). * Small fishing vessels and large shipping traffic will likely be seen during transit. * Review iceberg status off Newfoundland and Labrador. If clear, make best speed to next task.   [yymmdd, hhmmz, lat/lon – task start]  [yymmdd, hhmmz, lat/lon – unplanned events: challenges; special discoveries; etc…]  [yymmdd, hhmmz, lat/lon – task end]  **Task 6**: Transit to start of NCAT offload. (*see* [*Course Architecture*](#_Course_Architecture) *WP 26-28*)   * Specific navigational and operational interests to be conducted by Client POC (or WGOC upon direction from Client POC). * Large shipping traffic will likely be seen during transit. * Following completion of task, make best speed to next task.   [yymmdd, hhmmz, lat/lon – task start]  [yymmdd, hhmmz, lat/lon – unplanned events: challenges; special discoveries; etc…]  [yymmdd, hhmmz, lat/lon – task end]  **Task 7**: Offload 75 VR4 receivers of NCAT. Receivers split into 18 “gates”. (*see* [*Course Architecture*](#_Course_Architecture) *WP 28-106*)   * Specific navigational and operational interests to be conducted by Client POC/MOS. * Following completion of task, make best speed to next task.   [yymmdd, hhmmz, lat/lon – task start]  [yymmdd, hhmmz, lat/lon – unplanned events: challenges; special discoveries; etc…]  [yymmdd, hhmmz, lat/lon – task end]  **Task 8:** Transit to Banquereau Bank (*see* [*Course Architecture*](#_Course_Architecture_1)*WP 106-113*):   * Specific navigational and operational interests to be conducted by Client POC (or WGOC upon direction from Client POC). * Large shipping traffic will likely be seen during transit. * Following completion of task, make best speed to next task.   [yymmdd, hhmmz, lat/lon – task start]  [yymmdd, hhmmz, lat/lon – unplanned events: challenges; special discoveries; etc…]  [yymmdd, hhmmz, lat/lon – task end]  **Task 9**: Banquereau Bank Offshore Wind survey TBD. (*see* [*Course Architecture*](#_Course_Architecture) *WP TBD*)   * Specific navigational and operational interests to be conducted by Client POC (or WGOC upon direction from Client POC). * Following completion of task, make best speed to next task.   [yymmdd, hhmmz, lat/lon – task start]  [yymmdd, hhmmz, lat/lon – unplanned events: challenges; special discoveries; etc…]  [yymmdd, hhmmz, lat/lon – task end]  **Task 10:** Transit to Halifax Harbour for recovery (*see* [*Course Architecture*](#_Course_Architecture_1)*WP TBD*):   * Specific navigational and operational interests to be conducted by Client POC (or WGOC upon direction from Client POC). * Small fishing vessels and large shipping traffic will likely be seen during transit to recovery location. Will need to observe and adjust course as necessary. * Recover in vicinity of 44.520 °N, 63.44 °W   [yymmdd, hhmmz, lat/lon – task start]  [yymmdd, hhmmz, lat/lon – unplanned events: challenges; special discoveries; etc…]  [yymmdd, hhmmz, lat/lon – task end] | | | | | | | | | |
| Piloting Tasks | | | | | | | | | |
| **Observations:** | | **Probable Response:** | | | | | | | **When to Escalate:** |
| Events | | * **Navigate** (threat evasion; drift management) * **Observe power management criteria** * **Take corrective action** * **Record accordingly** | | | | | | | • Unsafe operation conditions • Mission deviation required |
| Power Management | | SV3 criteria (minimum safe operations for 72 hrs. of diminished solar insolation):   * **Light**: Launch/recover/threat evasion use only * *Night use requires local authority authorization* * **Telemetry**: 5min nominal; 10-15min (400Wh auto) * *Consider glider position (AIS notification diminished at TRR >5min)* * **Water Speed Sensor**: <500Wh, use as needed * **WX:** Duty cycle at 400Wh, off at <200Wh (use as needed for alternate GPS) * **Payloads**: Duty cycle at 400Wh (off at <200Wh)   + *G1 (GPSWaves, GPCTD+DO, VemcoVM4, RUDICS)*   + *T1 (VemcoVM4, MobileRx)* * **AIS**: Off at 200Wh   + *Consider glider position (no vessel awareness aides, and risk of power loss)* * **Move to Safe Harbor**: At 100Wh * **Power Restoration**: In reverse order +25Wh   + *Increase thresholds by 100Wh when entering periods of deteriorating weather forecasts* | | | | | | | • Notify Program Manager if total available power reaches 500Wh  • If course change required |
| Device Configurations / Duty Cycling Regime | | | | | | | | | |
| **Instrument (SV3 v300)** | | | **Data Rate** | **Effective**  **Duty Cycle** | | **Notes** | | | |
| AIS Receiver | | | Continuous | 100% | | Data acquisition reported at same interval as telemetry rate (assumes 5 min telemetry). | | | |
| Water Speed Sensor | | | Continuous | 100% | | Measurement reported at same interval as telemetry rate (assumes 5 min telemetry). | | | |
| Weather Station  Airmar 200WX | | | 1 ensemble/ 10 min. | 100% | | 600 1Hz samples averaged into one data value and reported every 10 minutes. | | | |
| Cell Modem | | | Continuous | 100% | | When available | | | |
| SMC/3MPU Payload (G1) | | | Continuous | 100% | |  | | | |
| (G1) GPSWaves | | | 1 ensemble/30 min. | 100% | |  | | | |
| (G1/T1) Vemco VM4 | | | Continuous | 100% | | Required for station data offloads. | | | |
| (G1) GPCTD+DO | | | 10 ensembles/ 60 min. | 2.8% | | 10 1Hz samples averaged into one data value and reported every 60 minutes. | | | |
| Visibility Light | | | Off | As needed | |  | | | |
| RUDICS | | | Continuous | 100% | |  | | | |
| (G2) APU | | | NA | NA | |  | | | |
| (G3) APU | | | NA | NA | |  | | | |

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| Course Architecture |
| **Overall Operating Area:**  **A map of the world  AI-generated content may be incorrect.**  **Task 1: Deploy**  A map of the ocean  AI-generated content may be incorrect.  Task 1: Deploy SV3-1121 outside of Halifax Harbour and perform system/nav checks  **Task 2: Transit and offload GULMPA**  A map with red lines and black text  AI-generated content may be incorrect.  Task 2: Transit to Gully MPA, offload two stations, 192nm  **Task 3: Transit and offload HaliBT E**  A map with red lines and black lines  AI-generated content may be incorrect.  Task 3: Transit to HaliBT east and offload six stations, 333nm  **Task 4: Transit and offload HaliBT W**  A map of fishing route  AI-generated content may be incorrect.  Task 4: Transit from HaliBT E to HaliBT W and offload seven stations, 158nm  **Task 5: Transit and check ice for NCAT**  **A map of a fishing area  AI-generated content may be incorrect.**  Task 5: Return transit from HaliBT W to HaliBT E, 155nm  **Task 6: Transit**    Task 6: Transit to NCAT  **Task 7: Offload NCAT**    Task 7: Offload 75 VR4 receivers split into 18 “gates, 880nm  **Task 8: Transit**  **A map of the north america  AI-generated content may be incorrect.**  Task 8: Transit from NCAT to Banquereau Bank, 540nm  **Task 9: Survey**  A map of a town  AI-generated content may be incorrect.  Task 9: Survey Banquereau Bank OSW TBD, 30 days  **Task 10: Transit and recover**  A map with red and black points  AI-generated content may be incorrect.  Task 10: Transit to Halifax Harbour for recovery, 215nm |

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| Emergency Equipment Retrieval | | |
| If escalation warrants emergency retrieval of a Wave Glider, local authorities are notified and Marine Operations is engaged to coordinate search and recovery operations. Logistics include: last know disposition for shipping crates; WG cart/stand/saddle; Ops kit (specifically recovery tool, bundling/release straps, sea-catch, and tagline carabineers); and vessel/crew of opportunity contracting/vetting. | | |
| Authorizations | | |
| **Client POC:** Sue L’Orsa/Tyler Byrne/Adam Comeau  **Mission POC:** Mike Kelley  **Account Representative:** Jimmy Board | **Dir., WGOC:** Mike Kelley  **VP, Field Operations:** Lorraine Day | |

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# Appendix

## [Operational Risk Assessment](https://liquidr.box.com/s/9r59bqpn31ybxzkybiav)

## [Evidence of Communications with Local Authorities & Permitting](https://liquidr.box.com/s/mu86d9de9b2ei10zoxk2)

## [Vehicle Pre-launch Validation and Detailed Vehicle Parameters](https://liquidr.box.com/s/edrjspcz032s57cj5o7d)

|  |
| --- |
| Mission Debrief |
| **Satisfaction of deliverables (results/details)**  **Client Perception**  **Budget vs. actual**  **Recognition**  **Continuous Improvement Initiatives**   * 1. **Opportunities**      1. **Plan to leverage successes**      2. **Plan to address issues** |